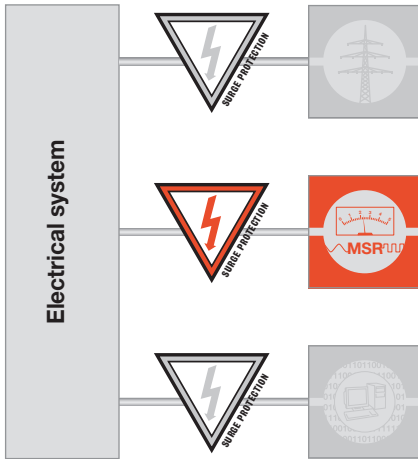


Surge protection for instrumentation and control equipment



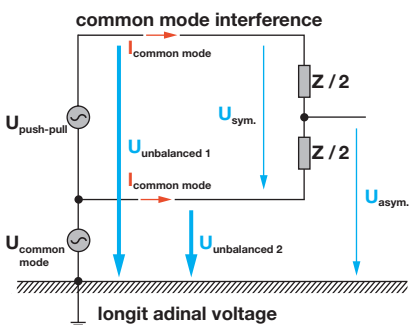
important areas in which breakdowns or malfunctions can lead to high costs. As the standards covering the low control voltages do not specify many parameters, the use of surge protection, apart from lightning protection zoning concepts, has to be classified according to type of signal, application circuit and the anticipated interference voltage phenomena.

Types of interference voltage

The transient surges coupled into a system via one or more coupling mechanisms occur as normal- or common-mode interference. These are measured as longitudinal or transverse voltages and, depending on the circuit, designated as symmetrical or asymmetrical voltages. (For further information see the “Principles” chapter.)

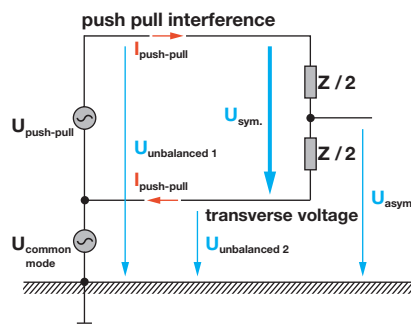
Basic classification

The current scope of automation technology results in a wide range of applications for surge protection in the field of instrumentation and control engineering. Of course, one important prerequisite is the consistent use of coordinated surge protection in all sections of the plant or building. In industry, instrumentation and control systems are



Common-mode interference (asymmetrical interference):

Common-mode voltage between conductor and reference potential. (earth) / Mainly caused by capacitive coupling (electrical field)



Normal-mode interference (symmetrical interference):

Normal-mode voltage between supply and return conductor Load and interference source connected in series, e.g. inductive (magnetic field) or conductive coupling (common impedance)

Types of signal

Binary signals

These are two-wire signals with a common reference potential which are required by, for example, switches, PLC switch outputs, photoelectric barriers, position sensors, solenoid valves, warning lamps, PLC inputs, etc. Normally, these signals have a common reference potential that can be either connected or not connected to earth potential depending on the type of protection. The coupled transient interference is primarily common-mode interference.

Analogue signals

Measuring circuits are normally designed as two-wire current loops or voltage signals without a common reference potential, like the 0(4)...20 mA current loop.

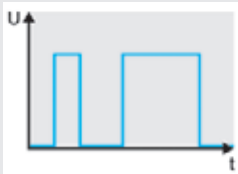
The coupled transient interference is primarily normal-mode interference. For temperature measurements with the PT100 measuring shunt in the three-wire version, the voltage drop at the shunt is measured via the third wire. This must be included in the system of protection.

The PT100 measuring shunt is also available in a four-wire version in which the voltage drop at the shunt is measured via the two additional lines without additional line losses in the PT100 measuring circuit. The coupled transient normal-mode interference occurs between the various wires.

Class III, varistor

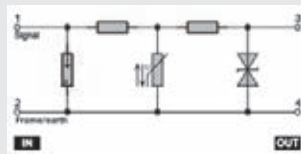


Binary signals

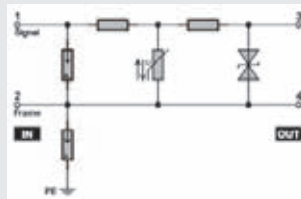


Two-wire, usually with common reference potential, e.g. signals from binary sensors, actuators and indicators such as limit switches, probes, position sensors, photoelectric barriers, contactors, solenoid valves, warning lamps.

Protection for binary signals connected to earth potential



Protection for binary signals not connected to earth potential



Type

MCZ OVP for high-frequency data signals
 MCZ OVP symm., 2 signal paths
 MCZ OVP GDT, MOV, TAZ, 1 signal path
 DKU, 1 signal path
 DK4U
 EGU 1, 1 signal path
 EGU 2, 1 signal path
 EGU 3
 EGU 4 symm., 2 signal paths
 LPU symm., 2 signal paths
 JACKPAC®, IP67
 RSU
 LPU, non-earthed
 Surge protection with ATEX approval

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Analogue signals



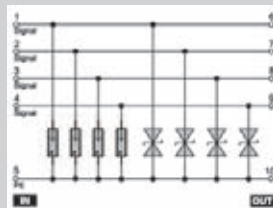
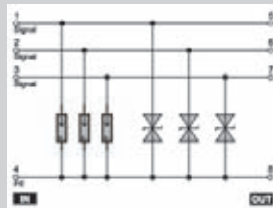
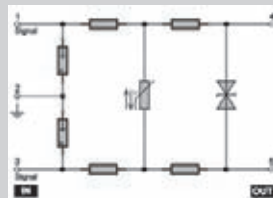
Two-, three- and four-wire versions without common reference potential



Signals from current loops (analogue measurements from sensors over long distances), 4...20 mA, 0...20 mA, etc., e.g. level measurements

Signals from voltage sensors (analogue measurements from sensors over short distances), 0...10 V, PT100, etc., e.g. temperature measurements

Protection for two-, three- and four-wire versions



MCZ OVP CL
 DK5U
 DK6U
 EGU 3 for current loops
 EGU 4 for current loops
 JACKPAC®, IP67
 RSU 6 A / RSU 10 A
 LPU for current loops

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Slim Surge protection terminals for instrumentation and control engineering

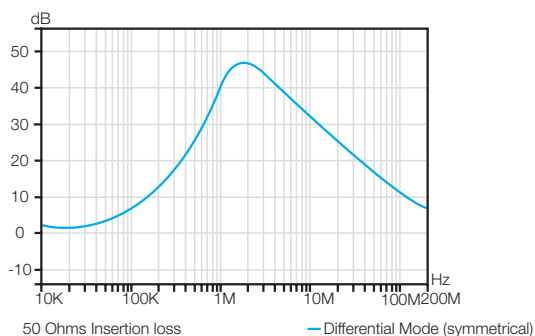
Weidmüller MCZ OVP surge protection terminals are characterised by their high level of protection concentrated in a compact space of 6 mm. The tension spring connection and direct earthing via the terminal rail contact results in time-savings during installation. The MCZ OVP terminals are suitable for installing in the narrowest of places in automated process, industrial and building services systems.



The three-stage surge 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 surge protection terminals are available with rated voltages of 24, 48, 115 and 230 V. The response time for the 3-stage MCZ OVP is typically 100 ps. 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 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 spring terminal every 600 mm.

Attenuation chart MCZ OVP Filter



The different models

MCZ OVP HF is a two-stage protective combination with a bridge circuit consisting of suppressor diodes. With this circuitry, high transmission rates of up to 90 Mhz can be reached in 100-Ohm systems.

This protective circuitry is particularly appropriate for protecting high-speed data transmission systems or high-speed analogue systems.

MCZ OVP CL is a three-stage protective combination with a suppression diode between the current paths. It limits the surge 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 surge in binary circuits, e.g. for actuators.

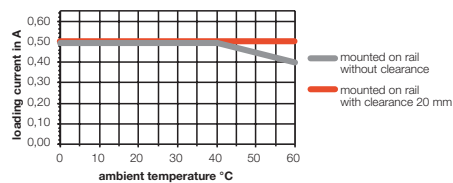
MCZ OVP CL FG is a three-stage protective combination with a suppression diode between the current paths. It limits the surge in analogue signal circuits. A high-resistance earth connection is achieved with a gas discharge tube.

MCZ OVP SL FG is a three-stage protective combination with two suppression diodes, each from the signal line to earth. It limits the surge in binary circuits, e.g. for actuators.

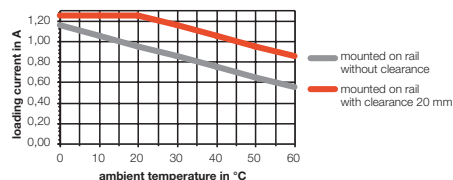
A high-resistance earth connection is achieved with three gas discharge tubes.

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

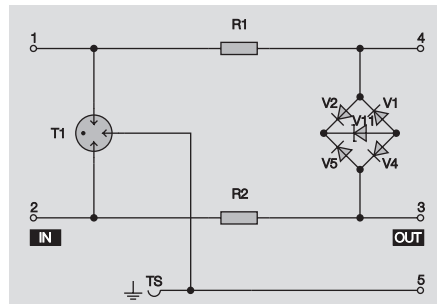
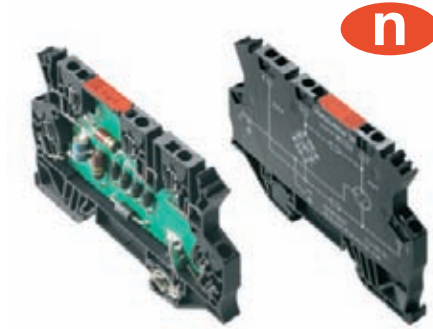


Surge protection for instrumentation and control systems

2-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

MCZ OVP HF 24V 0.3A



Technical data

Technical data

Rated voltage (AC/DC)
 max. continuous voltage, U_c (DC)
 max. continuous voltage, U_c (AC)
 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.
 Protection level on output side sym., input 10/350 μ s, typ.
 Protection level on output side unsym., input 10/350 μ s, typ.
 Lightning test voltage I_{imp} (10/350 μ s)
 Specification class to IEC 61643-21
 Design
 Storage temperature, min./max.
 Operating temperature, min./max.
 Approvals

24 V
40 V
28 V
0.3 A
2.50 Ω
90 V
100.0 MHz (measured in 100 Ω system)
5 kA
80 V
80 V
80 V
150 V
C1 ;C2 ;C3 ;D1
terminal
-40 °C/85 °C
-40 °C/60 °C
CE

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

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP HF 24V 0,3A	10	8948600000

Note

Accessories

Note

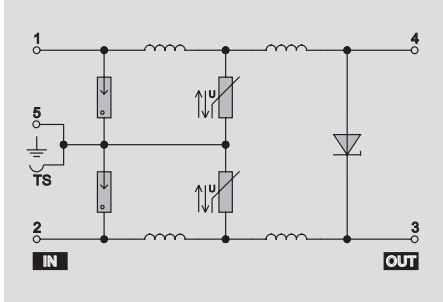
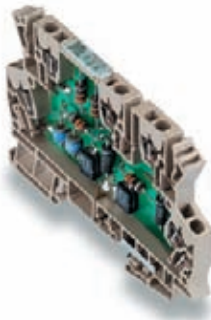
End plate
 AP MCZ 1.5: 1046410000

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

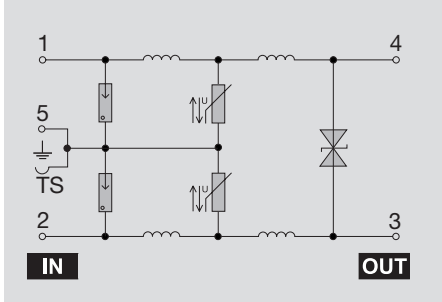
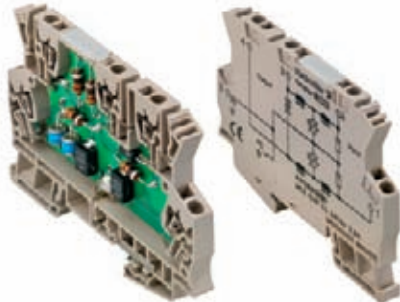
MCZ OVP CL 24 V DC 0.5 A

Protection for current loops



MCZ OVP CL 24 V AC 0.5 A

Protection for current loops



Technical data

Technical data

Rated voltage (AC)
Rated voltage (DC)
max. continuous voltage, U_c (AC)
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 1 kV/ μs , typ.
Protection level on output side unsym., input 8/20 μs , typ.
Protection level on output side sym., input 10/350 μs , typ.
Protection level on output side unsym., input 10/350 μs , typ.
Lightning test voltage I_{imp} (10/350 μs)
Specification class to IEC 61643-21
Design
Ambient temperature (operational)
Storage temperature
Approvals

24 V
28 V
0.5 A
2.50 Ω
yes
yes
yes
500.0 kHz 240 Ω
5 kA
40 V
65 V
40 V
45 V
65 V
1 kA
D1
terminal
-40 ... 60°C
-40 ... 85°C
CE;UL listed

24 V
28 V
38 V
0.5 A
1.00 Ω
yes
yes
yes
500.0 kHz 240 Ω
5 kA
45 V
70 V
45 V
70 V
48 V
88 V
1 kA
D1
terminal
-40 ... 60°C
-40 ... 85°C
CE;UL listed

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

Refer to derating curve

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Ordering data

Version

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

Accessories

Note

End plate
AP MCZ 1.5: 8389030000

End plate
AP MCZ 1.5: 8389030000

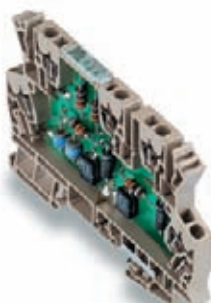
Surge protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

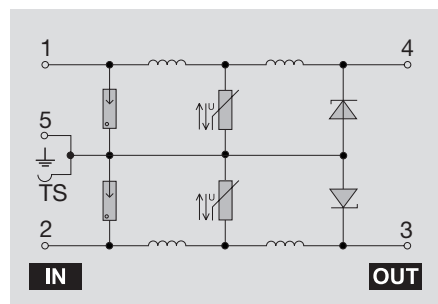
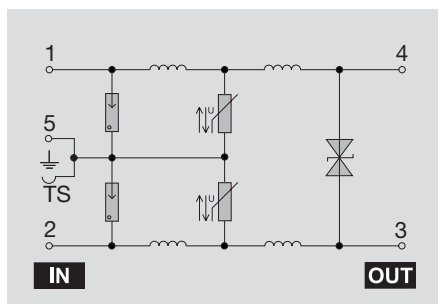
MCZ OVP CL 24 V UC 1.25 A

Protection for current loops



MCZ OVP SL 24 V DC 0.5 A

Protection for binary signals



Technical data

Technical data

Rated voltage (AC)	24 V
Rated voltage (DC)	24 V
max. continuous voltage, U _c (AC)	27 V
Operating current, I _{max}	1.3 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)	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 1 kV/μs, typ.	40 V
Protection level on output side unsym., input 8/20 μs, typ.	65 V
Protection level on output side sym., input 10/350 μs, typ.	58 V
Protection level on output side unsym., input 10/350 μs, typ.	76 V
Lightning test voltage I _{imp} (10/350 μs)	1 kA
Specification class to IEC 61643-21	D1
Design	terminal
Ambient temperature (operational)	-40 ... 60°C
Storage temperature	-40 ... 85°C
Approvals	CE;UL listed

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

Refer to derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP CL 24VUC 1,25A	10	8448960000

Note

Accessories

Note

End plate
AP MCZ 1.5: 8389030000

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP SL 24VDC 0,5A	10	8448940000

