

MARINE HEATERS

UT-S, UT-C

Operating manual

TABLE OF CONTENTS

INTRODUCTION	3
1 DESCRIPTION AND OPERATION OF THE PRODUCT	4
1.1 Description	4
1.2 Technical specifications	4
1.3 The Product's structure and operation.....	5
1.4 Measurement tools, instruments and appliances	7
1.5 Marking and sealing	7
1.6 Packaging	7
2 INTENDED USE.....	8
2.1 Operational constraints.....	8
2.2 Preparation for the Product operation.....	8
2.3 Usage of the Product	9
3 TECHNICAL SERVICE OF THE PRODUCT.....	13
3.1 General instructions.....	13
3.2 Safety features	13
3.3 Maintenance routine	13
3.4 Preservation	15
4 CURRENT REPAIR OF THE PRODUCT.....	16
4.1 General description.....	16
4.2 Safety features	16
4.3 Current repair.....	16
5 STORAGE	17
6 TRANSPORTATION.....	18
7 DISPOSAL	19
8 WARRANTY	20
ANNEX A OUTLINE AND INSTALLATION DIMENSIONS OF THE PRODUCT	21

INTRODUCTION

This operating manual (hereinafter referred to as the OM) covers structure, construction, specifications of Marine heaters type UT-S, UT-C (hereinafter referred to as the Product), its components and instructions required for the Product's correct and safe operation (intended use, technical service, current repair), as well as disposal information for its components.

Only those who have read operational documentation shall be permitted to operate the Product.

Only those who have had general education in the area of electronic devices and read operational documentation shall be permitted to provide the Product's service.

TERMS AND ABBREVIATIONS

CL	Check list
OM	Operating Manual
TS	Technical service
TS-1	Semi-annual technical service
TS-2	Annual technical service
TEH	Tubular electric heater

1 DESCRIPTION AND OPERATION OF THE PRODUCT

1.1 DESCRIPTION

The Product is designed to heat rooms on ships or waterborne vehicles of any navigating zone. The Product can also have an industrial application.

1.2 TECHNICAL SPECIFICATIONS

1.2.1 The Product has the following types:

- 1) UT-S – Marine electric convection heaters, stationary;
- 2) UT-C – Marine electric convection heaters, stationary, splash-proof.

1.2.2 Tables 1 и 2 describe main parameters and technical specifications of the Product.

Table 1 – Technical specifications of the UT-S

Parameter	UT-300S	UT-600S	UT-800S	UT-1200S	UT-1800S
	Value				
Input voltage, V AC, 50 Hz	127 (114.3 to 139.7); 220 (198 to 242); 380 (2 phase) (342 to 418)				
Power consumption, W	300	600	800	1200	1800
Heating capacity, m ³	7	14	19	27	42
Dimensions	see ANNEX A				
Weight, kg	7.8	7.8	10.0	10.0	10.5
Protection degree	IP22				
Operating temperature, °C	–15 to +55				
Limiting temperature, °C	–60 to +70				

Table 2 – Technical specifications of the UT-C

Parameter	UT-300C	UT-600C	UT-800C	UT-1200C	UT-1800C
	Value				
Input voltage, V AC, 50 Hz	127 (114.3 to 139.7); 220 (198 to 242); 380 (2 phase) (342 to 418)				
Power consumption, W	300	600	800	1200	1800
Heating capacity, m ³	7	14	19	27	42
Dimensions	see ANNEX A				
Weight, kg	7.8	8.3	10.0	13.3	18.4
Protection degree	IP44				
Operating temperature, °C	–15 to +55				
Limiting temperature, °C	–60 to +70				

Note – Table 1 and 2 describe approximate volume of heating; it depends on real operation conditions and thermal insulation characteristics of heated spaces.

