ECOTERMAL®

Heat makes the home - we the heat

INSTRUCTION MANUAL

FOR MAINTENANCE AND OPERATION

OF ELECTRIC CONTINUOUS FLOW HEATER/MODULE

DOSSIER

ELECTRIC CONTINUOUS FLOW HEATER/MODULE

"Deluxe BH" 207, 209, 312, 315, 318, 321, 324

"Deluxe Module BK" 336, 350

"Deluxe Combi BH" 209 E, 212 E, 312 E, 315 E, 318 E, 321 E, 324 E

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Dear Customers, ECOTERMAL LTD Co. would like to thank you for your good choice! Please read this Instruction Manual carefully to enjoy utmost satisfaction through the advantages of the electric heaters and modules, which can provide comfortable, environmentally –friendly and economic heating solution due to their quality and reliable modern automated devices.

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1. RECOMMENDATIONS:

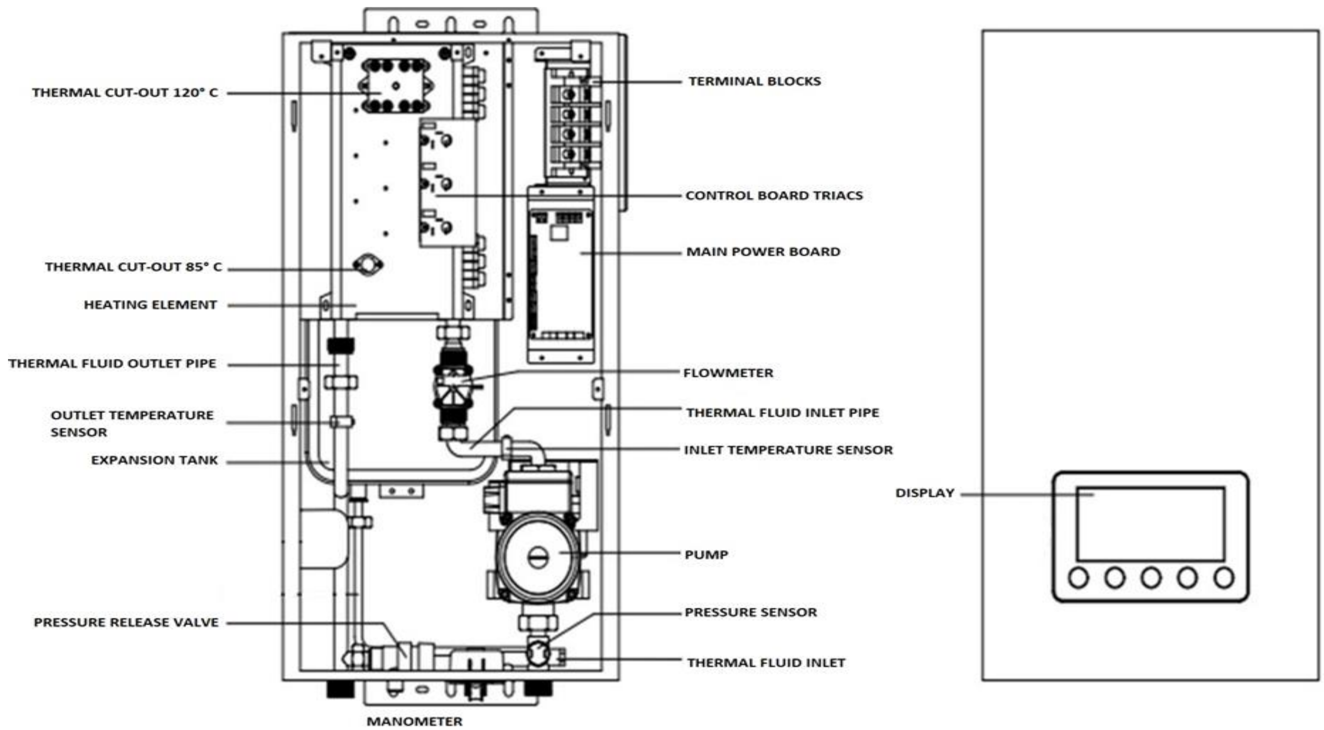
This electric heater shall not be operated by physically disabled and mentally infirm individuals and/or individuals without the necessary qualification and/or experience (unless they are given special training).
-Never permit CHILDREN to interfere with the heater operation.
-Be sure to understand well and observe the instructions for heater safe operation and installation.
- After removal of the package, be sure to check the integrity of the heater and availability of all accessories.
- Protection class of this electrical heater is IP X4, valid after installation at the operating site.
-Make sure that the heater type is appropriate for your intended application.
-It is advisable to have a project developed for every specific installation.
-Installation shall only be made by qualified authorized personnel.
-Heater installation shall be in conformity with the currently valid regulations, standards and this instruction manual.
-Heater connection to the power mains shall be approved (if required) by the local power distribution operator; the user shall make the necessary arrangements prior to heater purchase.
-Heater adjustment and commissioning shall only be made by the vendor's approved service engineer.
-Incorrect installation can result in damages and the vendor shall not be liable for such damages.
-In case of failure, contact the authorized service. Non-professional intervention can result in heater damages.
-Preventive maintenance shall be provided at least once a year to ensure proper performance, safety and long service life for the heater.
-Vendor shall not be liable for any damage attributable to non-professional installation and/or disregard to the recommendations and/or the operating instructions; no maintenance services will be due in that case.
-Heating systems shall be provided with vent valves in dedicated points, as required.
- No modifications are allowed to be made on the electric diagram of this device, except for connection of a room temperature controller.
- Hydraulic and thermal testing shall be performed on every heating system upon commissioning.
- This electric heater can be operated at 80°C max at operating pressure of 1, 8 bar in a separate heating loop.
- The installer company shall provide information to the customer on the rules of operation of the heating system in general.

