ИСО 9001

AC LINE PROTECTION MODULE

BZS

User's Manual

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This user's manual explains the principles of operating BZS AC Line Protection Module.

Only the personnel who have studied this manual are allowed to operation activities. All activities on mounting, start-up, programming, and testing shall be performed in compliance with the requirements of the regulatory documentation in force at the place of operation.

The BZS parts carry dangerous mains voltage!

Operation with removed cover is prohibited!

Mounting and maintenance of the product can be carried out only when mains voltage is off!

1 Description and Operation

1.1 Product Purpose

BZS AC Line Protection Module (hereinafter referred to as the BZS) is to be used in electric mains (~220 V, 50 Hz) to protect various electrical equipment against high-voltage surge noise (noise of natural origin induced by lightning; industrial noise from power switching devices) as well as long-duration overvoltages above 265 V.

The BZS provides protection against surge overvoltages (8/20 μs shape surges)* with peak voltage value of up to 10 kV and against long-duration overvoltages higher than 253 V in case of one or both fuses are blown. The equipment restores its operability after replacing the fuses.

The BZS provides indication of presence of output voltage.

The BZS is designed for round-the-clock operation.

The BZS is intended to operate in residential, commercial, and industrial areas.

The BZS shall be operated within mounting enclosures (cabinets, boxes etc.) which provide protection against atmospheric precipitations and mechanical damage. The BZS design does not provide operating it in fire and explosion hazardous premises.

The BZS is classed as a restorable and periodically maintained item.

1.2 Specifications

Technical parameters of the BZS are as shown in Table 1.

Table 1

No.	Parameter	Value
1.2.1	Power Inputs	1
1.2.2	Working range of input voltage, V	150…253
1.2.3	Insertion resistance (mains frequency 50 Hz), ohm, max	1
1.2.4	Supply voltage frequency, Hz	50/60
1.2.5	Maximum power, VA / load current, A	500 / 3
1.2.6	Maximum symmetrical surge voltage between 220 V (L) и 220 V (N) (with blowing fuse(s), mains frequency 50/60 Hz), V, max	320
1.2.7	Surge peak voltage (8/20 μs)*, kV	10
1.2.8	Peak surge discharge current (8/20 μs)*, kA	4.5
1.2.9	Enclosure protection degree as per GOST 14254-2015	IP30
1.2.10	Resistance to mechanical exposure as per OST 25 1099-83	Arrangement Category III
1.2.11	Vibration exposure: - Frequency range, Hz - Max acceleration, g	 1-35, 0.5
1.2.12	Environment category as per OST 25 1099-83	O3
1.2.13	Operating temperature range, °C	Minus 30 through +50
1.2.14	Relative air humidity, %	93

*8 μs signifies the time taken for the surge to reach 90% of its peak value; 20 μs is the time taken for the surge to decay to half of the peak value.

No.	Parameter	Value
1.2.15	Weight, kg, max	0.12
1.2.16	Overall dimensions, mm	102×107×39
1.2.17	MTBF in the quiescent mode, hours	40,000
1.2.18	Survival probability after 1,000 hours	0.975
1.2.19	Expected lifetime, years	10

1.2.20 The BZS is ready for operation no later than one second after the input power is turned on.

1.2.21 As to immunity to man-made radio disturbance, the BZS meets the requirements for Test Severity Level II as per GOST R 50009.

Note. *Correct performance of the BZS cannot be guaranteed if electromagnetic environment does not meet the operation conditions defined in this manual.*

1.2.22 The BZS passes the industrial interference standards prescribed for Class 'Б' equipment as per GOST R 30805.22.

1.2.23 The BZS does not feature any operation controls. Access inside the product is possible after removing the front cover, which is fixed with the screw provided.

1.2.24 The BZS design provides its fire safety in case of emergency operation and upon the breach of operational regulations in accordance with GOST 12.1.004-91.

1.3 Standard Delivery

The standard delivery for BZS is shown in Table 2.

Table 2

Item	Quantity, pcs.
BZS AC Line Protection Module	1
Operations Manual	1
Fuse ВПБ6-11 3.15 A (or similar)	2
Fastening elements (screw with wall plug)	3
Tapping screw 2.2×6.5	1
Packaging	1

1.4 Measuring Instruments, Tools, and Accessories

While mounting, commissioning, and maintaining the BZS please use the instruments, tools, and accessories shown in Table 3.