1.3 THE PRODUCT'S STRUCTURE AND OPERATION

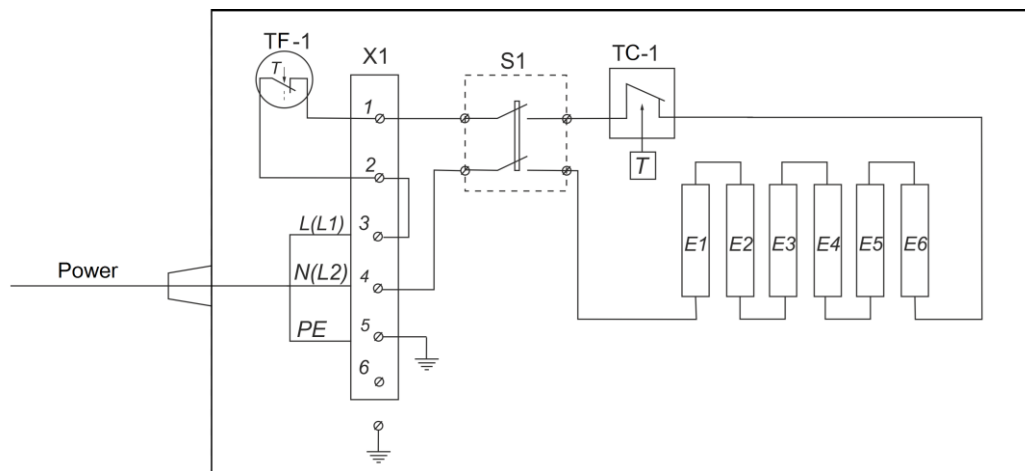
1.3.1 General description

TEHs, placed inside the Product (see Figures 1 and 2), heat the air causing natural convection within the heated spaces.

The Product is additionally equipped with:

1) capillary temperature controller (with adjustable threshold of actuation) TC-1, which temporarily switches TEH off, once air temperature reaches the preset one;

2) temperature fuse (sensor-relay) TF-1, which prevents the Product casing from overheating by disconnecting TEH power circuit.

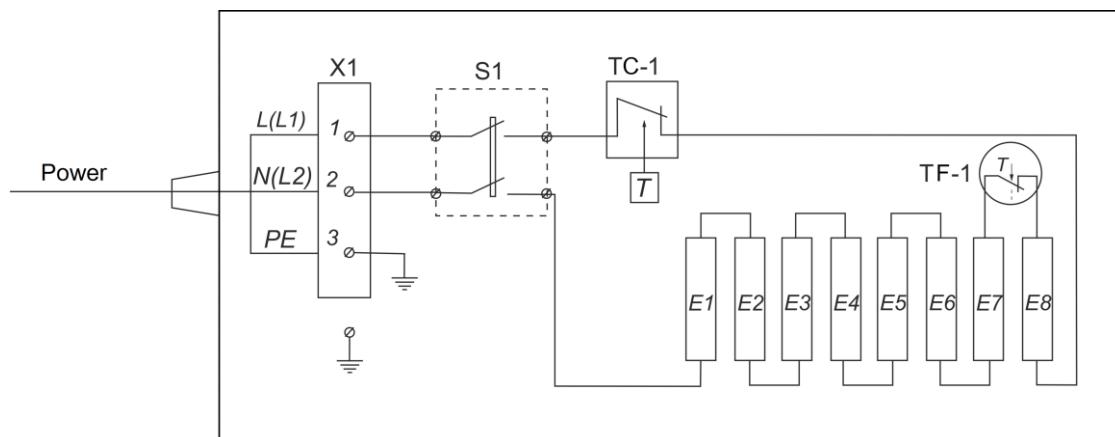


X1 – terminal block to connect power supply network (127; 220; 380 V AC);

S1 – power breaker (switch); E1–E6 – TEHs

Figure 1 – Structural diagram of the Product, UT-S type

Note – TEHs E1–E2 are installed on UT-300S, UT-600S and UT-800S types, E1–E4 –UT-1200S types, E1–E6 – UT-1800S type.



X1 – terminal block to connect power supply network (127; 220; 380 V AC);

E1–E8 –TEHs; S1 – power breaker (switch)

Figure 2 – Structural diagram of the Product, UT-C type

Notes

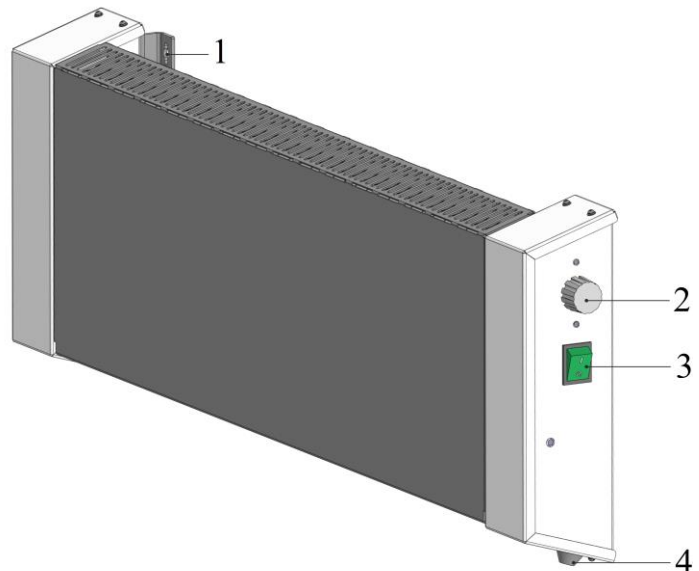
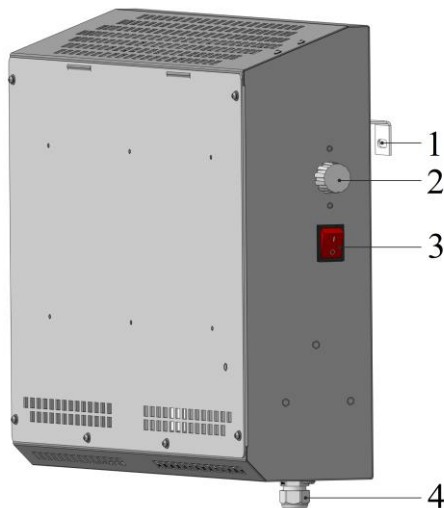
1 TEHs E1–E8 are installed on UT-300C, UT-600C, UT-800C and UT-1200C types, E1–E4 – to heaters UT-1800C type.

