Heating devices Local Modular Automated Heating Systems
SOLMA

User Manual
2.469.025 NE

PJSC "ROSTOK COMPANY"
Kyiv
2022

Ver. 3.07

WARNING!

Only buy SOLMA heaters from the manufacturer or its regional representatives

When buying, check the completeness, appearance of the device, the correctness and completeness of the coupons of this manual

In case of violations of the rules of installation and operation set out in the instructions, as well as the absence of appropriate marks in the coupons, the warranty is terminated and the repair is carried out at the expense of the owner

Content

This operating manual provides basic information about the operation of the heating system of the local modular automated SOLMA (short name - device), a description of its design, the sequence of installation, connection, and methods of adjustment. A description of possible faults and recommendations for their elimination are given. Appendices to this guide are available on the manufacturer's website solma.com.ua. Read these instructions carefully before installing and commissioning the device, as the correct installation, adjustment and maintenance of the device will ensure its safe and trouble-free operation for a long time. Follow the instructions in this manual and keep it for future reference.

1 General instructions

1.1 The SOLMA heating device is intended for heat supply of the rooms equipped with heating system with forced circulation of the heat carrier. The internal excess pressure of the coolant in the system is not more than 0.2 MPa (2 at). The minimum gauge pressure in front of the circulation pump (support) is 0.01 MPa (0.1 atm). The pre-pumping pressure of the membrane expansion tank should be 0.02 - 0.03 MPa above the pressure at the inlet to the tank. The capacity of the circulation pump is not less than 0.5 m3 / h and is set depending on the power of the device and the conditions of use.

1.2 It is recommended to operate the device in rooms with the following limiting climatic parameters:

atmospheric pressure - 84 ... 107 kPa (630 ... 880 mm Hg);
temperature plus 5 ... 40 o C;
relative humidity - 80% at 25 o C.

There should be no dust in the room air, as well as aggressive and flammable gas and steam.

1.3 During the operation of the device it is necessary to regularly monitor its operation. Do not allow the installation of the device on objects where there are no people who periodically monitor the condition and operation of equipment.

1.4 The device is manufactured by PJSC "COMPANY ROSTOK" (hereinafter - the manufacturer) The manufacturer has a certificate of conformity for the device № UA.11.006.00158-21 (valid until 29.11.2022).

Declaration of conformity as required by the directives EC Directive 2014/35/EU and Directive 2014/30/EU available at the link http://solma.com.ua/p/docs/DoC_001_2022.pdf.

1.5 The structure of the conditional cognition of the device consists of nineelements:

SOLMA-1-2-3-4-5-6

The element cognition	Parameter naming	Possible meanings	Opis
1	Capacity of the device, kW	3; 4; 5; 6; 7,5; 9; 12; 15; 18; 50*	
2	Number of phases elektrozhivlennya	1	Single-phase
		3	Triphasne
3	Nominal voltage Electric power supply, V	220	~220 B
		380	~380 B
4	Acoustic noise level regulating apparatus	N	Low
		B	Silent
5	Number of heating steps	-	one step
		2S	two steps
		3S	three steps
6	Circulation pump capacity and type of power	-	1-phase pump up to 120 W
		N1/0,8	1-phase pump up to 0.8 kW
		N3/4**	3-phase pump up to 4 kW

* - appliance 50 kW - only 3-phase ~380 V.

** - 3-phase pumps are used only for appliances with a capacity of 50 kW

The application of the conditional designation of the heating device with a nominalcapacity of 50 kW for a nominal voltage of 380 V, three-phase, single-circuit:

SOLMA-50-3-380-N.

Application of the conditional designation of the device with a nominal power of 9 kW for 220 V nominal voltage, three-phase, three-stage with the possibility of controlling a 1-phase pump up to 0.8 kW:

SOLMA-9-3-220-3S-N-N1/0,8

1 Technical specifications

2.1 Enterprise-manufacturer produces electric heaters SOLMA wall mount devices of the following nominal capacities: 3; 4; 5; 6; 7,5; 9; 12; 15; 18; 50 kW. General view of the devices is shown in Fig.1.

2.2Electric power supply of the devices is carried out from the mains with a nominal voltage of 220V or 380V with a tolerable deviation of +5%, to minus 10% with a frequency of 50Hz. The efficiency of the devices is not less than 98%.

2.3Overpressure of heat in the system - not more than 0.2 MPa.

2.4 According to the number of heating stages, the devices have one-, two- and three- stage operation.

In addition, the heating system can consist of one to nine units, thus providing one, two, three, four or five heating power levels. The large-stage heating system consists of the main device - the first stage heater - and additional devices.

The thermostat of the device automatically switches on additional heating stages if the capacity of the interrupted stages is not enough to heat the heat carrier atthe set heating speed. The optimum heating rate is set by the installer during commissioning ofthe system.

2.5 Dimensions of the devices: width x depth, not more than 140 x 140 mm, height andinstallation size are shown in Table 1.

Dimensions of the single-phase temperature controller: 210 x 200 x 150 mm, three-phase devices: 320 x 390 x 160 mm.

2.6The maximum temperature of the heated heat carrier is 80^{O} C. Temperature ofemergency shutdown does not exceed 90^{O} C.

Control range of the temperature of the heating circulation is

$15...60^{O}$ C.Temperature control range of the heated room is

$5...50^{O}$ C.

2.7 The thermostat of the device provides automatic maintenance of the set temperature with the width of the shifting range of $1\text{-}6^{o}$ C. The optimum width of the baffle is automatically determined by the device or set by the user during commissioning.

2.8The device also provides the possibility to control the heating by means of an external thermostat, WiFi relay, GSM relay, etc. - See section 5.

2.9The heat exchanger of the device is made of high quality stainless steel.

2.10According to the level of acoustic noise during the operation of the controlling equipment, the devices have two functions that ensure low noise level or silent operation.

2.11The unit can be equipped with 3-way valves to organize additional heating circuits.

Dual circuit systems provide heating of two separate circuits, e.g. space heating and hotwater heating in a hot water boiler or space heating and heat accumulation in a heat accumulator.

2.12If equipped with the flow sensors (see section *3*), the devices provide for limitation of the consumed power to prevent exceeding the set power limit for each phase of electricity separately.

2.13The units can be equipped with a schedule function for the heating or a schedule function for the pump operation.

The low temperature program (*software*) maintains the temperature set by the user for the selected time intervals of each day of the month.

The features of the device with weekly heating program are shown in Section 6 and
appendix 1.

The low pressure pump program (*low pressure* package) ensures that the circulation pump is switched on andoff at the time set by the user for each day of the day. When thecirculation pump is switched on, the heating is not performed.

The special features of the device with weekly pump programming are shown in
appendix 2, which is used for the *FN* devices.

2.14The units are available in G1 connection sizes. The possibility of connecting pipesof other diameters is ensured by equipping the device with suitable transition fittings. (See Section *3*) Flanged connections are provided for pipelines 100 mm in diameter andlarger.

2.15Basic technical data of the devices are shown in Table 1.

2.16The power of the circulating pump, which can be operated by the unit indirectly - not more than 120 W for one- or two-stage units, and 800 W for three-stage units.

2.17The average operating time is 30 years.

2.18The CR2032 backup battery has a life of at least 3 years.

