

EMP Surge Protector / Filter 10/100 Mb/s Ethernet, RJ45 Jacks USN-40001

Excellent lightning and EMP protection for two twisted pairs of a 10/100 Mbit/s Ethernet link using 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 and isolated input and output

Feed-through type nickel-plated body for direct installation to wall of Faraday cage

Fully tested against HEMP according to MIL-STD-188-125, short and intermediate pulse



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-40001 combines the protection of two pieces Meteolabor® USS-2-AQ in one case to provide excellent protection for two twisted pairs of a 10/100 Mbit/s Ethernet connection of sensitive electronics such as computers, telecommunication equipment etc. against the effects of lightning and EMP. USN-40001 has shielded RJ45 jacks and can be easily installed by using of-the-shelf patch cables. For best results shielded cables are recommended. Input and output of USN-40001 are isolated by a magnetic circuit which provides best protection and filtering effect in a feed-through installation from an unprotected volume into a shielded and protected room. However, PoE (Power over Ethernet) is not possible with USN-40001. USN-40001 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-40001

Application	Ethernet protection	10/100 Mbit/s, not applicable for Power over Ethernet (PoE)
Max. operating voltage	±3V	Peak voltage between wire pairs 1-2 and 3-6; wire pairs 4-5 and 7-8 are not connected
Data rate	10 / 100 Mbit/s	Ethernet or Fast 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	Open circuit	Input / output isolated
Residual voltage common mode	< 20 V	Wires → ground/case, pulse 4 kV / 2 kA according to IEC 61000-4-5
Residual voltage differential mode	< 20 V	Between wire pair, pulse 4 kV / 2 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, see drawing for details
Weight	approx. 250 g	Incl. 2 nuts

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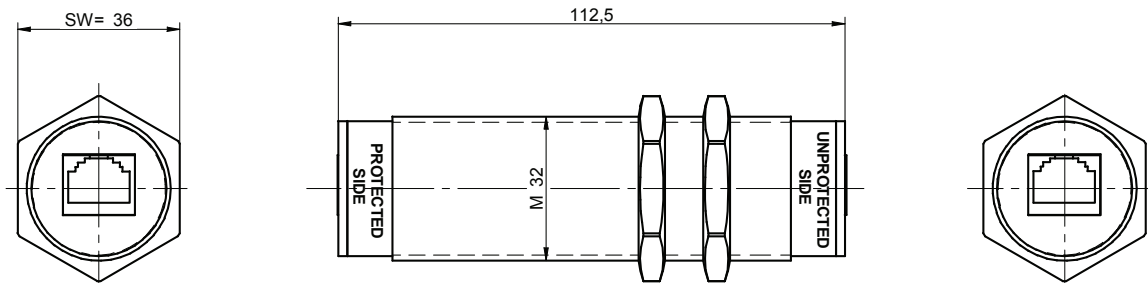
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Dimensions [mm]



Note: Pins 4, 5, 7 and 8 of RJ45 socket are not required for 10/100Mbit/s and are not connected

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-40001 EMP Protector/Filter 10/100Mbit/s Ethernet

Note: USN-40001 replaces 2 pieces of EMP protector USS-2-AQ (NSN-Nr. 5920-12-354-9312)



Caution

Maximum torque for installation screw shall not exceed 30 Nm