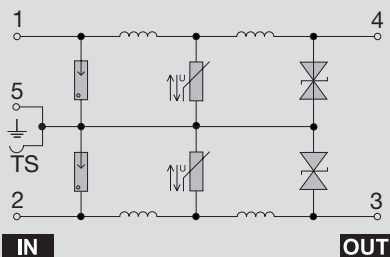
End plate
AP MCZ 1.5: 8389030000

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

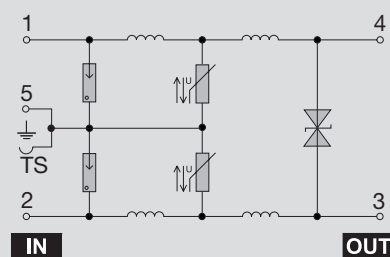
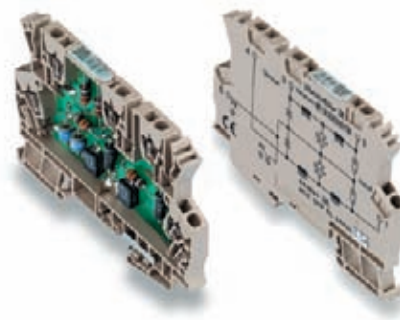
MCZ OVP SL 24 V UC 1.25 A

Protection for binary signals



MCZ OVP CL 48 V UC 0.5 A

Protection for current loops



Technical data

Technical data

Rated voltage (AC)
Rated voltage (DC)
max. continuous voltage, U_c (AC)
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.
Protection level on output side sym., input 10/350 μ s, typ.
Protection level on output side unsym., input 10/350 μ s, typ.
Lightning test voltage I_{imp} (10/350 μ s)
Specification class to IEC 61643-21
Design
Ambient temperature (operational)
Storage temperature
Approvals

Dimensions

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

Note

Ordering data

Version

Note

Accessories

Note

24 V
24 V
28 V
1.3 A
1.00 Ω
yes
yes
yes
500.0 kHz 240 Ω
5 kA
80 V
130 V
40 V
65 V
108 V
56 V
1 kA
D1
terminal
-40 ... 60°C
-40 ... 85°C
CE:UL listed

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP SL 24VUC 1,25A	10	8448970000

48 V
48 V
53 V
0.5 A
2.50 Ω
yes
yes
yes
500.0 kHz 240 Ω
5 kA
82 V
150 V
80 V
150 V
149 V
223 V
2.5 kA
D1
terminal
-40 ... 60°C
-40 ... 85°C
CE:UL listed

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP CL 48VUC 0,5A	10	8449000000

End plate
AP MCZ 1.5: 8389030000

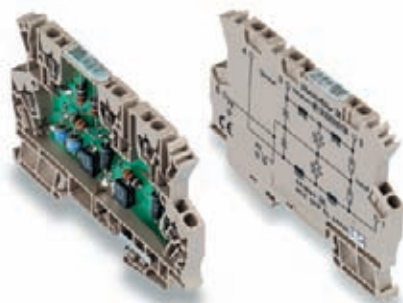
Surge protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

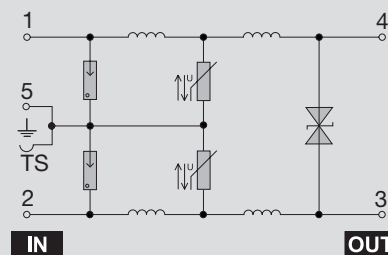
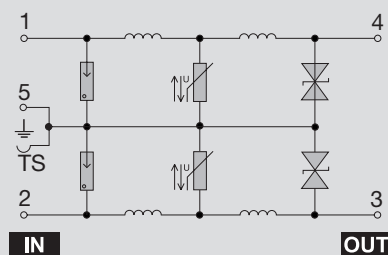
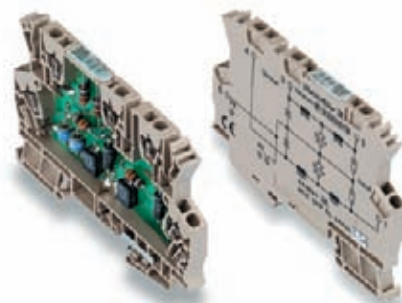
MCZ OVP SL 48 V UC 0.5 A

Protection for binary signals



MCZ OVP CL 48 V UC 1.25 A

Protection for current loops



Technical data

Technical data

Rated voltage (AC)	48 V
Rated voltage (DC)	48 V
max. continuous voltage, U_c (AC)	53 V
Operating current, I_{max}	0.5 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 μ s)	5 kA
Protection level on output side sym., input 1 kV/ μ s, typ.	160 V
Protection level on output side sym., input 8/20 μ s, typ.	300 V
Protection level on output side unsym., input 1 kV/ μ s, typ.	82 V
Protection level on output side unsym., input 8/20 μ s, typ.	150 V
Protection level on output side sym., input 10/350 μ s, typ.	145 V
Protection level on output side unsym., input 10/350 μ s, typ.	81 V
Lightning test voltage I_{imp} (10/350 μ s)	1 kA
Specification class to IEC 61643-21	D1
Design	terminal
Ambient temperature (operational)	-40 ... 60°C
Storage temperature	-40 ... 85°C
Approvals	CE;UL listed

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

Refer to derating curve

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP SL 48VUC 0,5A	10	8449030000

Note

Type	Qty.	Order No.
MCZ OVP CL 48VUC 1,25A	10	8449040000

Accessories

Note

End plate
AP MCZ 1.5: 8389030000

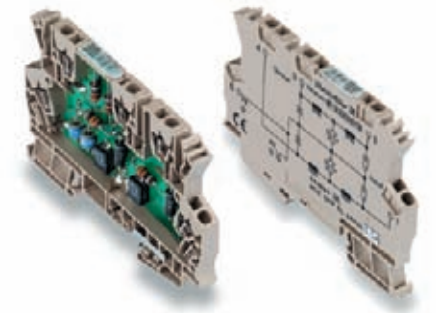
End plate
AP MCZ 1.5: 8389030000

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

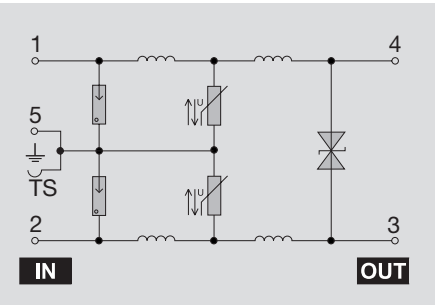
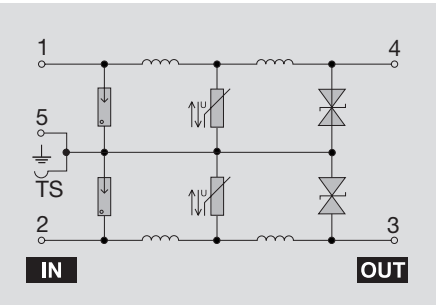
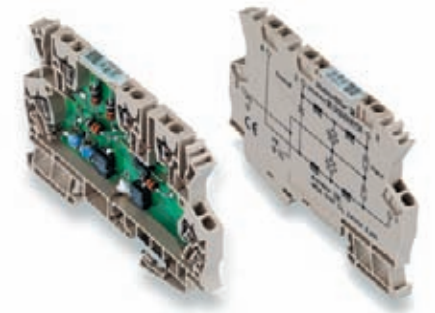
MCZ OVP SL 48 V UC 1.25 A

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 (AC)	53 V
Operating current, I _{max}	1.3 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)	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 1 kV/μs, typ.	80 V
Protection level on output side unsym., input 8/20 μs, typ.	150 V
Protection level on output side sym., input 10/350 μs, typ.	197 V
Protection level on output side unsym., input 10/350 μs, typ.	119 V
Lightning test voltage I _{imp} (10/350 μs)	2.5 kA
Specification class to IEC 61643-21	D1
Design	terminal
Ambient temperature (operational)	-40 ... 60°C
Storage temperature	-40 ... 85°C
Approvals	CE;UL listed

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

Note

Ordering data

Version

Note

Accessories

Note

48 V
48 V
53 V
1.3 A
1.00 Ω
yes
yes
yes
500.0 kHz 240 Ω
5 kA
160 V
300 V
80 V
150 V
197 V
119 V
2.5 kA
D1
terminal
-40 ... 60°C
-40 ... 85°C
CE;UL listed

tension clamp connection	
1.5 / 0.5 / 1.5	
91 x 6 x 63.5	

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP SL 48VUC 1,25A	10	8449050000

115 V
115 V
127 V
1.3 A
1.00 Ω
yes
yes
yes
500.0 kHz 240 Ω
5 kA
220 V
360 V
220 V
360 V
228 V
234 V
1 kA
D1
terminal
-40 ... 60°C
-40 ... 85°C
CE;

tension clamp connection	
1.5 / 0.5 / 1.5	
91 x 6 x 63.5	

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP CL 115VUC 1,25A	10	8449060000

Note

End plate AP MCZ 1.5: 8389030000

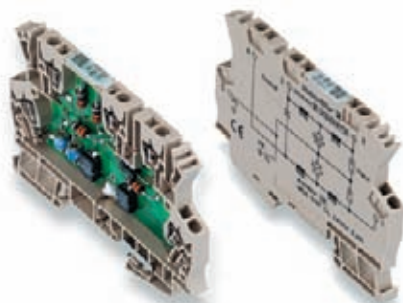
Surge protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

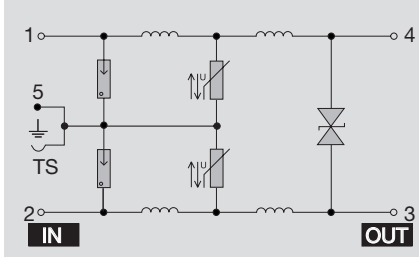
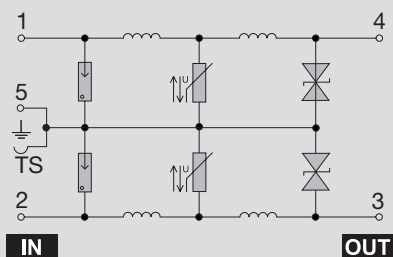
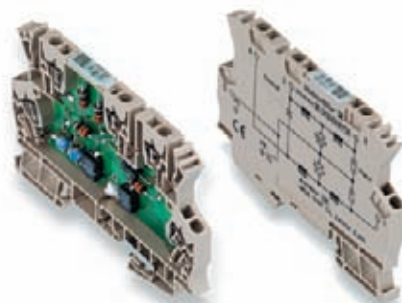
MCZ OVP SL 115 V UC 1.25 A

Protection for binary signals



MCZ OVP CL 230 V UC 1.25 A

Protection for current loops



Technical data

Technical data

Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U_c (AC)	127 V
Operating current, I_{max}	1.3 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 μ s)	5 kA
Protection level on output side sym., input 1 kV/ μ s, typ.	440 V
Protection level on output side sym., input 8/20 μ s, typ.	720 V
Protection level on output side unsym., input 1 kV/ μ s, typ.	220 V
Protection level on output side unsym., input 8/20 μ s, typ.	360 V
Protection level on output side sym., input 10/350 μ s, typ.	249 V
Protection level on output side unsym., input 10/350 μ s, typ.	322 V
Lightning test voltage I_{imp} (10/350 μ s)	2.5 kA
Specification class to IEC 61643-21	D1
Design	terminal
Ambient temperature (operational)	-40 ... 60°C
Storage temperature	-40 ... 85°C
Approvals	CE;

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

Refer to derating curve

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP SL 115VUC 1,25A	10	8449070000

Note

Type	Qty.	Order No.
MCZ OVP CL 230VUC 1,25A	10	8449080000

Accessories

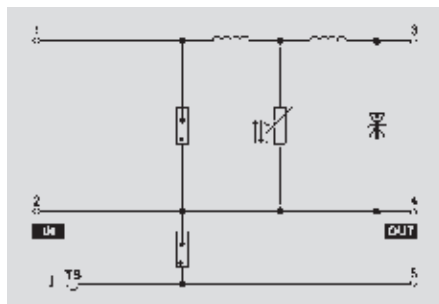
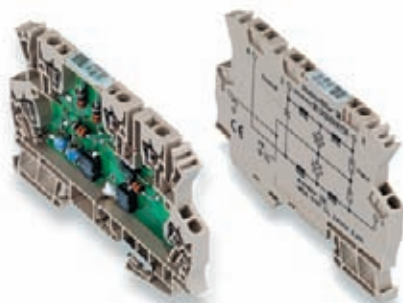
Note

End plate
AP MCZ 1.5: 8389030000

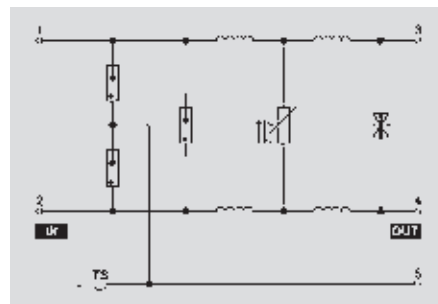
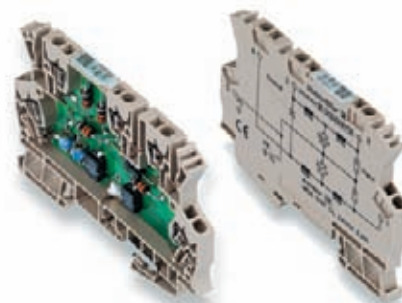
End plate
AP MCZ 1.5: 8389030000

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

not earthed



not earthed



Technical data

Rated voltage (AC)
Rated voltage (DC)
max. continuous voltage, U_c (AC)
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.
Protection level on output side sym., input 10/350 μ s, typ.
Protection level on output side unsym., input 10/350 μ s, typ.
Lightning test voltage I_{imp} (10/350 μ s)
Specification class to IEC 61643-21
Design
Ambient temperature (operational)
Storage temperature
Approvals

Dimensions

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

Note

Version

Note

tension clamp connection

1.5 / 0.5 / 1.5

91 x 6 x 63.5

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP SL FG 24VUC 0,5A	10	8823280000

End plate
AP MCZ 1.5: 8389030000

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP CL FG 24VUC 0,5A	10	8704240000

End plate
AP MCZ 1.5: 8389030000

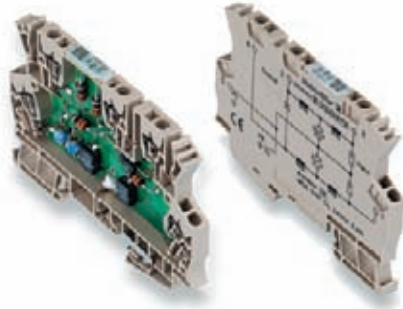
Surge protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

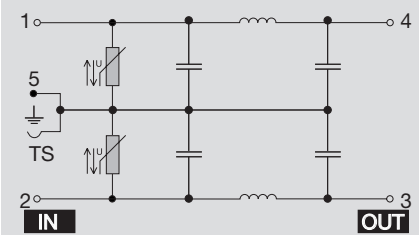
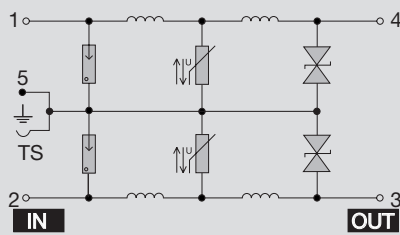
MCZ OVP SL 230 V UC 1.25 A