2.19The device is made with the protection level of class I (with grounding latch).

2.20Protection stages of the protective cover of the device IR43 with a closed hinged crate, and IR30 with an open crate.

2.21The instruction may not reflect minor design changes of the device made by the manufacturer after this instruction was issued.

Table 1

Parameters and characteristics	SOLMA single-phase modifications				
	3-1-220	**4-1-220**	**5-1-220**	**6-1-220**	**16-1-380**
Voltage supply, V	**1 x 220**	**1 x 220**	**1 x 220**	**1 x 220**	**1 x 380**
Consumable capacity, kW:	3	4	5	6	16,5
Circulation pump productivity, m3/year, not less	0,7	1,0	1,5	1,5	3,5
Weight, kg, not more	4,5	4,5	5	6	10
Dimensions: height of the low-noise heating unit, mm, not more:	489	544	554	564	1115
height of the silent operation heater, mm, not more:	464	464	586	586	-
Installation size for low-noise (H), mm	375	375	497	497	1070
Installation size for silent operation (H), mm	420	420	542	542	-
Overlap of copper core cables, mm2, not less	2,5	2,5	4,0	4,0	10,0

Continuation of Table 1

Parameters and characteristics	SOLMA triphasic modifications								
	4-3-220	**5-3-220**	**6-3-220**	**7,5-3-220**	**9-3-220**	**12-3-220**	**15-3-220**	**18-3-220**	**50-3-380**
Voltage supply, V	**3 x 220**	**3 x 220**	**3 x 220**	**3 x 220**	**3 x 220**	**3 x 220**	**3 x 220**	**3 x 220**	**3 x 380**
Consumable capacity, kW:	4	5	6	7,5	9	12	15	18	50
Productivity of the circulation pump, m3/year, not less than	1,0	1,5	1,5	1,5	2,0	2,5	3,0	3,5	6,0
Weight, kg, not more	4,5	5	6	7	7	8	10	10	30
Dimensions: height of the low-noise heater of the execution, mm, not more:	594	644	564	814	1024	1179	1224	1115	1115
height of the silent heater of the execution, mm, not more:	464	586	586	610	746	884	1007	1160	-
Installation size (H) for Low-noise operation, mm	375	497	497	520	657	795	918	1070	1070

Installation size (H) for silent operation, mm	420	542	542	565	702	840	963	1115	-
Overlap of copper cable worms of the power supply, mm2, not less	2,5	2,5	2,5	2,5	2,5	2,5	4,0	4,0	16,0

3 *Completeness*

3.1 The delivery set according to the order includes:

- SOLMA heating device with thermostat
- Additional heating devices for large-stage systems
- additional contactors depending on the type, capacity and number ofcirculation pumps
- Case, wall-mounted or floor-mounted, or wall-mounted elements
- set of transition fittings and fittings
- Clamping devices and cables for installation of the device
- temperature sensor of the heated room
- 3-way valves for large circuit systems
- WiFi relay, external thermostat, GSM adapter - according to order
- Stream gauges for power-limiting systems

3.2 The scope of supply of the device is defined by the scope code

2469025- | P | P | N | N | H | C | F | R | S | A |

- Capacity,kW

[03; 04; 05; 06; 7,5; 09; 12; 15; 18; 50]

- Number of phases [1; 3]

A	*Additional contours*
0	- no additional circuits
1	+ contour +HVP
2	+ heat accumulator circuit

T	*Strum sensors*
0	Without jet sensors
1...3	1, 2 and 3 sensors

R	*Remote control*
0	Without dist. control
1	Drotovy thermostat
2	Radiothermostat
3	WiFi relay (Internet)
4	GSM Adapter

N	*Number of heating stages* (heaters)
1...4	1, 2, 3 or 4 heaters of the specified capacity
7 -	
8 -	
9	non-standard kitting to order

F	*Frame*
0	Without the hull
1	Wall-mounted case of the
2	Shafa on the plinth
3	Bracket for mounting on the
4	wall Non-supporting frame

H	*Permissible pump parameters*
0	1-phase pump, max. power up to 120 W
1	1-phase pump, max. power up to 2.6 kW
2	Three-phase pump, max. power up to 4.0 kW
3	1-phase pump, max. power up to 600 W
4	One 1-pump 2.6 kW per stage (C)
5	One 3-pump 4 kW per stage (C)

C	*Connection*									
	0	1	2	3	4	5	6	7	8	9
Ø	32 mm	40 mm	50 mm	63 mm	¾ HP	1" HP	1½" HP	2" HP	100 mm	-

3.3 For the convenience of the user, the SOLMA devices are divided into thefollowing categories:

Designation	*Name*	*Appointment and special features*	*appendix*
SAS	Solma Apartment Studio	For small-sized apartments of apartment houses: a complete set of heating system in the hinged decorative case. Minimum installation time.	5
SBX	Solma Box System	Complete set of heating system in the case for installation on a floor, or in a niche. Can be installed in public places. Minimum installation time.	
SIS	Solma Industrial System	Modular heating system for large industrial and residential premises with an area of 500 ... 5000 m2. Power of the module is 50 kW.	6
SHS	Solma Heat Storage	Modular system with storage tanks. When using multi-tariff accounting provides a significant reduction in heating costs.	8
SCS	Solma Compact System	The device of integrated execution in which the temperature regulator is combined with a heater - for a compact arrangement.	
SJS	Solma Joint System	Electric heating system for "parallel"of work with gas or solid fuel boilers	
SPS	Solma Pool System	For heating and filtration of water in swimming pools	3
STC	Solma Two-circuit System	Dual circuit system for heating and hot water supply	

3.4 The set that is supplied is presented in Table 2.

Table 2

	Name	Quantity
1	Electric appliance for heating SOLMA	1
2	Thermostat	1
3	Fitting G1" with coupling nut	
4	Fitting G1½" with coupling nut	
5	Clamp 1" 32-35 nut M8	2
6	Combined screw/screw 8/120	2
7	Dowel 10x50	2
8	Dowel with self-drilling screw 4 x 30 mm (for dissection)	4
9	Temperature sensor of the heated room MT5504-_____ (by order, length by order)	
10	Conductive cable with connection 5.501.001-__mm2-. _____ (length by order)	
11	Cable 5.501.002- (custom length)	
12	Cable 5.501.003- (custom length)	
13	Operating instructions	1
14	Pakuvalna tara	1
15	Wall-mounted housing	
16	Case - shafa	
17	Bracket for wall mounting 8.120.015	2

3.5 Cable products and other accessories required or the external connection of the device are not included in the scope of delivery.

4.1 The appliance is a stationary building, the conditions of safe operation of which must be ensured by the service personnel, who adhere to the requirements of the DDEOP 0.00-1.21-98 "Rules for Safe Operation of Consumers' Electrical Installations" and "Rules for Technical Operation ofConsumers' Electrical Installations" (TEC).

Caution! The electrical power supply equipment that powers the device must ensure that all poles of the power supply are switched on!

4.2 This device can be used by children from the age of 8 years and by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, they are under constant supervision or they have been instructed onhow to use the device safely and they understand the possible dangers.

