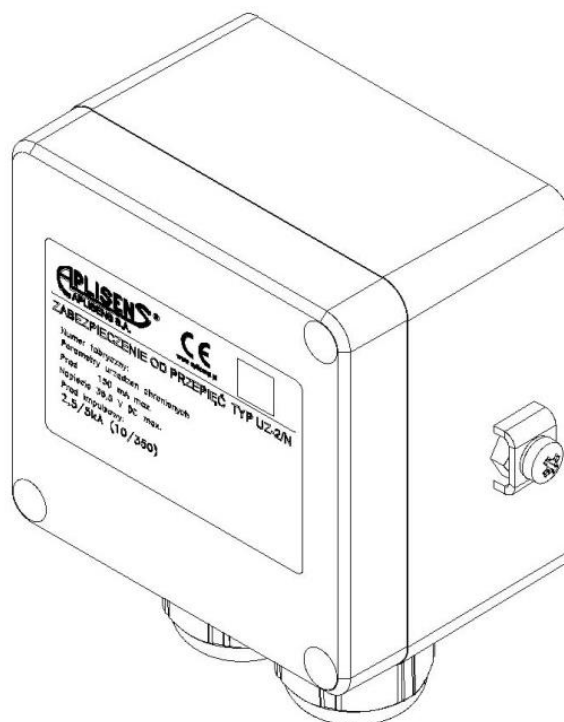
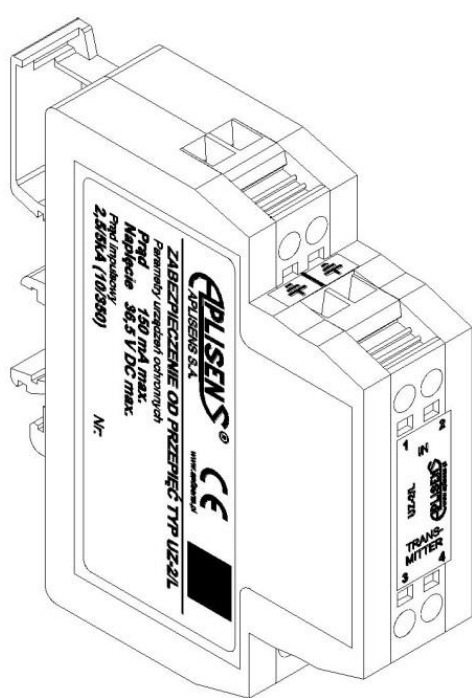


APLISENS®

USER'S MANUAL

OVERVOLTAGE PROTECTION CIRCUIT

UZ-2/N, UZ-2/L



1. IMMUNITY OF ELECTRONIC DEVICES TO OVERVOLTAGES

Electronic devices must be resistant to overvoltage impulses in accordance with the requirements of the EN IEC 61000-6-2 standard. Devices operating in industrial conditions with long signal lines should have immunity corresponding to installation class 1 or 2.

Test levels according to the mentioned standard:

- installation class 1: 0.5 kV - wire/wire, 1 kV - wires / earth or housing;
- installation class 2: – 1 kV - wire/wire, 2 kV - wires/earth.

Immunity between wires and earth or mass is usually achieved by using insulation of appropriate strength. To enhance the immunity to overvoltage pulses between wires (these are generally the inputs or outputs of devices), it is necessary to connect (in parallel to these wires) protective elements, such as “transil” diodes or varistors. Such limiters are then components of the device.

If the immunity of the equipment is insufficient, additional protection circuits, such as **UZ-2**, should be used.

2. UZ-2 OVERVOLTAGE PROTECTION CIRCUITS, PURPOSE

The UZ-2 protection systems act as voltage limiters and are designed to protect measurement and automatic equipment (including transmitters, data transmission systems etc.) against damage caused by transient overvoltages and partial lightning current (they do not protect against direct lightning discharges). UZ-2 limit overvoltages to a level lower than the immunity of the protected equipment (→ [1. IMMUNITY OF ELECTRONIC DEVICES TO OVERVOLTAGES](#)).

The UZ-2 protection circuits are designed for cooperation with devices connected to a 2-wire line with nominal voltages at the terminals of protected circuits: 30V.