2. INTRODUCTION

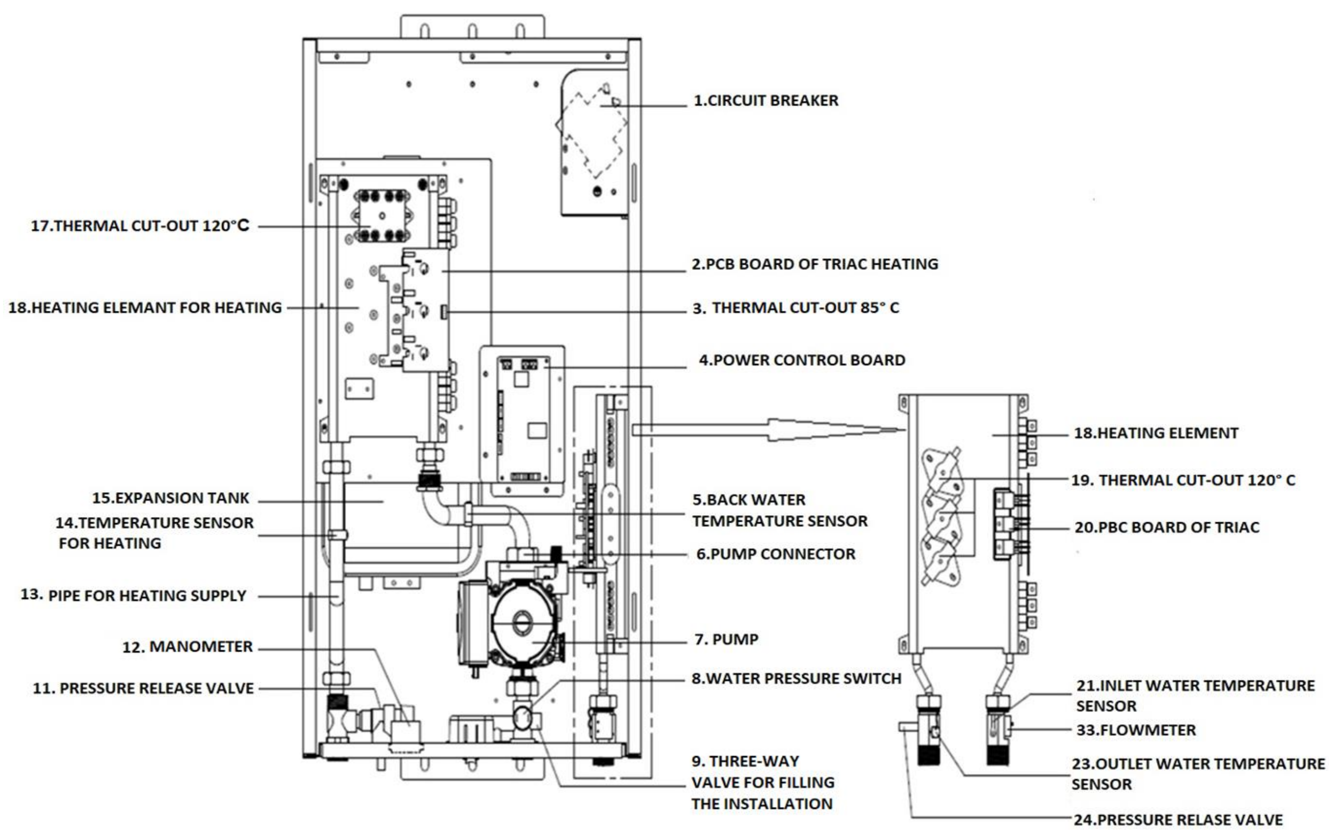
This continuous flow electric heater is a modern, environmentally friendly heat source, intended for floor and central heating application for small and medium size residential and business buildings. The basic advantages of electric heating are primarily these: highly efficient, environmentally friendly performance, compact design and power saving features. This electric heater can be used for any heating system of the central or single floor (local) types, in a direct, accumulating or hybrid diagram. It can also be integrated in existing heating systems, in parallel with a heater running on solid fuel. Electric heaters shall be installed in systems provided with pumps to ensure forced circulation of the heating fluid.