4.3 The children are not obliged to be in the house.

4.4 It is forbidden to carry out maintenance and repairs of the device when the electric power supply is switched on.

4.5 Before turning on the power supply to the device, make sure that there is no danger to life or limb and check the integrity of the grounding conductorand the reliability of its contact with the grounding lug. Check the continuity ofthe power supply and its voltage.

4.6 The appliance must not be switched on unless it is filled with heating fluid when the appliance connection valves are closed and if the water in the appliance or the heating system is frozen. It is forbidden to use the heat carrier from the heating system for domestic use.

4.7 **Warning!** Disconnect the device from the electric power supply by using the automatic heating switch for the period of mothballing, troubleshooting, circulating pump interruption, and long periods of disconnection.

4.8 In order to exclude any damage to the efficiency and tightness of the heating appliance or the heating circuit with a possible increase of the internal pressure in case of emergency modes of operation, it is necessary to install in theheating system the safety devices - expansion tank and safety valve.

4.9 **Warning!** To prevent accidents, all works on installation, connection, repair and maintenance of the device must be carried out only by qualified specialists, who have the competence and authority to perform them.

5 Structure and principle of operation

5.1 The device consists of two units - a flow-through electric heater and a thermostat, which are installed separately and connected by an electric cable (see **illustration 1**).
The unit is mounted vertically on the wall and connected to the heating system (see **Fig. 2**). Connect the electrical leads of the device, circulation pump and flow switch (if available) to the appropriate terminals of the temperature controller.
WARNING! The use in the heating system of a circulation pump of the required efficiency (see Table 1) is mandatory.

5.2 The main components of the heater - heat exchanger of stainless steel with bar-mounted heating elements, thermal resistors, switching elements (if available), temperature sensors of the circulating and heated heat carrier - are located in the metal case. The device is fixed on the wall by means of clamps with brackets included in the set of the device.
5.3 The thermostat includes an automatic power switch for the circulation pump, an automatic power switch for the heater, a heater contactor, a remote temperature sensor for the heated room and a microprocessor controller. All elements of the thermostat are housed in a plastic housing with a hinged lid.
The ground clamp is located on the heater housing.

5.4 The principle of operation of the device is as follows. The cold heat carrier (e.g. water) from the heating system is supplied by the circulation pump through the supply pipe to the heat exchanger. Strick heating elements through the heat exchanger heat the heat carrier. The heated heat carrier is supplied to the heating system via an outlet pipe. The temperature of the heat carrier is monitored by temperature sensors installed in the heat exchanger. The flow of the heating medium is monitored by an external or built-in flow switch.
In addition to the automatic control of the temperature of the heat carrier by the own thermostat, the device provides the possibility of controlling the heat using an external thermostat, WiFi relay, GSM relay, etc. – contact the "software" on **the fig. 3**. When the "ON" contact of the external thermostat is closed, the unit heats the heat carrier, when it is open - the heat is disconnected. If the external thermostat is absent, the electrical column "software" should be short-circuited. Specifics of using external control devicesare described **in Appendix 4.**

5.5 Automatic control of the device operation is provided by the thermostat, which

performs the following functions:

- Maintaining the set temperature of the circulating heat carrier with automatic hysteresis detection
- Reduction of the temperature of the heated heat carrier at a safe level
- emergency switching off of the electric heater when the temperature is morethan +85^{O} C (for swimming pools - more than +60^{O} C)
- Maintaining the temperature in the heated room to an accuracy of 1^{o} C
- automatic shutdown of the pump in case of continuous absence of heat topreserve the resource of the pump
- preventing the pump from jamming when there is no heat for a long time(on the fly) by means of a periodic short-term insertion
- protection against overloading by excessive currents
- Dry run protection
- protection against freezing of the heating system
- Automatic reduction of the consumed power when the set power limit is exceeded by each phase of the power supply separately - if equipped with power sensors

6 *Preparation for work and order work*

6.1 The installation of the device, its connection to the power grid and the heating system (with the installation of a coarse filter before the pump), testing should be carried out by qualified professionals respecting all the rules of installation and operation.

Warning! Connection to the ground loop is mandatory**!**

Warning! The electrical switchgear from which the device is electrically powered must ensure that all power poles are opened!

Damage to the safety valve can lead to device failure during abnormal operation!

6.2 The device is fixed vertically on the wall with dowels, pins and clamps included in the kit and connected to the heating system. Recommended schemes of heating systems are shown in Fig.2. The installation size for fixing the device is given in Table 1. Features of the device in the pool heating systems SOLMA AquaHit are described in Annex 3. After installation and connection to the heating system, remove the protective film from the housing of the device, if any.

6.3 To access the thermostat clamps, remove the protective front cover by unscrewing the mounting screws.

Connect to the thermostat a circulating pump, and, if available, an external thermostat, WiFi-relay, GSM-relay (contact "PO"), or a three-way valve in accordance with Fig.3, according to the device. Features of remote control of the device via the Internet using WiFi-relay, GSM-relay, WiFi-adapter and GSM-adapter are described in Annex 4.

If the device is equipped with current sensors, connect them to the thermostat in accordance with Annex 7.

The thermostat of the separate device is connected to the heater according to Fig. 4 according to the device version and with the cables included. At the same time it is necessary to consider recommendations concerning crossing of wires of a power cable given in tab.1.

Place the temperature sensor of the heated room in the selected location.

6.4 Run the power cable of the device through the bushing of the thermostathousing and connect the cable as shown in Fig**. 3**.

6.5 Connect the thermostat to a single-phase power supply ~220V, or to a three-phase electric power supply ~380V, depending on the modification of the device, and to the ground loop.

Check externally the reliability of the grounding and the quality of installation of electrical installations. The circulation pumpis switched to the maximum mode of operation.

Install and secure the face cover of the thermostat housing.

6.6 After checking that there is water in the heating system (at a maximum pressure of 0.2 MPa according to the pressure gauge) and that the air pressure in the expansion tank is sufficient and the system is airtight, reset the power supply and switch on the electrical supply to the thermostat and circulation pump by means of the automatic switch "Pump" on the face panel of the thermostat. The circulation pump starts operating and starts pumping coldwater in the heating system for a few more minutes. At the same time the greenindicator light blinks.

After the pumping is completed, the green indicator lights steadily when thepump is on and does not light up when the pump is turned off.

If there are no faults in the operation of the device a n d it is ready for heating, the yellow indicator turns on.

The thermostat displays the temperature of the heated room.

6.7 Confirm that there is no water or other problems with the heating circulation in the heating system. If there is no circulation, the thermostat will display fault code E1 ("no water or pump jamming"), the yellow indicator will turn off and the heater contactor will not be activated.

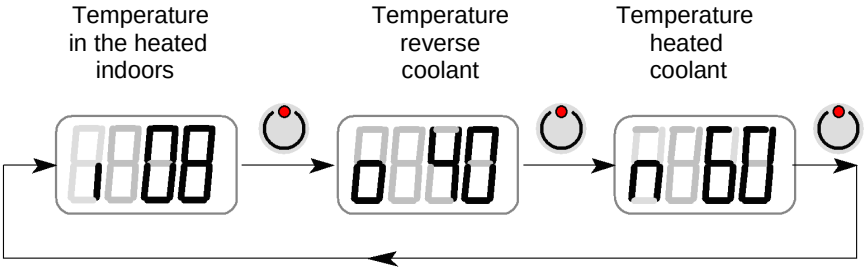
When the circulation is resumed, the yellow indicator turns on. To switch to the temperature display you need to press the *Select* button.