Protection for binary signals



MCZ OVP 24 V 0.5 A

Filter



Technical data

Technical data

Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U_c (AC)	250 V
Operating current, I_{max}	1.3 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 μ s)	5 kA
Protection level on output side sym., input 1 kV/ μ s, typ.	840 V
Protection level on output side sym., input 8/20 μ s, typ.	1420 V
Protection level on output side unsym., input 1kV/ μ s, typ.	420 V
Protection level on output side unsym., input 8/20 μ s, typ.	710 V
Protection level on output side sym., input 10/350 μ s, typ.	
Protection level on output side unsym., input 10/350 μ s, typ.	
Lightning test voltage I_{imp} (10/350 μ s)	< 0.5 kA
Specification class to IEC 61643-21	D1
Design	terminal
Ambient temperature (operational)	-40 ... 60°C
Storage temperature	-40 ... 85°C
Approvals	CE;

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

Refer to derating curve

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to 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 MCZ 1.5: 8389030000

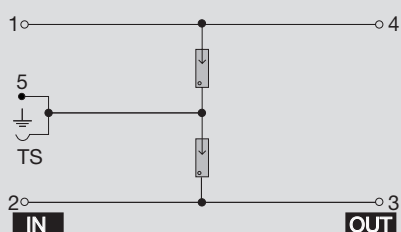
End plate
AP MCZ 1.5: 8389030000

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

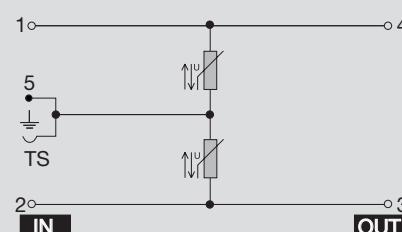
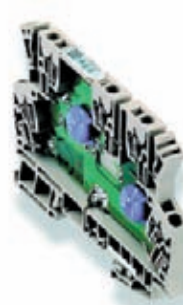
MCZ OVP 90 V

Gas discharge tube



MCZ OVP S10K30

Varistor S10K30



Technical data

Technical data

Rated voltage (AC)
Rated voltage (DC)
max. continuous voltage, U_c (AC)
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.
Protection level on output side sym., input 10/350 μ s, typ.
Protection level on output side unsym., input 10/350 μ s, typ.
Lightning test voltage I_{imp} (10/350 μ s)
Specification class to IEC 61643-21
Design
Ambient temperature (operational)
Storage temperature
Approvals

Dimensions

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

Note

Ordering data

Version

Note

Accessories

Note

50 V
70 V
72 V
16 A
0.20 Ω
90 V / 10 kA
no
no
5 kA
700 V
800 V
700 V
800 V
763 V
782 V
1 kA
D1
terminal
-40 ... 60°C
-40 ... 85°C
CE:UL listed

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP Gas charge eliminator 90V	10	8449130000

24 V
24 V
30 V
16 A
0.20 Ω
no
yes
no
125 A
45 V
55 V
45 V
55 V
263 V
136 V
0.5 kA
D1
terminal
-40 ... 60°C
-40 ... 85°C
CE:UL listed

tension clamp connection

1.5 / 0.5 / 1.5
91 x 6 x 63.5

Refer to derating curve

Type	Qty.	Order No.
MCZ OVP VARISTOR S10K30	10	8449140000

End plate
AP MCZ 1.5: 8389030000

Surge protection for instrumentation and control systems

3- or 1-stage protection with tension clamp connection

- Slimline surge protection terminal with tension clamp connection
- 6 mm slimline fine surge protection
- fast wiring thanks to TS contact and tension clamp connections
- can be cross-connected using ZQV

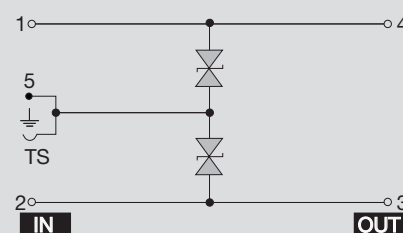
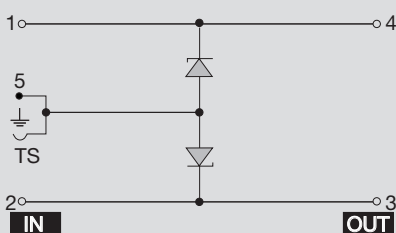
MCZ OVP TAZ 24 V DC

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 (AC)
 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.
 Protection level on output side sym., input 10/350 μ s, typ.
 Protection level on output side unsym., input 10/350 μ s, typ.
 Lightning test voltage I_{imp} (10/350 μ s)
 Specification class to IEC 61643-21
 Design
 Ambient temperature (operational)
 Storage temperature
 Approvals

24 V
 30 V
 16 A
 0.20 Ω
 no
 no
 yes

112 A
 55 V
 65 V
 55 V
 65 V

terminal
 -40 ... 60°C
 -40 ... 85°C
 CE;UL listed

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5

Refer to derating curve

24 V
 27 V
 27 V
 16 A
 0.20 Ω
 no
 no
 yes

0.5 kA
 55 V
 65 V
 110 V
 130 V

terminal
 -40 ... 60°C
 -40 ... 85°C
 CE;UL listed

tension clamp connection

1.5 / 0.5 / 1.5
 91 x 6 x 63.5

Refer to derating curve

Dimensions

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

Note

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
 AP MCZ 1.5: 8389030000

End plate
 AP MCZ 1.5: 8389030000

3-stage protection with screw connection

Surge 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 surge 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 for all DKU 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 surges, 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

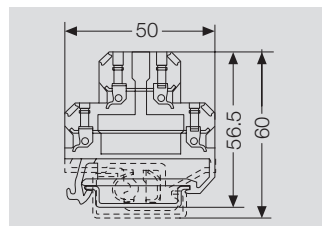
switching times are shorter. RD combinations are also less expensive than RC combinations.

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.

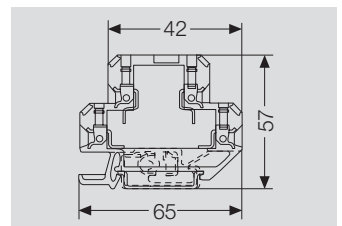
WPO 4

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.

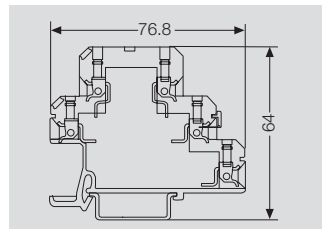
DK 4 U Varistor gas discharge tube



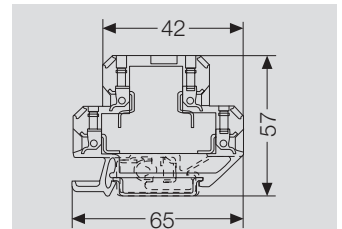
DK 4 U with suppression diode



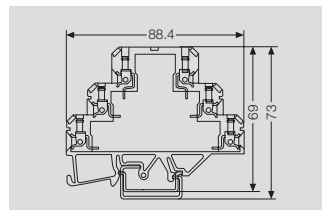
DK 5 U



DKU with combination circuit



DK 6 U



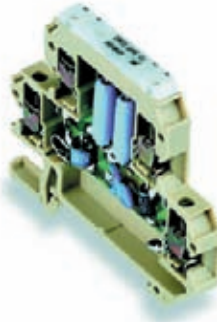
Surge protection for instrumentation and control systems

3-stage protection with screw connection

Slimline surge protection terminal with screw connection

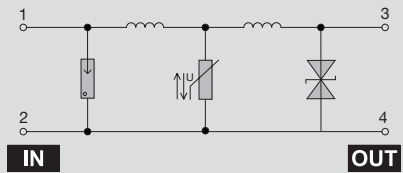
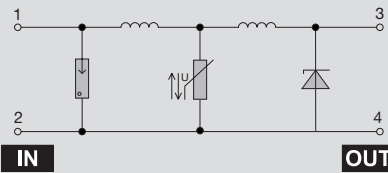
DKU 24 V DC 0.3 A

Protection for binary signals



DKU 48 V UC 0.3 A

Protection for binary signals



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c (AC)
 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
 Ambient temperature (operational)
 Storage temperature

24 V
 28 V
 0.3 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 ... 60°C
 -25 ... 85°C

48 V
 48 V
 54 V
 0.3 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 ... 60°C
 -25 ... 85°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 DKT4 PA: 0687560000

End plate
 AP DKT4 PA: 0687560000

3-stage protection with screw connection

Slimline surge protection terminal with screw connection

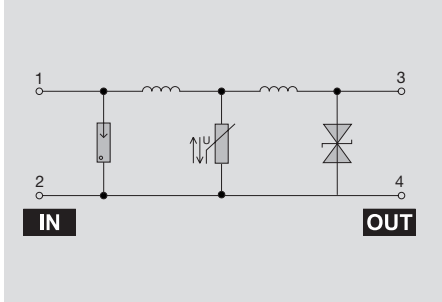
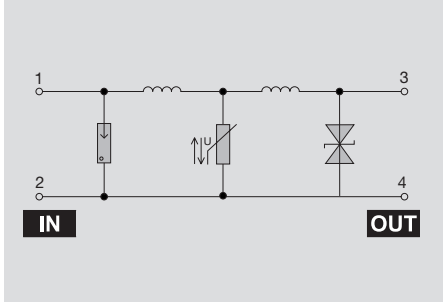
DKU 115 V UC 0.3 A

Protection for binary signals



DKU 230 V UC 0.3 A

Protection for binary signals



Technical data

Technical data	
Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c (AC)	122 V
Operating current, I _{max}	0.3 A
Volume resistivity	3.00 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	1.0 MHz 50 Ω
Discharge current, max. (8/20 μs)	7 kA
Protection level on output side sym., input 1 kV/μs, typ.	180 V
Protection level on output side sym., input 8/20 μs, typ.	220 V
Protection level on output side unsym., input 1kV/μs, typ.	180 V
Protection level on output side unsym., input 8/20 μs, typ.	220 V
Design	terminal
Type of connection	Screw connection
Ambient temperature (operational)	-25 ... 60°C
Storage temperature	-25 ... 85°C

115 V
115 V
122 V
0.3 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 ... 60°C
-25 ... 85°C

230 V
230 V
240 V
0.3 A
3.00 Ω
yes
yes
yes
1.0 MHz 2200Ω
7 kA
400 V
520 V
400 V
520 V
terminal
Screw connection
-25 ... 60°C
-25 ... 85°C

Type of connection

Clamping range (rating- / min. / max.)	mm ²	2.5 / 0.5 / 4
Length x width x height	mm	65 x 6 x 60

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 35 115VUC 0,3A	10	8019310000

Type	Qty.	Order No.
DKU 35 115VUC 0,3A	10	8019310000

Note

DKU 35 height 57mm

Type	Qty.	Order No.
DKU 35 230VUC 0,3A	10	8019330000

DKU 35 height 57mm

Accessories

Note

End plate
AP DKT4 PA: 0687560000

End plate
AP DKT4 PA: 0687560000

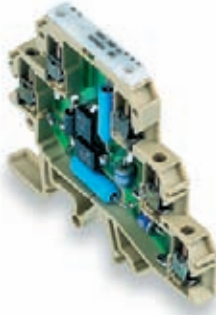
Surge protection for instrumentation and control systems

3-stage protection with screw connection

Slimline surge protection terminal with screw connection

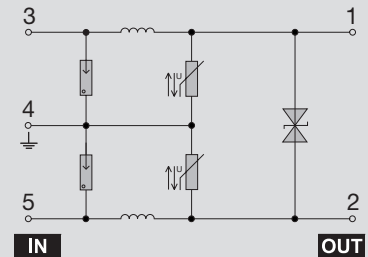
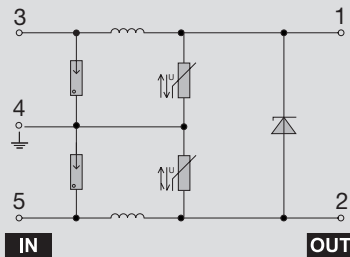
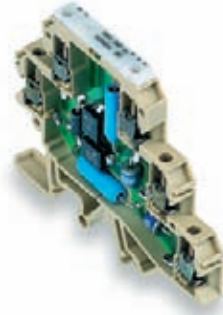
DKU DK5 24 V DC 0.3 A

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 (AC)
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
Ambient temperature (operational)
Storage temperature

24 V
28 V
0.3 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 ... 60°C
-25 ... 85°C

48 V
48 V
54 V
0.3 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 ... 60°C
-25 ... 85°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
AP DK5 PA BE: 4036780000

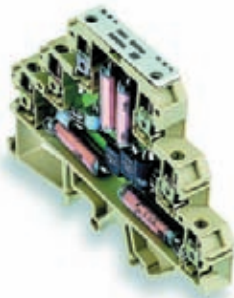
End plate
AP DK5 PA BE: 4036780000

3-stage protection with screw connection

Slimline surge protection terminal with screw connection

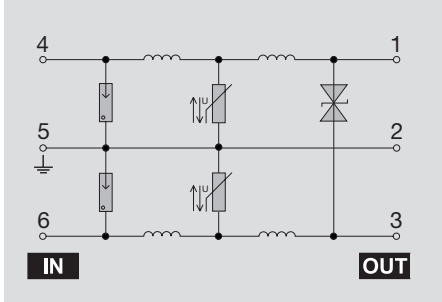
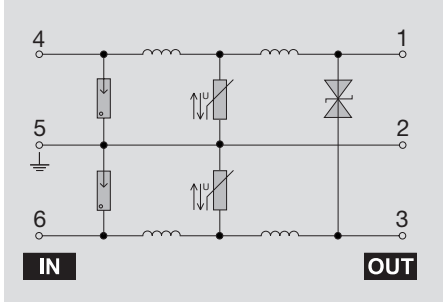
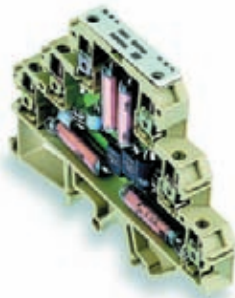
DKU DK6 120 V UC 1 A

Protection for analogue signals



DKU DK6 230 V UC 1 A

Protection for analogue signals



Technical data

Technical data	
Rated voltage (AC)	120 V
Rated voltage (DC)	120 V
max. continuous voltage, U _c (AC)	130 V
Operating current, I _{max}	1 A
Volume resistivity	0.30 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	22.0 kHz 120 Ω
Discharge current, max. (8/20 μs)	7 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.	290 V
Protection level on output side unsym., input 1kV/μs, typ.	290 V
Protection level on output side unsym., input 8/20 μs, typ.	350 V
Design	terminal
Type of connection	Screw connection
Ambient temperature (operational)	-25 ... 60°C
Storage temperature	-25 ... 85°C

120 V
120 V
130 V
1 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 ... 60°C
-25 ... 85°C

230 V
230 V
240 V
1 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 ... 60°C
-25 ... 85°C

Type of connection

Clamping range (rating- / min. / max.)	mm ²
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 120VAC 1,0A	10	8262480000

Note

DK6U TS35, 69 mm high

Type	Qty.	Order No.
DKU DK6 230VAC 1,0A	10	8263760000

DK6U TS35, 69 mm high

Accessories

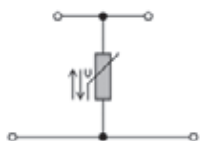
Note

End plate AP DK6 PA BE: 8324560000

End plate AP DK6 PA BE: 8324560000

Surge protection for instrumentation and control systems

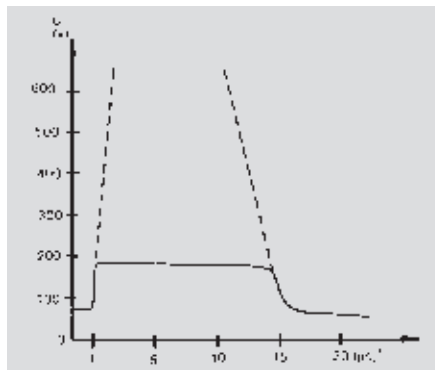
DK-SERIES with varistor in terminal design



