

EMP Surge Protector / Filter RS422 / RS485 / PROFIBUS USN-40002

Excellent lightning and EMP protection for two wire pairs in a single case for RS422 / RS485 / PROFIBUS interfaces

WAGO MCS Micro terminal block, locking lever

Protects against overvoltages produced by NEMP / HEMP, lightning or other transients

Multi-stage protection/filter design with high transient energy absorption capability

Feed-through installation into wall of Faraday cage

For HEMP-protection according to MIL-STD-188-125, short and intermediate pulses



Product

The Meteolabor® USN-series protection circuits against surge and interference voltages are designed as feed-through type mechanical units for the protection of data and control line systems. Depending on the specific application different types are available. The highly effective multi-stage transient protection design combined with filtering components provides excellent protection against the effects of atmospheric discharges (lightning, electrostatic discharge) or a High Altitude Electro-Magnetic Pulse (HEMP), sometimes also referred to as Nuclear Electro-Magnetic Pulse (NEMP) or simply EMP. Special features of this series of protection circuits include high surge current capability, compact feed-through design and simple installation directly to Faraday cage. The USN-Series is threat-level tested against EMP according to MIL-STD-188-125, short pulse and intermediate pulse.

Applications

Meteolabor® USN-40002 protects two wire pairs of RS422 / RS485 / PROFIBUS interfaces against the effects of lightning and EMP. It replaces the Meteolabor® USS-4-RS422/485/FD in a much smaller case and has even better performance. USN-40002 has pluggable WAGO MCS Micro terminal blocks with locking levers and CAGE CLAMP® contacts. The wires are easy to install by using the supplied operating tool or a matching screw driver. For best protection results a feed-through installation from an unprotected volume into a shielded and protected room is recommended. USN-40002 protector/filter is designed to be used in fixed installations (buildings, underground shelters etc.) as well as in portable and mobile systems like containers or shelters and vehicles, which need to be EMP-tested according to RS105 of MIL-STD-461F.

Technical Data USN-40002

Application	Protects 2 wire pairs	Of RS422 / RS485 / PROFIBUS
Max. operating voltage	6V	Peak-to-peak balanced signal voltage between wire pairs 1-2, 4-5
Max. operating current	100 mA	Each wire pin 1,2,4,5; pin 3 is connected to ground/case
Data rate	Up to 12Mbit/s	Effective data rate depends on wiring length
Max. surge current I_{Max}	4x10 kA	Each wire → ground/case, shape 8/20 μ s, at least 1 pulse
Max. lightning impulse current I_{imp}	2x2 kA	Each wire → ground/case, shape 10/350 μ s, at least 1 pulse
DC resistance input - output	6 Ω typically	Each wire pin 1,2,4,5; pin 3 is connected to ground/case
Residual voltage surge	< 240 V typically	wire → ground/case, pulse 4 kV / 2 kA according to IEC 61000-4-5
Residual voltage fast rising pulse	< 320 V typically	wire → ground/case, fast pulse 4 kV, 5/50ns, load 1 MOhms
Residual voltage differential mode	< 23 V typically	Between wire pair, pulse 4 kV / 2 kA according to IEC 61000-4-5
Connection terminals	WAGO MCS Micro	Pluggable terminal block,locking lever, CAGE CLAMP®, 0.08–0.5mm ²
Case material	Brass	Nickel-plated
Max. allowed installation torque	30 Nm	Not to be exceeded under all circumstances
Dimensions	\varnothing 32x112.5 mm	2 nuts M32x1.5 for feed-through installation
Weight	approx. 250 g	Incl. 2 nuts

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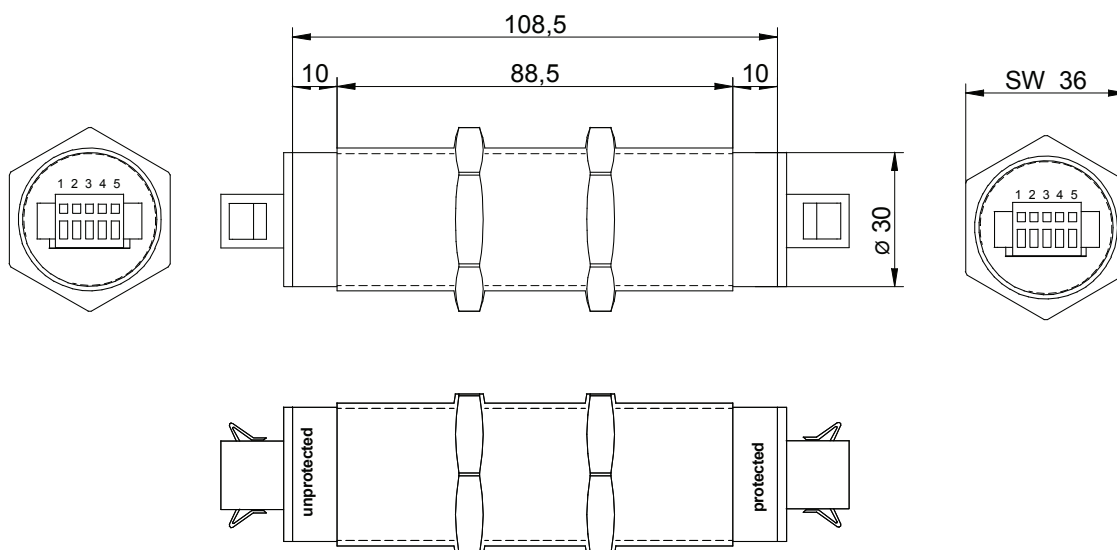
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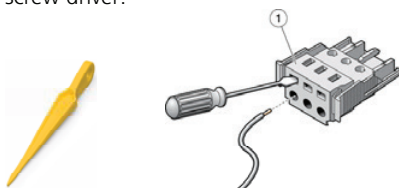
Dimensions [mm]



NOTE: Use always 1-2 (or 4-5) as wire pairs, Pin 3 is GND/case for optional ground / or shield connection

Installation Notes

- The USN-series EMP protector/filters shall be installed by electrically skilled personnel.
- The electrical wiring must be done according to local regulations.
- The max. values stated in this datasheet must not be exceeded under any circumstances.
- Do not exceed max. installation torque of 30 Nm as this can destroy the device.
- USN-series EMP protector/filters may be directly installed into the wall of a Faraday cage as feed-through device.
- Strip wires 5-6 mm (solid or stranded) and insert into terminal block with or without ferrule by using the insulated operating tool supplied or an appropriate screw driver.



Ordering Information / Part Number

USN-40002 EMP Surge Protector/Filter
for 2 pairs of RS422/RS485 interface
Replaces USS-4-RS422/485/FD

General Recommendations for Protection Installation

- In order to achieve the full performance of a protection circuit the application of good-practice EMC design techniques is necessary for the whole system to be protected.
- For EMP-protection usually a shield as an electromagnetic barrier to protect a certain volume is necessary. This shield avoids coupling of radiated disturbances inside the protected volume. In addition to shielding all penetrating wires must be protected from conducted transient interferences by an appropriate POE (point of entry) protection.
- Use tested, high quality POE (point of entry) protection elements for all wires entering an electromagnetic shield and install these as feed-through devices, e.g. the Meteolabor® USS-1, USS-2, USN, USP, CSP or PLP series.



Caution

Maximum torque for installation screw shall not exceed 30 Nm

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