6.8 Then set the desired mode of operation of the device using the buttons on the face of the thermostat.

Designation of the thermostat controls

* - button MENU Δ button –UP ∇button –DOWN ● - button Select

Select an option that is indicated by a short press of a button Select



To display or change the setting (set point) of a parameter, press the Δ or ∇ buttons.The digital indicator blinks when the settings are displayed.

The maximum value of the setpoint temperature of the heating circuit is limited depending on the supply setpoint:

Supply temperature setting,° C	*Setting range of the temperature of the heating circulation,° C*
40	15...30
50	15...40
60	15...50
75	15...60

The setting change mode ends automatically after 10 seconds, or by pressing the "Select" button.
Changing the mode of the thermostat is done by pressing the "*Menu*" button. The desired mode can be selected with the Δ or ∇ buttons and confirmed with the "*Select*" button.

Mode		*Functions*
Manual	RUCH	Regulation of the heating temperature according tothe settings set by the controller
Programmatic	PROG	Regulation of the heating temperature according to the weekly program
Unfreezing	ESO	Heating is activated only when the ambient temperature is lower than +6^{O} C or the room temperature is lower than +10^{O} C (mode "Summer")
Time display	WRE	Indication and management of daily and holiday time
Program editing	PED.P	Editing the daily program

6.5 Lower Heating Programming

The temperature program can have up to 20 commands. Each command at the set time of the day changes the temperature setting of the heated room or the heating system.

Each program command consists of 4 elements:

- parameter **i/o** - indicates which setting is to be changed: a room or a heatingsystem
- **day of the month** - indicating on which days of the month the command isexecuted
- **time** - specifies the time in which the command is to be executed.
- **temperature** - temperature setting, which will be set

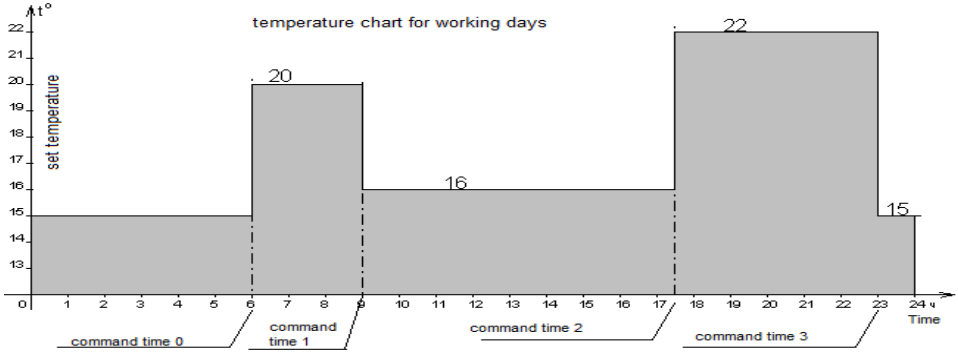
It can be reversed the value of **the day of the day of** the command:0- "empty" command: the command is not executed

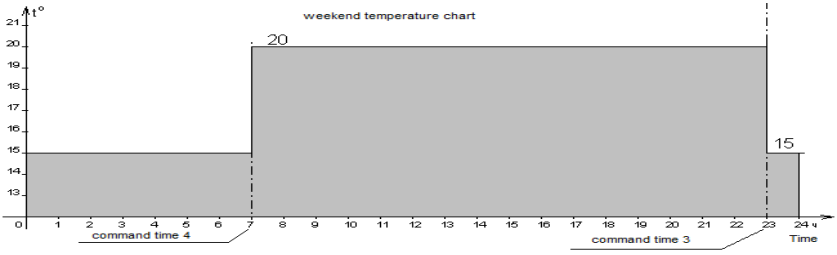
1...7 - Monday ... Sunday
8 - any day of the week
9 - Weekdays (Monday - Friday)
A -Weekends (Saturday, Sunday)

- In the program mode, the second (left) digit of the indicator shows the symbol "p". If you change the setting manually in this case, the manual mode is set to the hourly mode (until the next command) and "n" will disappear.

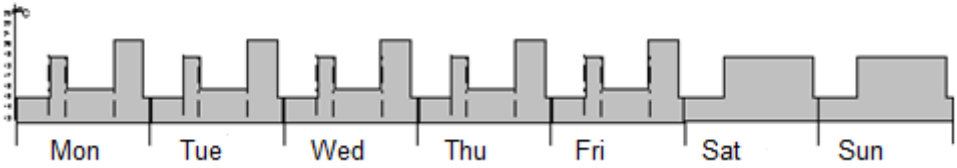
- The buttstock

It is necessary to program the thermostat to maintain the temperature in the heated roomaccording to the following graphs:





Weekly program



No. of commands	i/o	Day of the week	Temperature change hour	Temperature adjustment
00	i	9	06:00	20
01	i	9	09:00	16
02	i	9	17:30	22
03	i	8	23:00	15
04	i	A	07:00	20
05...19	i	0	00:00	00

The procedure for setting up the modes of the daily program is shown in **appendix 1**

6.10 After setting the desired operating mode of the device, switch on the automatic heater power switch "Heat". Heating is performed in automaticmode. This maintains the set temperature of the circulating heat carrier with a possible deviation from 3 to 6° C. The value of the offset is set automatically by the thermostat depending on the return temperature to ensure the optimal mode of the heater.
If the temperature measured by the sensor of the heated room exceeds the set point, the heating is stopped and resumed when the specified temperature is reduced by 1° C.
If the heat carrier is heated to the supply temperature limit, the heating is stopped and resumed when the temperature decreases to the set point temperature of the circulating heat carrier.

6.11 The unit is equipped with a safety system ("dry running") - it automatically switches off the electric power supply to the heater if the heating water flows out of the heating system, or if the pump is jammed. In this case the malfunction code E1 ("no water or pump jamming") is displayed and the amber indicat

o r turns off. If the system is filled with heat and water, the electric heating is automatically resumed, and the yellow indicator turns on. The device is equipped with overheating protection, which automaticallyturns off the electric power supply of the heater when the temperature of the heater rises above 85° C. The thermostat displays the fault code E2 ("heater overheating").

The electric power supply is switched on only after troubleshooting and lowering the temperature of the heat carrier below 80° C. Mode indication and signaling of malfunctions

6.13 Mode indication and signaling of malfunctions

In case of any malfunction, the operating contactor is deactivated and the heating is stopped. If there is no water or the circulation pump is jammed (fault codes "E1" and "E3", see below) the heating is resumed automatically after the flow of the heating medium is restored and the heater is cooled. Resumption of heating in case of other malfunctions is only possible after elimination of the cause of malfunction, switching offand reactivation ofthe electric power supply with the "Pump" switch.