2 TEH power of UT-1800C type is higher than others, therefore number of TEHs is smaller.

1.3.2 Controls and indication

The following controls and LEDs are located on the Product casing:

- knob of temperature controller TC-1 (see 1, figures 3, 4) to set required air heating temperature;
- power piano type on/off switch (see 3, figures 3, 4) with an integrated LED displaying Product operation.



1 – mountings (4 pcs.), 2 – knob of temperature controller TC-1,
3 – power piano type on/off switch, 4 – cable gland

Figure 3 – The Product, UT-S type

Figure 4 – The Product, UT-C type

1.4 MEASUREMENT TOOLS, INSTRUMENTS AND APPLIANCES

Table 3 describes tools and consumables required for the TS of the Product.

Table 3 – Number of consumables required for the TS

Name and identifier of consumables	Weight of consumables	Note
Cleaning cloth	0.10 kg	1 To clean surfaces and parts of the device – use clean cloth 2 To clean severe contamination – use alcohol-soaked cloth
Rectified hydrolytic technical ethyl alcohol	0.01 l	To soak cloth while removing contamination
Varnish AK-113	0.05 kg	To cover surfaces of the device in case of paint coating damage
Abrasive cloth	0.06 x 0.06 m	To polish surfaces of the device in case of paint coating damage

1.5 MARKING AND SEALING

The Product has a nameplate where a user can find a serial number, date of manufacturing, weight, IP rating, rated input voltage and power consumption.

Sealing of the Product is not provided.

1.6 PACKAGING

When delivered, the Product is wrapped in stretch-film and placed in corrugated cardboard box with foam plastic placed on each side, ensuring the Product transportation and storage at warehouse.

Transport packaging is also used as a returnable packaging for transportation of the Product to the place of repair and back.

Packaging sealing is not provided.

2 INTENDED USE

2.1 OPERATIONAL CONSTRAINTS

Select a place for the Product's installation according to the operational limitations (operating temperature and protection degree).

Caution!

Installation site of the Product must not be less than 1 m from a magnetic compass!

2.2 PREPARATION FOR THE PRODUCT OPERATION

2.2.1 Safety features

While preparing the Product to operation, observe it and make sure there is no mechanical damage.

Connect the Product to the power mains only considering input power requirements.

The Products must be switched off and grounded before connection.

The staff shall follow «The technical rules for operation of electric installation» and «Safety rules for operation of electric installation» while testing electrical circuits and insulation resistance.

2.2.2 Visual check procedure

Before switching the Product on, the staff shall:

- observe visually the cable integrity and initial position of the controls on the front panel;
- clean front panels by clean soft cloth, if necessary;
- check fail-safe cable connections to the Product and grounding.

2.3 USAGE OF THE PRODUCT

2.3.1 Installation and mounting

Select an installation place providing free access, connection of cables and termination of cable ends in accordance with the overall dimensions, see ANNEX A.

The Product should be mounted on a vertical bulkhead inside the ship.

Caution!

Install the Product only vertically in order to avoid cyclical transition to mode of overheating protection and to ensure natural convection!

Install the Product vertically; the panel with control elements shall be on the right-hand side.

When mounting, leave not less than 70 mm free space from the top and bottom of the Product to ensure air circulation.

The Product UT-S type may be installed in spaces with increased humidity; the Product shall be grounded.

Caution!

Do not install the Product in the strong draught, it may impede heating and temperature control!

2.3.2 Installation of UT-C type

Install the Product on vertical surface according to drawings in Annex A. It is not necessary to take off the front panel.

