

JACKPAC® (IP67)

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The Concept

The IP20 Solution

Until now, all signal conditioning tasks were carried out by modules designed to IP20. For their own protection, these need to be installed in central switchgear cabinets.

However, decentralised solutions that do not require large switchgear cabinets are increasingly being sought for use in modern-day industrial automation technology.

It is true that shielded signals can be fed to the machinery via powerful fieldbus systems; but in each case, however, there remains an interconnecting cable between the subdistribution boards and the sensors/actuators that is susceptible to interference from surrounding operations.

As has always been the case, signals are still influenced by over-voltages and earth loops; interference pulses are superimposed on sensor signals and malfunctions can be initiated.

The result is that signal conditioning modules sealed to IP20 require terminal boxes, such as switchgear cabinets, or even cost-intensive special solutions (for example, sensor-actuator distributors with integrated signal-conditioning functions providing as many functionalities as possible, even when these are surplus to requirements).

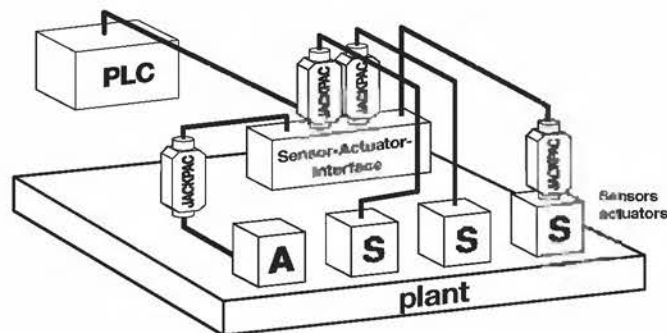
The JACKPAC® Solution

By introducing **JACKPAC®**, the new M12 Signal Box with the high IP67 ingress protection. Weidmüller can now provide a modular and versatile concept that makes it possible to condition signals in an industrial environment. Requiring no additional enclosure, these modules can be installed directly on the machine, in the production plant, conveyor system or within a process.

The M12 connector, which is standardised all over the world, makes it possible to integrate the **JACKPAC®** at any point in the sensor-actuator cabling. The fixed pin assignment means it is easy to install and is protected against polarity reversal.

This versatility really comes into its own when an installation needs to be altered or modernised, simply because no additional enclosures or cabling are required.

By providing this high degree of protection and versatility, **JACKPAC®** renders possible innovative automation concepts based on decentralised applications – without large control cabinets or small distribution boards – for consistent, transparent, efficient and cost-efficient installations.



- Easy 'Plug and Play' installation
- Universal and versatile usage
- No additional enclosure required
- Saves time and costs
- Ideal for decentralised concepts and plant modernisation (retrofitting)

Switching amplifier

The switching amplifiers are simply integrated into the control line of the actuator.

It is therefore possible to, for example, amplify switched outputs with 24 V DC/0.5 A to 24 V DC/2 A.

The switching amplifier with electrical isolation simultaneously isolates the input and output circuits. This prevents feedback from the actuator to the sensitive switched output of the I/O module. The switching voltage at the output is fed via a T-distributor.

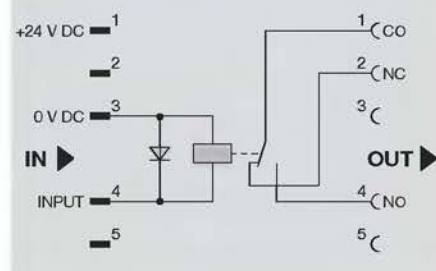
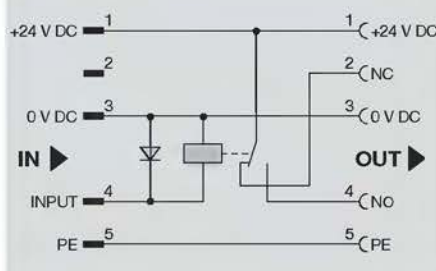
JPR 24 V DC 1CO M12

without isolation



JPR 24 V DC ISO 1CO M12

with electrical isolation



Technical data

Input	
Rated voltage	24 V DC ±20 %
Rated current DC	8 mA
Power rating	200 mW
DC Response/dropout Volt	16,8 V / 1,2 V
Pick-up/drop-out current, DC coil	5 mA / 1 mA
Free-wheel diode	Yes
Output	
max. switching power	24 V / 2 A
min. switching power	12 V / 10 mA
Contact base material	AgSnO
Mechanical endurance	10 ⁷ switching cycles
max. switching frequency at rated load	0,1 Hz
Response time / Drop-out time	approx. 5 ms
Insulation coordination	
Rated voltage	300 V
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	no
General data	
Operating temperature	-25 °C...+70 °C
Storage temperature	-25°C...+70°C
Connection system	M12 - plug/socket, A-coded
Approvals	CE, ULus
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
Details for TU = 20°C	

Input	
Rated voltage	24 V DC ±20 %
Rated current DC	8 mA
Power rating	200 mW
DC Response/dropout Volt	16,8 V / 1,2 V
Pick-up/drop-out current, DC coil	5 mA / 1 mA
Free-wheel diode	Yes
Output	
max. switching power	24 V / 2 A
min. switching power	12 V / 10 mA
Contact base material	AgSnO
Mechanical endurance	10 ⁷ switching cycles
max. switching frequency at rated load	0,1 Hz
Response time / Drop-out time	approx. 5 ms
Insulation coordination	
Rated voltage	300 V
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes
General data	
Operating temperature	-25 °C...+70 °C
Storage temperature	-25°C...+70°C
Connection system	M12 - plug/socket, A-coded
Approvals	CE, ULus
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
Details for TU = 20°C	

Input	
Rated voltage	24 V DC ±20 %
Rated current DC	8 mA
Power rating	200 mW
DC Response/dropout Volt	16,8 V / 1,2 V
Pick-up/drop-out current, DC coil	5 mA / 1 mA
Free-wheel diode	Yes
Output	
max. switching power	24 V / 2 A
min. switching power	12 V / 10 mA
Contact base material	AgSnO
Mechanical endurance	10 ⁷ switching cycles
max. switching frequency at rated load	0,1 Hz
Response time / Drop-out time	approx. 5 ms
Insulation coordination	
Rated voltage	300 V
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes
General data	
Operating temperature	-25 °C...+70 °C
Storage temperature	-25°C...+70°C
Connection system	M12 - plug/socket, A-coded
Approvals	CE, ULus
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
Details for TU = 20°C	

Ordering data

Type	Qty.	Order No.
JPR 24VDC 1CO M12	1	8771420000

Type	Qty.	Order No.
JPR 24VDC ISO 1CO M12	1	8771430000

Type	Qty.	Order No.
JPR 24VDC ISO 1CO M12	1	8771430000

Note

Accessories

Note	Refering clip: JP-CLIP-M 8778190000
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Note	Refering clip: JP-CLIP-M 8778190000
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Note	Refering clip: JP-CLIP-M 8778190000
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JACKPAC® timer

Timing relay

Malfunctions in automated systems are becoming ever more common because the ever higher clock rates mean that the sensors are no longer damped for a sufficient time in order to supply pulses that can be processed reliably by the control modules. Pulse stretchers are simply included in the lines between sensors and input modules and lengthen pulses from min. 1 ms to 50 or 100 ms. This enables even short sensor signals to be detected and evaluated reliably by the control.

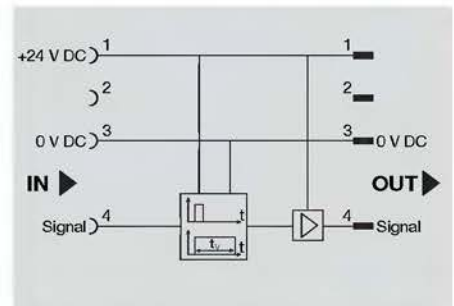
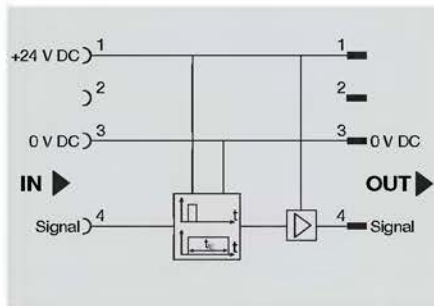
JPTA 50 ms 24 V DC PNP M12

Pulse stretching, 50 ms



JPTA 100 ms 24 V DC PNP M12

Pulse stretching, 100 ms



Technical data

Input

Rated voltage
Rated current DC
Switch-off delay

Output

max. switching voltage DC
max. switching current

Insulation coordination (EN 50178)

Rated voltage
Impulse withstand voltage
Overvoltage category
Pollution severity

General data

Operating temperature
Storage temperature
Connection system
Approvals

18...24...30 V DC
3,5...7,0...10,0 mA
50 ms

30 V
400

32 V
330 V
I
2

0 °C...+60 °C
-20 °C...+85 °C
M12 - plug/socket, A-coded
CE, dULus

18...24...30 V DC
3,5...7,0...10,0 mA
100 ms

30 V
400

32 V
330 V
I
2

0 °C...+60 °C
-20 °C...+85 °C
M12 - plug/socket, A-coded
CE, dULus

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

83 x 36 x 14,4

83 x 36 x 14,4

Ordering data

Type	Qty.	Order No.
JPTA 50MS 24VDC PNP M12	1	8771440000

Type	Qty.	Order No.
JPTA 100MS 24VDC PNP M12	1	8836630000

Note

Accessories

Note

Retaining clip
JP CLIP M 8778490000

Retaining clip
JP CLIP M 8778490000

1-stage overvoltage protection

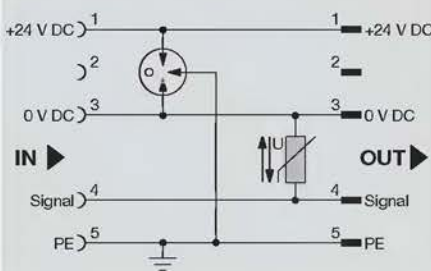
The overvoltage protection is plugged in to protect the sensitive electronics in the signalling circuit.

The suppression circuit with varistor suppresses the induced voltage in solenoid valves.

The PE connection leaves the housing via a separate line. The green/yellow earthing cable must be connected to the system east to ensure reliable discharge of interference pulses.

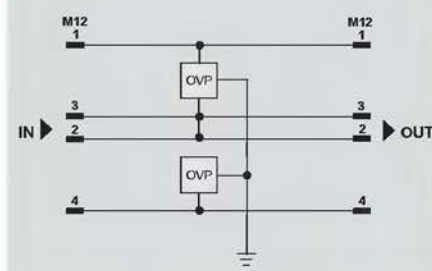
JPOVP 24 V DC MOV M12

Suppression circuit with diode



JPOVP Cat.5 M12

Ethernet Cat.5



Technical data

Technical data

Rated voltage
Operating voltage (DC), max.
Rated discharge current per path (8/20 µs)
Total discharge current, max. (8/20 µs)
DC response voltage
Attenuation
Response time
Rated current
Protection level, signal line, wire to wire/PE
Protection level, supply, wire to wire/PE
Leakage current at U_n

General data

Operating temperature
Overvoltage category
Pollution severity
Type of connection
Approvals

24 V DC
28 V
5,00 kA
10 kA
90 V
-
≤ 25 ns
2,00 A
230 V/230 V
85 V/85 V
1,00 µA

-25°C ... 60°C
II
2
M12 - plug/socket, A-coded
CE

30 V AC/DC
30 V
5,00 kA
10 kA
230 V
< 0,3 dB at 250 Hz
≤ 5 ns
0,20 A
130 V/600 V
80 V/300 V

-25°C ... 60°C
III
2
to IEC 61076-2-101-A4; M12 - plug/plug, D-coded
CE

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

83 x 36 x 14,4

57 x 36 x 14,4

Each cable 1,5 m long

Ordering data

Type	Qty.	Order No.
JPOVP 24VDC MOV M12	1	8760960000

Type	Qty.	Order No.
JPOVP M12 D-coded Cat5	1	8805570000

Note

Accessories

Note

Retaining clip
JP-CLIP M 8778490000

Retaining clip
JP-CLIP M 8778490000

1-stage overvoltage protection

Jackpac OVP terminal equipment against the overvoltages that can occur as a result of atmospheric discharges or storms. This type of protection in the form of an adapter is available in IP20 and IP67 versions and complies with the requirements of class III to IEC 61643-21.

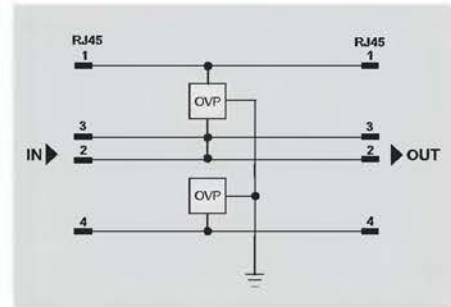
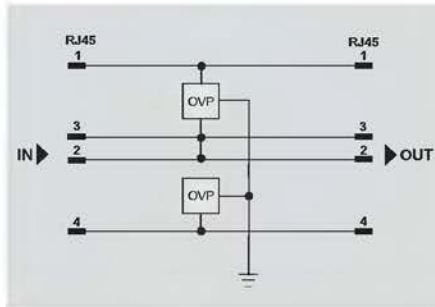
JPOVP Cat.6 IP20

Ethernet Cat.6



JPOVP Cat.6 IP67

Ethernet Cat.6



Technical data

Technical data

Rated voltage
 Operating voltage (DC), max.
 Rated discharge current per path (8/20 µs)
 Total discharge current, max. (8/20 µs)
 DC response voltage
 Attenuation
 Response time
 Rated current
 Protection level, signal line, wire to wire/PE
 Protection level, supply, wire to wire/PE
 Leakage current at U_n

34 V AC / 48 V DC
 48 V
 5,00 kA
 10 kA
 230 V
 < 0,3 dB at 250 Hz
 ≤ 5 ns
 0,20 A
 130 V/600 V
 80 V/300 V

34 V AC / 48 V DC
 48 V
 5,00 kA
 10 kA
 230 V
 < 0,3 dB at 250 Hz
 ≤ 5 ns
 0,20 A
 130 V/600 V
 80 V/300 V

General data

Operating temperature
 Overvoltage category
 Pollution severity
 Type of connection
 Approvals

-25°C ... 60°C
 III
 2
 RJ45 plug, IP20
 CE

-25°C ... 60°C
 III
 2
 RJ45 plug, IP67
 CE

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

53 x 36 x 14,4

53 x 36 x 14,4

Note

each with 1,5 m cable

each with 1 m cable and IP67 cable gland

Ordering data

Type	Qty.	Order No.
JPOVP RJ45 Cat6 IP20	1	8805550000

Type	Qty.	Order No.
JPOVP RJ45 Cat6 IP67	1	8805560000

Note

Accessories

Note

Retaining clip
 JP CLIP M 8778490000

Retaining clip
 JP CLIP M 8778490000

3-stage protection

With gas discharge tube, varistor and suppression diode.

For protecting binary switching signals up to 24 V, or for analogue measuring circuits with 0...20 mA or 0...10 V.

The PE connection leaves the housing via a separate line. The green/yellow cable must be securely connected to the systems earth to ensure reliable discharging of interference pulses.

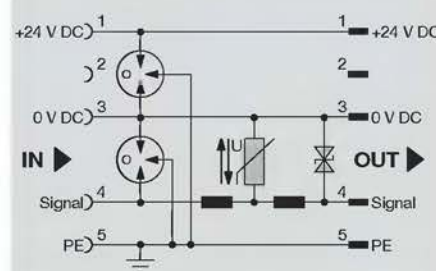
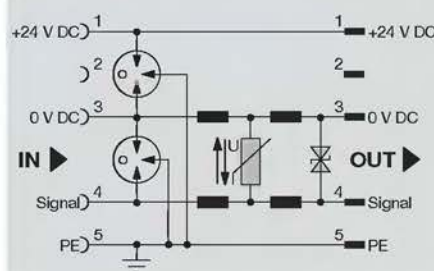
JPOVP 24 V DC ANA M12

for analogue signals



JPOVP 24 V DC BIN M12

for digital signals



Technical data

Technical data	
Rated voltage	24 V DC
Operating voltage (DC), max.	28 V
Rated discharge current per path (8/20 µs)	5.00 kA
Total discharge current, max. (8/20 µs)	10 kA
DC response voltage	90 V
Varistor	30 V
Suppression diodes	yes
Response time	≤ 100 ps
Rated current	2.00 A
Protection level, signal line, wire to wire/PE	45 V/65 V
Protection level, supply, wire to wire/PE	85 V/85 V
Leakage current at U _n	1.00 µA

General data	
Operating temperature	-25°C ... 60°C
Overvoltage category	II
Pollution severity	2
Type of connection	M12 - plug/socket, A-coded
Approvals	CE

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note	

Ordering data

Type	Qty.	Order No.
JPOVP 24VDC ANA M12	1	8760970000

Note	

Accessories

Note	
Retaining clip: JP-CLIP M 8778490000	

24 V DC
28 V
5.00 kA
10 kA
90 V
30 V
yes
≤ 100 ps
2.00 A
45 V/65 V
85 V/85 V
1.00 µA

-25°C ... 60°C
II
2
M12 - plug/socket, A-coded
CE

83 x 36 x 14.4

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Type	Qty.	Order No.
JPOVP 24VDC ANA M12	1	8760970000

Note	

Retaining clip: JP-CLIP M 8778490000

24 V DC
28 V
5.00 kA
10 kA
90 V
30 V
yes
≤ 100 ps
2.00 A
45 V/65 V
85 V/85 V
1.00 µA

-25°C ... 60°C
II
2
M12 - plug/socket, A-coded
CE

83 x 36 x 14.4

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Type	Qty.	Order No.
JPOVP 24VDC BIN M12	1	8760960000

Note	

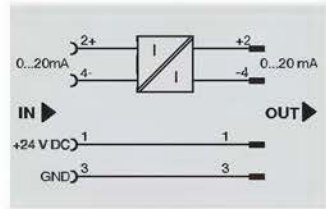
Retaining clip: JP-CLIP M 8778490000

DC/DC passive signal isolators

0(4)...20 mA / 0(4)...20 mA

2-way separation

Passive isolators are used for the electrical isolation of standard signals 0(4)...20 mA / 0...10 V. The modules fed from the input side draw the energy they need for signal transmission and power supply from the active input circuit. A stable current signal for control purposes is available on the output side.



Technical data

Input

Input capacitance
Input voltage
Input current
Input resistance, voltage
Input resistance, current

approx. 1 nF
-
0(4)...20 mA
-
≤ 0.1 V at 20 mA (with open current output or mains failure approx. 350 mV)
< 100 mA

Overload protection

Output

Output current
Output voltage
Chopper frequency
Accuracy

0...20 mA (max. 12 V)
-
approx. 100 kHz
< 0.1% of upper limit and < 0.02% of measured value/100Ω load
≥ 100 Hz

Cut-off frequency (-3dB)

Load impedance, voltage

Load impedance, current

Offset current/Offset voltage

Residual ripple

Temperature coefficient

-
≤ 600 Ω
< 20 μA/
< 10 mV_{rms}
≤ 100 ppm/K of final value

Insulation coordination

EMC standards

Test voltage

Ingress protection class

Pollution severity

Overvoltage category

DIN EN 61326
510 V @ 50 Hz
IP 68
3
II

General data

Supply voltage

Type of connection

Operating temperature

Storage temperature

Approvals

24 V DC ± 15 %
M12 - plug/socket, A-coded
-10 °C...+70 °C
-40 °C...+85 °C
CE, cULFus

Dimensions

Clamping range (rating- / min. / max.) mm²

Length x width x height mm

83 x 36 x 14.4

Note

Ordering data

Type	(Qty.=1)	Order No.
JPA CCC LP M12		8778790000

Note

Accessories

Note

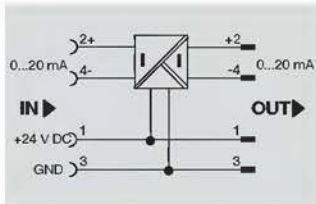
Retaining clip: JPA-CP M 8778490000

DC/DC active signal isolators

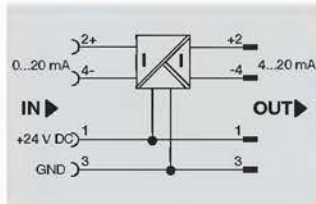
3-way separation

The new active signal isolator/ converter for electrical isolation of standard signals 0/4...20 mA, bzw. 0...10 V is used for opening earth loops and for eliminating interference variables from the input side. Input and output are supplied with the necessary auxiliary power via the electrically isolated auxiliary voltage supply.

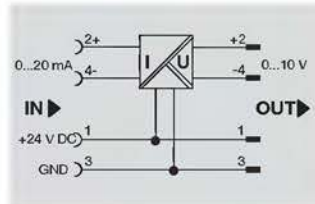
0-20 mA / 0-20 mA



0-20 mA / 4-20 mA



0-20 mA / 0-10 V



Technical data

Input	
Input capacitance	
Input voltage	
Input current	
Input resistance, voltage	
Input resistance, current	
Overload protection	
Output	
Output current	
Output voltage	
Chopper frequency	
Accuracy	
Cut-off frequency (-3dB)	
Load impedance, voltage	
Load impedance, current	
Offset current/Offset voltage	
Residual ripple	
Temperature coefficient	
Insulation coordination	
EMC standards	
Test voltage	
Ingress protection class	
Pollution severity	
Overvoltage category	
General data	
Supply voltage	
Type of connection	
Operating temperature	
Storage temperature	
Approvals	

approx. 1 nF
-
0...20 mA
-
≤ 0.1 V at 20 mA (with open current output or mains failure approx. 350 mV)
< 100 mA
0...20 mA
-
approx. 100 kHz
< 0.2% of final value
≥ 100 Hz
-
≤ 500 Ω @ 20 mA
< 20 µA
< 10 mV _{rms}
≤ 100 ppm/K of final value
DIN EN 61326
510 V @ 50 Hz
IP 68
3
II
24 V DC ± 15% / 0,6 W
M12 - plug/socket, A-coded
-10 °C...+70 °C
-40 °C...+85 °C
CE, dUFus

approx. 1 nF
-
0...20 mA
-
≤ 0.1 V at 20 mA (with open current output or mains failure approx. 350 mV)
< 100 mA
4...20 mA
-
approx. 100 kHz
< 0.2% of final value
≥ 100 Hz
-
≤ 500 Ω @ 20 mA
< 20 µA
< 10 mV _{rms}
≤ 100 ppm/K of final value
DIN EN 61326
510 V @ 50 Hz
IP 68
3
II
24 V DC ± 15% / 0,6 W
M12 - plug/socket, A-coded
-10 °C...+70 °C
-40 °C...+85 °C
CE, dUFus

approx. 1 nF
-
0...20 mA
-
≤ 0.1 V at 20 mA (with open current output or mains failure approx. 350 mV)
< 100 mA
0...10 V
-
approx. 100 kHz
< 0.3% of measuring range
≥ 100 Hz
≥ 10 kΩ @ 10 V
-
< 10 mV
< 10 mV _{rms}
≤ 100 ppm/K of final value
DIN EN 61326
510 V @ 50 Hz
IP 68
3
II
24 V DC ± 15% / 0,6 W
M12 - plug/socket, A-coded
-10 °C...+70 °C
-40 °C...+85 °C
CE, dUFus

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

83 x 36 x 14,4

83 x 36 x 14,4

83 x 36 x 14,4

Ordering data

Note		
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Type	(Qty.=1)	Order No.
JPA CCC DC 0-20/0-20MA		8828960000

Type	(Qty.=1)	Order No.
JPA CCC DC 0-20/4-20MA		8833440000

Type	(Qty.=1)	Order No.
JPA CVG DC 0-20MA/0-10V		8833380000

Accessories	
Note	

Retaining clip JP-Clip M 87849000

Retaining clip JP-Clip M 87849000

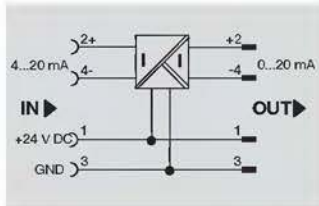
Retaining clip JP-Clip M 87849000

DC/DC active signal isolators

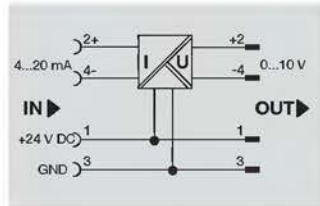
3-way separation

The new active signal isolator/ converter for electrical isolation of standard signals 0/4...20 mA, bzw. 0...10 V is used for opening earth loops and for eliminating interference variables from the input side. Input and output are supplied with the necessary auxiliary power via the electrically isolated auxiliary voltage supply.

4-20 mA / 0-20 mA



4-20 mA / 0-10 V



Technical data

Input

Input capacitance
Input voltage
Input current
Input resistance, voltage
Input resistance, current

Overload protection

Output

Output current
Output voltage
Chopper frequency
Accuracy
Cut-off frequency (-3dB)
Load impedance, voltage
Load impedance, current
Offset current/Offset voltage
Residual ripple
Temperature coefficient

Insulation coordination

EMC standards
Test voltage
Ingress protection class
Pollution severity
Overvoltage category

General data

Supply voltage
Type of connection
Operating temperature
Storage temperature
Approvals

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Ordering data

Note

Accessories

Note

approx. 1 nF
-
4...20 mA
-
≤ 0.1 V at 20 mA (with open current output or mains failure approx. 350 mV)
< 100 mA
0...20 mA
-
approx. 100 kHz
< 0.2% of final value
≥ 100 Hz
-
≤ 500 Ω @ 20 mA
< 20 μV
< 10 mV _{rms}
≤ 100 ppm/K of final value
DIN EN 61326
510 V @ 50 Hz
IP 68
3
II
24 V DC ± 15 % / 0,6 W
M12 - plug/socket, A-coded
-10 °C...+70 °C
-40 °C...+85 °C
CE, dUFus

83 x 36 x 14.4

Type	(Qty.=1)	Order No.
JPA CCC DC 4-20/0-20MA		8833390000

Retaining clip JP-clip M 8x784905/00

approx. 1 nF
-
4...20 mA
-
≤ 0.1 V at 20 mA (with open current output or mains failure approx. 350 mV)
< 100 mA
0...10 V
-
approx. 100 kHz
< 0.3% of measuring range
≥ 100 Hz
-
≤ 10 kΩ @ 10 V
< 10 mV
< 10 mV _{rms}
≤ 100 ppm/K of final value
DIN EN 61326
510 V @ 50 Hz
IP 68
3
II
24 V DC ± 15 % / 0,6 W
M12 - plug/socket, A-coded
-10 °C...+70 °C
-40 °C...+85 °C
CE, dUFus

83 x 36 x 14.4

Type	(Qty.=1)	Order No.
JPA CVG DC 4-20MA/0-10V		8833400000

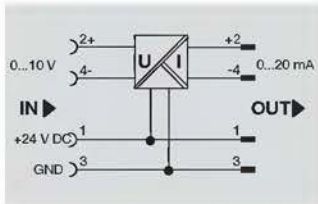
Retaining clip JP-clip M 8x784905/00

DC/DC active signal isolators

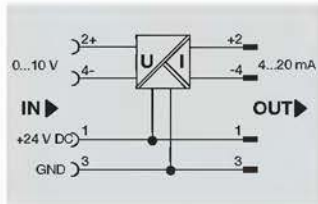
3-way separation

The new active signal isolator/ converter for electrical isolation of standard signals 0/4...20 mA, bzw. 0...10 V is used for opening earth loops and for eliminating interference variables from the input side. Input and output are supplied with the necessary auxiliary power via the electrically isolated auxiliary voltage supply.

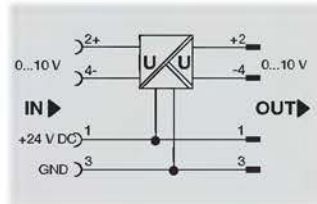
0-10 V / 0-20 mA



0-10 V / 4-20 mA



0-10 V / 0-10 V



Technical data

Input	
Input capacitance	approx. 1 nF
Input voltage	0...10 V
Input current	-
Input resistance, voltage	100 kΩ
Input resistance, current	-
Overload protection	Suppression diodes
Output	
Output current	0...20 mA
Output voltage	-
Chopper frequency	approx. 100 kHz
Accuracy	< 0.3% of measuring range
Cut-off frequency (-3dB)	≥ 100 Hz
Load impedance, voltage	-
Load impedance, current	≤ 500 Ω @ 20 mA
Offset current/Offset voltage	< 20 μA/
Residual ripple	< 10 mV _{rms}
Temperature coefficient	≤ 100 ppm/K of final value
Insulation coordination	
EMC standards	DIN EN 61326
Test voltage	510 V @ 50 Hz
Ingress protection class	IP 68
Pollution severity	3
Overvoltage category	II
General data	
Supply voltage	24 V DC ± 15 % / 0,6 W
Type of connection	M12 - plug/socket, A-coded
Operating temperature	-10 °C...+70 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE, cULFus

Input capacitance	approx. 1 nF
Input voltage	0...10 V
Input current	-
Input resistance, voltage	100 kΩ
Input resistance, current	-
Overload protection	Suppression diodes
Output current	4...20 mA
Output voltage	-
Chopper frequency	approx. 100 kHz
Accuracy	< 0.3% of measuring range
Cut-off frequency (-3dB)	≥ 100 Hz
Load impedance, voltage	-
Load impedance, current	≤ 500 Ω @ 20 mA
Offset current/Offset voltage	< 20 μA/
Residual ripple	< 10 mV _{rms}
Temperature coefficient	≤ 100 ppm/K of final value
EMC standards	DIN EN 61326
Test voltage	510 V @ 50 Hz
Ingress protection class	IP 68
Pollution severity	3
Overvoltage category	II
Supply voltage	24 V DC ± 15 % / 0,6 W
Type of connection	M12 - plug/socket, A-coded
Operating temperature	-10 °C...+70 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE, cULFus

Input capacitance	approx. 1 nF
Input voltage	0...10 V
Input current	-
Input resistance, voltage	100 kΩ
Input resistance, current	-
Overload protection	Suppression diodes
Output current	0...10 V
Output voltage	approx. 100 kHz
Chopper frequency	< 0.3% of measuring range
Accuracy	< 0.3% of measuring range
Cut-off frequency (-3dB)	≥ 100 Hz
Load impedance, voltage	≥ 10 kΩ @ 10 V
Load impedance, current	-
Offset current/Offset voltage	< 10 mV
Residual ripple	< 10 mV _{rms}
Temperature coefficient	≤ 100 ppm/K of final value
EMC standards	DIN EN 61326
Test voltage	510 V @ 50 Hz
Ingress protection class	IP 68
Pollution severity	3
Overvoltage category	II
Supply voltage	24 V DC ± 15 % / 0,6 W
Type of connection	M12 - plug/socket, A-coded
Operating temperature	-10 °C...+70 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE, cULFus

Input capacitance	approx. 1 nF
Input voltage	0...10 V
Input current	-
Input resistance, voltage	100 kΩ
Input resistance, current	-
Overload protection	Suppression diodes
Output current	0...10 V
Output voltage	approx. 100 kHz
Chopper frequency	< 0.3% of measuring range
Accuracy	< 0.3% of measuring range
Cut-off frequency (-3dB)	≥ 100 Hz
Load impedance, voltage	≥ 10 kΩ @ 10 V
Load impedance, current	-
Offset current/Offset voltage	< 10 mV
Residual ripple	< 10 mV _{rms}
Temperature coefficient	≤ 100 ppm/K of final value
EMC standards	DIN EN 61326
Test voltage	510 V @ 50 Hz
Ingress protection class	IP 68
Pollution severity	3
Overvoltage category	II
Supply voltage	24 V DC ± 15 % / 0,6 W
Type of connection	M12 - plug/socket, A-coded
Operating temperature	-10 °C...+70 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE, cULFus

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Ordering data

Type	(Qty.=1)	Order No.
JPA VCC DC 0-10V/0-20MA		8833410000

Type	(Qty.=1)	Order No.
JPA VCC DC 0-10V/4-20MA		8833420000

Type	(Qty.=1)	Order No.
JPA VCC DC 0-10V/0-10V		8833430000

Type	(Qty.=1)	Order No.
JPA VCC DC 0-10V/0-10V		8833430000

Note

Note

Note

Note

Accessories

Note

Retaining clip JP-clip Id: 87849000

Retaining clip JP-clip Id: 87849000

Retaining clip JP-clip Id: 87849000

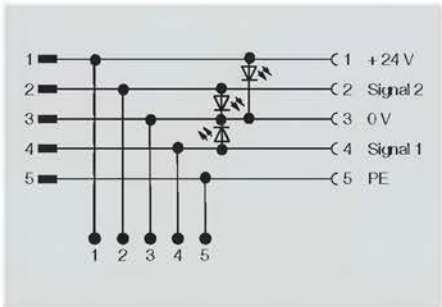
JACKPAC® test

Test adapter

The new JACKPAC® test adapter now provides a simple way of intervening in the M12 network. It can be integrated at any point and enables quick and easy connection of a testing device via the 5 push-in connections. Status indicators show the status of the 2 signal channels as well as the 24 V DC auxiliary voltage.

JP Test

with status indication



Technical data

Input

Rated voltage
Rated current DC
Status indicator

18...24...30 V DC
2,2mA (LED)
green LED

Output

Continuous current
Power

2 A
2,2 mA at 24 V

General data

Operating temperature
Storage temperature
Connection system

0 °C...+55 °C
-25°C...+70°C
M12 - plug/socket, A-coded

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

83 x 36 x 14,4

Note

Ordering data

Type	Qty.	Order No.
JP TEST	1	8794120000

Note

Accessories

Note

Retaining clip:
JP-CLIP M 8778190000

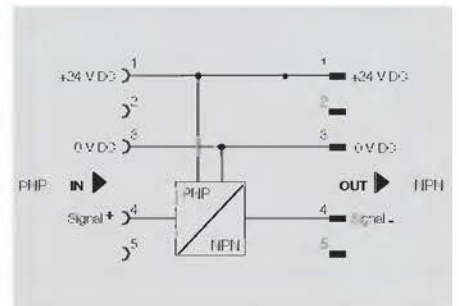
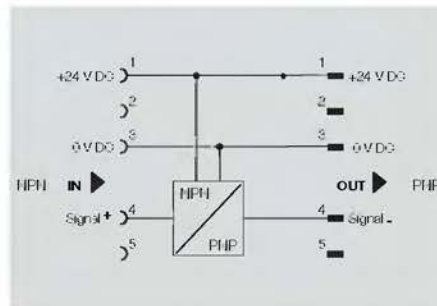
Signal inverter

The signal inverters convert sensor signals from PNP to NPN, or from NPN to PNP. This helps to reduce the costly efforts required to adapt the currently available switching circuit and to make optimum use of the available inputs on the I/O cards #2013 a solution which may be particularly interesting for the Asian and North American market.

JPP NPN PNP 24 V DC



JPP PNP NPN 24 V DC



Technical data

Input	
Sensor	
Rated voltage	18...24...30 V DC
Speisestrom für Sensor	< 200 mA
Type of contact	NO contact
Output	
Type	Solid State Relay
Output voltage	18...30 V DC
Output current (max.)	400 mA
Voltage drop at max. load	< 0.1 V
Insulation coordination (EN 50178)	
Rated voltage	32 V
Impulse withstand voltage	330 V
Overtoltage category	1
Pollution severity	2
General data	
Operating temperature	0 °C...+60 °C
Storage temperature	-20 °C...+85 °C
Connection system	M12 - plug/socket, A-coded
Approvals	CE
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

2- / 3-Conductor Sensor NPN-Type		
Rated voltage	18...24...30 V DC	
Speisestrom für Sensor	< 200 mA	
Type of contact	NO contact	
Output		
Type	Solid State Relay	
Output voltage	18...30 V DC	
Output current (max.)	400 mA	
Voltage drop at max. load	< 0.1 V	
Insulation coordination (EN 50178)		
Rated voltage	32 V	
Impulse withstand voltage	330 V	
Overtoltage category	1	
Pollution severity	2	
General data		
Operating temperature	0 °C...+60 °C	
Storage temperature	-20 °C...+85 °C	
Connection system	M12 - plug/socket, A-coded	
Approvals	CE	
Clamping range (rating- / min. / max.)	mm ²	
Length x width x height	mm	
Note		

2- / 3-Conductor Sensor PNP-Type		
Rated voltage	18...24...30 V DC	
Speisestrom für Sensor	< 200 mA	
Type of contact	NO contact	
Output		
Type	Solid State Relay	
Output voltage	18...30 V DC	
Output current (max.)	400 mA	
Voltage drop at max. load	< 0.1 V	
Insulation coordination (EN 50178)		
Rated voltage	32 V	
Impulse withstand voltage	330 V	
Overtoltage category	1	
Pollution severity	2	
General data		
Operating temperature	0 °C...+60 °C	
Storage temperature	-20 °C...+85 °C	
Connection system	M12 - plug/socket, A-coded	
Approvals	CE	
Clamping range (rating- / min. / max.)	mm ²	
Length x width x height	mm	
Note		

Ordering data

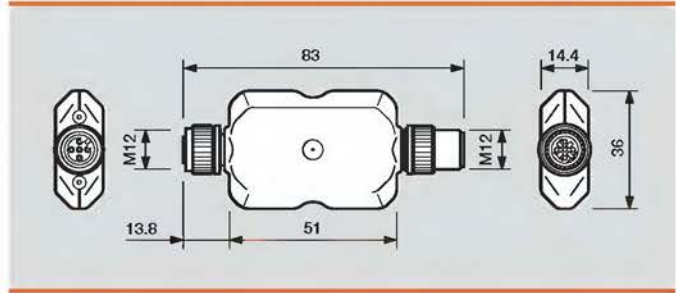
Note	
Accessories	
Note	

Type	Qty.	Order No.
JPP NPN PNP 24VDC	1	8852350000
Note		
Accessories		
Note		

Type	Qty.	Order No.
JPP PNP NPN 24VDC	1	8857030000
Note		
Accessories		
Note		

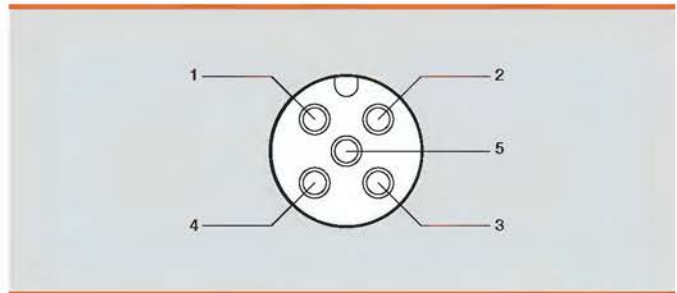
General data

Ingress protection class	IP67
Housing material	PBT, RAL 7032 (grey)
Flammability class	V0 to UL94
Screw socket	M12, CuZn, nickel plated, A-coded
Rated torque	0.8 ... 1 Nm



Contact assignment (socket)

Pole	Assignment
1	+24 VDC
2	Input / output 2
3	0 VDC
4	Input / output 1
5	PE / Earth



Accessories

Retaining clip



Type	Qty	Order No.
Stainless steel JP CLIP M	1	8778490000

Twin plug



Type	Qty	Order No.
5-pole SAI-Y-5S PARA M12/M12	1	1783430000

Screwty M12



Type	Qty	Order No.
With torque SCREWTY M12 DM	1	1900001000

Sensor cables



Type	Qty	Order No.
4-pole, length 0.3 m	1	9457150000
4-pole, length 0.6 m	1	9457160000
4-pole, length 1.5 m	1	9457170000
5-pole, length 0.3 m	1	9457340030
5-pole, length 0.6 m	1	9457340060
5-pole, length 1.5 m	1	9457340150

Further accessories are available in our catalogue 'Sensor-Aktor-Interface'

Interface units

Interface units	Introduction	B.2
	Card holders	B.4
	Interface units IEC 603-1	B.16
	Interface units IEC 807-2	B.18
	Supply voltage distributor modules	B.20
	Interface units with RJ45 plug connector	B.22
	ELCO interface units	B.23
	PLC Front adapters	B.24
	PLC Front adapter for SIEMENS S7	B.26
	Passive PLC Input/output modules	B.28
	Active PLC I/O modules	B.38

Weidmüller interface units

Given the need to reduce costs in electrical cabinet construction, interface units offer an alternative to wiring concepts with point-to-point wiring. The prime function of interface units is to act as a trouble-free adapter element between standardised plug connectors and point-to-point wiring or other connection systems.

Weidmüller interface units consist of the following individual components:

- Extruded profile for inserting the PCB
- End plates for fitting on the mounting rail
- Clip-on feet for locking on standardised mounting rails TS 32 and TS 35
- PCB with connecting and indicating elements, DIN plug connectors and ample marking facilities for equipment identification

The plug connectors used for the interface units can be divided into the following groups:

- Plug connector to IEC 603-1/DIN 41651
- Sub-miniature plug connectors (SUB-D) to IEC 807-2/DIN 41652
- Plug connectors for PCBs to IEC 603/DIN 41612 and DIN 41615
- ELCO plug connectors for hazardous area applications

Advantages of the interface units:

- Two- and three-tier PCB terminals save space
- Conventional point-to-point wiring only needed on one side, thus saving costs
- Greater safety, preventing wiring errors
- Optional: status LED on the interface units
- Rapid troubleshooting with additional test and measuring devices
- Simplified setup and documentation

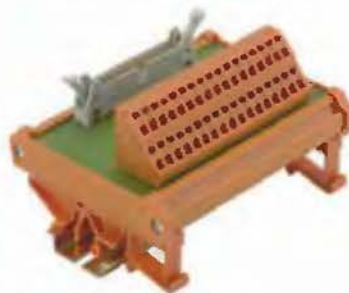
Interface units let users implement pioneering concepts in switchboard design with potential for rationalisation. Customised wiring concepts can also be solved rationally through the use of special interface units.

Pre-assembled leads with the corresponding plug connector systems are used as the connection between the series-connected controller and the interface unit. This provides the greatest savings for the user. The use of interface units reduces the individual circuitry, which reduces labour and installation time and also hidden costs, in particular a reduction material costs following a reduction in the number of individual cables and leads, cable ducts, terminals and terminal blocks required. The transition to point-to-point wiring takes place directly at the interface element.



Users have a choice between screw, tension clamp or spade connections for connecting actuators and/or sensors. As an option, interface units can also integrate additional functions such as status indicator, signal disconnecter, fuses or shielding. Identification systems make it easier to trace the signals to the corresponding element.

RSF interface units for pre-assembled leads with plug connectors to IEC 603-1/DIN 41651



Passive interface for 10 ... 64 signals for adapting pre-assembled leads with plug connectors to IEC 603-1 / DIN 41651 to screw or tension clamp connection systems.

When used in combination with a status indicator (LED), this guarantees rapid information about the switching state of incoming and outgoing signals.

RSSD interface units for pre-assembled leads with SUB-D plug connectors to IEC 807-2/DIN 41652



Passive interface unit for 9 ... 50 signals for adapting pre-assembled leads with SUB-D plug to IEC 807-2/DIN 41652 to screw or tension clamp connection systems.

The components are supplied with either female or male connectors. A spacer block between plug connector and PCB cushions the mechanical forces occurring between the connected cables. RSSD interface units can be supplied with an earth terminal for shielded leads as an optional feature. An additional test point simplifies testing and measuring during initial setup and when servicing the system.

RS VERT interface unit as voltage distributor



Passive interface unit for the distribution of dc supply voltage. These interface units are available in three designs for distribution to 8, 16 and 72 connections, for positive and negative voltages in each case:

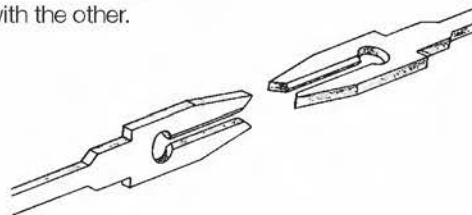
- 8x and 16x distributor just 45 mm wide overall, 72x distributor 100 mm wide
- Fed by two connection elements for positive and negative voltages in each case
- Fits on TS32/35 mounting rails

RS VERT voltage distributors can also be used in small enclosures and provide clearly organised distribution.

RS ELCO interface elements for pre-assembled leads with hermaphrodite plug connector system



Weidmüller's passive interface units are used for adapting hermaphrodite ELCO multi-pole connectors, for input and output, to screw terminal systems. The hermaphrodite contact is a fork-type contact that is identical in design on both sides of the connection, but with one fork turned through 90° to engage with the other.



RS RJ45 interface units for connecting data lines



The RS RJ45 interface module offers the user a convenient, easy-to-use interface for connecting modems, notebooks and other office equipment in the electrical cabinet.

The module converts the standard RJ45 connection to a screw terminal system or acts as a coupling to connect data leads by means of two RJ45 sockets. For data transmission rates of up to 100 Mbps, it is advisable to connect one end of the shield of the data cable to a protective earth. The interface modules can be fitted on TS 32/35 mounting rails.

The advantages of card holders

Pluggable PCB holders for adapting Euro cards to plug connectors to IEC 603/DIN 41612 and DIN 41617

B

Plug-in PCB holders are used for rapid adaptation of electronic components. Just like interface units, plug connectors to IEC 803/DIN 41612/41617 are adapted to screw or spade connections on the plug-in PCB holder.



A plug-in PCB holder has the following features:

- Board with PCB terminals and standardised plug connectors to accommodate an electronic module in 19" Euro format, 160 x 100 mm or 233 x 1260 mm
- Holding post and locking mechanism for fixing the card
- Mounting plate and mounting feet for direct assembly or fitting on mounting rails

SKH2 plug-in PCB holders provide ideal design and functions:

- 19" Euro cards covered completely from the back
- Eject mechanism for one-hand operation
- Card can be fixed with a screw at the front, as in a 19" rack

Plug-in PCB holders can be used in industrial applications for quickly adapting various 19" modules while saving the cost of a 19" component rack. Racks also take up more space and can usually only be accessed from behind. In addition, they often lack screw or tension clamp terminals for external circuits.

Plug-in PCB holders are used when

- there are just a few cards to be accommodated and connected,
- the PCB card is in a remote location, where wiring is inconvenient,
- there is a need to extend older systems by adding more electronic modules.

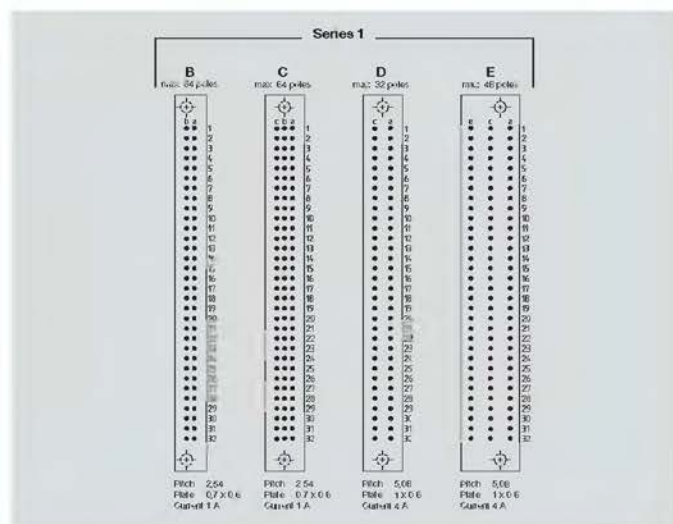
Other typical applications include testing devices in production processes and laboratories, where it is important to be able to replace the PCB quickly and handle the connection planes without difficulty.

Standards

The products meet the following standards:

- EN 50178 Electrical equipment for use in high-current installations
- DIN VDE 0109 Isolation coordination in low voltage systems including creepage and clearance paths for PCB assemblies

Plug connector types to IEC 603/DIN 41612



Series 1

Plug connectors in this series are available in multi-pole design with small contact gaps and high current load of 1 A. Versions with up to 4 A contact current are also available on the market with a pitch size of 5.08 mm and fewer poles (up to 48 poles).

Design B

64-pole plug connector with a and b row configuration and max. contact current load 1A. Rated voltage 125 V to IEC 664/EN 50178. There is also a version with 32 poles where only the even numbered poles are used.

Design C

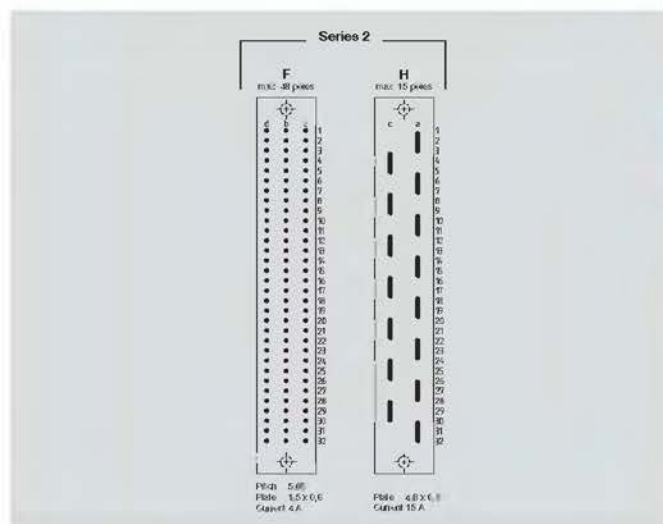
Extension of type B with row c also configured to produce a 96-pole plug connector. There is also a C 64 version where only the outer rows c and a are used. A further reduction in configuration to the even numbered poles results in type C 32, with a vertical and horizontal contact pitch size of 5.08 mm.

Design D

Dimensions and contact arrangements identical with type C 32. The reinforced contacts can take up to 4 A.

Design E

Extension of type D32, with contact row e configured to produce a 48-pole version. This plug connector with 4 A contact current in pitch size 5.08 mm is rated for high current loads. All even numbered poles in contact rows e, c and a are configured.



Series 2

This series differs from series 1 with different pitch sizes of 5.08 mm for the back connections and 3.81 mm for the contact rows on the connector face. The plastic housing is higher at the back to increase the creepage paths (metal plate, board). The wiring plane is therefore different to series 1. All contacts are rated for a current load of 4 A. The attachment holes are arranged centrally at the outer edge of the sockets.

Design F

This unit offers 48 poles with complete configuration of contact rows d, b and z. Also available are 32-pole versions configured using rows z and b or z and d. The significant feature of the z and b 32-pole version is improved creepage and clearance paths.

Design H

Same dimensions as type F, configured with 11- or 15-pole high-current contacts. The connection geometry differs from the other types. The contacts can take up to max. 15 A.

Card holders

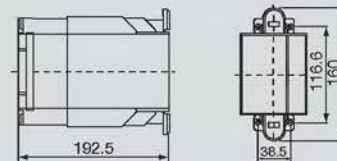
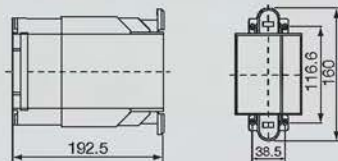
19" Euro format

- For inserting 19" rack cards with Euro format 100 x 160 mm
- Converts IEC 603/ DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Mechanical lever for releasing and ejecting card
- 19" units can be fixed with screws at front
- Protective cover on rear of board
- Direct mounting or optional rail mounting on TS35

SKH2 31



SKH2 B64



Technical data

Connection data		SKH2 31	SKH2 B64
Connection on process side		PCB terminal LP 5,08	PCB terminal LP2N
Stripping length		7,0 mm	7,0 mm
Connection on control side		Plug-in connector to DIN 41617 female connector	Plug-in connector to DIN 41617 female connector
Rated data			
Conversion PCB/plug connector		1:1	1:1
Rated voltage		125 V AC/ 150 V DC	125 V AC/ 150 V DC
Rated current per connection		4 A	2 A
Test voltage (-eff)		0,9 kV	1,0 kV
Test torque		0,40 Nm	0,40 Nm
Storage temperature		-40 °C...+160 °C	-40 °C...+160 °C
Operating temperature		0 °C...+55 °C	0 °C...+55 °C
Terminal rail		IS 35 + direct assembly	IS 35 + direct assembly
Insulation coordination (EN 50178)			
Overvoltage category		III	III
Pollution severity		2	2
Approvals			
Standards		EN 50178	EN 50178
Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4	2,5 / 0,5 / 4
Length x width x height	mm	60,7 x - x 192,5	80,7 x - x 192,5
Note		160 mm wide	160 mm wide

Ordering data

Type	Qty	Order No.	Type	Qty	Order No.
SKH2 31 LP	1	8174800000	SKH2 B64 LP2N	1	8174810000

Note

Accessories

Note	SKH2 31	SKH2 B64
	Assembly kit TS35 SPH35 8209340000	Assembly kit TS35 SPH56 8209340000

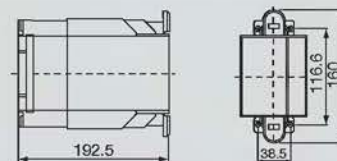
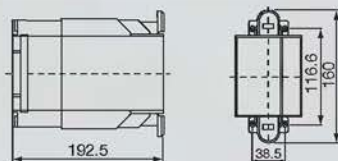
19" Euro format

- For inserting 19" rack cards with Euro format 100 x 160 mm
- Converts IEC 603/ DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Mechanical lever for releasing and ejecting card
- 19" units can be fixed with screws at front
- Protective cover on rear of board
- Direct mounting or optional rail mounting on TS35

SKH2 C64



SKH2 D32



Technical data

Connection data

Connection on process side
Stripping length
Connection on control side

PCB terminal LP2N
7,0 mm
Plug-in connector to DIN 41617 female connector

PCB terminal LP 5,08
7,0 mm
Plug-in connector to DIN 41617 female connector

Rated data

Conversion PCB/plug connector
Rated voltage
Rated current per connection
Test voltage (-eff)
Test torque
Storage temperature
Operating temperature
Terminal rail

1:1
125 V AC/ 150 V DC
2 A
1,0 kV
0,40 Nm
-40 °C...+160 °C
0 °C...+55 °C
TS 35 + direct assembly

1:1
250 V
4 A
1,0 kV
0,40 Nm
-40 °C...+160 °C
0 °C...+55 °C
TS 35 + direct assembly

Insulation coordination (EN 50178)

Overvoltage category
Pollution severity

III
2

III
2

Approvals

Standards

EN 50178

EN 50178

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

2,5 / 0,5 / 4
80,7 x – x 192,5

2,5 / 0,5 / 4
55 x – x 192,5

Note

160 mm wide

160 mm wide

Ordering data

Type	Qty	Order No.
SKH2 C64 LP2N	1	8174820000

Type	Qty	Order No.
SKH2 D32 LP	1	8174830000

Note

Accessories

Note

Assembly bit TS35 SKH35 8209340000

Assembly bit TS35 SKH36 8209340000

Card holders

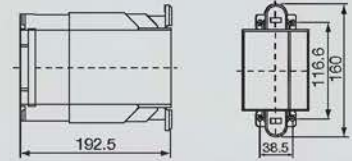
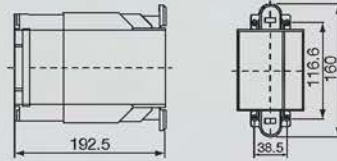
19" Euro format

- For inserting 19" rack cards with Euro format 100 x 160 mm
- Converts IEC 603/ DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Mechanical lever for releasing and ejecting card
- 19" units can be fixed with screws at front
- Protective cover on rear of board
- Direct mounting or optional rail mounting on TS35

SKH2 F32 Z+B



SKH2 F32 Z+D



Technical data

Connection data

Connection on process side
Stripping length
Connection on control side

PCB terminal LP 5,08
7,0 mm
Plug-in connector to DIN 41617 female connector

PCB terminal LP 5,08
7,0 mm
Plug-in connector to DIN 41617 female connector

Rated data

Conversion PCB/plug connector
Rated voltage
Rated current per connection
Test voltage (-eff)
Test torque
Storage temperature
Operating temperature
Terminal rail

1:1
250 V
4 A
1,0 kV
0,40 Nm
-40 °C...+160 °C
0 °C...+55 °C
TS 35 + direct assembly

1:1
250 V
4 A
1,0 kV
0,40 Nm
-40 °C...+160 °C
0 °C...+55 °C
TS 35 + direct assembly

Insulation coordination (EN 50178)

Overvoltage category
Pollution severity

III
2

III
2

Approvals

Standards

EN 50178

EN 50178

Clamping range (rating- / min. / max.)
Length x width x height

mm²
mm
2,5 / 0,5 / 4
80,7 x - x 192,5

2,5 / 0,5 / 4
80,7 x - x 192,5

Note

160 mm wide

160 mm wide

Ordering data

Type	Qty	Order No.
SKH2 F32 (Z+B) LPP	1	8174850000

Type	Qty	Order No.
SKH2 F32 (Z+D) LP	1	8174860000

Note

Accessories

Note

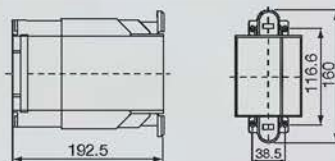
Assembly bit TS35 SKH35 8209340000

Assembly bit TS35 SKH36 8209340000

19" Euro format

- For inserting 19" rack cards with Euro format 100 x 160 mm
- Converts IEC 603/ DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Mechanical lever for releasing and ejecting card
- 19" units can be fixed with screws at front
- Protective cover on rear of board
- Direct mounting or optional rail mounting on TS35

SKH2 F48



Technical data

Connection data

Connection on process side
Stripping length
Connection on control side

PCB terminal LP2N
7,0 mm
Plug-in connector to DIN 41617 female connector

Rated data

Conversion PCB/plug connector
Rated voltage
Rated current per connection
Test voltage (-eff)
Test torque
Storage temperature
Operating temperature
Terminal rail

1:1
250 V
4 A
1,0 kV
0,40 Nm
-40 °C...+160 °C
0 °C...+55 °C
IS 35 + direct assembly

Insulation coordination (EN 50178)

Overvoltage category
Pollution severity

III
2

Approvals

Standards

EN 50178

Clamping range (rating- / min. / max.)

mm²

2,5 / 0,5 / 4

Length x width x height

mm

80,7 x - x 192,5

Note

160 mm wide

Ordering data

Type	Qty	Order No.
SKH2 F48 LP	1	8174880000

Note

Accessories

Note

Assembly rail TS35 SKH35 8209340000

Card holders

19" Euro format

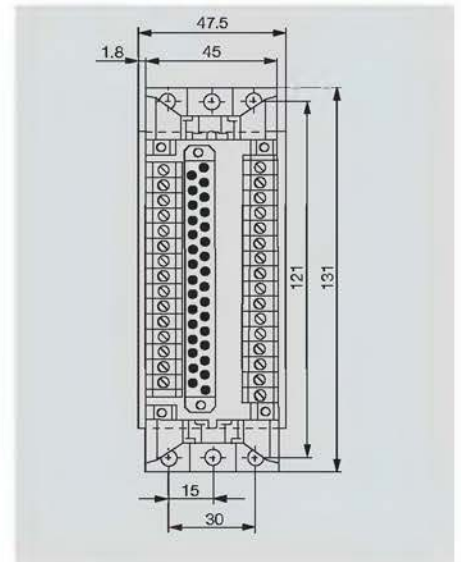
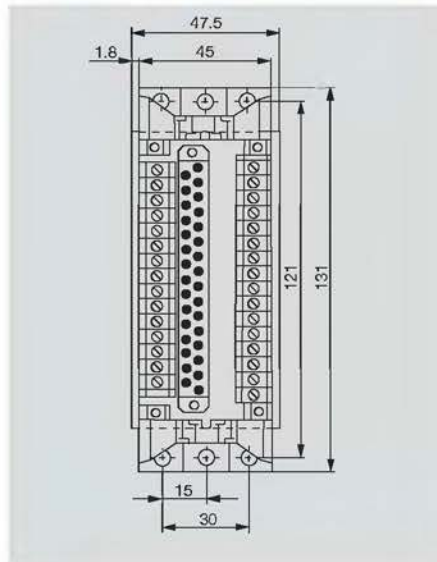
- For inserting cards in Euro format 100 x 160 mm
- Converts IEC 603/DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Direct mounting or rail mounting on TS35 with accessories

Accessories:

- Fixing plate HP 0137100000 (included in scope of supply)
- Grip white ZG 0128000000
- Grip black ZG 0128060000
- Mounting plate MP 2054280000
- Mounting foot TS35 FM 0687900000

SKH 31

SKH 31 250 V



Technical data

Connection data		SKH 31	SKH 31 250 V
Connection on process side		PCB terminal LP 5.08	PCB terminal LP 5.08
Stripping length		7.0 mm	7.0 mm
Design/Contact complement		DIN41617 31-pole /	DIN41617 31-pole /
Type		PCB locking 1 clip	PCB locking 1 clip
Rated data			
Conversion PCB/plug connector		1:1	1:1
Rated voltage/Rated current per connection		125 V AC/ 150 V DC /5 A	250 V /5 A
Test voltage (-eff)/Test torque		1.3 kV/0.40 Nm	1.5 kV/0.40 Nm
Storage temperature		-40 °C...+60 °C	-40 °C...+60 °C
Operating temperature		0 °C...+55 °C	0 °C...+55 °C
Terminal rail		TS 35 + direct assembly	TS 35 + direct assembly
Insulation coordination (EN 50178)			
Overvoltage category/Pollution severity		III /2	III /2
Standards		EN 50178	EN 50178
Dimensions			
Clamping range (rating- / min. / max.)	mm²	2.5 / 0.5 / 4	2.5 / 0.5 / 4
Length x width x height	mm	47.5 x 131 x 144	47.5 x 131 x 144
Note			

Ordering data

Type	Qty.	Order No.	Type	Qty.	Order No.
PCB locking 1 clip	1	0586661001	SKH 31 LP 250VAC RH1	1	0648661001
Note		Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000			Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000

19" Euro format

- For inserting cards in Euro format 100 x 160 mm
- Converts IEC 603/DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Direct mounting or rail mounting on TS35 with accessories

Accessories:

Fixing plate HP 0137100000 (included in scope of supply)

Grip white ZG 0128000000

Grip black ZG 0128060000

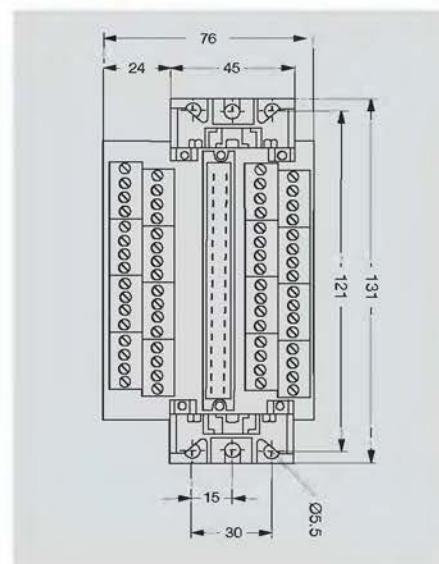
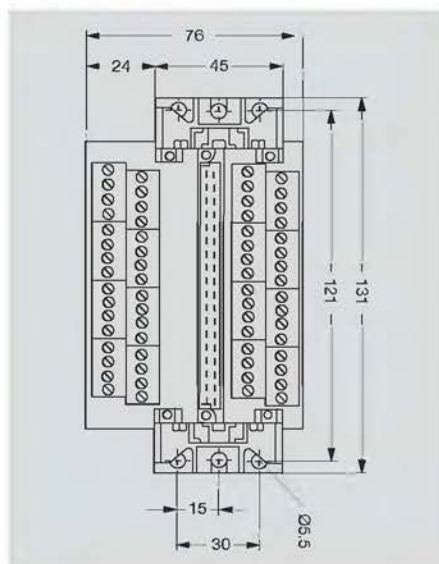
Mounting plate MP 2054280000

Mounting foot TS35 FM 0687900000

SKH B64



SKH C64



Technical data

Connection data	
Connection on process side	
Stripping length	
Design/Contact complement	
Type	
Rated data	
Conversion PCB/plug connector	
Rated voltage/Rated current per connection	
Test voltage (-eff)/Test torque	
Storage temperature	
Operating temperature	
Terminal rail	
Insulation coordination (EN 50178)	
Overvoltage category/Pollution severity	
Standards	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

PCB terminal LP2N	
Stripping length	7,0 mm
Design/Contact complement	IEC603 B64 /a and b
Type	PCB locking 2 clips
Rated data	
Conversion PCB/plug connector	1:1
Rated voltage/Rated current per connection	125 V AC / 150 V DC / 2 A
Test voltage (-eff)/Test torque	0,5 kV/0,40 Nm
Storage temperature	-40 °C...+60 °C
Operating temperature	0 °C...+55 °C
Terminal rail	TS 35 + direct assembly
Insulation coordination (EN 50178)	
Overvoltage category/Pollution severity	III / 2
Standards	EN 50178
Dimensions	
Clamping range (rating- / min. / max.)	2,5 / 0,5 / 4
Length x width x height	76 x 131 x 144
Note	

PCB terminal LP2N	
Stripping length	7,0 mm
Design/Contact complement	IEC603 C64 /a and c
Type	
Rated data	
Conversion PCB/plug connector	1:1
Rated voltage/Rated current per connection	125 V AC / 150 V DC / 2 A
Test voltage (-eff)/Test torque	0,5 kV/0,40 Nm
Storage temperature	-40 °C...+60 °C
Operating temperature	0 °C...+55 °C
Terminal rail	TS 35 + direct assembly
Insulation coordination (EN 50178)	
Overvoltage category/Pollution severity	III / 2
Standards	EN 50178
Dimensions	
Clamping range (rating- / min. / max.)	2,5 / 0,5 / 4
Length x width x height	76 x 131 x 144
Note	

Ordering data

PCB locking 2 clips	
Note	

Type	Qty.	Order No.
SKH B64 FH2	1	0577360000
Note		
Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000		

Type	Qty.	Order No.
SKH C64 FH1	1	0178960000
SKH C64 FH2	1	0646680000
Note		
Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000		

Card holders

19" Euro format

- For inserting cards in Euro format 100 x 160 mm
- Converts IEC 603/DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Direct mounting or rail mounting on TS35 with accessories

Accessories:

Fixing plate HP 0137100000 (included in scope of supply)

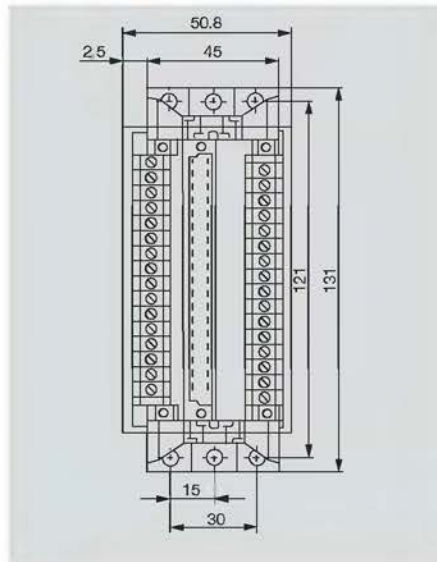
Grip white ZG 0128000000

Grip black ZG 0128060000

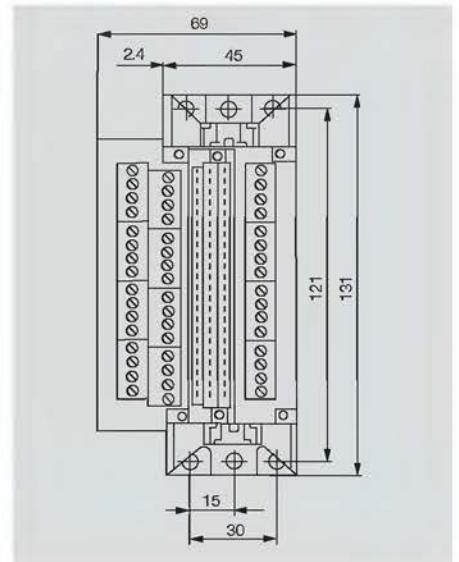
Mounting plate MP 2054280000

Mounting foot TS35 FM 0687900000

SKH D32



SKH E48



Technical data

Connection data		SKH D32		SKH E48	
Connection on process side		PCB terminal LP 5.08		PCB terminal LP2N	
Stripping length		7.0 mm		7.0 mm	
Design/Contact complement		IEC603 D32 /a and c		IEC603 E48 /e, c, a	
Type		PCB locking 1 clip		PCB locking 1 clip	
Rated data		SKH D32		SKH E48	
Conversion PCB/plug connector		1:1		1:1	
Rated voltage/Rated current per connection		250 V /6 A		125 V AC/ 150 V DC /5 A	
Test voltage (-eff)/Test torque		2.0 kV/0.40 Nm		1.3 kV/0.40 Nm	
Storage temperature		-40 °C...+60 °C		-40 °C...+60 °C	
Operating temperature		0 °C...+55 °C		0 °C...+55 °C	
Terminal rail		TS 35 + direct assembly		TS 35 + direct assembly	
Insulation coordination (EN 50178)		SKH D32		SKH E48	
Overvoltage category/Pollution severity		III /2		III /2	
Standards		EN 50178		EN 50178	
Dimensions		SKH D32		SKH E48	
Clamping range (rating- / min. / max.)	mm ²	2.5 / 0.5 / 4		2.5 / 0.5 / 4	
Length x width x height	mm	50.8 x 131 x 144		69 x 131 x 144	
Note		SKH D32		SKH E48	

Ordering data

	Type	Qty.	Order No.	Type	Qty.	Order No.
PCB locking 1 clip	SKH D32 LP 5/16 RH2	1	0586761001	SKH E48 LP2/LP	1	0690660000
Note	Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000			Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000		

19" Euro format

- For inserting cards in Euro format 100 x 160 mm
- Converts IEC 603/DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Direct mounting or rail mounting on TS35 with accessories

Accessories:

Fixing plate HP 0137100000 (included in scope of supply)

Grip white ZG 0128000000

Grip black ZG 0128060000

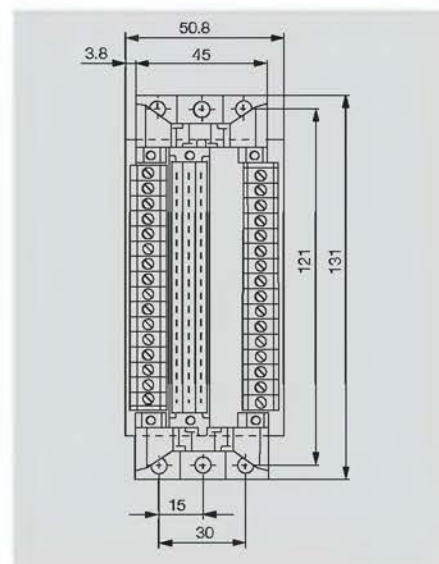
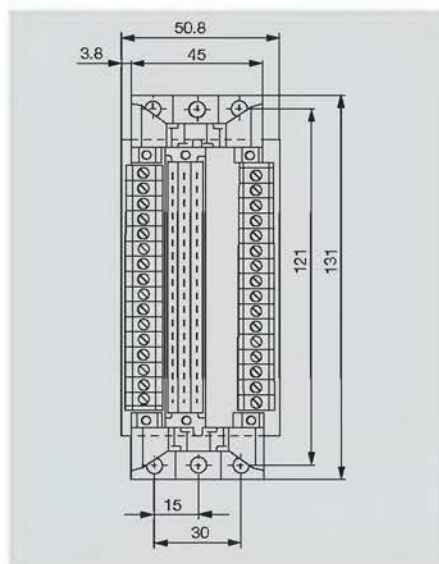
Mounting plate MP 2054280000

Mounting foot TS35 FM 0687900000

SKH F32 Z&B



SKH F32 Z&D



Technical data

Connection data	
Connection on process side	
Stripping length	
Design/Contact complement	
Type	
Rated data	
Conversion PCB/plug connector	
Rated voltage/Rated current per connection	
Test voltage (-eff)/Test torque	
Storage temperature	
Operating temperature	
Terminal rail	
Insulation coordination (EN 50178)	
Overvoltage category/Pollution severity	
Standards	
Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Note	

PCB terminal LP 5.08
7,0 mm
IEC603 F32 /z and b
PCB locking 1 clip
1:1
250 V /6 A
1,3 kV/0,40 Nm
-40 °C...+60 °C
0 °C...+55 °C
TS 35 + direct assembly
III /2
EN 50178
2,5 / 0,5 / 4
50,8 x 131 x 144

PCB terminal LP 5.08
7,0 mm
IEC603 F32 /z and d
PCB locking 1 clip
1:1
250 V /6 A
1,3 kV/0,40 Nm
-40 °C...+60 °C
0 °C...+55 °C
TS 35 + direct assembly
III /2
EN 50178
2,5 / 0,5 / 4
50,8 x 131 x 144

Ordering data

PCB locking 1 clip	
Note	

Type	Qty.	Order No.
SKH F32 (Z&B) LP RH2	1	0586861001
Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000		

Type	Qty.	Order No.
SKH F32 (Z&D) LP RH2	1	0586961001
Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000		

Card holders

19" Euro format

- For inserting cards in Euro format 100 x 160 mm
- Converts IEC 603/DIN 41612 or DIN 41617 plug-in connectors to PCB connection elements
- Direct mounting or rail mounting on TS35 with accessories

Accessories:

Fixing plate HP 0137100000 (included in scope of supply)

Grip white ZG 0128000000

Grip black ZG 0128060000

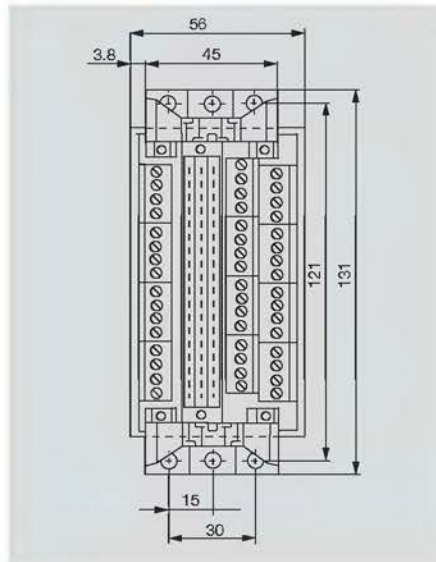
Mounting plate MP 2054280000

Mounting foot TS35 FM 0687900000

SKH F48



SKH H15



Technical data

Connection data		SKH F48	SKH H15
Connection on process side		PCB terminal LP2N	PCB terminal LP 5.08
Stripping length		7,0 mm	7,0 mm
Design/Contact complement		IEC603 F48 z, b, d	IEC603 H15 /
Type		PCB locking 1 clip	PCB locking 1 clip
Rated data			
Conversion PCB/plug connector		1:1	1:1
Rated voltage/Rated current per connection		125 V AC/ 150 V DC /5 A	250 V /10 A
Test voltage (-eff)/Test torque		1,3 kV/0,40 Nm	1,3 kV/0,40 Nm
Storage temperature		-40 °C...+60 °C	-40 °C...+60 °C
Operating temperature		0 °C...+55 °C	0 °C...+55 °C
Terminal rail		TS 35 + direct assembly	TS 35 + direct assembly
Insulation coordination (EN 50178)			
Overvoltage category/Pollution severity		III /2	III /2
Standards		EN 50178	EN 50178
Dimensions			
Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4	2,5 / 0,5 / 4
Length x width x height	mm	56 x 131 x 144	56 x 131 x 144
Note			

Ordering data

Type	Qty.	Order No.	Type	Qty.	Order No.
PCB locking 1 clip			SKH H15S	1	8051300000
Note		Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000	Mounting plate MP 2054280000 Mounting foot TS35 FM 0687900000		

19" Double Euro format

- For inserting cards in Double Euro format 233 x 160 mm
- Converts IEC 603/DIN 41612 plug-in connectors to PCB connection elements
- Direct mounting or rail mounting on TS35 with accessories

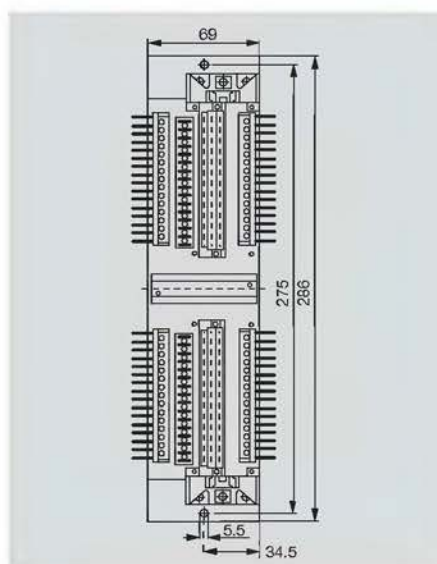
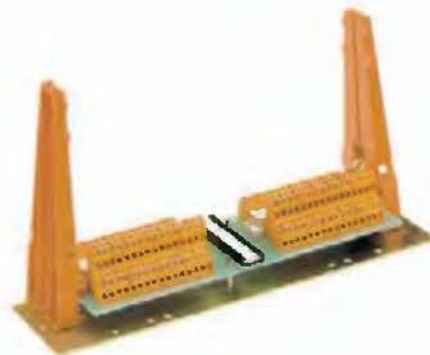
Accessories:

Fixing plate HP 0136800000 (included in scope of supply)

Grip white ZG 0128000000

Grip black ZG 0128060000

SKH (233 x 160 mm)



Technical data

Connection data		Screw connection	
Connection on process side		7,0 mm	
Stripping length		/z, b, d/ a and c	
Design/Contact complement		PCB locking 2 clips	
Type			
Rated data		1:1	
Conversion PCB/plug connector		125 V AC/ 150 V DC /5 A	
Rated voltage/Rated current per connection		1.3 kV/0.40 Nm	
Test voltage (-eff)/Test torque		-40 °C...+70 °C	
Storage temperature		0 °C...+55 °C	
Operating temperature		TS 35 + direct assembly	
Terminal rail			
Insulation coordination (EN 50178)		III /2	
Overvoltage category/Pollution severity		EN 50178	
Standards		IEC603 C64 a, c IEC603 D32 a, c	
Dimensions		2,5 / 0,5 / 4 2,5 / 0,5 / 4	
Clamping range (rating- / min. / max.)	mm²	69 x 286 x 144 69 x 286 x 144	
Length x width x height	mm		
Note			

Ordering data

Type	Design	Type	Qty.	Order No.
PCB locking 2 clips	IEC603 C64 a, c	SKH C64*2 (A&C) RH2	1	8013120000
PCB locking 2 clips	IEC603 D32 a, c	SKH D32*2 LP5.08/16 RH2	1	8050981001

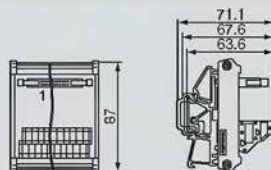
Note	Mounting plate MP 3551490000 Mounting foot TS35 RM4 6627000000
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Interface unit IEC 603-1

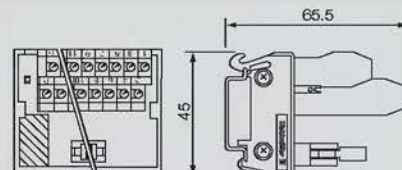
Interface unit IEC 603-1

- Pin connector with locking feature to IEC 603-1
- Tension clamp or screw connection system
- 45 or 87 mm wide
- For mounting on TS32, TS35 x 7.5 and TS35 x 15

RSF Z/ IEC 603-1



RSF S 45 mm/ IEC 603-1



Technical data

Connection data

Connection on process side
Stripping length
Connection on control side

PCB terminal LM2NZF

7,0 mm

Plug-in connector to IEC 603-1/ DIN 41651

PCB terminal LPK 2 H

7,0 mm

Plug-in connector to IEC 603-1/ DIN 41651

Rated data

Conversion PCB/plug connector
Rated voltage
Rated current per connection
Test voltage (-eff)
Test torque
Storage temperature
Operating temperature
Terminal rail

1:1

60 V AC/ 75 V DC

1 A

1,0 kV

-40 °C...+70 °C

0 °C...+55 °C

IS 35 + TS 32

1:1

60 V AC/ 75 V DC

1 A

1,0 kV

0,40 Nm

-40 °C...+70 °C

0 °C...+55 °C

IS 35

Insulation coordination (EN 50178)

Overvoltage category
Pollution severity

III

2

III

2

Approvals

Standards

EN 50178

EN 50178

Clamping range (rating- / min. / max.)

mm²

1,5 / 0,5 / 2,5

Length x width x height

mm

87,0 x – x 64,0

1,5 / 0,5 / 2,5

45,0 x – x 65,5

Note

Ordering data

10-pole
14-pole
16-pole
20-pole
26-pole
34-pole
40-pole
50-pole
60-pole
64-pole

Type	Width	Order No.
RS F10 Z	50,0 mm	8537190000
RS F14 Z	50,0 mm	8537200000
RS F20 Z	65,0 mm	8537110000
RS F26 Z	80,0 mm	8537180000
RS F34 Z	110,0 mm	8537130000
RS F40 Z	115,0 mm	8537140000
RS F50 Z	145,0 mm	8537150000

Type	Width	Order No.
RS F10 LPK 2H/12	49,0 mm	8155610000
RS F14 LPK 2H/16	56,0 mm	8258980000
RS F16 LPK 2H/18	64,0 mm	8265540000
RS F20 LPK 2H/22	71,0 mm	8155600000
RS F26 LPK 2H/28	86,0 mm	8213470000
RS F34 LPK 2H/36	106,0 mm	8155590000
RS F40 LPK 2H/42	121,0 mm	8155580000
RS F50 LPK 2H/52	150,3 mm	8155570000
RS F60 LPK 2H/62	180,0 mm	8259000000
RS F64 LPK 2H/66	186,0 mm	8155550000

Note

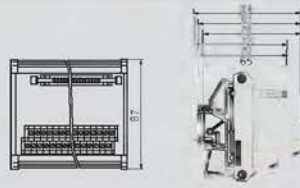
Accessories

Note

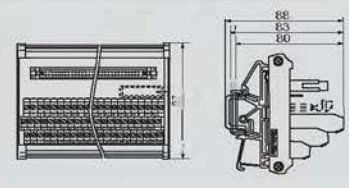
Interface unit IEC 603-1

- Pin connector with locking feature to IEC 603-1
- Tension clamp or screw connection system
- 87 mm wide
- For mounting on TS32, TS35 x 7.5 and TS35 x 15

RSF S/ IEC 603-1



RSF S/ IEC 603-1



Technical data

Connection data

Connection on process side
Stripping length
Connection on control side

PCB terminal LP2N
7,0 mm
Plug-in connector to IEC 603-1/ DIN 41651

PCB terminal LP3R
7,0 mm
Plug-in connector to IEC 603-1/ DIN 41651

Rated data

Conversion PCB/plug connector
Rated voltage
Rated current per connection
Test voltage (-eff)
Test torque
Storage temperature
Operating temperature
Terminal rail

1:1
60 V AC/ 75 V DC
1 A
1,0 kV
0,50 Nm
-40 °C...+60 °C
0 °C...+55 °C
IS 35 + IS 32

1:1
60 V AC/ 75 V DC
1 A
1,0 kV
0,50 Nm
-40 °C...+70 °C
0 °C...+55 °C
TS 35 + TS 32

Insulation coordination (EN 50178)

Overvoltage category
Pollution severity

III
2

III
2

Approvals

Standards

EN 50178

EN 50178

Clamping range (rating- / min. / max.)

mm²

2,5 / 0,5 / 4

2,5 / 0,5 / 4

Length x width x height

mm

87,0 x - x 70,0

87,0 x - x 76,0

Note

Ordering data

10-pole
14-pole
16-pole
20-pole
26-pole
34-pole
40-pole
50-pole
60-pole
64-pole

Type	Width	Order No.
RS F10 LP2N 5/10	50,0 mm	022496100t
RS F14 LP2N 5/14	50,0 mm	022506100t
RS F16 LP2N 5/16	55,0 mm	022516100t
RS F20 LP2N 5/20	65,0 mm	022426100t
RS F26 LP2N 5/26	80,0 mm	022486100t
RS F34 LP2N 5/34	110,0 mm	022436100t
RS F40 LP2N 5/40	115,0 mm	022446100t
RS F50 LP2N 5/50	145,0 mm	022456100t
RS F60 LP2N 5/60	180,0 mm	022466100t
RS F64 LP2N 5/64	180,0 mm	022476100t

Type	Width	Order No.
RS F10 LP3R 3/12	40,0 mm	80t2850000
RS F14 LP3R 3/14	45,0 mm	80t2860000
RS F16 LP3R 3/18	50,0 mm	80t2870000
RS F20 LP3R 3/21	50,0 mm	80t2910000
RS F26 LP3R 3/27	55,0 mm	80t2920000
RS F34 LP3R 3/36	70,0 mm	80t2930000
RS F40 LP3R 3/42	80,0 mm	80t2940000
RS F50 LP3R 3/51	95,0 mm	80t2950000
RS F60 LP3R 3/63	115,0 mm	80t2960000
RS F64 LP3R 3/66	120,0 mm	80t2970000

Note

Accessories

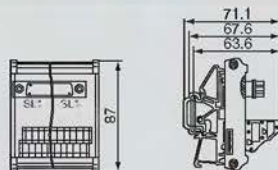
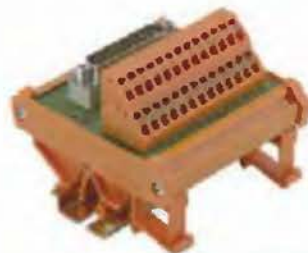
Note

Interface unit IEC 807-2

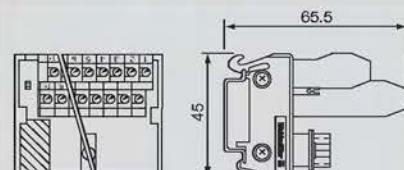
Interface unit IEC 807-2

- Pin and socket connector with screw locking system UNC 4/40
- Tension clamp or screw connection system
- 45 or 87 mm wide
- For mounting on TS32, TS35 x 7.5 and TS35 x 15

RSSD Z/ SUB-D



RSSD S/ SUB-D



Technical data

Connection data

Connection on process side
Stripping length
Connection on control side

PCB terminal LM2NZF
7,0 mm
D-SUB to IEC 807-2

PCB terminal LPK 2 H
7,0 mm
D-SUB to IEC 807-2

Rated data

Conversion PCB/plug connector
Rated voltage
Rated current per connection
Test voltage (-eff)
Test torque
Storage temperature
Operating temperature
Terminal rail

1:1
125 V AC/ 150 V DC
1,5 A
1,0 kV
-40 °C...+70 °C
0 °C...+55 °C
IS 35 + IS 32

1:1
125 V AC/ 150 V DC
1,5 A
1,0 kV
0,40 Nm
-40 °C...+70 °C
0 °C...+55 °C
TS 35

Insulation coordination (EN 50178)

Overvoltage category
Pollution severity

III
2

III
2

Approvals

Standards

EN 50178

EN 50178

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

1,5 / 0,5 / 2,5
87,0 x – x 63,6

1,5 / 0,5 / 2,5
45,0 x – x 65,5

Note

Ordering data

Male connectors
Male connectors
Male connectors
Male connectors
Male connectors
Female connectors
Female connectors
Female connectors
Female connectors

Type	Width	Order No.
RS SD9 SZ	45.0 mm	8537260000
RS SD15 SZ	60.0 mm	8537390000
RS SD25 SZ	80.0 mm	8537370000
RS SD37 SZ	110.0 mm	8537240000
RS SD50 SZ	145.0 mm	8537350000
RS SD9 BZ	45.0 mm	8537320000
RS SD15 BZ	60.0 mm	8537400000
RS SD25 BZ	80.0 mm	8537380000
RS SD37 BZ	110.0 mm	8537250000

Type	Width	Order No.
RS SD9S UNC LPK2	50.0 mm	8259010000
RS SD15S UNC LPK2	61.0 mm	8233350000
RS SD25S UNC LPK2	86.0 mm	8155650000
RS SD37S UNC LPK2	116.0 mm	8155660000
RS SD50S UNC LPK2	154.0 mm	8155670000
RS SD9B UNC LPK2	50.0 mm	8216480000
RS SD15B UNC LPK2	61.0 mm	8209730000
RS SD25B UNC LPK2	86.0 mm	8155620000
RS SD37B UNC LPK2	116.0 mm	8155630000
RS SD50B UNC LPK2	154.0 mm	8155640000

Note

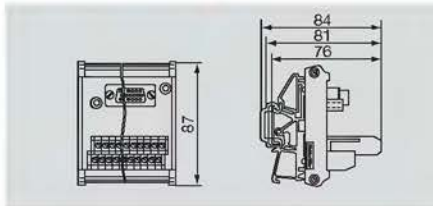
Accessories

Note

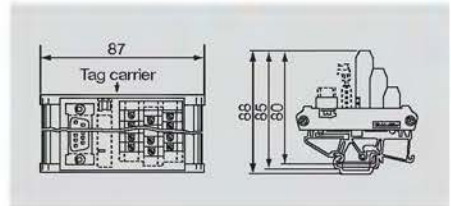
Interface unit IEC 807-2

- Pin and socket connector with screw locking system UNC 4/40
- PCB connection element with screw connection
- Clip-on foot for mounting on TS32, TS35 x 7.5 and TS35 x 15

RSSD S/ SUB-D



RSSD S/ SUB-D



Technical data

Connection data

Connection on process side
Stripping length
Connection on control side

PCB terminal LP2N
7,0 mm
D-SUB to IEC 807-2

PCB terminal LP3R
7,0 mm
D-SUB to IEC 807-2

Rated data

Conversion PCB/plug connector
Rated voltage
Rated current per connection
Test voltage (-eff)
Test torque
Storage temperature
Operating temperature
Terminal rail

1:1
125 V AC/ 150 V DC
1,5 A
1,0 kV
0,50 Nm
-40 °C...+70 °C
0 °C...+55 °C
IS 35 + TS 32

1:1
125 V AC/ 150 V DC
1,5 A
1,0 kV
0,50 Nm
-40 °C...+70 °C
0 °C...+55 °C
IS 35 + TS 32

Insulation coordination (EN 50178)

Overvoltage category
Pollution severity

III
2

III
2

Approvals

Standards

EN 50178

EN 50178

Clamping range (rating- / min. / max.)

mm²

2,5 / 0,5 / 4

Length x width x height

mm

87,0 x - x 76,0

2,5 / 0,5 / 4

87,0 x - x 80,0

Note

Ordering data

Male connectors
Male connectors
Male connectors
Male connectors
Male connectors
Female connectors
Female connectors
Female connectors
Female connectors
Female connectors

Type	Width	Order No.
RS SD9S UNC 4,40 LP2N	45,0 mm	8003901001
RS SD15S UNC 4,40	60,0 mm	8005201001
RS SD25S UNC 4,40 LP2N	80,0 mm	8005181001
RS SD37S UNC 4,40 LP2N	110,0 mm	8003881001
RS SD50S UNC 4,40 LP2N	154,0 mm	8005161001
RS SD9B UNC 4,40 LP2N	45,0 mm	8003911001
RS SD15B UNC 4,40 LP2N	60,0 mm	8005211001
RS SD25B UNC 4,40 LP2N	80,0 mm	8005191001
RS SD37B UNC 4,40 LP2N	110,0 mm	8003891001
RS SD50B UNC 4,40 LP2N	154,0 mm	8005171001

Type	Width	Order No.
RS SD9S LP3R	40,0 mm	8019930000
RS SD15S LP3R	45,0 mm	8019940000
RS SD25S LP3R	60,0 mm	8019950000
RS SD37S LP3R	80,0 mm	8019960000
RS SD50S LP3R	100,0 mm	8019970000
RS SD9B LP3R	40,0 mm	8019880000
RS SD15B LP3R	45,0 mm	8019890000
RS SD25B LP3R	60,0 mm	8019900000
RS SD37B LP3R	80,0 mm	8019910000
RS SD50B LP3R	100,0 mm	8019920000

Note

Accessories

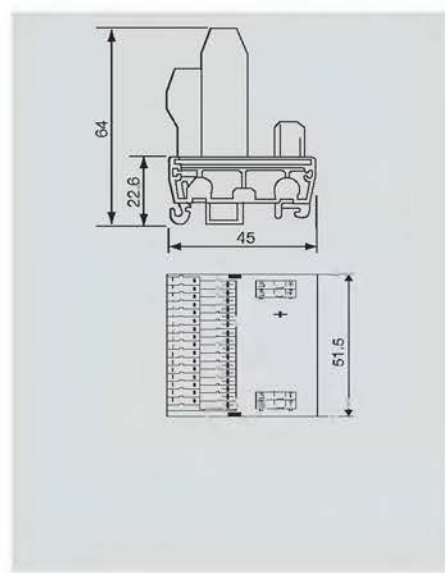
Note

Supply voltage distributor modules

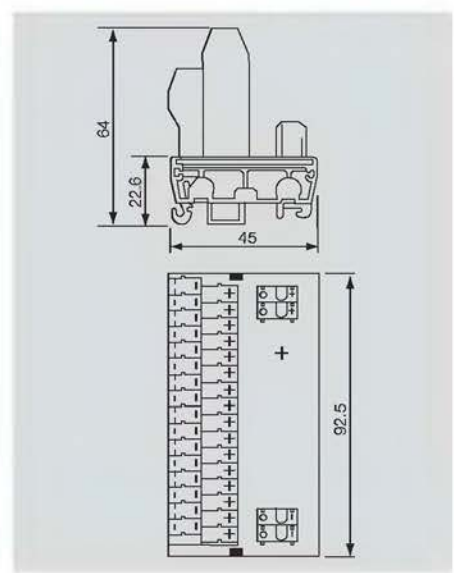
Supply voltage distributor modules

- Distribution module for 2 supply connections to 8 or 16 potential distribution terminals
- 45 mm wide
- Potential distributor designed as 2-tier connection element
- Total current max. 10 A
- For mounting on rail TS 35

RS VERT 8 LPK2



RS VERT 16 LPK2



Technical data

Connection data	
Connection on process side	
Stripping length	
Conversion PCB/plug connector	
Rated data	
Rated voltage	
Rated current per connection	
Total current feed, max.	
Electrical distribution, plus/minus	
Storage temperature	
Operating temperature	
Housing/terminal rail	
Insulation coordination (EN 50178)	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	

PCB terminal LPK 2	
Stripping length	7.0 mm
8-way supply voltage distributor +/- / 2-pole feed	
24 V AC/DC	
10 A	
+/- potential	
-40 °C...+60 °C	
0 °C...+55 °C	
RS 45 section /TS 35	
III /2	
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	

PCB terminal LPK 2	
Stripping length	7.0 mm
16-way supply voltage distributor +/- / 2-pole feed	
24 V AC/DC	
10 A	
+/- potential	
-40 °C...+60 °C	
0 °C...+55 °C	
RS 45 section /TS 35	
III /2	
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	

Ordering data

Note	
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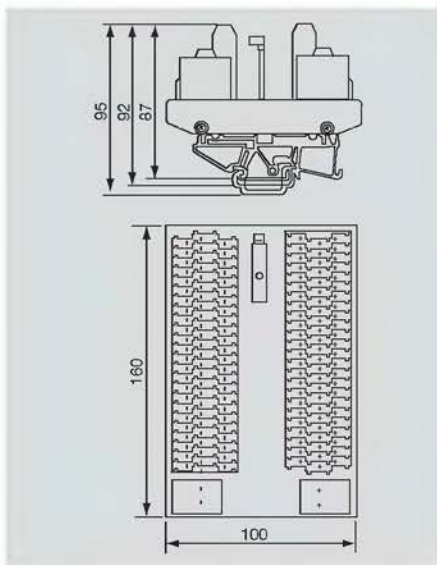
Type	Qty.	Order No.
RS VERT 8 LPK2	1	8252010000
Note		

Type	Qty.	Order No.
RS VERT 16 LPK2	1	8234620000
Note		

Supply voltage distributor modules

- Distribution module for 2 supply connections to 72 potential distribution terminals
- Potential distributor designed as 3-tier connection element
- Total current max. 20 A
- For mounting on rail TS 32/35

RS VERT 144 LPK3



Technical data

Connection data		PCB terminal LPK 3
Connection on process side		7,0 mm
Stripping length		72-way supply voltage distributor +/- / 2-pole feed
Conversion PCB/plug connector		
Rated data		250 V AC/DC
Rated voltage		20 A
Rated current per connection		+/- potential
Total current feed, max.		-40 °C...+60 °C
Electrical distribution, plus/minus		0 °C...+55 °C
Storage temperature		RS 100 section /TS 35 + TS 32
Operating temperature		
Housing/terminal rail		III /2
Insulation coordination (EN 50178)		
Overvoltage category/Pollution severity		
Dimensions		
Clamping range (rating- / min. / max.)	mm²	1,5 / 0,5 / 2,5
Length x width x height	mm	104 x 160 x 87
Note		
Ordering data		
Type	Qty.	Order No.
RS LPK3/144 VERT	1	8199510000
Note		

Interface unit with RJ45 plug connectors

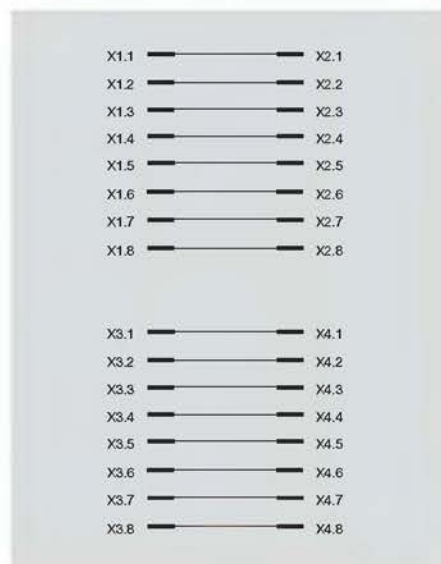
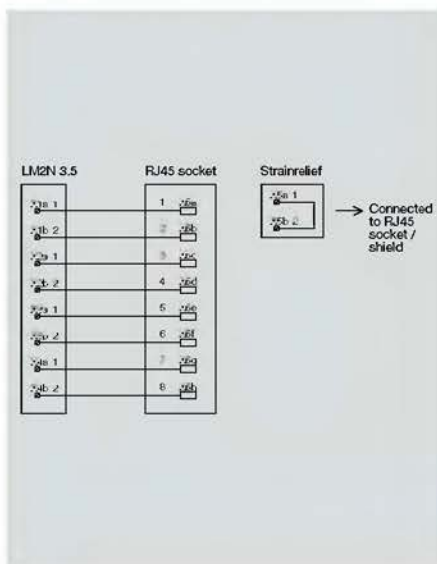
Interface unit with RJ45 plug connectors

- Direct coupling of PC and modem in control cabinet
- Connection of typical office equipment
- Data rate Cat5 100 Mbit
- Available as RJ 45/screw connection conversion or as RJ 45 coupling
- For mounting on rail TS 32/35

RS RJ45



RS RJ45 2WAY



Technical data

Connection data	
Connection on process side	
Connection on control side	
Design	
Conversion PCB/plug connector	
Rated data	
Rated current per connection	
Number of signals	
Contact material	
Storage temperature	
Operating temperature	
Housing	
Terminal rail	
Insulation coordination (EN 50178)	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm
Length x width x height	mm
Note	

screw connection/ RJ45 plug-in connector	
screw connection/ RJ45 plug-in connector	
RJ45 female connector	
1:1	
1.5 A	
8 shielded	
phosphor- bronze 6µ AU	
-40 °C...+70 °C	
0 °C...+55 °C	
RS 70 section	
TS 35 + TS 32	
II / 2	
1.5 / 0.5 / 1.5	
70 x 30 x 48	
Connect shielding of data line to protective earth at one end	

2 x RJ45 connector	
2 x RJ45 connector	
RJ45 female connector	
1:1, RJ45 coupling	
1.5 A	
8 shielded	
phosphor- bronze 6µ AU	
-40 °C...+70 °C	
0 °C...+55 °C	
RS 70 section	
TS 35 + TS 32	
II / 2	
70 x 38 x 48	
Connect shielding of data line to protective earth at one end	

Ordering data

Note	
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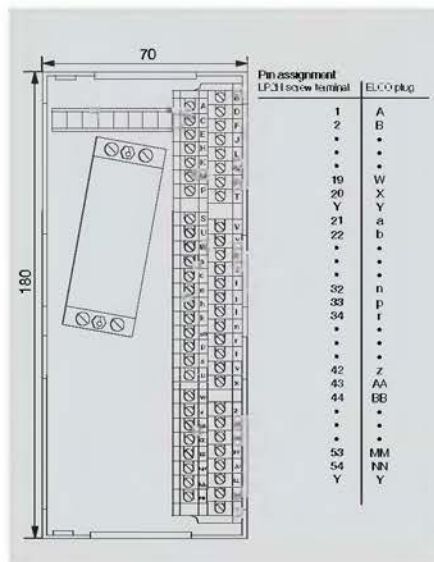
Type	Qty.	Order No.
RS RJ45	10	8611320000

Type	Qty.	Order No.
RS RJ45 2WAY	1	8555440000

ELCO interface units

- Conversion from screw connection system to hermaphroditic ELCO plug-in connector
- Cable easily fitted thanks to angled arrangement of the ELCO plug on the left or right side of the module
- High shock and vibration resistance
- Suitable for low currents
- Consecutive numbering
- For mounting on TS32, TS35 x 7.5 and TS 35 x 15

RS ELCO



Technical data

Connection data

Connection on process side
Design
Stripping length
Connection on control side

Rated data

Rated voltage
Rated current per connection
Test voltage (-eff)
Storage temperature
Operating temperature
Housing
Terminal rail

Insulation coordination (EN 50178)

Overvoltage category/Pollution severity

Dimensions

Clamping range (rating- / min. / max.)
Length x width x height

Note

PCB terminal LP2N

ELCO connector 56-pole

7.0 mm

ELCO type 8016

125 V AC/ 150 V DC

1.5 A

1.5 kV

-40 °C...+70 °C

0 °C...+55 °C

RS 70 section

TS 35 + TS 32

III / 2

left

right

2.5 / 0.5 / 4

2.5 / 0.5 / 4

70 x 160 x 76

70 x 160 x 76

Ordering data

type	type	Qty.	Order No.
left	RS ELCO LH 1..54Y LP2N	1	1149361001
right	RS ELCO RH 1..54Y LP2N	1	1149461001

Note

PLC system interface

Wiring and circuitry is becoming increasingly complicated as a result of the growing complexity of machines and systems in process, automation and building services control systems.

Conventional connections (point-to-point wiring) between PLC controllers and peripheral devices results in high installation and commissioning costs. The Weidmüller range of PLC system interface products provides the user with a quickly and easily installed output level for SIEMENS SIMATIC® S7.

The specific front adapters replace the usual screw terminal technology used on the PLC input/output cards. 40- or 10-pole connectors transfer the PLC signals to the active or passive components via pre-assembled control leads.

The PLC signals are converted either

- in double word mode to a 40-pole ribbon cable connector, or
- in byte mode to 4 ribbon cable connectors each with 10 poles.
- PLC I/O cards usually have two connection systems:
 - screw clamp,
 - crimp connectors.

In both cases, the signals have to be wired individually with the corresponding connection elements.

Disadvantages of individual wiring:

- High assembly costs
- The risk of wiring mistakes increases with the number of individual wires at one point
- Requires considerable space in the switchboard
- High installation workload
- Time-consuming routing and assembly of connecting leads
- High labelling and documentation workload

System advantages

• Fast

- Reduced planning and design times
- Time-saving installation
- Less time required for commissioning and troubleshooting
- Minimised wiring effort on site thanks to plug-type connectors

• Safe

- Rules out the risk of wiring mistakes
- Clear organisation in the switchboard (system cable instead of individual wires)
- Marking corresponds with PLC
- Additional individual marking

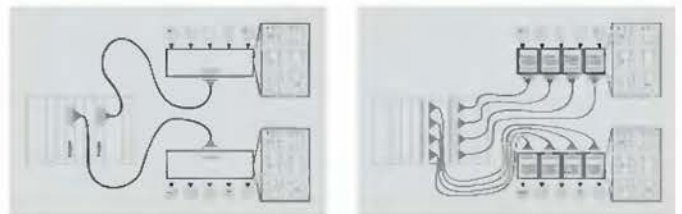
• Variable

- Multitude of about 40 different I/O components
- Variable cable lengths
- Modular design of all components
- 1 x 4 byte and 4 x 1 byte system designs without signal routing module
- Functions mixed by byte to an input or output level
- Expansion possible without difficulty
- Flexibility due to simple swapping of input/output interfaces

• Small

- Saves space in cable ducts
- Small module widths
- No terminal levels

Use of PLC front adapters



SIEMENS SIM S7/300 and SIM S7/400

Front adapters SIM S7/300 and SIM S7/400 are contacted quickly and safely to the input and output modules of Siemens Simatic® S7-300 and S7-400 controllers.

Pre-assembled control leads with 10- or 40-pole socket connectors to IEC 603-1/DIN 41651 connect the PLC input/output groups to the passive and active interface elements of the PLC system interface.

Electrical isolation of the power supply is accomplished by means of plug-in cross connection on PLC adapters and input/output modules with the following options:

- 1 x 32 signals
- 2 x 16 signals
- 4 x 8 signals

There are two options for the power feed to PLC I/O cards:

- Direct feed on the front adapter via screw terminals
- Feed via passive/active components by means of pre-assembled control wire (max. 1A/byte)

For the 32-bit PLC components, there is a choice of front adapters with four 10-pole < 4 x 1 byte structure or 40-pole control lead < 1 x 4 byte structure. This enables fast, cost-efficient installation and allows wiring mistakes to be minimised and commissioning times to be reduced.

Pole configuration

Front adapter	SIM S7/300...KONV		SIM S7/400...KONV	
	Socket 4 x 10 poles	1 x 40 poles	4 x 10 poles	1 x 40 poles
Pin 1	X 1.9 B0+	X 1.32 B0+		
Pin 2	X 1.1	X 1.40		
Pin 3	X 1.2	X 1.39	X 1.9 B0+	X 1.32 B0+
Pin 4	X 1.3	X 1.38	X 1.1	X 1.40
Pin 5	X 1.4	X 1.37	X 1.2	X 1.39
Pin 6	X 1.5	X 1.36	X 1.3	X 1.38
Pin 7	X 1.6	X 1.35	X 1.4	X 1.37
Pin 8	X 1.7	X 1.34	X 1.5	X 1.36
Pin 9	X 1.8	X 1.33	X 1.6	X 1.35
Pin 10	X 1.10 B0-	X 1.31 B0-	X 1.7	X 1.34
Pin 11	X 2.9 B1+	X 1.22 B1+	X 1.8	X 1.33
Pin 12	X 2.1	X 1.30		
Pin 13	X 2.2	X 1.29		
Pin 14	X 2.3	X 1.28	X 2.9 B1+	X 1.22 B1+
Pin 15	X 2.4	X 1.27	X 2.1	X 1.30
Pin 16	X 2.5	X 1.26	X 2.2	X 1.29
Pin 17	X 2.6	X 1.25	X 2.3	X 1.28
Pin 18	X 2.7	X 1.24	X 2.4	X 1.27
Pin 19	X 2.8	X 1.23	X 2.5	X 1.26
Pin 20	X 2.10 B1-	X 1.21 B1-	X 2.6	X 1.25
Pin 21	X 3.9 B2+	X 1.12 B2+	X 2.7	X 1.24
Pin 22	X 3.1	X 1.20	X 2.8	X 1.23
Pin 23	X 3.2	X 1.19		
Pin 24	X 3.3	X 1.18		
Pin 25	X 3.4	X 1.17		
Pin 26	X 3.5	X 1.16	X 3.9 B2+	X 1.12 B2+
Pin 27	X 3.6	X 1.15	X 3.1	X 1.20
Pin 28	X 3.7	X 1.14	X 3.2	X 1.19
Pin 29	X 3.8	X 1.13	X 3.3	X 1.18
Pin 30	X 3.10 B2-	X 1.11 B2-	X 3.4	X 1.17
Pin 31	X 4.9 B3+	X 1.2 B3+	X 3.5	X 1.16
Pin 32	X 4.1	X 1.10	X 3.6	X 1.15
Pin 33	X 4.2	X 1.9	X 3.7	X 1.14
Pin 34	X 4.3	X 1.8	X 3.8	X 1.13
Pin 35	X 4.4	X 1.7		
Pin 36	X 4.5	X 1.6		
Pin 37	X 4.6	X 1.5		
Pin 38	X 4.7	X 1.4	X 4.9 B3+	X 1.2 B3+
Pin 39	X 4.8	X 1.3	X 4.1	X 1.10
Pin 40	X 4.10 B3-	X 1.1 B3-	X 4.2	X 1.9
Pin 41			X 4.3	X 1.8
Pin 42			X 4.4	X 1.7
Pin 43			X 4.5	X 1.6
Pin 44			X 4.6	X 1.5
Pin 45			X 4.7	X 1.4
Pin 46			X 4.8	X 1.3
Pin 47				
Pin 48			X 1.10 B0-	X 1.11 B0-
Pin 48			X 2.10 B1-	X 1.21 B1-
Pin 48			X 3.10 B2-	X 1.31 B2-
Pin 48			X 4.10 B3-	X 1.1 B3-
Plug-in cross connectors				
	B0+/B1+		B0+/B1+	
	B1+/B2+		B1+/B2+	
	B2+/B3+		B2+/B3+	
	B0-/B1-			
	B1-/B2-			
	B2-/B3-			

PLC Front adapter for SIEMENS S7

PLC Front adapter for SIEMENS S7

- Pre-assembled control cable
- Control cable 1x40- or 4x10 pole in 4 standard lengths
- Separate feeding of the supply voltage via screw connection terminals
- Outstanding cross connectability using ZQV system
- Versatile accessories
- Inexpensive coupling of the interface modules

Front adapter for SIEMENS S7 300 E/A-modules

Digital input:

S7/300 6ES7 321-1BL00-0AA0, 32DI

Digital output:

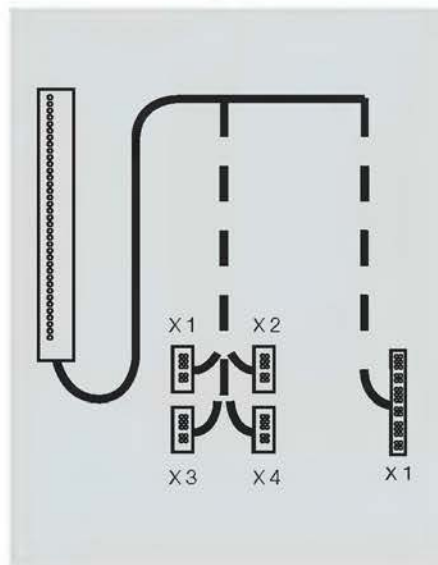
S7/300 6ES7 322-1BL00-0AA0, 32DO

Digital input/output:

S7/300 6ES7 323-1BL00-0AA0, 16DI/16DO

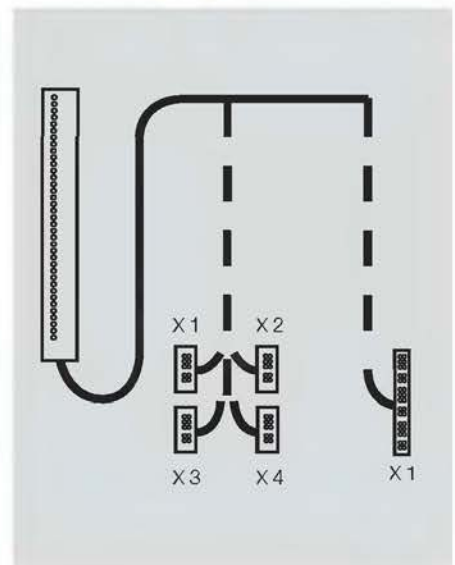
SIEMENS S7/300 1 x 4 Byte

Simatic S7/300 1 x 4 Byte



SIEMENS S7/300 4 x 1 Byte

Simatic S7/300 4 x 1 Byte



Technical data

Connection data	
Connection on process side	
Type of connection	
Design	
Configuration of single conductor	
Connection system, supply voltage/other connections	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
Current-carrying capacity/ cable 10-pole/Line, 40-pole	
Voltage supply/Byte disconnection	
Total current feed, max.	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

SIEMENS front panel housing	
1x40-pole pre-assembled cable with IEC603/1 plug-in connector	
1x40-pole pre-assembled cable with female connector	
7-core control line AWG 26/7	
PCB screw connection terminals	
32 / 1x4 byte	
60 V AC/ 75 V DC	
1 A	
/26 A/ dT = 20 K	
yes	
16 A	

SIEMENS front panel housing	
4 x 10-pole pre-assembled cable with IEC603/1 plug-in connector	
4x10-pole pre-assembled cable with 10-pole female connector	
7-core control line AWG 26/7	
PCB screw connection terminals	
32 / 4x1 byte	
60 V AC/ 75 V DC	
1 A	
11,5 A/ dT = 20 K /	
yes	
16 A	

Ordering data

2 m control line	
2.5 m control line	
3 m control line	
5 m control line	
Note	

Type	Qty.	Order No.
SIM S7/300 FB40 2.0M	1	8433290200
SIM S7/300 FB40 2.5M	1	8433290250
SIM S7/300 FB40 3.0M	1	8433290300
SIM S7/300 FB40 5.0M	1	8433290500

Type	Qty.	Order No.
SIM S7/300 FB4*10 2.0M	1	8433310200
SIM S7/300 FB4*10 2.5M	1	8433310250
SIM S7/300 FB4*10 3.0M	1	8433310300
SIM S7/300 FB4*10 5.0M	1	8433310500

PLC Front adapter for SIEMENS S7

- Pre-assembled control cable
- 1x40-pole or 4x10-pole cables in 4 standard lengths
- Separate feeding of supply voltage via screw connection terminals
- Outstanding cross connectability using ZQV system
- Versatile system accessories
- Inexpensive coupling of interface modules

Front adapter for SIEMENS S7 400 I/O modules

Digital input:

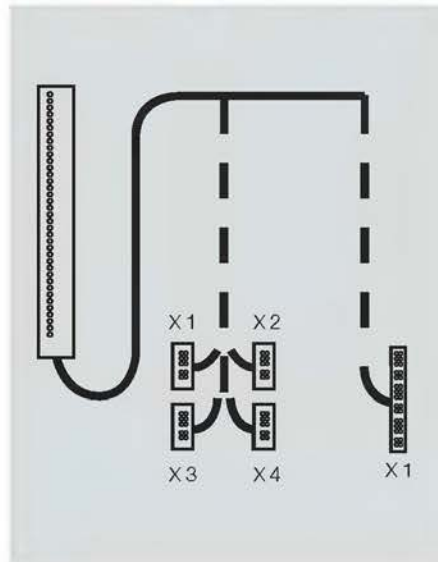
S7/400 6ES7 421-1BL00-0AA0, 32DI

Digital output:

S7/400 6ES7 422-1BL00-0AA0, 32DO

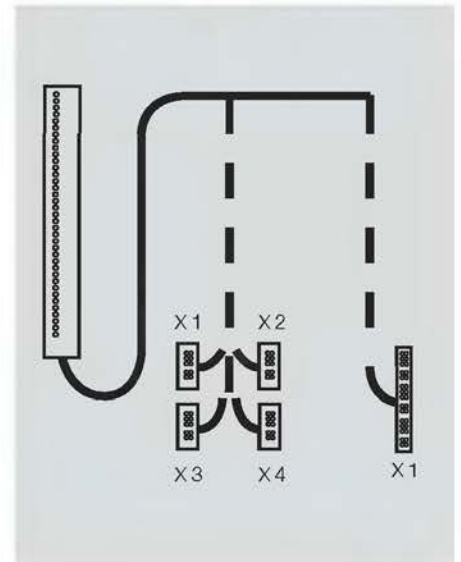
SIEMENS S7/400 1 x 4 Byte

Simatic S7/400 1 x 4Byte



SIEMENS S7/400 4 x 1 Byte

Simatic S7/400 4 x 1Byte



Technical data

Connection data	
Connection on process side	
Type of connection	
Design	
Configuration of single conductor	
Connection system, supply voltage/other connections	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
Current-carrying capacity/ cable 10-pole/Line, 40-pole	
Voltage supply/Byte disconnection	
Total current feed, max.	
Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Note	

SIEMENS front panel housing	
1x40-pole pre-assembled cable with IEC603/1 plug-in connector	
1x40-pole pre-assembled cable with female connector	
7-core control line AWG 26/7	
PCB screw connection terminals	
32 / 1x4 byte	
60 V AC/ 75 V DC	
1 A	
/26 A/ dT = 20 K	
yes	
16 A	

SIEMENS front panel housing	
4 x 10-pole pre-assembled cable with IEC603/1 plug-in connector	
4x10-pole pre-assembled cable with 10-pole female connector	
7-core control line AWG 26/7	
PCB screw connection terminals	
32 / 4x1 byte	
60 V AC/ 75 V DC	
1 A	
11,5 A/ dT = 20 K /	
yes	
16 A	

Ordering data

2 m control line	
2.5 m control line	
3 m control line	
5 m control line	
Note	

Type	Qty.	Order No.
SIM S7/400 FB40 2.0M	1	8335900200
SIM S7/400 FB40 2.5M	1	8335900250
SIM S7/400 FB40 3.0M	1	8335900300
SIM S7/400 FB40 5.0M	1	8335900500

Type	Qty.	Order No.
SIM S7/400 FB4*10 2.0M	1	83359t0200
SIM S7/400 FB4*10 2.5M	1	83359t0250
SIM S7/400 FB4*10 3.0M	1	83359t0300
SIM S7/400 FB4*10 5.0M	1	83359t0500

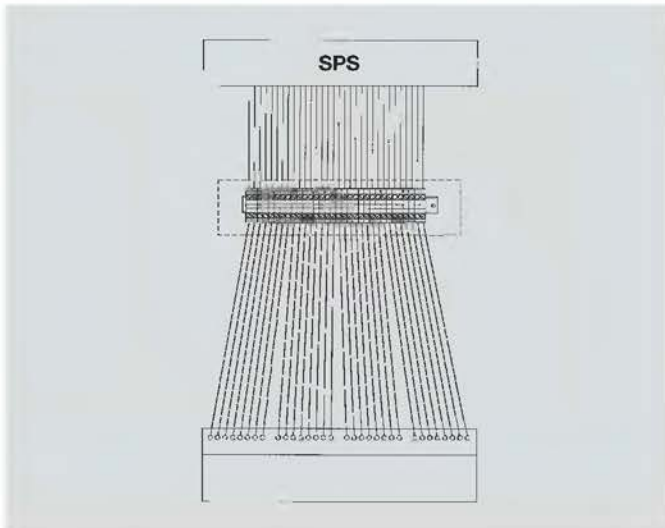
Passive components

The RSF40 or RS F10 passive interface units for 32 or 8 signals allow for efficient connection of peripheral initiators, sensors and actuators to PLC input/output modules. The link between the PLC and the interface module consists of the controller-specific front adapter and the pre-assembled control lead. This wiring version replaces point-to-point wiring, which is prone to mistakes and is costly to install. The necessary auxiliary voltage is provided at the connection units. An optional status indicator (LED) shows the switching state and the operating voltages.

Features

- Choice of screw or tension clamp terminal
- RS45 modules with extremely narrow width of 45 mm
- 32x module via plug-in jumpers in sensor groups (1 x 32, 2 x 16 or 4 x 8 signals)
- Signals grouped by byte
- Test point on the board through connection element
- Clearly organised terminal marking
- Additional labelling panel for group identification
- Clips to TS35 DIN rail (RS 45 profile) in 45 mm width and TS 32/35 DIN rail in 87 mm width

Individual wiring



Input/output module RS 45 profile designed for

- 1:1 signal transfer of 32 or 8 signals to PLC input/output modules,
- connection of RS F40 LPK2 and RS F10 LPK2 two-wire and three-wire sensors/initiators to PLC input/output modules.

Input/Output in single-conductor system

- Compact design
- Tension clamp connection system
- Clear connection designation
- Clips to TS 35

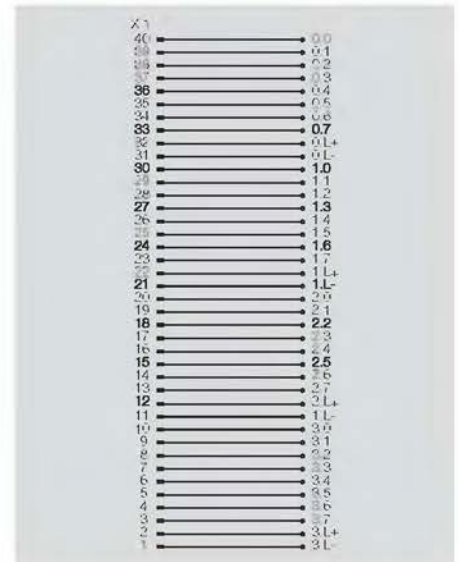
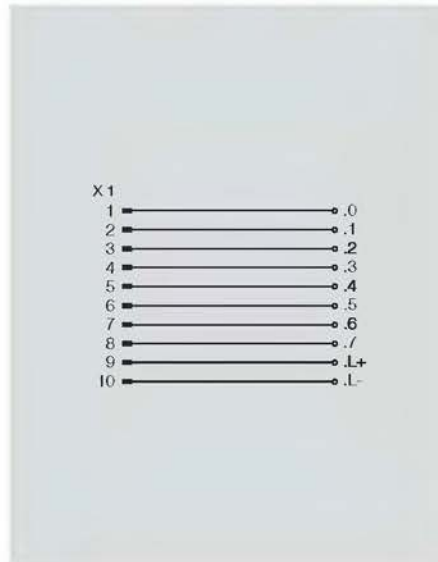
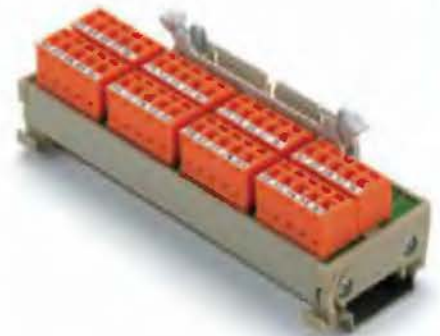
RS F10 I/O8 LMZF

I/O module



RS F40 I/O32 LMZF

I/O module



Technical data

Connection data	
Connection on process side	
Stripping length	
Connection system, supply voltage/other connections	
Coupling on control side, 8- way module	
Coupling on control side, 32- way module/	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
LED current	
Common potential at terminal/voltage supply/Byte disconnection	
Operating temperature/Storage temperature	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

PCB terminal LMZF	
7,0 mm	
Tension clamp connection terminal	
10-pole FB-socket IEC 603-1	
/	
8 / 1x1 byte	
60 V AC/ 75 V DC	
1 A	
/	
0 °C...+55 °C /-40 °C...+70 °C	
II /2	
1,5 / 0,5 / 2,5	
45 x 43 x 54	

PCB terminal LMZF	
7,0 mm	
Tension clamp connection terminal	
40-pole FB-socket IEC 603-1/	
32 / 1x4 byte	
60 V AC/ 75 V DC	
1 A	
/no	
0 °C...+55 °C /-40 °C...+70 °C	
II /2	
TS 35	
1,5 / 0,5 / 2,5	
45 x 125 x 54	

Ordering data

Note	
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Type	Qty.	Order No.
RS F10 I/O8 LMZF	1	8428870000

Type	Qty.	Order No.
RS F40 I/O32 LMZF	1	8428880000

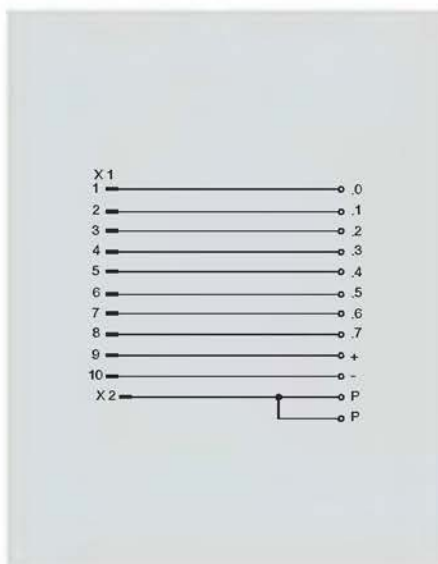
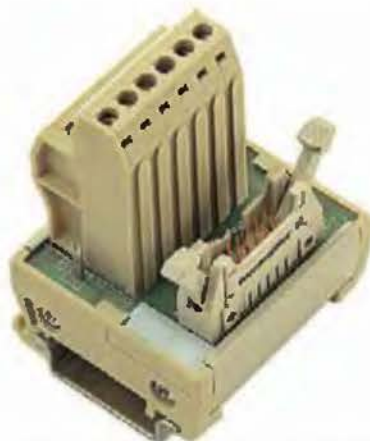
PLC input/output module passive

Input/Output in single-conductor system

- Compact design
- Screw connection system
- Clear connection designation
- Clips to TS 35

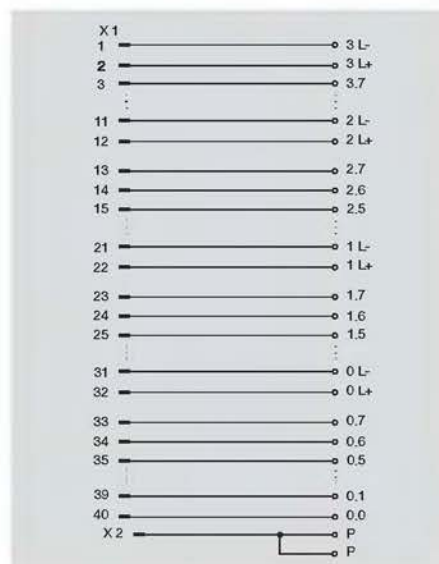
RS F10 LPK 2H/12

I/O module



RS F40 LPK 2H/42

I/O module



Technical data

Connection data	
Connection on process side	
Stripping length	
Connection system, supply voltage/other connections	
Coupling on control side, 8-way module	
Coupling on control side, 32-way module/	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
LED current	
Common potential at terminal/voltage supply/Byte disconnection	
Operating temperature/Storage temperature	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	

PCB terminal LPK 2 H
7,0 mm
Screw connection
10-pole FB-socket IEC 603-1
/
8 / 1x1 byte
60 V AC/ 75 V DC
1 A
/-
0 °C...+55 °C /-40 °C...+70 °C
II /2
1.5 / 0.5 / 2.5
45 x 49 x 65.5

PCB terminal LPK 2 H
7,0 mm
Screw connection
40-pole FB-socket IEC 603-1/
32 / 1x4 byte
60 V AC/ 75 V DC
1 A
/no
0 °C...+55 °C /-40 °C...+70 °C
II /2
TS 35
1.5 / 0.5 / 2.5
45 x 121 x 65.5

Ordering data

Type	Qty.	Order No.
RS F10 LPK 2H/12	1	8248050000
Note		

Type	Qty.	Order No.
RS F40 LPK 2H/42	1	8248060000
Note		

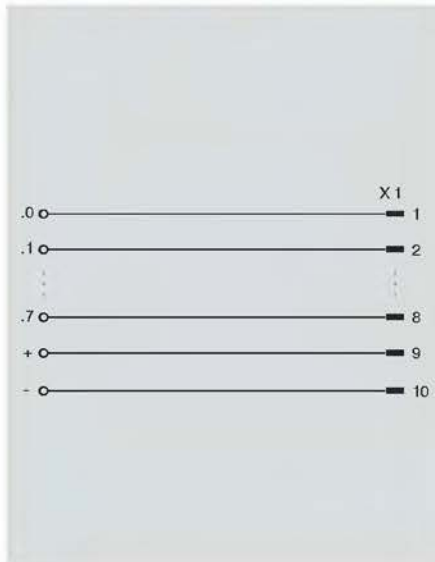
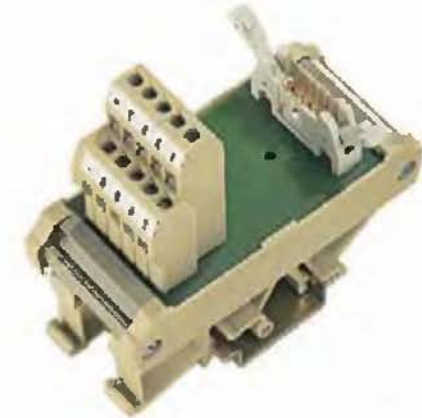
Type	Qty.	Order No.
RS F40 LPK 2H/42	1	8248060000
Note		

Input/Output in single-conductor system

- Screw connection system
- Clear connection designation
- Optional status indicator
- Additional labelling panel for group designation
- Clips to TS 32/35

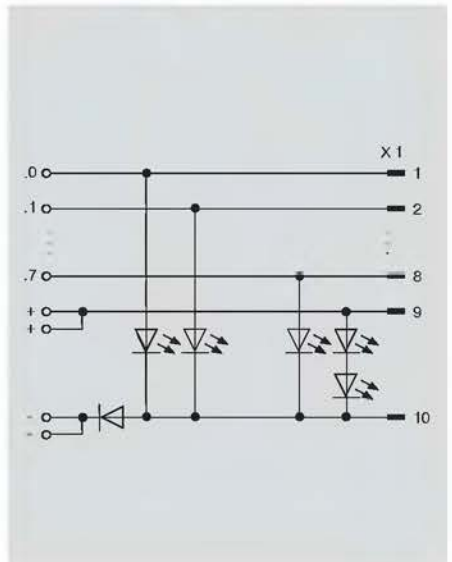
RS F10 I/O8 LPK2

I/O module



RS F10 I/O8 LD LPK2

I/O module



Technical data

Connection data

Connection on process side
Stripping length
Connection system, supply voltage/other connections
Coupling on control side, 8-way module
Coupling on control side, 32-way module/

Rated data

Number of signals
Rated voltage
Rated current per connection
LED current
Common potential at terminal/voltage supply/Byte disconnection
Operating temperature/Storage temperature
Overvoltage category/Pollution severity

Dimensions

Clamping range (rating- / min. / max.) mm
Length x width x height mm

Note

PCB terminal LPK 2 H
7,0 mm
Screw connection
10-pole FB-socket IEC 603-1

8 / 1x1 byte
60 V AC / 75 V DC
1 A
/
0 °C...+55 °C / -40 °C...+70 °C
II / 2

1,5 / 0,5 / 2,5
87 x 40 x 80

PCB terminal LPK 2 H
7,0 mm
Screw connection
10-pole FB-socket IEC 603-1

8 / 1x1 byte
24 V DC ±20 %
1 A
< 5 mA
/
0 °C...+55 °C / -40 °C...+70 °C
II / 2

1,5 / 0,5 / 2,5
87 x 40 x 80

Ordering data

Type	Qty.	Order No.
RS F10 I/O8 LPK2	1	8224290000

Type	Qty.	Order No.
RS F10 I/O8 LD LPK2	1	8224260000

Note

PLC input/output module passive

Input module in 2-conductor system

- Screw connection system
- Connection of 2-wire sensors
- Plug-in cross connectors allow group-type splitting of sensors into 1x32, 2x16 or 4x8 signals
- Clear byte-by-byte grouping of signals
- Optional status indicator
- Additional labelling panel for group designation
- Clips to TS 32/35

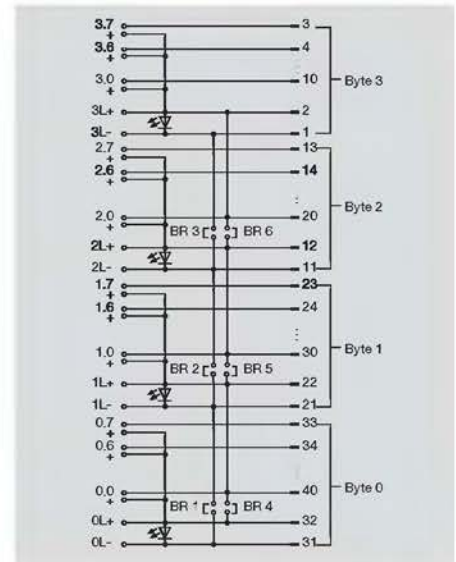
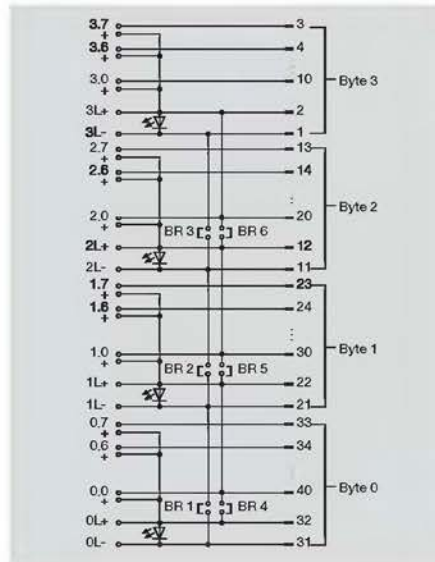
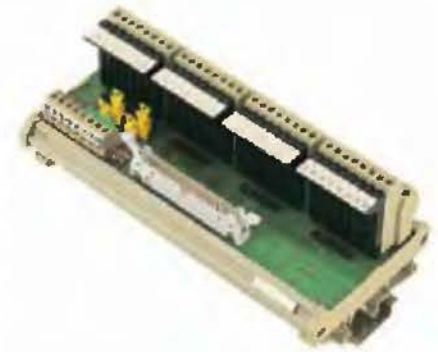
RS F40 INIT32 LPK2

Input module



RS F40 INIT32 LD LPK2

Input module



Technical data

Connection data	
Connection on process side	
Stripping length	
Connection system, supply voltage/other connections	
Coupling on control side, 8-way module	
Coupling on control side, 32-way module/	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
LED current	
Common potential at terminal/voltage supply/Byte disconnection	
Operating temperature/Storage temperature	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	

PCB terminal LPK 2 H	
7,0 mm	
Screw connection	
40-pole FB-socket IEC 603-1/	
32 / 1x4 byte	
60 V AC/ 75 V DC	
1 A	
< 5 mA	
+ potential /yes	
0 °C...+55 °C /-40 °C...+70 °C	
II /2	
TS 35 + TS 32	
1,5 / 0,5 / 2,5	
87 x 185 x 80	

PCB terminal LPK 2 H	
7,0 mm	
Screw connection	
40-pole FB-socket IEC 603-1/	
32 / 1x4 byte	
24 V DC ±20 %	
1 A	
< 5 mA	
+ potential /yes	
0 °C...+55 °C /-40 °C...+70 °C	
II /2	
TS 35 + TS 32	
1,5 / 0,5 / 2,5	
87 x 185 x 80	

Ordering data

Type	Qty.	Order No.
RS F40 INIT32 LPK2	1	8224510000
Note		

Type	Qty.	Order No.
RS F40 INIT32 LDK2	1	8224520000
Note		

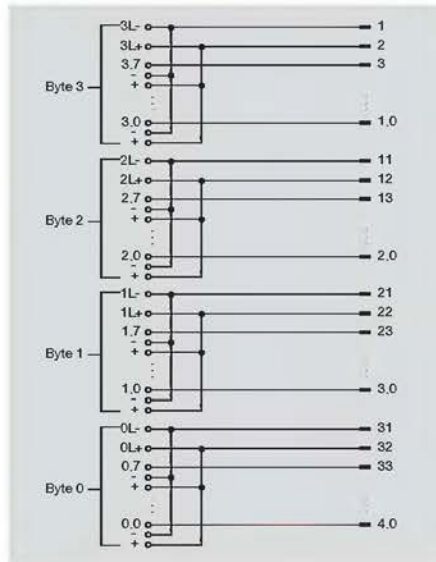
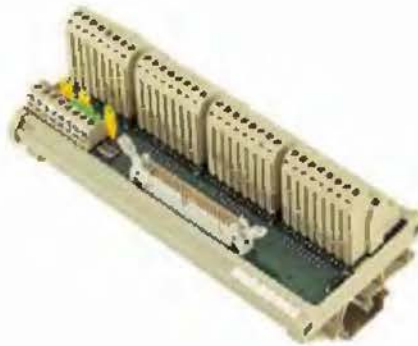
Type	Qty.	Order No.
RS F40 INIT32 LD LPK2	1	8224520000
Note		

Input module in 3-conductor system

- Screw connection system
- Connection of 3-wire sensors/initiators
- Clear byte-by-byte grouping of signals
- Additional labelling panel for group designation
- Clips to TS 32/35

RS F40 INIT32 LPK3

Input module



Technical data

Connection data	
Connection on process side	
Stripping length	
Connection system, supply voltage/other connections	
Coupling on control side, 8-way module	
Coupling on control side, 32-way module/	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
LED current	
Common potential at terminal/voltage supply/Byte disconnection	
Operating temperature/Storage temperature	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

PCB terminal LPK 3
7,0 mm
Screw connection
40-pole FB-socket IEC 603-1/
32 / 1x4 byte
60 V AC/ 75 V DC
1 A
+/- potential /yes
0 °C...+55 °C /-40 °C...+70 °C
II /2
TS 35 + TS 32
1,5 / 0,5 / 2,5
87 x 185 x 80
Note

Ordering data

Type	Qty.	Order No.
RS F40 INIT32 LPK3	1	8248040000

Note

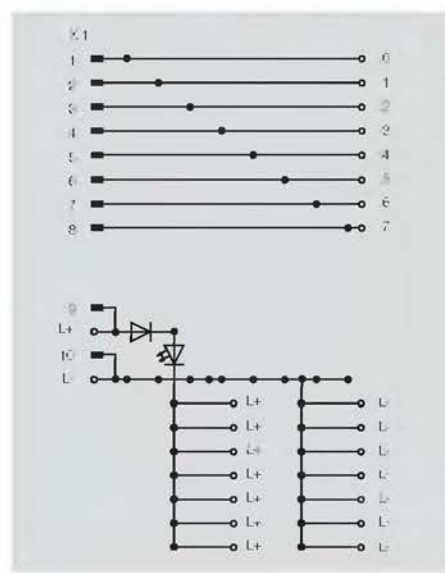
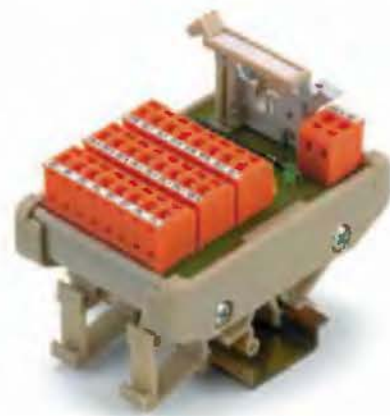
PLC input/output module passive

Input module in 3-conductor system

- Tension clamp connection system
- Connection of 3-wire initiators
- Optional status indicator
- Additional labelling panel for group designation
- Clips to TS 32/35

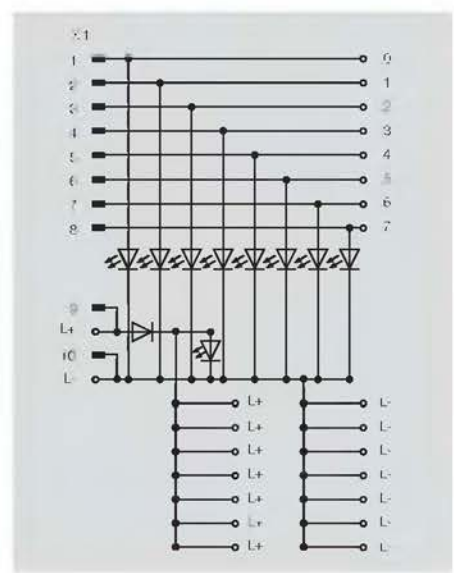
RS F10 INIT8 LMZF

Input module



RS F10 INIT8 LD LMZF

Input module



Technical data

Connection data	
Connection on process side	
Stripping length	
Connection system, supply voltage/other connections	
Coupling on control side, 8-way module	
Coupling on control side, 32-way module/	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
LED current	
Common potential at terminal/Voltage supply/Byte disconnection	
Operating temperature/Storage temperature	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

PCB terminal LMZF	
7,0 mm	
Tension clamp connection terminal	
10-pole FB-socket IEC 603-1	
/	
8 / 1x1 byte	
60 V AC / 75 V DC	
1 A	
+/- potential /-	
0 °C...+55 °C / -40 °C...+70 °C	
II / 2	
TS 35 + TS 32	
1,5 / 0,5 / 2,5	
87 x 54 x 73	
Note	

PCB terminal LMZF	
7,0 mm	
Tension clamp connection terminal	
10-pole FB-socket IEC 603-1	
/	
8 / 1x1 byte	
24 V DC ±20 %	
1 A	
< 5 mA	
+/- potential /-	
0 °C...+55 °C / -40 °C...+70 °C	
II / 2	
TS 35 + TS 32	
1,5 / 0,5 / 2,5	
87 x 54 x 73	
Note	

Ordering data

Note	
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Type	Qty.	Order No.
RS F10 INIT8 LMZF	1	8430970000
Note		

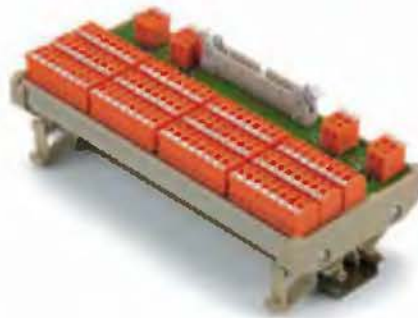
Type	Qty.	Order No.
RS F10 INIT8 LD LMZF	1	8428890000
Note		

Input module in 3-conductor system

- Tension clamp connection system
- Connection of 3-wire initiators
- Wire jumpers on the 32-way modules enable group-type splitting of the initiators into 1x32, 2x16 or 4x8 signals
- Clear byte-by-byte grouping of signals
- Optional status indicator
- Additional labelling panel for group designation
- Clips to TS 32/35

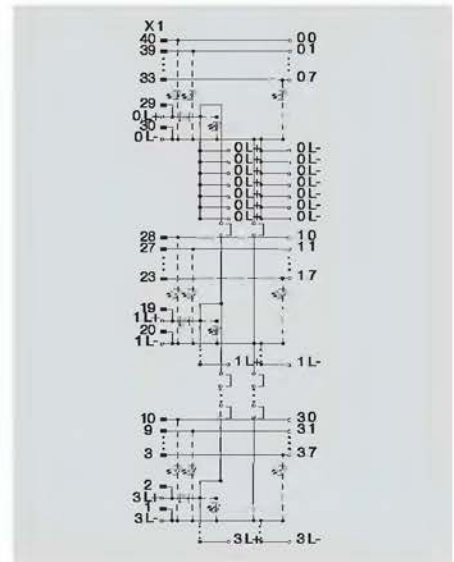
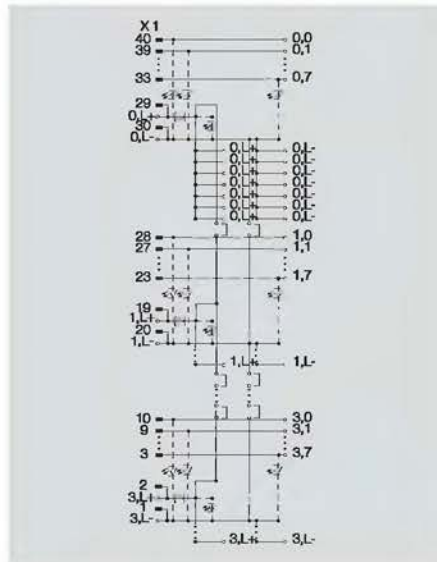
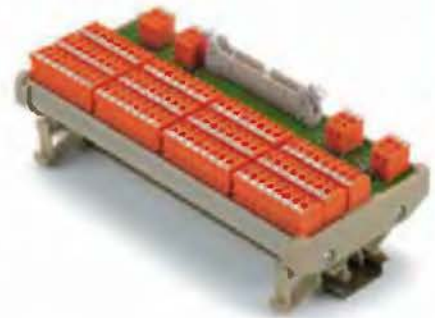
RS F40 INIT32 LMZF

Input module



RS F40 INIT32 LD LMZF

Input module



Technical data

Connection data	
Connection on process side	
Stripping length	
Connection system, supply voltage/other connections	
Coupling on control side, 8-way module	
Coupling on control side, 32-way module/	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
LED current	
Common potential at terminal/voltage supply/Byte disconnection	
Operating temperature/Storage temperature	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	

PCB terminal LMZF	7,0 mm
Tension clamp connection terminal	
40-pole FB-socket IEC 603-1/	
32 / 1x4 byte	
60 V AC/ 75 V DC	
1 A	
+/- potential /yes	
0 °C...+55 °C /-40 °C...+70 °C	
II /2	
TS 35 + TS 32	
1,5 / 0,5 / 2,5	
87 x 185 x 73	

PCB terminal LMZF	7,0 mm
Tension clamp connection terminal	
40-pole FB-socket IEC 603-1/	
32 / 1x4 byte	
24 V DC ±20 %	
1 A	
< 5 mA	
+/- potential /yes	
0 °C...+55 °C /-40 °C...+70 °C	
II /2	
TS 35 + TS 32	
1,5 / 0,5 / 2,5	
87 x 185 x 73	

Ordering data

Type	Qty.	Order No.
RS F40 INIT32 LMZF	1	8430980000
Note		

Type	Qty.	Order No.
RS F40 INIT32 LD LMZF	1	8428900000
Note		

Type	Qty.	Order No.
RS F40 INIT32 LD LMZF	1	8428900000
Note		

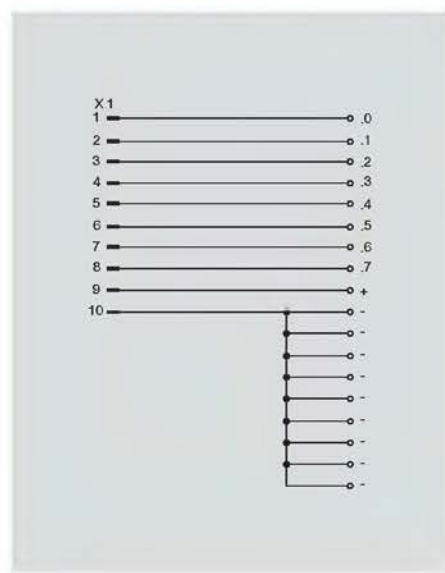
PLC input/output module passive

Output module in 2-conductor system

- Screw connection system
- Clear byte-by-byte grouping of signals
- Optional integral LED status indicator
- Additional labelling panel for group designation
- Clips to TS 32/35

RS F10 OUT8 LD LPK2H

Output module



Technical data

Connection data	
Connection on process side	
Stripping length	
Connection system, supply voltage/other connections	
Coupling on control side, 8-way module	
Coupling on control side, 32-way module/	
Rated data	
Number of signals	
Rated voltage	
Rated current per connection	
LED current	
Common potential at terminal/voltage supply/Byte disconnection	
Operating temperature/Storage temperature	
Overvoltage category/Pollution severity	
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	

PCB terminal LPK 2 H
7,0 mm
Screw connection
10-pole FB-socket IEC 603-1
/
8 / 1x1 byte
24 V DC ±20 %
1 A
< 5 mA
- potential /
0 °C...+55 °C / -40 °C...+70 °C
II / 2
TS 35 + TS 32
1,5 / 0,5 / 2,5
87 x 65 x 80

Ordering data

Note	
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Type	Qty.	Order No.
RS F10 OUT8 LD LPK2H	1	8256970000

Active components

Relay coupler output modules allow transmission of electric signals between PLC controller and the actuator level. A signal isolator guarantees transmission free of reference potential and decoupling of the electric signals.

Relay coupler output modules for controlling actuators free from reference potential from a PLC.

- RS F40 16 RS for output of 16 signals (with expansion module max. 32 signals),
- RS F40 LMZF 32 RS for output of 32 signals,
- RS F10 8RS for output of 8 signals.

The advantages of active interface components:

- low-disturbance and noise-free signal transmission
- power gain
- compact design
- cost- and time-saving wiring with pre-assembled lines
- screw or tension spring connections as required
- inexpensive adaptation via pre-assembled control lines to the PLC
- electrical isolation of input and output circuits
- expansion board for upgrading a 16-way module to a 32-way module
- plug-in relay
- integral switching status indicator
- labelling panel for group designation
- can be clipped to TS 32/35

Relay coupler

- Screw connection system
- Base and expansion modules each equipped with 16 relays
- Plug-in relays with changeover contact
- Expansion module connected via 20-pole ribbon cable
- Electrical isolation of input and output circuits
- LED status indicator
- For mounting on TS 32/35

RS F40 16RS OUT

Output module



Technical data

Connection data

Number of signals
 Connection on process side
 Type of connection
 Connection system, supply voltage/other connections
 Stripping length

16 / 1x2 byte
 Screw connection
 40-pole pin connector IEC 603/1
 Screw connection/ IEC 603-1 20-pole
 7.00 mm

Input

Rated voltage
 DC Response/dropout Volt
 Rated current DC
 Pick-up/drop-out current, DC coil
 Power rating
 Status indicator/LED - current consumption
 Response time / Drop-out time
 max. switching frequency at rated load

24 V DC ±10 %
 > 16 V / < 4 V
 30 mA
 23 mA / 2 mA
 0.75 W
 yellow /3.00 mA
 < 8 ms / < 7 ms
 10.0 Hz

Output

max. switching voltage AC/max. DC
 Continuous current/Making current/min. switching current
 max. switching power
 Type of relay/Relay mounting
 Type of contact/Contact base material

250 V/250 V
 6 A/8 A /100 mA
 2000 VA / 200 W
 SIEMENS RT 1 /pluggable
 CO contact /AgNi 90/10

Insulation coordination (EN 50178)

Operating temperature
 Storage temperature
 Rated voltage
 Dielectric strength, Input/Output
 Overvoltage category
 Pollution severity
 DIN Rail compatibility
 Standards/Approvals

0 °C...+55 °C
 -40 °C...+70 °C
 300 V
 4 kV_{eff}
 II
 2
 IS 32/35
 EN 50178 /CE

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

2.5 / 0.5 / 4
 87 x 350 x 76

Note

Ordering data

Basic module
 Expansion module

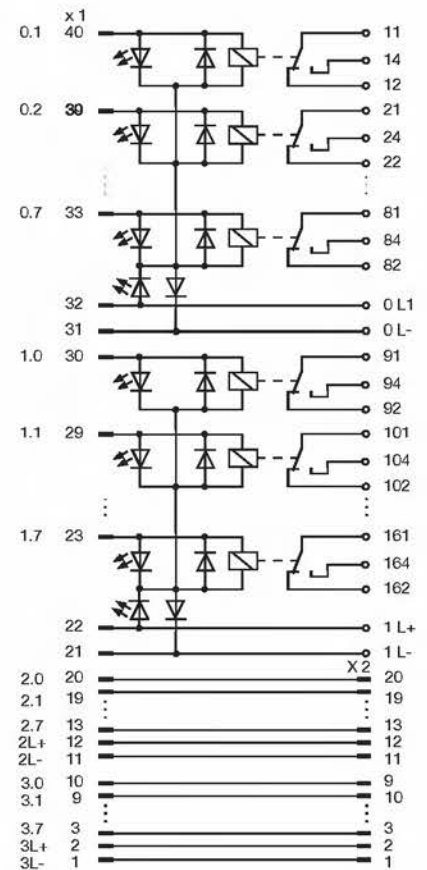
Type	Qty.	Order No.
RS F40 16RS OUT 24VDC	1	8224181001
RS F40 16RS OUT 24VDC E	1	8224191001

Note

Accessories

Note

Square relay: RT314/04-40584806/00



PLC input/output module active

Relay coupler

- Screw connection system
- Compact design
- Electrical isolation of input and output circuits
- Relay soldered with changeover contact
- LED status indicator
- Clips to TS 35

RS F10 8R OUT 24 V DC

Output module



Technical data

Connection data	
Type	IEC603-1 10-pole/ screw connection
Number of signals	8 / 1x1 byte
Connection on process side	Screw connection
Type of connection	10-pole pin connector IEC 603/1
Connection system, supply voltage/other connections	Screw connection LM 3.5
Stripping length	5.00 mm
Input	
Rated voltage	24 V DC ±10 %
DC Response/dropout Volt	> 18 V / < 4 V
Rated current DC	20 mA
Pick-up/drop-out current, DC coil	20 mA / 2mA
Power rating	0,5 W
Status indicator/LED - current consumption	yellow /5.00 mA
Response time / Drop-out time	< 8 ms / < 4 ms
max. switching frequency at rated load	
Output	
max. switching voltage AC/max. DC	250 V / 120 V
Continuous current/Making current/min. switching current	3 A / 5 A / 100 mA
max. switching power	1250 VA / 80 W
Type of relay/Relay mounting	DOLD OW5691 /soldered
Type of contact/Contact base material	CO contact /AgNi
Insulation coordination (EN 50178)	
Operating temperature	0 °C...+55 °C
Storage temperature	-40 °C...+70 °C
Rated voltage	250 V
Dielectric strength, Input/Output	4 kV _{eff}
Overvoltage category	II
Pollution severity	2
DIN Rail compatibility	TS 35
Standards/Approvals	EN 50178 /CE

Dimensions	
Clamping range (rating- / min. / max.)	mm ² 1,5 / 0,5 / 1,5
Length x width x height	mm 45 x 93 x 51

Note

Ordering data

IEC603-1 10-pole/ screw connection

Note

Accessories

Note

Type	RS F10 8R OUT 24VDC
Qty.	1
Order No.	8329800000

Dimensions	
Clamping range (rating- / min. / max.)	mm ² 1,5 / 0,5 / 1,5
Length x width x height	mm 45 x 93 x 51

Note

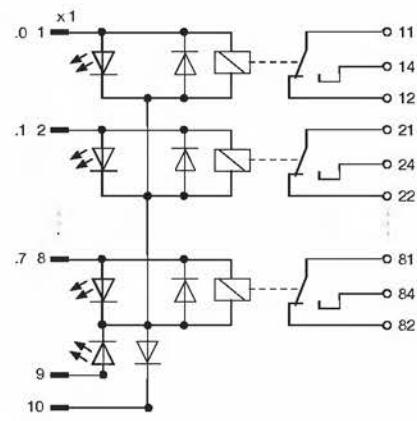
Ordering data

IEC603-1 10-pole/ screw connection

Note

Accessories

Note

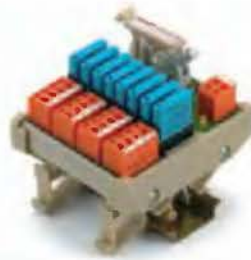


Relay coupler

- Tension clamp connection system
- Compact design
- Electrical isolation of input and output circuits
- 8 plug-in relays
- NOC design
- LED status indicator
- Additional labelling panel for group designation
- Clips to TS 32/35

RS F10 8RS OUT LMZF

Output module



Technical data

Connection data

Type
 Number of signals
 Connection on process side
 Type of connection
 Connection system, supply voltage/other connections
 Stripping length

IEC603-1 10-pole/ tension clamp connection
 8 / 1x1 byte
 PCB terminal LMZF
 10-pole pin connector IEC 603/1
 Tension clamp connection
 7.00 mm

Input

Rated voltage
 DC Response/dropout Volt
 Rated current DC
 Pick-up/drop-out current, DC coil
 Power rating
 Status indicator/LED - current consumption
 Response time / Drop-out time
 max. switching frequency at rated load

24 V DC $\pm 10\%$
 $> 19\text{ V} / < 7\text{ V}$
 30 mA
 20 mA / 2mA
 0,5 W
 yellow /3,00 mA
 $< 5\text{ ms} / < 15\text{ ms}$

Output

max. switching voltage AC/max. DC
 Continuous current/Making current/min. switching current
 max. switching power
 Type of relay/Relay mounting
 Type of contact/Contact base material

250 V/125 V
 3 A/5 A /10 mA
 1250 VA / 600 W
 FUJITSU NYP-24WK /pluggable
 NO contact /AgNi 5 μ Au

Insulation coordination (EN 50178)

Operating temperature
 Storage temperature
 Rated voltage
 Dielectric strength, Input/Output
 Overvoltage category
 Pollution severity
 DIN Rail compatibility
 Standards/Approvals

0 °C...+55 °C
 -40 °C...+70 °C
 300 V
 2,5 kV
 II
 2
 TS 32/35
 EN 50178 /CE

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

1,5 / 0,5 / 2,5
 87 x 78 x 73

Note

Ordering data

IEC603-1 10-pole/ tension clamp connection

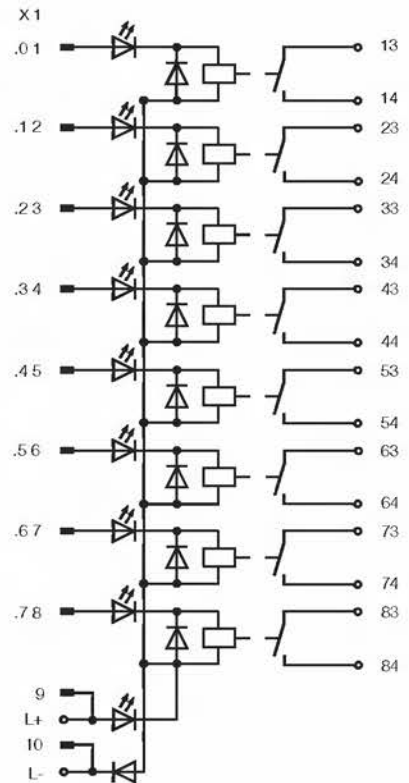
Type	Qty.	Order No.
RS F10 8RS OUT LMZF	1	8430990000

Note

Accessories

Note

Spare relay HVP-24 WK 406251/000



PLC input/output module active

Relay coupler

- Tension clamp connection system
- Compact design
- Electrical isolation of input and output circuits
- 32 plug-in relays
- NOC design
- LED status indicator
- Additional labelling panel for group designation
- Clips to TS 32/35

RS F40 32RS OUT LMZF

Output module



Technical data

Connection data	
Type	IEC603-1 40-pole/ tension clamp connection
Number of signals	32 / 1x4 byte
Connection on process side	PCB terminal LMZF
Type of connection	40-pole pin connector IEC 603/1
Connection system, supply voltage/other connections	Tension clamp connection
Stripping length	7.00 mm
Input	
Rated voltage	24 V DC ±10 %
DC Response/dropout Volt	> 19 V / < 7 V
Rated current DC	30 mA
Pick-up/drop-out current, DC coil	20 mA / 2mA
Power rating	0,5 W
Status indicator/LED - current consumption	yellow /3,00 mA
Response time / Drop-out time	< 5 ms / < 15 ms
Output	
max. switching voltage AC/max. DC	250 V / 125 V
Continuous current/Making current/min. switching current	3 A / 5 A / 10 mA
max. switching power	1250 VA / 600 W
Type of relay/Relay mounting	FUJITSU NYP-24WK /pluggable
Type of contact/Contact base material	NO contact /AgNi 5 µ Au
Insulation coordination (EN 50178)	
Operating temperature	0 °C...+55 °C
Storage temperature	-40 °C...+70 °C
Rated voltage	300 V
Dielectric strength, Input/Output	2,5 kV
Overvoltage category	II
Pollution severity	2
DIN Rail compatibility	TS 32/35
Standards/Approvals	EN 50178 /CE

Dimensions	
Clamping range (rating- / min. / max.)	mm ² 1,5 / 0,5 / 2,5
Length x width x height	mm 87 x 263 x 73

Note	

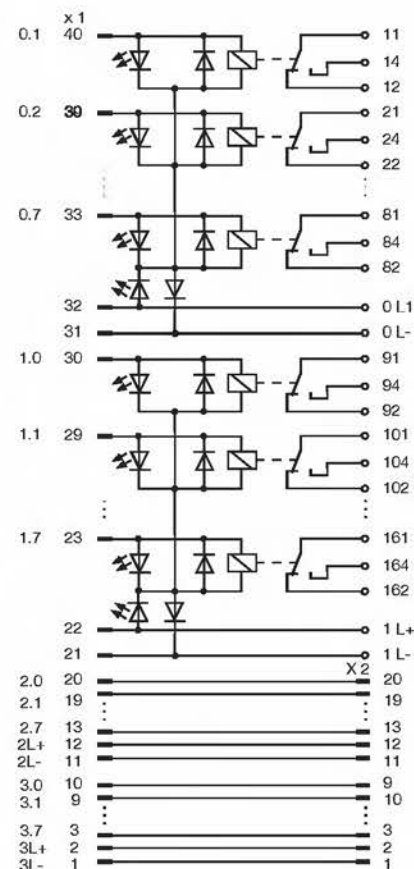
Ordering data

IEC603-1 40-pole/ tension clamp connection	Type	Qty.	Order No.
	RS F40 32RS OUT LMZF	1	8431000000

Note	

Accessories

Note	
Spare relay HWP-24 WK 406251/000	



Digital signal processing

Digital signal processing	
Relay couplers – overview	C.2
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Relay couplers – RIDERSERIES	C.32
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Time relays – BT SERIES	C.112
Timing relay – DK SERIES	C.118
Timing relay – MCZ SERIES	C.121
Function components	C.122

Housing forms for relay couplers



DK SERIES

All the components of the DKR mini-couplers are extremely narrow. Their width of just 6 mm is possible thanks to the use of the very latest surface mounted devices (SMDs). Weidmüller can supply four or five screw connections for 0.5 ... 4 mm² conductor cross-sections. The mini-couplers can be used for a wide range of applications where it is necessary to couple digital sensor/actuator signals with automation devices and the process field. The DKR relay couplers enable signals from the field with different voltages to be picked up and standardised.