Table 3

Instrument	Specifications
Digital multimeter	AC/DC voltage up to 500 V, AC/DC current up to 10 A, resistance up to 20M Ohm
Flat head insulated screwdriver	SL2.5 × 75 mm
Cross slot insulated screwdriver	PH1 × 75 mm
Side-cutting pliers	160 mm
Pliers	160 mm

1.5 Marking

Every BZS has a marking applied to the rear side of its housing. The marking contains the name of the device, its decimal number, factory number, the year and quarter of production, and conformity marks.

1.6 Packaging

The BZS along with accessory kit and operation documentation is packed in a separate cardboard box.

2 Intended Use

2.1 Operating Restrictions

The BZS shall be operated in areas protected against exposure to atmospheric precipitation and mechanical damage. The BZS design doesn't provide its operation in explosion and fire hazardous premises.

2.2 Preparing for Use

2.2.1 Safety Rules:

Sources of danger in the BZS are current-carrying circuits connected to the 230 V mains.

2.2.1.1 Safety Precautions:

a) Check the BZS grounding.

b) Be sure the fuse is good and of proper rating.

c) It is prohibited to open the BZS without previous shutting off from the mains.

While operating, the BZS shall be grounded for the purpose of electric shock protection. Protection Class I as per GOST R IEC 60950-2002.

2.2.2 Design

2.2.2.1 The BZS poses a standalone device, with its PCB being placed within its housing. The housing consists of two parts: the top cover and the base, which the PCB board is attached to. There are input and output terminal blocks (XT1: "IN" and XT2: "OUT" respectively), two fuses, protection elements, and a LED indicator on the PCB board (see Figure 1).

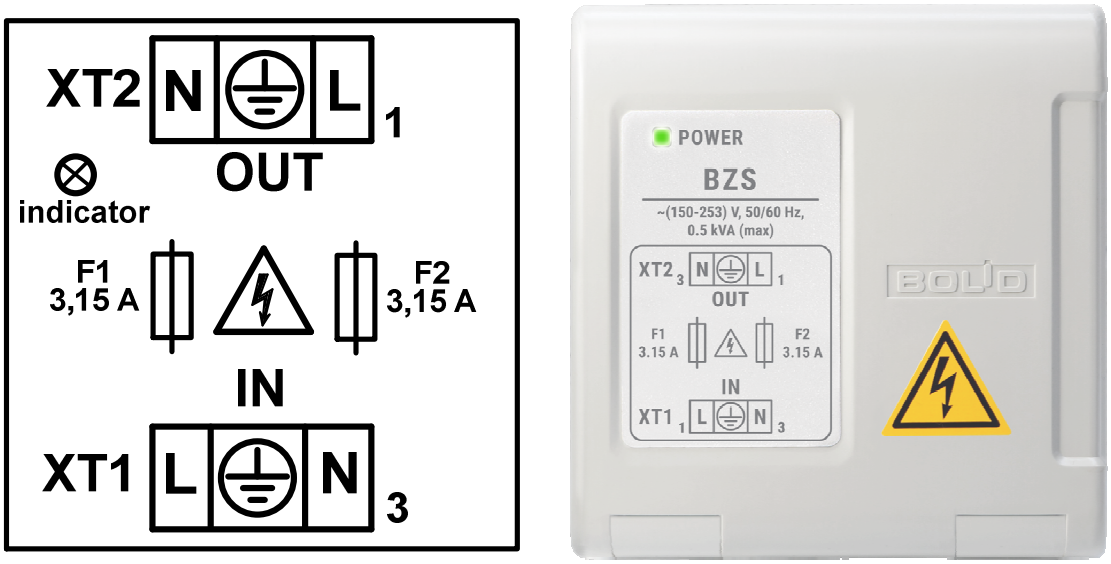


Figure 1

2.2.3 Mounting

2.2.3.1 Installation, mounting, and maintenance shall not be carried out until the equipment is disconnected from mains power.

2.2.3.2 Installation and maintenance shall be carried out by professionals qualified for Accident Prevention of Class III or higher.

The BZS parts carry dangerous mains voltage!
Operation with removed cover is prohibited!
It is prohibited to use fuses rated at more than 3.15 A and time-lag fuses for the BZS.
It is strictly prohibited to use homemade fuses!
Do replace fuses as well as connect and disconnect the load only when the 230 V mains power is off!
The BZS does not replace a residual current protective device!

2.2.3.3 The BZS is installed within mount boxes or other structures of secured premises at places protected against atmospheric precipitations, mechanical damage, and unauthorized access.