The UZ-2 circuit shows a two-stage reduction:

- coarse reduction of partial lightning current,
- exact limitation.

The UZ-2 circuits are used when the equipment to be protected does not have its own voltage limiters and a low level of protection between wires and earth is also permissible and/or desirable (→ [Table 2. Electrical parameters](#)).

3. TECHNICAL DATA

Table 1. Technical parameters

Version depending on the type of housing	wall-mounted UZ-2/N	rail mounted UZ-2/L
Housing dimensions and mounting	as in Figure 1	as in Figure 2
Degree of protection and casing material	IP65, polycarbonate	IP20, polyamide
Operating temperature	-25÷80°C	+5÷60°C
Cross-sections of the line wires	2,5 mm ² max.	2,5 mm ² max.
Cross-sections of the wires to the earthing terminal	4 mm ² max	2x2,5 mm ² max
Version	01 (other version by arrangement)	01 (other version by arrangement)

Table 2. Electrical parameters

Version		UZ-2/N	UZ-2/L
Voltage that can be permanently connected to terminals 1, 2	Nominal	30V	30V
	Maximum	36,5V	36,5V
Maximum working current		150mA	
Surge current 10/350 per 1 wire		2,5kA	
Surge current 8/20 per 1 wire		10kA	
Level of protection	wire / wire	Approx. 50V	Approx. 50V
	Wire / ground	Approx. 55V	Approx. 55V
Series impedance / wire		5 ÷ 7 Ω	

4. ASSEMBLY, CONNECTION AND USE

Install the UZ-2/N circuits on the board, wall or support structure (→ [Figure 1. The UZ-2/N overvoltage protection circuit. Dimension](#)) with the glands downwards and under the canopy.

Connect the earthing terminal to the local earthing and potential equalisation system.

Install the UZ-2/L circuits on T35, T32 rails (→ [Figure 2. The UZ-2/L overvoltage protection circuit. Dimension](#)) in dry rooms without dust and aggressive gas atmosphere.

Ground the UZ-2/L circuits using any of the 4 earthing terminals.

Connect the UZ-2 circuits to the protected device as shown in → [Figure 3. Possible configurations of protection circuit UZ-2N, UZ-2L](#).

When selecting and applying safeguards, factors such as:

- Predicted degree of risk of overvoltage.
- Maximum operating voltage and line current. Avoid selecting a significantly higher nominal voltage of the protection circuit than the voltage of the protected equipment.
- Installation and operating conditions, including the possibility of effective connection to the equipotential bonding and earthing system.

The inspections of the UZ-2 protective circuits should be carried out especially before the storms and after the occurrence of strokes. Check the state of continuity of the protective wires and their connections, especially under conditions of increased corrosivity.



The producer of the safety systems has no knowledge of the local conditions at the place of use, and is not involved in the design of the safety system or in its installation and use. Therefore, the aforementioned activities fall within the scope of the user's duties and responsibilities.

5. MAIN STANDARDS ON SURGE PROTECTION

EN 62305-4	Protection against lightning. Part 4. Electrical and electronic systems within structures.
EN IEC 61000-6-2	Electromagnetic compatibility (EMC) - Part 6-2 Generic standards - Immunity standard for industrial environments.
EN 61000-4-5	Electromagnetic compatibility (EMC). Testing and measurement technique. Surge immunity test.
IEC 60364-5-54	Electrical installations of buildings. Selection and erection of electrical equipment Earthing arrangements, protective conductors and protective bonding conductors.