MCZ SERIES

With a width of just 6 mm, the MCZ housing is the narrowest of its kind. It is distinguished by the following technical features:

- tension clamp connection reduces installation costs
- integral cross-connection at input/output minimises the wiring workload

MCZR mini-conditioners (relay couplers) have four or five tension clamp connections for 0.5...1.5 mm² conductor cross-sections.

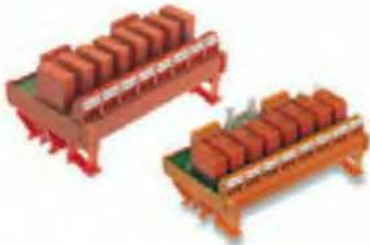
In the **MICROSERIES** it is the product features of the Weidmüller RSS mains relays that have been incorporated into the world of modular terminals. Here, the user can take advantage of the specific properties of modular terminals. A free choice of connection system, plug-in cross-connections, extensive labelling options and the space-savings so typical of relays, are all available to the user.

Proven product properties from the world of connection systems combined with the efficiency of the Weidmüller RCL power relay – those are the features of the **PLUGSERIES**.

The plug-in ZQV cross-connection enables quick and easy bridging of inputs and outputs, and also extensive labelling options.

Besides the unrestricted choice of connection system, it is, more than anything else, the Wemid housing material that turns the PLUGSERIES into a unique range of products.

The **RIDERSERIES** represents the successful integration into the Weidmüller relay range with the RCL, RCM, RRD and RPW products. In terms of design, this modular series complies with the international standard. The numerous pluggable versions are available with up to 4-way change-over contacts with an unrestricted choice of connection system.



RS SERIES

Clip-on bases with RS 30, 31, 32 relays are between 11.2 and 25 mm wide, depending on the particular version. The open clip-on profile means that relay couplers can be built in a pluggable format. The components on their clip-on base profiles are fitted with clamping yoke (screw connection) or spade connections for connecting conductors. The following conductors can be connected:

- solid: 0.5 ... 4 mm²,
- stranded: 0.5 ... 2.5 mm².

Clip-on base with multiple interface

RSM multiple interfaces are available fitted with 4, 8 or 16 relays as an option. To save wiring work on the input side, versions with common plus or minus potential are also available. PCB connection components are fitted with clamping yokes (screw connection) and are suitable for connecting the following conductor cross-sections:

- solid: 0.5 ... 4 mm²,
- stranded: 0.5 ... 2.5 mm².



EG SERIES

EG 7 build-in housings have a special status: these housings are designed exclusively for incorporating narrow 10 mm relay couplers. The EG 7 relay couplers are available for mounting on either TS 32 or TS 35 DIN rails. Also available is a clip-on base RS EG7 for RST plug-in relay couplers.



WAVE SERIES

Innovative electronic components need housings designed to match their functions. Therefore, setting and operating functions are required, and technical requirements must be supported, e.g. heat dissipation or electromagnetic compatibility. A compact design saves space in the electrical cabinet and cuts installation costs. Ergonomics and design are becoming more and more important for high-quality relay coupler interfaces. The WAVEBOX fulfils these criteria and is distinguished by:

- installation without tools
- plug-in PCB
- plug-in ZQV 2.5 N cross-connection
- hinged, transparent cover
- labelling with WS tags
- clips onto TS 35 DIN rail

Switching large and small capacities

Basically, the reliability of the contacts in a relay reaches a maximum at a medium current load thanks to the continuous self-cleaning effect. As the contact load increases and hence leads to more severe erosion of the contacts, the switching reliability decreases with an increasing number of switching operations. This reduces the service life of the contacts. Although at very low loads the minimal erosion of the contacts does raise the service life more or less to the level of the mechanical service life, the lack of a self-cleaning effect contributes to a lower contact reliability.

Reliable contact at low currents, especially when only small voltages are involved as well, depends on the choice of contact material. Contacts of silver-nickel, which is standard for the majority of Weidmüller relays, are generally suitable for currents of approx. 10 mA and higher. Such large-surface contacts can switch both low and high currents. However, at low currents occasional failures can occur due to erosion and the lack of the self-cleaning effect. The higher the current, the more reliable is the contact – thanks to the self-cleaning. Silver-nickel is suitable as a contact material for low currents/voltages. It provides, however, only **moderate switching reliability**. If this is acceptable, then conventional standard relays represent an inexpensive solution.

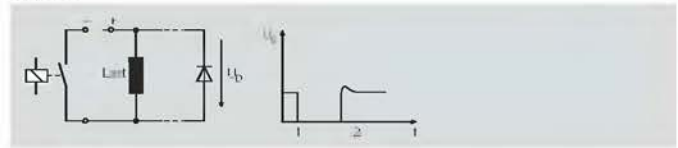
For applications that call for **improved contact reliability** or low currents/voltages, conventional relays with hard-plated gold contacts are preferable because they do not erode and therefore operate more reliably.

If **maximum switching reliability** is necessary, especially for low currents/voltages, a relay should not be your first choice. In these instances Weidmüller advises the use of optocouplers. Wear and abrasion caused by mechanical movements are non-existent in optocouplers.

Protective circuits for the contacts

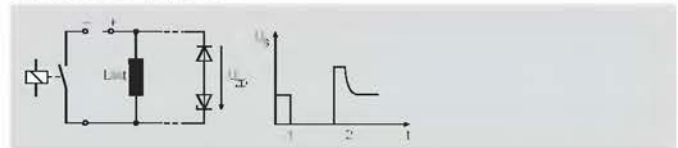
The switching of inductive or capacitive loads produces switching sparks which can influence the electrical service life of the relays. The following protective circuits for the contacts reduce contact wear:

Diode



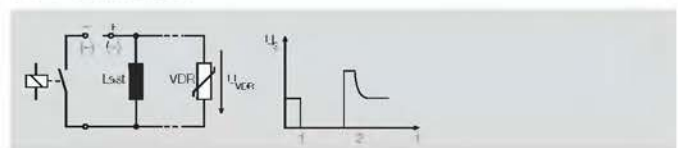
- Advantage: Can be used for all capacities, low overvoltage, minimum space required, low price
- Disadvantage: Very long release delay

Diode and Z-diode



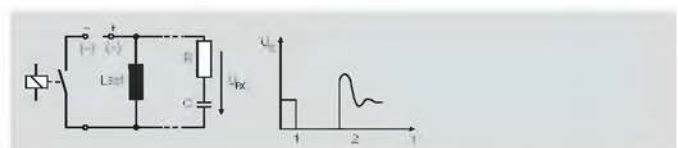
- Advantage: Low overvoltage (defined by Z-diode), short release delay
- Disadvantage: Cannot be used for large capacities

RC combination



- Advantage: Low overvoltage, short release delay
- Disadvantage: High current load on the contacts when switching on; more complicated and expensive at greater capacities

Varistor



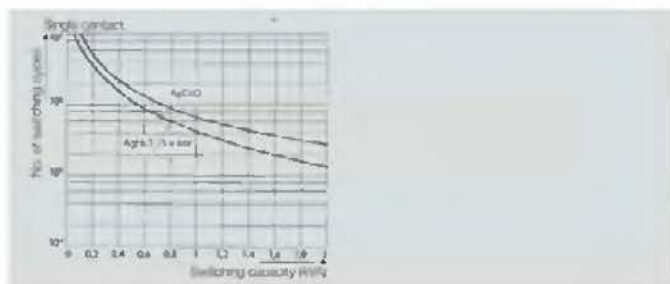
- Advantage: Short release delay, low price
- Disadvantage: Cannot be used for all operating voltages and capacities

U_b = Voltage progression 1 = Closing 2 = Opening

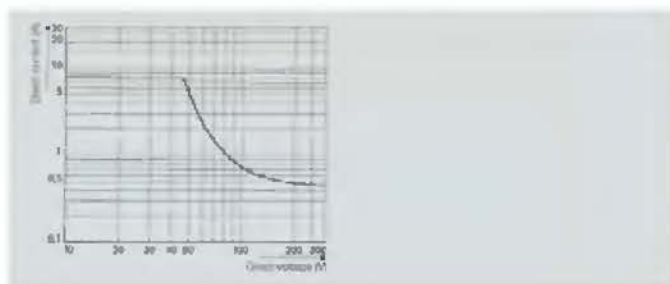
Principal characteristics of relay contacts

Although every relay contact has its own characteristics, the performance curves are very similar in terms of shape, but not in terms of the actual values. The examples below show curves for

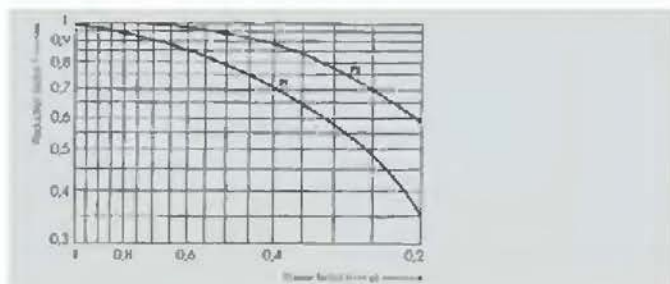
- contact lifetime (number of make-break operations plotted against make-break capacity)
- DC limit curve (direct current plotted against direct voltage)
- reduction factor for inductive load (reduction factor plotted against $\cos \varphi$)



Contact lifetime for ohmic load



DC limit curve for ohmic load



Reduction factor for inductive load $\cos \varphi < 1$
 Eff. make-break op. = make-break operations for $(\cos \varphi = 1) \times$

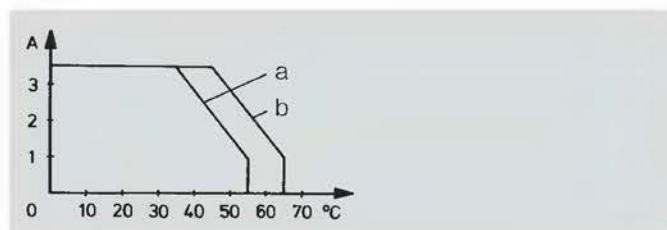
Derating curve

The transition resistance of the relay contacts is a key factor contributing to temperature increase inside the relay modules. This relationship is illustrated by a derating curve, defined as the function of the permissible current plotted against the ambient temperature.

The permissible current (curve a) is determined for the following operating conditions:

- Continuous operation
- Rated input voltage + 10 percent
- Several relay modules working under load, mounted horizontally in rows on mounting rail, without any spacing

If the modules are mounted with a spacing > 20 mm, this results in a higher current load (curve b). Curve b also shows the maximum values for switching or short-time operation when mounted horizontally.



Relay couplers – overview

Contact materials

AgNi Au (silver-nickel hard gold plated)

For dry loads, measuring and switching circuits, control inputs (1 mV – 10 V, 0.1 mA – 100 mA).

AgNi 0.15 (fine-grain silver)

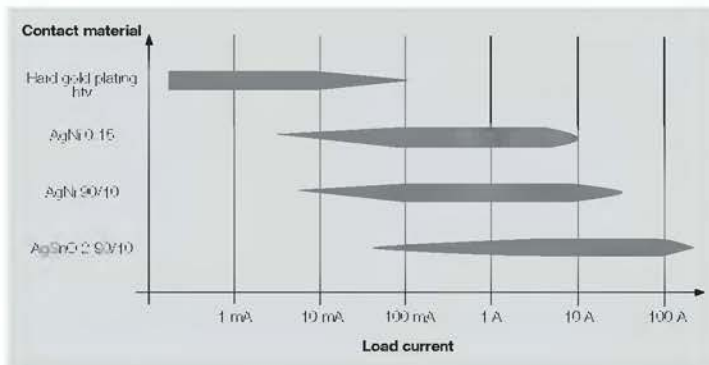
Suitable for low to medium loads, AC and DC loads, resistive and inductive (solenoid valves, fans, heaters); not suitable for high inrush currents.

AgNi 90/10 (silver-nickel)

Suitable for all loads, constantly low contact-circuit resistances in the low load range, AC and DC loads, resistive and inductive (solenoid valves, fans, heaters); not suitable for capacitive inrush currents.

AgSnO₂ 90/10 (silver-tin oxide)

Suitable for all loads. Well suited to higher loads. Particularly well suited to high inrush currents with short rise times (lamp loads, capacitive loads, fluorescent tubes, switch-mode power supplies, etc.). Well suited to resistive, inductive and capacitive DC applications due to low material transport.

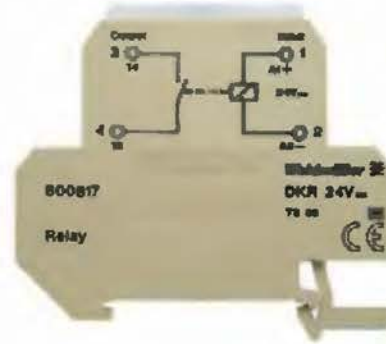


Definition of technical data

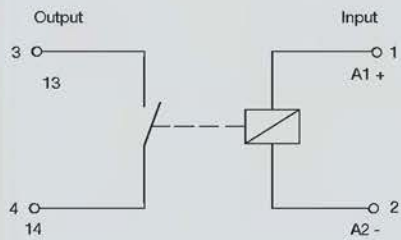
Input Circuit	
Nominal voltage [V]	Reference voltage at which the relay coupler operates; typical input voltages => 5 V DC, 12, 24, 48, 60, 115, 230 AC/DC
Nominal current [mA]	Input voltage and input resistance; input resistance => coil resistance + resistance of triggering device (R, LED, GL ...)
Nominal power [W/VA]	Input voltage x input current DC/AC with tolerance $\pm 10\%$ or $+5/-15\%$, typical range for relay coupler 250 mW ... 1 W or 0.4 VA ... 1.2 VA
Response voltage [V]	Smallest input voltage required for the relay coupler to respond ($T_u = 293\text{ K}$)
Pick-up current [mA]	Smallest input current at which the relay switches from normal to operating position ($T_u = 293\text{ K}$)
Pick-up power [W/VA]	Product of response voltage and pick-up current
Drop-out voltage [V]	Voltage level at which the relay reliably drops out
Drop-out current [mA]	Input current at which the relay reliably drops out
Output Circuit	
Max. switching voltage [V]	Max. voltage that can be applied to the relay contact
Making current [A]	The current allowed to flow for max. 4 seconds after the relay contact closes
Continuous current [A]	Current allowed to flow continuously after the contact closes
Switching power [W/VA]	Product of output voltage and making current for resistive, inductive or capacitive load
Min. switching power [μW]	Smallest power that can be switched via the contact
Service life	Number of switching operations until the contact fails – mechanical => without electrical load – electrical => under resistive or inductive AC/DC load
Response time [ms]	Time until contact closes/opens after switching the excitation voltage
Drop-out time [ms]	Time until contact closes/opens after opening the excitation current circuit
Switching frequency [Hz]	Switching operations per second in pulse duty factor 1 : 2 ($t_{on} = t_{off}$)
Dielectric strength [kV]	Max. test voltage between input and output circuits that does not result in a discharge
Protective separation	Relay couplers to EN 50178 and VDE 0106 part 101

Relay coupler - DK SERIES

1 NO contact
input bottom
DC/UC coil



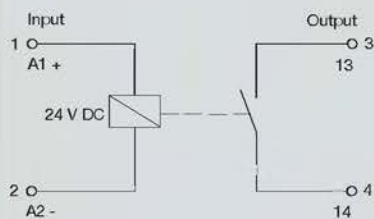
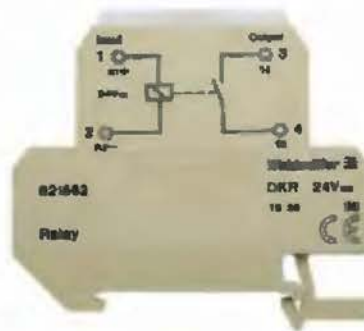
C



Output	
max. switching voltage AC/Continuous current	100 V/0.5 A
min. switching power	1 V / 1 mA
Response time / Drop-out time	typically 0.7...2.5 ms/0.2...2 ms
Contact base material	Rh/Ru
Mechanical endurance	10 ⁶ switching cycles
max. switching frequency at rated load	200.0 Hz
Rated data	
Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	150 V
Impulse withstand voltage	1.5 kV
Creepage and clearance path input - output	≥ 3 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	no
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 4.0 / 0.5 / 4
Length x width x height	mm 77 / 6 / 62
Note	End plate: 2P DfT4_0087560000

Ordering data	5 V DC 1NO	12 V DC 1NO	24 V UC 1NO	24 V DC 1NO
Input				
Rated voltage	5 V DC ±5%	12 V DC ±10 %	24 V UC ±10 %	24 V DC +5% / -10%
Rated current AC			15 mA	
Rated current DC	12.5 mA	12 mA	9 mA	9.3 mA
Power rating	65 mW	144 mW	0.36 V A / 260 mW	225 mW
AC Response/dropout Volt			12 V / 8 V	
DC Response/dropout Volt	4.4 V	9 V	11 V / 10 V	11 V
AC pickup/dropout current			6.3 mA / 4.3 mA	
DC pickup/dropout current	11.8 mA	10 mA	3.8 mA / 3 mA	7.5 mA
Ordering data				
For TS 32				
Type	DKR 32 5VDC 1A		DKR 32 24VUC 1A	DKR 32 24VDC 1A
Order No.	8019600000		8008110000	8016620000
For TS 35				
Type	DKR 35 5VDC 1A	DKR 35 12VDC 1A	DKR 35 24VUC 1A	DKR 35 24VDC 1A
Order No.	8019610000	8171100000	8016610000	8008170000
Ordering data				
Type				
Order No.				
Note				

1 NO contact
input top
DC coil



Output	
max. switching voltage AC/Continuous current	100 V/0.5 A
min. switching power	1 V / 1 mA
Response time / Drop-out time	typically 0.7...2.5 ms/0.2...2 ms
Contact base material	Rh/Ru
Mechanical endurance	10 ⁶ switching cycles
max. switching frequency at rated load	25.0 Hz
Rated data	
Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	150 V
Impulse withstand voltage	1.5 kV
Creepage and clearance path input - output	≥ 3 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	no
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 4.0 / 0.5 / 4
Length x width x height	mm 77 / 6 / 62
Note	End plate: 8P DfT4_0087560000

Ordering data

Input		24 V DC 1NO			
Rated voltage		24 V DC +5% / -10%			
Rated current AC					
Rated current DC		9.3 mA			
Power rating		225 mW			
AC Response/dropout Volt					
DC Response/dropout Volt		11 V			
AC pickup/dropout current					
DC pickup/dropout current		3.75 mA			

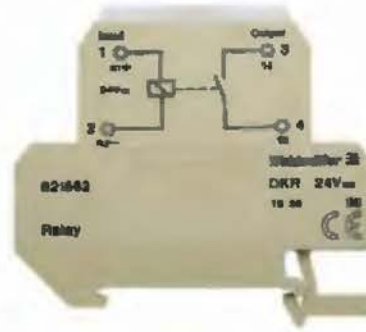
Ordering data					
For TS 32	Type				
	Order No.				
For TS 35	Type	DKR 35 24VDC 1A			
	Order No.	8215620000			

Ordering data					
	Type				
	Order No.				

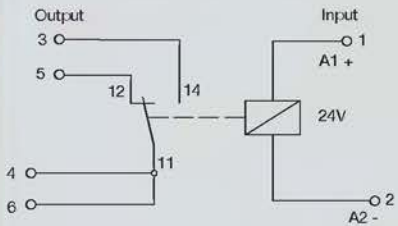
Note					

Relay coupler - DK SERIES

**1 change-over contact
input bottomDC/UC coil**



C



Output	
max. switching voltage AC/Continuous current	250 V/6 A
min. switching power	10 V / 100 mA
Response time / Drop-out time	6 ms/15 ms AC; 8 ms DC
Contact base material	AgSnO2
Mechanical endurance	2x10 ⁷ switching cycles
max. switching frequency at rated load	20.0 Hz
Rated data	
Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	not available
Operating temperature	-40 °C...+60 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;ESD;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Impulse withstand voltage	4 kV
Creepage and clearance path input - output	≥ 8 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	no
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 4.0 / 0.5 / 4
Length x width x height	mm 77 / 6 / 62
Note	End plate AP DK5: 8388270000; AP DK T4: C687160000

Ordering data	24 V UC 1CO	24 V DC 1CO	24 V UC 1CO	
Input				
Rated voltage	24 V UC ±20 %	24 V DC ±20 %	24 V UC ±20 %	
Rated current AC	9 mA		20 mA	
Rated current DC	7 mA	11.5 mA	16 mA	
Power rating	220 mVA/ 180 mW	384 mW	480 mW / 400 mW	
AC Response/dropout Volt	18 V		18 V	
DC Response/dropout Volt	19 V	19 V	18 V	
AC pickup/dropout current	7 mA		12.8 mA	
DC pickup/dropout current	5.5 mA	9 mA	11.5 mA	
Ordering data				
For TS 32	Type DKR DK5 24VUC 1U			
	Order No. 9454910000			
For TS 35	Type DKR DK5 24VUC 1U	DKR 35 24VDC 1U	DKR 35 24VUC 1U	
	Order No. 9454910000	8181980000	8181970000	
Ordering data				
	Type			
	Order No.			
Note				

Relay coupler - MCZ SERIES

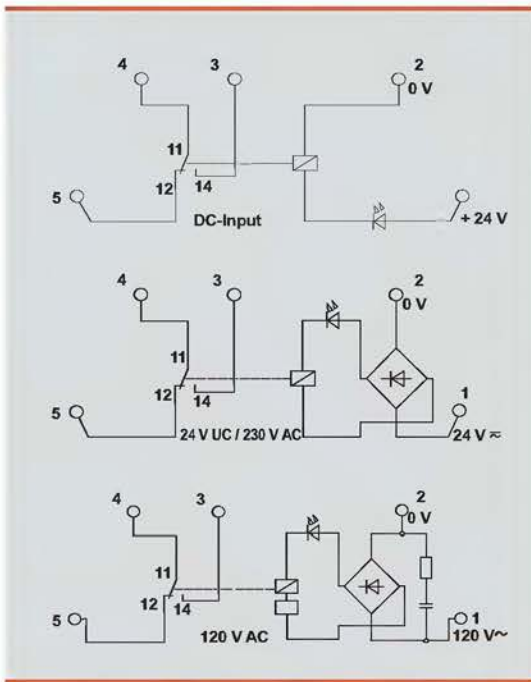
Mini-conditioner MCZ R
1 change-over contact
AC/ DC/ UC coil

Module can be used as an universal interface between control and actuator to switch small and medium-sized loads.

- 1 change-over contact
- Pluggable cross-connection at input and output minimises the wiring workload.
- 6 mm wide, low height



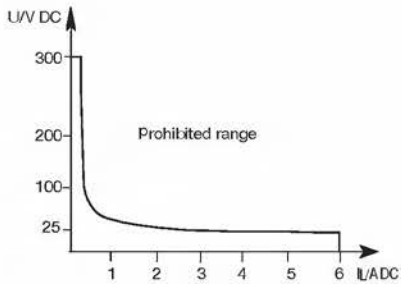
C



Output		
max. switching voltage AC/Continuous current	400 V/6 A	
min. switching power	12 V / 100 mA	
Response time / Drop-out time	4.5 ms/10 ms	
Contact base material	AgSnO2	
Mechanical endurance	20x10 ⁶ switching cycles	
max. switching frequency at rated load	0.1 Hz	
Rated data		
Status indicator/Free wheel diode	green LED/Yes	
Reverse pol. prot	available	
Operating temperature	-25 °C...+55 °C	
Storage temperature	-40 °C...+60 °C	
Humidity	40°C/93% RH, no condensation	
Approvals	CSA;cULFus;CE;ESD;GL;	
Insulation coordination (EN 50178)		
Standards	EN 50178	
Rated voltage	300 V	
Impulse withstand voltage	6 kV	
Creepage and clearance path input - output	≥ 5,5 mm	
Overvoltage category	III	
Pollution severity	2	
Protective separation to VDE 0106 part 101	yes	
Dimensions		
Clamping range (rating- / min. / max.)	mm ²	1.5 / 0.5 / 2.5
Length x width x height	mm	91 / 6 / 63.2
Note	End plate #P MCZ 1.5: 8389000900 for cross-connections and markings see MCZ Series accessories	

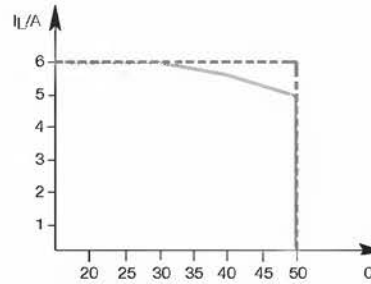
Applications

Limit curve



Derating curve

— in a row without spacing on terminal rail
 - - - in a row with 20 mm spacing on terminal rail



Mini-conditioner MCZ R 1 change-over contact AC/ DC/ UC coil

Ordering data	24 V DC 1CO	24 V DC 1CO Au	24 V UC 1CO	60 V DC 1CO
Input				
Rated voltage	24 V DC $\pm 20\%$	24 V DC $\pm 20\%$	24 V UC $\pm 10\%$	60 V DC $\pm 20\%$
Rated current AC			10.8 mA	
Rated current DC	6.3 mA	6.3 mA	6.1 mA	3 mA
Power rating	156 mW	156 mW	160 mVA / 150 mW	180 mW
AC Response/dropout Volt			approx. 17 V/ approx. 7 V	
DC Response/dropout Volt	12 V...19 V/4 V...5.5 V	12 V...19 V/4 V...5.5 V	approx. 19 V/ approx. 4 V	approx. 38 V/ approx. 14 V
AC pickup/dropout current				
DC pickup/dropout current	5.7 mA	5.7 mA	9 mA / 5 mA	2.7 mA
Ordering data Complete module				
Change-over contact Type	MCZ R 24VDC	MCZ R 24VDC	MCZ R 24VUC	MCZ R 60VDC
Order No.	8365980000	8442960000	8390590000	8470380000
NO contact Type				
Order No.				
Ordering data Spare relay				
Type				
Order No.				
Note				
Ordering data	110 V DC 1CO	120 V AC 1CO	230 V AC 1CO	
Input				
Rated voltage	110 V DC $\pm 10\%$	120 V AC -15 %/ +10 %	230 V AC $\pm 10\%$	
Rated current AC		7 mA	9.5 mA	
Rated current DC	2.85 mA			
Power rating	340 mW	0.85 VA	2.1 VA	
AC Response/dropout Volt		approx. 70 V/ approx. 22 V	approx. 115 V/ approx. 60 V	
DC Response/dropout Volt	approx. 68 V/ approx. 19 V			
AC pickup/dropout current		4 mA / 1,3 mA	5 mA / 2,5 mA	
DC pickup/dropout current	1.6 mA/0.4 mA			
Ordering data Complete module				
Change-over contact Type	MCZ R 110VDC	MCZ R 120VAC	MCZ R 230VAC	
Order No.	8467470000	8420880000	8237710000	
NO contact Type				
Order No.				
Ordering data Spare relay				
Type				
Order No.				
Note				

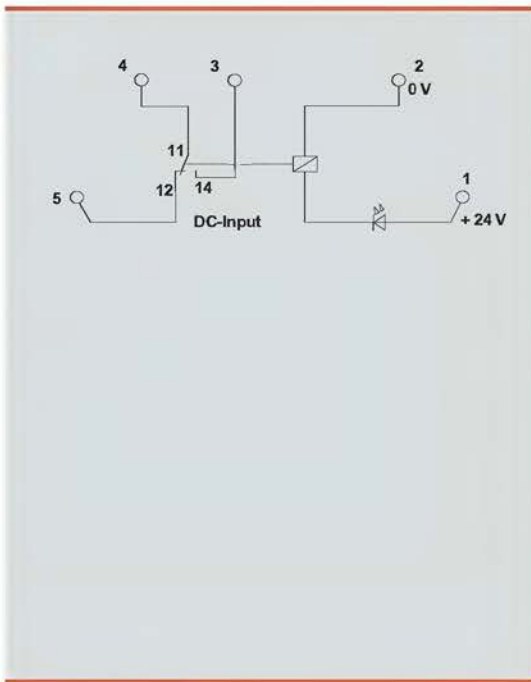
Relay coupler - MCZ TRAK SERIES

MCZ R TRAK
1 CO contact or 1 NO contact
DC coil

- 1 change-over contact, also with gold contacts
- Module for rail industry applications
- Vibration requirements to EN 61373, requirements category 1 class B
- Voltage fluctuations -30%/+25% and ±40% for 0.1 s
- Voltage interruptions at input up to 10 ms
- Condensation permissible

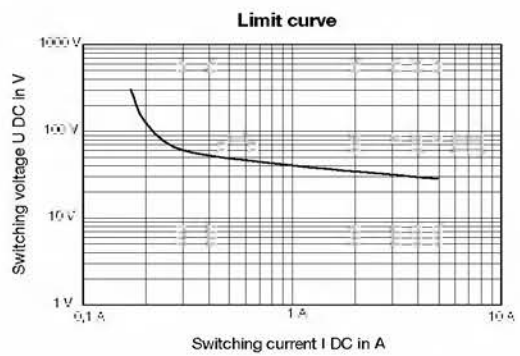
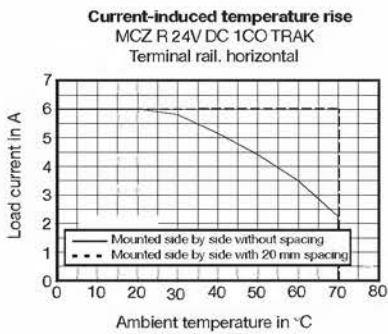


C



Output	
max. switching voltage AC/Continuous current	250 V/6 A
min. switching power	12 V / 100 mA
Response time / Drop-out time	< 6,5 ms / < 75 ms
Contact base material	AgSnO
Mechanical endurance	20x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	+85°C for 10 minutes; -25 °C...+70 °C
Storage temperature	-40 °C...+85 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Screw connection	
	1.5 / 0.5 / 2.5
Tension clamp connection	
	91 / 6 / 63.2
Note	End plate AP MCZ 1.5: 8389000900 for cross-connectors and markings see MCZ Series accessories

Applications

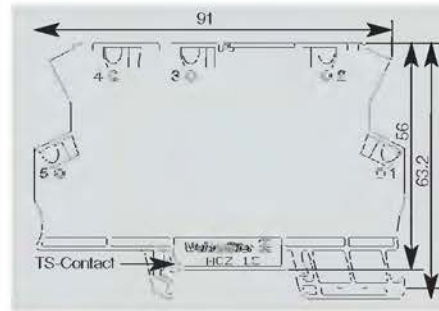


MCZ R TRAK
1 CO contact or 1 NO contact
DC coil

Ordering data	24 V DC TRAK	36 V DC TRAK	48...110 V DC TRAK	
Input				
Rated voltage	24 V DC	36 V DC	48...110 V DC	
Rated current AC				
Rated current DC	11,5...16,5 V	8...12 mA	< 3 mA	
Power rating	195...50 mW	200...540 mW	< 300 mW	
AC Response/dropout Volt				
DC Response/dropout Volt	7...14 V / 3...5 V	4,5...15 V	> 25 V / < 6 V	
AC pickup/dropout current				
DC pickup/dropout current				
Ordering data				
Complete module				
CO contact	Type	MCZ R 24Vdc 1CO TRAK	MCZ R 36Vdc 1CO TRAK	MCZ R 48...110Vdc 1CO TRAK
	Order No.	8713890000	8713900000	8713910000
NO contact	Type	MCZ R 24Vdc 1NO TRAK	MCZ R 36Vdc 1NO TRAK	MCZ R 48...110Vdc 1NO TRAK
	Order No.	8499550000	8582130000	8574070000
Ordering data				
Spare relay	Type			
	Order No.			
Note				

Ordering data	24 V DC TRAK Au	36 V DC TRAK Au	48...110 V DC TRAK Au	
Input				
Rated voltage	24 V DC	36 V DC	48...110 V DC	
Rated current AC				
Rated current DC	11,5...16,5 mA	8...12 mA	< 3 mA	
Power rating	195...50 mW	200...540 mW	< 300 mW	
AC Response/dropout Volt				
DC Response/dropout Volt	7...14 V / 3...5 V	4,5...15 V	> 25 V / < 6 V	
AC pickup/dropout current				
DC pickup/dropout current				
Ordering data				
Complete module				
Change-over contact	Type	MCZ R 24VDC 1CO AU TRAK	MCZ R 36VDC 1CO AU TRAK	MCZ R 48...110VDC 1CO AU
	Order No.	8790520000	8790510000	8790500000
NO contact	Type			
	Order No.			
Ordering data				
Spare relay	Type			
	Order No.			
Note				

MCZ accessories



Ordering data

End plate

Type	Qty	Order No.
AP MCZ 1.5	50	8389030000



Ordering data

Cross-connection, 2-pole, yellow
Cross-connection, 3-pole, yellow
Cross-connection, 4-pole, yellow
Cross-connection, 5-pole, yellow
Cross-connection, 6-pole, yellow
Cross-connection, 7-pole, yellow
Cross-connection, 8-pole, yellow
Cross-connection, 9-pole, yellow
Cross-connection, 10-pole, yellow

Type	Qty	Order No.
ZQV 4/2 ge	20	1608950000
ZQV 4/3 ge	20	1608960000
ZQV 4/4 ge	20	1608970000
ZQV 4/5 ge	20	1608980000
ZQV 4/6 ge	20	1608990000
ZQV 4/7 ge	20	1609000000
ZQV 4/8 ge	20	1609010000
ZQV 4/9 ge	20	1609020000
ZQV 4/10 ge	20	1609030000



Ordering data

Marker

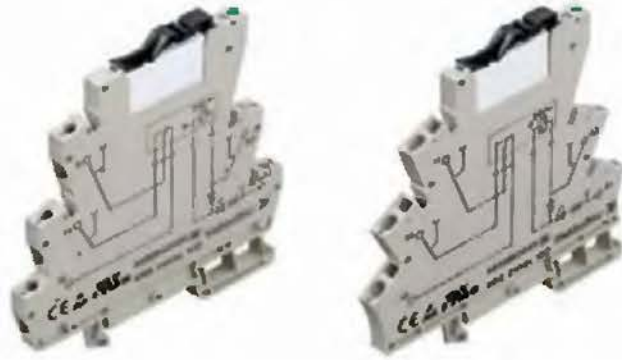
Type	Qty	Order No.
WS10/6	200	1060960000

Relay coupler - MICROSERIES

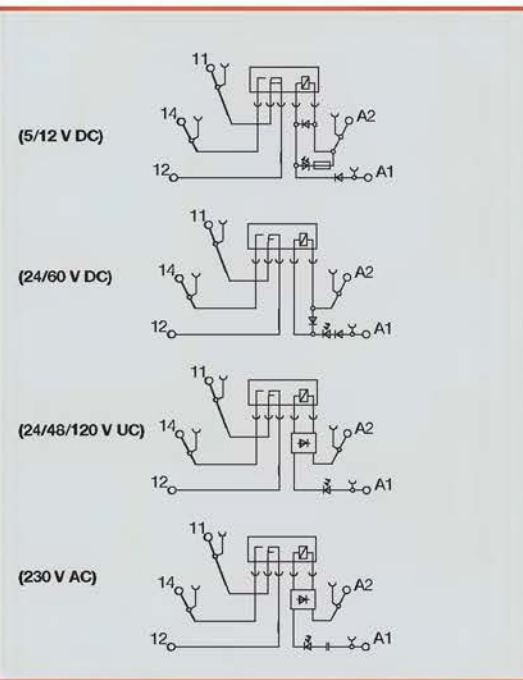
1 change-over contact AC/DC/UC coil

Module can be used as an universal interface between the controller and the actuator to switch small and medium-sized loads.

- Relay interchangeable, can also be exchanged for an optocoupler
- 6.1 mm wide
- Pluggable cross-connection at input and output minimises the wiring workload.



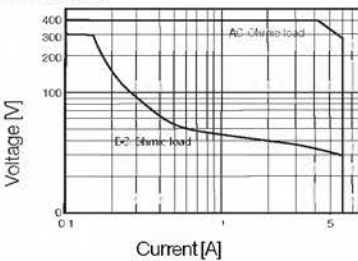
C



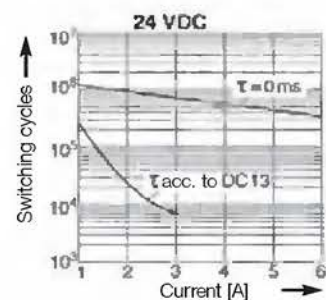
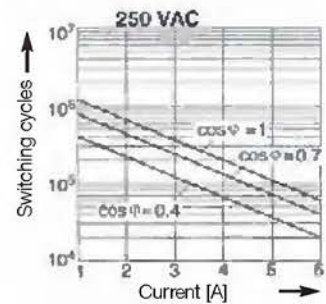
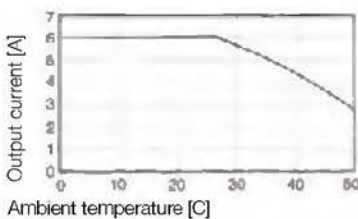
Output		
max. switching voltage AC/Continuous current	250 V/6 A	
min. switching power	12 V / 100 mA	
Response time / Drop-out time	6.2ms/3.9ms	
Contact base material	AgSnO	
Mechanical endurance	20x10 ⁶ switching cycles	
max. switching frequency at rated load	0.1 Hz	
Rated data		
Status indicator/Free wheel diode	green LED/Yes	
Reverse pol. prot	available	
Operating temperature	-25 °C...+50 °C	
Storage temperature	-40 °C...+60 °C	
Humidity	40°C/93% RH, no condensation	
Approvals	CE; cULus;	
Insulation coordination (EN 50178)		
Standards	EN 50178	
Rated voltage	300 V	
Impulse withstand voltage	4 kV	
Creepage and clearance path input - output	≥ 5,5 mm	
Overtoltage category	III	
Pollution severity	2	
Protective separation to VDE 0106 part 101	yes	
Dimensions		
Clamping range (rating- / min. / max.)	mm ²	2.5 / 0.5 / 4
Length x width x height	mm	93 / 6.1 / 92
Note	Cross-connection and marking: see MICROSERIES accessories	
Screw connection		
Clamping range (rating- / min. / max.)	mm ²	2.5 / 0.5 / 4
Length x width x height	mm	93 / 6.1 / 92
Tension clamp connection		
Clamping range (rating- / min. / max.)	mm ²	1.5 / 0.5 / 2.5
Length x width x height	mm	94 / 6.1 / 91

Applications

Limit curve



Current-Temperature rise curve



1 change-over contact
AC/DC/UC coil

Ordering data	5 V DC 1CO	12 VDC 1CO	24 V DC 1CO	24 V UC 1CO
Input				
Rated voltage	5 V DC ±20%	12 V DC ±20 %	24 V DC ±20 %	24 V UC ±10 %
Rated current AC				11 mA
Rated current DC	38.5 mA	17 mA	6.6mA	6.4 mA
Power rating	193 mW	210 mW	160 mW	154 mW
AC Response/dropout Volt				15.8V/7V
DC Response/dropout Volt	3.2V/1.6V	6.4V/ 2.5V	15.4V/6.5V	15.8V/7V
AC pickup/dropout current				3.6mA/1.3mA
DC pickup/dropout current	21.6mA/8mA	8.4mA/2.4mA	4mA/1.2mA	3.6mA/1.3mA
Ordering data Complete module				
Screw connection Type	MRS 5Vdc 1CO	MRS 12Vdc 1CO	MRS 24Vdc 1CO	MRS 24Vuc 1CO
Order No.	8556080000	8556070000	8533640000	8556050000
Tension clamp connection Type	MRZ 5Vdc 1CO	MRZ 12Vdc 1CO	MRZ 24Vdc 1CO	MRZ 24Vuc 1CO
Order No.	8556150000	8556140000	8533660000	8556120000
Ordering data Spare relay, pluggable				
Type	RSS113005 05Vdc-Rel1U	RSS113012 12Vdc-Rel1U	RSS113024 24Vdc-Rel1U	RSS113024 24Vdc-Rel1U
Order No.	4061580000	4061610000	4060120000	4060120000
Note				
Ordering data	48 V UC 1CO	60 V DC 1CO	120 V UC 1CO	230 V AC 1CO
Input				
Rated voltage	48 V UC ±10 %	60 V DC ±20 %	120 V UC + 10 %/ -15 %	230 V AC ±10%
Rated current AC	5 mA		3.5 mA	7.6 mA
Rated current DC	4 mA	3.3 mA	3.5 mA	
Power rating	190 mW	200 mW	0.42 VA	1.75 VA
AC Response/dropout Volt	29V/11V		71V/22V	103V/49V
DC Response/dropout Volt	29V/11V	35V/11V	71V/22V	
AC pickup/dropout current	2.2mA/1.3mA		1.8mA/0.5mA	5mA/2.5mA
DC pickup/dropout current	2.2mA/1.3mA	1.6mA/0.6mA	1.8mA/0.5mA	
Ordering data Complete module				
Screw connection Type	MRS 48Vuc 1CO	MRS 60Vdc 1CO	MRS 120Vuc 1CO	MRS 230Vac 1CO
Order No.	8556040000	8556080000	8556030000	8556020000
Tension clamp connection Type	MRZ 48Vuc 1CO	MRZ 60Vdc 1CO	MRZ 120Vuc 1CO	MRZ 230Vac 1CO
Order No.	8556110000	8556130000	8556100000	8556090000
Ordering data Spare relay, pluggable				
Type	RSS113048 48Vdc-Rel1U	RSS113060 60Vdc-Rel1U	RSS113060 60Vdc-Rel1U	RSS113024 24Vdc-Rel1U
Order No.	4061620000	4061630000	4061630000	4060120000
Note				

C

Relay coupler - MICROSERIES

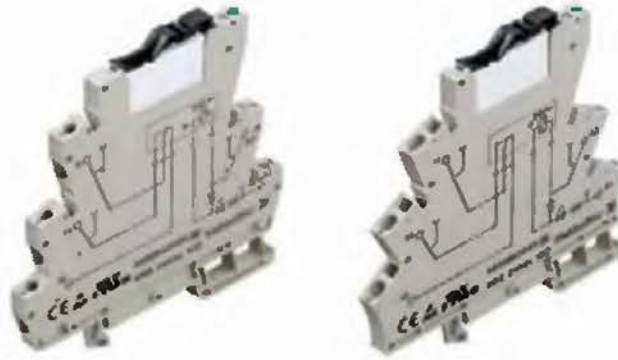
1 NO contact special versions

- 24 V DC actuator version:

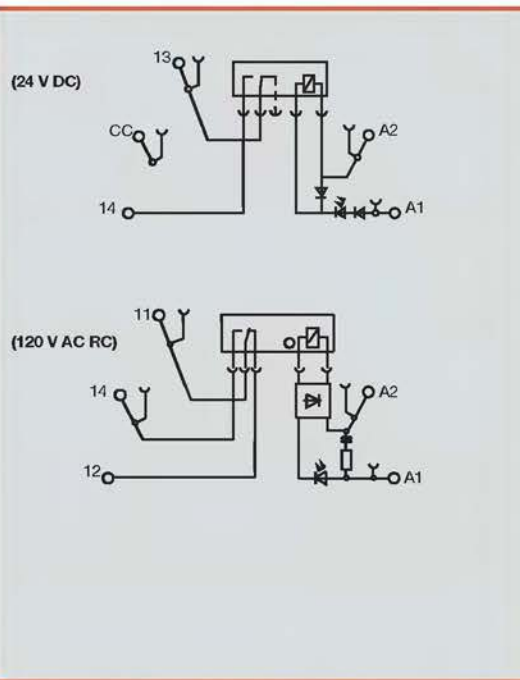
Bridgeable, floating connection for direct connection of actuators at the output

- 120 V AC RC version:

RC circuit at the input guarantees safe switching thresholds, e.g. for leakage currents on the control side



C



Output	
max. switching voltage AC/Continuous current	250 V/6 A
min. switching power	12 V / 10 mA
Response time / Drop-out time	6.6 ms/5.8 ms
Contact base material	AgSnO
Mechanical endurance	20x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	-25 °C...+55 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE; cULFus;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Impulse withstand voltage	4 kV (1.2/50 µs)
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	

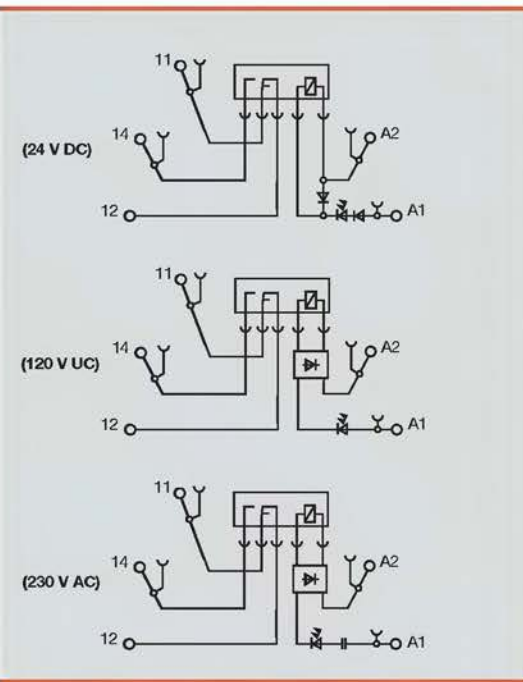
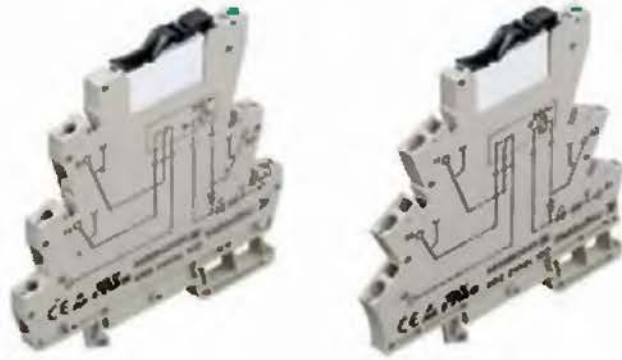
Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4	1.5 / 0.5 / 2.5
Length x width x height	mm 93 / 6.1 / 92	94 / 6.1 / 91
Note	Cross-connection and marking - see MICROSERIES accessories	

Ordering data	24 V DC ACT	120 V AC 1CO RC		
Input				
Rated voltage	24 V DC ±20 %	120 V AC + 10 % / -15 %		
Rated current AC		7 mA		
Rated current DC	6,6 mA			
Power rating	160 mW	0,84 VA		
AC Response/dropout Volt		79 V / 65 V		
DC Response/dropout Volt	15,4 V / 6,5 V			
AC pickup/dropout current		4,5 mA / 3,7 mA		
DC pickup/dropout current	4 mA / 1,2 mA			
Ordering data Complete module				
Screw connection Type	MRS 24Vdc ACT	MRS 120VAC 1CO RC		
Order No.	8660920000	8825970000		
Tension clamp connection Type	MRZ 24VDC ACT	MRZ 120VAC 1CO RC		
Order No.	8660910000	8825960000		
Ordering data Spare relay, pluggable				
Type	RSS113024 24Vdc-Rel1U	RSS113060 60Vdc-Rel1U		
Order No.	4060120000	4061630000		
Note				

1 change-over contact with gold-plated contact AC/DC/UC coil

Module can be used as an universal interface between the controller and the actuator to switch small and medium-sized loads.

- Relay interchangeable, can also be exchanged for an optocoupler
- 6.1 mm wide
- Pluggable cross-connection at input and output minimises the wiring workload.



Output	
max. switching voltage AC/Continuous current	250 V/6 A
min. switching power	12 V / 10 mA
Response time / Drop-out time	6.6ms/5.8ms
Contact base material	AgSnO 5 µm Au
Mechanical endurance	20x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE; cULFus;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Impulse withstand voltage	4 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overtoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4
Length x width x height	mm 93 / 6.1 / 92
Note	Cross-connector and marker - see MICROSERIES accessories

Ordering data

	24 V DC 1CO Au	120 V UC 1CO Au	230 V AC 1CO Au	
Input				
Rated voltage	24 V DC ±20 %	120 V UC + 10 %/ -15 %	230 V AC ±10%	
Rated current AC		3.5mA ±15%	7.6mA	
Rated current DC	6.6 mA	3.5mA ±15%		
Power rating	160 mW	0.42 VA ±15%	1.75VA	
AC Response/dropout Volt		71 V/ 22 V	103V/49V	
DC Response/dropout Volt	15.4V/6.5V	71 V/ 22 V	103V/49V	
AC pickup/dropout current		1.8 mA/0.5 mA	5mA/2.5mA	
DC pickup/dropout current	4mA/1.2mA	1.8mA/0.5mA	5mA/2.5mA	

Ordering data Complete module

	24 V DC 1CO Au	120 V UC 1CO Au	230 V AC 1CO Au	
Screw connection	MRS 24Vdc 1CO 5uAu	MRS 120Vuc 1CO 5uAu	MRS 230Vac 1CO 5uAu	
Order No.	8596060000	8652030000	8596050000	
Tension clamp connection	MRZ 24Vdc 1CO 5uAu	MRZ 120Vuc 1CO 5uAu	MRZ 230Vac 1CO 5uAu	
Order No.	8596060000	8652040000	8596070000	

Ordering data Spare relay, pluggable

	24 V DC 1CO Au	120 V UC 1CO Au	230 V AC 1CO Au	
Type	RSS112024 24Vdc-Rel1U	RSS112060 60Vdc-Rel1U	RSS112024 24Vdc-Rel1U	
Order No.	4061590000	4061600000	4061590000	

Note				
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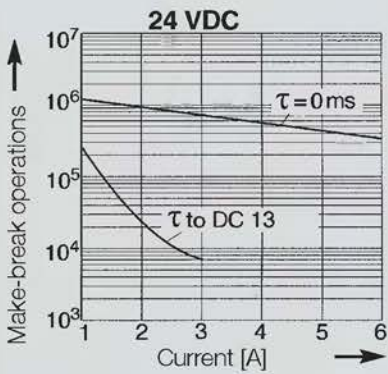
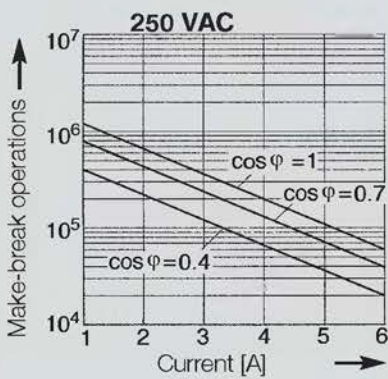
Relay coupler - MICROSERIES

RSS Relays
1 change-over contact DC coil

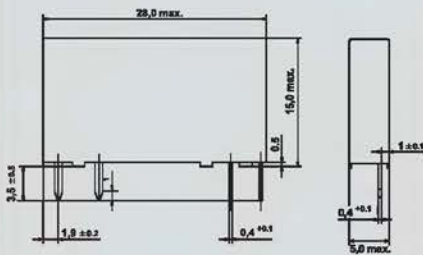


C

Contact life expectancy, material AgSnO₂



Dimensions



Technical data

Number of contacts and type	1 change-over contact
Contact form	single
Switching current	6 A
Switching voltage / max. switching voltage	250 V DC / 400 V AC
Switching capacity	1500 VA
Contact material / recommended min. load	AgSnO ₂ 12 V, 100 mA AgSnO ₂ 5 μ Au 12 V, 10 mA 1)
Typical bounce time, NOC	1 ms
Typical bounce time, NCC	5 ms
Other data	
UL 94 flammability rating	V-0
Ambient temperature	-40 ... +85 °C
Max. switching frequency at nom. load / without load	6/1200 make-break operations per minute
Pick-up / drop-out time	5 / 2.5 ms
Bounce time, NOC / NCC	1.5 / 5 ms
Ingress protection class housing	IP 67

1) Recommended switching capacity: μ W up to 0.25 W (depends on load characteristics), at 2.5 W the silver coating remains effective for about 20 000 make-break operations.

Ordering data

	Type	Qty	Order No.
Coil voltage 5 V, 1 change-over contact	RSS 113005	20	4061580000
Coil voltage 12 V, 1 change-over contact	RSS 113012	20	4061610000
Coil voltage 24 V, 1 change-over contact	RSS 113024	20	4060120000
Coil voltage 48 V, 1 change-over contact	RSS 113048	20	4061620000
Coil voltage 60 V, 1 change-over contact	RSS 113060	20	4061630000
Coil voltage 24 V, 1 change-over contact, 5 μ Au ¹⁾	RSS 112024	20	4061590000
Coil voltage 60 V, 1 change-over contact, 5 μ Au ¹⁾	RSS 112060	20	4061600000

Type code for RSS relays

Type code	RSS				
Type	RIDER Signal Slim				
Model	1 Printing, vertical, waterproof				
Type of contact	1 1 Changeover contact				
Contact material	2 AgSnO ₂ htv 3 AgSnO ₂				
Coil	005 5 V DC 012 12 V DC 024 24 V DC 048 48 V DC 060 60 V DC				

Accessories



Plug-in cross-connection

Type	No. of poles	Qty	Order No.
yellow			
ZQV 4N / 2 GE	2	60	1758250000
ZQV 4N / 3 GE	3	60	1762630000
ZQV 4N / 4 GE	4	60	1762620000
ZQV 4N / 10 GE	10	20	1758260000
ZQV 4N / 20 GE	20	20	1909020000
red			
ZQV 4N / 2 RT	2	60	1793950000
ZQV 4N / 3 RT	3	60	1793980000
ZQV 4N / 4 RT	4	60	1794010000
ZQV 4N / 10 RT	10	20	1794040000
ZQV 4N / 20 RT	20	20	1909150000
blue			
ZQV 4N / 2 BL	2	60	1793960000
ZQV 4N / 3 BL	3	60	1793990000
ZQV 4N / 4 BL	4	60	1794020000
ZQV 4N / 10 BL	10	20	1794050000
ZQV 4N / 20 BL	20	20	1909100000
black			
ZQV 4N / 2 SW	2	60	1793970000
ZQV 4N / 3 SW	3	60	1794000000
ZQV 4N / 4 SW	4	60	1794030000
ZQV 4N / 10 SW	10	20	1794060000
ZQV 4N / 20 SW	20	20	1909120000

Other accessories

Type	Qty	Order No.	
Base only			
MRZ 24VDC 1CO BASIS	10	8826000000	
MRS 24VDC 1CO BASIS	10	8826010000	
MRZ 120VUC 1CO BASIS	10	8826020000	
MRS 120VUC 1CO BASIS	10	8826030000	
MRZ 230VAC 1CO BASIS	10	8826040000	
MRS 230VAC 1CO BASIS	10	8826050000	
Markers			
WS 12/6	12 x 6 mm	200	1061160000
Labels, Lasermark			
LM MT 300 15/6 ge	484 labels/sheet	10	1686360000
Screwdriver			
SD 0.6 x 3.5 x 100		10	9008330000

General data – MICROSERIES

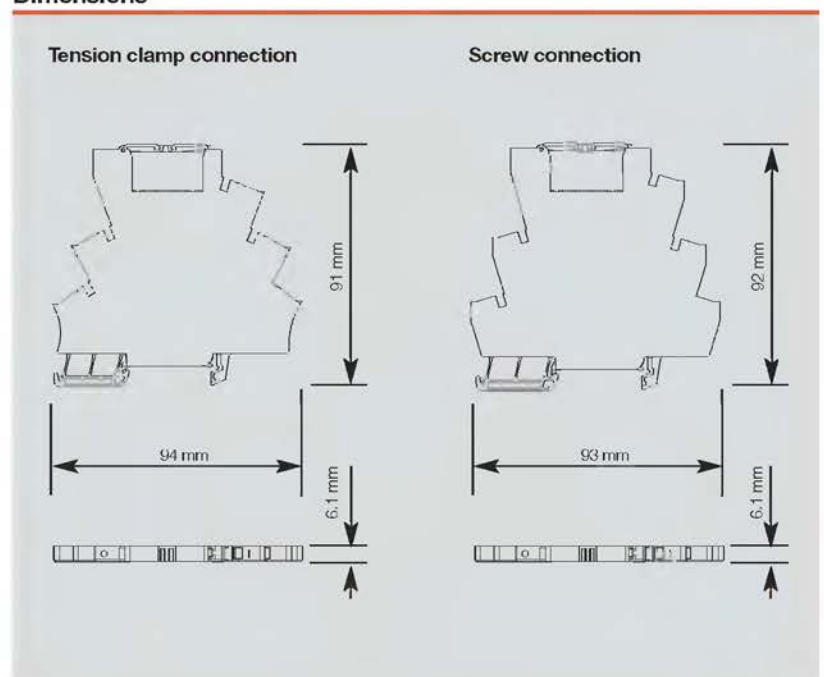
Technical data

Conductor		Tension spring connection	Screw connection
Solid H07V-U	mm ²	0.5 ... 2.5	0.5 ... 4.0
Stranded H07V-K	mm ²	0.5 ... 2.5	0.5 ... 2.5
"I" with wire end ferrules to DIN 46228-1	mm ²	0.5 ... 1.5	0.5 ... 1.5
"I" with wire end ferrules with plastic collar	mm ²	0.5 ... 1.5	0.5 ... 1.5
Max. clamping range	mm ²	0.13 ... 2.5	0.13 ... 4.0
Plug gauge to IEC 60947-1	size	A 2	A 3

General technical data

Nominal torque		-	0.6
Continuous current for 2-pole cross-connection	A	10	10
Continuous current for multi-pole cross-connection	A	10	10
Stripping length	mm	10	7
Ingress protection class		IP 20	IP 20
Housing material		Wemid	Wemid
UL 94 flammability rating		V-0	V-0
Nominal current	A	6	6
Nominal voltage	V	250	250

Dimensions



MICROinterface Digital

Link field and control with a system instead of masses of wires.

MICROinterface Digital is the answer to connecting eight MICROSERIES couplers to a PLC I/O module via pre-assembled lines. It results in simple, error-free connections between field and control.

First, set up a block of eight couplers using Weidmüller's well-known relay coupler or optocoupler modules from the MICROSERIES range (available with screw or tension clamp connections). Plug the interface module into the corresponding cross-connection openings using a ribbon cable or SUB-D connection. Using the pre-assembled cables available in various lengths, simply connect to the main PLC.

Features

- No tools required for installation
- Compatible with MICROSERIES screw and tension clamp connections
- Electrical isolation and signal adaptation with relay couplers or optocouplers as required

MICROinterface module for ribbon cable connection



MICROinterface module for SUB-D connection



MICROinterface digital

MI8DI-S/Z

MI8DO-S/Z

Input module

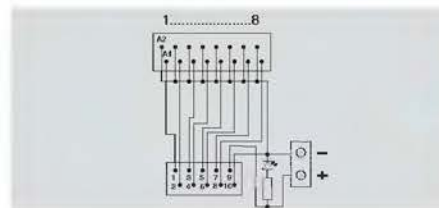
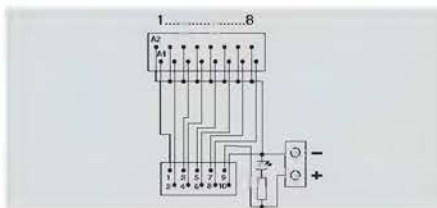
Output module



n



n



Technical data

Connection data

Type
Type of terminal / Connection system

Input module
MICRO series; Screw or tension clamp connection; available for ribbon cable or Sub-D connection

Output module
MICRO series; Screw or tension clamp connection; available for ribbon cable or Sub-D connection

Rated data

Operating voltage, max.
Current-carrying capacity
Total current feed, max.
Impulse withstand voltage (1.2/50 µs)
Rated insulation voltage
Storage temperature
Operating temperature

30 V AC/DC
0.5 A per channel
2 A
330 V
32 V
-20 °C...+85 °C
0 °C...+55 °C

30 V AC/DC
0.5 A per channel
2 A
330 V
32 V
-20 °C...+85 °C
0 °C...+55 °C

Insulation coordination (EN 50 178)

Overvoltage category
Pollution severity
Clearances/Creepage distances to EN

I
2
0,1 mm

I
2
0,1 mm

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

x --

x --

Note

Wiring diagram for ribbon cable

Wiring diagram for SUB-D

Ordering data

Connection system, pre-assembled cable	
Ribbon cable connector, 10-pole	
SUB-D plug, 15-pole	
Ribbon cable connector, 10-pole	
SUB-D plug, 15-pole	

Type	Qty	Order No.
MI8DI-S F10 S	1	8773510000
MI8DI-S SUB D15S	1	8773460000
MI8DI-Z F10 S	1	8773530000
MI8DI-Z SUB D15S	1	8773490000

Type	Qty	Order No.
MI8DO-S F10 S	1	8773600000
MI8DO-S SUB D15S	1	8773550000
MI8DO-Z F10 S	1	8773620000
MI8DO-Z SUB D15S	1	8773570000

Note

MI8DI-S = Screw connection
MI8DI-Z = Tension clamp connection

MI8DO-S = Screw connection
MI8DO-Z = Tension clamp connection

Accessories

Note

Note

Relay coupler - PLUGSERIES

1 change-over contact AC/DC coil

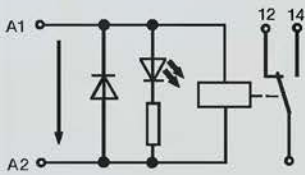
- Modular system comprising
- relay socket for rail mounting
 - LED indicator unit / RC combination
 - Retaining clip
 - plug-in relay

cross-section of coil connections
and relay changeover contacts by means of
plug-in cross-connection ZQV 2.5N

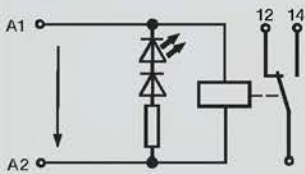


C

DC version



AC version



Output

max. switching voltage AC/Continuous current	250 V/10 A
min. switching power	10 V / 100 mA
Response time / Drop-out time	5.8ms/6.9ms
Contact base material	AgNi 90/10
Mechanical endurance	30x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz

Rated data

Status indicator/Free-wheeling diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;ULFus;

Insulation coordination (EN 50178)

Standards	EN 50178
Rated voltage	250 V
Impulse withstand voltage	6 kV
Creepage and clearance path input - output	> 8 mm
Overtoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Screw connection

2.5 / 0.5 / 2.5
92 / 15.3 / 95

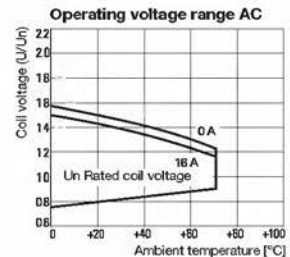
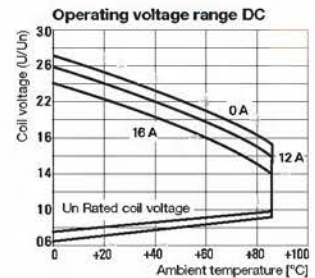
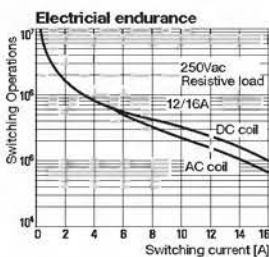
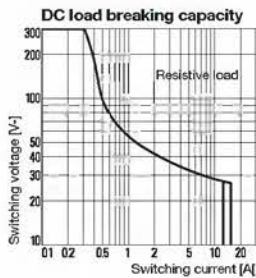
Tension clamp connection

2.5 / 0.5 / 2.5
92 / 15.3 / 87

Note

Cross-connections and markers: see PLUGSERIES accessories

Applications



1 change-over contact AC/DC coil

Ordering data	12 V DC 1CO	24 V DC 1CO	115 V DC 1CO	24 V AC 1CO
Input				
Rated voltage	12 V DC $\pm 20\%$	24 V DC $\pm 10\%$	115 V DC $\pm 10\%$	24 V AC $\pm 10\%$
Rated current AC				32 mA
Rated current DC	33 mA	16 mA	3.5 mA	
Power rating	400 mW	400 mW	400 mW	0.75 VA
AC Response/dropout Volt				17V/3.6V
DC Response/dropout Volt	8.4V/1.2V	16.8 V / 2.4 V	76 V / 11 V	
AC pickup/dropout current				
DC pickup/dropout current				
Ordering data				
Complete module				
Screw connection	Type Order No.	Type Order No.	Type Order No.	Type Order No.
	PRS 12Vdc LD 1CO 8536471001	PRS 24Vdc LD 1CO 8530621001	PRS 115Vdc LD 1CO 8536510000	PRS 24Vac LD 1CO 8536530000
Tension clamp connection	Type Order No.	Type Order No.	Type Order No.	Type Order No.
	PRZ 12Vdc LD 1CO 8536571001	PRZ 24Vdc LD 1CO 8530691001	PRZ 115Vdc LD 1CO 8536610000	PRZ 24Vac LD 1CO 8536651001
Ordering data				
Spare relay, pluggable				
	Type Order No.	Type Order No.	Type Order No.	Type Order No.
	RCL314012 8693240000	RCL314024 8693260000	RCL314110 8821910000	RCL314524 8693500000
Note				
Ordering data				
Input				
Rated voltage	120 V AC $\pm 10\%$	230 V AC $\pm 10\%$		
Rated current AC	6.6 mA	3.2 mA		
Rated current DC				
Power rating	0.75 VA	0.75 VA		
AC Response/dropout Volt	86.3 V / 17.3 V	171 V / 34 V		
DC Response/dropout Volt				
AC pickup/dropout current				
DC pickup/dropout current				
Ordering data				
Complete module				
Screw connection	Type Order No.	Type Order No.		
	PRS 120Vac LD 1CO 8530641001	PRS 230Vac LD 1CO 8530671001		
Tension clamp connection	Type Order No.	Type Order No.		
	PRZ 120Vac LD 1CO 8530710000	PRZ 230Vac LD 1CO 8530731001		
Ordering data				
Spare relay, pluggable				
	Type Order No.	Type Order No.		
	RCL314615 8693890000	RCL314730 8693320000		
Note				

Relay coupler - PLUGSERIES

2 change-over contacts AC/DC coil

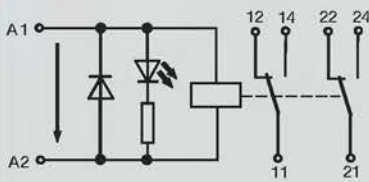
- Modular system comprising
- relay socket for rail mounting
 - LED indicator unit / RC combination
 - Retaining clip
 - plug-in relay

cross-section of coil connections
and relay changeover contacts by means of
plug-in cross-connection ZQV 2.5N

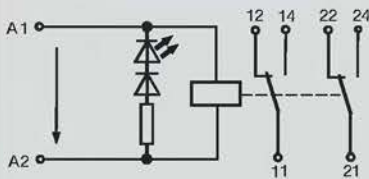


C

DC version



AC version



Output

max. switching voltage AC/Continuous current	250 V/10 A
min. switching power	10 V / 100 mA
Response time / Drop-out time	9ms/45ms
Contact base material	AgNi 90/10
Mechanical endurance	5x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz

Rated data

Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	-40 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE; cULFus;

Insulation coordination (EN 50178)

Standards	EN 50178
Rated voltage	250 V
Impulse withstand voltage	6 kV
Creepage and clearance path input - output	> 8 mm
Overtoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes

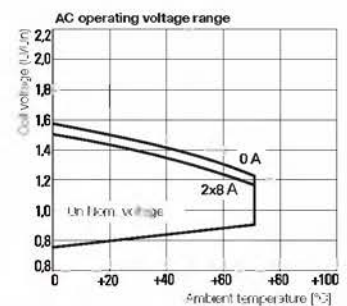
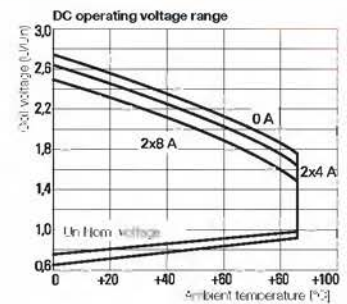
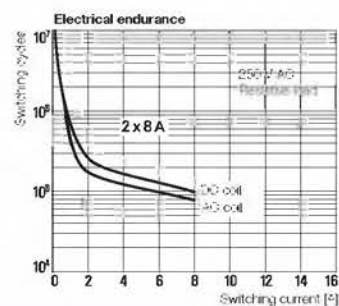
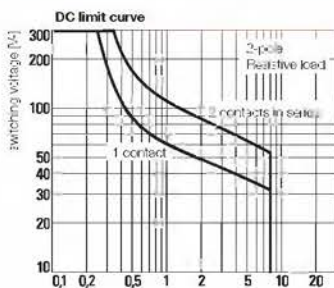
Dimensions

	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5
Length x width x height	mm 92 / 15.3 / 95	92 / 15.3 / 87

Note

Cross-connector and marker: see PLUGSERIES accessories

Applications



2 change-over contacts AC/DC coil

Ordering data	12 V DC 2CO	24 V DC 2CO	115 V DC 2CO	24 V AC 2CO
Input				
Rated voltage	12 V DC $\pm 20\%$	24 V DC $\pm 10\%$	115 V DC $\pm 10\%$	24 V AC $\pm 10\%$
Rated current AC				32 mA
Rated current DC	33 mA	16 mA	3.5 mA	
Power rating	400 mW	400 mW	400 mW	0.75 VA
AC Response/dropout Volt				17 V / 3.6 V
DC Response/dropout Volt	8.4 V / 1.2 V	16.8 V / 2.4 V	76 V / 11 V	
AC pickup/dropout current				
DC pickup/dropout current				
Ordering data				
Complete module				
Screw connection	Type Order No.	Type Order No.	Type Order No.	Type Order No.
	PRS 12Vdc LD 2CO 8536501001	PRS 24Vdc LD 2CO 8530631001	PRS 115Vdc LD 2CO 8536520000	PRS 24Vac LD 2CO 8536560000
Tension clamp connection	Type Order No.	Type Order No.	Type Order No.	Type Order No.
	PRZ 12Vdc LD 2CO 8536591001	PRZ 24Vdc LD 2CO 8530701001	PRZ 115Vdc LD 2CO 8536630000	PRZ 24Vac LD 2CO 8536681001
Ordering data				
Spare relay, pluggable				
	Type Order No.	Type Order No.	Type Order No.	Type Order No.
	RCL 424012 12Vdc-Rel2U 4058560000	RCL 424024 24Vdc-Rel2U 4058570000	RCL 424110 110Vdc-Rel2U 4058590000	RCL 424524 24Vac-Rel2U 4058600000
Note				
Ordering data				
Input				
Rated voltage	120 V AC $\pm 10\%$	230 V AC $\pm 10\%$		
Rated current AC	6.6 mA	3.2 mA		
Rated current DC				
Power rating	0.75 VA	0.75 VA		
AC Response/dropout Volt	86.3 V / 17.3 V	172.5 V / 34.5 V		
DC Response/dropout Volt				
AC pickup/dropout current				
DC pickup/dropout current				
Ordering data				
Complete module				
Screw connection	Type Order No.	Type Order No.		
	PRS 120Vac LD 2CO 8530661001	PRS 230Vac LD 2CO 8530681001		
Tension clamp connection	Type Order No.	Type Order No.		
	PRZ 120Vac LD 2CO 8530720000	PRZ 230Vac LD 2CO 8530741001		
Ordering data				
Spare relay, pluggable				
	Type Order No.	Type Order No.		
	RCL 424615 115Vac-Rel2U 4058610000	RCL 424730 230Vac-Rel2U 4058630000		
Note				

Relay coupler - PLUGSERIES

2 change-over contacts with gold-plated contacts AC/DC coil

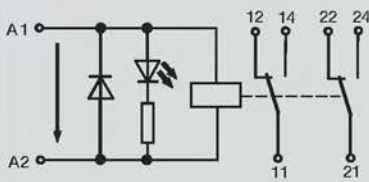
- Modular system comprising
- relay socket for rail mounting
 - LED indicator unit / RC combination
 - Retaining clip
 - plug-in relay

cross-section of coil connections and relay changeover contacts by means of plug-in cross-connection ZQV 2.5N

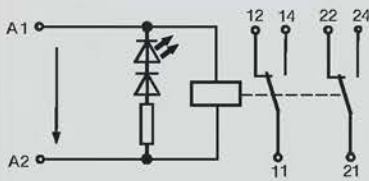


C

DC version



AC version



Output	
max. switching voltage AC/Continuous current	250 V/10 A
min. switching power	5 V / 10 mA
Response time / Drop-out time	9ms/45ms
Contact base material	AgNi 90/10
Mechanical endurance	5x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	green LED/no
Reverse pol. prot	
Operating temperature	-40 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;ULFus;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	250 V
Impulse withstand voltage	6 kV
Creepage and clearance path input - output	> 8 mm
Overtoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5
Length x width x height	mm 92 / 15.3 / 95	92 / 15.3 / 87
Note	Cross-connector: and marker: see PLUGSERIES accessories	

Ordering data

Input	24 V DC 2CO Au	120 V AC 2CO Au	230 V AC 2CO AU	
Rated voltage	24 V DC ±10 %	120 V AC ±10 %	230 V AC ±10%	
Rated current AC		6.6 mA	3.2 mA	
Rated current DC	16 mA			
Power rating	400 mW	0.75 VA	0.75 VA	
AC Response/dropout Volt		86,3 V/ 17,3 V	172.5 V/ 34.5 V	
DC Response/dropout Volt	16.8 V / 2.4 V			
AC pickup/dropout current				
DC pickup/dropout current				

Ordering data Complete module

Screw connection	Type	24 V DC 2CO Au	120 V AC 2CO Au	230 V AC 2CO AU	
Type		PRS 24VDC LD 2COAU	PRS 120VAC LD 2CO AU	PRS 230VAC LD 2CO AU	
Order No.		8561760000	8595960000	8595990000	
Tension clamp connection	Type	24 V DC 2CO Au	120 V AC 2CO Au	230 V AC 2CO AU	
Type		PRZ 24Vdc LD 2CO AU	PRZ 120VAC LD 2COAU	PRZ 230VAC LD 2COAU	
Order No.		8552440000	8575940000	8575950000	

Ordering data Spare relay, pluggable

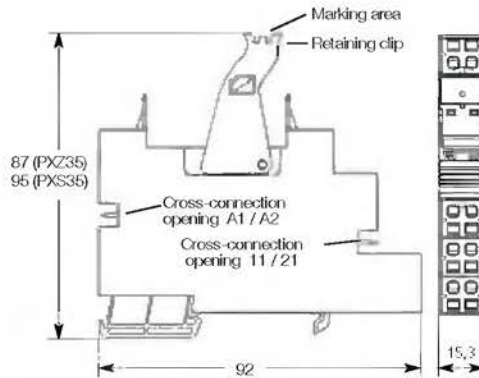
Spare relay, pluggable	Type	24 V DC 2CO Au	120 V AC 2CO Au	230 V AC 2CO AU	
Type		RCL 425024 24Vdc-Rel2U	RCL 425615 115Vac-Rel2U	RCL 425730 230Vac-Rel2U	
Order No.		4058580000	4058620000	4058640000	

Note				
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Accessories

PLUGSERIES

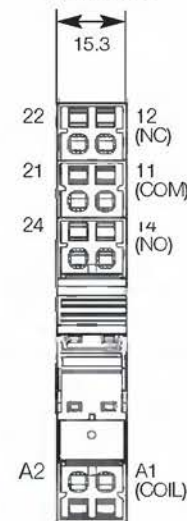
Relays for high making currents



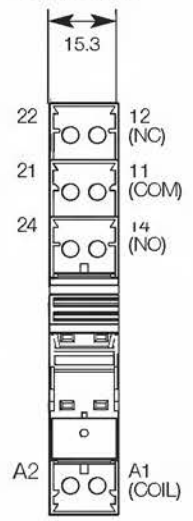
Technical data

Base without relay		
Nominal current	16 A	
Nominal voltage	250 V	
Dielectric strength coil/contact	> 4 kV	
Ingress protection class	IP 20	
Nominal cross-section	2,5 mm ²	
Stripping length	screw connection	8 mm
	tension clamp connection	10 mm
Ambient temperature	-40 °C ... +60 °C	
UL 94 flammability rating	V-0	

Tension clamp connection



Screw connection



Ordering data

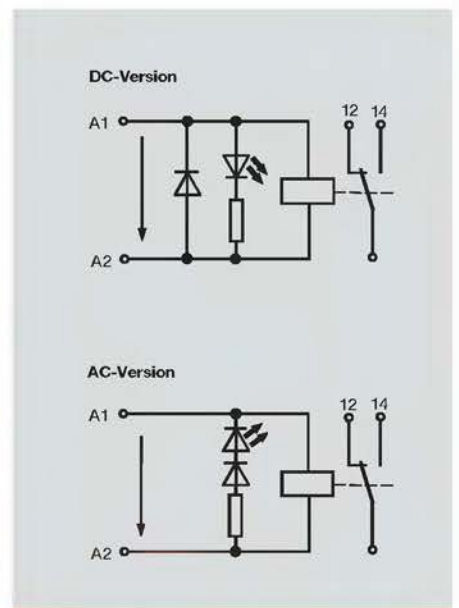
Base for mounting on TS 35 DIN Rail			
Screw connection	Type	Qty	Order No.
Tension clamp connection	PXS35	10	8533771001
	PXZ35	10	8536691001

Retaining clip			
PRC	Qty	100	8536700000

LED indicator with free wheel diode			
6 ... 24 V DC	PLED 24 V DC	20	8536710000
red LED, 6 ... 24 V DC	PLED 24 V DC rot	20	8611010000
48 ... 60 V DC	PLED 48 V DC	20	8536720000
115 V DC	PLED 115 V DC	20	8536730000
12 ... 24 V AC	PLED 24 V AC	20	8536750000
115 V AC	PLED 120 V AC	20	8536760000
230 V AC	PLED 230 V AC	20	8536780000
red LED, 230 V AC	PLED 230 V AC rot	20	8611000000
RC combination 120 ... 230 V AC/DC	PLRC 200 nF/200Ω	20	8566530000

Plug-in cross-connections				
2-pole	black	ZQV 2.5N/4-2SW	60	1784270000
	red	ZQV 2.5N/4-2RT	60	1784280000
	blue	ZQV 2.5N/4-2BL	60	1784290000

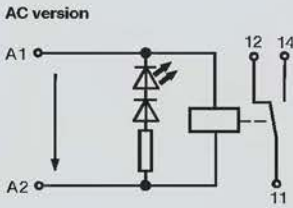
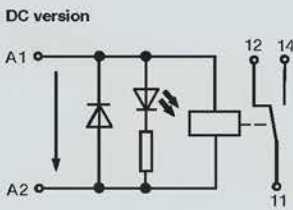
Markers			
10 x 5 mm	WS 10/5	200	1060860000
	WS 15/5	96	1609880000



Relay coupler - RIDERSERIES

RCL KIT 1 CO contact AC/DC coil

- Modular system comprising
- relay socket for rail mounting
 - LED indicator unit
 - retaining clip
 - plug-in relay
 - markers
- Choice of connection system:
- screw or tension clamp



Output	
max. switching voltage AC	250 V
Continuous current	16 A
Contact base material	AgNi 90/10
Mechanical endurance	AC coil 10x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	7 ms / 3 ms
Rated data	
Status indicator/Free wheel diode	Green LED = DC coil; red LED = AC coil/Yes
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	dJFus;UR/CSA;CE;
Insulation coordination (IEC 60664)	
Rated voltage	250 V
Creepage and clearance path input - output	10 mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	yes

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 2.5	1.5 / 0.5 / 1.5
Length x width x height	mm 78.5 / 15.5 / 62	96.9 / 16 / 63.2

Note

Ordering data

Input	24 V DC 1CO LED	24 V AC 1CO LED	115 V AC 1CO LED	230 V AC 1CO LED
Rated voltage	24 V DC	24 V AC	115 V AC	230 V AC
Rated current AC		31,6 mA	6,6 mA	3,2 mA
Rated current DC	16,7 mA			
Power rating	500 mW	0,75 VA	0,75 VA	0,75 VA
AC Response/dropout Volt		18,0 V / 3,6 V	86,3 V / 17,3 V	172,5 V / 34,5 V
DC Response/dropout Volt	16,8 V / 2,4 V			

Ordering data

Complete module		24 V DC 1CO LED	24 V AC 1CO LED	115 V AC 1CO LED	230 V AC 1CO LED
Screw connection	Type	RCLKIT 24VDC 1CO LED GN	RCLKIT 24VAC 1CO LED RT	RCLKIT 115VAC 1CO LD RT	RCLKIT 230VAC 1CO LED RT
	Order No.	7940006158	7940006161	8810160000	7940006160
Tension clamp connection	Type	RCLKITZ 24VDC 1CO LED	RCLKITZ 24VAC 1CO LED	RCLKITZ 115VAC 1CO LDRT	RCLKITZ 230VAC 1CO LED
	Order No.	8798620000	8798640000	8810110000	8798660000

Ordering data Spare relay, pluggable

Type	RCL314024	RCL314524	RCL314615	RCL314730
Order No.	8693260000	8693500000	8693890000	8693320000

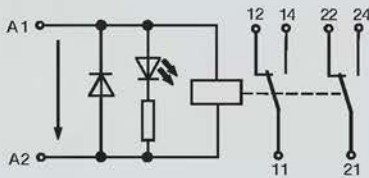
Note	24 V DC 1CO LED	24 V AC 1CO LED	115 V AC 1CO LED	230 V AC 1CO LED

RCL KIT
2 CO contact
AC/DC coil

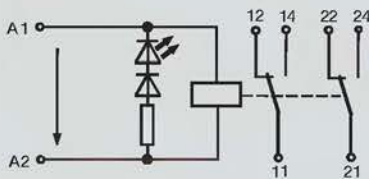
- Modular system comprising
- relay socket for rail mounting
 - LED indicator unit
 - retaining clip
 - plug-in relay
 - markers
- Choice of connection system:
- screw or tension clamp



DC version



AC version



Output	
max. switching voltage AC	250 V
Continuous current	8 A / 1 contact
Contact base material	AgNi 90/10 or AgNi 5 µAu
Mechanical endurance	AC coil 5x10 ⁷ / DC coil 30x10 ⁷ switching operations
Response time / Drop-out time	7 ms / 3 ms
Rated data	
Status indicator/Free wheel diode	Green LED = DC coil; red LED = AC coil/Yes
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	dJFus;UR;CSA;CE;
Insulation coordination (IEC 60664)	
Rated voltage	250 V
Creepage and clearance path input - output	10 mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	yes
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 2.5
Length x width x height	mm 78.5 / 15.5 / 62
Note	

Ordering data

Input	24 V DC 2CO LED	24 V AC 2CO LED	115 V AC 2CO LED	230 V AC 2CO LED
Rated voltage	24 V DC	24 V AC	115 V AC	230 V AC
Rated current AC		31,6 mA	6,6 mA	3,2 mA
Rated current DC	16,7 mA			
Power rating	500 mW	0,75VA	0,75 VA	0,75VA
AC Response/dropout Volt		18,0 V / 3,6 V	86,3 V / 17,3 V	172,5 V / 34,5 V
DC Response/dropout Volt	16,8 V / 2,4 V			

Ordering data
Complete module

Connection	Type	24 V DC 2CO LED	24 V AC 2CO LED	115 V AC 2CO LED	230 V AC 2CO LED
Screw connection	Type	RCLKIT 24VDC 2CO LED GN	RCLKIT 24VAC 2CO LED RT	RCLKIT 115VAC 2CO LD RT	RCLKIT 230VAC 2CO LED RD
	Order No.	7940006157	7940006162	8810100000	7940006159
Tension clamp connection	Type	RCLKITZ 24VDC 2CO LED	RCLKITZ 24VAC 2CO LED	RCLKITZ 115VAC 2CO LDRT	RCLKITZ 230VAC 2CO LED
	Order No.	8798630000	8798650000	8810120000	8798670000

Ordering data
Spare relay, pluggable

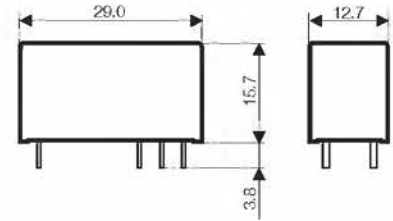
Connection	Type	24 V DC 2CO LED	24 V AC 2CO LED	115 V AC 2CO LED	230 V AC 2CO LED
Screw connection	Type	RCL 424024 24Vdc-Rel2U	RCL 424524 24Vac-Rel2U	RCL 424615 115Vac-Rel2U	RCL 424730 230Vac-Rel2U
	Order No.	4058570000	4058600000	4058610000	4058630000

Note				
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Relay coupler - RIDERSERIES

RCL relay 1 CO contact AC/DC coil

- 3000 or 4000 VA switching capacity
- Low height of 15.7 mm
- Hard gold-plated contacts available
- For boiler controls, timing relays, garage door controls, Interface modules

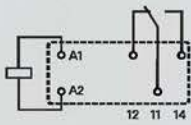


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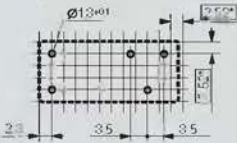
PCB layout / terminal assignment

View on solder pins, dimensions in mm

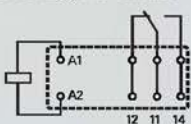
1 C/O changeover contacts



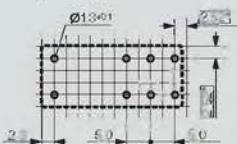
12 A, Pinning 3.5 mm



1 C/O changeover contacts



16 A, Pinning 5 mm



Output

max. switching voltage AC	250 V
Continuous current	12 A for 3.5 mm / 16 A for 5 mm pinning
Contact base material	AgNi 90/10 or AgNi 5 μ Au
Mechanical endurance	AC coil 10x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	7 ms / 3 ms

Rated data

Status indicator/Free wheel diode	/
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	cULFus; VDE;

Insulation coordination (IEC 60664)

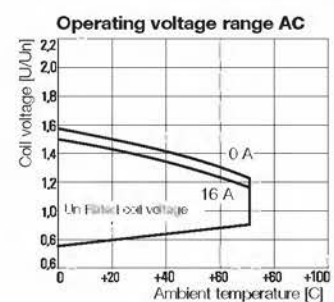
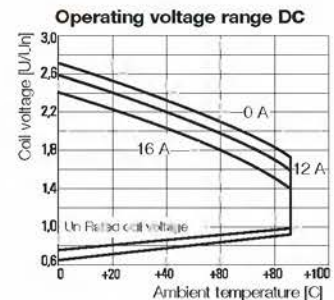
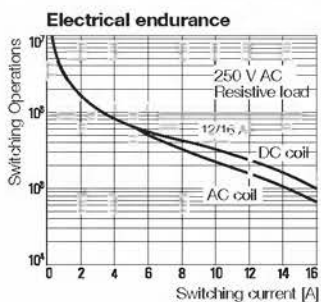
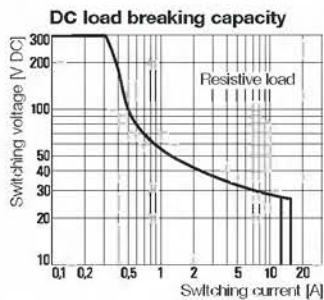
Rated voltage	250 V
Creepage and clearance path input - output	10 mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	yes

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 29 / 12.7 / 15.7

Note

Applications



RCL relay
1 CO contact AC/DC coil

Type code	RCL				
Type	RIDER Control Low				
Type of construction	1 12 A, Pitch 3.5 mm, flux proof 2 12 A, Pitch 5 mm, flux proof 3 16 A, Pitch 5 mm, flux proof				
Type of contact	1 1 CO contacts 3 1 NO contacts				
Contact material	4 AgNi 90/10 5 AgNi 90/10 hgp				
DC coil	006 6 V DC 012 12 V DC 024 24 V DC 048 48 V DC 060 60 V DC 110 110 V DC				
AC coil	512 12 V AC 524 24 V AC 548 48 V AC 615 115 V AC 730 230 V AC				

Ordering data

Input	6 V DC 1CO	12 V DC 1CO	24 V DC 1CO	48 V DC 1CO
Rated voltage	6 V DC	12 V DC	24 V DC	48 V DC
DC Response/dropout Volt	4.2 V / 0.6 V	8.4 V / 1.2 V	16.8 V / 2.4 V	33.6 V / 4.8 V
Power rating	500 mW	500 mW	500 mW	500 mW
Rated current DC	66.7 mA	33.3 mA	16.7 mA	8.7 mA
Coil resistance	90 Ω ±10%	360 Ω ±10%	1440 Ω ±10%	5520 Ω ±10%

Ordering data
Complete module

12 A / 3.5 mm Type	RCL114006	RCL114012	RCL114024	RCL114048
AgNi 90/10 Order No.	8693400000	8693190000	8693180000	8693480000
16 A / 5 mm Type	RCL314006	RCL314012	RCL314024	RCL314048
AgNi 90/10 Order No.	8693800000	8693240000	8693260000	8693380000
16 A / 5 mm Type		RCL315012	RCL315024	RCL315048
AgNi 5 μ Au Order No.		on request	8824830000	on request

Note

Ordering data

Input	24 V AC 1CO	48 V AC 1CO	115 V AC 1CO	230 V AC 1CO
Rated voltage	24 V AC	48 V AC	115 V AC	230 V AC
AC Response/dropout Volt	18.0 V / 3.6 V	64 V / 7.2 V	86.3 V / 17.3 V	172.5 V / 34.5 V
Power rating	0.75 VA	0.75 VA	0.75 VA	0.75 VA
Rated current AC	31.6 mA	15.6 mA	6.6 mA	3.2 mA
Coil resistance	1440 Ω ±10%	1420 Ω ±10%	8100 Ω ±15%	32500 Ω ±15%

Ordering data
Complete module

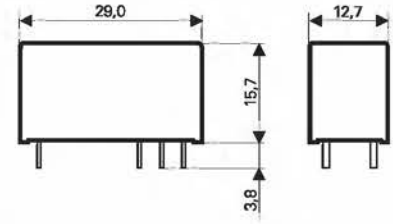
12 A / 3.5 mm Type	RCL114524	RCL114548	RCL114615	RCL114730
AgNi 90/10 Order No.	8693220000	8693510000	8693390000	8693230000
16 A / 5 mm Type	RCL314524	RCL314548	RCL314615	RCL314730
AgNi 90/10 Order No.	8693500000	8693880000	8693890000	8693320000
16 A / 5 mm Type	RCL315524	RCL315548	RCL315615	RCL315730
AgNi 5 μ Au Order No.	8824870000	on request	on request	on request

Note

Relay coupler - RIDERSERIES

**RCL relay
2 CO contact AC/DC coil**

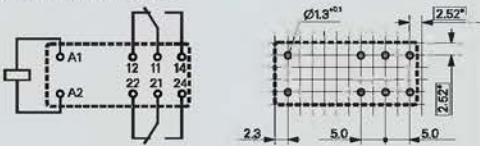
- 2000 VA switching capacity
- Low height of 15.7 mm
- Hard gold-plated contacts available
- For domestic appliances, heating controllers, emergency lighting systems, modems



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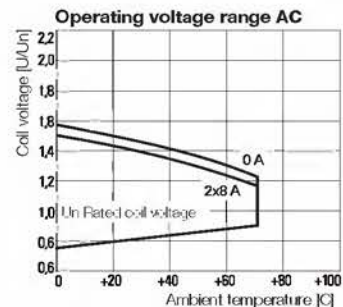
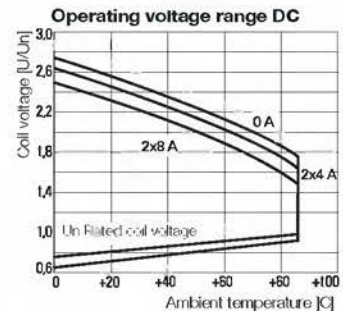
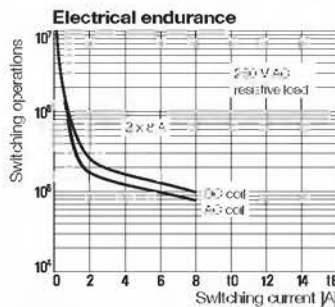
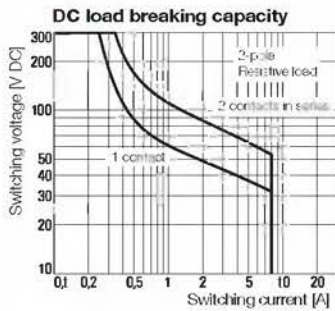
Circuit diagram
View of connections
Dimensions in mm

2 C/O changeover contacts



Output	
max. switching voltage AC	250 V
Continuous current	8 A / 1 contact
Contact base material	AgNi 90/10 or AgNi 5 µ Au
Mechanical endurance	AC coil 5x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	7ms / 2ms
Rated data	
Status indicator/Free wheel diode	/
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	cULFus; VDE;
Insulation coordination (IEC 60664)	
Rated voltage	250 V
Creepage and clearance path input - output	10 mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	yes
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 29 / 12.7 / 15.7
Note	

Applications



RCL relay
2 CO contact AC/DC coil

Type code	RCL				
Type	RIDER Control Low				
Type of construction	4 8 A, pitch 5 mm, flux proof				
Type of contact	2 2 CO contacts 4 2 NO contacts				
Contact material	4 AgNi 90/10 5 AgNi 90/10 hgp				
DC coil	006	6 V DC			
	012	12 V DC			
	024	24 V DC			
	048	48 V DC			
	060	60 V DC			
	110	110 V DC			
AC coil	512	12 V AC			
	524	24 V AC			
	548	48 V AC			
	615	115 V AC			
	730	230 V AC			

Ordering data

	12 V DC 2CO	24 V DC 2CO	48 V DC 2CO	110 V DC 2CO
Input				
Rated voltage	12 V DC	24 V DC	48 V DC	110 V DC
DC Response/dropout Volt	8,4 V / 1,2 V	16,8 V / 2,4 V	33,6 V / 4,8 V	77 V / 11 V
Power rating	500 mW	500 mW	500 mW	500 mW
Rated current DC	33,3 mA	16,7 mA	8,7 mA	4,1 mA
Coil resistance	360 Ω ±10%	1440 Ω ±10%	5520 Ω ±10%	26600 Ω ±12%

Ordering data	12 V DC 2CO	24 V DC 2CO	48 V DC 2CO	110 V DC 2CO
Complete module				
8 A / 5 mm Type	RCL 424012 12Vdc-Rel2U	RCL 424024 24Vdc-Rel2U	RCL424048	RCL 424110 110Vdc-Rel2U
AgNi 90/10 Order No.	4058560000	4058570000	4058750000	4058590000
Type Order No.				
8 A / 5 mm Type	RCL425012	RCL 425024 24Vdc-Rel2U	RCL425048	RCL425110
AgNi 5 μ Au Order No.	on request	4058580000	on request	on request

Note	12 V DC 2CO	24 V DC 2CO	48 V DC 2CO	110 V DC 2CO

Ordering data

	24 V AC 2CO	48 V AC 2CO	115 V AC 2CO	230 V AC 2CO
Input				
Rated voltage	24 V AC	48 V AC	115 V AC	230 V AC
AC Response/dropout Volt	18 V / 3,6 V	64 V / 7,2 V	86,3 V / 17,3 V	172,5 V / 34,5 V
Power rating	0,75 VA	0,75 VA	0,75 VA	0,75 VA
Rated current AC	31,6 mA	15,6 mA	6,6 mA	3,2 mA
Coil resistance	350 Ω ±10%	1420 Ω ±10%	8100 Ω ±15%	32500 Ω ±15%

Ordering data	24 V AC 2CO	48 V AC 2CO	115 V AC 2CO	230 V AC 2CO
Complete module				
8 A / 5 mm Type	RCL 424524 24Vac-Rel2U	RCL424548	RCL 424615 115Vac-Rel2U	RCL 424730 230Vac-Rel2U
AgNi 90/10 Order No.	4058600000	8693340000	4058610000	4058630000
Type Order No.				
8 A / 5 mm Type	RCL425524	RCL425548	RCL 425615 115Vac-Rel2U	RCL 425730 230Vac-Rel2U
AgNi 5 μ Au Order No.	on request	on request	4058620000	4058640000

Note	24 V AC 2CO	48 V AC 2CO	115 V AC 2CO	230 V AC 2CO

Relay coupler - RIDERSERIES

**RCH Safety Relay
DC coil**

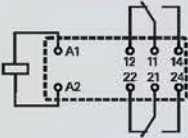
- Relay with positively driven contacts to EN 50205
- 2 CO contacts or 1 NOC + 1 NCC
- 1500 VA switching capacity
- 6 kV impulse withstand voltage



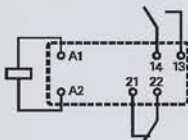
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Circuit diagram
View of connections

2 changeover contacts



1 NOC + 1 NCC



Output	
max. switching voltage AC	250 V
Continuous current	6 A
Contact base material	AgNi
Mechanical endurance	10x10 ⁷ switching cycles
Response time / Drop-out time	10 ms / 4 ms
Rated data	
Status indicator/Free wheel diode	/
Operating temperature	-25 °C...+70 °C
UL 94 flammability rating	
Approvals	cULFus;
Insulation coordination (IEC 60664)	
Rated voltage	250 V
Creepage and clearance path input - output	8 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 29 / 12.6 / 25.5
Note	

Ordering data

Input	12 V DC 1CO	24 V DC 1CO	12 V DC 1NC / 1NO	24 V DC 1NC / 1NO
Rated voltage	12 V DC	24 V DC	12 V DC	24 V DC
Rated current AC				
Rated current DC	58.3 mA	29.2 mA	58.3 mA	29.2 mA
Power rating	700 mW	700 mW	700 mW	700 mW
AC Response/dropout Volt				
DC Response/dropout Volt	9.0 V / 1.2 V	18.0 V / 2.4 V	9.0 V / 1.2 V	18.0 V / 2.4 V

Ordering data				
NCC/NOC	Type		RCH S51012	RCH S51024
	Order No.		8768670000	8768700000
CO contact	Type	RCH S21012	RCH S21024	
	Order No.	8768660000	8768680000	

Ordering data				
	Type			
	Order No.			

Note				

Accessories for RCL relays
Plug-in module with screw and tension clamp connection



Ordering data

Description	Type	Qty	Order No.
Plug-in module with screw connections, pinnings 3.5 mm, snaps onto DIN mounting rail	SRC 1CO	10	8690840000
Plug-in module with screw connections, pinnings 5 mm, snaps onto DIN mounting rail	SRC 2CO	10	8690830000
Plug-in module with screw connections, pinnings 5 mm, snaps onto DIN mounting rail	SRC 2CO N	10	8693930000
Plug-in module with tension clamp connections, pinnings 5 mm, snaps onto DIN mounting rail	SRC 2CO Z	10	8783930000

Technical data

Nominal current	1-pole 2-pole	12 A 2 x 12 A*)
Nominal voltage		250 V~
Dielectric strength, screw/tension clamp connection		> 3000 Veff / 4000 Veff
Insulation group (VDE 0110b)		C / 250 V~
Ambient temperature		-25 ... +80 °C
Ingress protection class		IP 20
Connection cross-section (screw connection) / with ferrules		2 x 2.5 mm ² / 2 x 1.5 mm ²
Connection cross-section (tension clamp connection)		2 x 1.5 mm ²
Terminal torque / max.		0.5 Nm / 0.7 Nm

*) In 1-pole relays (16 A) connect terminal 11 to 21, 12 to 22 and 14 to 24.
In 1-pole relays (12 A) connect relay terminals 11-12-14 to module terminals 21-22-24.

Accessories

Description	Type	Qty	Order No.
Plastic retaining clip RCL	SRC CLIP LP	10	8691090000
Plastic retaining clip RCH	SRC CLIP HP	10	8691070000
Markers, individual	SRC MARK	10	8693270000
Markers, MultiCard	ESG 6/15 MC RIDERSERIES	200	1881280000
Markers, MultiCard, custom print	ESG 6/15 RIDERS SONDEFB	40	1881290000

LED and protection modules for SRC 1 CO, SRC 2 CO

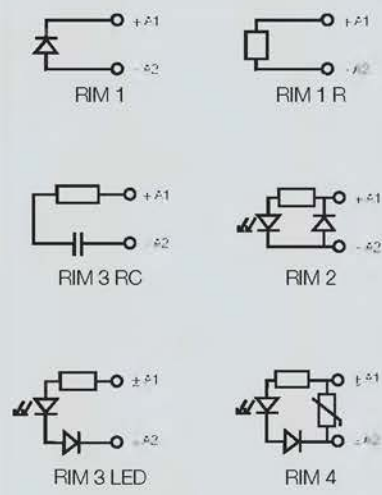
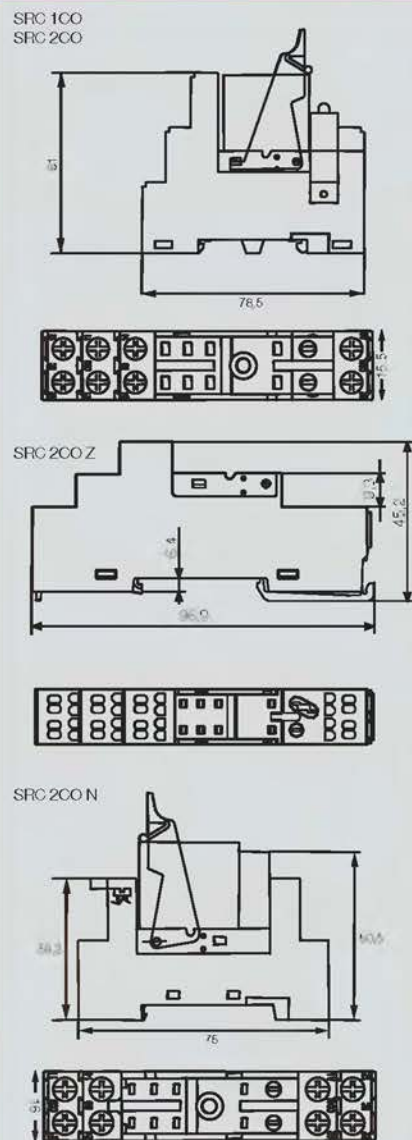
Plug simply into the base module; reverse-connect protection
Connect parallel to coil



Ordering data

Description	Type	Qty	Order No.	Order No.
Free-wheel diode 1N4007	RIM 1 6/320 V	10	8690940000	
Resistor 62 kOhm 1 Watt	RIM 1 R 110/230 V AC	10	8816590000	
RC element 6 ... 24 V AC	RIM 3 6/24 V AC	10	8690980000	
RC element 24 ... 60 V AC	RIM 3 24/60 V AC	10	8690990000	
RC element 110 ... 230 V AC	RIM 3 110/230 V AC	10	8691000000	
LED			red	green
LED 6 ... 24 V DC with free-wheel diode	RIM 2 6/24 V DC	10	8690950000	8713720000
LED 24 ... 60 V DC with free-wheel diode	RIM 2 24/60 V DC	10	8690960000	8713730000
LED 110 ... 230 V DC with free-wheel diode	RIM 2 110/230 V DC	10	8690970000	8713740000
LED 6 ... 24 V DC / V AC	RIM 3 6/24 V UC	10	8691010000	8713750000
LED 24 ... 60 V DC / V AC	RIM 3 24/60 V UC	10	8691020000	8713760000
LED 110 ... 230 V DC / V AC	RIM 3 110/230 V UC	10	8691030000	8713770000
LED 6 ... 24 V DC / V AC with varistor protection	RIM 4 6/24 V UC	10	8691040000	8713780000
LED 24 ... 60 V DC / V AC with varistor protection	RIM 4 24/60 V UC	10	8691050000	8713790000
LED 110 ... 230 V DC / V AC with varistor protection	RIM 4 110/230 V UC	10	8691060000	8713800000

Dimensions in mm



Relay coupler - RIDERSERIES

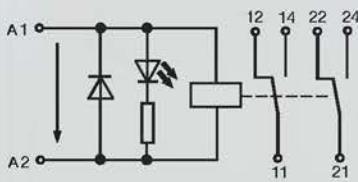
RCM KIT 2 CO contact AC/DC coil

- Modular system comprising
- relay socket for rail mounting
 - LED indicator unit
 - retaining clip
 - plug-in relay
 - markers

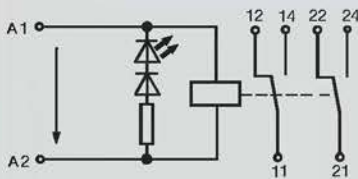


C

DC version



AC version



Output	
max. switching voltage AC	250 V
Continuous current	12 A
Contact base material	AgNi 90/10
Mechanical endurance	AC coil 20x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	15ms / 10ms
Rated data	
Status indicator/Free wheel diode	Green LED = DC coil; red LED = AC coil/Yes
Operating temperature	-40 °C... +70 °C
UL 94 flammability rating	V-0
Approvals	dJFus;UR;CSA;CE;
Insulation coordination (IEC 60664)	
Rated voltage	240 V
Creepage and clearance path input - output	≤ 4mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 2.5
Length x width x height	mm 75 / 27 / 82
Note	

Ordering data

Input	24 V DC 2CO LED	24 V AC 2CO LED	115 V AC 2CO	230 V AC 2CO LED
Rated voltage	24 V DC	24 V AC	115 V AC	230 V AC
Rated current AC		41,6 mA	8,8 mA	4,3 mA
Rated current DC	31,3 mA			
Power rating	750 mW	1,0 VA	1,0 VA	1,0 VA
AC Response/dropout Volt		19,2 V / 7,2 V	92 V / 34,5 V	184,0 V / 69,0 V
DC Response/dropout Volt	18,0 V / 2,4 V			

Ordering data

Complete module

Screw connection	Type	24 V DC 2CO LED	24 V AC 2CO LED	115 V AC 2CO	230 V AC 2CO LED
	Type	RCMKIT 24VDC 2CO LED GN	RCMKIT 24VAC 2CO LED RT	RCMKIT 115VAC 2CO LEDRT	RCMKIT 230VAC 2CO LED RT
	Order No.	7940007061	7940007113	8810130000	7940007116
Tension clamp connection	Type				
	Order No.				

Ordering data

Spare relay (pluggable)

Screw connection	Type	24 V DC 2CO LED	24 V AC 2CO LED	115 V AC 2CO	230 V AC 2CO LED
	Type	RCM270024	RCM270524	RCM270615	RCM270730
	Order No.	8689860000	8689760000	8689800000	8689820000

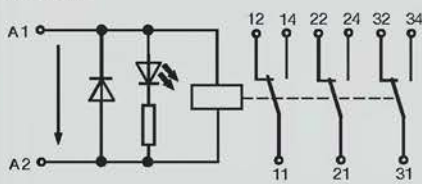
Note				
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RCM KIT
3 CO contact
AC/DC coil

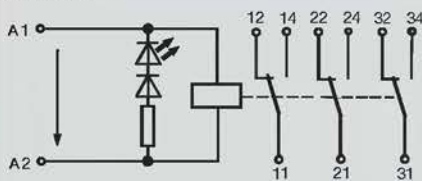
- Modular system comprising
- relay socket for rail mounting
 - LED indicator unit
 - retaining clip
 - plug-in relay
 - markers



DC version



AC version



Output	
max. switching voltage AC	250 V
Continuous current	10 A
Contact base material	AgNi 90/10
Mechanical endurance	AC coil 20x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	15ms / 10ms
Rated data	
Status indicator/Free wheel diode	Green LED = DC coil; red LED = AC coil/Yes
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	dJFus;URCSA;CE;
Insulation coordination (IEC 60664)	
Rated voltage	240 V
Creepage and clearance path input - output	≤ 4mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ²	2.5 / 0.5 / 2.5
Length x width x height	mm	75 / 27 / 82

Note

Ordering data

	24 V DC 3CO LED	24 V AC 3CO LED	115 V AC 3CO LED	230 V AC 3CO LED
Input				
Rated voltage	24 V DC	24 V AC	115 V AC	230 V AC
Rated current AC		41,6 mA	8,8 mA	4,3 mA
Rated current DC	31,3 mA			
Power rating	750 mW	1,0 VA	1,0 VA	1,0 VA
AC Response/dropout Volt		19,2 V / 7,2 V	92 V / 34,5 V	184,0 V / 69,0 V
DC Response/dropout Volt	18,0 V / 2,4 V			

Ordering data
Complete module

	24 V DC 3CO LED	24 V AC 3CO LED	115 V AC 3CO LED	230 V AC 3CO LED
Screw connection	Type RCMKIT 24VDC 3CO LED GN	Type RCMKIT 24VAC 3CO LED RT	Type RCMKIT 115VAC 3CO LEDRT	Type RCMKIT 230VAC 3CO LED RT
	Order No. 7940007062	Order No. 7940007114	Order No. 8810140000	Order No. 7940007117
Tension clamp connection	Type	Type	Type	Type
	Order No.	Order No.	Order No.	Order No.

Ordering data
Spare relay (pluggable)

	24 V DC 3CO LED	24 V AC 3CO LED	115 V AC 3CO LED	230 V AC 3CO LED
Spare relay (pluggable)	Type RCM370024	Type RCM370524	Type RCM370615	Type RCM370730
	Order No. 8690040000	Order No. 8690030000	Order No. 8689980000	Order No. 8690000000

Note				
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Relay coupler - RIDERSERIES

RCM KIT
4 CO contact
AC/DC coil

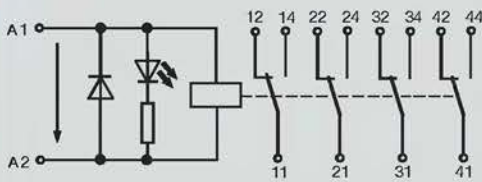
- Modular system comprising
- relay socket for rail mounting
 - LED indicator unit
 - retaining clip
 - plug-in relay
 - markers

Choice of connection system:

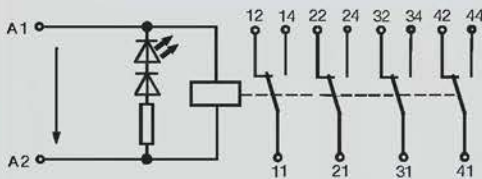
- screw or tension clamp



DC version



AC version



Output

max. switching voltage AC	250 V
Continuous current	6 A
Contact base material	AgNi 90/10
Mechanical endurance	AC coil 20x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	15ms / 10ms

Rated data

Status indicator/Free wheel diode	Green LED = DC coil; red LED = AC coil/Yes
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	dJFus;UR;CSA;CE;

Insulation coordination (IEC 60664)

Rated voltage	240 V
Creepage and clearance path input - output	≤ 3mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	

Dimensions

	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ² 2,5 / 0,5 / 2,5	1,5 / 0,5 / 1,5
Length x width x height	mm 75 / 27 / 82	96 / 31 / 60

Note

Ordering data

Input	24 V DC 4CO LED	24 V AC 4CO LED	115 V AC 4CO LED	230 V AC 4CO LED
Rated voltage	24 V DC	24 V AC	115 V AC	230 V AC
Rated current AC		41,6 mA	8,8 mA	4,3 mA
Rated current DC	31,3 mA			
Power rating	750 mW	1,0 VA	1,0 VA	1,0 VA
AC Response/dropout Volt		19,2 V / 7,2 V	92 V / 34,5 V	184,0 V / 69,0 V
DC Response/dropout Volt	18,0 V / 2,4 V			

Ordering data

Complete module

Connection	Type	24 V DC 4CO LED GN	24 V AC 4CO LED RT	115 V AC 4CO LED RT	230 V AC 4CO LED RT
Screw connection	Type	RCMKIT 24VDC 4CO LED GN	RCMKIT 24VAC 4CO LED RT	RCMKIT 115VAC 4CO LEDRT	RCMKIT 230VAC 4CO LED RT
	Order No.	7940007063	7940007115	8810150000	7940007118
Tension clamp connection	Type	RCMKITZ 24VDC 4CO LED	RCMKITZ 24VAC 4CO LED	RCMKITZ 115VAC 4CO LDRT	RCMKITZ 230VAC 4CO LED
	Order No.	8798740000	8798750000	8810080000	8798760000

Ordering data

Spare relay (pluggable)

Type	24 V DC 4CO LED GN	24 V AC 4CO LED RT	115 V AC 4CO LED RT	230 V AC 4CO LED RT
Type	RCM570024	RCM570524	RCM570615	RCM570730
Order No.	8690200000	8690110000	1180800000	1181100000

Note

Accessories for miniature relays RCM
Plug-in module with screw and tension spring connection



Ordering data

Description	Type	Qty	Order No.
Plug-in module with screw connections, snap-on installation, 3-pole	SCM 2CO	10	8690880000
Plug-in module with screw connections, snap-on installation, 3-pole	SCM 3CO	10	8690890000
Plug-in module with screw connections, snap-on installation, 4-pole	SCM 4CO	10	8690900000
Plug-in module with screw connections, snaps onto DIN mounting rails, 4-pole	SCM 4CO N	10	8690910000
Plug-in module with tension spring connections, snaps onto DIN mounting rails, 4-pole	SCM 4CO Z	10	8783920000

Technical data

Nominal current	4-pole 6 A, 3-pole 10 A, 2-pole 12 A
Nominal voltage	300 V AC
Dielectric strength, coil/contacts	> 4000 Veff
Insulation group (VDE 0110b)	C / 250 V AC
Ambient temperature	-45 ... +70 °C ¹⁾
Protection class (IEC 61810)	IP 20
Electric shock protection	VBG 4
Connection cross-section (tension spring connection)	2 x 1.5 mm ²
Connection cross-section (ferrules)	2 x 2.5 mm ²
Terminal torque (screw connection)	0.5 Nm
Max.	0.8 Nm

1) At nominal current up to +40 °C, up to +70 °C at 70 %

Accessories

Description	Type	Qty	Order No.
Plastic retaining clip RCM	SCM CLIP P	10	8691110000
Metal retaining clip RCM	SRC CLIP H	10	8691100000
Markers for SCM 2CO, SCM 3CO, SCM 4CO, SCM 4CO N			
Markers, individual	SCM MARK	10	8694370000
Markers for SCM 4CO Z			
Markers, individual	SRC MARK	10	8693270000
Markers, MultiCard	ESG 6/15 MC RIDERSERIES	200	1881280000
Markers, MultiCard, custom printing	ESG 6/15 RIDERS SONDERP	40	1881290000

LED and protection modules for SRC 1 CO, SRC 2 CO

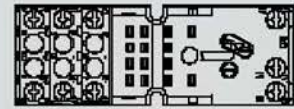
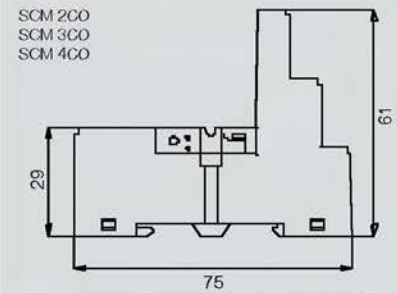
Simply plug into the base module; reverse polarity protection
Connect parallel to coil



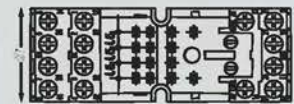
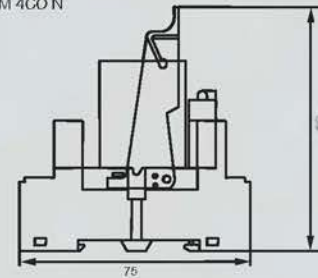
Ordering data

Description	Type	Qty	Order No.	Order No.
Free-wheeling diode 1N4007	RIM 1 6/320V	10	8690940000	
Resistor 62 kOhm 1 Watt	RIM 1 R 110/230 V AC	10	8816590000	
RC element 6 ... 24 V AC	RIM 3 6/24 V AC	10	8690980000	
RC element 24 ... 60 V AC	RIM 3 24/60 V AC	10	8690990000	
RC element 110 ... 230 V AC	RIM 3 110/230 V AC	10	8691000000	
LED			red	green
LED 6 ... 24 V DC with free-wheeling diode	RIM 2 6/24 V DC	10	8690950000	8713720000
LED 24 ... 60 V DC with free-wheeling diode	RIM 2 24/60 V DC	10	8690960000	8713730000
LED 110 ... 230 V DC with free-wheeling diode	RIM 2 110/230 V DC	10	8690970000	8713740000
LED 6 ... 24 V DC / V AC	RIM 3 6/24 V UC	10	8691010000	8713750000
LED 24 ... 60 V DC / V AC	RIM 3 24/60 V UC	10	8691020000	8713760000
LED 110 ... 230 V DC / V AC	RIM 3 110/230 V UC	10	8691030000	8713770000
LED 6 ... 24 V DC / V AC with protection varistor	RIM 4 6/24 V UC	10	8691040000	8713780000
LED 24 ... 60 V DC / V AC with protection varistor	RIM 4 24/60 V UC	10	8691050000	8713790000
LED 110 ... 230 V DC / V AC with protection varistor	RIM 4 110/230 V UC	10	8691060000	8713800000

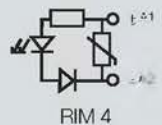
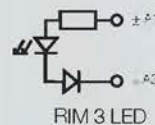
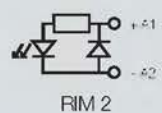
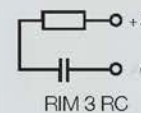
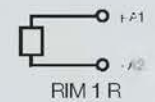
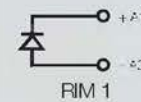
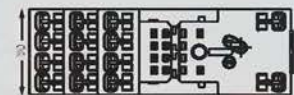
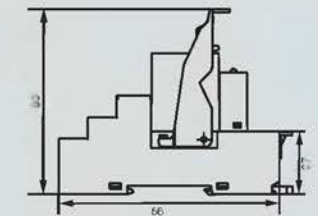
Dimensions in mm



SCM 4CO N



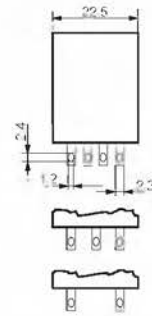
SCM 4CO Z



Relay coupler - RIDERSERIES

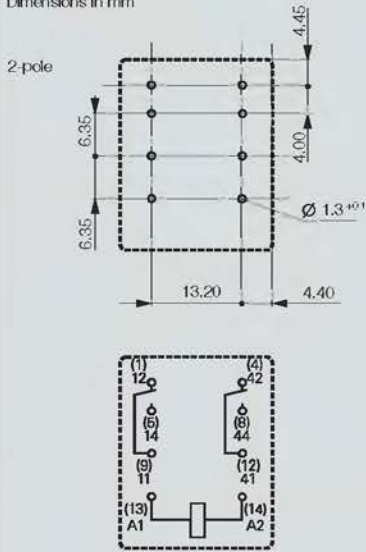
RCM relay
2 CO contact
AC/DC coil

- 3000 VA switching capacity
- Solder and plug connection
- Safe-to-touch test button, selectable locking
- White labelling panel



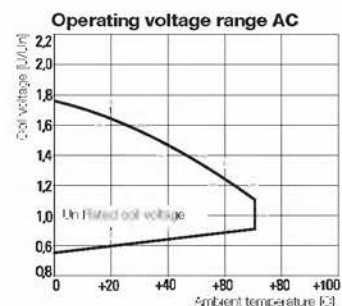
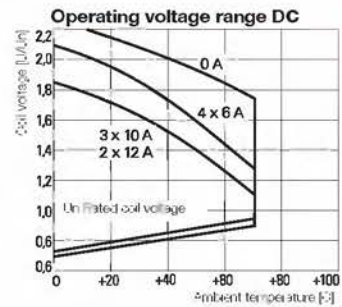
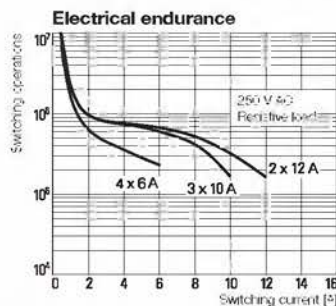
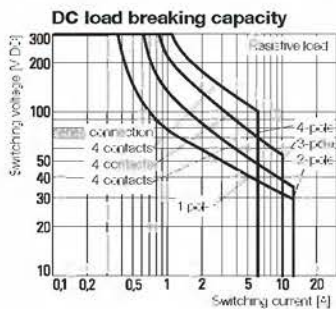
C

Circuit diagram
View of connections
Dimensions in mm



Output	
max. switching voltage AC	250 V
Continuous current	12 A
Contact base material	AgNi 90/10
Mechanical endurance	AC coil 20x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	15ms / 10ms
Rated data	
Status indicator/Free-wheeling diode	/
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	dJFus; CE; VDE;
Insulation coordination (IEC 60664)	
Rated voltage	240 V
Creepage and clearance path input - output	≤ 4mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 28 / 22.5 / 29
Note	

Applications



**RCM relay
2 CO contact
AC/DC coil**

Type code

Type RIDER Control Multiple

Contacts

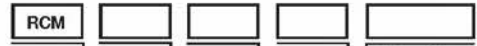
- 2 2 CO contacts
- 3 3 CO contacts
- 5 4 CO contacts

Contact material

- 7 AgNi 90/10, with test button
- 8 AgNi 90/10 hgp, with test button

Type of construction

- 0 Standard, 2,8 mm Faston
- 1 Print connections



DC coil	
006	6 V DC
012	12 V DC
024	24 V DC
048	48 V DC
060	60 V DC
110	110 V DC
220	220 V DC
AC coil	
506	6 V AC
512	12 V AC
524	24 V AC
548	48 V AC
615	115 V AC
730	230 V AC

Ordering data

Input	12 V DC 2CO	24 V DC 2CO	48 V DC 2CO	110 V DC 2CO
Rated voltage	12 V DC	24 V DC	48 V DC	110 V DC
DC Response/dropout Volt	9.0 V / 1.2 V	18.0 V / 2.4 V	36.0 V / 4.8 V	82.5 V / 11.0 V
Power rating	750 mW	750 mW	750 mW	750 mW
Rated current DC	62.5 mA	31.3 mA	15.6 mA	6.8 mA
Coil resistance	192 Ω ±10%	777 Ω ±10%	3072 Ω ±10%	16133 Ω ±15%

Ordering data Complete module				
without LED Type	RCM270012	RCM270024	RCM270048	RCM270110
AgNi 90/10 Order No.	8689840000	8689860000	8689860000	8689900000
with LED Type	RCM270L12	RCM270L24	RCM270L48	RCM270M10
AgNi 90/10 Order No.	8689850000	8689870000	8689890000	8689910000
Type				
Order No.				

Note				

Ordering data

Input	24 V AC 2CO	48 V AC 2CO	115 V AC 2CO	230 V AC 2CO
Rated voltage	24 V AC	48 V AC	115 V AC	230 V AC
AC Response/dropout Volt	38.4 V / 14.4 V	48.0 V / 18.0 V	92.0 V / 34.5 V	184.0 V / 69.0 V
Power rating	1.0 VA	1.0 VA	1.0 VA	1.0 VA
Rated current AC	41.6 mA	21.3 mA	8.8 mA	4.3 mA
Coil resistance	192 Ω ±10%	777 Ω ±10%	4845 Ω ±12%	19465 Ω ±15%

Ordering data Complete module				
without LED Type	RCM270S24	RCM270S48	RCM270S15	RCM270T30
AgNi 90/10 Order No.	8689760000	8689760000	8689800000	8689820000
with LED Type	RCM270R24	RCM270R48	RCM270S15	RCM270T30
AgNi 90/10 Order No.	8689770000	8689790000	8689810000	8689830000
Type				
Order No.				

Note				

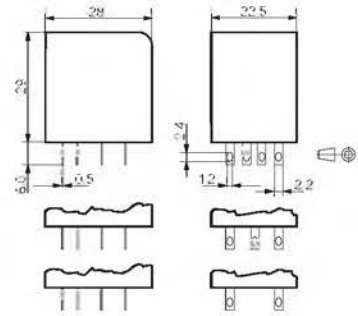
Relay coupler - RIDERSERIES

RCM relay
3 CO contact
AC/DC coil

- 2500 VA switching capacity
- Solder and plug connection
- Safe-to-touch test button, selectable locking
- White labelling panel



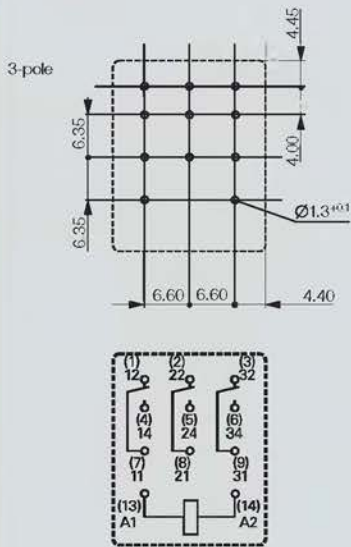
Solder- and plug-in terminals (standard version)



C

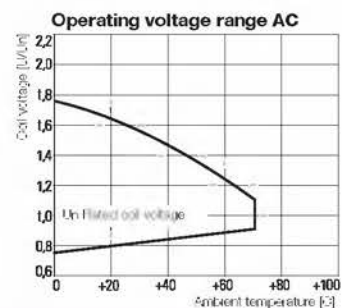
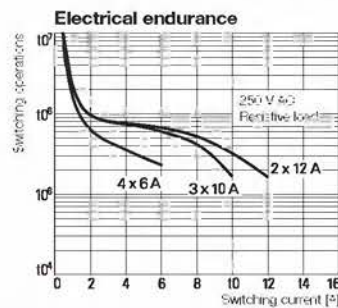
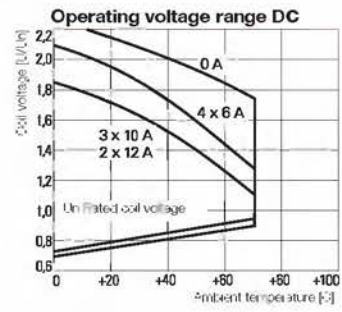
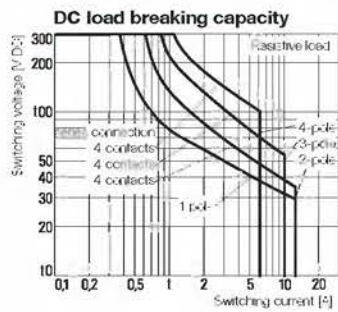
Circuit diagram

View of connections
Dimensions in mm



Output	
max. switching voltage AC	250 V
Continuous current	10 A
Contact base material	AgNi 90/10
Mechanical endurance	AC coil 20x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	15ms / 10ms
Rated data	
Status indicator/Free-wheeling diode	/
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	dJFus; CE; VDE;
Insulation coordination (IEC 60664)	
Rated voltage	240 V
Creepage and clearance path input - output	≤ 4mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 28 / 22.5 / 29
Note	

Applications



**RCM relay
3 CO contact
AC/DC coil**

Type code

Type RIDER Control Multiple

Contacts

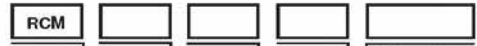
- 2 2 CO contacts
- 3 3 CO contacts
- 5 4 CO contacts

Contact material

- 7 AgNi 90/10, with test button
- 8 AgNi 90/10 hgp, with test button

Type of construction

- 0 Standard, 2,8 mm Faston
- 1 Print connections



DC coil	
006	6 V DC
012	12 V DC
024	24 V DC
048	48 V DC
060	60 V DC
110	110 V DC
220	220 V DC
AC coil	
506	6 V AC
512	12 V AC
524	24 V AC
548	48 V AC
615	115 V AC
730	230 V AC

Ordering data

Input	12 V DC 3CO	24 V DC 3CO	48 V DC 3CO	110 V DC 3CO
Rated voltage	12 V DC	24 V DC	48 V DC	110 V DC
DC Response/dropout Volt	9.0 V / 1.2 V	18.0 V / 2.4 V	36.0 V / 4.8 V	82.5 V / 11.0 V
Power rating	750 mW	750 mW	750 mW	750 mW
Rated current DC	62.5 mA	31.3 mA	15.6 mA	6.8 mA
Coil resistance	192 Ω ±10%	777 Ω ±10%	3072 Ω ±10%	16133 Ω ±15%

Ordering data Complete module					
without LED	Type	RCM370012	RCM370024	RCM370048	RCM370110
AgNi 90/10	Order No.	8690020000	8690040000	8690060000	8690060000
with LED	Type	RCM370L12	RCM370L24	RCM370L48	RCM370M10
AgNi 90/10	Order No.	8694310000	8690050000	8689940000	8690090000
	Type				
	Order No.				

Note				

Ordering data

Input	24 V AC 3CO	48 V AC 3CO	115 V AC 3CO	230 V AC 3CO
Rated voltage	24 V AC	48 V AC	115 V AC	230 V AC
AC Response/dropout Volt	19.2 V / 7.2 V	38.4 V / 14.4 V	92.0 V / 34.5 V	184.0 V / 69.0 V
Power rating	1.0 VA	1.0 VA	1.0 VA	1.0 VA
Rated current AC	41.6 mA	21.3 mA	8.8 mA	4.3 mA
Coil resistance	192 Ω ±10%	777 Ω ±10%	4845 Ω ±12%	19465 Ω ±15%

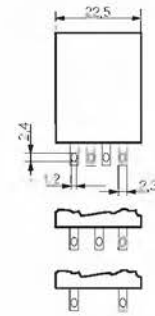
Ordering data Complete module					
without LED	Type	RCM370524	RCM370548	RCM370615	RCM370730
AgNi 90/10	Order No.	8690030000	8689960000	8689960000	8690000000
with LED	Type	RCM370R24	RCM370R48	RCM370S15	RCM370T30
AgNi 90/10	Order No.	8689950000	8689970000	8689990000	8690010000
	Type				
	Order No.				

Note				

Relay coupler - RIDERSERIES

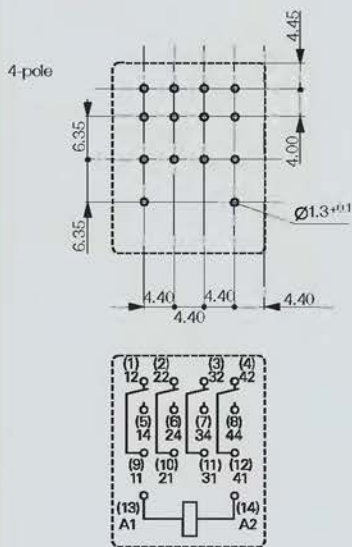
RCM relay 4 CO contact AC/DC coil

- 1500 VA switching capacity
- Solder and plug connection
- AC/DC versions also with gold-plated contacts
- Safe-to-touch test button, selectable locking
- White labelling panel



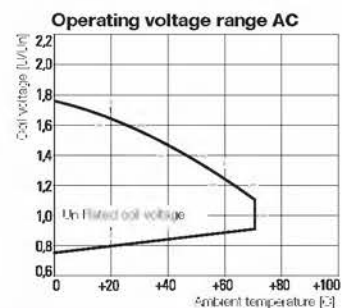
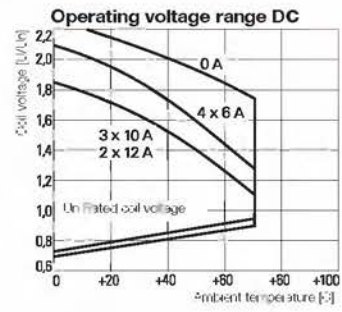
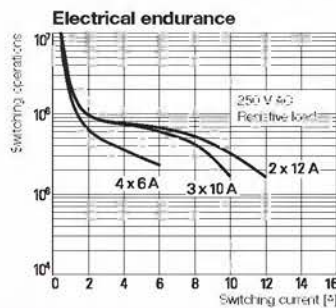
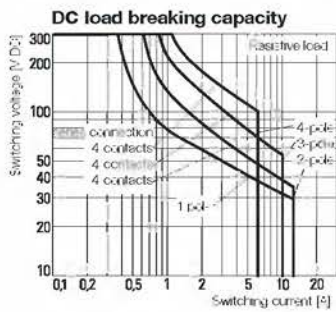
C

Circuit diagram View of connections Dimensions in mm



Output	
max. switching voltage AC	250 V
Continuous current	6 A
Contact base material	AgNi 90/10 or AgNi 5 µ Au
Mechanical endurance	AC coil 20x10 ⁶ / DC coil 30x10 ⁶ switching operations
Response time / Drop-out time	15ms / 10ms
Rated data	
Status indicator/Free-wheeling diode	/
Operating temperature	-40 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	dJFus; CE; VDE;
Insulation coordination (IEC 60664)	
Rated voltage	240 V
Creepage and clearance path input - output	≤ 3mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 28 / 22.5 / 29
Note	

Applications



RCM relay
4 CO contact
AC/DC coil

Type code

Type RIDER Control Multiple

Contacts

- 2 2 CO contacts
- 3 3 CO contacts
- 5 4 CO contacts

Contact material

- 7 AgNi 90/10, with test button
- 8 AgNi 90/10 hgp, with test button

Type of construction

- 0 Standard, 2,8 mm Faston
- 1 Print connections

RCM				
DC coil				
006	6 V DC			
012	12 V DC			
024	24 V DC			
048	48 V DC			
060	60 V DC			
110	110 V DC			
220	220 V DC			
AC coil				
506	6 V AC			
512	12 V AC			
524	24 V AC			
548	48 V AC			
615	115 V AC			
730	230 V AC			

Ordering data

Input

	12 V DC 4CO	24 V DC 4CO	48 V DC 4CO	110 V DC 4CO
Rated voltage	12 V DC	24 V DC	48 V DC	110 V DC
DC Response/dropout Volt	9,0 V / 1,2 V	18 V / 2,4 V	36 V / 4,8 V	82,5 V / 11 V
Power rating	750 mW	750 mW	750 mW	750 mW
Rated current DC	62,5 mA	31,3 mA	15,6 mA	6,8 mA
Coil resistance	192 Ω ±10%	777 Ω ±10%	3072 Ω ±10%	16133 Ω ±15%

Ordering data

Complete module

	12 V DC 4CO	24 V DC 4CO	48 V DC 4CO	110 V DC 4CO
without LED	Type	RCM570012	RCM570024	RCM570048
AgNi 90/10	Order No.	8054360000	8690200000	8074670000
with LED	Type	RCM570L12	RCM570L24	RCM570L48
AgNi 90/10	Order No.	8690180000	8690220000	8690230000
without LED	Type	RCM580012	RCM580024	RCM580048
AgNi 5 μ Au	Order No.	on request	8694460000	on request

Note

Ordering data

Input

	24 V AC 4CO	48 V AC 4CO	115 V AC 4CO	230 V AC 4CO
Rated voltage	24 V AC	48 V AC	115 V AC	230 V AC
AC Response/dropout Volt	19,2 V / 7,2 V	38,4 V / 14,4 V	92 V / 34,5 V	184 V / 69 V
Power rating	1,0 VA	1,0 VA	1,0 VA	1,0 VA
Rated current AC	41,6 mA	21,3 mA	8,8 mA	4,3 mA
Coil resistance	192 Ω ±10%	777 Ω ±10%	4845 Ω ±12%	19465 Ω ±15%

Ordering data

Complete module

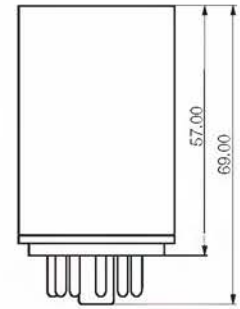
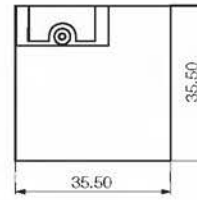
	24 V AC 4CO	48 V AC 4CO	115 V AC 4CO	230 V AC 4CO
without LED	Type	RCM570524	RCM570548	RCM570615
AgNi 90/10	Order No.	8690110000	1180900000	1180800000
with LED	Type	RCM570R24	RCM570R48	RCM570S15
AgNi 90/10	Order No.	8690120000	8690130000	8690150000
without LED	Type	RCM580524		RCM580615
AgNi 5 μ Au	Order No.	7940008171		8824860000

Note

Relay coupler - RIDERSERIES

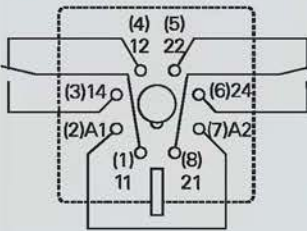
RRD relay 2 CO contact AC/DC coil

- 2 change-over contacts
- 2500 VA switching capacity
- Mechanical operating indicator
- Safe-to-touch test button, selectable locking



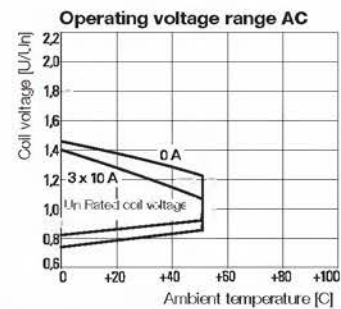
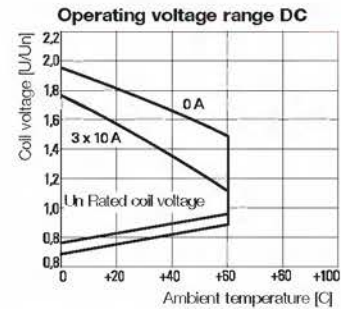
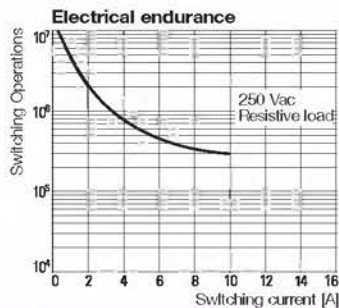
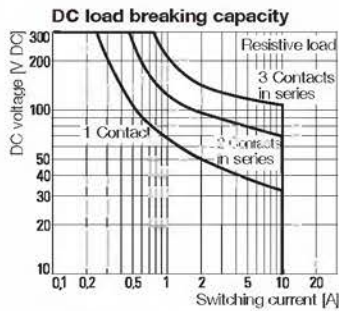
C

Circuit diagram View of connections



Output	
max. switching voltage AC	250 V
Continuous current	10 A
Contact base material	AgNi 90/10
Mechanical endurance	20x10 ⁷ switching cycles
Response time / Drop-out time	12 ms / 5 ms
Rated data	
Status indicator/Free-wheeling diode	/
Operating temperature	-45 °C... +50 °C
UL 94 flammability rating	V-0
Approvals	dJFus; CE; VDE;
Insulation coordination (IEC 60664)	
Rated voltage	250 V
Creepage and clearance path input - output	≤ 4mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 35.5 / 35.5 / 57
Note	

Applications



**RRD relay
2 CO contact
AC/DC coil**

Type code	RRD						
Type	RIDER Round						
Contacts	2 2 change-over contacts, 8-pole 3 3 change-over contacts, 11-pole						
Contact material	2 AgNi 90/10						
Type of construction	1 DC coil with test button 3 DC coil with test button and bi-polar LED 6 AC coil with test button 8 AC coil with test button and bi-polar LED						
						DC coil	Free wheel diode
						006	6 V DC
						012	12 V DC
						024	24 V DC
						048	48 V DC
						060	60 V DC
						110	110 V DC
						220	220 V DC
							OC4
							OE8
							OG0
							1B0
							2C0
						AC coil	
						506	6 V AC
						512	12 V AC
						524	24 V AC
						548	48 V AC
						615	115 V AC
						730	230 V AC

Ordering data	24 V DC 2CO	48 V DC 2CO	110 V DC 2CO	220 V DC 2CO
Input				
Rated voltage	24 V DC	48 V DC	110 V DC	220 V DC
DC Response/dropout Volt	18.0 V / 2.4 V	36.0 V / 4.8 V	82.5 V / 11.5 V	165 V / 22 V
Power rating	1.2 W	1.2 W	1.2 W	1.2 W
Rated current DC	50.5 mA	24.0 mA	11.0 mA	5.5 mA
Coil resistance	475 Ω ±10%	2000 Ω ±10%	10000 Ω ±12%	40000 Ω ±15%

Ordering data	24 V DC 2CO	48 V DC 2CO	110 V DC 2CO	220 V DC 2CO
Complete module				
with test button	Type	FRD221024	FRD221048	FRD221110
AgNi 90/10	Order No.	8690370000	8690390000	8690410000
with test button/LED	Type	FRD223024	FRD223048	FRD223110
AgNi 90/10	Order No.	8690380000	8690400000	8690420000
	Type			FRD223220
	Order No.			8798600000

Note				
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Ordering data	24 V AC 2CO	48 V AC 2CO	115 V AC 2CO	230 V AC 2CO
Input				
Rated voltage	24 V AC	48 V AC	115 V AC	230 V AC
AC Response/dropout Volt	19.2 V / 9.6 V	38.4 V / 19.2 V	92.0 V / 46.0 V	184.0 V / 92.0 V
Power rating	2.3 VA	2.3 VA	2.3 VA	2.3 VA
Rated current AC	94.2 mA	47.5 mA	20.6 mA	10.1 mA
Coil resistance	86 Ω ±10%	345 Ω ±10%	2000 Ω ±10%	8300 Ω ±12%

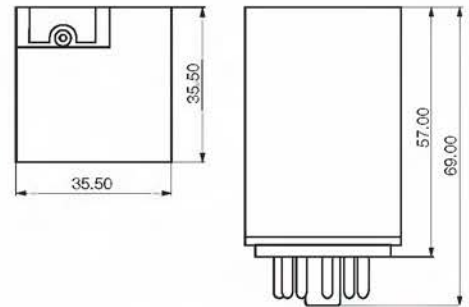
Ordering data	24 V AC 2CO	48 V AC 2CO	115 V AC 2CO	230 V AC 2CO
Complete module				
with test button	Type	FRD226024	FRD226048	FRD226115
AgNi 90/10	Order No.	8690270000	8690290000	8690310000
with test button/LED	Type	FRD228024	FRD228048	FRD228115
AgNi 90/10	Order No.	8690280000	8690300000	8690320000
	Type			FRD228230
	Order No.			8690340000

Note				
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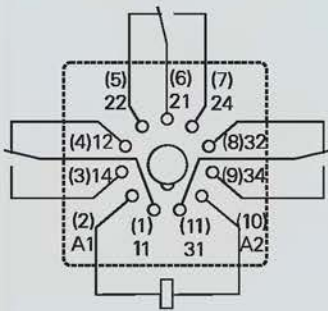
Relay coupler - RIDERSERIES

RRD relay 3 CO contact AC/DC coil

- 3 change-over contacts
- 500 VA switching capacity
- Mechanical operating indicator
- Safe-to-touch test button, selectable locking

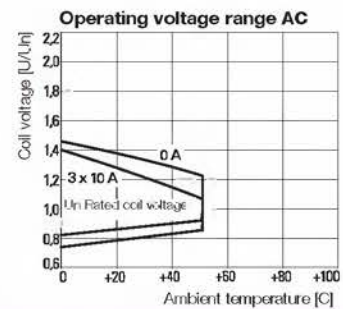
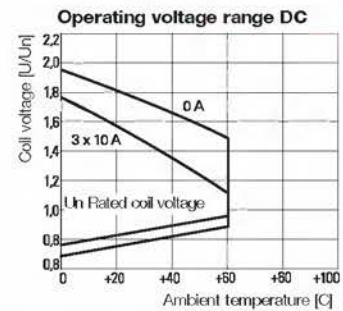
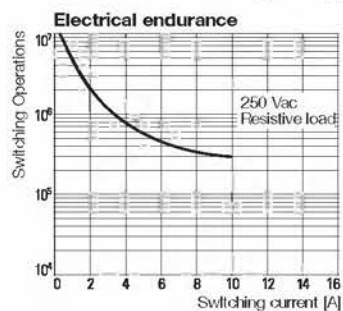
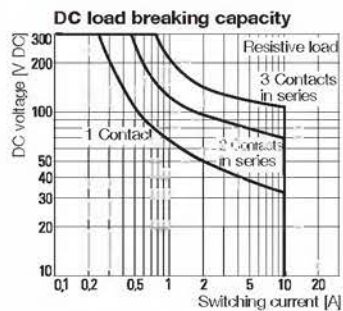


Circuit diagram View of connections



Output	
max. switching voltage AC	250 V
Continuous current	4 A
Contact base material	AgNi 90/10
Mechanical endurance	20x10 ⁷ switching cycles
Response time / Drop-out time	12 ms / 5 ms
Rated data	
Status indicator/Free-wheeling diode	/
Operating temperature	AC coil -45...+50°C / DC coil -45...+60°C
UL 94 flammability rating	V-0
Approvals	
Insulation coordination (IEC 60664)	
Rated voltage	250 V
Creepage and clearance path input - output	≤ 4mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 35.5 / 35.5 / 57
Note	

Applications



**RRD relay
3 CO contact
AC/DC coil**

Type code	RRD						
Type	RIDER Round						
Contacts	2 2 change-over contacts, 8-pole 3 3 change-over contacts, 11-pole						
Contact material	2 AgNi 90/10						
Type of construction	1 DC coil with test button 3 DC coil with test button and bi-polar LED 6 AC coil with test button 8 AC coil with test button and bi-polar LED						
						DC coil	Free wheel diode
						006	6 V DC
						012	12 V DC
						024	24 V DC
						048	48 V DC
						060	60 V DC
						110	110 V DC
						220	220 V DC
							0C4
							0E8
							0G0
							1B0
							2C0
						AC coil	
						506	6 V AC
						512	12 V AC
						524	24 V AC
						548	48 V AC
						615	115 V AC
						730	230 V AC

Ordering data

Input	12 V DC 3CO	24 V DC 3CO	110 V DC 3CO	220 V DC 3CO
Rated voltage	12 V DC	24 V DC	110 V DC	220 V DC
DC Response/dropout Volt	9 V / 1,2 V	18 V / 2,4 V	82,5 V / 11,5 V	165 V / 22 V
Power rating	1,2 W	1,2 W	1,2 W	1,2 W
Rated current DC	109,1 mA	50,5 mA	11 mA	5,5 mA
Coil resistance	110 Ω ±10%	475 Ω ±10%	10000 Ω ±12%	40000 Ω ±15%

Ordering data Complete module				
with test button Type	FRD321012	FRD321024	FRD321110	FRD321220
AgNi 90/10 Order No.	8799030000	8690610000	8690650000	7940007742
with test button/LED Type		FRD323024	FRD323110	FRD323220
AgNi 90/10 Order No.		8690620000	8690660000	8798610000
Type				
Order No.				

Note				

Ordering data

Input	24 V AC 3CO	48 V AC 3CO	115 V AC 3CO	230 V AC 3CO
Rated voltage	24 V AC	48 V AC	115 V AC	230 V AC
AC Response/dropout Volt	19,2 V / 9,6 V	38,4 V / 19,2 V	92 V / 46 V	184 V / 92 V
Power rating	2,3 VA	2,3 VA	2,3 VA	2,3 VA
Rated current AC	94,2 mA	47,5 mA	20,6 mA	10,1 mA
Coil resistance	86 Ω ±10%		2000 Ω ±10%	8300 Ω ±12%

Ordering data Complete module				
with test button Type	FRD326024	FRD326048	FRD326115	FRD326230
AgNi 90/10 Order No.	8690450000	8690470000	8690550000	8690570000
with test button/LED Type	FRD328024	FRD328048	FRD328115	FRD328230
AgNi 90/10 Order No.	8690460000	8690480000	8690560000	8690580000
Type				
Order No.				

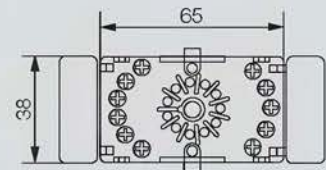
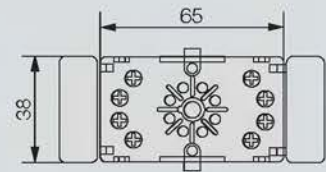
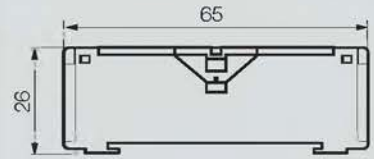
Note				

RIDERSERIES

**Accessories for RRD relays
Plug-in module with screw connection**



Dimensions in mm



Ordering data

Description
Plug-in module with screw connections, 8-pole
Plug-in module with screw connections, 11-pole

Type	Qty	Order No.
SFD 2CO	10	8690930000
SFD 3CO	10	8690920000

Contact data
Nominal current
Nominal voltage
Dielectric strength, coil/contacts
Ambient temperature
Ingress protection class (IEC 61810)
Electric shock protection
Mounting/mounting rail
Connection cross-section
Terminal torque

10 A
400 V AC
> 3000 Veff
-40 °C ... +85 °C
IP 20
to German standard VEG 4
DIN 50022
2 x 2.5 mm ²
0.8 Nm

Retaining clip (metal)

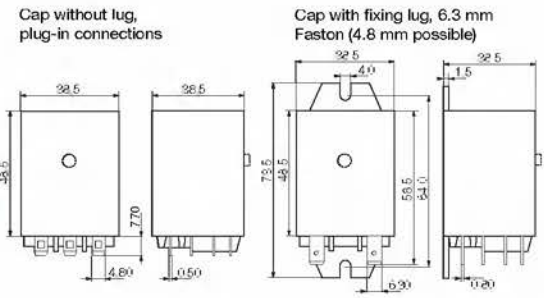
Ordering data
Accessories for
Description
Metal retaining clip, RRD

Type	Order No.
SFD CLIP M	8691120000

Relay coupler - RIDERSERIES

RPW relay
2 CO contact AC/DC coil
3 CO contact AC/DC coil

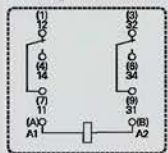
- 6000 VA switching capacity
- Mechanical indicator
- with and without test button / lug fixing



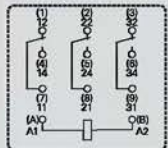
C

Circuit diagram
 View of connections

2 changeover contacts

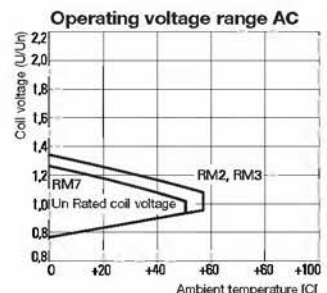
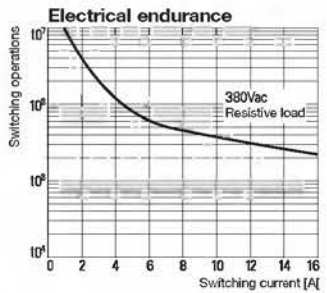
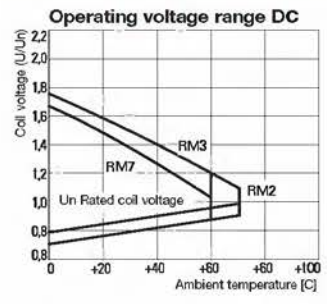
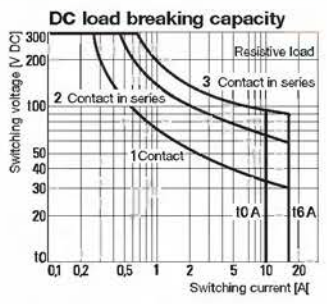


3 changeover contacts



Output	
max. switching voltage AC	400 V
Continuous current	16 A
Contact base material	AgCdO
Mechanical endurance	20x10 ⁶ switching cycles
Response time / Drop-out time	15 ms / 10 ms
Rated data	
Status indicator/Free-wheeling diode	/
Operating temperature	-45 °C...+70 °C
UL 94 flammability rating	V-0
Approvals	dJFus; CE; VDE;
Insulation coordination (IEC 60664)	
Rated voltage	400 V
Creepage and clearance path input - output	≤ 6mm
Overvoltage category	III
Pollution severity	3
Protective separation to VDE 0106 part 101	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm 38.5 / 38.5 / 48.5
Note	

Applications



RPW relay
2 CO contact AC/DC coil
3 CO contact AC/DC coil

Type code		RPW				
Typ	RIDER PoWer					
Contacts	2 2 change-over contacts 7 3 change-over contacts					
Type of construction	0 Without test button 3 With test button					
Housing	2 Cap without lug, 4.8 mm Faston 5 Cap with lug, 6.3 mm Faston					
					DC coil	
					006	6 V DC
					012	12 V DC
					024	24 V DC
					048	48 V DC
					060	60 V DC
					110	110 V DC
						AC coil
					506	6 V AC
					512	12 V AC
					524	24 V AC
					548	48 V AC
					615	115 V AC
					730	230 V AC

Ordering data

Input	24 V DC 2CO	24 V AC 2CO	115 V AC 2CO	230 V AC 2CO
Rated voltage	24 V DC	24 V AC	115 V AC	230 V AC
DC Response/dropout Volt	18 V / 2.4 V	19.2 V / 9.6 V	92 V / 46 V	184 V / 92 V
Power rating	1.2 W	2.3 VA	2.3 VA	2.3 VA
Rated current DC	50.5 mA	94.2 mA	20.6 mA	10.1 mA
Coil resistance	475 Ω ±10%	86 Ω ±10%	2000 Ω ±10%	8300 Ω ±12%

Ordering data
Complete module

without lug, without test button	RPW202024	RPW202524	RPW202615	RPW202730
AgCdO	8690730000	8690710000	on request	8690720000
Order No.	RPW232024	RPW232524	RPW232615	RPW232730
without lug, with test button	on request	on request	on request	on request
Type	RPW205024	RPW205524	RPW205615	RPW205730
AgCdO	8690790000	8690770000	on request	8690780000
Order No.				