A lighted indication on the faceplate of the thermostat signals the status of the circulation pump and heater, as well as the presence of malfunctions:

Indicator	***It's constantly shining***	***flashes***
Green	Switch-on pump	• Pumping before the start of heating • The pump is switched on according to the weekly program
Yellow	There are not a lot of irregularities.	-*-*-*- • Heating is switched off by remote control signal "**software**" • Boiler heating (in a 2-circuit system)
		-*---*---*- Summer mode
Red	Heating unit included	• Turns on the second heating step (if available) • Heating in non-freezing mode
Blue (on availability)	The other circuit is on, or the third circuit is on heating level	• Reduced capacity limitation mode has been reduced

Error code

E0 - freezing of the system, the heat carrier is colder than +3^{O}C

E1 - water missing or circulation pump jammed

E2 - heater overheating, supply temperature is higher than 85^{O}C

E3 - the first heating stage does not heat up
E4 - supply thermometer malfunction
E5 - mismatch of the bell thermometer
E6 - mismatch ofthe thermometer of the heated room

Warning! Activate the device in the following sequence. Activate the "Heating" switch
When the green indicator stops illuminating, the "Pump" switch can be activated.

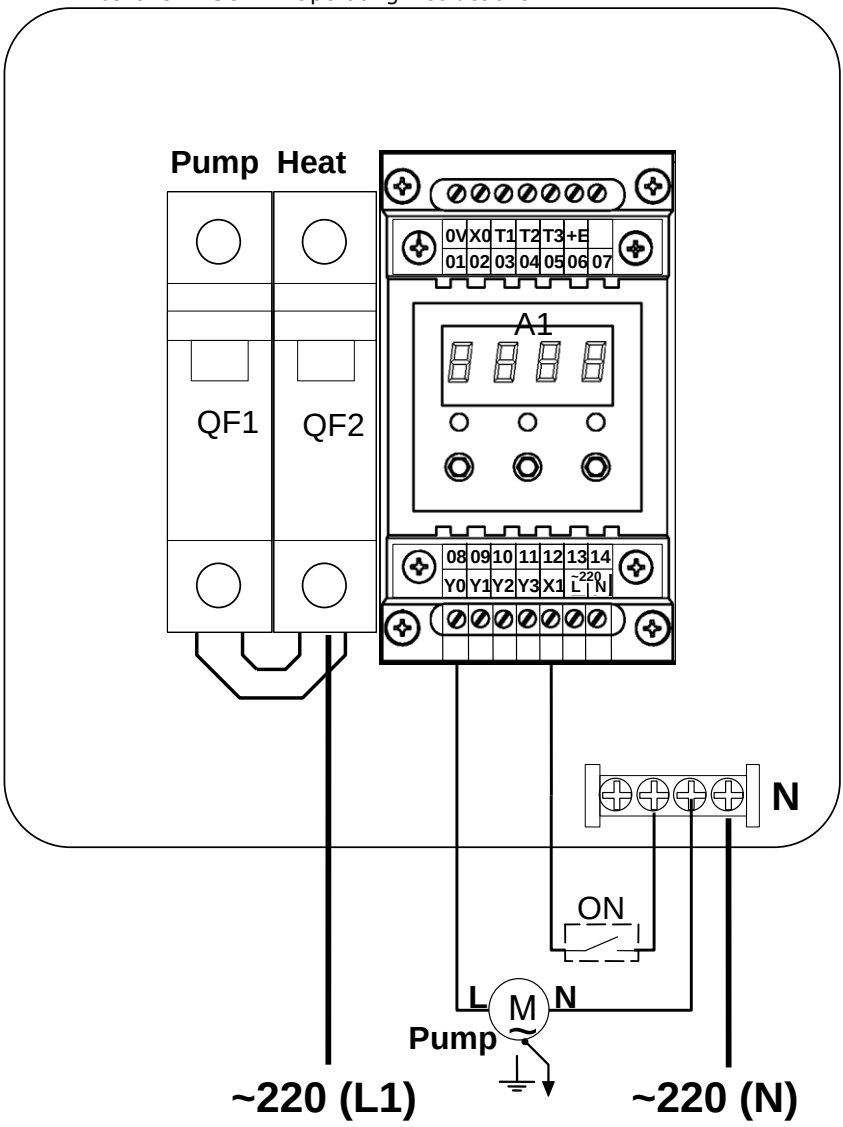


Fig.3.1 Connection of single-phase devices

In the absence of an external thermostat "PO" it is replaced by a jumper. Heating is possible with an electrical connection of the terminal X1 thermostat with bus N.

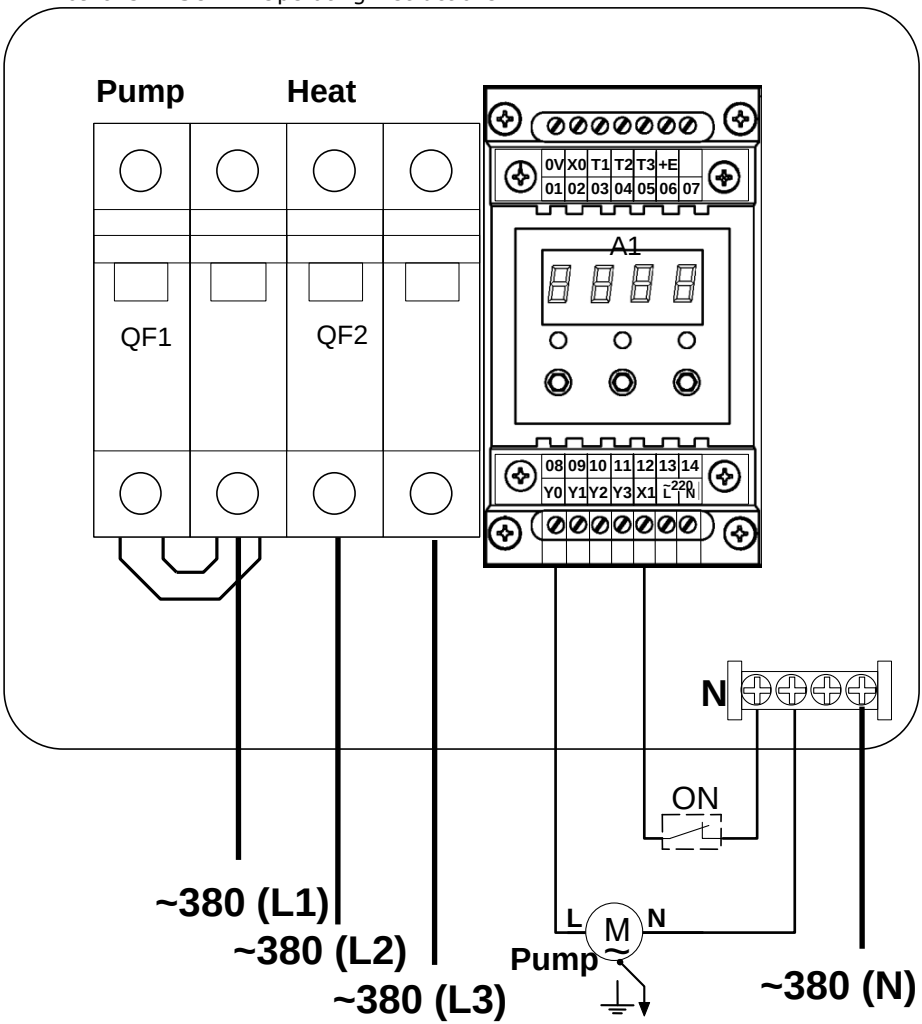


Fig.3.2 Connection of triphasic devices

In the absence of an external thermostat "PO" it is replaced by a jumper.
Heating is possible with an electrical connection of the terminal X1 thermostat with bus N.