2.3.3 Installation of UT-S type

The installer shall:

- 1) take off the front panel (see Figure 5), and unscrew four mounting brackets inside the casing on the rear side (see Figure 6);

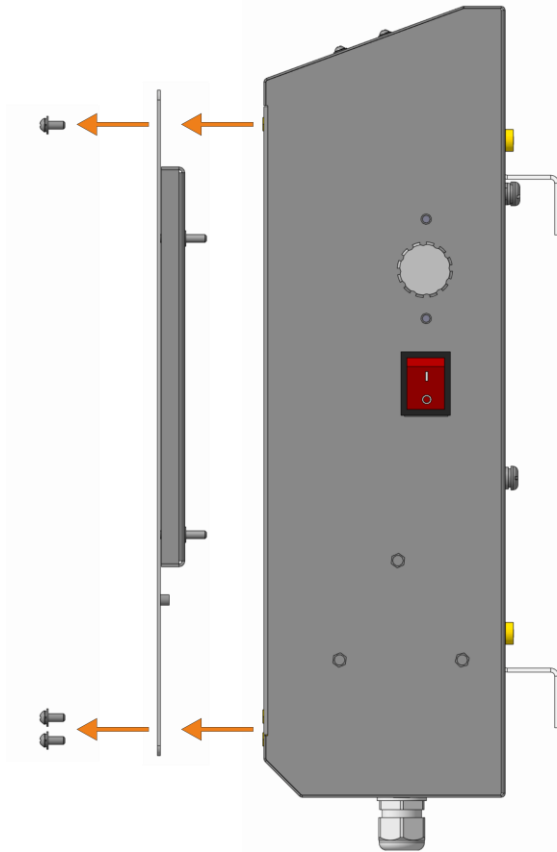


Figure 5 – Take off the front panel

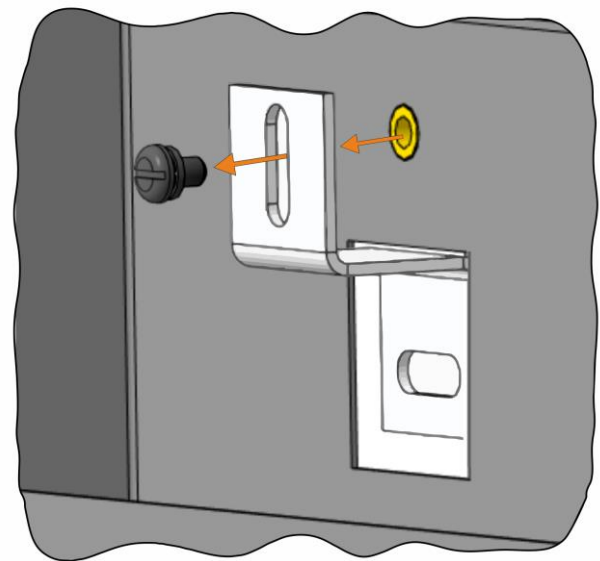


Figure 6 – Unscrew mounting bracket

- 2) screw mounting brackets onto the vertical surface using standard screws according to Figure 7;

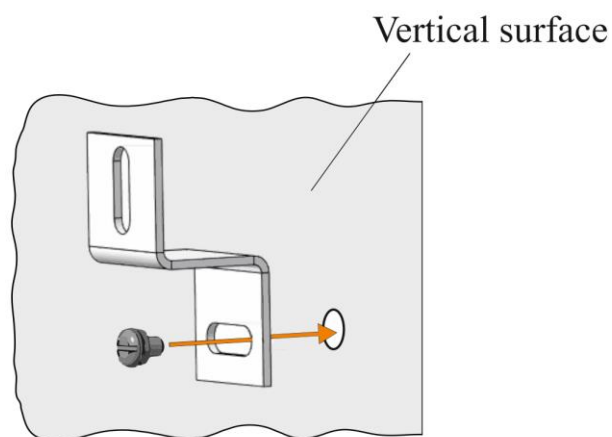


Figure 7 – Screw mounting brackets onto the vertical surface

3) hinge the casing onto the brackets and tighten the screws (see Figures 8, 9).
Mount the casing on the vertical bulkhead and check that the mounting is reliable;