Note

Ordering data

Input	24 V DC 3CO	24 V AC 3CO	115 V AC 3CO	230 V AC 3CO
Rated voltage	24 V DC	24 V AC	115 V AC	230 V AC
DC Response/dropout Volt	18 V / 2.4 V	19.2 V / 9.6 V	92 V / 46 V	184 V / 92 V
Power rating	1.6 W	2.8 VA	2.8 VA	2.8 VA
Rated current DC	69.6 mA	109.2 mA	23 mA	11.7 mA
Coil resistance	345 Ω ±10%	80 Ω ±10%	1850 Ω ±10%	7500 Ω ±10%

Ordering data
Complete module

without lug, without test button	RPW702024	RPW702524	RPW702615	RPW702730
AgCdO	8690760000	8690740000	8693110000	8690750000
Order No.	RPW732024	RPW732524	RPW732615	RPW732730
without lug, with test button	on request	8692990000	on request	on request
Type	RPW705024	RPW705524	RPW705615	RPW705730
AgCdO	8690820000	8690800000	on request	8690810000
Order No.				

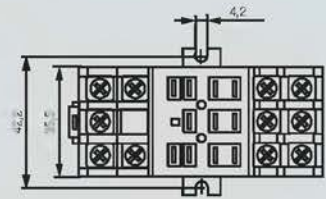
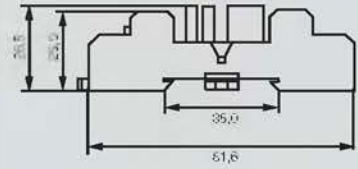
Note

Relay couplers – RIDERSERIES

Accessories for RPW Plug-in module with screw connection



Dimensions in mm



Ordering data

Description	Type	Qty	Order No.
Plug-in module with screw connections	SPW 3C0	25	8697680000
Contact data			
Nominal current	16 A		
Nominal voltage	250 V AC		
Dielectric strength, coil/contacts	> 2500 Vms		
Ambient temperature	-40 °C ... +40 °C		
Terminal torque	0.8 Nm		
Max.	1.2 Nm		

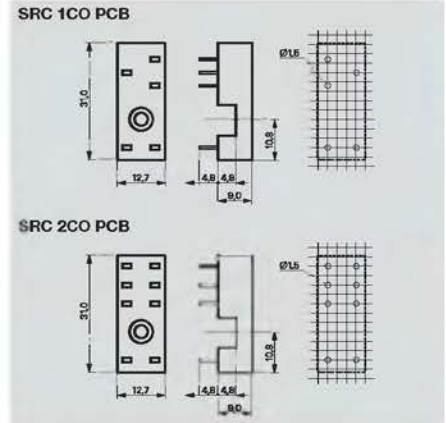
Plug-in socket with PCB connections
for RCL relays



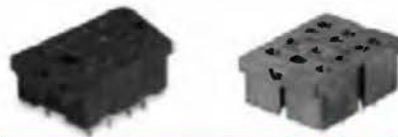
Ordering data

Description	
Plug-in socket with PCB connections, pinning 3.5 mm	
Plug-in socket with PCB connections, pinning 5 mm	
Accessory: metal retaining clip, 15.7 mm high	
Accessory: metal retaining clip, 25.5 mm high	
Technical data	
Nominal current	1-pole
	2-pole
Nominal voltage	
Ambient temperature	
Approvals	

Type	Qty	Order No.
SRC 1CO PCB	100	8690860000
SRC 2CO PCB	100	8690850000
SRC CLIP LM		8693810000
SRC CLIP HM		8692620000
Technical data		
Nominal current	12 A	
Nominal voltage	2 x 12 V AC	
Ambient temperature	300 V AC	
	-40 °C ... +80 °C	
Approvals		



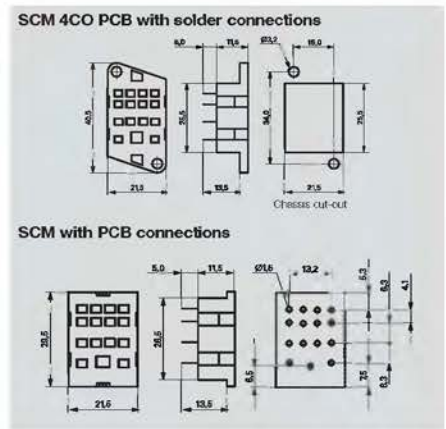
Plug-in socket with solder/PCB connections
for RCM relays



Ordering data

Description	
Plug-in socket with solder connections, 4-pole	
Plug-in socket with PCB connections, 2-pole	
Plug-in socket with PCB connections, 3-pole	
Plug-in socket with PCB connections, 4-pole	
Accessory: metal retaining clip, 29 mm high	
Technical data	
Nominal current	
Nominal voltage	
Ambient temperature	
Approvals	

Type	Qty	Order No.
SCM 4CO PCB	25	8697610000
SCM 2CO PCB	25	8697620000
SCM 3CO PCB	25	8697640000
SCM 4CO PCB	25	8697660000
SRM CLIP LM		8694400000
Technical data		
Nominal current	10 A	
Nominal voltage	250 V AC	
Ambient temperature	-40 °C ... +80 °C	
Approvals		



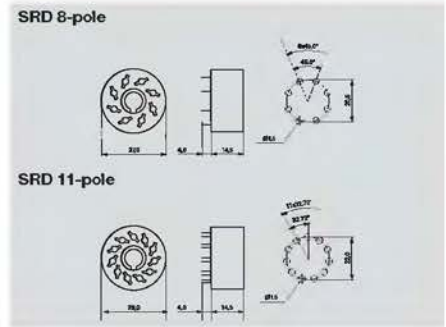
Plug-in socket with PCB connections
for RRD relays



Ordering data

Description	
Plug-in socket with solder and PCB connections	8-pole
Plug-in socket with solder and PCB connections	11-pole
Technical data	
Nominal current	
Nominal voltage	
Ambient temperature	

Type	Qty	Order No.
SRD 2CO PCB	25	8697750000
SRD 3CO PCB	25	8697730000
Technical data		
Nominal current	10 A	
Nominal voltage	250 V AC	
Ambient temperature	-40 °C ... +70 °C	



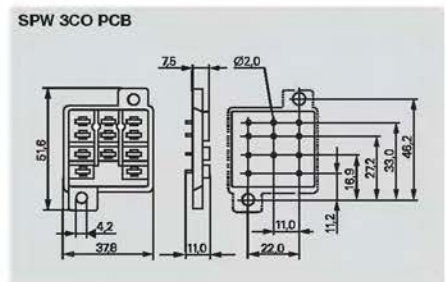
Plug-in socket with PCB connections
for RPW relays



Ordering data

Description	
Plug-in socket with PCB connections	
Accessory: metal retaining clip, RPW	
Technical data	
Approvals	

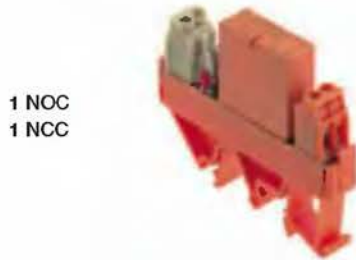
Type	Qty	Order No.
SPW 3CO PCB		8697710000
SPW CLIP M		8697780000
Approvals		



1 NCC, 1 NOC
or 1 change-over contact

RS 30

Screw connection



1 NOC
1 NCC

1 change-over contact



RS 30

Isolating plug with screw connection



1 NOC
1 NCC

1 change-over contact



Technical data

Input voltage 5 ... 60 V ± 10 %; 115 V/230 V + 5 % – 15 %
Nominal consumption – (W)
Nominal consumption – (VA)
Drop-out current of relay (at 20 °C)
Drop-out current of relay (at 20 °C)
Pick-up current
Output voltage max.
Continuous current
Derating curve a = fitted on mounting rail in horizontal row without spacing b = fitted on mounting rail in horizontal row with 20 mm spacing
Making current
Making power under ohmic load
Min. switching power/switching current
Duration of bounce
Typical switching times
–, Pick-up delay
–, Drop-out delay
Max. switching frequency
Contact material
Service life, mechanical
–, 24 V-, 1A ohmic load
–, 230 V-, 3A, ohmic load
Storage temperature
Ambient temperature, fitted on mounting rail
–, in horizontal row without spacing
–, in horizontal row with > 20 mm spacing
Insulation coordination to EN 50178
Overvoltage category
Pollution severity
Dimensions
Mounting width
Length (at 90° to mounting rail)
Height (with TS 32 / TS 35 x 7.5)

5 VTTL	12 V~	24 V~	24 V~	48 V~	48 V~	60 V~	115 V~	115 V~	230 V~ ²⁾	240 V~
0.45 W ¹⁾	0.45 W	0.45 W	0.45 W	0.45 W	0.45 W	0.45 W	–	0.82 W	–	–
–	–	–	0.7 VA	–	0.6 VA	–	0.8 VA	–	0.8 VA	1.2 VA
–	3 mA	3 mA	2.5 mA~	2 mA	2.5 mA~	1 mA~	–	2 mA~	–	0.5 mA~
–	–	–	3.5 mA~	–	4.5 mA~	–	1 mA~	–	1 mA~	1 mA~
–	–	12 mA	–	10 mA	–	–	6 mA	4.3 mA	–	–
250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V	250 V
5 A	6 A	6 A	6 A	6 A	5 A	5 A	5 A	5 A	3 A	3 A

Constant current

Constant current spacing > 20 mm

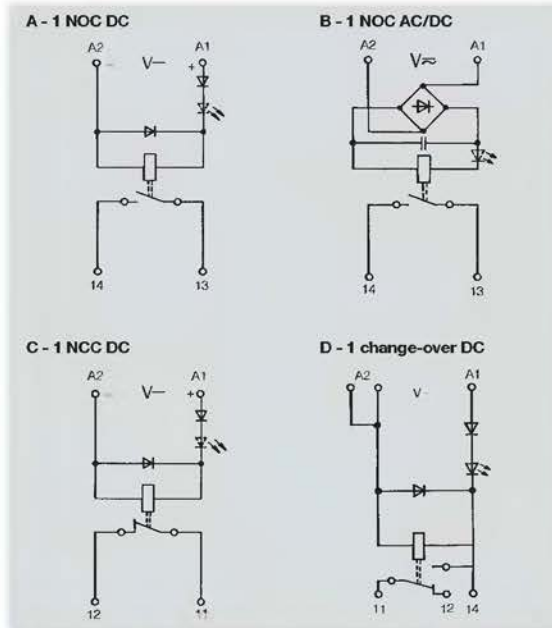
Switching mode on/off < 1 min (50 / 50%)

8 A										
2000 VA / 100 W										
250 mW / 10 mA										
≤ 3 ms										
≤ 8 ms	≤ 8 ms	≤ 8 ms	≤ 8 ms	≤ 12 ms	≤ 13 ms	≤ 12 ms	≤ 9 ms	≤ 12 ms	≤ 10 ms	≤ 10 ms
≤ 7 ms	≤ 7 ms	≤ 7 ms	≤ 16 ms	≤ 11 ms	≤ 12 ms	≤ 11 ms	≤ 8 ms	≤ 11 ms	≤ 9 ms	≤ 9 ms
70 Hz	70 Hz	70 Hz	30 Hz	70 Hz	20 Hz	70 Hz	30 Hz	70 Hz	30 Hz	30 Hz
AgNi, gold-flashed										
> 10 ⁷ switching cycles										
> 5 x 10 ⁶ switching cycles										
> 7 x 10 ⁶ switching cycles										
–40 °C ... +60 °C										
–25 °C ... +40 °C										
–25 °C ... +50 °C										
III										
2										
11.2 mm NOC / NCC, 25 mm change-over contact										
70 mm (74 mm BL/SL version)										
56 mm / 51.5 mm										

1) Rated consumption of auxiliary voltage 24 V~
2) 230 V~ on request

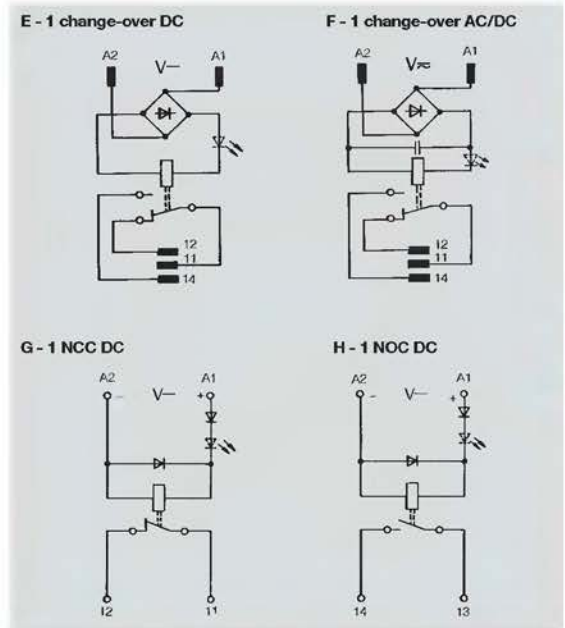
RS 30

Screw connection



RS 30

Isolating plug with screw connection



Ordering data

Wiring diagram		A	B	C	D	E	F	G	H
Input voltage	Function indicator	NOC	NOC	NCC	change-over	change-over	change-over	NOC	NCC
5 V _{TTL}	without							1167660000	1167760000
12 V ₋	without LED red	1129421001		1129521001			1129660000		
24 V ₋	without LED green LED red	1101661001 1101611001 1101621001		1100961001 1100911001 1100921001	1181511001 1181521001	1100260000 1100210000 1100220000			
24 V ₌	without LED green LED red		1101761001 1101711001 1101721001				1100360000		
48 V ₋	LED green LED red	1101861001 1101811001				1100410000 1100420000			
48 V ₌	without LED green		1101911001				1100560000		
60 V ₋	without LED green LED red	1102061001 1102011001				1100620000			
115 V ₋	without LED green LED red	1155161001 1155111001 1155121001		1155260000 1155211001 1155221001					
115 V ₌	without LED green LED red		1102161001 1102111001 1102121001				1100760000		
230 V ₋	without LED green LED red		1102261001 1102211001 1102221001				1100860000		
240 V ₋	without LED green LED red		1128561001 1128511001 1128521001						

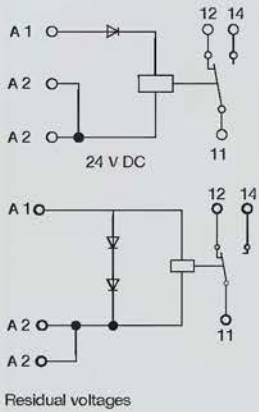
Relay coupler - RS SERIES - RS 31

1 change-over contact
AC/DC/UC coil

- For high switching capacity
- Suitable for switching inductive loads



C



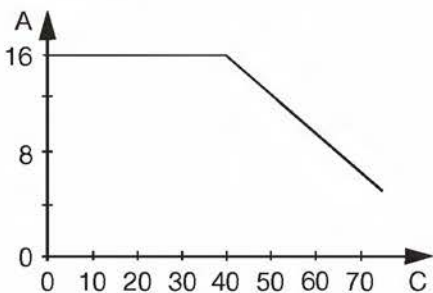
Output	
max. switching voltage AC/Continuous current	250 V/16 A
min. switching power	1 W
Response time / Drop-out time	9ms/10ms
Contact base material	AgCdO
Mechanical endurance	3x10 ⁷ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	/Yes
Reverse pol. prot	available
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	250 V
Impulse withstand voltage	6 kV
Creepage and clearance path input - output	3 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	no

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4	
Length x width x height	mm 70 / 25 / 53.5	

Note

Applications

Derating curve

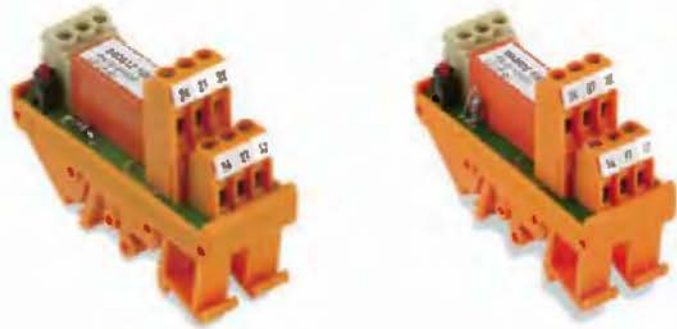


1 change-over contact
AC/DC/UC coil

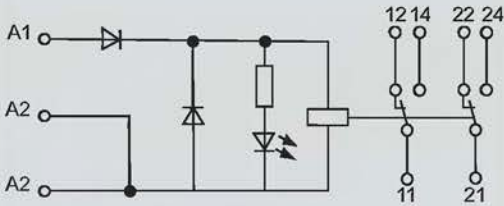
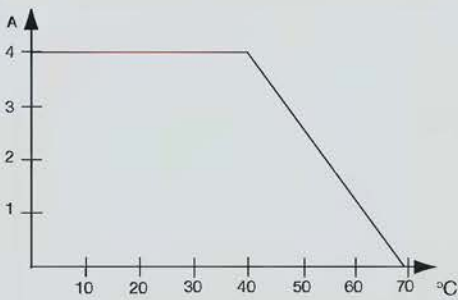
Ordering data	24VDC 1CO	48VDC 1CO	115VAC 1CO	230VAC 1CO
Input				
Rated voltage	24 V DC ±10 %	48 V DC ±10 %	115 V AC +5 %/ -15 %	230 V AC + 5 / - 15%
Rated current AC			8 mA	4.5mA
Rated current DC	40 mA	20 mA		
Power rating	1W	1W	1 VA	1VA
AC Response/dropout Volt			98 V	195 V
DC Response/dropout Volt	21.5V	43 V		
AC pickup/dropout current			-1.5mA	-2.2mA
DC pickup/dropout current	-/11.5mA	-/13.5mA		
Ordering data				
Complete module				
Screw connection	Type Order No.	Type Order No.	Type Order No.	Type Order No.
	RS 31 24VDC LD LP 1U 1128361001	RS 31 48VDC LD 1U LP 1150761001	RS 31 115VAC LD LP 1U 1150461001	RS 31 230VAC LD LP 1U 1128461001
Tension clamp connection	Type Order No.	Type Order No.	Type Order No.	Type Order No.
Ordering data				
Spare relay (pluggable)				
	Type Order No.	Type Order No.	Type Order No.	Type Order No.
Note				
Ordering data				
Input				
Rated voltage				
Rated current AC				
Rated current DC				
Power rating				
AC Response/dropout Volt				
DC Response/dropout Volt				
AC pickup/dropout current				
DC pickup/dropout current				
Ordering data				
Complete module				
Screw connection	Type Order No.	Type Order No.	Type Order No.	Type Order No.
Tension clamp connection	Type Order No.	Type Order No.	Type Order No.	Type Order No.
Ordering data				
Spare relay (pluggable)				
	Type Order No.	Type Order No.	Type Order No.	Type Order No.
Note				

Relay coupler - RS SERIES - RS 32

2 change-over contacts
DC coil



C



Output	
max. switching voltage AC/Continuous current	250 V/4 A
min. switching power	10 V / 100 mA
Response time / Drop-out time	13ms/10ms
Contact base material	AgNi 0.15 gold flashed
Mechanical endurance	>30x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	/no
Reverse pol. prot	available
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	250 V
Impulse withstand voltage	4 kV
Creepage and clearance path input - output	3 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	no
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4
Length x width x height	mm 70 / 25 / 63.5
Note	

Ordering data

	12VDC 2CO	24VDC 2CO	48VDC 2CO	
Input				
Rated voltage	12 V DC ±10 %	24 V DC ±10 %	48 V DC ±10 %	
Rated current AC				
Rated current DC	50 mA	25 mA	12 mA	
Power rating	0.6W	0.6W	0.6W	
AC Response/dropout Volt				
DC Response/dropout Volt	11 V	21.5V	43 V	
AC pickup/dropout current				
DC pickup/dropout current	-79.5mA	-75 mA	-72 mA	

Ordering data
Complete module

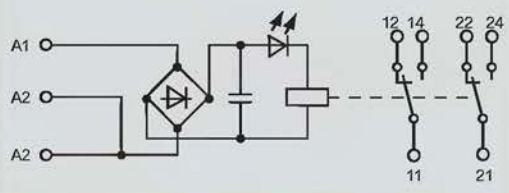
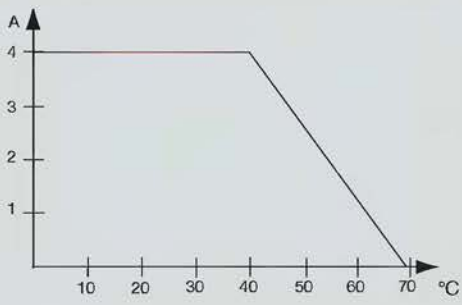
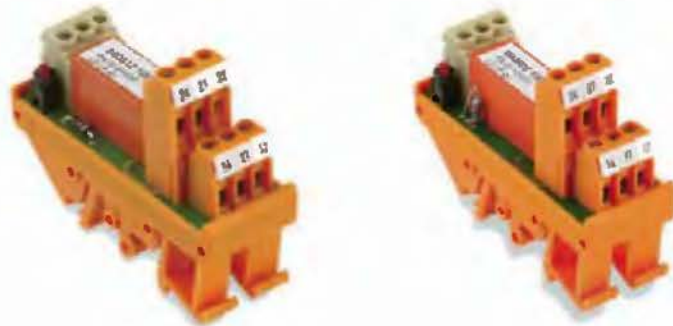
	12VDC 2CO	24VDC 2CO	48VDC 2CO	
Screw connection	Type RS 32 12VDC LD LP 2U	Type RS 32 24VDC LD LP 2U	Type RS 32 48VDC LD LP 2U	
Order No.	9406021001	9406121001	9406321001	
Tension clamp connection	Type	Type	Type	
Order No.				

Ordering data
Spare relay (pluggable)

	12VDC 2CO	24VDC 2CO	48VDC 2CO	
Type				
Order No.				

Note	12VDC 2CO	24VDC 2CO	48VDC 2CO	

2 change over contacts
UC coil



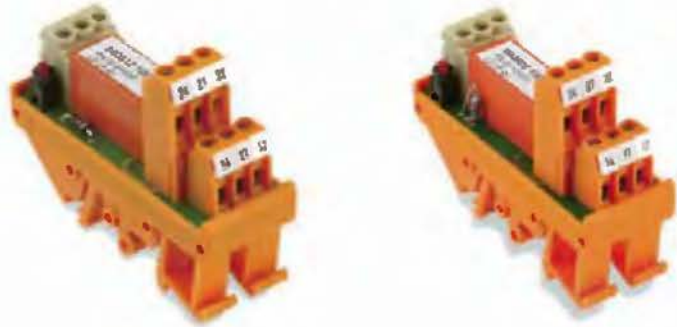
Output		
max. switching voltage AC/Continuous current	250 V/4 A	
min. switching power	10 V / 100 mA	
Response time / Drop-out time	13ms/10ms	
Contact base material	AgNi 0.15 gold flashed	
Mechanical endurance	>30x10 ⁶ switching cycles	
max. switching frequency at rated load	0.1 Hz	
Rated data		
Status indicator/Free wheel diode	/no	
Reverse pol. prot	not available	
Operating temperature	-25 °C...+40 °C	
Storage temperature	-40 °C...+60 °C	
Humidity	40°C/93% RH, no condensation	
Approvals	CE;	
Insulation coordination (EN 50178)		
Standards	EN 50178	
Rated voltage	250 V	
Impulse withstand voltage	4 kV	
Creepage and clearance path input - output	3 mm	
Overvoltage category	III	
Pollution severity	2	
Protective separation to VDE 0106 part 101	no	
Dimensions		
	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ²	2.5 / 0.5 / 4
Length x width x height	mm	70 / 25 / 63.5
Note		

Ordering data

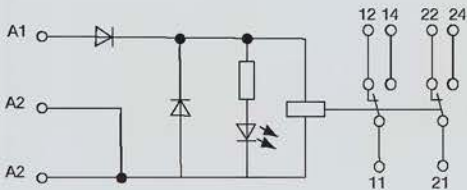
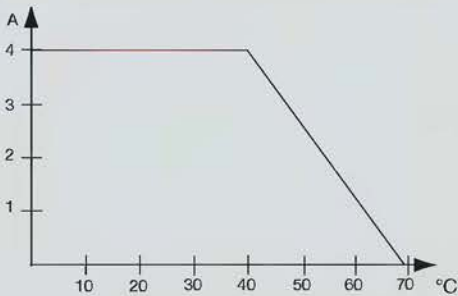
	24VUC 2CO	48VUC 2CO	115VUC 2CO	230VUC 2CO
Input				
Rated voltage	24 V UC ±10 %	48 V UC ±10 %	115 V UC +5 / - 15%	230 V UC +5 / - 15%
Rated current AC	28 mA	18mAac	5mA	4.3mA
Rated current DC	18 mA	12 mA	5 mA	4.3mA
Power rating	0.6W // 0.9VA	0.6W // 0.9VA	0.5W // 0.6VA	1W //1VA
AC Response/dropout Volt				
DC Response/dropout Volt	21.5V	43 V	98 V	195 V
AC pickup/dropout current	-/2.5mA	-/4.5mA	-/1.5mA	-/2 mA
DC pickup/dropout current	-/4.5mA	-/2 mA	-/1 mA	-/1.2mA
Ordering data Complete module				
Screw connection	Type RS 32 24VUC LD LP 2U	Type RS 32 48VUC LD LP 2U	Type RS 32 115VUC LD LP 2U	Type RS 32 230VUC LD LP 2U
	Order No. 9406221001	Order No. 9406421001	Order No. 9406621001	Order No. 9406721001
Tension clamp connection	Type 	Type 	Type 	Type
	Order No. 	Order No. 	Order No. 	Order No.
Ordering data Spare relay (pluggable)				
	Type 	Type 	Type 	Type
	Order No. 	Order No. 	Order No. 	Order No.
Note				

Relay coupler - RS SERIES - RS 32

2 change over contacts
multiple voltage input



C



Output	
max. switching voltage AC/Continuous current	250 V/4 A
min. switching power	10 V / 100 mA
Response time / Drop-out time	13ms/10ms
Contact base material	AgNi 0.15 gold flashed
Mechanical endurance	>30x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	/no
Reverse pol. prot	not available
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	250 V
Impulse withstand voltage	4 kV
Creepage and clearance path input - output	3 mm
Overtoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	no

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ²	2.5 / 0.5 / 4
Length x width x height	mm	70 / 25 / 63.5

Note

Ordering data

	24-48VUC 2CO	115-230VUC 2CO		
Input				
Rated voltage	24 V // 48 V UC ±10 %	115 // 230 V UC + 5 / - 15%		
Rated current AC	28 mA / 22 mA	5.6mA/5.3mA		
Rated current DC	18 mA / 20 mA	5.4mA/5mA		
Power rating	0.6W // 0.9VA	1W // 1VA		
AC Response/dropout Volt				
DC Response/dropout Volt	21.5V/43V	98 V / 195 V		
AC pickup/dropout current	-/3mA // -/4.5mA	-/1.5mA // -/2mA		
DC pickup/dropout current	-/5mA // -/2mA	-/1mA // -/1.2mA		

Ordering data

Complete module				
Screw connection	Type	RS 32 24-48VUC LD LP 2U	RS 32 115-230VUC LD 2U	
	Order No.	1122661001	1122761001	
Tension clamp connection	Type			
	Order No.			

Ordering data

Spare relay (pluggable)				
	Type			
	Order No.			

Note				
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RS SERIES – with RSM multiple interface

4-/8-/16-way, ea. with 1 COC

- Red LEDs , other colours on request
- Mounting feet can also be mounted turned through an angle of 180°

RSM 4 R / RSM 4 RS

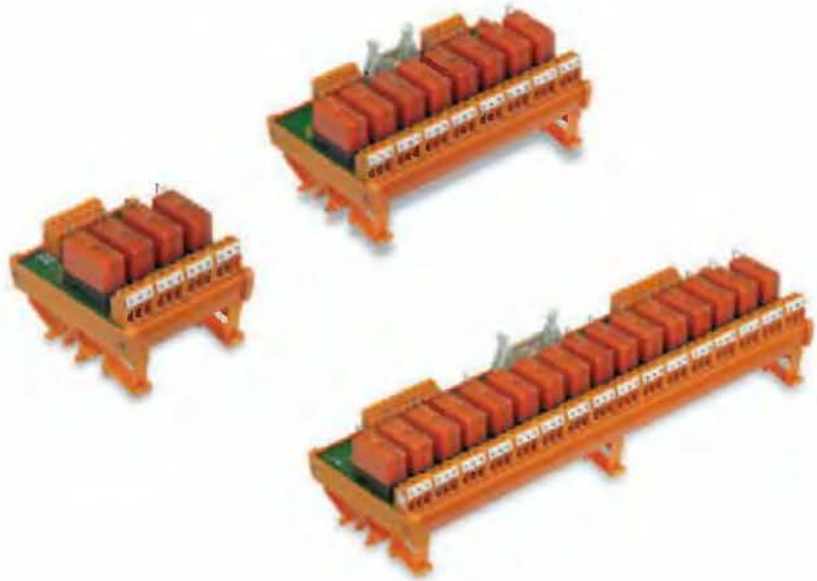
**4 relays
soldered or plug-in**

RSM 8 R / RSM 8 RS

**8 relays
soldered or plug-in**

RSM 16 R / RSM 16 RS

**16 relays
soldered or plug-in**



Technical data

Rated data	
Input voltage	
Nominal consumption	soldered relay
	plug-in relay
Nominal consumption	soldered relay
	plug-in relay
Pick-up current	soldered relay
	plug-in relay
Pick-up current	soldered relay
	plug-in relay

Drop-out current of relay (at 20 °C)	
Output voltage max.	
Continuous current	

Derating curve
 a = fitted on mounting rail in horizontal row without spacing
 b = fitted on mounting rail in horizontal row with 20 mm spacing



24 V DC	24 V AC/DC	48 V DC	115 V AC/DC	230 V AC
0.45 W	–	–	–	–
0.75 W	0.45 W	0.75 W	–	–
–	–	–	–	–
–	0.7 VA	–	0.6 VA	1.2 VA
12 mA	–	–	–	–
23 mA	12 mA	14 mA	5 mA	–
–	–	–	–	–
–	16.5 mA	–	6 mA	4 mA
2 mA	–	1.5 mA	–	1 mA
250 V	250 V	250 V	250 V	250 V
6 A	6 A	6 A	6 A	3 A



Typical making times	
	Pick-up delay (AC / DC)
	Drop-out delay (AC / DC)

≤ 8 ms	≤ 10 ms / 10 ms	≤ 12 ms	≤ 8 ms / 10 ms	≤ 10 ms
≤ 7 ms	≤ 15 ms / 25 ms	≤ 11 ms	≤ 5 ms / 8 ms	≤ 10 ms

Duration of bounce	
Making current	
Making power under ohmic load	
Min. switching power / switching current	
Contact material	
Service life	mechanical
	24 V DC, 1A, ohmic load
	230 V AC, 3A, ohmic load

≤ 3 ms
8 A
2000 VA
250 mW/10 mA
AgNi 90/10, AgNi0,15, gold-flashed
> 30 x 10 ⁶ switching cycles
> 5 x 10 ⁶ switching cycles
> 7 x 10 ⁶ switching cycles
-40 °C ... +60 °C
-25 °C ... +50 °C

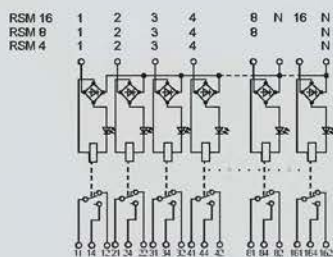
Insulation coordination to EN 50178	
Overvoltage category	
Pollution severity	

III
2

Dimensions	
Conductor cross-section (screw connection)	

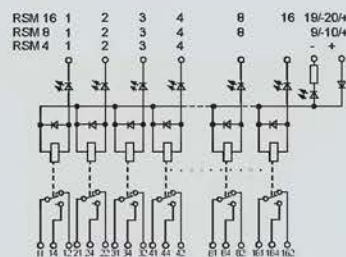
0.5 ... 2.5 mm ²

DC/AC/AC voltage



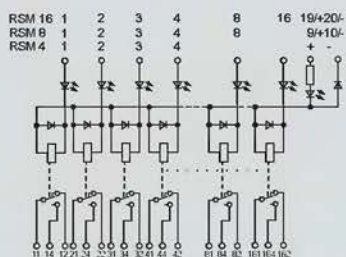
DC voltage, negative-switching

common plus potential,
minus connected



DC voltage, positive-switching

common minus potential,
plus connected



Ordering data

Connection system	
Input	Screw connection
	<ul style="list-style-type: none"> • Plug-in relay Screw connection and multiple plug to IEC 603-1/DIN 41651 • Relay soldered Multiple plug to IEC 603-1/DIN 41651
Output	Screw connection

		4 relays RSM 4 R/RS (B = 75 mm)	8 relays RSM 8 R/RS (B = 145 mm)	16 relays RSM 16 R/RS (B = 285 mm)
Input voltage	24 V DC, switching plus	Relay pluggable 1113361001 ¹⁾	Relay pluggable 1113561001 ¹⁾	Relay pluggable 1113761001 ¹⁾
		Relay soldered 1112361001	Relay soldered 1107761001	Relay soldered 1107861001
	24 V DC, switching minus	Relay pluggable 1113461001 ¹⁾	Relay pluggable 1113661001 ¹⁾	Relay pluggable 1113861001 ¹⁾
			Relay soldered 1112661001	
	24 V AC/DC	Relay pluggable 1173461001	Relay pluggable 1173561001	Relay pluggable 1173661001
	48 V DC, switching plus	Relay pluggable 1113961001	Relay pluggable 1114161001	Relay pluggable 1114361001
	115 V AC/DC	Relay pluggable 1114561001	Relay pluggable 1114661001	Relay pluggable 1114761001
	230 V AC	Relay pluggable 1114861001	Relay pluggable 1114961001	Relay pluggable 1115061001

¹⁾ approved by Germanisch Lloyd

Spare relays (pluggable)

For RSM ... R/RS, 24 V
For RSM ... R/RS, 48 V
For RSM ... R/RS, 115 V and 230 V

Input voltage	Contact material	Remarks	Order no.
24 V DC	AgNi 90/10	RT 314024 with clip	8630780000
	AgNi 90/10	RT 314024 without clip	4058480000
48 V DC	AgNi 90/10	RT 314048 with clip	8630790000
	AgNi 90/10	RT 314048 without clip	4058740000
115 V DC	AgNi 90/10	RT 314110 with clip	8630770000
	AgNi 90/10	RT 314110 without clip	4058500000

EG SERIES

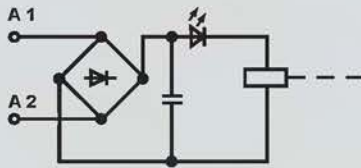
1 NCC, 1 NOC, 1 COC

- Also with hard gold-plated contacts
- With combination foot for TS 32 or TS 35 DIN Rail (clip-in base for plug-in) change-over contacts
- 10 mm wide
- Screw connection

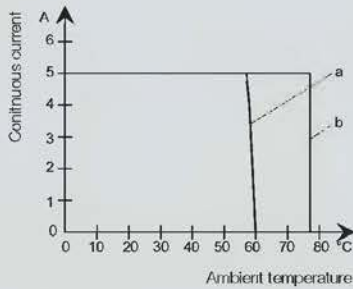


C

Wiring diagram



Wiring diagram



a = fitted on mounting rail in horizontal row without spacing
 b = fitted on mounting rail in horizontal row with 20 mm spacing

Technical data

Output	
Max. switching voltage AC / continuous current	250 V / 5 A
Min. switching power	100 mW / 10 mA
hard gold-plated contacts	40 µW
Response time/drop-out time	≤ 8 ms / ≤ 6 ms
Contact base material	AgNi 0.15 gold-flashed
hard gold-plated contacts	AgNi 0.15 / 5 µ Au
Mechanical service life	> 15 x 10 ⁶ switching cycles
Max. switching frequency at rated load	0.1 Hz
Nominal data	
Status indicator/recovery diode	green LED / yes
Ambient temperature arranged in horizontal row with spacing	-25 °C ... +60 °C
Storage temperature	-40 °C ... +60 °C
Insulation coordination (EN 50 178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse voltage	8 kV
Creepage and clearance path input-output	≥ 8 mm
Overvoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	DIN VDE 0106

		1 NOC, 1 NCC	1 change-over contact
Clamping range (nom./min./max)	mm ²	1.5 x 0.5 x 1.5	1.5 x 0.5 x 1.5
Length x width x height	mm	44.0 x 10.0 x 96.0	95.0 x 10.0 x 93.0
Remarks			

1 NOC, 1 NCC, 1 COC

Ordering data	12 V AC/DC	24 V DC	24 V AC/DC	115 V AC/DC
Input				
Rated voltage	12 V AC/DC +15 % -10 %	24 V DC +15 % -10 %	24 V AC/DC +15 % -10 %	115 V AC/DC + 15 % -10 %
Nominal power	320 mW +20 % -10 %	280 mW +20 % -10 %	280 mW +20 % -10 %	330 mW +15 % -10 %
Making current, max.	120 mA	12 mA	240 mA	160 mA
Ordering data with combination foot				
1 NOC	EGR EG 7	EGR EG 7	EGR EG7	EGR EG7
Order No.	8092310000	8216520000	8092340000	8092430000
1 NCC	EGR EG 7	EGR EG 7	EGR EG7	EGR EG7
Order No.	8092320000	8216530000	8092350000	8092440000
Ordering data, pluggable (order clip-in base separately)				
1 change-over contact	FST EG 7	FST EG 7	FST EG 7	FST EG 7
Order No.	8216550000	8216570000	8216580000	8216610000
1 clip-in base	RS EG 7	RS EG 7	RS EG 7	RS EG 7
Order No.	8193830000	8193830000	8193830000	8193830000

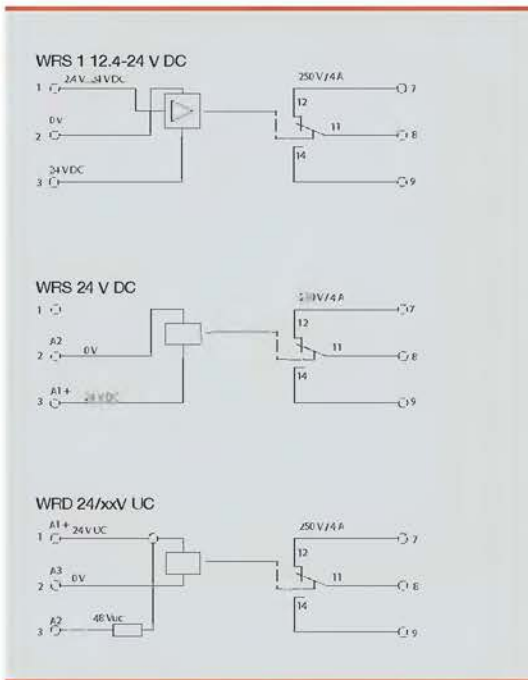
Ordering data	230 V AC	Contacts hard gold-plated	24 V DC	230 V AC
Input				
Rated voltage	230 V AC +15 % -10 %		24 V DC +15 % -10 %	230 V AC +15 % -10 %
Nominal power	280 mW +15 % -10 %		280 mW +20 % -10 %	280 mW +15 % -10 %
Making current, max.	185 mA		12 mA	185 mA
Ordering data with combination foot				
1 NOC	EGR EG 7		EGR EG 7	EGR EG 7
Order No.	8092460000		8147120000	8178200000
1 NCC	EGR EG 7		EGR EG 7	
Order No.	8092470000		8147140000	
Ordering data, pluggable (order clip-in base separately)				
1 change-over contact	FST EG 7		FST EG 7	FST EG 7
Order No.	8216620000		8216560000	8216630000
1 clip-in base	RS EG 7		RS EG 7	RS EG 7
Order No.	8193830000		8193830000	8193830000

Relay coupler - WAVESERIES

**1 change-over contact
AC/DC/UC coil**

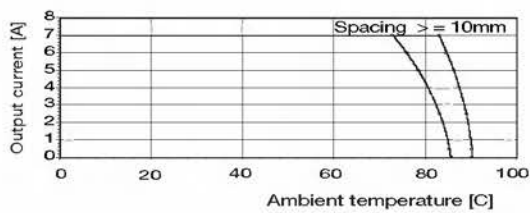


C



Output		
max. switching voltage AC/Continuous current	250 V/5 A	
min. switching power	100 mA / 5 V DC	
Response time / Drop-out time	7ms/6ms	
Contact base material	Gold alloy	
Mechanical endurance	20x10 ⁶ switching cycles	
max. switching frequency at rated load	0.1 Hz	
Rated data		
Status indicator/Free wheel diode	green LED/Yes	
Reverse pol. prot	available	
Operating temperature	-25 °C...+50 °C	
Storage temperature	-40 °C...+60 °C	
Humidity	40°C/93% RH, no condensation	
Approvals	CSA;cULFus;CE;	
Insulation coordination (EN 50178)		
Standards	EN 50178	
Rated voltage	300 V	
Impulse withstand voltage	6 kV (1.2/50 µs)	
Creepage and clearance path input - output	≥ 5,5 mm	
Overtoltage category	III	
Pollution severity	2	
Protective separation to VDE 0106 part 101	yes	
Dimensions		
	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ²	1.5 / 0.5 / 2.5
Length x width x height	mm	72 / 22.5 / 92.4
Note		

Applications



1 change-over contact
AC/DC/UC coil

Ordering data	2.4-24 V DC 1CO	24 V DC 1CO	24 / 48 V UC 1CO	24 V UC/230 V AC 1CO
Input				
Rated voltage	2,4...24 V DC ±10 %	24 V DC ±10 %	24 V // 48 V UC ±10 %	24 V UC // 230 V AC, ±10 %
Rated current AC			approx. 14 mA	approx. 15 mA
Rated current DC	4.6 mA	9 mA	14 mA	14 mA (24 V DC)
Power rating	200 mW	220 mW	0,35 VA(W) // 0,5 VA(W)	0,34 VA / 0,32 W // 3,5 VA
AC Response/dropout Volt			16 V/9,5 V // 29 V/15 V	13 V /9 V //115 V /66 V
DC Response/dropout Volt	1,9 V	16 V / 7,5 V	16 V/9,5 V // 29 V/15 V	13 V /9 V (24 V DC)
AC pickup/dropout current			9 mA/4,5 mA // 8,3 mA/4,1 mA	7,5 mA/4,7 mA // 7,4 mA/4,3 mA
DC pickup/dropout current	3,88 mA	5,7 mA / 2,2 mA	9 mA/4,5 mA // 8,3 mA/4,1 mA	7,5 mA/4,7 mA
Ordering data				
Complete module				
Screw connection	Type			
	Order No.	WRS1 2.4-24VDC 1U	WRS1 24VDC 1U	WRS1 24VUC/230VAC 1U
		8275320000	8275350000	8418230000
Tension clamp connection	Type			
	Order No.			
Ordering data				
Spare relay, pluggable				
	Type			
	Order No.			
Note				
Ordering data				
Input				
Rated voltage				
Rated current AC				
Rated current DC				
Power rating				
AC Response/dropout Volt				
DC Response/dropout Volt				
AC pickup/dropout current				
DC pickup/dropout current				
Ordering data				
Complete module				
Screw connection	Type			
	Order No.			
Tension clamp connection	Type			
	Order No.			
Ordering data				
Spare relay, pluggable				
	Type			
	Order No.			
Note				

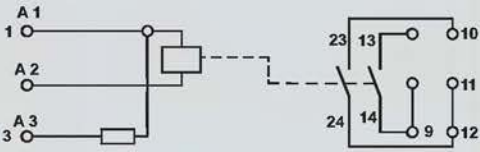
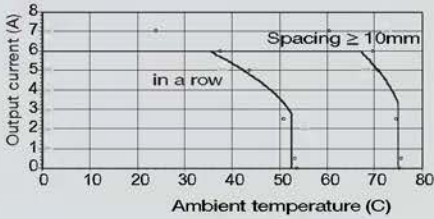
Relay coupler - WAVESERIES

2 NO contacts
AC/DC/UC coil



C

Derating curve



Output	
max. switching voltage AC/Continuous current	250 V/5 A
min. switching power	100 mA / 5 V DC
Response time / Drop-out time	5ms/6ms
Contact base material	AgSnO2
Mechanical endurance	50x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CSA;cULFus;CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Impulse withstand voltage	6 kV (1.2/50 µs)
Creepage and clearance path input - output	≥ 8 mm
Overtoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ²	1.5 / 0.5 / 2.5
Length x width x height	mm	92.4 / 22.5 / 112.4

Note

Ordering data

Input	12 / 24 V DC 2NO	24 / 48 V UC 2NO	115 V UC/230 V AC 2NO
Rated voltage	12 V DC // 24 V DC, ±10 %	24 V // 48 V UC ±10 %	115 V UC // 230 V AC, ±10 %
Rated current AC		approx. 11 mA	approx. 10 mA
Rated current DC	approx. 20 mA	approx. 8.5 mA	9 mA (115 V DC)
Power rating	0,24 W // 0,5 W	0,17 W/0,21 VA // 0,4 W/0,48 VA	1 VA / 0,9 W // 2,5 VA
AC Response/dropout Volt		13,5 V / 9 V // 24 V/16 V	58 V / 22 V // 110 V/40 V
DC Response/dropout Volt	7,5 V / 3,5 V // 14,5 V/6,1 V	16 V / 7,8 V // 28 V/12 V	54 V / 20 V (115 V DC)
AC pickup/dropout current		4,4 mA/2,7 mA // 4,3 mA/2,6 mA	4,8 mA/1,7 mA V // 5 mA/2 mA
DC pickup/dropout current	10 mA/4,2 mA // 10 mA/4 mA	4,3 mA/1,6 mA // 4,4 mA/1,6 mA	4 mA / 2 mA

Ordering data
Complete module

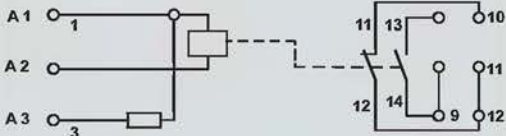
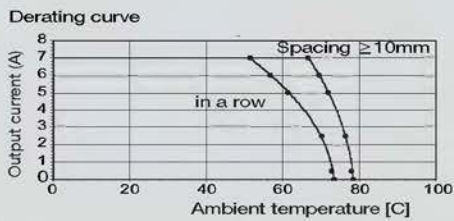
Screw connection	Type	12 / 24 V DC 2NO	24 / 48 V UC 2NO	115 V UC/230 V AC 2NO
Type		WRS2 12/24VDC 2A	WRS2 24/48VUC 2A	WRS2 115VUC/230VAC 2A
Order No.		8418240000	8418250000	8418260000
Tension clamp connection	Type			
Type				
Order No.				

Ordering data
Spare relay, pluggable

Type	12 / 24 V DC 2NO	24 / 48 V UC 2NO	115 V UC/230 V AC 2NO
Type			
Order No.			

Note			
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1 NC contact / 1 NO contact
DC/UC coil



Output	
max. switching voltage AC/Continuous current	250 V/5 A
min. switching power	100 mA / 5 V
Response time / Drop-out time	7ms/5ms
Contact base material	
Mechanical endurance	50x10 ⁶ switching cycles
max. switching frequency at rated load	0.1 Hz
Rated data	
Status indicator/Free wheel diode	green LED/Yes
Reverse pol. prot	available
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+60 °C
Humidity	40°C/93% RH, no condensation
Approvals	CSA;cULFus;CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Impulse withstand voltage	6 kV (1.2/50 µs)
Creepage and clearance path input - output	≥ 8 mm
Overtoltage category	III
Pollution severity	2
Protective separation to VDE 0106 part 101	yes

Dimensions		Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ²	1.5 / 0.5 / 2.5	
Length x width x height	mm	92.4 / 22.5 / 112.4	

Note

Ordering data

Input	12/24 V DC 1NO/1NC	24/48 V UC 1NO/1NC	115 V UC/230 V AC	
Rated voltage	12 V DC // 24 V DC, ±10 %	24 V // 48 V UC ±10 %	115 V UC // 230 V AC, ±10 %	
Rated current AC		approx. 11 mA	approx. 10 mA	
Rated current DC	approx. 20 mA	approx. 8.5 mA	9 mA (115 V DC)	
Power rating	0,24 W // 0,5 W	0,17 W/0,21 VA // 0,4 W/0,48 VA	1 VA / 0,9 W // 2,5 VA	
AC Response/dropout Volt		13,5 V /9 V // 24 V/16 V	58 V /22 V // 110 V/40 V	
DC Response/dropout Volt	7,5 V /3,5 V // 14,5 V/6,1 V	13,5 V /9 V // 24 V/16 V	54 V /20 V (115 V DC)	
AC pickup/dropout current		4,4 mA/2,7 mA // 4,3 mA/1,6 mA	4,8 mA/1,7 mA // 5 mA/2 mA	
DC pickup/dropout current	10 mA/4,2 mA // 10 mA/4 mA	4,3 mA/1,6 mA // 4,4 mA/1,6 mA	4 mA/1,6 mA	

Ordering data
Complete module

Screw connection	Type	WRS2 12/24VDC 1A1R	WRS2 24/48VUC 1A1R	WRS2 115VUC/230VAC 1A1R	
Order No.		8418270000	8418280000	8418290000	
Tension clamp connection	Type				
Order No.					

Ordering data
Spare relay, pluggable

Type				
Order No.				

Note				
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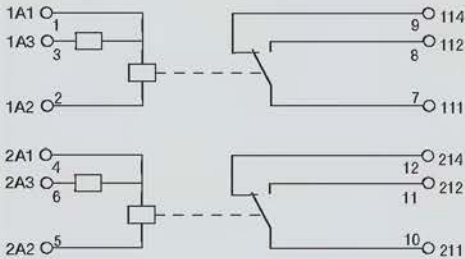
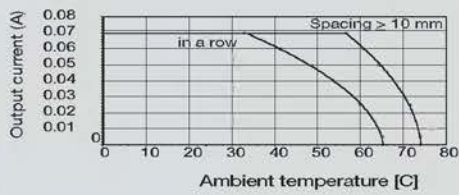
Relay coupler - WAVESERIES

2 change-over contacts
AC/DC/UC coil



C

Derating curve



Output		
max. switching voltage AC/Continuous current	250 V/5 A	
min. switching power	100 mA / 5 V DC	
Response time / Drop-out time	6ms/10ms	
Contact base material	Gold alloy	
Mechanical endurance	20x10 ⁶ switching cycles	
max. switching frequency at rated load	0.1 Hz	
Rated data		
Status indicator/Free wheel diode	green LED/Yes	
Reverse pol. prot	available	
Operating temperature	-25 °C...+50 °C	
Storage temperature	-40 °C...+60 °C	
Humidity	40°C/93% RH, no condensation	
Approvals	CSA;cULus;CE;	
Insulation coordination (EN 50178)		
Standards	EN 50178	
Rated voltage	300 V	
Impulse withstand voltage	6 kV (1.2/50 µs)	
Creepage and clearance path input - output	≥ 5,5 mm	
Overtoltage category	III	
Pollution severity	2	
Protective separation to VDE 0106 part 101	yes	
Dimensions		
Clamping range (rating- / min. / max.)	mm ²	1.5 / 0.5 / 2.5
Length x width x height	mm	92.4 / 22.5 / 112.4
Note		
Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ²	1.5 / 0.5 / 2.5
Length x width x height	mm	92.4 / 22.5 / 112.4

Ordering data

	12/24 V DC 2CO	24/48 V UC 2CO	24 V UC/230 V AC 2CO	
Input				
Rated voltage	12 V DC // 24 V DC, ±10 %	24 V // 48 V UC ±10 %	24 V UC // 230 V AC, ±10 %	
Rated current AC		approx. 15 mA	approx. 15 mA	
Rated current DC	approx. 23 mA	14 mA	14 mA (24 V DC)	
Power rating	0,26 W // 0,53 W	0,35 VA(W) // 0,7 VA(W)	0,35 W // 3,45 VA	
AC Response/dropout Volt			13 V/9 V // 115 V/66 V	
DC Response/dropout Volt	8,5 V /3 V // 15 V/4,8 V	16 V /9,5 V // 29 V /15 V	13 V /9 V (24 V DC)	
AC pickup/dropout current		9 mA/4,5 mA // 8,3 mA/4,1 mA	7,5 mA/4,7 mA // 7,4 mA/4,3 mA	
DC pickup/dropout current	15,2 mA/5,7 mA//15,3 mA/5,6 mA	9 mA/4,5 mA // 8,3 mA/4,1 mA	7,5 mA // 4,7 mA	
Ordering data Complete module				
Screw connection	Type	WRS2 12/24VDC 2U	WRS2 24/48VUC 2U	WRS2 24VUC/230VAC 2U
	Order No.	8418300000	8418310000	8418320000
Tension clamp connection	Type			
	Order No.			
Ordering data Spare relay, pluggable				
	Type			
	Order No.			
Note				

Housing forms for optocouplers



DK SERIES

All the components of the DKO mini-couplers are extremely narrow. Their width of just 6 mm is possible thanks to the use of the very latest surface mounted devices (SMDs). Weidmüller can supply four or five screw connections for 0.5 ... 1.5 mm² conductor cross-sections. The mini-couplers can be used for a wide range of applications where it is necessary to couple digital sensor/actuator signals with automation devices and the process field. The DKO optocouplers enable signals from the field with different voltages to be picked up and standardised.

MCZ SERIES

With a width of just 6 mm, the MCZ housing is the narrowest of its kind. It is distinguished by the following technical features:

- tension clamp connection reduces installation costs
- integral cross-connection at input/output minimises the wiring workload

MCZO mini-conditioners (optocouplers) have four or five tension clamp connections for 0.5 ... 1.5 mm² conductor cross-sections.

MICROSERIES

The relay couplers and optocouplers of the MICROSERIES can be used for disconnecting and coupling digital input and output signals in industrial automation applications. Their narrow form makes them ideal for use in subdistribution boards or control cabinets. The compact design of the MICROSERIES unites the functionality of the traditional coupling and clamping planes.

- 6.1 mm modular width
- Amazing cross connectability
- Proven ZQV 4 N cross-connection system
- Wide range of input voltages, 5 ... 230 V
- LED function indicator, diode for reverse polarity protection, free-wheel diode
- Housing material WEMID (UL 94 flammability rating V0)
- Innovative retaining and ejection aids
- Marking panel accepts standard marker WS 12/6

CE symbol

Weidmüller optocouplers are marked with the CE symbol and meet the requirements of EN 50081 part 1 and EN 50082 part 2. They may be used in industrial and commercial operations. Suitable electrostatic discharge (ESD) measures must be taken during installation. In the case of long cables, over-voltage protection to protect against interference due to atmospheric discharges must be incorporated.



PLUGSERIES

This modular system represents a new generation of plug-in optocouplers. The heart of the series is an innovative relay base, PXS or PXZ. Both products reflect the functionality and experience gained from Weidmüller's many years in the relay and modular terminal business. The PLUGSERIES is the ideal connection between solid-state relay (SSR) and application.

Modular principle

The new PLUGSERIES is particularly easy to service. Customary SSRs are simply plugged in, retaining/removal clip provide a secure fixing, LEDs with free-wheel diode can be plugged in.

- Simple plug-in SSR, suitable for standard and RT forms
- Independent connection system, screw or tension clamp, nominal cross-section 0.5 ... 2.5 mm²
- Robust retaining/removal clip
- Control voltage 24 V AC/DC
- Nominal switching voltage 24 V DC, 24 V AC/DC, 230 V AC
- Up to 5 A continuous current
- Low wiring workload thanks to plug-in ZQV 2.5 N cross-connections
- Easy to service thanks to the modular system:
 - relay base, LED indicator, retaining clip and SSR
 - can be clipped to TS 35 rail
 - labelling with WS tags on retaining clip
- Plug-in LED indicator with free-wheel diode



EG SERIES

EG 7 build-in housings have a special status: these housings are designed exclusively for incorporating narrow 10 mm optocouplers. The EG 7 optocouplers are available for mounting on either TS 32 or TS 35 DIN rails. Also available is a clip-on base RS EG7 for OST pluggable optocouplers. The fully enclosed EG 7 housings are fitted with clamping yokes for screw connections.

The following conductor cross-sections may be connected:

- EG 7 build-in housing: 0.5 ... 1.5 mm²,
- OST clip-on base: 0.5 ... 2.5 mm².



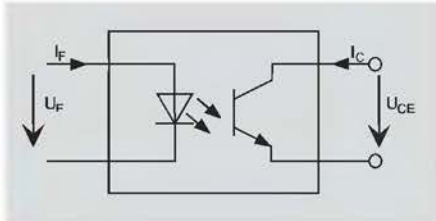
WAVE SERIES

Innovative electronic components need housings designed to match their functions. Therefore, setting and operating functions are required, and technical requirements must be supported, e.g. heat dissipation or electromagnetic compatibility. A compact design saves space in the control cabinet and cuts installation costs. Ergonomics and design are becoming more and more important for high-quality optocoupler interfaces. The WAVE SERIES fulfils these criteria and is distinguished by:

- installation without tools
- plug-in PCBs
- plug-in ZQV 2.5 N cross-connection
- hinged, transparent cover
- labelling with WS tags
- clips onto TS 35 rail

The control side of the optocoupler interface

C

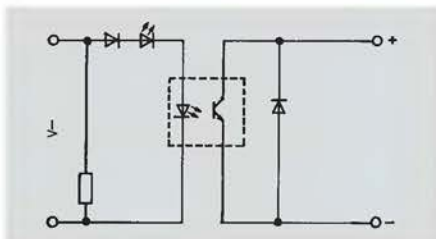


Optocouplers for electrical or “protective separation”

The partial discharge test to DIN VDE 0884 is the primary requirement for “protective separation” with optoelectronic coupling components. Doubled or reinforced insulation for “protective separation” must protect against partial discharge. A high-voltage test, as is customary for relays, cannot be carried out with semiconductors because the voltage can cause irreparable damage. “Protective separation” for coupling components with integral optocouplers is deemed to be provided for the given rated voltage when the following requirements are fulfilled:

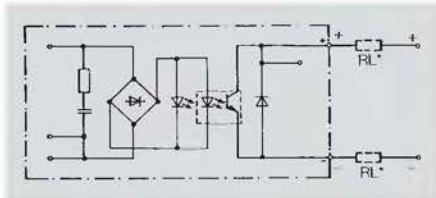
- optocoupler passes test to DIN VDE 0884,
- creepage distances and clearances on PCBs and connection components comply with EN 50178, DIN VDE 0106 or 0109.

We distinguish between three principal circuit arrangements on the input side of the optocoupler interface:



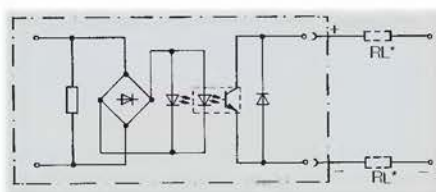
– DC input

with diode to protect against reverse polarity (reversing the input polarity could cause irreparable damage to the component).



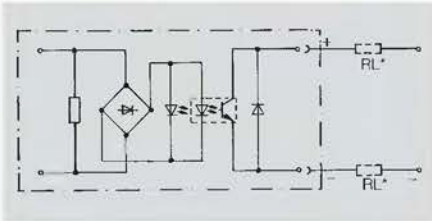
– AC/DC input

In this input circuit it is not possible to reverse the polarity of the DC input signal. The disadvantage of the AC/DC input circuit (with control by DC signal) is the lower operating frequency of the component because the charging capacitor (CL, required for AC input signals) lowers the maximum operating frequency.



– AC input

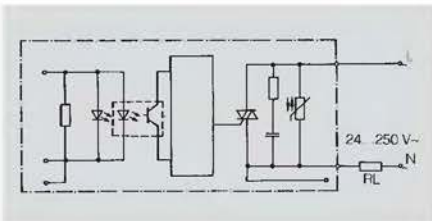
Here again, the charging capacitor has a considerable influence on the maximum operating frequency of the complete component. Weidmüller optocouplers with AC/DC or AC input signals are designed for mains frequencies of approx. 40 ... 60 Hz. In the case of AC input signals the maximum operating frequency of the optocoupler component is less than half the mains frequency. A higher operating frequency is not feasible because otherwise the outcome would be constant switching in the rhythm of the mains frequency.



2-pole DC output

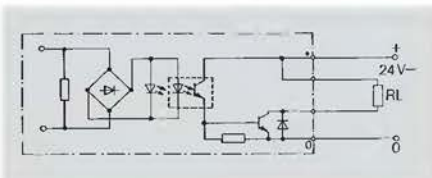
The 2-pole DC output is comparable with a conventional switch. In this variation the location of the load (in the output circuit) is irrelevant. However, the output supply voltage required must be available with the right polarity.

Optocoupler components are generally specified with an output supply voltage range of, for example, 5 ... 48 V DC. On no account should the voltage lie outside this range. The load current should not be higher than the specified maximum output current. A constant higher voltage will cause irreparable damage to the output stage. Derating curves show how the output current is dependent on the ambient temperature (given on the following pages for the various products).



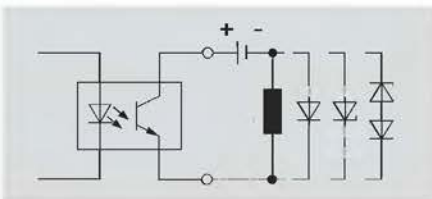
2-pole AC output

A special semiconductor element (TRIAC) is incorporated in the output stage of the optocoupler for switching AC voltages. Like with the DC output, the characteristic parameters such as voltage, frequency, maximum load current and ambient temperature must be taken into account. The use of the zero-voltage switch ensures that the load is connected only when the voltage is zero. To protect against unacceptable voltage peaks, the components are always fitted with appropriate protective elements (varistor, RC combination).



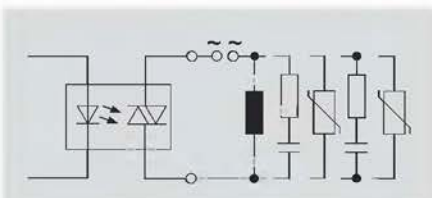
3-pole DC output

To guarantee reliable operation, this form of the output stage requires a non-floating output supply voltage with one output. It is designed either for positive-switching (common reference potential: GND or 0 V) or for negative-switching (common reference potential: positive voltage terminal).



Protective circuit

All optocoupler components are provided with a protective circuit (normally a free-wheel diode) at the output. To prevent interference from other signals in other lines, the load side must be protected.



Optocoupler - DK SERIES

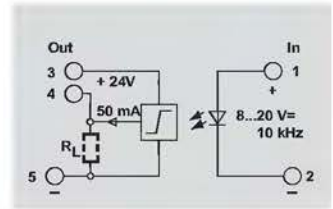
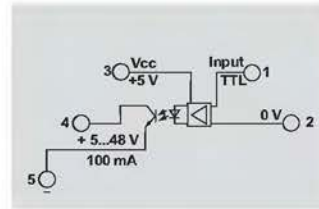
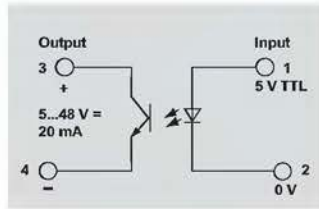
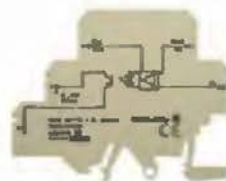
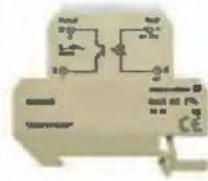
Mini-coupler DKO

- Coupling of digital sensor/actuator signals between PLC and process
- Inexpensive solution for adapting level and potential
- Low input power
- Screw connection system
- 6 mm width
- For mounting on TS35

5 V DC

5 V TTL

12 V DC 10 kHz



Technical data

Input

Rated voltage
Rated current
Power rating
max. input frequency
Auxiliary voltage
Status indicator

Output

Output voltage
Output current (max.)
Voltage drop at max. load
Block-state curr. (closed-circuit curr.)
Switch-on delay/Switch-off delay
Short-circuit-proof/Protective circuit

General data

Operating temperature
Storage temperature
Approvals

Insulation coordination (EN 50178)

Standards
Rated voltage
Rated impulse withstand voltage
Creepage and clearance path input - output
Overvoltage category
Pollution severity

5 V DC $\pm 5\%$
10 mA
50 mW
300 Hz
no
green LED

5 V TTL
1 μ A
50 μ W
3 kHz
no
green LED

12 V DC $\pm 20\%$
11 mA
max. 130 mW
max. 10 kHz
no
green LED

5...48 V DC
20 mA
 $\leq 1,6$ V
50 μ A
 $\leq 15 \mu$ s/ $\leq 70 \mu$ s
no/diode

5...48 V DC
100 mA
 $\leq 1,6$ V
 $\leq 50 \mu$ A
approx. 27 μ s/approx. 35 μ s
no/diode

24 V DC $\pm 10\%$
50 mA
 ≤ 1 V
 $\leq 50 \mu$ A
1 μ s/2,5 μ s
no/diode

-25 °C...+40 °C
-40 °C...+85 °C
CE

-25 °C...+40 °C
-40 °C...+85 °C
CE

-25 °C...+40 °C
-40 °C...+85 °C
CE

EN 50178
150 V
4.0 kV
 ≥ 4 mm
III
2

EN 50178
300 V
6.0 kV
 $\geq 5,5$ mm
III
2

EN 50178
300 V
6.0 kV
 $\geq 5,5$ mm
III
2

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
65 x 6 x 57

Screw connection

4.0 / 0.5 / 4
77 x 6 x 62

Screw connection

4.0 / 0.5 / 4
65 x 12 x 57

Ordering data

Connection system

Screw connection

Type	(Qty.=1)	Order No.
DKO 35 5VDC		8018630000

Type	(Qty.=1)	Order No.
DKO DK5 5VTTL		8228650000

Type	(Qty.=1)	Order No.
DKO 35 12VDC 10KHZ		8184030000

Note

Input at bottom

Input at bottom

Input at bottom

Accessories

Note

End plate
AP DKT4 0687560000

End plate
AP DK5 PA BE 4067800000

End plate
AP DKT4 0687560000

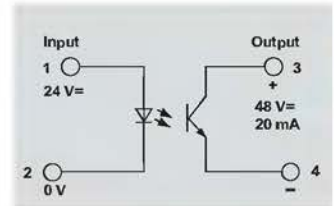
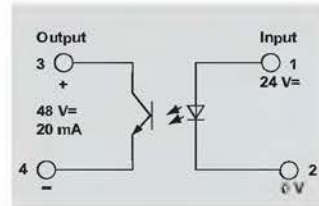
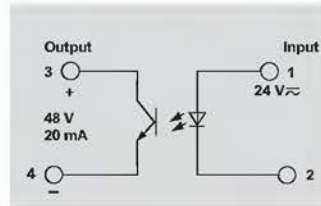
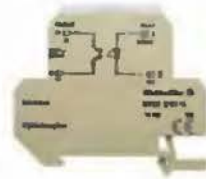
Mini-coupler DKO

- Coupling of digital sensor/actuator signals between PLC and process
- Inexpensive solution for adapting level and potential
- Low input power
- Screw connection system
- 6 mm width
- For mounting on TS35

24 V UC

24 V DC 3 kHz

24 V DC 3 kHz



Technical data

Input	
Rated voltage	24 V UC ±10 %
Rated current	11,4 mA AC / 9,6 mA DC
Power rating	280 mVA / 230 mW
max. input frequency	10 Hz at DC
Auxiliary voltage	no
Status indicator	green LED
Output	
Output voltage	5...48 V DC
Output current (max.)	20 mA
Voltage drop at max. load	≤ 1 V
Block-state curr. (closed-circuit curr.)	≤ 50 µA
Switch-on delay/Switch-off delay	≤ 15 ms bei DC/≤ 25 ms bei DC
Short-circuit-proof/Protective circuit	no/diode
General data	
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 4 mm
Overtoltage category	III
Pollution severity	2

Input	
Rated voltage	24 V DC ±10 %
Rated current	≤ 15 mA
Power rating	max. 360 mW
max. input frequency	3 kHz
Auxiliary voltage	no
Status indicator	green LED
Output	
Output voltage	5...48 V DC
Output current (max.)	20 mA
Voltage drop at max. load	≤ 900 mV
Block-state curr. (closed-circuit curr.)	0.16 mA
Switch-on delay/Switch-off delay	approx. 50 µs/approx. 80 µs
Short-circuit-proof/Protective circuit	no/diode
General data	
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 4 mm
Overtoltage category	III
Pollution severity	2

Input	
Rated voltage	24 V DC ±10 %
Rated current	≤ 15 mA
Power rating	max. 360 mW
max. input frequency	3 kHz
Auxiliary voltage	no
Status indicator	green LED
Output	
Output voltage	5...48 V DC
Output current (max.)	20 mA
Voltage drop at max. load	≤ 900 mV
Block-state curr. (closed-circuit curr.)	50 µA
Switch-on delay/Switch-off delay	approx. 50 µs/approx. 80 µs
Short-circuit-proof/Protective circuit	no/diode
General data	
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 4 mm
Overtoltage category	III
Pollution severity	2

Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Note	

Screw connection	
Clamping range (rating- / min. / max.)	4.0 / 0.5 / 4
Length x width x height	65 x 6 x 57
Note	

Screw connection	
Clamping range (rating- / min. / max.)	4.0 / 0.5 / 4
Length x width x height	65 x 6 x 57
Note	

Screw connection	
Clamping range (rating- / min. / max.)	4.0 / 0.5 / 4
Length x width x height	65 x 6 x 57
Note	

Ordering data

Connection system	
	Screw connection
Note	

Type	(Qty.=1)	Order No.
DKO 35 24VUC		8008150000
Note		
Input at bottom		

Type	(Qty.=1)	Order No.
DKO 35 24VDC 3KHZ EU		8028300000
Note		
Input at bottom		

Type	(Qty.=1)	Order No.
DKO 35 24VDC 3KHZ E.O		8215640000
Note		
Input at top		

Accessories

Note	
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End plate	AP DfT4	0687560000
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End plate	AP DfT4	0687560000
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End plate	AP DfT4	0687560000
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Optocoupler - DK SERIES

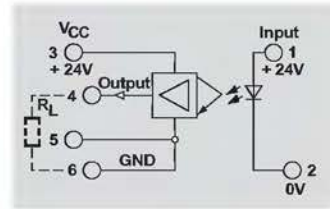
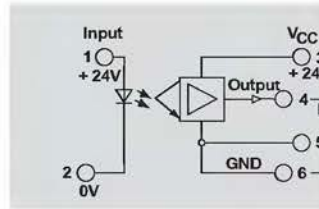
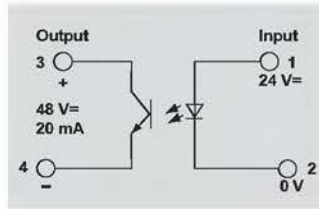
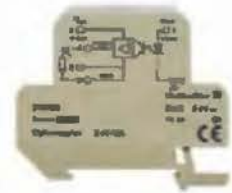
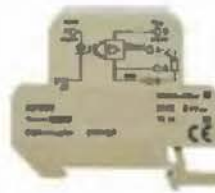
Mini-coupler DKO

- Coupling of digital sensor/actuator signals between PLC and process
- Inexpensive solution for adapting level and potential
- Low input power
- Screw connection system
- 6 mm width
- For mounting on TS35

24 V DC 3 kHz

24 V DC 100 Hz

24 V DC 100 Hz



Technical data

Input

- Rated voltage
- Rated current
- Power rating
- max. input frequency
- Auxiliary voltage
- Status indicator

Output

- Output voltage
- Output current (max.)
- Voltage drop at max. load
- Block-state curr. (closed-circuit curr.)
- Switch-on delay/Switch-off delay
- Short-circuit-proof/Protective circuit

General data

- Operating temperature
- Storage temperature
- Approvals

Insulation coordination (EN 50178)

- Standards
- Rated voltage
- Rated impulse withstand voltage
- Creepage and clearance path input - output
- Overvoltage category
- Pollution severity

Rated voltage	24 V DC ±10 %
Rated current	8,5 mA
Power rating	max. 204 mW
max. input frequency	3 kHz
Auxiliary voltage	no
Status indicator	green LED
Output voltage	5...48 V DC
Output current (max.)	20 mA
Voltage drop at max. load	≤ 900 mV
Block-state curr. (closed-circuit curr.)	50 µA
Switch-on delay/Switch-off delay	approx. 50 µs/approx. 80 µs
Short-circuit-proof/Protective circuit	no/diode
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 4 mm
Overvoltage category	III
Pollution severity	2

Rated voltage	24 V DC ±10 %
Rated current	12 mA
Power rating	max. 290 mW
max. input frequency	100 Hz
Auxiliary voltage	no
Status indicator	green LED
Output voltage	24 V DC ±10%
Output current (max.)	2 A
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	2 ms/7 ms
Short-circuit-proof/Protective circuit	no/varistor
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 3 mm
Overvoltage category	III
Pollution severity	2

Rated voltage	24 V DC ±10 %
Rated current	12 mA
Power rating	max. 290 mW
max. input frequency	100 Hz
Auxiliary voltage	no
Status indicator	green LED
Output voltage	24 V DC ±10%
Output current (max.)	2 A
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	2 ms/7 ms
Short-circuit-proof/Protective circuit	no/diode
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 3 mm
Overvoltage category	III
Pollution severity	2

Dimensions

- Clamping range (rating- / min. / max.) mm²
- Length x width x height mm

Note

Screw connection

- 4.0 / 0.5 / 4
- 65 x 6 x 57

Screw connection

- 4.0 / 0.5 / 4
- 65 x 12 x 57

Screw connection

- 4.0 / 0.5 / 4
- 65 x 12 x 57

Ordering data

Connection system

Screw connection

Type	(Qty.=1)	Order No.
DKO 35 24VDC 3KHZ EU		8248790000

Type	(Qty.=1)	Order No.
DKO 35 24VDC EU		8181990000

Type	(Qty.=1)	Order No.
DKO 35 24VDC E.O.		8215600000

Note

Input at bottom

Input at bottom

Input at top

Accessories

Note

End plate
AP DfT4 0687560000

End plate
AP DfT4 0687560000

End plate
AP DfT4 0687560000

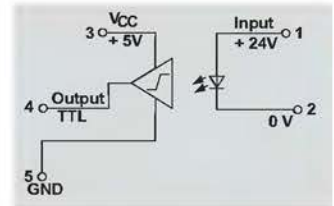
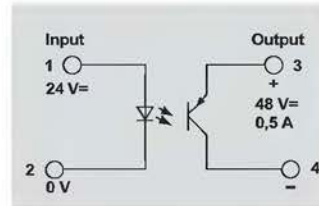
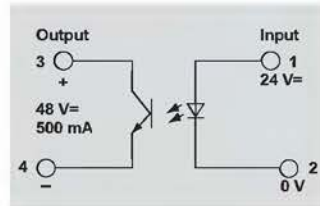
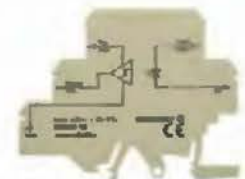
Mini-coupler DKO

- Coupling of digital sensor/actuator signals between PLC and process
- Inexpensive solution for adapting level and potential
- Low input power
- Screw connection system
- 6 mm width
- For mounting on TS35

24 V DC 200 Hz

24 V DC 200 Hz

24 V DC 50 kHz



Technical data

Input
Rated voltage
Rated current
Power rating
max. input frequency
Auxiliary voltage
Status indicator
Output
Output voltage
Output current (max.)
Voltage drop at max. load
Block-state curr. (closed-circuit curr.)
Switch-on delay/Switch-off delay
Short-circuit-proof/Protective circuit
General data
Operating temperature
Storage temperature
Approvals
Insulation coordination (EN 50178)
Standards
Rated voltage
Rated impulse withstand voltage
Creepage and clearance path input - output
Overvoltage category
Pollution severity

24 V DC ±10 %
6 mA
145 mW
200 Hz
no
green LED
5...48 V DC
500 mA
≤ 800 mV
approx. 40 µs/approx. 65 µs
no/diode
-25 °C...+40 °C
-40 °C...+85 °C
CE
EN 50178
300 V
4.0 kV
≥ 4 mm
III
2

24 V DC ±10 %
6 mA
max. 145 mW
200 Hz
no
green LED
5...48 Vdc
500 mA
≤ 800 mV
≤ 10 µA
approx. 40 µs/approx. 65 µs
no/diode
-25 °C...+40 °C
-40 °C...+85 °C
CE
EN 50178
300 V
4.0 kV
≥ 4 mm
III
2

24 V DC ±20 %
4.7 mA
max. 112 mW
100 kHz
no
green LED
5 VTTL
8 mA, fan out = 20 LS-TTL
1 µs/2.5 µs
no/diode
-25 °C...+40 °C
-25 °C...+85 °C
CE
EN 50178
300 V
4.0 kV
≥ 5.5 mm
III
2

Dimensions
Clamping range (rating- / min. / max.) mm²
Length x width x height mm
Note

Screw connection
4.0 / 0.5 / 4
65 x 6 x 57

Screw connection
4.0 / 0.5 / 4
65 x 6 x 57

Screw connection
4.0 / 0.5 / 4
77 x 6 x 62

Ordering data

Connection system
Screw connection
Note

Type (Qty.=1) Order No.
DKO 35 24VDC E:U 8019590000
Note
Input at bottom

Type (Qty.=1) Order No.
DKO 35 24VDC E:O 8215630000
Note
Input at top

Type (Qty.=1) Order No.
DKO DK5 24VDC 50kHz 8228640000
Note
Input at top

Accessories

Note

End plate AP DfT4 0687560000

End plate AP DfT4 0687560000

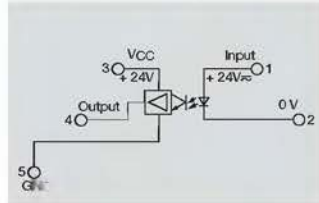
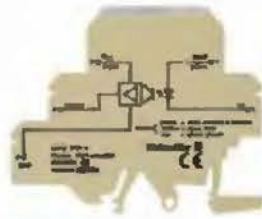
End plate AP DfT5 PE BE 4086780000

Optocoupler - DK SERIES

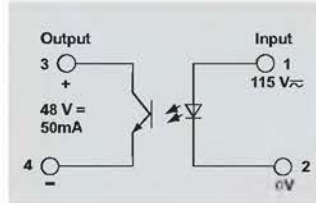
Mini-coupler DKO

- Coupling of digital sensor/actuator signals between PLC and process
- Inexpensive solution for adapting level and potential
- Low input power
- Screw connection system
- 6 mm width
- For mounting on TS35

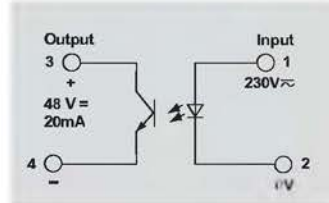
24 V UC



115 V UC



230 V UC



Technical data

Input

Rated voltage	24 V UC ±20 %
Rated current	13 mA AC/ 12 mA DC
Power rating	max.: 220 mVA / 195 mW
max. input frequency	≤ 10 Hz
Auxiliary voltage	no
Status indicator	green LED

Output

Output voltage	24 V DC ±20%
Output current (max.)	2 A
Voltage drop at max. load	
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	2 ms/7 ms
Short-circuit-proof/Protective circuit	no/

General data

Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+85 °C
Approvals	CE

Insulation coordination (EN 50178)

Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2

Dimensions

Clamping range (rating- / min. / max.)	mm ² 4.0 / 0.5 / 4
Length x width x height	mm 77 x 6 x 62

Note

Screw connection

4.0 / 0.5 / 4
77 x 6 x 62

Screw connection

4.0 / 0.5 / 4
65 x 6 x 57

Screw connection

4.0 / 0.5 / 4
65 x 6 x 57

Ordering data

Connection system	Screw connection
-------------------	------------------

Type	(Qty.=1)	Order No.
DKO DK5 24VUC		8228630000

Type	(Qty.=1)	Order No.
DKO 35 115VUC		8077860000

Type	(Qty.=1)	Order No.
DKO 35 230VUC		8008160000

Note

Input at bottom

Input at bottom

Input at bottom

Accessories

Note	End plate AP DFT 5 PA BE 4087560000
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Note	End plate AP DFT 4 0887560000
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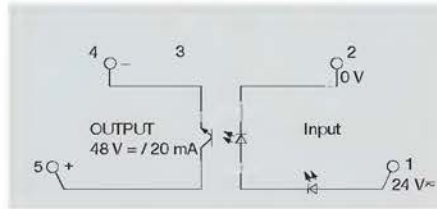
Note	End plate AP DFT 4 0887560000
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Optocoupler - MCZ SERIES

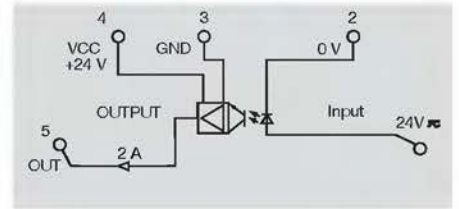
MiniConditioner MCZ O

- Universal interface between control and sensor/actuator
- Direct switching of load currents up to 2 A DC
- Tension clamp connection system
- Plug-in cross-connection
- Width 6 mm

24 V UC



24 V UC / 24 V 2 A



Technical data

Input

Rated voltage
Rated current
Power rating
max. input frequency
Auxiliary voltage
Status indicator

Output

Output voltage
Output current (max.)
Voltage drop at max. load
Block-state curr. (closed-circuit curr.)
Switch-on delay/Switch-off delay
Short-circuit-proof/Protective circuit

General data

Operating temperature
Storage temperature
Approvals

Insulation coordination (EN 50178)

Standards
Rated voltage
Rated impulse withstand voltage
Creepage and clearance path input - output
Overvoltage category
Pollution severity

24 V UC $\pm 20\%$
11 mA AC / 9 mA DC
230 mW / 280 mVA
AC: 5 Hz / DC: 10 Hz
no
green LED

5...48 V DC
20 mA
 ≤ 1 V

AC: 10 ms / DC: 20 ms / AC: 45 ms / DC: 40 ms
no / integrated free wheel diode

-25 °C...+50 °C
-40 °C...+85 °C
CSA; cULFus; CE; ESD;

EN 50178
300 V
6.0 kV
 $\geq 5,5$ mm
III
2

24 V UC $\pm 20\%$
13 mA AC / 12 mA DC
195 mW / 220 mVA
AC: 10 Hz / DC: 30 Hz
no
green LED

24 V DC $\pm 20\%$
2 A

/
no / varistor

-25 °C...+40 °C
-40 °C...+60 °C
CSA; cULFus; CE; ESD;

EN 50178
300 V
6.0 kV
 $\geq 5,5$ mm
III
2

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 64
CE, UL, CSA
for mounting on TS-33

Tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 64
CE, UL, CSA
for mounting on TS-53

Ordering data

Connection system
Tension clamp connection

Type	Qty.	Order No.
MCZ O 24VUC	10	8365940000

Type	Qty.	Order No.
MCZ O 24VUC	10	8287730000

Note

Accessories

Note
End plate 4P MCZ 1.5: 836906000
for cross-connectors and markers see MCZ Series accessories

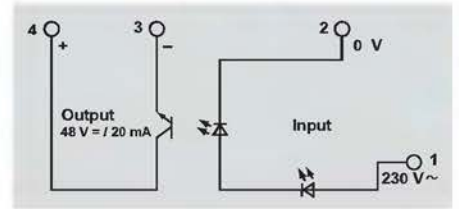
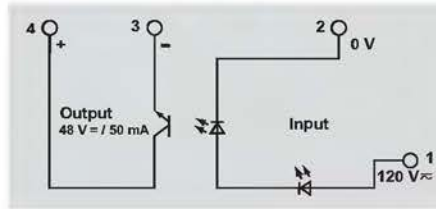
Note
End plate 4P MCZ 1.5: 828906000
for cross-connectors and markers see MCZ Series accessories

MiniConditioner MCZ O

- Universal interface between control and sensor/actuator
- Tension clamp connection system
- Plug-in cross-connection
- Width 6mm

120 V UC

230 V AC



Technical data

Input	
Rated voltage	120 V UC +5/-15 %
Rated current	3 mA
Power rating	350 mW / 400 mVA
max. input frequency	AC: 5 Hz duty factor 1:2, DC: 20 Hz duty factor 1:2
Auxiliary voltage	no
Status indicator	green LED
Output	
Output voltage	5...48 V DC
Output current (max.)	50 mA
Voltage drop at max. load	≤ 1,6 V
Block-state curr. (closed-circuit curr.)	0,16 mA
Switch-on delay/Switch-off delay	≤ 30 ms / ≤ 40 ms
Short-circuit-proof/Protective circuit	no / Integrated free wheel diode
General data	
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+60 °C
Approvals	CSA; cULFus; CE; ESD;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6,0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2

120 V UC	
Rated voltage	120 V UC +5/-15 %
Rated current	3 mA
Power rating	350 mW / 400 mVA
max. input frequency	AC: 5 Hz duty factor 1:2, DC: 20 Hz duty factor 1:2
Auxiliary voltage	no
Status indicator	green LED
Output	
Output voltage	5...48 V DC
Output current (max.)	50 mA
Voltage drop at max. load	≤ 1,6 V
Block-state curr. (closed-circuit curr.)	0,16 mA
Switch-on delay/Switch-off delay	≤ 30 ms / ≤ 40 ms
Short-circuit-proof/Protective circuit	no / Integrated free wheel diode
General data	
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+60 °C
Approvals	CSA; cULFus; CE; ESD;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6,0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2

230 V AC	
Rated voltage	230 V AC +5 % / -15 %
Rated current	10 mA
Power rating	2,3 VA
max. input frequency	AC: 5 Hz duty factor 1:2
Auxiliary voltage	no
Status indicator	green LED
Output	
Output voltage	5...48 V DC
Output current (max.)	20 mA
Voltage drop at max. load	≤ 1,6 V
Block-state curr. (closed-circuit curr.)	0,16 mA
Switch-on delay/Switch-off delay	≤ 30 ms / ≤ 40 ms
Short-circuit-proof/Protective circuit	no / Integrated free wheel diode
General data	
Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+85 °C
Approvals	CSA; cULFus; CE; ESD;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6,0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2

Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Note	

Tension clamp connection	
1.5 / 0.5 / 1.5	
91 x 6 x 64	
CE, UL, CSA for mounting on TS-33	

Tension clamp connection	
1.5 / 0.5 / 1.5	
91 x 6 x 64	
CE, UL, CSA for mounting on TS-33	

Ordering data

Connection system	Tension clamp connection
Note	

Type	Qty.	Order No.
MCZ O 120VUC	10	8421060000

Type	Qty.	Order No.
MCZ O 230VAC	10	8421380000

Accessories

Note	End plate 4P-MCZ 1.5 8389060000 for cross-connectors and markers see MCZ Series accessories
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Note	End plate 4P-MCZ 1.5 8389060000 for cross-connectors and markers see MCZ Series accessories
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Note	End plate 4P-MCZ 1.5 8389060000 for cross-connectors and markers see MCZ Series accessories
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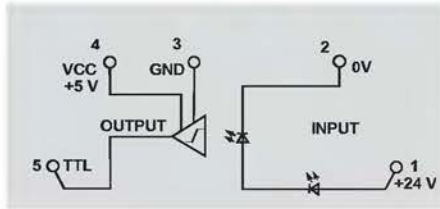
Optocoupler - MCZ SERIES

MiniConditioner MCZ O

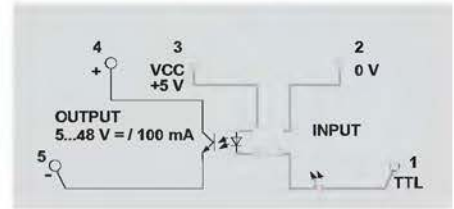
Module can be used as an universal interface:

- Between control and actuator, to convert signals from 24 V DC to 5 VTTL
- Between control and actuator, to convert signals from 5 VTTL to 5...48 V DC

24 V DC / 5 V TTL



5 V TTL / 5...48 V DC



Technical data

Input

Rated voltage	24 V DC $\pm 16\%$
Rated current	4.7 mA
Power rating	112 mW
max. input frequency	100 kHz duty factor 1:2, 50 kHz duty factor 1:10
Auxiliary voltage	no
Status indicator	green LED

Output

Output voltage	5 V TTL (4.75...5.25 V)
Output current (max.)	8 mA, fan out = 20 LS-TTL
Voltage drop at max. load	
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	1 μ s (at 20 V DC) / 2.5 μ s (at 28 V DC)
Short-circuit-proof/Protective circuit	/diode

General data

Operating temperature	-25 °C...+40 °C
Storage temperature	-40 °C...+60 °C
Approvals	CSA; cULFus; CE; ESD;

Insulation coordination (EN 50178)

Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	$\geq 5,5$ mm
Overvoltage category	III
Pollution severity	2

Input

Rated voltage	5 V TTL
Rated current	1 μ A
Power rating	10 mW
max. input frequency	2.4 kHz
Auxiliary voltage	5 V
Status indicator	green LED

Output voltage	5...48 V DC
Output current (max.)	100 mA
Voltage drop at max. load	$\leq 1,8$ V
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	/
Short-circuit-proof/Protective circuit	/diode

Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Approvals	CSA; cULFus; CE; ESD;

Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	$\geq 5,5$ mm
Overvoltage category	III
Pollution severity	2

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Tension clamp connection

Clamping range (rating- / min. / max.)	1.5 / 0.5 / 1.5
Length x width x height	91 x 6 x 64

CE, UL, CSA
for mounting on TS-33

Tension clamp connection

Clamping range (rating- / min. / max.)	1.5 / 0.5 / 1.5
Length x width x height	91 x 6 x 64

CE, UL, CSA
for mounting on TS-53

Ordering data

Connection system	Tension clamp connection
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Type	Qty.	Order No.
MCZ O 24VDC	10	8324610000

Type	Qty.	Order No.
MCZ O 5VTTL	10	8398940000

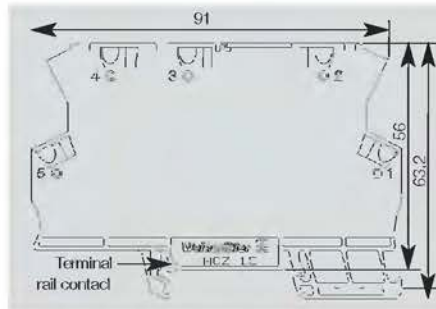
Note

Accessories

Note
End plate 4P-MCZ 1.5-8398940000
for cross-connectors and markers see MCZ Series accessories

Note
End plate 4P-MCZ 1.5-8398940000
for cross-connectors and markers see MCZ Series accessories

MCZ accessories



Ordering data

End plate

Type	Qty	Order No.
AP MCZ 1.5	50	8389030000



Ordering data

Cross-connection, 2-pole, yellow
Cross-connection, 3-pole, yellow
Cross-connection, 4-pole, yellow
Cross-connection, 5-pole, yellow
Cross-connection, 6-pole, yellow
Cross-connection, 7-pole, yellow
Cross-connection, 8-pole, yellow
Cross-connection, 9-pole, yellow
Cross-connection, 10-pole, yellow

Type	Qty	Order No.
ZQV 4/2 ge	20	1608950000
ZQV 4/3 ge	20	1608960000
ZQV 4/4 ge	20	1608970000
ZQV 4/5 ge	20	1608980000
ZQV 4/6 ge	20	1608990000
ZQV 4/7 ge	20	1609000000
ZQV 4/8 ge	20	1609010000
ZQV 4/9 ge	20	1609020000
ZQV 4/10 ge	20	1609030000



Ordering data

Connector marker

Type	Qty	Order No.
WS10/6	200	1060960000

Optocoupler - MICROSERIES

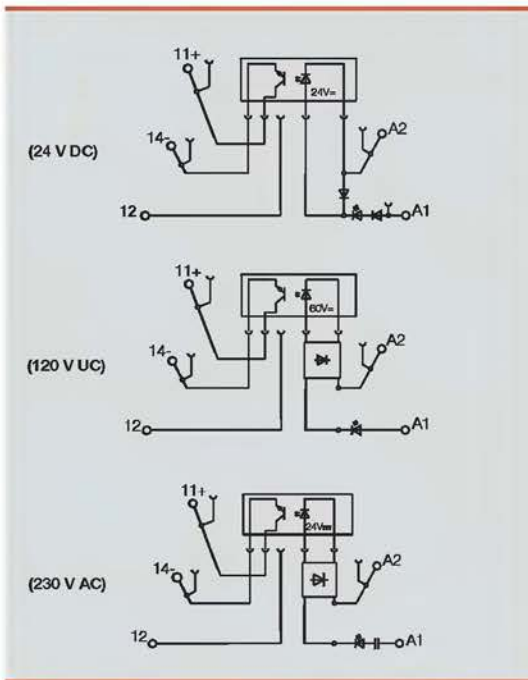
MOS / MOZ 0.1 A

Universal interface between control and sensor/actuator

- Plug-in cross-connection ZQV 4N
- Interchangeable solid-state relay
- 6.1 mm wide
- Screw or tension clamp connection
- For mounting on TS35



C



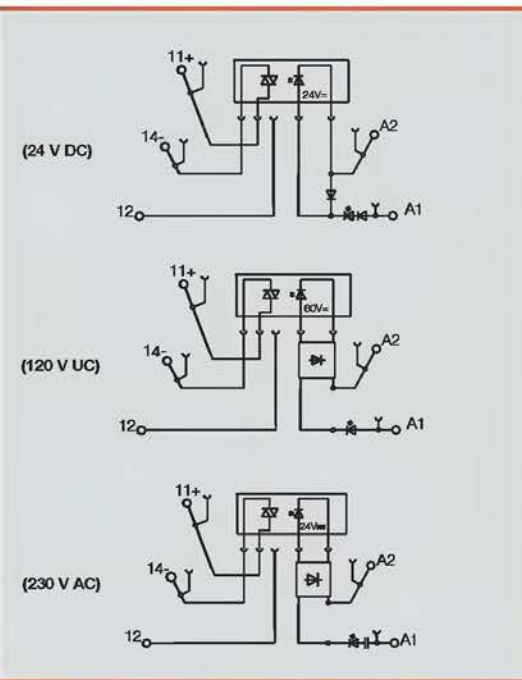
Output	
Output voltage	3...48 V DC
Output current (max.)	0,1 A
Voltage drop at max. load	≤ 1 V
Block-state curr. (closed-circuit curr.)	≤ 1 mA
Short-circuit-proof/Protective circuit	no/integrated free wheel diode
General data	
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+60 °C
Approvals	CE; cULus;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4,0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2,5 / 0,5 / 4
Length x width x height	mm 93 / 6,1 / 92
Note	
Cross-connector and markers: see MICROSERIES accessories	

Ordering data	5 V DC / 24 V DC 0,1 A	24 V DC / 24 V DC 0,1 A	120 V UC / 24 V DC 0,1 A	230 V AC / 24 V DC 0,1 A
Input	5 V DC ±20%	24 V DC ±20 %	120 V UC + 10 % / -15 %	230 V AC ±10%
Rated voltage	5 V DC ±20%	24 V DC ±20 %	120 V UC + 10 % / -15 %	230 V AC ±10%
Rated current	11 mA ±10 %	5,7 mA	3,4mA AC/2,8mA DC	7,4mA
Power rating	55 mW ±10 %	140 mW	340 mW / 0,4 VA	1,7 VA
max. input frequency	300 Hz	300 Hz	DC: 10 Hz / AC: 3 Hz	3 Hz
Switch-on delay	< 6,5 ms	35µs	< 6,5 ms	< 6,5 ms
Switch-off delay	< 10 ms	355µs	< 10 ms	< 10 ms
Ordering data Complete module				
Screw connection	Type MOS 5Vdc / 24Vdc 0,1A	Type MOS 24Vdc / 24Vdc 0,1A	Type MOS 120Vuc / 24Vdc 0,1A	Type MOS 230Vac / 24Vdc 0,1A
	Order No. 8633020000	Order No. 8607340000	Order No. 8607690000	Order No. 8607710000
Tension clamp connection	Type MOZ 5Vdc / 24Vdc 0,1A	Type MOZ 24Vdc / 24Vdc 0,1A	Type MOZ 120Vuc / 24Vdc 0,1A	Type MOZ 230Vac / 24Vdc 0,1A
	Order No. 8633010000	Order No. 8607360000	Order No. 8607730000	Order No. 8607750000
Ordering data Spere relay, pluggable				
	Type	Type	Type	Type
	Order No.	Order No.	Order No.	Order No.
Note				

MOS / MOZ 1 A

Universal interface between control and sensor/actuator

- Plug-in cross-connection ZQV 4N
- Interchangeable solid-state relay
- 6.1 mm wide
- Screw or tension clamp connection
- For mounting on TS35



Output	
Output voltage	75 ... 250 V AC
Output current (max.)	1 A
Voltage drop at max. load	approx. 1.6 V
Block-state curr. (closed-circuit curr.)	approx. 1.5 mA at 200 V
Short-circuit-proof/Protective circuit	no/integrated free wheel diode
General data	
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+60 °C
Approvals	CE; dUPlus;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4
Length x width x height	mm 93 / 6.1 / 92
Note	
Cross-connector and marker: see MICROSERIES accessories	

Ordering data	24 V DC / 230 V DC 1 A	230 V AC / 230 V AC 1 A	120 V UC / 230 V AC 1 A	
Input				
Rated voltage	24 V DC ±20 %	230 V UC ±10 %	120 V UC + 10 % / -15 %	
Rated current	10.4 mA ± 10%	7.4 mA ±10 %	2,5...3,8 mA	
Power rating	250 mW ± 15 %	1,7 VA ± 20%	0,4 VA ±15%	
max. input frequency	3 Hz	3 Hz	3 Hz	
Switch-on delay	< 11 ms	< 20 ms	< 11 ms	
Switch-off delay	< 11 ms	< 20 ms	< 11 ms	
Ordering data Complete module				
Screw connection	Type MOS 24Vdc/ 230VAC 1A	Type MOS 230Vac/ 230VAC 1A	Type MOS 120Vuc / 230VAC 1A	
	Order No. 8652010000	Order No. 8651990000	Order No. 8651930000	
Tension clamp connection	Type MOZ 24Vdc/ 230VAC 1A	Type MOZ 230Vac/ 230VAC 1A		
	Order No. 8652020000	Order No. 8651970000		
Ordering data Spere relay, pluggable				
	Type			
	Order No.			
Note				

Optocoupler - MICROSERIES

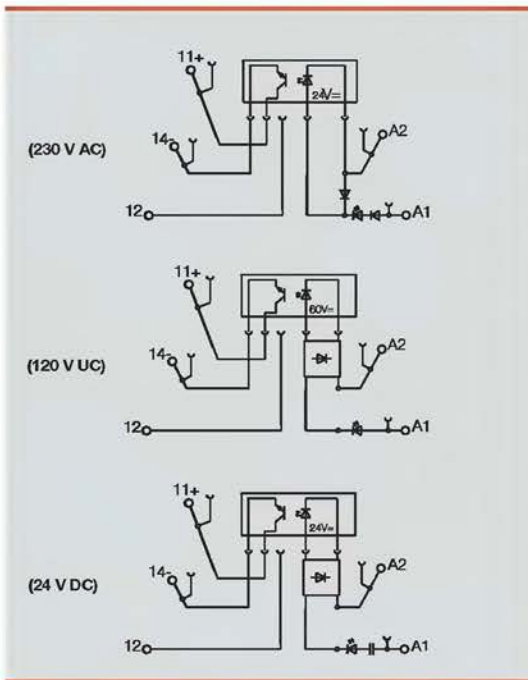
MOS / MOZ 2 A

Universal interface between control and sensor/actuator

- Plug-in cross-connection ZQV 4N
- Interchangeable solid-state relay
- 6.1 mm wide
- Screw or tension clamp connection
- For mounting on TS35



C



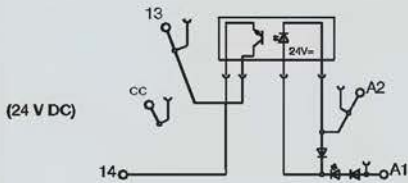
Output	
Output voltage	3...33 V DC
Output current (max.)	2 A
Voltage drop at max. load	≤ 120 mV
Block-state curr. (closed-circuit curr.)	approx. 10 µA
Short-circuit-proof/Protective circuit	no/integrated free wheel diode
General data	
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+60 °C
Approvals	CE; cULFus;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4
Length x width x height	mm 93 / 6.1 / 92
Note Cross-connector and marker: see MICROSERIES accessories	

Ordering data	5 V DC / 24 V DC 2 A	24 V DC / 24 V DC 2 A	120 V UC / 24 V DC 2 A	230 V AC / 24 V DC 2 A
Input	5 V DC ±20%	24 V DC ±20 %	120 V UC + 10 %/ -15 %	230 V AC ±10%
Rated voltage	5 V DC ±20%	24 V DC ±20 %	120 V UC + 10 %/ -15 %	230 V AC ±10%
Rated current	11 mA DC ±10 %	5.7mA	3,4 mA AC/2,8 mA DC	7.4mA
Power rating	55 mW ±10 %	140 mW	340 mW / 0.4 VA	1.7 VA
max. input frequency	300 Hz	300 Hz	DC: 10 Hz / AC: 3 Hz	3 Hz
Switch-on delay	< 55 µs	< 55 µs	< 6.5 ms	< 6.5 ms
Switch-off delay	< 1 ms	< 1.2 ms	< 10 ms	< 10 ms
Ordering data Complete module				
Screw connection Type	MOS 5Vdc / 24Vdc 2A	MOS 24Vdc / 24Vdc 2A	MOS 120Vuc / 24Vdc 2A	MOS 230Vac / 24Vdc 2A
Order No.	8633000000	8607350000	8607700000	8607720000
Tension clamp connection Type	MOZ 5Vdc / 24Vdc 2A	MOZ 24Vdc / 24Vdc 2A	MOZ 120Vuc / 24Vdc 2A	MOZ 230Vac / 24Vdc 2A
Order No.	8632990000	8607370000	8607740000	8607760000
Ordering data Spare relay, pluggable				
Type				
Order No.				
Note				

MOS / MOZ actuator version

Universal interface between control and sensor/actuator

- Plug-in cross-connection ZQV 4N
- Interchangeable solid-state relay
- 6.1 mm wide
- Screw or tension clamp connection
- For mounting on TS35



Output	
Output voltage	3...33 V DC
Output current (max.)	2 A
Voltage drop at max. load	≤ 120 mV
Block-state curr. (closed-circuit curr.)	approx. 10 µA
Short-circuit-proof/Protective circuit	no/integrated free wheel diode
General data	
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+60 °C
Approvals	CE; dUPlus;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overtoltage category	III
Pollution severity	2

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 4	1.5 / 0.5 / 2.5
Length x width x height	mm 93 / 6.1 / 92	94 / 6.1 / 91
Note	Cross-connectors and markers: see MICROSERIES accessories	

Ordering data

Input	24 V DC ACT			
Rated voltage	24 V DC ±20 %			
Rated current	5.7 mA ±10 %			
Power rating	140 mW ±10 %			
max. input frequency				
Switch-on delay	< 55 µs			
Switch-off delay	< 1.2 ms			

Ordering data Complete module				
Screw connection	Type	MOS 24Vdc / 24Vdc ACT		
	Order No.	8676250000		
Tension clamp connection	Type	MOZ 24Vdc / 24Vdc ACT		
	Order No.	8676230000		

Ordering data Spare relay, pluggable				
	Type			
	Order No.			

Note				

Optocouplers – MICROSERIES

Plug-in solid-state relay

SSS Relay

Switching current 100 mA

SSS Relay

Switching current 2 A

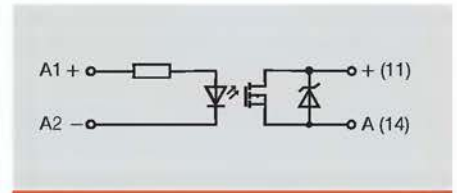
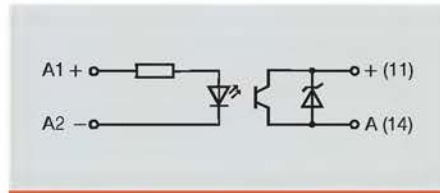


Technical data

Input	Non-fired control voltage
Control voltage min / max	
Control current at $U_{IN} = 24\text{ V}$	
Drop-out voltage	
Control circuit resistance	
Output	
Switching voltage	
Switching/continuous current at $U_s > 5\text{ V DC}$	
Conducting-state voltage	
Insulation	
Test voltage between control circuit / switching circuit	
Other data	
Operating temperature range	
Storage temperature range	
Weight	
Approvals	
* Ambient temperature 20 °C	
Wiring diagram	

24 V DC	60 V DC
16 V DC / 30 V DC	52 V DC / 72 V DC
7 mA ± 10 %	2.8 mA ± 10 %
10 V DC	40 V DC
approx. 4 kOhm	approx. 20 kOhm
Bipolar transistor	
3 ... 48 V DC	
100 mAdc	
< 1 V DC	
2.5 kV	
-20 °C ... +60 °C	
-40 °C ... +70 °C	
3.65 g	

24 V DC	60 V DC
18 V DC / 30 V DC	35 V DC / 72 V DC
7 mA ± 10 %	3.0 mA ± 10 %
10 V DC	20 V DC
approx. 3.2 kOhm	approx. 16 kOhm
MOS-FET	
3 ... 33 V DC	
2 Adc	
< 120 mV DC	
2.5 kV	
-20 °C ... +60 °C	
-40 °C ... +70 °C	
3.65 g	



Ordering data

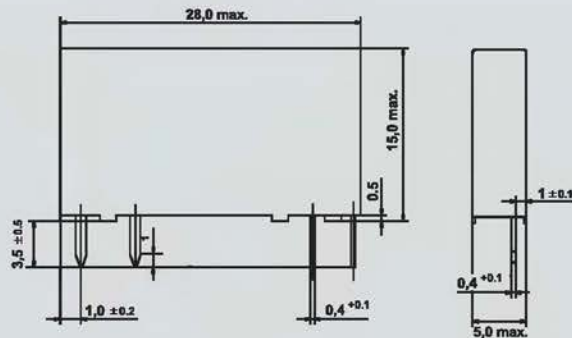
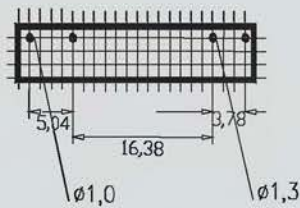
Nominal control voltage	24 V DC
	60 V DC

Type	Order No.
SSS Relay 24 V / 24 V 0.1 Adc	4061180000
SSS Relay 60 V / 24 V 0.1 Adc	4061230000

Type	Order No.
SSS Relay 24 V / 24 V 2 Adc	4061190000
SSS Relay 60 V / 24 V 2 Adc	4061200000

Dimensions

Printing details



Accessories



Plug-in cross-connection

Type	No. of poles	Qty	Order No.
yellow			
ZQV 4N / 2 GE	2	60	1758250000
ZQV 4N / 3 GE	3	60	1762630000
ZQV 4N / 4 GE	4	60	1762620000
ZQV 4N / 10 GE	10	20	1758260000
ZQV 4N / 20	20	20	1909020000
red			
ZQV 4N / 2 RT	2	60	1793950000
ZQV 4N / 3 RT	3	60	1793980000
ZQV 4N / 4 RT	4	60	1794010000
ZQV 4N / 10 RT	10	20	1794040000
ZQV 4N / 20 RT	20	20	1909150000
blue			
ZQV 4N / 2 BL	2	60	1793960000
ZQV 4N / 3 BL	3	60	1793990000
ZQV 4N / 4 BL	4	60	1794020000
ZQV 4N / 10 BL	10	20	1794050000
ZQV 4N / 20 BL	20	20	1909100000
black			
ZQV 4N / 2 SW	2	60	1793970000
ZQV 4N / 3 SW	3	60	1794000000
ZQV 4N / 4 SW	4	60	1794030000
ZQV 4N / 10 SW	10	20	1794060000
ZQV 4N / 20 SW	20	20	1909120000

General data – MICROSERIES

Technical data

Conductor		Tension clamp connection	Screw connection
Solid H07V-U	mm ²	0.5 ... 2.5	0.5 ... 4.0
Stranded H07V-K	mm ²	0.5 ... 2.5	0.5 ... 2.5
"I" with wire end ferrules to DIN 46228-1	mm ²	0.5 ... 1.5	0.5 ... 1.5
"I" with wire end ferrules with plastic collar	mm ²	0.5 ... 1.5	0.5 ... 1.5
Max. clamping range	mm ²	0.13 ... 2.5	0.13 ... 4.0
Plug gauge to IEC 60947-1	size	A 2	A 3

General technical data

Nominal torque		-	0.6
Continuous current for 2-pole cross-connection	A	10	10
Continuous current for multi-pole cross-connection	A	10	10
Stripping length	mm	10	7
Ingress protection class		IP 20	IP 20
Housing material		Wemid	Wemid
UL 94 flammability rating		V-0	V-0
Nominal current	A	6	6
Nominal voltage	V	250	250

Other accessories

Type	Qty	Order No.
Base only		
MRZ 24VDC 1CO BASIS	10	8826000000
MRS 24VDC 1CO BASIS	10	8826010000
MRZ 120VUC 1CO BASIS	10	8826020000
MRS 120VUC 1CO BASIS	10	8826030000
MRZ 230VAC 1CO BASIS	10	8826040000
MRS 230VAC 1CO BASIS	10	8826050000

Markers

WS 12/6	12 x 6 mm	200	1061160000
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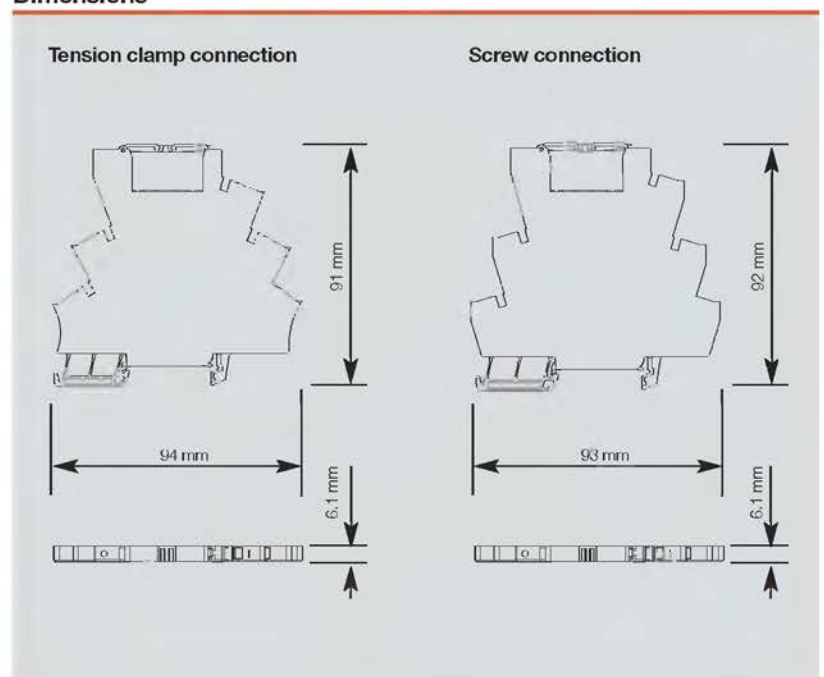
Labels, Lasermark

LM MT 300 15/6 ge	484 labels / sheet	10	1686360000
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Screwdriver

SD 0,6 x 3,5 x 100		10	9008330000
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Dimensions



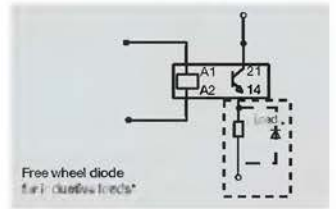
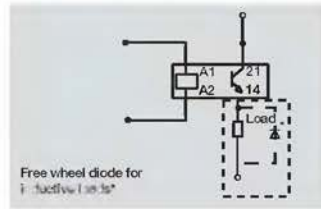
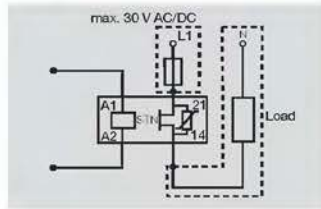
Optocoupler - PLUGSERIES

POS / POZ

24 V DC / 24 V UC 1 A

24 V DC / 24 V DC 2.5 A

24 V DC / 24 V DC 5 A



Technical data

Input

Rated voltage	15 V DC...30 V DC
Rated current	approx. 10 mA
Power rating	250 mW
Auxiliary voltage	no
Status indicator	green LED

Output

Output voltage	0...30 V UC
Output current (max.)	1 A
Voltage drop at max. load	≤ 0,9 V
Block-state curr. (closed-circuit curr.)	≤ 1 mA
Switch-on delay/Switch-off delay	5 ms / 12 ms
Short-circuit-proof/Protective circuit	no / Integrated free wheel diode

General data

Operating temperature	-40 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Approvals	CE, eURus;

Insulation coordination to EN 50178

Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4,0 kV _{eff}
Creepage and clearance path input - output	8 mm
Overvoltage category	III
Pollution severity	2

Dimensions

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 2,5	Tension clamp c.	2,5 / 0,5 / 2,5
Length x width x height	mm	92 x 15,3 x 95		92 x 15,3 x 87

Note

Ordering data

Connection system	Type	(Qty.=1)	Order No.
Screw connection	POS 24VDC/24VUC 1A		8610890000
Tension clamp connection	POZ 24VDC/24VUC 1A		8610960000

Note

Accessories

Note	*Cable-connectors and markers - see PLUGSERIES accessories
-------------	--

Rated voltage	15 V DC...30 V DC
Rated current	approx. 10 mA
Power rating	250 mW
Auxiliary voltage	no
Status indicator	green LED

Output voltage	0...30 V DC
Output current (max.)	2,5 A
Voltage drop at max. load	≤ 0,4 V
Block-state curr. (closed-circuit curr.)	≤ 1 mA
Switch-on delay/Switch-off delay	2 ms / 18 ms
Short-circuit-proof/Protective circuit	no / Integrated free wheel diode

Operating temperature	-40 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Approvals	CE, eURus;

Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	2,5 kV _{eff}
Creepage and clearance path input - output	8 mm
Overvoltage category	III
Pollution severity	2

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 2,5	Tension clamp c.	2,5 / 0,5 / 2,5
Length x width x height	mm	92 x 15,3 x 95		92 x 15,3 x 87

Connection system	Type	(Qty.=1)	Order No.
Screw connection	POS 24VDC/24VDC 2A		8610840000
Tension clamp connection	POZ 24VDC/24VDC 2A		8610920000

Note

Note	*Cable-connectors and markers - see PLUGSERIES accessories
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Rated voltage	15 V DC...30 V DC
Rated current	approx. 10 mA
Power rating	250 mW
Auxiliary voltage	no
Status indicator	green LED

Output voltage	0...30 V DC
Output current (max.)	5 A
Voltage drop at max. load	≤ 0,3 V
Block-state curr. (closed-circuit curr.)	≤ 1 mA
Switch-on delay/Switch-off delay	2 ms / 18 ms
Short-circuit-proof/Protective circuit	no / Integrated free wheel diode

Operating temperature	-40 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Approvals	CE, eURus;

Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	2,5 kV _{eff}
Creepage and clearance path input - output	8 mm
Overvoltage category	III
Pollution severity	2

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 2,5	Tension clamp c.	2,5 / 0,5 / 2,5
Length x width x height	mm	92 x 15,3 x 95		92 x 15,3 x 87

Connection system	Type	(Qty.=1)	Order No.
Screw connection	POS 24VDC/24VDC 5A		8610900000
Tension clamp connection	POZ 24VDC/24VDC 5A		8610970000

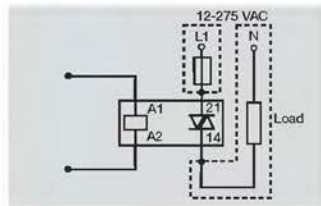
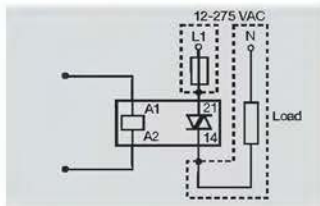
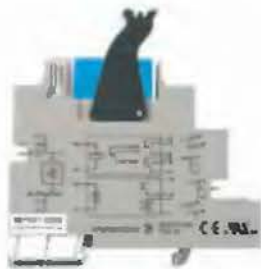
Note

Note	*Cable-connectors and markers - see PLUGSERIES accessories
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POS / POZ

24 V DC / 230 V AC 2 A

24 V DC / 230 V AC 4 A



Technical data

Input	
Rated voltage	15 V DC...30 V DC
Rated current	approx. 10 mA
Power rating	250 mW
Auxiliary voltage	no
Status indicator	green LED
Output	
Output voltage	12...275 V AC
Output current (max.)	2 A
Voltage drop at max. load	≤ 1 V
Block-state curr. (closed-circuit curr.)	≤ 1 mA
Switch-on delay/Switch-off delay	12ms /20ms
Short-circuit-proof/Protective circuit	no /RC element
General data	
Operating temperature	-40 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Approvals	CE;ULFus;
Insulation coordination to EN 50178	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV _{eff}
Creepage and clearance path input - output	8 mm
Overvoltage category	III
Pollution severity	2

Rated voltage	15 V DC...30 V DC
Rated current	approx. 10 mA
Power rating	250 mW
Auxiliary voltage	no
Status indicator	green LED
Output voltage	12...275 V AC
Output current (max.)	2 A
Voltage drop at max. load	≤ 1 V
Block-state curr. (closed-circuit curr.)	≤ 1 mA
Switch-on delay/Switch-off delay	12ms /20ms
Short-circuit-proof/Protective circuit	no /RC element
Operating temperature	-40 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Approvals	CE;ULFus;
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV _{eff}
Creepage and clearance path input - output	8 mm
Overvoltage category	III
Pollution severity	2

Rated voltage	15 V DC...30 V DC
Rated current	approx. 10 mA
Power rating	250 mW
Auxiliary voltage	no
Status indicator	green LED
Output voltage	12...275 V AC
Output current (max.)	3 A (4 A at 20°C)
Voltage drop at max. load	≤ 1,1 V
Block-state curr. (closed-circuit curr.)	≤ 1 mA
Switch-on delay/Switch-off delay	12ms /20ms
Short-circuit-proof/Protective circuit	no /RC element
Operating temperature	-40 °C...+50 °C
Storage temperature	-40 °C...+50 °C
Approvals	CE;ULFus;
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	4.0 kV _{eff}
Creepage and clearance path input - output	8 mm
Overvoltage category	III
Pollution severity	2

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5
92 x 15.3 x 95	92 x 15.3 x 87

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5
92 x 15.3 x 95	92 x 15.3 x 87

Ordering data

Connection system	
Screw connection	
Tension clamp connection	
Note	

Type	(Qty.=1)	Order No.
POS 24VDC/230VAC 2A		8610860000
POZ 24VDC/230VAC 2A		8610930000

Type	(Qty.=1)	Order No.
POS 24VDC/230VAC 4A		8610910000
POZ 24VDC/230VAC 4A		8610980000

Accessories

Note

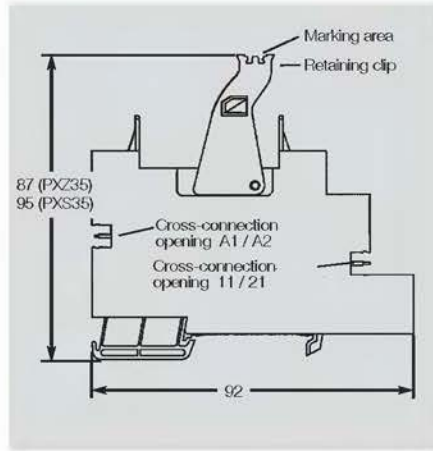
*Gross-connectors and markers - see PLUGSERIES accessories

*Gross-connectors and markers - see PLUGSERIES accessories

Accessories

PLUGSERIES

Optocoupler relays for high making currents



Technical data

Base without relay	
Nominal current	16 A
Nominal voltage	250 V
Dielectric strength coil/contact	> 4 kV
Ingress protection class	IP 20
Nominal cross-section	2,5 mm ²
Stripping length	8 mm
	screw connection
	tension clamp connection
Ambient temperature	-40 °C ... +60 °C
UL 94 flammability rating	V-0

Ordering data

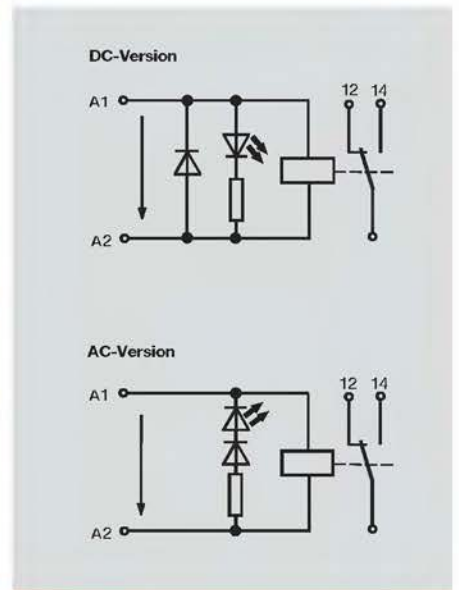
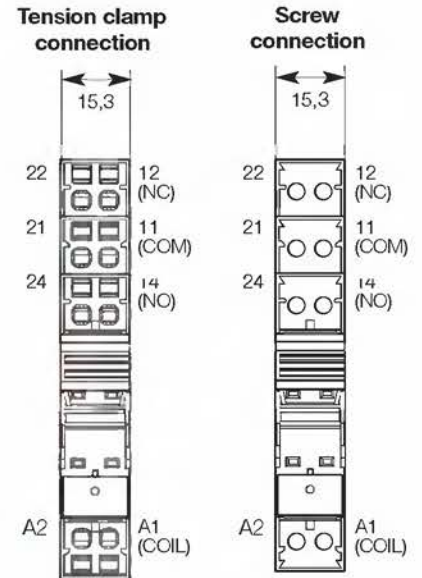
Base for mounting on TS 35 rail			
Screw connection	Type	Qty	Order No.
Tension clamp connection	PXS35	10	8533771001
	PXZ35	10	8536691001

Retaining clip			
	PRC	100	8536700000

LED indicator with free-wheel diode			
6 ... 24 V DC	PLED 24 V DC	20	8536710000
red LED, 6 ... 24 V DC	PLED 24 V DC red	20	8611010000
48 ... 60 V DC	PLED 48 V DC	20	8536720000
115 V DC	PLED 115 V DC	20	8536730000
12 ... 24 V AC	PLED 24 V AC	20	8536750000
115 V AC	PLED 120 V AC	20	8536760000
230 V AC	PLED 230 V AC	20	8536780000
red LED, 230 V AC	PLED 230 V AC red	20	8611000000
RC combination, 120 ... 230 V AC/DC	PLRC 200 nF/200 Ω	20	8566530000

Plug-in cross-connections				
2-pole	black	ZQV 2.5N/4-2SW	60	1784270000
	red	ZQV 2.5N/4-2RT	60	1784280000
	blue	ZQV 2.5N/4-2BL	60	1784290000

Markers				
	10 x 5 mm	WS 10/5	200	1060860000
	15 x 5 mm	WS 15/5	96	1609880000



Optocoupler - EG SERIES

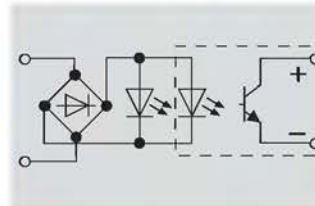
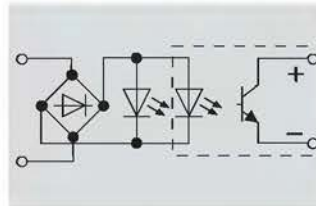
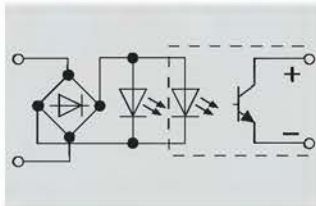
EG 7

- Combination foot for TS15, TS32 or TS35
- Plug-in option for clip-on base RS EG7
- Width 10 mm
- Safe isolation according to VDE 0884

5 V DC

12 V UC

24 V UC



Technical data

Input

Rated voltage
Rated current
Power rating
max. input frequency
Auxiliary voltage
Status indicator

5 V DC ±20%
6.8 mA
40 mW
15 Hz
no
green LED

12 V UC ±20 %
33 mA AC / 30 mA DC
40 mW / 50 mVA
15 Hz
no
green LED

24 V UC ±20 %
3,4 mA AC / 2,8 mA DC
70 mW / 90 mVA
15 Hz
no
green LED

Output

Output voltage
Output current (max.)
Voltage drop at max. load
Block-state curr. (closed-circuit curr.)
Switch-on delay/Switch-off delay
Short-circuit-proof/Protective circuit

5...48 V DC
100 mA
≤ 1,5 V
≤ 50 µA
6 ms/12 ms
no/integrated Free wheel diode

5...48 V DC
100 mA
≤ 1,5 V
≤ 50 µA
6 ms/12 ms
no/integrated Free wheel diode

5...48 V DC
100 mA
≤ 1,5 V
≤ 50 µA
5 ms/15 ms
no/integrated Free wheel diode

General data

Operating temperature
Storage temperature
Approvals

-25 °C...+60 °C
-40 °C...+60 °C
CE

-25 °C...+60 °C
-40 °C...+60 °C
CE

-25 °C...+60 °C
-40 °C...+60 °C
CE

Insulation coordination (EN 50178)

Standards
Rated voltage
Rated impulse withstand voltage
Creepage and clearance path input - output
Overvoltage category
Pollution severity

EN 50178
300 V
6.0 kV
≥ 5,5 mm
III
2

EN 50178
300 V
6.0 kV
≥ 5,5 mm
III
2

EN 50178
300 V
6.0 kV
≥ 5,5 mm
III
2

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Complete module	Pluggable
1.5 / 0.5 / 1.5	2.5 / 0.5 / 2.5
44 x 10 x 96	95 x 10 x 99

Complete module	Pluggable
1.5 / 0.5 / 1.5	2.5 / 0.5 / 2.5
44 x 10 x 96	95 x 10 x 99

Complete module	Pluggable
1.5 / 0.5 / 1.5	2.5 / 0.5 / 2.5
44 x 10 x 96	95 x 10 x 99

Note

Dimensions of plug-in optocoupler incl. clip-on base RS E37

Dimensions of plug-in optocoupler incl. clip-on base RS E37

Dimensions of plug-in optocoupler incl. clip-on base RS E37

Ordering data

Description of part

Complete module
Pluggable

Type	(Qty.=1)	Order No.
EGO EG7 5VDC K-FU		8092490000
OST EG7 5VDC		8234560000

Type	(Qty.=1)	Order No.
EGO EG7 12VUC K-FU		8092510000
OST EG7 12VUC		8234570000

Type	(Qty.=1)	Order No.
EGO EG7 24VUC K-FU		8092530000
OST EG7 24VUC		8234580000

Note

Accessories

Note

Clip-on base
RS E37 - 8193230000

Clip-on base
RS E37 - 8193230000

Clip-on base
RS E37 - 8193230000

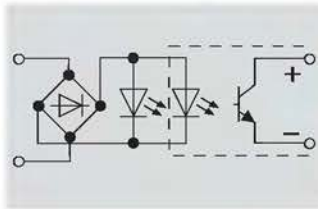
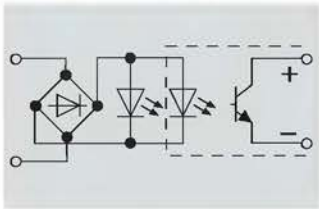
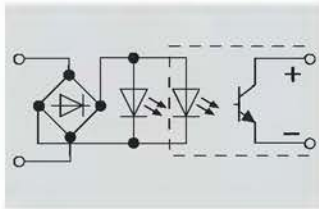
EG 7

- Combination foot for TS15, TS32 or TS35
- Plug-in option for clip-on base RS EG7
- Width 10 mm
- Safe isolation according to VDE 0884

48 V UC

115 V UC

230 V AC



Technical data

Input	
Rated voltage	48 V UC ±20 %
Rated current	3,4 mA AC / 2,8 mA DC
Power rating	135 mW / 155 mVA
max. input frequency	15 Hz
Auxiliary voltage	no
Status indicator	green LED
Output	
Output voltage	5...48 V DC
Output current (max.)	100 mA
Voltage drop at max. load	≤ 1,5 V
Block-state curr. (closed-circuit curr.)	≤ 50 µA
Switch-on delay/Switch-off delay	5 ms/15 ms
Short-circuit-proof/Protective circuit	no/integrated Free wheel diode
General data	
Operating temperature	-25 °C...+60 °C
Storage temperature	-40 °C...+60 °C
Approvals	CE
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overtoltage category	III
Pollution severity	2

Rated voltage	115 V UC ±20 %
Rated current	9 mA AC / 3,3 mA DC
Power rating	0.4 W / 0.5 VA
max. input frequency	12 Hz
Auxiliary voltage	no
Status indicator	green LED
Output voltage	5...48 V DC
Output current (max.)	100 mA
Voltage drop at max. load	≤ 1,5 V
Block-state curr. (closed-circuit curr.)	≤ 50 µA
Switch-on delay/Switch-off delay	9 ms/25 ms
Short-circuit-proof/Protective circuit	no/integrated Free wheel diode
Operating temperature	-25 °C...+60 °C
Storage temperature	-40 °C...+60 °C
Approvals	CE
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overtoltage category	III
Pollution severity	2

Rated voltage	230 V AC +6/-15 %
Rated current	14 mA
Power rating	3.2 VA
max. input frequency	12 Hz
Auxiliary voltage	no
Status indicator	green LED
Output voltage	5...48V DC
Output current (max.)	100 mA
Voltage drop at max. load	≤ 1,5 V
Block-state curr. (closed-circuit curr.)	≤ 50 µA
Switch-on delay/Switch-off delay	15 ms/15 ms
Short-circuit-proof/Protective circuit	no/integrated Free wheel diode
Operating temperature	-25 °C...+60 °C
Storage temperature	-40 °C...+60 °C
Approvals	CE
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overtoltage category	III
Pollution severity	2

Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Note	

Complete module	Pluggable
1.5 / 0.5 / 1.5	2.5 / 0.5 / 2.5
44 x 10 x 96	95 x 10 x 99
Dimensions of plug-in optocoupler incl. clip-on base RS E37	

Complete module	Pluggable
1.5 / 0.5 / 1.5	2.5 / 0.5 / 2.5
44 x 10 x 96	95 x 10 x 99
Dimensions of plug-in optocoupler incl. clip-on base RS E37	

Complete module	Pluggable
1.5 / 0.5 / 1.5	2.5 / 0.5 / 2.5
44 x 10 x 96	95 x 10 x 99
Dimensions of plug-in optocoupler incl. clip-on base RS E37	

Ordering data

Description of part	Type	(Qty.=1)	Order No.
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Complete module	EGO EG7 48VUC K-FU		8092550000
Pluggable	OST EG7 48VUC		8234590000

Complete module	EGO EG7 115VUC K-FU		8092570000
Pluggable	OST EG7 115VUC		8234600000

Complete module	EGO EG7 230VAC K-FU		8092590000
Pluggable	OST EG7 230VAC		8234610000

Note

Accessories

Note	Clip-on base RS E37 - 8193230000
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Note	Clip-on base RS E37 - 8193230000
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Note	Clip-on base RS E37 - 8193230000
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Note	Clip-on base RS E37 - 8193230000
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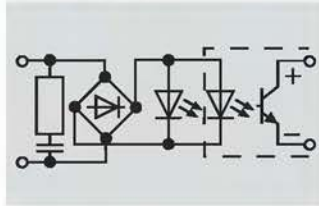
Optocoupler - EG SERIES

for long control wires

For long control lines

- RC input circuit for suppressing interference signals
- Safe switching behavior in the event of interference on the control side

230 V AC RC



Technical data

Input

Rated voltage	230 V AC +6/-15 %
Rated current	3.8 mA
Power rating	870 mVA
max. input frequency	12 Hz
Auxiliary voltage	no
Status indicator	green LED

Output

Output voltage	5...48 V DC
Output current (max.)	100 mA
Voltage drop at max. load	≤ 1,5 V
Block-state curr. (closed-circuit curr.)	≤ 50 µA
Switch-on delay/Switch-off delay	5 ms/18 ms
Short-circuit-proof/Protective circuit	no/Varistor, integral Free wheel diode

General data

Operating temperature	-25 °C...+60 °C
Storage temperature	-40 °C...+60 °C
Approvals	CE

Insulation coordination (EN 50178)

Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2

Dimensions

	Complete module	Pluggable
Clamping range (rating- / min. / max.)	1.5 / 0.5 / 1.5 mm ²	2.5 / 0.5 / 2.5 mm ²
Length x width x height	44 x 10 x 96 mm	95 x 10 x 99 mm

Note

Dimensions of plug-in optocoupler incl. d (p-on base) RS E57

Ordering data

Description of part	Type	(Qty.=1)	Order No.
Complete module	EGO EG7 RC 230VAC		8387580000
Pluggable	OST EG7 230VAC RC		8394990000

Note

Accessories

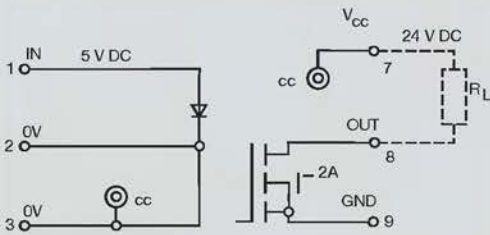
Note	<p>Clamp-on base RS E57 - 8193230000</p>
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Optocoupler - WAVE SERIES

Output voltage 24 V DC
negative-switching
wide input range



C



Output	
Output voltage	18 V DC ... 24 V DC ... 30 V DC
Output current (max.)	2 A, negative switching
Voltage drop at max. load	
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	1 ms/6 ms
Short-circuit-proof/Protective circuit	no/varistor
General data	
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Approvals	CSA; cULFus; CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- /min. /max.)	mm ² 1.5 / 0.5 / 2.5	
Length x width x height	mm 72 / 22.5 / 92.4	
Note	Cross-connector: and markers: see WAVE SERIES accessories	

Ordering data

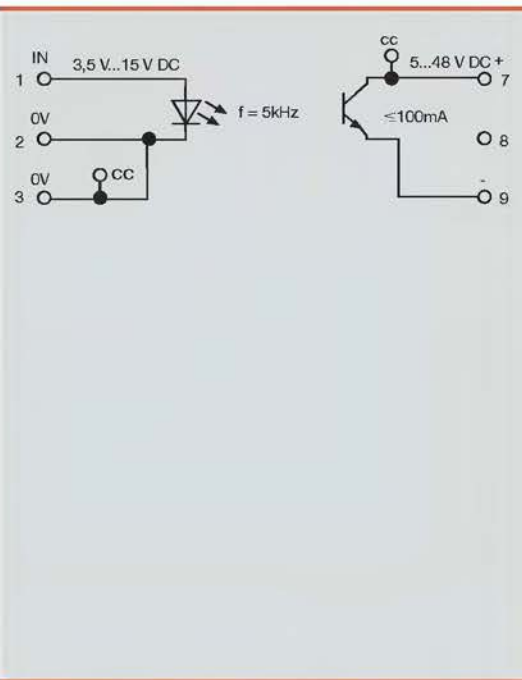
Input	5 V DC			
Rated voltage	4.0 V DC...5 V DC...6.0 V DC			
Rated current	7.5...19 mA			
Power rating	30 ...114 mW			
Auxiliary voltage	no			
Status indicator	LED green in output			

Ordering data Complete module				
Screw connection Type	WOS1 5VDC			
Order No.	8275430000			
Tension clamp connection Type				
Order No.				

Ordering data Spare relay, pluggable				
Type				
Order No.				

Note				

Output voltage 5-48 V DC
wide input range



Output	
Output voltage	5 V DC ... 48 V DC
Output current (max.)	100 mA
Voltage drop at max. load	
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	8 μ s/35 μ s
Short-circuit-proof/Protective circuit	no/Varistor, integral Free wheel diode
General data	
Operating temperature	-25°C...+60°C
Storage temperature	-40 °C...+85 °C
Approvals	CSA; cULRus; CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	\geq 5,5 mm
Overvoltage category	III
Pollution severity	2
Dimensions	
Clamping range (rating- /min. /max.)	mm ² 1.5 / 0.5 / 2.5
Length x width x height	mm 72 / 22.5 / 92.4
Note	Cross-connector: and markers: see WAVE SERIES accessories

Ordering data

Input		3.5-15 V DC 5 KHZ			
Rated voltage		3.5 V DC...15 V DC			
Rated current		10 ... 25 mA			
Power rating		32 ... 375 mW			
Auxiliary voltage		no			
Status indicator		LED green in output			
Ordering data Complete module					
Screw connection	Type	WOS1 3.5-15VDC 5KHZ			
	Order No.	8275390000			
Tension clamp connection	Type				
	Order No.				
Ordering data Spare relay, pluggable					
	Type				
	Order No.				
Note					

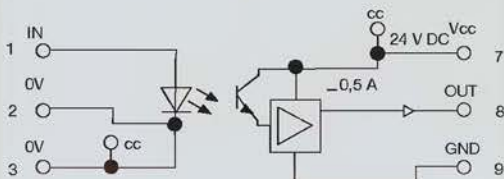
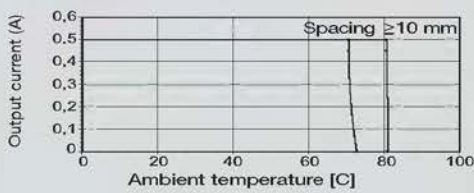
Optocoupler - WAVE SERIES

Output voltage 24 V DC 0.5 A
short-circuit-proof and protected
against overload



C

Derating curve



Output	
Output voltage	12 V DC ... 24 V DC ... 28 V DC
Output current (max.)	500 mA
Voltage drop at max. load	
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	approx. 10 ms/approx. 20 ms
Short-circuit-proof/Protective circuit	Yes/max. 96 h/Varistor, polarity reversal protection
General data	
Operating temperature	-25°C...+60°C
Storage temperature	-40 °C...+85 °C
Approvals	CSA; cULFus; CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2
Dimensions	
Clamping range (rating- /min. /max.)	mm ² 1.5 / 0.5 / 2.5
Length x width x height	mm 72 / 22.5 / 92.4
Note: Cross-connector and marker: see WAVE SERIES accessories	

Ordering data

Input	12 V UC / 24 V DC 0,5 A	15-60 V DC 1 kHz	115 V UC / 24 V DC 0,5 A	230 V UC / 24 V DC 0,5 A
Rated voltage	10 V DC...12 V DC...14 V DC	15 V DC...60 V DC	115 V UC, max. 130 V UC	230 V UC, max. 250 V UC
Rated current	15 mA AC / 12 mA DC	1.4 ... 4.1 mA	2,9 mA AC / 3,1 mA DC	11,5 mA AC / 1,8 mA DC
Power rating	0.18 VA / 0.14 W	21 ... 246 mW	0.16 VA / 0.23 W	2,6 VA / 0.4 W
Auxiliary voltage	no	no	no	no
Status indicator	LED green in output	LED green in output	LED green in output	LED green in output

Ordering data Complete module

Screw connection	Type	12 V UC	15-60 V DC	115 V UC	230 V UC
Order No.		WOS1 12VUC 8275500000	WOS1 15-60VDC 1KHZ 8237730000	WOS1 115VUC 8235180000	WOS1 230VUC 8275380000
Tension clamp connection	Type				
Order No.					

Ordering data Spare relay, pluggable

Type	12 V UC	15-60 V DC	115 V UC	230 V UC
Order No.				

Note	12 V UC	15-60 V DC	115 V UC	230 V UC

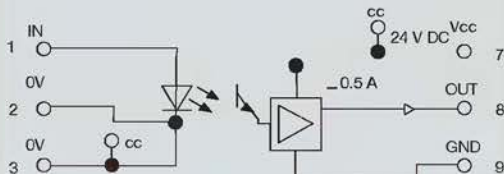
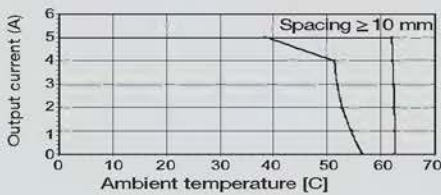
**Output voltage 24 V DC 5 A
short-circuit-proof and protected
against overload**

Note

- LED red: hard short-circuit, LED on permanently. The output cuts out and does not switch on again automatically. Reset by briefly interrupting the power supply/input voltage
- Overload: LED pulsing, approx. 2 s on, approx. 30 s off. Device switches on again after removing the overload
- Low load: LEDs on permanently, output is switched through



Derating curve



Output	
Output voltage	19.2 V DC ... 24 V DC ... 28.8 V DC
Output current (max.)	5 A
Voltage drop at max. load	
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	approx. 8 ms/25 ms
Short-circuit-proof/Protective circuit	Yes/max. 96 h/Varistor, polarity reversal protection
General data	
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Approvals	CSA; cULRus; CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- /min. /max.)	mm ² 1.5 / 0.5 / 2.5	
Length x width x height	mm 92.4 / 22.5 / 112.4	

Note Cross-connector: and marker: see WAVE SERIES accessories

Ordering data

Input	24 V UC / 24 V DC 5 A	115 V UC / 24 V DC 5 A	230 V UC / 24 V DC 5 A
Rated voltage	24 V UC ±10 %	115 V UC, max. 130 V UC	230 V UC, max. 250 V UC
Rated current	16.3 mA ac / 13.5 mA dc	3.1 mA ac / 2.8 mA dc	12 mA ac / 1.8 mA dc
Power rating	0.39 VA / 0.32 W	0.35 VA / 0.32 W	2.7 VA / 0.4W
Auxiliary voltage	no	no	no
Status indicator	LED green in output	LED green in output	LED green in output

Ordering data Complete module

Screw connection	Type	24 V UC / 24 V DC 5 A	115 V UC / 24 V DC 5 A	230 V UC / 24 V DC 5 A
Order No.		WOS2 24VUC 8275190000	WOS2 115VUC 8296250000	WOS2 230VUC 8275220000
Tension clamp connection	Type			
Order No.				

Ordering data Spare relay, pluggable

Screw connection	Type	24 V UC / 24 V DC 5 A	115 V UC / 24 V DC 5 A	230 V UC / 24 V DC 5 A
Order No.				

Note	24 V UC / 24 V DC 5 A	115 V UC / 24 V DC 5 A	230 V UC / 24 V DC 5 A

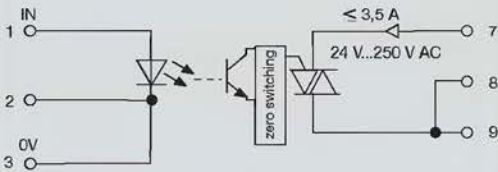
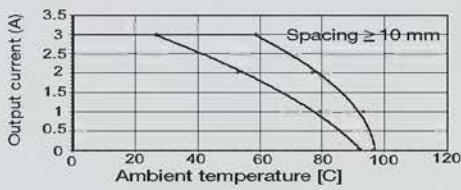
Optocoupler - WAVESERIES

Output voltage 230 V AC 3.5 A



C

Derating curve



Output	
Output voltage	24 V AC ... 250 V AC
Output current (max.)	3.5 A
Voltage drop at max. load	1.6 V
Block-state curr. (closed-circuit curr.)	2 mA
Switch-on delay/Switch-off delay	max. 20 ms/max. 20 ms
Short-circuit-proof/Protective circuit	no/RC combination with resistor
General data	
Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C
Approvals	CSA; cULRus; CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- /min. /max.)	mm ² 1.5 / 0.5 / 2.5	
Length x width x height	mm 92.4 / 22.5 / 112.4	

Note: Cross-connector: and markers: see WAVESERIES accessories

Ordering data

Input	15-60 V UC / 24 V DC 5 A	115 V UC / 230 V AC 3,5 A	230 V UC / 230 V AC 3,5 A
Rated voltage	15 V UC...60 V AC/66 V DC	115 V UC, max. 130 V UC	230 V UC, max. 250 V UC
Rated current	3,3...5,6 mA	3,8 mA ac / 7,2 mA dc	11,8 mA ac / 3,3 mA dc
Power rating	0,31 VA / 0,33 W	0,44 VA / 0,82 W	2,7 VA / 0,75 W
Auxiliary voltage	no	no	no
Status indicator	LED green in output	LED green in output	LED green in output

Ordering data Complete module

Screw connection	Type	Order No.
15-60VAC 66VDC	WOS2 15-60VAC 66VDC	8275440000
115VUC	WOS2 115VUC	8259950000
230VUC	WOS2 230VUC	8275400000

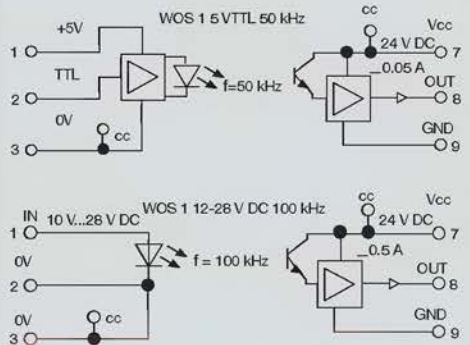
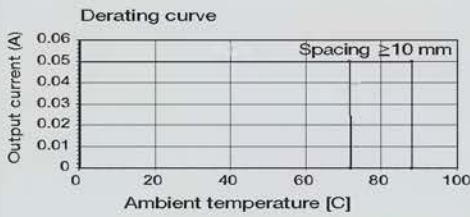
Ordering data Spare relay, pluggable

Screw connection	Type	Order No.
15-60VAC 66VDC		
115VUC		
230VUC		

Tension clamp connection	Type	Order No.

Note

for high switching frequency up to 100kHz



Output	
Output voltage	21.6 V DC ... 24 V DC ... 26.4 V DC
Output current (max.)	50 mA
Voltage drop at max. load	
Block-state curr. (closed-circuit curr.)	
Switch-on delay/Switch-off delay	1 μs/7 μs
Short-circuit-proof/Protective circuit	no/Varistor, polarity reversal protection
General data	
Operating temperature	-25°C...+60°C
Storage temperature	-40 °C...+85 °C
Approvals	CSA; ULFus; CE;
Insulation coordination (EN 50178)	
Standards	EN 50178
Rated voltage	300 V
Rated impulse withstand voltage	6.0 kV
Creepage and clearance path input - output	≥ 5,5 mm
Overvoltage category	III
Pollution severity	2
Dimensions	
Clamping range (rating- /min. /max.)	mm ² 1.5 / 0.5 / 2.5
Length x width x height	mm 72 / 22.5 / 92.4
Note	Cross-connector: and markers: see WAVESERIES accessories

Ordering data

Input	5 V TTL 50 KHZ	12-28 V DC 100 KHZ		
Rated voltage	5 V TTL	12 V DC...28 V DC		
Rated current	13 mA	8 mA		
Power rating	65 mW	190 mW		
Auxiliary voltage	5 V	no		
Status indicator	LED green in output	LED green in output		

Ordering data Complete module

Screw connection	Type	WOS1 5VTTL 50KHZ	WOS1 12-28VDC 100KHZ		
Order No.		8275210000	8275450000		
Tension clamp connection	Type				
Order No.					

Ordering data Spare relay, pluggable

Type				
Order No.				

Note				

Installation time relays

Electronic time relays from the BT product range offer ideal solutions for industrial applications.

The BT product range provides the following functions:

- Pick-up delay (BTR)
- Pulse emitter (BTTT)
- Multifunction (BTM)
- Multifunction (BTMF)
- Star-delta change-over

Time ranges and power supply for time relays

Using the central knob, you can select the functions of the modules precisely over either 4 or 8 time ranges.

The multi-voltage supply voltage range offers a wide bandwidth for industrial use (see table).

Time ranges

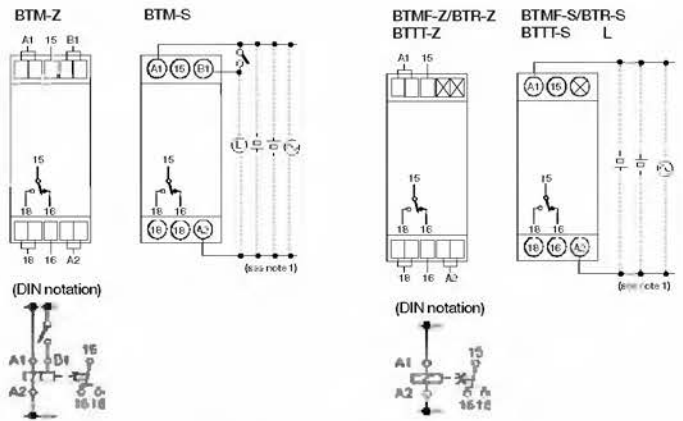
Display of time scale	Time range
0.1 s	0.1 to 1.2 s
1 s	1 to 12 s
0.1 min	0.1 to 1.2 min
1 min	1 to 12 min
0.1 h	0.1 to 1.2 h
1 h	1 to 12 h
10 h	10 to 120 h


Note:

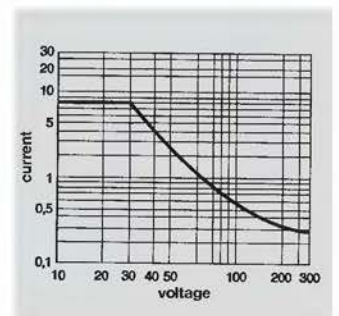
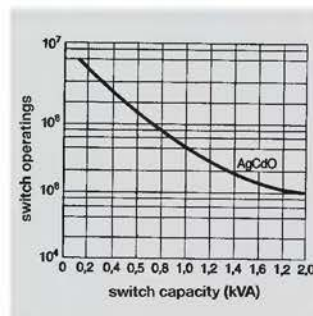
If the rotary knob for time adjustment is set to "0", the output will be switched without delay.

Output of the time relays

In every module, a change-over contact (250 V, 8A) switches the load. The multifunction module (BTM) activates both change-over contacts immediately, or one change-over contact immediately and the second after a delay.



- Note:
1. Pole numbers are not necessary for DC voltage supply.
 2. The contact symbol of H3DS is marked with  as it provides several operating modes and differs from the delayed contacts of conventional time relays.



Choosing the time range

The time range is chosen by turning the rotary switch for the ON-time scale and OFF-time scale. The time scales are visible in the display to the left of the rotary switch in the following order: 0.1 s, 1 s, 0.1 m, 1 m, 0.1 h, 1 h.

Note:

The time scales “1 s” and “0.1 h” are given twice. Both adjustments represent the same time scale.

Locking/unlocking of selectors and time setting dial

The rotary switches for the ON/OFF time adjustment and the option selector for the time scale can be locked with the locking key.

This pen-style special tool is available separately. To lock either rotary switches or the option selector, simply insert the locking key into the keyhole bottom right of the rotary switch/option selector and turn it clockwise until the knob/switch is totally covered by the red cover. To unlock, simply turn the key in the opposite direction.

Connection system

The units offers the following connection technologies:

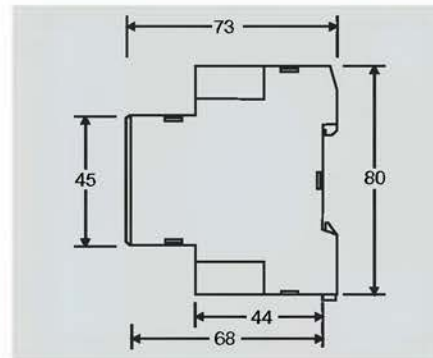
Screw connection

- 2 x 1.5 mm² with wire end ferrule
- 2 x 2.5 mm² without wire end ferrule

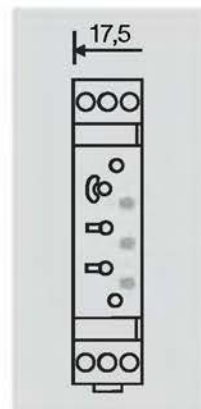
Tension clamp connection

- 2 x 1.5 mm² with wire end ferrule
- 2 x 2.5 mm² without wire end ferrule

Dimensions



Screw connection



Tension clamp connection



Time relays – BT SERIES

Installation time relays

- Screw or tension clamp connection
- LED status indicator Input: voltage present
Output: output active
- Approvals

508 EN 61812-1 IEC 60947-5-1 IEC 60664-1 EN 55011	22.2 Nr. 14 IEC 60664-1 EN 61812-1 IEC 60947-5-1 EN 50062-2
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Type designation:

- B** = Building
- T** = Timer
- R** = Response Delay
- TT** = Two Times
- M** = Multifunction, 8 ranges
- MF** = Multifunction, 4 ranges
- DS** = Delta, Star
- S** = Screw
- Z** = Tension

input		Contacts hard gold plated	
Rated voltage		24 ... 230 V AC, 50/60 Hz, 24 ... 48 V DC	
Voltage tolerance		85 ... 100 % of rated voltage	
Breaking voltage		Max. 2.4 V AC/V DC	
Power consumption per type	V AC	21 ... 33 VA at 230 V	
	V DC	0.6 ... 1.3 W at 24 V	
Reset time		Min. 0.1 s (BTDS: 0.5 s)	
Insulation			
Insulation resistance		100 MΩ min, at 500 V DC	
Insulation test voltage			
	between input and output, to enclosure	2000 V AC, 50/60 Hz, 1 min	
	between non-adjacent contacts	1000 V AC, 50/60 Hz, 1 min	
Ingress protection class		IP30, terminal block IP20	
Output			
Contact/contact material		1 change-over contact (BTDS 2 NOC) / AgNi 90/10	
Switch output		5A at 250 V AC, resistive load (cos φ = 1)	
Service life	mechanical min.	10 ⁷ switching cycles (no load, 1800/h)	
	electrical min.	10 ⁷ switching cycles (5A at 250 V AC, resistive load at 1800/h)	
Time range		0.10 s ... 120 h	
Repetition accuracy		± 1 %	
Other data			
Flammability class as per UL 94		V-2	
Ambient temperature/storage temperature		-10 ... +55 °C / -25 ... +65 °C (without condensation)	
Clamping range (nominal/min/max)	mm ²		
Length x width x height	mm	80.0 x 17.5 x 73.0	

Accessories

Designation	Type	Qty.	Order No.
Locking and adjusting key	BT Lock Pen	1	8659840000

Multifunction relay with control input (BTM)

Ordering data

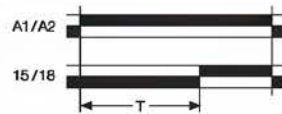
Connection system	Type	Qty	Order No.
Screw connection	BTM-S	1	8647700000
Tension clamp	BTM-Z	1	8647710000

Functions

Function A – pick-up delay

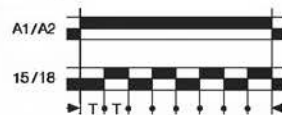
The set time T begins to be subject to delay when the input signal (A1/A2) is applied.

The output R (15/18) connects the load at the end of the set time.