3. TECHNICAL DESCRIPTION OF THE HEATER/MODULE

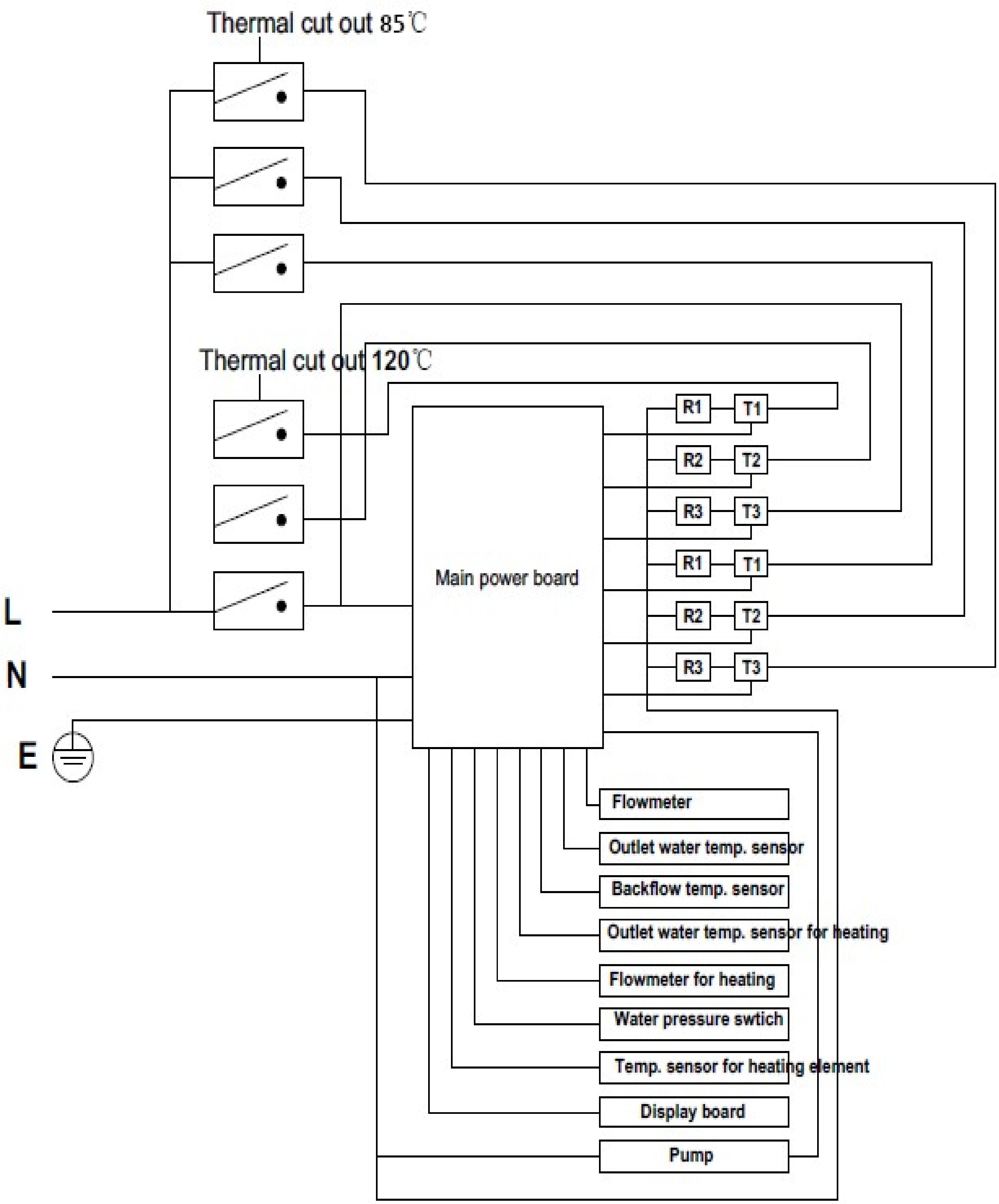
For heating application only



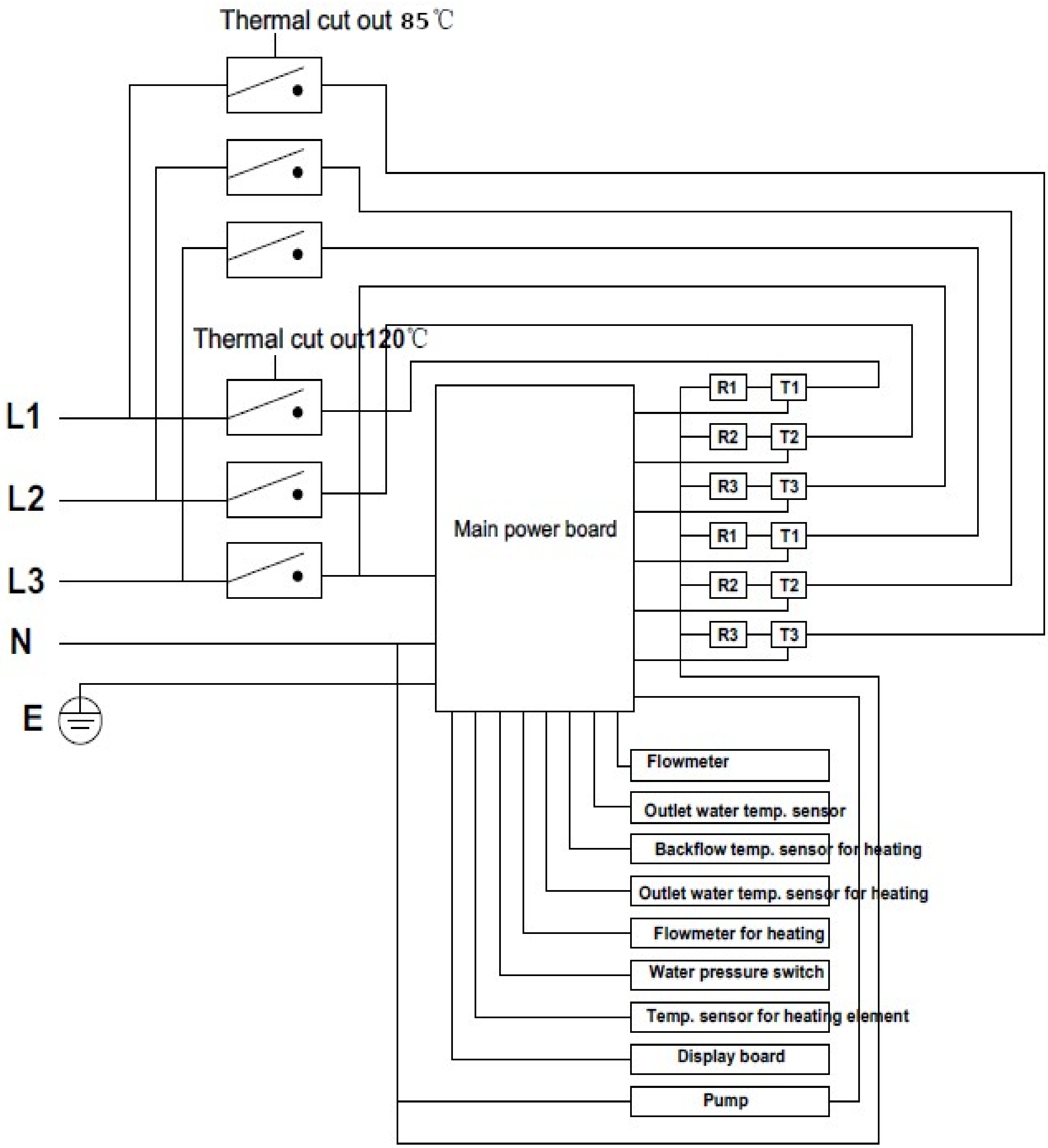
Heating and domestic hot water



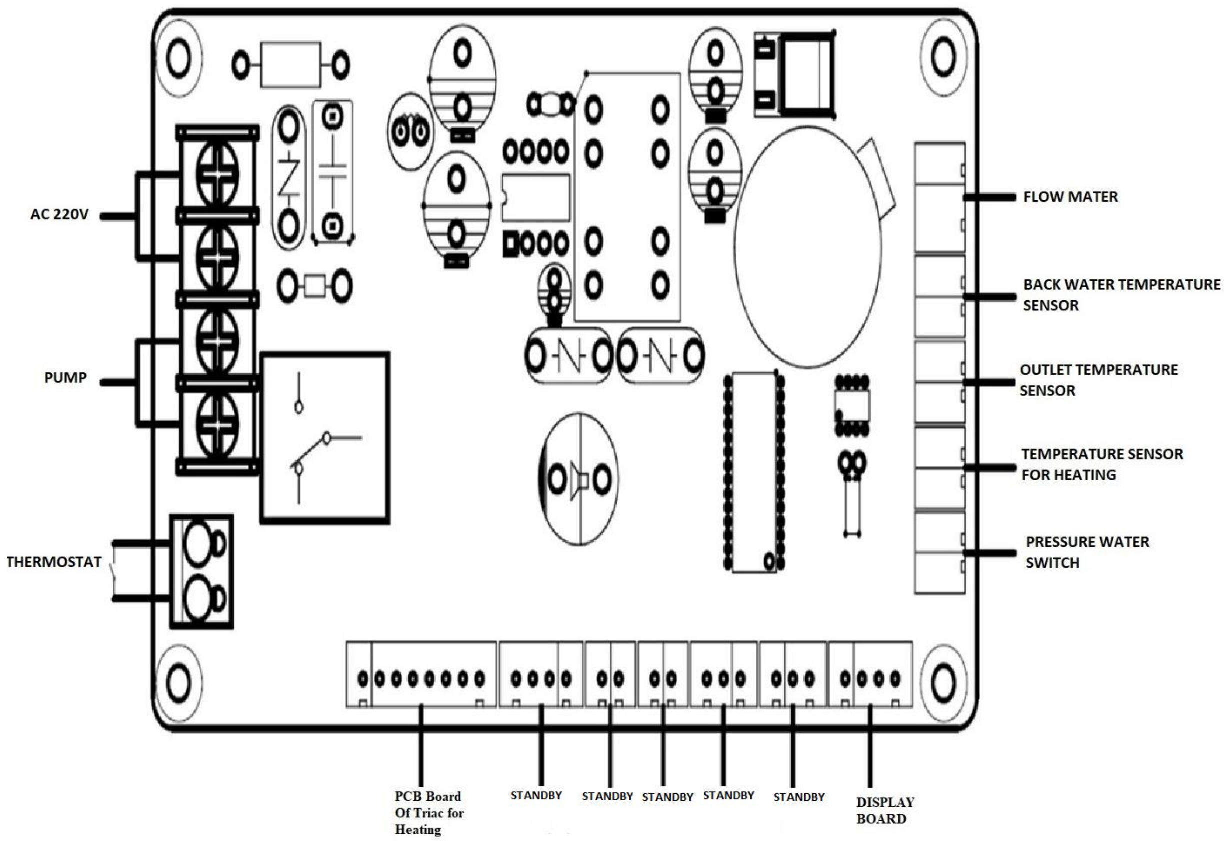
Electric diagram, a single-phase option



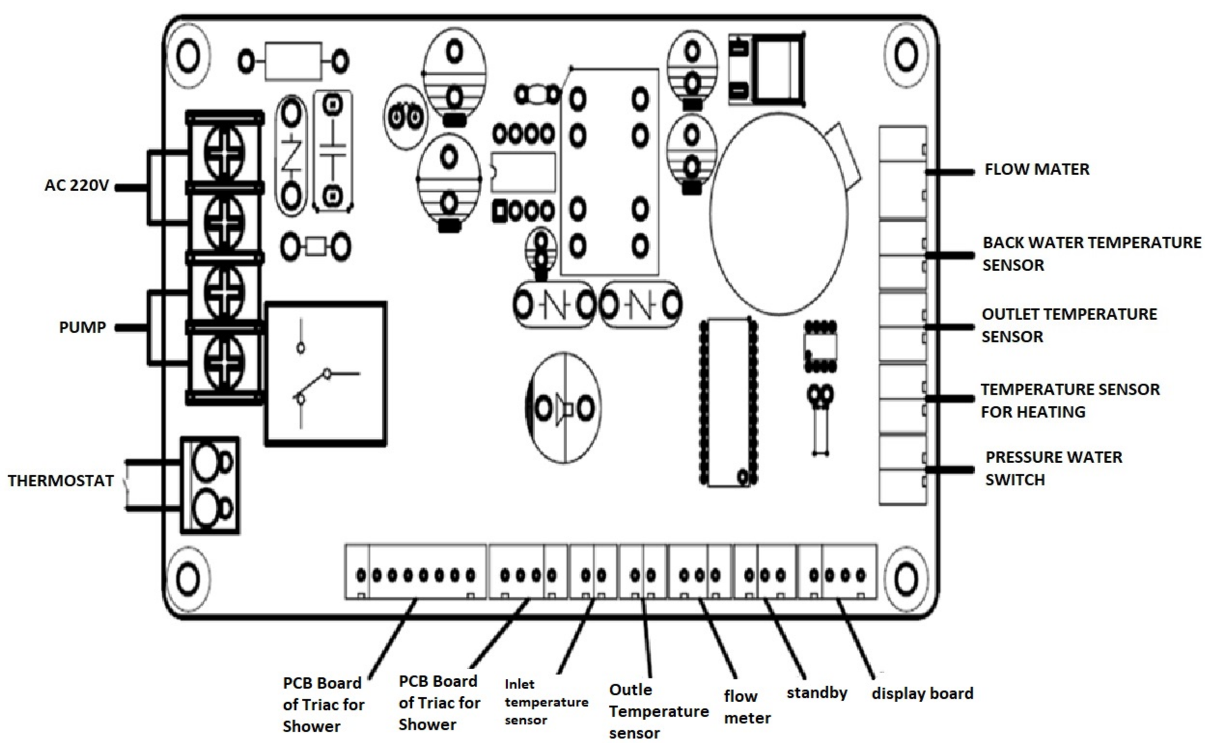
Electric diagram, a three-phase option



Control diagram, heating application only



Control diagram, heating system and domestic hot water application



Technical parameters

Model	Deluxe BH207	Deluxe BH209	Deluxe BH212	Deluxe BH215	Deluxe BH312	Deluxe BH315	Deluxe BH318	Deluxe BH321	Deluxe BH324
	Deluxe Combi BH207E	Deluxe Combi BH209E	Deluxe Combi BH212E	Deluxe Combi BH215E	Deluxe Combi BH312E	Deluxe Combi BH315E	Deluxe Combi BE318E	Deluxe Combi BH321E	Deluxe Combi BH324E
Voltage	240V				400V				
Frequency	50Hz				50Hz				
Phases	1				3				
Power rating kW	7	9	12	15	12	15	18	21	24
Current A	27	40.9	54.5	68.2	18.2	22.7	27.3	31.8	36.4
Cable mm^2	4	6	10	10	3*2.5	3*2.5	3*4	3*6	3*6
Application	**For heating and domestic hot water**								
Circuit breaker A	32	63		80	20	25	32	40	
Operating temperature range	30°C~80°C (radiator mode)								
	30°C~60°C (floor heating)								
Max water temperature	85°C								
Temperature setting range	5~20°C								
Minimum temperature level for freeze protection	<8°C								
Temperature for deactivation of the freeze protection function	≥10°C								
