

EMP Surge Protector/Filter for Ground-free Signals / Supplies USS-2-C

Excellent lightning and EMP protection of an earth-free and short-circuit current limited low voltage power supply or signal line pair

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

Operating up to 6 A, and up to 50V

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

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

Threat-level tested against HEMP according to MIL-STD-188-125, short and medium



Product

The Meteolabor® USS-2 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 USS-2-Series is threat-level tested against EMP according to MIL-STD-188-125, short pulse and intermediate pulse.

Applications

The Meteolabor® USS-2-C overvoltage protector/filter is intended to protect earth-free signal pairs (e.g. analog telephone) or AC or DC low voltage power supply lines, which are short-circuit current limited to < 0.5 A (or fused). USS-2-C will protect against overvoltage effects caused by NEMP / HEMP or lightning strikes. USS-2-C uses gas tube arrestors in combination with other elements. For reliable extinction of gas tube arrestors it is very important, that the short-circuit current of the power feeding source is fused with 6 A or less, or the short circuit current must be limited to less than 0.5 A.

USS-2-C has been used in many fixed installations (buildings, underground shelters etc.) as well as in portable and mobile systems like containers, shelters and vehicles, which were successfully EMP-tested according to RS105 of MIL-STD-461F.

Technical Data USS-2-C

Application	Low voltage power	Source and load must be earth-free and short-circuit current limited
Nominal operating voltage U_{Max}	± 50 V DC / AC	Short time 150 V peak (e.g. ringing signal of telephone)
Nominal operating current I_N	6 A	$T_{amb} = 40$ °C, short-circuit current must be limited to < 0.5 A or fused 6A or less for safe extinction of gas tube arrester
DC resistance	2 x 40 m Ω	
Max. surge current I_{Max}	2 x 10 kA	wires → ground/case, shape 8/20 μ s, $T_{amb} = 40$ °C
Max. lightning impulse current I_{imp}	2x2 kA	wires → ground/case, shape 10/350 μ s, at least 1 pulse
Residual voltage	< 500 V	wire → wire, worst case, depending on pulse shape
Residual voltage	< 700 V	wire → ground/case, worst case, depending on pulse shape
Operating bandwidth	typ. DC – 1 MHz	Typically at 50 Ω
Insulation resistance to ground	> 1 G Ω	Wire → ground/case measured @ 120 V DC
Operating temperature range	- 40 °C / + 85 °C	
Connection terminals	2.8 / 6.3 mm	Choice of FASTON flat receptacle, solder or screw connection
Max. allowed installation torque	25 Nm	Not to be exceeded under all circumstances
Dimensions (Overall)	113 x 31.2 x 27 mm	Major dimensions, details see drawing
Weight	approx. 180 g	

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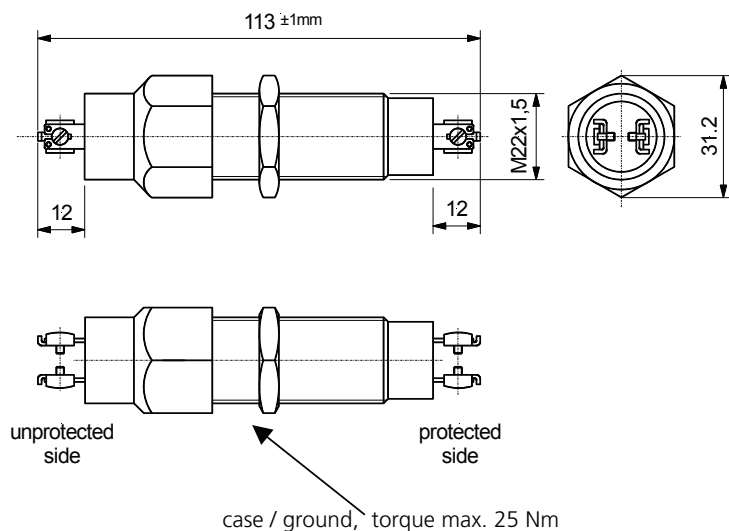
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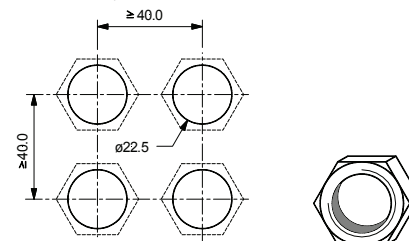


Dimensions

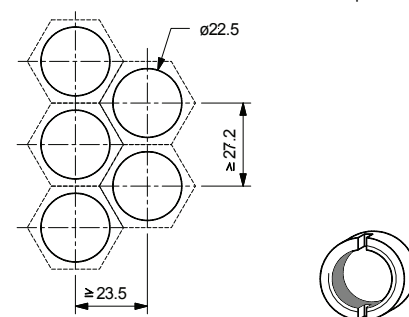


Installation Layouts

Standard drilling layout for USS-2 series with standard hexagonal nut (included, spanner size 27mm)



Space saving "honeycomb" mounting hole layout for USS-2 series (requires optional slotted nut USS-SM2 and USS-SK2 spanner)



Installation Instructions

- The USS-2 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 25 Nm as this can destroy the device.
- USS-2 series EMP protector/filters may be directly installed into the wall of a Faraday cage as feed-through device. Otherwise the cabling on the protected side must be shielded for best performance.
- For space-saving installation of multiple protectors a "honeycomb" layout is recommended (see drawings).

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

USS-2-C Surge protector/filter EMP USS2-C

USS-SM2 optional slotted nut

USS-SK2 optional special socket spanner for slotted nut

Caution
Maximum torque for installation screw shall not exceed 25 Nm