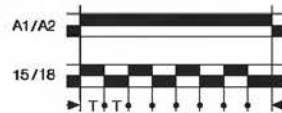
Function B – pulse emitter (starts at normal setting)

After applying the input signal (A1/A2), output R (15/18) switches the load synchronously and alternately between the normal and operating settings within the set time T . The cycle starts at the normal setting in this function.



Function B2 – pulse emitter (starts at operating setting)

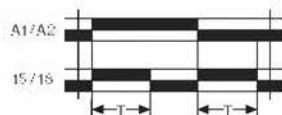
After applying the input signal (A1/A2), output R (15/18) switches the load synchronously and alternately between the normal and operating settings within the set time T . The cycle starts at the operating setting in this function.



Function C – wipe function

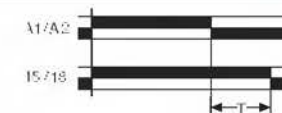
After applying the input signal (A1/A2), output R (15/18) connects the load for the set time T . Output R switches the load off again at the end of time T .

After switching off the input signal (A1/A2), output R (15/18) connects the load again for the set time T . Output R (15/18) switches the load off again at the end of time T .



Function D – drop-out delayed

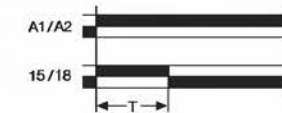
After applying the input signal (A1/A2), output R (15/18) connects the load. The time delay T begins after the input signal (A1/A2) has been switched off. At the end of time T , output R (15/18) switches the load off again.



Function E – passing make contact

After applying the input signal (A1/A2), output R (15/18) connects the load immediately.

At the end of the set delay time T , output R (15/18) switches the load off again.

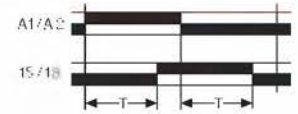


Function G – pick-up and drop-out delayed

Time delay T begins after applying the input signal (A1/A2).

At the end of this time, output R (15/18) connects the load (pick-up delayed).

After the input signal (A1/A2) has been switched off again, the output switches the load off again after the set time (drop-out delayed).



Function J – pick-up delay with pulse

Time delay T begins after applying the input signal (A1/A2).

At the end of this time, the output R (15/18) connects the load for 1 second.



Time relays – BT SERIES

Multi-function relay without control input (BTMF)

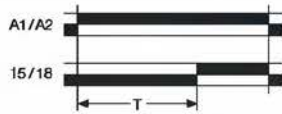
Functions

Connection system	Type	Qty	Order No.
Screw connection	BTMF-S	1	8647680000
Tension clamp	BTMF-Z	1	8647690000

Ordering data

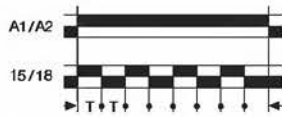
Function A – pick-up delay

The set time T begins to be subject to delay when the power supply is applied. At the end of the set time, the output connects the load.



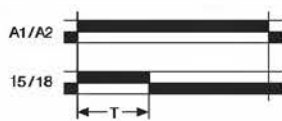
Function B2 – pulse emitter (starts at operating setting)

After applying the supply voltage, output R switches the load synchronously and alternately between the normal and operating settings within the set time T. The cycle starts at the operating setting in this function.



Function E – passing make contact

After applying the supply voltage, output R connects the load immediately. After the set delay time T, output R (15/18) switches the load off again.



Function J – pick-up delay with pulse

The time delay T begins after applying the power supply. At the end of this time, the output R (15/18) connects the load for 1 second.



Time relay (BTR)

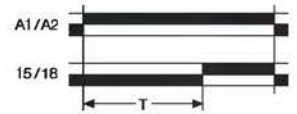
Functions

Connection system	Type	Qty	Order No.
Screw connection	BTR-S	1	8647720000
Tension clamp	BTR-Z	1	8647730000

Ordering data

Function A – pick-up delay

The set time T begins to be subject to delay when the power supply is applied. At the end of the set time, the output R connects the load.



Time relay (BTTT)

Functions

Connection system	Type	Qty	Order No.
Screw connection	BTTT-S	1	8647740000
Tension clamp	BTTT-Z	1	8647750000

Ordering data

Function BTTT – pulse emitter

After applying the supply voltage, the repeat cycle begins with two independently adjusted times. The standard setting is to begin with the normal setting. A bridge between connections A1 and A2 allows the module to begin at the operating setting.



Time relay (BTDS)

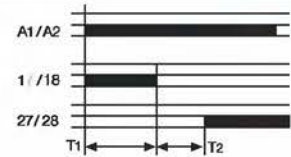
Functions

Connection system	Type	Qty	Order No.
Screw connection	BTDS-S	1	8647660000
Tension clamp	BTDS-Z	1	8647670000

Ordering data

Star-deita change-over

After applying the supply voltage, output R1 (17/18) connects immediately. At the end of time T1, output R1 (17/18) switches off and time T2 starts. At the end of time T2, output R2 (27/28) connects. After switching off the supply voltage, output R2 (27/28) switches off.



Timing relay - DK SERIES

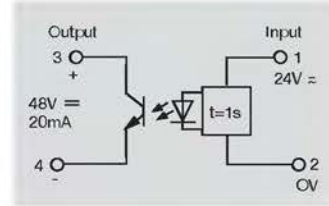
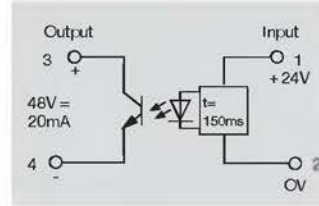
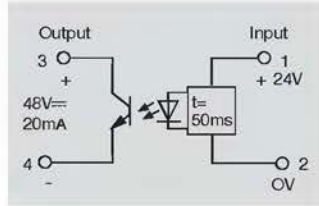
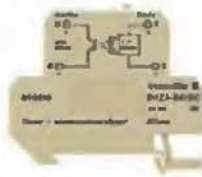
Mini-coupler DKZ

- Components for lengthening short pulses for the PLC
- Fixed switch-on/switch-off delay
- Low input power
- Screw clamp connection system
- Plug-in cross-connection
- 6 mm wide
- For mounting on TS 35

24 V DC 50 ms

24 V DC 150 ms

24 V UC 1 s



Technical data

Input

Rated voltage	24 V DC ±18 %
Rated current DC	6.7mA
Rated current AC	
Power rating	160 mW
Switch-on delay	50 ms
Switch-off delay	
min. impulse duration	2.0

Output

max. switching voltage DC	48 V
max. switching current	20 mA
max. switching frequency at rated load	20.0 Hz

Rated data

Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C

Insulation coordination (EN 50178)

Rated voltage	300 V
Impulse withstand voltage	4 kV
Overvoltage category	III
Pollution severity	2
Creepage and clearance path input - output	≥ 4 mm
Dielectric strength, Input/Output	4 kV

Rated voltage	24 V DC ±18 %
Rated current DC	6.7mA
Rated current AC	
Power rating	160 mW
Switch-on delay	50 ms
Switch-off delay	
min. impulse duration	2.0
max. switching voltage DC	48 V
max. switching current	20 mA
max. switching frequency at rated load	20.0 Hz
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Rated voltage	300 V
Impulse withstand voltage	4 kV
Overvoltage category	III
Pollution severity	2
Creepage and clearance path input - output	≥ 4 mm
Dielectric strength, Input/Output	4 kV

Rated voltage	24 V DC ±18 %
Rated current DC	6.7 mA
Rated current AC	
Power rating	160 mW
Switch-on delay	150 ms
Switch-off delay	
min. impulse duration	2.5
max. switching voltage DC	48 V
max. switching current	20 mA
max. switching frequency at rated load	20.0 Hz
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Rated voltage	300 V
Impulse withstand voltage	4 kV
Overvoltage category	III
Pollution severity	2
Creepage and clearance path input - output	≥ 4 mm
Dielectric strength, Input/Output	4 kV

Rated voltage	24 V UC ±10 %
Rated current DC	5.1 mA
Rated current AC	6.1 mA
Power rating	130 mW / 150 mVA
Switch-on delay	1 s
Switch-off delay	
min. impulse duration	max. 0.7 ms
max. switching voltage DC	48 V
max. switching current	20 mA
max. switching frequency at rated load	0.9 Hz
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Rated voltage	300 V
Impulse withstand voltage	4 kV
Overvoltage category	III
Pollution severity	2
Creepage and clearance path input - output	≥ 4 mm
Dielectric strength, Input/Output	4 kV

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Screw connection

4.0 / 0.5 / 4
65 x 6 x 62
for mounting on rail TS 35

Screw connection

4.0 / 0.5 / 4
65 x 6 x 62
for mounting on rail TS 35

Screw connection

4.0 / 0.5 / 4
65 x 6 x 62
for mounting on rail TS 35

Ordering data

Connection system	Screw connection
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Type	(Qty.=1)	Order No.
DKZA 35 24VDC 50MS		8008180000

Type	(Qty.=1)	Order No.
DKZA 35 24VDC 150MS		8022110000

Type	(Qty.=1)	Order No.
DKZ 35 24VUC 1S		8008190000

Note

Accessories

Note	End plate AP DF4 0687560000
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Note	End plate AP DF4 0687560000
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Note	End plate AP DF4 0687560000
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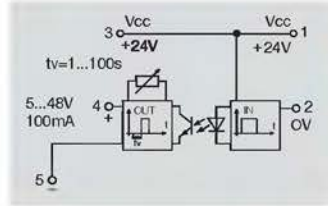
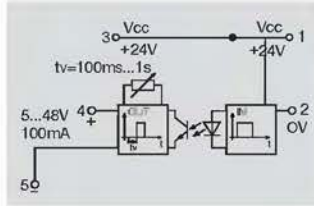
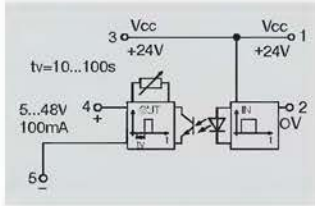
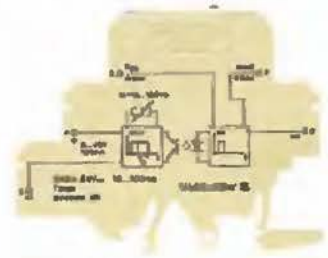
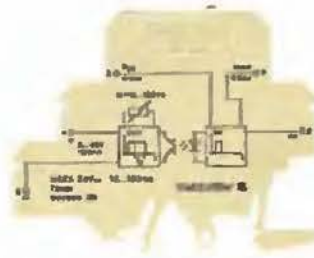
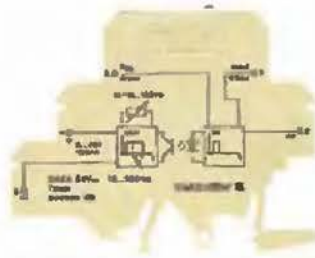
Mini-coupler DKZ

- Components for lengthening short pulses for the PLC
- Fixed switch-on/switch-off delay
- Low input power
- Screw clamp connection system
- Plug-in cross-connection
- 6 mm wide
- For mounting on TS 35

24 V DC 10-100 ms

24 V DC 0.1-1 s

24 V DC 1-100 s



Technical data

Input	
Rated voltage	24 V DC ±20 %
Rated current DC	approx. 12 mA
Power rating	290 mW
Switch-on delay	10...100 ms (adjustable)
Output	
max. switching voltage DC	48 V
max. switching current	100 mA
Rated data	
Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C
Insulation coordination (EN 50178)	
Rated voltage	300 V
Impulse withstand voltage	6 kV
Overvoltage category	IV
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Input	
Rated voltage	24 V DC ±20 %
Rated current DC	approx. 12 mA
Power rating	290 mW
Switch-on delay	100 ms ... 1 s (adjustable)
Output	
max. switching voltage DC	48 V
max. switching current	100 mA
Rated data	
Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C
Insulation coordination (EN 50178)	
Rated voltage	300 V
Impulse withstand voltage	6 kV
Overvoltage category	IV
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Input	
Rated voltage	24 V DC ±20 %
Rated current DC	approx. 12 mA
Power rating	290 mW
Switch-on delay	1 ... 100 s (adjustable)
Output	
max. switching voltage DC	48 V
max. switching current	100 mA
Rated data	
Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C
Insulation coordination (EN 50178)	
Rated voltage	300 V
Impulse withstand voltage	6 kV
Overvoltage category	IV
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Input	
Rated voltage	24 V DC ±20 %
Rated current DC	approx. 12 mA
Power rating	290 mW
Switch-on delay	1 ... 100 s (adjustable)
Output	
max. switching voltage DC	48 V
max. switching current	100 mA
Rated data	
Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C
Insulation coordination (EN 50178)	
Rated voltage	300 V
Impulse withstand voltage	6 kV
Overvoltage category	IV
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Note	

Screw connection	
4.0 / 0.5 / 4	
77 x 6 x 62	
for mounting on rail TS 35x35	

Screw connection	
4.0 / 0.5 / 4	
77 x 6 x 62	
for mounting on rail TS 35x35	

Screw connection	
4.0 / 0.5 / 4	
77 x 6 x 62	
for mounting on rail TS 35x35	

Ordering data

Connection system	
Screw connection	
Note	

Type	(Qty.=1)	Order No.
DKZ DK5 24VDC 10-100MS		8228680000

Type	(Qty.=1)	Order No.
DKZ DK5 24VDC 0.1-1S		8243780000

Type	(Qty.=1)	Order No.
DKZ DK5 24VDC 1-100S		8019650000

Accessories

Note	
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Note	
End plate AP DF5	8268870000

Note	
End plate AP DF5	8268870000

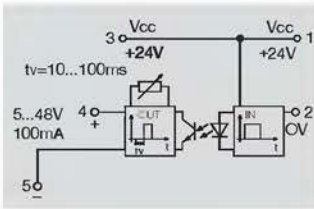
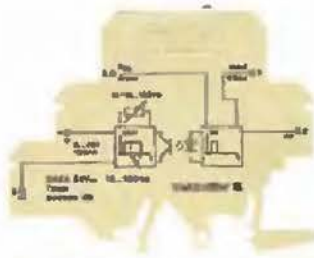
Note	
End plate AP DF5	8268870000

Timing relay - DK SERIES

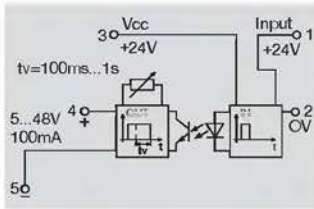
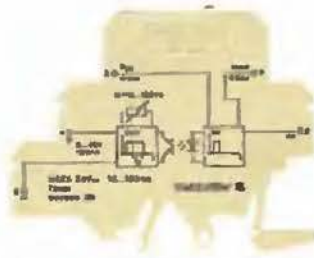
Mini-coupler DKZ

- Components for lengthening short pulses for the PLC
- Fixed switch-on/switch-off delay
- Low input power
- Screw clamp connection system
- Plug-in cross-connection
- 6 mm wide
- For mounting on TS 35

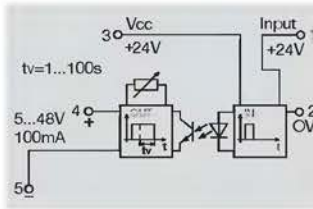
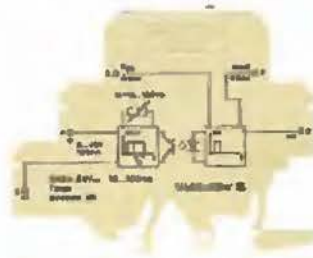
24 V DC 10-100 ms



24 V DC 0.1-1 s



24 V DC 1-100 s



Technical data

Input

Rated voltage	24 V DC ±20 %
Rated current DC	approx. 11 mA
Power rating	260 mW
Switch-off delay	10 ... 100 ms (adjustable)

Output

max. switching voltage DC	48 V
max. switching current	100 mA

Rated data

Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C

Insulation coordination (EN 50178)

Rated voltage	300 V
Impulse withstand voltage	6 kV
Overvoltage category	IV
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Dimensions

Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm

Note

Ordering data

Connection system	Screw connection
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Note

Accessories

Note

Rated voltage	24 V DC ±20 %
Rated current DC	approx. 11 mA
Power rating	260 mW
Switch-off delay	10 ... 100 ms (adjustable)
max. switching voltage DC	48 V
max. switching current	100 mA
Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C
Rated voltage	300 V
Impulse withstand voltage	6 kV
Overvoltage category	IV
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Screw connection

4.0 / 0.5 / 4
77 x 6 x 62

for mounting on rail
TS 35x7.5

Type	(Qty.=1)	Order No.
DKZA DK5 24VDC 10-100MS		8228690000

End plate
AP DF5 - 8268870000

Rated voltage	24 V DC ±20 %
Rated current DC	approx. 11 mA
Power rating	260 mW
Switch-off delay	100 ms ... 1 s (adjustable)
max. switching voltage DC	48 V
max. switching current	100 mA
Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C
Rated voltage	300 V
Impulse withstand voltage	6 kV
Overvoltage category	IV
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Screw connection

4.0 / 0.5 / 4
77 x 6 x 62

for mounting on rail
TS 35x7.5

Type	(Qty.=1)	Order No.
DKZA DK5 24VDC 0.1-1S		8243770000

End plate
AP DF5 - 8268870000

Rated voltage	24 V DC ±20 %
Rated current DC	approx. 11 mA
Power rating	260 mW
Switch-off delay	1 ... 100 s (adjustable)
max. switching voltage DC	48 V
max. switching current	100 mA
Operating temperature	-25 °C... +50 °C
Storage temperature	-40 °C... +85 °C
Rated voltage	300 V
Impulse withstand voltage	6 kV
Overvoltage category	IV
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Screw connection

4.0 / 0.5 / 4
77 x 6 x 62

for mounting on rail
TS 35x7.5

Type	(Qty.=1)	Order No.
DKZA DK5 24VDC 1-100S		8019630000

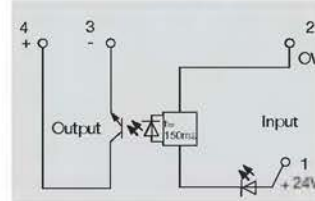
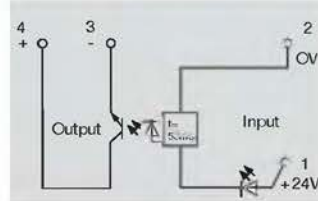
End plate
AP DF5 - 8268870000

Miniconditioner MCZ TO

- Components for lengthening short pulses for the PLC
- Fixed switch-off delay
- Low input power
- Tension clamp connection system
- Plug-in cross-connection
- 6 mm wide
- For mounting on TS 35

24 V DC 50 ms

24 V DC 150 ms



Technical data

Input	
Rated voltage	24 V DC ±10 %
Rated current DC	6.7mA +/-10%
Power rating	160 mW
Switch-off delay	50 ms
min. impulse duration	2.0 ms
Output	
max. switching voltage DC	48 V
max. switching current	20 mA
max. switching frequency at rated load	20.0 Hz
Rated data	
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Insulation coordination (EN 50178)	
Rated voltage	300 V
Impulse withstand voltage	6 kV
Oversoltage category	III
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Rated voltage	24 V DC ±10 %
Rated current DC	6.7mA +/-10%
Power rating	160 mW
Switch-off delay	50 ms
min. impulse duration	2.0 ms
max. switching voltage DC	48 V
max. switching current	20 mA
max. switching frequency at rated load	20.0 Hz
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Rated voltage	300 V
Impulse withstand voltage	6 kV
Oversoltage category	III
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Rated voltage	24 V DC ±10 %
Rated current DC	6.7mA +/-10%
Power rating	160 mW
Switch-off delay	150 ms
min. impulse duration	2.5 ms
max. switching voltage DC	48 V
max. switching current	20 mA
max. switching frequency at rated load	5.0 Hz
Operating temperature	-25 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Rated voltage	300 V
Impulse withstand voltage	6 kV
Oversoltage category	III
Pollution severity	2
Creepage and clearance path input - output	≥ 5,5 mm
Dielectric strength, Input/Output	4 kV

Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Note	

Tension clamp connection	
Clamping range (rating- / min. / max.)	1.5 / 0.5 / 2.5
Length x width x height	91 x 6 x 63.2
for mounting on TS 35	

Tension clamp connection	
Clamping range (rating- / min. / max.)	1.5 / 0.5 / 2.5
Length x width x height	91 x 6 x 63.2
for mounting on TS 35	

Ordering data

Connection system	
Tension clamp connection	
Note	

Type	(Qty.=1)	Order No.
MCZ TO 24VDC/50MS		8324590000

Type	(Qty.=1)	Order No.
MCZ TO 24VDC/150MS		8286410000

Accessories

Note	
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End plate	AP-MCZ	8289000000
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End plate	AP-MCZ	8289000000
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Overview of function components

C

Switch and button modules

The dimensions of the switch and button modules are adapted to suit the electronic components in the integral housing.

The housings are equipped with a universal DIN rail mounting foot for TS 32 and TS 35 terminal rails.

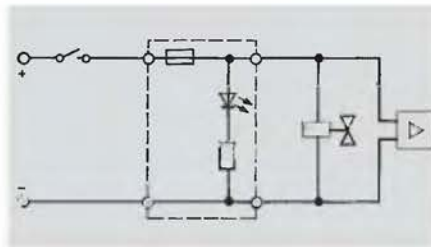
Buttons and switches simplify the commissioning, maintenance, monitoring and repair of systems. The contacts are rated for inductive or resistive load.

When switching inductive loads, a contact protection circuit has to be provided, such as Weidmüller terminals with diodes or RC combination.

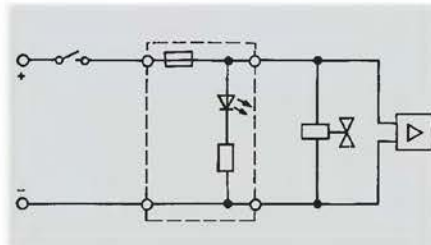
Fuse modules

Unlike fuse terminals with a failure indicator, here an LED indicates that the fuse is functional. The circuit carries no closed-circuit current when the fuse is defective.

Example of use:
Fuse for a solenoid valve



If the fuse is defective, no data is sent to the electronic component.

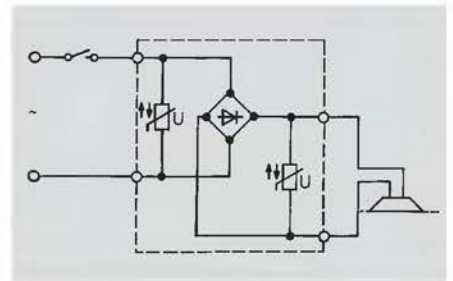


The electronic component receives – via the current of the LED – incorrect data about the switching state of the solenoid valve.

Rectifier circuit

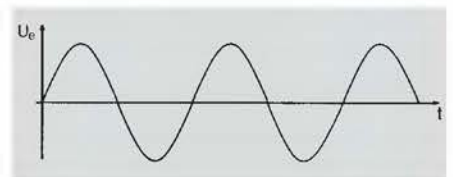
EGD rectifier modules are accommodated in EG2 housings which clip onto the mounting rail.

The bridge circuit consists of 4 individual diodes which allow for an extended input voltage range of 5 to 240 V AC

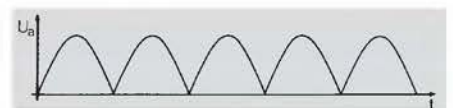


The DC output voltage is 90 % of the AC input voltage; a load capacitor is not used. Varistors in both the input and output circuits protect the industry-grade rectifier circuits from dangerous overvoltages.

Input voltage



Output voltage



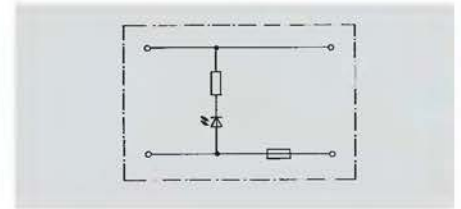
EGT 1

Switch and button module



EGS

Fuse module with indicator



Technical data

Nominal data	
Input voltage	
Rated current	

Max. 250 V~	EGT 0	EGT 1 to EGT 6
Resistive load	3 A/250 V~	6 A/250 V~
Inductive load	5 A/30 V~	4 A/250 V~

230 V~ or 24 V~ or 42 V~
Max. 6.3 A
5 x 20 mm fuse

Storage temperature	-40 °C ... +100 °C
Ambient temperature	
- fitted without spacing on rail	-25 °C ... +8 °C
- fitted with 20 mm spacing on rail	-25 °C ... +85 °C
Insulation coordination as per EN 50178	
Overvoltage category	
Pollution severity	

-40 °C ... +100 °C
-25 °C ... +8 °C
-25 °C ... +85 °C

-40 °C ... +100 °C
-25 °C ... +55 °C
-25 °C ... +65 °C
1
2

Ordering data

Type	Switching function	Qty	Order No.
EGT 0	1 NOC	10	8002290000
	1 NOC		
EGT 1	Circuit-breaker	10	0126360000
EGT 2	Change-over contact, switching	10	0104060000
EGT 3	Change-over contact, off position in the middle, switching to both sides	10	0104160000
EGT 4	Change-over contact, off position in the middle, button to one side, switching to one side	10	0104360000
EGT 5	Change-over contact, off position in the middle, button to both sides	10	0104260000
EGT 6	Change-over contact, button	10	0114660000

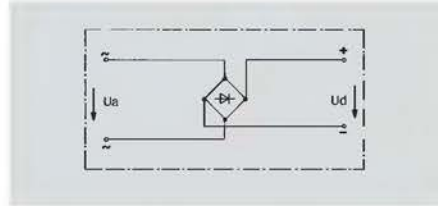
Type	Qty	Order No.
EGS 230 V~	10	1115860000
EGS 24 V~	10	0193860000
EGS 42 V~	10	8029370000

Function components

C

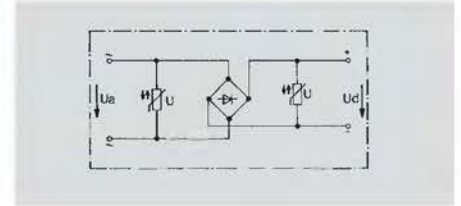
EGD 1

Rectifier circuit



EGD 2

Rectifier circuit with varistor protection circuit



Technical data

Nominal data

Input voltage

Rated current

5 V~ ... 240 V~, 50 ... 60 Hz

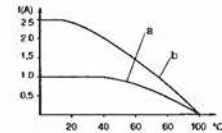
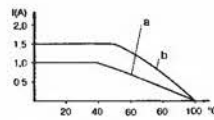
1 A

5 V~ ... 240 V~, 50 ... 60 Hz

1 A

Derating curve

a = fitted without spacing on mounting rail
b = fitted at 20 mm spacing on mounting rail



Max. downstream load capacitor

Current load max.

Surge current limit value

Conducting-state voltage

Output voltage

Storage temperature

Ambient temperature

- fitted without spacing on mounting rail

- fitted at 20 mm spacing on mounting rail

Insulation coordination as per EN 50178

Overvoltage category

Pollution severity

200 µF

1,5A (see derating curve)

40 A (10 ms)

≤ 2 V

$U_d = 0,9 \times U_a$

-45 °C ... +100 °C

-30 °C ... +40 °C

-30 °C ... +70 °C

II

2

500 µF

2,5 A (see derating curve)

10 A (10 ms)

≤ 2,2 V

$U_d = 0,9 \times U_a$

-45 °C ... +100 °C

-30 °C ... +40 °C

-30 °C ... +70 °C

II

2

Ordering data

Type	Qty	Order No.
EGD 1	10	0546160000

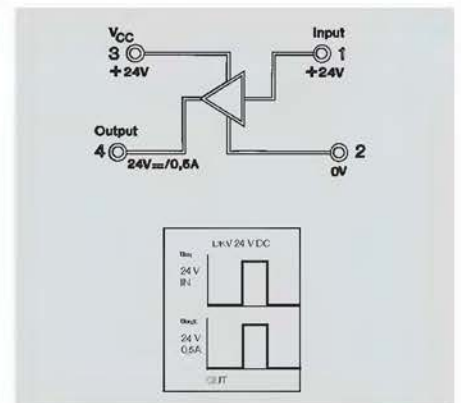
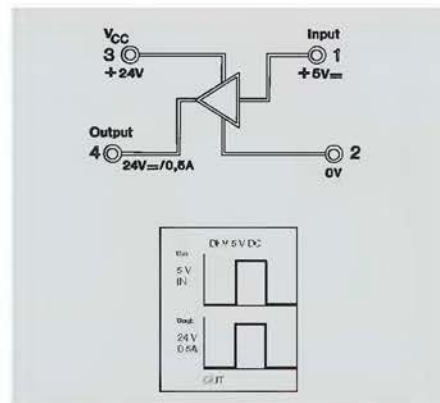
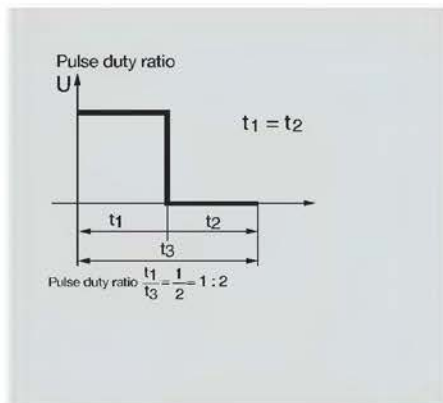
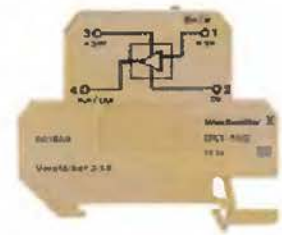
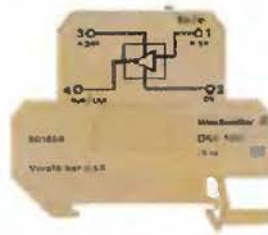
Type	Qty	Order No.
EGD 2	10	0546260000

Inputs and outputs

Amplified DKV

DKV 5 V DC

DKV 24 V DC



Technical data

Input voltage	5 V DC ± 10 % off: ≤ 1.5 V on: ≥ 4.5 V	24 V DC ± 10 % off: ≤ 6 V on: ≥ 20.4 V
Switching threshold	approx. 3 V	approx. 13 V
Input current	100 µA	5 mA
Power loss, max.	500 µW	550 mW
Output voltage	24 V DC	24 V DC
Output current, max.	500 mA	500 mA
Output current, min.	50 µA	50 µA
Switching frequency, max.; duty factor 1:2	3 kHz	3 kHz
Voltage drop at max. load	≤ 450 mV	≤ 900 mV
Block-state current	≤ 20 µA	≥ 50 µA
Insulation coordination as per EN 50178		
Operating temperature	no galvanic isolation between input and output -25 °C ... +40 °C -25 °C ... +50 °C	no galvanic isolation between input and output -25 °C ... +40 °C -25 °C ... +50 °C
Storage temperature	-40 °C ... +85 °C	-25 °C ... +85 °C
Conductor	AWG 22 ... 12	AWG 22 ... 12
Conductor cross-section	0.5 ... 4 mm ²	0.5 ... 4 mm ²
Width	6 mm	6 mm

Ordering data

for TS 35	Type DKV 5 V DC	Order No. 8018590000	Type DKV 24 V DC	Order No. 8015790000
	input at bottom		input at bottom	

Accessories

End plate	Type AP DKT4	Order No. 0687560000	Type AP DKT4	Order No. 0687560000
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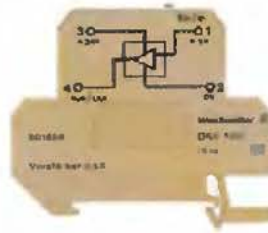
Function components

Inputs and outputs

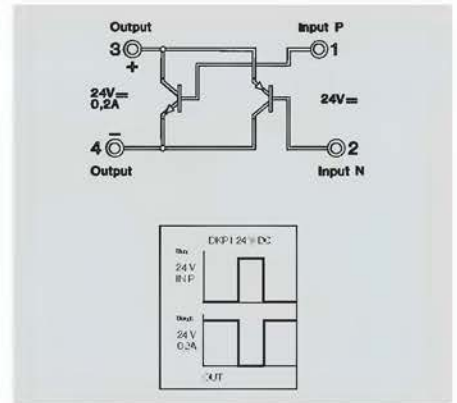
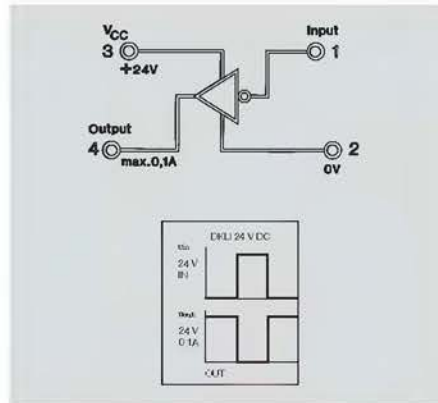
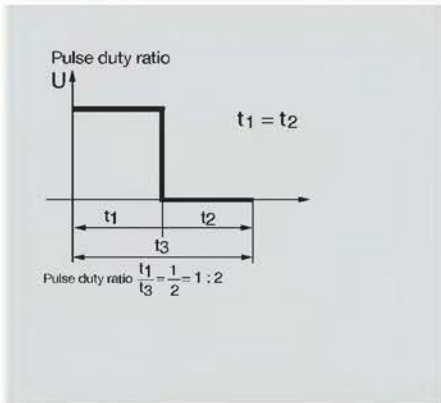
Inverter

DKLI 24 V DC

DKPI 24 V DC



C



Technical data

Input voltage	
Switching threshold	
Input current	
Power loss, max.	
Output voltage	
Output current, max.	
Output current, min.	
Switching frequency, max.; duty factor 1:2	
Voltage drop at max. load	
Block-state current	
Insulation coordination as per EN 50178	
Operating temperature	without spacing
	with spacing
Storage temperature	
Conductor	
Conductor cross-section	
Width	

24 V DC \pm 10 %	
off: \geq 20.4 V on: \leq 4 V	
approx. 8 V	
7.5 mA	
230 mW	
24 V DC	locked
100 mA	0 mA
50 μ A	
3 kHz	
100 mV	
\leq 50 μ A	
no isolation between input and output	
-25 $^{\circ}$ C ... +40 $^{\circ}$ C	
-25 $^{\circ}$ C ... +50 $^{\circ}$ C	
-40 $^{\circ}$ C ... +85 $^{\circ}$ C	
AWG 22 ... 12	
0.5 ... 4 mm ²	
6 mm	

P: 24 V DC \pm 10 %	
N: -24...+24 V DC	
P: approx. 18 V / N: approx. 8 V	
approx. 8 mA	
approx. 500 mW	
24 V DC	
200 mA	
50 μ A	
3 kHz	
\leq 1.5 V	
\leq 50 μ A	
no isolation between input and output	
-25 $^{\circ}$ C ... +40 $^{\circ}$ C	
-25 $^{\circ}$ C ... +50 $^{\circ}$ C	
-25 $^{\circ}$ C ... +85 $^{\circ}$ C	
AWG 22 ... 12	
0.5 ... 4 mm ²	
6 mm	

Ordering data

for TS 35	

Type	Order No.
DKLI 24 V DC	8010950000
input at bottom	

Type	Order No.
DKPI 24 V DC	8019530000
input at bottom	

Accessories

End plate	

Type	Order No.
AP DKT4	0687560000

Type	Order No.
AP DKT4	0687560000

Analogue signal processing

Analogue signal processing	
Introduction	D.2
MCZ-SERIES	D.4
MCZ-SERIES – DC/DC passive isolator	D.5
MCZ-SERIES – PT 100/RTD signal isolator	D.6
MCZ-SERIES – Frequency signal isolator	D.7
MCZ-SERIES – Limit value monitoring	D.8
MCZ-SERIES – Accessories	D.9
MICROinterface Analogue	D.10
MICROSERIES	D.12
MICROSERIES – DC/DC 3-way isolator	D.13
MICROSERIES – Feed isolator	D.14
MICROSERIES – PT 100/RTD signal isolator	D.16
MICROSERIES – Thermoelement signal isolator/converter	D.17
MICROSERIES – Accessories	D.19
WAVESERIES	D.20
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WAVESERIES – PT100/RTD	D.36
WAVESERIES – Thermoelement signal converter, configurable	D.42
WAVESERIES – Thermoelement signal isolator/converter	D.43
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WAVESERIES – Bridge-type measuring isolating transformer	D.46
WAVESERIES – Limit value monitoring	D.47
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WAVESERIES – Current monitoring	D.50
WAVESERIES – Voltage monitoring	D.54
WAVESERIES – Accessories	D.57
RS-SERIES – AD/DA converters	D.58
DK-SERIES – Preprocessing logic	D.66
Logic distribution	D.70
CMA – Current monitoring	D.72
PLUGCONTROL	D.73

Analogue signal processing

The working environment can be measured in many different forms, e.g. in terms of temperature, humidity or air pressure. The values of these physical variables change constantly. Elements that monitor the statuses and status changes of a given environment and supply an indication of this changing environment must be able to portray the continuous change.

D

In industrial monitoring tasks, sensors are responsible for registering ambient statuses. Sensors provide signals which allow detailed conclusions for downstream evaluation and monitoring systems with detailed conclusions about the statuses or status changes, e.g. in a production process. Sensor signals monitor continuous changes in the field. They occur in digital and analogue form. As a rule, they supply an electrical voltage or current value which corresponds proportionally to the physical variables being monitored.

If automation processes are expected to reach certain statuses or keep them constant, then analogue signal processing is required. It is also important in areas where this has already been part of long established practice, e.g. in process engineering or the chemicals industry.

In process engineering, standardised electrical signals are normally used. Currents of 0 ... 20 mA, 4 ... 20 mA or voltages of 0 ... 10 V have become established as the output variables for sensors recording various different physical parameters.

Weidmüller takes account of the growing preference for automation – including and in particular with analogue signal processing – and offers a wide range of products tailor-made to the requirements involved in handling sensor signals. Units for the common signals (0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V) generate an output signal as a proportional value of the variable input signal. “Protective separation”, e.g. of the sensor circuit from the evaluation circuit, is also taken into account. “Protective separation” prevents mutual interference among several sensor circuits, e.g. as in the case of earth loops in interlinked measuring circuits.

The wide range of Weidmüller products completely covers the functions involved in signal conversion, signal separation and signal monitoring. The products can thus handle nearly all applications in industrial measuring technology, and safeguard elementary functions between field signals and further processing systems. The mechanical properties of the products are built up around a consistent concept.

Signal converters can be used with other Weidmüller products and combined with each other. They are designed to entail a minimum wiring workload and maintenance in both electrical and mechanical terms.

The product range contains the following functions:

- DC/DC converters
- Current converters
- Voltage converters
- Temperature transformers for resistance thermometers and thermoelements
- Frequency converters
- Potentiometer transducers
- AC transducers
- Bridge transducers (strain gauges)
- Threshold monitoring modules
- AD/DA converters

The products are available as pure signal conversion, 2-way isolation, 3-way isolation and passive disconnectors – depending on the production functions in each case.



2-way isolation separates the signals from each other electrically and decouples the measuring circuits. Potential differences – caused by long line lengths and common reference points – are eliminated. Furthermore, the electrical separation protects against irreparable damage caused by overvoltages as well as inductive and capacitive interference.

3-way isolation decouples the supply voltage from the input and output circuits as well and enables the function to operate with just one operating voltage.

The passive separator offers an extra, decisive advantage – it requires no additional voltage supply. The power supply to the module is achieved via the input or output circuit and is transmitted to the input/output. This current loop feed is characterised by a very low consumption.

A number of products are available for temperature measurements. For example, PT100 signals in 2-, 3- and 4-wire systems are converted into standard 0-20 mA, 4-20 mA and 0-10 V signals.

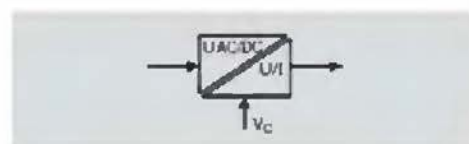
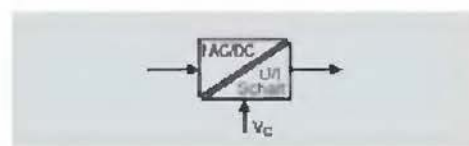
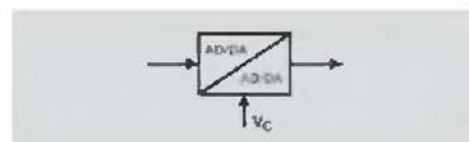
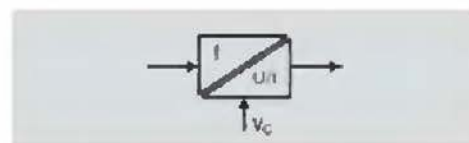
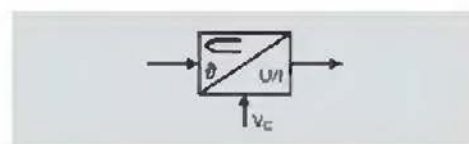
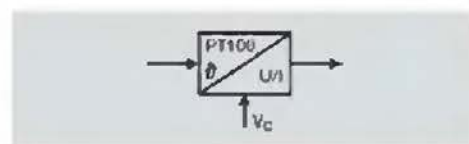
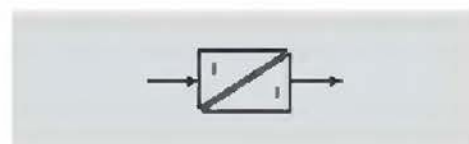
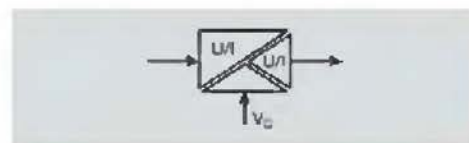
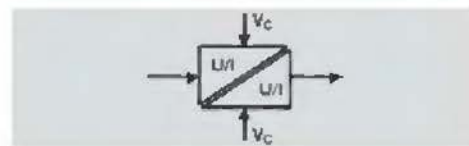
The modules for connecting conventional thermoelements are fitted with cold trap compensation as standard. Furthermore, they amplify and linearise the voltage signal provided by the thermocouple. This guarantees accurate analogue signal conditioning while eliminating sources of interference or error.

Frequency converters convert frequencies into standard analogue signals. Downstream controls can therefore directly process pulse strings for measuring rpm or speed.

AD or DA converters are required for bringing together the analogue signal forms mapping the local conditions and the digital processing in the process monitoring system. Weidmüller can supply such components for the customary 0–20 mA, 4–20 mA and 0–10 V input and output signals. 8-bit or 12-bit processors are available on the digital side.

Current monitoring modules permit the control of currents up to 60 A AC or DC. Currents above or below the set value cause a switched output to be triggered. Components with analogue outputs monitor the current load continuously via downstream controls.

Voltage monitoring modules can be used to monitor AC and DC voltages. Voltage fluctuations due to switching processes or mains overloads can be reliably detected and signalled by means of the user-defined switching threshold.



Advantages of the MICROSERIES and MCZ SERIES

D

Width

Just 6 mm wide (without cover plate), the MCZ SERIES offers enough space for electronic circuits.

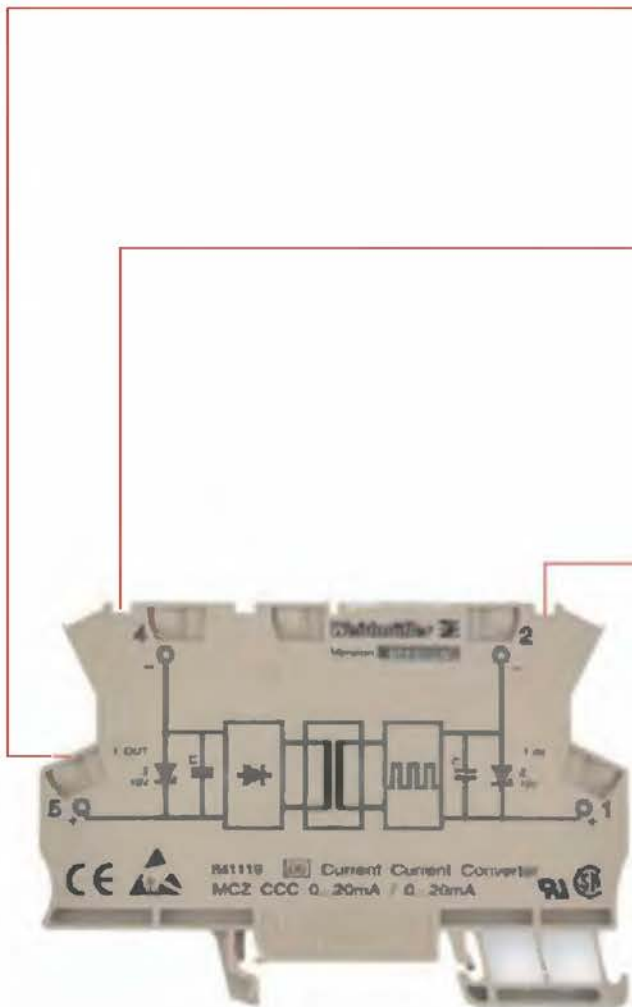
Connecting

Tension clamp connection



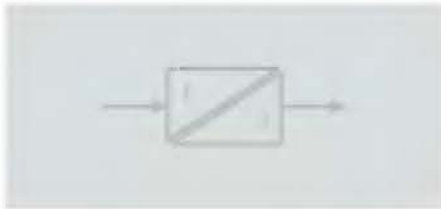
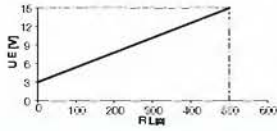
Cross-connection

The power supply and another potential can be cross-connected

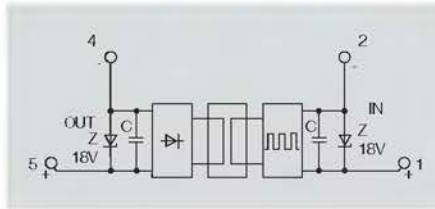
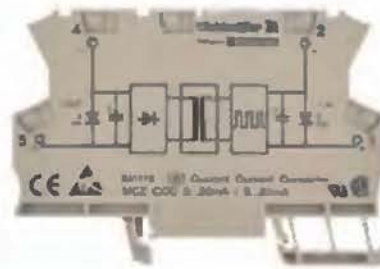


Input current loop feed

Passive isolator for electrical isolation of standard 0/4...20 mA signals. It takes its power from the measuring signal and does not need any auxiliary power supply. Special features of this component are its low power consumption and the operating current of <100 µA.



MCZ CCC



Technical data

Input	
Input voltage/Input current	/0(4)...20 mA current loop
max. voltage/max. current	15 V /50 mA
Pick-up current	< 100 µA
Voltage drop	2.5...3 V at 20 mA
Output	
Output voltage/Output current	/0(4)...20 mA
Load impedance, voltage/Current	/ \leq 500 Ω
Accuracy	< 0.1% of final value
Temperature coefficient	\leq 50ppm/K of measure. value at 0 Ω load resistance
Influence of load impedance	0.05% of measurement value/100 Ω load resistance
Residual ripple	< 10 mV _{rms}
Chopper frequency	approx. 200 kHz
General data	
Operating temperature	-25 °C...+60 °C
Storage temperature	-40 °C...+85 °C
Approvals	CSA / LULUR / CE
Insulation coordination	
Standards	EN 60529, EN 61010-1
EMC standards	EN 61000-6
Isolation voltage input, output	510 V _{rms}

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Tension clamp connection	
	1.5 / 0.5 / 1.5
	91 x 6 x 63.2

Ordering data

Type of connection	Tension clamp connection
Note	

Type	Qty.	Order No.
MCZ CCG 0-20mA/0-20mA	10	8411190000

Accessories

Note	Excess-connectors for power supply and markers - see MCZ series accessories
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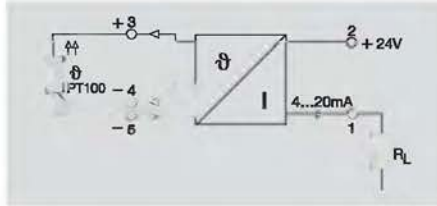
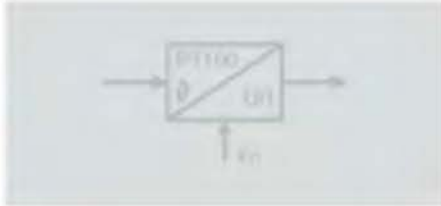
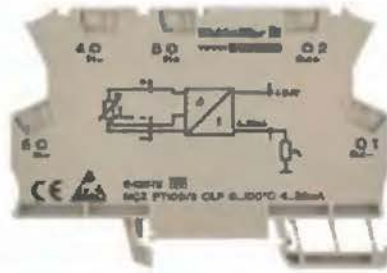
D

MCZ-SERIES - PT100/RTD-signal isolator

PT100, 2-/3-conductor converter

- For 2- or 3-conductor PT100 sensors
- Loop-fed output current
- High accuracy and linearity

MCZ PT100/3 CLP



D

Technical data

Input	
Sensor	
Supply current/Supply voltage	
Output	
Output current	
Load impedance, voltage/Current	
Accuracy/Influence of cable resistance	
Response time	
General data	
Operating temperature/Storage temperature	
Approvals	
Standards	
EMC standards	
Dimensions	
Clamping range (rating- / min. / max.)	mm*
Length x width x height	mm
Note	

PT100/2-/3-conductor
0.8 mA/9 - 30 V DC
4...20 mA (current loop)
≅ 600 Ω
typical 0.2%, max. 0.5% of FSR / max. 0.006 K/Ω
10 ms
0 °C...+50 °C / -20 °C...+85 °C
CSA;UL;UR;CE;
EN 50178, EN 60751, IEC751
EMV, EN 61000-6
Tension clamp connection
1.5 / 0.5 / 1.5
91 x 6 x 63.2
T _U =23°C, single module

Ordering data

Temperature input range	Type of connection
0...100 °C	Tension clamp connection
0...120 °C	Tension clamp connection
0...150 °C	Tension clamp connection
0...200 °C	Tension clamp connection
0...300 °C	Tension clamp connection
-50...+150 °C	Tension clamp connection
-40...+100 °C	Tension clamp connection
Note	

Type	Qty.	Order No.
MCZ PT100/3 CLP 0...100C	10	8425720000
MCZ PT100/3 CLP 0...120C	10	8483680000
MCZ PT100/3 CLP 0...150C	10	8604420000
MCZ PT100/3 CLP 0...200C	10	8473010000
MCZ PT100/3 CLP 0...300C	10	8473020000
MCZ PT100/3 CLP -50C...+150C	10	8473000000
MCZ PT100/3 CLP -40C...100C	10	8604430000
Note		
*0-line-connector for power supply and others - see MCZ series & accessories		

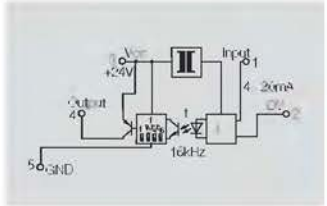
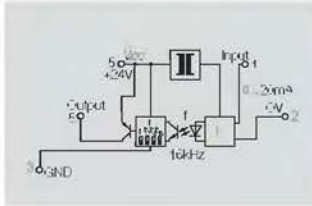
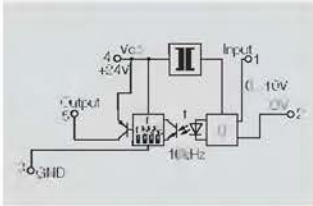
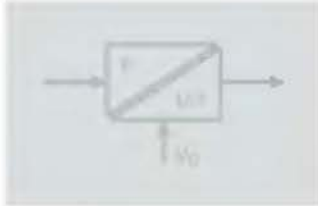
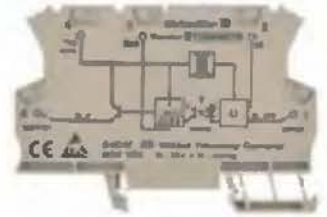
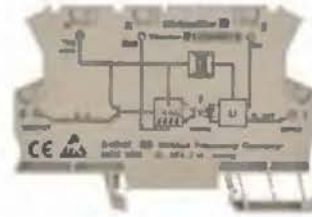
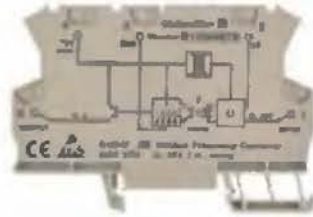
DC/f converter

The conversion of analogue signals to frequencies means it is possible to import analogue signals from the field via the counter inputs of the controller.

MCZ VFC

MCZ CFC

MCZ CFC



Technical data

Input	
Input voltage/Input current	0...10 V /
max. voltage/max. current	30 V /
Input resistance, voltage/Current	100 kΩ /
Voltage drop	
Output	
Output frequency	0...1/ 4/ 8/ 16 kHz
Output level	PNP, Lib-0.7 V
Output current	max. 20 mA
Accuracy	0.2% of FSR
Temperature coefficient	≤ 250 ppm/K
Status indicator	LED, pulsing
General data	
Supply voltage	24 V DC ± 10 %
Current consumption	14 mA without load
Current-carrying capacity of cross-connect.	≤ 20 A
Operating temperature	0 °C...+50 °C
Storage temperature	-20 °C...+85 °C
Approvals	CE,
Insulation coordination	
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	100 V
Impulse withstand voltage	1.5 kV
Isolation voltage input, output	1 kV DC
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 1,5 mm

	0...10 V /
	30 V /
	100 kΩ /
	0...1/ 4/ 8/ 16 kHz
	PNP, Lib-0.7 V
	max. 20 mA
	0.2% of FSR
	≤ 250 ppm/K
	LED, pulsing
	24 V DC ± 10 %
	14 mA without load
	≤ 20 A
	0 °C...+50 °C
	-20 °C...+85 °C
	CE,
	EN 50178
	EN 55011, EN 61000-6
	100 V
	1.5 kV
	1 kV DC
	III
	2
	≥ 1,5 mm

	/0...20 mA
	/50 mA
	/50 Ω
	1 V at 20 mA
	0...1/ 4/ 8/ 16 kHz
	PNP, Lib-0.7 V
	max. 20 mA
	0.2% of FSR
	≤ 250 ppm/K
	LED, pulsing
	24 V DC ± 10 %
	14 mA without load
	0 °C...+50 °C
	-20 °C...+85 °C
	CE,
	EN 50178
	EN 55011, EN 61000-6
	100 V
	1.5 kV
	1 kV DC
	III
	2
	≥ 1,5 mm

	/4...20 mA (current loop)
	/50 mA
	/
	5.8...6.4 V at 20 mA
	0...1/ 4/ 8/ 16 kHz
	PNP, Lib-0.7 V
	max. 20 mA
	0.15 % of FSR
	≤ 250 ppm/K
	LED, pulsing
	24 V DC ± 20 %
	14 mA without load
	0 °C...+50 °C
	-20 °C...+85 °C
	CE,
	EN 50178
	EN 55011, EN 61000-6
	150 V
	2.5 kV
	III
	2
	≥ 2 mm

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Tension clamp connection

	1.5 / 0.5 / 1.5
	91 x 6 x 63.2

Tension clamp connection

	1.5 / 0.5 / 1.5
	91 x 6 x 63.2

Tension clamp connection

	1.5 / 0.5 / 1.5
	91 x 6 x 63.2

without D3/D3 converter input current loop-fed

Ordering data

Type of connection	
Tension clamp connection	

Type	(Qty.=1)	Order No.
MCZ VFC 0-10V		8461470000

Type	(Qty.=1)	Order No.
MCZ CFC 0-20MA		8461480000

Type	(Qty.=1)	Order No.
MCZ CFC 4-20MA		8461490000

Note

Accessories

Note	
-------------	--

*Cable-connectors for power supply and markers - see MCZ series accessories.

*Cable-connectors for power supply and markers - see MCZ series accessories.

*Cable-connectors for power supply and markers - see MCZ series accessories.

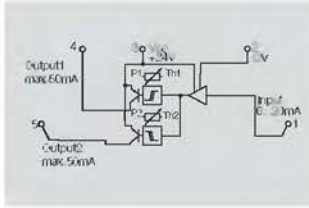
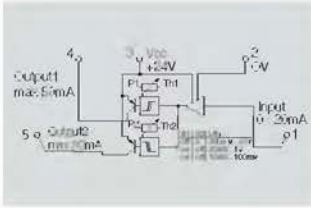
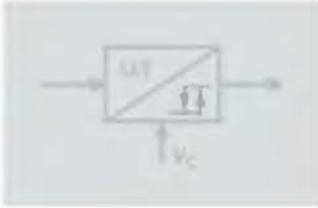
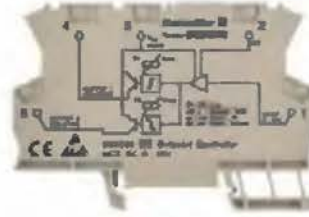
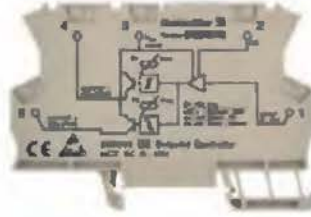
MCZ-SERIES - limit value monitoring

Transistor output

- 2 digital outputs
- Monitoring of upper and lower limits

MCZ SC 0...10 V

MCZ SC 0...20 mA



D

Technical data

	MCZ SC 0...10 V	MCZ SC 0...20 mA
Input		
Input voltage/Input current	0...10 V /	/0.5...20 mA
Input resistance, voltage/Current	60 kΩ /	/50 Ω
Voltage drop		1 V
Output		
Contact complement	double switch output PNP	double switch output PNP
Function	$U_{IN} < U_{TH1}$: Output 1 active / $U_{IN} > U_{TH2}$: Output 2 active	$I_{IN} < I_{TH1}$: Output 1 active / $I_{IN} > I_{TH2}$: Output 2 active
Switching thresholds	via 2 potentiometers (12 turns)	via 2 potentiometers (12 turns)
Hysteresis	1% of adjusted final value	1% of final value
max.	50 mA - per channel (voltage drop at output transistor: < 1.2 V at 50 mA)	50 mA - per channel (voltage drop at output transistor: < 1.2 V at 50 mA)
Step response time	< 250 μs (switch threshold at 90% of max. input signal; $P_1 \leq 1 \text{ k}\Omega$)	< 250 μs (switch threshold at 90% of max. input signal; $P_1 \leq 1 \text{ k}\Omega$)
Cut-off frequency (-3dB)	100 Hz	100 Hz
Temperature coefficient	250 ppm/K (max. 500 ppm/K)	max. 250 ppm/K
General data		
Supply voltage	24 V DC $\pm 20 \%$	24 V DC $\pm 20 \%$
Current consumption	15 mA	15 mA
Operating temperature	0 °C...+50 °C	0 °C...+50 °C
Storage temperature	-25 °C...+60 °C	-25 °C...+60 °C
Approvals	CSA / UL/UR / CE	CSA / UL/UR / CE
Insulation coordination		
Standards	EN 50178	EN 50178
EMC standards	EN 55011, EN 61000-6	EN 55011, EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.2

Tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.2

Note

Ordering data

Type of connection	Type	(Qty.=1)	Order No.	Type	(Qty.=1)	Order No.
Tension clamp connection	MCZ SC 0-10V		8260280000	MCZ SC 0-20MA		8227350000

Note

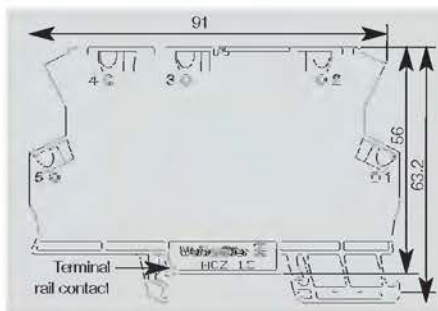
Accessories

Note

*Cable-connectors for power supply and markers - see MCZ series accessories.

*Cable-connectors for power supply and markers - see MCZ series accessories.

Accessories MCZ



Ordering data

End plate

Type	Qty	Order No.
AP MCZ 1.5	50	8389030000



Ordering data

Cross-connection, 2-pole, yellow
Cross-connection, 3-pole, yellow
Cross-connection, 4-pole, yellow
Cross-connection, 5-pole, yellow
Cross-connection, 6-pole, yellow
Cross-connection, 7-pole, yellow
Cross-connection, 8-pole, yellow
Cross-connection, 9-pole, yellow
Cross-connection, 10-pole, yellow

Type	Qty	Order No.
ZQV 4/2 ge	20	1608950000
ZQV 4/3 ge	20	1608960000
ZQV 4/4 ge	20	1608970000
ZQV 4/5 ge	20	1608980000
ZQV 4/6 ge	20	1608990000
ZQV 4/7 ge	20	1609000000
ZQV 4/8 ge	20	1609010000
ZQV 4/9 ge	20	1609020000
ZQV 4/10 ge	20	1609030000



Ordering data

Markers

Type	Qty	Order No.
WS10/6	200	1060960000

Introduction

MICROINTERFACE Analogue sets standards in analogue signal processing. It offers wide-ranging functionality within a width of just 6 mm.

The new adapter module MICROINTERFACE Analogue simplifies the wiring of your installation. The time-consuming individual wiring so vulnerable to mistakes is no longer necessary. First, set up a block of eight MAS modules and connect the two power supply modules with the plug-in ZQV cross-connectors.

Mount the MICROINTERFACE Analogue adapter on the signal terminals (input or output) and connect it. Signal transmission is via the 15-pole SUB-D plug-in connector with pre-assembled cables.

The features of MICROINTERFACE Analogue

- Electrical separation and signal conversion of analogue signals
- Upgrading of SPS I/O cards and fieldbus modules without electrical separation
- Block setup for 8 or 2 x 4 signals in a width of just 60 mm
- Adapter for all MICROINTERFACE Analogue modules, with mixed assemblies also possible
- Optional power supply via signal line, cross-connectable



Interface module

2 Microanalogue power supply modules are required to provide the power supply. The voltage applied may not exceed 50 V_{eff}.

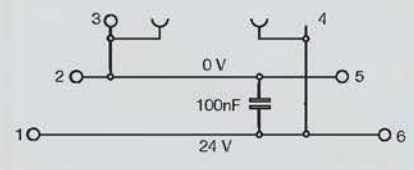
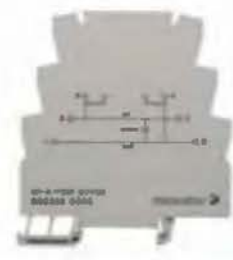
MI 8 A-I/O S-SUBD15B

Interface module analogue



MI-A-PSM 24 V DC

Power supply module



Technical data

General data

Supply voltage
Current-carrying capacity

Operating temperature
Storage temperature

Insulation coordination

Rated voltage
Pollution severity
Overvoltage category
Clearance & creepage distance

max. 30 V AC/DC
Signal paths SUB D Pin 1...8: max. 250 mA
Power supply SUB D Pin 9 & 14: 300 mA; 10 & 15: 1.3 A
0 °C...+50 °C
-20 °C...+85 °C

50 V
2
III

max. 30 V AC/DC
0 °C...+50 °C
-20 °C...+85 °C

50 V
2
II

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

SUB D socket, 15-pole

32 x 61 x 42

Screw connection

2.5 / 0.5 / 2.5
88 x 6.1 x 97.8

Ordering data

Type of connection
SUB D socket, 15-pole

Type	Qty.	Order No.
MI8A-I/O S-SUBD15B	10	8800220000

Type	Qty.	Order No.
MI-A-PSM24Vdc	10	8800230000

Note

Accessories

Note

Advantages of the MICROSERIES and MCZ-SERIES

Connecting

BLZ screw connection or BLZF tension clamp offers the the greatest possible flexibility at the wiring stage (up to 2.5 mm²).

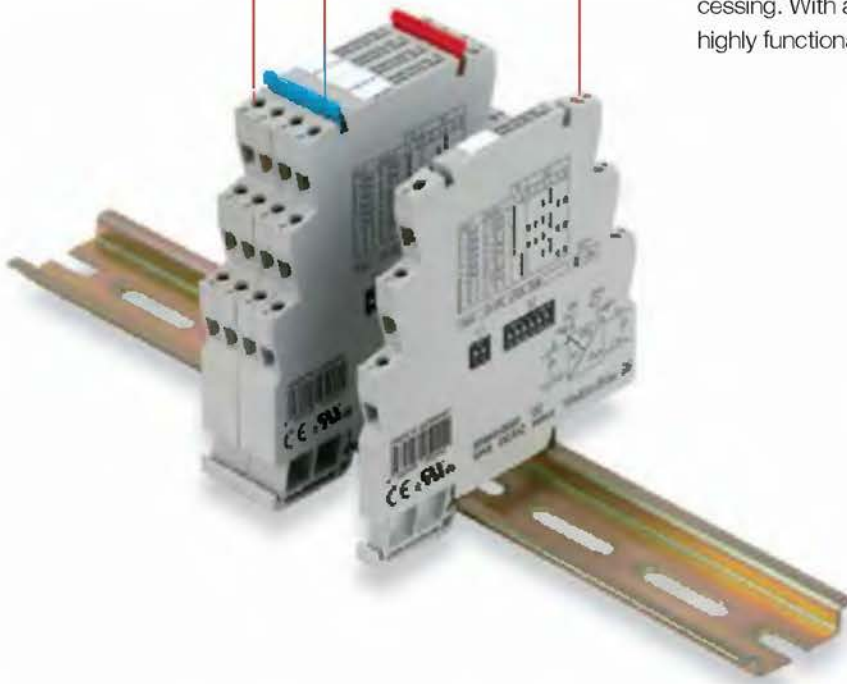


Cross-connection

The supply voltage can be bridged from one module to the next.

Width

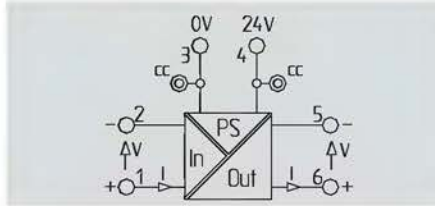
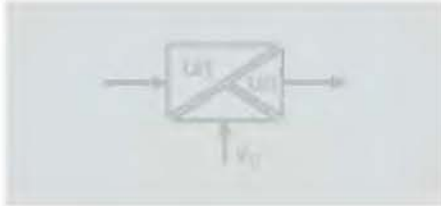
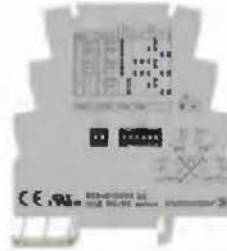
MICROANALOGUE sets standards for analogue signal processing. With a width of just 6 mm, MICROSERIES is highly functional with a completely enclosed housing.



configurable

- 3-way isolation
- calibrated switching via DIP switch
- Power supply can be cross-connected
- Low power loss

DC/DC select



Technical data

Input	0...10 V / 0(4)...20 mA
Input voltage/Input current	100 kΩ /
Input resistance, voltage/Current	< 0.1 V at I _{IN} = 20 mA (current input)
Voltage drop	
Output	0...10 V / 0(4)...20 mA
Output voltage/Output current	≥ 10 kΩ / ± 500 Ω
Load impedance, voltage/Current	< 0.5% of final value
Accuracy	≤ 150 ppm/K of final value
Temperature coefficient	≤ 20 A
Cut-off frequency (-3dB)	0 °C...+55 °C
General data	-20 °C...+85 °C
Supply voltage	0...20mA / 0...20mA
Power consumption	CE / d.f.f.us
Current-carrying capacity of cross-connect.	
Operating temperature	EN 50178
Storage temperature	DIN EN 61326
Default setting	50 V
Approvals	500 V _{eff}
Insulation coordination	II
Standards	2
EMC standards	
Rated voltage	
Isolation voltage input, output	
Overvoltage category	
Pollution severity	

Dimensions	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
Length x width x height	88 x 6.1 x 97.8	92 x 6.1 x 97.8
Note	I _u =23%; single module	

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	MAS DC/DC select	1	8594810000
Tension clamp connection	MAZ DC/DC select	1	8594840000

Note

Accessories

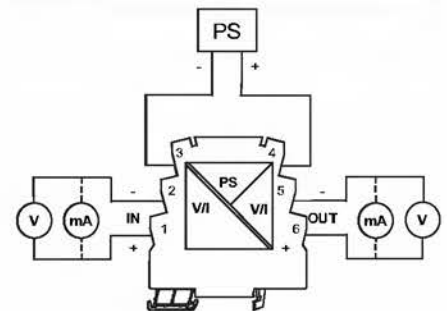
Note
Cross-connectors for power supply and markers - see MIPRO series accessories

Setting options/switch position

Input	Output	Switch							
		S1		S2					
0 ... 20 mA	0 ... 20 mA	1	2	1	2	3	4	5	6
0 ... 20 mA	4 ... 20 mA	■	□	□	□	□	□	□	□
0 ... 20 mA	0 ... 10 V	■	□	□	□	□	□	■	■
4 ... 20 mA	0 ... 20 mA	■	□	■	■	■	□	□	□
4 ... 20 mA	4 ... 20 mA	■	□	□	□	□	■	■	□
4 ... 20 mA	0 ... 10 V	■	□	■	■	■	□	■	■
0 ... 10 V	0 ... 20 mA	□	■	□	□	□	□	□	□
0 ... 10 V	4 ... 20 mA	□	■	□	□	□	■	■	□
0 ... 10 V	0 ... 10 V	□	■	□	□	□	□	□	■

■ = on
□ = off

Connection

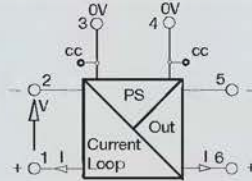


MICROSERIES - feed isolator

without HART

- 2-conductor system
- 3-port isolation
- Power supply can be cross-connected

MAS RPS



D

Technical data

Input	
Input current	4...20 mA (sensor circuit)
Sensor	2-conductor
Supply voltage	16.5 V / constant for 3...22 mA
Output	
Output current	4...20 mA
Output signal limit	22...25 mA
Load impedance, voltage/Current	/ $\leq 500 \Omega$
Accuracy	< 0.1 %
Offset current	< 30 μ A
Temperature coefficient	≤ 50 ppm/K
Residual ripple	< 10 mV _{eff}
General data	
Supply voltage	24 V DC ± 15 %
Power consumption	approx. 1 W
Current-carrying capacity of cross-connect.	≤ 20 A
Operating temperature	0 °C...+55 °C
Storage temperature	-25 °C...+85 °C
Approvals	CE; cULRus;
Insulation coordination	
Standards	EN 50178
EMC standards	DIN EN 61326 class B
Rated voltage	300 V
Isolation voltage input, output	1.5 kV AC
Overvoltage category	II
Pollution severity	2
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 2.5 / 0.5 / 2.5
Length x width x height	mm 88 x 6.1 x 97.8
Note	
Screw connection	
2.5 / 0.5 / 2.5	
88 x 6.1 x 97.8	
Note	

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	MAS RPS	1	8721150000
Note			

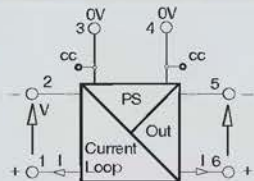
Accessories

Note	Cross-connectors for power supply and markers - see MAS RPS series accessories
-------------	--

with HART

- 2-conductor system
- 3-way isolation
- With Hart transmission
- Output signal switchable

MAS RPSH



Technical data

Input	
Input current	4...20 mA (sensor circuit)
Sensor	2-conductor
Supply voltage	16.5 V / constant for 3...22 mA
Output	
Output current	0(4)...20 mA
Output voltage	0...10 V
Output signal limit	22...25 mA resp. 11...12.5 V
Load impedance, voltage/Current	$\geq 10 \text{ k}\Omega / \leq 500 \Omega$
Accuracy	$I_{out}: < 0.1\% / U_{out}: < 0.2\%$
Offset current	$< 30 \mu\text{A}$
Temperature coefficient	$\leq 50 \text{ ppm/K}$
Residual ripple	$< 10 \text{ mV}_{eff}$
General data	
Supply voltage	24 V DC $\pm 15\%$
Power consumption	approx. 1 W
Communication	to HART specification
Current-carrying capacity of cross-connect.	$\leq 20 \text{ A}$
Operating temperature	0 °C...+55 °C
Storage temperature	-25 °C...+85 °C
Approvals	CE / cULRus
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	DIN EN 61326 class B
Rated voltage	600 V
Isolation voltage input, output	2.5 kV AC
Overvoltage category	II
Pollution severity	2

Dimensions		Screw connection
Clamping range (rating- / min. / max.)	mm ²	1.5 / 0.5 / 2.5
Length x width x height	mm	88 x 6.1 x 97.8
Note		

Ordering data

Type of connection	Screw connection	Type	Qty.	Order No.
		MAS RPSH	1	8721170000
Note				

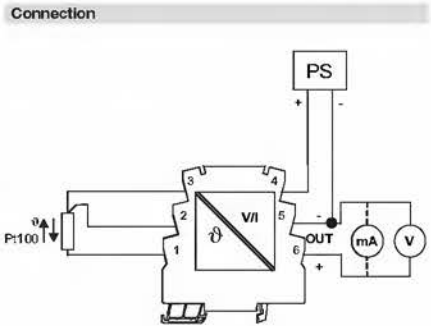
Accessories

Note	Cross-connectors for power supply and markers - see HART series accessories
-------------	---

Setting options/switch position

Output	Switch			
	1	2	3	4
4 ... 20 mA	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0 ... 20 mA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... 10 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

■ = on
□ = off

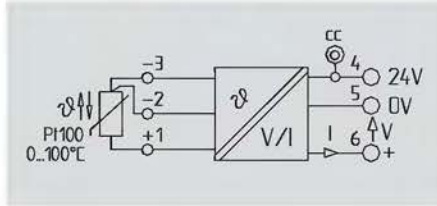
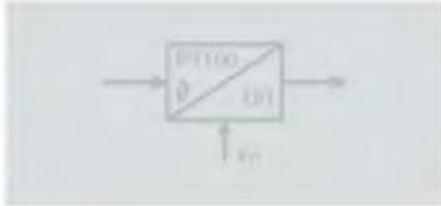


MICROSERIES - PT100/RTD-signal isolator

PT100, 2-/3-conductor converter

- 2-way isolation between input/output and power supply
- PT100 2-/3-conductor
- Output can be switched via DIP switch

PT100 Output select



D

Technical data

Input

Sensor
Supply current
Temperature input range

Output

Output voltage/Output current
Load impedance, voltage/Current
Accuracy
Temperature coefficient
Step response time

General data

Supply voltage
Power consumption
Current-carrying capacity of cross-connect.
Operating temperature
Storage temperature
Default setting
Approvals

Insulation coordination

Standards
EMC standards
Rated voltage
Impulse withstand voltage
Isolation voltage input, output
Overvoltage category
Pollution severity
Clearance & creepage distance

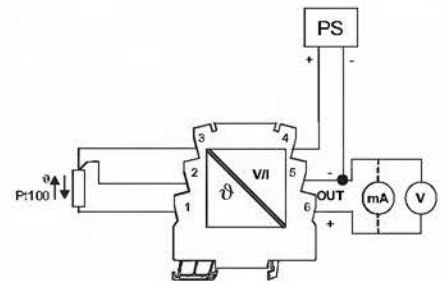
PT100/2-/3-conductor
0.8 mA
0...100 °C
0...10V / 0...5V / 0(4)...20 mA
$\geq 10 \text{ k}\Omega / \leq 300 \Omega, \leq 400 \Omega @ 24 \text{ V}$
< 0.5% of measuring range
$\leq 250 \text{ ppm/K}$ of final value
< 0.7 s
24 V DC $\pm 10 \%$
approx. 0.6 W
$\leq 20 \text{ A}$
0 °C...+55 °C
-20 °C...+85 °C
0...20 mA
CE / cULus
EN 50178, EN 60751, IEC751
EN 55011, EN 61000-6 /-2, EN 61326
100 V
1.5 kV
500 V _{eff} / 1 s
III
2
$\geq 1,5 \text{ mm}$

Setting options/switch position

Output	Switch			
	1	2	3	4
0 ... 10 V	■	■	■	□
0 ... 20 mA	□	□	□	□
4 ... 20 mA	□	□	□	■
0 ... 5 V	■	■	■	■

■ = on
□ = off

Connection



Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Screw connection	Tension clamp connection
2,5 / 0,5 / 2,5	1,5 / 0,5 / 2,5
88 x 6,1 x 97,8	92 x 6,1 x 97,8

I_u=23%; single module

Ordering data

Type of connection	
Screw connection	
Tension clamp connection	

Type	Qty.	Order No.
MAS PT100 0...100C	1	8594820000
MAZ PT100 0...100C	1	8594850000

Note

Accessories

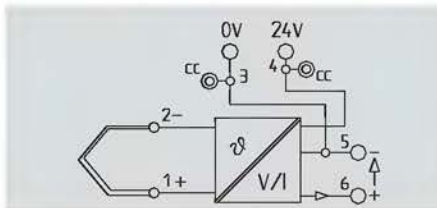
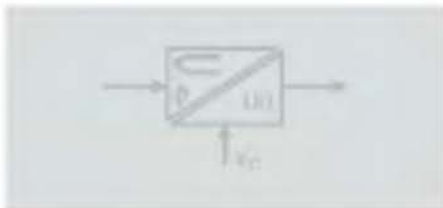
Note

Cross-connectors for power supply and markers - see MIPRO series accessories

Thermal isolator/converter type K

- 2-way isolation between input/output and power supply
- Cold-junction compensation
- Linearisation
- Output can be switched via DIP switch

Thermo K Output Select



Technical data

Input	
Sensor	Thermo element to IEC 584, type: K
Temperature input range	0...1000 °C
Output	
Output voltage/Output current	0...10V / 0...5V / 0(4)...20 mA
Load impedance, voltage/Current	≥ 10 kΩ / ≤ 300 Ω, ≤ 400 Ω @ 24 V
Accuracy	< 0.6% of measuring range
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	< 0.7 s
Wire break detection	output value: > 20 mA, > 10 V
Residual ripple	< 20 mV _{eff}
General data	
Supply voltage	24 V DC ± 10 %
Power consumption	approx. 0.6 W
Current-carrying capacity of cross-connect.	≤ 20 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Default setting	0...20mA
Approvals	CE / cULFus
Insulation coordination	
Standards	EN 50178, EN 60584, IEC 584
EMC standards	EN 55011, EN 61000-6 / 2, EN 61326
Rated voltage	100 V
Impulse withstand voltage	1.5 kV
Isolation voltage input, output	500 V _{eff} / 1 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 1,5 mm

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
I _u =23%; single module	

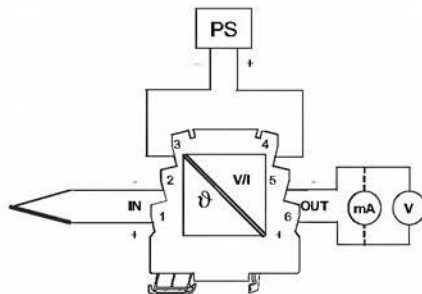
Ordering data

Type of connection	
	Screw connection
	Tension clamp connection
Note	

Accessories

Note	Cross-connectors for power supply and markers - see MIPRO series accessories
-------------	--

Setting options/switch position	
	Switch
Output	1 2 3 4
0 ... 10 V	■ ■ ■ □
0 ... 20 mA	□ □ □ □
4 ... 20 mA	□ □ □ ■
0 ... 5 V	■ ■ ■ ■
■ = on □ = off	
Connection	
Screw connection	Tension clamp connection
2,5 / 0,5 / 2,5	1,5 / 0,5 / 2,5
88 x 6,1 x 97,8	92 x 6,1 x 97,8
Note	
I _u =23%; single module	



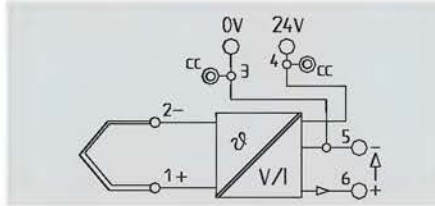
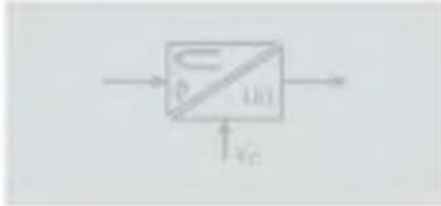
D

MICROSERIES - thermo element signal isolator / converter

Thermal isolator/converter type J

- 2-way isolation between input/output and power supply
- Cold-junction compensation
- Linearisation
- Output can be switched via DIP switch

Thermo J Output Select



D

Technical data

Input

Sensor
Temperature input range

Output

Output voltage/Output current
Load impedance, voltage/Current
Accuracy
Temperature coefficient
Step response time
Wire break detection
Residual ripple

General data

Supply voltage
Power consumption
Current-carrying capacity of cross-connect.
Operating temperature
Storage temperature
Default setting
Approvals

Insulation coordination

Standards
EMC standards
Rated voltage
Impulse withstand voltage
Isolation voltage input, output
Overvoltage category
Pollution severity
Clearance & creepage distance

Thermo element to IEC 584, type: J
0...700 °C

0...10V / 0...5V / 0(4)...20 mA
≥ 10 kΩ / ≤ 300 Ω, ≤ 400 Ω @ 24 V
< 0.7% of measuring range
≤ 250 ppm/K of final value
< 0.7 s
output value: > 20 mA, > 10 V
< 20 mV_{eff}

24 V DC ± 10 %
approx. 0.6 W
≤ 20 A
0 °C...+55 °C
-20 °C...+85 °C
0...20mA
CE / cULFus

EN 50178, EN 60584, IEC 584
EN 55011, EN 61000-6 / 2, EN 61326
100 V
1.5 kV
500 V_{eff} / 1 s
III
2
≥ 1,5 mm

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

2,5 / 0,5 / 2,5
88 x 6,1 x 97,8

Tension clamp connection

1,5 / 0,5 / 2,5
92 x 6,1 x 97,8

tu=23%; single module

Ordering data

Type of connection

Screw connection
Tension clamp connection

Type	Qty.	Order No.
MAS Thermo-J 0...700°C Output select	1	8615210000
MAZ Thermo-J 0...700°C Output select	1	8615240000

Note

Accessories

Note

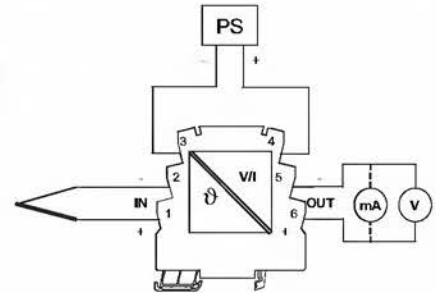
Cross-connectors for power supply and markers - see MIPRO series accessories

Setting options/switch position

Output	Switch			
	1	2	3	4
0 ... 10 V	■	■	■	□
0 ... 20 mA	□	□	□	□
4 ... 20 mA	□	□	□	■
0 ... 5 V	■	■	■	■

■ = on
□ = off

Connection



Accessories



Plug-in cross-connection

Type	No. of poles	Qty	Order No.
yellow			
ZQV 4N / 2 GE	2	60	1758250000
ZQV 4N / 3 GE	3	60	1762630000
ZQV 4N / 4 GE	4	60	1762620000
ZQV 4N / 10 GE	10	20	1758260000
ZQV 4N / 20 GE	20	20	1909020000
red			
ZQV 4N / 2 RT	2	60	1793950000
ZQV 4N / 3 RT	3	60	1793980000
ZQV 4N / 4 RT	4	60	1794010000
ZQV 4N / 10 RT	10	20	1794040000
ZQV 4N / 20 RT	20	20	1909150000
blue			
ZQV 4N / 2 BL	2	60	1793960000
ZQV 4N / 3 BL	3	60	1793990000
ZQV 4N / 4 BL	4	60	1794020000
ZQV 4N / 10 BL	10	20	1794050000
ZQV 4N / 20 BL	20	20	1909100000
black			
ZQV 4N / 2 SW	2	60	1793970000
ZQV 4N / 3 SW	3	60	1794000000
ZQV 4N / 4 SW	4	60	1794030000
ZQV 4N / 10 SW	10	20	1794060000
ZQV 4N / 20 SW	20	20	1909120000

General data – MICROSERIES

Technical data

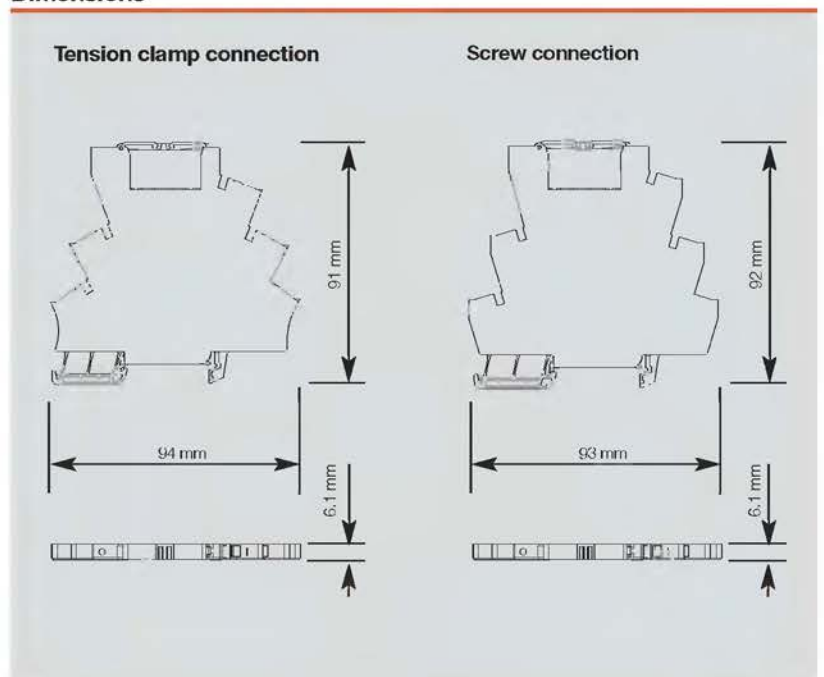
Conductor		Tension clamp connection	Screw connection
Solid H07V-U	mm ²	0.5 ... 2.5	0.5 ... 4.0
Stranded H07V-K	mm ²	0.5 ... 2.5	0.5 ... 2.5
"I" with wire end ferrules to DIN 46228-1	mm ²	0.5 ... 1.5	0.5 ... 1.5
"I" with wire end ferrules with plastic collar	mm ²	0.5 ... 1.5	0.5 ... 1.5
Max. clamping range	mm ²	0.13 ... 2.5	0.13 ... 4.0
Plug gauge to IEC 60 947-1	size	A 2	A 3

General technical data			
Nominal torque		-	0.6
Continuous current for 2-pole cross-connection	A	10	10
Continuous current for multi-pole cross-connection	A	10	10
Stripping length	mm	10	7
Ingress protection class		IP 20	IP 20
Housing material		Wemid	Wemid
UL 94 flammability rating		V-0	V-0
Nominal current	A	6	6
Nominal voltage	V	250	250

Other accessories

Type		Qty	Order No.
Base only			
MRZ 24VDC 1CO BASIS		10	8826000000
MRS 24VDC 1CO BASIS		10	8826010000
MRZ 120VUC 1CO BASIS		10	8826020000
MRS 120VUC 1CO BASIS		10	8826030000
MRZ 230VAC 1CO BASIS		10	8826040000
MRS 230VAC 1CO BASIS		10	8826050000
Markers			
WS 12/6	12 x 6 mm	200	1061160000
Labels, Lasermark			
LM MT 300 15/6 ge	484 labels/sheet	10	1686360000
Screwdriver			
SD 0.6 x 3.5 x 100		10	9008330000

Dimensions



Advantages WAVESERIES

The modules in the WAVE SERIES are ideal when users need analogue separating transducers. Weidmüller's WAVE SERIES combines the compact, space-saving design of the WAVEBOX housing with many different functions. The product range offers a wide range of signal transducers.

Features

- Independent connection system – screw or tension clamp with plug-in socket connector
- Assembly without tools
- Fast commissioning – plug-in spare boards
- Standardised current and voltage signals
- Cross-connectors for low wiring workload
- Highly functional
- Clear type designations for simple selection
- Ideal size – for more space in the control cabinet
- A cost effective solution



Replacement

The PCB can be removed from the enclosure without any tools. Simply press in the locking hook at the top and pull out the upper part with connection plane and PCB.

Cross-connection

Cross-connectors are used to connect units in the same series to bridge and transmit the power supply from one module to the next.

Safety

“Protective separation” has to be guaranteed as per EN 50178. WAVE SERIES complies with this requirement to the full with analogue signal transmission with potential separation.

Coding

The coding elements can be used to code the module for screw and also tension clamp connections without loss of poles. In this way, it is not possible to confuse the plugs.

Connecting

BLZ (screw) or BLZF (tension clamp) connectors offer the greatest possible flexibility at the wiring stage (up to 2.5 mm²).

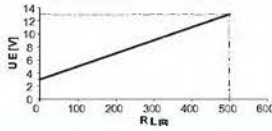
Housing (WAVEBOX)

The WAVEBOX is an ideal combination of technology, design and functionality. The enclosure is made of recyclable plastic and comes in four different widths. It needs practically no tools for assembly and fulfils the EMC requirements. Ventilation slots allow good heat dissipation.

WAVESERIES - DC/DC passive isolator

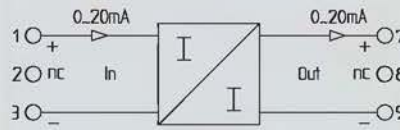
Input current loop feed

- Electrical isolation
- Very low power consumption
- Reliable isolation



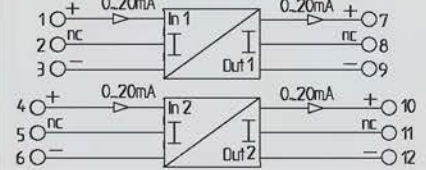
CCC LP

(1-channel)



CCC LP

(2-channel)



D

Technical data

Input

Input voltage/Input current
max. voltage/max. current
Pick-up current
Voltage drop

Output

Output voltage/Output current
Load impedance, voltage/Current
Accuracy
Temperature coefficient
Influence of load impedance
Residual ripple
Chopper frequency

General data

Operating temperature
Storage temperature
Approvals

Insulation coordination

Standards
EMC standards
Rated voltage
Impulse withstand voltage
Isolation voltage input, output
Overvoltage category
Pollution severity
Clearance & creepage distance

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Ordering data

Type of connection

Screw connection
Tension clamp connection

Note

Accessories

Note

/I(4)...20 mA current loop

18 V /50 mA

< 100 µA

approx. 3V at R_L = 0 Ω; approx. 13V at R_L = 500 Ω; (I_{IN} = 20mA)

/I(4)...20 mA

/ ≤ 500 Ω

< 0.1% of final value

≤ 50 ppm/K of final value

< 0.1% of measurement value/100 Ω load resistance

< 20 mV_{rff}

approx. 170 kHz

-25 °C...+70 °C

-40 °C...+80 °C

CSA / GL / dULus / CE

EN 50178 (protective separation)

EN 55011, EN 61000-6

300 V

6 kV

4 kV_{rff} / 1 s

III

2

≥ 5,5 mm

Screw connection

2.5 / 0.5 / 2.5

92.4 x 17.5 x 112.4

TU=23°C, single module

Tension clamp connection

1.5 / 0.5 / 2.5

92.4 x 17.5 x 112.4

/I(4)...20 mA current loop

18 V /50 mA

< 100 µA

approx. 3V at R_L = 0 Ω; approx. 13V at R_L = 500 Ω; (I_{IN} = 20mA)

/I(4)...20 mA

/ ≤ 500 Ω

< 0.1% of final value

≤ 50 ppm/K of final value

< 0.1% of measurement value/100 Ω load resistance

< 20 mV_{rff}

approx. 170 kHz

-25 °C...+70 °C

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CSA / GL / dULus / CE

EN 50178 (protective separation)

EN 55011, EN 61000-6

300 V

6 kV

4 kV_{rff} / 1 s

III

2

≥ 5,5 mm

Screw connection

2.5 / 0.5 / 2.5

92.4 x 17.5 x 112.4

TU=23°C, single module

Tension clamp connection

1.5 / 0.5 / 2.5

92.4 x 17.5 x 112.4

Type

WAS5 CCC LP 0-20/0-20mA Qty. 1 Order No. 8444950000

WAZ5 CCC LP 0-20/0-20mA Qty. 1 Order No. 8444960000

Type

WAS5 CCC LP 0-20/0-20mA Qty. 1 Order No. 8463580000

WAZ5 CCC LP 0-20/0-20mA Qty. 1 Order No. 8463590000

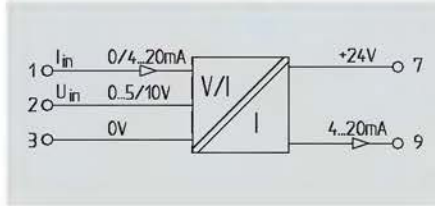
Markers see "Accessories"

Markers see "Accessories"

Output current loop feed

- Electrical isolation
- Very low power consumption
- Input range selected via DIP switch
- No calibration necessary

OLP



Technical data

Input

Input voltage
max. voltage
Input resistance, voltage/Current
Input current
max. current

0... (5) 10 V
30 V DC
0...5V: 210 kΩ; 0...10V: 430 kΩ / 51 Ω
0(4)...20 mA
40 mA

Output

Output current
Output signal limit
Load impedance, voltage/Current
Accuracy
Temperature coefficient
Residual ripple
Step response time
Cut-off frequency (-3dB)

4...20 mA (current loop)
approx. 24 mA
 $R_L = (U_D - 12 V) / 20 \text{ mA}$ e.g. 600 Ω at 24 V
0.2% of measuring range final value
 $\leq 150 \text{ ppm/K}$
50 mV_{rms} at 500 Ω
< 10 Hz: 80 ms; 100 Hz: 50 ms
10 Hz/ 100 Hz switchable

General data

Supply voltage
Operating temperature
Storage temperature
Default setting
Approvals

min. 12 V DC / max. 30 V DC
(0°C...+55°C (fitted)
-20 °C...+85 °C
0...20mA, 10 Hz
CE / cULus

Insulation coordination

Standards
EMC standards
Rated voltage
Impulse withstand voltage
Isolation voltage input, output
Overvoltage category
Pollution severity
Clearance & creepage distance

EN 50178
EN 55011, EN 61000-6
300 V
4 kV
4 kV_{eff} / 5 s
III
2
 $\geq 5,5 \text{ mm}$

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Screw connection	Tension clamp connection
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4

Note

T_{amb} = 23°C, single module

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS5 OLP	1	8543720000
Tension clamp connection	WAZ5 OLP	1	8543730000

Note

Accessories

Note

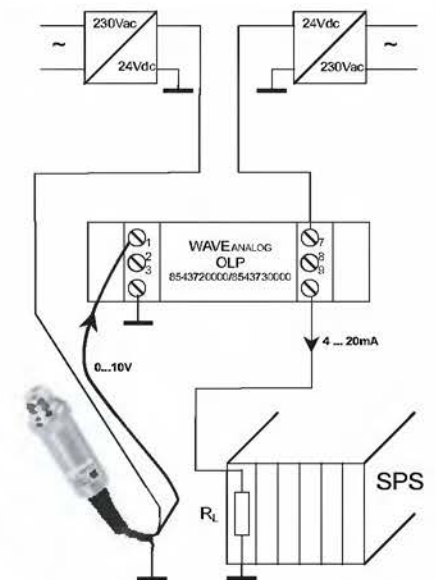
Markers see "Accessories"

Setting options/switch position

Input	SW 1			
	1	2	3	4
0...20 mA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4...20 mA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0...5 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0...10 V	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transmission frequency				
10 Hz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
100 Hz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

■ = on
□ = off

Example of application

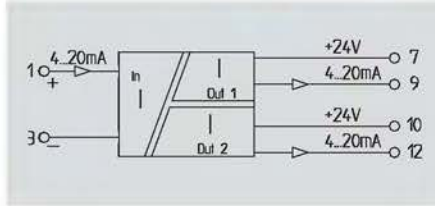
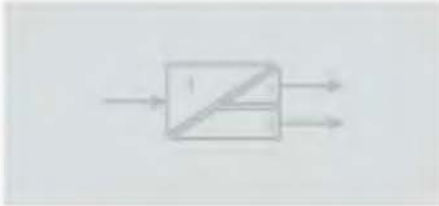


WAVESERIES - DC/DC passive isolator

Signal distributor

- Electrical isolation
- Input and output current loop feed
- Very low power consumption
- No calibration necessary

20LP



Technical data

Input

Input current
max. current
Voltage drop

4...20 mA (current loop)
40 mA
3.8 V

Output

Output current
Output signal limit
Load impedance, voltage/Current
Accuracy
Temperature coefficient
Step response time
Cut-off frequency (-3dB)

2 x 4...20 mA (current loop)
approx. 31 mA
 $R_L = (U_D - 12 V) / 20 \text{ mA}$ e.g. 600 Ω at 24 V
typical 0.1%, max. 0.2%
 $\leq 150 \text{ ppm/K}$
 $< 20 \text{ ms}$
30 Hz

General data

Supply voltage
Operating temperature
Storage temperature
Approvals

min. 12 V DC / max. 30 V DC
($0^\circ\text{C} \dots +55^\circ\text{C}$ (fitted))
 $-20^\circ\text{C} \dots +85^\circ\text{C}$
CE / cULus

Insulation coordination

Standards
EMC standards
Rated voltage
Impulse withstand voltage
Isolation voltage input, output
Overvoltage category
Pollution severity
Clearance & creepage distance

EN 50178
EN 55011, EN 61000-6
300 V
4 kV
4 kV_{eff} / 5 s
III
2
 $\geq 5,5 \text{ mm}$

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Screw connection

2.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4

Tension clamp connection

1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4

Note

$T_U = 23^\circ\text{C}$, single module

Ordering data

Type of connection

Screw connection
Tension clamp connection

Type

Type	Qty.	Order No.
WAS5 CCC 20LP	1	8581160000
WAZ5 CCC 20LP	1	8581170000

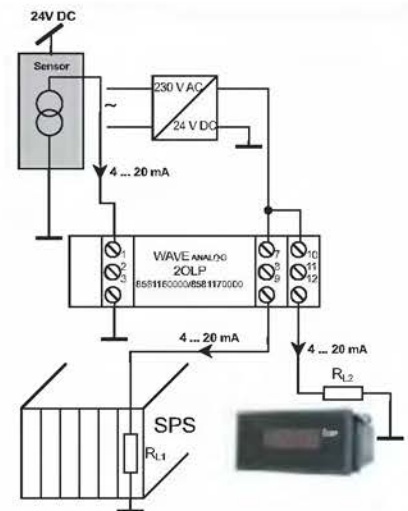
Note

Accessories

Note

Markers call "Accessories"

Example of application



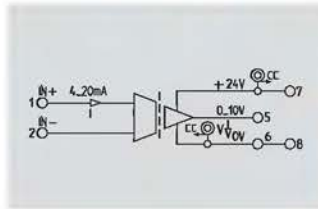
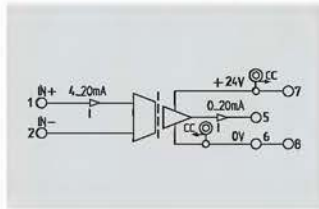
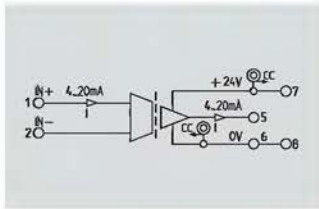
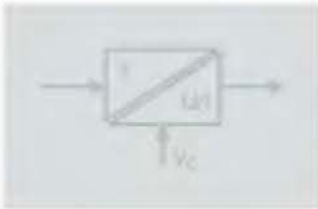
**on output side,
power supply**

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZQV cross connection system

4...20 mA/4...20 mA

4...20 mA/0...20 mA

4...20 mA/0...10 V



Technical data

Input	
Input voltage/Input current	4...20 mA (current loop)
max. voltage	7 V
max. current	25 mA
Output	
Output voltage/Output current	4...20 mA
Load impedance, voltage/Current	≥ 500 Ω
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 20 ms)
Out-off frequency (-3dB)	≥ 15 Hz (typically 20 Hz)
General data	
Supply voltage	24 V DC ± 20 %
Current consumption	< 32 mA at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Insulation coordination	
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	4...20 mA (current loop)
max. voltage	7 V
max. current	25 mA
Output voltage/Output current	0...20 mA
Load impedance, voltage/Current	≥ 500 Ω
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 20 ms)
Out-off frequency (-3dB)	≥ 15 Hz (typically 20 Hz)
Supply voltage	24 V DC ± 20 %
Current consumption	< 32 mA at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	4...20 mA (current loop)
max. voltage	7 V
max. current	25 mA
Output voltage/Output current	0...10 V /
Load impedance, voltage/Current	≥ 1 kΩ /
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 20 ms)
Out-off frequency (-3dB)	≥ 15 Hz (typically 20 Hz)
Supply voltage	24 V DC ± 20 %
Current consumption	< 20 mA at I _{OUT} = 10 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	4...20 mA (current loop)
max. voltage	7 V
max. current	25 mA
Output voltage/Output current	0...10 V /
Load impedance, voltage/Current	≥ 1 kΩ /
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 20 ms)
Out-off frequency (-3dB)	≥ 15 Hz (typically 20 Hz)
Supply voltage	24 V DC ± 20 %
Current consumption	< 20 mA at I _{OUT} = 10 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4
T _U =23°C, single module	

Ordering data

Type of connection	
Screw connection	
Tension clamp connection	

Type	(Qty.=1)	Order No.
WAS4 CCC DC 4-20/4-20mA		8444960000
WAZ4 CCC DC 4-20/4-20mA		8444990000

Type	(Qty.=1)	Order No.
WAS4 CCC DC 4-20/0-20mA		8445010000
WAZ4 CCC DC 4-20/0-20mA		8445020000

Type	(Qty.=1)	Order No.
WAS4 CVC DC 4-20/0-10V		8445040000
WAZ4 CVC DC 4-20/0-10V		8445050000

Note

Accessories

Note

*Cable-connectors for power supply and markers - see WAVE series accessories

*Cable-connectors for power supply and markers - see WAVE series accessories

*Cable-connectors for power supply and markers - see WAVE series accessories

WAVESERIES - DC/DC 2-way isolator

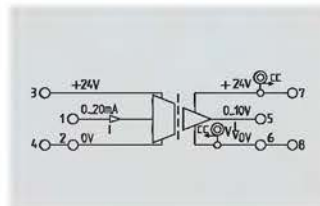
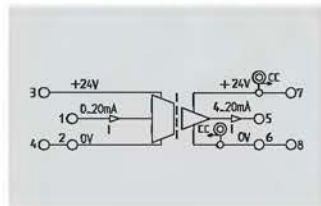
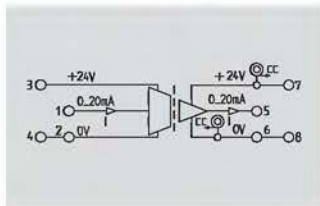
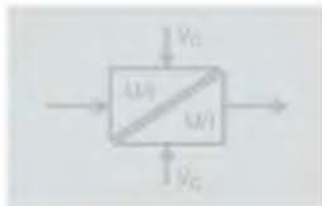
Voltage supply both sides

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZQV cross connection system

0...20 mA/0...20 mA

0...20 mA/4...20 mA

0...20 mA/0...10 V



D

Technical data

	0...20 mA/0...20 mA	0...20 mA/4...20 mA	0...20 mA/0...10 V
Input			
Input voltage/Input current	/0...20 mA	/0...20 mA	/0...20 mA
max. voltage/max. current	/25 mA	/25 mA	/25 mA
Input resistance, voltage/Current	/50 Ω	/50 Ω	/50 Ω
Output			
Output voltage/Output current	/0...20 mA	/4...20 mA	0...10 V /
Load impedance, voltage/Current	/≤ 500 Ω	/≤ 500 Ω	≥ 1 kΩ /
Accuracy	± 0.2% of final value	± 0.2% of final value	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value	≤ 250 ppm/K of final value	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 16 ms)	≤ 30 ms (typically 16 ms)	≤ 30 ms (typically 16 ms)
Out-off frequency (-3dB)	≥ 15 Hz (typically 25 Hz)	≥ 15 Hz (typically 25 Hz)	≥ 15 Hz (typically 25 Hz)
General data			
Supply voltage	24 V DC ± 20 %	24 V DC ± 20 %	24 V DC ± 20 %
Current consumption, input	< 11 mA at I _N = 20 mA	< 11 mA at I _N = 20 mA	< 11 mA at I _N = 20 mA
Current consumption, output	< 32 mA at I _{OUT} = 20 mA	< 32 mA at I _{OUT} = 20 mA	< 20 mA at I _{OUT} = 10 mA
Current-carrying capacity of cross-connect.	≤ 2 A	≤ 2 A	≤ 2 A
Operating temperature	0°C...+55°C (fitted)	0°C...+55°C (fitted)	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C	-20 °C...+85 °C	-20 °C...+85 °C
Approvals	CSA / cULus / CE	CSA / cULus / CE	CSA / cULus / CE
Insulation coordination			
Standards	EN 50178	EN 50178	EN 50178
EMC standards	EN 55011, EN 61000-6	EN 55011, EN 61000-6	EN 55011, EN 61000-6
Rated voltage	300 V	300 V	300 V
Impulse withstand voltage	4 kV	4 kV	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s	1.2 kV _{eff} / 5 s	1.2 kV _{eff} / 5 s
Overvoltage category	III	III	III
Pollution severity	2	2	2
Clearance & creepage distance	≥ 3 mm	≥ 3 mm	≥ 3 mm

	0...20 mA/0...20 mA		0...20 mA/4...20 mA		0...20 mA/0...10 V	
Dimensions	Screw connection	Tension clamp c.	Screw connection	Tension clamp c.	Screw connection	Tension clamp c.
Clamping range (rating- / min. / max.)	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
Length x width x height	92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4
Note	T _U =23°C, single module		T _U =23°C, single module		T _U =23°C, single module	

Ordering data

Type of connection	Type	(Qty.=1)	Order No.	Type	(Qty.=1)	Order No.	Type	(Qty.=1)	Order No.
Screw connection	WAS4	CCC DC 0-20/0-20MA	8445070000	WAS4	CCC DC 0-20/4-20MA	8446970000	WAS4	CVC DC 0-20/0-10V	8447020000
Tension clamp connection	WAZ4	CCC DC 0-20/0-20MA	8445080000	WAZ4	CCC DC 0-20/4-20MA	8446990000	WAZ4	CVC DC 0-20/0-10V	8447030000

Note									
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Accessories

Note	*Cable-connectors for power supply and markers - see WAVE series accessories	*Cable-connectors for power supply and markers - see WAVE series accessories	*Cable-connectors for power supply and markers - see WAVE series accessories
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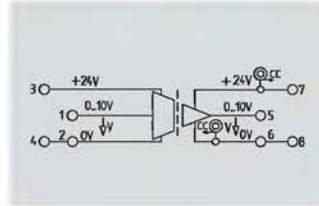
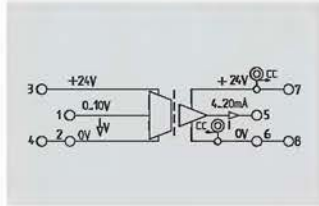
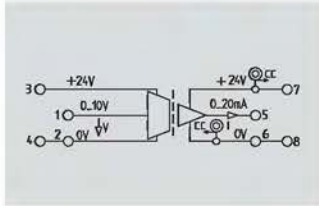
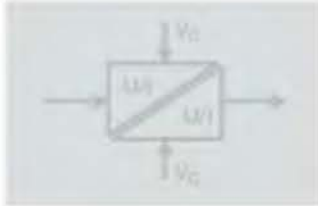
Voltage supply both sides

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZQV cross connection system

0...10 V/0...20 mA

0...10 V/4...20 mA

0...10 V/0...10 V



Technical data

Input	
Input voltage/Input current	0...10 V /
max. voltage/max. current	15 V /
Input resistance, voltage/Current	500 kΩ /
Output	
Output voltage/Output current	/0...20 mA
Load impedance, voltage/Current	/≥ 500 Ω
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 25 ms)
Out-off frequency (-3dB)	≥ 13 Hz (typically 17 Hz)
General data	
Supply voltage	24 V DC ± 20 %
Current consumption, input	< 11 mA at U _{IN} = 10 V
Current consumption, output	< 32 mA at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Insulation coordination	
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	0...10 V /
max. voltage/max. current	15 V /
Input resistance, voltage/Current	500 kΩ /
Output voltage/Output current	/4...20 mA
Load impedance, voltage/Current	/≥ 500 Ω
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 25 ms)
Out-off frequency (-3dB)	≥ 13 Hz (typically 17 Hz)
Supply voltage	24 V DC ± 20 %
Current consumption, input	< 11 mA at U _{IN} = 10 V
Current consumption, output	< 32 mA at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	0...10 V /
max. voltage/max. current	15 V /
Input resistance, voltage/Current	500 kΩ /
Output voltage/Output current	/0...10 V /
Load impedance, voltage/Current	≥ 1 kΩ /
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 25 ms)
Out-off frequency (-3dB)	≥ 13 Hz (typically 17 Hz)
Supply voltage	24 V DC ± 20 %
Current consumption, input	< 11 mA at U _{IN} = 10 V
Current consumption, output	< 20 mA at I _{OUT} = 10 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	0...10 V /
max. voltage/max. current	15 V /
Input resistance, voltage/Current	500 kΩ /
Output voltage/Output current	/0...20 mA
Load impedance, voltage/Current	/≥ 500 Ω
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 30 ms (typically 25 ms)
Out-off frequency (-3dB)	≥ 13 Hz (typically 17 Hz)
Supply voltage	24 V DC ± 20 %
Current consumption, input	< 11 mA at U _{IN} = 10 V
Current consumption, output	< 32 mA at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4
T _U =23°C, single module	

Ordering data

Type of connection	
Screw connection	
Tension clamp connection	
Note	

Type	(Qty.=1)	Order No.
WAS4 VCC DC 0-10/0-20MA		8447050000
WAZ4 VCC DC 0-10/0-20MA		8447080000

Type	(Qty.=1)	Order No.
WAS4 VCC DC 0-10/4-20MA		8447100000
WAZ4 VCC DC 0-10/4-20MA		8447110000

Type	(Qty.=1)	Order No.
WAS4 VCC DC 0-10/0-10V		8447130000
WAZ4 VCC DC 0-10/0-10V		8447140000

Accessories

Note	*Cable-connectors for power supply and markers - see WAVE series accessories
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Note	*Cable-connectors for power supply and markers - see WAVE series accessories
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Note	*Cable-connectors for power supply and markers - see WAVE series accessories
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Note	*Cable-connectors for power supply and markers - see WAVE series accessories
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WAVESERIES - DC/DC 3-way isolator

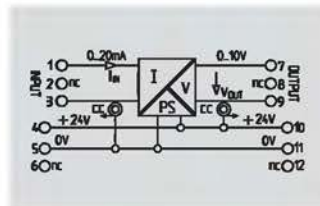
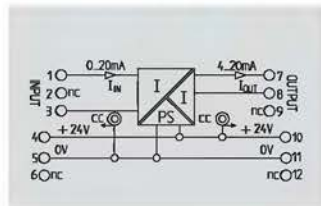
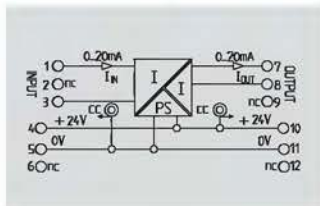
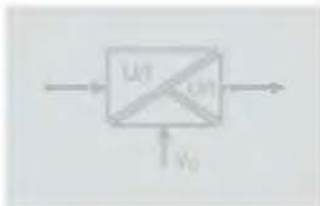
10 Hz limiting frequency

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZCV cross connection system

0...{4}20 mA/0...{4}20 mA

0...20 mA/4...20 mA

0...20 mA/0...10 V



Technical data

Input	0...{4}20 mA	0...20 mA	0...20 mA
Input voltage/Input current	/I(4)...20 mA	/I...20 mA	/I...20 mA
max. voltage	25 mA	25 mA	25 mA
max. current	25 mA	25 mA	25 mA
Output			
Output voltage/Output current	/I(4)...20 mA	/4...20 mA	0...10 V /
Load impedance, voltage/Current	/± 600 Ω	/± 600 Ω	≥ 1 kΩ /
Accuracy	0.2 %	0.2 %	0.2 %
Temperature coefficient	± 250 ppm/K	± 250 ppm/K	± 250 ppm/K
Step response time	≤ 45 ms	≤ 45 ms	≤ 45 ms
Out-off frequency (-3dB)	10 Hz	10 Hz	10 Hz
General data			
Supply voltage	24 V DC ± 25 %	24 V DC ± 25 %	24 V DC ± 25 %
Power consumption	< 1.5 W at I _{OUT} = 20 mA	< 1.5 W at I _{OUT} = 20 mA	< 1.3 W at I _{OUT} = 5 mA
Current-carrying capacity of cross-connect.	≤ 2 A	≤ 2 A	≤ 2 A
Operating temperature	0°C...+55°C (horiz. mounting)	0°C...+55°C (horiz. mounting)	0°C...+55°C (horiz. mounting)
Storage temperature	-20 °C...+85 °C	-20 °C...+85 °C	-20 °C...+85 °C
Approvals	CE / dULus	CE / dULus	CE / dULus
Insulation coordination			
Standards	EN 50178	EN 50178	EN 50178
EMC standards	EN 55011, EN 61000-6	EN 55011, EN 61000-6	EN 55011, EN 61000-6
Rated voltage	300 V	300 V	300 V
Impulse withstand voltage	4 kV	4 kV	4 kV
Isolation voltage input, output	2 kV _{eff} / 5 s	2 kV _{eff} / 5 s	2 kV _{eff} / 5 s
Overvoltage category	III	III	III
Pollution severity	2	2	2
Clearance & creepage distance	≥ 3 mm	≥ 3 mm	≥ 3 mm

Dimensions	Screw connection		Tension clamp c.	
Clamping range (rating- / min. / max.)	2.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
Length x width x height	92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
Note	T _U =23°C, single module			

Ordering data

Type of connection	Type	(Qty.=1)	Order No.
Screw connection	WAS5 CCC 0-20/0-20mA		8540180000
Tension clamp connection	WAZ5 CCC 0-20/0-20mA		8540190000

Type of connection	Type	(Qty.=1)	Order No.
Screw connection	WAS5 CVC 0-20mA/0-10V		8540270000
Tension clamp connection	WAZ5 CVC 0-20mA/0-10V		8540260000

Accessories

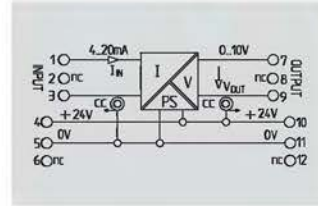
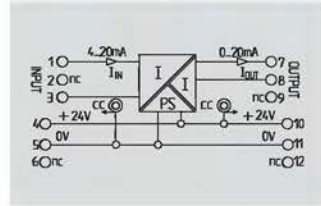
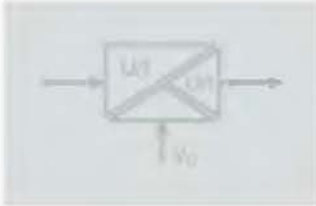
Note	
	*Cable-connectors for power supply and markers - see WAVE series accessories

10 Hz limiting frequency

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZCV cross connection system

4...20 mA/0...20 mA

4...20 mA/0...10 V



Technical data

Input	
Input voltage/Input current	4...20 mA
max. voltage	25 mA
max. current	
Output	
Output voltage/Output current	0...20 mA
Load impedance, voltage/Current	≥ 600 Ω
Accuracy	0.2 %
Temperature coefficient	± 250 ppm/K
Step response time	≤ 45 ms
Out-off frequency (-3dB)	10 Hz
General data	
Supply voltage	24 V DC ± 25 %
Power consumption	< 1.5 W at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (horiz. mounting)
Storage temperature	-20°C...+85°C
Approvals	CE / dJULus
Insulation coordination	
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	4...20 mA
max. voltage	25 mA
max. current	
Output voltage/Output current	0...20 mA
Load impedance, voltage/Current	≥ 600 Ω
Accuracy	0.2 %
Temperature coefficient	± 250 ppm/K
Step response time	≤ 45 ms
Out-off frequency (-3dB)	10 Hz
Supply voltage	24 V DC ± 25 %
Power consumption	< 1.5 W at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (horiz. mounting)
Storage temperature	-20°C...+85°C
Approvals	CE / dJULus
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	4...20 mA
max. voltage	25 mA
max. current	
Output voltage/Output current	0...10 V /
Load impedance, voltage/Current	≥ 1 kΩ /
Accuracy	0.2 %
Temperature coefficient	± 250 ppm/K
Step response time	≤ 45 ms
Out-off frequency (-3dB)	10 Hz
Supply voltage	24 V DC ± 25 %
Power consumption	< 1.3 W at I _{OUT} = 5 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0°C...+55°C (horiz. mounting)
Storage temperature	-20°C...+85°C
Approvals	CE / dJULus
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _u =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _u =23°C, single module	

Ordering data

Type of connection	
Screw connection	
Tension clamp connection	
Note	

Type	(Qty.=1)	Order No.
WAS5 CCC 4-20/0-20MA		8540200000
WAZ5 CCC 4-20/0-20MA		8540210000

Type	(Qty.=1)	Order No.
WAS5 CVC 4-20mA/0-10V		8540230000
WAZ5 CVC 4-20mA/0-10V		8540240000

Accessories

Note

*Cross-connectors for power supply and markers - see WAVE series accessories

*Cross-connectors for power supply and markers - see WAVE series accessories

WAVESERIES - DC/DC 3-way isolator

10 Hz limiting frequency

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZCV cross connection system

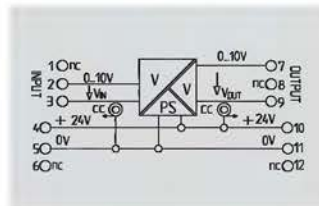
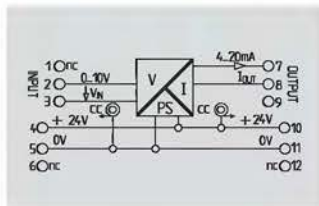
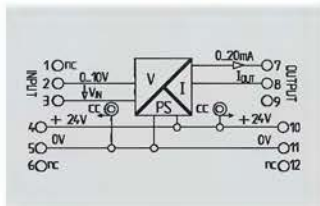
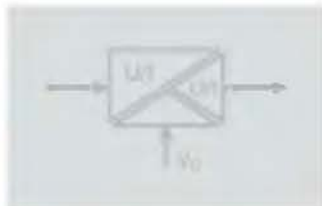
0...10 V/0...20 mA



0...10 V/4...20 mA



0...10 V/0...10 V



Technical data

Input	0...10 V /	0...10 V /	0...10 V /
Input voltage/Input current	0...10 V /	0...10 V /	0...10 V /
max. voltage	15 V	15 V	15 V
max. current			
Output			
Output voltage/Output current	0...20 mA	4...20 mA	0...10 V /
Load impedance, voltage/Current	$\geq 600 \Omega$	$\geq 600 \Omega$	$\geq 1 k\Omega$ /
Accuracy	0.2 %	0.2 %	0.2 %
Temperature coefficient	± 250 ppm/K	± 250 ppm/K	± 250 ppm/K
Step response time	≤ 45 ms	≤ 45 ms	≤ 45 ms
Cut-off frequency (-3dB)	10 Hz	10 Hz	10 Hz
General data			
Supply voltage	24 V DC ± 25 %	24 V DC ± 25 %	24 V DC ± 25 %
Power consumption	< 1.5 W at $I_{OUT} = 20$ mA	< 1.5 W at $I_{OUT} = 20$ mA	< 1.3 W at $I_{OUT} = 5$ mA
Current-carrying capacity of cross-connect.	≤ 2 A	≤ 2 A	≤ 2 A
Operating temperature	0°C...+55°C (horiz. mounting)	0°C...+55°C (horiz. mounting)	0°C...+55°C (horiz. mounting)
Storage temperature	-20°C...+85°C	-20°C...+85°C	-20°C...+85°C
Approvals	CE / dJLus	CE / dJLus	CE / dJLus
Insulation coordination			
Standards	EN 50178	EN 50178	EN 50178
EMC standards	EN 55011, EN 61000-6	EN 55011, EN 61000-6	EN 55011, EN 61000-6
Rated voltage	300 V	300 V	300 V
Impulse withstand voltage	4 kV	4 kV	4 kV
Isolation voltage input, output	2 kV _{eff} / 5 s	2 kV _{eff} / 5 s	2 kV _{eff} / 5 s
Overvoltage category	III	III	III
Pollution severity	2	2	2
Clearance & creepage distance	≥ 3 mm	≥ 3 mm	≥ 3 mm

Dimensions	Screw connection	Tension clamp c.	Screw connection	Tension clamp c.	Screw connection	Tension clamp c.
Clamping range (rating- / min. / max.)	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
Length x width x height	92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
Note	T _U =23°C, single module		T _U =23°C, single module		T _U =23°C, single module	

Ordering data

Type of connection	Type	(Qty.=1)	Order No.	Type	(Qty.=1)	Order No.	Type	(Qty.=1)	Order No.
Screw connection	WAS5 VCC 0-10V/0-20MA		8540310000	WAS5 VCC 0-10V/4-20MA		8540290000	WAS5 VCC 0-10V/0-10V		8540330000
Tension clamp connection	WAZ5 VCC 0-10V/0-20MA		8540320000	WAZ5 VCC 0-10V/4-20MA		8540300000	WAZ5 VCC 0-10V/0-10V		8540340000

Note

Accessories

Note			
	*Cable-connectors for power supply and markers - see WAVE series accessories	*Cable-connectors for power supply and markers - see WAVE series accessories	*Cable-connectors for power supply and markers - see WAVE series accessories

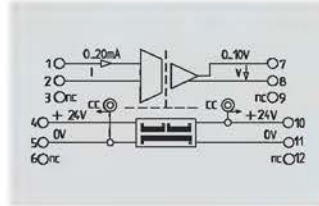
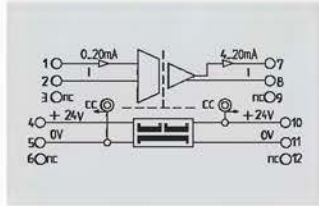
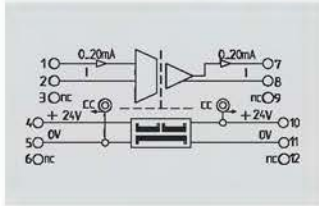
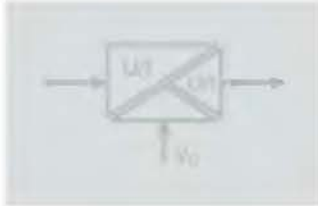
20 kHz limiting frequency

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZCV cross connection system

0(4)...20 mA/0(4)...20 mA

0...20 mA/4...20 mA

0...20 mA/0...10 V



Technical data

Input	
Input voltage/Input current	/0...20 mA
max. voltage/max. current	/50 mA
Input resistance, voltage/Current	/50 Ω
Output	
Output voltage/Output current	/0...20 mA
Load impedance, voltage/Current	/≤ 500 Ω
Accuracy	< 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 40 μs (typically 30 μs)
Out-off frequency (-3dB)	≥ 15 kHz (typ. 20 kHz)
General data	
Supply voltage	24 V DC ± 25 %
Power consumption	< 1.5 W at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Insulation coordination	
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Coupling capacitance, I/O, power supply	1 nF
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	/0...20 mA
max. voltage/max. current	/50 mA
Input resistance, voltage/Current	/50 Ω
Output voltage/Output current	/4...20 mA
Load impedance, voltage/Current	/≤ 500 Ω
Accuracy	< 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 40 μs (typically 30 μs)
Out-off frequency (-3dB)	≥ 15 kHz (typ. 20 kHz)
Supply voltage	24 V DC ± 25 %
Power consumption	< 1.5 W at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Coupling capacitance, I/O, power supply	1 nF
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	/0...20 mA
max. voltage/max. current	/50 mA
Input resistance, voltage/Current	/50 Ω
Output voltage/Output current	0...10 V /
Load impedance, voltage/Current	≥ 2 kΩ /
Accuracy	< 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 40 μs (typically 30 μs)
Out-off frequency (-3dB)	≥ 15 kHz (typ. 20 kHz)
Supply voltage	24 V DC ± 25 %
Power consumption	< 1.3 W at I _{OUT} = 5 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Coupling capacitance, I/O, power supply	1 nF
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Input voltage/Input current	/0...20 mA
max. voltage/max. current	/50 mA
Input resistance, voltage/Current	/50 Ω
Output voltage/Output current	0...10 V /
Load impedance, voltage/Current	≥ 2 kΩ /
Accuracy	< 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 40 μs (typically 30 μs)
Out-off frequency (-3dB)	≥ 15 kHz (typ. 20 kHz)
Supply voltage	24 V DC ± 25 %
Power consumption	< 1.3 W at I _{OUT} = 5 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Coupling capacitance, I/O, power supply	1 nF
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _U =23°C, single module	

Ordering data

Type of connection	Type	(Qty.=1)	Order No.
Screw connection	WAS5 CCC HF 0-20/0-20MA		8447160000
Tension clamp connection	WAZ5 CCC HF 0-20/0-20MA		8447170000
Note			

Type	(Qty.=1)	Order No.
WAS5 CCC HF 0-20/4-20MA		8447190000
WAZ5 CCC HF 0-20/4-20MA		8447200000
Note		

Type	(Qty.=1)	Order No.
WAS5 CVC HF 0-20/0-10V		8447220000
WAZ5 CVC HF 0-20/0-10V		8447230000
Note		

Type	(Qty.=1)	Order No.
WAS5 CVC HF 0-20/0-10V		8447220000
WAZ5 CVC HF 0-20/0-10V		8447230000
Note		

Accessories

Note
*Cable-connectors for power supply and markers - see WAVE series accessories

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*Cable-connectors for power supply and markers - see WAVE series accessories

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*Cable-connectors for power supply and markers - see WAVE series accessories

Note
*Cable-connectors for power supply and markers - see WAVE series accessories

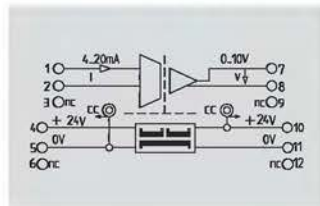
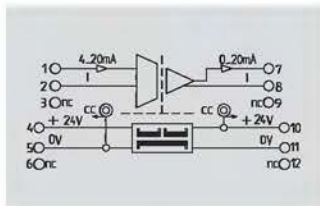
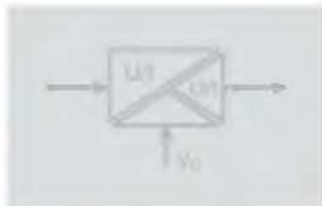
WAVESERIES - DC/DC 3-way isolator

20 kHz limiting frequency

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZCV cross connection system

4...20 mA/0...20 mA

4...20 mA/0...10 V



Technical data

Input

Input voltage/Input current
max. voltage/max. current
Input resistance, voltage/Current

Output

Output voltage/Output current
Load impedance, voltage/Current
Accuracy
Temperature coefficient
Step response time
Cut-off frequency (-3dB)

General data

Supply voltage
Power consumption
Current-carrying capacity of cross-connect.
Operating temperature
Storage temperature
Approvals

Insulation coordination

Standards
EMC standards
Rated voltage
Impulse withstand voltage
Isolation voltage input, output
Coupling capacitance, I/O, power supply
Overvoltage category
Pollution severity
Clearance & creepage distance

/4...20 mA
/50 mA
/50 Ω

/0...20 mA
/≤ 500 Ω
< 0.2% of final value
≤ 250 ppm/K of final value
≤ 40 μs (typically 30 μs)
≥ 15 kHz (typ. 20 kHz)

24 V DC ± 25 %
< 1.5 W at I_{OUT} = 20 mA
≤ 2 A
0 °C...+55 °C
-20 °C...+85 °C
CSA / cULus / CE

EN 50178
EN 55011, EN 61000-6
300 V
4 kV
1.2 kV_{eff} / 5 s
1 nF
III
2
≥ 3 mm

/4...20 mA
/50 mA
/50 Ω

0...10 V /
≥ 2 kΩ / ≤ 600 Ω
< 0.2% of final value
≤ 250 ppm/K of final value
≤ 40 μs (typically 30 μs)
≥ 15 kHz (typ. 20 kHz)

24 V DC ± 25 %
< 1.3 W at I_{OUT} = 5 mA
≤ 2 A
0 °C...+55 °C
-20 °C...+85 °C
CSA / cULus / CE

EN 50178
EN 55011, EN 61000-6
300 V
4 kV
1.2 kV_{eff} / 5 s
1 nF
III
2
≥ 3 mm

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4

T_U=23°C, single module

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4

T_U=23°C, single module

Ordering data

Type of connection

Screw connection
Tension clamp connection

Type	(Qty.=1)	Order No.
WAS5 CCC HF 4-20/0-20MA		8447250000
WAZ5 CCC HF 4-20/0-20MA		8447260000

Type	(Qty.=1)	Order No.
WAS5 CVC HF 4-20/0-10V		8447280000
WAZ5 CVC HF 4-20/0-10V		8447290000

Note

Accessories

Note

*Cross-connectors for power supply and markers - see WAVE series accessories

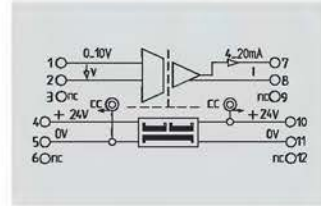
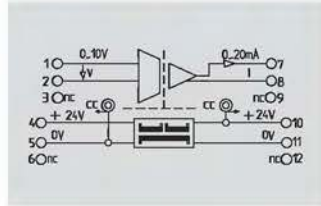
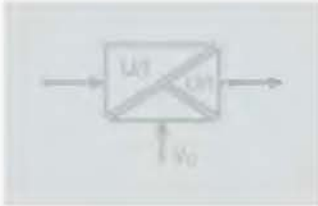
*Cross-connectors for power supply and markers - see WAVE series accessories

20 kHz limiting frequency

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZCV cross connection system

0...10 V/0...20 mA

0...10 V/4...20 mA



Technical data

Input	
Input voltage/Input current	0...10 V /
max. voltage/max. current	15 V /
Input resistance, voltage/Current	500 kΩ /
Output	
Output voltage/Output current	/0...20 mA
Load impedance, voltage/Current	/≥ 500 Ω
Accuracy	± 0.2% of final value
Temperature coefficient	≤ 250 ppm/K of final value
Step response time	≤ 40 μs (typically 30 μs)
Out-off frequency (-3dB)	≥ 15 kHz (typ. 20 kHz)
General data	
Supply voltage	24 V DC ± 25 %
Power consumption	< 1.5 W at I _{OUT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Approvals	CSA / cULus / CE
Insulation coordination	
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	1.2 kV _{eff} / 5 s
Coupling capacitance, I/O, power supply	1 nF
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

	0...10 V /
	15 V /
	500 kΩ /
	/0...20 mA
	/≥ 500 Ω
	± 0.2% of final value
	≤ 250 ppm/K of final value
	≤ 40 μs (typically 30 μs)
	≥ 15 kHz (typ. 20 kHz)
	24 V DC ± 25 %
	< 1.5 W at I _{OUT} = 20 mA
	≤ 2 A
	0 °C...+55 °C
	-20 °C...+85 °C
	CSA / cULus / CE
	EN 50178
	EN 55011, EN 61000-6
	300 V
	4 kV
	1.2 kV _{eff} / 5 s
	1 nF
	III
	2
	≥ 3 mm

	0...10 V /
	15 V /
	500 kΩ /
	/4...20 mA
	/≥ 500 Ω
	± 0.2% of final value
	≤ 250 ppm/K of final value
	≤ 40 μs (typically 30 μs)
	≥ 15 kHz (typ. 20 kHz)
	24 V DC ± 25 %
	< 1.5 W at I _{OUT} = 20 mA
	≤ 2 A
	0 °C...+55 °C
	-20 °C...+85 °C
	CSA / cULus / CE
	EN 50178
	EN 55011, EN 61000-6
	300 V
	4 kV
	1.2 kV _{eff} / 5 s
	1 nF
	III
	2
	≥ 3 mm

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _U =23°C, single module	

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _U =23°C, single module	

Ordering data

Type of connection	
Screw connection	
Tension clamp connection	
Note	

Type	(Qty.=1)	Order No.
WAS5 VCC HF 0-10/0-20MA		8447310000
WAZ5 VCC HF 0-10/0-20MA		8447320000

Type	(Qty.=1)	Order No.
WAS5 VCC HF 0-10/4-20MA		8447340000
WAZ5 VCC HF 0-10/4-20MA		8447350000

Accessories

Note	
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*Cable-connectors for power supply and markers - see WAVE series accessories

*Cable-connectors for power supply and markers - see WAVE series accessories

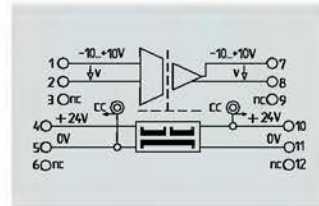
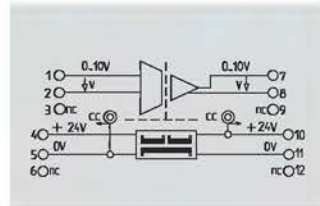
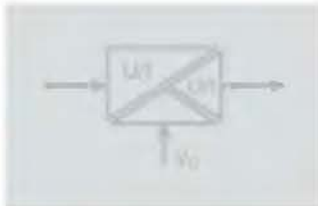
WAVESERIES - DC/DC 3-way isolator

20 kHz limiting frequency

- Signal conversion
- Electrical isolation between input and output signals
- Power supply can be cross-connected using ZCV cross connection system

0...10 V/0...10 V

-10...+10 V/-10...+10 V



Technical data

Input

Input voltage/Input current
max. voltage/max. current
Input resistance, voltage/Current

Output

Output voltage/Output current
Load impedance, voltage/Current
Accuracy
Temperature coefficient
Step response time
Cut-off frequency (-3dB)

General data

Supply voltage
Power consumption
Current-carrying capacity of cross-connect.
Operating temperature
Storage temperature
Approvals

Insulation coordination

Standards
EMC standards
Rated voltage
Impulse withstand voltage
Isolation voltage input, output
Coupling capacitance, I/O, power supply
Overvoltage category
Pollution severity
Clearance & creepage distance

0...10 V /
15 V /
500 kΩ /

0...10 V /
≥ 2 kΩ /

± 0.2% of final value
≤ 250 ppm/K of final value
≤ 40 μs (typically 30 μs)
≥ 15 kHz (typ. 20 kHz)

24 V DC ± 25 %
< 1.3 W at I_{crit} = 5 mA
≤ 2 A
0 °C...+55 °C
-20 °C...+85 °C
CSA / cULus / CE

EN 50178
EN 55011, EN 61000-6
300 V
4 kV
1.2 kV_{eff} / 5 s
1 nF
III
2
≥ 3 mm

-10...+10 V /
± 15 V /
500 kΩ /

-10...+10 V /
≥ 2 kΩ /

± 0.2% of measuring range
≤ 250 ppm/K of measuring range
≤ 40 μs (typically 30 μs)
≥ 15 kHz (typ. 20 kHz)

24 V DC ± 25 %
< 1.3 W at I_{crit} = 5 mA
≤ 2 A
0 °C...+55 °C
-20 °C...+85 °C
CE / cULus

EN 50178
EN 55011, EN 61000-6
300 V
4 kV
1.2 kV_{eff} / 5 s
1 nF
III
2
≥ 3 mm

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4

T_U=23°C, single module

Screw connection	Tension clamp c.
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4

T_U=23°C, single module

Ordering data

Type of connection

Screw connection
Tension clamp connection

Type	(Qty.=1)	Order No.
WAS5 VVC HF 0-10/0-10V		8447370000
WAZ5 VVC HF 0-10/0-10V		8447380000

Type	(Qty.=1)	Order No.
WAS5 VVC HF +10V/+10V		8561610000
WAZ5 VVC HF +10V/+10V		8587000000

Note

Accessories

Note

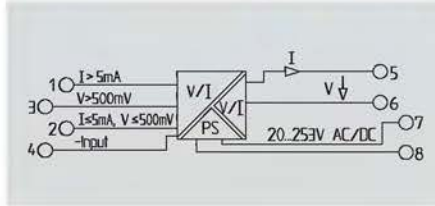
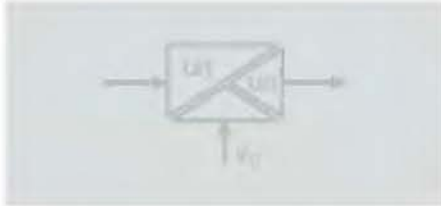
*Cross-connectors for power supply and terminals - see WAVE series accessories

*Cross-connectors for power supply and terminals - see WAVE series accessories

configurable

- Universal adjustable via DIP switch
- Service tool WAVETOOL via Internet
- Voltage supply 20...230 V AC/DC
- Low power loss
- Adjustable transmission frequency

PRO DC/DC



Technical data

Input	
Input voltage/Input current	$\pm 20 \text{ mV} \dots \pm 200 \text{ V} / \pm 0.1 \text{ mA} \dots \pm 100 \text{ mA}$
Input resistance, voltage/Current max. current	$\approx 1 \text{ M}\Omega / < 5 \text{ mA}$; approx. 100Ω ; $> 5 \text{ mA}$: approx. 5Ω
Output	
Output voltage/Output current	$0 \dots \pm 10 \text{ V} / 0 \dots \pm 20 \text{ mA}$
Load impedance, voltage/Current	$\geq 1 \text{ k}\Omega / \leq 600 \Omega$
Accuracy	$< 0.1\%$ of final value
Temperature coefficient	$\leq 60 \text{ ppm/K}$ of end value
Cut-off frequency (-3dB)	$> 10 \text{ kHz} / < 10 \text{ Hz}$
Offset	$20 \mu\text{A}$ or 10 mV
Adjustment range, zero point	$\pm 25\%$ of measuring range of chosen output range
Adjustment range, amplification	$0.33 \dots 3.30 \times$ final value of selected output range
Displacement	$-100\%, -50\%, 0\%, 50\%, 100\%$ of measuring range
General data	
Supply voltage	$22 \dots 230 \text{ V AC/DC} \pm 10\%$ / $48 \dots 62 \text{ Hz}$
Power consumption	approx. 1 W
Operating temperature	$-10 \text{ }^\circ\text{C} \dots +70 \text{ }^\circ\text{C}$
Storage temperature	$-40 \text{ }^\circ\text{C} \dots +85 \text{ }^\circ\text{C}$
Default setting	$0 \dots 10 \text{ V} / 0 \dots 10 \text{ V} / 10 \text{ Hz}$
Approvals	GL / CE / cULus
Insulation coordination	
Standards	EN 50178
EMC standards	DIN EN 61326, EN 61326/A1, EN 61000-6 / 2
Rated voltage	600 V
Impulse withstand voltage	$5 \text{ kV}, 1.2/50 \mu\text{s}$ (IEC 255-4)
Isolation voltage input, output	4 kV_{eff}
Overvoltage category	III
Pollution severity	2
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
$I_U = 23\%$; single module	

Screw connection		Tension clamp connection	
2.5 / 0.5 / 2.5		1.5 / 0.5 / 2.5	
92.4 x 12.5 x 112.4		92.4 x 12.5 x 112.4	
Type			
WAS4 PRO DC/DC	Qty. 1	Order No. 8560740000	
WAZ4 PRO DC/DC	Qty. 1	Order No. 8560750000	

Ordering data

Type of connection	Screw connection
	Tension clamp connection

Note

Accessories

Note
Cable-connectors for power supply and markers - see WAVE series accessories

Switch position/setting options

Input	Switch							
	S1				S2			
Input range	1	2	3	4	1	2	3	4
0 ... $\pm 60 \text{ mV}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 100 \text{ mV}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 150 \text{ mV}$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 300 \text{ mV}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 500 \text{ mV}$	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 1 \text{ V}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 5 \text{ V}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 10 \text{ V}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 100 \text{ V}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 0.3 \text{ mA}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 1 \text{ mA}$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 5 \text{ mA}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 10 \text{ mA}$	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 20 \text{ mA}$	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 50 \text{ mA}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 ... $\pm 20 \text{ mA}^*$	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Offset conversion not calibrated

Switch S2		4
calibrated ranges		<input checked="" type="checkbox"/>
Span-pot. activated: input x 0.33 ... x 3.30		

Output	Switch				
	S1			S3	
Output range	5	6	7	1	2
0 ... $\pm 10 \text{ V}$	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2 ... 10 V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 5 \text{ V}$	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 ... 5 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... $\pm 20 \text{ mA}$	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 ... 20 mA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Offset (in % of output voltage)	Switch				
	S1			S2	
	8	9	10	5	
0 %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
-100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
-50 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
+50 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
+100 %	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Zero pot. activated: additions! $\pm 25\%$

Switch S3		3
Bandwidth 10 kHz		<input type="checkbox"/>
Bandwidth 10 Hz		<input checked="" type="checkbox"/>
Self range can be documented on side of housing.		

= on
 = off

WAVESERIES - PT100 / RTD - signal converter

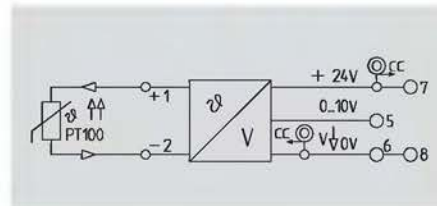
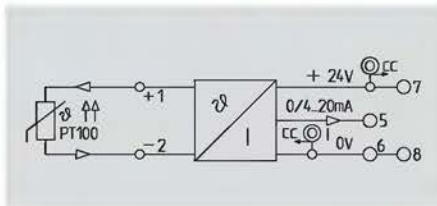
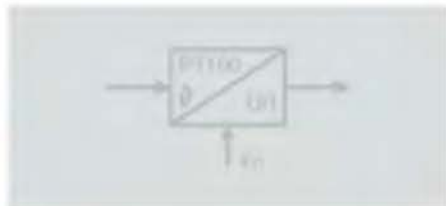
PT100, 2-conductor converter

- 2-conductor system
- -200°C...+800°C adjustable temperature range
- Power supply can be cross-connected using ZQV cross connection system

PT100/2 0(4)...20 mA



PT100/2 0...10 V



Technical data

Input
Sensor
Supply current
Output
Output voltage/Output current
Load impedance, voltage/Current
Accuracy
General data
Supply voltage/Current consumption
Operating temperature/Storage temperature
Approvals
Standards
EMC standards
Dimensions
Clamping range (rating- / min. / max.)
Length x width x height
Note

PT100/2-conductor
1.45 mA
0(4)...20 mA
/± 500 Ω
± 0.5% of measuring range
24 V DC ± 20 % / < 48 mA at I _{quff} = 20 mA
0 °C...+55 °C / -20 °C...+85 °C
CSA / cULus / CE
EN 50178, EN 60751, IEC751
EN 55011, EN 61000-6
Screw connection
2.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4
Tension clamp connection
1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4
T _u =23°C, single module

PT100/2-conductor
1.45 mA
0...10 V /
≥ 1 kΩ /
± 0.5% of measuring range
24 V DC ± 20 % / < 38 mA at I _{quff} = 20 mA
0 °C...+55 °C / -20 °C...+85 °C
CSA / cULus / CE
EN 50178, EN 60751, IEC751
EN 55011, EN 61000-6
Screw connection
2.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4
Tension clamp connection
1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4
T _u =23°C, single module

Ordering data

Temperature input range	Type of connection
adjustable -200...+800°C	Screw connection
adjustable -200...+800°C	Tension clamp connection
Special adjustment	Screw connection
Special adjustment	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection

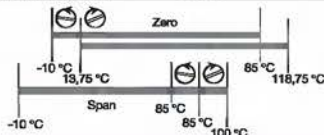
Type	Qty.	Order No.
WTS4 PT100/2 C 0/4-20mA	1	8432210000
WTZ4 PT100/2 C 0/4-20mA	1	8432220000
WTS4 PT100/2 C 0/4-20mA variable	1	8432219999
WTZ4 PT100/2 C 0/4-20mA variable	1	8432229999
WTS4 PT100/2 C 0-20mA 0...100C	1	8432210001
WTZ4 PT100/2 C 0-20mA 0...100C	1	8432220001
WTS4 PT100/2 C 4-20mA 0...100C	1	8432210011
WTZ4 PT100/2 C 4-20mA 0...100C	1	8432220011

Type	Qty.	Order No.
WTS4 PT100/2 V 0-10V	1	8432180000
WTZ4 PT100/2 V 0-10V	1	8432190000
WTS4 PT100/2 V 0-10V variable	1	8432189999
WTZ4 PT100/2 Vn 0-10V variable	1	8432199999
WTS4 PT100/2 V 0-10V 0...100C	1	8432180001
WTZ4 PT100/2 V 0-10V 0...100C	1	8432190001

Application

Example for Zero and Span

Temperature adjustment:	
T _{min}	-10 °C
Span	75...110 °C
Span	95 °C
Adjustment of Span	+ 25 %



Temperature coefficient	
Measurement range	≥ 200 K ≤ 200 ppm / °C (typ. 80 ppm / °C)
100K ≤ Measurement range < 200 K ≤ 225 ppm / °C (typ. 90 ppm / °C)	
40K ≤ Measurement range < 100 K ≤ 450 ppm / °C (typ. 180 ppm / °C)	

- Aids**
- Voltage supply 24 Vdc, 50 mA
 - Simulator for PT 100 or precision-resistance-decade
 - Ampere-/voltmeter which can be calibrated to an accuracy of >0.1% of the end value.

Switch position/setting options

	1	2	3	Span	4	5	6
0 °C	■	■	■	40 ... 50 °C	■	■	■
-10 °C	■	■	■	50 ... 75 °C	■	■	■
-20 °C	■	■	■	75 ... 110 °C	■	■	■
-40 °C	■	■	■	110 ... 165 °C	■	■	■
-60 °C	■	■	■	165 ... 245 °C	■	■	■
-80 °C	■	■	■	245 ... 360 °C	■	■	■
-100 °C	■	■	■	360 ... 540 °C	■	■	■
-200 °C	■	■	■	540 ... 800 °C	■	■	■

Output 1)	7	PT 100	a	9	10
Range	7				
0 ... 20 mA	■	2 - wire	■	■	■
4 ... 20 mA	■	3 - wire	■	■	■
		4 - wire	■	■	■

1) only modules with current output

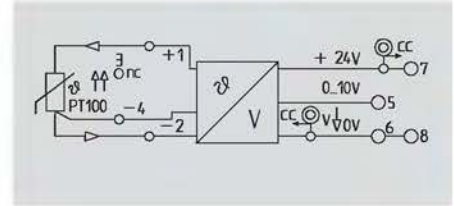
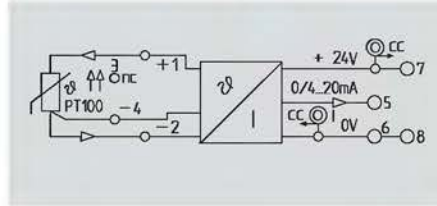
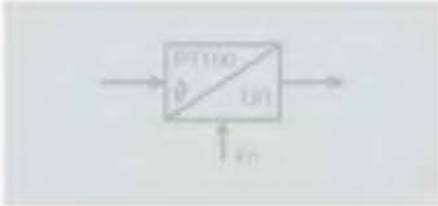
■ = on
□ = off

PT100, 3-conductor converter

- 3-conductor system
- -200°C...+800°C adjustable temperature range
- Power supply can be cross-connected using ZQV cross connection system

PT100/3 0(4)...20 mA

PT100/3 0...10 V



Technical data

Input
Sensor
Supply current
Output
Output voltage/Output current
Load impedance, voltage/Current
Accuracy
General data
Supply voltage/Current consumption
Operating temperature/Storage temperature
Approvals
Standards
EMC standards
Dimensions
Clamping range (rating- / min. / max.)
Length x width x height
Note

PT100/3-conductor
1.45 mA
0(4)...20 mA
/± 500 Ω
± 0.5% of measuring range
24 V DC ± 20 % / < 48 mA at I _{qu} = 20 mA
0 °C...+55 °C / -20 °C...+85 °C
CSA / cULus / CE
EN 50178, EN 60751, IEC751
EN 55011, EN 61000-6
Screw connection
2.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4
Tension clamp connection
1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4
T _u =23°C, single module

PT100/3-conductor
1.45 mA
0...10 V /
≥ 1 kΩ /
± 0.5% of measuring range
24 V DC ± 20 % / < 38 mA at I _{qu} = 20 mA
0 °C...+55 °C / -20 °C...+85 °C
CSA / cULus / CE
EN 50178, EN 60751, IEC751
EN 55011, EN 61000-6
Screw connection
2.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4
Tension clamp connection
1.5 / 0.5 / 2.5
92.4 x 12.5 x 112.4
T _u =23°C, single module

Ordering data

Temperature input range	Type of connection
adjustable -200...+800°C	Screw connection
adjustable -200...+800°C	Tension clamp connection
Special adjustment	Screw connection
Special adjustment	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection

Note

Type	Qty.	Order No.
WTS4 PT100/3 C 0/4-20mA	1	8432150000
WTZ4 PT100/3 C 0/4-20mA	1	8432160000
WTS4 PT100/3 C 0/4-20mA variable	1	8432159999
WTZ4 PT100/3 C 0/4-20mA variable	1	8432169999
WTS4 PT100/3 C 0-20mA 0...100C	1	8432150001
WTZ4 PT100/3 C 0-20mA 0...100C	1	8432160001
WTS4 PT100/3 C 4-20mA 0...100C	1	8432150011
WTZ4 PT100/3 C 4-20mA 0...100C	1	8432160011

Note

Type	Qty.	Order No.
WTS4 PT100/3 V 0-10V	1	8432090000
WTZ4 PT100/3 V 0-10V	1	8432130000
WTS4 PT100/3 V 0-10V variable	1	8432099999
WTZ4 PT100/3 V 0-10V variable	1	8432139999
WTS4 PT100/3 V 0-10V 0...100C	1	8432090001
WTZ4 PT100/3 V 0-10V 0...100C	1	8432130001

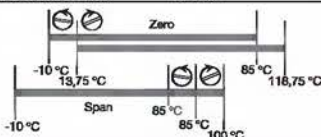
Note

Application

Example for Zero and Span

Temperature adjustment:

T _{min}	-10 °C
Span	75...110 °C
Span	95 °C
Adjustment of Span	+ 25 %



Temperature coefficient

Measurement range ≥ 200 K	≤ 200 ppm / °C (typ. 80 ppm / °C)
100K ≤ Measurement range < 200K	≤ 250 ppm / °C (typ. 100 ppm / °C)
40K ≤ Measurement range < 100K	≤ 500 ppm / °C (typ. 200 ppm / °C)

Aids

- Voltage supply 24 Vdc, 50 mA
- Simulator for PT 100 or precision-resistance-decade
- Ampere-/voltmeter which can be calibrated to an accuracy of >0.1% of the end value.

Switch position/setting options

T _{min}	1	2	3	Span	4	5	6
0 °C	■	■	■	40 ... 50 °C	■	■	■
-10 °C	■	■	■	50 ... 75 °C	■	■	■
-20 °C	■	■	■	75 ... 110 °C	■	■	■
-40 °C	■	■	■	110 ... 165 °C	■	■	■
-80 °C	■	■	■	165 ... 245 °C	■	■	■
-80 °C	■	■	■	245 ... 360 °C	■	■	■
-100 °C	■	■	■	360 ... 540 °C	■	■	■
-200 °C	■	■	■	540 ... 800 °C	■	■	■

Output 1)	7
0 ... 20 mA	■
4 ... 20 mA	■

- 1) only modules with current output
- = on
 - = off

WAVESERIES - PT100 / RTD - signal isolator/converter

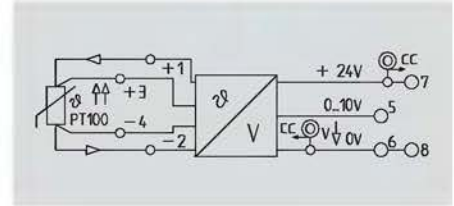
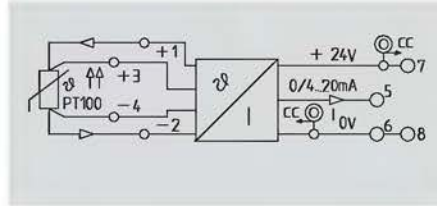
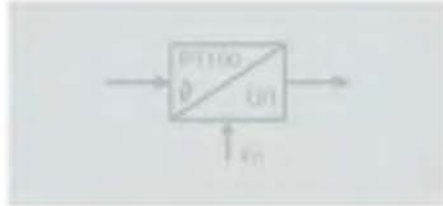
PT100, 4-conductor converter

- 4-conductor system
- -200°C...+800°C adjustable temperature range
- Power supply can be cross-connected using ZQV cross connection system

PT100/4 0(4)...20 mA



PT100/4 0...10 V



Technical data

Input	
Sensor	PT100/4-conductor
Supply current	1.45 mA
Output	
Output voltage/Output current	0(4)...20 mA
Load impedance, voltage/Current	/ \approx 500 Ω
Accuracy	100K \leq measuring range < 600K: 0.1%; measuring range \geq 600K: 0.2%; of measuring range
General data	
Supply voltage/Current consumption	24 V DC \pm 20 % / < 48 mA at $I_{ref} = 20$ mA
Operating temperature/Storage temperature	0 °C...+55 °C / -20 °C...+85 °C
Approvals	CSA / dULus / CE
Standards	EN 50178, EN 60751, IEC751
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	
$t_u = 23^\circ\text{C}$, single module	

Input	
Sensor	PT100/4-conductor
Supply current	1.45 mA
Output	
Output voltage/Output current	0...10 V /
Load impedance, voltage/Current	\geq 1 k Ω /
Accuracy	100K \leq measuring range < 600K: 0.1%; measuring range \geq 600K: 0.2%; of measuring range
General data	
Supply voltage/Current consumption	24 V DC \pm 20 % / < 38 mA at $I_{ref} = 20$ mA
Operating temperature/Storage temperature	0 °C...+55 °C / -20 °C...+85 °C
Approvals	CSA / dULus / CE
Standards	EN 50178, EN 60751, IEC751
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	
$t_u = 23^\circ\text{C}$, single module	

Input	
Sensor	PT100/4-conductor
Supply current	1.45 mA
Output	
Output voltage/Output current	0...10 V /
Load impedance, voltage/Current	\geq 1 k Ω /
Accuracy	100K \leq measuring range < 600K: 0.1%; measuring range \geq 600K: 0.2%; of measuring range
General data	
Supply voltage/Current consumption	24 V DC \pm 20 % / < 38 mA at $I_{ref} = 20$ mA
Operating temperature/Storage temperature	0 °C...+55 °C / -20 °C...+85 °C
Approvals	CSA / dULus / CE
Standards	EN 50178, EN 60751, IEC751
Dimensions	
Clamping range (rating- / min. / max.)	mm'
Length x width x height	mm
Note	
$t_u = 23^\circ\text{C}$, single module	

Ordering data

Temperature input range	Type of connection
adjustable -200...+800°C	Screw connection
adjustable -200...+800°C	Tension clamp connection
Special adjustment	Screw connection
Special adjustment	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection

Type	Qty.	Order No.
WTS4 PT100/4 C 0/4-20mA	1	8432270000
WTZ4 PT100/4 C 0/4-20mA	1	8432280000
WTS4 PT100/4 C 0/4-20mA variable	1	8432279999
WTZ4 PT100/4 C 0/4-20mA variable	1	8432289999
WTS4 PT100/4 C 0...20mA 0...100C	1	8432270001
WTZ4 PT100/4 C 0...20mA 0...100C	1	8432280001
WTS4 PT100/4 C 4-20mA 0...100C	1	8432270011
WTZ4 PT100/4 C 4-20mA 0...100C	1	8432280011

Type	Qty.	Order No.
WTS4 PT100/4 V 0-10V	1	8432240000
WTZ4 PT100/4 V 0-10V	1	8432250000
WTS4 PT100/4 V 0-10V variable	1	8432249999
WTZ4 PT100/4 V 0-10V variable	1	8432259999
WTS4 PT100/4 V 0-10V 0...100C	1	8432240001
WTZ4 PT100/4 V 0-10V 0...100C	1	8432250001

Note

Cross-connection for power supply and metering - see WAVE series accessories

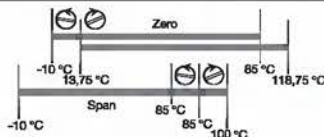
Specify temperature range for special calibration

Application

Example for Zero and Span

Temperature adjustment:

Tmin	-10 °C
Span	75...110 °C
Span	95 °C
Adjustment of Span	+ 25 %



Temperature coefficient

Measurement range	≥ 200 K ≤ 200 ppm / °C (typ. 80 ppm / °C)
100K \leq Measurement range < 200 K ≤ 225 ppm / °C (typ. 90 ppm / °C)	
40K \leq Measurement range < 100 K ≤ 450 ppm / °C (typ. 180 ppm / °C)	

Aids

- Voltage supply 24 Vdc, 50 mA
- Simulator for PT 100 or precision-resistance-decade
- Ampere-voltmeter which can be calibrated to an accuracy of >0.1% of the end value.