Pump output voltage	240Vac, 0.5A								
Expansion drum capacity	6 liters								
Inlet and outlet connections	G1/2”								
Recycle water inlet connection	G3/4”								
Product dimensions	Deluxe BH- 620mm*350mm*200mm/Deluxe Combi BH-E -710mm*425mm*245mm								

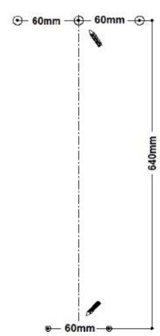
Technical parameters

Model	Deluxe Module BK336	Deluxe Module BK350
	400V	
Voltage	*50Hz*	
Frequency	*3*	
Power rating kw	*36*	*50*
Current A	*55*	*76*
Cable mm^2	*16*	*16*
Application	**Heating**	
Circuit breaker A	80	80

Operating temperature range	30°C~80°C (in radiator mode)
	30°C~60°C (in floor heating mode)
Max water temperature	85°C
Temperature setting range	5~20°C
Minimum temperature level for freeze protection	<8°C
Temperature for deactivation of the freeze protection function	》10C
Pump output voltage	240Vac, 0.5A
Inlet and outlet connections	G1/2”
Recycle water inlet connection	G3/4”
Product dimensions	575mm*435mm*195mm

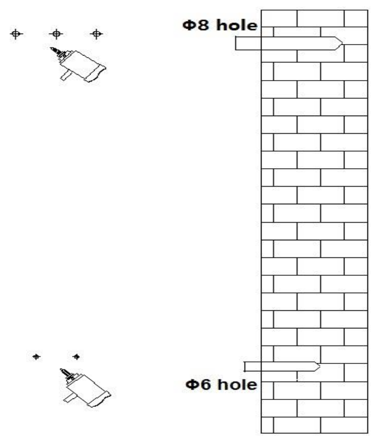
4. Installation instructions

Step 1： Use an impact perforator to drill 5 holes; the 3 upper holes with diameter Φ8, distance between holes shall be 60mm; the 2 lower with diameter Φ6, distance between holes shall be 60mm, as shown in the Figure



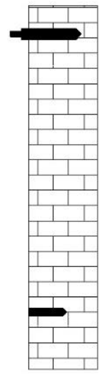
Step 2: Drill and install 3 dowel pins-, diameter Φ8 and 2 dowel pins, diameter Φ6, as shown in the Figure

