

EMP Surge Protector/Filter for Analog Telephone, Signal Lines USS-1-C

Effectively protects one wire of an analog telephone line or control signal

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

Coordinated multi-stage protection and filter designed for low residual voltages

High surge current 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-1 series overvoltage protector/filter elements consist of coordinated coarse and fine protection stages in combination with filtering components. This ensures best protection of sensitive equipment against very fast transient overvoltages (e.g. NEMP / HEMP). Surge currents up to 20 kA can be handled. In addition high frequency interferences are filtered efficiently within a wide range.

The unique mechanical design offers easy installation and compact fitting into Faraday cages, shielded rooms and mechanical enclosures. Single point of entry concepts can be simply realized to achieve best possible EMI behavior of penetrating feed-through elements.

Applications

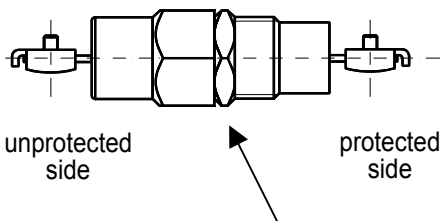
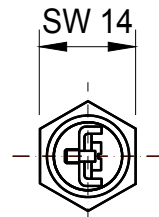
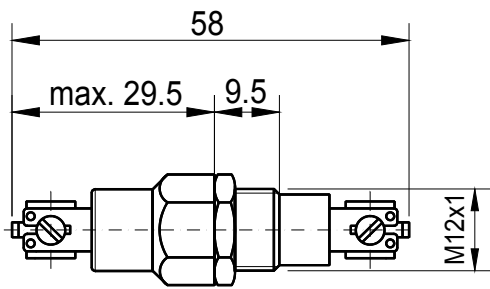
The Meteolabor® USS-1-C surge protector/filter is intended to protect one wire of an analog telephone line or control signals of sensitive telecom, sensor or other electronic equipment against destructive overvoltage effects caused by NEMP / HEMP or lightning strikes. USS-1-C is specially designed for analog 600 Ω telephone lines, it has a very low insertion loss in the frequency range of 300 – 3400 Hz.

USS-1-C has been used in many fixed installations (buildings, underground shelters etc.) as well as in portable and mobile systems like containers or shelters and vehicles, which were successfully EMP-tested on threat-level according to RS105 of MIL-STD-461F.

Technical Data USS-1-C

Application	Telephone, signal line	Analog telephone, signal below 100 kHz, protects one wire
Maximum operating voltage U_{Max}	± 150 V DC	
Maximum operating current I_N	0.5 A	$T_{amb} = 40$ °C, short-circuit current must be limited to 0.5 A
DC resistance	< 5 Ω	
Insulation resistance	> 1 GΩ	wire → ground / case, @120 V measuring voltage
Max. surge current I_{Max}	20 kA	wire → ground / case, shape 8/20 μs
Max. lightning impulse current I_{Imp}	2 kA	Wire → ground/case, shape 10/350 μs, at least 1 pulse
DC sparkover voltage	230 V	Gas tube arrester, respect max. operating parameters for extinction
Residual voltage (surge 8/20 μs)	< 600 V	wire → ground / case, worst case depending on surge amplitude
Average common mode attenuation	typ. 50 dB	at 50 Ω, up to 1 GHz
Low pass cut-off frequency	180 kHz	3 dB
Insertion loss	typ. 0.15 dB	600 Ω measuring impedance, 300 – 3400 Hz
Output capacity	typ. 1.8 nF	Capacity to ground / case
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	12 Nm	Not to be exceeded under all circumstances
Dimensions (Overall)	58 x 16 x 14 mm	details see reverse page
Weight	23 g	

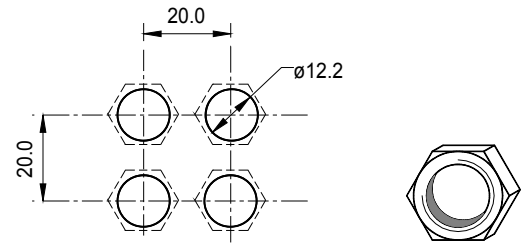
Dimensions [mm]



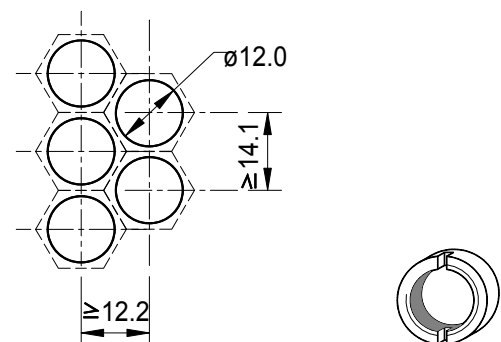
case / ground, torque max. 12 Nm

Installation Layouts

Standard drilling layout for USS-1 series with standard hexagonal nut (included, spanner size 14 mm)



Space saving "honeycomb" mounting hole layout for USS-1 series (requires optional slotted nut USS-SM1 and USS-SK1 spanner)



Installation Notes

- The USS-1 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 12 Nm as this can destroy the device.
- USS-1 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).

Ordering Information / Part Number

USS-1-C	Surge protector/filter EMP USS1-C
USS-SM1	2 pieces required for 1 telephone wire pair slotted nut (optional)
USS-SK1	special box-spanner for slotted nut (optional)

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.



Caution

Maximum torque for installation screw shall not exceed 12 Nm