Switch position/setting options

	1	2	3	Span	4	5	6
0 °C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	40 ... 50 °C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-10 °C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	50 ... 75 °C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-20 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75 ... 110 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-40 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	110 ... 165 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-60 °C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	165 ... 245 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-80 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	245 ... 360 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-100 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	360 ... 540 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-200 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	540 ... 800 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Output 1)		PT 100			
Range	7	8	9	10	
0 ... 20 mA	<input type="checkbox"/>	2 - wire	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4 ... 20 mA	<input checked="" type="checkbox"/>	3 - wire	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		4 - wire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1) only modules with current output

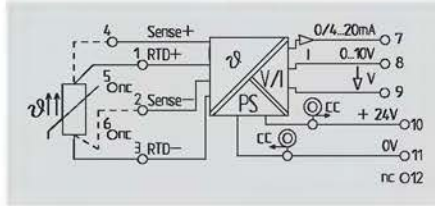
= on
 = off

RTD, signal isolator/converter

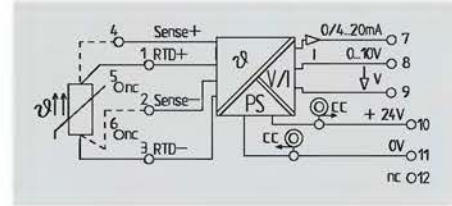
- Universally adjustable via DIP switch
- 3-way isolation
- Linearisation
- Power supply can be cross-connected using ZQV cross connection system



PRO RTD



PRO RTD 1000



Technical data

Input	
Sensor	
Temperature input range	
Output	
Output current/Output voltage	
Offset current/Offset voltage	
Load impedance, voltage/Current	
Step response time	
Line resistance in measuring circuit	
Influence of cable resistance	
Wire break detection	
Fine adjustment	
Status indicator	
General data	
Supply voltage	
Power consumption	
Current-carrying capacity of cross-connect.	
Operating temperature	
Storage temperature	
Default setting	
Approvals	
Insulation coordination	
Standards	
EMC standards	
Rated voltage	
Impulse withstand voltage	
Isolation voltage input, output	
Overvoltage category	
Pollution severity	
Clearance & creepage distance	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

PT100/2-/3-/4-conductor, Ni100/2-/3-/4-conductor, potentiometer: min. 0-100 Ω, max. 0-100 kΩ, resistor: 0-450 Ω configurable	
0(4)...20 mA / 0... 10 V	
max. 100 μA / max. 0.05 V	
≥ 1 kΩ / ≤ 600 Ω	
fast: 1.2 s / slow: 2.2 s	
50 Ω for 3- and 4-conductor	
max. + 0.25°C at 50 Ω conductor resistance	
LED flashes (output value > 20 mA, >10 V)	
± +/- 5%, Version 1: ±12.5% / Pot: 12.5%...25%	
active: LED on/cond. broken: LED flashing/Error: LED off	
24 V DC ± 25 %	
830...880...960mW at I _{q,IF} = 20 mA	
≤ 2 A	
0 °C...+55 °C	
-20 °C...+85 °C	
PT100/3-cond./ 0...100°C / 4...20 mA / man. fine calib.: off / slow step response	
GL / CE / cULus	
EN 50178, EN 60751, IEC 751, DIN 43760	
EN 55011, EN 61000-6	
300 V	
4 kV	
2 kV _{eff} / 5 s	
III	
2	
≥ 3 mm	
Screw connection	Tension clamp connection
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _u =23°C, single module	

PT1000/2-/3-/4-cond.; Ni1000/2-/3-/4-cond.; potentiometer: min. 0-1 kΩ, max. 0-100 kΩ; resistor: 0-4.5 kΩ configurable	
0(4)...20 mA / 0... 10 V	
max. 100 μA / max. 0.05 V	
≥ 1 kΩ / ≤ 600 Ω	
fast/slow: 2-/3-/4-cond.: 1.2s/2.3s; potentiometer: 0.5s/1.2s	
50 Ω for 3- and 4-conductor	
max. + 0.25°C at 50 Ω conductor resistance	
LED flashes (output value > 20 mA, >10 V)	
± 12.5% of FSP; Pot: ± 12.5% ... ± 25%	
active: LED on/cond. broken: LED flashing/Error: LED off	
24 V DC ± 25 %	
830...880...960mW at I _{q,IF} = 20 mA	
≤ 2 A	
0 °C...+55 °C	
-20 °C...+85 °C	
PT1000/3-cond./ 0...100°C / 4...20mA / man. adjustment: off / slow step response	
GL / CE / cULus	
EN 50178, EN 60751, IEC 751, DIN 43760	
EN 55011, EN 61000-6	
300 V	
4 kV	
2 kV _{eff} / 5 s	
III	
2	
≥ 3 mm	
Screw connection	Tension clamp connection
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4
T _u =23°C, single module	

Ordering data

Type of connection	
Screw connection	
Tension clamp connection	
Note	

Type	Qty.	Order No.
WAS5 PRO RTD	1	8560700000
WAZ5 PRO RTD	1	8560710000

Type	Qty.	Order No.
WAS5 PRO RTD 1000	1	8679490000
WAZ5 PRO RTD 1000	1	on demand

Accessories

Note
Cross-connectors for power supply and markers - see WAVE series accessories

Note
Cross-connectors for power supply and markers - see WAVE series accessories

WAVESERIES – PT100/RTD signal separator/converter – configurable

WAVEANALOG PRO RTD

WAVEANALOG PRO RTD 1000

Switch positions/setting options

Input	Selection of input		
	Switch 1		
	1	2	3
PT100 2-conductor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PT100 3-conductor	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PT100 4-conductor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
R 2-conductor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NH100 2-conductor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NH100 3-conductor	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NH100 4-conductor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Potentiometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

■ = on
□ = off

Switch positions/setting options

Input	Selection of input		
	Switch 1		
	1	2	3
PT1000 2-conductor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PT1000 3-conductor	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PT1000 4-conductor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
R 2-conductor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NH1000 2-conductor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NH1000 3-conductor	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NH1000 4-conductor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Potentiometer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

■ = on
□ = off

Output	Selection of output		Switching on the manual adjustment	S.1
	Switch 2			
	6	7	adjustment	8
0 ... 10V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	off	<input type="checkbox"/>
0 ... 20mA	<input type="checkbox"/>	<input type="checkbox"/>	on	<input checked="" type="checkbox"/>
4 ... 20mA	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

step response	Selection of the step response	
	S.2	
	8	
slow	<input checked="" type="checkbox"/>	
fast	<input type="checkbox"/>	

D

Selection of minimum input size						
θ _{min}	R _{min}	Pot _{min}	Switch 1			
			4	5	6	7
0 °C	0 Ω	0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-10 °C	10 Ω	10 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-20 °C	20 Ω	20 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-25 °C	20 Ω	25 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-30 °C	30 Ω	30 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-40 °C	40 Ω	40 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-50 °C	50 Ω	50 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-60 °C	60 Ω	60 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-70 °C	70 Ω	70 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-80 °C	80 Ω	80 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-90 °C	90 Ω	80 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-100 °C	100 Ω		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-150 °C	150 Ω		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-200 °C	200 Ω		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Special range			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Selection of minimum input size						
θ _{min}	R _{min}	Pot _{min}	Switch 1			
			4	5	6	7
0 °C	0 Ω	0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-10 °C	100 Ω	10 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-20 °C	200 Ω	20 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-25 °C	200 Ω	25 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-30 °C	300 Ω	30 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-40 °C	400 Ω	40 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-50 °C	500 Ω	50 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-60 °C	600 Ω	60 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-70 °C	700 Ω	70 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-80 °C	800 Ω	80 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-90 °C	900 Ω	80 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-100 °C	1000 Ω		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-150 °C	1500 Ω		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-200 °C	2000 Ω		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Special range			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

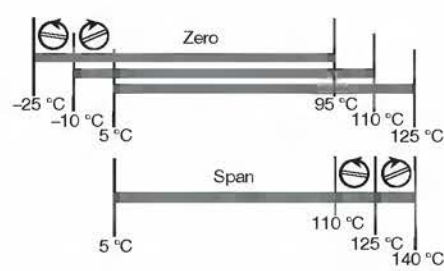
Accuracy, slow/fast step response	
PT 100, Ni100: 0.3 % of measuring range	0.8 %
Measuring range:	
Potentiometer: 0.2 % of final value / 0.3 %	
Resistance: 0.2 % of final value / 0.3 %	

Temperature coefficient	
Measuring range ≥ 200 K	≤ 200 ppm / °C
100 K < Measuring range < 200 K	≤ 250 ppm / °C
40 K ≤ Measuring range < 100 K	≤ 400 ppm / °C

Choice of measuring range							
T	R	Potentiometer	Switch 2				
			1	2	3	4	5
40K	20 Ω	20 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
50K	25 Ω	25 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
60K	30 Ω	30 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
70K	35 Ω	35 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
80K	40 Ω	40 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
90K	45 Ω	45 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
100K	50 Ω	50 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
110K	55 Ω	55 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
120K	60 Ω	60 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
125K	62.5 Ω	62.5 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
130K	65 Ω	65 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
140K	70 Ω	70 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
150K	75 Ω	75 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
160K	80 Ω	80 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
170K	85 Ω	85 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
180K	90 Ω	90 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
190K	95 Ω	95 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
200K	100 Ω	100 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
250K	125 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
300K	150 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
350K	175 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
400K	200 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
450K	225 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
500K	250 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
550K	275 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
600K	300 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
650K	325 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
700K	350 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
750K	375 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
800K	400 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
850K	425 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
900K	450 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Choice of measuring range							
T	R	Potentiometer	Switch 2				
			1	2	3	4	5
40K	200 Ω	20 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
50K	250 Ω	25 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
60K	300 Ω	30 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
70K	350 Ω	35 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
80K	400 Ω	40 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
90K	450 Ω	45 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
100K	500 Ω	50 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
110K	550 Ω	55 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
120K	600 Ω	60 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
125K	625 Ω	62.5 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
130K	650 Ω	65 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
140K	700 Ω	70 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
150K	750 Ω	75 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
160K	800 Ω	80 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
170K	850 Ω	85 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
180K	900 Ω	90 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
190K	950 Ω	95 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
200K	1000 Ω	100 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
250K	1250 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
300K	1500 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
350K	1750 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
400K	2000 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
450K	2250 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
500K	2500 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
550K	2750 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
600K	3000 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
650K	3250 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
700K	3500 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
750K	3750 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
800K	4000 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
850K	4250 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
900K	4500 Ω	---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Examples for setting zero and range	
Temperature setting:	
Output	4 ... 20 mA
DIP switch	-10 °C ... +110 °C
Range	75 ... 110 °C
Range	120 °C
Range adjustment	± 12.5 %

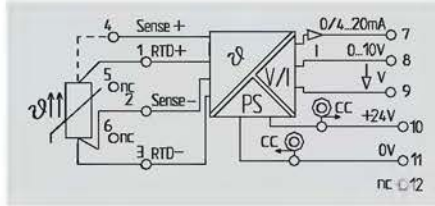


WAVE TOOL setting aid
 The service tool is used for fast, uncomplicated configuration of WAVEANALOGUE PRO. Download from the internet: <http://www.weidmueller.com>

RTD, signal isolator/converter

- Universally adjustable via DIP switch
- 3-way isolation
- Linearisation
- Power supply can be cross-connected using ZQV cross connection system

PRO RTD Cu



Connection	Selection of connection Switch 1		Selection of sensor Type	
	1	2	2	3
3-wire	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cu 10	<input checked="" type="checkbox"/>
4-wire	<input type="checkbox"/>	<input type="checkbox"/>	Cu 25	<input checked="" type="checkbox"/>
			Cu 50	<input type="checkbox"/>
			Cu 100	<input type="checkbox"/>

θ _{min}	Selection of minimum input values Switch 1			
	4	5	6	7
- 0 °C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-10 °C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-20 °C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-25 °C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-30 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-40 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-50 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-60 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-70 °C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-80 °C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
-90 °C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-100 °C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-150 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-200 °C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
special range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Span	Selection of the measurement range Switch 2				
	1	2	3	4	5
40 K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
50 K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
60 K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70 K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80 K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
90 K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
100 K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
110 K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
120 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
125 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
130 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
140 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
150 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
160 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
170 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
180 K	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
190 K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
200 K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
210 K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
220 K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
230 K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
240 K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
250 K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
260 K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
270 K	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
280 K	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
290 K	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
300 K	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
350 K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
400 K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
450 K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
460 K	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Output	Selection of Output Switch 2		Switching on the manual fine adjustment Switch 1	
	6	7	man. adj.	8
0...10 V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	off	<input type="checkbox"/>
0...20 mA	<input type="checkbox"/>	<input type="checkbox"/>	on	<input checked="" type="checkbox"/>
4...20 mA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	on	<input checked="" type="checkbox"/>

Time of step response	Selection of step set time Switch 2	
	8	
slow	<input checked="" type="checkbox"/>	<input type="checkbox"/>
fast	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Technical data

Input
Sensor
Temperature input range
Output
Output current/Output voltage
Offset current/Offset voltage
Load impedance, voltage/Current
Step response time
Line resistance in measuring circuit
Influence of cable resistance
Wire break detection
Fine adjustment
Status indicator
General data
Supply voltage
Power consumption
Current-carrying capacity of cross-connect.
Operating temperature
Storage temperature
Default setting
Approvals
Insulation coordination
Standards
EMC standards
Rated voltage
Impulse withstand voltage
Isolation voltage input, output
Overvoltage category
Pollution severity
Clearance & creepage distance

Cu 10, Cu 25, Cu 50, Cu 100; 3-/4-conductor adjustable -200...+260°C.
0(4)...20 mA/0...10 V
max. 100 µA /max. 0.05 V
≥ 1 kΩ /≤ 600 Ω
fast: 1.2 s/ slow: 2.2 s
5 Ω Cu 10; 15 Ω Cu 25; 25 Ω Cu 50; 50 Ω Cu 100
max. + 0.25°C at max. conductor resistance
LED flashes (output value > 20 mA, >10 V)
± 12.5% of FSR
active: LED on/cond. broken; LED flashing/Error; LED off
24 V DC ± 25 %
880...980...1080mW at I _{CLT} = 20 mA
≤ 2 A
0 °C...+55 °C
-20 °C...+85 °C
CU 10/3-cond.; 0...100°C; 4...20 mA; no filter, no manual fine calib.; slow step response
GL / CE / cULus
EN 50178
EN 55011, EN 61000-6
300 V
4 kV
2 kV _{eff} / 5 s
III
2
≥ 3 mm

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Screw connection	Tension clamp connection
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 17.5 x 112.4	92.4 x 17.5 x 112.4

Note	I _u =23%; single module
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Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS5 PRO RTD Cu	1	8638950000
Tension clamp connection	WAZ5 PRO RTD Cu	1	on request

Note	
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Accessories

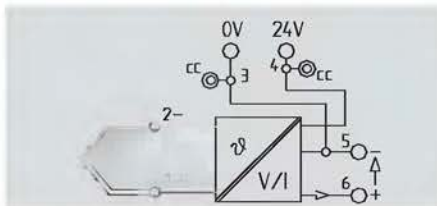
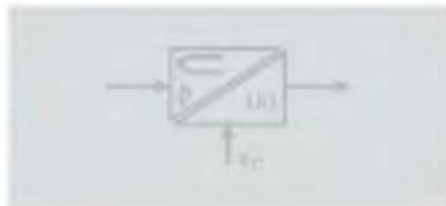
Note	Cross-connectors for power supply and markers - see WAVE series accessories
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WAVESERIES - thermo element signal converter, configurable

Thermal converter type K, J, T, E, N, R, S, B

- No calibration necessary
- Cold-junction compensation
- Output signal selectable
- Power supply can be cross-connected using ZQV cross connection system

Thermo Select



Technical data

Input	
Sensor	Thermo element (IEC 584) type: K,J,T,E,N,R,S,B
Temperature input range	-200...+1820 °C
Output	
Output voltage/Output current	0...10 V / 0(4)...20 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 500 Ω
Temperature coefficient	± (200 ppm from range + 0.075 K)/K
Step response time	with filter: 1.1 s; without filter: 6 s
Wire break detection	LED flashes (output value > 20 mA, >10 V)
General data	
Supply voltage	24 V DC ± 20 %
Current consumption	< 38 mA at I _{ref} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Approvals	CSA / dULus / CE
Insulation coordination	
Standards	EN 50178, EN 60584, IEC 584
EMC standards	EN 55011, EN 61000-6

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Ordering data

Type of connection	
Screw connection	WTS4 THERMO
Tension clamp connection	WTZ4 THERMO

Note

Accessories

Note

Screw connection	2.5 / 0.5 / 2.5
Tension clamp connection	1.5 / 0.5 / 2.5
	92.4 x 12.5 x 112.4
	92.4 x 12.5 x 112.4
Note	U ₁ =23%, single module

Type	Qty.	Order No.
WTS4 THERMO	1	8432300000
WTZ4 THERMO	1	8432310000

Cross-connectors for power supply and markers - see WAVE series accessories

Switch position/setting options

SW 1			SW 2						
Type	1	2	3	Span	1	2	3	4	5
K	■	■	■	100 °C	■	■	■	■	■
J	□	■	■	150 °C	■	■	■	■	■
T	■	□	■	200 °C	■	■	■	■	■
E	□	□	■	250 °C	■	■	■	■	■
N	■	■	□	300 °C	■	■	■	■	■
R	□	■	□	350 °C	■	■	■	■	■
S	■	□	□	400 °C	■	■	■	■	■
B	□	□	□	450 °C	■	■	■	■	■
				500 °C	■	■	■	■	■
				550 °C	■	■	■	■	■
SW 1									
Tmin	4	5	6	7	600 °C	■	■	■	■
0 °C	■	■	■	■	650 °C	■	■	■	■
-10 °C	■	■	■	■	700 °C	■	■	■	■
-20 °C	■	■	■	■	750 °C	■	■	■	■
-30 °C	■	■	■	■	800 °C	■	■	■	■
-40 °C	■	■	■	■	850 °C	■	■	■	■
-50 °C	■	■	■	■	900 °C	■	■	■	■
-100 °C	■	■	■	■	950 °C	■	■	■	■
-150 °C	■	■	■	■	1000 °C	■	■	■	■
-200 °C	■	■	■	■	1050 °C	■	■	■	■
+50 °C	■	■	■	■	1100 °C	■	■	■	■
+100 °C	■	■	■	■	1150 °C	■	■	■	■
+150 °C	■	■	■	■	1200 °C	■	■	■	■
+200 °C	■	■	■	■	1250 °C	■	■	■	■
+250 °C	■	■	■	■	1300 °C	■	■	■	■
+500 °C	■	■	■	■	1350 °C	■	■	■	■
SW 2									
Output	6	7			1400 °C	■	■	■	■
0 - 10 V	■	□			1450 °C	■	■	■	■
0 - 20 mA	□	□			1500 °C	■	■	■	■
4 - 20 mA	□	■			1600 °C	■	■	■	■
					1700 °C	■	■	■	■
					1800 °C	■	■	■	■
Filter									
					8				
					off	□			
					on	■			

■ = on
□ = off

Temperature coefficient

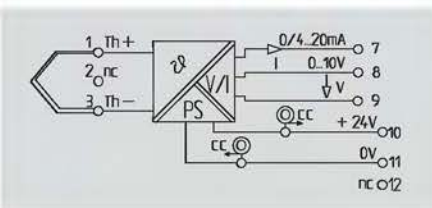
K	-200°C ... -150°C	± (5K + 0.1% of set range)
	-150°C ... 1200°C	± (3K + 0.1% of set range)
	1200°C ... 1372°C	± (4K + 0.1% of set range)
J	-200°C ... -150°C	± (4K + 0.1% of set range)
	-150°C ... 1200°C	± (3K + 0.1% of set range)
T	-200°C ... -150°C	± (5K + 0.1% of set range)
	-150°C ... 400°C	± (3K + 0.1% of set range)
E	-200°C ... -150°C	± (4K + 0.1% of set range)
	-150°C ... 1000°C	± (3K + 0.1% of set range)
N	-200°C ... -150°C	± (6K + 0.1% of set range)
	-150°C ... 1300°C	± (3K + 0.1% of set range)
R	-50°C ... 200°C	± (10K + 0.1% of set range)
	200°C ... 1760°C	± (6K + 0.1% of set range)
S	-50°C ... 200°C	± (10K + 0.1% of set range)
	200°C ... 1760°C	± (6K + 0.1% of set range)
B	50°C ... 250°C	± (25K + 0.1% of set range)
	250°C ... 500°C	± (10K + 0.1% of set range)
	500°C ... 1820°C	± (6K + 0.1% of set range)

Thermal converter type K, J, T, E, N, R, S, B

- 3-way isolation
- No calibration necessary
- Cold-junction compensation
- Output signal selectable
- Power supply can be cross-connected using ZQV cross connection system



PRO Thermo



Select of thermocoupler SW1				Selection of minimum temperature SW1			
Typ	1	2	3	ϑ_{min}	4	5	6 7
K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
J	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-10°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-20°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-30°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-40°C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-50°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-100°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-150°C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				-200°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				+50°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				+100°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				+150°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				+200°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				+250°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				500°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				Special range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Selection of temperature span SW2					Selection of output SW2		
Span	1	2	3	4	5	Output	6 7
100°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0...10V	<input checked="" type="checkbox"/>
150°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0...20mA	<input type="checkbox"/>
200°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4...20mA	<input type="checkbox"/>
250°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
300°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
350°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
400°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
450°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
500°C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>
550°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
600°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
650°C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
700°C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
750°C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
800°C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
850°C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
900°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
950°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1000°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1050°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1100°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1150°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1200°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1250°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1300°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
1350°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1400°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1450°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1500°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1600°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1700°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
1800°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

Temperature coefficient		
K -200°C...-150°C	±(5K + 0,1% of set range)	
-150°C...1200°C	±(3K + 0,1% of set range)	
1200°C...1372°C	±(4K + 0,1% of set range)	
J -200°C...-150°C	±(4K + 0,1% of set range)	
-150°C...1200°C	±(3K + 0,1% of set range)	
T -200°C...-150°C	±(5K + 0,1% of set range)	
-150°C...400°C	±(3K + 0,1% of set range)	
E -200°C...-150°C	±(4K + 0,1% of set range)	
-150°C...1000°C	±(3K + 0,1% of set range)	
N -200°C...-150°C	±(6K + 0,1% of set range)	
-150°C...1300°C	±(3K + 0,1% of set range)	
R -50°C...200°C	±(10K + 0,1% of set range)	
200°C...1760°C	±(6K + 0,1% of set range)	
S -50°C...200°C	±(10K + 0,1% of set range)	
200°C...1760°C	±(6K + 0,1% of set range)	
B 50°C...250°C	±(25K + 0,1% of set range)	
250°C...500°C	±(10K + 0,1% of set range)	
500°C...1820°C	±(6K + 0,1% of set range)	

Technical data

Input	
Sensor	Thermo element (IEC 584) type: K,J,T,E,N,R,S,B
Temperature input range	-200...+1820 °C
Output	
Output voltage/Output current	0...10 V A(4)...20 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Offset current/Offset voltage	max. 100 µA / max. 0,05 V
Step response time	max. 1,4 s; with filter: max. 7,5 ms
Line resistance in measuring circuit	50 Ω
Wire break detection	LED flashes (output value > 20 mA, >10 V)
Fine adjustment	± 5% (switchable)
Status indicator	active: LED on/cond. broken: LED flashing/Error: LED off
General data	
Supply voltage	24 V DC ± 25 %
Power consumption	800...950 mW at I _{CT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Default setting	type K; 0...1000°C; 4...20mA; filter: off; man. calib.: off
Approvals	GL / CE / eULus
Insulation coordination	
Standards	EN 50178, EN 60584, IEC 584
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output	2 kV _{eff} / 5 s
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
PUL=23°C, single module	

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS5 PRO Thermo	1	8560720000
Tension clamp connection	WAZ5 PRO Thermo	1	8560730000
Note			

Accessories

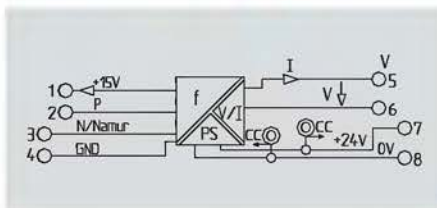
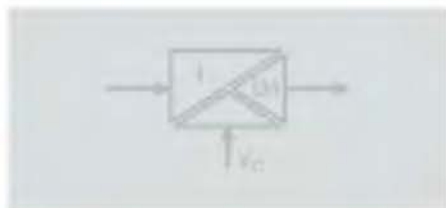
Note
Cross-connectors for power supply and markers - see WAVE series accessories

WAVESERIES - frequency signal isolator/converter, configurable

f/DC isolator/converter

- 3-way isolation
- Max. input frequency 100 kHz
- Input and output ranges adjustable via DIP switch
- No calibration necessary
- Special ranges can be programmed

PRO Frequency



Selecting the operating mode	
Operating mode	Switch 2
	3 4
0...fmax	<input type="checkbox"/> <input type="checkbox"/>
fmin...fmax	<input type="checkbox"/> <input checked="" type="checkbox"/>
saving	<input type="checkbox"/> <input type="checkbox"/>
fmin	<input checked="" type="checkbox"/> <input type="checkbox"/>

$$f = (A+B) \times C$$

Selecting the frequency				
A	Switch 1			
	1 2 3 4			
0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Selecting the frequency							
B	Switch 1						
	5 6 7 8						
0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

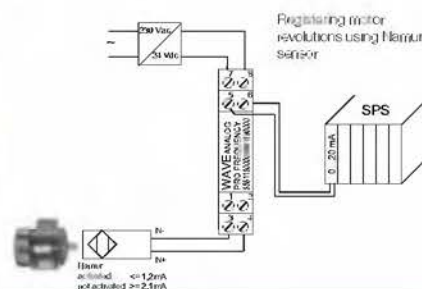
Selecting the frequency		
C	Switch 2	
	1 2	
x1	<input type="checkbox"/>	<input type="checkbox"/>
x10	<input type="checkbox"/>	<input checked="" type="checkbox"/>
x100	<input checked="" type="checkbox"/>	<input type="checkbox"/>
x1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Selecting the output			
Output	Switch 2		
	5 6 7 8		
0...10 V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0...20 mA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4...20 mA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0...5 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Special range (frequency generator is required)				
Funktion	Switch 2			
	1 2 3 4			
save min. frequency	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
save max. frequency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
select special range	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

■ = on
□ = off

Application



Technical data

Input	
Sensor/	
Rated input level	
Resolution	
Output	
Output voltage/Output current	
Load impedance, voltage/Current	
Offset current/Offset voltage	
Accuracy	
Temperature coefficient	
Step response time	
Status indicator	
General data	
Supply voltage	
Power consumption	
Current-carrying capacity of cross-connect.	
Operating temperature	
Storage temperature	
Default setting	
Approvals	
Insulation coordination	
Standards	
EMC standards	
Rated voltage	
Impulse withstand voltage	
Isolation voltage input, output/	
Overvoltage category	
Pollution severity	
Clearance & creepage distance	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

2-, 3-wire PNP/NPN, namur initiator, push-pull step /			
Threshold / Hysteresis: Namur: approx. 1.7 mA/approx. 0.2 mA;			
NPN: approx. 6.5 V/approx. 0.2V; PNP: approx. 6.7V/approx. 0.5V			
0.1 mHz or 5 ppm from measured value			
0...10 V A(4)...20 mA			
≥ 1 kΩ / ± 600 Ω			
max. 100 μA / max. 0.05 V			
0.2% of output range			
max. 200 ppm/K of output range			
360 ms + 2-fold period time of input frequency			
green LED			
24 V DC ± 25 %			
max. 1.6 W at I _{cl} = 20 mA			
≤ 2 A			
0 °C...+55 °C			
-20 °C...+85 °C			
0...10kHz / 4...20mA			
CE / cULus			
Screw connection		Tension clamp connection	
2,5 / 0,5 / 2,5		1,5 / 0,5 / 2,5	
92,4 x 12,5 x 112,4		92,4 x 12,5 x 112,4	
TU=23°C, single module			

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS4 PRO Freq	1	8581180000
Tension clamp connection	WAZ4 PRO Freq	1	8581190000

Note

Accessories

Note
Cross-connectors for power supply and markers - see WAVE series accessories

WAVEANALOG PRO Frequency

Setting the input range using the DIP switches (doesn't require a frequency generator):

There are 2 different methods:

1. Lower measuring frequency = 0 Hz

- Choose operating mode “= ... fmax”
S2.3 = 0 and S2.4 = 0
- Set the upper measuring frequency using DIP switches S1 and S2.1, S2.2 (see table)
- That's all!

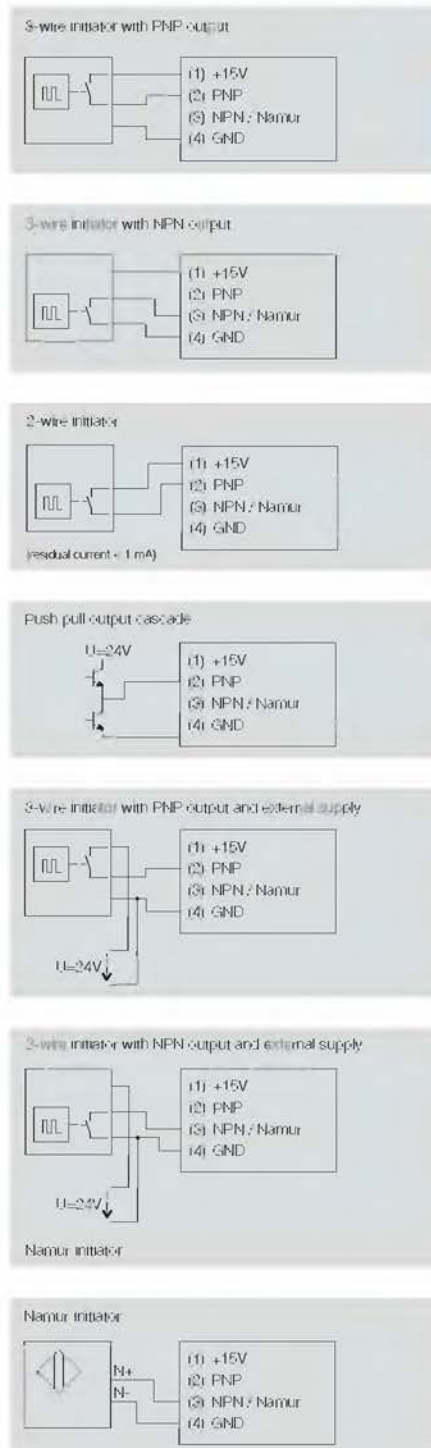
2. Lower measuring frequency ≠ 0 Hz

- First the lower measuring frequency must be saved.
Select mode “save fmin”.
S2.3 = 1 and S2.4 = 0.
Set the frequency using DIP switches S1 and S2.1, S2.2 (see table)
To save the frequency, briefly connect the module to the power supply.
- Select mode “fmin ... fmax”
S2.3 = 0 and S2.4 = 1
- Set the upper measuring frequency using DIP switches S1 and S2.1, S2.2 (see table).
- That's all!

Adjusting the input range using a frequency generator:

- Select the switch setting for saving the frequency: S2.1 = 0, S2.2 = 1, S2.3 = 1 and S2.4 = 1
- Apply min. frequency to the module
- Connect the module to the power supply
- The LED lights up when the input frequency is being measured. If the LED goes off, the frequency has been saved and the module can be disconnected from the power supply again.
- Repeat with max. frequency: S2.1 = 1, S2.2 = 0, S2.3 = 1 and S2.4 = 1
- Select special range: S2.1 = 1, S2.2 = 1, S2.3 = 1 and S2.4 = 1

Connection configuration for the sensors



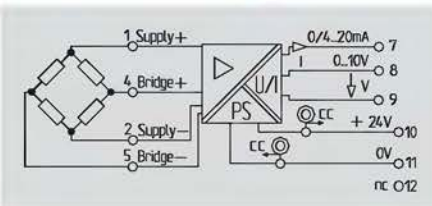
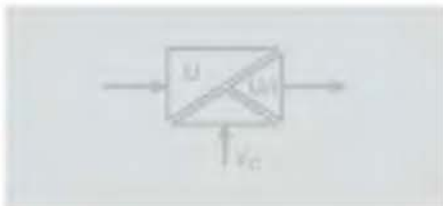
D

WAVESERIES - bridge-type test/isolator/converter

configurable

- 3-way isolation
- Input and output ranges adjustable via DIP switch
- No calibration necessary
- Inverse output signals possible

PRO BRIDGE



Technical data

Input	
Input voltage/	-500 mV...+500 mV /
Input resistance, voltage	> 1 MΩ
Output	
Output voltage/Output current	0...5 V, 5...0 V, 10...0 V, 0...10 V / 0...20 mA, 20...0 mA, 4...20 mA, 20...4 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Offset current/Offset voltage	max. 100 μA / max. 0,05 V
Accuracy	0,3% of output range
Temperature coefficient	± 250 ppm/K of output range
Step response time	typically < 200 ms
Status indicator	green LED
Wire break detection	output: 0 V resp. 0/4 mA
Bridge supply voltage	+10 V, +5 V, 4,8...10,2 V; offset adjustable; max. 40 mA
General data	
Supply voltage	24 V DC ± 25 %
Power consumption	max. 1,9 W at $I_{q,IT} = 20$ mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Default setting	-500 mV...+500 mV / 0...10 V / + 10 V / standard
Approvals	CE / dULus
Insulation coordination	
Standards	EN 50178
EMC standards	EN 61000-6 / 2
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage input, output/	2 kV _{eff} / 5 s /
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 3 mm

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Screw connection	Tension clamp connection
2,5 / 0,5 / 2,5	1,5 / 0,5 / 2,5
92,4 x 17,5 x 112,4	92,4 x 17,5 x 112,4

TU=23°C, single module

Ordering data

Type of connection	
Screw connection	
Tension clamp connection	

Note

Type	Qty.	Order No.
WAS5 PRO Bridge	1	8581200000
WAZ5 PRO Bridge	1	8581210000

Accessories

Note

Cross-connectors for power supply and markers - see WAVE series accessories

Switch position/setting options

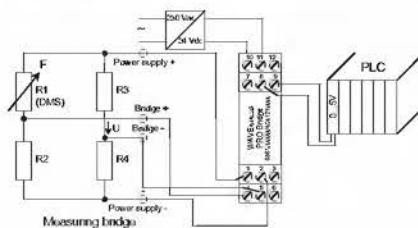
Input voltage	SW 1									
	1	2	3	4	5	6	7	8	9	10
0...10 mV										
0...20 mV									■	■
0...50 mV								■	■	■
0...100 mV								■	■	■
0...200 mV								■	■	■
0...500 mV								■	■	■
-10 mV... 10 mV								■	■	■
-20 mV...20 mV								■	■	■
-50 mV...50 mV								■	■	■
-100 mV...100 mV								■	■	■
-200 mV...200 mV								■	■	■
-500 mV...500 mV								■	■	■
Output										
0...+10 V									■	■
0...+5 V									■	■
0...20 mA									■	■
4...20 mA									■	■
Bridge supply voltage										
+10V									■	■
+5V									■	■
+4,8...+10,2V adjustable									■	■
+4,8...+10,2V adjustable man. adjustment and offset possible									■	■
Transmission method										
standard output signal										■
inverse output signal										■

■ = on
□ = off

Status LED

LED on	normal operating
LED off	Error
LED blinks slow	measurement range undershoot $U_{in} < U_{max} + 10\%$
LED blinks fast	measurement range overshoot $U_{in} < U_{max} - 10\%$

Application

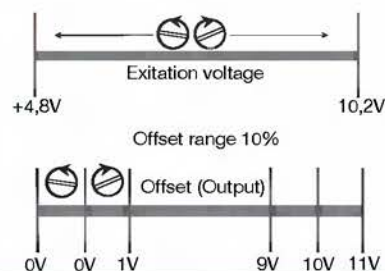


Example for bridge supply voltage

Temperature adjustment:

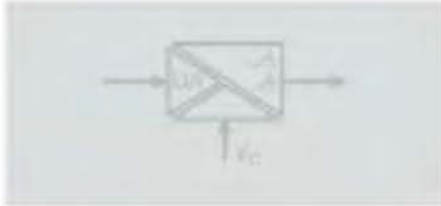
Input voltage	0...10 mA
Output	0...10 V
Bridge supply voltage	+4,8...10,2 V
Bridge excitation	1 mV/V

(Declaration from manufacturer)

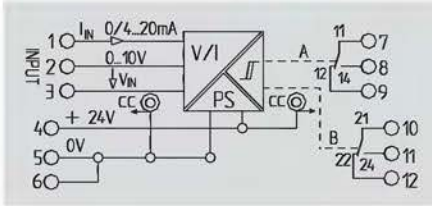


Relay output

- 3-way isolation
- Low trip / High trip
- FAILSAFE / NON-FAILSAFE
- 2 Relay outputs



DC/Alarm



Technical data

Input	
Input voltage	0...10 V
Input current	0(4)...20 mA
Input resistance, voltage/Current	≥ 100 kΩ / ≤ 110 Ω
Output	
Contact complement	2 change-over contacts
Contact material	AgNi 90/10
Switching thresholds	1...90% (independently for channel 1 and channel 2)
Hysteresis	1...90% (independently for channel 1 and channel 2)
Switching voltage, min./max.	/253 V AC
Continuous current	3 A
Function	Open-circuit/closed-circuit principle
Temperature coefficient	≤ 500 ppm/K
Status indicator	LED green ON: OK, LED red ON: alarm (per channel)
General data	
Supply voltage	24 V DC ± 25 %
Power consumption	typically 1 W both relays picked up
Current-carrying capacity of cross-connection	≤ 2 A
Operating temperature	(°C)...+55°C (filled)
Storage temperature	-20 °C...+85 °C
Default setting	channel A/B: low trip and FAILSAFE
Approvals	CE / dULus
Insulation coordination	
Standards	EN 50178
EMC standards	EN 61000-4-2, -3, -4, -5, -6
Rated voltage	300 V
Impulse withstand voltage	4 kV
Pollution severity	2
Oversvoltage category	III
Clearance & creepage distance	≥ 3 mm
Isolation voltage input, output	2 kV _{eff} / 5 s

Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Note	

Ordering data

Type of connection	
Screw connection	
Tension clamp connection	

Note

Accessories

Note

Screw connection	Tension clamp connection
2,5 / 0,5 / 2,5	1,5 / 0,5 / 2,5
92,4 x 17,5 x 112,4	92,4 x 17,5 x 112,4

Type	Qty.	Order No.
WAS5 DC/Alarm	1	8543820000
WAZ5 DC/Alarm	1	8543880000

Cross-connectors for power supply and markers - see WAVE series accessories

Switch position/setting options

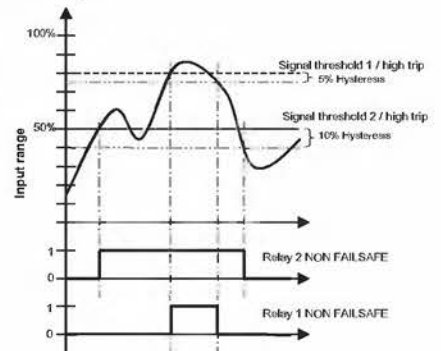
function	SW 1			
	1	2	3	4
Channel A High Trip	■			
Channel A Low Trip	□			
Channel B High Trip		■		
Channel B Low Trip		□		
FAILSAFE, Channel 1 & 2			□	□
NON FAILSAFE, Chan. 1 & 2			■	■

■ = on
□ = off

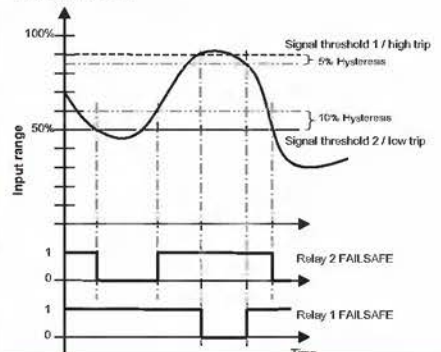
- NON FAILSAFE:** The relay picks up when the alarm is triggered
- FAILSAFE:** The relay drops out when the alarm is triggered. An alarm is also triggered in the FAILSAFE mode, if for example, the operating voltage to the module fails
- Low Trip:** Alarm is triggered if the signal is undershoot the threshold.
- High Trip:** Alarm is triggered if the signal is overshoot the threshold.
- Signal threshold:** Adjustments of the signal threshold (1...90%) are made for channel 1 with the potentiometer P1, and separately for channel 2 via potentiometer P2.
- Hysteresis:** Adjustments of the hysteresis (1...10%) are made for channel 1 with the potentiometer P3, and separately for channel 2 via potentiometer P3.

WAVEANALOG DC/Alarm – Alarm indication

Example 1



Example 2

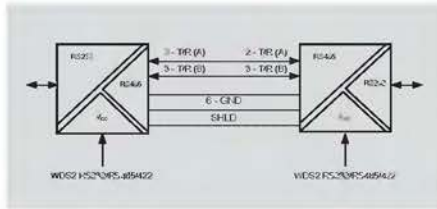
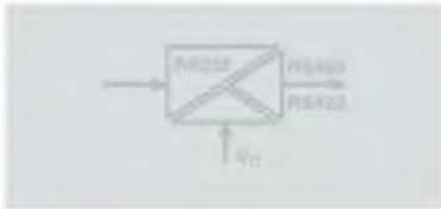


WAVESERIES - serial interface disconnecter/converter

RS232/RS485/422

- 3-way isolation
- RS232 connection via SUB-D 9
- RS485/422, TTY shield connection via locking bar
- Switchable DTE or DCE assignment
- Bidirectional communication

RS232/RS485/422



D

Technical data

RS232	
Connection/input current	
Assignment	
RS485/422	
Terminating resistors	
Connection	
Bit distortion	
Bit delay	
Control of data direction	
Shield connection	
Status indicator	
max. transmission rate	
Transmission channels	
Transmission distance	
General data	
Supply voltage	
Power consumption	
Operating temperature	
Storage temperature	
Approvals	
Insulation coordination	
Standards	
EMC standards	
Rated voltage	
Impulse withstand voltage	
Pollution severity	
Overtoltage category	
Clearance & creepage distance	
Isolation voltage input, output	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

SUB-D9 (plug) /	
DTE/DCE switchable with DIP switch	
pull-down/pull-up via DIP switch	
Screw connection	
< 5 %	
≤ 3 μs	
automatic or via RS232 RTS/CTS	
KLBÜ 4-6/Z1	
LED green: supply voltage, TxD, RxD	
115.2 kBit/s	
half duplex (RS485, 2 wire)	
full duplex (RS485, 4 wire and RS422)	
max. 1200 m twisted pair	
24 V DC ± 25 %	
approx. 1.5 W	
(0°C...+55°C (horiz. mounting))	
-20 °C...+85 °C	
CE / cULFus	
EN 50178	
EN 61000-6-2, EN 61000-6-4, EN 55011	
between adjacent electric circuits: 300 V	
between electric circuits and PE: 150 V	
4 kV	
2	
III	
between adjacent electric circuits: 3 mm	
between electric circuits and PE: 1.5 mm	
2 kV DC / 1 min.	
Screw connection	
2.5 / 0.5 / 2.5	
92.4 x 22.5 x 112.4	
Tu=23°C, single module	

Ordering data

Type of connection	Screw connection
Note	

Type	Qty.	Order No.
WDS2 RS232/RS485/422	1	8615700000

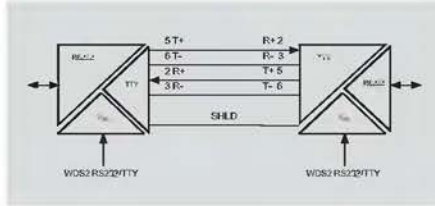
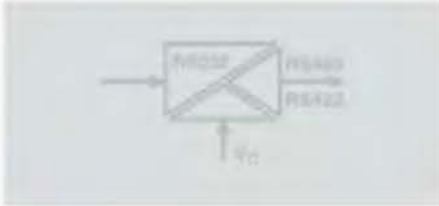
Accessories

Note	Cross-connectors for power supply and markers - see WAVE series accessories
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RS232/TTY

- 3-way isolation
- RS232 connection via SUB-D 9
- RS485/422, TTY shield connection via locking bar
- Switchable DTE or DCE assignment
- Bidirectional communication

RS232/TTY



Technical data

RS232

Connection/input current
Assignment

TTY

Connection
Bit distortion
Bit delay
Load
Shield connection
Status indicator
max. transmission rate
Transmission channels
Transmission distance

General data

Supply voltage
Power consumption
Operating temperature
Storage temperature
Approvals

Insulation coordination

Standards
EMC standards
Rated voltage

Impulse withstand voltage
Pollution severity
Overvoltage category
Clearance & creepage distance

Isolation voltage input, output

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Ordering data

Type of connection
Screw connection

Note

Accessories

Note

SUB-D9 (plug) /
DTE/DCE switchable with DIP switch
Screw connection
< 1.5%
≤ 3 μs
≤ 500 Ω
KLBO 4-6 Z/1
LED green: supply voltage, TxD, RxD
19.2 kBit/s
full duplex
max. 1000 m twisted pair
24 V DC ± 25 %
approx. 0.8 W
0°C...+55°C (horiz. mounting)
-20 °C...+85 °C
CE; cULFus;
EN 50178
EN 61000-6-2, EN 61000-6-4, EN 55011
between adjacent electric circuits: 300 V
between electric circuits and PE: 150 V
4 kV
2
III
between adjacent electric circuits: 3 mm
between electric circuits and PE: 1.5 mm
2 kV DC / 1 min.

Screw connection

2.5 / 0.5 / 2.5
92.4 x 22.5 x 112.4

Tu=23°C; single module

Type	Qty.	Order No.
WDS2 RS232/TTY	1	8615690000

Cross-connectors for power supply and markers - see WAVE series accessories

WAVESERIES - current monitoring

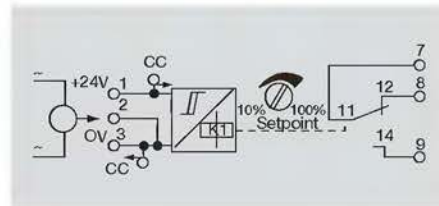
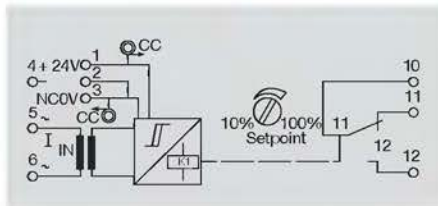
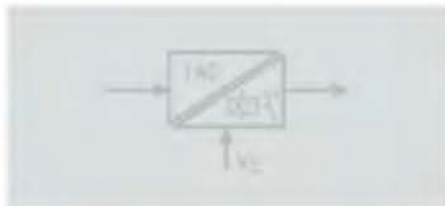
Relay output

- Current ranges adjustable via DIP switch
- Switchable hysteresis
- Operating or closed-circuit current principle

1/5/10 A AC



20/40/60 A AC



Technical data

	1/5/10 A AC	20/40/60 A AC
Input		
Input current	0...1 A AC / 0...5 A AC / 0...10 A AC	0...20 A AC / 0...40 A AC / 0...60 A AC
Input frequency	50...60 Hz	50...60 Hz
max. current	100 A for 1s	depends on conductor cross-section
max. voltage	250 V AC	400 V AC, > 400 V AC depends on wire insulation
Sensor	Transforming (internally)	Hall sensor (internal)
Diameter of entry		8 mm
Output		
Switching thresholds	adjustable 10...100% with front potentiometer	adjustable 10...100% with front potentiometer
Hysteresis	5% or 10% of threshold value	5% or 10% of threshold value
Switching voltage, min./max.	6 V AC/DC / 60 V DC / 250 V AC	6 V AC/DC / 60 V DC / 250 V AC
Switching current min./max.	100 mA / 7 A	100 mA / 7 A
Continuous current	0.7 A DC / 3 A AC	0.7 A DC / 3 A AC
Step response time	typ. 700 ms	typ. 700 ms
Temperature coefficient	≤ 800 ppm/K	≤ 250 ppm/K
Status indicator	green LED	green LED
General data		
Supply voltage	24 V DC ± 10 %	24 V DC ± 10 %
Current consumption	8.3 mA (relay not triggered) / 24 mA (relay triggered)	23 mA (relay not triggered) / 47 mA (relay triggered)
Current-carrying capacity of cross-connect.	≤ 2 A	≤ 2 A
Operating temperature/Storage temperature	0 °C...+50 °C / -20 °C...+70 °C	0 °C...+50 °C / -20 °C...+70 °C
Default setting	0...5 A / 10% Hysteresis / operating current principle	0...40 A / 10% Hysteresis / operating current principle
Approvals	CE / cULus	CE / cULus
Contact complement	1 changeover contact	1 changeover contact
Insulation coordination		
EMC standards	EN 55011, EN 61000-6	EN 55011, EN 61000-6
Rated voltage	300 V	300 V
Impulse withstand voltage	4 kV	4 kV
Pollution severity	2	2
Overvoltage category	III	III
Clearance & creepage distance	≥ 3 mm	≥ 3 mm
Isolation voltage input, output	4 kV _{eff} / 5 s	4 kV _{eff} / 5 s

	1/5/10 A AC		20/40/60 A AC	
	Screw connection	Tension clamp connection	Screw connection	Tension clamp connection
Clamping range (rating- / min. / max.)	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5	2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
Length x width x height	92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4
Note	T _U =23°C, single module		T _U =23°C, single module	

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS2 CMR 1/5/10A ac	1	8516560000
Tension clamp connection	WAZ2 CMR 1/5/10A ac	1	8516570000

Note

Accessories

Note	
	Cross-connectors for power supply and markers - see WAVE series accessories
	Cross-connectors for power supply and markers - see WAVE series accessories

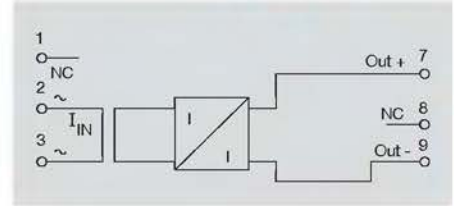
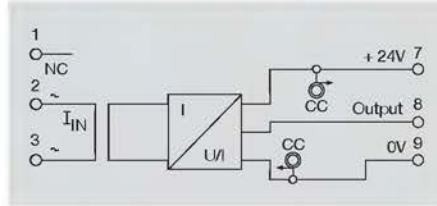
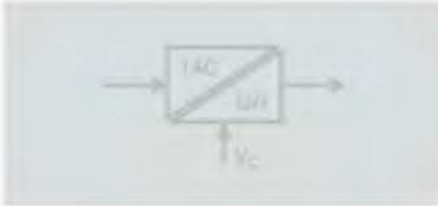
Analogue output

- Input and output ranges adjustable via DIP switch
- No calibration necessary

1/5/10 A AC

1/5/10 A AC 4...20 mA

Loop Powered



Technical data

Input	
Input current	0...1 A AC / 0...5 A AC / 0...10 A AC
Input frequency	50...60 Hz
max. current	100 A for 1s
Voltage of measuring circuit	250 V AC
Sensor	Transforming (internally)
Output	
Output current/Output voltage	0(4)...20 mA / 0...10 V
Offset current	max. 100 µA
Output signal limit	approx. 13 V resp. 24 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Step response time	typ. 700 ms
Accuracy	0.5% FSR
Temperature coefficient	≤ 200 ppm/K
Status indicator	LED ON: OK; FLASHING: signal out of range; LED OFF: Error
General data	
Supply voltage	24 V DC ± 10%
Current consumption	40 mA at I _{q,IT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature/Storage temperature	0 °C...+50 °C / -20 °C...+70 °C
Default setting	0...5 A AC, 4...20 mA
Approvals	CE; cULus;
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	6 kV
Pollution severity	2
Oversoltage category	III
Clearance & creepage distance	≥ 5,5 mm
Isolation voltage input, output	4 kV _{eff} / 5 s
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
I _u =23% ² , single module	

Input	
Input current	0...1 A AC / 0...5 A AC / 0...10 A AC
Input frequency	50...60 Hz
max. current	100 A for 1s
Voltage of measuring circuit	250 V AC
Sensor	Transforming (internally)
Output	
Output current/Output voltage	4...20 mA (current loop) / 0...10 V
Offset current	max. 100 µA
Output signal limit	approx. 24 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Step response time	typ. 700 ms
Accuracy	0.5% FSR
Temperature coefficient	≤ 200 ppm/K
Status indicator	LED ON: OK; FLASHING: signal out of range; LED OFF: Error
General data	
Supply voltage	13...30 V DC
Current consumption	
Current-carrying capacity of cross-connect.	
Operating temperature/Storage temperature	0 °C...+50 °C / -20 °C...+70 °C
Default setting	0...5 A AC, 4...20 mA
Approvals	CE; cULus;
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	6 kV
Pollution severity	2
Oversoltage category	III
Clearance & creepage distance	≥ 5,5 mm
Isolation voltage input, output	4 kV _{eff} / 5 s
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
I _u =23% ² , single module	

Input	
Input current	0...1 A AC / 0...5 A AC / 0...10 A AC
Input frequency	50...60 Hz
max. current	100 A for 1s
Voltage of measuring circuit	250 V AC
Sensor	Transforming (internally)
Output	
Output current/Output voltage	4...20 mA (current loop) / 0...10 V
Offset current	max. 100 µA
Output signal limit	approx. 24 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Step response time	typ. 700 ms
Accuracy	0.5% FSR
Temperature coefficient	≤ 200 ppm/K
Status indicator	LED ON: OK; FLASHING: signal out of range; LED OFF: Error
General data	
Supply voltage	13...30 V DC
Current consumption	
Current-carrying capacity of cross-connect.	
Operating temperature/Storage temperature	0 °C...+50 °C / -20 °C...+70 °C
Default setting	0...5 A AC, 4...20 mA
Approvals	CE; cULus;
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	6 kV
Pollution severity	2
Oversoltage category	III
Clearance & creepage distance	≥ 5,5 mm
Isolation voltage input, output	4 kV _{eff} / 5 s
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
I _u =23% ² , single module	

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS1 CMA 1/5/10A ac	1	8523400000
Tension clamp connection	WAZ1 CMA 1/5/10A ac	1	8523410000
Note			

Type	Qty.	Order No.
WAS1 CMA 1/5/10A ac	1	8523400000
WAZ1 CMA 1/5/10A ac	1	8523410000
Note		

Type	Qty.	Order No.
WAS1 CMA LP 1/5/10A ac	1	8528650000
WAZ1 CMA LP 1/5/10A ac	1	8528660000
Note		

Accessories

Note	Cross-connectors for power supply and markers - see WAVE series accessories
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Note	Cross-connectors for power supply and markers - see WAVE series accessories
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Note	Cross-connectors for power supply and markers - see WAVE series accessories
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WAVESERIES - current monitoring

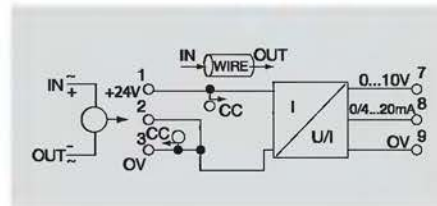
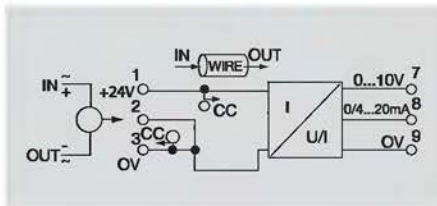
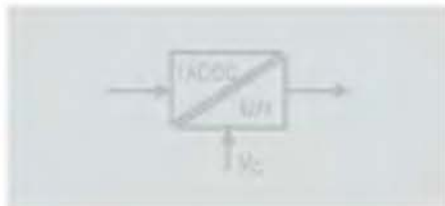
Analogue output

- Input and output ranges adjustable via DIP switch
- No calibration necessary

5/10 A AC/DC



20/25/30 A AC/DC



D

Technical data

Input	
Input current	0...5 A AC/DC / 0...10 A AC/DC
Input frequency	0...2 kHz (true RMS to DC converter)
max. current	depends on conductor cross-section
Voltage of measuring circuit	400 V AC, >400V AC depends on conductor insulation
Sensor	Hall sensor (internal)
Diameter of entry	8 mm
Output	
Output current/Output voltage	0(4)...20 mA / 0...10 V
Offset current	max. 150 µA
Output signal limit	approx. 13 V resp. 24 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Step response time	typ. 700 ms
Accuracy	1 % FSR
Temperature coefficient	≤ 650 ppm/K
Status indicator	LED ON: OK; FLASHING: signal out of range; LED OFF: Error
General data	
Supply voltage	24 V DC ± 10 %
Current consumption	50 mA at I _{q,IT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature/Storage temperature	0 °C...+50 °C / -20 °C...+70 °C
Default setting	0...5 A, 4...20 mA
Approvals	CE / cULus
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	6 kV
Pollution severity	2
Overvoltage category	III
Clearance & creepage distance	≥ 5,5 mm
Isolation voltage input, output	4 kV _{eff} / 5 s
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
T _u =23°C, single module	

5/10 A AC/DC	
Input current	0...5 A AC/DC / 0...10 A AC/DC
Input frequency	0...2 kHz (true RMS to DC converter)
max. current	depends on conductor cross-section
Voltage of measuring circuit	400 V AC, >400V AC depends on conductor insulation
Sensor	Hall sensor (internal)
Diameter of entry	8 mm
Output	
Output current/Output voltage	0(4)...20 mA / 0...10 V
Offset current	max. 150 µA
Output signal limit	approx. 13 V resp. 24 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Step response time	typ. 700 ms
Accuracy	1 % FSR
Temperature coefficient	≤ 650 ppm/K
Status indicator	LED ON: OK; FLASHING: signal out of range; LED OFF: Error
General data	
Supply voltage	24 V DC ± 10 %
Current consumption	50 mA at I _{q,IT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature/Storage temperature	0 °C...+50 °C / -20 °C...+70 °C
Default setting	0...5 A, 4...20 mA
Approvals	CE / cULus
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	6 kV
Pollution severity	2
Overvoltage category	III
Clearance & creepage distance	≥ 5,5 mm
Isolation voltage input, output	4 kV _{eff} / 5 s
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
T _u =23°C, single module	

20/25/30 A AC/DC	
Input current	0...20 A AC/DC / 0...25 A AC/DC / 0...30 A AC/DC
Input frequency	0...2 kHz (true RMS to DC converter)
max. current	depends on conductor cross-section
Voltage of measuring circuit	400 V AC, >400V AC depends on conductor insulation
Sensor	Hall sensor (internal)
Diameter of entry	8 mm
Output	
Output current/Output voltage	0(4)...20 mA / 0...10 V
Offset current	max. 150 µA
Output signal limit	approx. 13 V resp. 24 mA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Step response time	typ. 700 ms
Accuracy	1 % FSR
Temperature coefficient	≤ 650 ppm/K
Status indicator	LED ON: OK; FLASHING: signal out of range; LED OFF: Error
General data	
Supply voltage	24 V DC ± 10 %
Current consumption	50 mA at I _{q,IT} = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Operating temperature/Storage temperature	0 °C...+50 °C / -20 °C...+70 °C
Default setting	0...25 A, 4...20 mA
Approvals	CE / cULus
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011, EN 61000-6
Rated voltage	300 V
Impulse withstand voltage	6 kV
Pollution severity	2
Overvoltage category	III
Clearance & creepage distance	≥ 5,5 mm
Isolation voltage input, output	4 kV _{eff} / 5 s
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
T _u =23°C, single module	

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS2 CMA 5/10A uc	1	8526610000
Tension clamp connection	WAZ2 CMA 5/10A uc	1	8526620000
Note			

Type of connection	Type	Qty.	Order No.
Screw connection	WAS2 CMA 20/25/30A uc	1	8545830000
Tension clamp connection	WAZ2 CMA 20/25/30A uc	1	8545840000
Note			

Accessories

Note

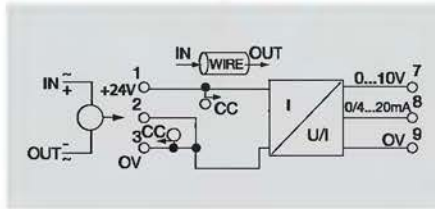
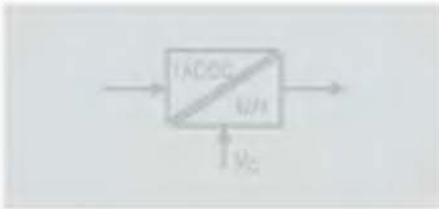
Order-connectors for power supply and markers - see WAVE series accessories

Order-connectors for power supply and markers - see WAVE series accessories

Analogue output

- Input and output ranges adjustable via DIP switch
- No calibration necessary

40/50/60 A AC/DC



Technical data

Input	0...40 A AC/DC / 0...50 A AC/DC / 0...60 A AC/DC	
Input current	0...2 kHz (true RMS to DC converter)	
Input frequency	depends on conductor cross-section	
max. current	400 V AC, >400V AC depends on conductor insulation	
Voltage of measuring circuit	Hall sensor (internal)	
Sensor	8 mm	
Diameter of entry		
Output	0(4)...20 mA / 0...10 V	
Output current/Output voltage	max. 150 µA	
Offset current	approx. 13 V resp. 24 mA	
Output signal limit	≥ 1 kΩ / ≤ 600 Ω	
Load impedance, voltage/Current	typ. 700 ms	
Step response time	1 % FSR	
Accuracy	≤ 650 ppm/K	
Temperature coefficient	LED ON: OK; FLASHING: signal out of range;	
Status indicator	LED OFF: Error	
General data	24 V DC ± 10 %	
Supply voltage	50 mA at I _{q,IT} = 20 mA	
Current consumption	≤ 2 A	
Current-carrying capacity of cross-connect.	0 °C...+50 °C / -20 °C...+70 °C	
Operating temperature/Storage temperature	0...50 A, 4...20 mA	
Default setting	CE / dULus	
Approvals		
Insulation coordination	EN 50178 (protective separation)	
Standards	EN 55011, EN 61000-6	
EMC standards	300 V	
Rated voltage	6 kV	
Impulse withstand voltage	2	
Pollution severity	III	
Overvoltage category	≥ 5,5 mm	
Clearance & creepage distance	4 kV _{eff} / 5 s	
Isolation voltage input, output	Screw connection	Tension clamp connection
Dimensions	2,5 / 0,5 / 2,5	1,5 / 0,5 / 2,5
Clamping range (rating- / min. / max.)	mm ²	
Length x width x height	mm	92,4 x 22,5 x 112,4
Note	T _u =23°C, single module	

Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS2 CMA 40/50/60A uc	1	8513330000
Tension clamp connection	WAZ2 CMA 40/50/60A uc	1	8526590000

Note

Accessories

Note: Cross-connectors for power supply and markers - see WAVE series accessories

WAVESERIES - voltage monitoring

Relay output

- 3-way isolation
- Monitoring of single-phase systems up to 260 V AC/DC
- 4 input ranges selected by DIP switches
- 1 relay with change-over contact
- Switchable hysteresis
- Switch adjusted via potentiometer
- Reset input

VMR Vac single-phase

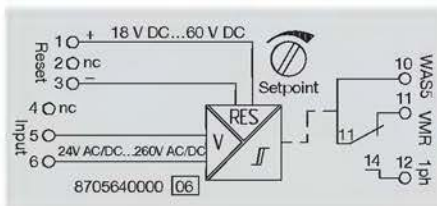


Table of setting options

Input	1	2	3	4	5	6	7	8
24 V AC/DC...70 V AC/DC				■	□	□	□	□
70 V AC/DC...140 V AC/DC			□	□	□	■		
140 V AC/DC...210 V AC/DC			□	□	■	□		
210 V AC/DC...260 V AC/DC			□	■	□	□		
Trip								
High Trip		■						
Low Trip		□						
Memory								
Memory on			□					
Memory out			■					
Hysteresis								
Hysteresis small			□					
Hysteresis large				■				
Input voltage								
AC voltage								■
DC voltage								□

■ = on
□ = out

Status indicator

- Set value not exceeded.
- Alarm status.
- Alarm status can be reset because set value has been exceeded.

Abb.1: Overvoltage monitoring
Alarm set to "high trip"
(Set permanently to closed-circuit principle.)

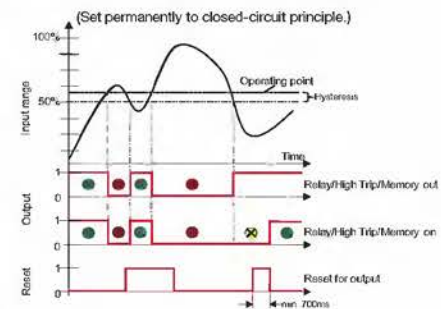
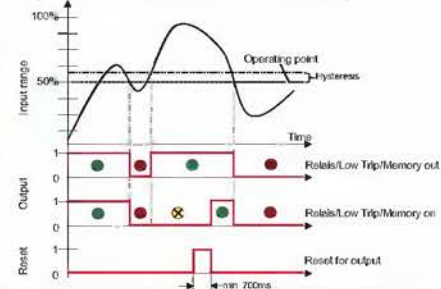


Abb.2: Undervoltage monitoring
Alarm set to "low trip"
(Set permanently to closed-circuit principle.)



Technical data

Input	
Input voltage	24...70 / 70...140 / 140...210 / 210...260 V AC / DC
Input frequency	50...60 Hz
max. voltage	260 V AC / DC
Output	
Switching voltage, min./max.	/250 V AC
Switching current min./max.	/8 A
Continuous current/AC switching capacity	3 A / 1000 VA
Hysteresis	24...70 V AC, small = 5 V / large = 10 V
Temperature coefficient	≤ 250 ppm/K
Step response time	< 300 ms
Repeat accuracy	< 0.3% of set range
Status indicator	LED green = OK / LED red/yellow = alarm status
General data	
Supply voltage	from the measuring circuit
Reset input voltage, min.-max.	18 V DC-30 V DC
Pulse length, min.	700 ms
Default setting	DIP switches: ON = 1,2,5,8 / OFF = 3,4,6,7
Operating temperature	-10°C...+55°C single module
Storage temperature	-20°C...+70°C
Approvals	CE / cULus
Insulation coordination	
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6, EN 61326
Rated voltage	input/output, input/reset input, reset input/output: 300 V
Impulse withstand voltage	input/output, input/reset input, reset input/output: 4 kV / 2 kV _{eff}
Isolation voltage input, output	III
Overvoltage category	2
Pollution severity	input/output, input/reset input, reset input/output: 3 mm
Clearance & creepage distance	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Ordering data

Type of connection	Screw connection
Note	

Accessories

Note	Markers call "Accessories"
-------------	----------------------------

Input	24...70 / 70...140 / 140...210 / 210...260 V AC / DC
Input frequency	50...60 Hz
max. voltage	260 V AC / DC
Output	/250 V AC
Switching current min./max.	/8 A
Continuous current/AC switching capacity	3 A / 1000 VA
Hysteresis	24...70 V AC, small = 5 V / large = 10 V
Temperature coefficient	≤ 250 ppm/K
Step response time	< 300 ms
Repeat accuracy	< 0.3% of set range
Status indicator	LED green = OK / LED red/yellow = alarm status
General data	from the measuring circuit
Reset input voltage, min.-max.	18 V DC-30 V DC
Pulse length, min.	700 ms
Default setting	DIP switches: ON = 1,2,5,8 / OFF = 3,4,6,7
Operating temperature	-10°C...+55°C single module
Storage temperature	-20°C...+70°C
Approvals	CE / cULus
Insulation coordination	EN 50178
Standards	EN 55011, EN 61000-6, EN 61326
Rated voltage	input/output, input/reset input, reset input/output: 300 V
Impulse withstand voltage	input/output, input/reset input, reset input/output: 4 kV / 2 kV _{eff}
Isolation voltage input, output	III
Overvoltage category	2
Pollution severity	input/output, input/reset input, reset input/output: 3 mm
Clearance & creepage distance	
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

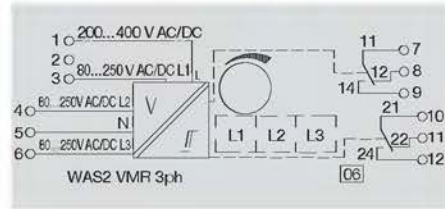
Type	Qty.	Order No.
WASS VMR 1ph	1	8705640000

Note	Markers call "Accessories"
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Relay output

- 2-way isolation
- Monitoring of 1- and 3-phase systems from 80 to 400 V AC/DC
- Adjusted by DIP switches
- Undervoltage and overvoltage monitoring
- 2 relays with change-over contact

VMR V AC 3-phase



Technical data

Input	
Input voltage 3~	80...250 V AC/DC
Input voltage 1~	200...400 V AC/DC
Input current	< 15 mA AC / < 10 mA DC
Output	
Switching voltage, min./max.	/250 V AC
Continuous current/AC switching capacity	3 A / 750 VA
Hysteresis	5% of final value
Temperature coefficient	≤ 300 ppm/K
Step response time	< 300 ms
Repeat accuracy	< 0.3% of set range
Status indicator	green LED
General data	
Supply voltage	from the measuring circuit
Reset input voltage, min.-max.	-
Pulse length, min.	-
Default setting	DIP switches: ON = 1,2,4 / OFF = 3
Operating temperature	0 °C...+50 °C
Storage temperature	-25 °C...+85 °C
Approvals	CE, ENEC, ULus
Insulation coordination	
Standards	EN 50178
EMC standards	EN 55011, EN 61000-6, EN 61326
Rated voltage	600 V
Impulse withstand voltage	6 kV
Isolation voltage input, output	4 kV _{eff} / 1 min.
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	-

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Ordering data

Type of connection	Screw connection
Note	

Accessories

Note	Markers use "Posiseries"
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Input	80...250 V AC/DC
	200...400 V AC/DC
Limit value	< 15 mA AC / < 10 mA DC
Hysteresis	5% of final value
Fault tolerance	≤ 300 ppm/K
Operating current method	< 300 ms
Closed-circuit current method	< 0.3% of set range
	green LED
Status indicator	from the measuring circuit
	-
	DIP switches: ON = 1,2,4 / OFF = 3
	0 °C...+50 °C
	-25 °C...+85 °C
	CE, ENEC, ULus
	EN 50178
	EN 55011, EN 61000-6, EN 61326
	600 V
	6 kV
	4 kV _{eff} / 1 min.
	III
	2

Screw connection	
2.5 / 0.5 / 2.5	mm ²
96.5 x 22.5 x 112.5	mm

Type	Qty.	Order No.
WAS2 VMR 3ph	1	8705630000

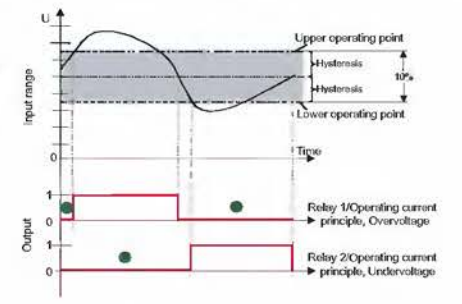
Table of setting options

Input	1	2	3	4
3 phases 80 V AC/DC...250 V AC/DC		■		
1 phase 200 V AC/DC...400 V AC/DC			□	
Limit value				
Setting to upper switching point		■		
Setting to lower switching point			□	
Hysteresis				
Hysteresis, small			■	
Hysteresis, large				□
Fault tolerance				
Operating current method				■
Closed-circuit current method				□

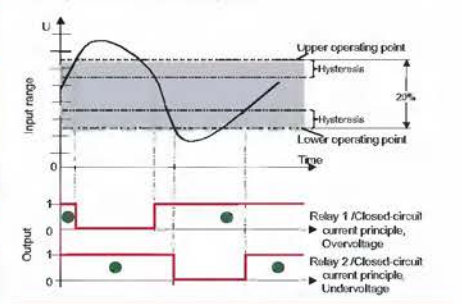
■ = on
□ = off

Status indicator
⊗ Voltage is in set range

- Fig. 1: Overvoltage and undervoltage monitoring, example of setting**
- 3-phase monitoring
 - Setting limit value to upper operating point: 230 V Hysteresis 5% = -12,5 V
 - Lower operating point 10% less 230 V - 25 V = 205 V Hysteresis 5% = +12,5 V
 - The device operates with the operating current principle.
 - All 3 phases monitored in parallel



- Fig. 2: Overvoltage and undervoltage monitoring, example of setting**
- 3-phase monitoring
 - Setting limit value to lower operating point: 150 V Hysteresis 5% = +12,5 V
 - Upper operating point 20% greater 150 V + 50 V = 200 V Hysteresis 5% = -12,5 V
 - The device operates with the closed-circuit current principle.
 - All 3 phases monitored in parallel

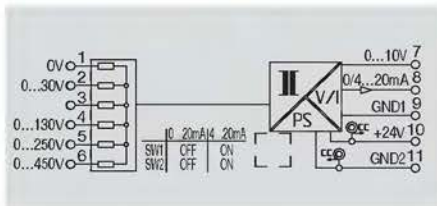
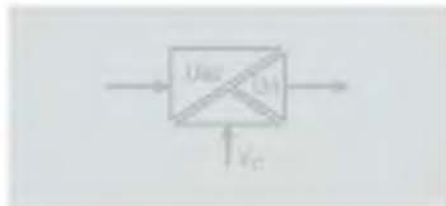


WAVESERIES - voltage monitoring

Analogue output

- 3-way isolation
- Max. measuring voltage 450 V AC_{eff}
- Output ranges selectable via DIP switch
- No calibration necessary

VMA V AC



D

Technical data

Input	
Input voltage	0...30 / 0...70 / 0...130 / 0...250 / 0...450 V AC
Input frequency	40...40 Hz sinus
max. voltage	45 / 100 / 180 / 270 / 475 V AC (short time)
Output	
Output voltage/Output current	0...10 V I(4)...20 mA
Offset voltage/Offset current	max. 0.02 V / max. 40 µA
Load impedance, voltage/Current	≥ 1 kΩ / ≤ 600 Ω
Accuracy	1.3% (40...60 Hz) typ. 1% / 2% (70...400 Hz) typically 1.5%
Temperature coefficient	≤ 250 ppm/K
Step response time	< 300 ms
Status indicator	green LED
General data	
Supply voltage	24 V DC ± 25 %
Current consumption	40...30...24 mA at I _L /I _U = 20 mA
Current-carrying capacity of cross-connect.	≤ 2 A
Default setting	0...10V/0...20mA
Operating temperature/Storage temperature	0 °C...+50 °C / -20 °C...+70 °C
Approvals	CE; cULus;
Insulation coordination	
Standards	EN 50178
EMC standards	EN 61000-6, EN 61000-2-6, EN 61326
Rated voltage	supply/output: 300 V; input/output, supply/output: 600 V
Impulse withstand voltage	supply/output: 4 kV; input/output, supply/output: 6kV
Isolation voltage input, output/	4 kV _{eff} / 5 s /
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	supply/output: 3 mm; input/output, supply/output: 5.5 mm
Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	
I _u =23%; single module	

Ordering data

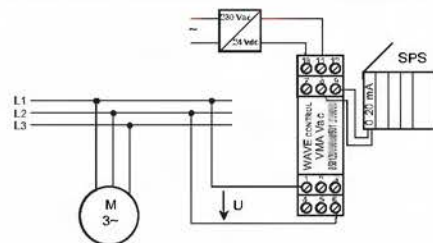
Type of connection	
	Screw connection
	Tension clamp connection
Note	

Screw connection	Tension clamp connection
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4
I _u =23%; single module	

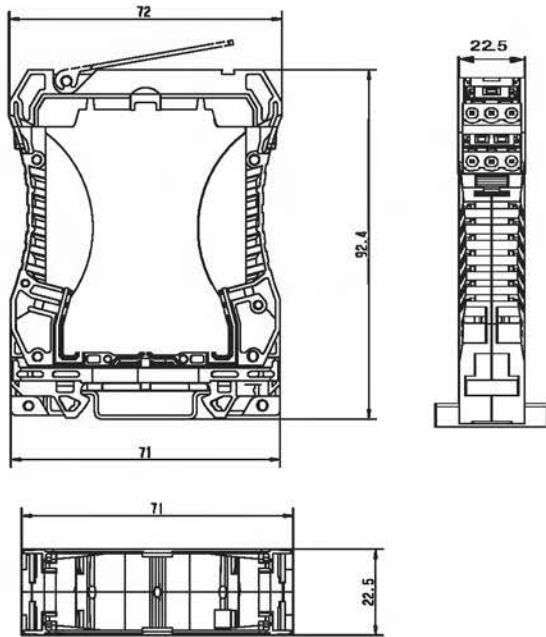
Accessories

Note	Cross-connectors for power supply and markers - see WAVE series accessories
-------------	---

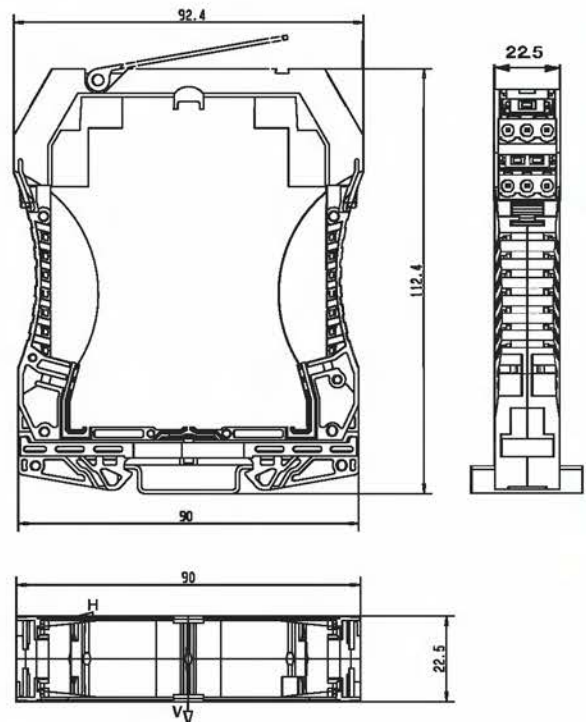
Application



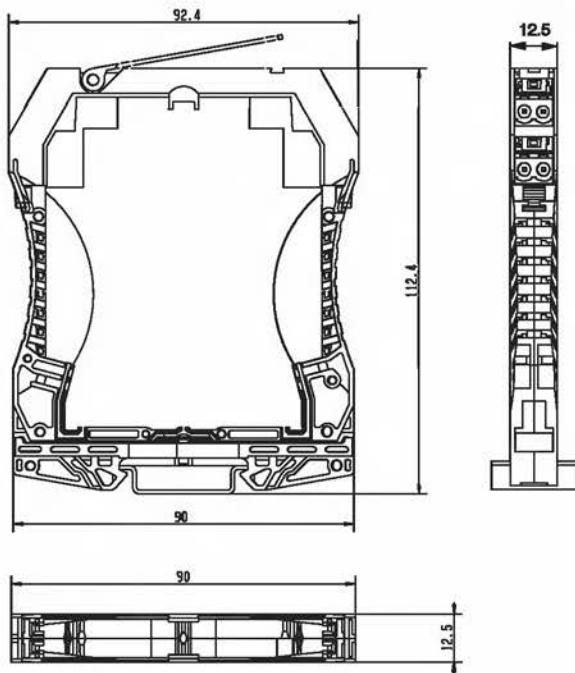
WAVEBOX S 22.5



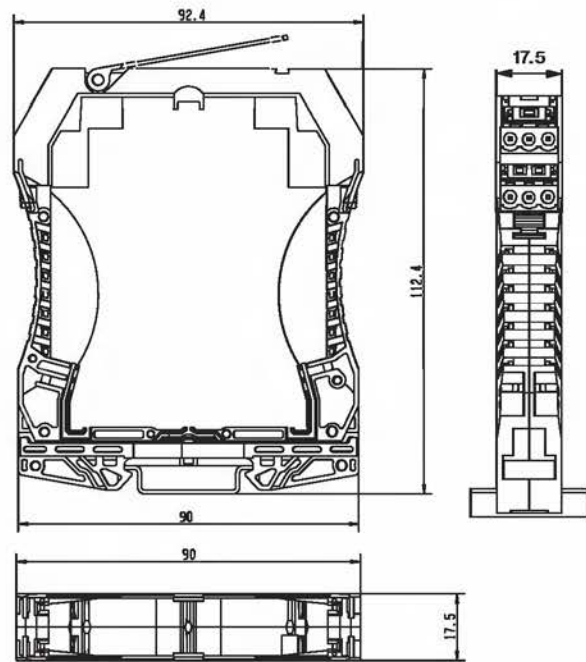
WAVEBOX L 22.5



WAVEBOX 12.5



WAVEBOX 17.5



Dimensions in mm

Accessories	Type	Qty	Order No.
Cross-connection ZQV 2.5N/2, black	ZQV 2.5N/2 sw	60	1718080000
Cross-connection ZQV 2.5N/2, red	ZQV 2.5N/2 rt	60	1717900000
Cross-connection ZQV 2.5N/2, blue	ZQV 2.5N/2 bl	60	1717990000
Cross-connection ZQV 2.5N/2, yellow	ZQV 2.5N/2 ge	60	1693800000
Markers			
WS 10/5 MultiCard for plotter labelling	WS10/5	144	1061160000
WS 10/5 blank	WS10/5 Blank	200	1060860000



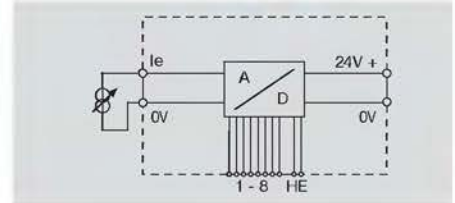
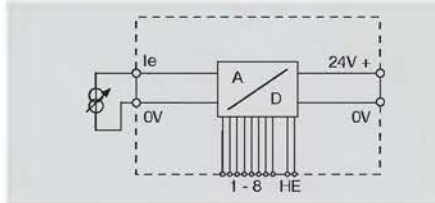
RS-SERIES - AD/DA converter

AD converter, 8-bit

- For more information and tables concerning input/output behaviour of A/D and D/A converters, please go to www.weidmueller.com, select a country and go to the download section.

RS I-D8 0...20 mA

RS I-D8 4...20 mA



D

Technical data

Input

Input voltage/Input current
 max. voltage/max. current
 Input resistance, voltage/Current
 Resolution

/0...20 mA
 3,5 V /25 mA
 50 kΩ per input /

/4...20 mA
 3,5 V /25 mA
 $\approx 51 \Omega$

Output

Number of outputs
 Output level
 Signs
 Output current
 Accuracy
 Cut-off frequency (-3dB)
 Conversion time

8 Bit (1-bit sign)
 17 V = H, 0 V = L
 ≤ 25 mA (as source)
 ± 1 LSB
 5 kHz at full scale (sinus)
 $\leq 4 \mu$ s

8 Bit (1-bit sign)
 17 V = H, 0 V = L
 ≤ 25 mA (as source)
 ± 1 LSB
 5 kHz at full scale (sinus)
 $\leq 4 \mu$ s

General data

Supply voltage
 Current consumption
 Operating temperature
 Storage temperature
 Approvals

24 V DC ± 20 %
 35 mA (plus output current)
 0 °C...+50 °C
 -40 °C...+80 °C
 CE

24 V DC ± 20 %
 35 mA (plus output current)
 0 °C...+50 °C
 -40 °C...+80 °C
 CE

Insulation coordination

Standards
 EMC standards

EN 50178
 EN 61000-6

EN 50178
 EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Screw connection

4.0 / 0.5 / 4
 70 x 35 x 72

Screw connection

4.0 / 0.5 / 4
 70 x 35 x 72

Note

Ordering data

Type of connection Screw connection

Type	Qty.	Order No.
RS I-D8 0...20mA	1	1160561001

Type	Qty.	Order No.
RS I-D8 4...20mA	1	1168561001

Note

Accessories

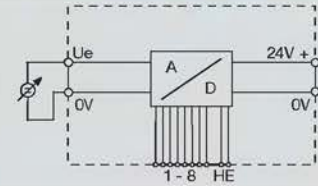
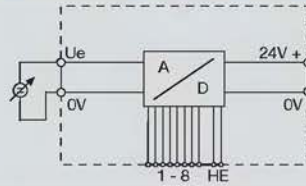
Note

AD converter, 8-bit

- For more information and tables concerning input/output behaviour of A/D and D/A converters, please go to www.weidmueller.com, select a country and go to the download section.

RS U-D8 +/-10 V

RS U-D8 0...10 V



Technical data

Input

Input voltage/Input current
 max. voltage/max. current
 Input resistance, voltage/Current
 Resolution

Output

Number of outputs
 Output level
 Signs
 Output current
 Accuracy
 Cut-off frequency (-3dB)
 Conversion time

General data

Supply voltage
 Current consumption
 Operating temperature
 Storage temperature
 Approvals

Insulation coordination

Standards
 EMC standards

-10...+10 V /
 / $\leq 55 \mu\text{A}$
 $\geq 200 \text{ k}\Omega$ /

8 Bit (1-bit sign)
 17 V = H, 0 V = L
 MSE: H = positive; L = negative
 $\leq 25 \text{ mA}$ (as source)
 $\pm 1 \text{ LSB}$
 5 kHz at full scale (sinus)
 $\leq 4 \mu\text{s}$

24 V DC $\pm 20 \%$
 35 mA (plus output current)
 0 °C...+50 °C
 -40 °C...+80 °C
 CE

EN 50178
 EN 61000-6

0...10 V /
 / $\leq 25 \mu\text{A}$
 $\geq 400 \text{ k}\Omega$ /

8 Bit (1-bit sign)
 17 V = H, 0 V = L
 $\leq 25 \text{ mA}$ (as source)
 $\pm 1 \text{ LSB}$
 5 kHz at full scale (sinus)
 $\leq 4 \mu\text{s}$

24 V DC $\pm 20 \%$
 35 mA (plus output current)
 0 °C...+50 °C
 -40 °C...+80 °C
 CE

EN 50178
 EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
 70 x 35 x 72

Screw connection

4.0 / 0.5 / 4
 70 x 35 x 72

Ordering data

Type of connection
 Screw connection

Type	Qty.	Order No.
RS U-D8 +/-10V	1	1122361001

Type	Qty.	Order No.
RS U-D8 0...10V	1	1160361001

Note

Accessories

Note

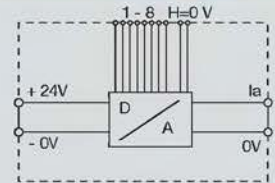
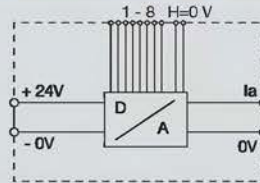
RS-SERIES - AD/DA converter

DA converter 8-bit

- For more information and tables concerning input/output behaviour of A/D and D/A converters, please go to www.weidmueller.com, select a country and go to the download section.

RS D8-I 0...20 mA

RS D8-I 4...20 mA



D

Technical data

Input

Input/Output
max. voltage
max. current
Input voltage/Input current
Input resistance, voltage/Current
Signs
Resolution

Output

Output voltage/Output current
Offset current/Offset voltage
Load impedance, voltage/Current
Accuracy
Conversion time

General data

Supply voltage
Current consumption
Operating temperature
Storage temperature
Approvals

Insulation coordination

Standards
EMC standards

8 Bit / Analogue
max. 30 V

5...24 V /
50 kΩ per input /

/0...20 mA (as source)
max. 0,08 mA /
≤ 500 Ω /
± 1 LSB
≤ 30 μs

24 V DC ± 20 %
25 mA (plus output current)
0 °C...+50 °C
-40 °C...+80 °C
CE;

EN 50178
EN 61000-6

8 Bit / Analogue
max. 30 V

5...24 V /
50 kΩ per input /

/4...20 mA (as source)
4 mA /
/ /
± 1 LSB
≤ 30 μs

24 V DC ± 20 %
25 mA (plus output current)
0 °C...+50 °C
-40 °C...+80 °C
CE;

EN 50178
EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
70 x 35 x 72

Screw connection

4.0 / 0.5 / 4
70 x 35 x 72

Ordering data

Type of connection	
Screw connection	

Type	Qty.	Order No.
RS D8-I 0...20mA	1	1165861001

Type	Qty.	Order No.
RS D8-I 4...20mA	1	1169261001

Note

Accessories

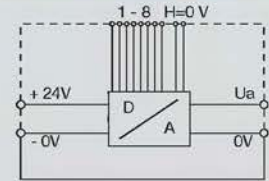
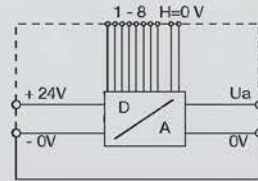
Note

DA converter 8-bit

- For more information and tables concerning input/output behaviour of A/D and D/A converters, please go to www.weidmueller.com, select a country and go to the download section.

RS D8-U +/-10 V

RS D8-U 0...10 V



Technical data

Input

Input/Output
max. voltage
max. current
Input voltage/Input current
Input resistance, voltage/Current
Signs
Resolution

Output

Output voltage/Output current
Offset current/Offset voltage
Load impedance, voltage/Current
Accuracy
Conversion time

General data

Supply voltage
Current consumption
Operating temperature
Storage temperature
Approvals

Insulation coordination

Standards
EMC standards

8 Bit / Analogue
max. 30 V
2,5 mA
5...24 V /
50 kΩ per input /
MSB: H = positive; L = negative

-10...+10 V / ≤ 10 mA max. current
/ ≤ 20 mV
≥ 1 kΩ /
± 1 LSB
≤ 30 μs

24 V DC ± 20 %
25 mA (plus output current)
0 °C...+50 °C
-40 °C...+80 °C
CE;

EN 50178
EN 61000-6

8 Bit / Analogue
max. 30 V
2,5 mA
5...24 V /
50 kΩ per input /

0...10 V / ≤ 10 mA max. current
/ ≤ 20 mV
≥ 1 kΩ /
± 1 LSB
≤ 30 μs

24 V DC ± 20 %
25 mA (plus output current)
0 °C...+50 °C
-40 °C...+80 °C
CE;

EN 50178
EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
70 x 35 x 72

Screw connection

4.0 / 0.5 / 4
70 x 35 x 72

Ordering data

Type of connection Screw connection

Type	Qty.	Order No.
RS D8-U +/-10V	1	1123361001

Type	Qty.	Order No.
RS D8-U 0...10V	1	1160761001

Note

Accessories

Note

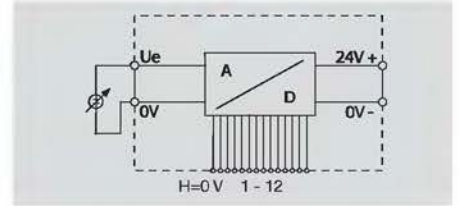
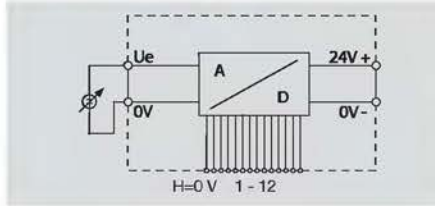
RS-SERIES - AD/DA converter

AD converter, 12-bit

- For more information and tables concerning input/output behaviour of A/D and D/A converters, please go to www.weidmueller.com, select a country and go to the download section.

RS I-D12 0...20 mA

RS I-D12 4...20 mA



D

Technical data

Input

Input voltage/Input current
 max. voltage/max. current
 Input resistance, voltage/Current
 Resolution

/0...20 mA
 /30 mA
 /500 Ω

/4...20 mA
 /30 mA
 /500 Ω

Output

Number of outputs
 Output level
 Signs
 Output current
 Accuracy
 Conversion time

12 Bit
 24 V = H, 0 V = L
 ≤ 25 mA (as source)
 ± 1 LSB
 ≤ 50 μs

12 Bit
 24 V = H, 0 V = L
 ≤ 25 mA (as source)
 ± 1 LSB
 ≤ 50 μs

General data

Supply voltage
 Current consumption
 Operating temperature
 Storage temperature
 Approvals

24 V DC ± 20 %
 0 °C...+50 °C
 -40 °C...+80 °C
 CE;

24 V DC ± 20 %
 0 °C...+50 °C
 -40 °C...+80 °C
 CE;

Insulation coordination

Standards
 EMC standards

EN 50178
 EN 61000-6

EN 50178
 EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Screw connection

4.0 / 0.5 / 4
 70 x 90 x 47.4

Screw connection

4.0 / 0.5 / 4
 70 x 90 x 47.4

Note

Ordering data

Type of connection Screw connection

Type	Qty.	Order No.
RS I-D12 0...20mA	1	1168461001

Type	Qty.	Order No.
RS I-D12 4...20mA	1	1169161001

Note

Accessories

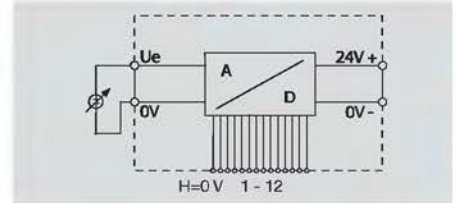
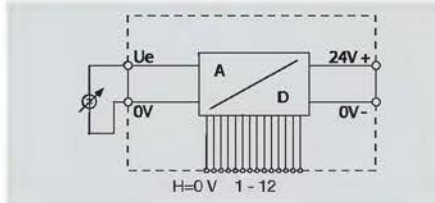
Note

AD converter, 12-bit

- For more information and tables concerning input/output behaviour of A/D and D/A converters, please go to www.weidmueller.com, select a country and go to the download section.

RS U-D12 +/-10 V

RS U-D12 0...10 V



Technical data

Input

Input voltage/Input current
 max. voltage/max. current
 Input resistance, voltage/Current
 Resolution

Output

Number of outputs
 Output level
 Signs
 Output current
 Accuracy
 Conversion time

General data

Supply voltage
 Current consumption
 Operating temperature
 Storage temperature
 Approvals

Insulation coordination

Standards
 EMC standards

-10...+10 V /
 ± 15 V /
 100 kΩ /

12 Bit
 24 V = H, 0 V = L
 MSB: H = positive; L = negative
 ≤ 25 mA (as source)
 ± 1 LSB
 ≤ 50 µs

24 V DC ± 20 %

0 °C...+50 °C
 -40 °C...+80 °C
 CE;

EN 50178
 EN 61000-6

0...10 V /
 15 V /
 100 kΩ /

12 Bit
 24 V = H, 0 V = L
 ≤ 25 mA (as source)
 ± 1 LSB
 ≤ 50 µs

24 V DC ± 20 %

0 °C...+50 °C
 -40 °C...+80 °C
 CE;

EN 50178
 EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
 70 x 90 x 47.4

Screw connection

4.0 / 0.5 / 4
 70 x 90 x 47.4

Ordering data

Type of connection Screw connection

Type	Qty.	Order No.
RS U-D12 +/-10V	1	1168261001

Type	Qty.	Order No.
RS U-D12 0...10V	1	1168361001

Note

Accessories

Note

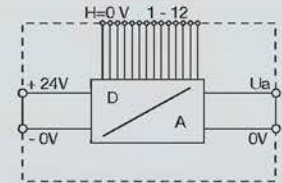
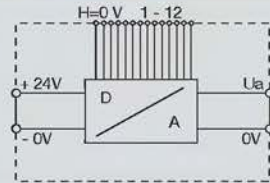
RS-SERIES - AD/DA converter

DA converter 12-bit

- For more information and tables concerning input/output behaviour of A/D and D/A converters, please go to www.weidmueller.com, select a country and go to the download section.

RS D12-I 0...20 mA

RS D12-I 4...20 mA



Technical data

Input

Input/Output
max. voltage
max. current
Input voltage/Input current
Input resistance, voltage/Current
Signs
Resolution

Output

Output voltage/Output current
Offset current/Offset voltage
Load impedance, voltage/Current
Accuracy
Conversion time

General data

Supply voltage
Current consumption
Operating temperature
Storage temperature
Approvals

Insulation coordination

Standards
EMC standards

12 Bit / analogue

24 V DC $\pm 20\%$ /4.2 mA
5.7 k Ω /

/0...20 mA (as source)
/
/ $\leq 500 \Omega$
 ± 1 LSB
 $\leq 4 \mu s$

24 V DC $\pm 20\%$
60 mA
0 °C...+50 °C
-40 °C...+80 °C
CE;

EN 50178
EN 61000-6

12 Bit / analogue

24 V DC $\pm 20\%$ /4.2 mA
5.7 k Ω /

/4...20 mA (as source)
/
/ $\leq 500 \Omega$
 ± 1 LSB
 $\leq 4 \mu s$

24 V DC $\pm 20\%$
60 mA
0 °C...+50 °C
-40 °C...+80 °C
CE;

EN 50178
EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
70 x 90 x 47.4

Screw connection

4.0 / 0.5 / 4
70 x 90 x 47.4

Ordering data

Type of connection
Screw connection

Type	Qty.	Order No.
RS D12-I 0...20mA	1	1166061001

Type	Qty.	Order No.
RS D12-I 4...20mA	1	1165961001

Note

Accessories

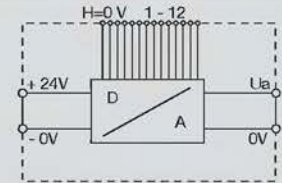
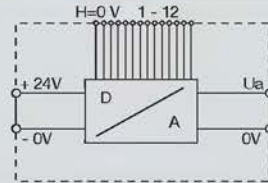
Note

DA converter 12-bit

- For more information and tables concerning input/output behaviour of A/D and D/A converters, please go to www.weidmueller.com, select a country and go to the download section.

RS D12-U +/-10 V

RS D12-U 0...10 V



Technical data

Input

Input/Output
max. voltage
max. current
Input voltage/Input current
Input resistance, voltage/Current
Signs
Resolution

Output

Output voltage/Output current
Offset current/Offset voltage
Load impedance, voltage/Current
Accuracy
Conversion time

General data

Supply voltage
Current consumption
Operating temperature
Storage temperature
Approvals

Insulation coordination

Standards
EMC standards

12 Bit / analogue

24 V DC $\pm 20\%$ / 4.2 mA

5.7 k Ω /

MSB: H = positive; L = negative

-10...+10 V / ≤ 10 mA

/

≥ 1 k Ω / ≤ 500 Ω

± 1 LSB

≤ 4 μ s

24 V DC $\pm 20\%$

40 mA

0 $^{\circ}$ C...+50 $^{\circ}$ C

-40 $^{\circ}$ C...+80 $^{\circ}$ C

CE;

EN 50178

EN 61000-6

12 Bit / analogue

24 V DC $\pm 20\%$ / 4.2 mA

5.7 k Ω /

0...10 V / ≤ 10 mA

/

≥ 1 k Ω / ≤ 500 Ω

± 1 LSB

≤ 4 μ s

24 V DC $\pm 20\%$

40 mA

0 $^{\circ}$ C...+50 $^{\circ}$ C

-40 $^{\circ}$ C...+80 $^{\circ}$ C

CE;

EN 50178

EN 61000-6

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
70 x 90 x 47.4

Screw connection

4.0 / 0.5 / 4
70 x 90 x 47.4

Ordering data

Type of connection
Screw connection

Type	Qty.	Order No.
RS D12-U +/-10V	1	1160861001

Type	Qty.	Order No.
RS D12-U 0...10V	1	1166161001

Note

Accessories

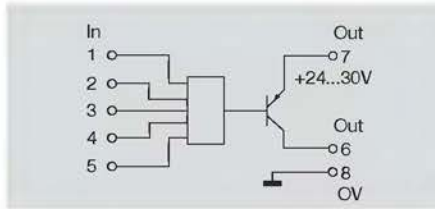
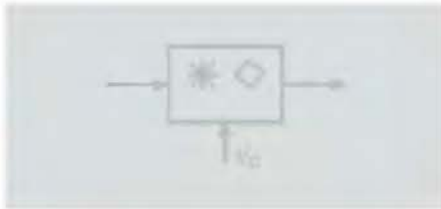
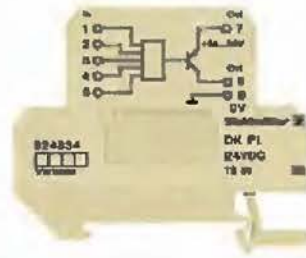
Note

DK-SERIES - preprocessing logic

Preprocessing logic

- Logic function and time function can be combined
- Can be programmed individually (further functions on request)

DKPL



D

Technical data

Input

- Rated input level
- Input current
- max. voltage
- Pulse duration

Output

- Output level
- Output current
- Switching thresholds

General data

- Supply voltage
- Current consumption
- Operating temperature
- Storage temperature
- Approvals

24 V DC = High, 0 V = Low
 approx. 1.5 mA per input (24 V)
 30 V DC
 ≥ 1 ms

PNP, Ub-1 V
 max. 20 mA
 high > 18 V, low < 7 V

24 V DC ± 20 %
 < 10 mA
 0 °C...+50 °C
 -40 °C...+60 °C
 CE

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

4,0 / 0,5 / 4
 65 x 12 x 57

Ordering data

Type of connection Screw connection

Type	Qty.	Order No.
DKPL 35 24VDC	5	8248340000

Note

not programmed - for functions see following page

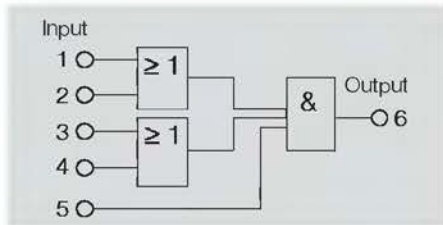
Accessories

Note

The module is programmed specifically to customer requirements. Up to 5 inputs can be linked with various logic and time functions, e.g. AND, OR, EXOR, NAND, NOR, EXNOR, delay links, etc. The output is either low- or high-active.

824834 0001 DKPL
A = (E1 OR E2) AND (E3 OR E4) AND E5

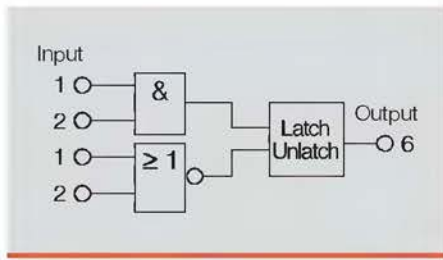
Status	5	4	3	2	1	Output
1	0	0	0	0	0	0
2	0	0	0	0	1	0
3	0	0	0	1	0	0
4	0	0	0	1	1	0
5	0	0	1	0	0	0
6	0	0	1	0	1	0
7	0	0	1	1	0	0
8	0	0	1	1	1	0
9	0	1	0	0	0	0
10	0	1	0	0	1	0
11	0	1	0	1	0	0
12	0	1	0	1	1	0
13	0	1	1	0	0	0
14	0	1	1	0	1	0
15	0	1	1	1	0	0
16	0	1	1	1	1	0
17	1	0	0	0	0	0
18	1	0	0	0	1	0
19	1	0	0	1	0	0
20	1	0	0	1	1	0
21	1	0	1	0	0	0
22	1	0	1	0	1	1
23	1	0	1	1	0	1
24	1	0	1	1	1	1
25	1	1	0	0	0	0
26	1	1	0	0	1	1
27	1	1	0	1	0	1
28	1	1	0	1	1	1
29	1	1	1	0	0	0
30	1	1	1	0	1	1
31	1	1	1	1	0	1
32	1	1	1	1	1	1



824834 0002 DKPL
Inputs 1 and 2 have the function of an RS FLIP-FLOP
Inputs 3, 4 and 5 have no function

Input	2	1	Output
0	0	0	0 (is saved)
0	1	0	no change to the saved status
1	0	0	no change to the saved status
1	1	1	1 (is saved)
1	1	0	no change to the saved status

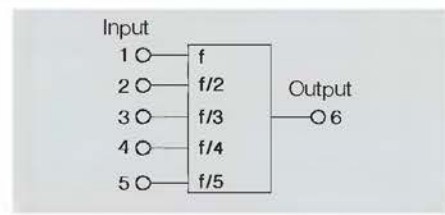
Inputs 3, 4 and 5 with: no function



824834 0003 DKPL Frequency divider
Inputs 1-5 determine the division factor
Input 1 = division factor 1: $F_{OUT} = F_{IN} / 1$
Input 2 = division factor 2: $F_{OUT} = F_{IN} / 2$
Input 5 = division factor 5: $F_{OUT} = F_{IN} / 5$; $F_{IN} \text{ max.} = 12 \text{ kHz}$

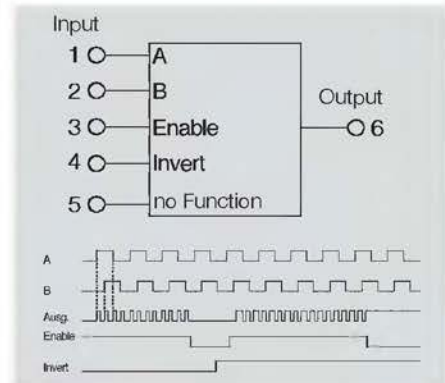
Input	Output
1	6
2	$f_{out} = f_{in}$
3	$f_{out} = f_{in} / 2$
4	$f_{out} = f_{in} / 3$
5	$f_{out} = f_{in} / 4$
6	$f_{out} = f_{in} / 5$

Remarks: a new division factor can only be used after the operating voltage has been switched off. $f_{in} \text{ max.} = 12 \text{ kHz}$



824834 0004 DKPL
Input 1: signal A from an incremental transducer
Input 2: signal B 90° offset
Input 3: enable high active
Input 4: output signal inverted high active
Input 5: no function
Output: the output is set for 20–30 μs at every edge of signal A or B
(i.e.: $F_{OUT} = 4 \times F_{IN}$)
 $F_{IN} \text{ max.} = 1 \text{ kHz}$

Connection	Description
1	A Signal A 90° leading $F_{max} = 1 \text{ kHz}$
2	B Signal B 90° trailing $F_{max} = 1 \text{ kHz}$
3	enable enable output
4	invert invert output signal
5	no function
6	$f_{out} = 4 \times f_{A/B}$ (max. 4 kHz)

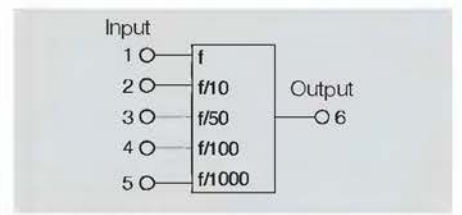


824834 0005 DKPL
Input pulse length between 80 and 100 ms
Output pulse length 100 ms, only 2 pulses
Pulse/pause ratio 1:1
The positive edge of the input signal must be evaluated.
Only input E1 is used.

824834 0006 DKPL
Input 1: $F_{OUT} = F_{IN}$
Input 2: $F_{OUT} = F_{IN} / 10$

Input	Output
1	6
2	$f_{out} = f_{in}$
3	$f_{out} = f_{in} / 10$
4	$f_{out} = f_{in} / 50$
5	$f_{out} = f_{in} / 100$
6	$f_{out} = f_{in} / 1000$

Remarks: a new division factor can only be used after the operating voltage has been switched off. $f_{in} \text{ max.} = 3 \text{ kHz}$



824834 0007 DKPL

Input	Output				
1	L	X	X	X	no function
2	H	L	X	X	$f = 1 \text{ Hz}$
3	L	H	X	X	$f = 10 \text{ Hz}$
4	H	H	X	X	$f = 1 \text{ Hz}$

L → 0 V or connection open
H → +24 ... 30 V DC
X → no influence on the output function, L or H

824834 0008 DKPL

Input	Output			
1	2	H	H	H
2	L	H	L	L

824834 0010 DKPL
RS FLIP-FLOP with superimposed S-input (connection 2)
Input connection 3, 4 and 5 must be at 0 V or remain open!

Connection 1 logic	Connection 2 logic	Connection 6 logic		
R-input	S-input	Output		
0 V or open	L	0 V or open	L	previous status is saved
+24 V DC	H	0 V or open	L	0 V
0 V or open	L	+24 V DC	H	+24 V DC
+24 V DC	H	+24 V DC	H	+24 V DC

824834 0501 DKPL
The component allows for division of the input frequency at connection 1 (0 ... max. 50 kHz) with 2 fixed division factors. Depending on connection 2, the output frequency is output at the output connection 6.
Connections 3, 4 and 5 have no function

Connection 2 logic	Factor	Input frequency	Output frequency	
		Connection 1	Connection 2	
0 V or open	L	76	0 ... 30 kHz	0 ... 400 Hz
24 V DC	H	27	0 ... 10 kHz	0 ... 400 Hz

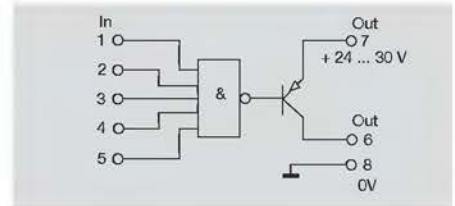
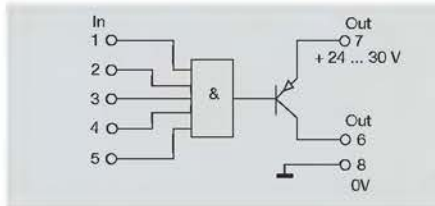
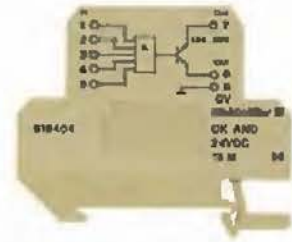
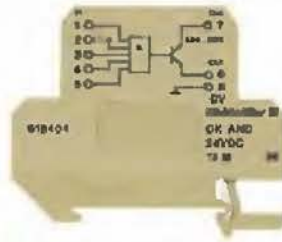
DK-SERIES - preprocessing logic

Preprocessing logic

- Logic functions
- Compact design
- PLC relieved

AND

NAND



Technical data

Input

Rated input level
Input current
max. voltage
Pulse duration

Output

Output level
Output current
Switching thresholds

General data

Supply voltage
Current consumption
Operating temperature
Storage temperature
Approvals

24 V DC = High, 0 V = Low
approx. 1.5 mA per input (24 V)
30 V DC
≥ 50 μs

PNP, U_b-1.8 V
max. 20 mA
high < 15 V, low < 9 V

24...30 V DC
< 5 mA
0 °C...+50 °C
-40 °C...+60 °C
CE

24 V DC = High, 0 V = Low
approx. 1.5 mA per input (24 V)
30 V DC
≥ 50 μs

PNP, U_b-1.8 V
max. 20 mA
high < 15 V, low < 9 V

24...30 V DC
< 5 mA
0 °C...+50 °C
-40 °C...+60 °C
CE

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
65 x 12 x 57

Screw connection

4.0 / 0.5 / 4
65 x 12 x 57

Ordering data

Type of connection Screw connection

Type	Qty.	Order No.
DK AND 35 24VDC	5	8184040000

Type	Qty.	Order No.
DK NAND 35 24VDC	5	8248320000

Note

Accessories

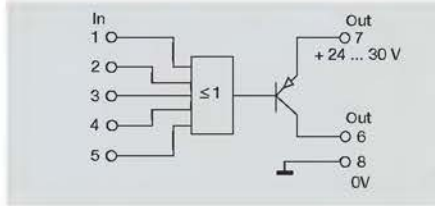
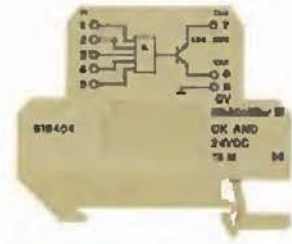
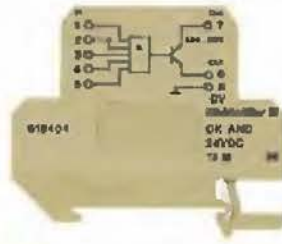
Note

Preprocessing logic

- Logic functions
- Compact design
- PLC relieved

OR

NOR



Technical data

Input

Rated input level
Input current
max. voltage
Pulse duration

Output

Output level
Output current
Switching thresholds

General data

Supply voltage
Current consumption
Operating temperature
Storage temperature
Approvals

24 V DC = High, 0 V = Low
approx. 1.5 mA per input (24 V)
30 V DC
≥ 50 μs

PNP, U_b-1.8 V
max. 20 mA
high < 15 V, low < 9 V

24...30 V DC
< 5 mA
0 °C...+50 °C
-40 °C...+60 °C
CE

24 V DC = High, 0 V = Low
approx. 1.5 mA per input (24 V)
30 V DC
≥ 50 μs

PNP, U_b-1.8 V
max. 20 mA
high < 15 V, low < 9 V

24...30 V DC
< 5 mA
0 °C...+50 °C
-40 °C...+60 °C
CE

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

4.0 / 0.5 / 4
65 x 12 x 57

Screw connection

4.0 / 0.5 / 4
65 x 12 x 57

Ordering data

Type of connection Screw connection

Type	Qty.	Order No.
DK OR 35 24VDC	5	8218440000

Type	Qty.	Order No.
DK NOR 35 24VDC	5	8248330000

Note

Accessories

Note

Distributors with preprocessing electronics



SAI-E processes signals for logic functions AND, OR, NAND and NOR with further version are in preparation. Four inputs can be coupled logically with one output.

The different versions are available in a plastic hood with an M12 plug-in connector in plug&play format, or in a metal hood with a cable gland for assembly by the user.

The logic distributor in the plastic hood can be connected using a pre-assembled M12 cable but also directly to a PCB (both in the same hood or a similar one).

In situ signal processing offers many advantages, with users avoiding the need for large multi core cables with a large number of poles and saving time and material costs. Savings can also be made at the input cards of the PLC by using one input instead of four.

The advantages:

- Cost-savings
- Savings in materials:
 - cables with just a few cores
 - fewer input ports required at the PLC
 - fewer cables to be connected
 - fewer cabling errors
- Hoods easily mounted on standard base module

If an input is not used, an input can be set to active with the simulation plug.



Pin assignment table, hood

Pin	Signal	Description
1	+24 V DC	Voltage supply, logic and sensors
2	+0 V	Reference potential, logic and sensors
3	PE	Earth
4	Output 1 +24 V	Logically connected output 1
5	Output 2 +24 V	Logically connected output 2

Pin assignment table, 5-pole M12 plug

Pin	Voltage	Description
1	+24 V	Voltage supply, +24 V DC, logic and sensors
3	GND	Voltage supply, 0 V DC, logic and sensors
5	PE	Earth
2	Output 1 +24 V	Logically connected output 1
4	Output 2 +24 V	Logically connected output 2

Ordering data

Type	Qty	Order No.
Electronic hood		
SAI-EH-8E/2A logik UND	1	1805420000
SAI-EH-8E/2A logik ODER	1	1816580000
SAI-EH-8E/2A logik NAND	1	1816590000
SAI-EH-8E/2A logik NOR	1	1816570000
Plastic hood		
SAI-EHK-8E/2A logik AND	1	1851830000
SAI-EHK-8E/2A logik NAND	1	1851820000
SAI-EHK-8E/2A logik OR	1	1851810000
SAI-EHK-8E/2A logik NOR	1	1851800000
Base module		
SAI-8 4P M12 UT	for 8 inputs	1 1705941000
SAI-4 4P M12 UT	for 4 inputs	1 1705921000
Simulation plug		
SAIS-T-4/1-K		1 8726310000

CMA current monitoring

Analogue output

- Max. conductor diameter 35 mm
- Can be mounted sideways
- For mounting on rail TS 35

CMA 100/5 A



CMA 250/5 A



CMA 500/5 A



D

Technical data

Input

Input current
Input frequency
max. current
Voltage of measuring circuit
Diameter of entry

Output

Output current
Load impedance, voltage/Current
Accuracy

General data

Operating temperature
Storage temperature
Approvals

Insulation coordination

Isolation voltage input, output

100 A AC
Class 1: 50...60Hz / Class 1.5: 16...400Hz
Thermal current $I_{th} > 3$ kA
600 V_{eff} (unfinished conductor)
35 mm

5 A AC
/± 600 Ω
class 1 / 1.5; residual current factor < 5

-5 °C...+40 °C
-40 °C...+85 °C

CE;eURus;

4 kV_{eff} / 1 min.

250 A AC
Class 1: 50...60Hz / Class 1.5: 16...400Hz
Thermal current $I_{th} > 3$ kA
600 V_{eff} (unfinished conductor)
35 mm

5 A AC
/± 600 Ω
class 1 / 1.5; residual current factor < 5

-5 °C...+40 °C
-40 °C...+85 °C

CE;eURus;

4 kV_{eff} / 1 min.

500 A AC
Class 1: 50...60Hz / Class 1.5: 16...400Hz
Thermal current $I_{th} > 3$ kA
600 V_{eff} (unfinished conductor)
35 mm

5 A AC
/± 600 Ω
class 1 / 1.5; residual current factor < 5

-5 °C...+40 °C
-40 °C...+85 °C

CE;eURus;

4 kV_{eff} / 1 min.

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection (secondary)

50 x 78 x 90.5

Screw connection (secondary)

50 x 78 x 90.5

Screw connection (secondary)

50 x 78 x 90.5

Ordering data

Type of connection

Screw connection (secondary)

Type	(Qty.=1)	Order No.
CMA 100/5A		8662140000

Type	(Qty.=1)	Order No.
CMA 250/5A		8664570000

Type	(Qty.=1)	Order No.
CMA 500/5A		8664580000

Note

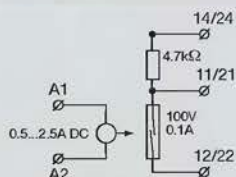
Accessories

Note

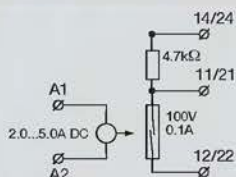
PLUGCONTROL

- Monitoring of currents up to 10 A DC
- For use with valves, servocontrols or DC motors
- pull-up/pull-down resistor

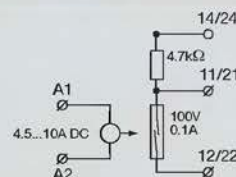
PAS CMR 0.5...2.5 A DC



PAS CMR 2.0...5.0 A DC



PAS CMR 4.5...10 A DC



Technical data

Input	
Input current	0.5...2.5 A DC
max. current	7.5 A for 10 s
Tripping current	≤ 500 mA
Resistance of sensor circuit	50 mΩ
Safe off	≤ 50 mA
Pulse duration	min. 1 ms
Output	
Switching current min./max.	100 μA / 100 mA
Switching voltage, min./max.	1 V AC/DC / 100 V AC/DC
Switching frequency, max.	15 Hz
Contact complement	1 NOC
Contact material	RH/Rd (Reed contact)*
Weitere Funktionen	pull-up/pull-down resistor 4.7 kΩ
General data	
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-40 °C...+85 °C
Climate	5...95 % RH
Approvals	T _{st} = 40°C, no condensation
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011; EN 61000-6-1, 2, 3, 4
Rated voltage	300 V
Impulse withstand voltage	6 kV
Isolation voltage input, output	4 kV _{eff} / 1 min.
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 5 mm (encapsulated)
Dimensions	
Clamping range (rating- / min. / max.)	mm² 1.5 / 2.5 / 2.5
Length x width x height	mm 92 x 15.3 x 95
Note	* Peak current must be limited to 100 mA for capacitive loads

Input	
Input current	2...5.0 A DC
max. current	15 A for 10 s
Tripping current	≤ 2 A
Resistance of sensor circuit	50 mΩ
Safe off	≤ 300 mA
Pulse duration	min. 1 ms
Output	
Switching current min./max.	100 μA / 100 mA
Switching voltage, min./max.	1 V AC/DC / 100 V AC/DC
Switching frequency, max.	15 Hz
Contact complement	1 NOC
Contact material	RH/Rd (Reed contact)*
Weitere Funktionen	pull-up/pull-down resistor 4.7 kΩ
General data	
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-40 °C...+85 °C
Climate	5...95 % RH
Approvals	T _{st} = 40°C, no condensation
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011; EN 61000-6-1, 2, 3, 4
Rated voltage	300 V
Impulse withstand voltage	6 kV
Isolation voltage input, output	4 kV _{eff} / 1 min.
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 5 mm (encapsulated)
Dimensions	
Clamping range (rating- / min. / max.)	mm² 1.5 / 2.5 / 2.5
Length x width x height	mm 92 x 15.3 x 95
Note	* Peak current must be limited to 100 mA for capacitive loads

Input	
Input current	4.5...10 A DC
max. current	30 A for 10 s
Tripping current	≤ 4.5 A
Resistance of sensor circuit	50 mΩ
Safe off	≤ 600 mA
Pulse duration	min. 1 ms
Output	
Switching current min./max.	100 μA / 100 mA
Switching voltage, min./max.	1 V AC/DC / 100 V AC/DC
Switching frequency, max.	15 Hz
Contact complement	1 NOC
Contact material	RH/Rd (Reed contact)*
Weitere Funktionen	pull-up/pull-down resistor 4.7 kΩ
General data	
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-40 °C...+85 °C
Climate	5...95 % RH
Approvals	T _{st} = 40°C, no condensation
Insulation coordination	
Standards	EN 50178 (protective separation)
EMC standards	EN 55011; EN 61000-6-1, 2, 3, 4
Rated voltage	300 V
Impulse withstand voltage	6 kV
Isolation voltage input, output	4 kV _{eff} / 1 min.
Overvoltage category	III
Pollution severity	2
Clearance & creepage distance	≥ 5 mm (encapsulated)
Dimensions	
Clamping range (rating- / min. / max.)	mm² 1.5 / 2.5 / 2.5
Length x width x height	mm 92 x 15.3 x 95
Note	* Peak current must be limited to 100 mA for capacitive loads

Ordering data

Type of connection	Screw connection
Note	
Accessories	
Note	

Type	(Qty.=1)	Order No.
PAS CMR 0,5...2,5 A DC		8742610000
Note		
Accessories		
Note		

Type	(Qty.=1)	Order No.
PAS CMR 2,0...5,0 A DC		8742620000
Note		
Accessories		
Note		

Type	(Qty.=1)	Order No.
PAS CMR 4,5...10 A DC		8742630000
Note		
Accessories		
Note		

Power supplies

Power supplies	Introduction	E.2
	Standards and approvals	E.3
	Switch-mode power supplies	E.4
	Diode modules	E.22
	DC/DC converter	E.24
	Unregulated power supplies	E.30
	UPS control unit	E.36
	Fuse protection for 24 V DC circuits	E.38

Introduction

Transformers and power supplies are important links in the energy supply chain of automation systems. They form the heart of each and every electrical cabinet. 24 V has become established as a control voltage throughout the world, supplying power to all manner of electrical subassemblies. Other voltages are still also being used to power user applications. Careful consideration must be given to choosing the correct power supply as this is decisive for the connected components to function reliably.

Power supply units always consist of a transformer, which converts an AC voltage into a different AC voltage to meet application requirements.

A rectifier converts the AC voltage on the secondary side into a pulsating DC voltage, which is smoothed by means of a filter circuit.

The output voltage of stabilised power supply units is kept constant by means of a stabilising unit.

Input voltage in accordance with DIN IEC 38

In 2003 the tolerance for the valid 230 V AC / 400 V AC mains voltage was extended to $\pm 10\%$.

Weidmüller's power supplies fulfilled the DIN IEC 38 specifications even before they came into force.

In use all over the world

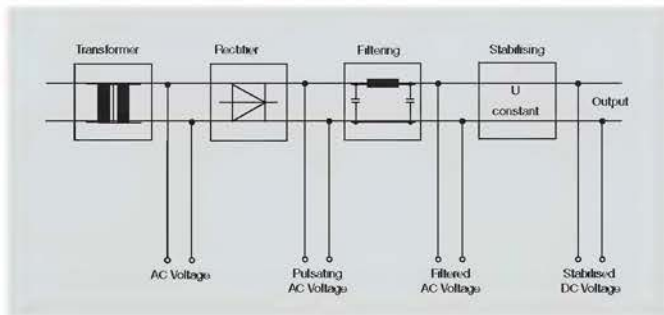
Power supplies from Weidmüller have internationally recognised approvals endorsing their suitability for use in widely varying applications all over the world. They are used in mechanical engineering, in industrial automation, in systems engineering and in the power supply industry, in production lines and in building technology.

Temperature range

The power loss constantly produced by the power supplies is converted into heat. This heat is dissipated via a heat sink and the surface of the housing. Depending on the module, Weidmüller power supplies are suitable for use in ambient temperatures up to 60 °C. The device to be installed is selected taking the prevailing ambient temperatures into consideration.

Compact designs

Due to their small footprint, Weidmüller's power supplies are also suitable for use in confined spaces. That saves space in electrical cabinets and reduces costs!



Weidmüller power supplies have proven themselves over many years in the supply of power to electrical subassemblies. They carry the CE mark and meet the requirements contained in the standards DIN EN 50081-1 and DIN EN 50082-2 (as of 1st April 2002, EN 61000-6-2).

As a result, they are suitable for use in industry, small businesses and residential areas. Their performance capabilities have also been proven in harsh environments.

Weidmüller can provide industry-standard power supplies and supplementary components:

- Unregulated transformer power supplies
- Primary switch-mode power supplies
- DC/DC converters
- Diode modules
- UPS control modules
- Electronic fusing

Standards and approvals

Standard/Approval	Description
DIN EN 50178 DIN VDE 0160	Electronic equipment for use in power installations
DIN EN 61558	Safety of power transformers, power supply units and similar
DIN EN 60950 IEC 950 DIN VDE 0805	Safety of information technology equipment
DIN EN 60742 DIN VDE 0550 part 1	Specifications for small transformers
DIN VDE 0550 part 3	Particular requirements for isolating and control transformers
DIN VDE 0551	Specification for safety isolating transformers
DIN VDE 0106 part 101	Basic specifications for safe isolation in electrical equipment
DIN VDE 0113 part 1	Electrical equipment of machines
DIN IEC 68	Basic environmental test procedures
IEC 38	Supplementary notes relating to status of international standards and European harmonisation of mains voltages 230/400 V
DIN EN 61131-2	Programmable logic controllers – equipment requirements and tests
UL	Safety approval for the United States market
CSA	Safety approval for the Canadian market
GL	Test specifications for electrical/electronic devices and systems for use in marine technology
73/23/EC	Electrical equipment for use within specific voltage limits (Low Voltage Directive)
89/336/EC	Electromagnetic compatibility (EMC Directive)
98/37/EC	Safety of machines (directive covering mechanical equipment)

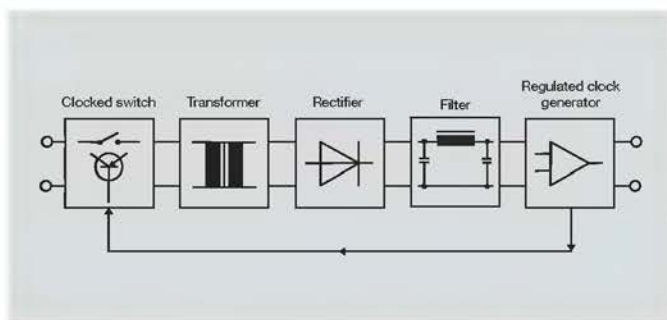
Switch-mode power supplies



Primary switch-mode power supplies connectPower

Thanks to the wide range of inputs (85 V AC to 265 V AC), the connectPower range of switch-mode power supplies is suitable for a wide variety of applications. The devices are interference-suppressed (in accordance with DIN EN 55022 Class B) and fulfil safety extra-low voltage (SELV) requirements.

Equipped with an electronic short-circuit feedback control on the output side, the primary switch-mode power supplies are rated between 12 W and 300 W. The power supplies are suitable for both industrial and building automation.



Method of operation

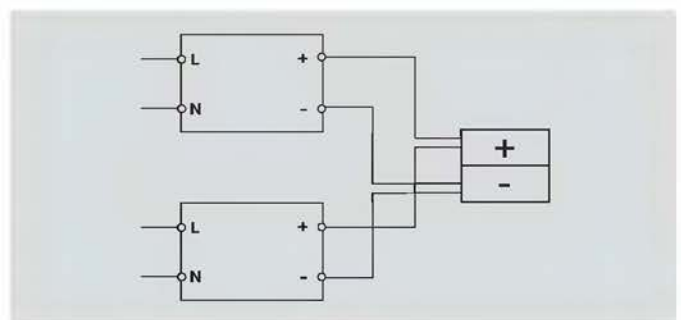
Primary switch-mode power supplies are distinguished by a high degree of efficiency and also by their compact dimensions and moderate generation of heat. The mains voltage is rectified directly. The rectified voltage is then chopped with a higher frequency than that of the mains frequency. A transformer – which can be quite small due to the high switching frequency – converts the voltage with the switching frequency to the required value.

The voltage is now rectified and smoothed by a filter. This regulator control itself is carried out by means of pulse-width modulation. The on and off times of the chopper transformers are regulated to ensure that the output voltage remains stable.

Power distribution and redundancy

To increase performance, or for redundancy purposes, switch-mode power supplies from Weidmüller can be connected in parallel. Two techniques are available: an active and a passive power distribution. Active power distribution requires more complex switching. The advantage is the exact power distribution and uniform device loading.

Requiring less sophisticated switching, passive power distribution results in lower costs, but also in a load-dependent characteristic curve and less exact power distribution. Before connecting in parallel, the output voltages of the devices must be adjusted exactly ($\pm 100 - 200$ mV).

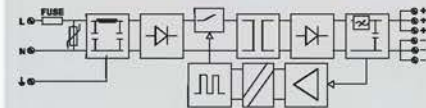
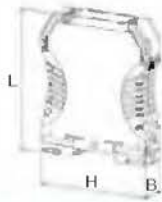


Power factor correction (PFC)

Power factor correction ensures that the mains current drawn is sinusoidal. One positive side-effect is the regulation of the power factor to approx. 1.

connectPower single phase
WAVEPOWER

CP SNT 12 W 24 V 0.5 A



Technical data

Input

Input voltage
Input current
Input frequency
Input fuse
Overvoltage protection

85...265 V AC; 120...300 V DC
260 mA @ 115 V AC; 180 mA @ 230 V AC
50/ 60 Hz
2 A slow-blow fuse (internal)
Varistor

Output

Output voltage
Output current
max. output power
max. residual ripple
Overload protection
Overvoltage protection
Mains failure bridge-over time
Control at 10...100% load
Parallel connection option

24 V DC
0.5 A
12 W
0.1 %
Overvoltage / thermal cut-out
Varistor
30 ms @ 115 V AC / 80 ms @ 230 V AC
0.6 %
no

Insulation coordination

Electrical isolation, output-earth
Electrical isolation, input-earth
Electrical isolation, input-output
Electrical isolation, I/O rail

500 V RMS
1.5 kV RMS
3 kV RMS
4 kV RMS

General data

Operating temperature
Storage temperature
Degree of efficiency at max. load
Status indication
Standards
EMC standards
Power factor correction
Approvals

-20 °C...+50 °C
-40 °C...+85 °C
80 %
green LED
EN 50178, EN 60950, IEC950
IEC 61000-6 /2, -3
no
CSA\UL\CE;

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Screw connection
2.5 / 0.5 / 2.5
112.4 x 22.5 x 92.4

Note

Ordering data

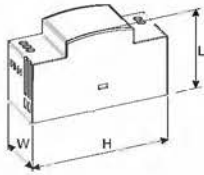
Type	Qty.	Order No.
CP SNT 12W 24V 0.5A	1	9918840024

Note

Accessories

Note

connectPower single phase INSTAPOW^{ER}



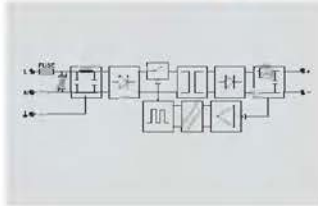
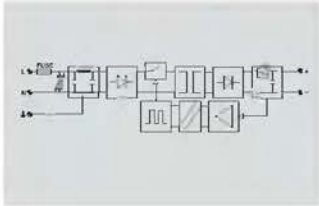
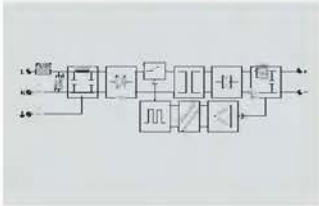
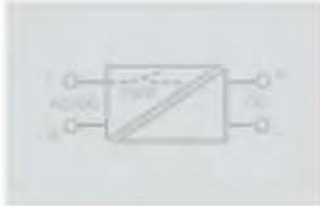
CP SNT 24 W 28 V 1 A



CP SNT 24 W 24 V 1 A



CP SNT 24 W 15 V 1.5 A



E

Technical data

Input

Input voltage
Input current
Input frequency
Making current limit
Input fuse
Overvoltage protection

Output

Output voltage
Output current
max. output power
max. residual ripple
Overload protection
Overvoltage protection
Mains failure bridge-over time
Control at 10...100% load
max. capacitance at output

Insulation coordination

Electrical isolation, output-earth
Electrical isolation, input-earth
Electrical isolation, input-output
Electrical isolation, I/O rail

General data

Operating temperature
Storage temperature
Degree of efficiency at max. load
Standards
Approvals
EMC standards

85...265 V AC, 120...300 V DC
460 mA @ 115 V AC; 250 mA @ 230 V AC
50/ 60 Hz
Thermistor
2 A slow-blow fuse (internal)
Varistor

28 V DC
1 A
28 W
< 2 %
Overvoltage / thermal out-out
Varistor
35 ms @ 115 V AC / 160 ms @ 230 V AC
0.5 %
8000 µF

500 V RMS
1.5 kV RMS
3 kV RMS
4 kV RMS

-20 °C...+50 °C
-40 °C...+85 °C
78 %
EN 50178, EN 60950, IEC950
CSA / CE / dULus
EN 61000-6 / 2, -3

Screw connection

4.0 / 0.1 / 4
62.5 x 52 x 90.5
Derating: 33% @ 60°C

85...265 V AC, 120...300 V DC
460 mA @ 115 V AC; 250 mA @ 230 V AC
50/ 60 Hz
Thermistor
2 A slow-blow fuse (internal)
Varistor

24 V DC
1 A
24 W
< 2 %
Overvoltage / thermal out-out
Varistor
35 ms @ 115 V AC / 160 ms @ 230 V AC
0.5 %
8000 µF

500 V RMS
1.5 kV RMS
3 kV RMS
4 kV RMS

-20 °C...+50 °C
-40 °C...+85 °C
78 %
EN 50178, EN 60950, IEC950
CSA / CE / dULus
EN 61000-6 / 2, -3

Screw connection

4.0 / 0.1 / 4
62.5 x 52 x 90.5
Derating: 33% @ 60°C

85...265 V AC, 120...300 V DC
460 mA @ 115 V AC; 250 mA @ 230 V AC
50/ 60 Hz
Thermistor
2 A slow-blow fuse (internal)
Varistor

15 V DC
1.5 A
23 W
< 2 %
Overvoltage / thermal out-out
Varistor
35 ms @ 115 V AC / 160 ms @ 230 V AC
0.5 %
8000 µF

500 V RMS
1.5 kV RMS
3 kV RMS
4 kV RMS

-20 °C...+50 °C
-40 °C...+85 °C
78 %
EN 50178, EN 60950, IEC950
CSA / CE / dULus
EN 61000-6 / 2, -3

Screw connection

4.0 / 0.1 / 4
62.5 x 52 x 90.5
Derating: 33% @ 60°C

Ordering data

Type	(Qty.=1)	Order No.
CP SNT 24W 28V 1A		9928890028

Type	(Qty.=1)	Order No.
CP SNT 24W 24V 1A		9928890024

Type	(Qty.=1)	Order No.
CP SNT 24W 15V 1.5A		9928890015

Note

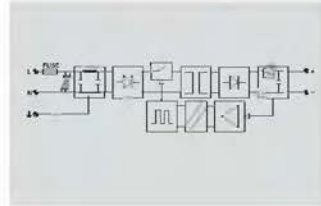
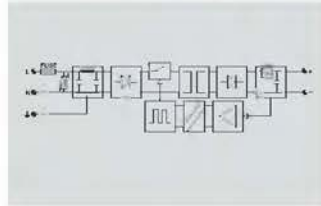
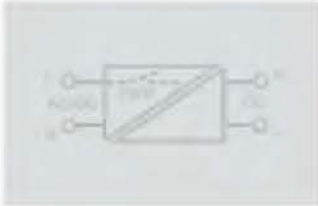
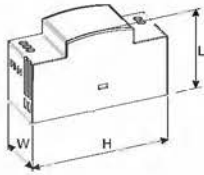
Accessories

Note

connectPower single phase
INSTAPOWERR

CP SNT 24 W 12 V 1.5 A

CP SNT 24 W 5 V 2 A



Technical data

Input

Input voltage
Input current
Input frequency
Making current limit
Input fuse
Overvoltage protection

85...265 V AC, 120...300 V DC
460 mA @ 115 V AC; 250 mA @ 230 V AC
50/ 60 Hz
Thermistor
2 A slow-blow fuse (internal)
Varistor

85...265 V AC, 120...300 V DC
460 mA @ 115 V AC; 250 mA @ 230 V AC
50/ 60 Hz
Thermistor
2 A slow-blow fuse (internal)
Varistor

Output

Output voltage
Output current
max. output power
max. residual ripple
Overload protection
Overvoltage protection
Mains failure bridge-over time
Control at 10...100% load
max. capacitance at output

12 V DC
1.5 A
18 W
< 2 %
Overvoltage / thermal out-out
Varistor
35 ms @ 115 V AC / 160 ms @ 230 V AC
0.5 %
8000 µF

5 V DC
2 A
10 W
< 2 %
Overvoltage / thermal out-out
Varistor
35 ms @ 115 V AC / 160 ms @ 230 V AC
0.5 %
8000 µF

Insulation coordination

Electrical isolation, output-earth
Electrical isolation, input-earth
Electrical isolation, input-output
Electrical isolation, I/O rail

500 V RMS
1.5 kV RMS
3 kV RMS
4 kV RMS

500 V RMS
1.5 kV RMS
3 kV RMS
4 kV RMS

General data

Operating temperature
Storage temperature
Degree of efficiency at max. load
Standards
Approvals
EMC standards

-20 °C...+50 °C
-40 °C...+85 °C
78 %
EN 50178, EN 60950, IEC950
CSA / CE / cULus
EN 61000-6 / 2, -3

-20 °C...+50 °C
-40 °C...+85 °C
78 %
EN 50178, EN 60950, IEC950
CSA / CE / cULus
EN 61000-6 / 2, -3

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Screw connection

4.0 / 0.1 / 4
62.5 x 52 x 90.5
Derating: 33% @ 60°C

Screw connection

4.0 / 0.1 / 4
62.5 x 52 x 90.5
Derating: 33% @ 60°C

Ordering data

Type	(Qty.=1)	Order No.
CP SNT 24W 12V 1.5A		9928890012

Type	(Qty.=1)	Order No.
CP SNT 24W 5V 2A		9928890005

Note

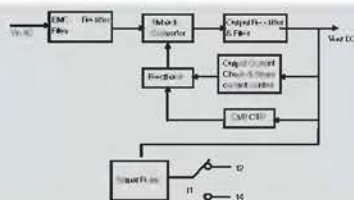
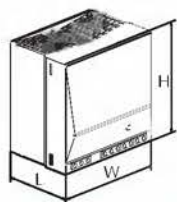
Accessories

Note

Switch-mode power supplies

connectPower single phase
ECOLINE

CP SNT 70 W 24 V 3 A



E

Technical data

Input

- Input voltage
- Input current
- Input frequency
- Input fuse
- Overvoltage protection

Output

- Output voltage
- Output current
- max. output power
- max. residual ripple
- Overload protection
- Overvoltage protection
- Mains failure bridge-over time
- Control at 10...100% load
- Parallel connection option
- Status relay / Change-over contact

Insulation coordination

- Electrical isolation, output-earth
- Electrical isolation, input-earth
- Electrical isolation, input-output

General data

- Operating temperature
- Storage temperature
- Degree of efficiency at max. load
- Status indication
- Standards
- EMC standards
- Mounting position horizontal
- Installation advice
- Weight
- Approvals

85...264 V AC / 110...370 V DC
2 A @ 100...240 V AC
50/ 60 Hz
Fusible link 2,5 A (T) / 250 V
Varistor
24...28 V DC (adjustable via potentiometer)
3 A
72 W
< 100 mV _{rms} / bandwidth 20 MHz
105%...130% I _{load} of max. output power, automatic restart
29...34 V
10 ms @ 115 V AC / 20 ms @ 230 V AC
< 2 %
recommended with diode module
250 V AC (max. 30 V DC) / 1 A
0,5 kV AC
1,5 kV AC
3 kV AC
-10 °C...+155 °C
-20 °C...+185 °C
80 %
green LED
EN 60204 (PELV); EN 60950 (SELV)
EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
on mounting rail TS 35
Clearance: above/below ≥ 3 cm
0,55 kg
CE / dULus 508 / dULus 60950

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Screw connection

2,5 / 0,1 / 4
110 x 55,5 x 125

For redundant operation or for maintaining built signaling function - operate with diode module only.

Ordering data

Type	Qty.	Order No.
CP SNT 70W 24V 3A	1	8708660000

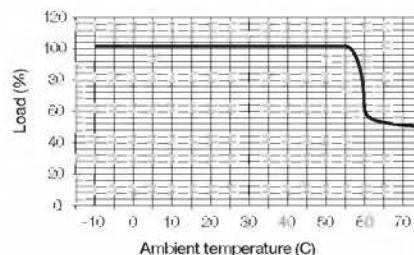
Note

Accessories

Note

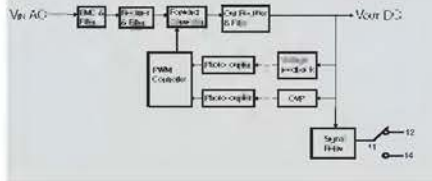
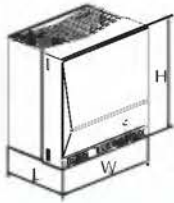
Derating curve

Output load/ambient temperature



connectPower single phase
ECOLINE

CP SNT 120 W 24 V 5 A



Technical data

Input	
Input voltage	88...132 V AC/176...264 V AC selectable; 250...370 V DC
Input current	3 A @ 115 V AC / 2 A @ 230 V AC
Input frequency	50/60 Hz
Input fuse	Fusible link 4 A (T) / 250 V
Overvoltage protection	Varistor
Output	
Output voltage	24...28 V DC (adjustable via potentiometer)
Output current	5 A
max. output power	120 W
max. residual ripple	< 100 mV _{rms} / bandwidth 20 MHz
Overload protection	105%...130% I _{load} of max. output power, automatic restart
Overvoltage protection	29...34 V
Mains failure bridge-over time	20 ms @ 115 V AC / 20 ms @ 230 V AC
Control at 10...100% load	< 2 %
Parallel connection option	recommended with diode module
Status relay / Change-over contact	250 V AC (max. 30 V DC) / 1 A
Insulation coordination	
Electrical isolation, output-earth	0,5 kV AC
Electrical isolation, input-earth	1,5 kV AC
Electrical isolation, input-output	3 kV AC
General data	
Operating temperature	-10 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Degree of efficiency at max. load	84 %
Status indication	green LED
Standards	EN 60204 (PELV); EN 60950 (SELV)
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Mounting position horizontal	on mounting rail TS 35
Installation advice	Clearance: above/below ≥ 3 cm
Weight	0,65 kg
Approvals	CE / dULus 508 / dULus 60950

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Ordering data

Type	Qty.	Order No.
CP SNT 120W 24V 5A	1	8708670000

Note

Accessories

Note

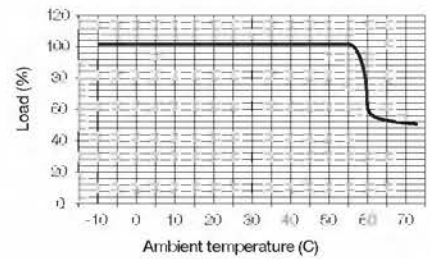
88...132 V AC/176...264 V AC selectable; 250...370 V DC
3 A @ 115 V AC / 2 A @ 230 V AC
50/60 Hz
Fusible link 4 A (T) / 250 V
Varistor
24...28 V DC (adjustable via potentiometer)
5 A
120 W
< 100 mV _{rms} / bandwidth 20 MHz
105%...130% I _{load} of max. output power, automatic restart
29...34 V
20 ms @ 115 V AC / 20 ms @ 230 V AC
< 2 %
recommended with diode module
250 V AC (max. 30 V DC) / 1 A
0,5 kV AC
1,5 kV AC
3 kV AC
-10 °C...+55 °C
-20 °C...+85 °C
84 %
green LED
EN 60204 (PELV); EN 60950 (SELV)
EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
on mounting rail TS 35
Clearance: above/below ≥ 3 cm
0,65 kg
CE / dULus 508 / dULus 60950

Screw connection	
2,5 / 0,1 / 4	
110 x 65,5 x 125	

For redundant operation or for maintaining built signaling function - operate with diode module only.

Derating curve

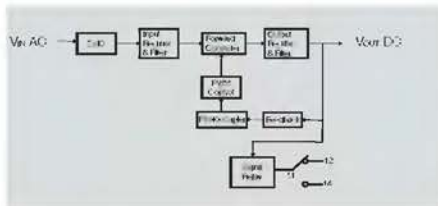
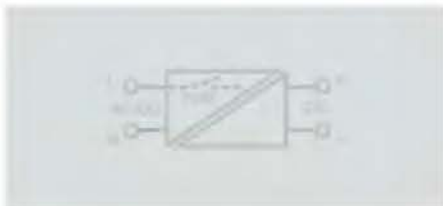
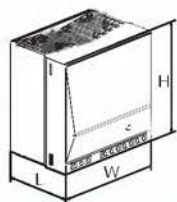
Output load/ambient temperature



Switch-mode power supplies

connectPower single phase
ECOLINE

CP SNT 250 W 24 V 10 A



E

Technical data

Input	
Input voltage	88...132 V AC/176...264 V AC selectable; 250...370 V DC
Input current	3.6 A @ 115 V AC / 2 A @ 230 V AC
Input frequency	50/60 Hz
Input fuse	Fusible link 5 A (T) / 250 V
Overvoltage protection	Varistor
Output	
Output voltage	24...28 V DC (adjustable via potentiometer)
Output current	10 A
max. output power	240 W
max. residual ripple	< 100 mV _r / bandwidth 20 MHz
Overload protection	105%...130% I _{load} of max. output power, automatic restart
Overvoltage protection	30...36 V
Mains failure bridge-over time	10 ms @ 115 V AC / 15 ms @ 230 V AC
Control at 10...100% load	< 2 %
Parallel connection option	recommended with diode module
Status relay / Change-over contact	250 V AC (max. 30 V DC) / 1 A
Insulation coordination	
Electrical isolation, output-earth	0,5 kV AC
Electrical isolation, input-earth	1,5 kV AC
Electrical isolation, input-output	3 kV AC
General data	
Operating temperature	-10 °C...+155 °C
Storage temperature	-20 °C...+185 °C
Degree of efficiency at max. load	84 %
Status indication	green LED
Standards	EN 60204 (PELV); EN 60950 (SELV)
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Mounting position horizontal	on mounting rail TS 35
Installation advice	Clearance: above/below ≥ 3 cm
Weight	1,6 kg
Approvals	CE / cULus 508 / cULus 60950

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Ordering data

Type	
CP SNT 250W 24V 10A	
Note	

Accessories

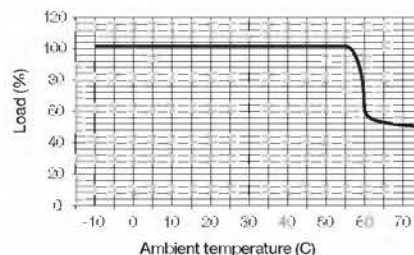
Note	
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Screw connection	
	4,0 / 0,1 / 6
	110 x 125,5 x 125
	For redundant operation or for maintaining built signaling function - operate with diode module only.

Type	Qty.	Order No.
CP SNT 250W 24V 10A	1	8708680000

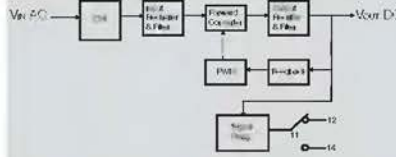
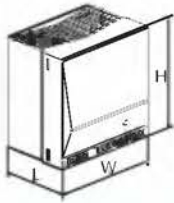
Derating curve

Output load/ambient temperature



connectPower single phase
ECOLINE

CP SNT 500 W 24 V 20 A



Technical data

Input	
Input voltage	88...132 V AC/176...264 V AC selectable; 250...370 V DC
Input current	9 A @ 115 V AC / 6 A @ 230 V AC
Input frequency	50/60 Hz
Input fuse	Fusible link 10 A (T) / 250 V
Overvoltage protection	Varistor
Output	
Output voltage	24...28 V DC (adjustable via potentiometer)
Output current	20 A
max. output power	480 W
max. residual ripple	< 100 mV _{rms} / bandwidth 20 MHz
Overload protection	105%...130% I_{load} of max. output power, automatic restart
Overvoltage protection	30...36 V
Mains failure bridge-over time	10 ms @ 115 V AC / 15 ms @ 230 V AC
Control at 10...100% load	< 2 %
Parallel connection option	recommended with diode module
Status relay / Change-over contact	250 V AC (max. 30 V DC) / 1 A
Insulation coordination	
Electrical isolation, output-earth	0,5 kV AC
Electrical isolation, input-earth	1,5 kV AC
Electrical isolation, input-output	3 kV AC
General data	
Operating temperature	-10 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Degree of efficiency at max. load	86 %
Status indication	green LED
Standards	EN 60950 (SELV); EN 60204 (PELV)
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Mounting position horizontal	on mounting rail TS 35
Installation advice	Clearance: above/below ≥ 3 cm
Weight	2 kg
Approvals	CE / dULus 508 / dULus 60950

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

88...132 V AC/176...264 V AC selectable; 250...370 V DC
9 A @ 115 V AC / 6 A @ 230 V AC
50/60 Hz
Fusible link 10 A (T) / 250 V
Varistor
24...28 V DC (adjustable via potentiometer)
20 A
480 W
< 100 mV _{rms} / bandwidth 20 MHz
105%...130% I_{load} of max. output power, automatic restart
30...36 V
10 ms @ 115 V AC / 15 ms @ 230 V AC
< 2 %
recommended with diode module
250 V AC (max. 30 V DC) / 1 A
0,5 kV AC
1,5 kV AC
3 kV AC
-10 °C...+55 °C
-20 °C...+85 °C
86 %
green LED
EN 60950 (SELV); EN 60204 (PELV)
EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
on mounting rail TS 35
Clearance: above/below ≥ 3 cm
2 kg
CE / dULus 508 / dULus 60950

Screw connection	
4,0 / 0,1 / 6	
110 x 227,5 x 125	

For redundant operation or for maintaining built signaling function - operate with diode module only.