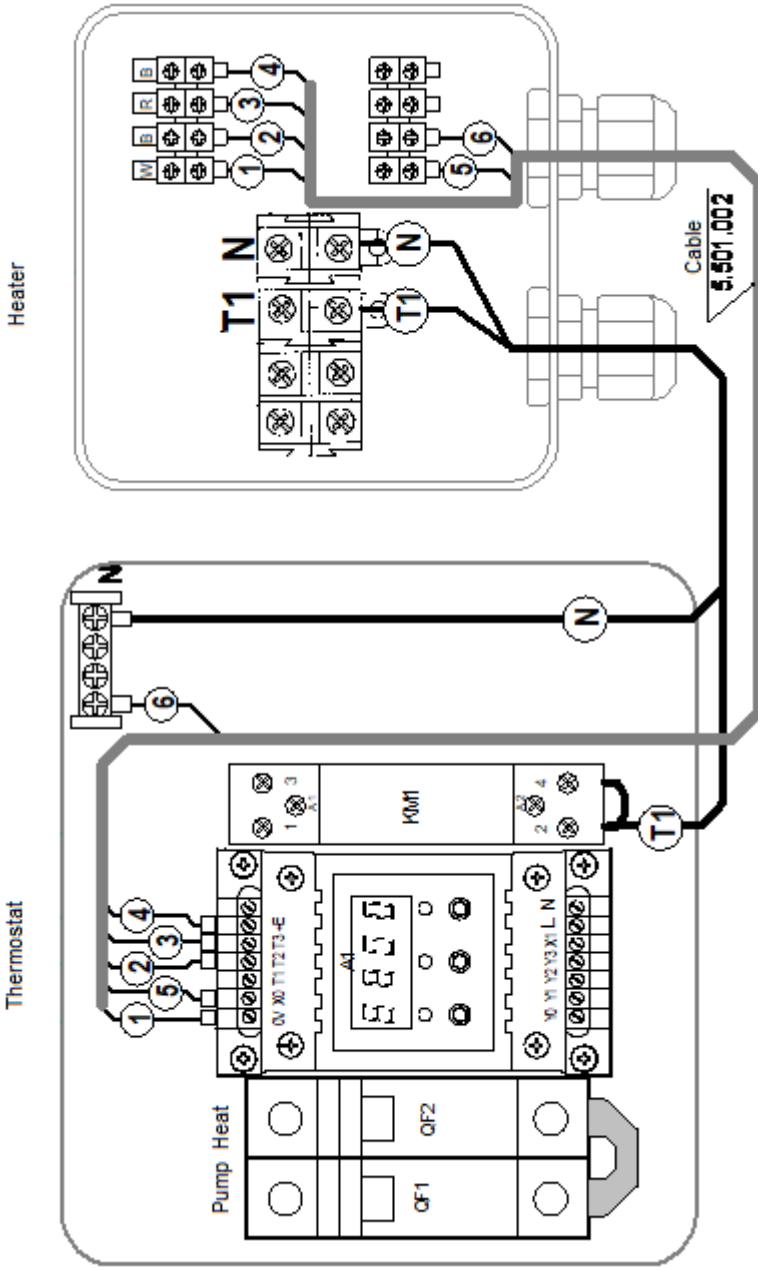


Fig.4.1 Connection heater and thermostat of single-phase devices

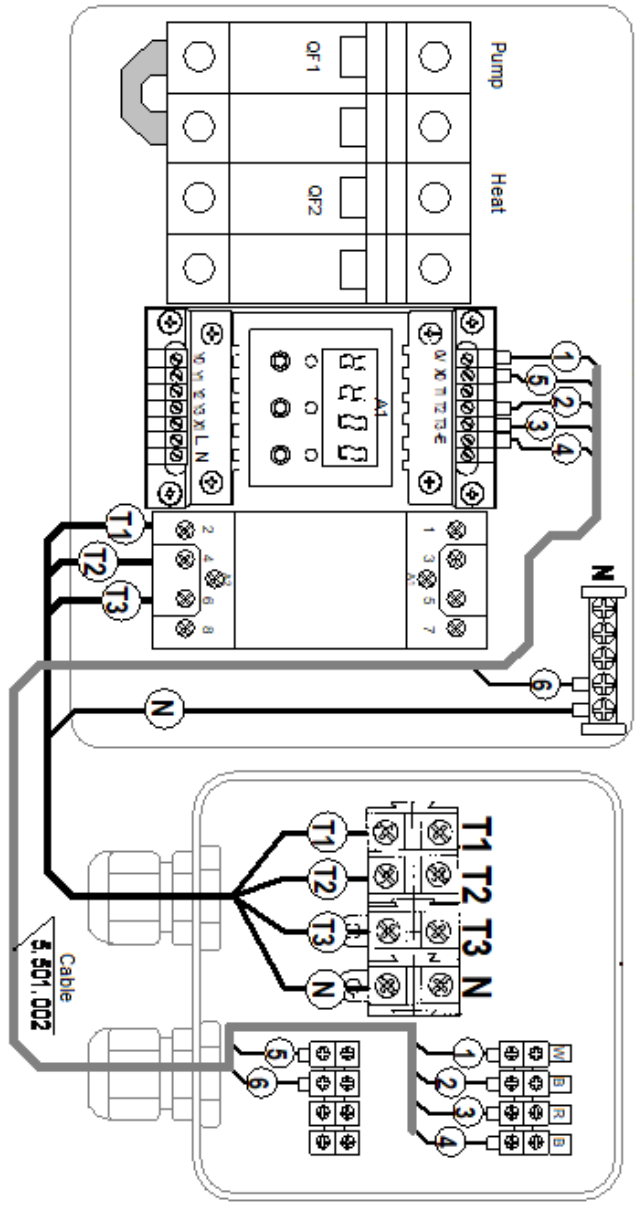


Fig.4.2 Connection heater and thermostat of triphasic devices

7 Technical maintenance

7.1 Before commissioning, as well as after two years of operation after commissioning and periodically, at least once a month, it is necessary to check the reliability of the fixings of the motors, cables, tightening of the threaded connections, wrapping of the pump rotor (rotating the rotor by hand). If necessary, retighten the connections, eliminating any damage that may affect the further use of the device.

> Maintenance of the device is carried out after disconnection of power supply of the network only by specially trained personnel.

7.3 The organization performing the installation and maintenance of the device must have a license to perform these works.

7.4 The device may only be operated by persons who have understood the operating principles, design, operating procedures, have been instructed in safety engineering and have been authorized to perform this type of work.
7.5 To operate the unit and components of the heating system without damage due to scale and sludge deposits or metal corrosion, the circulating water and the heating water used must be adequately treated. Water quality indicators must meet the following requirements:

- total hardness not more than 20 μg-eq/kg,
- The volume of mechanical particles and suspended particles in the water is not allowed.

Requirements for the quality of water in swimming pools are given in **Appendix 3.**

The choice of methods of water treatment, which ensure that these requirements are met, must be carried out by the owner of the device, or by a specialized organization.