Hole Φ8

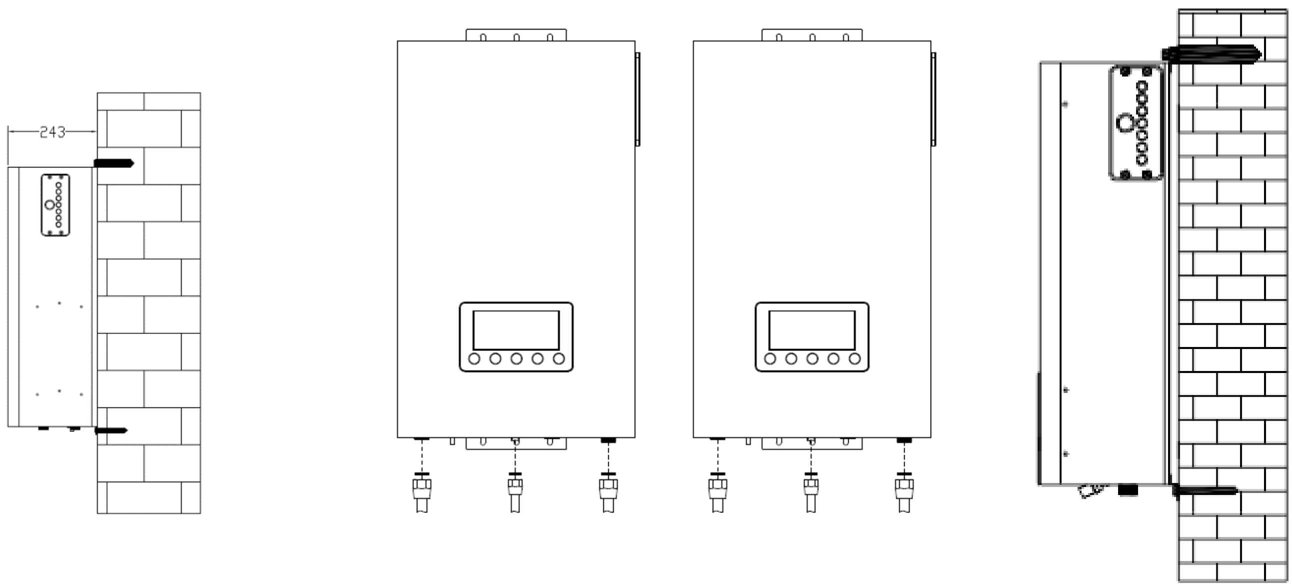


Hole Φ6

Step 3： Tighten 3 screws in the 3 upper dowel pins, as shown in the **Figure**



Step 4: Mount the heater on 3 fixed screws. Tighten 2 screws in the lower dowel pins

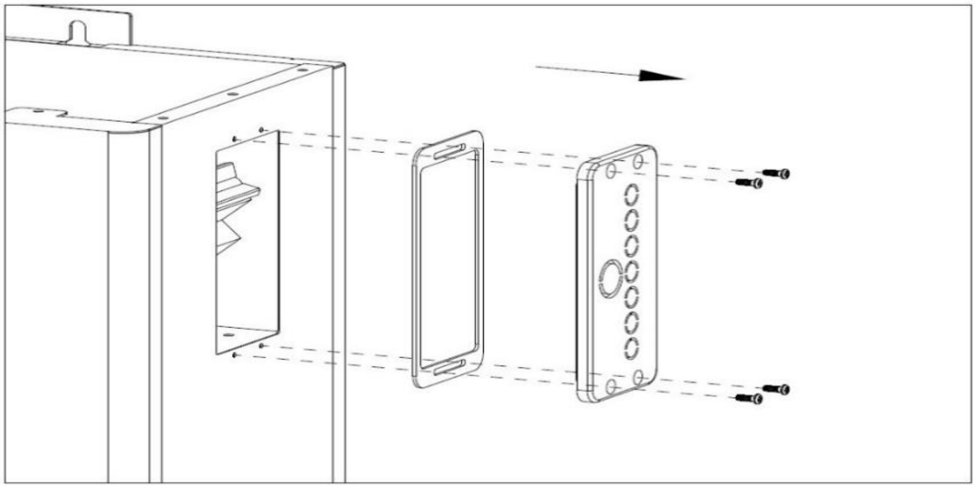


5. Electrical connections

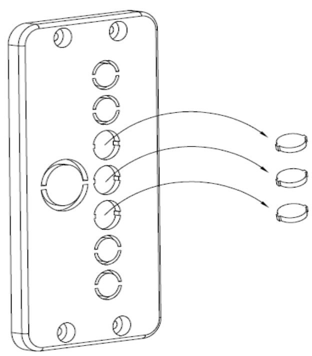
1. All electrical works shall be in conformity with the currently valid national and local electrical standards.
2. The heater shall be properly grounded via a dedicated grounding loop with a suitable voltage design.
3. Ensure that the ends of metal wires to the terminal strips/circuit breakers make full contact when laying the cable to the terminal strips/circuit breakers. Then tighten the screws to ensure maximum current voltage.

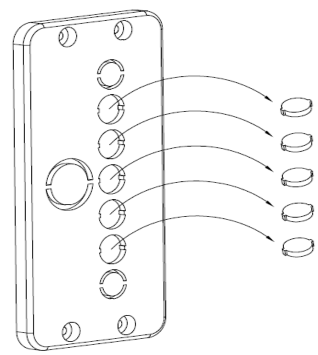
4. Before commencement of electrical works, ensure that the switch of the main power board circuit breaker is in the OFF position, to avoid any hazards due to electric shock; all installation and plumbing works shall be performed prior to electrical connections.
5. Ensure a circuit breaker and a hole on the heater side for wiring.

5.1 Untighten the screws and then remove the hole cover.



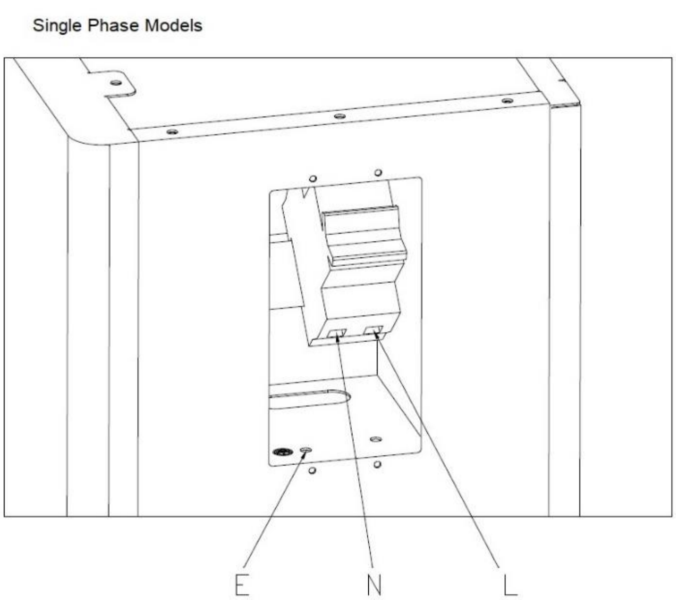
5.2 According to the cable size, open the relevant hole numbers in the cover. Cables can also be installed through a major common hole.

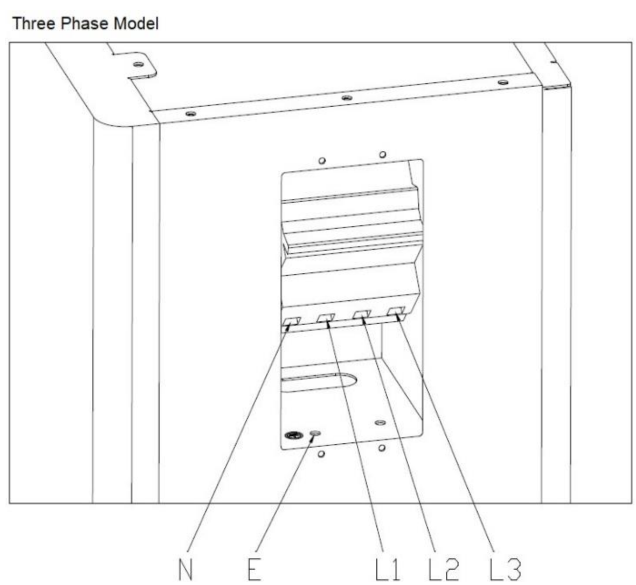




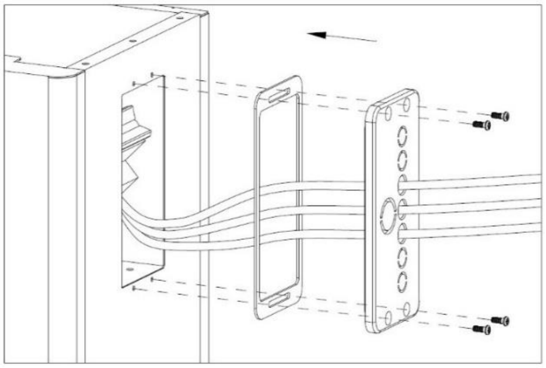
5.3 Connect the L, N, E cables as per the instructions shown on the sticker.