Ordering data

Type	Qty.	Order No.
CP SNT 500W 24V 20A	1	8778870000

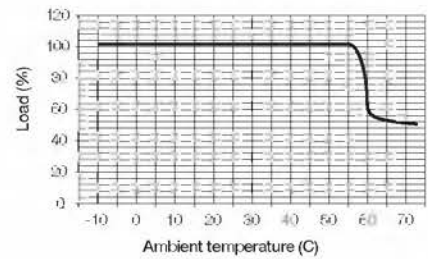
Note

Accessories

Note

Derating curve

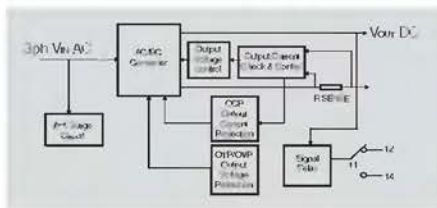
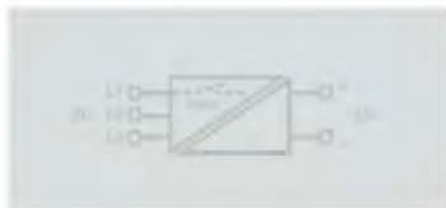
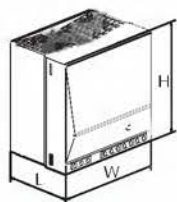
Output load/ambient temperature



Switch-mode power supplies

connectPower 3-phase
ECOLINE

CP SNT3 250 W 24 V 10 A



E

Technical data

Input	
Input voltage	3x400 V AC / 340...575 V AC
Input current	0,95 A @ 400 V AC
Input frequency	47...63 Hz
Input fuse	External via 3 circuit-breakers up to 6 A, char. C
Overvoltage protection	Varistor
Output	
Output voltage	24...28 V DC (adjustable via potentiometer)
Output current	10 A
max. output power	250 W
max. residual ripple	< 100 mV _{rms} / bandwidth 20 MHz
Overload protection	105%...130% I _{load,rated} of max. output power, automatic restart
Overvoltage protection	29...34 V
Mains failure bridge-over time	> 10 ms @ 400 V AC
Control at 10...100% load	< 2 %
Parallel connection option	recommended with diode module
Status relay / Change-over contact	250 V AC (max. 30 V DC) / 1 A
Insulation coordination	
Electrical isolation, output-earth	0,5 kV AC
Electrical isolation, input-earth	1,5 kV AC
Electrical isolation, input-output	3 kV AC
General data	
Operating temperature	-10 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Degree of efficiency at max. load	88 %
Status indication	green LED
Standards	EN 60204 (PELV); EN 60950 (SELV)
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Mounting position horizontal	on mounting rail TS 35
Installation advice	Clearance: above/below ≥ 3 cm
Weight	1,5 kg
Approvals	CE / dULus 508 / dULus 60950

Clamping range (rating- / min. / max.)	mm ²	4,0 / 0,1 / 6
Length x width x height	mm	110 x 125,5 x 125
Note		For redundancy or correct function of the signal relays use a diode module

Ordering data

Type	Qty.	Order No.
CP SNT3 250W 24V 10A	1	8708700000

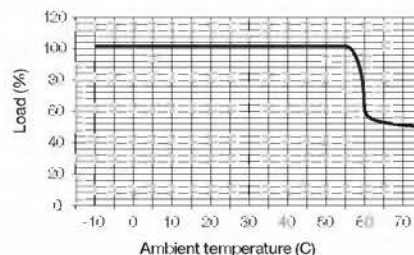
Note

Accessories

Note

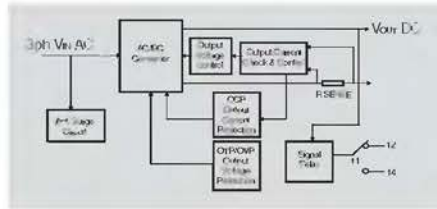
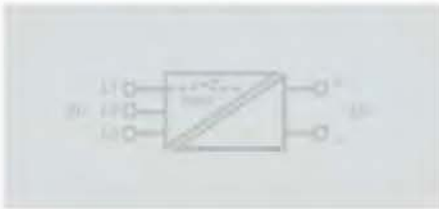
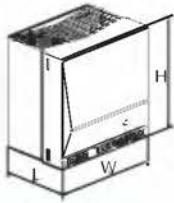
Derating curve

Output load/ambient temperature



connectPower 3-phase
ECOLINE

CP SNT3 500 W 24 V 20 A



Technical data

Input	
Input voltage	3x400 V AC / 340...575 V AC
Input current	1.7 A @ 400 V AC
Input frequency	47...63 Hz
Input fuse	External via 3 circuit-breakers up to 6...16 A, char. C
Overvoltage protection	Varistor
Output	
Output voltage	24...28 V DC (adjustable via potentiometer)
Output current	20 A
max. output power	480 W
max. residual ripple	< 100 mV _{rms} / bandwidth 20 MHz
Overload protection	105%...130% I _{load,rated} of max. output power, automatic restart
Overvoltage protection	29...34 V
Mains failure bridge-over time	> 10 ms @ 400 V AC
Control at 10...100% load	< 2 %
Parallel connection option	recommended with diode module
Status relay / Change-over contact	250 V AC (max. 30 V DC) / 1 A
Insulation coordination	
Electrical isolation, output-earth	0,5 kV AC
Electrical isolation, input-earth	1,5 kV AC
Electrical isolation, input-output	3 kV AC
General data	
Operating temperature	-10 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Degree of efficiency at max. load	88 %
Status indication	green LED
Standards	EN 60204 (PELV); EN 60950 (SELV)
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Mounting position horizontal	on mounting rail TS 35
Installation advice	Clearance: above/below ≥ 3 cm
Weight	3 kg
Approvals	CE / dULus 508 / dULus 60950

Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 6
Length x width x height	mm	110 x 227.5 x 125
Note		For redundancy or correct function of the signal relays use a diode module

Ordering data

Type	Qty.	Order No.
CP SNT3 500W 24V 20A	1	8708710000

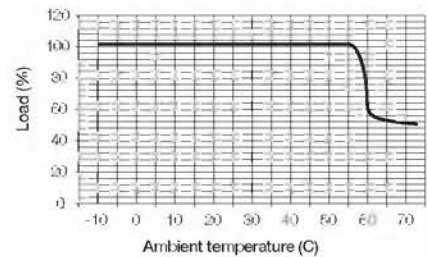
Note

Accessories

Note

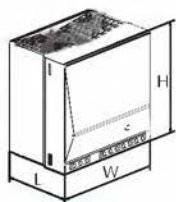
Derating curve

Output load/ambient temperature

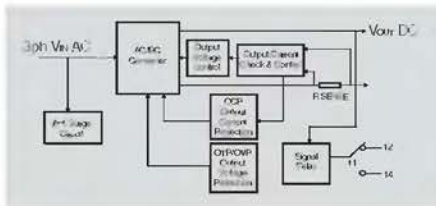
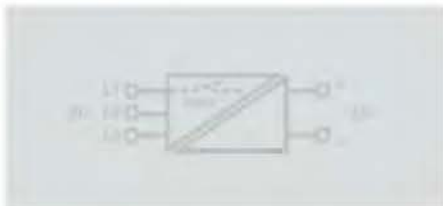


Switch-mode power supplies

connectPower 3-phase ECOLINE



CP SNT3 1000 W 24 V 40 A



E

Technical data

Input

Input voltage	3x400 V AC / 340...575 V AC (450...800 V DC)
Input current	3.4 A @ 400 V AC
Input frequency	47...63 Hz
Input fuse	External via 3 circuit-breakers up to 10...16 A, char. C
Overvoltage protection	Varistor

Output

Output voltage	24...28 V DC (adjustable via potentiometer)
Output current	40 A
max. output power	960 W
max. residual ripple	< 100 mV _{rms} / bandwidth 20 MHz
Overload protection	105%...130% I _{load} of max. output power, automatic restart
Overvoltage protection	29...34 V
Mains failure bridge-over time	> 10 ms @ 400 V AC
Control at 10...100% load	< 2 %
Parallel connection option	direct for same type
Status relay / Change-over contact	250 V AC (max. 30 V DC) / 1 A

Insulation coordination

Electrical isolation, output-earth	0,5 kV AC
Electrical isolation, input-earth	1,5 kV AC
Electrical isolation, input-output	3 kV AC

General data

Operating temperature	-10 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Degree of efficiency at max. load	88 %
Status indication	green LED
Standards	EN 60204 (PELV); EN 60950 (SELV)
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Mounting position horizontal	on mounting rail TS 35
Installation advice	Clearance: above/below ≥ 3 cm
Weight	3,5 kg
Approvals	CE / dULus 508 / dULus 60950

Clamping range Input (rating-/min./max)	mm ²
Clamping range Output (rating-/ min./max)	mm ²
Length x width x height	mm

Note

Screw connection

4 / 0.1 / 6
10 / 0.3 / 16
125 x 260 x 150

Clamping range identical for input and signalling contact

Ordering data

Type	Qty.	Order No.
CP SNT3 1000W 24V 40A	1	8708730000

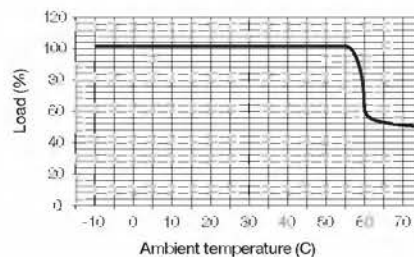
Note

Accessories

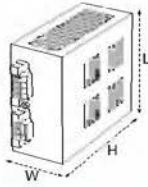
Note

Derating curve

Output load/ambient temperature

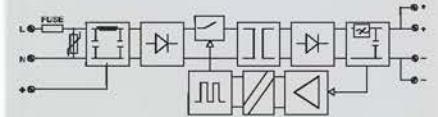
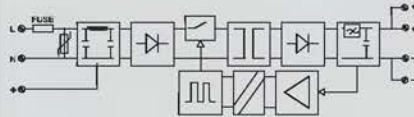


connectPower single phase



CP SNT 55 W 48 V 1.04 A

CP SNT 55 W 24-28 V 2.3 A



Technical data

Input

- Input voltage
- Input current
- Input frequency
- Input fuse
- Overvoltage protection

Output

- Output voltage
- Output current
- max. output power
- max. residual ripple
- Overload protection
- Overvoltage protection
- Mains failure bridge-over time
- Control at 10...100% load
- Parallel connection option

Insulation coordination

- Electrical isolation, output-earth
- Electrical isolation, input-earth
- Electrical isolation, input-output
- Electrical isolation, I/O rail

General data

- Operating temperature/Storage temperature
- Degree of efficiency at max. load
- Status indication
- Standards
- EMC standards
- Power factor correction
- Approvals

85...265 V AC; 120...300 V DC
 1.1 A @ 115 V AC; 0.55 A @ 230 V AC
 50/60 Hz
 2 A slow-blow fuse (internal)
 Varistor

48 V DC
 1.04 A
 50 V
 < 50 mV RMS
 Overvoltage / thermal cut-out
 Varistor
 30 ms @ 115 V AC / 180 ms @ 230 V AC
 1%
 no

500 V RMS
 1.5 kV RMS
 3 kV RMS
 3 kV RMS

-20 °C...+40 °C / -40 °C...+85 °C
 78 %
 green LED
 EN 50178, EN 60950, IEC950
 IEC 61000-6 / 2, -3
 no
 CSA;ULUR;CE;

85...265 V AC; 120...300 V DC
 1.1 A @ 115 V AC; 0.55 A @ 230 V AC
 50/60 Hz
 2 A slow-blow fuse (internal)
 Varistor

24...28 V DC
 2.3 A
 55 V
 < 50 mV RMS
 Overvoltage / thermal cut-out
 Varistor
 30 ms @ 115 V AC / 180 ms @ 230 V AC
 1%
 no

500 V RMS
 1.5 kV RMS
 3 kV RMS
 3 kV RMS

-20 °C...+40 °C / -40 °C...+85 °C
 78 %
 green LED
 EN 50178, EN 60950, IEC950
 IEC 61000-6 / 2, -3
 no
 CSA;ULUR;CE;ULFus;eCSAus;UL/ULIST

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

4.0 / 0.1 / 4
 131 x 57 x 98
 Derating: 2.1A/24V @ 50°C; 1.5A/24V @ 60°C

Screw connection

4.0 / 0.1 / 4
 131 x 57 x 98
 Derating: 2.1A/24V @ 50°C; 1.5A/24V @ 60°C

Ordering data

Type	Qty.	Order No.
CP SNT 55W 48V 1.04A	1	9927480048

Type	Qty.	Order No.
CP SNT 55W 24-28V 2.3A	1	9927480024

Note

Accessories

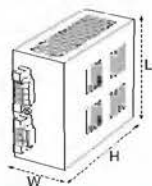
Note

Bracket for wall mounting: 792056/0009

Bracket for wall mounting: 792060/0009

Switch-mode power supplies

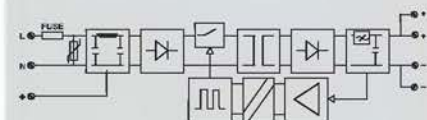
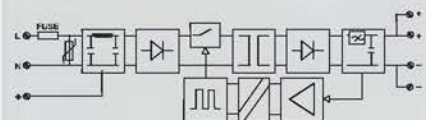
connectPower single phase



CP SNT 55 W 12-15 V 3 A



CP SNT 55 W 5 V 3 A



E

Technical data

Input

Input voltage
Input current
Input frequency
Input fuse

Overvoltage protection

Output

Output voltage
Output current
max. output power
max. residual ripple
Overload protection
Overvoltage protection
Mains failure bridge-over time
Control at 10...100% load
Parallel connection option

Insulation coordination

Electrical isolation, output-earth
Electrical isolation, input-earth
Electrical isolation, input-output
Electrical isolation, I/O rail

General data

Operating temperature/Storage temperature
Degree of efficiency at max. load
Status indication
Standards
EMC standards
Power factor correction
Approvals

85...265 V AC, 120...300 V DC
1.1 A @ 115 V AC; 0.55 A @ 230 V AC
50/60 Hz
2 A slow-blow fuse (internal)
Varistor

12...15 V DC
3 A
36 V
< 50 mV RMS

Overvoltage / thermal cut-out
Varistor
30 ms @ 115 V AC / 180 ms @ 230 V AC
1%
no

500 V RMS
1.5 kV RMS
3 kV RMS
3 kV RMS

-20 °C...+40 °C / -40 °C...+85 °C
78 %
green LED
EN 50178, EN 60950, IEC950
IEC 61000-6 / 2, -3
no
CSA;ULUR;CE;

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection

4.0 / 0.1 / 4
131 x 57 x 98

Derating: 2.1A/24V @ 50°C; 1.5A/24V @ 60°C

Ordering data

Note

Accessories

Note

Type	Qty.	Order No.
CP SNT 55W 12-15V 3A	1	9927480012

Bracket for wall mounting: 7920560009

85...265 V AC, 120...300 V DC
1.1 A @ 115 V AC; 0.55 A @ 230 V AC
50/60 Hz
2 A slow-blow fuse (internal)
Varistor

5 V DC
3 A
15 V
< 50 mV RMS

Overvoltage / thermal cut-out
Varistor
30 ms @ 115 V AC / 180 ms @ 230 V AC
1%
no

500 V RMS
1.5 kV RMS
3 kV RMS
3 kV RMS

-20 °C...+40 °C / -40 °C...+85 °C
78 %
green LED
EN 50178, EN 60950, IEC950
IEC 61000-6 / 2, -3
no
CSA;ULUR;CE;

Screw connection

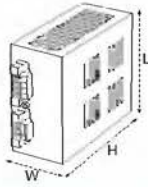
4.0 / 0.1 / 4
131 x 57 x 98

Derating: 2.1A/24V @ 50°C; 1.5A/24V @ 60°C

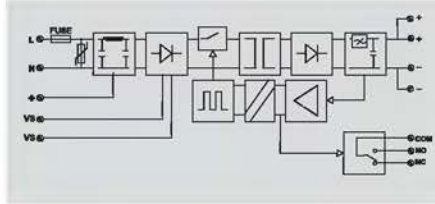
Type	Qty.	Order No.
CP SNT 55W 5V 3A	1	9927480005

Bracket for wall mounting: 7920560009

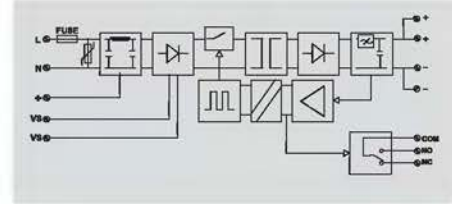
connectPower single phase



CP SNT 160 W 48 V 3.5 A



CP SNT 160 W 24-28 V 6.5 A



Technical data

Input

Input voltage
Input current
Input frequency
Input fuse
Overvoltage protection

Output

Output voltage
Output current
max. output power
max. residual ripple
Overload protection
Overvoltage protection
Mains failure bridge-over time
Control at 10...100% load
Parallel connection option

Insulation coordination

Electrical isolation, output-earth
Electrical isolation, input-earth
Electrical isolation, input-output
Electrical isolation, I/O rail

General data

Operating temperature/Storage temperature
Degree of efficiency at max. load
Status indication
Standards
EMC standards
Power factor correction
Approvals

min. 85/138 V AC, max. 195/250 V AC, typ. 115...230 V AC
2,9 A @ 115 V AC; 1,45A @ 230 V AC
50/60 Hz
6,3 A slow-blow fuse (internal)
Varistor

48 V DC
3,5 A
168 W
0,2 % RMS
Overcurrent and overvoltage protection
Varistor
40 ms @ 115 V AC / 50 ms @ 230 V AC
1%
no

500 V RMS
1,5 kV RMS
3 kV RMS
3 kV RMS

0 °C...+50 °C / -40 °C...+85 °C
85 %
green LED
EN 50178, EN 60950, IEC950
EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
no
CSA;ULUR;CE;

Screw connection

4,0 / 0,1 / 4
175 x 57 x 127
Derating: 10% @ 60°C

min. 85/138 V AC, max. 195/250 V AC, typ. 115...230 V AC
2,9 A @ 115 V AC; 1,45A @ 230 V AC
50/60 Hz
6,3 A slow-blow fuse (internal)
Varistor

24...28 V DC
6,5 A
156 W
0,2 % RMS
Overcurrent and overvoltage protection
Varistor
40 ms @ 115 V AC / 50 ms @ 230 V AC
1%
no

500 V RMS
1,5 kV RMS
3 kV RMS
3 kV RMS

0 °C...+50 °C / -40 °C...+85 °C
85 %
green LED
EN 50178, EN 60950, IEC950
EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
no
CSA;ULUR;CE;

Screw connection

4,0 / 0,1 / 4
175 x 57 x 127
Derating: 10% @ 60°C

Clamping range (rating- / min. / max.) mm²

Length x width x height mm

Note

Ordering data

Type	Qty.	Order No.
CP SNT 160W 48V 3.5A	1	9925340048

Type	Qty.	Order No.
CP SNT 160W 24-28V 6.5A	1	9925340024

Note

Accessories

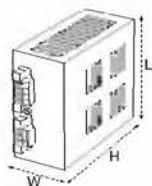
Note

Bracket for wall mounting: 7920560009

Bracket for wall mounting: 7920600009

Switch-mode power supplies

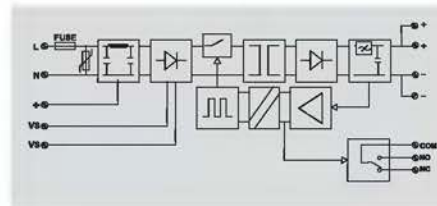
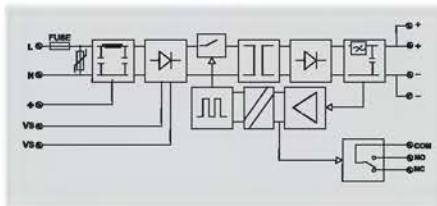
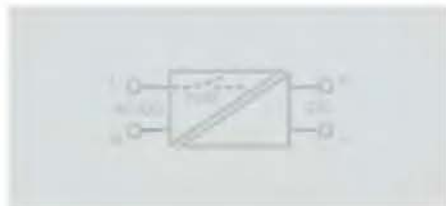
connectPower single phase



CP SNT 160 W 12-15 V 8 A



CP SNT 160 W 5 V 8 A



E

Technical data

Input	
Input voltage	min. 85/138 V AC, max. 195/250 V AC, typ. 115...230 V AC
Input current	2,9 A @ 115 V AC; 1,45A @ 230 V AC
Input frequency	50/ 60 Hz
Input fuse	6,3 A slow-blow fuse (internal)
Overvoltage protection	Varistor
Output	
Output voltage	12...15 V DC
Output current	8 A
max. output power	96 W
max. residual ripple	0,2 % RMS
Overload protection	Overcurrent and overvoltage protection
Overvoltage protection	Varistor
Mains failure bridge-over time	40 ms @ 115 V AC / 50 ms @ 230 V AC
Control at 10...100% load	1%
Parallel connection option	no
Insulation coordination	
Electrical isolation, output-earth	500 V RMS
Electrical isolation, input-earth	1,5 kV RMS
Electrical isolation, input-output	3 kV RMS
Electrical isolation, I/O rail	3 kV RMS
General data	
Operating temperature/Storage temperature	0 °C...+50 °C / -40 °C...+85 °C
Degree of efficiency at max. load	85 %
Status indication	green LED
Standards	EN 50178, EN 60950, IEC950
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction	no
Approvals	CSA;ULUR;CE;
Screw connection	
Clamping range (rating- / min. / max.)	4,0 / 0,1 / 4
Length x width x height	175 x 57 x 127
Note	Derating: 10% @ 60°C

Input	
Input voltage	min. 85/138 V AC, max. 195/250 V AC, typ. 115...230 V AC
Input current	2,9 A @ 115 V AC; 1,45A @ 230 V AC
Input frequency	50/ 60 Hz
Input fuse	6,3 A slow-blow fuse (internal)
Overvoltage protection	Varistor
Output	
Output voltage	5 V DC
Output current	8 A
max. output power	40 W
max. residual ripple	0,2 % RMS
Overload protection	Overcurrent and overvoltage protection
Overvoltage protection	Varistor
Mains failure bridge-over time	40 ms @ 115 V AC / 50 ms @ 230 V AC
Control at 10...100% load	1%
Parallel connection option	no
Insulation coordination	
Electrical isolation, output-earth	500 V RMS
Electrical isolation, input-earth	1,5 kV RMS
Electrical isolation, input-output	3 kV RMS
Electrical isolation, I/O rail	3 kV RMS
General data	
Operating temperature/Storage temperature	0 °C...+50 °C / -40 °C...+85 °C
Degree of efficiency at max. load	85 %
Status indication	green LED
Standards	EN 50178, EN 60950, IEC950
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction	no
Approvals	CSA;ULUR;CE;
Screw connection	
Clamping range (rating- / min. / max.)	4,0 / 0,1 / 4
Length x width x height	175 x 57 x 127
Note	Derating: 10% @ 60°C

Input	
Input voltage	min. 85/138 V AC, max. 195/250 V AC, typ. 115...230 V AC
Input current	2,9 A @ 115 V AC; 1,45A @ 230 V AC
Input frequency	50/ 60 Hz
Input fuse	6,3 A slow-blow fuse (internal)
Overvoltage protection	Varistor
Output	
Output voltage	5 V DC
Output current	8 A
max. output power	40 W
max. residual ripple	0,2 % RMS
Overload protection	Overcurrent and overvoltage protection
Overvoltage protection	Varistor
Mains failure bridge-over time	40 ms @ 115 V AC / 50 ms @ 230 V AC
Control at 10...100% load	1%
Parallel connection option	no
Insulation coordination	
Electrical isolation, output-earth	500 V RMS
Electrical isolation, input-earth	1,5 kV RMS
Electrical isolation, input-output	3 kV RMS
Electrical isolation, I/O rail	3 kV RMS
General data	
Operating temperature/Storage temperature	0 °C...+50 °C / -40 °C...+85 °C
Degree of efficiency at max. load	85 %
Status indication	green LED
Standards	EN 50178, EN 60950, IEC950
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction	no
Approvals	CSA;ULUR;CE;
Screw connection	
Clamping range (rating- / min. / max.)	4,0 / 0,1 / 4
Length x width x height	175 x 57 x 127
Note	Derating: 10% @ 60°C

Ordering data

Type	Qty.	Order No.
CP SNT 160W 12-15V 8A	1	9925340012

Type	Qty.	Order No.
CP SNT 160W 5V 8A	1	9925340005

Note

Accessories

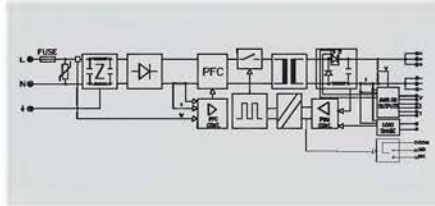
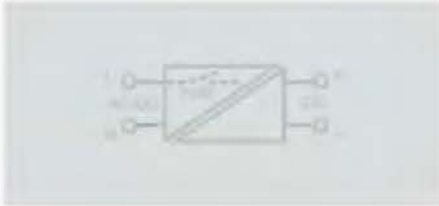
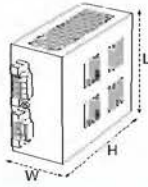
Note

Bracket for wall mounting: 7920560009

Bracket for wall mounting: 7920600009

connectPower single phase

CP SNT 300 W 24 V 12.5 A



Technical data

Input	86...265 V AC; 100...200 V DC; typ 115...230 V AC
Input voltage	3.3 A @ 115 V AC; 1.65 A @ 230 V AC
Input current	50/ 60 Hz
Input frequency	Thermistor
Input fuse	Varistor
Overvoltage protection	
Output	Adjustable, 22-28 V DC
Output voltage	12.5 A
Output current	300 W
max. output power	at 100 kHz: 2 mV _{rms} ; at 120 Hz: 20 mV AC RMS
max. residual ripple	Overcurrent and overvoltage protection
Overload protection	Varistor
Overvoltage protection	40 ms @ 115 V AC / 40 ms @ 230 V AC
Mains failure bridge-over time	0.2 %
Control at 10...100% load	Yes, max. 5 devices, active current splitting
Parallel connection option	2 s
Signalling delay	Output voltage, current, temperature
Monitoring function	
Insulation coordination	500 V RMS
Electrical isolation, output-earth	1.5 kV RMS
Electrical isolation, input-earth	3 kV RMS
Electrical isolation, input-output	4 kV RMS
Electrical isolation, I/O rail	
General data	-15°C...+50°C (at 100% duty cycle) / -40 °C...+85 °C
Operating temperature/Storage temperature	80 %
Degree of efficiency at max. load	Current limiting: yellow LED / Error: red LED / On: green LED
Status indication	EN 50178, EN 60950, IEC950
Standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
EMC standards	PFC passive
Power factor correction	Derating: 20% @ 60°C
Derating	CSA;UL;UR;CE;
Approvals	

Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	101 x 240 x 155

Note

Ordering data

Type	Qty.	Order No.
CP SNT 300W 24V 12.5A	1	9916250024

Note

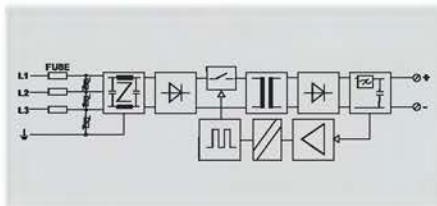
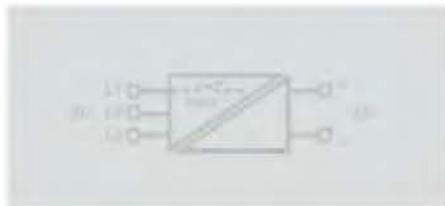
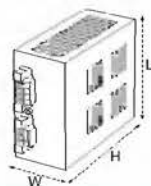
Accessories

Note	Bracket for wall mounting: 792056/0009
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Switch-mode power supplies

connectPower 3-phase

CP-SNT 380-480 V AC/24 V



E

Technical data

Input	
Input voltage	306... 550 V AC, typ.: 360...480 V AC
Input current	120 mA @ 360 V AC; 100 mA @ 230 V AC
Input frequency	50/ 60 Hz
Input fuse	3 x 1 A slow-blow fuse (internal)
Overvoltage protection	Varistor
Output	
Output voltage	24 V DC
Output current	2,3 A
max. output power	55 W
max. residual ripple	< 50 mV RMS
Overload protection	Overvoltage / thermal cut-out
Overvoltage protection	Varistor
Mains failure bridge-over time	120 ms @ 360 V AC / 120 ms @ 480 V AC
Control at 10...100% load	1%
Parallel connection option	no
Overload protection	Overvoltage / thermal cut-out
Insulation coordination	
Electrical isolation, output-earth	500 V RMS
Electrical isolation, input-earth	1,5 kV RMS
Electrical isolation, input-output	3 kV RMS
Electrical isolation, I/O rail	3 kV RMS
General data	
Operating temperature	0 °C...+50 °C
Storage temperature	-40 °C...+85 °C
Degree of efficiency at max. load	
Status indication	green LED
Standards	EN 50178, EN 60950, IEC950
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction	no
Approvals	CSA;ULUR;CE;
Screw connection	
Clamping range (rating- / min. / max.)	4,0 / 0,1 / 4
Length x width x height	168 x 60 x 108
Note	Derating: 10% @ 25°C

Ordering data

Type	Qty.	Order No.
CP-SNT 380-480VAC/24V	1	9917790324

Note

Accessories

Note

Diode modules



Power supply to critical loads

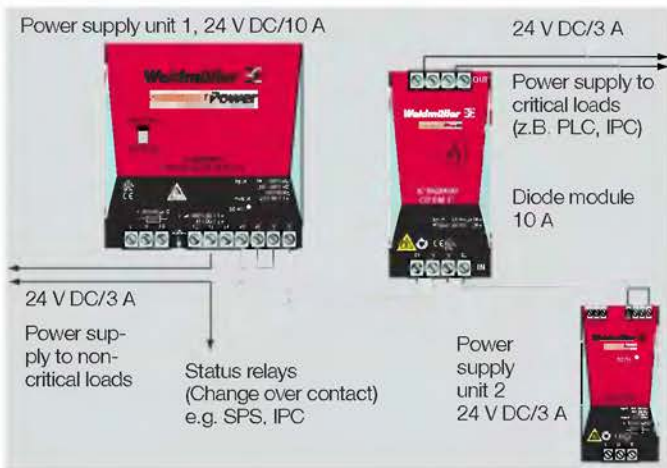
As a rule, actuators require relative high amounts of current, and a modern power supply concept should envisage supplying them separately. It is also recommended that a second power supply unit with lower output be used to supply the controls (for example, PLC, IPC). Together with a diode module, doubling up guarantees that the controls are constantly supplied with power should one of the devices fail; thus ensuring that no data is lost.

Redundant circuit for fail-safe power supply to loads

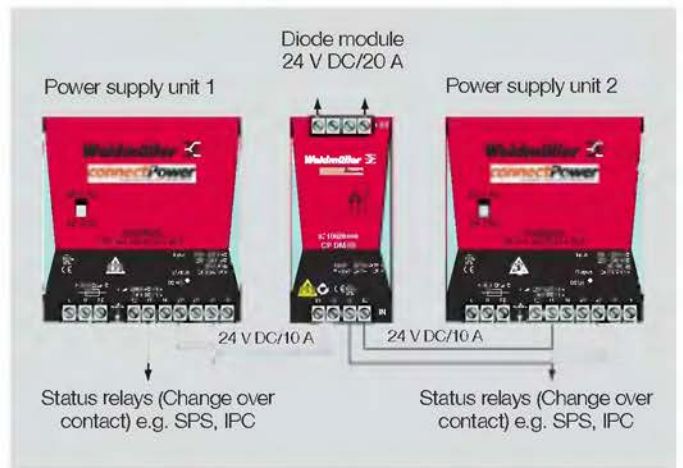
Both devices operate in parallel and share the load required by the equipment via the diode module. Should one of these devices fail, the second device immediately supplies the full amount of power. The diode module decouples both switch-mode power supplies to 100 %, so that they do not negatively affect each other if a failure occurs.

E

Power supply to critical loads



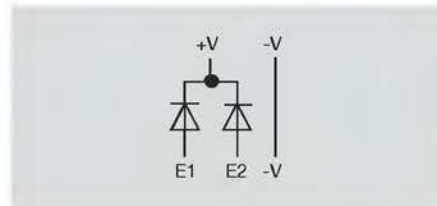
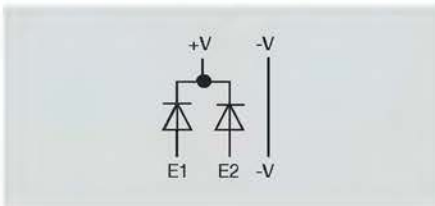
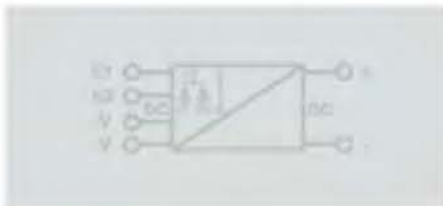
Redundant circuit for fail-safe power supply to loads



connectPower diode module
ECOLINE

CP DM 10

CP DM 20



Technical data

Input	
Input voltage	
Input current	
Output	
Output voltage	
Output current	
General specifications	
Operating temperature	
Storage temperature	
Efficiency under max. load	
DIN rail mounting	
Mounting position	
Mounting	
Weight	
Approvals	

40 V DC max.
2 x 0 ... 10 A max.
V_{in} - 0.5 typical
0 ... 20 A max. or 10 A max. in redundancy mode
0 °C ... 50 °C
-20 °C ... +85 °C
approx. 95.5 % at 24 V DC
TS35 top-hat rail to DIN EN 50022
Horizontal rail
Clearance: side ≥ 4 cm; above/below ≥ 10 cm
approx. 0.15 kg
CE

40 V DC max.
2 x 0 ... 20 A max.
V_{in} - 0.5 typical
0 ... 40 A max. or 20 A max. in redundancy mode
0 °C ... 50 °C
-20 °C ... +85 °C
approx. 97.5 % at 24 V DC
TS35 top-hat rail to DIN EN 50022
Horizontal rail
Clearance: side ≥ 4 cm; above/below ≥ 10 cm
approx. 0.6 kg
CE

Input clamping range (nom. / min. / max.)	mm ²
Output clamping range (nom. / min. / max.)	mm ²
Length x width x height	mm
Note	

Screw connection
4 / 0.13 / 4
125.0 x 55.5 x 100.0
*Clamping range identical for input/output

Screw connection
4 / 0.13 / 4
10.0 / 0.32 / 16.0
142.0 x 55.5 x 100.0

Ordering data

Type	Qty	Order No.
CP DM 10	1	8710620000

Type	Qty	Order No.
CP DM 20	1	8768650000

Note

Accessories

Note

DC/DC converters



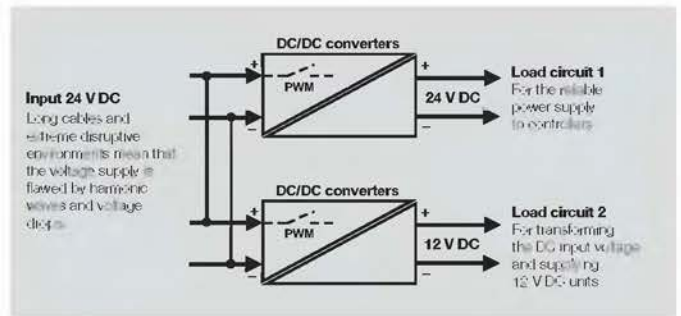
If there is no regulated and stable DC voltage available to supply sensitive equipment, DC/DC converters can guarantee a stabilised voltage. To a certain extent, other voltage levels are generated at the output; consequently, DC/DC converters can also be utilised for converting to other voltage levels. Electrical isolation of the input and output ensures reliable and safe separation of the circuits. The status of the output is reliably indicated by means of a status LED.

DC/DC converters

DC/DC converters are particularly suitable for decentralised power supplies to circuitry, subassemblies and modules. DC/DC converters are often required in emergency power supplies supplying electrical devices from batteries and other DC systems.

DC/DC converters for supplying sensitive loads for example, PLCs, mini controllers etc.

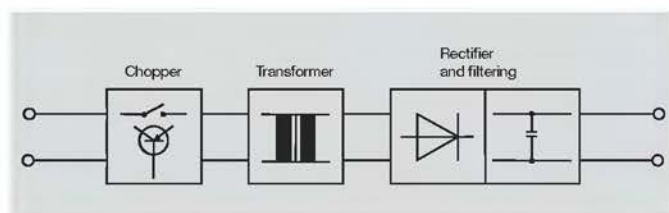
Power supply to loads with different voltage levels



It is possible to supply both sides of an analogue coupling module with the help of a DC/DC converter without neutralising the electrical isolation. Weidmüller's DC/DC converters are available in housings suitable for mounting on DIN rails.

Method of operation

DC/DC converters are a variation on switched-mode regulators. The DC current at the input is chopped with the switching frequency and brought up to the required voltage by a transformer. The voltage is then rectified, smoothed and regulated.

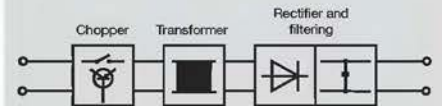
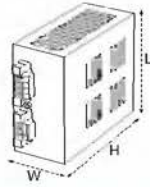


DC/DC converter

connectPower

CP DCDC 50 W 22-24 V DC 2 A

CP DCDC 50 W 15 V DC 3 A



E

Technical data

Input	
Input voltage	18...30 V DC, typ. 24 V DC
Input fuse	internal
Output	
Output voltage	22...24 V DC
Output current	2 A
Overload behaviour	Overvoltage cut-out with self-reset
General data	
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Input	
Input voltage	18...30 V DC, typ. 24 V DC
Input fuse	internal
Output	
Output voltage	15 V DC
Output current	3 A
Overload behaviour	Overvoltage cut-out with self-reset
General data	
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Input	
Input voltage	18...30 V DC, typ. 24 V DC
Input fuse	internal
Output	
Output voltage	15 V DC
Output current	3 A
Overload behaviour	Overvoltage cut-out with self-reset
General data	
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Screw connection		
Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Screw connection		
Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Ordering data

Connection system	Screw connection
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Type	Qty.	Order No.
CP DCDC 50W 22-24V 2A	1	9919372424

Type	Qty.	Order No.
CP DCDC 50W 15V 3A	1	9919372415

Note

Accessories

Note	Bracket for wall mounting: 7920560009
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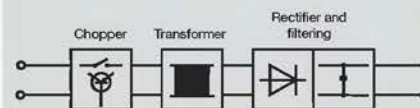
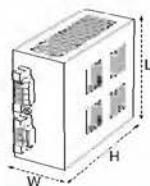
Note	Bracket for wall mounting: 7920560009
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Note	Bracket for wall mounting: 7920560009
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connectPower

CP DCDC 50 W 12 V DC 3 A

CP DCDC 50 W 5 V DC 8 A



Technical data

Input	
Input voltage	9...16 V DC, type 12 V DC
Input fuse	internal
Output	
Output voltage	12 V DC
Output current	3 A
Overload behaviour	Overvoltage cut-out with self-reset
General data	
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Input voltage	9...16 V DC, type 12 V DC
Input fuse	internal
Output voltage	12 V DC
Output current	3 A
Overload behaviour	Overvoltage cut-out with self-reset
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Input voltage	9...16 V DC, type 12 V DC
Input fuse	internal
Output voltage	5 V DC
Output current	8 A
Overload behaviour	Overvoltage cut-out with self-reset
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Screw connection	
4.0 / 0.1 / 4	
131 x 57 x 98	

Screw connection	
4.0 / 0.1 / 4	
131 x 57 x 98	

Ordering data

Connection system	
Screw connection	
Note	

Type	Qty.	Order No.
CP DCDC 50W 12V 3A	1	9919371212

Type	Qty.	Order No.
CP DCDC 50W 5V 8A	1	9919371205

Accessories

Note	
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Bracket for wall mounting: 7920560009

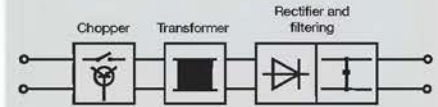
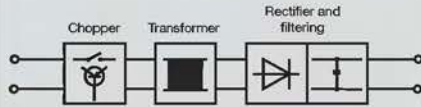
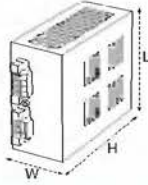
Bracket for wall mounting: 7920560009

DC/DC converter

connectPower

CP DCDC 50 W 22-24 V DC 2 A

CP DCDC 50 W 15 V DC 3 A



E

Technical data

Input	
Input voltage	9...16 V DC, type 12 V DC
Input fuse	internal
Output	
Output voltage	22...24 V DC
Output current	2 A
Overload behaviour	Overvoltage cut-out with self-reset
General data	
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Input	
Input voltage	9...16 V DC, type 12 V DC
Input fuse	internal
Output	
Output voltage	22...24 V DC
Output current	2 A
Overload behaviour	Overvoltage cut-out with self-reset
General data	
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Input	
Input voltage	9...16 V DC, type 12 V DC
Input fuse	internal
Output	
Output voltage	15 V DC
Output current	3 A
Overload behaviour	Overvoltage cut-out with self-reset
General data	
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Screw connection		
Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Screw connection		
Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Ordering data

Connection system	Screw connection
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Type	Qty.	Order No.
CP DCDC 50W 22-24V 2A	1	9919371224

Type	Qty.	Order No.
CP DCDC 50W 15V 3A	1	9919371215

Note	
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Note	
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Accessories

Note	
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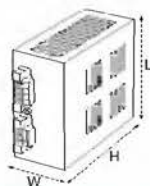
Bracket for wall mounting: 7920560009	
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Bracket for wall mounting: 7920600009	
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connectPower

CP DCDC 50 W 12 V DC 3 A

CP DCDC 50 W 5 V DC 8 A



Technical data

Input	
Input voltage	18...30 V DC, typ. 24 V DC
Input fuse	internal
Output	
Output voltage	12 V DC
Output current	3 A
Overload behaviour	Overvoltage cut-out with self-reset
General data	
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Input voltage	18...30 V DC, typ. 24 V DC
Input fuse	internal
Output voltage	12 V DC
Output current	3 A
Overload behaviour	Overvoltage cut-out with self-reset
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Input voltage	18...30 V DC, typ. 24 V DC
Input fuse	internal
Output voltage	5 V DC
Output current	8 A
Overload behaviour	Overvoltage cut-out with self-reset
Operating temperature	0 °C...+40 °C max. full rate load
Storage temperature	-40 °C...+85 °C
Status indication	green LED
Switching frequency	200.0 kHz
Approvals	CSA / ULUR / CE

Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Screw connection		
Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Screw connection		
Clamping range (rating- / min. / max.)	mm ²	4.0 / 0.1 / 4
Length x width x height	mm	131 x 57 x 98
Note		

Ordering data

Connection system	Screw connection
Note	

Type	Qty.	Order No.
CP DCDC 50W 12V 3A	1	9919372412
Note		

Type	Qty.	Order No.
CP DCDC 50W 5V 8A	1	9919372405
Note		

Accessories

Note	Bracket for wall mounting: 7920560009
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Note	Bracket for wall mounting: 7920560009
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Note	Bracket for wall mounting: 7920560009
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Unregulated power supplies



Unregulated power supplies – compactPower

Compact power supply units are important links in the power supplies for controllers. They are utilised where processes or control voltages are required that vary from the mains voltage. Transformers provide the electrical isolation between the input circuit and the output circuit.

The minimum requirement (to VDE 0550) is 2000 V.

Screw terminals secure the input-side connection to the mains.

The single-phase devices are rated for a nominal voltage of $\sim 230 \pm \sim 15\text{V}$, or $\sim 400 \text{V} \pm \sim 15\text{V}$, 50/60 Hz, the 3-phase devices for $3 \times 400 \text{V} \pm 5\%$. The secondary DC voltage from the transformer is conducted to a bridge rectifier where it is rectified.

The pulsating DC voltage is then fed from the rectifier and filtered to a low residual ripple by means of an electrolytic capacitor.

This DC voltage is then fed to the output terminal. These are designed as pluggable screw terminals. A varistor is integrated in the output circuitry to attenuate voltage peaks. The operating status is indicated by means of a green LED via the output circuit. Devices with 600 W and higher are equipped with a fan.

Well-balanced spectrum for optimum economy

The output currents of these practical products are defined by way of two ambient temperatures.

Size selection is based on the maximum effectiveness of the components.

Adapted to standard voltages in accordance with IEC 38

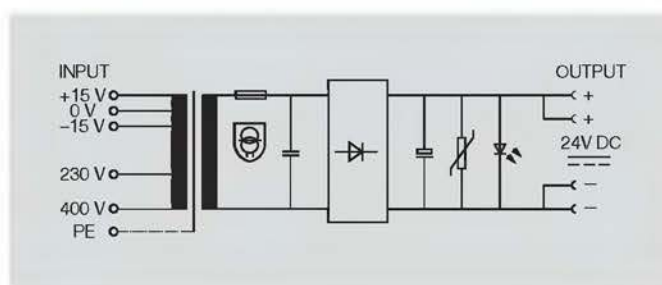
By choosing the appropriate terminals, the $\pm 15 \text{V}$ tapping capability allows the single-phase devices to be connected to six different nominal AC voltages: 215, 230, 245, 385, 400, 415 V.

The $\pm 5\%$ tapping capability allows the 3-phase devices to be connected to three different nominal voltages: 380, 400, 415 V.

Single-phase unregulated power supplies



Block diagram for single-phase devices CP NT



Reliable short-circuit and overload protection

Integrated on the secondary side in device sizes up to CP NT 192W, the FKS fuse protects against overloads and short-circuits. For the devices CP NT 264W and CP NT 432W, this protection is achieved by means of a thermostatic switch built into the transformer.

Easy mounting

Keyhole assembly simplifies mounting and saves time. A snap-on fixing attachment for 35 mm DIN rails is available as an accessory for single-phase devices up to 144 W. Simply plugged into the device and secured with two screws, it ensures easiest possible mounting!

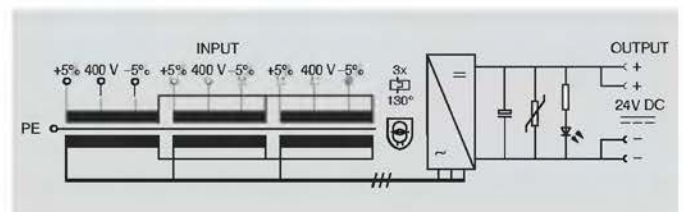
Transformers, vacuum-impregnated, painted black

- No humming
- Moisture cannot ingress into the windings
- Windings mechanically secured
- Improved heat dissipation from the windings
- Good heat dissipation

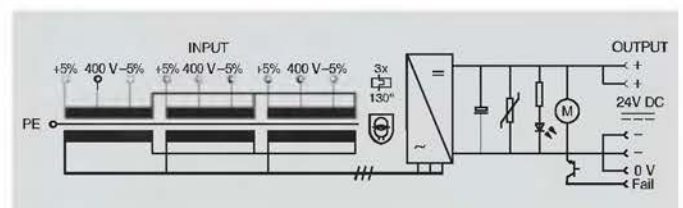
3-phase unregulated power supplies



Block diagram for 3-phase devices CP NT3 250 / 400 / 500 W

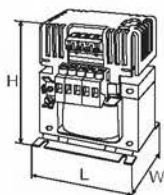


Block diagram for 3-phase devices CP NT3 600 / 750 / 1000 W



Unregulated power supplies

compactPower single phase



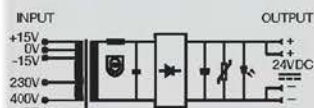
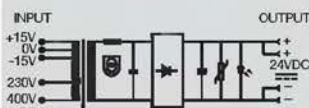
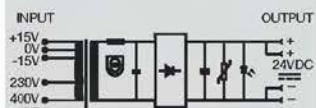
CP NT 36



CP NT 72



CP NT 144



E

Technical data

Input	
Input voltage	230 V/ 400 V ±15V
Input current	0.35 A/ 0.2 A
Input frequency	50/ 60 Hz
No-load input current	0.1A / 0.06A
External back-up time	0.63At / 0.315At
Output	
Output voltage	24 V SELV
Output current at 40°C	2 A
Output current at 55°C	1 A
max. output power	36 W
max. residual ripple	< 5 %
Fuse, max.	3 At flat plug-in fuse
Protective circuit	varistor
Insulation coordination	
Electric shock protection	to VBG4
Insulation strength	4 kV
Insulation class	B
Ingress protection class	IP 20
pollution severity	1
General data	
Operating temperature	-20 °C...+55 °C
Storage temperature	-20 °C...+80 °C
Degree of efficiency at max. load	80 %
Mounting position horizontal/arbitrary	1A @ 55 °C; 1.5A @ 40 °C / 1A @ 40 °C
Status indication	green LED
Weight	1.5 kg
Standards	EN 60950, EN 61558-2-4, -6, 72/23/EWG
DIN Rail compatibility	Direct mounting, TS 35 with clip-on plate
EMC standards	EN 61000-6 /-2, -3
Approvals	CE:cURus;UL/ULST;
Screw connection	
Clamping range In. (rating-/min./max) mm ²	2.5 / 0.13 / 2.5
Clamping range Out. (rating-/ min./max)mm ²	2.5 / 0.5 / 4
Length x width x height mm	68 x 78 x 123
Note	

Input	
Input voltage	230 V/ 400 V ±15V
Input current	0.56 A/ 0.32 A
Input frequency	50/ 60 Hz
No-load input current	0.13A / 0.08A
External back-up time	0.1 At / 0.63 At
Output	
Output voltage	24 V SELV
Output current at 40°C	3 A
Output current at 55°C	3 A
max. output power	72 W
max. residual ripple	< 5 %
Fuse, max.	7.5 At flat plug-in fuse
Protective circuit	varistor
Insulation coordination	
Electric shock protection	to VBG4
Insulation strength	4 kV
Insulation class	B
Ingress protection class	IP 20
pollution severity	1
General data	
Operating temperature	-20 °C...+55 °C
Storage temperature	-20 °C...+80 °C
Degree of efficiency at max. load	83 %
Mounting position horizontal/arbitrary	2.5A @ 55 °C; 3A @ 40 °C / 2.5A @ 40 °C
Status indication	green LED
Weight	2.1 kg
Standards	EN 60950, EN 61558-2-4, -6, 72/23/EWG
DIN Rail compatibility	Direct mounting, TS 35 with clip-on plate
EMC standards	EN 61000-6 /-2, -3
Approvals	CE:cURus;UL/ULST;
Screw connection	
Clamping range In. (rating-/min./max) mm ²	2.5 / 0.13 / 2.5
Clamping range Out. (rating-/ min./max)mm ²	2.5 / 0.5 / 4
Length x width x height mm	85 x 84 x 125
Note	

Input	
Input voltage	230 V/ 400 V ±15V
Input current	0.95 A/ 0.55 A
Input frequency	50/ 60 Hz
No-load input current	0.33A / 0.19A
External back-up time	1.6At / 1.0At
Output	
Output voltage	24 V SELV
Output current at 40°C	6 A
Output current at 55°C	5 A
max. output power	144 W
max. residual ripple	< 5 %
Fuse, max.	10 At flat plug-in fuse
Protective circuit	varistor
Insulation coordination	
Electric shock protection	to VBG4
Insulation strength	4 kV
Insulation class	B
Ingress protection class	IP 20
pollution severity	1
General data	
Operating temperature	-20 °C...+55 °C
Storage temperature	-20 °C...+80 °C
Degree of efficiency at max. load	88 %
Mounting position horizontal/arbitrary	5A @ 55 °C; 6A @ 40 °C / 5A @ 40 °C
Status indication	green LED
Weight	3.1 kg
Standards	EN 60950, EN 61558-2-4, -6, 72/23/EWG
DIN Rail compatibility	Direct mounting, TS 35 with clip-on plate
EMC standards	EN 61000-6 /-2, -3
Approvals	CE:cURus;UL/ULST;
Screw connection	
Clamping range In. (rating-/min./max) mm ²	2.5 / 0.13 / 2.5
Clamping range Out. (rating-/ min./max)mm ²	2.5 / 0.5 / 4
Length x width x height mm	92 x 96 x 135
Note	

Input	
Input voltage	230 V/ 400 V ±15V
Input current	0.56 A/ 0.32 A
Input frequency	50/ 60 Hz
No-load input current	0.13A / 0.08A
External back-up time	0.1 At / 0.63 At
Output	
Output voltage	24 V SELV
Output current at 40°C	3 A
Output current at 55°C	3 A
max. output power	72 W
max. residual ripple	< 5 %
Fuse, max.	7.5 At flat plug-in fuse
Protective circuit	varistor
Insulation coordination	
Electric shock protection	to VBG4
Insulation strength	4 kV
Insulation class	B
Ingress protection class	IP 20
pollution severity	1
General data	
Operating temperature	-20 °C...+55 °C
Storage temperature	-20 °C...+80 °C
Degree of efficiency at max. load	83 %
Mounting position horizontal/arbitrary	2.5A @ 55 °C; 3A @ 40 °C / 2.5A @ 40 °C
Status indication	green LED
Weight	2.1 kg
Standards	EN 60950, EN 61558-2-4, -6, 72/23/EWG
DIN Rail compatibility	Direct mounting, TS 35 with clip-on plate
EMC standards	EN 61000-6 /-2, -3
Approvals	CE:cURus;UL/ULST;
Screw connection	
Clamping range In. (rating-/min./max) mm ²	2.5 / 0.13 / 2.5
Clamping range Out. (rating-/ min./max)mm ²	2.5 / 0.5 / 4
Length x width x height mm	85 x 84 x 125
Note	

Ordering data

Type	(Qty.=1)	Order No.
CP NT 36W 24V 1.5A		8575260000

Type	(Qty.=1)	Order No.
CP NT 72W 24V 3A		8575270000

Type	(Qty.=1)	Order No.
CP NT 144W 24V 6A		8575280000

Note

Accessories

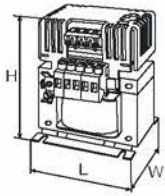
Note

*clip-in plate for TS35: 8582500000

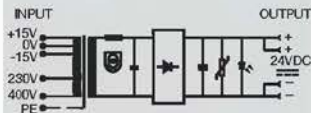
*clip-in plate for TS35: 8582500000

*clip-in plate for TS35: 8582500000

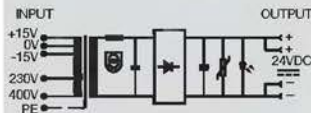
compactPower
single phase



CP NT 192



CP NT 264



CP NT 432



Technical data

Input

Input voltage
Input current
Input frequency
No-load input current
External back-up fuse

Output

Output voltage
Output current at 40°C
Output current at 55°C
max. output power
max. residual ripple
Fuse, max.
Protective circuit

Insulation coordination

Electric shock protection
Insulation strength
Insulation class
Ingress protection class
pollution severity

General data

Operating temperature
Storage temperature
Degree of efficiency at max. load
Mounting position horizontal/arbitrary
Status indication
Weight
Standards
DIN Rail compatibility
EMC standards
Approvals

230 V/ 400 V ±15V
1.3 A/ 0.7 A
50/ 60 Hz
0.3A / 0.16A
2.0At / 1.25At

24 V SELV
8 A
7 A
192 W
< 5 %
15 At flat plug-in fuse
varistor

to VBG4
4 kV
B
IP 20
1

-20 °C...+55 °C
-20 °C...+80 °C
90 %
7A @ 55 °C; 8A @ 40 °C /7A @ 40 °C
green LED
4.3 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
Direct mounting
EN 61000-6 /-2, -3
CE:cURus;UL/ULIST;

Screw connection
2.5 / 0.13 / 2.5
2.5 / 0.5 / 4
105 x 105 x 145

230 V/ 400 V ±15V
1.8 A/ 1 A
50/ 60 Hz
0.5A / 0.28A
3.15At / 1.6At

24 V SELV
11 A
10 A
264 W
< 5 %
Thermal switch
varistor

to VBG4
4 kV
B
IP 20
1

-20 °C...+55 °C
-20 °C...+80 °C
93 %
10A @ 55 °C; 11A @ 40 °C /10A @ 40 °C
green LED
6.1 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
Direct mounting
EN 61000-6 /-2, -3
CE:cURus;UL/ULIST;

Screw connection
2.5 / 0.13 / 2.5
2.5 / 0.5 / 4
113 x 120 x 165

230 V/ 400 V ±15V
2.5 A/ 1.3 A
50/ 60 Hz
0.54A / 0.31A
4.0At / 2.0At

24 V SELV
18 A
15 A
432 W
< 5 %
Thermal switch
varistor

to VBG4
4 kV
B
IP 20
1

-20 °C...+55 °C
-20 °C...+80 °C
95 %
15A @ 55 °C; 18A @ 40 °C /15A @ 40 °C
green LED
9.1 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
Direct mounting
EN 61000-6 /-2, -3
CE:cURus;UL/ULIST;

Screw connection
2.5 / 0.13 / 2.5
2.5 / 0.5 / 4
135 x 135 x 185

Clamping range In. (rating-/min./max) mm²
Clamping range Out. (rating-/ min./max)mm²
Length x width x height mm

Note

Ordering data

Type	(Qty.=1)	Order No.
CP NT 192W 24V 8A		8575300000

Type	(Qty.=1)	Order No.
CP NT 264W 24V 11A		8575310000

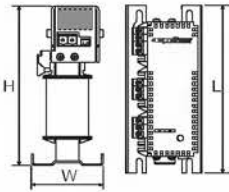
Type	(Qty.=1)	Order No.
CP NT 432W 24V 18A		8575320000

Note

Accessories

Note

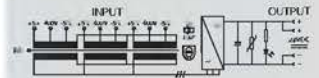
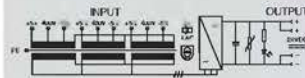
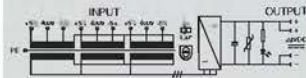
compactPower 3-phase



CP NT3 250

CP NT3 400

CP NT3 500



E

Technical data

Input

Input voltage
Input current
Input frequency
No-load input current
Input fuse

3 x 400 V ±5 %
0.5 A
50/ 60 Hz
0.1A
3 No. thermostatic switches in primary winding

3 x 400 V ±5 %
0.75 A
50/ 60 Hz
0.11 A
3 No. thermostatic switches in primary winding

3 x 400 V ±5 %
0.9 A
50/ 60 Hz
0.13 A
3 No. thermostatic switches in primary winding

External back-up fuse

3 x 1.0AT

3 x 1.2 AT

3 x 1.6 AT

Output

Output voltage
Output current at 40°C/60°C
max. output power
max. residual ripple
Fuse, max.
Protective circuit

24 V SELV
11 A/10 A
250 W
< 2 %
External 10 AT varistor

24 V SELV
18 A/16 A
400 W
< 2 %
External 16/18 AT varistor

24 V SELV
22 A/20 A
500 W
< 2 %
External 20/22 AT varistor

Insulation coordination

Electric shock protection
Insulation strength
Insulation class
Ingress protection class
pollution severity

to VBG4
4 kV
B
IP 20
I

to VBG4
4 kV
B
IP 20
I

to VBG4
4 kV
B
IP 20
I

General data

Operating temperature
Storage temperature
Degree of efficiency at max. load
Mounting position horizontal/vertical
Fan signal
Status indication
Weight
Standards
EMC standards
DIN Rail compatibility

-20 °C...+60 °C
-20 °C...+80 °C
76 %
11A @ 40 °C /10A @ 60 °C
no integral fan
green LED
4.7 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
EN 61000-6 /-2, -3
Direct mounting

-20 °C...+60 °C
-20 °C...+80 °C
77 %
18A @ 40 °C /16A @ 60 °C
no integral fan
green LED
6.9 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
EN 61000-6 /-2, -3
Direct mounting

-20 °C...+60 °C
-20 °C...+80 °C
78 %
22A @ 40 °C /20A @ 60 °C
no integral fan
green LED
10 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
EN 61000-6 /-2, -3
Direct mounting

Clamping range In. (rating-/min./max) mm²
Clamping range Out. (rating-/ min./max)mm²
Length x width x height mm

Screw connection
2.5 / 0.5 / 2.5
6 / 0.5 / 6
185 x 84 x 192

Screw connection
2.5 / 0.5 / 2.5
6 / 0.5 / 6
220 x 88 x 213

Screw connection
2.5 / 0.5 / 2.5
6 / 0.5 / 6
220 x 108 x 215

Note

Condensation not allowed.

Condensation not allowed.

Condensation not allowed.

Ordering data

Type	(Qty.=1)	Order No.
CP NT3 250W 24V 10A		8628620000

Type	(Qty.=1)	Order No.
CP NT3 400W 24V 15A		8628630000

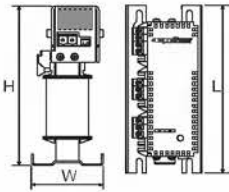
Type	(Qty.=1)	Order No.
CP NT3 500W 24V 20A		8628650000

Note

Accessories

Note

compactPower 3-phase



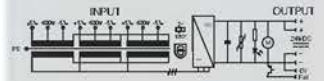
CP NT3 600



CP NT3 750



CP NT3 1000



Technical data

Input

Input voltage
Input current
Input frequency
No-load input current
Input fuse

External back-up fuse

Output

Output voltage
Output current at 40°C/60°C
max. output power
max. residual ripple
Fuse, max.
Protective circuit

Insulation coordination

Electric shock protection
Insulation strength
Insulation class
Ingress protection class
pollution severity

General data

Operating temperature
Storage temperature
Degree of efficiency at max. load
Mounting position horizontal/vertical
Fan signal
Status indication
Weight
Standards
EMC standards
DIN Rail compatibility

Clamping range In. (rating-/min./max) mm²
Clamping range Out. (rating-/ min./max)mm²
Length x width x height mm

Note

Ordering data

Note

Accessories

Note

3 x 400 V ±5 %
1.2 A
50/ 60 Hz
0.15 A
3 No. thermostatic switches in primary winding
3 x 2 AT

24 V SELV
26 A/25 A
600 W
< 2 %
External 25/26 AT varistor

to VBG4
4 kV
B
IP 20
I

-20 °C...+60 °C
-20 °C...+80 °C
78 %
26A @ 40 °C /25A @ 60 °C
Open collector <30 V/ <5 mA during fault
green LED
11 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
EN 61000-6 /-2, -3
Direct mounting

Screw connection
2.5 / 0.5 / 2.5
6 / 0.5 / 6
230 x 108 x 212
Condensation not allowed

3 x 400 V ±5 %
1.4 A
50/ 60 Hz
0.16 A
3 No. thermostatic switches in primary winding
3 x 2.5 AT

24 V SELV
32 A/30 A
750 W
< 2 %
External 30/32 AT varistor

to VBG4
4 kV
B
IP 20
I

-20 °C...+60 °C
-20 °C...+80 °C
77 %
32A @ 40 °C /30A @ 60 °C
Open collector <30 V/ <5 mA during fault
green LED
14 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
EN 61000-6 /-2, -3
Direct mounting

Screw connection
2.5 / 0.5 / 2.5
6 / 0.5 / 6
270 x 121 x 255
Condensation not allowed

3 x 400 V ±5 %
1.8 A
50/ 60 Hz
0.14 A
3 No. thermostatic switches in primary winding
3 x 3.15 AT

24 V SELV
42 A/40 A
1000 W
< 2 %
External 40/42 AT varistor

to VBG4
4 kV
B
IP 20
I

-20 °C...+60 °C
-20 °C...+80 °C
77 %
42A @ 40 °C /40A @ 60 °C
Open collector <30 V/ <5 mA during fault
green LED
18 kg
EN 60950, EN 61558-2-4, -6, 72/23/EWG
EN 61000-6 /-2, -3
Direct mounting

Screw connection
2.5 / 0.5 / 2.5
10 / 0.5 / 10
260 x 122 x 275
Condensation not allowed

Type	(Qty.=1)	Order No.
CP NT3 600W 24V 25A		8628660000

Type	(Qty.=1)	Order No.
CP NT3 750W 24V 30A		8628670000

Type	(Qty.=1)	Order No.
CP NT3 1000W 24V 40A		8628680000

UPS control unit

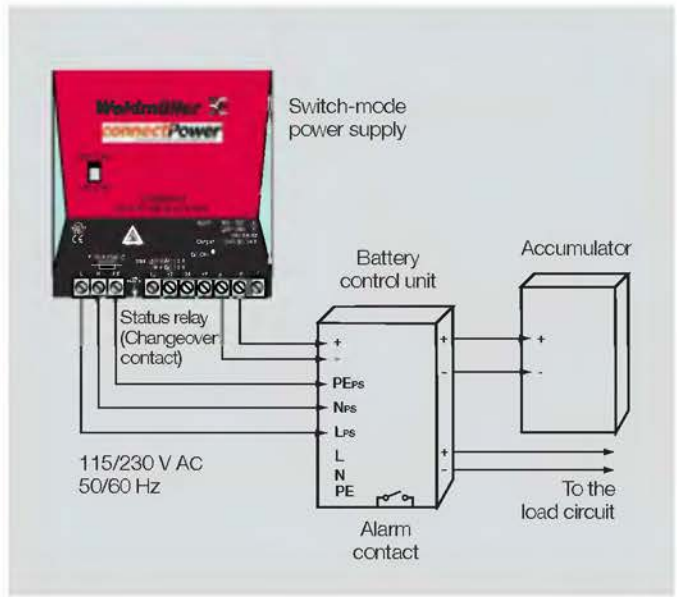


When the power supply fails, UPS control units take over the 12/24 V DC power supply to the installation within seconds, and guarantee plant availability for a defined length of time.

Professional signalling guarantees that all relevant signal statuses can be evaluated on the spot. Critical statuses can also be immediately redirected to a higher-level controller.

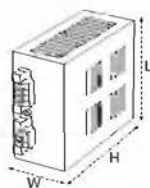
The battery module undertakes complete battery management of the connected lead-acid batteries. Constant charging and discharging plus electronic overcurrent protection guarantee an extremely long operational lifetime for the batteries.

Switch-mode power supply, battery control unit and battery providing an uninterrupted power supply.



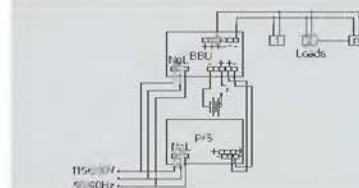
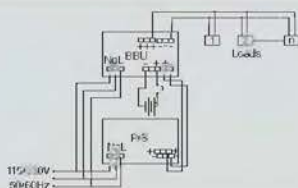
E

connectPower



CP-BBU 115-230 V AC / 12 V DC

CP-BBU 115-230 V AC / 24 V DC



Technical data

Input	
Input voltage	85...265 V AC; 120...300 V DC; typ.115-230 V AC \pm 10%
Input current	0.8 A @ 115 V AC; 0.5 A @ 230 V AC
Input frequency	50/ 60 Hz
Input fuse	2 A slow-blow fuse (internal)
Making current limit	Thermistor
Oversvoltage protection	Varistor
Output	
Output voltage	12 V DC
Output current	max. 15 A / max 9.2 A for power supply
Mains failure bridge-over time	
Battery charging current	2.00 A
Battery voltage	13.65 V
Control at input voltage	0.2 %
General data	
Operating temperature	-20 °C...+50 °C
Storage temperature	-20 °C...+85 °C
Status indication	LED green (Full Charge): Battery voltage > 14.75 Vdc LED yellow (Battery Low): Battery voltage < 11 Vdc LED yellow (Chargin): BBU charges Battery LED red (Fault): no AC input voltage LED red (Battery Reverse): Battery polarizing
Standards	EN 50178, EN 60950, IEC950
EMC standards	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Approvals	CSA;ULUR;CE;
Dimensions	
Clamping range (rating- / min. / max.)	mm ² 4.0 / 0.1 / 4
Length x width x height	mm 161 x 72.5 x 127.5
Note	

Screw connection		
4.0 / 0.1 / 4		
161 x 72.5 x 127.5		
Note		

Screw connection		
4.0 / 0.1 / 4		
161 x 72.5 x 127.5		
Note		

Ordering data

Connection system	
	Screw connection
Note	
Accessories	
Note	

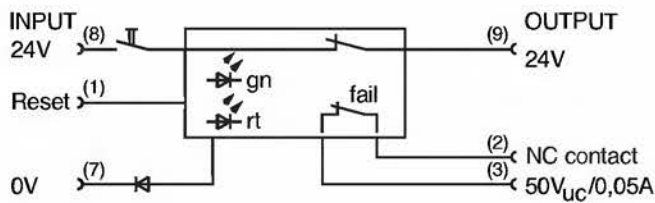
Type	Qty.	Order No.
CP-BBU 115-230VAC / 12VDC	1	9916280012
Note		
Bracket for wall mounting: 7920960009		

Type	Qty.	Order No.
CP-BBU 115-230VAC / 24VDC	1	9916280024
Note		
Bracket for wall mounting: 7920960009		

WAVEGUARD electronic fusing

Owing to their technical characteristics, switch-mode power units cannot supply a dynamic output current, or at best only a very limited one. For protection in the case of an overload, the device switches to a current limit and reduces the voltage. As this means that sufficient power is no longer available, circuit-breakers and cartridge fuses do not operate reliably. Selective electronic fusing eliminates detrimental cross-coupling between parallel current paths, protects and switches off only the defective circuits. That results in high system availability and minimises the troubleshooting workload in the ever more complex systems.

E



Additional reset input

The reset input can be switched with a voltage pulse for remote resetting of the system, and the load circuit is closed again with the trailing pulse edge. A cyclic automatic reset is not permissible and is also inadvisable for safety reasons.

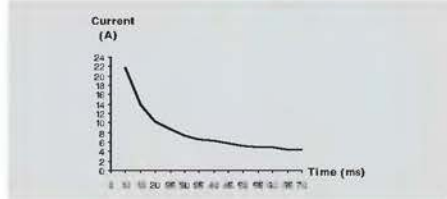
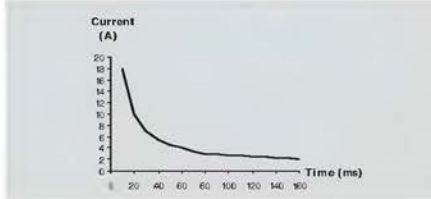
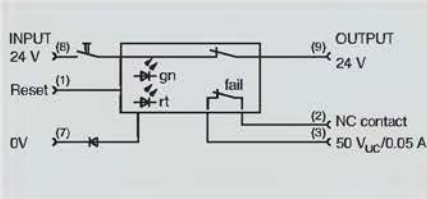
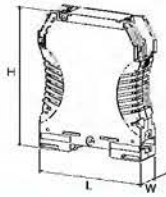
Visual signalling and floating signal contact

It is necessary to signal one malfunction: the switching status of the fuse is shown by the integral LED and the signal contact (NCC). This speeds up troubleshooting and therefore reduces maintenance costs.

WAVEGUARD

24 V DC 1.6 A

24 V DC 3.15 A



Technical data

Input

Rated voltage
Rated current
Reset

Output

Status relay / Change-over contact
Signalling delay

General data

Operating temperature
Storage temperature
Status indication
Standards
EMC standards
Sliding switch
Approvals

24 V DC
1.6 A
Pulse > 100 ms +24 V, falling edge ON

NCC, max. 50 V / 0.05 A; for low voltage only!
3.5 ms typically

0°C...+55°C (fitted)
-20°C...+85°C
LED green: OK, LED red: Tripped
EN 50178
EN 61000-6-1, 2, 4; EN 55011
OFF - wait 10 s - ON; on / off
CE / dJFus

24 V DC
3.15 A
Pulse > 100 ms +24 V, falling edge ON

NCC, max. 50 V / 0.05 A; for low voltage only!
3.5 ms typically

0°C...+55°C (fitted)
-20°C...+85°C
LED green: OK, LED red: Tripped
EN 50178
EN 61000-6-1, 2, 4; EN 55011
OFF - wait 10 s - ON; on / off
CE / dJFus

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection Tension clamp connection

2.5 / 0.5 / 2.5 1.5 / 0.5 / 2.5
92.4 x 22.5 x 72 92.4 x 22.5 x 72

Periodic auto-reset not permitted; Tu=23°C; single module

Screw connection Tension clamp connection

2.5 / 0.5 / 2.5 1.5 / 0.5 / 2.5
92.4 x 22.5 x 72 92.4 x 22.5 x 72

Periodic auto-reset not permitted; Tu=23°C; single module

Ordering data

Connection system

Screw connection
Tension clamp connection

Type	Qty.	Order No.
WGS 24Vdc 1.6A	1	8618890000
WGZ 24Vdc 1.6A	1	8621040000

Type	Qty.	Order No.
WGS 24Vdc 3.15A	1	8618910000
WGZ 24Vdc 3.15A	1	8621030000

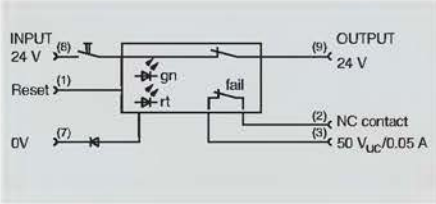
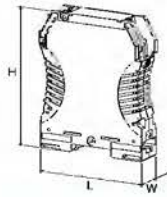
Note

Accessories

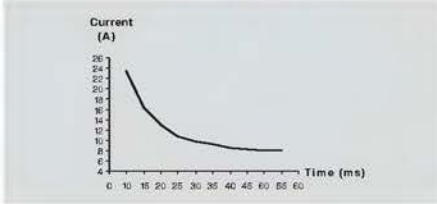
Note

Fuse for 24V DC electric circuits

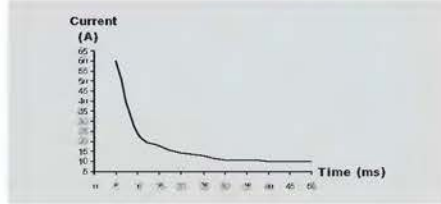
WAVEGUARD



24 V DC 6.3 A



24 V DC 8 A



E

Technical data

Input

Rated voltage
Rated current
Reset

Output

Status relay / Change-over contact
Signalling delay

General data

Operating temperature
Storage temperature
Status indication
Standards
EMC standards
Sliding switch
Approvals

24 V DC
6.3 A
Pulse > 100 ms +24 V, falling edge ON

NCC, max. 50 V / 0.05 A; for low voltage only!
3.5 ms typically

0°C...+55°C (fitted)
-20°C...+85°C
LED green: OK, LED red: Tripped
EN 50178
EN 61000-6-1, 2, 4; EN 55011
OFF - wait 10 s - ON; on / off
CE / dJFus

24 V DC
8 A
Pulse > 100 ms +24 V, falling edge ON

NCC, max. 50 V / 0.05 A; for low voltage only!
3.5 ms typically

0°C...+55°C (fitted)
-20°C...+85°C
LED green: OK, LED red: Tripped
EN 50178
EN 61000-6-1, 2, 4; EN 55011
OFF - wait 10 s - ON; on / off
CE / dJFus

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Screw connection	Tension clamp connection
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 22.5 x 72	92.4 x 22.5 x 72

Periodic auto-reset not permitted; Tu=23°C; single module

Screw connection	Tension clamp connection
2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 22.5 x 72	92.4 x 22.5 x 72

Periodic auto-reset not permitted; Tu=23°C; single module

Ordering data

Connection system

Screw connection
Tension clamp connection

Type	Qty.	Order No.
WGS 24Vdc 6.3A	1	8618930000
WGZ 24Vdc 6.3A	1	8621020000

Type	Qty.	Order No.
WGS 24Vdc 8.0A	1	8618940000
WGZ 24VDC 8.0A	1	8621010000

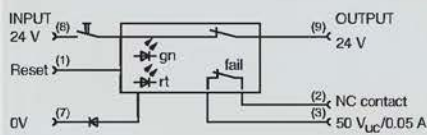
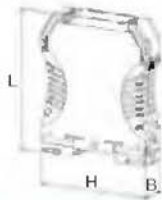
Note

Accessories

Note

WAVEGUARD

24 V DC 0.5...5 A



Technical data

Input

Rated voltage
Rated current
Reset

Output

Status relay / Change-over contact
Signalling delay

General data

Operating temperature
Storage temperature
Status indication
Standards
EMC standards
Sliding switch
Approvals

Rated voltage	24 V DC
Rated current	0.5...5 A adjustable
Reset	Pulse > 100 ms +24 V, falling edge ON
Status relay / Change-over contact	NCC, max. 50 V / 0.05 A; for low voltage only!
Signalling delay	3.5 ms typically
Operating temperature	0°C...+55°C (fitted)
Storage temperature	-20 °C...+85 °C
Status indication	LED green: OK, LED red: Tripped
Standards	EN 50178
EMC standards	EN 61000-6-1, 2, 4; EN 55011
Sliding switch	OFF - wait 10 s - ON; on / off
Approvals	n.a.

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Screw connection Tension clamp connection

2.5 / 0.5 / 2.5	1.5 / 0.5 / 2.5
92.4 x 22.5 x 72	92.4 x 22.5 x 72

Periodic auto-reset not permitted; T_{st}=23°C; single module

Ordering data

Connection system

Screw connection
Tension clamp connection

Type	Qty.	Order No.
WGS 24Vdc 0.5...5A	1	8710270000
WGZ 24Vdc 0.5...5A	1	8727630000

Note

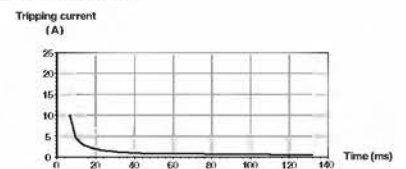
Accessories

Note

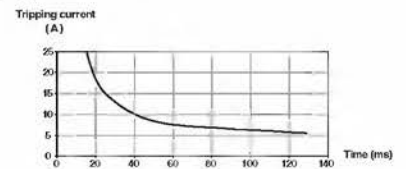
Derating curve

Dynamic tripping characteristic

Tripping current: 0.5 A



Tripping current: 5.0 A



Overvoltage protection

Overvoltage protection	Overvoltage protection for low-voltage supplies	F.2
	Overvoltage protection for instrumentation and control equipment	F.40
	Overvoltage protection for data interfaces	F.88

Class I overvoltage protection with sparkover gaps

Lightning conductors with sparkover gap for lightning protection or equipotential bonding providing Overvoltage Protection class I (B charge eliminators)

According to the requirements of class B (DIN VDE 0675 part 6, draft: Nov. 1989/A1: Mar 1996) and class I to IEC 61643-1 (Jan 2002), the lightning conductor at the transfer from interface 0 to 1 (to IEC 1312-1) is used as the lightning protection providing equipotential bonding. In combination with several lightning protectors, the overvoltage protection is used in the mains forms TN, TT and IT. When lightning strikes, the triggered air gap protector provides the necessary equipotential bonding between the building lightning protection and the earthing system of the power supply. The use of a sparkover gap satisfies the inspection requirements for class B overvoltage protection systems according to the VDEW (Association of German Power Stations) directive (1st ed., 1998).



Electrical connection for building installation

The PU 1 TSG 35 kA class I lightning arrester is connected between the phase conductors (L1, L2, L3) and N/PE. A Weidmüller PU 1 TSG 50 kA is used to provide the N-PE sparkover gap. The lines for this should be kept as short as possible.

The triggered and non-blowout PU 1 TSG devices can be clipped to TS 35 rails in electrical cabinets or distribution boards. The maximum permissible operating voltage U_c is 260 V AC. Decoupling from downstream class II (C) arresters is unnecessary because triggered sparkover gaps with a low sparkover voltage are used. Please follow the installation instructions.

Electrical connection for industrial installations

The PU 1 TSG+ 50 kA/330 V or 440 V class I lightning arrester is connected between the phase conductors (L1, L2, L3) and N/PE. A Weidmüller PU 1 TSG 50 kA is used to provide the N-PE sparkover gap. The lines for this should be kept as short as possible.

The triggered and blowout PU 1 TSG+ 50 kA devices can be clipped to TS 35 rails in electrical cabinets or distribution boards. Owing to the emissions given off when the sparkover gap is tripped, a safety clearance of min. 100 mm must be maintained between this and any current-conducting components.

The maximum permissible operating voltage U_c is 330 or 440 V AC. Decoupling from downstream class II (C) arresters for 470 V is unnecessary because triggered sparkover gaps with a low sparkover voltage are used. Please follow the installation instructions.

Checking operation, maintenance and approvals

A visual check is necessary to ensure that PU 1 TSG and PU 1 TSG+ overvoltage protection components are operating correctly. Besides signalling a mains power failure, the LED illuminates above 120 V AC to indicate the failure of the firing electronics. It is advisable to check frequently during stormy weather.

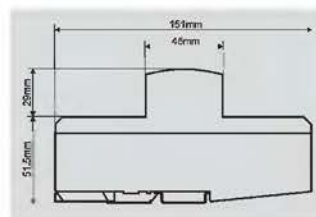
The use of triggered sparkover gaps achieves a very low protection level of < 1.5 kV with high discharge currents. Depending on the cross-section of the line, the PU 1 TSG must be protected with a fuse of max. 125 A gL, the PU 1 TSG+ max. 250 A gL.

The connection is designed for the following cross-sections:

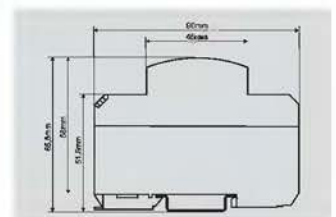
- solid wire: 10 ... 35 mm²
- stranded wire: 10 ... 25 mm²

The operating temperature range is -40 °C ... +85 °C.

The PU 1 TSG lightning arresters have UL and KEMA approval and are hence suitable for use worldwide.

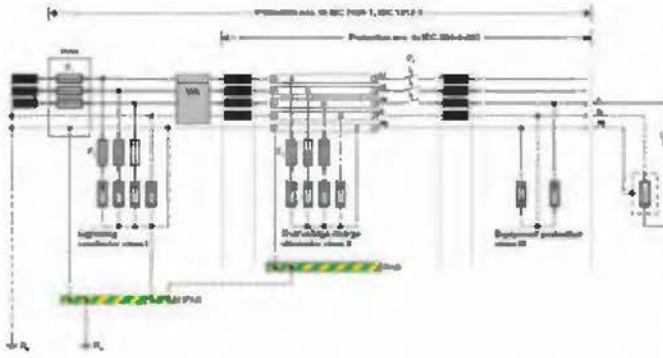


Dimensions
PU 1 TSG+
Overall width 36 mm

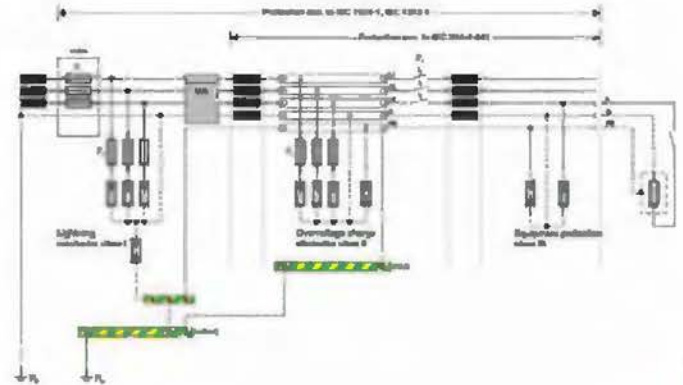


Dimensions
PU 1 TSG
Overall width 18 mm

Protection in the TN-S-system

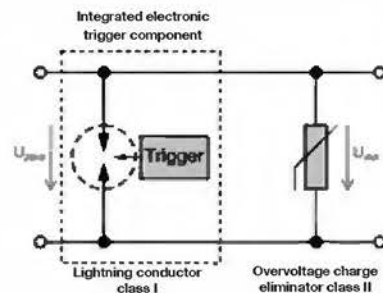
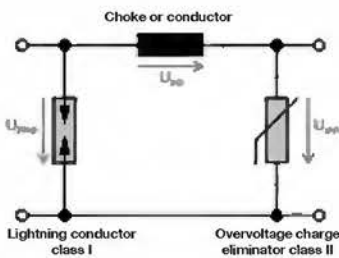


Protection in the TT-system



In contrast to conventional sparkover gaps, the Weidmüller PU 1 TSG+ and PU 1 TSG sparkover gaps operate with electronic triggering. This fires the sparkover gap at such an early point that the downstream class II (Pu x C) arresters are relieved. Decoupling from downstream class II (C) arresters is unnecessary because triggered sparkover gaps with a low sparkover voltage are used.

The PU 1 TSG+ and PU 1 TSG differ in terms of the follow current extinction. The PU 1 TSG+ distributes the arc drop voltage over several chambers. As soon as the total arc drop voltage exceeds the mains voltage flowing, the follow current is extinguished. In the PU 1 TSG the follow current extinction takes place at the next current zero of the mains voltage.



Overvoltage protection for low-voltage supplies

Class I with triggered sparkover gap

Class I lightning arrester

- encapsulated version
- no decoupling necessary thanks to trigger electronics
- suitable for networks with high short-circuit currents
- suitable for lightning protection classes I, II, III, IV

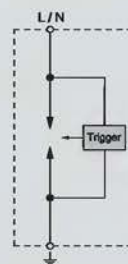
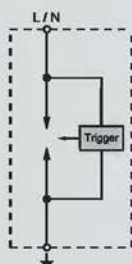
PU 1 TSG + 50 kA / 0.9 kV - 330 V

for use in industrial systems



PU 1 TSG + 50 kA / 1.5 kV - 440 V

for use in industrial systems



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Lightning test voltage U_{imp} (10/350 μ s)
 Specific energy, per path
 Short-circuit current extinction without back-up fuse
 Short-circuit strength with max. back-up fuse
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

330 V
 330 V
 Class I
 50 kA with 25 As charge
 625,00 kJ/ Ω
 50 kA / 50 Hz
 25 kA_{eff}
 ≤ 150 ns
 250 A gl
 900,00 V
 green LED
 black
 -40 °C/85 °C
 -40 °C/85 °C
 dJFus;File E198315;KEMA

440 V
 440 V
 Class I
 50 kA with 25 As charge
 625,00 kJ/ Ω
 50 kA / 50 Hz
 25 kA_{eff}
 ≤ 150 ns
 250 A gl
 1500,00 V
 green LED
 black
 -40 °C/85 °C
 -40 °C/85 °C
 dJFus;File E198315;KEMA

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

35 / 10 / 35
 150 x 35 x 80

35 / 10 / 35
 150 x 35 x 80

Note

Ordering data

Version

Type	Qty.	Order No.
PU1 TSG Plus 330 VAC 0,9kV	1	8561220000

Type	Qty.	Order No.
PU1 TSG Plus 440 VAC 1,5kV	1	8561250000

Note

Cross-connection CB 18-4 order No. 8619440000
 Cross-connection CB 18-6 order No. 8619450000

Cross-connection CB 18-4 order No. 8619440000
 Cross-connection CB 18-6 order No. 8619450000

Accessories

Note

Designation BZ18; PE PE PE PE PE; order No. 8619470000
 Designation BZ18; L1 L2 L3 N PE; order No. 8619460000

Designation BZ18; PE PE PE PE PE; order No. 8619470000
 Designation BZ18; L1 L2 L3 N PE; order No. 8619460000

Class I with triggered sparkover gap

Class I lightning arrester

- encapsulated version
- no decoupling necessary thanks to trigger electronics
- suitable for lightning protection classes I, II, III, IV

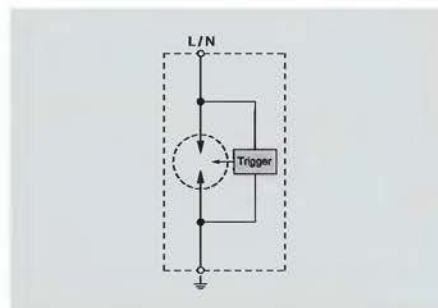
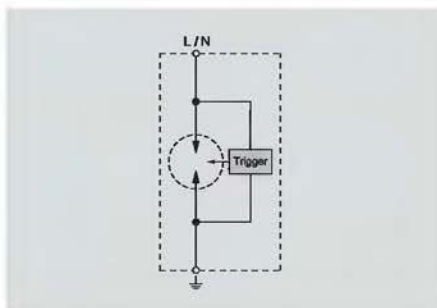
PU 1 TSG 35 kA / 0.9 kV - 260 V

for use in building systems (L-N/PE)



PU 1 TSG 50 kA / 1.5 kV - 260 V

for use in building systems (N-PE)



Technical data

Technical data
Rated voltage (AC)
max. continuous voltage, U _c
Requirements class to IEC 61643-1
Lightning test voltage I _{imp} (10/350 μs)
Specific energy, per path
Short-circuit current extinction without back-up fuse
Short-circuit strength with max. back-up fuse
Response time
Fuse, max.
Protection level Up (typical)
Optical function indicator
Colour
Operating temperature, min./max.
Storage temperature, min./max.
Approvals

230 V
260 V
Class I
35 kA with 17.5As charge
305.00 kJ/Ω
3 kA / 50 Hz
25 kA _{Aref}
≤ 1 μs
125 A gl
900.00 V
green LED
grey
-40 °C/85 °C
-40 °C/85 °C
dJfus:File E198315;KEMA

230 V
260 V
Class I
50 kA with 25 As charge
625.00 kJ/Ω
500 A / 50 Hz
25 kA _{Aref}
≤ 1 μs
125 A gl
1500.00 V
no
grey
-40 °C/85 °C
-40 °C/85 °C
dJfus:File E198315;KEMA

Dimensions

Clamping range (rating- / min. / max.)	mm ²	35 / 10 / 35
Length x width x height	mm	91 x 18 x 63

35 / 10 / 35
91 x 18 x 63

35 / 10 / 35
91 x 18 x 63

Note

Ordering data

Version

Type	Qty.	Order No.
PU 1 TSG 35kA / 0,9kV	1	8561260000

Type	Qty.	Order No.
PU 1 TSG 50kA / 1,5kV	1	8561230000

Note

Cross-connection DB 18-4 order No. 8619440000
 Cross-connection DB 18-6 order No. 8619450000

Cross-connection DB 18-4 order No. 8619440000
 Cross-connection DB 18-6 order No. 8619450000

Accessories

Note
 Designation BZ18, PE PE PE PE PE, order No. 8619470000
 Designation BZ18, L1 L2 L3 N PE, order No. 8619460000

Note
 Designation BZ18, PE PE PE PE PE, order No. 8619470000
 Designation BZ18, L1 L2 L3 N PE, order No. 8619460000

Overvoltage protection for low-voltage supplies

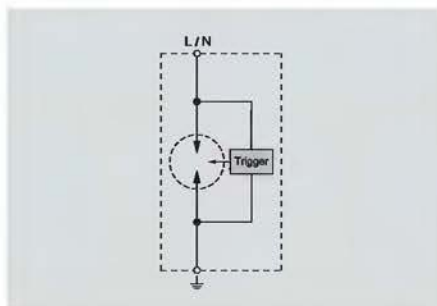
Class I with triggered sparkover gap

Class I lightning arrester

- encapsulated version
- no decoupling necessary thanks to trigger electronics
- suitable as N-PE arrester
- suitable for lightning protection classes I, II, III, IV

PU 1 TSG + 100 kA / 1.5 kV - 260 V

for use as N-PE arrester



F

Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Lightning test voltage U_{imp} (10/350 μ s)
 Specific energy, per path
 Short-circuit current extinction without back-up fuse
 Short-circuit strength with max. back-up fuse
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 260 V
 Class I
 100 kA with 50 As charge
 2500.00 kJ/ Ω
 100 A 260 V/50 Hz

 $\leq 1 \mu$ s
 125 A gI
 1500.00 V
 no
 grey
 -40 °C/85 °C
 -40 °C/85 °C
 dJFus;File E198315;KEMA

Dimensions

Clamping range (rating- / min. / max.) mm² 50 / 6 / 50
 Length x width x height mm 90 x 36 x 63

Note

Ordering data

Version

Type	Qty.	Order No.
PU 1 TSG 100kA/1,5 kV	1	8762020000

Note

Cross-connection 5B 18-4 order No. 8619440000
 Cross-connection 5B 18-6 order No. 8619450000

Accessories

Note

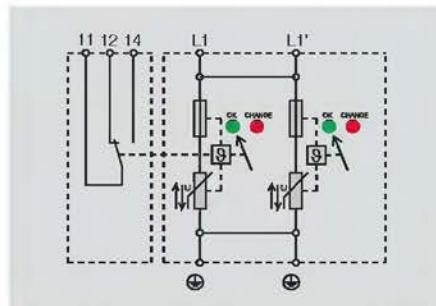
Designation BZ18, PE PE PE PE PE, order No. 8619470000
 Designation BZ18, L1 L2 L3 N PE, order No. 8619460000

Class I + II with lightning arrester

- Plug-in class I + II arrester for lightning protection equipotential bonding
- suitable for lightning protection classes II, III and IV
- High 16 kA (10/350 μ s) discharge current complying with VDE 0100-534
- Low residual voltage of < 1.3 kV, so can also be used as class II overvoltage protection
- 2 plug-in high-power varistors with redundancy function
- Non-blowout arrester
- Uncoupling from downstream class II and III arresters unnecessary

PU BC/BCR 16 kA / 280 V

Can be used in all systems



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Lightning test voltage U_{imp} (10/350 μ s)
 Specific energy, per path
 Short-circuit current extinction without back-up fuse
 Short-circuit strength with max. back-up fuse
 Response time
 Fuse, max.
 Protection level U_p (typical)
 Optical function indicator
 Signalling contact
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 280 V
 I+II (combination arrester)
 16 kA
 64.00 kJ/ Ω
 25 kA_{eff}
 ≤ 25 ns
 160 A gI
 1300.00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU BCR
 orange
 -40 °C/60 °C
 -40 °C/80 °C
 CE; ÖVE

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 36 x 61	90 x 54 x 61

Note

Ordering data

Version	
	without telecomm. contact
	with telecomm. contact

Type	Qty.	Order No.
PU BC 16kA/280V	1	8805440000
PU BCR 16kA/280V	1	8805450000

Note

Accessories

Note

Plug-in type arrester PU BC 280 V 8805440000

Class I with high-power varistors

Lightning arresters with varistors for lightning protection equipotential bonding

Class I overvoltage protection (B arresters)

Weidmüller overvoltage protection type PU B is designed for lightning protection and provides equipotential bonding to DIN VDE 0185 part 1 (Nov 1982). The PU B is a class I lightning arrester (B arrester) to DIN VDE 0675 part 6 (Nov 1989), IEC 61643-1 (Feb 1998), ENV 61024-1 (Jan 1995) and IEC 1312-1 (Feb 1995).

In the event of a lightning strike, the integral plug-in high-power varistors create the necessary equipotential bonding between the building's lightning protection system and the earthing system of the power supply.

Electrical connection

The PU B class I lightning arresters are connected between the phase conductors (L1, L2, L3), or the neutral conductor, the earth of the consumer installation and, in addition, the earthing bar of the distribution board. The lines for this should be kept as short as possible.

The PU B is clipped to a TS 35 rail in the control cabinet or distribution board. The maximum permissible operating voltage U_c is 275 Vac. No inductances are required for decoupling from downstream class II (C) arresters.

Please follow the installation instructions.



Checking operation, maintenance and approvals

A visual check is necessary (more frequently during storms) to ensure that the PU B overvoltage protection components are operating correctly. This visual check is easy because the varistor is fitted with a thermal disconnecter. If this has been tripped and protection is no longer provided, the flag in the status window changes from green to red. A tripped arrester is easily replaced by a qualified technician without having to disconnect any wiring.

The top section of the varistor is coded according to voltage and – to distinguish it from class II overvoltage arresters (C arresters) – integrated in a black plastic housing (PA 6.6). Therefore, it is not possible to plug in a different, i.e. wrong, replacement varistor.

These plug-in high-power varistors achieve a very low protection level of < 2 kV with high discharge currents. The arrester is to be fused (max. 160 A gL) to suit the cross-section of the line. The use of varistors means that overvoltages do not give rise to any emissions within the installation. The connection is to be designed to IEC 947-7-1 for the following cross-sections:

- solid wire: 6 ... 10 mm²
- stranded wire: 16 ... 25 mm²
- flexible wire 10 ... 25 mm²

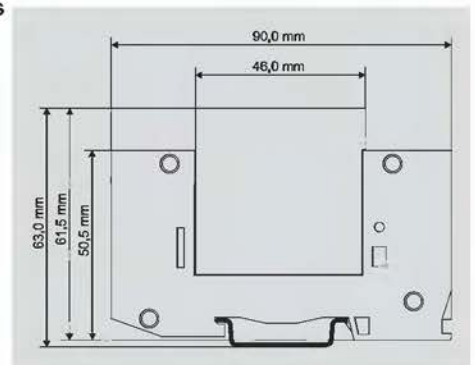
The operating temperature range is –40 °C ... +60 °C.

The PU B is an arrester that can be used both as a class I and also a class II arrester.

Weidmüller PU B lightning arresters have UL approval and are hence suitable for use worldwide.

PU-B dimensions

Width	
PU3B	54 mm
PU3BR	72 mm
PU4B	72 mm
PU4BR	90 mm



Class I with high-power varistors

- Class I lightning arrester with high-power varistors, also suitable as class II arrester
- plug-in version with visual function indicator
- coded voltage level, diverse voltages
- high energy absorption, 7 kA 10/350 µs per disc
- low residual voltage
- short time to sparkover, no follow current
- thermal overcurrent protection for varistors
- no decoupling inductance required between PU B and PU C

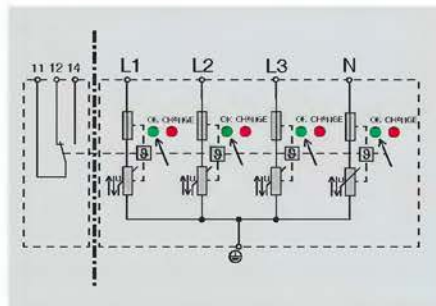
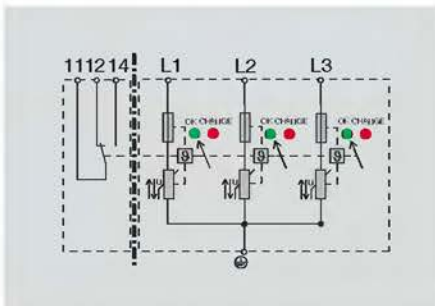
PU 3 B/BR 230 / 400 V AC

Use in building systems



PU 4 B/BR 230 / 400 V AC

Use in building systems



Technical data

Technical data

- Rated voltage (AC)
- max. continuous voltage, U_c
- Requirements class to IEC 61643-1
- Lightning test voltage I_{imp} (10/350 µs)
- Specific energy, per path
- Discharge current, max. (8/20 µs)
- Response time
- Fuse, max.
- Protection level Up (typical)
- Optical function indicator
- Signalling contact
- Design
- Colour
- Operating temperature, min./max.
- Storage temperature, min./max.
- Approvals

230 V
275 V
Class I
20 kA
100.00 kJ/Ω
100 kA
≤ 25 ns
160 A gI
2000.00 V
green = OK; red = arrester faulty, replace
250 V 1A 1CO at PU 3 BR
Installation housing
black
-40 °C/60 °C
-40 °C/80 °C
dURus;CE

230 V
275 V
Class I
25 kA
100.00 kJ/Ω
100 kA
≤ 25 ns
160 A gI
2000.00 V
green = OK; red = arrester faulty, replace
250 V 1A 1CO at PU 4 BR
Installation housing
black
-40 °C/60 °C
-40 °C/80 °C
dURus;CE

Dimensions

Clamping range (rating- / min. / max.)	mm ²	10 / 6 / 50
Length x width x height	mm	90 x 54 x 61

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 54 x 61	90 x 72 x 61

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 72 x 61	90 x 90 x 61

Note

Ordering data

Version	without telecomm. contact	with telecomm. contact
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Type	Qty.	Order No.
PU 3 B 275 V AC	1	8381890000
PU 3 BR 275 V AC	1	8381900000

Type	Qty.	Order No.
PU 4 B 275 V AC	1	8147020000
PU 4 BR 275 V AC	1	8291640000

Note

Accessories

Note	Plug-in spare arrester PU 3 B 275 V, 8381890000
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Plug-in spare arrester PU 3 BR 275 V, 8381900000
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Plug-in spare arrester PU 4 B 275 V, 8147020000

Combination arrester

Combination arrester

Combined lightning and overvoltage protection for low-voltage consumer installations and electronics

The PU I+II COMBI combined overvoltage protection incorporates triggered PU 1 TSG class I sparkover gaps, class II varistor arresters PU x C and cross-connections. This setup protects low-voltage consumer installations and electronic devices against overvoltages, both those caused by atmospheric discharges (lightning) and those caused by switching operations (transients).

The PU COMBI complies with the requirements of IEC 61643-1 (Feb 1998). The PU R COMBI also has a remote signalling function achieved via a floating contact.

Electrical connection

The PU COMBI overvoltage protection device is connected with lines as short as possible between the phase conductors (L1, L2, L3), or the neutral conductor (N), and the earth of the consumer installation. Unprotected lines (e.g. to meters) and protected lines must not be routed together.

The PU COMBI can be supplied for a 4-conductor system with three phases plus PEN conductor, and also for a 5-conductor system with three phases plus N-PE arrester.

Checking operation, maintenance and approvals

A visual check is necessary to ensure that the PU COMBI overvoltage protection components are operating correctly. This visual check is easy because the arrester is fitted with a thermal disconnecter. If this has been tripped and protection is no longer provided, the flag in the status window changes from green to red. A tripped arrester is easily replaced by a qualified technician without having to disconnect any wiring. The top section of the varistor is coded according to voltage. Therefore, it is not possible to plug in a different, i.e. wrong, replacement varistor.

The cross-section of the earth line must be at least 10 mm² or half the cross-sectional area of the phase conductor. The fuse protection (max. 125 A gL) for the PU modules is chosen depending on the line cross-section and the type of wiring.

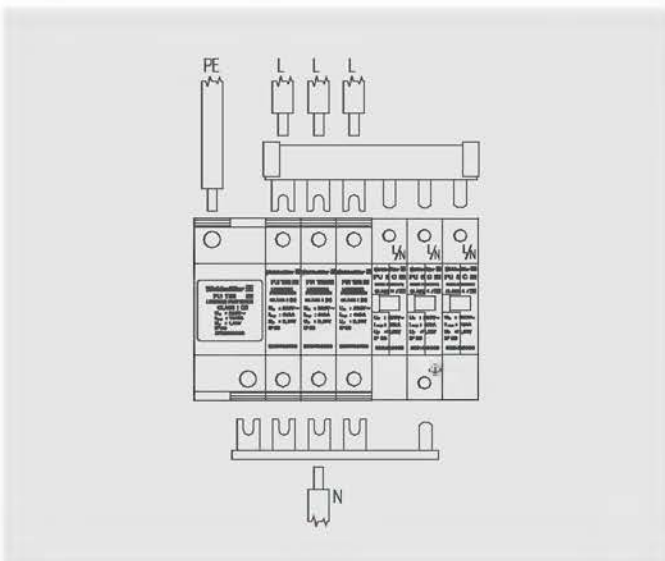
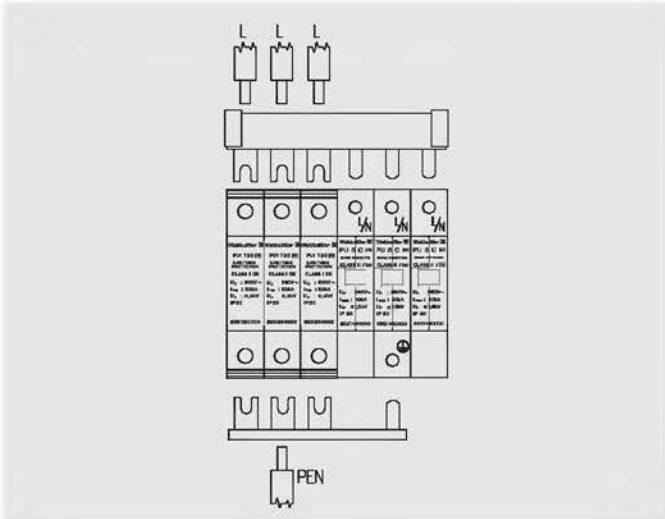
The connection is designed to IEC 947-7-1 for the following cross-sections:

solid wire:	10 ... 35 mm ²
stranded wire:	10 ... 25 mm ²
flexible:	10 ... 25 mm ²

The operating temperature range is -40 °C ... +60 °C.



Connection scheme for combination arrester



Dimensions

Type	length x width x height
PU Combi I+II 4-conductor system	90 x 65 x 110 mm
PU R Combi I+II 4-conductor system	90 x 65 x 126 mm
PU Combi I+II 5-conductor system	90 x 65 x 148 mm
PU R Combi I+II 5-conductor system	90 x 65 x 162 mm

Overvoltage protection for low-voltage supplies

Suitable for 4-wire systems

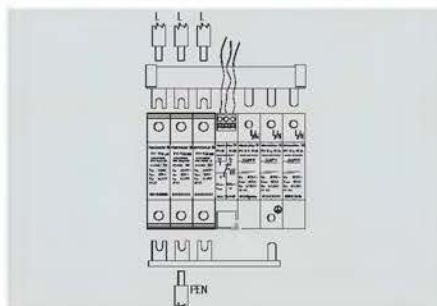
The overvoltage protection combination consists of the class I triggered sparkover gap PU 1 TSG for protecting the phase to N of an N-PE sparkover gap and the class II PU 3 C. The arresters are interconnected via 16 mm² cross connection system.

The connection to the power line is made at the PU 1 TSG.

- Suitable for lightning protection classes I, II, III, IV.

PU/R COMBI I + II 4 Wire

Use in building systems



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Lightning test voltage I_{imp} (10/350 μs)
 Specific energy, per path
 Short-circuit current extinction without back-up fuse
 Short-circuit strength with max. back-up fuse
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 280 V
 I+II (combination arrester)
 35 kA with 17.5 As charge
 64.00 kJ/Ω
 3 kA / 50 Hz
 25 kA_{eff}
 sym/ asym: ≤ 100 ns
 125 A gI
 900.00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU R COMBI
 grey
 -40 °C/60 °C
 -40 °C/80 °C
 n.a.

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

without telecomm. contact with telecomm. contact

35 / 6 / 10 35 / 6 / 10
 91 x 110 x 65 90 x 126 x 65

Note

Ordering data

Version
 without telecomm. contact
 with telecomm. contact

Type	Qty.	Order No.
PU COMBI I+II 4 Wire	1	8729960000
PU R COMBI I+II 4 Wire	1	8729970000

Note

Accessories

Note

Set PU3(F), PUTS3, jumpers

Suitable for 5-wire systems

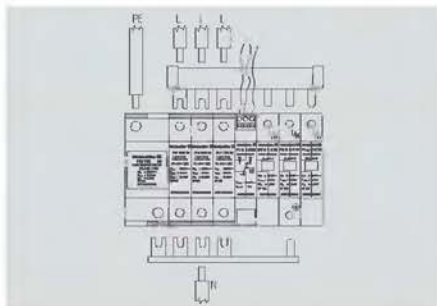
The overvoltage protection combination consists of the class I triggered sparkover gap PU 1 TSG for protecting the phase to N of an N-PE sparkover gap and the class II PU 3 C. The arresters are interconnected via 16 mm² cross connection system.

The connection to the power line is made at the PU 1 TSG.

- Suitable for lightning protection classes I, II, III, IV.

PU/R COMBI I + II 5 Wire

Use in building systems



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Lightning test voltage U_{imp} (10/350 μs)

Specific energy, per path
 Short-circuit current extinction without back-up fuse
 Short-circuit strength with max. back-up fuse
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 280 V
 I+II (combination arrester)
 35 kA with 17.5 As charge
 50 kA with 25 As charge
 64.00 kJ/Ω
 3 kA
 25 kA_{eff}
 sym/ asym: ≤ 100 ns
 125 A gI
 1500.00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU R COMBI
 grey
 -40 °C/60 °C
 -40 °C/80 °C
 n.a.

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

without telecomm. contact	with telecomm. contact
35 / 6 / 10	35 / 6 / 10
90 x 148 x 65	91 x 165 x 65

Note

Ordering data

Version
 without telecomm. contact
 with telecomm. contact

Type	Qty.	Order No.
PU COMBI I+II 5 Wire	1	8729950000
PU R COMBI I+II 5 Wire	1	8729930000

Note

Accessories

Note

Set PU3(F), PUTS4, jumpers



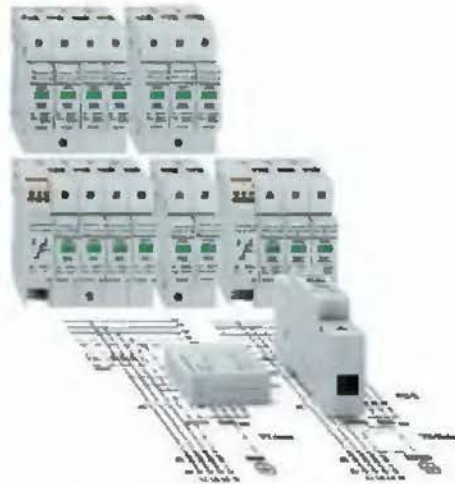
Class II with varistors

Overvoltage protection for low-voltage consumers and electronic components

Low-voltage protection class II (C arresters)

Weidmüller overvoltage protection type PU C protects low-voltage consumer installations and electronic devices against overvoltages, both those caused by atmospheric discharges (lightning) and those caused by switching operations (transients). The PU C complies with the requirements of DIN VDE 0675 part 6, class C (Nov 89), DIN VDE 0675 part 6, A2 (Oct 96), ÖVE SN 60 parts 1 and 4, and IEC 61643-1 (Feb 98).

F



Electrical connection

The PU COMBI overvoltage protection device is connected with lines as short as possible between the phase conductors (L1, L2, L3), or the neutral conductor (N), and the earth of the consumer installation. Unprotected lines (e.g. to meters) and protected lines must not be routed together. PU C arresters for the "3+1" circuit are also available.

PU C overvoltage protection is available as a compact module, 3- or 4-pole, with up to 100 kA (8/20 μ s), with the PE connections of the discs already interconnected. Versions can be supplied for the following rated voltages:

- 60 V AC
- 115/230 V AC
- 230/400 V AC
- 470/600 V AC
- for "3+1" circuits
- special types for IT systems

Checking operation, maintenance and approvals

A visual check is necessary to ensure that the PU COMBI overvoltage protection components are operating correctly. This visual check is easy because the arrester is fitted with a thermal disconnecter. If this has been tripped and protection is no longer provided, the flag in the status window changes from green to red. A tripped arrester is easily replaced by a qualified technician without having to disconnect any wiring.

The top section of the varistor is coded according to voltage and – to distinguish it from class I overvoltage arresters (B arresters) – integrated in a light grey plastic housing (PA 6.6). Therefore, it is not possible to plug in a different, i.e. wrong, replacement varistor.

The cross-section of the earth line must be at least 10 mm² or half the cross-sectional area of the phase conductor. The fuse protection (max. 125 A gL) for the PU modules is chosen depending on the line cross-section and the type of wiring. Weidmüller PU C arresters have ÖVE SN 60 and UL approval and are hence suitable for use worldwide.

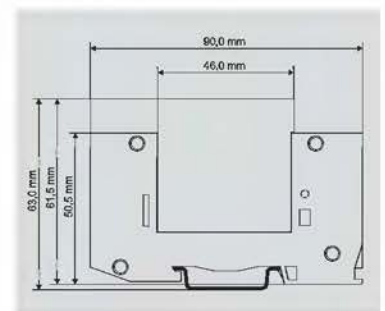
The connection is designed to IEC 947-7-1 for the following cross-sections:

- solid wire: 6 ... 10 mm²
- stranded wire: 16 ... 25 mm²
- flexible wire: 10 ... 25 mm²

The operating temperature range is –40 °C ... +60 °C.

Dimensions PU-C

Overall width	
PU1C	18 mm
PU2C	36 mm
PU3C	54 mm
PU3CR, PU4C	72 mm
PU4CR	90 mm



Monitoring unit



Class II with varistors

Class II overvoltage protection with U_c : 280 V

- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- installed in Insta distributor
- thermal and dynamic overcurrent protection
- coordination between class I with $U_p < 900$ V

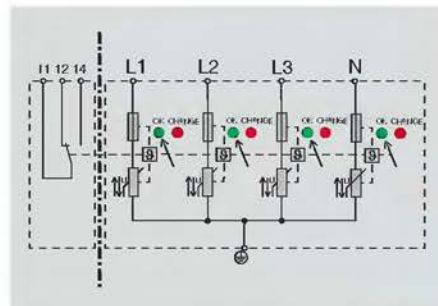
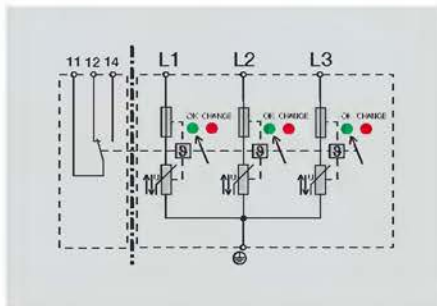
PU 3 C/CR 230 / 400 V AC

Use in TN-C systems



PU 4 C/CR 230 / 400 V AC

Use in TN-C-S systems



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Rated discharge current (8/20 μ s)
 Limiting discharge current (8/20 μ s)
 Discharge current, max. (8/20 μ s)
 Response time
 Fuse, max.
 Protection level U_p (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 280 V
 Class II
 20 kA
 40 kA
 100 kA
 ≤ 25 ns
 125 A gI
 1300.00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU 3 CR
 Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS;

230 V
 280 V
 Class II
 20 kA
 40 kA
 100 kA
 ≤ 25 ns
 125 A gI
 1300.00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU 4 CR
 Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS;

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 54 x 61	90 x 72 x 61

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 72 x 61	90 x 91 x 61

Note

Ordering data

Version	Type	Qty.	Order No.
without telecomm. contact	PU 3 C 275 V AC	1	8021490000
with telecomm. contact	PU 3 CR 275 V AC	1	8021510000

Type	Qty.	Order No.
PU 3 C 275 V AC	1	8021490000
PU 3 CR 275 V AC	1	8021510000

Type	Qty.	Order No.
PU 4 C 275 V AC	1	8021500000
PU 4 CR 275 V AC	1	8021520000

Note

Accessories

Note

Plug-in spare arrester PU 0-G 280 V 8539510000

Plug-in spare arrester PU 0-G 280 V 8539510000

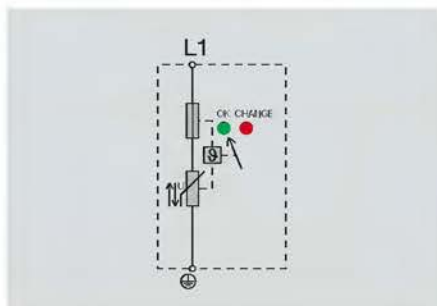
Overvoltage protection for low-voltage supplies

Class II with varistors

Class II overvoltage protection
with U_c : 280 V

- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- installed in Insta distributor
- thermal and dynamic overcurrent protection
- coordination between class I with $U_p < 900$ V

PU 1 C 230 V



F

Technical data

Technical data

Rated voltage (AC)
max. continuous voltage, U_c
Requirements class to IEC 61643-1
Rated discharge current (8/20 μ s)
Limiting discharge current (8/20 μ s)
Discharge current, max. (8/20 μ s)
Response time
Fuse, max.
Protection level U_p (typical)
Optical function indicator
Signalling contact
Design
Colour
Operating temperature, min./max.
Storage temperature, min./max.
Approvals

230 V
280 V
Class II
20 kA
40 kA
40 kA
 ≤ 25 ns
125 A gI
1300,00 V
green = OK; red = arrester faulty, replace

Installation housing
grey
-40 °C/70 °C
-40 °C/80 °C
dJFus;CE;ÖVE SN 60;SABS;

Dimensions

Clamping range (rating- / min. / max.) mm² 10 / 6 / 50
Length x width x height mm 90 x 18 x 61

Note

Ordering data

Version

Type	Qty.	Order No.
PU 1 C 275 VAC	1	8102610000

Note

Accessories

Note

Plug-in type arrester PU 0 G 280 V 8339510000

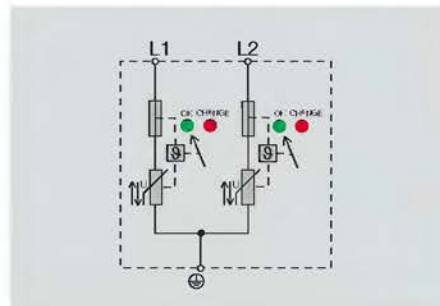
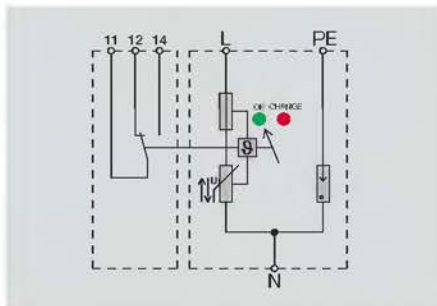
Class II with varistors

Class II overvoltage protection with U_c : 280 V

- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- installed in Insta distributor
- thermal and dynamic overcurrent protection
- coordination between class I with $U_p < 900$ V

PU 1 + 1 C/CR 230 V AC

PU 2 C/CR 230 / 400 V AC



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Rated discharge current (8/20 μ s)
 Limiting discharge current (8/20 μ s)
 Discharge current, max. (8/20 μ s)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 280 V
 Class II
 20 kA
 40 kA
 40
 ≤ 25 ns
 125 A gI
 1300,00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU 1+1 CR
 Installation housing
 grey/orange
 -40 °C/70 °C
 -40 °C/80 °C

230 V
 280 V
 Class II
 20 kA
 40 kA
 75 kA
 ≤ 25 ns
 125 A gI
 1300,00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU 2 CR
 Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dUFus;CE;ÖVE SN 60;SABS;

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

without telecomm. contact with telecomm. contact
 10 / 6 / 50 10 / 6 / 50
 90 x 36 x 61 90 x 54 x 61

without telecomm. contact with telecomm. contact
 10 / 6 / 50 10 / 6 / 50
 90 x 36 x 61 90 x 54 x 61

Note

Ordering data

Version
 without telecomm. contact
 with telecomm. contact

Type	Qty.	Order No.
PU 1+1 C	1	8730790000
PU 1+1 CR 230V	1	8781860000

Type	Qty.	Order No.
PU 2 C 275 VAC	1	8098170000
PU 2 CR 275 VAC	1	8425240000

Note

Accessories

Note

Plug-in spare arrester PU 0-G 280 V. 8539510000

Plug-in spare arrester PU 0-G 280 V. 8539510000

Overvoltage protection for low-voltage supplies

Class II with varistors

Class II overvoltage protection with U_c : 280 V

- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- installed in Insta distributor
- thermal and dynamic overcurrent protection
- coordination between class I with $U_p < 900$ V
- complete 3- or 4-pole modules for TN and TT systems with 100 kA 8/20 μ s discharge current

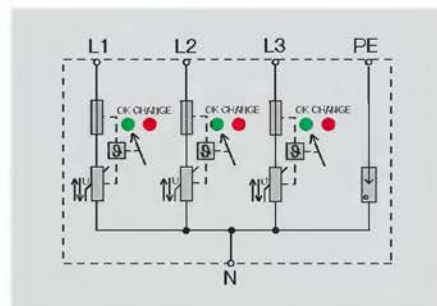
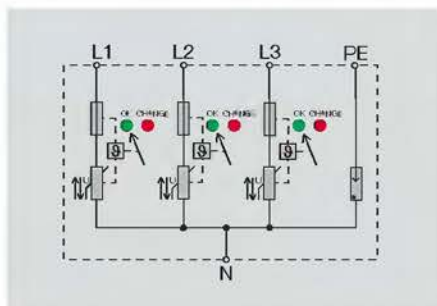
PU 3 + 1 C/CR 230 / 400 V AC

Use in TT/IT systems



PU 3 + 1 C/CR 385 V AC

Use in TT/IT systems



F

Technical data

Technical data

Rated voltage (AC)
max. continuous voltage, U_c
Requirements class to IEC 61643-1
Rated discharge current (8/20 μ s)
Limiting discharge current (8/20 μ s)
Discharge current, max. (8/20 μ s)
Response time
Fuse, max.
Protection level U_p (typical)
Optical function indicator
Signalling contact
Design
Colour
Operating temperature, min./max.
Storage temperature, min./max.
Approvals

230 V
280 V
Class II
20 kA
40 kA
100 kA
 $\leq 1 \mu$ s
125 A gI
1300,00 V
green = OK; red = arrester faulty, replace
250 V 1A 1CO at PU 3+1 CR
Installation housing
grey/orange
-40 °C/70 °C
-40 °C/80 °C
CE; CSA in preparation

230 V
385 V
Class II
20 kA
40 kA
100 kA
 $\leq 1 \mu$ s
125 A gI
1900,00 V
green = OK; red = arrester faulty, replace
250 V 1A 1CO at PU 3+1 CR
Installation housing
grey/orange
-40 °C/70 °C
-40 °C/80 °C
CE; CSA in preparation

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

without telecomm. contact	with telecomm. contact
16 / 6 / 50	16 / 6 / 50
91 x 72 x 61	91 x 72 x 61

without telecomm. contact	without telecomm. contact
10 / 6 / 50	10 / 6 / 50
91 x 72 x 61	91 x 72 x 61

Note

Ordering data

Version
without telecomm. contact
with telecomm. contact

Type	Qty.	Order No.
PU 3+1 C 275 V AC	1	8416370000
PU 3+1 CR 275 V AC	1	8576190000

Type	Qty.	Order No.
PU 3+1 C 385 V AC	1	8616990000
PU 3+1 CR 385 V AC	1	8616980000

Note

Accessories

Note

Plug-in spare arrester PU 0 C 230 V 8338510000
Plug-in spare arrester N-PE distance PU 0 C N-PE 8796160000

Plug-in spare arrester, 385V PU 0 C 8338510000
Plug-in spare arrester N-PE distance PU 0 C N-PE 8796160000

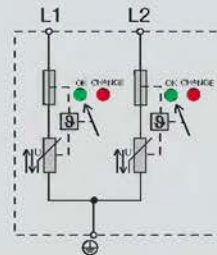
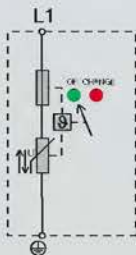
Class II with varistors

Class II overvoltage protection with Uc: 130 V

- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- thermal and dynamic overcurrent protection

PU 1 C 115 V

PU 2 C 115 V



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, Uc
 Requirements class to IEC 61643-1
 Rated discharge current (8/20 μs)
 Limiting discharge current (8/20 μs)
 Discharge current, max. (8/20 μs)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

115 V
 130 V
 Class II
 20 kA
 40 kA
 40 kA
 ≤ 25 ns
 125 A gI
 800.00 V
 green = OK; red = arrester faulty, replace

Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS

115 V
 130 V
 Class II
 20 kA
 40 kA
 75 kA
 ≤ 25 ns
 125 A gI
 800.00 V
 green = OK; red = arrester faulty, replace

Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

10 / 6 / 50
 90 x 18 x 61

10 / 6 / 50
 90 x 36 x 61

Note

Ordering data

Version

Type	Qty.	Order No.
PU 1 C 130 V AC	1	8215820000

Type	Qty.	Order No.
PU 2 C 130 V AC	1	8291650000

Note

Accessories

Note

Plug-in spare arrester PU 0 C 130 V 8432430000

Plug-in spare arrester PU 0 C 130 V 8432430000

Overvoltage protection for low-voltage supplies

Class II with varistors

Class II overvoltage protection with U_c : 130 V

- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- thermal and dynamic overcurrent protection
- complete 3- or 4-pole modules for TN and TT systems with 100 kA 8/20 μ s discharge current

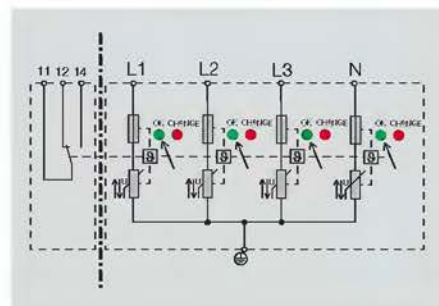
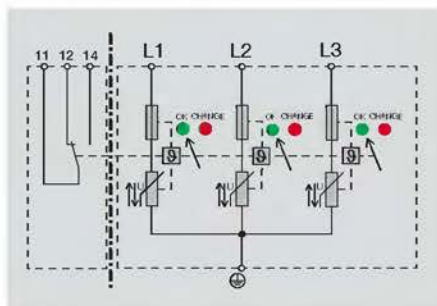
PU 3 C/CR 115 / 230 V AC

Use in TN-C systems



PU 4 C/CR 115 / 230 V AC

Use in TN-C-S systems



Technical data

Technical data

Rated voltage (AC)
max. continuous voltage, U_c
Requirements class to IEC 61643-1
Rated discharge current (8/20 μ s)
Limiting discharge current (8/20 μ s)
Discharge current, max. (8/20 μ s)
Response time
Fuse, max.
Protection level Up (typical)
Optical function indicator
Signalling contact
Design
Colour
Operating temperature, min./max.
Storage temperature, min./max.
Approvals

115 V
130 V
Class II
20 kA
40 kA
100 kA
 ≤ 25 ns
125 A gI
800,00 V
green = OK; red = arrester faulty, replace
250 V 1A 1CO at PU 3 CR
Installation housing
grey
-40 °C/70 °C
-40 °C/80 °C
dURus;CE;ÖVE SN 60;SABS;

115 V
130 V
Class II
20 kA
40 kA
100 kA
 ≤ 25 ns
125 A gI
800,00 V
green = OK; red = arrester faulty, replace
250 V 1A 1CO at PU 4 CR
Installation housing
grey
-40 °C/70 °C
-40 °C/80 °C
dURus;CE;ÖVE SN 60;SABS;

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 54 x 61	90 x 72 x 61

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 72 x 61	90 x 90 x 61

Note

Ordering data

Version	
without telecomm. contact	
with telecomm. contact	

Type	Qty.	Order No.
PU 3 C 130 VAC	1	8291660000
PU 3 CR 130 VAC	1	8291680000

Type	Qty.	Order No.
PU 4 C 130 VAC	1	8291670000
PU 4 CR 130 VAC	1	8291690000

Note

Accessories

Note

Plug-in spare arrester PU 0 C 130 V 8432430000

Plug-in spare arrester PU 0 C 130 V 8432430000

Class II with varistors

Class II overvoltage protection with U_c : 385 V

- suitable for IT networks
- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- installed in Insta distributor
- thermal and dynamic overcurrent protection
- complete 3- or 4-pole modules with 100 kA 8/20 μ s discharge current

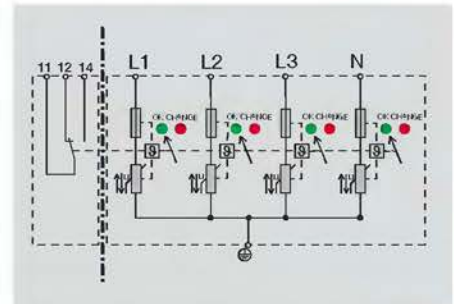
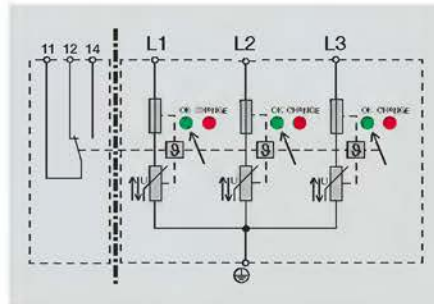
PU 3 C/CR 385 V AC

(to Austrian standard 8001 section 18)



PU 4 C/CR 385 V AC

(to Austrian standard 8001 section 18)



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Rated discharge current (8/20 μ s)
 Limiting discharge current (8/20 μ s)
 Discharge current, max. (8/20 μ s)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 385 V
 Class II
 20 kA
 40 kA
 100 kA
 ≤ 25 ns
 125 A gI
 1500,00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU 3 CR
 Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS;

230 V
 385 V
 Class II
 20 kA
 40 kA
 100 kA
 ≤ 25 ns
 125 A gI
 1500,00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU 4 CR
 Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS;

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 54 x 61	90 x 72 x 61

without telecomm. contact	with telecomm. contact
10 / 6 / 50	10 / 6 / 50
90 x 72 x 61	90 x 91 x 61

Note

Ordering data

Version	Type	Qty.	Order No.
without telecomm. contact	PU 3 C 385 V AC	1	8197930000
with telecomm. contact	PU 3 CR 385 V AC	1	8380730000

Type	Qty.	Order No.
PU 3 C 385 V AC	1	8197930000
PU 3 CR 385 V AC	1	8380730000

Type	Qty.	Order No.
PU 4 C 385 V AC	1	8601280000
PU 4 CR 385 V AC	1	8494040000

Note

Accessories

Note

Plug-in spare arrester PU 0-G 385 V 8328570000

Plug-in spare arrester PU 0-G 385 V 8328670000

Overvoltage protection for low-voltage supplies

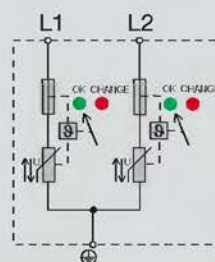
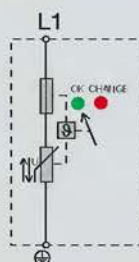
Class II with varistors

Class II overvoltage protection with U_c : 550 V

- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- installed in Insta distributor
- thermal and dynamic overcurrent protection
- coordination between class I with $U_p < 1.5$ kV

PU 1 C 470 V AC

PU 2 C 470 V AC



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Rated discharge current (8/20 μ s)
 Limiting discharge current (8/20 μ s)
 Discharge current, max. (8/20 μ s)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

470 V
 550 V
 Class II
 20 kA
 40 kA
 40 kA
 ≤ 25 ns
 125 A gI
 2200,00 V
 green = OK; red = arrester faulty, replace

Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS;

470 V
 550 V
 Class II
 20 kA
 40 kA
 75 kA
 ≤ 25 ns
 125 A gI
 2200,00 V
 green = OK; red = arrester faulty, replace

Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS;

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

10 / 6 / 50
 90 x 18 x 61

10 / 6 / 50
 90 x 36 x 61

Note

Ordering data

Version

Type	Qty.	Order No.
PU 1 C 550 V AC	1	8291700000

Type	Qty.	Order No.
PU 2 C 550 V AC	1	8291710000

Note

Accessories

Note

Plug-in spare arrester PU 0 C 550 V 845100000

Plug-in spare arrester PU 0 C 550 V 845100000

Class II with varistors

Class II overvoltage protection with U_c : 550 V

- plug-in varistor top section
- coded voltage level, diverse voltages
- high energy absorption
- short time to sparkover
- no follow current
- installed in Insta distributor
- thermal and dynamic overcurrent protection
- coordination between class I with $U_p < 1.5$ kV

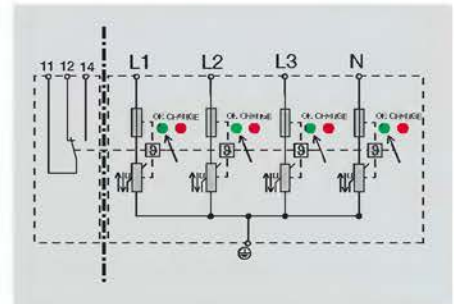
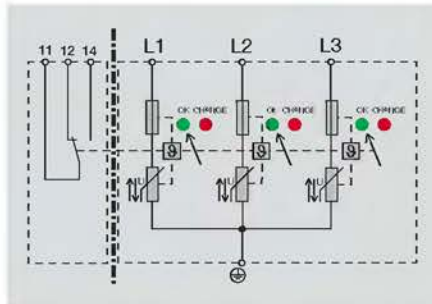
PU 3 C/CR 470 / 690 V AC

Use in TN-C systems



PU 4 C/CR 470 / 690 V AC

Use in TN-C systems



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Rated discharge current (8/20 μ s)
 Limiting discharge current (8/20 μ s)
 Discharge current, max. (8/20 μ s)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

470 V
 550 V
 Class II
 20 kA
 40 kA
 100 kA
 ≤ 25 ns
 125 A gI
 2200,00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU 3 CR
 Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS;

470 V
 550 V
 Class II
 20 kA
 40 kA
 100 kA
 ≤ 25 ns
 125 A gI
 2200,00 V
 green = OK; red = arrester faulty, replace
 250 V 1A 1CO at PU 4 CR
 Installation housing
 grey
 -40 °C/70 °C
 -40 °C/80 °C
 dURus;CE;ÖVE SN 60;SABS;

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

	without telecomm. contact	with telecomm. contact
Clamping range (rating- / min. / max.) mm ²	10 / 6 / 10	10 / 6 / 10
Length x width x height mm	90 x 54 x 61	90 x 72 x 61

	without telecomm. contact	with telecomm. contact
Clamping range (rating- / min. / max.) mm ²	10 / 6 / 50	10 / 6 / 50
Length x width x height mm	90 x 72 x 60	90 x 90 x 60

Note

Ordering data

Version	
without telecomm. contact	
with telecomm. contact	

Type	Qty.	Order No.
PU 3 C 550 V AC	1	8451050000
PU 3 CR 550 V AC	1	8451060000

Type	Qty.	Order No.
PU 4 C 550 V AC	1	8291720000
PU 4 CR 550 V AC	1	8451070000

Note

Accessories

Note

Plug-in spare arrester PU 0-G 550 V 8451060000

Plug-in spare arrester PU 0-G 550 V 8451070000

Class III with varistors

Low-voltage consumers, small distribution boards and electronic components

Overvoltage protection class III (D arresters)

Our overvoltage protection PU D protects low-voltage consumers and electronic devices from overvoltages caused by atmospheric discharges (lightning) or switching procedures (transients).

The PU D can be mounted in small or storey distribution boards.

PU D corresponds to the requirements of DIN VDE 0675, part 6, class C (Nov 1989), part 6, A2 (Oct 1996) and IEC 61643-1 (Feb 1998).



Electrical connection

PU D overvoltage protection is installed downstream of the PU C but before the device/consumer being protected. It can protect circuits up to 16 A.

For example, an installation for a circuit in small distribution boards can be used to protect a monitor.

Functional checks and maintenance

Ageing of the varistors can cause high temperatures at the varistors. In low voltage systems, this can cause a fire.

The integral temperature monitoring automatically disconnects the varistor from the power supply.

This is indicated by the LED going off. The PO DS unit is also equipped with a switching contact to signal this.

The back-up fuse depends on the conductor cross-section and type of routing. For PU D arresters, the maximum power rating is 16 A.

The connection is rated to IEC 947-7-1 for the following cross-sections:

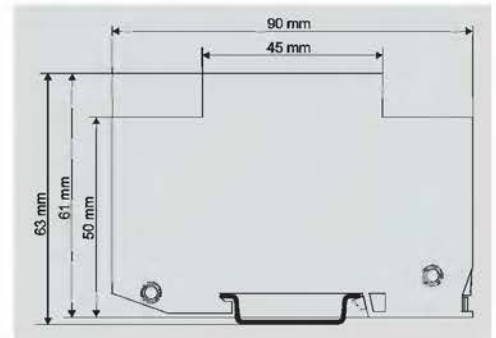
solid conductor: 0.5 ... 2.5 mm²

flexible conductor: 0.5 ... 2.5 mm²

The operating temperature range is -25 °C ... +55 °C, and the storage temperature range is -40 °C ... +60 °C.

Dimensions PU DS

Overall width 18 mm



Class III with varistors

Class III overvoltage protection

- suitable for protecting terminals
- installed in the vicinity of the equipment to be protected
- with remote signalling contact

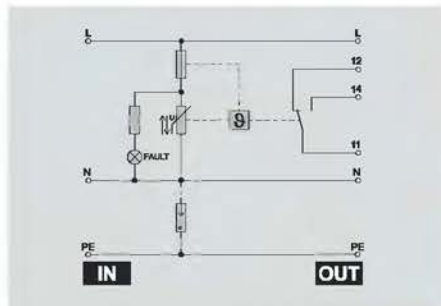
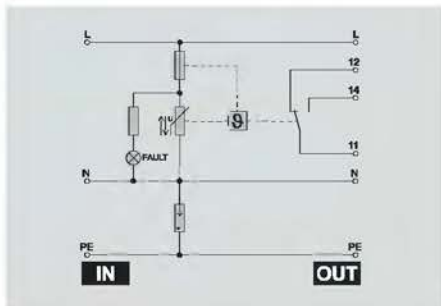
PU DS 230 V AC 16 A

Use as device protector



PU DS 115 V AC / DC 16 A

Use as device protector



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Combined pulse U_{oc}
 Rated discharge current per path (8/20 μs)
 Discharge current, max. (8/20 μs)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 275 V
 Class III
 4,00 kV
 2,50 kA
 5 kA
 ≤ 150 ns
 16 A
 1500,00 V
 green LED = OK
 250 V 1A 1CO
 Installation housing
 grey
 -30 °C/70 °C
 -40 °C/70 °C
 CE; dULus

115 V
 130 V
 Class III
 4,00 kV
 2,50 kA
 5 kA
 ≤ 150 ns
 16 A
 850,00 V
 green LED = OK
 250 V 1A 1CO
 Installation housing
 grey
 -30 °C/70 °C
 -40 °C/70 °C
 CE

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

2,5 / 0,5 / 2,5
 91 x 18 x 61

Screw connection

2,5 / 0,5 / 2,5
 91 x 18 x 61

Ordering data

Type	Qty.	Order No.
PU DS 230VAC 16A	1	8523740000

Type	Qty.	Order No.
PU DS 115VAC 16A	1	8568650000

Note

Accessories

Note

Overvoltage protection for low-voltage supplies

Class III with varistors

Class III overvoltage protection

- suitable for protecting terminals
- installed in the vicinity of the equipment to be protected
- with remote signalling contact

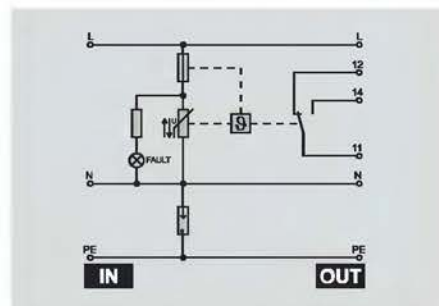
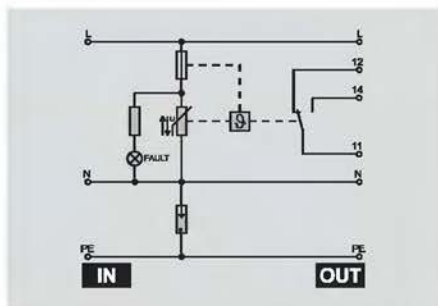
PU DS 48 V AC / DC 16 A

Use as device protector



PU DS 24 V AC / DC 16 A

Use as device protector



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Combined pulse U_{oc}
 Rated discharge current per path (8/20 μ s)
 Discharge current, max. (8/20 μ s)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

48 V
 60 V
 Class III
 4,00 kV
 2,50 kA
 5 kA
 ≤ 150 ns
 16 A
 1100,00 V
 green LED = OK
 250 V 1A 1CO
 Installation housing
 grey
 -30 °C/70 °C
 -40 °C/70 °C
 CE

24 V
 30 V
 Class III
 4,00 kV
 1,00 kA
 2 kA
 ≤ 150 ns
 16 A
 1100,00 V
 green LED = OK
 250 V 1A 1CO
 Installation housing
 grey
 -30 °C/70 °C
 -40 °C/70 °C
 CE; dULus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

2,5 / 0,5 / 2,5
 91 x 18 x 61

Screw connection

2,5 / 0,5 / 2,5
 91 x 18 x 61

Ordering data

Type	Qty.	Order No.
PU DS 48V 16A	1	8670740000

Type	Qty.	Order No.
PU DS 24V _{uc} 16A	1	8682100000

Note

Accessories

Note

Class III with varistors

Class III overvoltage protection

- suitable for protecting terminals
- installed in the vicinity of the equipment to be protected
- with remote signalling contact

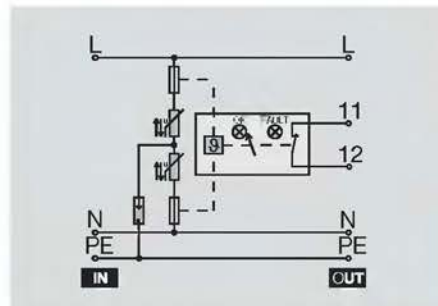
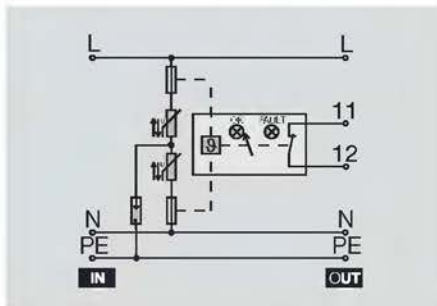
PU D 230 V AC 16 A

Use as device protector



PU D 115 V AC 16 A

Use as device protector



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Combined pulse U_{oc}
 Rated discharge current per path (8/20 μs)
 Discharge current, max. (8/20 μs)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 275 V
 Class III
 4.00 kV
 2.50 kA
 7 kA
 ≤ 150 ns
 16 A
 850.00 V
 green LED = OK; red LED = fault
 250 V 1 A 1 NC
 Installation housing
 grey
 -25 °C/55 °C
 -40 °C/55 °C
 CE

115 V
 130 V
 Class III
 4.00 kV
 2.50 kA
 7 kA
 ≤ 150 ns
 16 A
 480.00 V
 green LED = OK; red LED = fault
 250 V 1 A 1 NC
 Installation housing
 grey
 -25 °C/55 °C
 -40 °C/55 °C
 CE

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

2.5 / 0.5 / 2.5
 91 x 54 x 61

Screw connection

2.5 / 0.5 / 2.5
 91 x 54 x 61

Ordering data

Type	Qty.	Order No.
PU D 230V 16A	1	8411930000

Type	Qty.	Order No.
PU D 115Vac 16A	1	8472100000

Note

Accessories

Note

Overvoltage protection for low-voltage supplies

Class III with varistors

Class III overvoltage protection

- suitable for protecting terminals
- installed in the vicinity of the equipment to be protected
- with remote signalling contact

PU 3 D 230 V / 400 V AC 16 A

Use as device protector

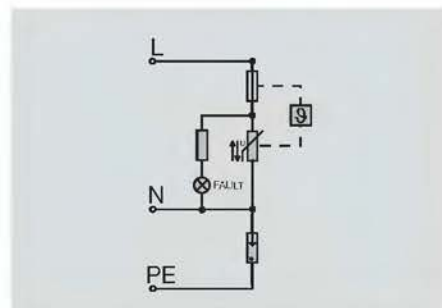
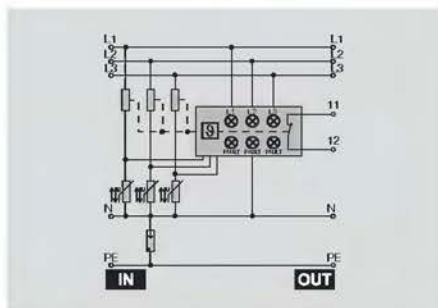


PO D S / AS 230 V 16 A

Use as device protector



F



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Requirements class to IEC 61643-1
 Combined pulse U_{oc}
 Rated discharge current per path (8/20 μs)
 Discharge current, max. (8/20 μs)
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Signalling contact
 Design
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 275 V
 Class III
 4,00 kV
 6,50 kA
 18 kA
 ≤ 150 ns
 16 A
 850,00 V
 green LED = OK; red LED = fault
 250 V 1 A 1 NC
 Installation housing
 grey
 -25 °C/55 °C
 -40 °C/55 °C
 CE

230 V
 275 V
 Class III
 4,00 kV
 2,50 kA
 5 kA
 sym/ asym: ≤ 100 ns
 16 A
 1500,00 V
 green LED
 Miscellaneous
 black
 -25 °C/55 °C
 -40 °C/60 °C
 CE

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

2,5 / 0,5 / 2,5
 91 x 54 x 61

with audible signal

20 x 34 x 41

without audible signal

12 x 34 x 41

Ordering data

Type	Qty.	Order No.
PU 3D 230V/400vac 16A	1	8509130000

Type	Qty.	Order No.
PO D AS	1	8581830000
PO D S	1	8581840000

Note

PO D AS with audible signal

Accessories

Note

Class III adapter plug

PU D ZS pluggable overvoltage protection

Class III overvoltage protection

The PU D ZS pluggable overvoltage protection device provides protection against transient overvoltages for equipment plugged into earthed power sockets. The pluggable overvoltage protection with its earthed power socket is designed for 230 V/16 A, fulfils the requirements of class III to IEC 61643-1 and is used in conjunction with class II, the PU C protection.

The PU D ZS is fitted with components to monitor varistor temperature. In the event of an excessive temperature rise due to pulses from the mains supply, these disconnect the unit.

The integral red warning lamp indicates that protection is no longer provided. The PU D ZS must then be replaced.

The **PU D ZS analog** pluggable overvoltage protection device provides protection against transient overvoltages for equipment and analogue devices plugged into earthed power sockets.

Besides the use of standard telephones, an analogue installation can also transmit data services like fault signalling systems and Internet. The fact that besides telephones other devices like fax machines and modems are also connected to the analogue line means that the hazards due to transient interference phenomena like overvoltages are on the increase.

In order to achieve protection against these overvoltages, combined overvoltage protection for analogue lines and mains voltages is incorporated. The basic version of this power socket adapter is protected by two-stage overvoltage protection achieved with gas discharge tube and fast-acting suppression diodes.

The gas discharge tube achieves a high energy discharge; the suppression diodes ensure a low residual voltage.

The **PU D ZS digital** plug-in overvoltage protection provides protection against transient overvoltages for equipment and digital devices plugged into earthed power sockets. This power socket adapter is available for Uko and So interfaces.

In order to achieve protection against these overvoltages, combined overvoltage protection for digital lines and mains voltages is incorporated. The basic version of this power socket adapter is protected by two-stage overvoltage protection achieved with gas discharge tube and fast-acting suppression diodes.

The gas discharge tube achieves a high energy discharge; the suppression diodes ensure a low residual voltage.

In the PU D ZS with the RJ45 sockets a connecting line with RJ45 plugs at both ends is included with the product.

Dimensions PU D ZS



Class III adapter plug

- Class III overvoltage protection
- with visual function indicator
- suitable for earthed power sockets

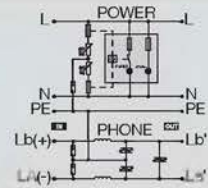
PU D ZS

PU D ZS S₀ 230 V 16 A



PU D ZS

PU D ZS analog 230 V 16 A



Technical data

Rated voltage (AC)
max. continuous voltage, U_c
Operating current, I_{max}
to DIN VDE 0675-6
Requirements class to IEC 61643-1
Combined pulse U_{oc}

Discharge current, max. (8/20 μs)
Fuse, max.
Response time
Protection level on output side sym., input 8/20 μs, typ.
Protection level on output side unsym., input 8/20 μs, typ.
Leakage current at U_n
Optical function indicator
Pollution severity

Overvoltage category
Operating temperature, min./max.
Storage temperature, min./max.

General data

Input voltage, max.
Rated current I_n, max.
Standard signal
Rated discharge current (8/20 μs)
Total current
Response time, typical
Resistance per path
Cut-off frequency f_{g,600 Ω} system
Transistor output, positive-switching
Residual voltage at output for input pulse of 1 kV/μs
Residual voltage at output for 8/20 μs and input pulse of 5kA

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Ordering data

Version

Note

Accessories

Note

230 V
275 V
16.00 A
Requirements class D
Class III
4.00 kV

5 kA
16 A
≤ 150 ns
600 V
1500 V
1.00 μA
green LED = OK; red LED = fault
2

III
0 °C/60 °C
-25 °C/85 °C

190 V
0.45 A
ISDN telephone signal RJ45/RJ11/12
4 kA
10 A
< 5 ns
1.1 Ω
80 MHz

a/b ≤ 270V a-b/PE ≤ 270V
a/b ≤ 100V a-b/PE ≤ 100V

Earthed contact

110 x 62 x 48
incl. conductor, RJ 11/12 both ends

Type	Qty.	Order No.
PU D ZS 230V- 16A / ISDN So	1	8697560000

Conductor, RJ 45 at both ends, order No. 8697590000

230 V
275 V
16.00 A
Requirements class D
Class III
4.00 kV

5 kA
16 A
≤ 150 ns
600 V
1500 V
1.00 μA
green LED = OK; red LED = fault
2

III
0 °C/60 °C
-25 °C/85 °C

190 V DC
0.45 A
Analogue telephone signal RJ45/RJ11/12
4 kA
10 A
< 5 ns
1.1 Ω
2 MHz

a/b ≤ 270V a-b/PE ≤ 270V
a/b ≤ 100V a-b/PE ≤ 100V

Earthed contact

110 x 62 x 48
incl. conductor, RJ 11/12 both ends

Type	Qty.	Order No.
PU D ZS 230V- 16A / analog a/b	1	8697600000

Conductor, RJ45 on both sides, order No. 8697590000

Overvoltage protection for low-voltage supplies

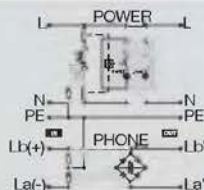
Class III adapter plug

Class III overvoltage protection

- with visual function indicator
- suitable for earthed power sockets
- PU D ZS AS with additional audible alarm

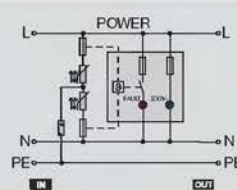
PU D ZS

PU D ZS UK₀ 230 V 16 A



PU D ZS / ZS AS

PU D ZS / AS 230 V 16 A



Technical data

Rated voltage (AC)
max. continuous voltage, U_c
Operating current, I_{max}
to DIN VDE 0675-6
Requirements class to IEC 61643-1
Combined pulse U_{oc}

Discharge current, max. (8/20 μs)
Fuse, max.
Response time
Protection level on output side sym., input 8/20 μs, typ.
Protection level on output side unsym., input 8/20 μs, typ.
Leakage current at U_n
Optical function indicator
Pollution severity

Overvoltage category
Operating temperature, min./max.
Storage temperature, min./max.

General data

Input voltage, max.
Rated current I_n, max.
Standard signal
Rated discharge current (8/20 μs)
Total current
Response time, typical
Resistance per path
Cut-off frequency f_g, 600 Ω system
Transistor output, positive-switching
Residual voltage at output for input pulse of 1 kV/μs
Residual voltage at output for 8/20 μs and input pulse of 5kA

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Ordering data

Version

Note

Accessories

Note

230 V
275 V
16,00 A
Requirements class D
Class III
4,00 kV

5 kA
16 A
≤ 150 ns
600 V
1500 V
1,00 μA
green LED = OK; red LED = fault
2

III
0 °C/60 °C
-25 °C/85 °C

190 V DC
0,45 A
ISDN telephone signal RJ45/RJ11/12
4 kA
10 A
< 5 ns
1,1 Ω
80 MHz

a/b ≤ 270V a-b/PE ≤ 270V
a/b ≤ 100V a-b/PE ≤ 100V

Earthed contact

110 x 62 x 48
incl. conductor, RJ 11/12 both ends

230 V
275 V
16,00 A
Requirements class D
Class III
4,00 kV

5 kA
16 A
≤ 150 ns
600 V
1500 V
1,00 μA
green LED = OK; red LED = fault
2

III
0 °C/60 °C
-25 °C/85 °C

Earthed contact Earthed contact

110 x 62 x 48 110 x 62 x 48
PU D ZS AS with audible signal

Type	Qty.	Order No.
PU D ZS UK ₀ 230V 16A	1	8697570000

Type	Qty.	Order No.
PU D ZS 230V- 16A	1	8697560000
PU D ZS AS	1	8750640000

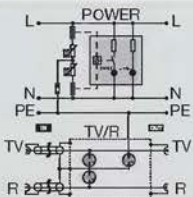
Conductor, RJ 45 at both ends, order No. 8697590000

Class III adapter plug

- Class III overvoltage protection for signals up to 1 GHz (radio/TV)
- with visual function indicator
 - protection for Ethernet Cat.6
 - suitable for earthed power sockets

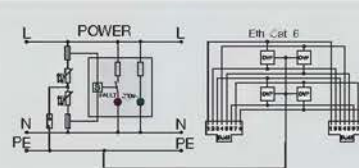
PU D ZS

PU D ZS TV / R 230 V 16 A



PU D ZS

PU D ZS Cat.6



Technical data

Rated voltage (AC)
max. continuous voltage, U_c
Operating current, I_{max}
to DIN VDE 0675-6
Requirements class to IEC 61643-1
Combined pulse U_{oc}

Discharge current, max. (8/20 μs)
Fuse, max.
Response time
Protection level on output side sym., input 8/20 μs, typ.
Protection level on output side unsym., input 8/20 μs, typ.
Leakage current at U_n
Optical function indicator
Pollution severity

Overvoltage category
Operating temperature, min./max.
Storage temperature, min./max.

General data

Input voltage, max.
Rated current I_n, max.
Standard signal
Rated discharge current (8/20 μs)
Total current
Response time, typical
Resistance per path
Cut-off frequency f_g, 600 Ω system
Transistor output, positive-switching
Residual voltage at output for input pulse of 1 kV/μs
Residual voltage at output for 8/20 μs and input pulse of 5kA

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Ordering data

Version

Note

Accessories

Note

230 V
275 V
16.00 A
Requirements class D
Class III
4.00 kV

5 kA
16 A
≤ 150 ns
600 V
1500 V
1.00 μA
green LED = OK; red LED = fault
2

III
0 °C/60 °C
-25 °C/85 °C

70 V
1.50 A
TV/R terrestrial and cable
5 kA
< 100 ns
1.1 Ω
1 GHz / 75 Ω

600 V
800 V

Earthed contact

110 x 62 x 48
Each coaxial cable approx. 35 cm long

Type	Qty.	Order No.
PU D ZS TV/R	1	8779230000

230 V
275 V
16.00 A
Requirements class D
Class III
4.00 kV

5 kA
16 A
≤ 150 ns
600 V
1500 V
1.00 μA
green LED = OK; red LED = fault
2

III
0 °C/60 °C
-25 °C/85 °C

30 V
0.20 A
Ethernet Cat.5 + Cat.6
2500 A
10 kA (8/20 μs)
< 5 ns

Cable / Cable ≤ 80 V; Cable / PE ≤ 300 V
Cable / Cable ≤ 130 V; Cable / PE ≤ 600 V

Earthed contact

110 x 63 x 48
Length of Cat.6 cable 0.75 m + 2.20 m

Type	Qty.	Order No.
PU D ZS CAT.6	1	8805530000

Overvoltage protection for low-voltage supplies

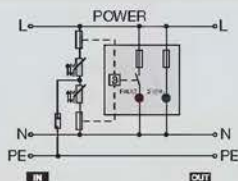
Class III adapter plug

Class III overvoltage protection

- with visual function indicator
- suitable for power sockets with earthing pin in France and the Benelux countries

PU D ZS

PU D ZS F



Technical data

Rated voltage (AC)
max. continuous voltage, U_c
Operating current, I_{max}
to DIN VDE 0675-6
Requirements class to IEC 61643-1
Combined pulse U_{oc}

Discharge current, max. (8/20 μ s)

Fuse, max.

Response time

Protection level on output side sym., input 8/20 μ s, typ.

Protection level on output side unsym., input 8/20 μ s, typ.

Leakage current at U_n

Optical function indicator

Pollution severity

Overvoltage category

Operating temperature, min./max.

Storage temperature, min./max.

General data

Input voltage, max.

Rated current I_n , max.

Standard signal

Rated discharge current (8/20 μ s)

Total current

Response time, typical

Resistance per path

Cut-off frequency f_g , 600 Ω system

Transistor output, positive-switching

Residual voltage at output for input pulse of 1 kV/ μ s

Residual voltage at output for 8/20 μ s and input pulse of 5 kA

Dimensions

Clamping range (rating- / min. / max.)

Length x width x height

Note

230 V

275 V

16,00 A

Class III

4,00 kV

5 kA

16 A

≤ 150 ns

600 V

1500 V

1,00 μ A

green LED = OK; red LED = fault

2

III

0 °C/60 °C

-25 °C/85 °C

Ordering data

Version

Type

Qty.

Order No.

PU D ZS F

1

8750650000

Note

Accessories

Note

Overvoltage protection mains filter

WAVEFILTERS for simple radio interference suppression in the control cabinet

The WAVEFILTER series eliminates the time-consuming work of screwing in mains filters. These filters are simply clipped on to the TS35 rail and connected to the device requiring suppression. The two-stage WAVEFILTER with overall width 22.5 mm in 1 A, 3 A, 6 A and 10 A versions offers high attenuation.

The WAVEFILTER with current-compensating choke is ideal for applications in drive technology and control/automation systems, e.g. for suppressing continuous interference types such as “noise” or “ripple” caused by interfering radiation from other systems, or interference from frequency converters and switch-mode power supplies. A short, low-ohm mass connection is required for the WAVEFILTER to function perfectly. We recommend earthing all devices directly with the largest possible cross-section to a central earthing point in the control cabinet.

F

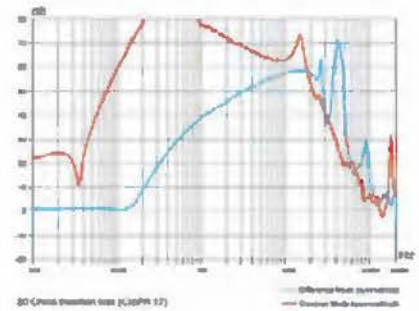
Interference signals

We distinguish between two types of induced transient and continuous interference signals: symmetrical (differential mode) and asymmetrical (common mode). The symmetrical interference signals generate a voltage between the signal leads of the system. The asymmetrical interference voltages occur between the signal leads and earth.

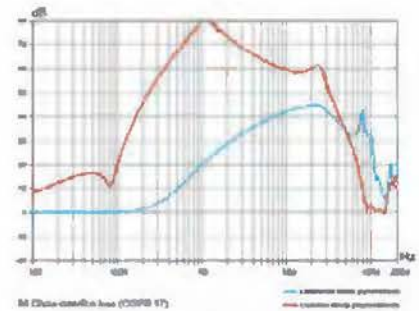
The WAVEFILTER is suitable for attenuating both kinds of interference signal. In addition, WAVEFILTER 10 A also has an earthing conductor choke. This earthing conductor choke supports both attenuation on the earthing conductor for the filter and additional attenuation of asymmetrical interference voltages.