8 Rules storage

8.1 Prior to operation the device must be stored in a closed room in a packed form. Temperature in the room is 5...40^{o} C, humidity of the air is not more than 80% at 25^{o} C. The interior of the room must be free of aggressive and easily liable vapors and gases.
8.2 Unpacked devices should be kept only in the repair areas for the period of repair.

8.3 The device is transported by closed transport means (motor vehicles), containers, wagons, etc.).
8.4 Ambient air temperature during transportation: from minus 10 to plus 50° C.

9 Possible malfunctions and methods of their elimination

9.1 Possible malfunctions and methods of their elimination are shown in Table 3.

Table 3

Mollyva Misunderstanding	*A fascinating reason*	*Method of removal*	*Note*
When the "Pump" switch is on, the display does not light up	1) No power to the network; 2) faulty vimikach	Check the voltage of the network. Replace faulty element	Replacement and inspection is performed by a specialist
The device does not develop its nominal power when the heat is on	1) Low voltage of the network; 2) The heater is not working properly; 3) rozriv elektro-lanzig 4) overheating protection worked	Check the voltage of the network. Replace the heater Renew the lancet Turning the thermo-exciters to working condition	Replacement and inspection is performed by a specialist The revisionand renewalis performedby a specialist
The device does not turn on the heat, the display shows"E1" for the presence of water in the systems	Locking the circulation pump	To remove the pump jamming	The inconsistencyis settled by a specialist

10 Certificate of Admission

Electric heating device (for stepless systems - basic)

SOLMA-_____ factory number _____
including the thermostat
3.672.272- factory number _____

with additional heating units (for staircase systems)

SOLMA-_____ factory number _____

SOLMA-_____ factory number _____

SOLMA-_____ factory number _____

complete set **2469025-** | | | | | | | | | | |

serial number of the set _____

has been subjected to an acceptance and commissioning test, meets thetechnical documentation and is considered ready for operation.

Date of issue _____ Soft version _____

WTC supervisor

WTCS tamp Stamp

11 Warranties producer

11.1 The manufacturer guarantees high quality and reliable operation of its products under the condition that the requirements contained in this document are met.
We ask you to pay attention to the situation:

- THE INITIAL COMMISSIONING OF THE EQUIPMENT MUST BE CARRIED OUT EXCLUSIVELY BY THE PERSON WHO HAS RECEIVED THE APPROPRIATE AUTHORITY (COMPETENCY PASSPORT) FROM THE MANUFACTURER. OTHERWISE, THE GUARANTEE IS INVALID!
- THE INITIAL COMMISSIONING OF THE EQUIPMENT MUST BE CARRIED OUT IN THE PRESENCE OF A REPRESENTATIVE OF THE ORGANIZATION THAT INSTALLED THE EQUIPMENT!
- THE SERVICE AND INSTALLATION COMPANY MUST HAVE THE NECESSARY

AND VALID LICENSE AND AUTHORIZATION TO START THE APPROPRIATE WORK.

• THE MANUFACTURER IS NOT RESPONSIBLE FOR MALFUNCTIONS THAT MAY OCCUR AS A RESULT OF PUTTING THE EQUIPMENT INTO OPERATION BY A PERSON WHO HAS NOT RECEIVED THE NECESSARY POWERS (PASSPORT OF A TECHNICIAN)!

You can get information about the authorized organizations on the website *solma.com.ua*, on the last page of this regulation, or by phone numbers of manufacturer, which are listed on the last page.

This instruction for use is considered an inseparable part of the equipment and is handed over to the user at the moment of its delivery, with the obligatory completion of the corresponding sales receipt!

All notes and records regarding the commissioning and maintenance of the equipment are made only by the service organization's representative.

In the design, construction, installation and operation of engineering systems and equipment must comply with the requirements of the current regulatory documents.

11.2 Warranty obligations of the manufacturer

11.2.1 The warranty period of operation of the device is 120 months from the date of commissioning, but not more than 126 months from the date of sale under the terms of using a heat carrier "SOLMA".

11.2.2 The warranty period of operation of the device when using other heat carriers, except SOLMA heat carrier, is 36 months from the date of commissioning, but not more than 42 months from the date of sale.

11.2.3 The warranty shelf life is 24 months from the date of manufacture.

11.2.4 The specified warranty period of the device is valid only under the condition of maintenance (hereinafter - TS) after the completion of the 36, 72 and 108 month periods of operation of the device.

The operation of SOLMA heat carrier or 12-month and 24-month terms of operation in case of other heat carrier.

11.2.5 The specified warranty period is valid under the condition of installation and commissioning of the device by the representative of the manufacturer's authorized service and installation organization (SIO) with the current certificate during 12 months from the date ofsale.

11.2.6 To perform maintenance the owner needs to contact one of the service and installation organizations authorized by the manufacturer.

11.2.7 The maintenance service is paid.

11.2.8 During the warranty period, all works related to the elimination of defects in the equipment operation, which are the fault of the manufacturer, are carried out by the SIO specialists free of charge.

11.2.9 The equipment and its components, which should be replaced under the procedure of warranty maintenance or repair, will not be returned to the owner.

Note:

The SIO is not obliged to eliminate the defects caused byimproper installationof the equipment. The SIO may, at the request of the owner, remove these defects for a separate fee. If any flaws that could cause malfunctions are notcorrected, the warranty will become null and void. Therefore, we recommend contacting the installation organizations, which have adequately trained staff(professionals who have taken the manufacturer'sresponsibilities), special equipment and tools, as well as a certain experience in the manufactureof the required equipment Only the equipment which has been transferred from the SIO to the manufacturer (commissioning coupons) is subject to warranty maintenance.

11.3 **The owner loses the right to warranty service in such cases**:

11.3.1 If the defect was caused by inadequate conditions of storage and transportation; inappropriate or improper use (damage by the owner), as well as the use of the device not for its intended purpose; Operation in non-appropriate rooms; use of non-appropriate accessories, such as incorrect selection or adjustment of the circulation pump, use of non-approved types of heating.

11.3.2 If the installation of the equipment was performed by specialists who do not have the required competence.
11.3.3 If the defect is caused by the influence of external factors (e.g. clogged heat supply; chemical or electrochemical effects; fluctuations or deviations in the permissible voltage in the electric power supply or the heat supply pressure.
11.3.4 If the defect occurred as a result of corrosion or scale formation.
11.3.5 If the defect occurred as a result of the use of inadequate antifreeze fluid as a heat carrier.
11.3.6 If the defect is caused by the failure of parts with reduced service life (see section 11.7).
11.3.7 If construction or repair works are carried out in the premises where the device is installed during its operation.
11.3.8 If the manufacturer's requirements specified in the instructions for design, installation, operation and maintenance of the device are violated or not fulfilled.
11.3.9 If the defect occurred as a result of unqualified actions or repair work performed by the owner of the device or a third party, as well as due to the use of parts produced by third-party companies.
11.3.10 If the defect occurred as a result of further operation of the device after the occurrence of the malfunction (except in emergencies that threaten safety and require the prevention of significantly greater damage, or if there is a delay in repairing the defect on the side of the ODR) .
11.3.11 If the defect was caused by a natural disaster (fire, flood, earthquake, etc.).
11.3.12 If the factory number has been changed, reduced or is missing.
11.3.13 If the operating instructions are missing or lost (except for devices with valid commissioning coupons which have been delivered to the manufacturer).
11.3.14 If the schedules of the operating instructions are not filled in.

