

## EMP Surge Protector / Filter 10/100/1000 Mb/s Ethernet, PoE USN-80001

Excellent lightning and EMP protection for four twisted pairs of a 10/100/1000 Mbit/s Ethernet link works also with PoE (Power over Ethernet)

RJ45 input and output jacks

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

Fully tested against HEMP 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 will be threat-level tested against EMP according to MIL-STD-188-125, short pulse and intermediate pulse.

### Applications

Meteolabor® USN-80001 protects all four twisted pairs of a 10/100/1000 Mbit/s Ethernet connection of sensitive electronics such as computers, telecommunication equipment etc. against the effects of lightning and EMP. USN-80001 has shielded RJ45 jacks and can be easily installed by using of-the-shelf patch cables. For best result shielded cables and a feed-through installation from an unprotected volume into a shielded and protected room are recommended. USN-80001 also transmits up to 50V DC and can be used for PoE applications according to IEEE 802.3af. USN-80001 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-80001

Application	Ethernet protection	10/100/1000 Mbit/s, works also with Power over Ethernet (PoE)
Max. operating voltage	±3V ±55V	Peak signal voltage between wire pairs 1-2, 3-6, 4-5 and 7-8 Max. DC voltage pair to pair and pair to ground (PoE IEEE 802.3af)
Max. operating current	250 mA	Each wire
Data rate	10/100/1000 Mbit/s	Ethernet, Fast Ethernet or Gigabit Ethernet as per IEEE 802.3
Max. surge current $I_{Max}$	2x10 kA *)	Each wire → ground/case, shape 8/20 μs, at least 1 pulse *) surge currents >2kA (8/20 μs) per wire may damage RJ45 contacts
Max. lightning impulse current $I_{imp}$	2x2 kA *)	Each wire → ground/case, shape 10/350 μs, at least 1 pulse
DC resistance input - output	<6 Ω	Each wire
Residual voltage common mode surge	< 100 V typically	pair → ground/case, pulse 4 kV / 2 kA according to IEC 61000-4-5
Residual voltage common mode fast	< 300 V typically	pair → ground/case, fast pulse 4 kV, 5/50ns, load 1 MOhms
Residual voltage differential mode	< 20 V typically	Between wire pair, pulse 2 kV / 1 kA according to IEC 61000-4-5
Connection terminals	RJ45 shielded	Use of shielded cables recommended
Case material	Brass	Nickel-plated
Max. allowed installation torque	30 Nm	Not to be exceeded under all circumstances
Dimensions	Ø 32x112.5 mm	2 nuts M32x1.5 for feed-through installation
Weight	approx. 250 g	Incl. 2 nuts

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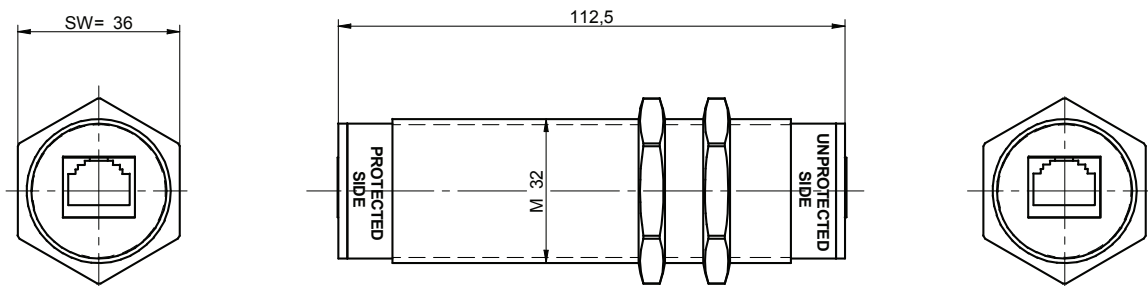
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## Dimensions [mm]



Use always 1-2, 3-6, 4-5 and 7-8 as wire pairs (same as in standard Ethernet connections)

### 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. For best performance the cabling should be shielded at least on the protected side.

### 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, USP, CSP or PLP series.

### Ordering Information / Part Number

**USN-80001** EMP Protector/Filter  
10/100/1000 Mbit/s Ethernet / PoE



#### Caution

Maximum torque for installation screw shall not exceed 30 Nm