

OPERATING AND INSTALLATION MANUAL

ELECTRIC WATER HEATER

TO/E 5.1 UP/IN
TO/E 10.1 UP/IN



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 **DRAŽICE**
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CAREFULLY READ THIS MANUAL BEFORE INSTALLING THE WATER HEATER!

Dear Customer,

Družstevní závody Dražice - strojírna s.r.o., would like to thank you for your decision to use a product of our brand. With this guide, we will introduce you to the use, construction, maintenance and other information on electrical water heaters.



The product is not intended to be controlled by

- a) people (including children) with reduced physical, sensual or mental capacities, or
- b) people with insufficient knowledge and experiences unless supervised by responsible person, or unless properly instructed by such responsible person.

The manufacturer reserves the right for engineering modification of the product. The product is designed for permanent contact with drinkable water.

It is recommended to use the product in indoor environment with air temperatures from +2 °C to +45 °C and a relative humidity up to 80 %.

Product's reliability and safety is proven by tests implemented by the Engineering Test Institute in Brno.

Made in the Czech Republic.



To ensure proper functioning, the water heater must be connected to a permanent power supply. The electrical installation may only be made by a person authorized to install electric appliances (does not apply to plugging the plug into the socket).

Meaning of pictograms used in the Manual



Important information for heater users.



Abiding by the recommendations of the manufacturer serves to ensure trouble-free operation and the long service life of the product.



**Caution!
Important notice to be observed.**

1 PRODUCT ACCESSORIES

The product is packed together with service instructions. The heater is equipped with a safety valve as a protective element. The valve is mounted on the cold water supply (see chapter 7- PLUMBING FIXTURE).

2 MESSAGE FOR CUSTOMERS

This electric heater is designed for preparation of hot water in households, cottages, and various welfare facilities. It allows installation of only one hot water consumption point with no pressure connection. In case of pressure connection, it is possible to connect more consumption points, but with limited use of parallel consumption. Its advantage is that it heats up water by electric current in an unlimited all-day time range, because of low accumulation it is not recommended to use the connection with the HDO control signal. The time of the domestic water heating is about 9 and 18 minutes, depending on the volume.

3 TECHNICAL DESCRIPTION

The heater vessel is steel enamelled for pressure connection, the electric heating element is immersed. The heater vessel consists of a magnesium anode that helps protect the heater vessel from corrosion. The heater vessel is equipped with polyurethane insulation, all in a plastic top and upper cover. The electric wiring is located in the lower (upper) part of the heater, under the removable heater cover. The water temperature is pre-set to 55 °C (Optimum position). The cold water inlet is indicated with a blue circle, the hot water outlet is indicated with a red circle.

TO/E 5.1, 10.1 **UP** - pressure heater with a capacity of 4.6 and 9.6 litres located above the consumption point

TO/E 5.1, 10.1 **IN** - pressure heater with a capacity of 4.6 and 9.6 litres located under the consumption point



The TO/E 5.1, 10.1 IN/UP heaters can also be used as non-pressure heaters.

4 GENERAL TECHNICAL DATA

		TO/E 5.1 IN/UP	TO/E 10.1 IN/UP
VOLUME	l	4.6	9.6
RATED PRESSURE	bar	6	6
ELECTRIC CONNECTION		1 PE-N 230V/50HZ	
RECOMMENDED BREAKER		16 A	
INPUT	W	1500	
EL. PROTECTION		IP X5	
MAX WEIGHT OF THE HEATER WITHOUT WATER	kg	6.0 (10.6)	8.0 (17.6)
TIME OF EL. HEATING FROM 10 °C TO 60 °C	min	13	25
MIXED WATER V40		4.06 / 5.51	11.2 / 13.38
LOAD PROFILE		XXS	XXS
ENERGY EFFICIENCY CLASS		A	A
ENERGY EFFICIENCY	%	36.24 / 37.10	35.17 / 35.12
ANNUAL CONSUMPTION OF ELECTRIC ENERGY	kWh	509 / 497	525

Table 1

5 OPERATING ACTIVITY

After the heater is connected to the electric network, the heating element starts heating the water. The element is turned on and off by a thermostat. After reaching the set temperature, the thermostat turns off the electric circuit and interrupts the water heating. The indicator signals if the element is in operation (indicator is on) or if it is out of operation (indicator is off).