11.4 List of typical nonwarranted accidents of devices breakdown

11.4.1 Regulators/control units/electronic boards:
11.4.1.1 Varistor tampering (collapse, freezing, or bruising that occurs due to overloading of the voltage supply over the
~275 B. In this case, the fuses, as a rule, are out of harmony);

11.4.1.2 Mechanical damage to electronic devices and electronic boards or their parts, including screw fasteners;
11.4.1.3 Damage (burnout) of the circuit boards;
11.4.1.4 The presence on the boards of the jet saw and / or brudu;
11.4.1.5 Presence of traces of moisture on the boards;
11.4.1.6 Use of non-original parts (spare parts, etc.);
11.4.1.7 Presence of signs of repair (non-welded soldering, etc.);
11.4.1.8 Presence of signs of high temperature influence on the electric apparatuses and electronic boards (melted, darkened, deformed).
11.4.2 Primary heat exchanger :
11.4.2.1 The presence of scale and / or brood in the middle of the heat exchanger;
11.4.2.2 The presence of traces of water or other impurities on the outside surface of the heat exchanger;
11.4.2.3 Failure to operate due to the use of inadequate non-freezing fluid;
11.4.2.4 Failure of tightness due to freezing of the heat exchanger.
11.4.3 Temperature sensors:
11.4.3.1 Mechanical damage;
11.4.3.2 Disruption of productivity as a result of water consumption.
11.4.4 The equipment is damaged from the outside:
11.4.4.1 Presence of mechanical deterioration of external facing parts;
11.4.4.2 Knobs and/or buttons of controls/controls are damaged.

11.5 Hibni wiklik

11.5.1 During the operation of the device there are cases when the owner can independently remove the defects in the device operation (according to the user manual).
The call of an ODR specialist to repair the malfunction in the following cases is considered hibnical and is paid for by the owner accordingly:
11.5.1.1 The device is not electrically live;
11.5.1.2 The voltage of the power supply has a negative effect on the normal operation of the device;
11.5.1.3 The phase/ground connection in the power supply network has been changed;
11.5.1.4 Absent or insufficient pressure in the heating circuit;
11.5.1.5 Malfunctions are caused by insufficient circulation of heat (usually due to clogging of heat exchangers and/or filters, or non-compliance of the circulation pump parameters with the heating circuit hydraulics characteristics);

11.5.1.6 The owner is to blame for the malfunction of the device.

11.6 The manufacturer and ODR have the right to refuse freewarranty service for your device in such cases:

11.6.1 If the operating conditions of your device do not ensure reliable operation;

11.6.2 If within 30 (thirty) days after the completion of the third year of operation of the appliance with SOLMA heat carrier or the first year of operation of the appliance with another heat carrier, the mandatory maintenance has not been performed or you refuse to pay for its cost;

11.6.3 If the ODR was not notified in advance about the change of the owner's phone number or the address of the device's residence;

11.6.4 If the call is made for the purpose of consultation and/ or instruction at the place where the device is installed;

11.6.5 If the response of the ODR representative is not relevant to the operation of the device.

11.6.6 If the time of operation or storage of your device has exceeded the terms specified in section 11.2.

11.7 Parts with limited service life

11.7.1 Some parts of the device have a limited service life due to natural deterioration resulting from the influence of external factors such as heat, high temperature, temperature fluctuations, significant jet and others. If such a part fails, although the warranty period of the device in general is not over, the cost of a new such part and all costs associated with its replacement is paid in full by the owner of the equipment.

11.7.2 The list of parts with limited service life:

The following items are available: bearings, plastic fasteners and fixation elements, fuses, electromechanical contactors, power elements (batteries, accumulators), filters, and others.

11.8 For warranty repair and after-warranty service, please contact the manufacturer at the address:

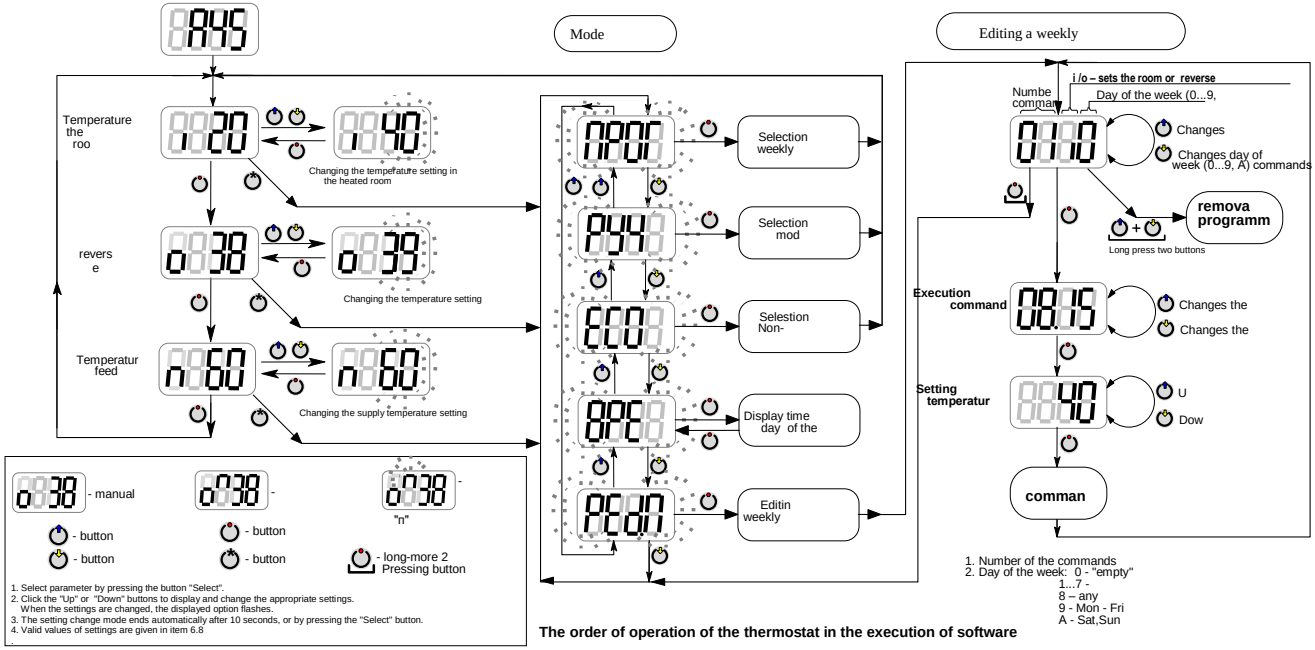
PJSC "ROSTOK COMPANY ",03067,
Kyiv, V. Havel Boulevard, 4,
m. +38 (044) 4540520,
Addresses on the Internet: ***solma.com.ua***

Authorised Representative:

Solma Hungary Kft
4400 Nyíregyháza, Bethlen Gábor utca 25. Magyarország
Tel.: +36306095284
e-mail: robertorobi1976@gmail.com

Appendices to this guide are available on the manufacturer's website ***solma.com.ua.***

The procedure for setting the modes of daily and weekly program of the device thermostat SOLMA



The order of operation of the thermostat in the execution of software