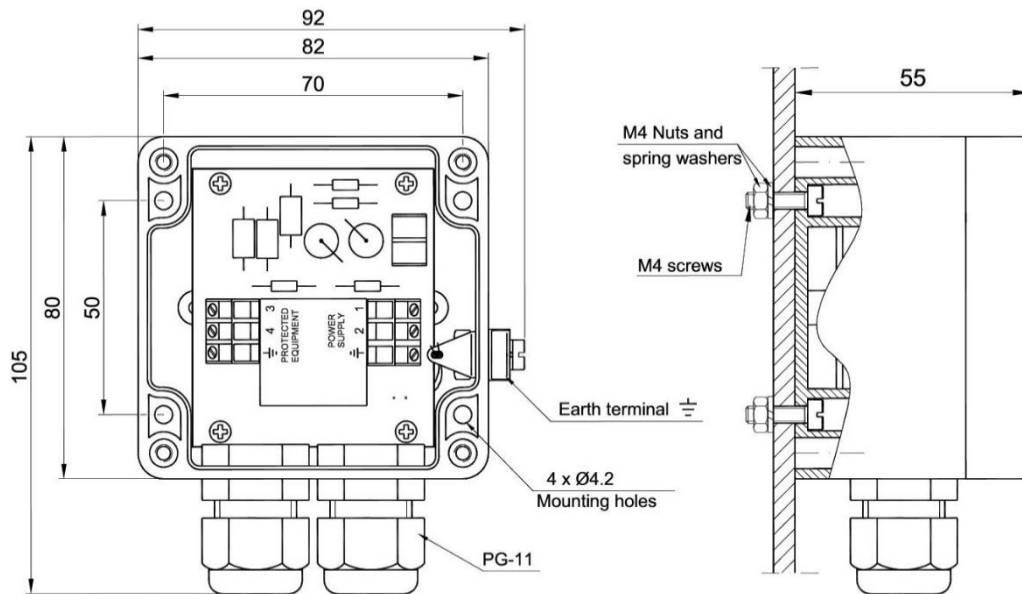


Figure 1. The UZ-2/N overvoltage protection circuit. Dimension

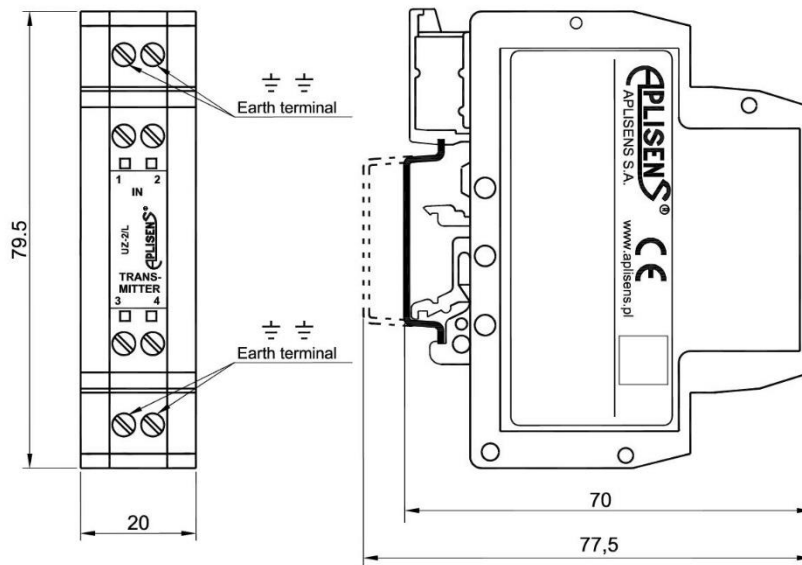


Figure 2. The UZ-2/L overvoltage protection circuit. Dimension

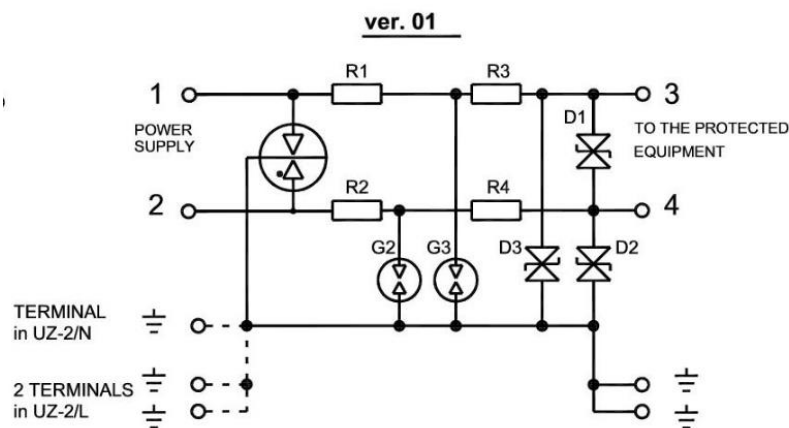


Figure 3. Possible configurations of protection circuit UZ-2N, UZ-2L