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

Rated data DK 4 U	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			
	U _{eff}	U–	Energy	Surge cur.	Energy	Surge cur.	Disch. cur.		Capacity	Order No.	Order No.
Type	V	V	J	A	J	A	V	V	pF	TS 32	TS 35
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	on request	on request
	17	22	2,7	1000	0,11	75	52	27	10000	on request	on request
	20	26	3,3	1000	0,13	75	65	33	7500	on request	on request
	25	31	3,7	1000	0,15	75	75	39	6500	on request	9401440000
Preferred types 24 V	30	38	4,4	1000	0,17	75	90	47	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	on request	on request
	50	65	27,0	4500	0,6	150	135	82	2900	on request	on request
	60	85	30,0	4500	0,7	150	155	100	2400	on request	9401490000
Preferred types 48 V	75	100	38,0	4500	0,8	150	185	120	1900	on request	on request
	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	on request
Preferred types 115 V	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	on request
	250	320	92,0	4500	2,4	150	610	390	500	on request	on request
	275	350	100,0	6500	2,5	190	660	430	450	9401180000	on request
	300	385	110,0	6500	2,6	190	740	470	400	on request	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	on request
	20	26	6,6	2000	0,24	125	60	33	17000	on request	on request
	25	31	7,8	2000	0,28	125	70	39	15000	on request	9401640000
Preferred types 24 V	30	38	9,0	2000	0,35	125	85	47	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	on request	on request
	50	65	36,0	6500	0,5	190	120	82	5500	on request	on request
	60	85	45,0	6500	0,7	190	150	100	4800	on request	on request
Preferred types 48 V	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
	130	170	80,0	6500	1,4	190	300	205	2000	on request	on request
	140	180	90,0	6500	1,5	190	320	220	2000	on request	on request
	150	200	95,0	6500	1,6	190	340	240	1800	on request	on request
Preferred types 115 V	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	on request	on request
	250	320	140,0	6500	2,7	190	600	390	1000	on request	on request
	275	350	150,0	8000	2,9	300	640	430	900	9401380000	9401780000
	300	385	160,0	8000	3,0	300	700	470	900	on request	on request

Overall width 12 mm

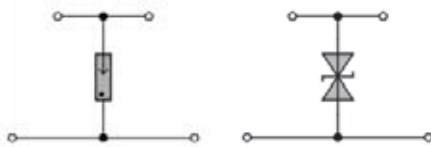
DK 4 U with gas discharge tube or suppression diode



The process depends on the temporal slew rate of the surge and the rated DC response voltage. The rated DC response voltage 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

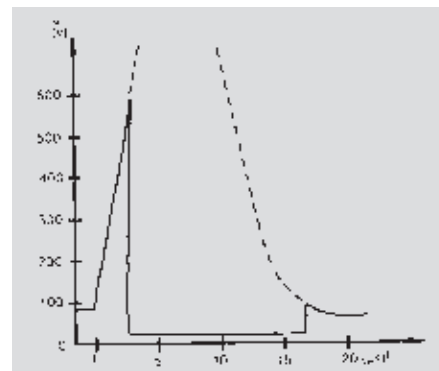
Suppression diodes work on a similar principle to conventional Zener diodes. If the indicated breakdown voltage is exceeded, the diode conducts. Compared to Zener diodes, suppression diodes have a higher current carrying capacity and faster response times in the ps range.



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 from high resistance to low resistance.

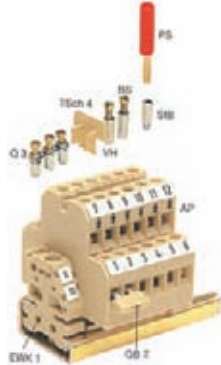
DK 4 U gas discharge tube 5 kA, 90 V

Rated data
DK 4 U

		Rated DC sparkover voltage		Impulse sparkover voltage at 1 kV/μs	Maximum rated voltage		Capacity	Order No.	Order No.
Type		V	Tolerance %	V	U _{eff} V	U ₋ V	pF	TS 32	TS 35
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	on request	9400540000
	Preferred types 230 V	600 –	±15	<1000	255	360	≈2	on request	9400550000
DK 4 U with suppression diode		20 –	±10	< 60	–	28	≈3000	on request	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

Surge protection for instrumentation and control systems

DK-SERIES with electronic components (other versions on request)



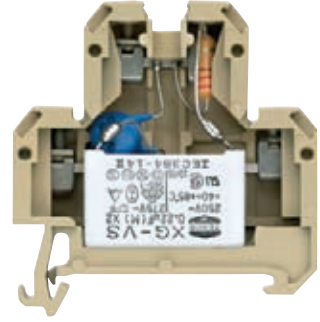
DK 4 RC

Arc suppression circuit for contactors and solenoid valves (AC)
Suppressor module for optos 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	

18 mm
9 mm
0,5 ... 4 mm ²
–
AWG 22 ... 12
–
250 V~/300 V-
–
–
10 A
–
220 Ω
0,22 µF
–
–
–

18 mm
9 mm
0,5 ... 4 mm ²
–
AWG 22 ... 12
–
24 V~/250 V
–
–
10 A
–
–
47 Ω
0,22 µF
S 14
50 V
–

Ordering data

Version	
	for TS 32
	for TS 35
	for TS 35
Note	

Type	Order No.
DK 4 RC	0692160000
DK 4 RC/35	0053160000
WDK 2.5 RC	8065910000
Note	

Type	Varistor	Order No.
DK 4 RC-VRS	50 V	on request
DK 4 RC-VRS	50 V	on request
DK 4 RC-VRS/35	250 V	on request
DK 4 RC-VRS/35	250 V	on request
Note		

Accessories

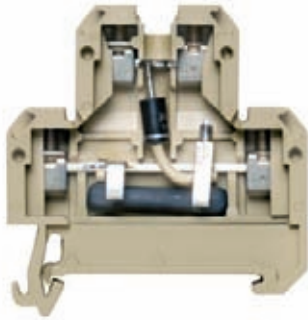
Accessories	
Mounting rail (2 m lengths)	
End bracket (thickness mm)	
End plate (thickness mm)	
Insulation plate	
Socket for test plug	
Test plug (pin diameter)	
Cross-connection (pre-assembled)	3-pole
	4-pole
	10-pole
Cover plate	
Fixing screw (plastic)	
Cross-connection bridge	2-pole
	3-pole
	4-pole
	75-pole
Insulation profile	
Note	

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
StB 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 ¹⁾	100	0482700000
QB 3 ¹⁾	50	0482800000
QB 4 ¹⁾	50	0482900000
QB 75 blank	10	0526400000
IP	–	0526700000
StB 8.5	50	0215700000
Note		
1) When using QB: wire connection max. 2.5 mm ²		

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
StB 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 ¹⁾	100	0482700000
QB 3 ¹⁾	50	0482800000
QB 4 ¹⁾	50	0482900000
QB 75 blank	10	0526400000
IP	–	0526700000
Note		

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	on request
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
StB 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')	100	0482700000
QB 3')	50	0482800000
QB 4')	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:

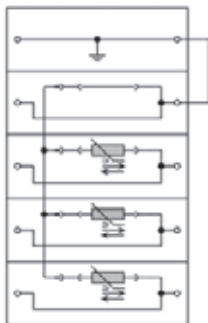
- Cost-savings
- Components can be changed quickly on site
- Service is limited to visual inspection
- Components are easy to distinguish
- Flexibility
- Components can immediately be adapted to changed conditions

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 0110/1.89/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	

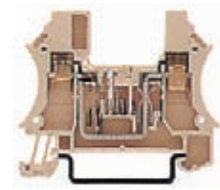
Ordering data

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	



Surges in a three-phase supplies discharged to earth via WPE with the aid of varistors and a gas discharge tube.

WPO 4



6/60/47
9 mm/M 3
250 V/32 A/4 mm ²
4 kV/3
0.5...1.0
2
0.5...4
1.5...4
0.5...4
0.5...4
0.5...4
A 3
32 A/4 mm ²
0.8...1.0 mm

Type	Qty	Order No.
	50	1036000000
ZR	20	1071100000
SSch 7.3x1.2	1 m	1071200000
S14k30		on request
S14k275		on request
90 V 20 kA		on request
600 V 20 kA		on request

Accessories

Marking tags	Type	Order No.
Print		
Consecutive horizontal	DEK6 FW	on request
Consecutive vertical	DEK6 FS	on request
Note		

3-stage protection with screw connection

EGU – surge 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 surge 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 °C ... +85 °C
 operating temperature: –25 °C ... +40 °C
 packed singly

EGU1



Two-stage surge 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 surge 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 surge 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 surge 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

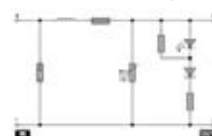
e.g. for binary signals

Dimensions:

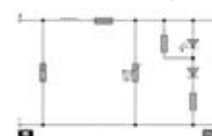
L x W x H = 58 x 63 x 20 mm



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**

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: 90 V 5 kA
	Varistor: 30 V
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

TypeEGU 1, 24 V UC **0243960000**

24 V UC
30 V AC / 38 V DC
90 V 5 kA
30 V
20 kHz / 500 Ω
6 kA

TypeEGU 1, 48 V UC **on request**

48 V UC
60 V AC / 85 V DC
230 V 5 kA
110 V
40 kHz / 1000 Ω
6 kA

TypeEGU 1, 115 V UC **on request**

115 V UC
130 V AC / 170 V DC
230 V 5 kA
130 V
88 kHz / 2200 Ω
6 kA

TypeEGU 1, 230 V UC **on request**

230 V UC
250 V AC / 320 V DC
600 V 20 kA
275 V
150 kHz / 4500 Ω
24 kA

EGU 2 50 mA

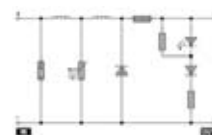
e.g. for binary signals

Dimensions:

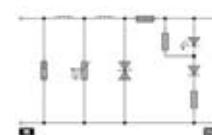
L x W x H = 58 x 63 x 20 mm



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**

Voltage, U _n 1.2:	24 V DC
Voltage, U _c 1.2:	28 V DC
Rated data of components	Gas discharge tube: 90 V 5 kA
	Varistor: 30 V
	Suppression diode: 33 V
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

TypeEGU 2, 24 V DC **0223060000**

24 V DC
28 V DC
90 V 5 kA
30 V
33 V
10 kHz / 500 Ω
6 kA

TypeEGU 2, 48 V UC **on request**

48 V UC
55 V AC / 88 V DC
230 V 5 kA
150 V
86 V
20 kHz / 500 Ω
6 kA

TypeEGU 2, 115 V UC **on request**

115 V UC
130 V AC / 170 V DC
230 V 5 kA
150 V
170 V
88 kHz / 2200 Ω
6 kA

TypeEGU 2, 230 V UC **0223260000**

230 V UC
250 V AC / 320 V DC
600 V 20 kA
275 V
264 V
150 kHz / 4500 Ω
24 kA

EGU 2 1.5 A

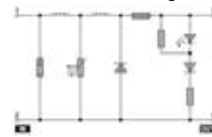
e.g. for power supplies

Dimensions:

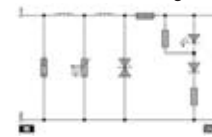
L x W x H = 58 x 63 x 20 mm



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**

Voltage, U _n 1.2:	24 V DC
Voltage, U _c 1.2:	28 V DC
Rated data of components	Gas discharge tube: 90 V 5 kA
	Varistor: 30 V
	Suppression diode: 33 V
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

TypeEGU 2, 24 V DC **9310830000**

24 V DC
28 V DC
90 V 5 kA
30 V
33 V
500 kHz / 16 Ω
6 kA

TypeEGU 2, 48 V UC **1170160000**

48 V UC
55 V AC / 88 V DC
230 V 5 kA
150 V
86 V
1 MHz / 32 Ω
6 kA

TypeEGU 2, 115 V UC **on request**

115 V UC
130 V AC / 170 V DC
230 V 5 kA
150 V
170 V
1.5 MHz / 70 Ω
6 kA

TypeEGU 2, 230 V UC **on request**

230 V UC
250 V AC / 320 V DC
600 V 20 kA
275 V
264 V
2 MHz / 150 Ω
24 kA

Surge protection for instrumentation and control systems

EGU 3 50 mA

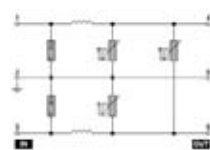
e.g. for current loops

Dimensions:

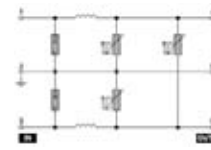
L x W x H = 58 x 95 x 22.5 mm



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.
	EGU 3, 24 V UC	0250560000	EGU 3, 48 V UC	0250660000	EGU 3, 115 V UC	9311530000	EGU 3, 230 V UC	0250860000
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:		230 V 5 kA		230 V 5 kA		600 V 20 kA	
	Varistor:		30 V		180 V		275 V	
			10 kHz / 500 Ω		44 kHz / 2200 Ω		75 kHz / 4500 Ω	
Max. frequency (–3 db/load impedance):	6 kA		6 kA		6 kA		24 kA	
Discharge current, I _{max} (8/20 μs), typical:								
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

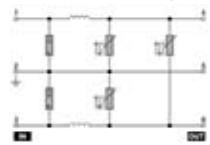
e.g. for power supplies

Dimensions:

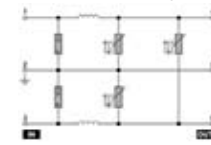
L x W x H = 58 x 95 x 22.5 mm



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.
	EGU 3, 24 V UC	1186760000	EGU 3, 48 V UC	1186960000	EGU 3, 115 V UC	on request	EGU 3, 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:		230 V 5 kA		230 V 5 kA		600 V 20 kA	
	Varistor:		30 V		180 V		275 V	
			300 kHz / 16 Ω		550 kHz / 70 Ω		800 kHz / 150 Ω	
Max. frequency (–3 db/load impedance):	6 kA		6 kA		6 kA		24 kA	
Discharge current, I _{max} (8/20 μs), typical:								
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

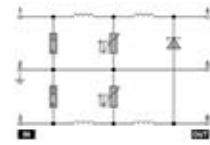
e.g. for current loops

Dimensions:

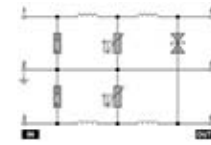
L x W x H = 58 x 95 x 22.5 mm



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

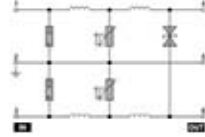
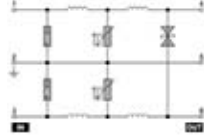
Ordering data	Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
	EGU 4, 24 V DC	0459460000	EGU 4, 48 V UC	0461860000	EGU 4, 115 V UC	on request	EGU 4, 230 V UC	0462060000
Technical data								
Voltage, U _n 1.3:	24 V DC		48 V UC		115 V UC		230 V UC	
Voltage, U _c 1.3:	28 V DC		55 V AC / 34 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		150 V 5 kA		600 V 20 kA	
	Varistor:		30 V		75 V		275 V	
	Suppression diode:		33 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 supplies

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

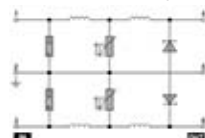
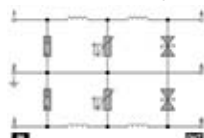
Ordering data		Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
		EGU 4, 24 V UC	1170960000	EGU 4, 48 V UC	on request	EGU 4, 115 V UC	1171160000	EGU 4, 230 V UC	1171260000
Technical data									
Voltage, U _n 1.3:		24 V UC		48 V UC		115 V UC		230 V UC	
Voltage, U _c 1.3:		34 V AC / 26.5 V 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 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):		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