2.2.3.4 The BZS can be installed in two ways.

2.2.3.4.1 The BZS can be attached to a vertical surface. For doing so please ensure that the surface the BZS will be installed onto is solid, flat, clean, and dry. Apply the mounting template to the wall (see Annex A). Drill three holes: two upper holes and a lower one. Insert wall plugs to the holes and screw provided woodscrews to the two upper holes so that a distance between a screw head and the wall is about 7 mm. Remove the cover from the unit. Hang the unit on the two screws. Screw the screw into the bottom mounting hole and fasten the unit to the wall.

2.2.3.4.2 The unit can be installed on an Ω type DIN rail by means of a special mount on the housing base (see Annex A).

We recommend using "flat" wires for wiring. Maximum cross section of the wires is 1.5 mm².

It is not allowed connecting input 220 V lines to the XT2 terminal block "OUT"!

2.2.4 Wiring the BZS

2.2.4.1 Input lines 220 V ("L" for "Line", "N" for "Neutral"), grounding, and output lines for the protected equipment shall be connected as per Figure 1.

CAUTION!
While connecting mains power 220 V to the mains terminal block, one should observe polarity of coupling the circuits Line and Neutral. Connect the circuits as guided by the marking on the front of the housing or as shown in Figure 1.

The BZS parts carry dangerous mains voltage 220 V!

Operating the BZS with the removed front cover is prohibited!

Do replace fuses, connect and disconnect the load only when the 220 V mains power is off.

Do not use fuses rated at more than 3.15 A for the BZS.

It is strictly prohibited to use homemade fuses!

1) Connect the conductors Line (L), Neutral (N), and Earth (⏚) to the terminal block XT1.
2) Connect the load circuit to the terminal block XT2.
3) Verify the installation is performed properly.
4) Put the BZS housing cover on and fix it with the screw provided.
5) Apply mains power voltage to the input terminal block XT1.

2.3 Usage

To be admitted to work with the module, the personnel are obliged to have studied this manual and to have a certificate of verification of knowledge on safety regulations.

Warning! Prior to applying power, be sure the wiring is performed properly!

BZS protects connected equipment in the electric mains (~220 V 50 Hz) (see para 2.1) from high-voltage surge noise (noise of natural origin induced by lightning strokes and/or industrial noise from power switching devices) as well as from long-duration overvoltages above 253 V. The BZS board incorporates protective elements: varistors, a thyristor, a gas-filled spark gap. The BZS being connected to the AC line and output voltage being available (fuses being intact), the READY LED illuminates in green. When output voltage is not available (one or both fuses are blown, protection has been activated) the indicator is off.

2.3.1 Extreme Situation Actions

Warning!
If sparks, fire, smoke, or smell of burning is found at the installation site of the product, the product must be de-energized and sent for repair

Table 4 below represents the list of potential problems and remedies.

Table 4

Fault	Possible Cause	Solution
POWER LED fails to turn on	1) A failure with the fuse F1 and (or) the fuse F2 2) Poor contact in the XT1 terminal block 3) A fault of mains wires	1) Replace fuse F1, F2 2) Repair contact in XT1 3) Eliminate the fault
The device connected to the BZS fails to turn on	Poor contact in the XT2 terminal block	Repair contact in XT2

3 Maintenance

3.1 General

Maintenance works are to be carried out subject to a planned preventive strategy which provides annual scheduled maintenance.

3.2 Safety Precautions

The product shall be maintained by personnel qualified for the Electrical Safety of Level III or higher.

3.3 Maintenance Procedures

Annual maintenance works are carried out by a service company employee and include:

1) Visual checking of conditions (checking to ensure the BZS housing is intact);

2) Inspecting the BZS for being fastened properly and its connecting wires and contact joints for being in good conditions;

3) Checking operation of the LED;

4) Cleaning contact joints and the BZS housing from dust, debris, and corrosion spots.

3.4 Testing BZS Operability

The BZS is considered to be functioning properly, if it is connected to the AC mains, output voltage is available (fuses are unfaulty), and the READY LED illuminates with green.

3.5 Technical Examination

Technical examination is not applicable for this equipment.

3.6 Preservation

Preservation is not applicable for this equipment.

4 Repair

IMPORTANT!
The manufacturer accepts no claims unless a malfunction report is applied

4.1 An equipment fault resulted from consumer's not observing rules of mounting and operation is not a reason for claims and warranty repair.

Warning!
Removing the BZS's PC board from the housing automatically voids the manufacturer's warranty

4.2 Repair of faulty equipment is to be conducted by the manufacturer or in authorized repair centers. The product shall be sent for repair in compliance with Company Standard QMS 8.5.3-2015, which can be found online at our website https://bolid.ru/support/remont/.