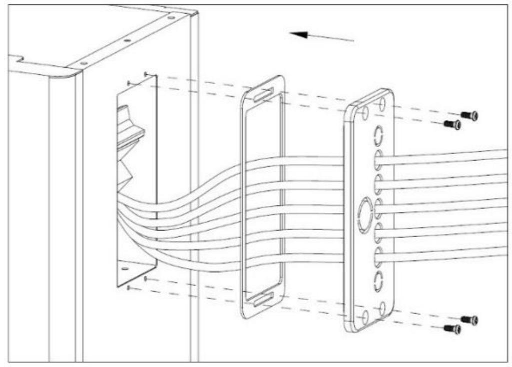
Single phase models **Three phase models**



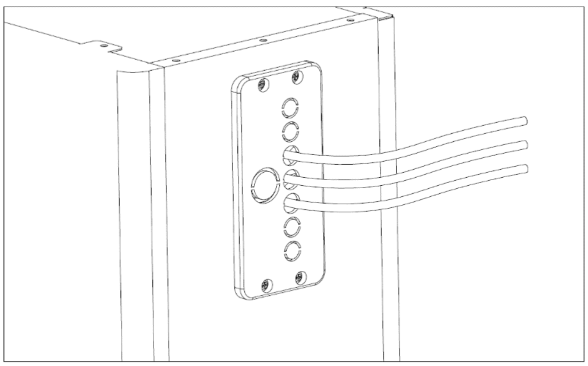


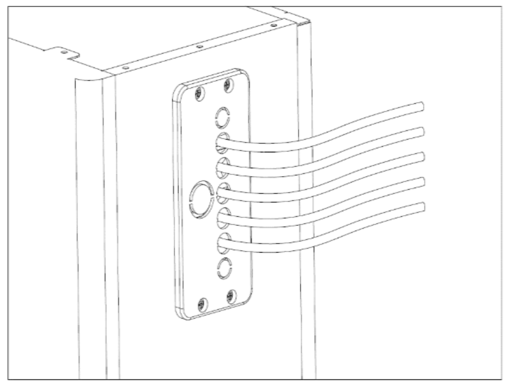
5.4 Insert the cable through the hole in the cover





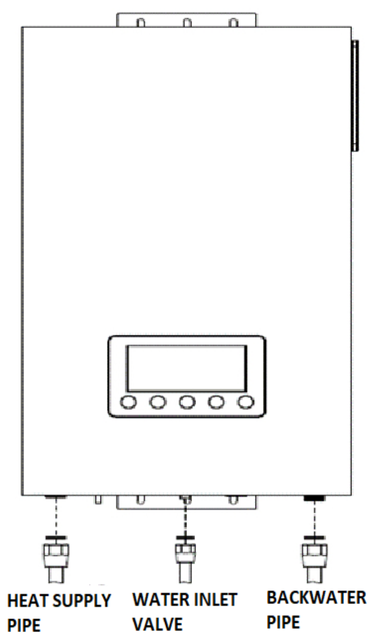
5.5 Fix the cover onto the hole and tighten the screws.



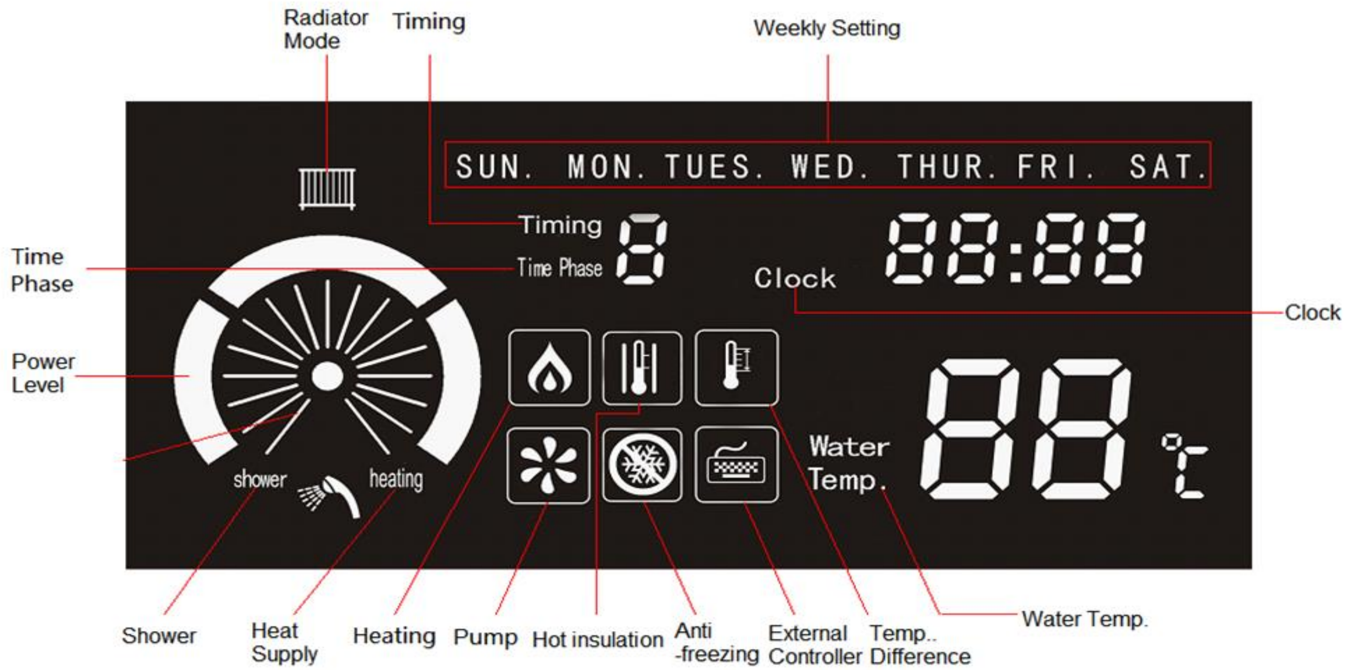


6. Connection to the heating system

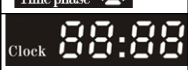
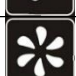
Make the water supply, recycle and automatic addition connections of the heater.