Insertion loss

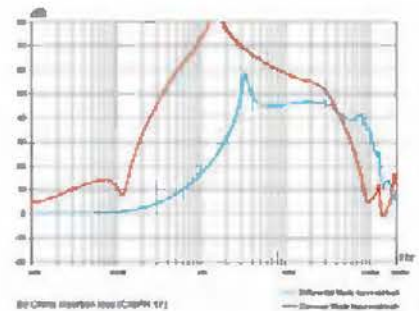
1 A WAVEFILTER



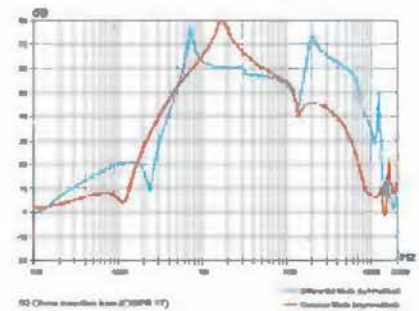
3 A WAVEFILTER



6 A WAVEFILTER



10 A WAVEFILTER



WAVEFILTER

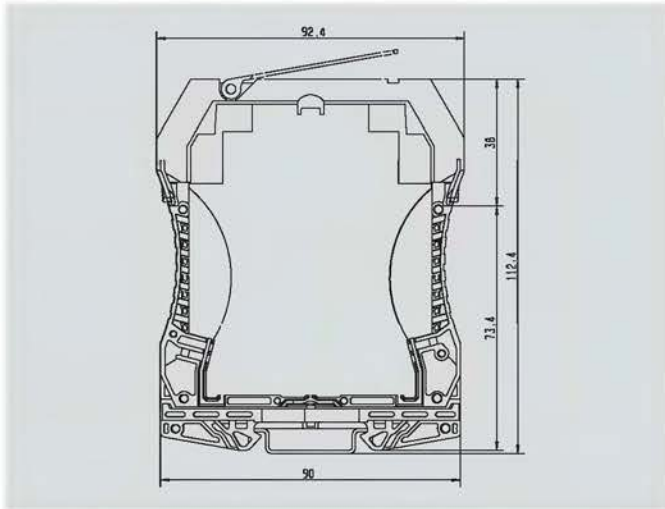
Installation height 112.4 mm



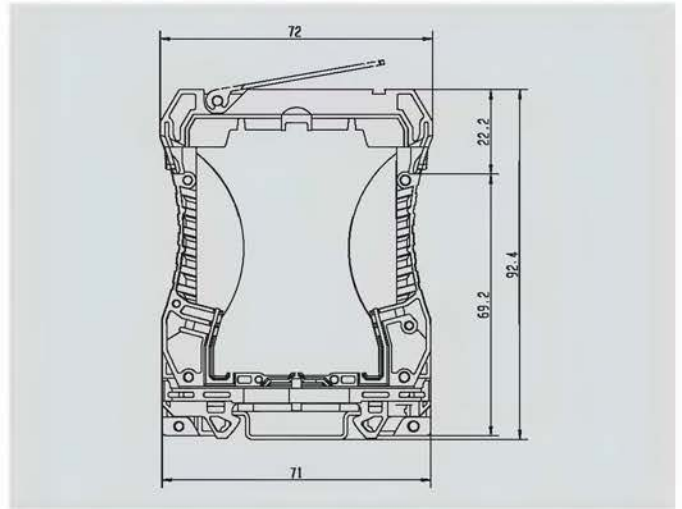
Installation height 92.4 mm



Dimensions



Dimensions

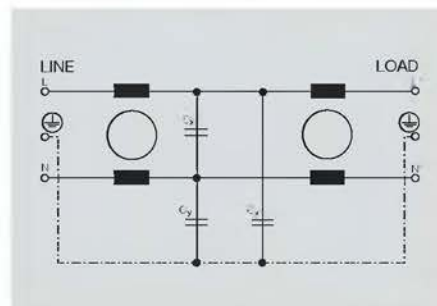
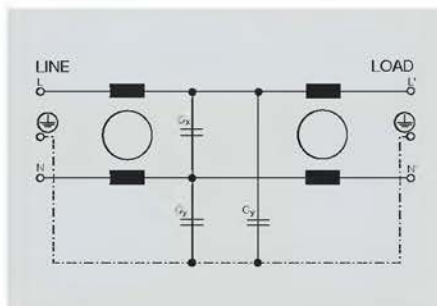


Overvoltage protection for low-voltage supplies

Overvoltage protection mains filter

WAVEFILTER 1 A 250 V

WAVEFILTER 3 A 250 V



Technical data

Technical data

Rated voltage (AC/DC)
 Rated current
 Capacitance
 Inductance L and L1
 Leakage current at U_n
 Test voltage P/N-PE
 Test voltage P-N
 Operating temperature, min./max.
 Approvals

Rated voltage (AC/DC)	250 V
Rated current	1,00 A
Capacitance	C_1 / C_2 ; 33nF
Inductance L and L1	10,00 mH
Leakage current at U_n	190,00 μ A
Test voltage P/N-PE	2000,00 V AC
Test voltage P-N	1700,00 V DC
Operating temperature, min./max.	-20 °C/40 °C
Approvals	dJFus

Rated voltage (AC/DC)	250 V
Rated current	3,00 A
Capacitance	C_1 / C_2 ; 33nF
Inductance L and L1	2,00 mH
Leakage current at U_n	190,00 μ A
Test voltage P/N-PE	2000,00 V AC
Test voltage P-N	1700,00 V DC
Operating temperature, min./max.	-20 °C/40 °C
Approvals	dJFus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

2,5 / 0,5 / 2,5
 90 x 22,5 x 73,4

2,5 / 0,5 / 2,5
 90 x 22,5 x 73,4

Note

see attenuation curve

see attenuation curve

Ordering data

Version

Type	Qty.	Order No.
WAVEFILTER 1A	1	8614790000

Type	Qty.	Order No.
WAVEFILTER 3A	1	8614780000

Note

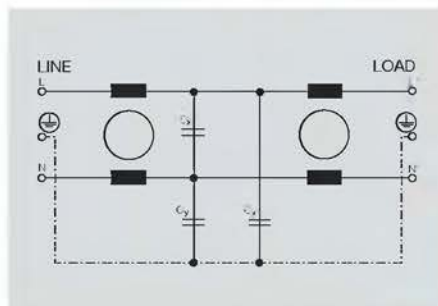
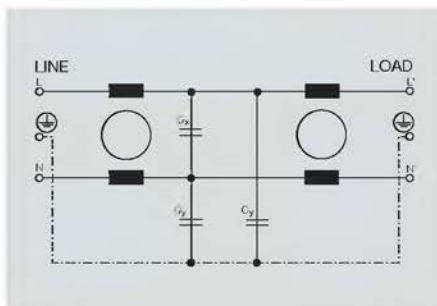
Accessories

Note

Overvoltage protection mains filter

WAVEFILTER 6 A 250 V

WAVEFILTER 10 A 250 V



Technical data

Technical data

Rated voltage (AC/DC)
 Rated current
 Capacitance
 Inductance L and L1
 Leakage current at Un
 Test voltage P/N-PE
 Test voltage P-N
 Operating temperature, min./max.
 Approvals

250 V
 6,00 A
 C_1 : 33 nF / C_2 : 22 nF
 0,80 mH
 190,00 µA
 2000,00 V AC
 1700,00 V DC
 -20 °C/40 °C
 dJFus

250 V
 10,00 A
 C_1 : 470 nF / C_2 : 4,7 nF
 0,80 mH
 190,00 µA
 2000,00 V AC
 1700,00 V DC
 -20 °C/40 °C
 dJFus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

2,5 / 0,5 / 2,5
 90 x 22,5 x 73,4

2,5 / 0,5 / 2,5
 90 x 22,5 x 73,4

Note

see attenuation curve

see attenuation curve

Ordering data

Version

Type	Qty.	Order No.
WAVEFILTER 6A	1	8614800000

Type	Qty.	Order No.
WAVEFILTER 10A	1	8614770000

Note

Accessories

Note

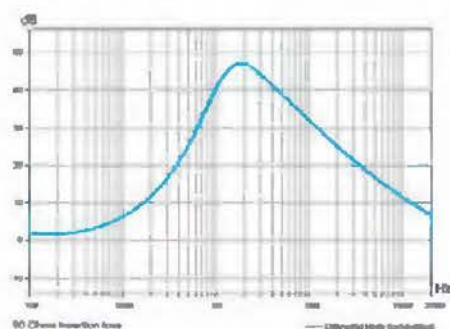
Slim overvoltage protection terminals for instrumentation and control engineering

Weidmüller MCZ ovp overvoltage protection terminals are characterised by their high level of protection concentrated in a compact space of 6 mm. The tension clamp connection and direct earthing via the terminal rail contact results in time-savings during installation. The MCZ ovp terminals are suitable for installing in the narrowest of places in automated process, industrial and building services systems.



The three-stage overvoltage protection terminals are fitted with gas discharge tubes, varistors, suppression diodes (TAZ) and decoupling inductors. Individual protective components such as varistors and suppression diodes complement the range. The MCZ ovp overvoltage protection terminals are available with rated voltages of 24, 48, 115 and 230 V. The earth contact is produced by clipping the terminal to an earthed terminal rail. To guarantee a safe energy discharge of up to 10 kA (8/20 μ s) via these terminals, the TS 35 DIN rail must therefore be earthed. EMC regulations require the terminal rail to be securely screwed to an earthed mounting plate. Optimum protection is achieved when the PE contact is made via a tension clamp terminal every 600 mm.

Derating curve MCZ ovp filter



The different models

MCZ ovp CL is a three-stage protective combination with a suppression diode between the current paths. It limits the overvoltage in analogue signal circuits, e.g. current loops.

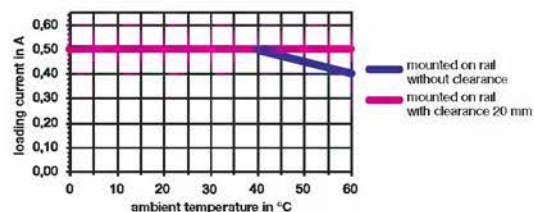
MCZ ovp SL is a three-stage protective combination with two suppression diodes, each from the signal line to earth. It limits the overvoltage in binary circuits, e.g. for actuators.

MCZ ovp CL FG is a three-stage protective combination with a suppression diode between the current paths. It limits the overvoltage in analogue signal circuits. A high-resistance earth connection is achieved with a gas discharge tube.

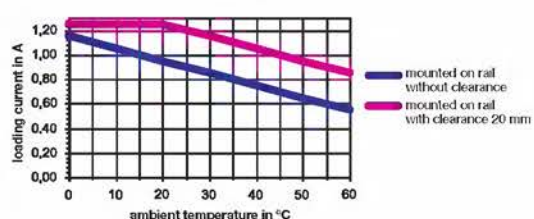
MCZ ovp SL FG is a three-stage protective combination with two suppression diodes, each from the signal line to earth. It limits the overvoltage in binary circuits, e.g. for actuators. A high-resistance earth connection is achieved with three gas discharge tubes.

MCZ ovp filter terminals contain selected varistors, capacitors and series inductances. They form reliable noise filters. Coupled interference in the kHz range is safely discharged to earth. For example, the signal inputs of a PLC, which can be protected against interference voltages and RF interference.

Derating curve MCZ ovp filter



Derating curve MCZ ovp filter



3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

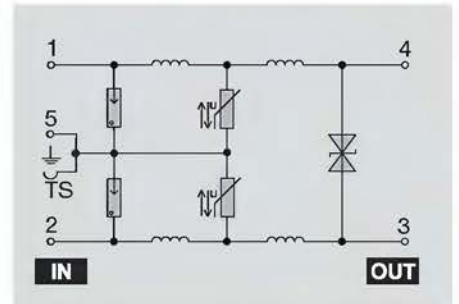
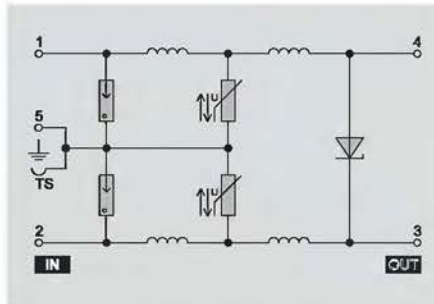
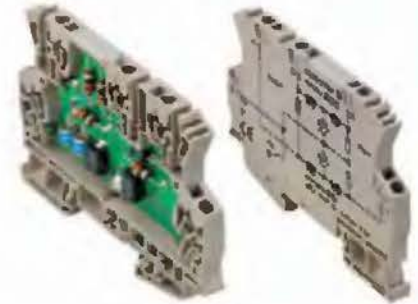
MCZ OVP CL 24 V DC 0.5 A

Protection for current loops



MCZ OVP CL 24 V AC 0.5 A

Protection for current loops



Technical data

Technical data	
Rated voltage (AC)	24 V
Rated voltage (DC)	28 V
max. continuous voltage, U _c	38 V
Operating current, I _{max}	0,50 A
Volume resistivity	2,50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500,0 kHz/240 Ω
Discharge current, max. (8/20 μs)	2,5 kA
Protection level on output side sym., input 1 kV/μs, typ.	40 V
Protection level on output side sym., input 8/20 μs, typ.	65 V
Protection level on output side unsym., input 1kV/μs, typ.	40 V
Protection level on output side unsym., input 8/20 μs, typ.	65 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Technical data	
Rated voltage (AC)	24 V
Rated voltage (DC)	28 V
max. continuous voltage, U _c	38 V
Operating current, I _{max}	0,50 A
Volume resistivity	2,50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500,0 kHz/240 Ω
Discharge current, max. (8/20 μs)	2,5 kA
Protection level on output side sym., input 1 kV/μs, typ.	40 V
Protection level on output side sym., input 8/20 μs, typ.	65 V
Protection level on output side unsym., input 1kV/μs, typ.	40 V
Protection level on output side unsym., input 8/20 μs, typ.	65 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Technical data	
Rated voltage (AC)	24 V
Rated voltage (DC)	28 V
max. continuous voltage, U _c	38 V
Operating current, I _{max}	0,50 A
Volume resistivity	1,00 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500,0 kHz/240 Ω
Discharge current, max. (8/20 μs)	2,5 kA
Protection level on output side sym., input 1 kV/μs, typ.	45 V
Protection level on output side sym., input 8/20 μs, typ.	70 V
Protection level on output side unsym., input 1kV/μs, typ.	45 V
Protection level on output side unsym., input 8/20 μs, typ.	70 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

tension clamp connection	
Clamping range (rating- / min. / max.)	1,5 / 0,5 / 1,5
Length x width x height	91 x 6 x 63,5
Note	see clamping curve

tension clamp connection	
Clamping range (rating- / min. / max.)	1,5 / 0,5 / 1,5
Length x width x height	91 x 6 x 63,5
Note	see clamping curve

Ordering data

Version
Note

Type	Qty.	Order No.
MCZ OVP CL 24VDC 0,5A	10	8448920000
Note		

Type	Qty.	Order No.
MCZ OVP CL 24VAC 0,5A	10	8472880000
Note		

Accessories

Note
End plate 4P MSZ 1,5 828900000

Note
End plate 4P MSZ 1,5 828900000

Note
End plate 4P MSZ 1,5 828900000

Overvoltage protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

MCZ OVP CL 24 V UC 1.25 A

Protection for current loops

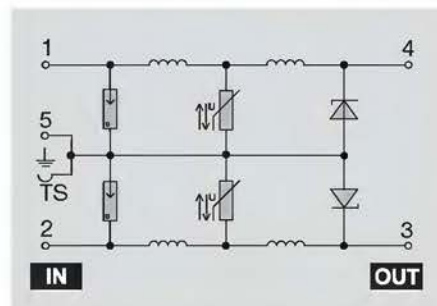
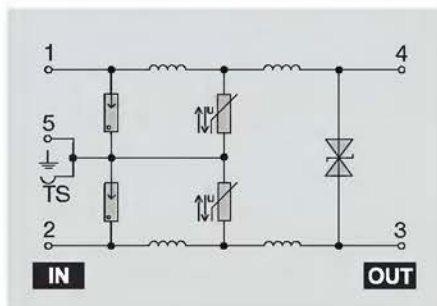


MCZ OVP SL 24 V DC 0.5 A

Protection for binary signals



F



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.
 Approvals

24 V
 24 V
 27 V
 1.25 A
 1.00 Ω
 yes
 yes
 yes
 500.0 kHz/240 Ω
 2.5 kA
 80 V
 130 V
 40 V
 65 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

24 V
 28 V
 0.50 A
 2.50 Ω
 yes
 yes
 yes
 500.0 kHz/240 Ω
 2.5 kA
 80 V
 130 V
 40 V
 65 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5
 see clamping curve

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5
 see clamping curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP CL 24VUC 1,25A	10	8448960000

Type	Qty.	Order No.
MCZ OVP SL 24VDC 0,5A	10	8448940000

Note

Accessories

Note

End plate
 4P M32 1.5 8289600000

End plate
 4P M32 1.5 8289600000

3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

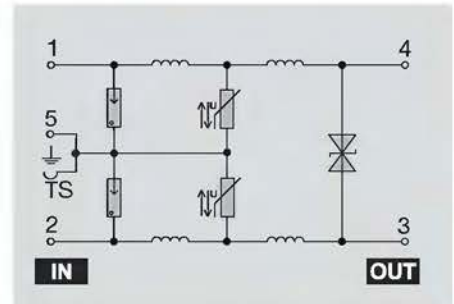
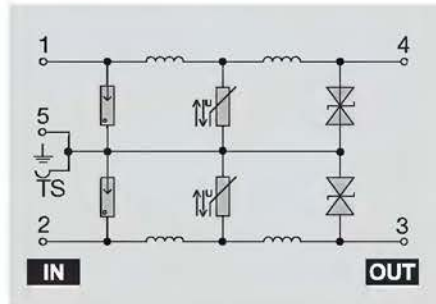
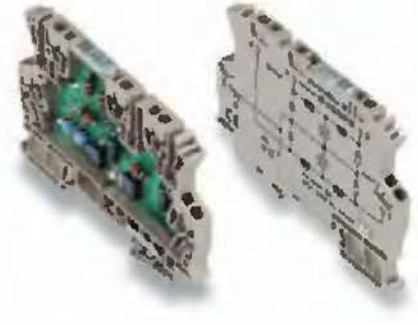
MCZ OVP SL 24 V UC 1.25 A

Protection for binary signals



MCZ OVP CL 48 V UC 0.5 A

Protection for current loops



Technical data

Technical data	
Rated voltage (AC)	24 V
Rated voltage (DC)	24 V
max. continuous voltage, U _c	28 V
Operating current, I _{max}	1.25 A
Volume resistivity	1.00 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500.0 kHz 240 Ω
Discharge current, max. (8/20 μs)	2.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	80 V
Protection level on output side sym., input 8/20 μs, typ.	130 V
Protection level on output side unsym., input 1kV/μs, typ.	40 V
Protection level on output side unsym., input 8/20 μs, typ.	65 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Rated voltage (AC)	24 V
Rated voltage (DC)	24 V
max. continuous voltage, U _c	28 V
Operating current, I _{max}	1.25 A
Volume resistivity	1.00 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500.0 kHz 240 Ω
Discharge current, max. (8/20 μs)	2.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	80 V
Protection level on output side sym., input 8/20 μs, typ.	130 V
Protection level on output side unsym., input 1kV/μs, typ.	40 V
Protection level on output side unsym., input 8/20 μs, typ.	65 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Rated voltage (AC)	48 V
Rated voltage (DC)	48 V
max. continuous voltage, U _c	53 V
Operating current, I _{max}	0.50 A
Volume resistivity	2.50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500.0 kHz 240 Ω
Discharge current, max. (8/20 μs)	2.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	80 V
Protection level on output side sym., input 8/20 μs, typ.	150 V
Protection level on output side unsym., input 1kV/μs, typ.	80 V
Protection level on output side unsym., input 8/20 μs, typ.	150 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

see derating curve

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

see derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP SL 24VUC 1,25A	10	8448970000

Type	Qty.	Order No.
MCZ OVP CL 48VUC 0,5A	10	8449000000

Note

Accessories

Note

End plate 4P MZ 1.5 828900000

End plate 4P MZ 1.5 828900000

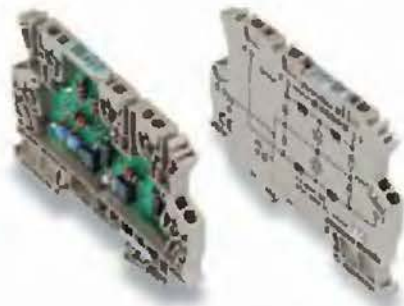
Overvoltage protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

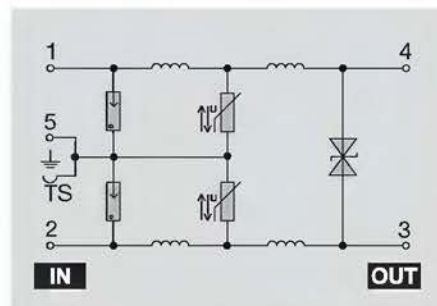
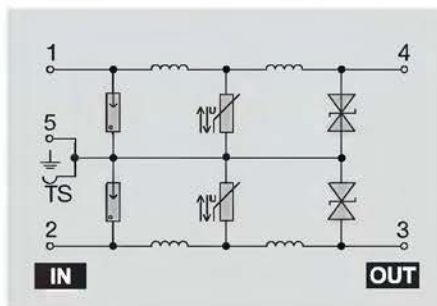
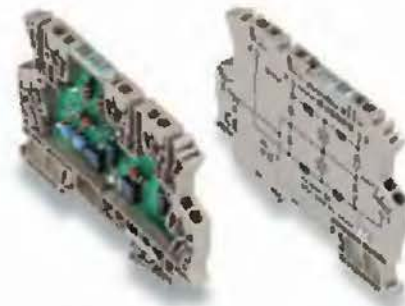
MCZ OVP SL 48 V UC 0.5 A

Protection for binary signals



MCZ OVP CL 48 V UC 1.25 A

Protection for current loops



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.
 Approvals

48 V
 48 V
 53 V
 0,50 A
 2,50 Ω
 yes
 yes
 yes
 500,0 kHz-240 Ω
 2,5 kA
 160 V
 300 V
 80 V
 150 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

48 V
 48 V
 53 V
 1,25 A
 1,00 Ω
 yes
 yes
 yes
 500,0 kHz-240 Ω
 2,5 kA
 80 V
 150 V
 80 V
 150 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

tension clamp connection

1,5 / 0,5 / 1,5
 91 x 6 x 63,5
 see derating curve

tension clamp connection

1,5 / 0,5 / 1,5
 91 x 6 x 63,5
 see derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP SL 48VUC 0,5A	10	8449030000

Type	Qty.	Order No.
MCZ OVP CL 48VUC 1,25A	10	8449040000

Note

Accessories

Note

End plate
 4P M52 1.5 828900000

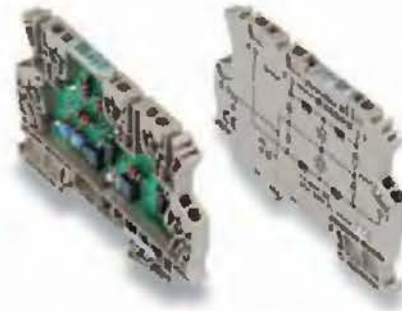
End plate
 4P M52 1.5 828900000

3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

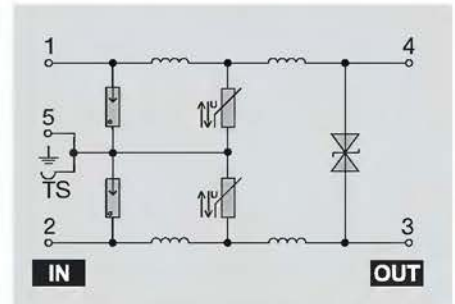
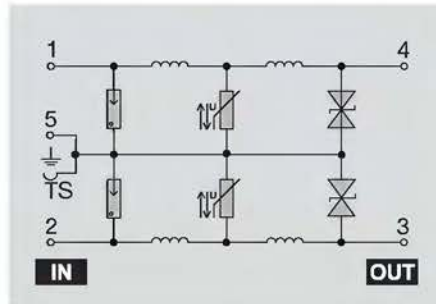
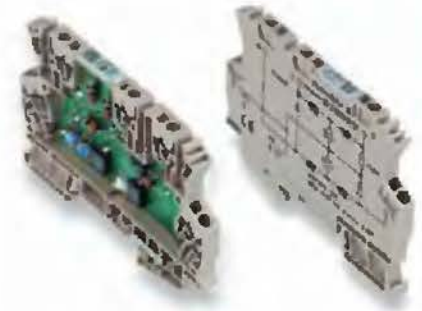
MCZ OVP SL 48 V UC 1.25 A

Protection for binary signals



MCZ OVP CL 115 V UC 1.25 A

Protection for current loops



Technical data

Technical data	
Rated voltage (AC)	48 V
Rated voltage (DC)	48 V
max. continuous voltage, U _c	53 V
Operating current, I _{max}	1.25 A
Volume resistivity	1.00 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500.0 kHz/240 Ω
Discharge current, max. (8/20 μs)	2.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	160 V
Protection level on output side sym., input 8/20 μs, typ.	300 V
Protection level on output side unsym., input 1kV/μs, typ.	80 V
Protection level on output side unsym., input 8/20 μs, typ.	150 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c	127 V
Operating current, I _{max}	1.25 A
Volume resistivity	1.00 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500.0 kHz/240 Ω
Discharge current, max. (8/20 μs)	2.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	220 V
Protection level on output side sym., input 8/20 μs, typ.	360 V
Protection level on output side unsym., input 1kV/μs, typ.	220 V
Protection level on output side unsym., input 8/20 μs, typ.	360 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Technical data	
Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c	127 V
Operating current, I _{max}	1.25 A
Volume resistivity	1.00 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	500.0 kHz/240 Ω
Discharge current, max. (8/20 μs)	2.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	220 V
Protection level on output side sym., input 8/20 μs, typ.	360 V
Protection level on output side unsym., input 1kV/μs, typ.	220 V
Protection level on output side unsym., input 8/20 μs, typ.	360 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5
see derating curve

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5
see derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP SL 48VUC 1,25A	10	8449050000

Type	Qty.	Order No.
MCZ OVP CL 115VUC 1,25A	10	8449060000

Note

Accessories

Note

End plate 4P MZ 1.5 828900000

End plate 4P MZ 1.5 828900000

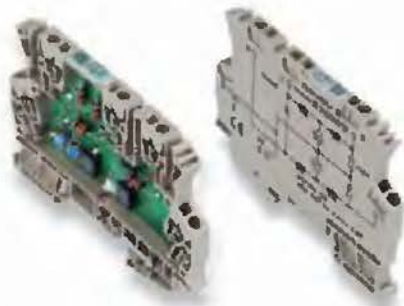
Overvoltage protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

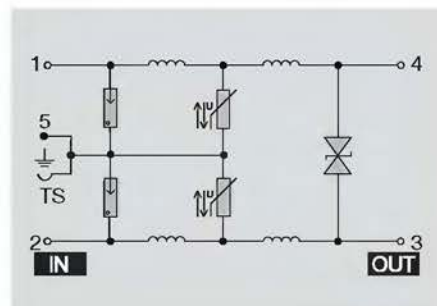
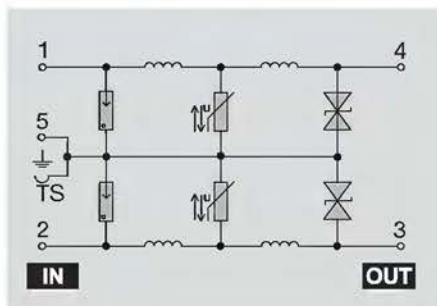
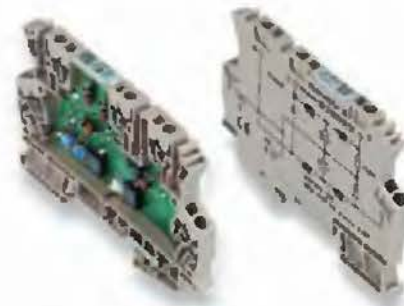
MCZ OVP SL 115 V UC 1.25 A

Protection for binary signals



MCZ OVP CL 230 V UC 1.25 A

Protection for current loops



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.
 Approvals

115 V
 115 V
 127 V
 1.25 A
 1.00 Ω
 yes
 yes
 yes
 500.0 kHz/240 Ω
 2.5 kA
 440 V
 720 V
 220 V
 360 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

230 V
 230 V
 250 V
 1.25 A
 1.00 Ω
 yes
 yes
 yes
 500.0 kHz/240 Ω
 2.5 kA
 420 V
 710 V
 420 V
 710 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5
 see derating curve

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5
 see derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP SL 115VUC 1,25A	10	8449070000

Type	Qty.	Order No.
MCZ OVP CL 230VUC 1,25A	10	8449060000

Note

Accessories

Note

End plate
 4P MZ 1.5 828900000

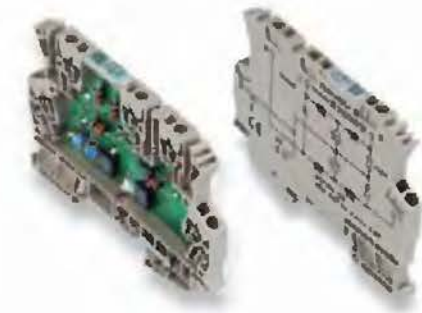
End plate
 4P MZ 1.5 828900000

3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

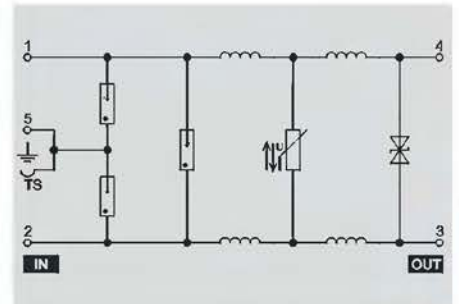
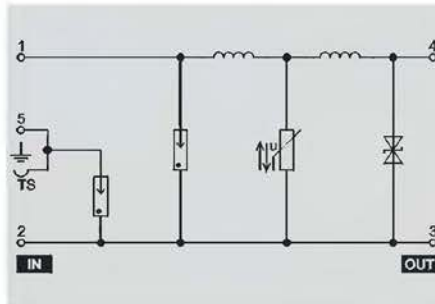
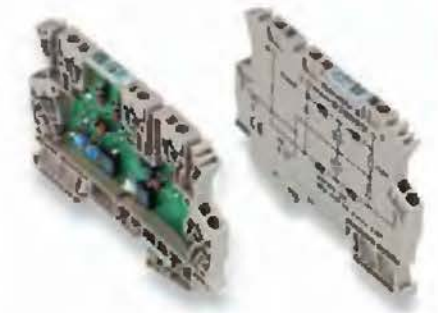
MCZ SL FG 24 V AC 0.5 A

not earthed



MCZ CL FG 24 V AC 0.5 A

not earthed



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.
 Approvals

24 V
 24 V
 28 V
 0.50 A
 1.00 Ω
 90 V / 10 kA
 30 V
 500.0 kHz / 240 Ω
 2.5 kA
 40 V
 65 V
 40 V
 65 V
terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

24 V
 24 V
 28 V
 0.50 A
 2.50 Ω
 90 V / 10 kA
 30 V
 500.0 kHz / 240 Ω
 2.5 kA
 40 V
 65 V
 40 V
 65 V
terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5
 see derating curve

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5
 see derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP SL FG 24VAC 0,5A	10	8823280000

Type	Qty.	Order No.
MCZ OVP CL FG 24VUC 0,5A	25	8704240000

Note

Accessories

Note

End plate
 4P MSZ 1.5 828900000

End plate
 4P MSZ 1.5 828900000

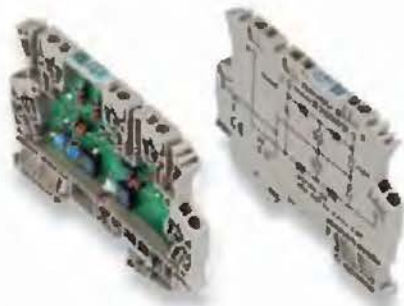
Overvoltage protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

MCZ OVP SL 230 V UC 1.25 A

Protection for binary signals

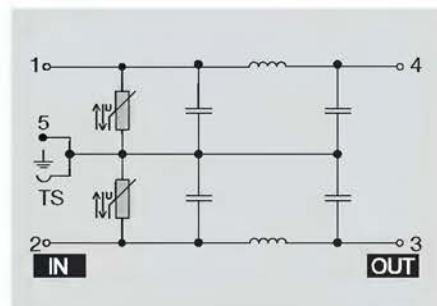
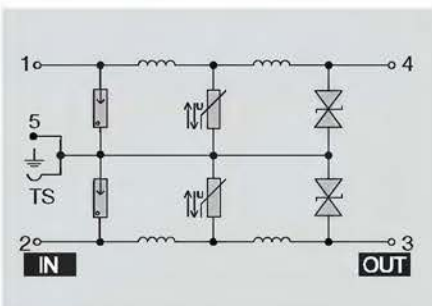


MCZ OVP 24 V 0.5 A

Filter



F



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.
 Approvals

230 V
 230 V
 250 V
 1.25 A
 1.00 Ω
 yes
 yes
 yes
 500.0 kHz 240 Ω
 2.5 kA
 840 V
 1420 V
 420 V
 710 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

24 V
 24 V
 26 V
 0.50 A
 1.50
 no
 yes
 no
 50.0 kHz 50 Ω
 0.5 kA
 140 V
 190 V
 70 V
 100 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5
 see derating curve

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5
 see derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP SL 230VUC 1,25A	10	8449090000

Type	Qty.	Order No.
MCZ OVP FILTER 24V 0,5A	10	8449100000

Note

Accessories

Note

End plate
 AP M32 1.5 828900000

End plate
 AP M32 1.5 828900000

3- or 1-stage protection with tension clamp connection

- Slimline overvoltage protection terminal with tension clamp connection
- 6 mm Slimline fine overvoltage protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

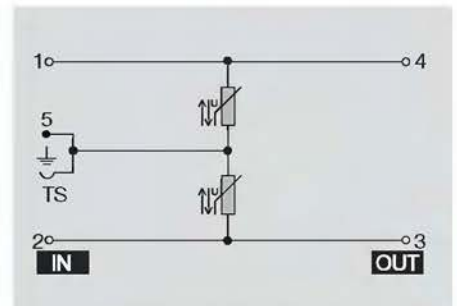
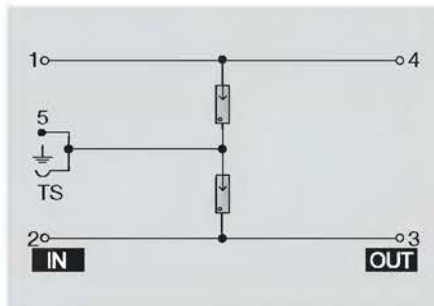
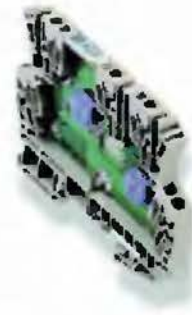
MCZ OVP 90 V

Gas discharge tube



MCZ OVP S10K30

Varistor S10K30



Technical data

Technical data	
Rated voltage (AC)	50 V
Rated voltage (DC)	70 V
max. continuous voltage, U _c	72 V
Operating current, I _{max}	16.00 A
Volume resistivity	0.20 Ω
Gas discharge tube	90 V / 10 kA
Varistor	no
Suppression diodes	no
Cut-off frequency (-3 dB) at load impedance	
Discharge current, max. (8/20 μs)	2.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	700 V
Protection level on output side sym., input 8/20 μs, typ.	800 V
Protection level on output side unsym., input 1kV/μs, typ.	700 V
Protection level on output side unsym., input 8/20 μs, typ.	800 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Rated voltage (AC)	24 V
Rated voltage (DC)	24 V
max. continuous voltage, U _c	30 V
Operating current, I _{max}	16.00 A
Volume resistivity	0.20 Ω
Gas discharge tube	no
Varistor	yes
Suppression diodes	no
Cut-off frequency (-3 dB) at load impedance	
Discharge current, max. (8/20 μs)	125
Protection level on output side sym., input 1 kV/μs, typ.	45 V
Protection level on output side sym., input 8/20 μs, typ.	55 V
Protection level on output side unsym., input 1kV/μs, typ.	45 V
Protection level on output side unsym., input 8/20 μs, typ.	55 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Technical data	
Rated voltage (AC)	50 V
Rated voltage (DC)	70 V
max. continuous voltage, U _c	72 V
Operating current, I _{max}	16.00 A
Volume resistivity	0.20 Ω
Gas discharge tube	90 V / 10 kA
Varistor	no
Suppression diodes	no
Cut-off frequency (-3 dB) at load impedance	
Discharge current, max. (8/20 μs)	2.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	700 V
Protection level on output side sym., input 8/20 μs, typ.	800 V
Protection level on output side unsym., input 1kV/μs, typ.	700 V
Protection level on output side unsym., input 8/20 μs, typ.	800 V
Design	terminal
Type of connection	tension clamp connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C
Approvals	CE;ULus

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

tension clamp connection	
1.5 / 0.5 / 1.5	
91 x 6 x 63.5	
see derating curve	

tension clamp connection	
1.5 / 0.5 / 1.5	
91 x 6 x 63.5	
see derating curve	

Ordering data

Version	
Note	

Type	Qty.	Order No.
MCZ OVP Gas charge eliminator 90V	10	8449130000

Type	Qty.	Order No.
MCZ OVP VARISTOR S10K30	10	8449140000

Accessories

Note
End plate 4P MZ 1.5 828900000

End plate 4P MZ 1.5 828900000

Note
End plate 4P MZ 1.5 828900000

Overvoltage protection for instrumentation and control systems

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- 6 mm Slimline fine overvoltage protection
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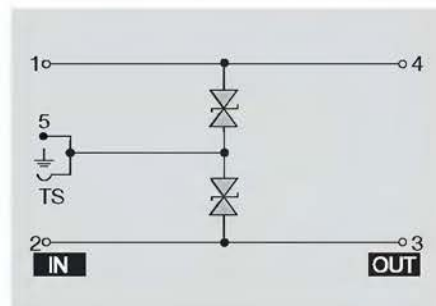
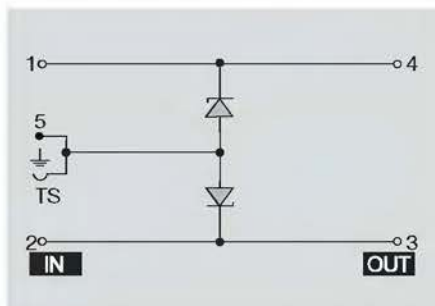
MCZ OVP TAZ 24 V DC

Diode unipolar



MCZ OVP TAZ 24 V UC

Diode bipolar



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.
 Approvals

24 V
 30 V
 16.00 A
 0.20 Ω
 no
 no
 yes
 112
 55 V
 65 V
 55 V
 65 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

24 V
 27 V
 27 V
 16.00 A
 0.20 Ω
 no
 no
 yes
 0.5 kA
 55 V
 65 V
 110 V
 130 V
 terminal
 tension clamp connection
 -25 °C/85 °C
 -25 °C/60 °C
 CE;ULus

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5

see derating curve

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5

see derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP TAZ DIODE 24VDC	10	8449150000

Type	Qty.	Order No.
MCZ OVP TAZ DIODE 24VUC	10	8449160000

Note

Accessories

Note

End plate
 4P M52 1.5 828900000

End plate
 4P M52 1.5 828900000

Narrow overvoltage protection terminals with screw connection

Overvoltage protection terminals with the tried-and-tested screw connection in the DKU series are characterised by their high level of protection concentrated in a compact design. They are suitable for installing in the narrowest of places in automated process, industrial and building services systems. The three-stage overvoltage protection terminals operate with gas discharge tubes, varistors, suppression diodes (TAZ) or decoupling inductances. The gas discharge tubes discharge high currents reliably; the varistors and suppression diodes absorb the residual voltages. The rated current for the DK4U and DK5U is max. 300 mA and for the DK6U max. 1 A. The DKU series comprises the DKU, DK4U, DK5U and DK6U, which are 6, 8 or 12 mm wide.

Type **DK4U** contains individual components such as varistors, gas discharge tubes or suppression diodes. Two types of varistor (MOV) are used: Type S14 is intended for lower levels of interference. It is suitable for interference protection circuits in solenoid valves or switching contacts. Type S20 is reserved for more demanding situations.

The fine gradation of the voltage varistors permits the use of all conventional rated voltages. This results in a wide range of variations. The preferred types are varistors that are used for rated voltages of 24, 48, 115 and 230 V.

Two types of gas discharge tube are used: **Gas discharge tubes** (GDT) up to 10 kA are suitable for integrating into instrumentation and control circuits, those up to 20 kA for higher signal and mains voltages.

The **suppression diodes** (Tranzorb diodes) differ in terms of voltage and are suitable for discharging small and fast transients. The tightening torque according to IEC 947 is 0.5 Nm.

RC combinations

RC combinations can be used as suppression circuits for contactors and solenoid valves, or for increasing the interference immunity of long AC lines. They exhibit very good properties with regard to limiting the opening overvoltages, reducing the rate of voltage variation and shortening break times. Weidmüller RC combinations may be used in both AC and DC circuits.

RD combinations

RD combinations are used with DC-operated equipment. Compared to a diode circuit, the resistance of the resistor / diode combination results in a shorter recovery time. RD combinations exhibit excellent suppression effects because the resistance limits the flow of current and, as a result, the

switching times are shorter. RD combinations are also less expensive than RC combinations.

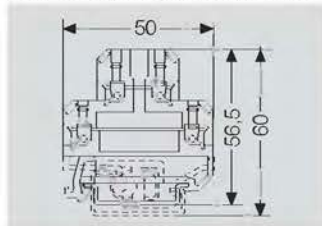
If the length of the recovery time of the connected device is irrelevant, a diode circuit is preferable. If the effect on the response times of the device to be connected are to be minimised, suppression combinations with varistors or RC combination are advantageous.

WPO 4

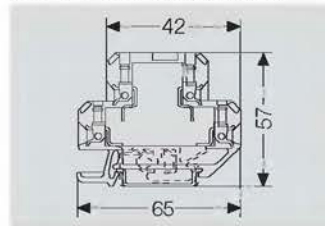
The Weidmüller WPO 4 terminal enables the retrofitting of electronic components like diodes, RC combinations, varistors or gas discharge tubes. As the protective elements are simply plugged in, specific protective circuits can be set up inexpensively in situ. All components are likewise easy to replace.

F

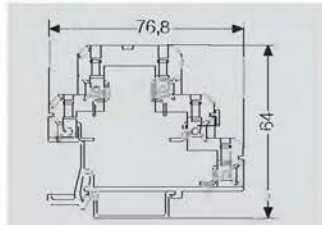
DK 4 U Varistor gas discharge tube



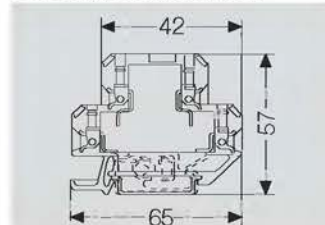
DK 4 U with suppression diode



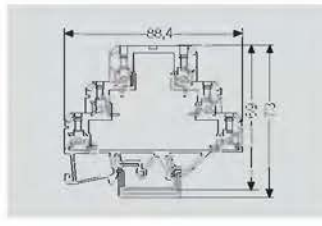
DK 5 U



DKU with combination circuit



DK 6 U



Overvoltage protection for instrumentation and control systems

3-stage protection with screw connection

Slimline overvoltage protection terminal with screw connection

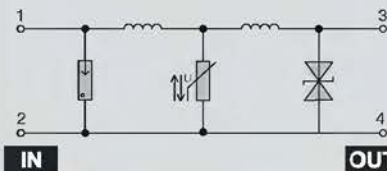
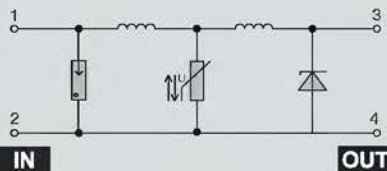
DKU 24 V DC 0.3 A

Protection for binary signals



DKU 48 V V UC 0.3 A

Protection for binary signals



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

24 V
 28 V
 0,30 A
 3,00 Ω
 yes
 yes
 yes
 500,0 kHz 240 Ω
 5 kA
 35 V
 45 V
 35 V
 45 V
 terminal
 Screw connection
 -25 °C/85 °C
 -25 °C/60 °C

48 V
 48 V
 54 V
 0,30 A
 3,00 Ω
 yes
 yes
 yes
 1000,0 kHz 480 Ω
 7 kA
 82 V
 110 V
 82 V
 180 V
 terminal
 Screw connection
 -25 °C/85 °C
 -25 °C/60 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

2,5 / 0,5 / 4
 65 x 6 x 60

2,5 / 0,5 / 4
 65 x 6 x 60

Note

Ordering data

Type	Qty.	Order No.
DKU 35 24VDC In:0,22A	10	8015810000

Type	Qty.	Order No.
DKU 35 48VUC In:0,22A	10	8019290000

Note

DKU 35 height 57mm

DKU 35 height 57mm

Accessories

Note

End plate
 AP DHT4 P#: 0e87560000

End plate
 AP DHT4 P#: 0e87560000

3-stage protection with screw connection

Slimline overvoltage protection terminal with screw connection

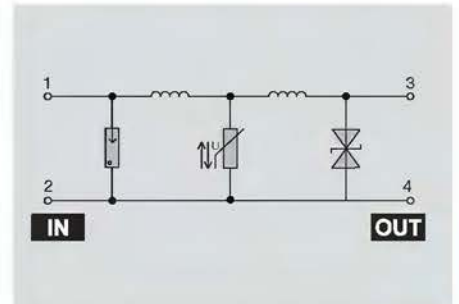
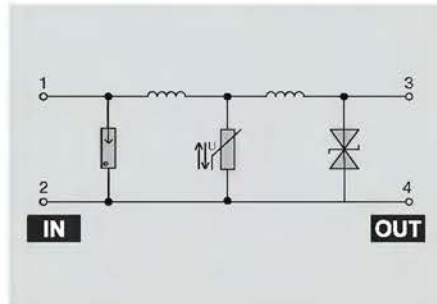
DKU 115 V UC 0.3 A

Protection for binary signals



DKU 230 V UC 0.3 A

Protection for binary signals



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μs)
 Protection level on output side sym., input 1 kV/μs, typ.
 Protection level on output side sym., input 8/20 μs, typ.
 Protection level on output side unsym., input 1kV/μs, typ.
 Protection level on output side unsym., input 8/20 μs, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

115 V
 115 V
 122 V
 0,30 A
 3,00 Ω
 yes
 yes
 yes
 1,0 MHz 50 Ω
 7 kA
 180 V
 220 V
 180 V
 220 V
 terminal
 Screw connection
 -25 °C/85 °C
 -25 °C/60 °C

230 V
 230 V
 240 V
 0,30 A
 3,00 Ω
 yes
 yes
 yes
 1,0 MHz 2200 Ω
 7 kA
 400 V
 520 V
 400 V
 520 V
 terminal
 Screw connection
 -25 °C/85 °C
 -25 °C/60 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

2,5 / 0,5 / 4
 65 x 6 x 60

2,5 / 0,5 / 4
 65 x 12 x 60

Note

Ordering data

Type	Qty.	Order No.
DKU 32 115VUC 0,3A	10	8019300000
DKU 35 115VUC 0,3A	10	8019310000

Type	Qty.	Order No.
DKU 32 230VUC 0,3A	10	8019320000
DKU 35 230VUC 0,3A	10	8019330000

Note

DKU 35 height 57mm

DKU 35 height 57mm

Accessories

Note

End plate
 4P DHT4 P8: 0es7560000

End plate
 4P DHT4 P8: 0es7560000

Overvoltage protection for instrumentation and control systems

3-stage protection with screw connection

Slimline overvoltage protection terminal with screw connection

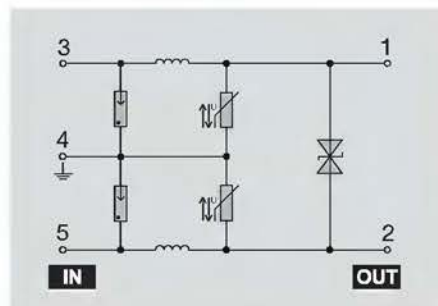
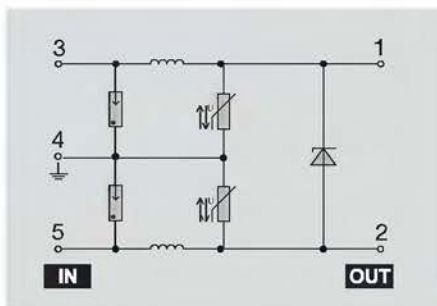
DKU DK5 24 V DC 0.3 A

Protection for analogue signals



DKU DK5 48 V UC 0.3 A

Protection for analogue signals



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1 kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

24 V
 28 V
 0,30 A
 3,00 Ω
 yes
 yes
 yes
 400,0 kHz/240 Ω
 5 kA
 30 V
 45 V
 35 V
 45 V
 terminal
 Screw connection
 -25 °C/85 °C
 -25 °C/60 °C

48 V
 48 V
 54 V
 0,30 A
 3,00 Ω
 yes
 yes
 yes
 400,0 kHz/240 Ω
 7 kA
 82 V
 110 V
 110 V
 180 V
 terminal
 Screw connection
 -25 °C/85 °C
 -25 °C/60 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

2,5 / 0,5 / 4
 76,8 x 6 x 72

2,5 / 0,5 / 4
 76,8 x 6 x 72

Note

Ordering data

Type	Qty.	Order No.
DKU DK5 24VDC 0,3A	10	8238340000

Type	Qty.	Order No.
DKU DK5 48VUC 0,3A	10	8262470000

Note

DKU DK5 TS35, 68 mm high

DKU DK5 TS35, 68 mm high

Accessories

Note

End plate
 4P DK5 P5 EE 4066790000

End plate
 4P DK5 P5 EE 4066790000

3-stage protection with screw connection

Slimline overvoltage protection terminal with screw connection

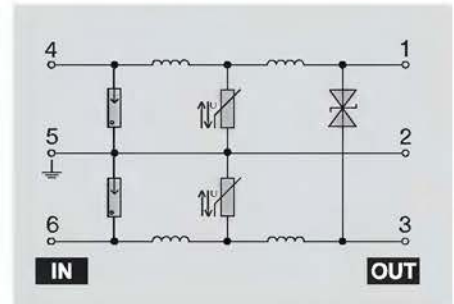
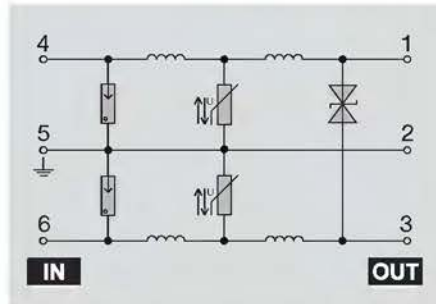
DKU DK6 120 V UC 1 A

Protection for analogue signals



DKU DK6 230 V UC 1 A

Protection for analogue signals



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

120 V
 120 V
 130 V
 1.00 A
 0.30 Ω
 yes
 yes
 yes
 22.0 kHz 120 Ω
 7 kA
 220 V
 290 V
 290 V
 350 V
 terminal
 Screw connection
 -25 °C/85 °C
 -25 °C/60 °C

230 V
 230 V
 240 V
 1.00 A
 0.30 Ω
 yes
 yes
 yes
 22.0 kHz 120 Ω
 7 kA
 600 V
 800 V
 820 V
 950 V
 terminal
 Screw connection
 -25 °C/85 °C
 -25 °C/60 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

2.5 / 0.5 / 4
 88.4 x 8 x 73

2.5 / 0.5 / 4
 88.4 x 8 x 73

Note

Ordering data

Type	Qty.	Order No.
DKU DK6 120VAC 1,0A	10	8262480000

Type	Qty.	Order No.
DKU DK6 230VAC 1,0A	10	8263760000

Note

DK6U TS35, 69 mm high

DK6U TS35, 69 mm high

Accessories

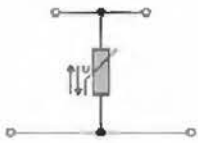
Note

End plate
 4P DK6 P5 EE 8232456000

End plate
 4P DK6 P5 EE 8232456000

Overvoltage protection for instrumentation and control equipment

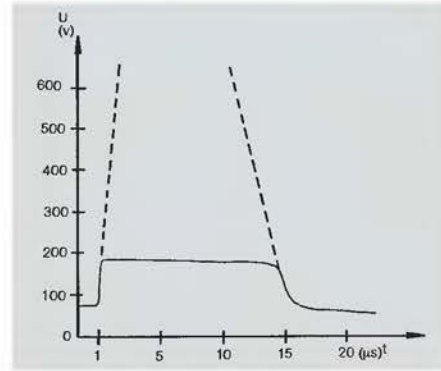
DK series with varistor in terminal design



Varistors

Metal-oxide varistors are used as varistors. These are approved for the maximum sinusoidal operating AC voltage indicated on the component. Any voltage exceeding the indicated voltage is safely discharged. Varistors can be used for medium to large ratings.

DK 4 U S 20 K 130



F

Rated data DK 4 U

Type	Max. operating voltage at varistor		Max. energy and surge current for 8/20 μs impulse		Max. energy and surge current for 10 000 8/20 μs impulses		Max. varistor voltage at 10 A		Max. varistor voltage at 1 mA		Capacity pF	Order No. TS 32	Order No. TS 35
	U _{eff} V	U- V	Energy J	Surge cur. A	Energy J	Surge cur. A	Disch. cur. V	V					
S 14	11	14	1,6	1000	0,07	75	36	18	18000	on request	9401400000		
	14	18	2,0	1000	0,08	75	42	22	15000	9401010000	on request		
	17	22	2,7	1000	0,11	75	52	27	10000	9401020000	on request		
	20	26	3,3	1000	0,13	75	65	33	7500	9401030000	9401430000		
	25	31	3,7	1000	0,15	75	75	39	6500	9401040000	9401440000		
	Preferred types 24 V		30	38	4,4	1000	0,17	75	90	5500	9401050000	9401450000	
	35	45	5,2	1000	0,23	75	110	56	4500	on request	on request		
	40	56	6,8	1000	0,27	75	125	68	3300	9401070000	9401470000		
	Preferred types 48 V		50	65	27,0	4500	0,6	150	135	2900	9401080000	9401480000	
	60	85	30,0	4500	0,7	150	155	100	2400	9401090000	9401490000		
Preferred types 115 V		75	100	38,0	4500	0,8	150	185	1900	9401100000	9401500000		
95	125	45,0	4500	1,0	150	230	150	1500	on request	on request			
130	170	55,0	4500	1,3	150	315	205	1000	9401120000	9401520000			
140	180	60,0	4500	1,5	150	330	220	1000	on request	on request			
150	200	65,0	4500	1,5	150	350	240	900	on request	9401540000			
175	225	68,0	4500	1,6	150	420	270	750	on request	on request			
230	300	85,0	4500	2,1	150	560	360	550	on request	9401560000			
250	320	92,0	4500	2,4	150	610	390	500	on request	9401570000			
Preferred types 230 V		275	350	100,0	6500	2,5	190	660	430	9401180000	9401580000		
300	385	110,0	6500	2,6	190	740	470	400	9401190000	9401590000			
S 20	11	14	3,0	2000	0,12	125	32	18	37000	on request	on request		
	14	18	4,0	2000	0,15	125	38	22	30000	on request	on request		
	17	22	5,6	2000	0,19	125	48	27	22000	on request	9401620000		
	20	26	6,6	2000	0,24	125	60	33	17000	on request	9401630000		
	25	31	7,8	2000	0,28	125	70	39	15000	9401240000	9401640000		
	Preferred types 24 V		30	38	9,0	2000	0,35	125	85	13000	9401250000	9401650000	
	35	45	10,8	2000	0,40	125	100	56	11000	on request	on request		
	40	56	14,0	2000	0,48	125	120	68	7000	9401270000	on request		
	Preferred types 48 V		50	65	36,0	6500	0,5	190	120	5500	on request	9401680000	
	60	85	45,0	6500	0,7	190	150	100	4800	on request	9401690000		
75	100	55,0	6500	0,8	190	180	120	3800	on request	on request			
95	125	65,0	6500	1,0	190	220	150	3000	on request	on request			
Preferred types 115 V		130	170	80,0	6500	1,4	190	300	2000	9401320000	9401720000		
140	180	90,0	6500	1,5	190	320	220	2000	9401330000	9401730000			
150	200	95,0	6500	1,6	190	340	240	1800	on request	9401740000			
175	225	110,0	6500	1,8	190	390	270	1600	on request	on request			
230	300	130,0	6500	2,4	190	550	360	1200	9401360000	9401760000			
250	320	140,0	6500	2,7	190	600	390	1000	9401370000	9401770000			
Preferred types 230 V		275	350	150,0	8000	2,9	300	640	900	9401380000	9401780000		
300	385	160,0	8000	3,0	300	700	470	900	on request	9401790000			

Overall width 12 mm

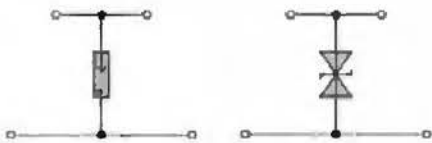
DK 4 U with gas discharge tube or suppression diode



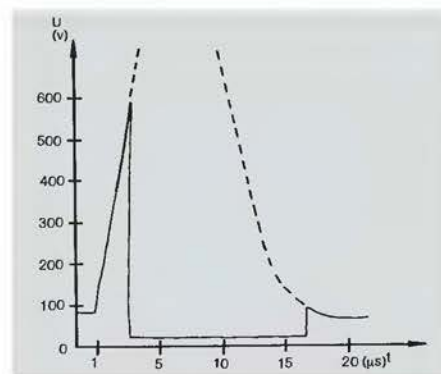
from high resistance to low resistance. This process depends on the surge of the overvoltage and the rated DC pull-in voltage. The rated DC pull-in voltage is printed on the side of the gas discharge tube. Once the gas is ignited a typical arcing voltage of 10 to 30 V is produced across the component. The ionisation of the gas causes the gas discharge tube to become low resistive, allowing a high follow current to flow. Suitable measures must be taken to limit the follow current, for example, by fusing.

Suppression diodes

Suppression diodes work on a similar principle to conventional Zener diodes. If the indicated breakdown voltage is exceeded, the diode conducts. Compared to Zener diodes, suppression diodes have a higher current carrying capacity and faster response times in the ps range.



DK 4 U gas discharge tube 5 kA, 90 V



Gas discharge tube

The so-called gas discharge tube consists of two electrodes spaced a defined distance apart, enclosed in a small glass or ceramic tube. Between the electrodes is an inert gas at a defined pressure. A voltage surge, which has a rise time of 1 kV/μs and reaches a peak of 10 kV, can be limited to approx. 600 ... 700 V. The gas-filled space changes

**Rated data
DK 4 U**

Type		Rated DC sparkover voltage		Impulse sparkover voltage at 1 kV/μs	Maximum rated voltage		Capacity	Order No. TS 32	Order No. TS 35
		V	Tolerance %		U _{eff} V	U ₋ V			
10 kA (8/20 μs)	Preferred types 24 V	90 –	±25	< 600	35	50	≈2	on request	9400300000
	Preferred types 48 V	150 –	±15	< 600	60	90	≈2	on request	on request
		230 –	±20	< 600	95	135	≈2	on request	on request
20 kA (8/20 μs)									
	Preferred types 24 V	90 –	±25	< 600	35	50	≈2	9400400000	9400500000
		150 –	±15	< 600	60	90	≈2	on request	on request
	Preferred types 48 V	230 –	±15	< 650	95	135	≈2	on request	on request
	Preferred types 115 V	470 –	±15	<1000	200	280	≈2	9400440000	9400540000
	Preferred types 230 V	600 –	±15	<1000	255	360	≈2	9400450000	9400550000
DK 4 U with suppression diode		20 –	±10	< 60	-	28	≈3000	8016950000	8016960000
		48 ac	±10	< 146	53	74	≈1400	on request	on request
		115 ac	±10	< 300	135	178	≈700	on request	on request
		230 ac	±10	< 700	320	240	≈400	on request	8017020000
WDK 2.5 V with suppression diode		24 ac	±10	< 60	33 V	28 V	≈3000		8132760000

Overvoltage protection for instrumentation and control equipment

DK series with electronic components (other versions on request)



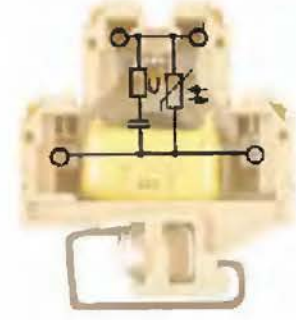
DK 4 RC

Arc suppression circuit for contactors and solenoid valves (AC)
Suppressor module for optocoupler inputs



DK 4 RC-VDR

Arc suppression circuit
for contactors and solenoid valves (AC)



Technical data

Dimensions DK 4/WDK 2.5

Terminal width (+ fitting tolerance 0.2)
Insulation stripping length

Connection data

Screw connection, flexible DK 4
Screw connection, flexible WDK 2.5
Wire cross-section DK 4
Wire cross-section WDK 2.5

VDE rated data

Voltage 250 V~/300 V-
Diode current
Diode reverse voltage
Current of continuous current bar 10 A

Diode
Resistance 220 Ω
Capacitor 0.22 µF
Varistor (max. operating voltage)
Gas discharge tube (rated DC sparkover voltage)
max. discharge current (standard wave 8/20 µs)

Note

Ordering data

Version	
	for TS 32
	for TS 35
	for TS 35

Note

Accessories

Mounting rail (2 m lengths)	
End bracket (thickness mm)	
End plate (thickness mm)	
Insulation plate	
Socket for test plug	
Test plug (pin diameter)	
Cross-connection (pre-assembled)	3-pole 4-pole 10-pole
Cover plate	
Fixing screw (plastic)	
Cross-connection bridge	2-pole 3-pole 4-pole 75-pole
Insulation profile	
Note	

18 mm	
9 mm	
0.5 ... 4 mm ²	
AWG 22 ... 12	
250 V~/300 V-	
10 A	
220 Ω	
0.22 µF	
-	
-	
-	

Type	Order No.
DK 4 RC	0692160000
DK 4 RC/35	0053160000
WDK 2.5 RC	8065910000

Note

Type	Qty.	Order No.
TS 32	-	0122800000
TS 35	-	0383400000
EWK 1 (8.5)	50	0206160000
EW 35 (8.5)	50	0383560000
AP PA (1.5)	20	0359260000
TSch 4	100	0363360000
SIB 8.5	50	0215700000
PS (ø 2.3)	20	0180400000
Q 4	50	0336600000
Q 10	20	0368600000
BSK M 2.5 x 18	100	0303300000
QB 2 ⁰)	100	0482700000
QB 3 ⁰)	50	0482800000
QB 4 ⁰)	50	0482900000
QB 75 blank	10	0526400000
IP	-	0526700000
SIB 8.5	50	0215700000

⁰) When using QB: wire connection max. 2.5 mm²

18 mm	
9 mm	
0.5 ... 4 mm ²	
AWG 22 ... 12	
24 V-	
10 A	10 A
47 Ω	47 Ω
0.22 µF	0.22 µF
S 14	S 14
50 V	250 V
-	-

Type	Gas discharge tube	Order No.
DK 4 RC-VRS	50 V	9401860000
DK 4 RC-VRS	50 V	9401960000
DK 4 RC-VRS/35	250 V	9402260000
DK 4 RC-VRS/35	250 V	9402360000

Note

Type	Qty.	Order No.
TS 32	-	0122800000
TS 35	-	0383400000
EWK 1 (8.5)	50	0206160000
EW 35 (8.5)	50	0383560000
AP PA (1.5)	20	0359260000
TSch 4	100	0363360000
SIB 8.5	50	0215700000
PS (ø 2.3)	20	0180400000
Q 4	50	0336600000
Q 10	20	0368600000
BSK M 2.5 x 18	100	0303300000
QB 2 ⁰)	100	0482700000
QB 3 ⁰)	50	0482800000
QB 4 ⁰)	50	0482900000
QB 75 blank	10	0526400000
IP	-	0526700000

DK 4 RD

Arc suppression circuit for contactor and solenoid valves (AC)



12 mm
9 mm
0.5 ... 4 mm ²
–
AWG 22 ... 12
–
3 A
1300 V
10 A
BY 255
22 Ω (4 W)
–
–
–

Type	Order No.
DK 4 RD	0150260000
DK 4 RD/35	0059160000

Type	Qty.	Order No.
TS 32	–	0122800000
TS 35	–	0383400000
EWK 1 (8.5)	50	0206160000
EW 35 (8.5)	50	0383560000
AP PA (1.5)	20	0359260000
TSch 4	100	0363360000
SIB 8.5	50	0215700000
PS (ø 2.3)	20	0180400000
Q 3	50	0336500000
Q 4	50	0336600000
Q 10	20	0368600000
AD 4 (4 terminals)	50	0303400000
BSK M 2.5 x 18	100	0303300000
QB 2 ¹	100	0482700000
QB 3 ¹	50	0482800000
QB 4 ¹	50	0482900000
QB 75 blank	10	0526400000
IP	–	0526700000

for retrofitting electronic components

WOP 4 with a pluggable varistor Weidmüller varistor terminals have been designed to allow the retrofitting of electronics components, e.g. varistors, diodes, gas discharge tubes, etc. These electronic terminals no longer have to be configured prior to installation and thus be delivered with soldered components which can no longer be distinguished.

The significant advantages of this new design are:

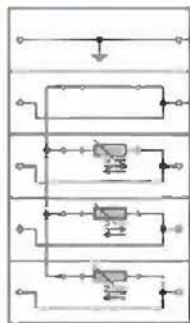
- Cost-savings
- Components can be changed quickly on site
- Service is limited to visual inspection
- Components are easy to distinguish
- Flexibility
- Components can immediately be adapted to changed conditions

Technical data

Dimensions	
Width x length x height (mm) with TS 35x7.5 V	
Insulation stripping length/clamping screw	
Rated data	
Rated voltage/current/cross-section	
Rated impulse voltage VDE 0110/1.93/pollution severity	
Further technical data	
Tightening torque range	Nm
Torque setting with DMS2 electric screwdriver clamping range	
"e" solid HO7V-U	mm ²
"m" stranded HO7V-R	mm ²
"f" flexible HO7V-K	mm ²
"f" flexible HO7V-K and AEH DIN 46228/1	mm ²
"f" flexible HO7V-K and AEH with plastic collar	mm ²
Plug gauge to 947-1	Size
Continuous current rating of terminal for wire size	
Wire diameter of electrical components	mm
Note	

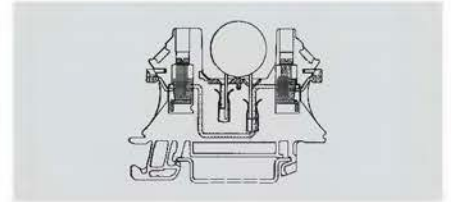
Ordering data

Version	Wemid
Intermediate frame	Thickness 1.5 mm
Busbar	
Varistors	for 24 V for 230 V
Gas discharge tube	for 90 V for 600 V
Note	



Overvoltages in a three-phase supply discharged to earth via WPE with the aid of varistors and a gas discharge tube.

WPO 4



Dimensions	
6x60x47	
9 mm/M 3	
Rated data	
250 V/32 A/4 mm ²	
4 kV/3	
Further technical data	
Tightening torque range	0.5 ... 1.0
Torque setting with DMS2 electric screwdriver clamping range	
2	
"e" solid HO7V-U	0.5 ... 4
"m" stranded HO7V-R	1.5 ... 4
"f" flexible HO7V-K	0.5 ... 4
"f" flexible HO7V-K and AEH DIN 46228/1	0.5 ... 4
"f" flexible HO7V-K and AEH with plastic collar	0.5 ... 4
Plug gauge to 947-1	A 3
Continuous current rating of terminal for wire size	
Wire diameter of electrical components	0.8 ... 1.0 mm
Note	

Type	Qty.	Order No.
	50	1036000000
ZR	20	1071100000
SSch 7.3x1.2	1m	1071200000
S14k30		4127830000
S14k275		4011070000
90 V 20 kA		4233030000
600 V 20 kA		4140810000

Accessories

Marking tags	Type	Order No.
Print		
Consecutive horizontal	DEK6 FW	on request
Consecutive vertical	DEK6 FS	on request

Note

Overvoltage protection combination in the SAI distributor



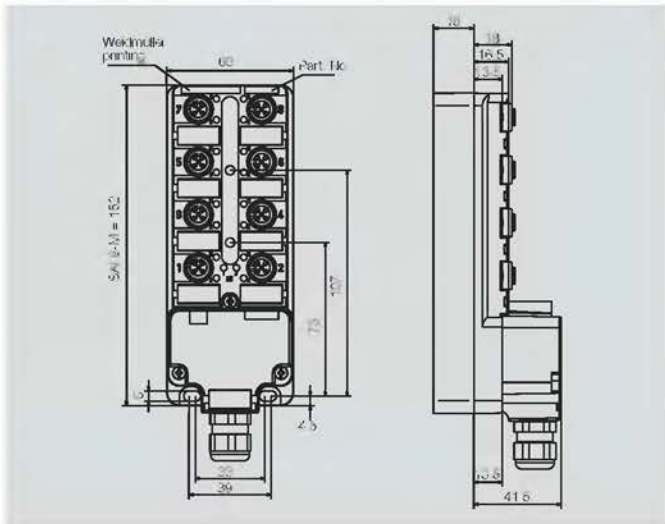
The SAI OVP provides in situ overvoltage protection for the installation. The distributor can be used in conjunction with a passive hood (see figure) or in conjunction with a plug-in fieldbus module. The cables are simply and securely connected to the SAI OVP by way of M12 plug-in connectors.

In situ overvoltage protection has many advantages:

The coupled overvoltage is discharged between the conductors and to earth in the vicinity of the sensor and actuator, and hence provides protection for the distributor as well as the consumers.

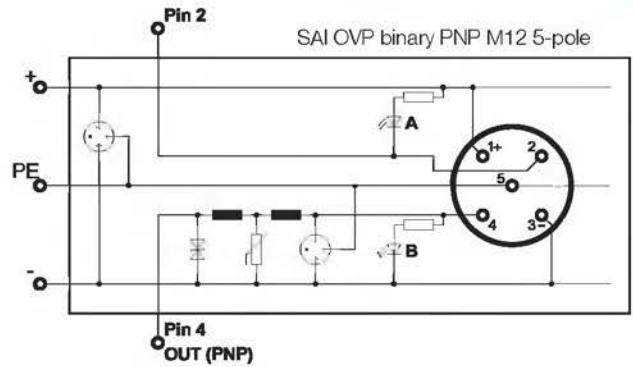
When located near to the control cabinet, further overvoltage protection in the cabinet is unnecessary.

F



Overvoltage protection in watertight enclosure

- 16 binary I/O channels, 8 of them protected against overvoltage
- 3-stage protective combination with gas discharge tube, varistor and suppression diode
- Pluggable connection module for bus line
- M12, 8-way, 5-pole design
- Ingress protection classification IP 68
- Standard pin arrangement
- Additional 6.3 mm spade connection for operational earthing



Hood, 8-way, 5-pole

Ordering data

Type	Qty	Order No.
SAI-8-M 5P M12 OVP	1	1864750000

3-stage protection with screw connection

EGU – overvoltage protection offering excellent protection from 0.05 to 10 A

These tried-and-tested protection modules with screw connections are ideal for process, industrial and building services automation. The series comprises the **EGU1**, **EGU2**, **EGU3**, **EGU4** and **RSU** versions, all of which can be clipped onto the **TS35** and **TS32** rails. The build-in housings can be mounted in either direction by turning the base through 180°. The two- or three-stage protection offered by the EGU series operates with gas discharge tubes, varistors, suppression diodes (TAZ) and uncoupling inductances. Gas discharge tubes discharge high currents reliably. Varistors and suppression diodes absorb the residual voltages. The rated current is up to 1.5 A for the EGU types, up to 10 A for the RSU types. The products can be supplied for rated voltages of 24, 48, 115 or 230 V.

RSU



Three-stage overvoltage protection with GDT, MOV and suppression diode for analogue signals with high current requirement, or for power supplies in instrumentation and control installations. Available in versions for 24, 48, 115 or 230 V.

General technical data for RSU:

storage temperature: -25 ... +85 °C
 operating temperature: -25 ... +40 °C
 packed singly

EGU1



Two-stage overvoltage protection with GDT and MOV for binary signals, with 24, 48, 115 or 230 V, and additional fuse plus LED signal indicator.

EGU2



Three-stage overvoltage protection with GDT, MOV and suppression diode for binary signals, with 24, 48, 115 or 230 V, and additional fuse plus LED signal indicator.

EGU3



Two-stage overvoltage protection with GDT and MOV for analogue signals, with 24, 48, 115 or 230 V. Two signal lines are protected from each other and against earth with varistors.

EGU4



Three-stage overvoltage protection with GDT, MOV and suppression diode for analogue signals, with 24, 48, 115 or 230 V. Two signal lines are protected from each other and against earth with varistors and suppression diodes. Special versions are available, upon request, for protecting data lines.

General technical data for EGU:

storage temperature: -25 ... +85 °C
 operating temperature: -25 ... +60 °C
 packed singly

EGU 1 50 mA

e.g. for binary signals

Dimensions:
L x W x H = 58 x 63 x 20 mm



Schematic circuit diagram



Schematic circuit diagram



Data

Current per path, I _{max} :	50 mA
Resistance per path, max:	28 Ω
Fuse 5x20:	F 63 mA
Model, Ingress protection class:	EG 2 IP20
Screw connection:	0.5 ... 6 mm ²

Ordering data

Technical data

Type	Order No.
EGU1, 24VUC	0243960000
Voltage, U _n 1.2:	24 V UC
Voltage, U _c 1.2:	30 V AC / 38 V DC
Rated data of components	Gas discharge tube:
	Varistor:
Max. frequency (-3 db/load impedance):	20 kHz / 500 Ω
Discharge current, I _{max} (8/20 μs), typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	55 V
For 8/20 μs (rated discharge current), typical:	75 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	55 V
For 8/20 μs (rated discharge current), typical:	75 V

Ordering data

Technical data

Type	Order No.
EGU1, 48VUC	0244460000
Voltage, U _n 1.2:	48 V UC
Voltage, U _c 1.2:	60 V AC / 85 V DC
Rated data of components	Gas discharge tube:
	Varistor:
Max. frequency (-3 db/load impedance):	40 kHz / 1000 Ω
Discharge current, I _{max} (8/20 μs), typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	130 V
For 8/20 μs (rated discharge current), typical:	190 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	130 V
For 8/20 μs (rated discharge current), typical:	190 V

Ordering data

Technical data

Type	Order No.
EGU1, 115VUC	0240560000
Voltage, U _n 1.2:	115 V UC
Voltage, U _c 1.2:	130 V AC / 170 V DC
Rated data of components	Gas discharge tube:
	Varistor:
Max. frequency (-3 db/load impedance):	88 kHz / 2200 Ω
Discharge current, I _{max} (8/20 μs), typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	180 V
For 8/20 μs (rated discharge current), typical:	250 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	180 V
For 8/20 μs (rated discharge current), typical:	250 V

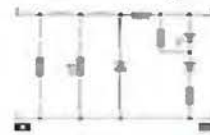
EGU 2 50 mA

e.g. for binary signals

Dimensions:
L x W x H = 58 x 63 x 20 mm



Schematic circuit diagram



Schematic circuit diagram



Data

Current per path, I _{max} :	50 mA
Resistance per path, max:	28 Ω
Fuse 5x20:	F 63 mA
Model, Ingress protection class:	EG 2 IP20
Screw connection:	0.5 ... 6 mm ²

Ordering data

Technical data

Type	Order No.
EGU2, 24VDC	0223060000
Voltage, U _n 1.2:	24 V DC
Voltage, U _c 1.2:	28 V DC
Rated data of components	Gas discharge tube:
	Varistor:
	Suppression diode:
Max. frequency (-3 db/load impedance):	10 kHz / 500 Ω
Discharge current, I _{max} (8/20 μs) typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	35 V
For 8/20 μs (rated discharge current), typical:	75 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	55 V
For 8/20 μs (rated discharge current), typical:	75 V

Ordering data

Technical data

Type	Order No.
EGU2, 48VUC	0226560000
Voltage, U _n 1.2:	48 V UC
Voltage, U _c 1.2:	55 V AC / 88 V DC
Rated data of components	Gas discharge tube:
	Varistor:
	Suppression diode:
Max. frequency (-3 db/load impedance):	20 kHz / 500 Ω
Discharge current, I _{max} (8/20 μs) typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	82 V
For 8/20 μs (rated discharge current), typical:	120 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	82 V
For 8/20 μs (rated discharge current), typical:	120 V

Ordering data

Technical data

Type	Order No.
EGU2, 115VUC	0226660000
Voltage, U _n 1.2:	115 V UC
Voltage, U _c 1.2:	130 V AC / 170 V DC
Rated data of components	Gas discharge tube:
	Varistor:
	Suppression diode:
Max. frequency (-3 db/load impedance):	88 kHz / 2200 Ω
Discharge current, I _{max} (8/20 μs) typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	230 V
For 8/20 μs (rated discharge current), typical:	350 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	230 V
For 8/20 μs (rated discharge current), typical:	350 V

EGU 2 1.5 A

e.g. for power supply

Dimensions:
L x W x H = 58 x 63 x 20 mm



Schematic circuit diagram



Schematic circuit diagram



Data

Current per path, I _{max} :	1.5 A
Resistance per path, max:	0.2 Ω
Fuse 5x20:	F 1.6 A
Model, Ingress protection class:	EG 2 IP20
Screw connection:	0.5 ... 6 mm ²

Ordering data

Technical data

Type	Order No.
EGU2, 24VDC	9310630000
Voltage, U _n 1.2:	24 V DC
Voltage, U _c 1.2:	28 V DC
Rated data of components	Gas discharge tube:
	Varistor:
	Suppression diode:
Max. frequency (-3 db/load impedance):	500 kHz / 16 Ω
Discharge current, I _{max} (8/20 μs) typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	35 V
For 8/20 μs (rated discharge current), typical:	45 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	55 V
For 8/20 μs (rated discharge current), typical:	75 V

Ordering data

Technical data

Type	Order No.
EGU2, 48VUC	1170160000
Voltage, U _n 1.2:	48 V UC
Voltage, U _c 1.2:	55 V AC / 88 V DC
Rated data of components	Gas discharge tube:
	Varistor:
	Suppression diode:
Max. frequency (-3 db/load impedance):	1 MHz / 32 Ω
Discharge current, I _{max} (8/20 μs) typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	82 V
For 8/20 μs (rated discharge current), typical:	120 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	82 V
For 8/20 μs (rated discharge current), typical:	120 V

Ordering data

Technical data

Type	Order No.
EGU2, 115VUC	9311520000
Voltage, U _n 1.2:	115 V UC
Voltage, U _c 1.2:	130 V AC / 170 V DC
Rated data of components	Gas discharge tube:
	Varistor:
	Suppression diode:
Max. frequency (-3 db/load impedance):	1.5 MHz / 70 Ω
Discharge current, I _{max} (8/20 μs) typical:	6 kA
Protection level on output side, symmetric	
For 1 kV/μs pulse at input, typical:	230 V
For 8/20 μs (rated discharge current), typical:	350 V
Level of protection on output side, asymmetric:	
For 1 kV/μs pulse at input, typical:	230 V
For 8/20 μs (rated discharge current), typical:	350 V

Overvoltage protection for instrumentation and control equipment

EGU 3 50 mA

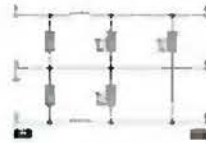
e.g. for current loops

Dimensions:

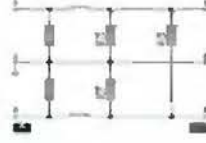
L x W x H = 58 x 95 x 22.5 mm



Schematic circuit diagram



Schematic circuit diagram



Data	
Current per path, I _{max}	50 mA
Resistance per path, max	18 Ω
Model, Ingress protection class	EG 3 IP20
Screw connection:	0.5 ... 4 mm ²

Ordering data	Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
	EGU3, 24 V UC	0250560000	EGU3, 48 V UC	0250660000	EGU3, 115 V UC	9311530000	EGU3, 230 V UC	0250660000
Technical data								
Voltage, U _n 1.3:	24 V UC		48 V UC		115 V UC		230 V UC	
Voltage, U _c 1.3:	30 V AC / 38 V DC		60 V AC / 85 V DC		130 V AC / 170 V DC		250 V AC / 320 V DC	
Rated data of components	Gas discharge tube:	90 V 5 kA	230 V 5 kA	230 V 5 kA	230 V 5 kA	600 V 20 kA		
	Varistor:	30 V	65 V	180 V	275 V			
Max. frequency (-3 dB/load impedance):	10 kHz / 500 Ω		20 kHz / 1000 Ω		44 kHz / 2200 Ω		75 kHz / 4500 Ω	
Discharge current, I _{max} (8/20 μs), typical:	6 kA		6 kA		6 kA		24 kA	
Protection level on output side, symmetric:								
For 1 kV/μs pulse at input, typical:	55 V		130 V		180 V		300 V	
For 8/20 μs (rated discharge current), typical:	75 V		150 V		220 V		350 V	
Level of protection on output side, asymmetric:								
For 1 kV/μs pulse at input, typical:	85 V		150 V		230 V		400 V	
For 8/20 μs (rated discharge current), typical:	105 V		190 V		290 V		430 V	

EGU 3 1.5 A

e.g. for power supply

Dimensions:

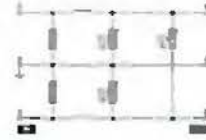
L x W x H = 58 x 95 x 22.5 mm



Schematic circuit diagram



Schematic circuit diagram



Data	
Current per path, I _{max}	1.5 A
Resistance per path, max	0.1 Ω
Model, Ingress protection class	EG 3 IP20
Screw connection:	0.5 ... 4 mm ²

Ordering data	Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
	EGU3, 24 V UC	1186760000	EGU3, 48 V UC	1186960000	EGU3, 115 V UC	1186860000	EGU3, 230 V UC	1187060000
Technical data								
Voltage, U _n 1.3:	24 V UC		48 V UC		115 V UC		230 V UC	
Voltage, U _c 1.3:	30 V AC / 38 V DC		60 V AC / 85 V DC		130 V AC / 170 V DC		240 V AC / 315 V DC	
Rated data of components	Gas discharge tube:	90 V 5 kA	230 V 5 kA	230 V 5 kA	230 V 5 kA	600 V 20 kA		
	Varistor:	30 V	65 V	180 V	275 V			
Max. frequency (-3 dB/load impedance):	300 kHz / 16 Ω		400 kHz / 32 Ω		550 kHz / 70 Ω		800 kHz / 150 Ω	
Discharge current, I _{max} (8/20 μs), typical:	6 kA		6 kA		6 kA		24 kA	
Protection level on output side, symmetric:								
For 1 kV/μs pulse at input, typical:	55 V		130 V		180 V		300 V	
For 8/20 μs (rated discharge current), typical:	75 V		150 V		220 V		350 V	
Level of protection on output side, asymmetric:								
For 1 kV/μs pulse at input, typical:	85 V		150 V		230 V		400 V	
For 8/20 μs (rated discharge current), typical:	105 V		190 V		290 V		430 V	

EGU 4 0.1 A

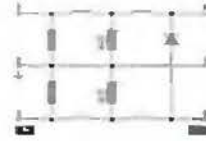
e.g. for current loops

Dimensions:

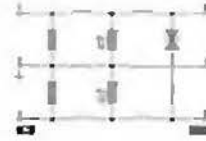
L x W x H = 58 x 95 x 22.5 mm



Schematic circuit diagram



Schematic circuit diagram



Data	
Current per path, I _{max}	100 mA
Resistance per path, max	22 Ω
Model, Ingress protection class	EG 3 IP20
Screw connection:	0.5 ... 4 mm ²

Ordering data	Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
	EGU4, 24 V DC	0459460000	EGU4, 48 V UC	0461860000	EGU4, 115 V UC	0461960000	EGU4, 230 V UC	0462060000
Technical data								
Voltage, U _n 1.3:	24 V DC		48 V UC		115 V UC		230 V UC	
Voltage, U _c 1.3:	28 V DC		55 V AC / 34 V DC		130 V AC / 170 V DC		250 V AC / 320 V DC	
Rated data of components	Gas discharge tube:	90 V 5 kA	90 V 5 kA	150 V 5 kA	600 V 20 kA			
	Varistor:	30 V	55 V	75 V	275 V			
Suppression diode:	33 V		48 V		120 V		240 V	
Max. frequency (-3 dB/load impedance):	5 kHz / 240 Ω		10 kHz / 240 Ω		20 kHz / 1200 Ω		1 MHz / 150 kΩ	
Discharge current, I _{max} (8/20 μs), typical:	6 kA		6 kA		6 kA		24 kA	
Protection level on output side, symmetric:								
For 1 kV/μs pulse at input, typical:	33 V		82 V		200 V		350 V	
For 8/20 μs (rated discharge current), typical:	45 V		130 V		250 V		420 V	
Protection level on output side, asymmetric:								
For 1 kV/μs pulse at input, typical:	48 V		110 V		310 V		390 V	
For 8/20 μs (rated discharge current), typical:	90 V		150 V		350 V		480 V	

EGU 4 1.5 A

e.g. for power supply

Dimensions:

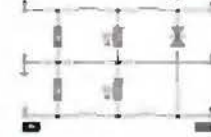
L x W x H = 58 x 95 x 22.5 mm



Schematic circuit diagram



Schematic circuit diagram



Data	
Current per path, I _{max}	1.5 A
Resistance per path, max	0.1 Ω
Model, Ingress protection class	EG 3 IP20
Screw connection:	0.5 ... 4 mm ²

Ordering data	Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
	EGU4, 24 VUC	1170960000	EGU4, 48 VUC	1171060000	EGU4, 115 VUC	1171160000	EGU4, 230 VUC	1171260000
Technical data								
Voltage, U _n 1.3:	24 V UC		48 V UC		115 V UC		230 V UC	
Voltage, U _c 1.3:	34 V AC / 26.5 V DC		53 V AC / 75 V DC		130 V AC / 170 V DC		250 V AC / 320 V DC	
Rated data of components	Gas discharge tube:	90 V 5 kA	230 V 5 kA		230 V 5kA		600 V 20 kA	
	Varistor:	30 V	55 V		75 V		275 V	
	Suppression diode:	33 V	48 V		120 V		240 V	
Max. frequency (-3 db/load impedance):	250 kHz / 16 Ω		500 kHz / 32 Ω		800 kHz / 70 kΩ		1 MHz / 150 kΩ	
Discharge current, I _{max} (8/20 μs), typical:	6 kA		6 kA		6 kA		24 kA	
Protection level on output side, symmetric:								
For 1 kV/μs pulse at input, typical:	33 V		82 V		200 V		400 V	
For 8/20 μs (rated discharge current), typical:	45 V		130 V		250 V		420 V	
Protection level on output side, asymmetric:								
For 1 kV/μs pulse at input, typical:	48 V		110 V		310 V		390 V	
For 8/20 μs (rated discharge current), typical:	90 V		150 V		350 V		480 V	

EGU 4 0.1 A

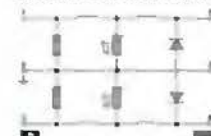
e.g. for symmetric loads

Dimensions:

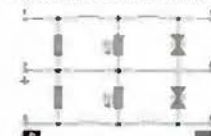
L x W x H = 58 x 95 x 22.5 mm



Schematic circuit diagram



Schematic circuit diagram



Data	
Current per path, I _{max}	100 mA
Resistance per path, max	12 Ω
Model, Ingress protection class	EG 3 IP20
Screw connection:	0.5 ... 4 mm ²

EGU 4 0.1 A

e.g. for symmetric loads

Dimensions:

L x W x H = 58 x 95 x 22.5 mm

Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
EGU4, 24 VDC	1170560000	EGU4, 48 VUC	1170660000	EGU4, 115 VUC	1170760000	EGU4, 230 VUC	1170860000
24 V DC		48 V UC		115 V UC		230 V UC	
31 V DC		55 V AC / 75 V DC		130 V AC / 170 V DC		250 V AC / 320 V DC	
90 V 5 kA		230 V 5 kA		230 V 5 kA		600 V 20 kA	
30 V		55 V		75 V		275 V	
33 V		48 V		120 V		240 V	
5 kHz / 240 Ω		20 kHz / 480 Ω		40 kHz / 1200 Ω		80 kHz / 2,2 kΩ	
6 kA		6 kA		6 kA		24 kA	
33 V		82 V		200 V		350 V	
45 V		130 V		250 V		420 V	
66 V		170 V		400 V		700 V	
110 V		190 V		480 V		880 V	

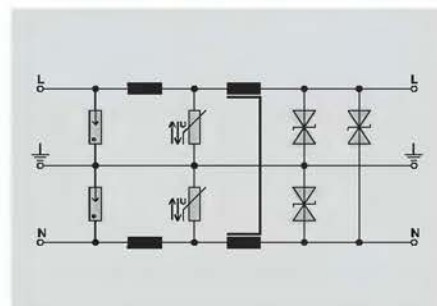
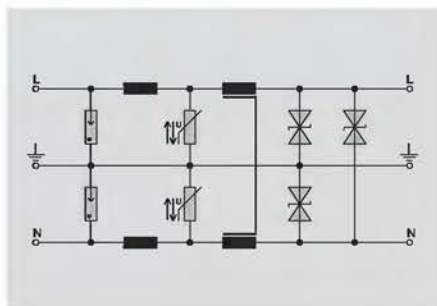
Overvoltage protection for instrumentation and control systems

3-stage protection with screw connection

- Overvoltage protection RSU for power supplies
- with current-compensated inductor
- low residual voltage thanks to suppression diodes

RSU 24 V UC 6 A

RSU 48 V UC 6 A



Technical data

Technical data

Rated voltage (AC)	24 V
Rated voltage (DC)	24 V
max. continuous voltage, U _c	27 V
Operating current, I _{max}	6,00 A
Volume resistivity	0,08 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	8,0 kHz 4 Ω
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	40 V
Protection level on output side sym., input 8/20 μs, typ.	45 V
Protection level on output side unsym., input 1kV/μs, typ.	40 V
Protection level on output side unsym., input 8/20 μs, typ.	45 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/40 °C

Rated voltage (AC)	48 V
Rated voltage (DC)	48 V
max. continuous voltage, U _c	54 V
Operating current, I _{max}	6,00 A
Volume resistivity	0,08 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	10,0 kHz 8 Ω
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	82 V
Protection level on output side sym., input 8/20 μs, typ.	130 V
Protection level on output side unsym., input 1kV/μs, typ.	82 V
Protection level on output side unsym., input 8/20 μs, typ.	130 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/40 °C

Rated voltage (AC)	48 V
Rated voltage (DC)	48 V
max. continuous voltage, U _c	54 V
Operating current, I _{max}	6,00 A
Volume resistivity	0,08 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	10,0 kHz 8 Ω
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	82 V
Protection level on output side sym., input 8/20 μs, typ.	130 V
Protection level on output side unsym., input 1kV/μs, typ.	82 V
Protection level on output side unsym., input 8/20 μs, typ.	130 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/40 °C

Type of connection

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	87 x 81 x 89

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	87 x 81 x 89

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	87 x 81 x 89

Note

Ordering data

Type	Qty.	Order No.
RSU 24VUC 6A LP	1	1171361001

Type	Qty.	Order No.
RSU 48VUC 6A	1	1171461001

Note

Accessories

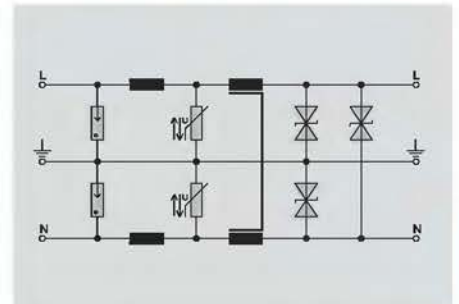
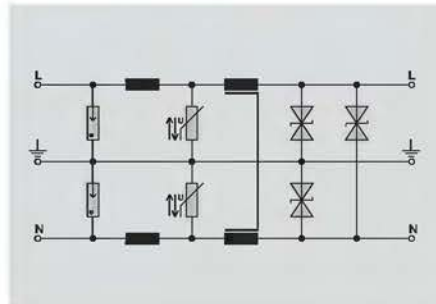
Note

3-stage protection with screw connection

- Overvoltage protection RSU for power supplies
- with current-compensated inductor
- low residual voltage thanks to suppression diodes

RSU 115 V UC 6 A

RSU 230 V UC 6 A



Technical data

Technical data

Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c	130 V
Operating current, I _{max}	6,00 A
Volume resistivity	0,08 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	30,0 kHz 20 Ω
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	200 V
Protection level on output side sym., input 8/20 μs, typ.	250 V
Protection level on output side unsym., input 1kV/μs, typ.	200 V
Protection level on output side unsym., input 8/20 μs, typ.	250 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/70 °C
Operating temperature, min./max.	-25 °C/40 °C

Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U _c	250 V
Operating current, I _{max}	6,00 A
Volume resistivity	0,08 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	90,0 kHz 40 kΩ
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	400 V
Protection level on output side sym., input 8/20 μs, typ.	420 V
Protection level on output side unsym., input 1kV/μs, typ.	400 V
Protection level on output side unsym., input 8/20 μs, typ.	420 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/70 °C
Operating temperature, min./max.	-25 °C/40 °C

Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U _c	250 V
Operating current, I _{max}	6,00 A
Volume resistivity	0,08 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	90,0 kHz 40 kΩ
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	400 V
Protection level on output side sym., input 8/20 μs, typ.	420 V
Protection level on output side unsym., input 1kV/μs, typ.	400 V
Protection level on output side unsym., input 8/20 μs, typ.	420 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/70 °C
Operating temperature, min./max.	-25 °C/40 °C

Type of connection

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	87 x 81 x 89

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	87 x 81 x 89

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	87 x 81 x 89

Note

Ordering data

Type	Qty.	Order No.
RSU 115VUC 6A	1	1171561001

Type	Qty.	Order No.
RSU 230VUC 6A LP	1	1171661001

Note

Accessories

Note

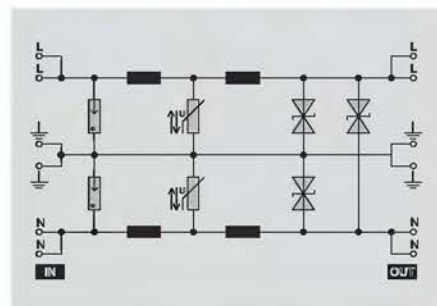
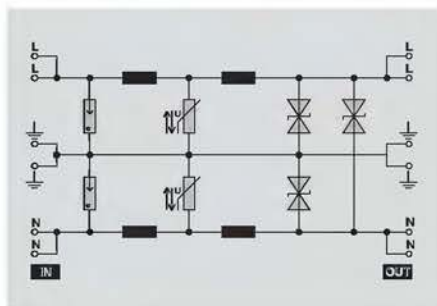
Overvoltage protection for instrumentation and control systems

3-stage protection with screw connection

- Overvoltage protection RSU for power supplies
- with current-compensated inductor
- low residual voltage thanks to suppression diodes

RSU 24 V UC 10 A

RSU 48 V UC 10 A



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

24 V
 24 V
 27 V
 10,00 A
 0,04 Ω
 yes
 yes
 yes
 8,0 kHz 4 Ω
 24 kA
 40 V
 45 V
 40 V
 45 V
 FS section
 Screw connection
 -25 °C/85 °C
 -25 °C/40 °C

48 V
 48 V
 54 V
 10,00 A
 0,04 Ω
 yes
 yes
 yes
 10,0 kHz 8 Ω
 24 kA
 82 V
 130 V
 82 V
 130 V
 FS section
 Screw connection
 -25 °C/85 °C
 -25 °C/40 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

2,5 / 0,5 / 4
 105 x 105 x 89

2,5 / 0,5 / 4
 105 x 105 x 89

Note

Ordering data

Type	Qty.	Order No.
RSU 24VUC 10A	1	8104201001

Type	Qty.	Order No.
RSU 48VUC 10A	1	8025371001

Note

Accessories

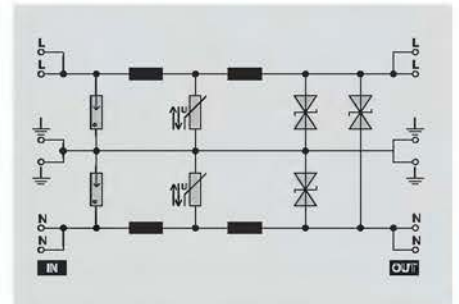
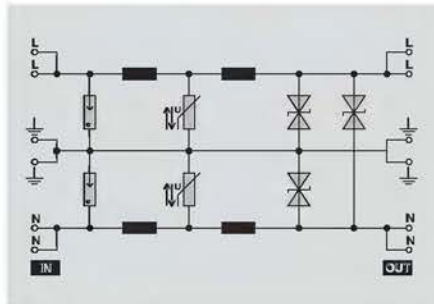
Note

3-stage protection with screw connection

- Overvoltage protection RSU for power supplies
- with current-compensated inductor
- low residual voltage thanks to suppression diodes

RSU 115 V UC 10 A

RSU 230 V UC 10 A



Technical data

Technical data

Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c	130 V
Operating current, I _{max}	10,00 A
Volume resistivity	0,04 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	30,0 kHz 20 Ω
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	200 V
Protection level on output side sym., input 8/20 μs, typ.	250 V
Protection level on output side unsym., input 1kV/μs, typ.	200 V
Protection level on output side unsym., input 8/20 μs, typ.	250 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/70 °C
Operating temperature, min./max.	-25 °C/40 °C

Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U _c	250 V
Operating current, I _{max}	10,00 A
Volume resistivity	0,04 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	90,0 kHz 40 kΩ
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	400 V
Protection level on output side sym., input 8/20 μs, typ.	420 V
Protection level on output side unsym., input 1kV/μs, typ.	400 V
Protection level on output side unsym., input 8/20 μs, typ.	420 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/70 °C
Operating temperature, min./max.	-25 °C/40 °C

Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U _c	250 V
Operating current, I _{max}	10,00 A
Volume resistivity	0,04 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	90,0 kHz 40 kΩ
Discharge current, max. (8/20 μs)	24 kA
Protection level on output side sym., input 1 kV/μs, typ.	400 V
Protection level on output side sym., input 8/20 μs, typ.	420 V
Protection level on output side unsym., input 1kV/μs, typ.	400 V
Protection level on output side unsym., input 8/20 μs, typ.	420 V
Design	FS section
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/70 °C
Operating temperature, min./max.	-25 °C/40 °C

Type of connection

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	105 x 105 x 89

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	105 x 105 x 89

Clamping range (rating- / min. / max.)	mm ²	2,5 / 0,5 / 4
Length x width x height	mm	105 x 105 x 89

Note

Ordering data

Type	Qty.	Order No.
RSU 115VUC 10A	1	8104221001

Type	Qty.	Order No.
RSU 230VUC 10A LP	1	8093281001

Note

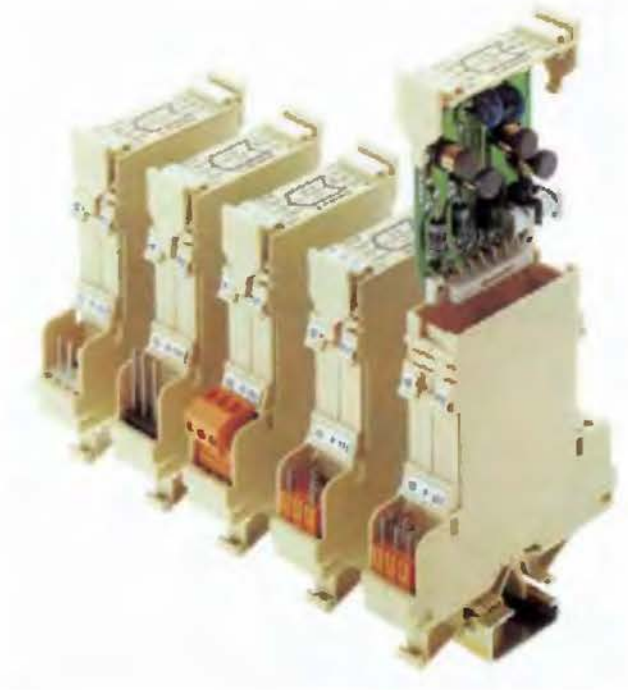
Accessories

Note

3-stage protection on PCB

Plug-in overvoltage protection

The Weidmüller LPU series consists of a PCB and the build-in SEG-U housing (to be ordered separately). These tried-and-tested protective components can be used in automated process, industrial and building services systems. Their great advantage is that the SEG-U housing can be connected in a number of different ways. The screw connection is standard, but screw/plug, Termipoint, wire-wrap and spade connections are also possible. The plug-in PCB provides test options; a visual check as well as electrical tests on the individual components are possible. The three-stage LPU boards operate with gas discharge tubes, varistors, suppression diodes (TAZ) and decoupling inductances. The LPU boards are characterised by a high level of protection for currents up to 1.5 A. They are available in rated voltages of 24, 48, 115 and 230 V.



F

Three different LPU boards are available:

- a) Two signal lines protected against earth (suitable for binary signals).
- b) Analogue signals are protected against each other and against earth (e.g. 0 ... 20 mA circuits).
- c) Isolated signals are given high-resistance protection against earth and against each other (suitable for thermal signals).

A testing unit fitted in a case is available for the electrical tests. The protective elements, e.g. gas discharge tubes, varistors, suppression diodes, integrated on the LPU board are tested to check their rated data and permissible tolerances. The integral inductances are also checked for continuity.

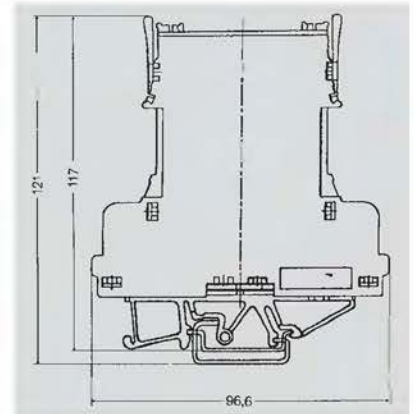
The results of the tests are recorded either by way of red/green LEDs or the integral printer. A self-test is performed after switching on the testing unit. The electrical tests on the LPU board are carried out automatically after plugging in the LPU overvoltage protection.

Testing unit



Dimensions SEG-U

- Width 20 mm
- Screw connection
- flexible 0.5 ... 2.5 mm²
- stranded 0.5 ... 4 mm²



Overvoltage protection for instrumentation and control systems

3-stage protection on circuit card

Pluggable overvoltage protection LPU

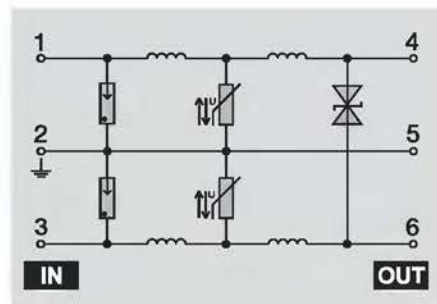
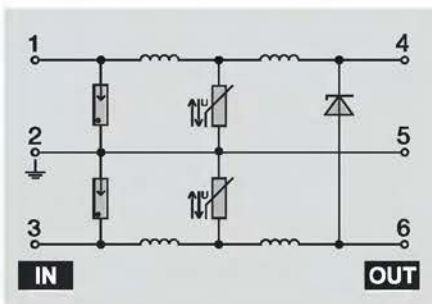
LPU 24 V DC 100 mA

Protection for current loops



LPU 48 V UC 100 mA

Protection for current loops



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

24 V
 29 V
 0.10 A
 12.50 Ω
 yes
 yes
 yes
 7.5 kHz / 240 Ω
 6 kA
 34 V
 45 V
 34 V
 45 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/50 °C

48 V
 48 V
 53 V
 0.10 A
 12.50 Ω
 yes
 yes
 yes
 9.0 kHz / 480 Ω
 6 kA
 82 V
 130 V
 82 V
 130 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/50 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

96.6 x 20 x 117

Height incl. housing SE3-U

96.6 x 20 x 117

Height incl. housing SE3-U

Ordering data

Type	Qty.	Order No.
LPU 24VDC 100MA	1	on request

Type	Qty.	Order No.
LPU 48VUC 100MA	1	8008330000

Note

Can be tested with test cable

Can be tested with test case

Accessories

Note

Housing SE3-U 800987 1001

Housing SE3-U 800987 1001

3-stage protection on circuit card

Pluggable overvoltage protection LPU

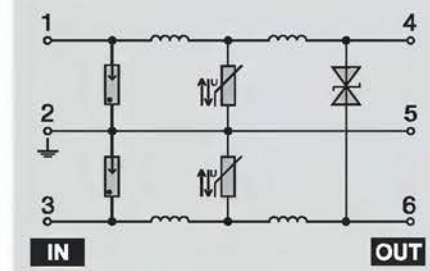
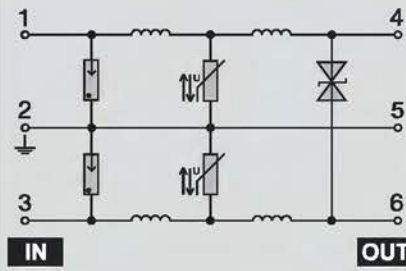
LPU 115 V UC 100 mA

Protection for current loops



LPU 230 V UC 100 mA

Protection for current loops



Technical data

Technical data	
Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c	130 V
Operating current, I _{max}	0.10 A
Volume resistivity	12.50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	9.0 kHz / 1100 Ω
Discharge current, max. (8/20 μs)	6 kA
Protection level on output side sym., input 1 kV/μs, typ.	200 V
Protection level on output side sym., input 8/20 μs, typ.	250 V
Protection level on output side unsym., input 1kV/μs, typ.	200 V
Protection level on output side unsym., input 8/20 μs, typ.	250 V
Design	Plug-in card
Type of connection	Plug-in connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/50 °C

Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U _c	240 V
Operating current, I _{max}	0.10 A
Volume resistivity	12.50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	40.0 kHz / 2200 Ω
Discharge current, max. (8/20 μs)	6 kA
Protection level on output side sym., input 1 kV/μs, typ.	400 V
Protection level on output side sym., input 8/20 μs, typ.	420 V
Protection level on output side unsym., input 1kV/μs, typ.	400 V
Protection level on output side unsym., input 8/20 μs, typ.	420 V
Design	Plug-in card
Type of connection	Plug-in connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/50 °C

Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U _c	240 V
Operating current, I _{max}	0.10 A
Volume resistivity	12.50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	40.0 kHz / 2200 Ω
Discharge current, max. (8/20 μs)	6 kA
Protection level on output side sym., input 1 kV/μs, typ.	400 V
Protection level on output side sym., input 8/20 μs, typ.	420 V
Protection level on output side unsym., input 1kV/μs, typ.	400 V
Protection level on output side unsym., input 8/20 μs, typ.	420 V
Design	Plug-in card
Type of connection	Plug-in connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/50 °C

Type of connection

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

96.6 x 20 x 117

Height incl. housing SE3-U

96.6 x 20 x 117

Height incl. housing SE3-U

Ordering data

Type	Qty.	Order No.
LPU 115VUC 100MA	1	8008350000

Type	Qty.	Order No.
LPU 230VUC 100MA	1	8008380000

Note

Can be tested with test cable

Can be tested with test cable

Accessories

Note

Housing SE3-U 8009871001

Housing SE3-U 8009871001

Overvoltage protection for instrumentation and control systems

3-stage protection on circuit card

Pluggable overvoltage protection LPU

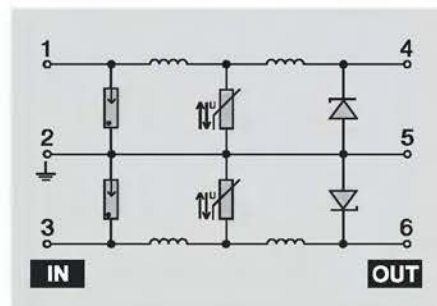
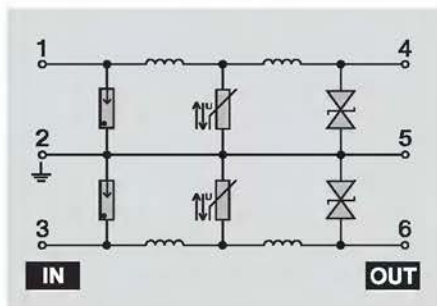
LPU 230 V UC 100 mA SL

Protection for 2 binary signals



LPU 24 V DC 100 mA SL

Protection for 2 binary signals



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

230 V
 230 V
 250 V
 0.10 A
 12.50 Ω
 yes
 yes
 yes
 80.0 kHz 2200 Ω
 6 kA
 400 V
 420 V
 800 V
 820 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/60 °C

24 V
 29 V
 0.10 A
 12.50 Ω
 yes
 yes
 yes
 7.5 kHz 240 Ω
 6 kA
 34 V
 45 V
 60 V
 90 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/60 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

96.6 x 20 x 117
 Height incl. housing SE3-U

96.6 x 20 x 117
 Height incl. housing SE3-U

Ordering data

Type	Qty.	Order No.
LPU 230VUC 100MA	1	8008280000

Type	Qty.	Order No.
LPU 24VDC 100MA	1	8008230000

Note

Can be tested with test cable

Can be tested with test cable

Accessories

Note

Housing SE3-U 800987 1001

Housing SE3-U 800987 1001

3-stage protection on circuit card

Pluggable overvoltage protection LPU

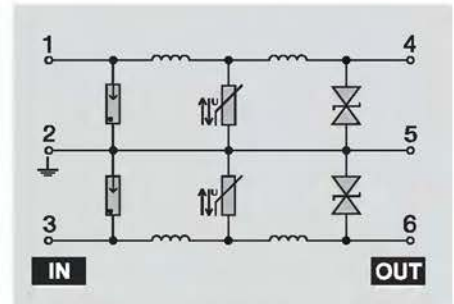
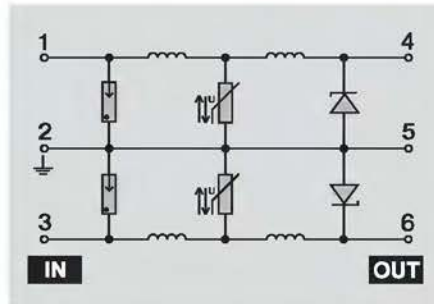
LPU 48 V UC 100 mA SL

Protection for 2 binary signals



LPU 115 V UC 100 mA SL

Protection for 2 binary signals



Technical data

Technical data	
Rated voltage (AC)	48 V
Rated voltage (DC)	48 V
max. continuous voltage, U _c	53 V
Operating current, I _{max}	0.10 A
Volume resistivity	12.50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	17.0 kHz 480 Ω
Discharge current, max. (8/20 μs)	6 kA
Protection level on output side sym., input 1 kV/μs, typ.	82 V
Protection level on output side sym., input 8/20 μs, typ.	130 V
Protection level on output side unsym., input 1kV/μs, typ.	160 V
Protection level on output side unsym., input 8/20 μs, typ.	260 V
Design	Plug-in card
Type of connection	Plug-in connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C

Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c	130 V
Operating current, I _{max}	0.10 A
Volume resistivity	12.50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	40.0 kHz 1100 Ω
Discharge current, max. (8/20 μs)	6 kA
Protection level on output side sym., input 1 kV/μs, typ.	200 V
Protection level on output side sym., input 8/20 μs, typ.	250 V
Protection level on output side unsym., input 1kV/μs, typ.	400 V
Protection level on output side unsym., input 8/20 μs, typ.	500 V
Design	Plug-in card
Type of connection	Plug-in connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C

Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c	130 V
Operating current, I _{max}	0.10 A
Volume resistivity	12.50 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	40.0 kHz 1100 Ω
Discharge current, max. (8/20 μs)	6 kA
Protection level on output side sym., input 1 kV/μs, typ.	200 V
Protection level on output side sym., input 8/20 μs, typ.	250 V
Protection level on output side unsym., input 1kV/μs, typ.	400 V
Protection level on output side unsym., input 8/20 μs, typ.	500 V
Design	Plug-in card
Type of connection	Plug-in connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C

Type of connection

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Note

Height incl. housing SE3-U

Height incl. housing SE3-U

Ordering data

Type	Qty.	Order No.
LPU 48VUC 100MA	1	8008250000

Type	Qty.	Order No.
LPU 115VUC 100MA	1	8008260000

Note

Can be tested with test cable

Can be tested with test cable

Accessories

Note

Housing SE3-U 800987 1001

Housing SE3-U 800987 1001

3-stage protection on circuit card

Pluggable overvoltage protection LPU

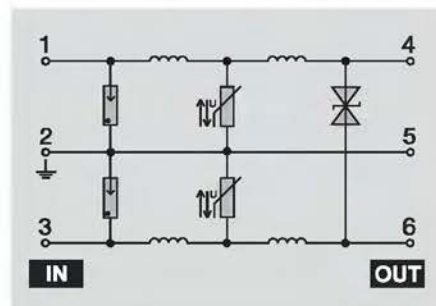
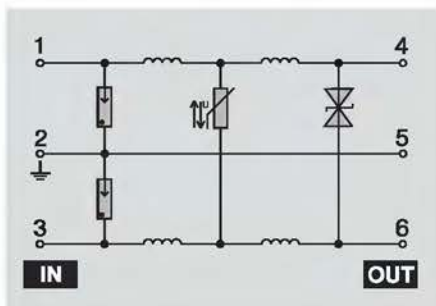
LPU 24 V UC 1.5 A

Protection for current loops



LPU 48 V UC 1.5 A

Protection for current loops



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

24 V
 24 V
 27 V
 1.50 A
 0.20 Ω
 yes
 yes
 yes
 150.0 kHz 16 Ω
 6 kA
 34 V
 45 V
 34 V
 45 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/50 °C

48 V
 48 V
 53 V
 1.50 A
 0.20 Ω
 yes
 yes
 yes
 300.0 kHz 32 Ω
 6 kA
 82 V
 130 V
 82 V
 130 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/50 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

96.6 x 20 x 117

Height incl. housing SE3-U

96.6 x 20 x 117

Height incl. housing SE3-U

Ordering data

Type	Qty.	Order No.
LPU 24VUC/ 1,5A	1	8237700000

Type	Qty.	Order No.
LPU 48VUC 1,5A	1	8008440000

Note

Can be tested with test cable

Can be tested with test case

Accessories

Note

Housing SE3-U 800987 1001

Housing SE3-U 800987 1001

3-stage protection on circuit card

Pluggable overvoltage protection LPU

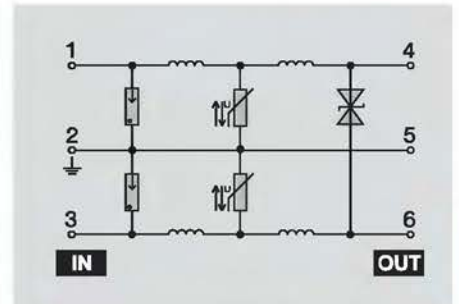
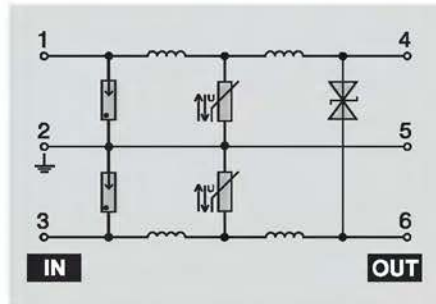
LPU 115 V UC 1.5 A

Protection for current loops



LPU 230 V UC 1.5 A

Protection for current loops



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

115 V
 115 V
 130 V
 1.50 A
 0.20 Ω
 yes
 yes
 yes
 600.0 kHz 70 k Ω
 6 kA
 200 V
 250 V
 200 V
 250 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/50 °C

230 V
 230 V
 250 V
 1.50 A
 0.20 Ω
 yes
 yes
 yes
 1.0 MHz 150 k Ω
 6 kA
 400 V
 420 V
 400 V
 420 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/50 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

96.6 x 20 x 117
 Height incl. housing SE3-U

96.6 x 20 x 117
 Height incl. housing SE3-U

Ordering data

Type	Qty.	Order No.
LPU 115VUC 1,5A	1	8008450000

Type	Qty.	Order No.
LPU 230VUC 1,5A	1	8008460000

Note

Can be tested with test cable

Can be tested with test cable

Accessories

Note

Housing SE3-U 800987 1001

Housing SE3-U 800987 1001

Overvoltage protection for instrumentation and control systems

3-stage protection on circuit card

Pluggable overvoltage protection LPU

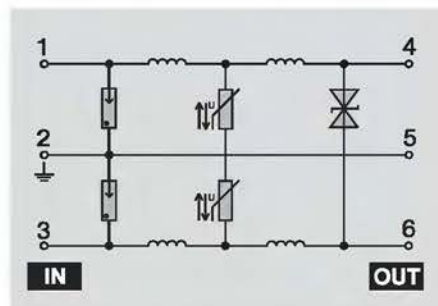
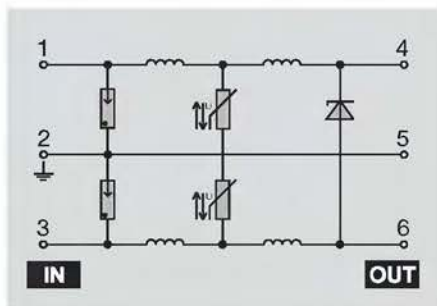
LPU 24 V DC 100 mA

not earthed



LPU 48 V UC 100 mA

not earthed



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

24 V
 29 V
 0.10 A
 12.50 Ω
 yes
 yes
 yes
 7.5 kHz 240 Ω
 6 kA
 34 V
 45 V
 600 V
 700 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/60 °C

48 V
 48 V
 53 V
 0.10 A
 12.50 Ω
 yes
 yes
 yes
 17.0 kHz 480 Ω
 6 kA
 82 V
 130 V
 600 V
 700 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/60 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

96.6 x 20 x 117

Height incl. housing SE3-U

96.6 x 20 x 117

Height incl. housing SE3-U

Ordering data

Type	Qty.	Order No.
LPU 24VDC 100MA	1	8008390000

Type	Qty.	Order No.
LPU 48VUC 100MA	1	on request

Note

Can be tested with test cable

Can be tested with test cable

Accessories

Note

Housing SE3-U 800987 1001

Housing SE3-U 800987 1001

3-stage protection on circuit card

Pluggable overvoltage protection LPU

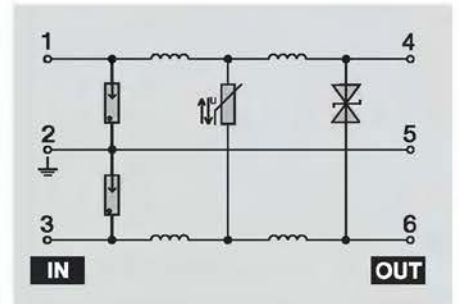
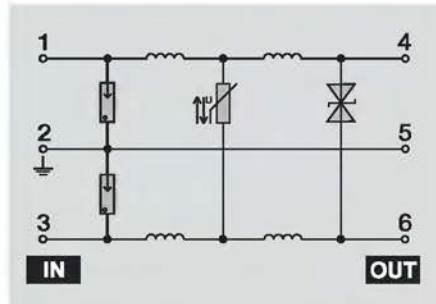
LPU 115 V UC 100 mA

not earthed



LPU 230 V UC 100 mA

not earthed



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μ s)
 Protection level on output side sym., input 1 kV/ μ s, typ.
 Protection level on output side sym., input 8/20 μ s, typ.
 Protection level on output side unsym., input 1kV/ μ s, typ.
 Protection level on output side unsym., input 8/20 μ s, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

115 V
 115 V
 130 V
 0.10 A
 12.50 Ω
 yes
 yes
 yes
 40.0 kHz 1100 Ω
 6 kA
 200 V
 220 V
 600 V
 700 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/60 °C

230 V
 230 V
 250 V
 0.10 A
 12.50 Ω
 yes
 yes
 yes
 80.0 kHz 2200 Ω
 6 kA
 400 V
 420 V
 600 V
 700 V
 Plug-in card
 Plug-in connection
 -25 °C/85 °C
 -25 °C/60 °C

Type of connection

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

96.6 x 20 x 117

Height incl. housing SE3-U

96.6 x 20 x 117

Height incl. housing SE3-U

Ordering data

Type	Qty.	Order No.
LPU 115VUC 100MA	1	on request

Type	Qty.	Order No.
LPU 230VUC 100MA	1	on request

Note

Can be tested with test cable

Can be tested with test cable

Accessories

Note

Housing SE3-U 809/87 1001

Housing SE3-U 809/87 1001

Extract from the TRbF – Technical Rules for Combustible Fluids

Requirements:

1. Indoor plants that require licences and are situated above ground for the storage, filling or conveying of combustible fluids, or outdoor tanks above ground and underground tanks not surrounded on all sides by earth, masonry or concrete or several of these materials must be protected against ignition hazards and lightning strikes by suitable means.
2. Paragraph 1 also applies to outdoor tanks above ground that are used for the storage of combustible fluids of hazard class A III if certain fluids of this hazard class are stored together with those of hazard classes A I, A II or B within one tank bund.
3. Irrespective of paragraphs 1 and 2 and furthermore, intrinsically safe circuits whose lines enter the tank for the purpose of, for example, instrumentation and control, ...

... must satisfy the following requirements:

1. Overvoltage protection in a metal enclosures (e.g. terminal box) must be incorporated before the line enters the tank. The steel enclosure containing the overvoltage protection is to have a direct and dependable electrically conductive connection with the tank wall or the shielding that guarantees a safe and secure equipotential bonding.
2. A suitable cable/line complying with CENELEC harmonisation documents 21 and 22 is required from the control room to the steel enclosure containing the overvoltage protection and the cable/line from the overvoltage protection installation to the storage tank should be provided in a protective metal conduit. The metal sheathing, shielding or the protective metal conduit must be earthed. The test voltage U_{eff} between the wires and the metal sheathing, shielding or protective metal conduit for the cable/line from the metal housing containing the overvoltage protection to the storage tank must be at least 1500 V.
3. The cable/line between the steel enclosure containing the overvoltage protection and the entry into the tank should be routed in such a way that lightning is unlikely to affect this line.

Solutions:

Overvoltage protection installation at the actuator (control room):

This is where the overvoltage protection is earthed. Types LPU 800433 or LPU 800844 are used. The plug-in LPU overvoltage protection is plugged into the SEG-U housing (available as an accessory). But the overvoltage protection system can be used in the form of a terminal:

- for current loops – DKU 843777
- for binary signals
 - 24 V – DKU 801580 or 802581
 - 60 V – DKU 801928 or 801929

Overvoltage protection installation at the sensor

This is where the overvoltage protection installation has a floating earth connection via a gas discharge tube. The earth is achieved via a gas discharge tube for 470 V from the line to earth (DK4U 940044 / DK4U 940045). Overvoltage protection may be incorporated between the lines, e.g. LPU 822524 / LPU 822525 or DK4U 940040, DK4U 940050. The overvoltage protection installation upstream of the sensor must be incorporated in an enclosure complying with the TRbF regulations before the line enters the tank. Weidmüller housings, which carry the appropriate approval, can be used for this. The enclosure must have a conductive connection to the tank.

Installation of overvoltage protection

The overvoltage protection developed by Weidmüller comprises "passive components" which can be used taking into account the internal inductance and capacitance in the instrumentation and control circuits. To simplify the installation, some other products from the standard overvoltage protection range have been approved to ATEX requirements (complying with EN 50014, EN 50020 and EN 50281).

These products can be employed in both intrinsically safe and non-intrinsically safe circuits. The difference lies in the maximum permissible rated data of these products. When planning your instrumentation and control circuits, please refer to the technical data on the following pages.

DKU

Slimline overvoltage protection terminals with ATEX approval

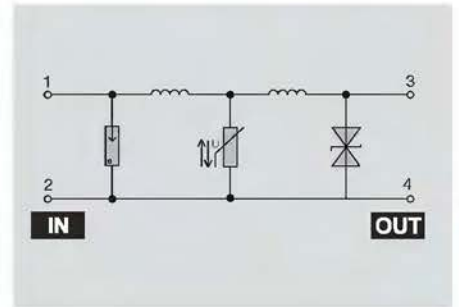
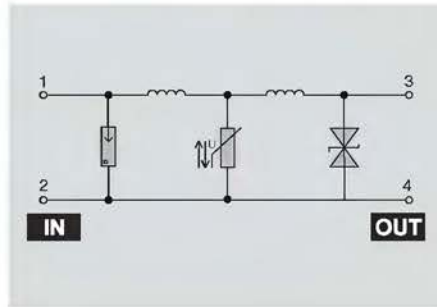
DKU 24 V

for TS 32



DKU 24 V

for TS 35



Technical data

Technical data	
DC voltage	26 V
Volume resistance 1/G	3,5 Ω
Rated current per path	0,22 A
Inductance of 4-pole network Li	0,2 mH
Capacitance of 4-pole network Ci	2,5 nF
Source impedance frequency response at 50 Ω/-3 dB	500 kHz at Fi = 240 Ω
ΔT _U at 0,1 A and 60 °C ambient temperature, typical	18 K
Sparkover voltage of gas discharge tube at 1 kV/μs, typical	700 V
Interference voltage at output for 1 kV/μs at input, typical	33 V
Interference voltage at output for 8/20 μs and 2,5 kA at input, typical	38 V
max. leakage current to PE	10 μA
Ingress protection class	IP20
Circuit earthed for safety	yes
Operating temperature	-25 °C ... +60 °C
Clamping point with self-locking screw	yes
Approval	II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
Registered design No.	TÜV 04 ATEX 2551 X

DC voltage	26 V
Volume resistance 1/G	3,5 Ω
Rated current per path	0,22 A
Inductance of 4-pole network Li	0,2 mH
Capacitance of 4-pole network Ci	2,5 nF
Source impedance frequency response at 50 Ω/-3 dB	500 kHz at Fi = 240 Ω
ΔT _U at 0,1 A and 60 °C ambient temperature, typical	18 K
Sparkover voltage of gas discharge tube at 1 kV/μs, typical	700 V
Interference voltage at output for 1 kV/μs at input, typical	33 V
Interference voltage at output for 8/20 μs and 2,5 kA at input, typical	38 V
max. leakage current to PE	10 μA
Ingress protection class	IP20
Circuit earthed for safety	yes
Operating temperature	-25 °C ... +60 °C
Clamping point with self-locking screw	yes
Approval	II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
Registered design No.	TÜV 04 ATEX 2551 X

DC voltage	26 V
Volume resistance 1/G	3,5 Ω
Rated current per path	0,22 A
Inductance of 4-pole network Li	0,2 mH
Capacitance of 4-pole network Ci	2,5 nF
Source impedance frequency response at 50 Ω/-3 dB	500 kHz at Fi = 240 Ω
ΔT _U at 0,1 A and 60 °C ambient temperature, typical	18 K
Sparkover voltage of gas discharge tube at 1 kV/μs, typical	700 V
Interference voltage at output for 1 kV/μs at input, typical	33 V
Interference voltage at output for 8/20 μs and 2,5 kA at input, typical	38 V
max. leakage current to PE	10 μA
Ingress protection class	IP20
Circuit earthed for safety	yes
Operating temperature	-25 °C ... +60 °C
Clamping point with self-locking screw	yes
Approval	II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
Registered design No.	TÜV 04 ATEX 2551 X

Connect the earth terminal to the equipotential bonding.
When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6X at least (to EN 60529) and also satisfies the conditions of EN 50231-1-1 points 4, 8 and 9.

Connect the earth terminal to the equipotential bonding.
When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6X at least (to EN 60529) and also satisfies the conditions of EN 50231-1-1 points 4, 8 and 9.

Notes

Ordering data

Version

Type	Qty	Order No.
DKU 32 24 VDC 0,22 A		801580000

Type	Qty	Order No.
DKU 35 24 VDC 0,22 A		801581000

Notes

Accessories

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Abschlussplatte AP DKT 4 PA	0687560000
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Abschlussplatte AP DKT 4 PA	0687560000
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Notes

Overvoltage protection for instrumentation and control systems

DKU

Slimline overvoltage protection terminals with ATEX approval

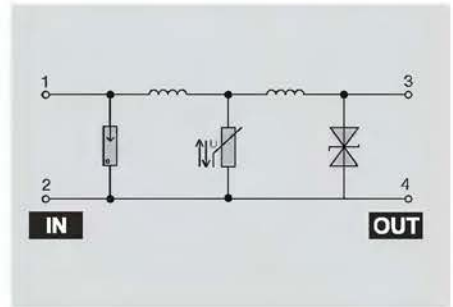
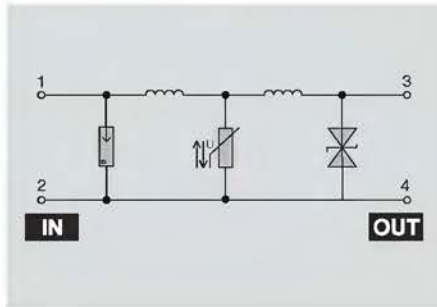
DKU 48 V

for TS 32



DKU 48 V

for TS 35



Technical data

Technical data
 DC voltage
 Volume resistance 1/G
 Rated current per path
 Inductance of 4-pole network L_i
 Capacitance of 4-pole network C_i
 Source impedance frequency response at 50 Ω/-3 dB
 Δ T_Ü at 0.1 A and 60 °C ambient temperature, typical
 Sparkover voltage of gas discharge tube at 1 kV/μs, typical
 Interference voltage at output for 1 kV/μs at input, typical
 Interference voltage at output for 8/20 μs and 2.5 kA at input, typical
 max. leakage current to PE
 Ingress protection class
 Circuit earthed for safety
 Operating temperature
 Clamping point with self-locking screw
 Approval
 Registered design No.

60 V
3,5 Ω
0,22 A
0,2 mH
1 nF
1000 kHz at F _i = 480 Ω
11 K
700 V
82 V
100 V
10 μA
IP20
yes
-25 °C ... +60 °C
yes
II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
TÜV 04 ATEX 2551 X

60 V
3,5 Ω
0,22 A
0,2 mH
1 nF
1000 kHz at F _i = 480 Ω
11 K
700 V
82 V
100 V
10 μA
IP20
yes
-25 °C ... +60 °C
yes
II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
TÜV 04 ATEX 2551 X

Connect the earth terminal to the equipotential bonding.
 When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6x, at least (to EN 60529) and also satisfies the conditions of EN 50231-1-1 points 4, 8 and 9.

Connect the earth terminal to the equipotential bonding.
 When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6x, at least (to EN 60529) and also satisfies the conditions of EN 50231-1-1 points 4, 8 and 9.

Notes

Ordering data

Version

Type	Qty	Order No.
DKU 32 48 VUC 0,22 A		8019280000

Type	Qty	Order No.
DKU 35 48 VUC 0,22 A		8019290000

Notes

Accessories

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Abschlussplatte AP DKT 4 PA	0687560000
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Abschlussplatte AP DKT 4 PA	0687560000
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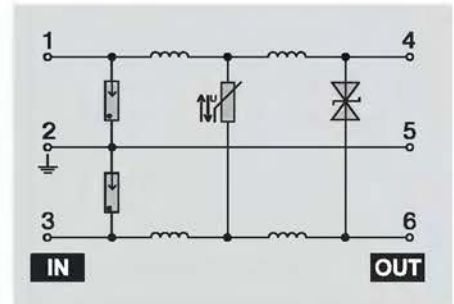
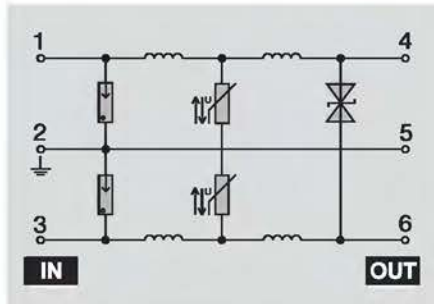
Notes

LPU pluggable overvoltage protection

with ATEX approval

LPU 24 V 0.5 A

LPU 29 V 0.062 A



Technical data

Technical data

DC voltage
 Volume resistance 1/G
 Rated current per path
 Inductance of 4-pole network L_i
 Capacitance of 4-pole network C_i
 Source impedance frequency response at 50 Ω/-3 dB
 Δ T_Ü at 0.1 A and 60 °C ambient temperature, typical
 Sparkover voltage of gas discharge tube at 1 kV/μs, typical
 Interference voltage at output for 1 kV/μs at input, typical
 Interference voltage at output for 8/20 μs and 2.5 kA at input, typical
 max. leakage current to PE
 Ingress protection class
 Storage temperature
 Operating temperature
 Circuit earthed for safety
 Clamping point with self-locking screw
 Approval
 Registered design No.

24 V
0.15 Ω
0.5 A
< 0.1 mH
7.5 nF
150 kHz at F _i = 16 Ω
< 15 K
700 V
39 V
65 V
10 μA
IP20
-25 °C ... +85 °C
-25 °C ... +60 °C
yes
yes
II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
TÜV 04 ATEX 2551 X

29 V
0.15 Ω
62 mA
9.5 mH
6 nF
4.5 kHz at F _i = 240 Ω
< 15 K
800 V
33 V
38 V
10 μA
IP20
-25 °C ... +85 °C
-25 °C ... +60 °C
no
yes
II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
TÜV 04 ATEX 2551 X

Connect the earth terminal to the equipotential bonding.
 When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6x, at least (to EN 60529) and also satisfies the conditions of EN 50231-1-1 points 4, 8 and 9.

Connect the earth terminal to the equipotential bonding.
 When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6x, at least (to EN 60529) and also satisfies the conditions of EN 50231-1-1 points 4, 8 and 9.

Notes

Ordering data

Version
Notes

Type	Qty	Order No
LPU 24 V UC 0.5A		8008430000

Type	Qty	Order No
LPU 24 V DC 62 mA		8225240000

Accessories

Version
Notes

Type	Qty	Order No
Gehäuse SEG-U		8007871001

Type	Qty	Order No
Gehäuse SEG-U		8007871001

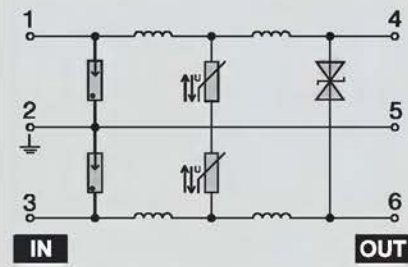
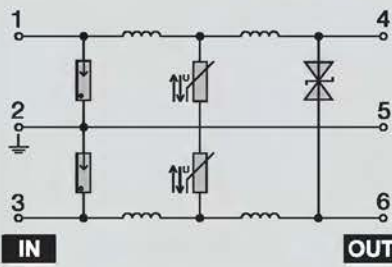
Overvoltage protection for instrumentation and control systems

LPU pluggable overvoltage protection LPU

with ATEX approval

LPU 48 V 0.062 A

LPU 60 V 0.5 A



Technical data

Technical data

DC voltage
Volume resistance 1/G
Rated current per path
Inductance of 4-pole network L_i
Capacitance of 4-pole network C_i
Source impedance frequency response at 50 Ω -3 dB
 ΔT_U at 0.1 A and 60 °C ambient temperature, typical
Sparkover voltage of gas discharge tube at 1 kV/ μ s, typical
Interference voltage at output for 1 kV/ μ s at input, typical
Interference voltage at output for 8/20 μ s and 2.5 kA at input, typical
max. leakage current to PE
Ingress protection class
Storage temperature
Operating temperature
Circuit earthed for safety
Clamping point with self-locking screw
Approval
Registered design No.

48 V
13 Ω
62 mA
9.5 mH
1.8 nF
9 kHz at $F_i = 480 \Omega$
< 15 K
800 V
82 V
90 V
10 μ A
IP20
-25 °C ... +85 °C
-25 °C ... +60 °C
no
yes
II 2 G EEx ia IIC T6 to II 2 D T85 °C IP6X
TÜV 04 ATEX 2551 X

60 V
13 Ω
0.5 A
< 0.1 mH
3.5 nF
300 kHz at $F_i = 32 \Omega$
< 15 K
700 V
82 V
115 V
10 μ A
IP20
-25 °C ... +85 °C
-25 °C ... +60 °C
yes
yes
II 2 G EEx ia IIC T6 to II 2 D T85 °C IP6X
TÜV 04 ATEX 2551 X

Connect the earth terminal to the equipotential bonding.
When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6X at least (to EH 60529) and also satisfies the conditions of EH 5231-1-1 points 4, 8 and 9.

Connect the earth terminal to the equipotential bonding.
When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6X at least (to EH 60529) and also satisfies the conditions of EH 5231-1-1 points 4, 8 and 9.

Notes

Ordering data

Version	Type	Qty	Order No.
	LPU 48 V 62mA		8225250000

Version	Type	Qty	Order No.
	LPU 60V 0,5A		8008440000

Notes

Accessories

Version	Type	Qty	Order No.
	Gehäuse SEG-U		8007871001

Version	Type	Qty	Order No.
	Gehäuse SEG-U		8007871001

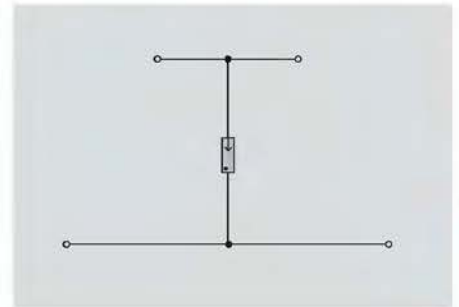
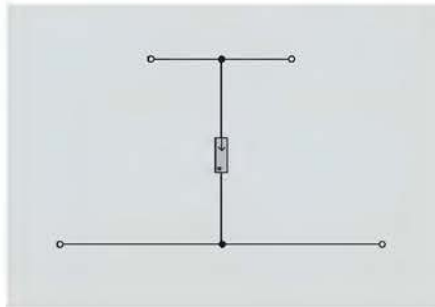
Notes

DKU slimline overvoltage protection terminals

with ATEX approval

DKU 48 V

DKU 65 V



Technical data

Technical data	
DC voltage	48 V
Volume resistance 1/G	-
Rated current per path	0.5 A
Inductance of 4-pole network Li	-
Capacitance of 4-pole network Ci	-
Source impedance frequency response at 50 Ω/-3 dB	-
Δ T _U at 0.1 A and 60 °C ambient temperature, typical	< 15 K
Sparkover voltage of gas discharge tube at 1 kV/μs, typical	700 V
Interference voltage at output for 1 kV/μs at input, typical	700 V
Interference voltage at output for 8/20 μs and 2.5 kA at input, typical	800 V
max. leakage current to PE	1 μA
Ingress protection class	IP20
Circuit earthed for safety	-25 °C ... +85 °C
Operating temperature	-25 °C ... +60 °C
Circuit safety grounded	yes
Clamping point with self-locking screw	yes
Approval	II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
Registered design No.	TÜV 04 ATEX 2551 X

DC voltage	48 V
Volume resistance 1/G	-
Rated current per path	0.5 A
Inductance of 4-pole network Li	-
Capacitance of 4-pole network Ci	-
Source impedance frequency response at 50 Ω/-3 dB	-
Δ T _U at 0.1 A and 60 °C ambient temperature, typical	< 15 K
Sparkover voltage of gas discharge tube at 1 kV/μs, typical	700 V
Interference voltage at output for 1 kV/μs at input, typical	700 V
Interference voltage at output for 8/20 μs and 2.5 kA at input, typical	800 V
max. leakage current to PE	1 μA
Ingress protection class	IP20
Circuit earthed for safety	-25 °C ... +85 °C
Operating temperature	-25 °C ... +60 °C
Circuit safety grounded	yes
Clamping point with self-locking screw	yes
Approval	II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
Registered design No.	TÜV 04 ATEX 2551 X

DC voltage	65 V
Volume resistance 1/G	-
Rated current per path	0.5 A
Inductance of 4-pole network Li	-
Capacitance of 4-pole network Ci	-
Source impedance frequency response at 50 Ω/-3 dB	-
Δ T _U at 0.1 A and 60 °C ambient temperature, typical	< 15 K
Sparkover voltage of gas discharge tube at 1 kV/μs, typical	1100 V
Interference voltage at output for 1 kV/μs at input, typical	1100 V
Interference voltage at output for 8/20 μs and 2.5 kA at input, typical	1200 V
max. leakage current to PE	1 μA
Ingress protection class	IP20
Circuit earthed for safety	-25 °C ... +85 °C
Operating temperature	-25 °C ... +60 °C
Circuit safety grounded	no
Clamping point with self-locking screw	yes
Approval	II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
Registered design No.	TÜV 04 ATEX 2551 X

Connect the earth terminal to the equipotential bonding.
When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6x, at least (to EN 60529) and also satisfies the conditions of EN 50231-1-1 points 4, 8 and 9.

Connect the earth terminal to the equipotential bonding.
When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6x, at least (to EN 60529) and also satisfies the conditions of EN 50231-1-1 points 4, 8 and 9.

Notes

Ordering data

Version

Type	Qty	Order No.
DK 4/35 U 90 V 20 kA		9400500000
DK 4/32 U 90 V 20 kA		9400400000

Type	Qty	Order No.
DK 4/35 U 470 V 20 kA		9400540000
DK 4/32 U 470 V 20 kA		9400440000

Notes

Accessories

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AP DK4	0359260000
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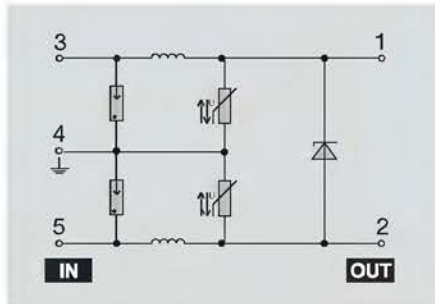
AP DK4	0359260000
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Notes

**DKU slimline
overvoltage protection**

with ATEX approval

DKU DK 5 28 V



Technical data

Technical data
 DC voltage
 Volume resistance 1/G
 Rated current per path
 Inductance of 4-pole network Li
 Capacitance of 4-pole network Ci
 Source impedance frequency response at 50 Ω/-3 dB
 Δ Tü at 0.1 A and 60 °C ambient temperature, typical
 Sparkover voltage of gas discharge tube at 1 kV/μs, typical
 Interference voltage at output for 1 kV/μs at input, typical
 Interference voltage at output for 8/20 μs and 2.5 kA at input, typical
 max. leakage current to PE
 Ingress protection class
 Storage temperature
 Operating temperature
 Circuit earthed for safety
 Clamping point with self-locking screw
 Approval
 Registered design No.

DC voltage	28 V
Volume resistance 1/G	3,5 Ω
Rated current per path	0.3 A
Inductance of 4-pole network Li	0.2 mH
Capacitance of 4-pole network Ci	1.3 nF
Source impedance frequency response at 50 Ω/-3 dB	500 kHz at Fi = 240 Ω
Δ Tü at 0.1 A and 60 °C ambient temperature, typical	< 15 K
Sparkover voltage of gas discharge tube at 1 kV/μs, typical	700 V
Interference voltage at output for 1 kV/μs at input, typical	33 V
Interference voltage at output for 8/20 μs and 2.5 kA at input, typical	38 V
max. leakage current to PE	10 μA
Ingress protection class	IP20
Storage temperature	-25 °C ... +85 °C
Operating temperature	-25 °C ... +60 °C
Circuit earthed for safety	yes
Clamping point with self-locking screw	yes
Approval	II 2 G EEx ia IIC T6 or II 2 D T85 °C IP6X
Registered design No.	TÜV 04 ATEX 2551 X

Connect the earth terminal to the equipotential bonding.
 When using the overvoltage protection component in areas at risk of dust explosion, provide a housing that complies with class of protection IP 6X, at least (to EN 60529) and also satisfies the conditions of EN 50331-1-1 points 4, 8 and 9.

Notes

Ordering data

Version

Notes

Type	Qty	Order No.
DKU DK5 24 VDC 100 MA		8437770000

Accessories

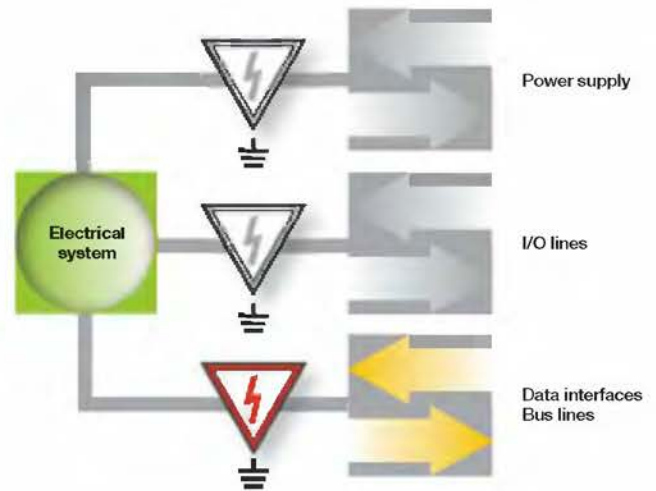
Notes

AP DK5		4036780000
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Overvoltage protection for data interfaces

The principles of data transmission

We understand data transmission to be the sending of characters, numbers, statuses, measurements, etc. between various decentralised units, e.g. controls, computers, measuring transducers, actuators, etc. One unit transmits the data, the other unit receives it. This is the simplest form of data transmission. However, it is often necessary for one unit to receive data and then send an "answer" back to the other unit. To do this we need two data lines that run back to back, or we combine the data lines by providing a transceiver at each end of the data line.



Structure and properties of networks

There are various options for networking data terminals. We distinguish between star-type, ring, point-to-point and bus networks.

Star-type networks

The main unit is located in the centre. The individual data lines then radiate out from this central unit to the individual terminals. In this system all data terminals are connected to the central terminal via their own cable.

Ring networks

The computers or data terminals are all connected to each other like a chain with one cable (e.g. a coaxial cable). In this case the data is passed on from one data terminal to the next. Therefore, the entire ring is always under load. The advantage of the ring network is that it can cover a larger area than a star-type network because the length of the transmission path is only ever the distance between two adjacent data terminals.

Point-to-point networks

These are basically networks between two data terminals that are connected directly with each other, e.g. an RS 232 or RS 422 link.

Bus networks

These are networks based on the parallel connection of modules. All components operate on one and the same line. Therefore, only two/four wires are required for the data bus. If bus cabling includes branches, then we call that a tree structure. Every bus system includes a bus controller that controls the transmissions sent by the individual data terminals.

Transmission media

In order to be able to send any data at all, data lines are necessary:

Two- and three-wire systems

Data transmissions requiring relatively low transmission rates can make use of two-wire systems. For example, an ISDN system acting as an exchange line in a building requires only two wires. However, other types of bus systems also operate with just two or three wires.

Four-wire systems

This is the current standard for the majority of corporate data networks. Two wires are used for transmitting data and two for receiving. These cables are well shielded and can transmit data with frequencies of up to 500 MHz over distances of up to 100 m.

Coaxial cable

Sending data via coaxial cables is a rather old technique. Such systems are too slow and inflexible and so are now rare. Speeds of up to about 12 Mbps are no longer adequate these days. Over longer distances, modern fibre-optic cables are replacing this technology; these can transmit several hundred Mbps.

Serial interfaces

A serial interface operates with 8 data bits (1 byte). A start bit (low bit) is always sent before the output of a byte, and one or two stop bits (high bits) are appended to the end of the byte. This encryption is important for the data receiver as it can then detect where each data byte begins and ends. Serial interfaces mostly operate with +5 V (logical 1) and 0 V (logical 0). Advantage: less cabling (only 3 wires). Disadvantage: slow data transmission.

Overvoltage protection for data interface

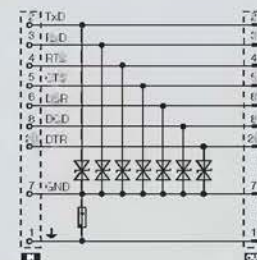
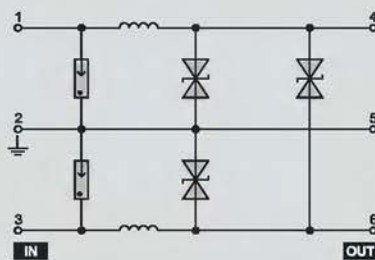
RS232

RS 232

RS 232

EGU 4 RS232

RS232 adapter plug



Technical data

Technical data	
Rated voltage (AC)	12 V
max. continuous voltage, U _c	15 V
Operating current, I _{max}	0.05 A
Volume resistivity	1.30 Ω
Build rate	≤ 9600 Bd
Response time	≤ 5 ns
Gas discharge tube	yes
Varistor	no
Suppression diodes	yes
Out-off frequency (-3 dB) at load impedance	30.0 kHz/600Ω
Discharge current, max. (8/20 μs)	5 kA
Protection level on output side sym., input 1 kV/μs, typ.	20 V
Protection level on output side sym., input 8/20 μs, typ.	32 V
Protection level on output side unsym., input 1kV/μs, typ.	20 V
Protection level on output side unsym., input 8/20 μs, typ.	32 V
Design	integral housing
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C

12 V
15 V
0.05 A
1.30 Ω
≤ 9600 Bd
≤ 5 ns
yes
no
yes
30.0 kHz/600Ω
5 kA
20 V
32 V
20 V
32 V
integral housing
Screw connection
-25 °C/85 °C
-25 °C/60 °C

12 V
15 V
0.10 A
1.00 Ω
≤ 19200 Bd
≤ 5 ns
yes
no
yes
30.0 kHz/1200Ω
0.5 kA
20 V
28 V
20 V
28 V
adapter plug
-40 °C/60 °C
-20 °C/55 °C

Dimensions

Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Screw connection

2.5 / 0.5 / 4
58 x 22.5 x 95

64 x 56 x 16.5

Note

Protection for data lines RxD, TxD and Gnd

Protection for data and handshake lines

Ordering data

Version

Type	Qty.	Order No.
EGU4 EG3 RS232 DATENLTG	1	1170460000

Type	Qty.	Order No.
RS232-8 B/S25	1	8570500000
RS232-8 S/B25	1	8570510000

Note

25-RS 232/B-S cable-side 25-pole SUB-D socket, unprotected
25-RS 232/S-B cable-side 25-pole SUB-D plug, unprotected

Accessories

Note

RS485/422

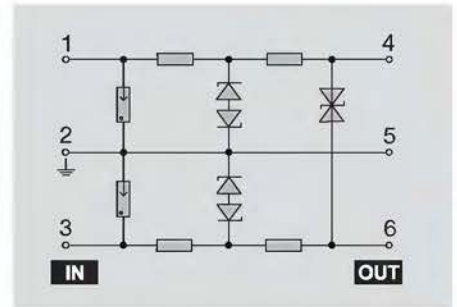
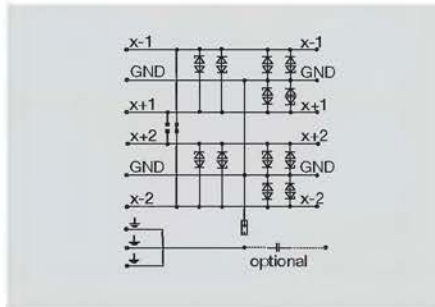
RS 485

RS485/RS422 overvoltage protection



RS 485

RS485/RS422 plug-in overvoltage protection



Technical data

Technical data	
Rated voltage (AC)	12 V
max. continuous voltage, U _c	12 V
Operating current, I _{max}	1.50 A
Volume resistivity	0.50 Ω
Build rate	≤ 6 MB
Response time	≤ 5 ns
Gas discharge tube	yes
Varistor	no
Suppression diodes	yes
Out-off frequency (-3 dB) at load impedance	
Discharge current, max. (8/20 μs)	0.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	18 V
Protection level on output side sym., input 8/20 μs, typ.	28 V
Protection level on output side unsym., input 1kV/μs, typ.	18 V
Protection level on output side unsym., input 8/20 μs, typ.	28 V
Design	Miscellaneous
Type of connection	Screw connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C

Rated voltage (AC)	6 V
max. continuous voltage, U _c	12 V
Operating current, I _{max}	1.50 A
Volume resistivity	12.00 Ω
Build rate	≤ 9600 Bd
Response time	≤ 5 ns
Gas discharge tube	yes
Varistor	no
Suppression diodes	yes
Out-off frequency (-3 dB) at load impedance	
Discharge current, max. (8/20 μs)	0.5 kA
Protection level on output side sym., input 1 kV/μs, typ.	18 V
Protection level on output side sym., input 8/20 μs, typ.	36 V
Protection level on output side unsym., input 1kV/μs, typ.	18 V
Protection level on output side unsym., input 8/20 μs, typ.	36 V
Design	Plug-in card
Type of connection	Plug-in connection
Storage temperature, min./max.	-25 °C/85 °C
Operating temperature, min./max.	-25 °C/60 °C

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Screw connection	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Plug-in connection	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm

Ordering data

Version

Type	Qty.	Order No.
RS 485 K21 UE-SCHUTZ SE	1	8008501001

Type	Qty.	Order No.
LPU RS 485	1	9454930000

Note

Accessories

Note

Housing SEB3-U 805/87 1001

Overvoltage protection for data interface

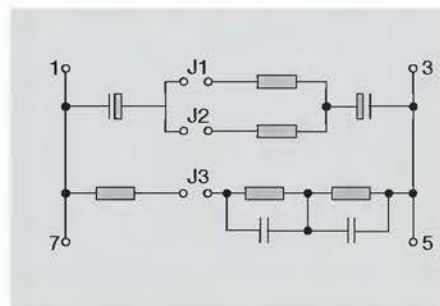
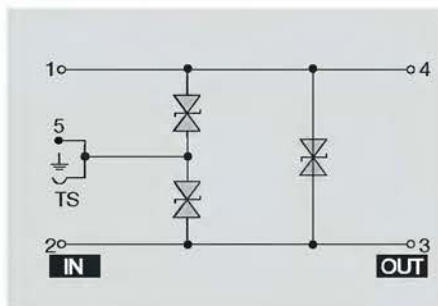
LON™

LON FTT / TP78

Dialoc termination

Protection for LonWorks signals

Bus terminator for LonWorks signals



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Build rate
 Response time
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μs)
 Protection level on output side sym., input 1 kV/μs, typ.
 Protection level on output side sym., input 8/20 μs, typ.
 Protection level on output side unsym., input 1kV/μs, typ.
 Protection level on output side unsym., input 8/20 μs, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

12 V
 14 V
 16.00 A
 0.50 Ω

 ≤ 100 ps
 no
 no
 yes

 0.1 kA
 20 V
 32 V
 20 V
 32 V
 terminal
 tension clamp connection
 -25 °C/60 °C
 -25 °C/55 °C

48 V
 60 V
 16.00 A
 0.50 Ω

 terminal
 Screw connection
 -25 °C/60 °C
 -25 °C/55 °C

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.2

Screw connection

2.5 / 0.5 / 4
 65 x 12 x 57

Note

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP LON-Bus	10	8473470000

Type	Qty.	Order No.
DIALOG BUS TERMINATION Abschluss	5	8496110000

Note

LON™ is a trademark of Echelon

Select termination LPT/FTT/TP78 via jumper

Accessories

Note

Cat.5 overvoltage protection

- Connection via RJ 45 sockets
- Protection for all signal lines
- Suitable for 10BaseTx and 100BaseTx
- PE connection via M4 screw

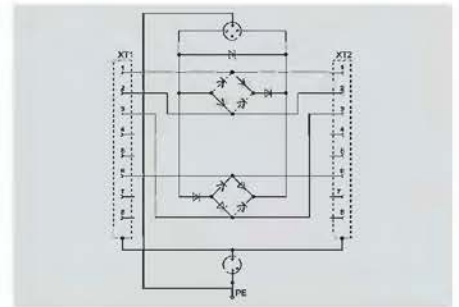
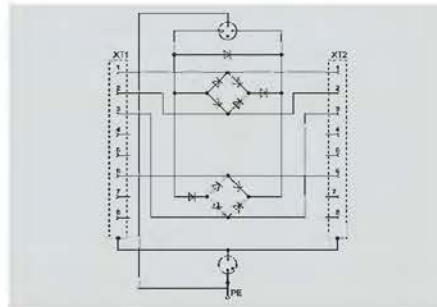
DME 100Tx-4RJ

Ethernet Cat.5



DME 100Tx-4RJ TS 35

Ethernet Cat.5



Technical data

Technical data

Rated voltage (AC)
 max. continuous voltage, U_c
 Operating current, I_{max}
 Volume resistivity
 Build rate
 Response time
 Gas discharge tube
 Varistor
 Suppression diodes
 Cut-off frequency (-3 dB) at load impedance
 Discharge current, max. (8/20 μs)
 Protection level on output side sym., input 1 kV/μs, typ.
 Protection level on output side sym., input 8/20 μs, typ.
 Protection level on output side unsym., input 1kV/μs, typ.
 Protection level on output side unsym., input 8/20 μs, typ.
 Design
 Type of connection
 Storage temperature, min./max.
 Operating temperature, min./max.

5 V
 7 V
 1,30 Ω
 ≤ 5 ns
 yes
 no
 yes
 2 kA
 40 V
 45 V
 450 V
 500 V
 Miscellaneous
 RJ45
 -25 °C/60 °C
 -20 °C/50 °C

5 V
 7 V
 1,30 Ω
 ≤ 5 ns
 yes
 no
 yes
 2 kA
 40 V
 45 V
 450 V
 500 V
 Miscellaneous
 RJ45
 -25 °C/60 °C
 -20 °C/50 °C

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

RJ45

51 x 64 x 22
 Data line protection for 10Base T and 100Base T

RJ45

51 x 64 x 22
 Data line protection for 10Base T and 100Base T

Ordering data

Version

Type	Qty.	Order No.
DME100TX-4RJ	1	8738780000

Type	Qty.	Order No.
DME 100TX-4RJ TS35 Ether. Cat5	1	8830230000

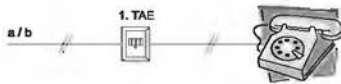
Note

Accessories

Note

Overvoltage protection for TAE telecommunications interfaces

Overvoltage protection for analogue connections



Besides the use of standard telephones, an analogue installation can also be used to transmit data services like fault signalling systems and Internet. The fact that besides telephones other devices like fax machines and modems are also connected to the analogue line means that the hazards due to transient interference phenomena like overvoltages are on the increase.

TAE overvoltage protection for analogue lines is necessary to achieve protection against these overvoltages. The basic version of the surface-mounted TAE-NFN socket has two-stage overvoltage protection provided by a gas discharge tube and fast-acting suppression diodes.

The gas discharge tube achieves a high energy discharge; the suppression diodes ensure a low residual voltage. This setup protects the end terminals.

Other TAE overvoltage protection sockets with monitoring functions are also available.

These monitor the connection of the voice voltage/operating voltage. As soon as this is interrupted or short-circuited, the output is switched to high resistance. This signal can be evaluated via a PLC input. A visual indication (green LED) instead of the remote signalling can be selected as an option.