Ordering data		Type	Order No.	Type	Order No.	Type	Order No.	Type	Order No.
		EGU 4, 24 V DC	1170560000	EGU 4, 48 V UC	on request	EGU 4, 115 V UC	on request	EGU 4, 230 V UC	on request
Technical data									
Voltage, U _n 1.3:		24 V DC		48 V UC		115 V UC		230 V UC	
Voltage, U _c 1.3:		31 V DC		55 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 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		20 kHz / 480 Ω		40 kHz / 1200 Ω		80 khz / 2,2 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:		66 V		170 V		400 V		700 V	
For 8/20 μs (rated discharge current), typical:		110 V		190 V		480 V		880 V	

Surge protection for instrumentation and control systems

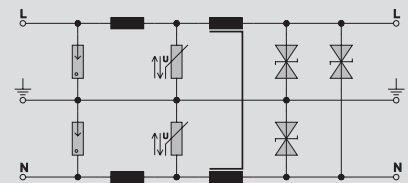
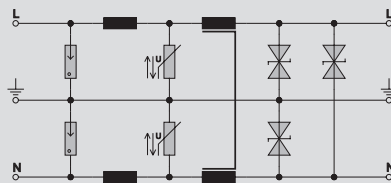
3-stage protection with screw connection

- Surge protection RSU for power supplies
- with current-compensated inductor
- low residual voltage thanks to suppression diodes

RSU 24 V UC 6 A



RSU 115 V UC 6 A



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c (AC)
 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
 Ambient temperature (operational)
 Storage temperature

24 V
 24 V
 27 V
 6 A
 0.08 Ω
 yes
 yes
 yes
 8.0 kHz 4 Ω
 24 kA
 40 V
 45 V
 40 V
 45 V
 RS section
 Screw connection
 -25 ... 40°C
 -25 ... 85°C

115 V
 115 V
 130 V
 6 A
 0.08 Ω
 yes
 yes
 yes
 30.0 kHz 20 Ω
 24 kA
 200 V
 250 V
 200 V
 250 V
 RS section
 Screw connection
 -25 ... 40°C
 -25 ... 70°C

Type of connection

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

2.5 / 0.5 / 4
 87 x 81 x 89

2.5 / 0.5 / 4
 87 x 81 x 89

Note

Ordering data

Type	Qty.	Order No.
RSU 24VUC 6A LP	1	1171361001

Type	Qty.	Order No.
RSU 115VUC 6A	1	1171561001

Note

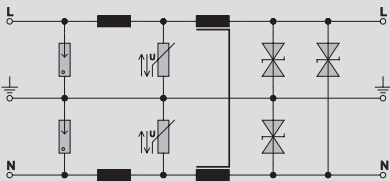
Accessories

Note

3-stage protection with screw connection

- Surge protection RSU for power supplies
- with current-compensated inductor
- low residual voltage thanks to suppression diodes

RSU 230 V UC 6 A



Technical data

Technical data	
Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U _c (AC)	250 V
Operating current, I _{max}	6 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	RS section
Type of connection	Screw connection
Ambient temperature (operational)	-25 ... 40°C
Storage temperature	-25 ... 70°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
Note	

Ordering data

Type	Qty.	Order No.
RSU 230VUC 6A LP	1	1171661001
Note		

Accessories

Note	
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Surge protection for instrumentation and control systems

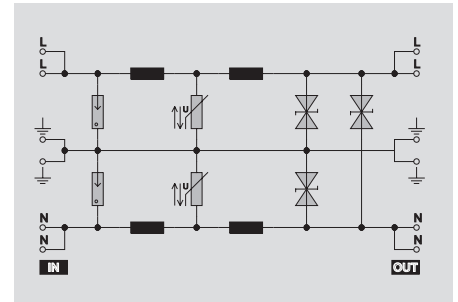
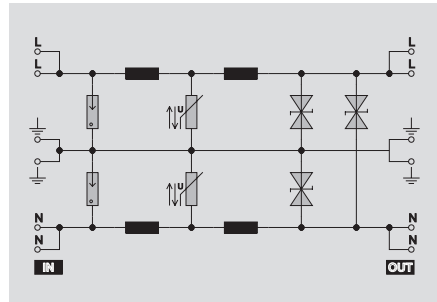
3-stage protection with screw connection

- Surge protection RSU for power supplies
- with current-compensated inductor
- low residual voltage thanks to suppression diodes

RSU 24 V UC 10 A



RSU 115 V UC 10 A



Technical data

Technical data

Rated voltage (AC)
 Rated voltage (DC)
 max. continuous voltage, U_c (AC)
 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
 Ambient temperature (operational)
 Storage temperature

24 V
 24 V
 27 V
 10 A
 0.04 Ω
 yes
 yes
 yes
 8.0 kHz 4 Ω
 24 kA
 40 V
 45 V
 40 V
 45 V
 RS section
 Screw connection
 -25 ... 40°C
 -25 ... 85°C

115 V
 115 V
 130 V
 10 A
 0.04 Ω
 yes
 yes
 yes
 30.0 kHz 20 Ω
 24 kA
 200 V
 250 V
 200 V
 250 V
 RS section
 Screw connection
 -25 ... 40°C
 -25 ... 70°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 115VUC 10A	1	8104221001

Note

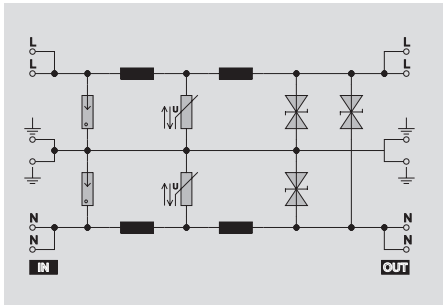
Accessories

Note

3-stage protection with screw connection

- Surge protection RSU for power supplies
- with current-compensated inductor
- low residual voltage thanks to suppression diodes

RSU 230 V UC 10 A



Technical data

Technical data	
Rated voltage (AC)	230 V
Rated voltage (DC)	230 V
max. continuous voltage, U _c (AC)	250 V
Operating current, I _{max}	10 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	RS section
Type of connection	Screw connection
Ambient temperature (operational)	-25 ... 40°C
Storage temperature	-25 ... 70°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
Note	

Ordering data

Type	Qty.	Order No.
RSU 230VUC 10A LP	1	8093281001
Note		

Accessories

Note

3-stage protection with screw connection

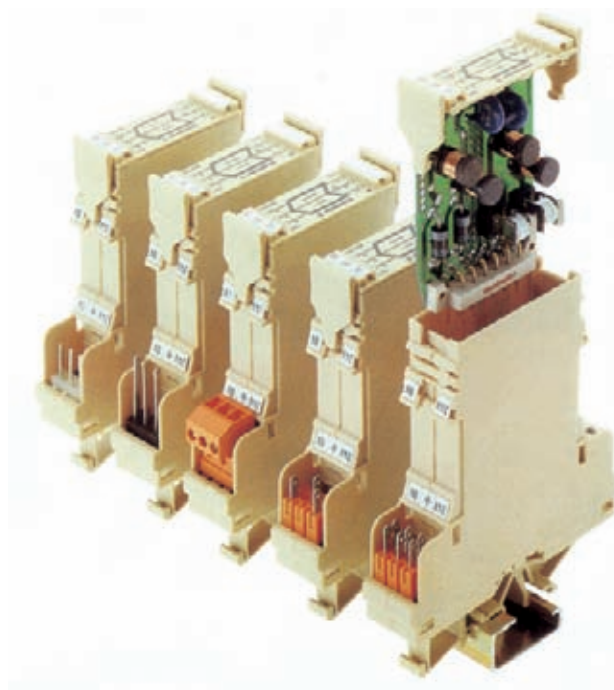
Plug-in surge protection

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.

Note:

The SEG-U housing for the LPU plug-in protection board must be ordered separately.



Three different LPU boards are available:

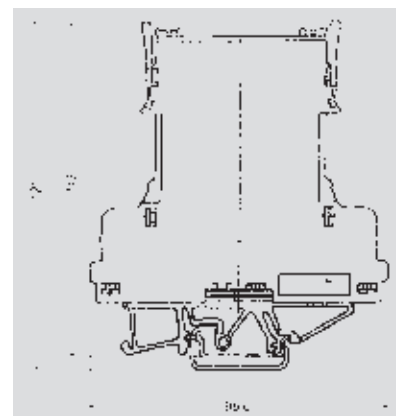
- Two signal lines protected against earth (suitable for binary signals).
- Analogue signals are protected against each other and against earth (e.g. 0 ... 20 mA circuits).
- Isolated signals are given high-resistance protection against earth and against each other (suitable for thermal signals).

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 surge protection.

Dimensions SEG-U

- Width 20 mm
- Screw connection
- flexible 0.5 ... 2.5 mm²
- stranded 0.5 ... 4 mm²



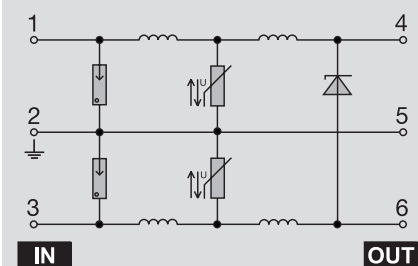
3-stage protection on circuit card

Plug-in surge protection LPU

- Please note: the housing for the LPU protection card must be ordered separately

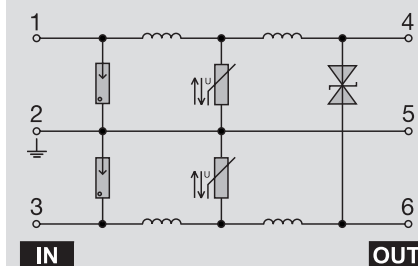
LPU 24 V DC 100 mA

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 (AC)
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

Ambient temperature (operational)

Storage temperature

24 V
29 V
0.1 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 ... 50°C
-25 ... 85°C

48 V
48 V
53 V
0.1 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 ... 50°C
-25 ... 85°C

Type of connection

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

Note

Height including enclosure SFG-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 case

Can be tested with test case

Accessories

Note

Housing SEG-U 8007871001Housing SEG-U 8007871001

Surge protection for instrumentation and control systems

3-stage protection on circuit card

Plug-in surge protection LPU

- Please note: the housing for the LPU protection card must be ordered separately

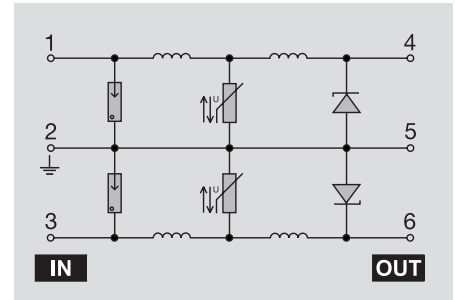
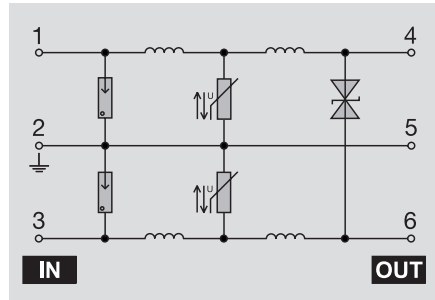
LPU 115 V UC 100 mA

Protection for current loops



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 (AC)
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
Ambient temperature (operational)
Storage temperature

115 V
115 V
130 V
0.1 A
12.50 Ω
yes
yes
yes
9.0 kHz / 1100 Ω
6 kA
200 V
250 V
200 V
250 V
Plug-in card
Plug-in connection
-25 ... 50°C
-25 ... 85°C

24 V
29 V
0.1 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 ... 60°C
-25 ... 85°C

Type of connection

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

Note

96.6 x 20 x 117

Height including enclosure SEG-U

96.6 x 20 x 117

Height including enclosure SEG-U

Ordering data

Type	Qty.	Order No.
LPU 115VUC 100MA	1	8008350000

Can be tested with test case

Type	Qty.	Order No.
LPU 24VDC 100MA	1	8008230000

Can be tested with test case

Accessories

Note

Housing SEG-U 8007871001

Housing SEG-U 8007871001

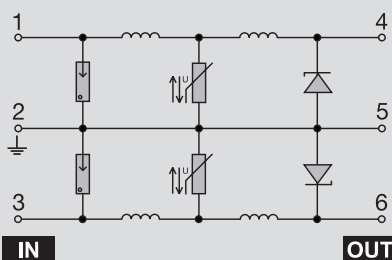
3-stage protection on circuit card

Plug-in surge protection LPU

- Please note: the housing for the LPU protection card must be ordered separately

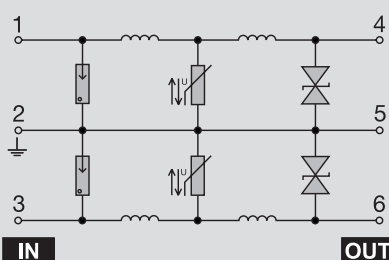
LPU 48 V UC 100 mA SL

Protection for 2 binary signals



LPU 115 V UC 100 mA SL

Protection for 2 binary signals



Technical data

Technical data

Rated voltage (AC)
Rated voltage (DC)
max. continuous voltage, U_c (AC)
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
Ambient temperature (operational)
Storage temperature

48 V
48 V
53 V
0.1 A
12.50 Ω
yes
yes
yes
17.0 kHz 480 Ω
6 kA
82 V
130 V
160 V
260 V
Plug-in card
Plug-in connection
-25 ... 60°C
-25 ... 85°C

115 V
115 V
130 V
0.1 A
12.50 Ω
yes
yes
yes
40.0 kHz 1100 Ω
6 kA
200 V
250 V
400 V
500 V
Plug-in card
Plug-in connection
-25 ... 60°C
-25 ... 85°C

Type of connection

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

Note

Height including enclosure SEG-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 case

Can be tested with test case

Accessories

Note

Housing SEG-U 8007871001Housing SEG-U 8007871001

Surge protection for instrumentation and control systems

3-stage protection on circuit card

Plug-in surge protection LPU

- Please note: the housing for the LPU protection card must be ordered separately

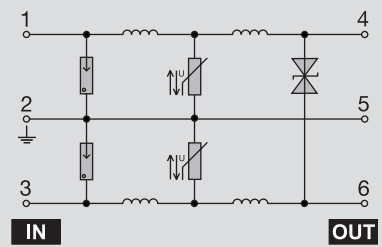
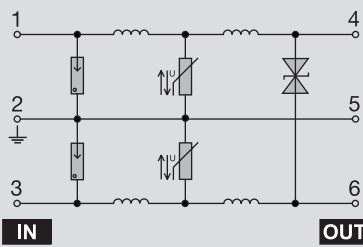
LPU 24 V UC 1.5 A

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 (AC)
 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
 Ambient temperature (operational)
 Storage temperature

24 V
 24 V
 27 V
 1.5 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 ... 50°C
 -25 ... 85°C

48 V
 48 V
 53 V
 1.5 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 ... 50°C
 -25 ... 85°C

Type of connection

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

Note

96.6 x 20 x 117

Height including enclosure SEG-U

96.6 x 20 x 117

Height including enclosure SEG-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 case

Can be tested with test case

Accessories

Note

Housing SEG-U 8007871001

Housing SEG-U 8007871001

3-stage protection on circuit card

Plug-in surge protection LPU

- Please note: the housing for the LPU protection card must be ordered separately

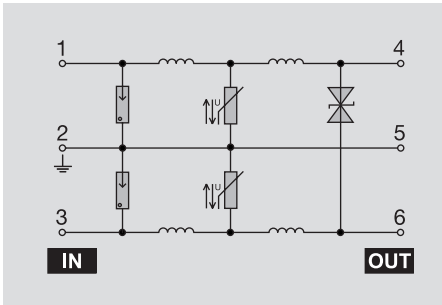
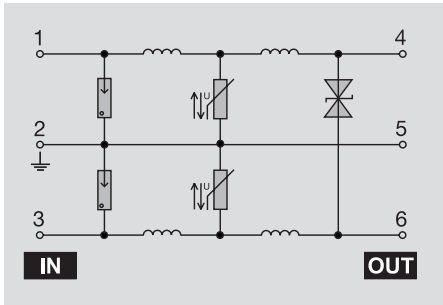
LPU 115 V UC 1.5 A