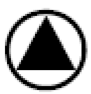


7. Heater display and adjustments



Icons and indicators

No.	Icons	Details
1		Displays the -7 week days
2		There are 9 time phases. You can set operating conditions for -9 phases in a 24-hour period.
3		Displays actual time (hour and minutes)
4		This icon will go on to indicate that the heater is in heating mode.
5		This icon will go on to indicate that the heater maintains insulation conditions. Heater operation when heating elements are off, because the setting was achieved.
6		Displays temperature difference between “heating fluid outlet temperature ” and “heating fluid inlet temperature”
7		This icon will go on to indicate that the pump is running.
8		This icon will go on to indicate that the heater is running with antifreeze protection function enabled. This mode is enabled when temperature falls below 8°C.
9		This icon will go on to indicate that the heater is connected to an external controller (room temperature controller) in standby mode.
10		This icon will go on to indicate that the heater is running in heating mode with radiators. We can select the floor-heating mode, where the icon would not go on.

Name	Operating state	Sensor type	Function
 ON/OFF Key	No set point	Touch and hold down	Touch and hold down for 2 sec. to turn ON/OFF.
	Set point exists	Touch once	Return to the previous menu.
 Function Key	Power on state, no set point	Touch and hold down	Touch and hold down for 3 sec to enter setting state
	Power off state	Touch and hold down	Touch and hold down for 5 sec to enter setting state for time calibration
	Adjustments menu state	Touch once	Scroll between different menus
	Time setting state	Touch once	Setting of data for time parameters
	Time calibration setting state	Touch once	Setting of data for time calibration parameters
	Setting of energy efficiency parameters state	Touch once	Scroll and define each energy efficiency parameter
	Actual time setting state	Touch once	With every touch ,parameters will increase by 1 step
		Touch and hold down	The relevant parameters will keep increasing.
	Power on for no setting state and operating state with time setting	Touch once	With every touch, the temperature setting will increase by 1 step.
		Touch and hold down	The temperature set point of the heating system will keep increasing.
	Time setting state	Touch once	Select the required time interval, the parameter will increase by 1 step.
		Touch and hold down	Select the required time interval, the parameter will keep increasing.
	System parameters setting or mode setting	Touch once	With every touch, the parameters will increase by 1 step.
		Touch and hold down	The parameter will keep increasing.
	Real time setting state	Touch once	With every touch, the parameters will decrease by 1 step.
		Touch and hold down	The relevant parameter will keep on decreasing.
	Power on, no setting state or time based operation	Touch once	With every touch, the temperature setting of the heating system will decrease by 1 degree.
		Touch and hold down	The temperature set point of the heating system will keep decreasing.
	Time setting state	Touch once	Select the required time setting period, the parameter will decrease by 1 step.
		Touch and hold down	Select the required time setting interval, the parameter will keep decreasing.
	Setting a system parameter or mode setting state	Touch once	With every touch, the parameters will decrease by 1 step.
		Touch and hold down	The parameter will keep on decreasing.
Energy efficiency keys  EEP Key	Power off state	Touch and hold down	Touch and hold down for 3 sec to enter EEF parameters setting.
	Power on state - no setting	Touch and hold down	Touch and hold down for 3 sec to switch over to time phase.
	Power on state - no setting	Touch once	Enter temperature difference setting –delta T

Heater adjustments

User adjustments

- **ON/OFF Operation**

In the OFF state, no settings made, touch and hold down " " for 2 seconds to turn the heater ON, touch " " and hold for 2 seconds again to switch the heater OFF.

- **Temperature adjustments**

Press and hold for 2 seconds to turn the heater ON. If the hear has no time setting, the pump will start running and internal test will be enabled, the pump will be running for 1 minute and then the heater will start heating operation.

If the heater has not time setting, press or to set the heating fluid temperature in a range of 30 deg.C to 80 deg.C (for radiator mode); you can set the heating fluid temperature in a range of 30 to 60 deg.C (for floor heating mode).

Press and hold down for 2 seconds to switch the heater OFF.

- **Timer adjustments (day, time and minutes)**

In the OFF state, touch and hold for 5 sec " " adjustments function key , press" " function key for scrolling between positions; press " " or " " for adjustment selection.

Upon completion of adjustments, press " " key to exit the Setting State. If no key action has been taken for 10 seconds, the system will exit and save automatically the parameter settings.

- **Time setting. Daily and weekly programming**

You can set the heater for a 24-hour operating mode for 7 days a week, as well as the heating fluid temperature and time settings. A detailed description of the various settings is given herein below.

Time phase setting: In the operating mode, press and hold down for 5 seconds" "; the setting mode switches to setting of time phase.

starts blinking; you can set 9 time phases for 24 hours. After you have confirmed the time phases, 1, 2, 3,….9 - stop pressing any keys, the time phase is confirmed.

After selection of a phase, the latter shall be enabled via the key and the symbol will change from "OFF" to "ON" and vice versa. Then confirm using and enter the weekly settings. There are 10 different options to select. All adjustments are selected using the and keys. After selection of an option, for example "1-7", using go to selection of time for the start of "phase" (time interval), for example - 6.00; after confirmation via , select the time for switch off operation. Upon confirmation of the switch off time using , we can adjust the operating temperature for this phase. After confirmation using , we can adjust the temperature difference within 10 seconds from the latest adjustment; the exit setting is enabled automatically, or you can press for exit from Settings.

- **Setting the operating parameters**

Setting of operating parameters shall be made in the operating mode. Press and hold for 3 seconds, the system will go to enable weekly operation. (Phase 1-9). To disable the program settings, press again and hold for 3 seconds.

- **Setting the temperature difference:** Temperature difference exists between outlet hot water and recycle water; if recycle water temperature is much lower compared to outlet hot water temperature, the heater must start; if recycle water temperature is almost equivalent to outlet hot water temperature, the heater need not start. In this situation, we must set a specific temperature difference ranging from 5 deg.C to 20 deg.C; if the temperature difference exceeds the setting, then the heater will start automatically; if the temperature difference is equal to or lower than the setting, the heater will shut down automatically.

Press once, will go on blinking; then press or to enter the value for the temperature difference. Setting range shall be 5 deg.C-20 deg.C.

Service adjustments

- **Connection of room temperature controller**: the heater can be connected to an auxiliary wired controller. You can select parameter setting at the panel or at the controller. While in the OFF mode, press and hold for 3 seconds , until “00“ lights, then using the and keys, go to “bE“ using the key for the left position, and key for the right position. Figures 1 to 9 will be displayed first, then – letters. After selection of “bE“, confirm using the key. Submenus will be displayed using the key; go to the “TC“submenu, the icon will be displayed then; after that make adjustments using the and keys. Display 00 means that no wired controller is connected. Display 01 means that there is a wired controller.

- **Heating mode setting: radiator or floor water heating mode**

Two heating modes are available – floor heating mode and radiator mode. Enter a different heating mode for the heater; factory settings for temperature range of water are different.

In the OFF mode, press and hold for 3 seconds until “00“goes ON, then using the and keys go to “be “using the key for left position, and the key for right position. Figures 1 to 9 will be displayed first, then – letters. After selection of “bE“ , confirm using the key Submenus will be displayed using the key; go to submenu “dП“ to display the icon, then make adjustments using the and keys. Display 01 means floor water heating; display 00 means radiators. When the heater is in the radiator mode, the icon in ON, and OFF for floor heating mode.