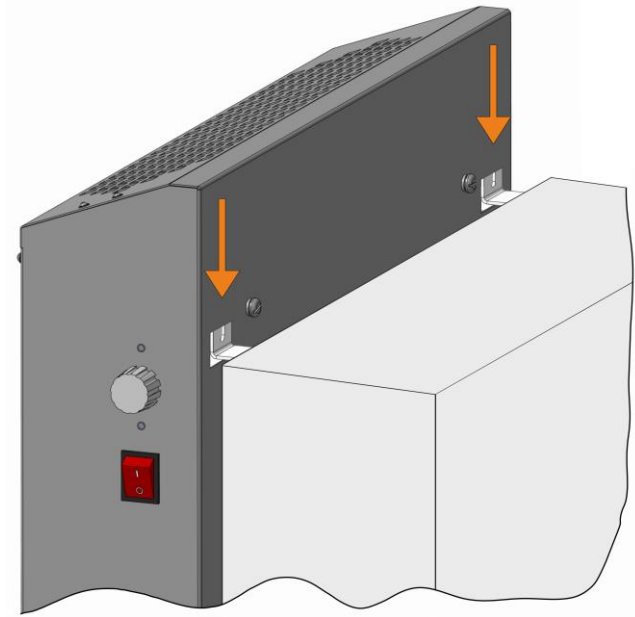


Figure 8 – Hinge the casing onto the brackets

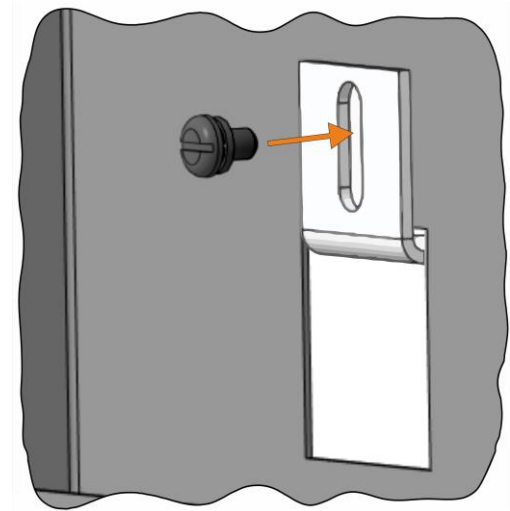


Figure 9 – Screw the casing onto the brackets

- 4) provide all necessary connections (power supply and grounding);
- 5) install the front panel (see Figure 10).

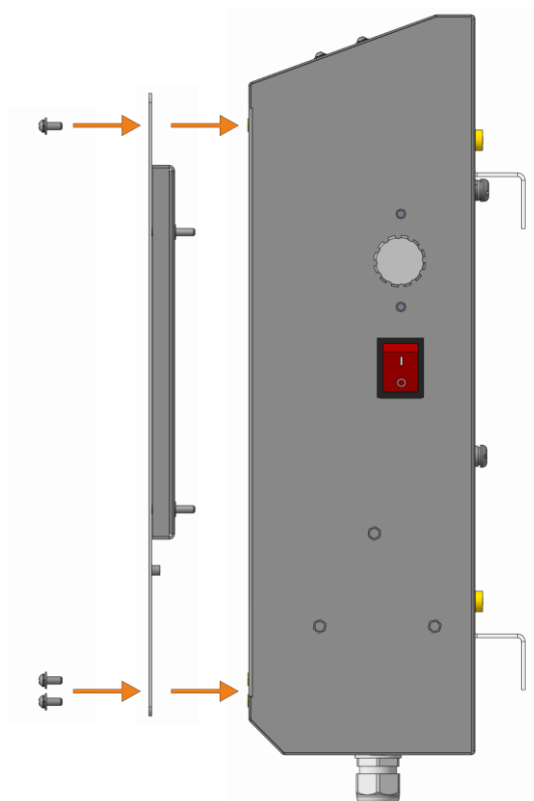


Figure 10 – Install the front panel

2.3.4 Connection

Connect the Product in compliance with the diagrams in Figures 1 and 2.

Connection terminal is located at the bottom – for UT-S type (see 4, Figure 3), at bottom on the right-hand side – for UT-C type (see 4, Figure 4). Remove the panel to connect the cable.

Power cable is led through the cable gland located at the bottom part of the casing.

Caution!

Ground the Product before power supply! Using ungrounded Product is strictly prohibited! Protective wire shall be connected to the screw marked with grounding sign

2.3.5 Cable requirements

Connect electric power supply to the Product using three-core cable with core section 2.5 – 4.0 mm².

2.2.3 Switching the Product on instructions

While connecting the Product and preparing it for operation follow the steps below:

- make sure that power mains voltage conforms with input voltage requirements;
- transfer circuit breakers of main power switchboard to «OFF position»;
- connect the Product (see 2.3.4);
- transfer circuit breakers of main power switchboard to «ON» position;
- transfer piano type switch «On/Off» to «On» position;
- check operation of integrated LED on the piano type switch;
- using control knob on the casing set up required heating temperature (0°C to +40°C).

Note – Heating elements at the first heating (use) may emit foreign smell which will disappear after some time passed.

To switch the Product off: transfer piano type switch «On/Off» to «Off» position, and then transfer switchboard circuit breaker to «Off» position.

3 TECHNICAL SERVICE OF THE PRODUCT

3.1 GENERAL INSTRUCTIONS

Only qualified staff familiarized with the System composition, structure and operation features shall perform the TS.

In order to provide safe and reliable operation of the System, the staff shall maintain TS-1 and TS-2.