Warning!
The equipment shall be submitted for repair being assembled and clean and along with all the parts listed in the documentation.
Claims are accepted only if a reclamation report describing the failure is applied to the submitted equipment.

4.3 An equipment fault resulted from consumer's not observing rules of mounting and operation is not a reason for claims and warranty repair.

4.4 Claims shall be submitted to the following address:

NVP BOLID, #4 Pionerskaya Str., Korolyov, Moscow Region, 141070, Russia

Phone: +7 (495) 775-71-55, E-mail: info@bolid.ru.

4.5 In case of any issue related to use of the product, please contact the technical support: +7 (495) 775-71-55 or e-mail to support@bolid.ru.

5 Storage

5.1 Storage in a transport container is permitted at ambient temperatures minus 30°C through plus 50°C and relative humidity up to 95% at plus 35°C.

5.2 Storage in the consumer package is permitted only in heated premises at temperatures plus 5 through plus 40°C and relative humidity up to 80% at plus 20°C.

6 Transporting

The product can be transported in a transport container at ambient temperatures minus 30 through plus 50°C and relative humidity up to 95 % at plus 35°C.

7 Disposal

7.1 The equipment is be disposed of considering that there are no toxic components in it.

7.2 The content of precious materials: doesn't require accountability for storage, retirement, and disposal (Clause 1.2 of GOST 2.608-78).

7.3 The content of non-ferrous metals: does not require accountability for retirement and further disposal.

8 Manufacturer Warranty

8.1 The manufacturer guaranties the product meets with technical requirements stated in the manuals if the user follows the instructions for transportation, storage, installation, and usage.

8.2 The warranty period is 18 months since putting the product into operation but no more than 24 months from the manufacturer's date of production.

9 Certification Information

9.1 BZS meets the requirements of technical regulations CU TR 004/2011 'On safety of low-voltage equipment', CU TR 020/2011 'Electromagnetic Compatibility of Technical Equipment' and is covered by the conformity declaration ЕАЭС N RU Д-RU.PA01.B.80479/21.

9.2 BZS meets the requirements of technical regulations EAEU TR 037/2016 'On restriction of the use of certain hazardous substances in electrical and electronic equipment' and is covered by the conformity declaration: ЕАЭС N RU Д-RU.PA01.B.82047/20.

9.3 BZS is a component of Intrusion and Panic Alarm System, which is covered by the certificate of conformity of transport safety technical arrangements with requirements for their functional properties No. МВД РФ.03.000971.

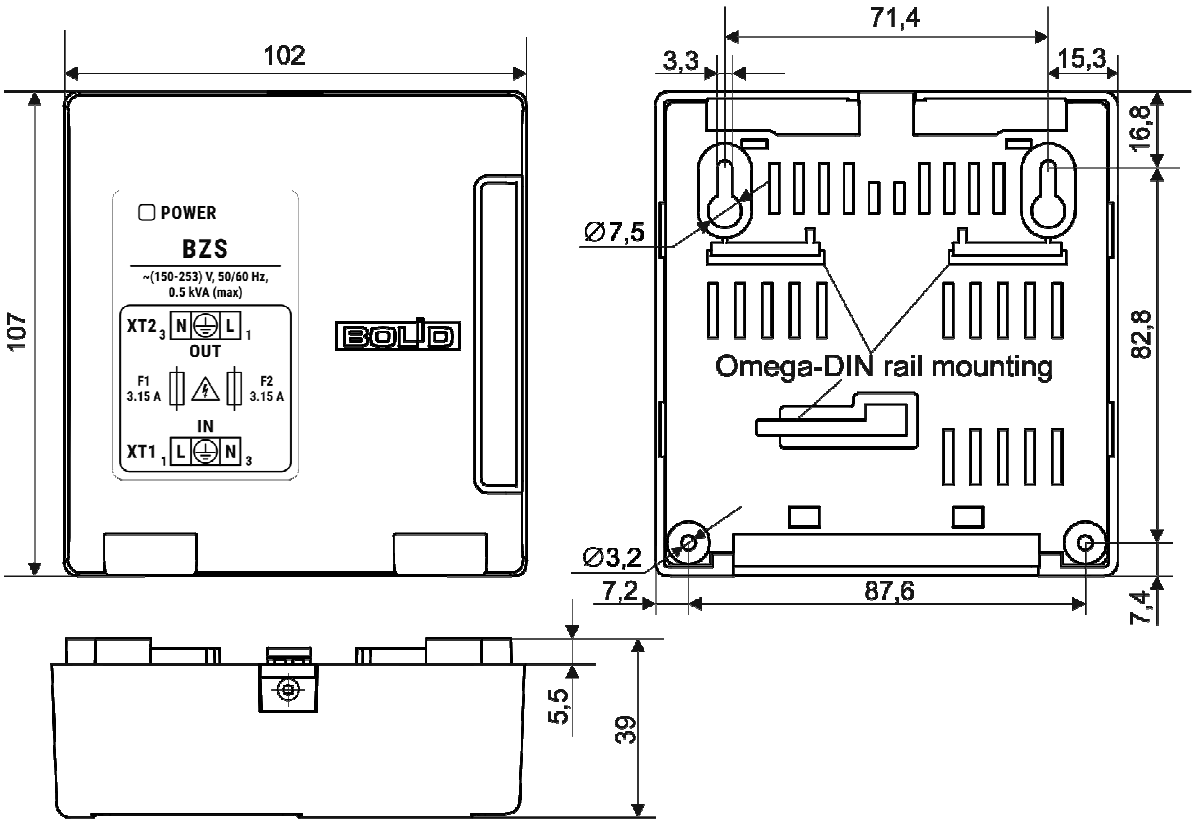
9.4 BZS is a component of Access Control System, which is covered by the certificate of conformity of transport safety technical arrangements with requirements for their functional properties No. МВД РФ.03.000972.