Protection for current loops



LPU 230 V UC 1.5 A

Protection for current loops



Technical data

Technical data	
Rated voltage (AC)	115 V
Rated voltage (DC)	115 V
max. continuous voltage, U _c (AC)	130 V
Operating current, I _{max}	1.5 A
Volume resistivity	0.20 Ω
Gas discharge tube	yes
Varistor	yes
Suppression diodes	yes
Cut-off frequency (-3 dB) at load impedance	600.0 kHz 70 kΩ
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
Ambient temperature (operational)	-25 ... 50°C
Storage temperature	-25 ... 85°C

115 V
115 V
130 V
1.5 A
0.20 Ω
yes
yes
yes
600.0 kHz 70 kΩ
6 kA
200 V
250 V
200 V
250 V
Plug-in card
Plug-in connection
-25 ... 50°C
-25 ... 85°C

230 V
230 V
250 V
1.5 A
0.20 Ω
yes
yes
yes
1.0 MHz 150 kΩ
6 kA
400 V
420 V
400 V
420 V
Plug-in card
Plug-in connection
-25 ... 50°C
-25 ... 85°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 including enclosure SEG-U

96.6 x 20 x 117
Height including enclosure SEG-U

Ordering data

Type	Qty.	Order No.
LPU 115VUC 1,5A	1	8008450000

Note

Can be tested with test case

Type	Qty.	Order No.
LPU 230VUC 1,5A	1	8008460000

Can be tested with test case

Accessories

Note

Housing SEG-U 8007871001

Housing SEG-U 8007871001

Surge protection for instrumentation and control systems

3-stage protection on circuit card

Plug-in surge protection LPU

- Please note: the housing for the LPU protection card must be ordered separately

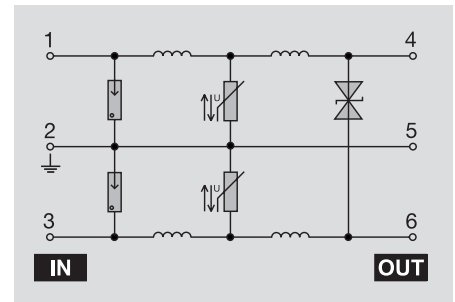
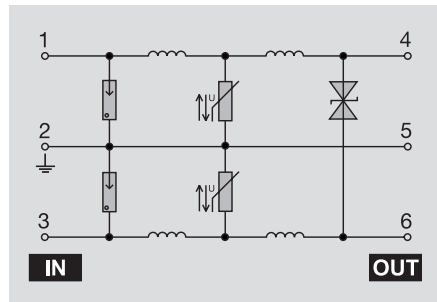
LPU 24 V DC 100 mA

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 (AC)
 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
 Ambient temperature (operational)
 Storage temperature

24 V
 29 V
 0.1 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 ... 60°C
 -25 ... 85°C

48 V
 48 V
 53 V
 0.1 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 ... 60°C
 -25 ... 85°C

Type of connection

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

Note

96.6 x 20 x 117

Height including enclosure SEG-U

96.6 x 20 x 117

Height including enclosure SEG-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 case

Can be tested with test case

Accessories

Note

Housing SEG-U 8007871001

Housing SEG-U 8007871001

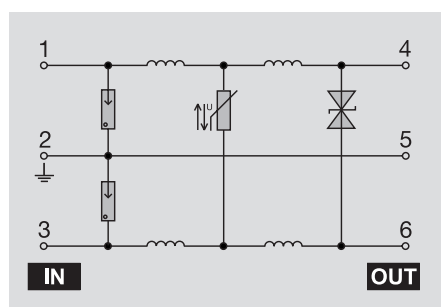
3-stage protection on circuit card

Plug-in surge protection LPU

- Please note: the housing for the LPU protection card must be ordered separately

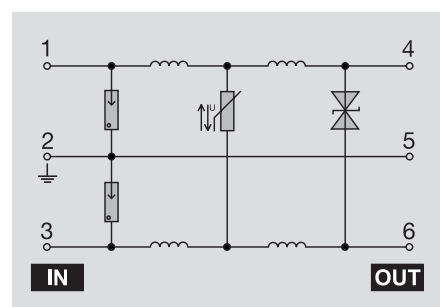
LPU 115 V UC 100 mA

Floating earth



LPU 230 V UC 100 mA

Floating earth



Technical data

Technical data

Rated voltage (AC)
Rated voltage (DC)
max. continuous voltage, U_c (AC)
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
Ambient temperature (operational)
Storage temperature

115 V
115 V
130 V
0.1 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 ... 60°C
-25 ... 85°C

230 V
230 V
250 V
0.1 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 ... 60°C
-25 ... 85°C

Type of connection

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

Note

Height including enclosure SEG-U

Ordering data

Note

Accessories

Note

Type	Qty.	Order No.
LPU 115VUC 100MA	1	on request
Can be tested with test case		

Type	Qty.	Order No.
LPU 230VUC 100MA	1	on request
Can be tested with test case		

Housing SEG-U 8007871001

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. Surge protection in a metal enclosures (e.g. terminal box) must be incorporated before the line enters the tank. The steel enclosure containing the surge 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 surge protection and the cable/line from the surge 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 surge protection to the storage tank must be at least 1500 V.
3. The cable/line between the steel enclosure containing the surge protection and the entry into the tank should be routed in such a way that lightning is unlikely to affect this line.

Solutions:

Surge protection installation at the actuator (control room):

This is where the surge protection is earthed. Types LPU 800433 or LPU 800844 are used. The plug-in LPU surge protection is plugged into the SEG-U housing (available as an accessory). But the surge 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

Surge protection installation at the sensor

This is where the surge 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). Surge protection may be incorporated between the lines, e.g. LPU 822524 / LPU 822525 or DK4U 940040, DK4U 940050. The surge 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 surge protection

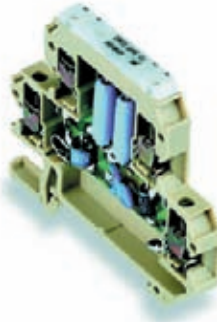
The surge protection developed by Weidmüller comprises “passive components” which can be used taking into account the internal inductance and capacitance in the instrumentation and control circuits. To simplify the installation, some other products from the standard surge protection range have been approved 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

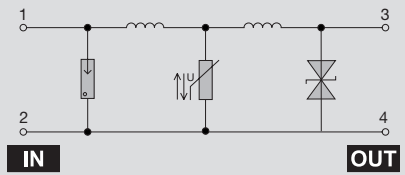
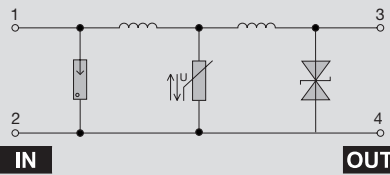
Slimline surge protection terminals with
ATEX approval

DKU 24 V

for TS 32

**DKU 24 V**

for TS 35

**Technical data****Technical data**

DC voltage
Volume resistance 1/3
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
 $\Delta T_{\bar{u}}$ 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
Circuit earthed for safety
Operating temperature
Clamping point with self-locking screw
Approval
Registered design No.

28 V
3.5 Ω
0.22 A
0.2 mH
2.5 nF
500 kHz at $R_i = 240 \Omega$
18 K
700 V
33 V
38 V
10 μ A
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

28 V
3.5 Ω
0.22 A
0.2 mH
2.5 nF
500 kHz at $R_i = 240 \Omega$
18 K
700 V
33 V
38 V
10 μ A
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 surge 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 50281-1-1 points 4, 8 and 9.

Connect the earth terminal to the equipotential bonding.

When using the surge 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 50281-1-1 points 4, 8 and 9.

Notes**Ordering data****Version**

Type	Qty	Order No.
DKU 32 24 VDC 0.22 A		8015800000

Type	Qty	Order No.
DKU 35 24 VDC 0.22 A		8015810000

Notes**Accessories**

Type	Qty	Order No.
Abschlussplatte AP DKT 4 PA		0687560000

Type	Qty	Order No.
Abschlussplatte AP DKT 4 PA		0687560000

Notes

Surge protection for instrumentation and control systems

DKU

Slimline surge protection terminals with
ATEX approval

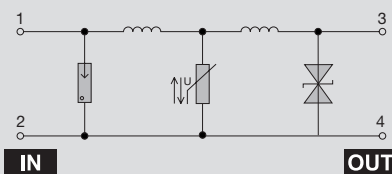
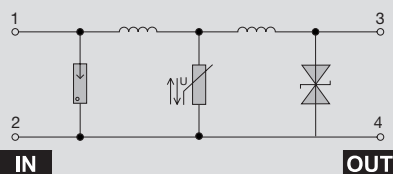
DKU 48 V

for TS 32



DKU 48 V

for TS 35



Technical data

Technical data

DC voltage
Volume resistance 1/3
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 Tü 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
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 $R_i = 480 \Omega$
11 K
700 V
82 V
100 V
10 μ A
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 $R_i = 480 \Omega$
11 K
700 V
82 V
100 V
10 μ A
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 surge 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 50281-1-1 points 4, 8 and 9.

Connect the earth terminal to the equipotential bonding.

When using the surge 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 50281-1-1 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

Type	Qty	Order No.
Abschlussplatte AP DKT 4 PA		0687560000

Type	Qty	Order No.
Abschlussplatte AP DKT 4 PA		0687560000

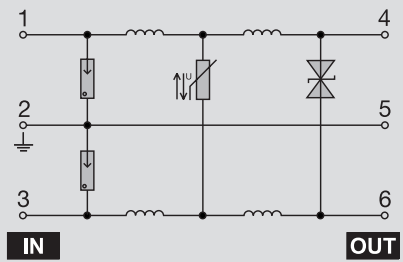
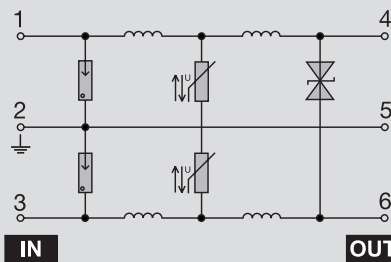
Notes

LPU pluggable surge protection

with ATEX approval

LPU 24 V 0.5 A

LPU 29 V 0.062 A



Technical data

Technical data

DC voltage
Volume resistance 1/3
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_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.

24 V
0.15 Ω
0.5 A
< 0.1 mH
7.5 nF
150 kHz at $R_i = 16 \Omega$
< 15 K
700 V
39 V
65 V
10 μ A
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

Connect the earth terminal to the equipotential bonding.

When using the surge 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 50281-1-1 points 4, 8 and 9.

29 V
0.15 Ω
62 mA
9.5 mH
6 nF
4.5 kHz at $R_i = 240 \Omega$
< 15 K
800 V
33 V
38 V
10 μ A
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 surge 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 50281-1-1 points 4, 8 and 9.

Notes

Ordering data

Version

Type	Qty	Order No
LPU 24 VUC 0.5A		8008430000

Type	Qty	Order No
LPU 24 V DC 62 mA		8225240000

Notes

Accessories

Version

Type	Qty	Order No
Gehäuse SEG-U		8007871001

Type	Qty	Order No
Gehäuse SEG-U		8007871001

Notes

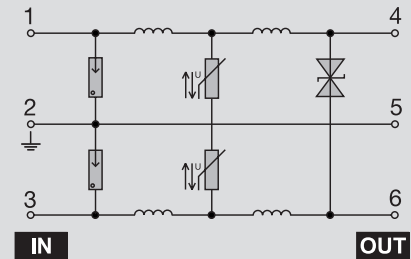
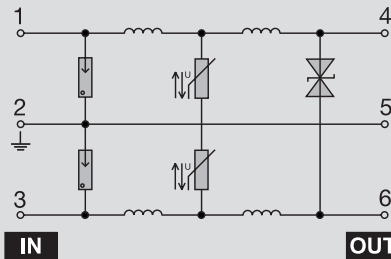
Surge protection for instrumentation and control systems

LPU pluggable surge 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 1/3
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 $R_i = 480 \Omega$
< 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 $R_i = 32 \Omega$
< 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 surge 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 50281-1-1 points 4, 8 and 9.

Connect the earth terminal to the equipotential bonding.

When using the surge 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 50281-1-1 points 4, 8 and 9.

Notes

Ordering data

Version

Type	Qty	Order No.
LPU 48 V 62mA		8225250000

Type	Qty	Order No.
LPU 60V 0,5A		8008440000

Notes

Accessories

Version

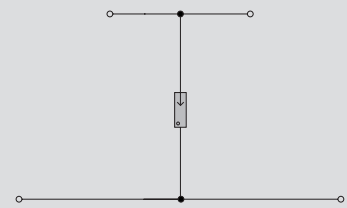
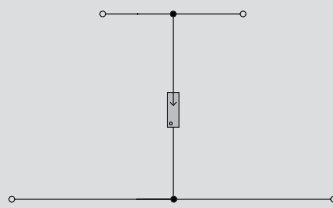
Type	Qty	Order No.
Gehäuse SEG-U		8007871001

Type	Qty	Order No.
Gehäuse SEG-U		8007871001

Notes

DKU slimline surge protection terminals

with ATEX approval

DKU 48 V**DKU 65 V****Technical data****Technical data**

DC voltage
Volume resistance 1/3
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_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
Circuit earthed for safety
Operating temperature
Circuit safety grounded
Clamping point with self-locking screw
Approval
Registered design No.

48 V
-
0.5 A
-
-
-
< 15 K
700 V
700 V
800 V
1 μ A
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

Connect the earth terminal to the equipotential bonding.

When using the surge 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 50281-1-1 points 4, 8 and 9.

65 V
-
0.5 A
-
-
-
< 15 K
1100 V
1100 V
1200 V
1 μ A
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 surge 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 50281-1-1 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		on request

Notes**Accessories**

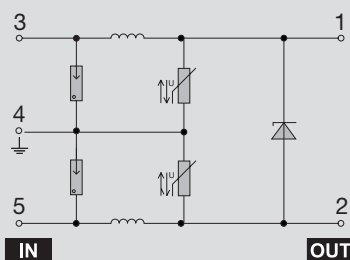
Type	Qty	Order No.
AP DK4		0359260000

Type	Qty	Order No.
AP DK4		0359260000

Notes

with ATEX approval

DKU DK 5 28 V



Technical data

Technical data

DC voltage
Volume resistance 1/3
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/ 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
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.

28 V
3.5 Ω
0.3 A
0.2 mH
1.3 nF
500 kHz at $R_i = 240 \Omega$
< 15 K
700 V
33 V
38 V
10 μ A
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

Connect the earth terminal to the equipotential bonding.

When using the surge 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 50281-1-1 points 4, 8 and 9.

Notes

Ordering data

Version
Notes

Type	Qty	Order No.
DKU DK5 24 VDC 100 MA		8437770000

Accessories

Notes

Type	Qty	Order No.
AP DK5		4036780000

ATEX certificates

**TÜV
CERT**
Translation

EC-TYPE EXAMINATION CERTIFICATE

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - **Directive 94/9/EC**

(3) EC-Type Examination Certificate Number

TÜV 04 ATEX 2551 X

(4) Equipment: Overvoltage protection component type DK... resp. LPU...