TS-1, TS-2 shall be provided on the equipment in operation/running.

To ensure fail-safe operation of the Product, heat it up for 3 hours under the rated voltage in the beginning of use and at times during operation.

3.2 SAFETY FEATURES

While providing TS the staff shall follow instructions, see 4.2. Amount of consumables required for TS is shown in Table 3.

3.3 MAINTENANCE ROUTINE

The list of works for all types of the TS is given in Table 4. Maintenance routine procedure is given in the CL, represented in Tables 5 и 6.

Table 4 – The list of the TS works

CL №	Name of work	TS type	
		TS-1	TS-2
1	Visual check of the Product	+	+
2	Product operation test	–	+
1 «+» – work is obligatory. 2 «–» – work is not required.			

Table 5 – CL № 1. Visual check

To be done	Routine	Man-hours per 1 Device
Visually examine the Product	<p>1 Check completeness and appearance of the Product; mechanical damage, paint defects must be absent; legends shall be read easily;</p> <p>2 Clean all surfaces by clean cloth;</p> <p>3 Remove severe contamination, parts of corrosion, oil spots:</p> <ul style="list-style-type: none"> – from metal surfaces: by suds, avoiding its penetration inside the device; all surfaces clean dry by clean cloth and dry up; – from LED: by alcohol soaked cloth. <p>Do not use hard cloth, paper, glass cleaning liquids or chemicals; Do not press hard on the surface while cleaning; Do not spray liquid directly to the surface of the Product;</p> <p>4 In case of varnish damage clean it with abrasive cloth, then alcohol soaked cloth, cover with varnish AK-113 and let dry</p>	<p>1 person 5 minutes</p>
Check reliability of cable connections and grounding buses	<p>1 Make sure that connectors and attaching screws are fastened tight, provide further fastening if needed;</p> <p>2 Check integrity (no mechanical damage) of leading cables which are visible</p>	<p>1 person 5 minutes</p>

Table 6 – CL №2. The Product's operability check

To be done	Routine	Man-hours per 1 Device
Check operation of the Product	<p>1) switch the Product on;</p> <p>2) check operation of piano type LED and heating of casing</p>	<p>1 person 5 minutes</p>

3.4 PRESERVATION

The Product and set of operational documents are stored in preserved condition in Manufacturer's packaging boxes.

The time of represervation – 2 years from the Manufacturer's commissioning.

The represervation is done in heated rooms in the same order as the preservation.

The represerved Product, SPTA kit and documents are placed in package. The time of storage – 2 years.

4 CURRENT REPAIR OF THE PRODUCT

4.1 GENERAL DESCRIPTION

Control the Product operation by LED integrated in piano type switch.

To provide diagnostics of the problems, see Table 7.

If trouble shooting cannot be provided, contact manufacturer's service center.

4.2 SAFETY FEATURES

Only qualified personnel, examined in occupational safety may perform repair works.

The Product must be grounded before repair works.

Replacing defected parts, cards and modules when power of device under repair is ON is **STRICTLY PROHIBITED**.

It is **PROHIBITED** to put a poster «DO NOT switch on! Under Operation!», when power supply switch is in OFF position.

Installation, commissioning and repair works are **PROHIBITED** in the room, where less than 2 people present.

4.3 CURRENT REPAIR

The service personnel can provide repair works as given in Table 7.

All other defects shall be carried out only by the Manufacturer's specialists or the Manufacturer's representatives.

Table 7 – Possible problems / defects and troubleshooting

Problem / defect	Possible reasons	To do
No operation of piano type switch LED (power supply is on)	Connection cable is not intact	Check power cable connection to the Product
	TEH malfunction	Replace TEH from SPTA kit

5 STORAGE

The Product must be stored in packaging inside areas complying with the required storage conditions (+5°C to +40°C) with the concentration of dust, oil, moisture and aggressive impurities in the air within the required limits for the working areas of production facilities.

After storage or transportation of the Product below +10°C, it must be unpacked only in heated premises and left in normal climate conditions for 12 hours beforehand.

6 TRANSPORTATION

The Product must be transported in the Manufacturer's transportation package in closed means of transport.

Types of shipment:

- motor vehicle and railroad transportation in closed means of transport (covered cars, multipurpose containers);
- air transportation (in sealed and heated compartments);
- sea transportation (in dry service spaces).

The Product must be transported in compliance with transportation rules applicable for each means of transport.

During loading/unloading operations and transportation, the requirements indicated on warning labels on the boxes/packaging must be observed, and no impacts are permitted since they can affect the safety and performance of the Product.

Inside the means of transport, the packed device must be firmly secured/fastened.

