

ELECTRICITY METER LOAD SIMULATOR

SZE-12

The electricity meter load simulator is designed for preliminary testing of the operation of electricity meters connected in distributors.



The testing is performed when the electricity meter is connected in the standard manner, with a live distribution point. Once contact is made, the SZE-12 is powered via the electricity meter under test (it has no internal power supply). It forces a test current of approximately 8A into the current circuit of the electricity meter. The exact value depends on the fluctuations of the mains voltage and on the level of contact resistance between the SZE-12 current terminals and the electricity meter current terminals. The SZE-12 is designed for 230V / 50Hz nominal voltage but it can also be used to test electricity meters connected to 120V / 50Hz mains – however, in such a case, the simulated load current is reduced by about half. The output circuit is protected with a 16A fuse, which does not melt during normal operation. For the electricity meter to show a 0.1kWh reading, the SZE12 must be connected for approximately 2.5 minutes. The test duration may be shorter in the case of electronic electricity meters indicating start-up with a blinking arrow or featuring a bar-graph showing the approximate output. During longer or repeated measurements, the simulator could overheat and trigger the resettable thermal protection. Until the device cools down, the simulator appears to be inoperative. The maximum operating time at maximum output power is 3 minutes. After that, the device must remain unconnected for 10 minutes (the time necessary for the device to cool down). Once cooled down, the SZE-12 can operate properly again. The load simulator is certified as CAT IV equipment in accordance with CSN EN 61326-1 and CSN EN 61010-1 ed. 2.

WARNING

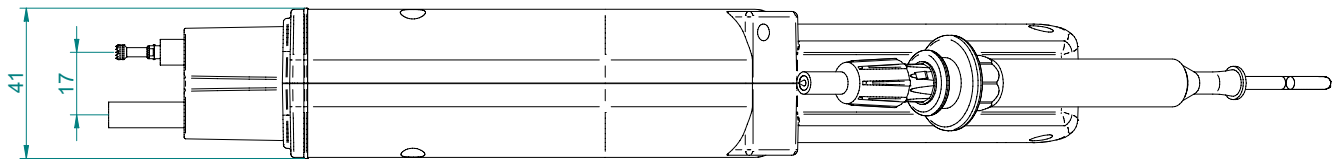
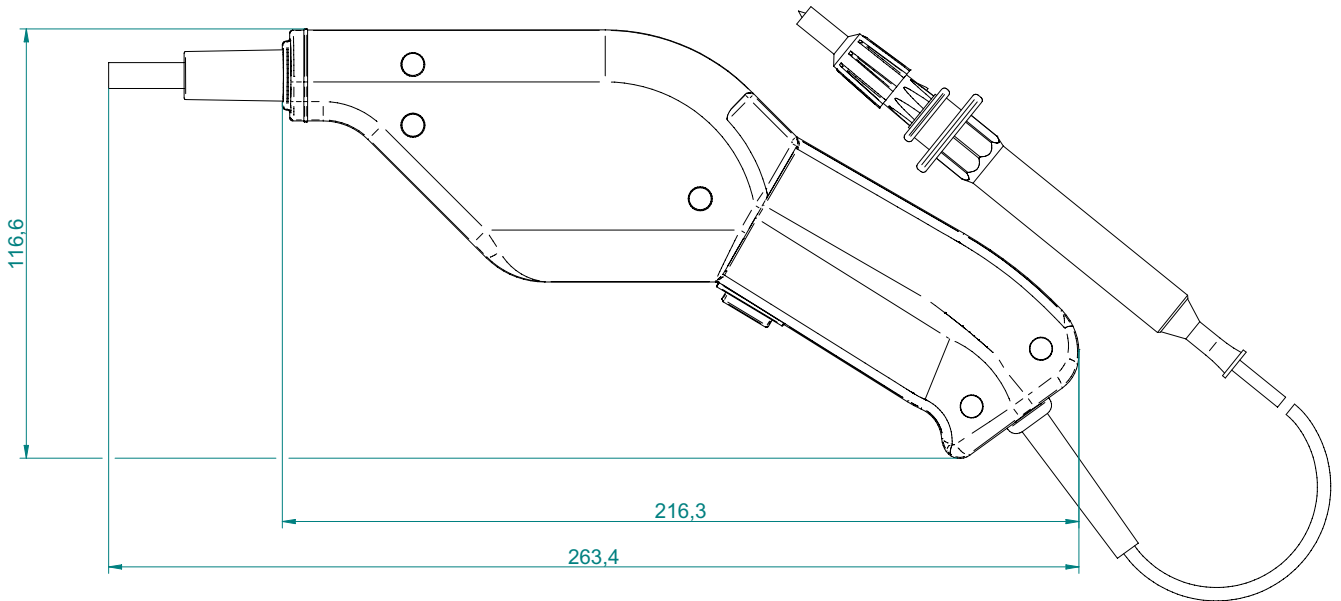
All the terminals are galvanically interconnected and connected to the mains while the operation of the electricity meter is being tested! It is essential to ensure compliance with any applicable work safety standards and rules, including those covering inspection activities. The device may only be used by trained persons who have the appropriate electrical engineering qualifications and know how distributors and electricity meters are to be connected.