(5) Manufacturer: Weidmüller Interface GmbH & Co. KG

(6) Address: Ringenbergstraße 16
D-32758 Detmold

(7) This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH & Co. KG, TÜV CERT-Certification Body, notified body number N° 0032 in accordance with Article 9 of the Council Directive of the E.C. of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report N° 04 YEX 551504.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60014-1997 • A1 • A2 EN 60020-2002 EN 50281-1-1:1998 • A1

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

**II 2 G EEx ia IIC T6 resp.
II 2 D T85°C IP6X**

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Certification Body
Am TÜV 1
D-50579 Hannover
Tel.: 0511 988-1475
Fax: 0511 988-0259

Hannover, 2008-09-21

**TÜV
NORD
CERT**

Head of the Certification Body

This certificate may only be reproduced without any change. Activities included.
Examples or changes shall be allowed by the TÜV NORD CERT GmbH & Co. KG.

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SCHEDULE

**TÜV
NORD**

(14) **EC-TYPE EXAMINATION CERTIFICATE N° TÜV 04 ATEX 2551 X**

(15) **Description of equipment**

The overvoltage protection component type DK... resp. LPU... is for the serial installation into the intrinsically safe circuit that has to be protected. The component limits overvoltages in the intrinsically safe circuit.

The permissible ambient temperature range is -25°C to +60°C.

Electrical data

Supply and output circuit in type of protection intrinsic Safety EEx ia IIC resp. III only for the connection of certified intrinsically safe circuits.

The electrical data, the permissible ambient temperature and the data about the safety-relevant earthing in dependence on the type have to be taken from the tables.

Type	DKU 801506 DKU 801501	DKU 801926 DKU 801929	DKAU 940544 DKAU 940554	DKAU 940540 DKAU 940550
Voltage	28 V	50 V	60 V	48 V
Current	200 mA	200 mA	500 mA	500 mA
Internal capacitance	2.5 nF	1 nF		
Internal inductance	0.2 mH	0.2 mH		
Circuit safety-relevant earthing	yes	yes	No	Yes

Type	LPU 800843	LPU 802524	LPU 802525	LPU 800844
Voltage	34 V	28 V	60 V	60 V
Current	500 mA	60 mA	60 mA	500 mA
Internal capacitance	7.5 nF	9 nF	1.8 nF	3.5 nF
Internal inductance	< 0.1 mH	0.5 mH	0.5 mH	< 0.1 mH
Circuit safety-relevant earthing	yes	no	No	yes

Type	DKU 943777
Voltage	28 V
Current	300 mA
Internal capacitance	1.2 nF
Internal inductance	0.2 mH
Circuit safety-relevant earthing	yes

(16) Test documents are listed in the test report No.: 04 YEX 551543.

page 2/3

**TÜV
NORD**

Schedule EC-Type Examination Certificate N° TÜV 04 ATEX 2551 X

(17) **Special conditions for safe use**

The earthing terminal has to be connected to the potential equalization system.

If the overvoltage protection component is used in hazardous areas caused by the presence of combustible dust an enclosure must be provided that at least fulfils the degree of protection of IP6X according to EN 60529 and the requirements of the standard EN 50281-1-1 paragraph 4, 6 and 9.

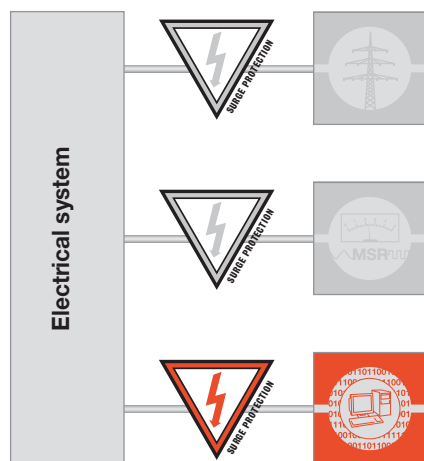
(18) **Essential Health and Safety Requirements**

no additional ones

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Surge protection for data interfaces

The principles of data transmission



"Data transmission" is the name given to the sending of characters, numbers, statuses and measurements between different, decentralised units. Decentralised units are, for example, controls, computers, measuring sensors, actuators, etc. One unit transmits the data, the second unit receives it. This corresponds to the simplest method of data transmission. It is often necessary for one unit to receive data and then send an "answer" back to the other unit. Two data lines in a back-to-back arrangement are required for this, or data lines are combined by providing each end of the data line with a transmitter and receiver.

Structures and properties of networks

There are various options for networking data terminals. We distinguish between star, ring, point-to-point and bus networks.

Star networks

The main unit is located in the centre. The individual data lines then radiate out from this centre 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 by means of, for example, 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 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 issues "transmission licences" to 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 to a building requires only two wires. However, other types of bus systems also require only 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

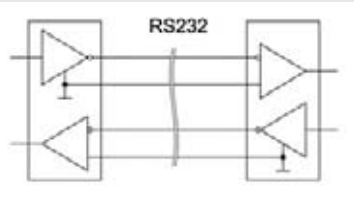
Sending data via coaxial cables is a rather old technique. This method is too slow and inflexible and so only a few businesses are still using such systems. Speeds of up to about 12 Mbps are no longer adequate these days. Over longer distances, modern fibre-optic cables are replacing this technology; 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 critical for the data receiver as it can then detect where each data byte begins and ends. Serial interfaces frequently operate with +5 V (logical 1) and 0 V (logical 0). Advantage: less cabling (only 3 wires). Disadvantage: slow data transmission.

**RS232**

Serial interface for point-to-point connections up to 20 kbit/s
Voltage signal to earth:
logic 1 (mark) -15 V to -3 V
logic 0 (space) +3 V to +15 V
max. signal level ± 15 V
Lines up to 20 m long depending on transmission rate.



Protective module in adapter plug housing

RS232-8 B/S25

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RS232-8 S/B25

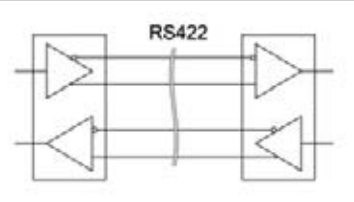
Page F.112

Protective module in housing for fitting to mounting rail
EGU4 EG3 RS232

Page F.112

RS422

Serial unidirectional high-speed interface for up to 10 parallel receivers
Differential voltage signal:
logic 1 (mark) $A-B < -0.3$ V
logic 0 (space) $A-B > +0.3$ V
max. signal level ± 12 V
Lines up to 1200 m long
max. data rate 10 Mbit/s



Protective module in housing for fitting to mounting rail
LPU RS422 / RS485

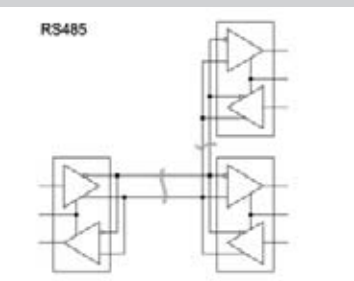
Page F.113

Protective module in housing for fitting to mounting rail
RS 485 K21 / RS 422

Page F.113

RS485

Serial bidirectional high-speed interface for up to 32 subscribers
2- or 4-wire system
Differential voltage signal:
logic 1 (mark) $A-B < -0.3$ V
logic 0 (space) $A-B > +0.3$ V
max. signal level -7 V to +12 V
Lines up to 1200 m long
max. data rate 10 Mbit/s



Protective module in housing for fitting to mounting rail
MCZ sp LON-Bus

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LON™ termination
DIALOG BUS TERMINATION

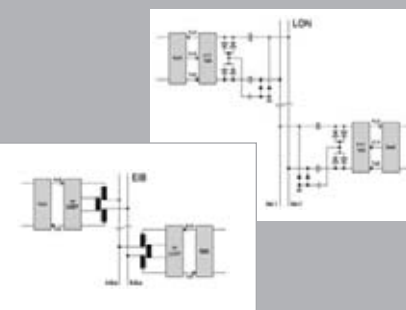
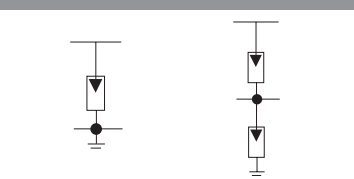
Page F.114

Ethernet Cat.5

Page F.115

LON™ (twisted pair)

Series bus with TP/XF-78 (old)
Series bus with TP/XF-1250
Series bus or free topology with TP/FT-10
Series bus or free topology with LPT-10
EIB (European Installation Bus)
Twisted pair or power line
Series, star-type or tree bus
(also combinations thereof) 9600 bit/s
Building services automation

**COAX**

Protective module for BNC- and N-cables

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Protective module for F- and UHF-cables

Page F.117

RS232

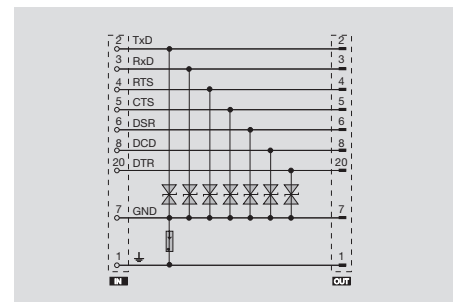
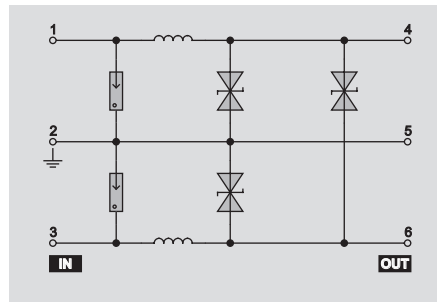
RS 232

EGU 4 RS232



RS 232

RS232 adapter plug



Technical data

Technical data

Rated voltage (AC)
max. continuous voltage, U_c (AC)
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 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
Ambient temperature (operational)
Storage temperature

12 V
14.5 V
0.1 A
1.30 Ω
≤ 9600 Bd
≤ 5 ns
yes
no
yes
30.0 kHz 600 Ω
5 kA
20 V
32 V
20 V
32 V
integral housing
Screw connection
-25 ... 60°C
-25 ... 85°C

12 V
15 V
0.1 A
1.00 Ω
≤ 19200 Bd
≤ 5 ns
yes
no
yes
30.0 kHz 1200 Ω
0.5 kA
20 V
28 V
20 V
28 V
adapter plug
-20 ... 55°C
-40 ... 60°C

Dimensions

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

Note

Screw connection

2.5 / 0.5 / 4
58 x 22.5 x 95

Protection for data lines Rx, Tx and Gnd

64 x 56 x 16.5

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

ZS-RS 232/B-S cable-side 25-pole SUB-D socket, unprotected
 ZS-RS 232/S-B cable-side 25-pole SUB-D plug, unprotected

Accessories

Note

RS485/422

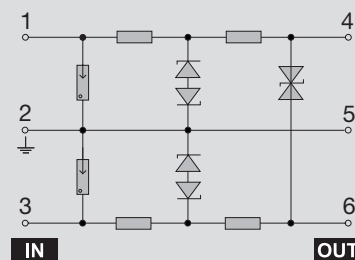
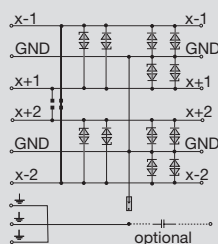
RS 485

RS485/RS422 surge protection



RS 485

RS485/RS422 plug-in surge protection



Technical data

Technical data

Rated voltage (AC)
max. continuous voltage, U_c (AC)
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 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
Ambient temperature (operational)
Storage temperature

12 V
12 V
1.5 A
0.50 Ω
≤ 6 MB
≤ 5 ns
yes
no
yes
0.5 kA
18 V
28 V
18 V
28 V
Miscellaneous
Screw connection
-25 ... 60°C
-25 ... 85°C

6 V
12 V
1.5 A
12.00 Ω
≤ 5 ns
yes
no
yes
1.5 MHz / 100 Ω -System max.
5 kA
18 V
36 V
18 V
36 V
Plug-in card
Plug-in connection
-25 ... 60°C
-25 ... 85°C

Dimensions

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

Note

Screw connection

1.5 / 0.5 / 4
125 x 80 x 57

Plug-in connection

96.6 x 20 x 117

Ordering data

Version

Type	Qty.	Order No.
------	------	-----------

RS 485 K21 UE-SCHUTZ SE	1	8008501001
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Type	Qty.	Order No.
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LPU RS 485	1	9454930000
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Note

Accessories

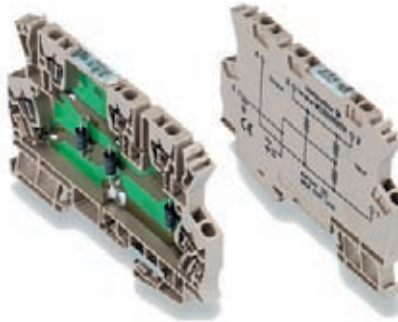
Note

Housing SEG-U 8007871001

LON™

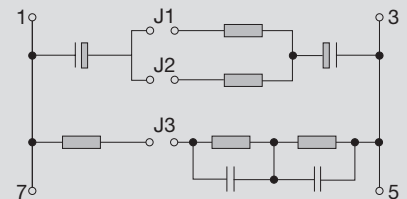
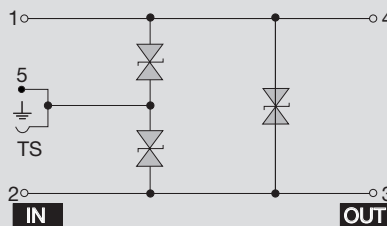
LON FTT / TP78

Protection for LonWorks signals



Dialoc termination

Bus terminator for LonWorks signals



Technical data

Technical data

Rated voltage (AC)
max. continuous voltage, U_c (AC)
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 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
Ambient temperature (operational)
Storage temperature

12 V
14 V
16 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 ... 55°C
-25 ... 60°C

48 V
60 V
16 A
0.50 Ω

no
no
no

terminal
Screw connection
-25 ... 55°C
-25 ... 60°C

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 63.2

Screw connection

2.5 / 0.5 / 4
65 x 12 x 57

Ordering data

Version

Type	Qty.	Order No.
MCZ OVP LON-Bus	10	8473470000

Type	Qty.	Order No.
DIALOC BUS TERMINATION Abschluss 5	5	8496110000

Note

LON is a trademark of Echolon

Select termination LPT/FTT/TP78 via jumper

Accessories

Note

Cat.5 surge protection

- Connection via RJ 45 sockets
- Protection for all signal lines
- Suitable for 10BaseTx and 100BaseTx
- PE connection via M4 screw

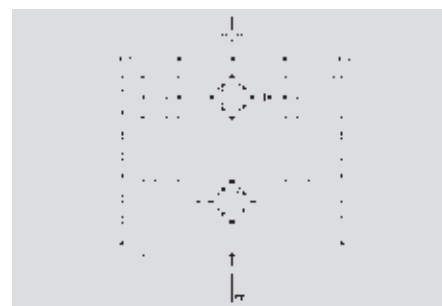
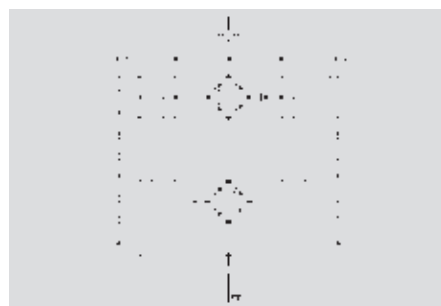
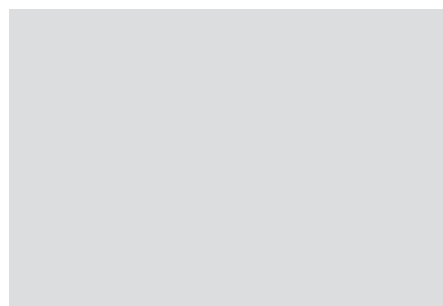
DME 100Tx-4RJ