- **Selection of heating mode and supply of domestic hot water**

In the OFF mode, press and hold for 3 seconds until “00“lights, then using the and keys go to “0A“, using the key for the right position. Figures 1 to 9 will be displayed first, then – letters. After selection of “0A”, confirm using the key. Submenus will be displayed using the key; go to submenu "CH", to display the shower heating icon, then make adjustments using the and keys. Display 00 heating means heating, display 01 shower means domestic hot water, display 02 shower heating means heating plus domestic hot water. When the heater is in the operating mode, the icon of the relevant mode selection will be ON. Upon completion of adjustments, press to save the settings.

In the automatic switch over mode, if water flow rate is ≥1.8 l/min, the heater will switch modes to supply domestic hot water; if water flow rate is ≤1.3 l/min, the heater will stop supply of domestic hot water. When hot water supply mode is switched on, heating system mode is switched off.

In the heating system mode, if the user opens a consumer of domestic hot water, heating system will go OFF and the system will switch over to mode supply of domestic hot water. As soon as the consumer is isolated, the heater will automatically switch over to heating system mode.

- **Pump operating modes:** Pump operating modes can be adjusted.

In the OFF mode, press and hold for 3 seconds until "00" is ON, then using the and keys, go to"bE", using the key for left position, and the key for the right position. Figures 1 to 9 will be displayed first, then – letters. After selection of "bE", confirm using the key. Submenus will be displayed using the key; go to submenu "SB" to display the pump icon, then make adjustments using the and keys. Display 00 means that the controller automatically controls the pump, display 01 means that the pump is in continuous operation while the heater is running.

- **Flow meter disabled:** Flow rate sensor performance can be adjusted.

In the OFF mode, press and hold for 3 seconds until "00" is ON, then using the and keys, go to "bE", using the key for left position and the key for right position. Figures 1 to 9 will be displayed first, then – letters. After selection of "bE", confirm using the key. Submenus will be displayed using the key; go to submenu "SL", then make adjustments using the and keys. Display 00 means that the flow rate sensor is enabled; display 01 means that flow rate sensor is disabled.

- **Setting limits for heater output**

In the OFF mode, press and hold for 3 seconds until "00" is ON, then using the and keys, go to "0A", using the key for right position. Figures 1 to 9 will be displayed first, then – letters. After selection of "0A", then make adjustments using the and keys. Display "P1" means 1/3 of the maximum output; display "P2"means 2/3 of the maximum output; display "P3" means maximum output. When the heater is running, the icon light will correspond proportionally to the mode selection. Upon completion of adjustments, press to save the settings.

8. Accessories for different models

	MODEL		
ACCESSORIES	**Deluxe BH*** **	**Deluxe Module BK*** **	**Deluxe Combi BH***E**
Expansion drum	√	–	√
Circulation pump	√	–	√
Filter	√	–	√
Safety relief valve	√	√	√
Low pressure protection	√	√	√
Emergency shutdown thermostat	√	√	√
Vent valve	√	√	√
Domestic hot water	–	–	√
Mounting brackets	√	√	√

Error codes

Error code	Cause analysis	Solution
E0	A, No water in the system or pressure too low B, closed contact of water pressure sensor	A, Feed water to the heater; pressure range 0.5-3bar B, If water pressure is over 0.5bar, ensure that the water pressure sensor is with contacts closed
E1	A, Open circuit of temperature sensor for supply of heating fluid; short circuit current B, NTC<-20 failure	A, Replace the temperature sensor for supply of heating fluid. B, It will recover automatically. C, Contact an authorized service dealer or Seller
E3	Heating fluid temperature >85C	This condition will exist for 60 seconds and will recover automatically.
E4	Thermal breaker switch failure	A, Wait until the surface of the heating elements cools down to 85 deg.C, it will then reset automatically. B, Contact an authorized service dealer or Seller
E5	A, Flow meter failure B, Piping or pump failure C, Filter plugging	A, Replace the flow meter B, Inspect the piping and the pump and solve the problem C, Contact an authorized service dealer or Seller
E6 (Available only for domestic hot water mode)	A, Loose connection between temperature sensor and PCB. B, Failure of temperature sensor for domestic hot water	A, Tighten the connection between temperature sensor and PCB. B, Replace the temperature sensor (Contact the local service provider)
E7 (Available only for domestic hot water mode)	Outlet temperature ≥73ºC for domestic hot water mode	Reduce the temperature setting, increase water flow rate
Leakage of connection at water inlet/outlet/heating fluid	A， Loose connection B, Damaged sealing ring of connection	A, Reconnect. B, Replace the sealing ring.
No indication on the control panel	A, Power failure B, Loose connection of the control PCB to the power supply PCB. C, Display PCB failure	A, Connect the cable and restore power supply. B, Reconnect the tape cable between the display PCB and the control PCB. C, Replace the display PCB. D, Contact an authorized service dealer or Seller
Key pressing failure	Failure of key being pressed or display PCB	Replace the key or the display PCB.
Heating system temperature too low	A, Heating element failure B, Thermal protection enabled C, Blown fuse D, Control PCB failure	A, Replace the heating element. B, Reset the thermal protection device. C, Replace the fuse. D, Contact an authorized service dealer or Seller
Frequent lack of water	Heating system piping not properly sealed, existing leakage from the system, which causes insufficient flow of heating fluid or pressure loss.	Inspect for heating system leakage; ensure sealing.

9. OPERATING INSTRUCTIONS

- The user of the electric heater shall provide water supply and power supply for the system.
- The user shall make sure that sealing is proper and control the system operating pressure.
- Make adjustments for heater or room temperature depending on the system function mode and user's individual preferences.
- In case of deviation from the parameter settings, the user shall inform the authorized service dealer.
- Maintenance shall be performed by authorized personnel experienced in control and operation of this device.
- In case of power failure and after power supply is restored, the electric heater will restart automatically.

10. COMMISSIONING

- This heater shall be started only upon completion of inspection and acceptance of all connections to the heating system, all electrical connections and the external line.
- Ensure that the heating system valves are open; check system pressure, as well. Enable the automatic fuse of the electric heater and enter the correct settings. Heating systems can be filled only with water or water containing antifreeze agent.

11. CONDITIONS PRECEDENT FOR COMMISSIOING AND GUARANTEE SERVICE – GENERAL REQUIREMENTS:

This electric heater/module is intended for installation using wall mount brackets, only for walls that can support its weight. Select the location for this electric heater/module to ensure easy access – distances as per the process requirements on all four sides.

1. This heater/module shall be installed in a location that can ensure convenient conditions for maintenance (easy access to the device) and possibility to open the front cover.
2. This heater/module shall be wall mounted at a minimum height of 1 m from the floor.
3. Install a filter upstream the pump (filter is a heater accessory) as per the manufacturer's instruction manual, attached.

1. Prevent contact of the heater with building materials.
2. Install screw connectors at the heater inlet and outlet.
3. Perform a hydraulic test of the system with a factor of 1.25 over the operating pressure.
4. Be sure to check the heater settings during commissioning. Actual control is performed during hot testing.
5. The guarantee becomes effective as from the date of commissioning, however not later than six months from the purchase date.

12. PRODUCT WARRANTY DATA:

Product Type____

Serial № ______________ **date of manufacturing** ____

Note: The Manufacturer reserves the right on structural modifications of this device.

Date: 20.01.2021