9.5 BZS is a component of Closed Circuit Television System, which is covered by the certificate of conformity of transport safety technical arrangements with requirements for their functional properties No. МВД РФ.03.000973.

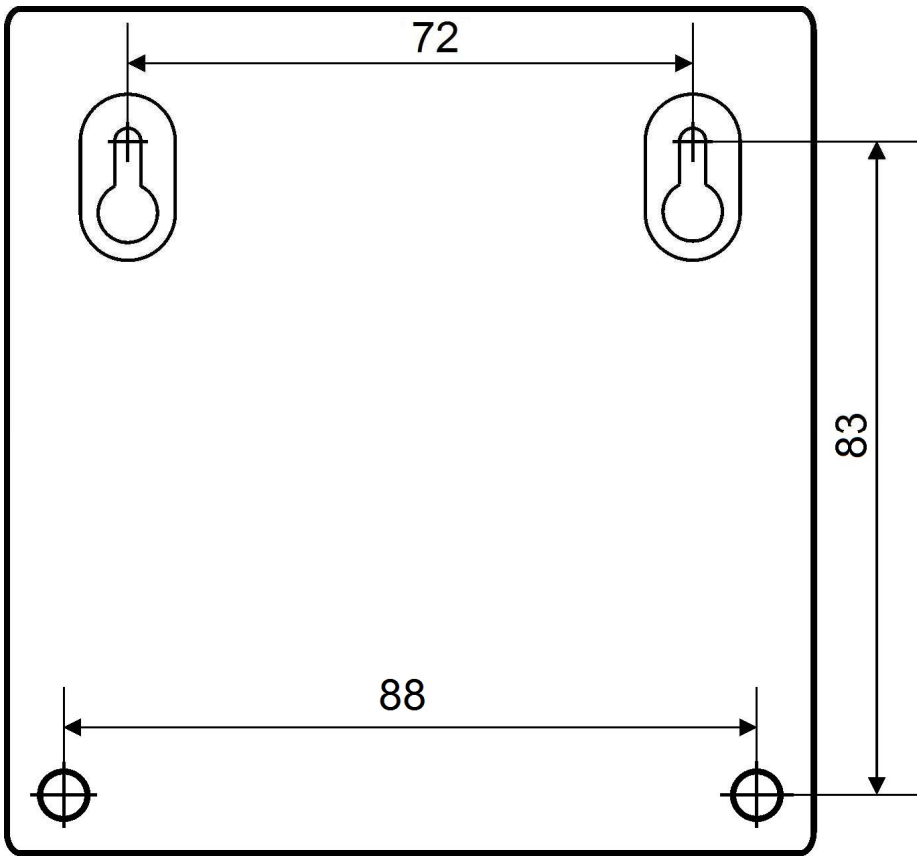
9.6 Production of BZS is awarded with the conformity certificate GOST R ISO 9001. The certificate can be found online at the website http://bolid.ru in Section «About Company».

Annex A

Overall and Mounting Dimensions



Wall Mounting Template:



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