Ethernet Cat.5



DME 100Tx-4RJ TS 35

Ethernet Cat.5



Technical data

Technical data

Rated voltage (AC)
max. continuous voltage, U_c (AC)
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 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
Ambient temperature (operational)
Storage temperature

5 V
7 V

1.30 Ω

 ≤ 5 ns
yes
no
yes

2 kA
40 V
45 V
450 V
500 V
Miscellaneous
RJ45
-20 ... 50°C
-25 ... 60°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
-20 ... 50°C
-25 ... 60°C

Dimensions

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

Note

RJ45

51 x 47 x 22

Data line protection for 10BaseT and 100BaseT

RJ45

55 x 64 x 22

Data line protection for 10BaseT and 100BaseT

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

Surge protection for data interfaces

Coax surge protection

Surge protection for COAX data networks

- Metal housings
- Surge protection using gas-filled arrestor
- Easy handling using socket-adaptor function, with minimal attenuation

BNC Connector / M-F

Protection for video monitoring systems



n

N Connector / M-F

Protection for transmitters, GSM



n

Technical data

Technical data

Transmission capacity, max.
max. continuous voltage, U_c (DC)
Characteristic impedance
Frequency range
Operating current, I_{max}
Insertion loss (attenuation)
Return loss (attenuation)
VSWR
Specification class to IEC 61643-21
Lightning test voltage I_{imp} (10/350 μs)
Discharge current, max. (8/20 μs)
Response time
Protection level Up (typical)
Earthing
Type of connection
Version
Ambient temperature (operational)

40 W
 $90 V \pm 20 \%$
50 Ω
0...2.5 GHz
5 A
< 0.2 dB
> 20 dB
< 1.2
C1;C2;C3;D1
5 kA
20 kA
< 100 ns
< 600 V
Required with M6 screw
Male / Female
adapter plug
-40 ... 80°C

25 W
 $90 V \pm 20 \%$
50 Ω
0...2.5 GHz
5 A
< 0.15 dB
> 20 dB
< 1.2
C1;C2;C3;D1
5 kA
20 kA
< 100 ns
< 600 V
Required with M6 screw
Male / Female
adapter plug
-40 ... 80°C

Dimensions

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

Note

Male / Female

66.3 x 25

Male / Female

80.3 x 25

Ordering data

Version

adapter plug

Type	Qty.	Order No.
BNC Connector / M-F	1	8947820000

Type	Qty.	Order No.
N Connector / M-F	1	8947830000

Note

Accessories

Note

Coax surge protection

Surge protection for COAX data networks

- Metal housings
- Surge protection using gas-filled arrestor
- Easy handling using socket-adaptor function, with minimal attenuation

F Connector / M-F

Protection for satellite systems



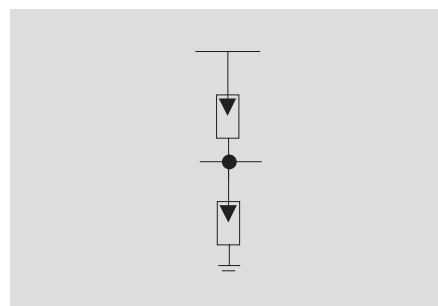
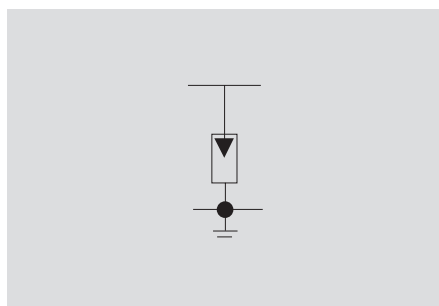
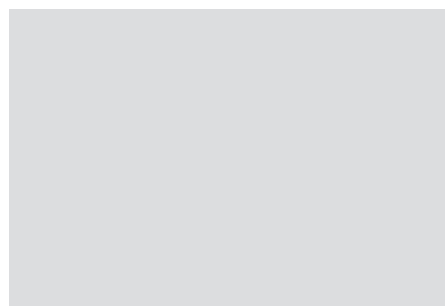
n

UHF Connector / M-F

Protection for terrestrial TV



n



F

Technical data

Technical data

Transmission capacity, max.
max. continuous voltage, U_c (DC)
Characteristic impedance
Frequency range
Operating current, I_{max}
Insertion loss (attenuation)
Return loss (attenuation)
VSWR
Specification class to IEC 61643-21
Lightning test voltage I_{imp} (10/350 μs)
Discharge current, max. (8/20 μs)
Response time
Protection level Up (typical)
Earthing
Type of connection
Version
Ambient temperature (operational)

25 W
 $90 V \pm 20 \%$
75 Ω
0...2.5 GHz
5 A
< 0.5 dB
> 20 dB
< 1.3
C1;C2;C3;D1
5 kA
20 kA
< 100 ns
< 600 V
Required with M6 screw
Male / Female
adapter plug
-40 ... 80°C

$75 V \pm 20 \%$
75 Ω
0...1 GHz
4 A
< 0.3 dB
> 20 dB
C1;C2;C3;D1
-
20 kA
< 100 ns
< 600 V
Required with 1.5mm² connection cable
Male / Female
adapter plug
-40 ... 80°C

Dimensions

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

Note

Male / Female

51.8 x 25

Male / Female

48 x 43 x 24

Ordering data

Version

adapter plug

Type	Qty.	Order No.
F Connector / M-F	1	8947840000

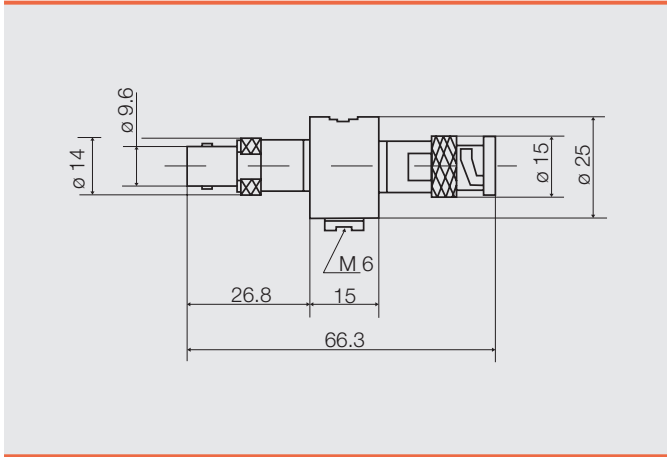
Type	Qty.	Order No.
UHF Connector / M-F	1	8947850000

Note

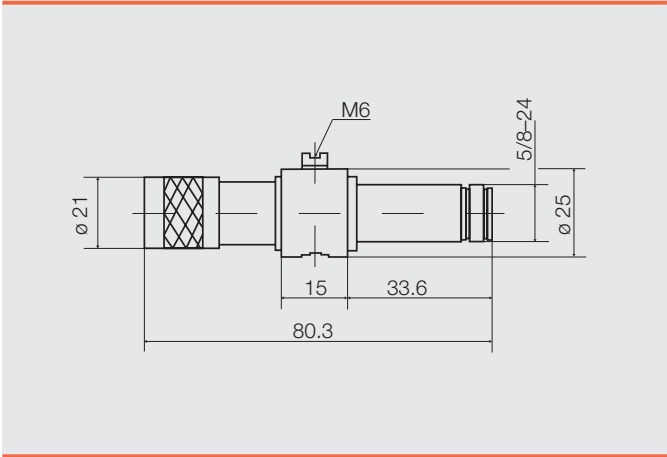
Accessories

Note

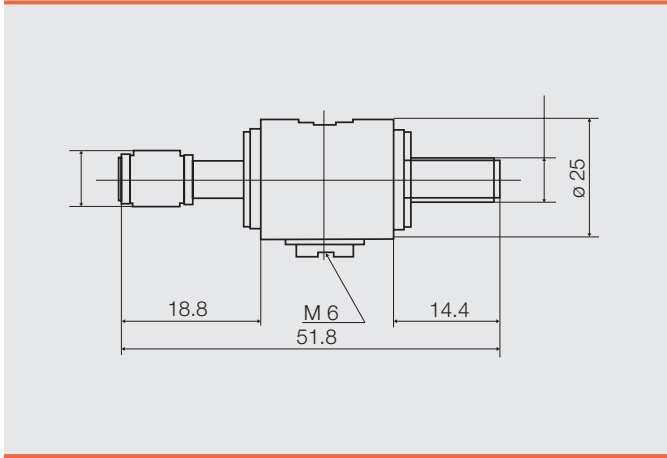
BNC Connector / M-F



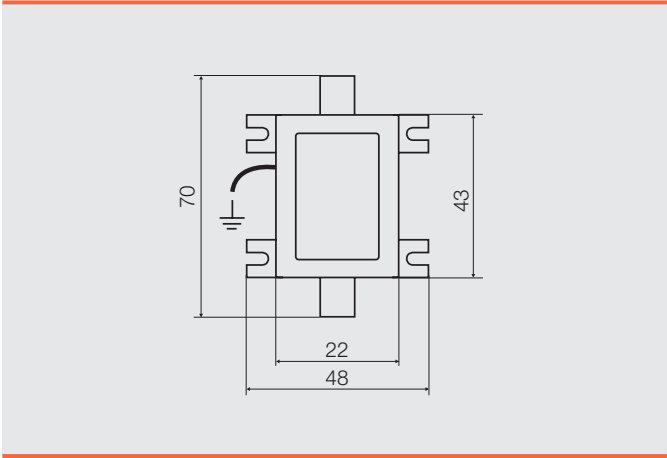
N Connector / M-F



F Connector / M-F

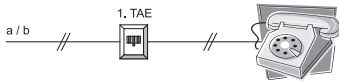


UHF Connector / M-F



Surge protection for TAE telecommunications interfaces

Surge 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 surges are on the increase.

TAE surge protection for analogue lines is necessary to achieve protection against these surges. The basic version of the surface-mounted TAE-NFN socket has two-stage surge 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 surge 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.

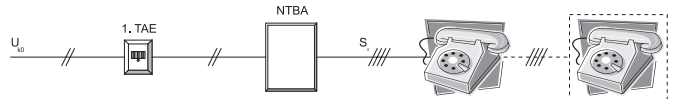
Installation instructions

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 sp ISDN FM can be evaluated via a PLC input.

On the TAE SP ISDN LED model an LED indicates the operating status.

Surge protection for ISDN connections

Telephone connections at the UK0/So interface



Digital signalling 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 surges.

The TAE surge protection for ISDN lines can be installed to protect against these surges.

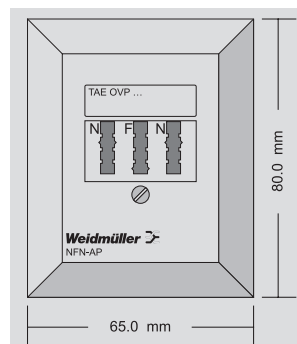
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Other TAE surge protection sockets with monitoring functions are also available.

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:

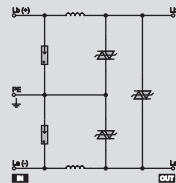


For telecommunication interface

- Surge protection for telecommunication interfaces
- High energy discharge with gas discharge tube
- Low residual voltage with special Transil diodes
- Surge protection for analogue telephone connections
- Including TAE-NFN wall-mounted socket

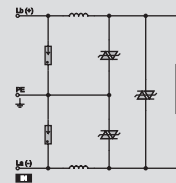
TAE OVP

TAE OVP analog



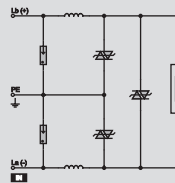
TAE OVP

TAE OVP analog LED



TAE OVP

TAE OVP analog FM



Technical data

Technical data

Rated voltage (AC)	190 V
max. continuous voltage, U_c (AC)	190 V
Operating current, I_{max}	0.5 A
Discharge current, max. (8/20 μ s)	10 kA
Response time	≤ 5 ns
Protection level on output side sym., input	100 V @5kA
8/20 μ s, typ.	
Protection level on output side unsym., input	100 V @5kA
8/20 μ s, typ.	
Optical function indicator	
Pollution severity	2
Surge category	III
Ambient temperature (operational)	0 ... 60°C
Storage temperature	-25 ... 85°C

General data

Input voltage, max.	190 V
Standard signal	Analogue telephone signal Uko
Rated discharge current (8/20 μ s)	4 kA
Total current	10 kA (8/20 μ s)
Response time, typical	< 5 ns
Resistance per path	1.1 Ω
Cut-off frequency f_g , 600 Ω system	2 MHz
Transistor output, positive-switching	
Residual voltage at output for input pulse of 1 kV/ μ s	a/b < 270 V, a-b/PE < 270V
Residual voltage at output for 8/20 μ s and input pulse of 5kA	a-b/PE < 100 V, a-b/PE < 100V

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

AP enclosure NFN

Clamp. yoke connection

0.8 / 0.5 / 1.5
30 x 65 x 80

AP enclosure NFN

Clamp. yoke connection

0.8 / 0.5 / 1.5
30 x 65 x 80

AP enclosure NFN

Ordering data

Version

Type	(Qty.=1)	Order No.
TAE OVP analog		8673980000

Note

Type	(Qty.=1)	Order No.
TAE OVP analog LED		8674020000

Type	(Qty.=1)	Order No.
TAE OVP analog FM		8649910000

Accessories

Note

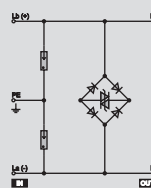
Surge protection for data interfaces

For telecommunication interface

- High energy discharge thanks to gas charge eliminator
- Low residual voltage thanks to special Transil diodes
- Surge protection for ISDN, including TAE-NFN wall-mounted socket

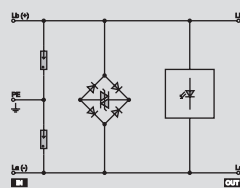
TAE OVP

TAE OVP ISDN



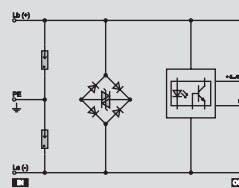
TAE OVP

TAE OVP ISDN LED



TAE OVP

TAE OVP ISDN FM



Technical data

Technical data

Rated voltage (AC)	190 V
max. continuous voltage, U_c (AC)	190 V
Operating current, I_{max}	0.5 A
Discharge current, max. (8/20 μ s)	10 kA
Response time	≤ 5 ns
Protection level on output side sym., input 8/20 μ s, typ.	100 V @5kA
Protection level on output side unsym., input 8/20 μ s, typ.	100 V @5kA
Optical function indicator	
Pollution severity	2
Surge category	III
Ambient temperature (operational)	0 ... 60°C
Storage temperature	-25 ... 85°C

General data

Input voltage, max.	190 V
Standard signal	ISDN telephone signal Uko interface
Rated discharge current (8/20 μ s)	4 kA
Total current	10 kA (8/20 μ s)
Response time, typical	< 5 ns
Resistance per path	1.1 Ω
Cut-off frequency fg,600 Ω system	80 MHz
Transistor output, positive-switching	
Residual voltage at output for input pulse of 1 kV/ μ s	a/b < 270 V, a-b/PE < 270V
Residual voltage at output for 8/20 μ s and input pulse of 5kA	a-b/PE < 100 V, a-b/PE < 100V

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

AP enclosure NFN

Clamp. yoke connection

0.8 / 0.5 / 1.5
30 x 65 x 80

AP enclosure NFN

Clamp. yoke connection

0.8 / 0.5 / 1.5
30 x 65 x 80

AP enclosure NFN

Ordering data

Version

Type	(Qty.=1)	Order No.
TAE OVP ISDN		8674000000

Note

Type	(Qty.=1)	Order No.
TAE OVP ISDN LED		8674010000

Type	(Qty.=1)	Order No.
TAE OVP ISDN FM		8673970000

Accessories

Note