The SZE-12 is designed for a 230 V~ power supply (phase voltage between the L and N terminals). When testing a 3-phase electricity meter, it is essential to connect the SZE-12 properly so as to avoid its connection to 400V~ coupled voltage (voltage between two phases). In particular, proper connection of both the SZE-12 tips to the respective current circuit must be ensured. The maximum voltage between the tips is 15V~. The SZE-12 features internal protection for phase-to-phase connection – in such a case, the red LED will come on.

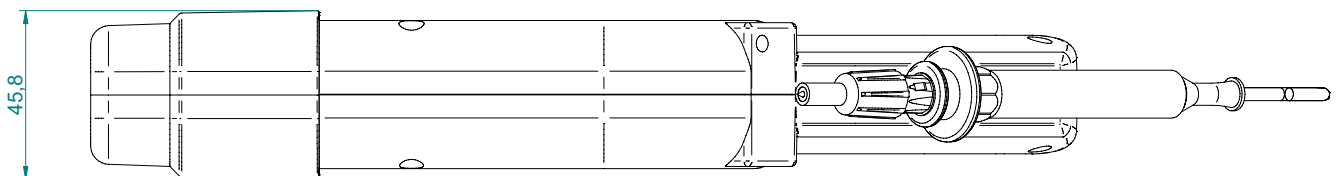
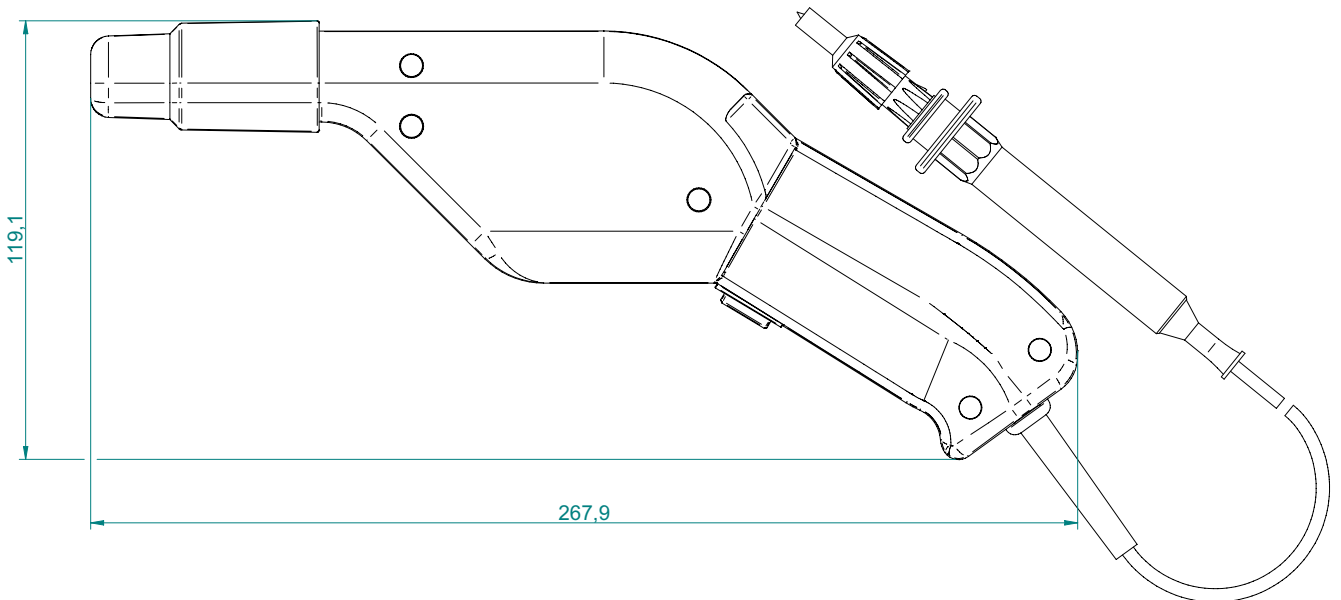
Should the internal 16A fuse melt or be damaged, the device needs to be returned to the manufacturer. Never interfere with any internal parts of the device and never repair/modify the device.