7 DISPOSAL

New equipment, the parts of the Product damaged during operation, and any outage equipment must not be disposed as standard household wastes, since they contain the materials suitable for re-use.

Decommissioned and non-used components of the Product must be delivered to a special waste disposal center licensed by local authorities. You can also send an over-age equipment/unit to the manufacturer for its further disposal.

Proper disposal of Product components allows avoiding possible negative environmental and health impacts, and it also allows for proper restoration of components with substantial energy and resources saving.

During operation and upon completion of its service life, the equipment is not hazardous for health and environment

This unit must be disposed according to the rules applied to electronic devices



Any products marked with a crossed trash bin must be disposed separately from standard household wastes

8 WARRANTY

The Manufacturer is under warranty obligations in case of correct System exploitation according to the OM. The Manufacturer will not consider damage claims in case of violation of operating conditions.

More information about warranty terms you can find on the official site of «NPK MSA» LLC, section *Support*.

Address and contacts of the Manufacturer's service centre:

«NPK MSA», LLC

26E, Kibalchicha str., 192174, St Petersburg, Russia

Tel.: + 7 (812) 602-02-64, 8-800-100-67-19

fax: +7 (812) 362-76-36

e-mail: service@unicont.com

ANNEX A

OUTLINE AND INSTALLATION DIMENSIONS OF THE PRODUCT

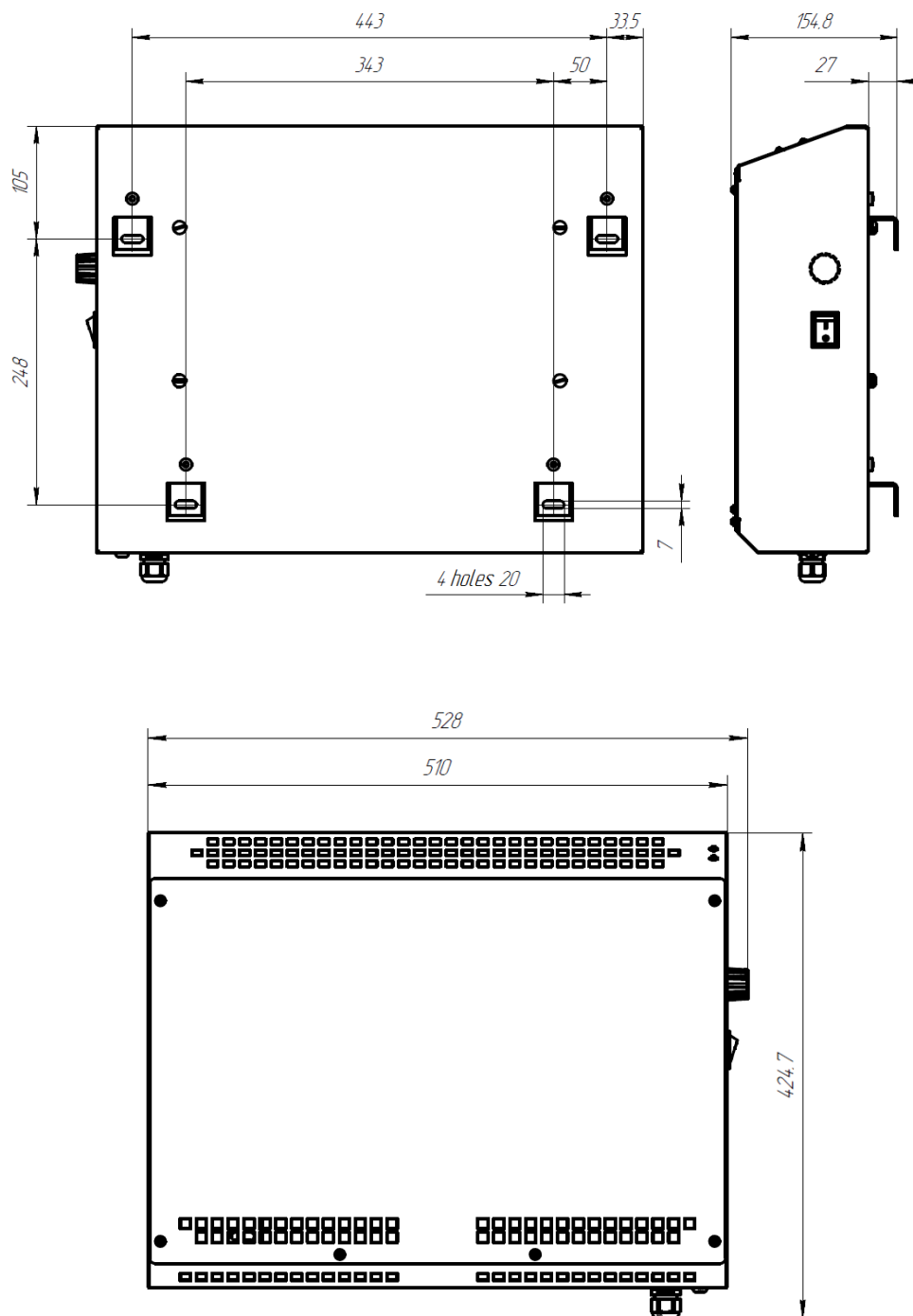


Figure A.1 – Overall dimensions of the UT-S

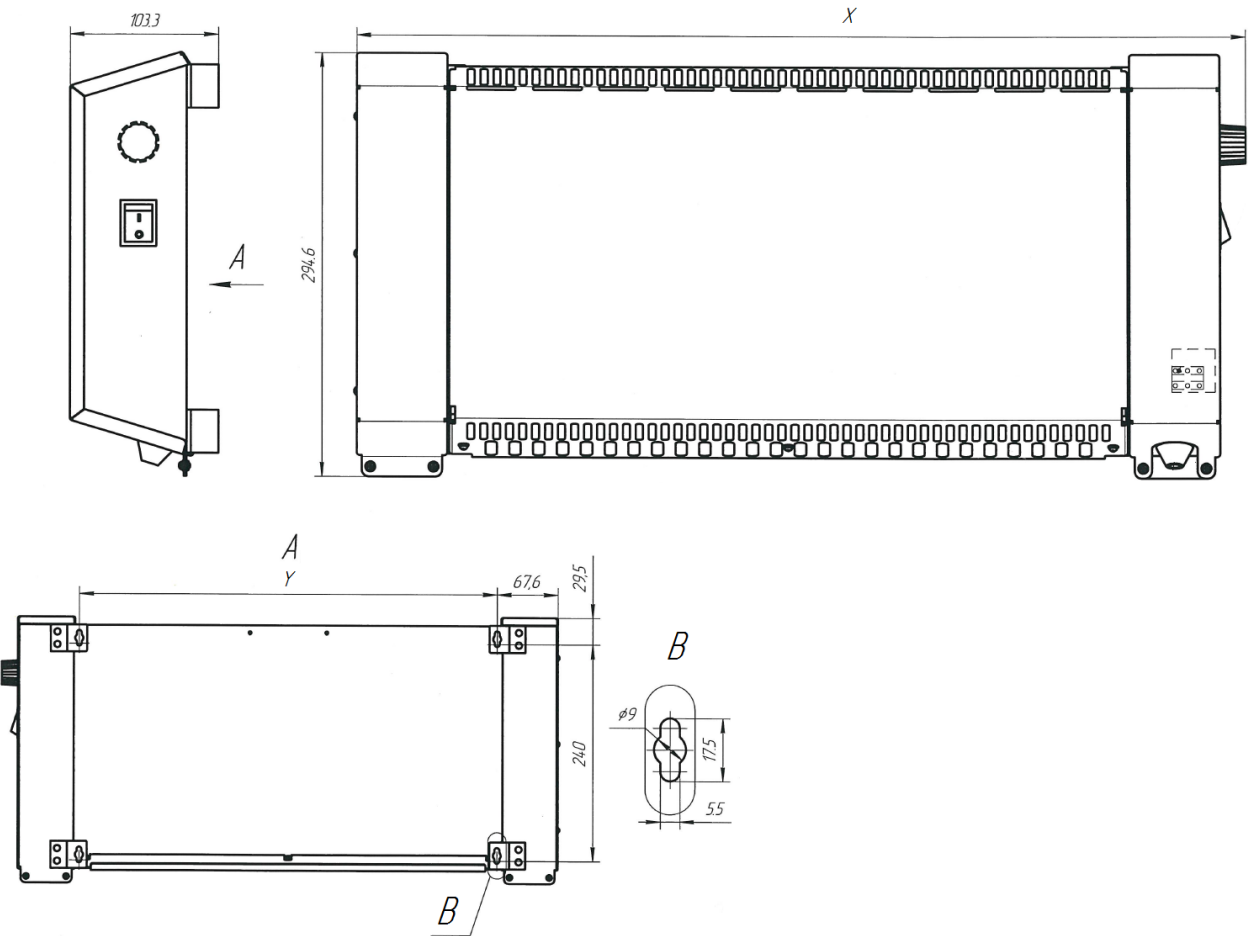


Figure A.2 – Overall dimensions of the UT-C

Table A.1 – Overall dimensions of the UT-C

Type	X, mm	Y, mm
UT-300C	416.6	264.9
UT-600C	516,6	364.9
UT-800C	616.6	464.9
UT-1200C	846.6	694.9
UT-1800C	1162.6	1010.9

FOR NOTES