Installation instructions

The incoming telephone line must be connected with the right polarity La (-) / Lb (+). The connection of the operating voltage for the UK0 interface is monitored (transistor output is enabled). As soon as this is interrupted or short-circuited, the output is switched to high resistance. This signalling voltage of the TAE ovp ISDN FM can be evaluated via a PLC input. On the TAE OVP ISDN LED model an LED indicates the operating status.

Overvoltage protection for ISDN connections Telephone connections at the U_{k0}/So interface



Digital signal processing enables more intensive use of larger volumes of data and higher demands to be placed on communications.

The desire to communicate via several lines calls for the installation of a digital system. Such systems make use of special modems as well as ISDN telephones.

This considerably increases the risk of transient interference such as overvoltages.

The TAE overvoltage protection for ISDN lines can be installed to protect against these overvoltages.

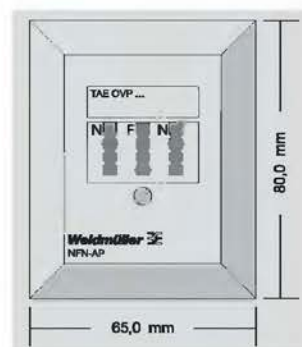
The basic version of the surface-mounted TAE-NFN socket has two-stage overvoltage protection provided by a gas discharge tube and fast-acting suppression diodes.

The gas discharge tube achieves a high energy discharge; the suppression diodes ensure a low residual voltage. This setup protects the end terminals.

Other TAE overvoltage protection sockets with monitoring functions are also available.

These monitor the connection of the voice voltage/operating voltage. As soon as this is interrupted or short-circuited, the output is switched to high resistance. This signal can be evaluated via a PLC input. A visual indication (green LED) instead of the remote signalling can be selected as an option.

Drawing with dimensions:

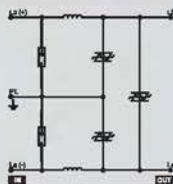


for telecommunication interface

- Overvoltage protection for telecommunication interfaces
- High energy discharge with gas discharge tube
- Low residual voltage with special Transil diodes
- Overvoltage protection for analogue telephone connections
- Including TAE-NFN wall-mounted socket

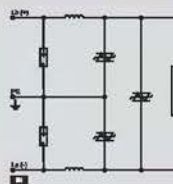
TAE OVP

TAE OVP analog



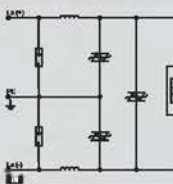
TAE OVP

TAE OVP analog LED



TAE OVP

TAE OVP analog FM



Technical data

Technical data	
Rated voltage (AC)	190 V
max. continuous voltage, U _c	190 V
Operating current, I _{max}	0.45 A
Discharge current, max. (8/20 μs)	10 kA
Response time	≤ 5 ns
Protection level on output side sym., input 8/20 μs, typ.	100 V @5kA
Protection level on output side unsym., input 8/20 μs, typ.	100 V @5kA
Optical function indicator	
Pollution severity	2
Overvoltage category	III
Operating temperature, min./max.	0 °C/60 °C
Storage temperature, min./max.	-25 °C/85 °C
General data	
Input voltage, max.	190 V
Standard signal	Analogue telephone signal Uko
Rated discharge current (8/20 μs)	4 kA
Total current	10 kA (8/20 μs)
Response time, typical	< 5 ns
Resistance per path	1.1 Ω
Cut-off frequency fg,600 Ω system	2 MHz
Transistor output, positive-switching	
Residual voltage at output for input pulse of 1 kV/μs	a/b < 270 V, a-b/PE < 270V
Residual voltage at output for 8/20 μs and input pulse of 5kA	a-b/PE < 100 V, a-b/PE < 100V

Rated voltage (AC)	190 V
max. continuous voltage, U _c	190 V
Operating current, I _{max}	0.45 A
Discharge current, max. (8/20 μs)	10 kA
Response time	≤ 5 ns
Protection level on output side sym., input 8/20 μs, typ.	100 V @5kA
Protection level on output side unsym., input 8/20 μs, typ.	100 V @5kA
Optical function indicator	LED
Pollution severity	2
Overvoltage category	III
Operating temperature, min./max.	0 °C/60 °C
Storage temperature, min./max.	-25 °C/85 °C
General data	
Input voltage, max.	190 V
Standard signal	Analogue telephone signal Uko
Rated discharge current (8/20 μs)	4 kA
Total current	10 kA (8/20 μs)
Response time, typical	< 5 ns
Resistance per path	1.1 Ω
Cut-off frequency fg,600 Ω system	2 MHz
Transistor output, positive-switching	
Residual voltage at output for input pulse of 1 kV/μs	a/b < 270 V, a-b/PE < 270V
Residual voltage at output for 8/20 μs and input pulse of 5kA	a-b/PE < 100 V, a-b/PE < 100V

Rated voltage (AC)	190 V
max. continuous voltage, U _c	190 V
Operating current, I _{max}	0.45 A
Discharge current, max. (8/20 μs)	10 kA
Response time	≤ 5 ns
Protection level on output side sym., input 8/20 μs, typ.	100 V @5kA
Protection level on output side unsym., input 8/20 μs, typ.	100 V @5kA
Optical function indicator	LED
Pollution severity	2
Overvoltage category	III
Operating temperature, min./max.	0 °C/60 °C
Storage temperature, min./max.	-25 °C/85 °C
General data	
Input voltage, max.	190 V
Standard signal	Analogue telephone signal Uko
Rated discharge current (8/20 μs)	4 kA
Total current	10 kA (8/20 μs)
Response time, typical	< 5 ns
Resistance per path	1.1 Ω
Cut-off frequency fg,600 Ω system	2 MHz
Transistor output, positive-switching	
Residual voltage at output for input pulse of 1 kV/μs	a/b < 270 V, a-b/PE < 270V
Residual voltage at output for 8/20 μs and input pulse of 5kA	a-b/PE < 100 V, a-b/PE < 100V

Rated voltage (AC)	190 V
max. continuous voltage, U _c	190 V
Operating current, I _{max}	0.45 A
Discharge current, max. (8/20 μs)	10 kA
Response time	≤ 5 ns
Protection level on output side sym., input 8/20 μs, typ.	100 V @5kA
Protection level on output side unsym., input 8/20 μs, typ.	100 V @5kA
Optical function indicator	
Pollution severity	2
Overvoltage category	III
Operating temperature, min./max.	0 °C/60 °C
Storage temperature, min./max.	-25 °C/85 °C
General data	
Input voltage, max.	190 V
Standard signal	Analogue telephone signal Uko
Rated discharge current (8/20 μs)	4 kA
Total current	10 kA (8/20 μs)
Response time, typical	< 5 ns
Resistance per path	1.1 Ω
Cut-off frequency fg,600 Ω system	2 MHz
Transistor output, positive-switching	
Residual voltage at output for input pulse of 1 kV/μs	5...48V DC / 0,1 A
Residual voltage at output for 8/20 μs and input pulse of 5kA	a/b < 270 V, a-b/PE < 270V

Dimensions	
Clamping range (rating- / min. / max.)	mm ²
Length x width x height	mm
Note	

Clamp. yoke connection	
0.8 / 0.5 / 1.5	
30 x 65 x 80	
4P Housing NFN	

Clamp. yoke connection	
0.8 / 0.5 / 1.5	
30 x 65 x 80	
4P Housing NFN	

Clamp. yoke connection	
0.8 / 0.5 / 1.5	
30 x 65 x 80	
4P Housing NFN	

Ordering data

Version	
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Type	(Qty.=1)	Order No.
TAE OVP analog		8673980000

Type	(Qty.=1)	Order No.
TAE OVP analog LED		8674020000

Type	(Qty.=1)	Order No.
TAE OVP analog FM		8649910000

Note	
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Accessories

Note	
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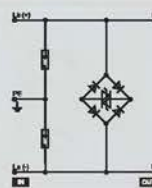
Overvoltage protection for data interface

for telecommunication interface

- High energy discharge thanks to gas charge eliminator
- Low residual voltage thanks to special Transil diodes
- Overvoltage protection for ISDN, including TAE-NFN wall-mounted socket

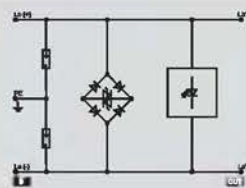
TAE OVP

TAE OVP ISDN



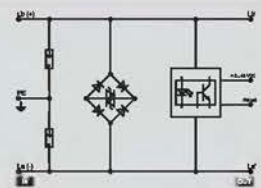
TAE OVP

TAE OVP ISDN LED



TAE OVP

TAE OVP ISDN FM



Technical data

Technical data

Rated voltage (AC)
max. continuous voltage, U_c
Operating current, I_{max}
Discharge current, max. (8/20 μ s)
Response time
Protection level on output side sym., input
8/20 μ s, typ.
Protection level on output side unsym., input
8/20 μ s, typ.
Optical function indicator
Pollution severity
Overvoltage category
Operating temperature, min./max.
Storage temperature, min./max.

General data

Input voltage, max.
Standard signal
Rated discharge current (8/20 μ s)
Total current
Response time, typical
Resistance per path
Cut-off frequency fg,600 Ω system
Transistor output, positive-switching
Residual voltage at output for input pulse of
1 kV/ μ s
Residual voltage at output for 8/20 μ s and
input pulse of 5kA

Dimensions

Clamping range (rating- / min. / max.) mm²
Length x width x height mm

Note

Ordering data

Version

Note

Accessories

Note

190 V
190 V
0.45 A
10 kA
 ≤ 5 ns
100 V @5kA
100 V @5kA
2
III
0 °C/60 °C
-25 °C/85 °C

190 V
ISDN telephone signal Uko interface
4 kA
10 kA (8/20 μ s)
< 5 ns
1.1 Ω
80 MHz
a/b < 270 V, a-b/PE < 270V
a-b/PE < 100 V, a-b/PE < 100V

Clamp. yoke connection

0.8 / 0.5 / 1.5
30 x 65 x 80
6P Housing NFN

Type	(Qty.=1)	Order No.
TAE OVP ISDN		8674000000

190 V
190 V
0.45 A
10 kA
 ≤ 5 ns
100 V @5kA
100 V @5kA
green LED
2
III
0 °C/60 °C
-25 °C/85 °C

190 V
ISDN telephone signal Uko interface
4 kA
10 kA (8/20 μ s)
< 5 ns
1.1 Ω
2 MHz
a/b < 270 V, a-b/PE < 270V
a-b/PE < 100 V, a-b/PE < 100V

Clamp. yoke connection

0.8 / 0.5 / 1.5
30 x 65 x 80
6P Housing NFN

Type	(Qty.=1)	Order No.
TAE OVP ISDN LED		8674010000

190 V
190 V
0.45 A
10 kA
 ≤ 5 ns
100 V @5kA
100 V @5kA
2
III
0 °C/60 °C
-25 °C/85 °C

190 V
ISDN telephone signal Uko interface
4 kA
10 kA (8/20 μ s)
< 5 ns
1.1 Ω
2 MHz
5...48V DC / 0,1 A
a/b < 270 V, a-b/PE < 270V
a-b/PE < 100 V, a-b/PE < 100V

Clamp. yoke connection

0.8 / 0.5 / 1.5
30 x 65 x 80
6P Housing NFN

Type	(Qty.=1)	Order No.
TAE OVP ISDN FM		8673970000

Fieldbus components

Fieldbus components	Profibus	G.2
	Profibus DP	G.6
	Profibus PA with standard distributor	G.7
	Profibus PA for industry	G.9
	Profibus PA with overvoltage protection	G.10
	Profibus PA ATEX	G.12
	Fieldbus Foundation	G.15
	FBCon DK6	G.18
	Profibus accessories	G.22
	Fieldbus Foundation accessories	G.24
	Accessories	G.25

Overview



G

ATEX



Profibus DP bus terminator with 24 V power supply

Profibus DP distributor

The Profibus topology is a line structure. The branches (T-pieces) connect the individual field devices or remote I/Os to the bus cable. The length of the branch cable depends on the transmission rate and should be as short as possible. The total of all branch lengths for transmission rates up to 1.5 MBaud may not exceed max. 6.6 m.

The trunk cable passes through an EMC cable gland into an aluminium enclosure where it is connected to a tension clamp terminal. The branch cable from the device is connected to a coded M12 socket. The enclosure has a pressure compensation element to counteract the effects of climatic cycles.

The guidelines issued by the Profibus user organisation must be observed.

Profibus PA

(EN 50170, IEC 1158-2, DIN 19245)
Profibus PA is an open fieldbus standard. It was specially developed for the requirements of process industry technology, in particular concerning remote supply and intrinsic safety.

Profibus PA allows users to operate several sensors and actuators on one common bus cable. Power supply to the devices is via a 2-wire system with digital transmission of the process data. 32 devices can be operated in one segment. Repeaters can extend the maximum number to 126 stations with a maximum bus length of 10 km. For a transmission rate of 31.25 kbps, the bus length can reach up to 1900 m without repeaters, or up to 1000 m in explosion-risk areas. The bus can be wired as line, tree or star.

Integration in the Profibus DP network is achieved by means of a segment coupler.

Specific advantages

- Low wiring costs
- Minimum design costs for the process control system
- Remote interrogation and programming of the field devices
- Intrinsically safe design for use in dangerous atmospheres
- Further development and support through the Profibus user organisation PNO

Weidmüller can supply Profibus PA T-connectors.

When servicing work is required or modifications are to be made to the system, the Weidmüller PROFIBUS-PA T-connectors allow for field devices to be connected up or replaced without interrupting the field system.

Profibus DP Technical data

Operating temperature	-25 to +55 °C
Ingress protection class	IP 66
Enclosure material	High grade aluminium alloy (Al-Si 12)
Finish	Painted RAL 7001
Profibus DP connection	Tension clamp terminals 0.5 – 1.5 mm ²
Cable entry	Cable gland M16
Cable gland clamping range	5.5 – 9.5 mm
Contact surface	M12 plug/socket CuZnAu
Transmission rate	Max. 1.5 MBaud
Power supply bus connection	24 Vdc ±10%

Installation advice

Torques	
M16 cable gland at enclosure	6.0 Nm
Union nut, M16 cable gland	4.0 Nm
Enclosure cover	1.8 – 2.0 Nm
External earthing cable	1.8 – 2.0 Nm
Adaptor/stud cable	hand-tight

Aluminium enclosure Technical data

Operating temperature	From -40 to +85 °C
Ingress protection class	IP 66
Enclosure material	High grade aluminium alloy (AL-Si 12)
Finish	Painted RAL 7001
Profibus PA connection	Tension clamp terminals 0.5 – 1.5 mm ²
Cable entry	Cable gland M16
Clamping range	5.5 – 9.5 mm
Measuring device connector M12 x 1.4-pin	Contacts brass, surface CuZnAu

Installation advice

Torques	
M16 cable gland at enclosure	-6.25 Nm
Union nut, M16 cable gland	-4.5 Nm
Enclosure cover	1.8 – 2.0 Nm
External earthing cable	1.8 – 2.0 Nm

Stainless steel enclosure Technical data

Operating temperature	From -40 to +85 °C
Ingress protection class	IP 66
Enclosure material	Stainless steel 316 (L) 1.4404
Profibus PA connection	Tension clamp terminals 0.5 – 1.5 mm ²
Cable entry	Cable gland M16
Clamping range	5.5 – 9.5 mm

Installation advice

Torques	
M16 cable gland at enclosure	-5 Nm
Union nut, M16 cable gland	-3.75 Nm
Enclosure cover	1.8 – 2.0 Nm
External earthing cable	1.8 – 2.0 Nm

Explosion protection

A new concept for explosion protection in Europe

The so-called ATEX directive (from the French “atmosphères explosives”), official title 94/9/EC, was made law in the CENELEC member states in 1996. The idea behind the new directive was to simplify the previous system, in which national and international standards regulated the changes to the laws of the member states.

The legislation was passed under article 100a of the Treaty of Rome (foundation of the European Union), in turn resulting in directive ATEX 100a.

Previously, standards such as the EN50014 series for hazard zones were incorporated in the EU directive. Given that national legislation requirements are based on this directive, even the slightest changes result in changes to the standards in the corresponding directive and then in national law.

The ATEX directive is not based on one single standard, but specifies a series of fundamental health and safety requirements. The EN 50014 series “Harmonised standards” supports the ATEX directive, but no longer prescribes its content. This is called the “new concept”.

Aim of the directive

ATEX 100a deals with the continuous introduction and commissioning of all products on the market. Basically, this concerns the free exchange of goods over and beyond national borders, within the EU and the CENELEC member states.

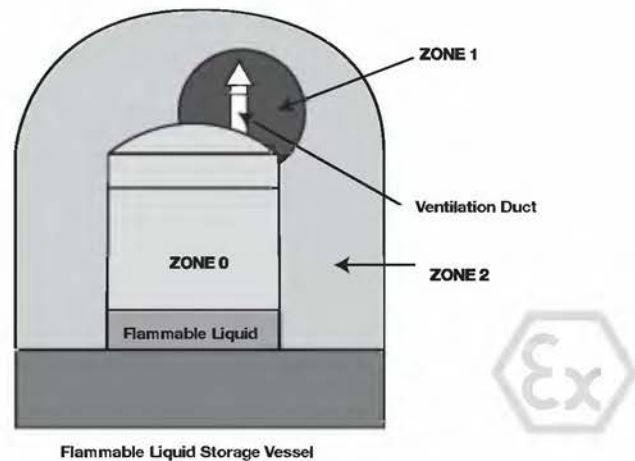
Timetable

As already mentioned above, ATEX became national law in 1996. Up until June 30, 2003, ATEX was available as an option on an equal status with the “old concept”, but was to be given preference. As from July 1, 2003, only ATEX is applicable. All products commissioned after this date must comply with the requirements of the directive. This also means that long-term projects which are already up and running now also have to consider ATEX.

The difference with ATEX

In contrast to the “old concept”, ATEX also takes into account the mechanical components and systems. This also includes mining operations.

The existing definition of the term “explosion-risk area” remains unaffected. This refers to flammable substances and materials that can deflagrate in air under atmospheric conditions.



Profibus DP

Standard distributor with or without active bus termination

1-way distributor



Terminator



Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon DP M12 1way	branch line M12	1	8564350000
FBCon DP CG 1way	branch line CG	1	8564340000

Stainless steel housing

FBCon SS DP M12 1way	branch line M12	1	8714270000
FBCon SS DP PCG 1way	branch line CG	1	8714260000

Trunk line via cable gland

Ordering data

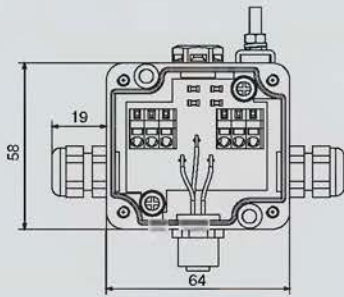
Aluminium housing	Type of connection	Qty.	Order No.
FBCon Term.D Ex FM/PEAN		1	8606180000
FBCon Term.D Ex PEAN		1	8606200000
FBCon Term.D Ex		1	8606190000

Stainless steel housing

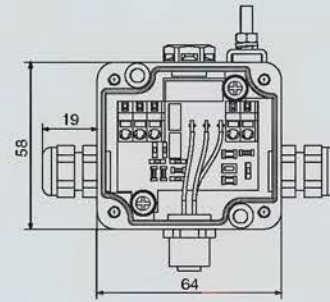
FBCon SS DP M12 Term 24V	branch line M12	1	8714250000
FBCon SS DP PCG Term 24V	branch line CG	1	8714240000

Trunk line via cable gland

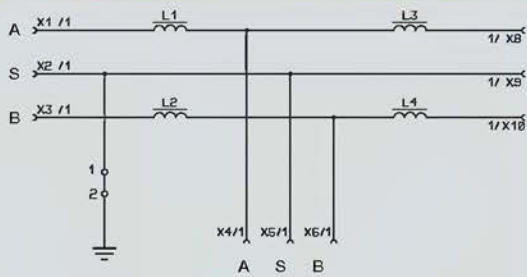
Dimensioned drawing



Dimensioned drawing

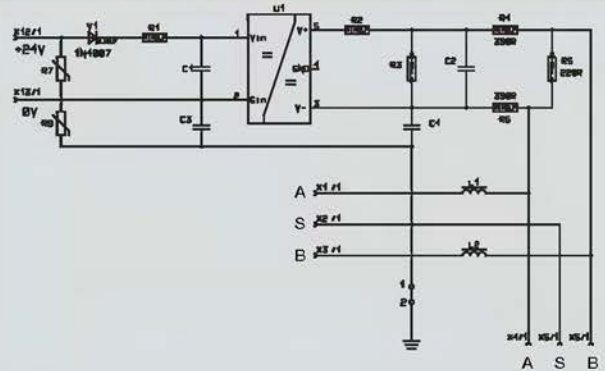


Wiring diagram



L1 = L2 = L3 = L4 = 120nH

Wiring diagram



Standard distributor

1-way distributor



2-way distributor



Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 1way	branch line CG	1	8564090000
FBCon PA CG/M12 1way	branch line M12	1	8564060000

Stainless steel housing	Type of connection	Qty.	Order No.
FBCon SS CG 1way	branch line CG	1	8703430000
FBCon SS CG/M12 1way	branch line M12	1	8726020000
FBCon SS PCG 1way	all connections PCG	1	8613670000

Trunk line via cable gland

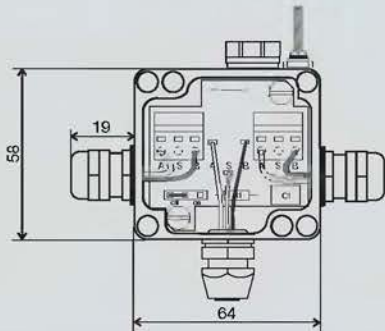
Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 2way	branch line CG	1	8564100000
FBCon PA CG/M12 2way	branch line M12	1	8564070000

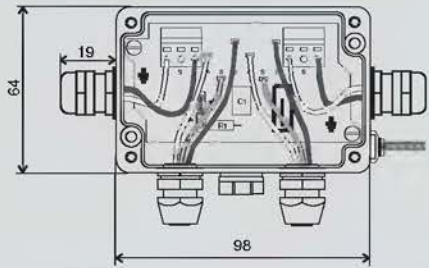
Stainless steel housing	Type of connection	Qty.	Order No.

Trunk line via cable gland

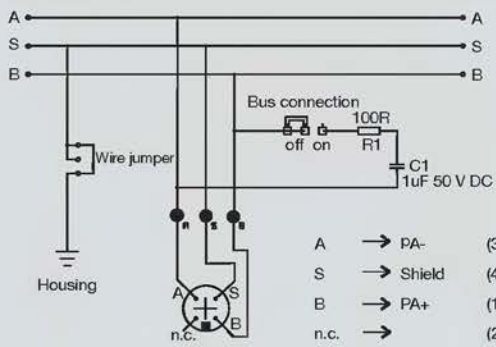
Dimensioned drawing



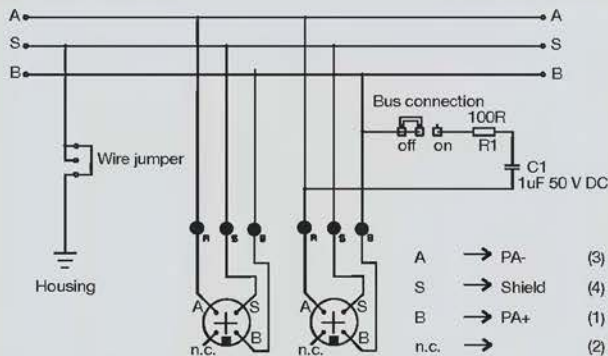
Dimensioned drawing



Wiring diagram



Wiring diagram



Profibus PA

Standard distributor

4-way distributor



Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 4way	branch line CG	1	8564110000
FBCon PA CG/M12 4way	branch line M12	1	8564060000

Stainless steel housing

FBCon SS CG 4way	branch line CG	1	8703450000
FBCon SS CG/M12 4way	branch line M12	1	8726040000
FBCon SS PCG 4way	all connections PCG	1	8613680000

Trunk line via cable gland

8-way distributor



Ordering data

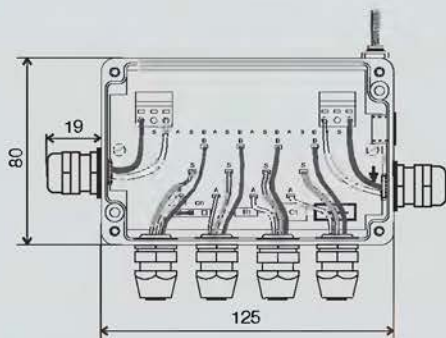
Aluminium housing	Type of connection	Qty.	Order No.
FBCon CG 8way	branch line CG	1	8564300000
FBCon CG/M12 8way	branch line M12	1	8564310000

Stainless steel housing

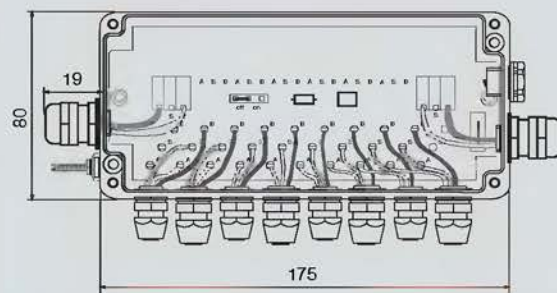
FBCon SS CG 8way	branch line CG	1	8703470000
FBCon SS CG/M12 8way	branch line M12	1	8726050000
FBCon SS PCG 8way	all connections PCG	1	8640720000

Trunk line via cable gland

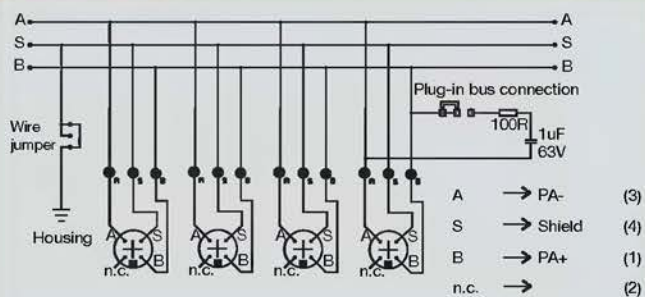
Dimensioned drawing



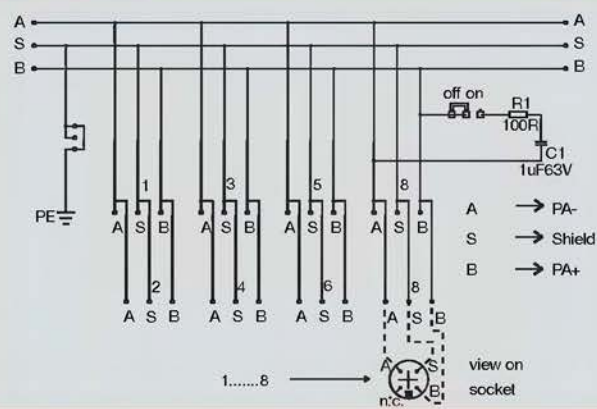
Dimensioned drawing



Wiring diagram



Wiring diagram



Profibus PA

Standard distributor with overvoltage protection (OVP) or fuse

1-way distributor OVP/Fuse



2-way distributor OVP/Fuse



Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 1way Limiter	branch line CG	1	8714200000
FBCon PA CG 1way OVP	branch line CG	1	8714120000
FBCon PA CG/M12 1way Limiter	branch line M12	1	8714160000
FBCon PA CG/M12 1way OVP	branch line M12	1	8714080000
Stainless steel housing			
FBCon SS PCG 1way Limiter	all connections PCG	1	8726110000
FBCon SS PCG 1way OVP	all connections PCG	1	8715270000

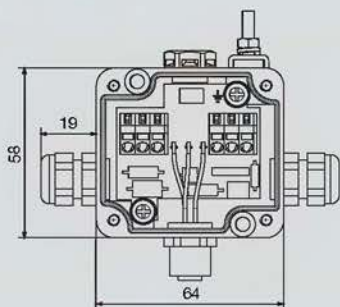
Trunk line via cable gland

Ordering data

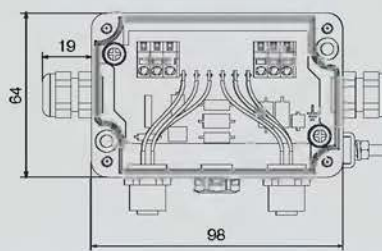
Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 2way Limiter	branch line CG	1	8714210000
FBCon PA CG 2way OVP	branch line CG	1	8714130000
FBCon PA CG/M12 2way Limiter	branch line M12	1	8714170000
FBCon PA CG/M12 2way OVP	branch line M12	1	8714090000
Stainless steel housing			

Trunk line via cable gland

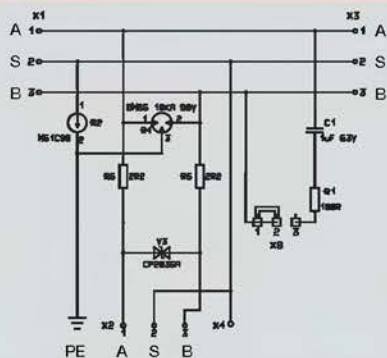
Dimensioned drawing



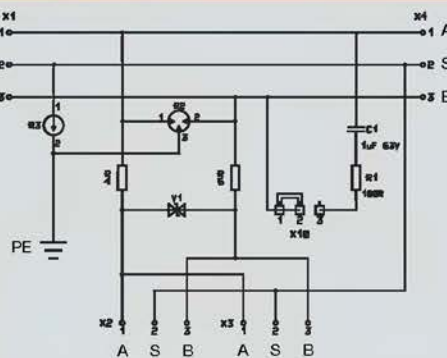
Dimensioned drawing



Wiring diagram



Wiring diagram



Standard distributor with overvoltage protection (OVP) or fuse

4-way distributor OVP/Fuse



8-way distributor OVP/Fuse



Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 4way Limiter	branch line CG	1	8714220000
FBCon PA CG 4way OVP	branch line CG	1	8714140000
FBCon PA CG/M12 4way Limiter	branch line M12	1	8714180000
FBCon PA CG/M12 4way OVP	branch line M12	1	8714100000
Stainless steel housing			
FBCon SS PCG 4way Limiter	all connections PCG	1	8715260000
FBCon SS PCG 4way OVP	all connections PCG	1	8726080000

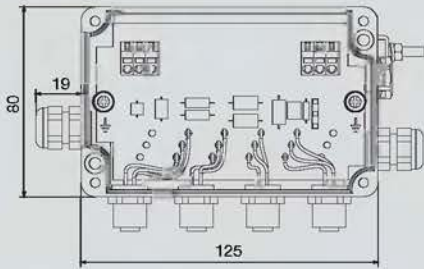
Trunk line via cable gland

Ordering data

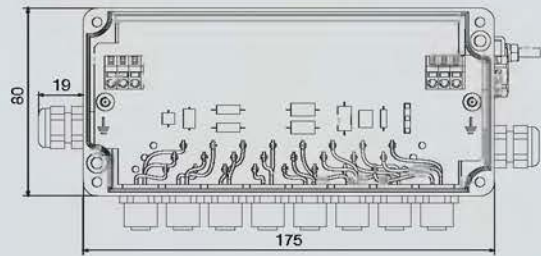
Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 8way Limiter	branch line CG	1	8714230000
FBCon PA CG 8way OVP	branch line CG	1	8714150000
FBCon PA CG/M12 8way Limiter	branch line M12	1	8714190000
FBCon PA CG/M12 8way OVP	branch line M12	1	8714110000
Stainless steel housing			
FBCon SS PCG 8way Limiter	all connections PCG	1	8726160000
FBCon SS PCG 8way OVP	all connections PCG	1	8726090000

Trunk line via cable gland

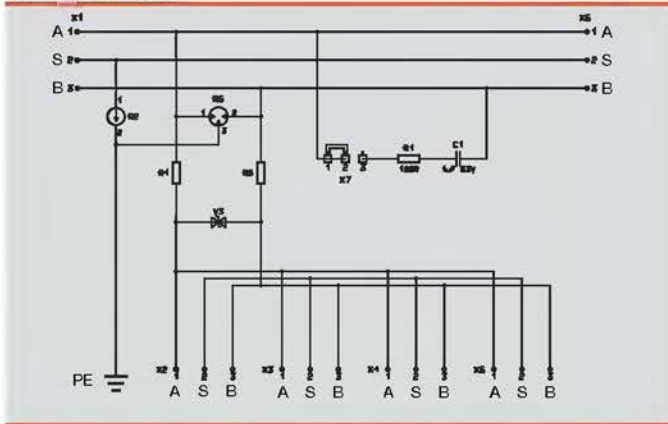
Dimensioned drawing



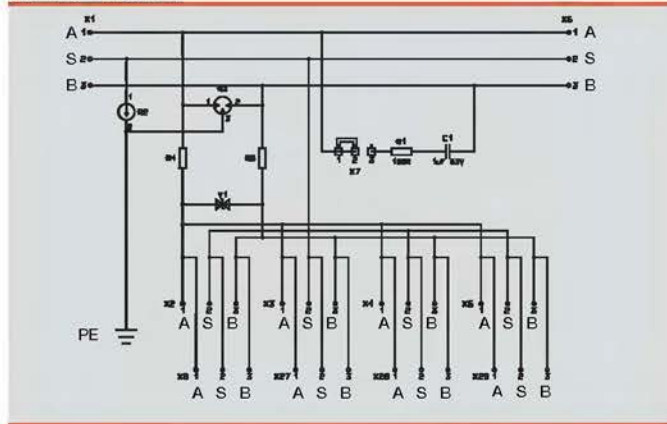
Dimensioned drawing



Wiring diagram



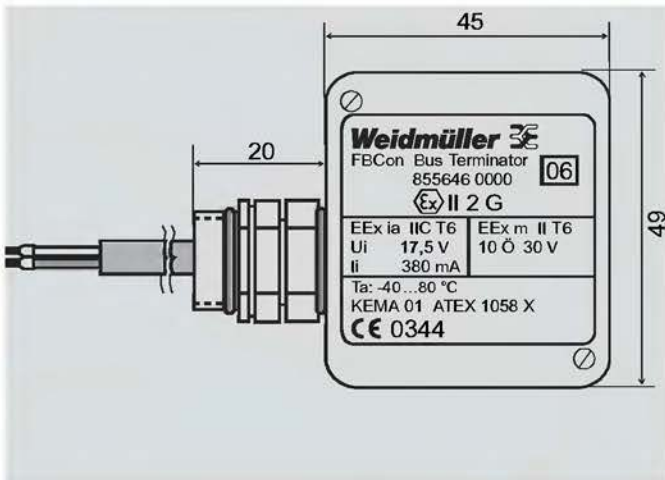
Wiring diagram



Profibus PA ATEX

FBCon bus terminator

FBCon bus terminator without earth connection



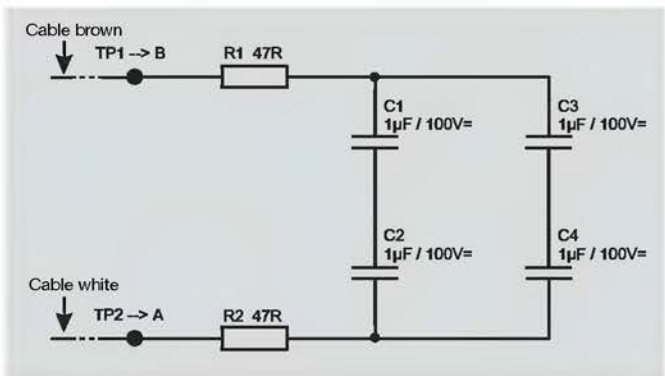
Ordering data

Type	Qty	Order No.
FBCon bus terminator Eex with locking clip, without earth connection	1	8556460000
FBCon bus terminator Eex without locking clip, without earth connection	1	8606190000

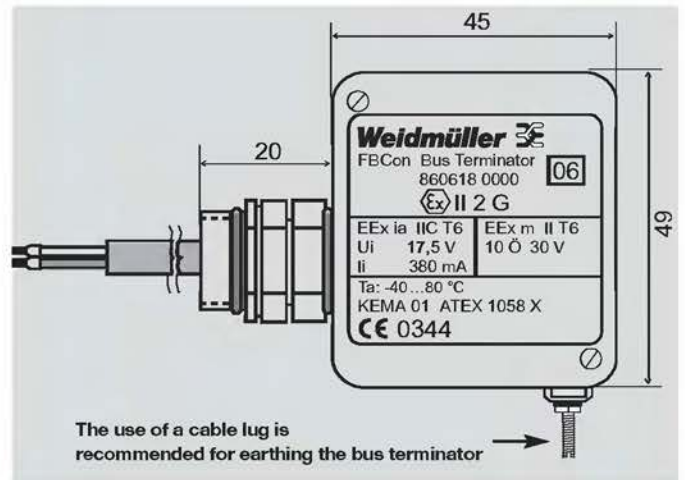
Technical data

Operating temperature	-40 to +80 °C
Ingress protection class	IP 66
Enclosure material	High grade aluminium alloy (Al - Si 12)
Finish	Black powder-coated
Connection lead	2 x 0.14 mm ²
Cable entry	Bus adapter M16

Circuit diagram



FBCon Bus Terminator with earth connection



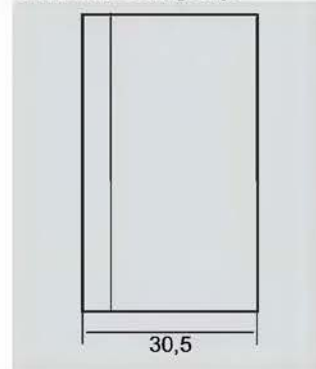
Ordering data

Type	Qty	Order No.
FBCon bus terminator Eex with locking clip, with earth connection	1	8606180000
FBCon bus terminator Eex without locking clip, with earth connection	1	8606200000

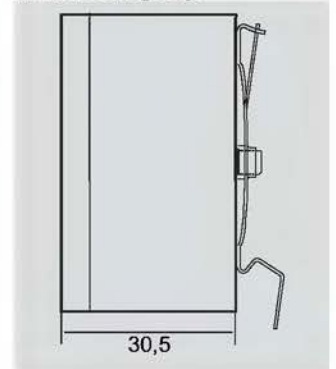
Installation advice

Torques	
M16 adapter on enclosure	6.0 Nm
External earthing cable (if required)	1.8 - 2.0 Nm

Enclosure cover without locking clip



Enclosure cover with locking clip



Standard distributor for Ex applications EEx(ia)

1-way distributor EEx



2-way distributor EEx



Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 1way Ex	branch line CG	1	8564180000
FBCon PA CG/M12 1way Ex	branch line M12	1	8564150000

Stainless steel housing

Trunk line via cable gland

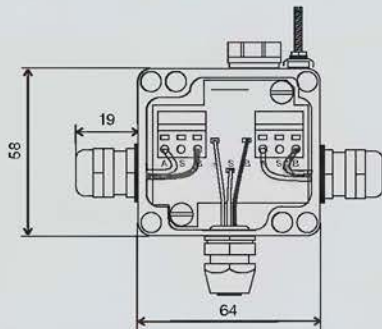
Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 2way Ex	branch line CG	1	8564190000
FBCon PA CG/M12 2way Ex	branch line CG	1	8564160000

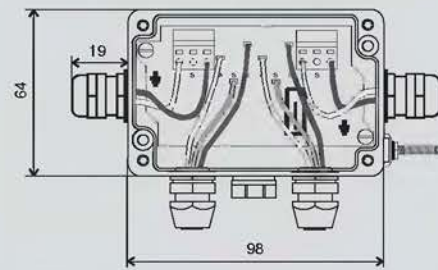
Stainless steel housing

Trunk line via cable gland

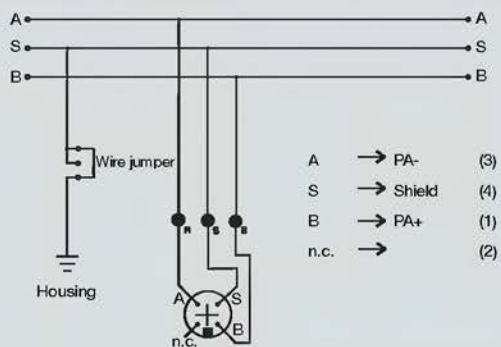
Dimensioned drawing



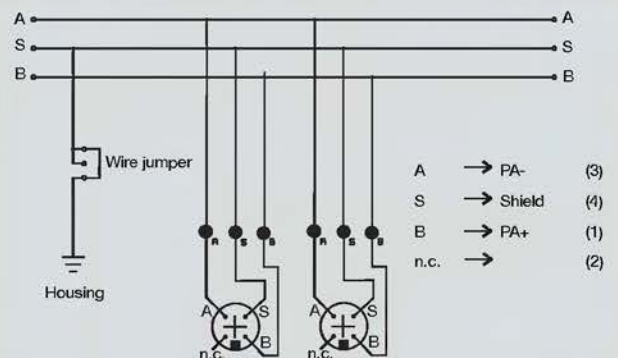
Dimensioned drawing



Wiring diagram



Wiring diagram



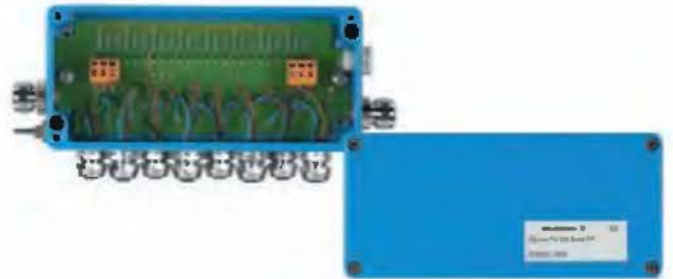
Profibus PA ATEX

Standard distributor for Ex applications EEx(ia)

4-way distributor EEx



8-way distributor EEx



Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 4 way Ex	branch line CG	1	8564200000
FBCon PA CG/M12 4way Ex	branch line M12	1	8564170000

Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon PA CG 8way Ex	branch line CG	1	8564240000
FBCon PA M12 8way Ex	branch line M12	1	8564250000

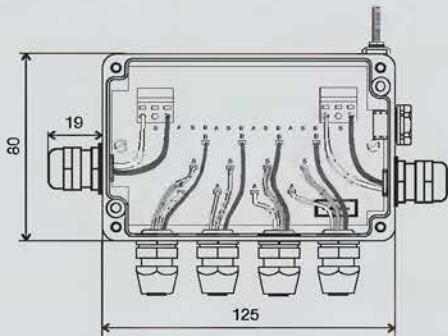
Stainless steel housing

Trunk line via cable gland

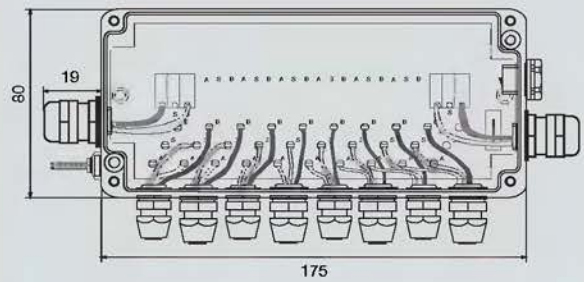
Stainless steel housing

Trunk line via cable gland

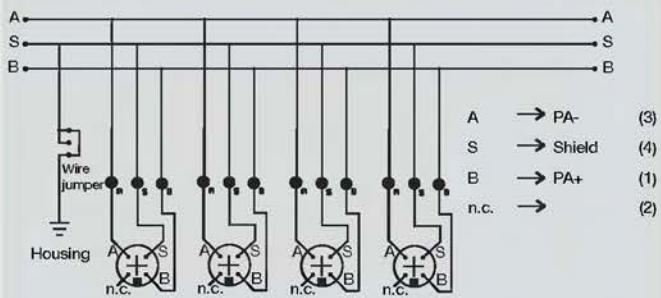
Dimensioned drawing



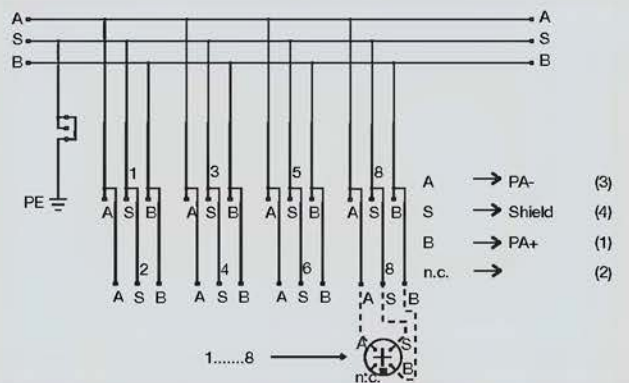
Dimensioned drawing



Wiring diagram

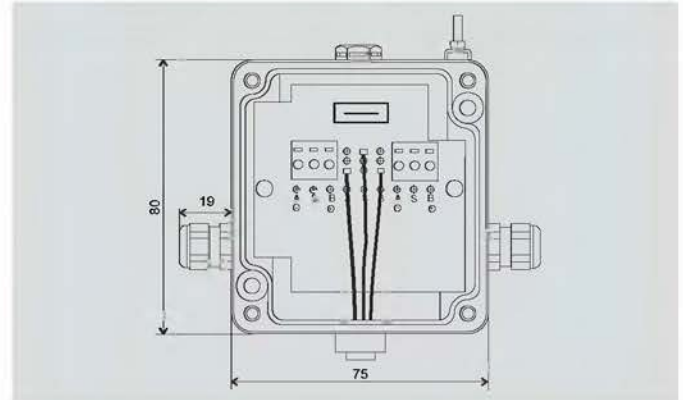


Wiring diagram





FF distributor, 1-way / type FBCon FF CG – 7/8" 1-way Eex (ia)



The Fieldbus Foundation is an open fieldbus standard. It was specially developed for the requirements of process industry technology, including remote supply and intrinsic safety. Fieldbus Foundation enables users to operate several sensors and actuators on one bus cable. Power supply to the devices is via a 2-wire system with digital transmission of the process data.

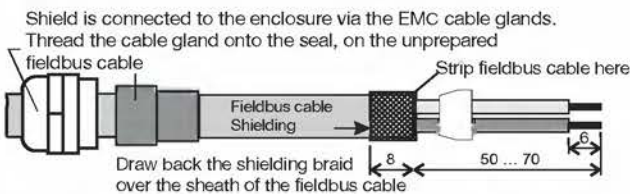
32 devices can be operated in one segment. Repeaters can extend the maximum number to 126 stations with a maximum bus length of 10 km. For a transmission rate of 31.25 kbps, the bus length can reach up to 1900 m without repeaters, or up to 1000 m in explosion-risk areas. The bus can be wired as line, tree or star.

Integration in the Fieldbus Foundation network is achieved by means of a segment coupler.

Specific advantages

- Low wiring costs
- Minimum design costs for the process control system
- Remote interrogation and programming of the field devices
- Intrinsically safe design for use in hazardous areas

Weidmüller can supply Fieldbus Foundation connectors. When servicing work is required or modifications are to be made to the system, Weidmüller Fieldbus Foundation connectors allow for field devices to be connected up or replaced without interrupting the bus system.



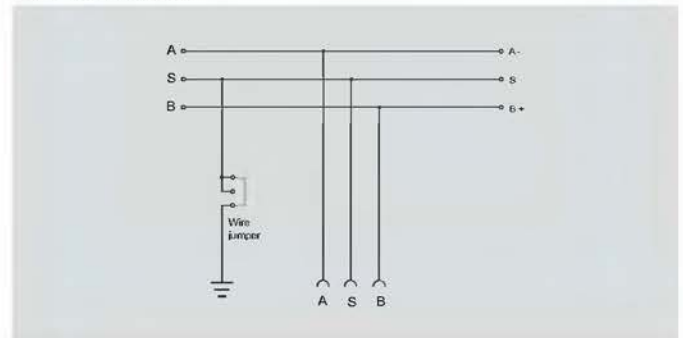
Technical data

Operating temperature	From -40 to +85 °C
Protection class	IP 66
Enclosure material	High grade aluminium alloy (Al-Si 12)
Finish	Enamelled PA1 9005
Fieldbus connection	Tension-clamp terminals 0.5 – 1.5 mm ²
Cable entry	Cable gland M16
Clamping range	5.5 – 9.5 mm

Installation advice

Torques	
M16 cable gland at enclosure	6.25 Nm
Union nut, M16 cable gland	4.5 Nm
Enclosure cover	1.8 – 2.0 Nm
External earthing cable	1.8 – 2.0 Nm

Circuit diagram



Fieldbus Foundation

Standard distributor for Ex applications EEx(ia)

1-way distributor



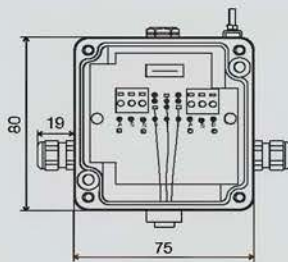
Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon FF CG-7/8 1way EX	branch line 7/8 inch	1	8564260000

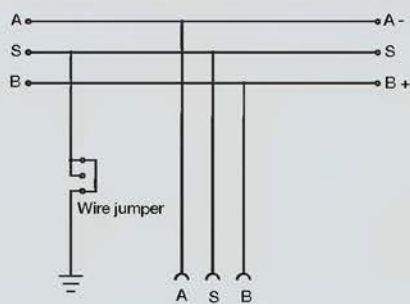
Stainless steel housing

Trunk line via cable gland

Dimensioned drawing



Wiring diagram



2-way distributor



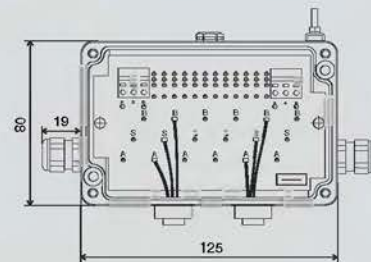
Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon FF CG-7/8 2way EX	branch line 7/8 inch	1	8564270000

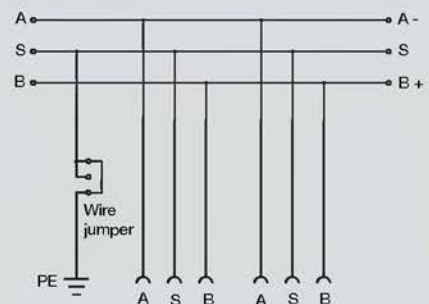
Stainless steel housing

Trunk line via cable gland

Dimensioned drawing



Wiring diagram



Standard distributor for Ex applications EEx(ia)

4-way distributor



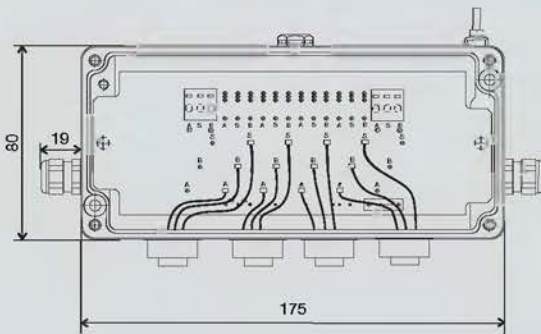
Ordering data

Aluminium housing	Type of connection	Qty.	Order No.
FBCon FF CG-7/8 4way EX	branch line 7/8 inch	1	8564280000

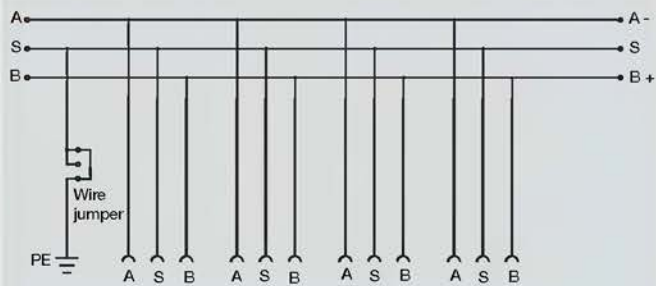
Stainless steel housing

Trunk line via cable gland

Dimensioned drawing



Wiring diagram



FBCon DK6

The FBCon fieldbus connectors are used in process automation, to set up different bus topologies such as line, tree or star on basis of the fieldbus systems. The fieldbus main line (trunk line) is distributed on several branch lines (spur lines).

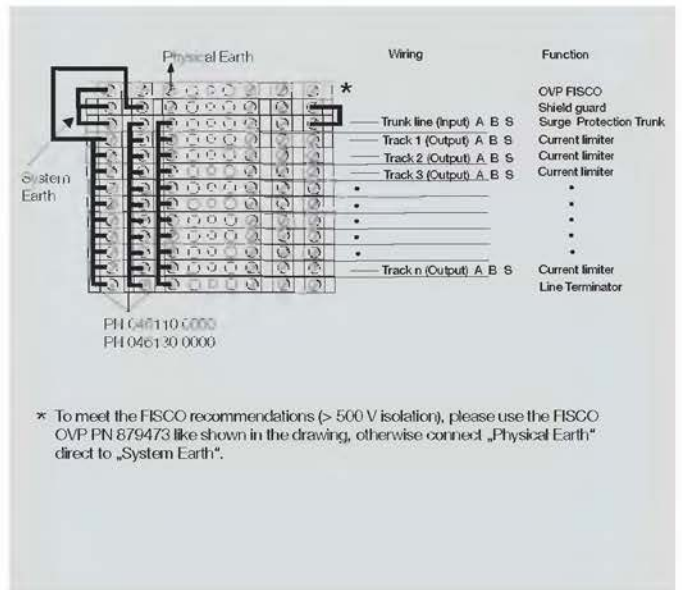
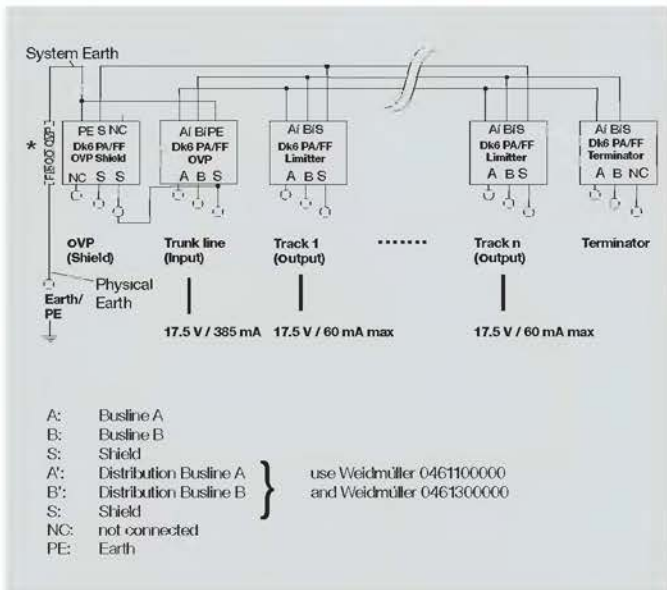
The field devices, with integrated fieldbus coupling (Profibus PA or Fieldbus Foundation), are connected directly to the spur lines.

The FBCon DK6 was designed for setting up the fieldbus connections for individual applications – with up to 20 spurs. The line-in module with overvoltage protection, current limitation (60mA) for the spurs and the terminator form the individual fieldbus connector for Profibus PA and Fieldbus Foundation

- For Fieldbus Foundation and Profibus PA
- Overvoltage protection for the trunk line
- Current limitation for the spur lines (60mA)
- LED indicates operation
- Cross-connection of the trunk line to each spur line
- 8 mm wide
- Screw connection
- ATEX EEx me, EEx ia

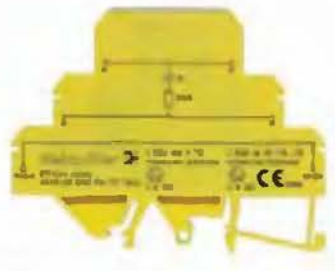


G



DK6 PA FF OVP Terminator

DK6 PA FF Shield



Technical data

Technical data

Bus system
 Rated voltage
 max. voltage
 Impulse sparkover voltage (1kV/μs)
 Rated discharge current (8/20 μs)
 Type of connection
 Operating temperature, min.-Operating temperature, max.
 Approvals

Profibus PA ;Foundation Fieldbus
 18

Screw connection
 -20 °C ...
 EEx me II T6, EEx ia IIC T6

Profibus PA ;Foundation Fieldbus
 24 V DC;18 V AC
 30 V DC
 90 V
 5 kA

Screw connection
 -20 °C ...
 EEx me II T6, EEx ia IIC T6

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

Note

Screw connection

2,5 / 0,5 / 4
 88,4 x 8 x 52

Screw connection

2,5 / 0,5 / 4
 88,4 x 8 x 52

Ordering data

Type of connection
 Screw connection

Type	Qty.	Order No.
DK6 PA FF Terminator	10	8770040000

Type	Qty.	Order No.
DK6 PA FF Shield	10	8781440000

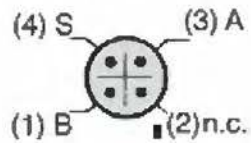
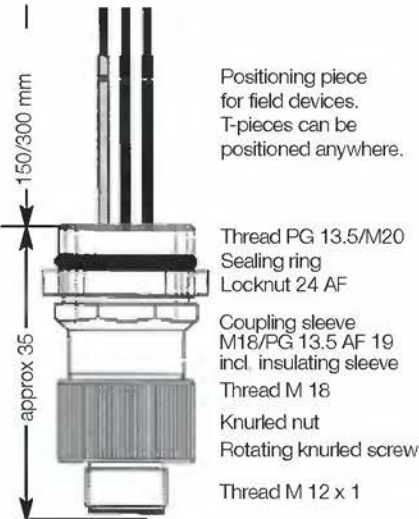
Note

Accessories

Note

Profibus accessories

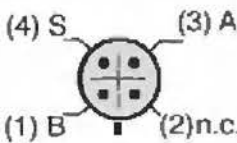
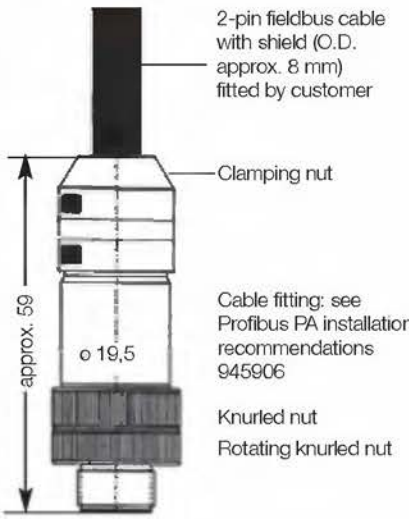
Locating plug-in connector (1)



Front view of pin insert and pins

- Pin A → Profibus PA-
- S → Shield
- B → PA+
- n.c. → not connected

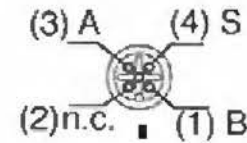
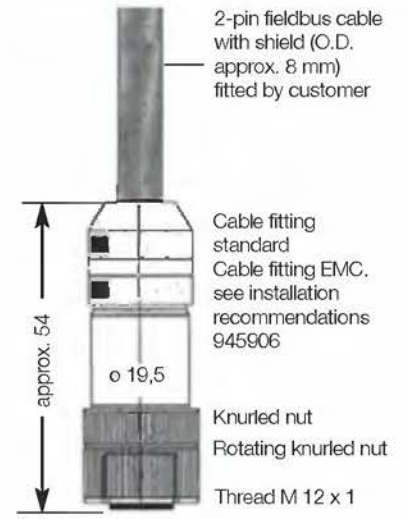
Cable plug (2)



Front view of pin insert and pins

- Pin A → Profibus PA-
- S → Shield
- B → PA+
- n.c. → not connected

Cable socket (3)



Front view of pin insert and pins

- Pin A → Profibus PA-
- S → Shield
- B → PA+
- n.c. → not connected

Ordering data

Type	Order No.
Locating plug-in connector PG 13.5 150 mm (1)	9455650000
Locating plug-in connector PG 13.5 300 mm (1)	8425910000
Locating plug-in connector M 20 150 mm (1)	8425930000
Locating plug-in connector M 20 300 mm (1)	8425940000
Cable plug for remote installation (2)	9455640000
Cable socket for remote installation (3)	8426220000

Technical data

	Locating plug-in connector for field device connection	Cable plug/socket
No. of pins	4-pin	4-pin
Type of connection	screw	screw
Connection cross-section	0.75 mm ²	0.75 mm ²
Connection thread	PG 13.5 / M20	M12
Contact surface	CuZnAu	CuZnAu
Enclosure protection class to DIN 40050 IEC 529	IP 67	IP 67 with cable o 4 – 9 mm
Enclosure material	Cu Zn surface Ni	Cu Zn surface Ni
Flammability to UL-94	V – 2	V – 2
Operating temperature	–40 °C ... +85 °C	–25 °C ... +85 °C
Rated current per contact	3 A	3A
Rated voltage to VDE standard 0110/ISO Group C	125 V ~ 150 V =	125 V ~ 150 V =
Tracking resistance	KC 800	KC 800
Volume resistivity to IEC 512 part 2	≤ 8 m Ω	≤ 8 m Ω
Insulation resistance to IEC 512 part 2	≥ 10 ¹² Ω	≥ 10 ¹² Ω

Installation advice

	Torque	Torque
Screw terminal		0.4 Nm
Union nut cable gland		4.0 Nm
Clamping nut	1.8 – 2.0 Nm	
Knurled nut	hand-tight	hand-tight
Lock nut	6.25 Nm	



If vibrations occur at the field device, we recommend installation of a spur cable to decouple the vibration source.

Pre-assembled cables for fieldbus distributor Profibus PA



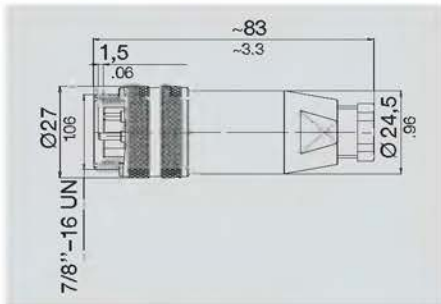
Ordering data

Designation	Type	Length	Colour	Order No.
Intrinsically safe range Exi				
Profibus PA cable with plug M12 assembled at one end, EMC/blue/1M	FBCEX PA M12 M 1m	1 m	blue Exi	1785150100
Profibus PA cable with plug M12 assembled at one end, EMC/blue/2M	FBCEX PA M12 M 2m	2 m	blue Exi	1785150200
Profibus PA cable with plug M12 assembled at one end, EMC/blue/5M	FBCEX PA M12 M 5m	5 m	blue Exi	1785150500
Profibus PA cable with plug M12 assembled at one end, EMC/blue/10M	FBCEX PA M12 M 10m	10 m	blue Exi	1785151000
<hr/>				
Profibus PA cable with socket M12 assembled at one end, EMC/blue/1M	FBCEX PA M12 FM 1m	1 m	blue Exi	1785140100
Profibus PA cable with socket M12 assembled at one end, EMC/blue/2M	FBCEX PA M12 FM 2m	2 m	blue Exi	1785140200
Profibus PA cable with socket M12 assembled at one end, EMC/blue/5M	FBCEX PA M12 FM 5m	5 m	blue Exi	1785140500
Profibus PA cable with socket M12 assembled at one end, EMC/blue/10M	FBCEX PA M12 FM 10m	10 m	blue Exi	1785141000
<hr/>				
Profibus PA cable assembled with plug/socket M12, EMC/blue/1M	FBCEX PA M12 M-FM 1m	1 m	blue Exi	1785130100
Profibus PA cable assembled with plug/socket M12, EMC/blue/2M	FBCEX PA M12 M-FM 2m	2 m	blue Exi	1785130200
Profibus PA cable assembled with plug/socket M12, EMC/blue/5M	FBCEX PA M12 M-FM 5m	5 m	blue Exi	1785130500
Profibus PA cable assembled with plug/socket M12, EMC/blue/10M	FBCEX PA M12 M-FM 10m	10 m	blue Exi	1785131000
<hr/>				
Industrial area non Exi				
Profibus PA cable with plug M12 assembled at one end, EMC/black/1M	FBC PA M12 M 1m	1 m	black /	1785120100
Profibus PA cable with plug M12 assembled at one end, EMC/black/2M	FBC PA M12 M 2m	2 m	black /	1785120200
Profibus PA cable with plug M12 assembled at one end, EMC/black/5M	FBC PA M12 M 5m	5 m	black /	1785120500
Profibus PA cable with plug M12 assembled at one end, EMC/black/10M	FBC PA M12 M 10m	10 m	black /	1785121000
<hr/>				
Profibus PA cable with socket M12 assembled at one end, EMC/black/1M	FBC PA M12 FM 1m	1 m	black /	1785110100
Profibus PA cable with socket M12 assembled at one end, EMC/black/2M	FBC PA M12 FM 2m	2 m	black /	1785110200
Profibus PA cable with socket M12 assembled at one end, EMC/black/5M	FBC PA M12 FM 5m	5 m	black /	1785110500
Profibus PA cable with socket M12 assembled at one end, EMC/black/10M	FBC PA M12 FM 10m	10 m	black /	1785111000
<hr/>				
Profibus PA cable assembled with plug/socket M12, EMC/black/1M	FBC PA M12 M-FM 1m	1 m	black /	1785100100
Profibus PA cable assembled with plug/socket M12, EMC/black/2M	FBC PA M12 M-FM 2m	2 m	black /	1785100200
Profibus PA cable assembled with plug/socket M12, EMC/black/5M	FBC PA M12 M-FM 5m	5 m	black /	1785100500
Profibus PA cable assembled with plug/socket M12, EMC/black/10M	FBC PA M12 M-FM 10m	10 m	black /	1785101000
<hr/>				
F > field / B > bus / C > cable / PA > process automation				
EEx > EEx area / M12 > connector / M > male / FM > female				
Other lengths on request				

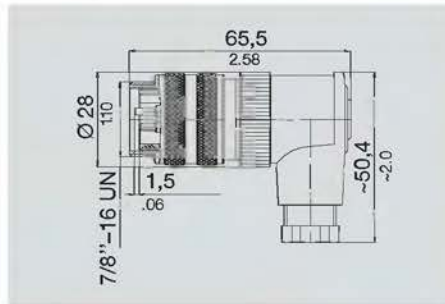
Fieldbus Foundation accessories

Plug-in connector FBCon 7/8"

Plug-in connector straight (plug)



Plug-in connector 90° (plug)

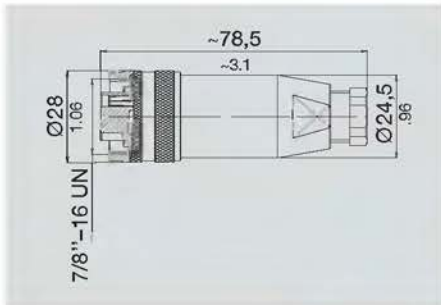


Ordering data		4-pole
Type	Qty	Order No.
FBCon 7/8" 4P M	1	1808830000

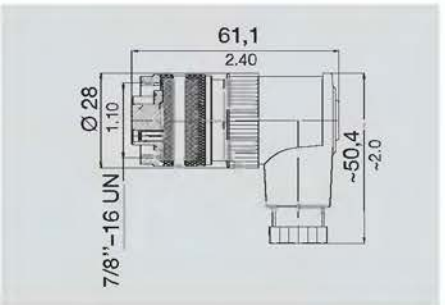
Ordering data		4-pole
Type	Qty	Order No.
FBCon 7/8" 4P M (A)	1	1808840000

Technical data	
No. of poles	4
Lock	Screw 7/8" UNF
Connection	Screw
Connection cross-section	Max. 1.5 mm ²
Connection cross-section	16 AWG
Enclosure protection class	IP 67
Mechanical service life	> 500 plugging cycles
Upper limit temperature	+85 °C
Lower limit temperature	-40 °C
Electrical data	
Rated voltage	250 V
Rated surge voltage	4000 V
Pollution severity	
	3
Overvoltage category	
	II
Insulation material group	
	III
Test surge voltage	4800 V
Rated current	9 A (40°)
Volume resistivity	≤ 5 m Ω
Insulation resistance	> 10 ¹⁰ Ω
Materials	
Contact pins	CuZn (brass)
Contact surface	Au (gold)
Socket body	PUR/PA (UL 94 HB)
Enclosure cable plug	PBT (UL 94 V-0)
Threaded ring	Anodised aluminium

Plug-in connector straight (socket)



Plug-in connector 90° (socket)



Ordering data		4-pole
Type	Qty	Order No.
FBCon 7/8" 4P FM	1	1812470000

Ordering data		4-pole
Type	Qty	Order No.
FBCon 7/8" 4P FM (A)	1	1812480000

Cable gland M16



Cable gland M16 EEx



Screw cap brass M16



Screw cap brass M16 EEx



Protective cap M12 metal



Thread sealing ring



Socket protective plug



Ordering data

Type	Order No.
Cable gland M16	1772210000
Cable gland M16 EEx	1737210000
Screw cap brass M16	1777790000
Screw cap brass M16 EEx	1737140000
Protective cap SAI-SK-M12-M1	1802750000
Protective cap plug (yellow)	1781520000
Protective cap socket (black)	9456050000
Thread sealing ring	1719550000

Profibus DP

Ordering data

Designation	Type	Qty	Order No.
M12 DP coded B plug	SAI SM 5/8S M12 5P B-COD	1	1784790000
M12 DP coded B socket	SAI BM 5/8S M12 5P B-COD	1	1784780000
Pre-assembled cable with plug	SAI L-M12G-PB-DP-0,3	1	1810520030
Locating plug-in connector	POS-5P M12/M20 300 MM	1	1795500000

Order key:

- CG: Connection of master line with cable gland
- M12: Connection of measuring devices with M12 plug-in connection
- PCG: Plastic cable gland M16 metric thread
- 7/8": Connection of measuring devices with 7/8" plug-in connection

Weidmüller Service

Weidmüller Service	Bespoke services: best advice, best solutions	V.2
	Overview of services	V.3
	Digital support: RailDesigner*, M-Print* PRO, Online catalogue	V.5

Best advice, best solutions

Services tailored to customers' needs

Service – at Weidmüller that means diversity. And it also means that you can take advantage of our comprehensive resources:

- Production of terminal rails and enclosures fitted with our modular terminals and other modules, and prewired
- Fitting of cable glands and the marking of terminals, conductors and enclosures according to your specification
- Competence in the processing of enclosure materials such as aluminium, plastics, sheet steel and stainless steel
- Flexibility in the product selection: besides Weidmüller products we can also integrate yours and even those of other manufacturers

This range of services enables Weidmüller to act as an external service provider to increase your capacities. And demanding standards guarantee a high level of quality every time.

The best advice for the best solutions

The start of a good partnership is always characterised by an intensive exchange of information to define the respective positions. Our contribution focuses on detailed advice with respect to:

- Optimum choice of products
- Practical pre-assembly
- Integration into your systems
- Consideration of requirements such as certification, classes of protection or hazard protection as required by your industry

That avoids mistakes right from the start – totally in keeping with the effective handling of the project, totally in keeping with perfect results. Our experience helps you create the foundation for good business and satisfied customers.



Overview of services



Production of terminal rails

Terminal rails are manufactured from steel, stainless steel, aluminium or copper to suit the diverse applications. And we can produce terminal rails with elongated or round holes, or in other forms to suit your requirements exactly. Terminal rails are fitted with modular terminals or electronic products, prewired and marked according to your specification.

The benefits for you

- No need to procure individual components
- No need to mount individual components
- No unnecessary stocks
- Just one order number for your pre-assembled terminal rail
- Constant high quality



Production of enclosures

High-tech brings benefits. Our state-of-the-art production methods open up new options for you:

- Inclusion of holes and threads in the enclosure
- Enclosure cover with hinges and other accessories if required
- More complex machining such as milling of contours or reaming of holes
- Special paint finishes: To protect against the effects of the weather, your enclosures can be painted individually. Simply specify the colour and printing you require. Special paint finishes and powder coating are also possible.

Enclosures are adapted to suit the intended application exactly. You get a tailored, individual product and the quality is guaranteed by our adherence to demanding standards.



The benefits for you

- Enclosures in various sizes and materials
- Inclusion of optional accessories such as hinges and locks
- Complex machining processes and special packaging

Cable ducts and individual accessories

In some electrical installations cable ducts can be used to improve clarity and operating safety. If required, we can integrate such cable ducts for individual switchgear such as contactors, automatic devices or control equipment. That guarantees better clarity.

The benefits for you

- Large range of different cable entries
- Enhanced flexibility thanks to the ordering of products ready to connect
- Space-, time- and cost-saving installation thanks to the Cabtite cable entry system

Overview of services



Heavy-duty connectors

To help ensure that your switchgear cabinets and installations are put into operation without delay, Weidmüller can supply prefabricated components such as heavy-duty connectors. These are assembled and prewired according to your specification and are supplied ready to connect. If required, we can also supply the finished enclosure with the heavy-duty connectors already integrated. The ConCept heavy-duty connector system from Weidmüller renders possible a whole series of applications. This modular system enables the flexible combination with different modules, crimping and cabling – all-inclusive if required.

The benefits for you

- Special requirements with respect to font, number of characters, material and printing durability for your markers
- Prewiring of connectors saves you valuable installation time
- Modular connector system can be ordered pre-crimped



Marking

Whether multi-line labelling, white or coloured terminal markers or group designations, the Weidmüller range can cater for every marking task – fast, clear and according to European standards. However, we can also supply you with preprinted markers to match your specification. Simply tell us the type of marker you require, the colour, the printing sequence and the text, and we'll look after the rest. If required, we can also install the finished markers during assembly.



Equipment labelling

Device markers are essential for marking your electrical installations. Therefore, Weidmüller can supply rating plates designed specially for your application. A wide range of different shapes, colours, materials and fixings – riveted, screwed or bonded with adhesive – are available from which to choose. And a whole range of different fonts mean that we can handle every request.

Integration of special accessories

In some cases it is necessary to integrate special accessories. This is no problem for Weidmüller because we can integrate buttons, switches, warning lamps, plugs or couplings – all properly planned, fitted, connected and tested. And that includes the products of other manufacturers as well as our own. We shall also be happy to advise you on standard accessories such as hinges.

The benefits for you

- Rating plates in various materials
- Individual printing or laser engraving
- Equipment and accessories to your specification

Digital support

RailDesigner®

RailDesigner® is a Weidmüller program for planning, assembling and ordering both terminal rails and enclosures. And it's so easy to use:

- Fast acquisition of all necessary data
- Realistic-looking graphic user interface and ideal conditions for simple assembly of your terminal rails and enclosures with all the necessary components
- Simply clip on all the products you need and add accessories such as markers or cross-connectors
- To configure an individual enclosure, simply choose an enclosure type from a standard range and then add holes and other accessories to suit your requirements

These parameters form the foundation for a perfect software assistant. You can view the enclosure on the screen complete with all the configured products, and print out a hardcopy, or simply send the file to Weidmüller via e-mail in the form of an order. RailDesigner® provides you with optimum planning security and clarity during the design phase. And hence simplifies the ordering process enormously.

M-Print® PRO label designer

The comprehensive range of Weidmüller services includes the M-Print® PRO software.

This is a professional-standard, Windows®-based program for printing and ordering labels and markers that is coordinated with our current printing systems and marking materials.

M-Print® PRO enables you to design your labelling materials professionally and quickly. Texts, borders, lines, graphics, bar-codes, serial numbers and photographs are all possible. The interface to RailDesigner® or your CAE system enables the transfer of all your configured data.

Online catalogue

If you have questions about the specifications and details of our products, perhaps even outside normal business hours, then our online catalogue at <http://catalog.weidmueller.com> – open 24 hours a day, 365 days a year – is the perfect source of information. Besides product features and part numbers, it contains extensive additional information on all product groups. And for further information, offers and your personal contact, simply consult the Weidmüller website at www.weidmueller.com.



Technical appendix

Technical appendix	Electrical data	W.2
	General technical information	W.6
	Materials	W.12
	Overview of connection systems	W.16
	ATEX	W.18
	Principles of overvoltage protection	W.20
	Overvoltage protection class I with sparkover gaps	W.26
	Glossary of overvoltage protection terms	W.28
	Overvoltage protection for low-voltage supplies	W.32

Design of clearances and creepage distances in electrical equipment



Since April 1997 the sizing of clearances and creepage distances has been covered by DIN VDE 0110, part 1 "Insulation coordination for electrical equipment in low-voltage systems".

DIN VDE 0110, part 1 contains the modified edition of IEC Report 664-1 (see also IEC 664-1/Oct 1992).

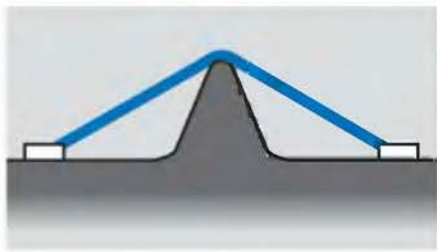
The design data resulting from these provisions is – if applicable – specified in this catalogue for each product.

For the design of clearances and creepage distances, application of the regulations for insulation coordination produces the following interrelationships:

Clearances

Clearances are rated in accordance with the following factors:

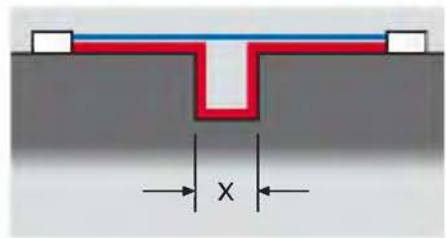
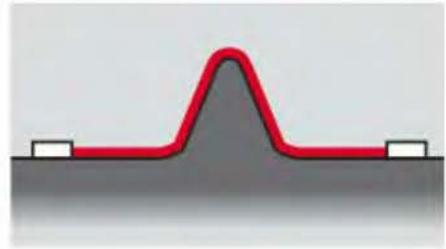
- Anticipated overvoltage
rated impulse withstand voltage
- Used
overvoltage protection precaution
- Measures to prevent pollution
pollution severity



Creepage distances

Creepage distances are rated in accordance with the following factors:

- Planned
rated voltage
- Insulation materials used
insulation group
- Measures to prevent pollution
pollution severity



Slots are taken into account when measuring creepage distances if their minimum width x is dimensioned according to the following table:

Pollution severity	min. width x [mm]
1	0.25
2	1.0
3	1.5
4	2.5

If the associated clearance in air is less than 3 mm, the minimum slot width can be reduced to 1/3 of the clearance.

Design of clearances and creepage distances in electrical equipment – influencing factors

Rated impulse withstand voltage

The rated impulse withstand voltage is derived from:

- **Voltage conductor – earth**
(the rated voltage of the network, taking into account all networks)
- **Overvoltage category**

Table 1: Rated impulse withstand voltages for electrical equipment

Rated voltage of power supply system *) in V		Rated impulse withstand voltage in kV			
Three-phase systems	Single-phase systems with neutral point	Electrical equipment at the supply point of the installation (Overvoltage category IV)	Electrical equipment as part of the permanent installation (Overvoltage category III)	Electrical equipment to be connected to the permanent installation (Overvoltage category II)	Specially protected electrical equipment (Overvoltage category I)
	120 bis 240	4.00	2.50	1.50	0.80
230/400 277/480		6.00	4.00	2.50	1.50
400/690		8.00	6.00	4.00	2.50
1000		Values depend on the particular project of, if no values are available, the values of the preceding line apply.			
*) to IEC 38					

Overvoltage categories

are stipulated in accordance with the German standard DIN VDE 0110-1 (for electrical equipment fed directly from the low-voltage network).

Overvoltage category I

- Equipment that is intended to be connected to the permanent electrical installation of a building. Measures to limit transient overvoltages to the specific level are taken outside the equipment, either in the permanent installation or between the permanent installation and the equipment.

Overvoltage category II

- Equipment to be connected to the permanent electrical installation of a building, e.g. household appliances, portable tools, etc.

Overvoltage category III

- Equipment that is part of the permanent electrical installation and other equipment where a higher degree of availability is expected, e.g. distribution boards, circuit-breakers, wiring systems (including cables, busbars, junction boxes, switches, power sockets) in the permanent installation, and equipment for industrial use and some other equipment, e.g. stationary motors with permanent connections to the permanent installation.

Overvoltage category VI

- Equipment for use at or near the power supply in the electrical installations of buildings, between the principal distribution and the mains, e.g. electricity meters, circuit-breakers and centralised ripple controllers.

Pollution severity categories

Pollution severity category 1

- No pollution, or only dry, non-conductive pollution that has no influence.

Pollution severity category 2

- Non-conductive pollution only; occasional condensation may cause temporary conductivity.

Pollution severity category 3

- Conductive pollution, or dry, non-conductive pollution that is liable to be rendered conductive through condensation.

Pollution severity category 4

- Contamination results in constant conductivity, e.g. caused by conductive dust, rain or snow.

Unless explicitly stated otherwise, the dimensioning of clearance and creepage distances and the resulting rating data for electromechanical products (terminals, terminal strips, PCB connection terminals and plug-in connectors) is based on pollution severity 3 and overvoltage category III, taking account of all network types.

Design of clearances and creepage distances in electrical equipment – influencing factors

Rated voltage

The rated voltage is derived from the nominal voltage of the power supply and the corresponding network type.

Single-phase 2- or 3-wire AC or DC systems

Rated voltage of the power supply (mains) ¹⁾	Voltages for table 4	
	For insulation phase-to-phase ¹⁾	For insulation phase-to-earth ¹⁾
	All systems	3-wire systems neutr. point earthing
V	V	V
12.5	12.5	–
24 / 25 30	25 32	–
42 / 48 / 50 ^{**} 60	50 63	–
30-60	63	32
100 ^{**}	100	–
110 / 120 150 ^{**}	125 160	–
220	250	–
110-220 120-240	250	125
300 ^{**}	320	–
220-440	500	250
600 ^{**}	630	–
480-960	1000	500
1000 ^{**}	1000	–

3-phase 3- or 4-wire AC systems

Rated voltage of the power supply (mains) ¹⁾	Voltages for table 4		
	For insulation phase-to-phase	For insulation phase-to-earth	
	All systems	3-phase 4-wire systems with earthed neutral wire ²⁾	3-phase 3-wire systems unearthed ¹⁾ or phase-earthed
V	V	V	V
60	63	32	63
110/120/127 150 ^{**}	125 160	80 –	125 160
208	200	125	200
220/230/240 300 ^{**}	250 320	160 –	250 320
380/400/415	400	250	400
440	500	250	500
480/500	500	320	500
575	630	400	630
600 ^{**}	630	–	630
660/690	630	400	630
720/830	800	500	800
960	1000	630	1000
1000 ^{**}	1000	–	1000

1) Phase-to-earth insulation levels for unearthed or impedance-earthed systems are equal to those of phase-to-phase because the operating voltage to earth of any phase can, in practice, reach full phase-to-phase voltage. This is because the actual voltage to earth is determined by the insulation resistance and capacitive reactance of each phase to earth; thus, a low (but acceptable) insulation resistance of one phase can earth it and raise the other two to full phase-to-phase voltage to earth.

2) For electrical equipment for use in both 3-phase 4-wire and 3-phase 3-wire supplies, earthed and unearthed, use the values for 3-wire systems only.

3) It is assumed that the rated voltage of the electrical equipment is not lower than the nominal voltage of the power supply.

4) Because of the common changes, the meaning of the ** symbol has not been used in table 1, i.e. the / symbol indicates a 4-wire 3-phase distribution system. The lower value is the phase-to-neutral voltage, while the higher value is the phase-to-phase voltage. Where only one value is indicated, it refers to 3-wire 3-phase systems and specifies the value phase-to-phase. The values given in table 1 are still taken into account in tables 3a and 3b by the ** symbol.

Insulating material group

The insulating materials are divided into four groups depending on the comparative figures for creepage distance (CTI = comparative tracking index):

Insulating material group

I	$600 \leq CTI$
II	$400 \leq CTI < 600$
III a	$175 \leq CTI < 400$
III b	$100 \leq CTI < 175$

The comparative tracking index must be determined using special samples produced for this purpose with test solution A in compliance with IEC 60112 (DIN IEC 60112 / DIN VDE 0303-1).

Derating curve (current-carrying capacity curve)

The **derating curve** shows which currents may flow continuously and simultaneously via all possible connections when the component is subjected to various ambient temperatures below its upper limit temperature.

The **upper limit temperature** of a component is the rated value determined by the materials used. The total of the ambient temperature plus the temperature rise caused by the current load (power loss at volume resistance) may not exceed the upper limit temperature of the component, otherwise it will be damaged or even completely ruined.

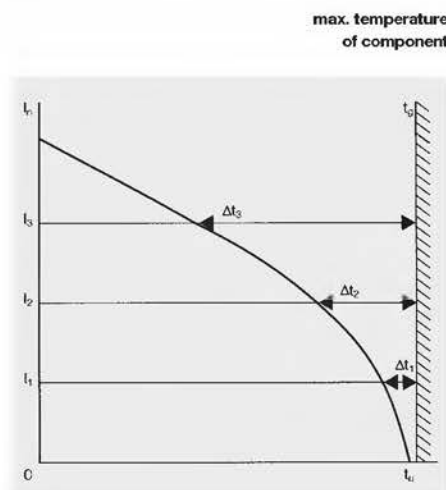
The current-carrying capacity is hence not a constant value, but rather decreases as the component ambient temperature increases. Furthermore, the current-carrying capacity is influenced by the geometry of the component, the number of poles and the conductor(s) connected to it.

The current-carrying capacity is determined empirically according to DIN IEC 60512-3. To do this, the resulting component temperatures t_{b1} , t_{b2} , t_{b3} and the ambient temperatures t_{u1} , t_{u2} , t_{u3} are measured for three different currents I_1 , I_2 , I_3 .

The values are entered on a graph with a system of linear coordinates to illustrate the relationships between the currents, the ambient temperatures and the temperature rise in the component.

The **loading currents** are plotted on the y-axis, the **component ambient temperatures** on the x-axis.

Base curve



t_g = maximum temperature of component
 t_u = ambient temperature
 I_n = current

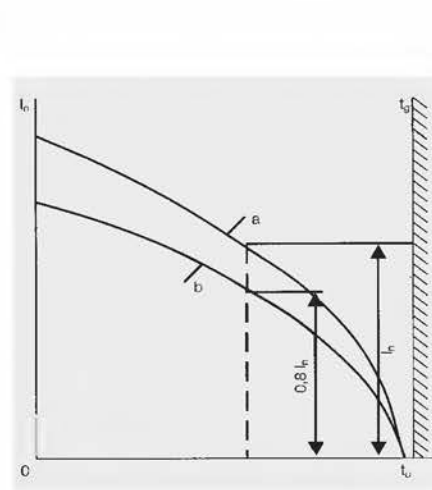
A line drawn perpendicular to the x-axis at the upper limit temperature t_g of the component completes the system of coordinates.

The associated average values of the temperature rise in the component, $\Delta t_1 = t_{b1} - t_{u1}$, $\Delta t_2 = t_{b2} - t_{u2}$, $\Delta t_3 = t_{b3} - t_{u3}$ are plotted for every current I_1, I_2, I_3 to the left of the perpendicular line. The points generated in this way are joined to form a roughly parabolic curve.

As it is practically impossible to choose components with the maximum permissible volume resistances for the measurements, the base curve must be reduced.

Reducing the currents to 80 % results in the **“derating curve”** in which the maximum permissible volume resistances and the measuring uncertainties in the

Derating curve



t_g = maximum temperature of component
 t_u = ambient temperature
 I_n = current
 a = base curve
 b = reduced base curve (derating curve)

temperature measurements are taken into account in such a way that they are suitable for practical applications, as experience has shown. If the derating curve exceeds the currents in the low ambient temperature zone, which is given by the current-carrying capacity of the conductor cross-sections to be connected, then the derating curve should be limited to the smaller current in this zone.

CE marking

CE marking

The CE marking, seen on various products and their packagings, is neither a sign of quality nor safety. The CE marking is a conformity marking that was introduced to ensure the unhindered movement of goods throughout the European Single Market.

It is not intended to be a reference for end consumers. The CE marking merely shows that the manufacturer has complied with all the EU directives applicable to that product. Therefore, the CE marking should be regarded as verification of conformity with the relevant directives and is aimed at the monitoring authorities responsible. For goods crossing the political borders of the European Union, the CE marking is like a "passport". Weidmüller takes into account all the relevant EU directives according to the best of its knowledge and belief.

Currently the following directives apply:

73/23 EWG – Electrical equipment for use within specific voltage ranges (Low-voltage Directive)

89/336 EWG – Electromagnetic compatibility (EMC Directive)

98/37 EG – Safety of machines (Machinery Directive)

The standards cited in the directives have long since been intrinsic to Weidmüller's development standards. This provides the guarantee of conformity with the EU directives. Our testing laboratory, accredited to EN 45001, performs the tests in accordance with the standards. The test reports are recognised within Europe within the framework of the accreditation process.

73/23 EWG – Electrical equipment in the meaning of this directive is all electrical equipment operated with a nominal voltage between 50 and 1000 V AC and between 75 and 1500 V DC. For an electrical product to be given the CE marking, it must fulfil the requirements of the EMC Directive and, if applicable, the Low-voltage Directive (50 V AC or 75 V DC).

According to the Low-voltage Directive, a conformity assessment procedure has to be carried out for the product. Conformity with the directive is deemed to be given if there is a reference to a harmonised European standard or another "technical specification", e.g. IEC standards or national standards.

EMC directives

EMC directives

With the decree of the directive of the European Council dated 3 May 1989 for the alignment of the legal requirements of the member states concerning „Electromagnetic Compatibility“ (89/336/EEC), the European Union has declared **EMC** as a protection objective.

The protection objectives are defined in Article 4 of the EMC Directive dated 19 November 1992 and state the following:

- “The electromagnetic disturbance it generates does not exceed a level allowing radio and telecommunications equipment and other apparatus to operate as intended.”
- “The apparatus has an adequate level of intrinsic immunity to electromagnetic disturbance to enable it to operate as intended.”

“Apparatus” is defined in the EMC Directive as follows:

- “all electrical and electronic appliances together with equipment and installations containing electrical and/or electronic components.”

This applies to the active/passive components and intelligent modules produced and stocked by Weidmüller.

Compliance with this directive is deemed to be given for apparatus that conforms with the harmonised European standards that are published in, for example, in Germany the Gazette of the Federal Minister for Post and Telecommunications.

Such apparatus is utilised in the following areas:

- industrial installations,
- medical and scientific equipment and devices
- information technology devices.

Weidmüller tests its electronic products according to the relevant standards in order to fulfil the agreed protection objectives.

Electronic products from Weidmüller with respect to EMC directives

Category 1

All passive components such as:

- terminals with status displays
- fuse terminals with status indicators
- passive interface units with and without status indicators
- overvoltage protection

These products cause no interference and they have a suitable immunity to interference. These products are not labelled with

the CE marking concerning the EMC Directive or the German EMC Act.

Category 2

These products are labelled with the CE marking after the conformity assessment procedure has been carried out which includes the reference to the harmonised European standards. The following are harmonised standards:

EN 50081-1

Generic Emission Standard – Part 1: residential, commercial and light industry

EN 50082-1

Generic Immunity Standard – Part 1: residential, commercial and light industry

EN 50081-2

Generic Emission Standard – Part 2: industrial environment

EN 50082-2

Generic Immunity Standard –Part 2: industrial environment

EN 55011

Industrial, scientific and medical (ISM) radio-frequency equipment – Radio disturbance characteristics – Limits and methods of measurement

EN 55022

Information technology equipment –Radio disturbance characteristics – Limits and methods of measurement

EN 61000-3-2

Electromagnetic compatibility (EMC) – Part 3-2: Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).

EN 61000-3-3

Electromagnetic compatibility (EMC) – Part 3-3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current less than or equal to 16 A per phase and not subject to conditional connection

EN 61000-4-x

approx. 10 tests for interference immunity (some tests not ratified)

Use of Tests

Generic standards are always used when standards specific to a product do not exist. The generic standards EN 50081-2 and EN 50082-2 are used as the basis for Weidmüller products.

General technical information

Note:

The relevance of EN 50082-1 for certain products must be checked as well as how far generic standards EN 50081-1 or EN 50082-1 were considered during testing.

The environment phenomena and test interference levels are specified in the generic immunity standards. In addition, Weidmüller considers the assessment criteria A, B and C.

Extract from the generic standard EN 50082-2:

Criterion A

The equipment shall continue to operate as intended.

No degradation of performance or loss of function is allowed below a minimum performance level as specified by the manufacturer, when the equipment is used as intended.

In certain cases the nominal performance level can be replaced by a permissible loss of performance. If the minimal performance level or permissible loss of performance is not specified by the manufacturer, both of these specifications can be derived from the description of the product, the relevant documentation and from what the operator expects from the equipment during its intended operation.

Criterion B

The equipment shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a minimum performance level as specified by the manufacturer, when the equipment is used as intended.

In certain cases the minimal performance level can be replaced by an permissible loss of performance. During testing degradation of the performance level is permitted; however, changes to the specified operation mode or data loss are not permitted. If the minimal performance level or permissible loss of performance is not specified by the manufacturer, both of these specifications can be derived from the description of the product, the relevant documentation and from what the operator expects from the equipment during its intended operation.

Criterion C

Temporary loss of function is allowed, provided the loss of function is self-recoverable or can be restored by the operation of the controls.

Criterion B is most frequently specified in the generic standards and is used by Weidmüller.

Taking the example of a WAVEANALOG analogue coupler: During testing, the analogue coupler may convert values that lie outside the permissible tolerances. After testing, however, the values must lie within the given tolerances.

General installation instructions

In conformity with the performance level and criteria A and B, the products may and can be affected by external influences during a fault. However, the aim should be to suppress this as far as possible by means of an optimum installation.

Measures:

- Install the products in a metal enclosure (control cabinet, metal housing).
- Protect the voltage supply with an overvoltage protection device (a PU model for a 230/400 V AC mains supply or an EGU or LPU model for 24 V DC).
- Use only shielded cables for analogue data signals.
- Apply ESD measures during installation, maintenance and operation.
- Maintain min. 200 mm clearance between electronic modules and sources of interference (e.g. inverters) or power lines.
- Ensure ambient temperature and relative humidity values do not exceed those specified.
- Protect long cables with overvoltage protection devices.

For safety reasons, do not operate walkie-talkies and mobile telephones within a radius of 2 m of the equipment.

IP class of protection to DIN EN 60529

The class of protection is indicated by a code consisting of the two letters IP and two digits representing the class of protection.



Protection against intrusion of external particle matter (1st digit)


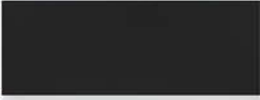
Digit		
0		No protection
1		Protection against ingress of large solid bodies with diameter > 50 mm. (Protection to prevent dangerous parts being touched with the back of the hand.)
2		Protection against ingress of large solid bodies with diameter > 12.5 mm. (Protection to prevent dangerous parts being touched with the fingers.)
3		Protection against ingress of large solid bodies with diameter > 2.5 mm. (Protection to prevent dangerous parts being touched with a tool.)
4		Protection against ingress of large solid bodies with diameter > 1 mm. (Protection to prevent dangerous parts being touched with a piece of wire.)
5		Protection against harmful deposits of dust, which cannot enter in an amount sufficient to interfere with satisfactory operation.
6		Complete protection against ingress of dust.

Protection against penetration of liquids (2nd digit)

Digit		
0		No protection
1		Protection against drops of condensed water falling vertically.
2		Protection against drops of liquid falling at an angle of 15° with respect to the vertical.
3		Protection against drops of liquid falling at an angle of 60° with respect to the vertical.
4		Protection against liquids splashed from any direction.
5		Protection against water jets projected by a nozzle from any direction.
6		Protection against water from heavy sea on ships' decks.
7		Protection against immersion in water under defined conditions of pressure and time.
8		Protection against indefinite immersion in water under defined conditions of pressure (which must be agreed between manufacturer and user and must be more adverse than number 7).

Insulating materials

In order to do justice to the most diverse requirements placed on our products, it is necessary to use different insulating materials tailored to the needs of the applications. None of the insulating materials used by Weidmüller contain any hazardous substances. Above all they can be considered RoHS compliant in accordance with the Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive 2002/95/EC. Furthermore, our insulating materials contain neither pigments based on heavy metals nor any substances that lead to the formation of dioxin or furan.

		Ceramics	Thermosetting plastics	
Plastic Abbreviation		Ceramics	Gemin KrG	Epoxy resin EP
		<p>Ceramics are excellent materials for electrical engineering because they fulfil all the requirements. Ceramics are resistant to heat, fluids and sparks, and are tested for leakage currents. Thanks to their high mechanical strength, low losses and good heat resistance, these materials have a very high chemical stability and are preferred because of their very low wear.</p>	<p>Thermosetting plastics exhibit high dimensional stability, low water absorption, extremely good tracking resistance and excellent fire resistance.</p> <p>The continuous operating temperatures are higher than those of thermoplastics. At higher thermal loads the deformation resistance of thermosetting plastics is better than that of thermoplastics.</p> <p>The disadvantage in comparison with thermoplastics is the reduced flexibility of thermosetting plastics.</p>	
		Insulating material	Melamine resin moulding compound, MF type 156 (DIN EN ISO 14 528) inorganic filler	Epoxy resin with inorganic filler
Colour		white	yellow, medium yellow	black
				
Description		<p>highest continuous operating temperature</p> <p>high fire resistance</p> <p>fluids-repellent</p> <p>high tracking resistance</p> <p>inherently flame-retardant</p>	<p>high continuous operating temperature</p> <p>high fire resistance</p> <p>high tracking resistance</p> <p>inherently flame-retardant</p>	<p>very good electrical properties</p> <p>very high continuous operating temperature</p> <p>resistant to high-energy radiation</p> <p>halogen- and phosphor-free flame-retardant agent</p>
Properties				
Specific volume resistance to IEC 93	$\Omega \times \text{cm}$	-	10^{11}	10^{14}
Electric strength to IEC243-1	kV / mm	>10	10	160
Tracking resistance (A) to IEC 112	CTI	≥ 600	≥ 600	≥ 600
Upper max. permissible temperature	°C	250	130	160
Lower max. permissible temperature, static	°C	-60	-60	-60
Flammability class to UL 94		V-0 (5 V-B)	V-0 (5 V-A)	V-0
Fire behaviour to railway standard				

Thermoplastics

Wemid	Polyamide PA	Polyamide PG GF	Polybutylene terephthalate, PBT	Polycarbonat PC
<p>Wemid is a modified thermoplastic whose properties have been specially devised to suit the requirements of our connectors.</p> <p>The advantages in comparison with PA are the better fire protection and the higher continuous operating temperature. Wemid fulfils the strict requirements placed on applications for railway rolling stock to NF F 16-101.</p>	<p>Polyamide (PA) is one of the most common commercial plastics. The advantages of this material are its very good electrical and mechanical properties, its flexibility and resistance to breakage. Furthermore, owing to its chemical structure PA achieves good fire resistance even without the use of flame-retardant agents.</p>	<p>Glass fibre-reinforced polyamide (PG GF) offers excellent dimensional stability and very good mechanical properties. That makes this material ideal for use in end brackets. Compared with unreinforced PA, this material can achieve UL 94 flammability class HB.</p>	<p>This thermoplastic polyester (PBT) offers excellent dimensional stability (and is therefore ideal for plug-in connectors) and a high continuous operating temperature. But the tracking resistance is lower than other insulating materials.</p>	
special Weidmüller insulating material	insulating material	insulating material	with or without glass fibre reinforcement depending on application	with or without glass fibre reinforcement depending on application
dark beige	beige	beige	orange	grey
<p>higher continuous operating temperature</p> <p>improved fire resistance</p> <p>halogen- and phosphor-free flame-retardant agent</p> <p>low smoke development in fire</p> <p>certified for railway applications to NF F 16-101</p>	<p>flexible, virtually unbreakable</p> <p>good electrical and mechanical properties</p> <p>self-extinguishing behaviour</p>	<p>excellent dimensional stability</p> <p>very good mechanical properties</p>	<p>high dimensional stability</p> <p>good electrical and mechanical properties</p> <p>flame-retardant substances do not lead to the formation of dioxin or furan</p>	<p>high dimensional stability</p> <p>high continuous operating temperature</p> <p>high electrical insulation capacity</p> <p>halogen-free flame-retardant agent</p>
10 ¹²	10 ¹²	10 ¹²	10 ¹²	10 ¹⁶
25	30	30	28	≥ 30
600	600	500	200	≥ 175
120	100	100	115 / 130	115 / 125
-50	-50	-50	-50	-50
V-0	V-2	HB	V-0	V-2 / V-0
I2 / F2 *)				I2 / F2
*) also certified to LUL E 1042				

Metals

Only materials that have proved suitable for electrical engineering applications are used in Weidmüller products.

All materials are subjected to the rigorous quality control measures of a QM system certified to DIN EN ISO 9001.

Environmental compatibility plays a crucial role in the selection of materials.

The selection, processing and surface treatment of all the metals used by Weidmüller are carried out according to the latest technical standards.

Steels

Steel parts required to maintain the contact force permanently are electro-galvanised and treated with an additional passivation technique.

The surface protection conforms to the highest standards. Experience gained from laboratory tests has been incorporated into the design of the surface protection.

Zinc protects against corrosion for a long time even after the zinc coating has been partially damaged by scratches or pores. In the presence of an electrolyte, zinc acts as a cathode (i.e. negative) with respect to steel. The metal ions of the zinc migrate to the steel, which provides long-term protection for the parent metal.

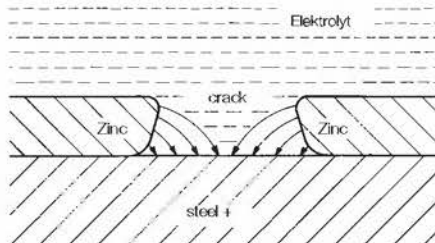
Conductive materials

The current-carrying materials copper, brass and bronze are characterised by their high conductivity and good mechanical properties.

The surfaces are usually given a coating of tin, which creates an extremely good, "malleable" contact with a low contact resistance. Apart from ensuring consistently good electrical properties, the tin coating provides excellent protection against corrosion.

Solder connections are also given a coating of tin. In order to guarantee the long-term solderability (shelf life), brass parts are given an additional nickel coating as a diffusion barrier.

The nickel coating provides effective protection against the loss of zinc atoms from the brass.



Derating curves

The maximum current that a modular terminal can accommodate depends on:

- The temperature rise in the terminal
- The ambient temperature
- The cross-section of the conductor connected to the terminal

An upper limit temperature that may not be exceeded in continuous operation is specified for every Weidmüller modular terminal.

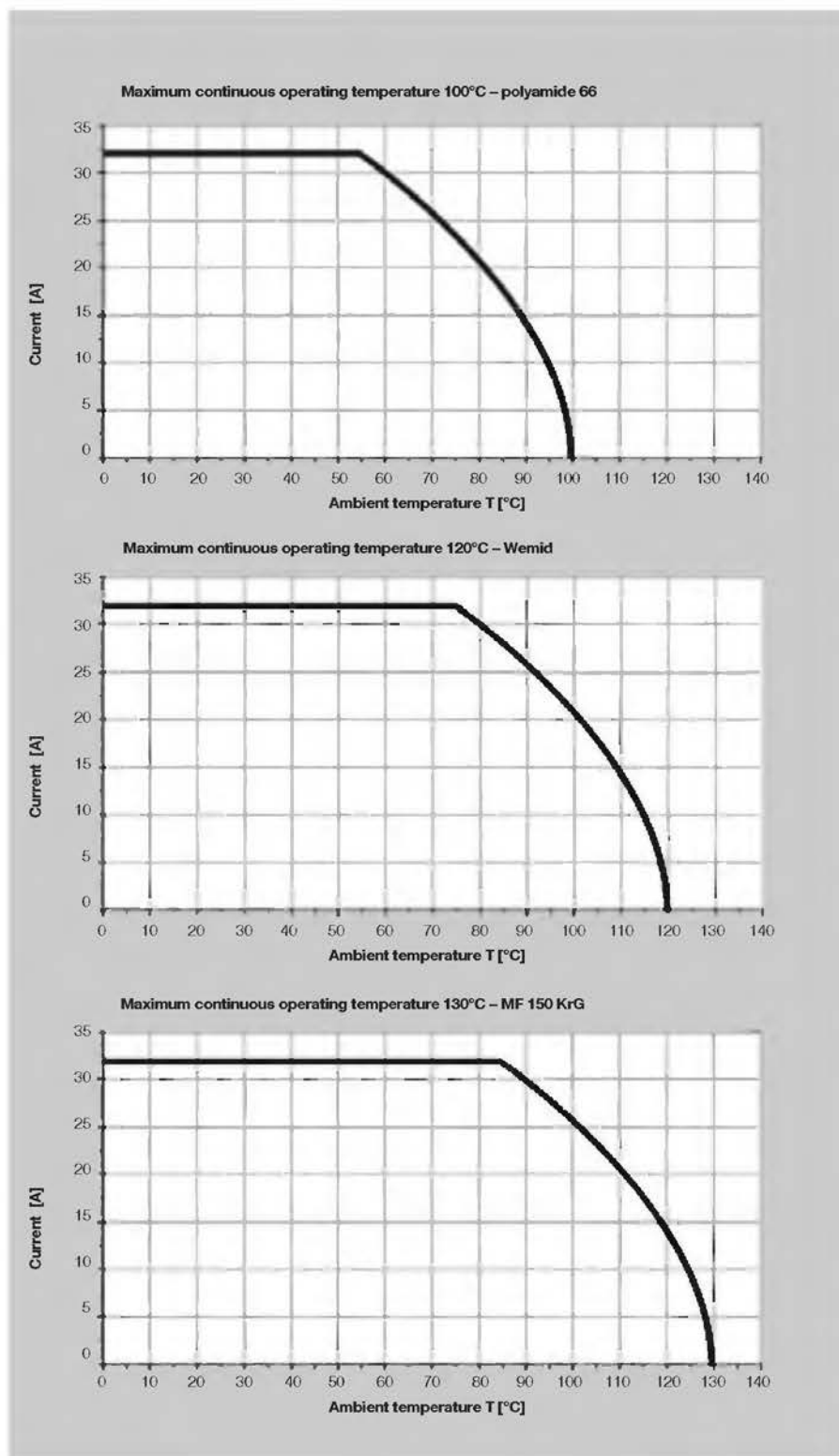
The continuous operating temperature depends on the insulating material used for the modular terminal. According to EN 60947-7-1 the maximum permissible temperature rise of a modular terminal is 45 K.

The continuous operating temperature governed by the insulating material, reduced by the maximum permissible temperature rise in the terminal as given by EN 60947-7-1 results in a maximum ambient temperature in which the modular terminal can be loaded with its rated current at least. The graphs on the right are the current-temperature rise curves for a rated current of 32 A and the following three insulating materials:

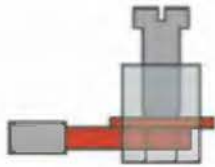
- Thermoplastic (polyamide 66)
- WEMID
- Thermosetting plastic (MF 150 KrG)

Depending on the insulating material used, the rated current can be carried up to an ambient temperature of 55°C for PA 66, 75°C for the Weidmüller insulating material WEMID, or 85°C for thermosetting plastic insulating materials (KrG). Above these temperature limits, the current should be reduced as shown on these graphs.

Derating curves



The connection systems – it's your choice



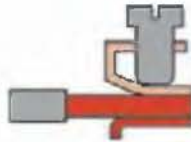
Clamping yoke

The **Weidmüller clamping yoke system** is an optimum combination of the specific properties of steel and copper. This clamping yoke system has proved its worth in billions of Weidmüller products over many decades. Both the clamping yoke and the clamping screw are made from hardened steel. This clamping yoke arrangement generates the necessary contact force. The clamping yoke presses the incoming conductor against a current bar made of copper or high-quality brass. The hardened Weidmüller clamping yoke ensures a gas-tight, vibration-resistant connection between conductor and current bar.



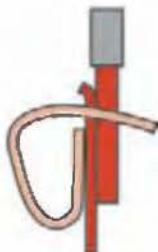
TOP connection

The Weidmüller **TOP connection system** ensures that the conductor can be inserted and the clamping screw tightened from the same direction. Such an arrangement eases the wiring work in certain installations, e.g. when there is little space at the sides in terminal boxes. The TOP connection system combines the specific properties of steel and copper. The hardened steel lever presses the conductor directly against a current bar made of copper or high-quality brass. The high contact force guarantees a gas-tight connection between conductor and current bar.



Leaf clamp connection

Weidmüller's patented **leaf clamp connection system** is a screw connection system for large conductor cross-sections. The insertion of large conductors into the clamping point is made easier here by the fact that the clamping unit can be removed first. The conductor can then be placed directly on the current bar before re-inserting the clamping unit and tightening the screw to grip the conductor.



Tension clamp connection

The **Weidmüller tension clamp system** functions similarly to the tried-and-tested clamping yoke. Here again, the mechanical and electrical functions are kept separate. The spring made from high-quality rustproof and acid-proof steel pulls the conductor against the tin-plated copper current bar. Treating the copper in this way ensures low contact resistance and high corrosion resistance. The compensating effect of the spring ensures a secure contact for the lifetime of the terminal.



IDC system

The **IDC system** is a type of connection for copper conductors that does not require the conductor to be prepared in any way – so no stripping and no crimping. When connecting the conductor, the insulation of the conductor is penetrated and an electrically conductive contact between conductor and current bar produced at the same time.

The Weidmüller IDC principle, like Weidmüller's other types of connection, again keeps mechanical and electrical functions separate.

A spring made from rustproof stainless steel presses the current bar onto the conductor and therefore guarantees a low contact resistance and a gas-tight, vibration-resistant connection.



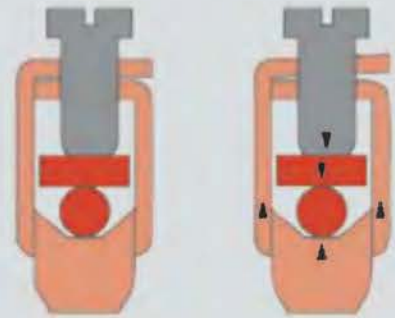
Push In system

In the **Push In system** the stripped solid conductor is simply inserted into the clamping point as far as it will go. And that completes the connection! No tools are required and the result is a reliable, vibration-resistant and gas-tight connection. Even flexible conductors with crimped wire end ferrules or ultrasonic-welded conductors can be connected without any problems. A stainless steel compression spring, which is fitted in a separate housing, guarantees a high contact force between the conductor and the current bar (tin-plated copper). The conductor pull-out force for this system is even higher than that for the tension clamp system. Spring and conductor stops in a steel housing ensure optimum connection conditions and a guide for the screwdriver needed to detach the conductor.

The principle of vibration resistance

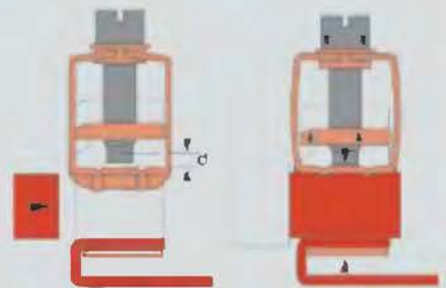
Clamping yoke connection

As the clamping screw is tightened, the ensuing force causes the upper threaded part to spring back and exert a locknut effect on the screw. The Weidmüller clamping yoke system is vibration-resistant. The relaxation of the conductor is compensated for by the elastic behaviour of the Weidmüller clamping yoke. It is therefore not necessary to retighten the clamping screw.



Leaf clamp connection

The distance "d" between the shaft of the clamping screw and the leaf clamp causes elastic deformation of the spring as the screw is tightened. The vibration resistance depends on the magnitude of the clamp spring of the leaf clamp, and this force also compensates for relaxation phenomena in the conductor. It is therefore not necessary to retighten the clamping screw.



TOP connection

Like with the clamping yoke, the force exerted by the steel lever as the screw is tightened forces apart the two threaded parts of the TOP connection. This exerts a locking effect on the screw and guarantees excellent vibration resistance.



ATEX directives

The old directive Explosive Atmospheres and Gassy Mines Directive 76/117/EEC was superseded by the new directive 94/9/EC, also known as ATEX 95 (ATEX: ATmosphère EXplosive = potentially explosive atmosphere), on 1 July 2003. Only the new directive is now valid, which is one of the so-called "New Approach" directives. It applies in all the countries of the European Union plus Iceland, Liechtenstein and Norway. In all these countries the directive applies to the sale and operation of products that have been specially developed for use in potentially explosive atmospheres in which gases, vapours, mists or dusts prevail. A new development is the inclusion of mining operations and purely mechanical devices.

The ATEX directive has been in force since March 1996, and its use up until 30 June 2003 (transitional period) was optional and existing directives remained applicable as well. But since 1 July 2003 all new installations and equipment for use in potentially explosive areas must comply with the ATEX directive and be certified accordingly. However, the previous breakdown into zones (Zone 0, 1 or 2) and classes of protection (e.g. "i": intrinsic safety, "e": increased safety) still remains in force.

Class of protection

Type of protection	Code	CENELEC EN	IEC	Product category explosion prot.
General requirements	–	50014	60079-0	–
Oil immersion	o	50015	60079-6	2
Pressurised apparatus	p	50016	60079-2	2
Powder filling	q	50017	60079-5	2
Flameproof enclosure	d	50018	60079-1	2
Increased safety	e	50019	60079-7	2
Intrinsic safety	ia	50020	60079-11	1
Intrinsic safety	ib	50020	60079-11	2
Equip. for zone 2 (EEx n)	n	50021	60079-15	3
Encapsulation	m	50028	60079-18	2

Classification for potentially explosive areas

CENELEC classification IEC60079-10	Presence of potentially explosive atmosphere	Product category	US classification NEC 500	Combustible media
Zone 0	permanent, long-term	1G	Class I, Div 1	gases, vapours
Zone 20	or frequently	1D	Class II, Div 1	dust
Zone 1	occasionally	2G	Class I, Div 1	gases, vapours
Zone 20		2D	Class II, Div 1	dust
Zone 2	rarely and briefly	3G	Class I, Div 2	gases, vapours
Zone 22		3D	Class II, Div 2	dust

Explosion groups

Gas (e.g.)	CENELEC	NEC 500
Propane	IIA	D
Ethylene	IIB	C
Hydrogen	IIC	B
Acetylene	IIC	A
Methane (mining)	I	mining (MSHA)

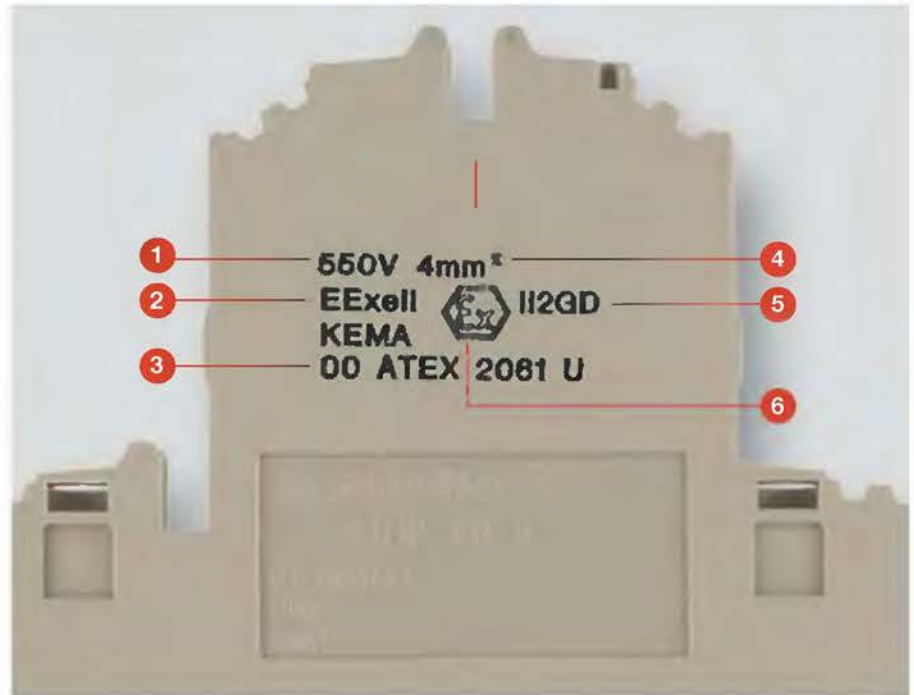
Temperature classes

Max. surface temperature (°C)	Temperature class CENELEC	Temperature class NEC 500-3
450	T1	T1
300	T2	T2
280	–	T2A
260	–	T2B
230	–	T2C
215	–	T2D
200	T3	T3
180	–	T3A
165	–	T3B
160	–	T3C
135	T4	T4
120	–	T4A
100	T5	T5
85	T6	T6

ATEX codes

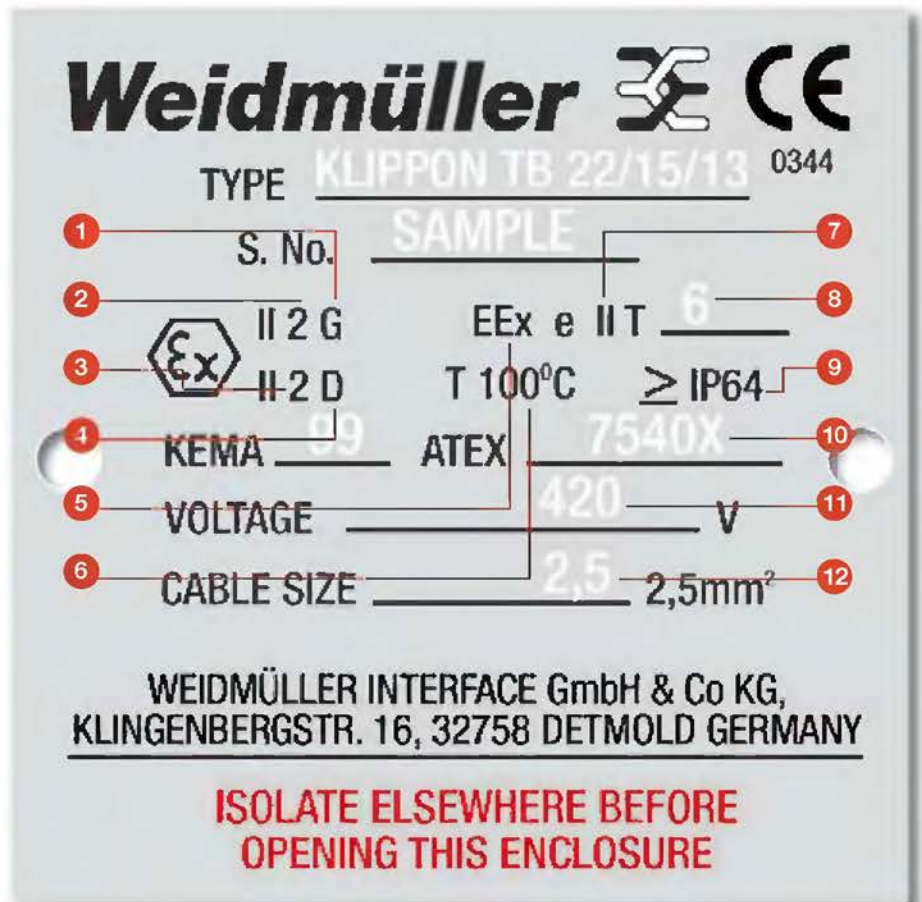
Example of marking – modular terminal WDK 4 N V

- 1 • Rated voltage
- 2 • CENELEC type of protection "e" – increased safety
- Equipment group II – above ground (gases, vapours, mists, dusts)
- 3 • Certificate number
- 4 • Rated conductor cross-section
- 5 • Equipment group II – above ground (gases, vapours, mists, dusts)
- Product category 2 – for use in zone 1 or 21
- Approved for use in gases "G" and/or dusts "D"
- 6 • European symbol for explosion protection



Example of marking – enclosure fitted with components for enhanced safety

- 1 • Approved for use in gases "G"
- 2 • Product category 2 – for use in zone 1
- 3 • Product category 2 – for use in zone 1
- 4 • Approved for use in dusts "D"
- 5 • CENELEC type of protection "e" – increased safety
- 6 • Max. surface temperature without ignition of dust 100 °C
- 7 • Equipment group II – above ground (gases, vapours, mists, dusts)
- 8 • Temperature class T6
- 9 • Class of protection of housing > IP 64
- 10 • Certificate number
- 11 • Rated voltage
- 12 • Rated conductor cross-section



Components for overvoltage protection

There is no ideal component that can fulfil all the technical requirements of overvoltage protection equally effectively. Instead, we use a variety of components whose different physical methods of operation complement each other; these possess distinct protective effects. Super-fast reaction time, high current-carrying capacity, low residual voltage and long service life cannot be found in one single component.

In practice we use three principal components:

1. sparkover gaps
2. varistors
3. suppression diodes

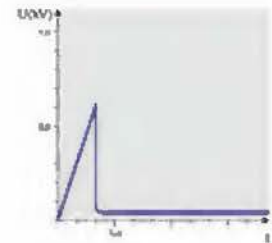
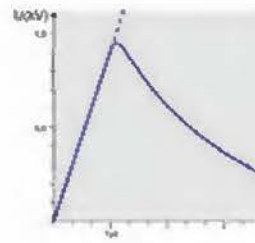
Therefore, to optimise the overvoltage protection, carefully matched groups of these components are often combined in one protective module.

4. Combination circuits

1. Sparkover gaps



The name says it all. High voltages are discharged to earth via a spark gap (e.g. gas discharge tube) that has been fired. The discharge capacity of sparkover gaps is very high – up to 100 kA.



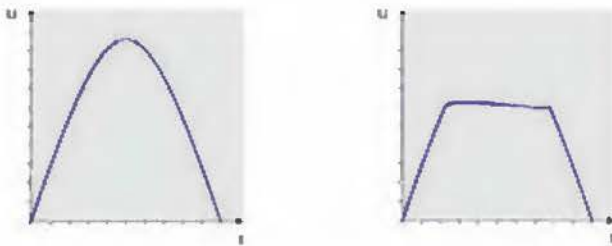
Gas sparkover gaps are incorporated in insulating glass or ceramic (aluminium oxide) housings. The electrodes of the sparkover gap are made from a special alloy and placed in housings which are vacuum sealed and filled with a noble gas such as argon or neon. The shape and spacing of the electrodes of the sparkover gap are such that the applied voltage results in a field strength distribution which has a fairly exact voltage for firing the sparkover gap. Bipolar operation is typical of sparkover gaps. This firing voltage value depends, however, on the steepness of the applied overvoltage. The characteristic curve for the firing of a gas-filled sparkover gap reveals that the response time shortens as the overvoltage rise becomes steeper. The firing voltage is thus correspondingly higher. The outcome of this is that with very steep overvoltage rises, the firing voltage – i.e. the protection level – is relatively high and can lie considerably higher than the rated voltage of the sparkover gap (approx. 600 – 800 V).

The problematic quenching behaviour of the fired sparkover gap can be a disadvantage. The arc has a very low voltage and is only extinguished when the value drops below this. Therefore, when designing the geometry of a sparkover gap, care is taken to ensure that – through long distances and also through cooling – the voltage of the arc remains as high as possible and so is quenched relatively quickly. Nevertheless, a longer follow current can ensue. This can draw its energy, in addition, from the incoming supply of the circuit to be protected. One effective solution is to wire a sparkover gap and a fast-acting fusible link in series.

2. Varistors



The varistors used in overvoltage protection (MOV – Metal Oxide Varistor) are voltage-dependent resistors in the form of discs of zinc oxide. Just above their rated voltage the resistance becomes so small that they become conductive. The overvoltage is limited by the varistor allowing the current to pass. Bipolar operation is typical of varistors.



Varistors have a medium to high discharge capacity; this lies in the region of 40 – 80 kA. The response time is less than 25 ns. Residual voltages are significantly lower than those of spark-over gaps. The lower protection level achieves better overvoltage protection and no power follow currents are drawn from the power supply.

However, varistors also have their disadvantages. Their ageing phenomena and relatively high capacitance must be taken into account.

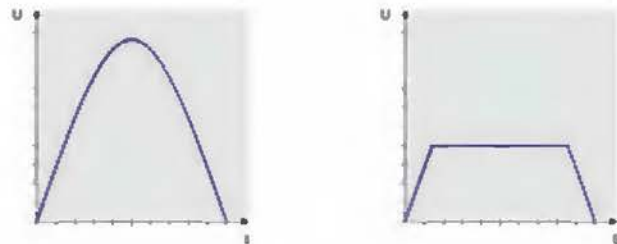
Leakage currents occur over time, depending on the frequency of the triggering, because individual resistance elements break down. This can cause temperature rise or even destroy them completely.

The high capacitance of varistors causes problems in circuits with high frequencies. Attenuation of the signals must be reckoned with for frequencies above about 100 kHz. Therefore, varistors are not recommended for use in data transmission systems.



3. Suppression diodes

A suppression diode operates in a similar manner to a Zener diode. Unidirectional and bidirectional versions are available. The unidirectional suppression diode is often used in d.c. circuits. Compared to conventional Zener diodes, suppression diodes have a higher current-carrying capacity and are considerably faster. They very quickly become conductive above a defined breakdown voltage and hence short-circuit the overvoltage.



However, their current-carrying capacity is not very high – less than 1800 W/ms. On the other hand, they exhibit an extremely fast response time, lying in the picoseconds range. And the low protection level of suppression diodes is another advantage.

Unfortunately, suppression diodes possess a significant inherent capacitance. Therefore, like with varistors, their possible attenuation effect on high frequencies must be taken into account.

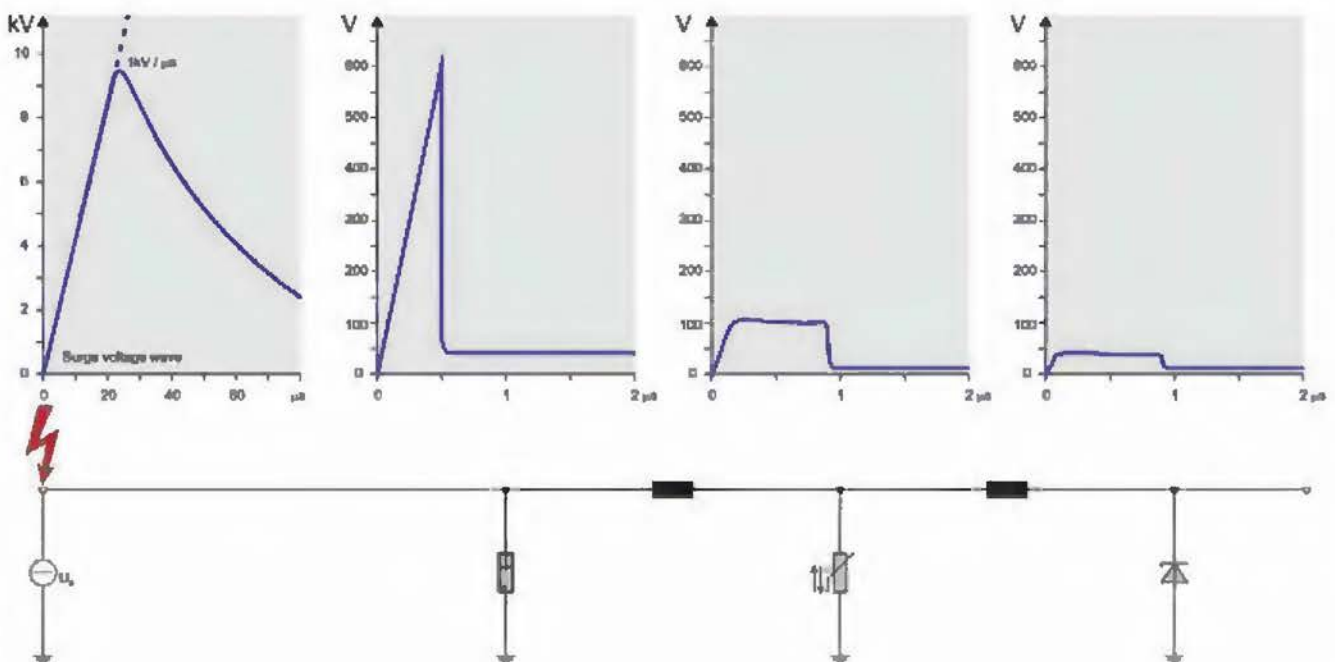
4. Combination circuits

Combining the components described above results in overvoltage fine protection products that can match individual requirements.

If a voltage pulse reaches the input of such a combination circuit, then the gas discharge tube is fired and discharges high current. The residual pulse is attenuated by a downstream inductance and subsequently received and limited by the varistor and/or suppression diode. If the gas discharge tube is not triggered, i.e. in the case of a slower voltage rise, then the pulse is discharged by the varistor or the suppression diode alone.

The sequence of the individual components results in an increasing response sensitivity towards the output.

An interference voltage with a rise of $1 \text{ kV}/\mu\text{s}$ and a peak value of 10 kV at the input is limited by a gas-filled overvoltage arrester to approx. $600 - 700 \text{ V}$. The second stage, decoupled from the first by means of an inductance, suppresses this value to approx. 100 V . This voltage pulse is then reduced to approx. 35 V (in a 24 V protective combination) by the suppression diode. Therefore, the downstream electronics need only be able to cope with a voltage pulse of approx. $1.5 \times U_B$.



Introduction of overvoltage protection in terminal format: miniconditioners

Application

In order to achieve a protection concept for the system, all lines must be protected with overvoltage protection products. Overvoltage protection for power supplies (PU B / PU C) protects low-voltage consumer installations and electronic devices



against the overvoltages caused by atmospheric discharges (thunderstorms) or the much more frequent switching operations (transients) in the network. The PU modules weaken severe pulses. However, in instrumentation and control circuits even weakened pulses can still cause damage and interference. These are ideal applications for three-stage overvoltage protection terminals with gas discharge tubes, varistors and suppression diodes (TAZ) plus decoupling inductances. Gas discharge tubes are overvoltage arresters that function with a sparkover gap. When an overvoltage occurs, an electric arc is fired between electrodes, and in doing so the sparkover gap switches abruptly ($1 \mu\text{s}$) from a high-resistance to a low-resistance region. Varistors are used with medium and higher power capacities. The metal oxide varistors reduce the resistance in the case of an excessive voltage. The varistor can switch to a low-resistance region within 25 ns and hence discharge the overvoltage. Suppression diodes function in a similar fashion to Zener diodes but have a higher pulse capacity. The response times lie in the region of a few picoseconds.

Combination circuit

Combinations of the aforementioned components result in highly effective MCZ OVP overvoltage protection terminals. High currents are discharged by the gas discharge tubes. The varistors and suppression diodes take care of the residual voltages. Integral inductances perform the decoupling.

The energy is discharged via the terminal rail (TS) contact. In addition, there is a clamping point for the PE connection.

Terminal rail contact

Simply clipping the terminal to the terminal rail automatically creates the contact. The TS 35 must be earthed in order to discharge currents of up to 10 kA ($8/20 \mu\text{s}$) via the MCZ terminals. For EMC reasons, the terminal rail should be screwed to the earthed mounting plate. In addition, it is possible to create the PE contact via the clamping point on the MCZ OVP.

Application

The MCZ OVP 24 Vdc CL for current loops has a fast-switching ($10 - 100 \text{ ps}$) suppression diode in the output. This diode keeps the voltage within the current loop when overvoltages occur, which prevents damage to the sensor or actuator.



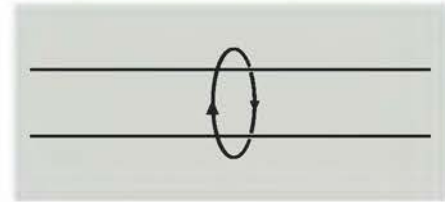
The MCZ OVP has tension clamp connections for quick wiring of instrumentation and control lines. The discharge takes place directly via a terminal rail contact. The contact is automatically created simply by clipping the terminal to the terminal rail.

Installation of overvoltage protection circuits

Overvoltage fine protection components should be installed in the immediate vicinity of the devices to be protected. The PE connection of the device must be connected to the overvoltage fine protection component.

- Use conductors with a cross-section of 2.5 – 4 mm² for the earthing lines.
- Keep the connections as short as possible.
- Avoid wiring several earthing lines in series.
- Design the earthing installation according to VDE 0100, VDE 0185, VDE 0800 and FBO 14 (Deutsche Telekom code).

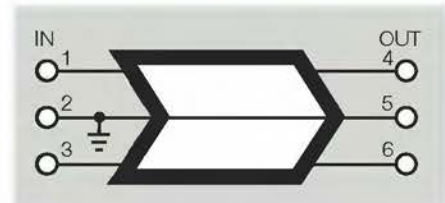
Laying the lines



Within the installation, the signal lines should take the shortest route to the overvoltage fine protection components and the electronics. Avoid laying the lines parallel to other lines, also avoid laying protected and unprotected lines together (take special care with cable ducts and cable trays).

If parallel routing is unavoidable, the distance between the lines should be at least 0.5 m.

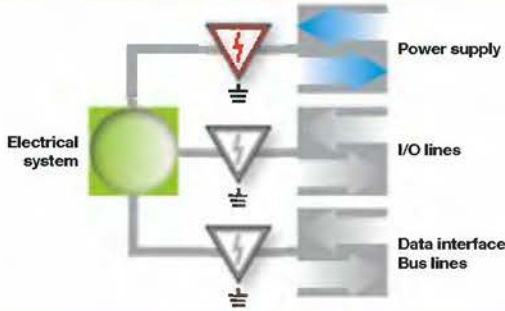
Marking of components



Overvoltage protection components are to be marked with an arrow or the letters "IN".

The arrow must point towards the protected side of the component, i.e. an overvoltage is diminished in this direction (see "Combination circuit").

Overvoltage protection class I with sparkover gap



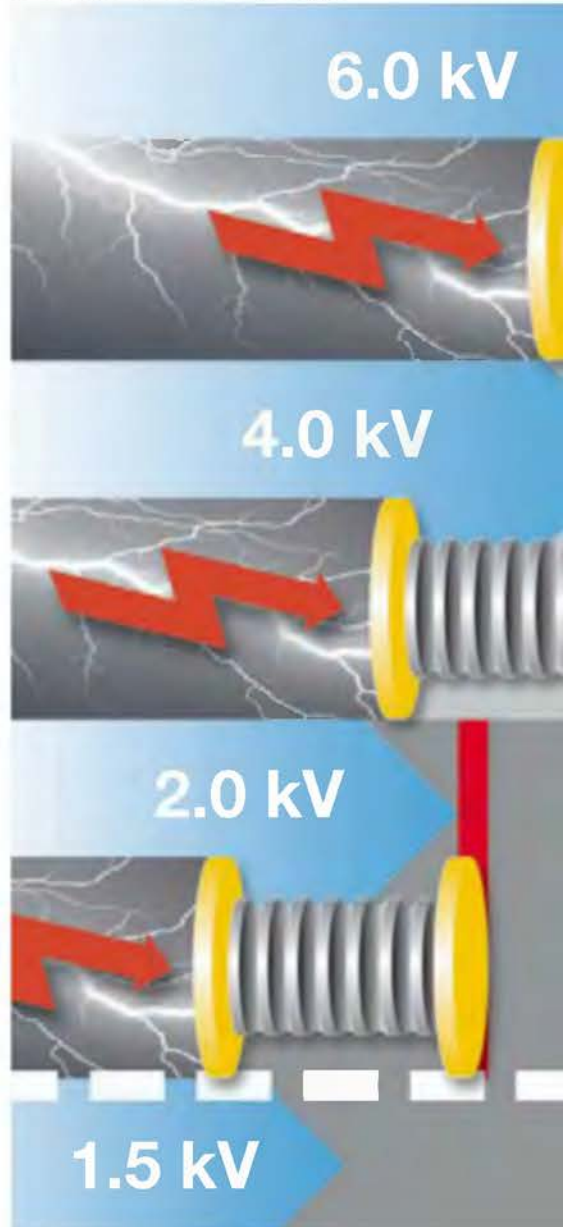
Class I, sparkover gap



Weidmüller series PU 1 TSG and PU B (class I), PU x C (class II) plus PU D and PO D (class III) overvoltage protection devices lower the overvoltage protection level to below the limits prescribed by the insulation coordination to DIN VDE 0110. This means that the entire system is subjected to less interference.

The coordination of the arresters is achieved by technical means. This means that decoupling between classes I, II and III is not necessary.

Design surge voltage



Class I, high-power varistor



Class II, varistor

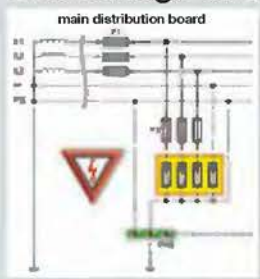


Class III, varistor



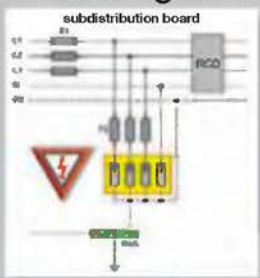
for insulation coordination to IEC 664 and DIN VDE 0110

Overvoltage arresters Class I



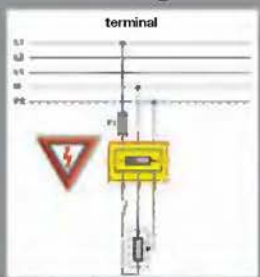
Sparkover gaps, triggered and enclosed, 35/50 kA	PU 1 TSG
Triggered sparkover gaps, 50 kA	PU 1 TSG+
Triggered sparkover gaps, 100 kA	PU 1 TSG 100 kA
High-power varistors, 20/25 kA	PU 3 B, PU 4 B
High-power varistors, 20/25 kA, with signalling contact	PU 3 BR, PU 4 BR
Replacement arrester, high-power varistor	PU 0 B
Combined overvoltage protection	PU COMBI I + II

Overvoltage arresters Class II



Varistor arresters up to 100 kA for diverse voltages	PU x C
Varistor arresters up to 100 kA for diverse voltages, with signalling contact	PU x CR
Replacement varistor to suit rated voltage	PU 0 C

Overvoltage arresters Class III



Single-phase arresters for diverse voltages, with signalling contact	PU D, PU DS
Three-phase arresters with signalling contact	PU 3 D
Schuko plug-in overvoltage protector	PU D ZS

Glossary

3+1 circuit	Overvoltage protection for TT systems with three varistors and one sparkover gap; avoids accidental energisation in the case of defective varistors.
ageing	A change in the original performance data caused by interference pulses, operation or unfavourable ambient conditions.
arrester disconnecter	Device to isolate an arrester from the mains power supply in the case of a failure and also to indicate this.
arrester	Protective unit that discharges energy symmetrically or asymmetrically.
asymmetric interference voltage	Voltage between DC offset and reference potential (earth).
backup fuse	Maximum fuse size to be provided depending on the connection cross-section and/or longitudinal decoupling.
binary signals	Switching signals with the status ON and OFF.
capacitive coupling	Coupling of interference circuit and useful circuit via coupling capacitances owing to a difference in potential.
class B	Prescribed for the purpose of lightning protection equipotential bonding to DIN VDE 0185 part 1 (see also class I).
class C	Prescribed for the purpose of overvoltage protection in a permanent installation, preferably for use in impulse test voltage category III (see also class II).
class D	Prescribed for the purpose of overvoltage protection in a permanent installation, preferably for use in impulse test voltage category II (see also class III).
class I	Prescribed for the purpose of lightning protection equipotential bonding to IEC 37A/44/CDV (see also class B).
class II	Prescribed for the purpose of overvoltage protection in a permanent installation, preferably for use in impulse test voltage category III (see also class B).
class III	Prescribed for the purpose of overvoltage protection in a permanent installation, preferably for use in impulse test voltage category II (see also class D).
class of protection of housing (IP code)	Degree of protection that the housing provides against coming into contact with conductive parts as well as the ingress of solid foreign bodies or water; tested according to IEC 529 section 7.4.
combined circuit	Protective circuit comprising, for example, gas discharge tube, varistor and/or suppression diode.
combined surge	The hybrid generator generates a 1.2/50 μ s pulse during no-load operation and an 8/20 μ s pulse during a short-circuit; the ratio of no-load peak voltage U_{oc} to short-circuit peak current I_{sc} is 2 W.
common-mode interference	Interference source lies between signal wire and reference conductor (e.g. capacitive coupling or increase in potential of separate earths).
conductive coupling	Interference circuit and useful circuit have a common impedance (conducted).
continuous operating current I_c	Current per protective path at continuous voltage U_c .
DK4U	Slimline modular protective terminal with varistor or gas discharge tube or suppression diode.
DK5U	Slimline modular protective terminal with combined circuit for current loops, with screw connection.
DK6U	Slimline modular protective terminal with combined circuit for 120 and 230 V current loops, with screw connection.
DKU	Slimline modular protective terminal with combined circuit for binary signals, with screw connection.
EGU 1	Overvoltage protection in build-in housing with gas discharge tube and varistor for binary signals, with fuse and voltage indicator.
EGU 2	Overvoltage protection in build-in housing with gas discharge tube, varistor and suppression diode for binary signals, with fuse and voltage indicator.
EGU 3	Overvoltage protection in build-in housing with gas discharge tube and varistor for 50 mA and 1.5 A current loops.
EGU 4	Overvoltage protection in build-in housing with gas discharge tube, varistor and suppression diode for 100 mA and 1.5 A current loops.
EMC	Electromagnetic Compatibility

follow current I_f	Current that flows through an overvoltage protection device after the discharge process and is fed from the mains power supply.
gas discharge tube (GDT)	Enclosed switch with high current-carrying capacity depending on voltage.
inductive coupling	Coupling through two or more conductor loops through which current is flowing.
insertion loss	Attenuation in decibels added to a circuit by inserting a four-pole network.
Insta	Installation housing to DIN 43880, suitable for incorporating in a distribution board.
insulation coordination	Current impulse strength of the insulation in installation sections, to DIN VDE 0110 part 1.
I_{peak}	Peak current value of test impulse.
I_{sn}	Peak value of rated discharge current.
IT system	Network with three phase conductors insulated with respect to earth potential; the PE of the building is not connected to the network.
leakage current	Current discharged to PE at rated voltage.
LEMP	Lightning Electromagnetic Pulse
lightning surge current I_{imp}	Defined by the peak current value I_{peak} and the charge Q in the test according to class I.
limit frequency	Specifies the maximum frequency at which transmission still functions; at higher frequencies the protective circuit attenuates so severely that transmission is no longer possible.
longitudinal voltage	Interference voltage between active conductor and earth.
LPZ	Lightning Protection Zone
max. continuous voltage U_c	Maximum effective AC voltage or maximum DC voltage that may be applied continuously to the protective path of an overvoltage protection device; continuous voltage = design voltage.
max. discharge current I_{max}	Peak value of 8/20 μ s current in class II operating duty test.
MCZ ovp	Slimline modular protective terminal with tension clamp connection and mounting rail contact for PE.
measured limiting voltage	Maximum voltage during the action of surges with a predefined impulse wave shape and amplitude in a test.
MOV	see "varistor".
normal-mode interference	Interference source and useful source are in series (e.g. magnetic or conductive coupling).
overvoltage protection (OVP)	Circuit or wiring in a circuit to limit the output voltage.
overvoltage protection classes	Classification of electrical equipment according to its voltage strength related to the rated voltage (EN 50178).
overvoltage protection device	Unit with at least one non-linear component for limiting transient overvoltages and discharging surge currents.
overvoltage protection installation	Device(s), including lines, to protect against overvoltages.
overvoltage	Unwanted continuous or brief potential difference between conductors or between conductor and earth that causes interference or damage.
PE	Protective and earthing system to which energy is discharged.
protection level U_p	Specifies the residual voltage that can still be measured at the terminals during an overvoltage impulse (preferred value – larger than maximum measured limiting voltage); key parameter characterising the performance of an overvoltage protection device.
protective path	Circuit of the components of an overvoltage protection device; conductor to conductor, conductor to earth, conductor to neutral conductor, and neutral conductor to earth are designated as protective paths.
PU	Overvoltage protection for high pulses in power systems, in installation housing.
radiation coupling	Electromagnetic field coupled in one or more conductor loops.
rated discharge current I_n	Peak value of 8/20 μ s surge current in class II test.
RCD	see "residual current circuit-breaker"
residual current circuit-breaker	If a fault current exceeds a certain threshold, the residual current circuit-breaker is tripped within 0.2 s.

Glossary

RSU	Overvoltage protection on clip-on base, with gas discharge tube, varistor and suppression diode for 6 and 10 A current loops.
short-circuit strength	Maximum non-influenced short-circuit current that an overvoltage protection device can withstand.
SPD	Surge Protection Device
suppression diode	Fast-acting (depending on voltage) semiconductor diode.
surge voltage 1.2/50 μs	Surge voltage with a front time of 1.2 μ s and a time to half-value of 50 μ s.
surge current 8/20 μs	Lightning test current with a front time of 8 μ s and a time to half-value of 20 μ s.
surge current 10/350 μs	Lightning test current with a front time of 10 μ s and a time to half-value of 350 μ s.
symmetric interference voltage	Voltage between forward and return conductor (normal-mode voltage).
TAZ	see "suppression diode"
time to sparkover	Reaction times vary from a few microseconds to picoseconds depending on type and structure of protective module.
TN system	Network consisting of four or five conductors; three phase conductors and PEN enter the building; PE of building and PE of mains are connected together.
transverse voltage	Interference voltage between two conductors of a circuit.
triggered sparkover gap	A gas-filled sparkover gap that fires at a preset voltage value due to a capacitive voltage component.
TT system	Network consisting of four conductors, three phase conductors and N conductor enter the building; PE of building is not connected to mains.
unsymmetrical interference voltage	Voltage between conductor and reference potential (earth).
varistor	Voltage-dependent metal oxide resistor whose resistance decreases as the voltage increases.

Installation specification for our PU Overvoltage protection in power supply networks

The overvoltage protection may only be installed by suitably qualified personnel. During the installation, please observe the connection conditions specific to the country of application.



1. Application

The PU C overvoltage protection to class C (class II) protects low-voltage consumer installations and electronic devices against overvoltages that can occur as a result of atmospheric discharges (thunderstorms) or switching operations. The PU C complies with VDE 0675 part 6, class C (draft, Nov 1989), DIN VDE 0675 part 6, A2 (Oct 1996), IEC 61643-1 (Feb 1998) and ÖVE SN 60 parts 1 and 4. High-power metal oxide varistors are employed as the voltage-limiting component.

The PU B is a class B (class I) lightning arrester complying with DIN VDE 0675 part 6 (Nov 1989), IEC 61643-1 (Feb 1998), ENV 61024-1 (Jan 1995) and IEC 1312-1 (Feb 1995). The integral varistors create the necessary equipotential bonding (lightning protection equipotential bonding according to DIN VDE 0185 part 1, Nov 1982) between the building's lightning protection and the earthing system of the power supply during lightning strikes.

The PU D overvoltage protection to class D (class III) protects low-voltage consumer installations and electronic devices against overvoltages and switching operations. The PU D is integrated in addition after the PU C in small/storey distribution boards. The PU D complies with DIN VDE 0675 part 6, class D (draft, Nov 1989), DIN VDE 0675 part 6, A2 (Oct 1996) and IEC 61643-1 (Feb 1998).

2. Installation specifications

2.1 Place of installation

The PU C must be incorporated in a meter cupboard or distribution board in such a way that the connection terminal compartment is not accessible to unauthorised persons. The PU B is incorporated near the incoming power lines in order to create the necessary lightning protection equipotential bonding between the lightning protection system and the power distribution network. All arresters must be installed by

a qualified electrician. The installation of systems with overvoltage protection devices is described in VDE 0100 part 534 (Apr 1999) "Selection and installation of equipment". This draft standard should be used in conjunction with the following standards:

1. IEC 60364-4-43

"Protection from overvoltage due to atmospheric influences and switching operations"

2. IEC 61024-1

"Protection of buildings against lightning"

3. IEC 61312-1

"Protection against electromagnetic lightning pulses"

2.2 Electrical connection

The lines connecting the PU C overvoltage protection and the PU B lightning arrester between the phase conductor (L1, L2, L3) or neutral conductor (N) and earth (PE) of the consumer installation should be kept as short as possible. The routing of protected and unprotected lines together must be avoided. (See diagrams on pp. 70-71 for examples of connections.)

2.2.1 Connection to phase conductor and neutral conductor

As a rule, the conductor cross-section for the connection lines to the PU C or PU B arrester is selected as for the phase conductor (L1, L2, L3) and neutral conductor (N). If a reduced cross-section is desired, a protective device (e.g. main terminal fuse) must guarantee short-circuit protection for the connecting lines. The connection terminals on the arresters may not be used as branch terminals. The backup fuse for the PU C should not exceed 125 A gl. Upstream residual-current circuit-breakers (RCD) type S (3 kA, 8/20 µs) must be able to withstand surge currents. The backup fuse for the PU B should not exceed 160 A gl.

Note: Three-pole PU C devices are employed in a TN-CS system (fig. 2). If the PE and N conductors of the PEN conductor are routed separately, a four-pole PU should be used. In a TT system, a four-pole PU C protector can be installed together with an arrester disconnecter according to DIN VDE 0100-534/A1 (Oct 1996). To avoid accidental energisation between PE and N and to be able to omit arrester disconnecters, the PU 4 C TT module (Part No. 8416370000) provides the best solution (3+1 circuit). A 385 V PU 3 C is installed in an IT system with 400 V phase-to-phase voltage.

2.2.2 Installation of D arrester

The PU D arrester is installed in conjunction with a PU C in the downstream direction. The PU D is incorporated in the line to be protected and can protect circuits up to 16 A. The installation can be carried out in small distribution boards for single circuits protecting, for example, monitors. The PO DS is suitable for incorporating in situ, directly in devices or cable ducts.

2.2.3 Connection to earth

The earth line of the arrester is connected to the earth of the consumer installation via the shortest route (= 0.5 m). Longer connecting lines reduce the effectiveness of the overvoltage protection. Routing the line parallel with other electrical cables should be avoided. In electrical consumer installations with equipotential bonding, an earthed equipotential bonding rail is available as a connection point (see p. 56 "Principles for low-voltage supplies"). A connection between the arrester earth and the consumer installation earth must always be guaranteed. In TN systems the PEN conductor and the arrester earth line should be connected together. The PEN conductor of the power supply company may not be used as an earth. If the PE or PEN rail of a distribution board is used as an earth connection point, it is then necessary for this rail to be connected to the consumer installation earth via a separate earth line.

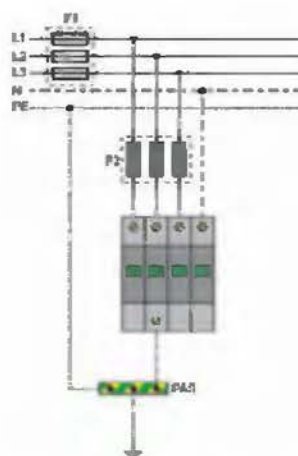
Earth line	Cross-section mm ²		
	≤ 16	25	≤ 35
Main protective conductor – coming from current source or protective conductor leaving – incoming service box or – main distribution board			
Phase conductor	≤ 35	50	≥ 70
Earth line of arrester	10	26	25

Table 1

Two earth connection terminals are available on the PU B. Both terminals must be connected. One connection goes to the equipotential bonding connection of the building, the other to the PE conductor of the installation. The cross-section for the earth line of the arrester is determined, as for lines, according to table 1 for the main equipotential bonding. It must be min. 0.5 times the cross-section of the main protective conductor, where 25 mm² copper is taken to be the upper limit and 10 mm² copper the lower limit.

3. Checking the function

A visual inspection of PU overvoltage protection devices and lightning arresters is especially important during storms. If the flag in the status window or the LED is red, the overvoltage protection device concerned must be replaced. Ageing of the varistors can lead to high temperatures in the varistors. This situation can cause fires in low-voltage systems. Therefore,



in a hazardous situation the integral temperature monitoring automatically disconnects the varistor from the power supply. This disconnection is indicated by the warning lamp being extinguished, and in the PO DS or the PUXCR, PUXBR and PU D by a switch contact as well. The backup fuse should be selected depending on the cross-section of the line and type of installation. Backup fuses of 16 A should be used for the PU D.

3.1 Replacement

If as described under point 3 above an arrester shows a red flag or red LED, it should be replaced by a qualified electrician. The individual class I and II and arresters are plug-in units and coded according to voltage. When insulation resistance tests to DIN VDE 0100 part 610 are carried out, the varistor arresters must be removed, e.g. by lifting off the top section. The arrester must be replaced by one suitable for the rated voltage of the system.

4. Connecting the remote signalling

4.1 Remote signalling with monitoring module type PUXCR, PUXBR or PU D

The signalling contact of a PUXCR or PUXBR is a changeover contact and is connected to terminals 11 and 14. In normal operation (green flag) terminals 11/12 are closed. In this situation terminals 11/14 are open. In the case of a fault (red flag), terminals 11/14 are closed and 11/12 open. In the PU D the triggering of

Overvoltage protection for low-voltage supplies

the disconnection device is signalled by the opening of an irreversible thermal release. The signalling circuit is connected with twisted lines (e.g. NYM); parallel routing with the connecting and earth lines must be avoided here. A protection circuit formed by an overvoltage fine protection corresponding to the voltage level reduces interference at and in the evaluator.

4.2 Remote signalling with photoelectric barrier type PU-O/S-E

Every PU C and PU B arrester is suitable for use with remote monitoring and this can be retrofitted at any time.

The transmitter must be clipped on to the top-hat rail to the left and the receiver to the right of the PU blocks and the devices connected to a 230 V supply.

Afterwards, the remote signalling is connected to terminals 11/14 and/or 11/12, as already described under point 4.1 above. This system allows up to 40 overvoltage arresters to be monitored simultaneously.

4.3 Approvals

PUxC(R) for 230/400 V power supply networks to ÖVE SN 60 parts 1 and 4.

PU units are provided with CE and UL symbols.

Accessories

A system marker is available from LogiMark with the text **“Warning! System protected by overvoltage arresters”**. Lift off plug-in top section for insulation measurements. This yellow card (Part No. 175184 1687) can be affixed with self-adhesive tape. Installation specification for PU1 TSG “Overvoltage protection in power supply networks”.

1. Application

The arrester serves as lightning protection equipotential bonding at the interface transition 0 to 1 (according to IEC 1312-1) in accordance with the requirements of class B to DIN VDE 0675 part 6 (draft, Nov 1989), A1 (Mar 1996) and the requirements of class I to IEC 61643-1 (Feb 1998).

Combinations of several overvoltage arresters are frequently used as an N-PE arrester in TN, TT and IT systems. The PU 1 TSG 50 kA / 1.5 kV-260 V can be used in a combination circuit as a 50 kA sparkover gap between L and N in systems designed for a short-circuit current of 500 A. The use of a sealed sparkover gap satisfies the inspection requirements for class B overvoltage protection systems according to the VDEW directive (1st ed., 1998).

2. Installation instructions

2.1 Special installation conditions for metal distribution boards

The following points should be taken into consideration when installing a PU x C:

1. The use of a plastic partition plate to separate it from adjacent metal parts. It is recommended to incorporate a WTW partition plate (Part No. 1058800000) or a WEW/2 end bracket (Part No. 1061200000).
2. The switching voltage of the PU x CR must be reduced to ≤ 48 V.
3. PU x C modules for U_c 550 V must always be closed with plastic covers.

2.2 Backup fuse

The overvoltage protection devices of the PU series exhibit passive behaviour in normal operation; no current is consumed. The necessary protection against short-circuits and overloads is thus provided by a fuse designed for the type of installation and the cross-section of the connecting lines.

In addition, the products of the PU series are tested with a maximum backup fuse (refer to technical data for details). If the fuse used in the installation is less than or equal to this value, then this can be used as the line protection in the incoming supply. However, if the fuse is larger than that given in the technical specification, additional fuses to suit the connecting line must be incorporated in the line to the PU module.

2.3 Application

PU 1 TSG (+) modules provide the necessary lightning protection equipotential bonding for existing lightning protection systems and incoming supplies.

Enclosed PU 1 TSG modules are preferably installed in the distribution boards of the building's electrical installation. Unenclosed PU 1 TSG+ modules with voltages of 330 or 440 V are frequently installed in industrial applications.

3. Maintenance

According to their applications, PU 1 TSG (+) modules are designed for high electrical and mechanical loads. Faulty arresters must be replaced immediately. The arresters may not be opened.

Installation specification for PU 1 TSG (+) overvoltage protection in power supply networks. May only be installed by qualified personnel. During the installation, please observe the connection conditions specific to the country of application.