DIMENSIONAL DRAWING










SZE-12 without the tip cover



SZE-12 with the tip cover



DESCRIPTION OF SYMBOLS

-  Current input to the electricity meter at terminal no. 1.
-  Current output from the electricity meter at terminal no. 3.
-  Value of the output from the SZE-12 to the electricity meter terminals.
-  Value of the output from the SZE-12 to the electricity meter terminals.
-  Indicates correct connection of the SZE-12 to the electricity meter terminals (green LED).
-  Indicates incorrect (phase-to-phase) connection of the SZE-12 to the terminals, or a defect (red LED).
-  Electrical equipment shall not be disposed of with regular municipal waste (do not throw it into containers intended for mixed waste or containers for bulky waste).
-  Protection class (2).
-  $> 1J$
 $< 5J$ according to IEC 62262

DESIGN AND FUNCTIONS

The SZE-12 is enclosed in a plastic casing measuring 46 x 268 x 119 mm.

SZE-12

The contacts for connection to the current terminals are fixed to the casing. To connect the device to the neutral terminal of the electricity meter, an insulated flexible wire with a protected contact at the end is used. The button is located on the bottom and the red/green LED indicator can be found on the top of the casing.

A red LED indicates a melted fuse or insufficient contact in the current circuit of the SZE-12 electricity meter and phase-to-phase connection. A green LED indicates the correct connection of the load current.

Full load is activated by pressing the button on the SZE-12 handle. This generates a current of approx. 8A and an output of approx. 1800W. This design is intended for testing 1-phase and 3-phase electricity meters featuring terminal boards with dimensions according to DIN 43857.

SZE-12/3Z

The contacts for connection to the current terminals are fixed to the casing. To connect the device to the neutral terminal of the electricity meter, an insulated flexible wire with a protected contact at the end is used. The button is located on the bottom and the red/green LED indicator can be found on the top of the casing.

A red LED indicates a melted fuse or insufficient contact in the current circuit of the SZE-12/3Z electricity meter and phase-to-phase connection. A green LED indicates correct connection of the load current.

The switch (positions I and II) is used to change the low load: position I - approx. 20W; position II - approx. 40W. This output (load) is activated automatically after connection to the current terminals and the zero potential.

Full load is activated by pressing the button on the SZE-12/3Z handle. This generates a current of approx. 8A and output of approx. 1800W. This design is intended for testing 1-phase and 3-phase electricity meters featuring terminal boards with dimensions according to DIN 43857.

TECHNICAL DATA

Supply voltage U_n	230 V
Nominal frequency f_n	50 Hz
Permissible tolerance f_n	-5 Hz to +2 Hz
Resistance to voltage peaks	8 kV 1.2 / 50 μ s
Input	max. 10 W
IP Code	IP40
Operating/storage temperature	-20 °C to +60 °C
El. insulation strength - terminals/box	4 kV minimum
Operating position	any
Type of operation	discontinuous: 3 minutes of operation / 10 minutes of cooling down
Device category	CAT IV
Degree of pollution	2
Use	up to 2000 meters above sea level
Dimensions, incl. the fixed tips	46 x 268 x 119 mm
Weight	0,57 kg



MAINTENANCE AND STORAGE

Care and maintenance

Throughout its service life, the device does not require any special maintenance. Depending on the frequency of use, the screw-on tips need to be checked to make sure they are not loose; re-tighten if necessary. To clean dust and other dirt from the external surfaces, the manufacturer does not recommend using organic solvents, aggressive chemicals or abrasive cleaning agents. The specified storage temperatures must be complied with. Failure to do so may reduce the service life of the electronic components. Furthermore, the product must be protected from wet and moist conditions. Precipitation, humidity and liquids containing minerals can cause corrosion of the electrical circuits if the device gets wet. The product is designed to be used indoors, i.e. it may only be used in areas providing additional protection against external influences (e.g. in a building or in a cabinet). The product must not be placed on or dried by a source of heat or put into a source of heat (e.g. microwave oven, kitchen oven or radiator) as it could overheat and some of its parts could explode. It must not be exposed to excessive heat as this could lead to deformation of the covers. Do not store the device in cold places, especially those which might get warm again (reaching the nominal operating temperature), as humidity could condense inside the device and damage the electronic components, or the insulation properties could deteriorate.

Service

Service is provided by the company ZPA Smart Energy a.s., Komenského 821, 541 01 Trutnov, Czech Republic, Smart Energy trademark, tel. + 420 499 907 111, e-mail zpa@zpa.cz, www.zpa.cz.

Transport

For transport the product shall be packed either in the original packaging supplied by the manufacturer or in packaging which prevents any damage as a result of handling or transport.

SAFETY

Manufacturer's instructions

The product is capable of safe operation. The manufacturer has issued the EU Declaration of Conformity in accordance with Act no. 90/2016 Coll.

Nonetheless, the manufacturer wishes to point out the possible danger resulting from improper handling or improper use of the product:

- Maintenance shall only be carried out by a trained person with the appropriate electrical engineering qualifications in accordance with Regulation 50, sec. 5.
- The product shall not be used for any purposes other than those for which it was manufactured.
- The product must not be deliberately modified contrary to the type design.
- Výrobek nesmí být provozován na jiné napětí a proud než byl vyroben nebo odborně upraven.
- The product must be placed and secured in such a way as to hinder or prevent its use by persons with no electrical engineering qualifications, especially children.
- When the device cover is open and the device is connected to a low voltage network, any live components of the device pose a high voltage risk.
- Every time that the device is to be put into operation again (e.g. after a repair, maintenance, etc.), the protection and any safety measures must be fully restored.
- During operation, the area where the product is installed must not be exposed to risk of fire or explosion as a result of the formation of any gas, flammable liquid vapours or the presence of flammable dust.
- The product must not be operated under conditions or in an environment not ensuring safe operation (e.g. placed on a flammable surface, covered with a flammable material, with insufficient protection against the entry of foreign bodies, water or other liquids).
- The product may only be placed and operated indoors, i.e. in areas providing additional protection against external influences (e.g. in a building or in a cabinet).
- The product must not be operated under conditions or in an environment where it is subject to vibrations and/or shocks on a large scale. Výrobek nesmí být provozován v podmínkách a prostředí s větším chvěním a otřesy.

The manufacturer shall not be liable for any defects which occur as a result of the user's failure to observe any of the aforementioned instructions. Non-compliance with the recommended storage, operating and safety conditions indicated in sections "Care and Maintenance" and "Safety" may negatively affect the service life of the product.

Responsibility

The device owner must make sure that anyone using the device or working with it:

- is competent and qualified in accordance with national regulations;
- has read and understood the relevant parts of this document;
- strictly observes the safety regulations and operating instructions provided in the individual chapters.

Furthermore, the device owner is responsible for:

- protecting persons;
- preventing any damage to material;
- staff training.

Safety instructions

The following safety instructions shall be observed under all circumstances:

- Local safety regulations must be complied with. The meters shall only be installed by qualified and trained persons.
- Make sure to hold or secure the device firmly so as to avoid any injury as a result of a fall.
- Meters which have been subjected to a fall must not be installed even if they do not show any visible signs of damage. Such meters must be returned for re-testing either to an authorized repair centre or directly to the manufacturer. Internal damage may cause functional defects or a short circuit.
- Never clean the device under running water or with high-pressure equipment. Water penetration may cause a short circuit. The IP code of the device needs to be respected.

DISPOSAL

Based on the data provided in the ISO 14001 certificate, the components used are mostly separable and may be accepted for disposal or recycling as appropriate. At the end of its service life, the device shall be handed over to a specialized company engaged in the separation of used materials and subsequent recycling. Unused devices must be disposed of in an eco-friendly manner and in compliance with the Waste Act.

The product does not contain any radioactive, carcinogenic or other materials with negative effects on health or the environment. All the plastic materials are recyclable.

The packaging materials are recyclable and shall be handed over to a specialized company as a source of reusable material or energy at the end of the service life.

Disposal and legal regulations concerning environmental protection

For disposal purposes, local regulations concerning environmental protection must be complied with at all times.

COMPONENTS	DISPOSAL
Printed circuit boards, LED	Electronic waste. To be disposed of in accordance with local regulations.
Metal parts	To be separated and handed over to a waste recycling centre for disposal in accordance with local regulations.
Plastic components	To be separated and handed over for disposal or re-granulation in accordance with local regulations.