6 WALL MOUNTING

Check the load-bearing capacity of the wall or reinforce the wall before mounting. Mount the water heater in vertical position only. The fastening screws must have a guaranteed spacing of 140 mm. The mounting dimensions are specified in Figure 3.

7 PLUMBING FIXTURE

Water inflow and outflow is indicated with different colour terminals on the heater tubes. Cold water supply is indicated with blue and hot water outflow is indicated with red. There are two ways of connecting the water heater to water network. Closed, pressure connection system allows water withdrawal at multiple supply (withdrawal) points whilst open flow system allows one supply (withdrawal) point only. With regard to the selected way of connection, you need to purchase suitable combination faucets.

For the open flow system you need to mount a return valve in order to avoid water outflow from the boiler if water supply gets discontinued. For this type of connection, you have to use the flow combination faucet. Due to heating, the volume of water increases, which causes water dripping from the combination faucet pipe. You will not prevent water from dripping by strong tightening of the combination faucet valve but you may damage the combination faucet.

For the closed pressure connection system you need to use pressurised combination faucets at the withdrawal points. You have to attach a safety valve to the filling pipe to avoid increase of pressure in the tank above the rated pressure. During water heating in the heater, the water pressure in the tank increases until it reaches the limit set on the safety valve.

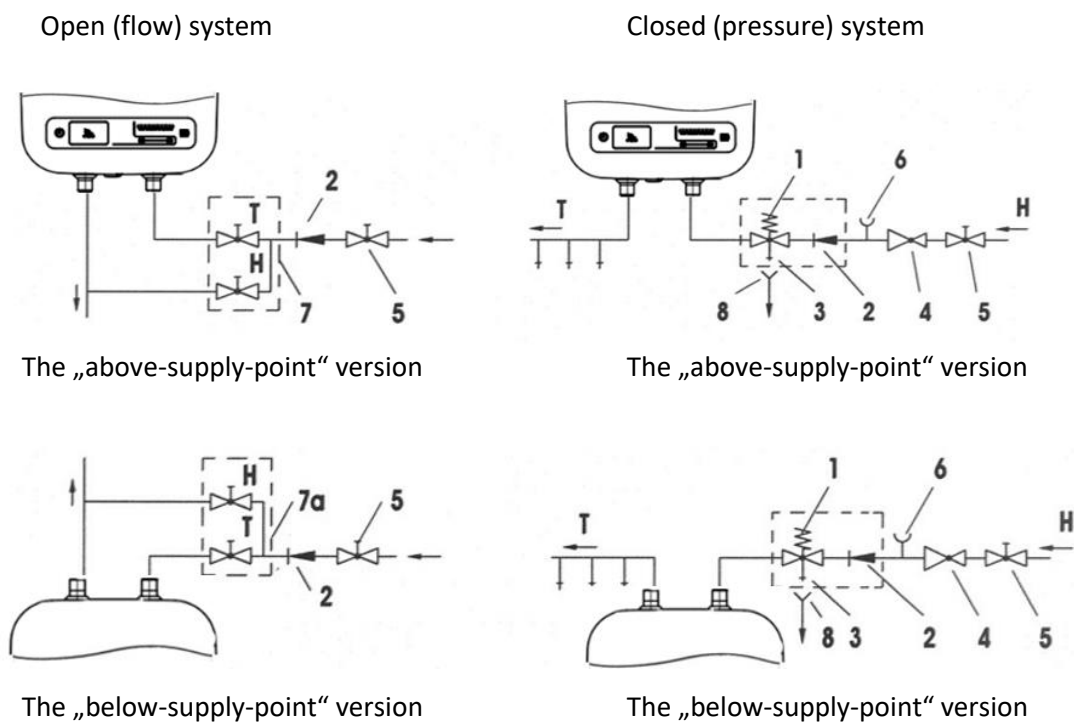


Figure 1

Explanation:

- | | |
|-------------------------|--|
| 1 - Safety valve | 6 - Test adaptor |
| 2 - Back pressure valve | 7, 7a - Flow combination faucet |
| 3 - Test valve | 8 - Funnel with connector to drain from the safety valve |
| 4 - Reduction valve | H - Cold water |
| 5 - Shut-off valve | T - Hot water |

Safety valve is mounted on the cold water inlet identified with a blue ring. Each hot service water pressure heater must have a safety valve with a membrane spring. Nominal clearance of safety valves is defined in the ČSN 0 60830 standard. The safety valve must be well accessible, as near to the heater as possible. The input pipes must have at least the same clearance as the safety valve. The safety valve is placed high enough to secure dripping water drain by gravity. We recommend mounting the safety valve onto a branch pipe. This allows easier exchange without having to drain the water from the heater. Safety valves with fixed pressure settings from the manufacturer are used for the assembly. Starting pressure of a safety valve must be identical to the maximum allowed heater pressure, and at least 20 % higher than the maximum pressure in the water main. If the water main pressure exceeds such value, a reduction valve must be added to the system.



No stop valves can be put between the heater and the safety valve.

During the assembly, follow the guide provided by the safety equipment manufacturer. It is necessary to check the safety valve each time before putting it into operation. It is checked by manual moving of the membrane from the seat, turning the make-and-break device button always in the direction of the arrow. After being turned, the button must click back into a notch. Proper function of the make-and-break device results in water draining through the safety valve outlet pipe. In common operation, such a check needs to be implemented at least once a month, and after each heater shutdown for more than 5 days. Water may be dripping off the drain pipe of the safety valve; the pipe must be open into the air, pointed down; environment temperatures must not drop below zero. When draining the heater, use a recommended draining valve. First, close water input into the heater

Find necessary pressure values in the following table - Table 2.

SAFETY VALVE STARTING PRESSURE [MPa]	ADMISSIBLE OPERATING WATER HEATER PRESSURE [MPa]	MAX PRESSURE IN THE COLD WATER PIPE [MPa]
0.6	0.6	up to 0.48

Table 2

For proper safety valve operation, a backflow valve must be mounted on the inlet pipes, preventing spontaneous heater draining and hot water penetrating back into the water main.



We recommend that the hot water distribution from the heater was as short as possible to minimise heat losses.

Heaters TO/E UP must be provided with a discharge valve mounted on the cold service water inlet to the heater for potential disassembly or repair.



When assembling the security equipment, follow the standard.

8 ELECTRIC INSTALLATION

The wiring diagram is attached in the manual to the water heater (Figure 4). The heater must be connected via a separate supply with a front-end main switch. The heater is connected to 230V/50Hz electric network by a wire with a plug into the socket. The electric installation must comply with the applicable electrical standards. The connection of the heater to the electric network must be made after the water heater is installed and the heater is filled with water.

Follow the rules of protection against electric shock in accordance with the ČSN 33 2000-4-41 standard.

The degree of protection of electric parts of the heater is IP X5.

9 HEATER COMMISSIONING

After connecting the heater to the water supply network, the heater can be put into operation. Before opening the power supply, the tank must be filled with water. The process of first heating must be executed by licensed professional who has to check it. Both the hot water outlet pipe and safety armature parts may be hot.

Procedure:

- a) check the electric and water main installation
- b) open the hot water valve on the combination faucet
- c) open the cold water inlet valve to the heater
- d) as soon as the water starts running through the hot water valve, the heater is filled and the valve closes
- e) using the front-end main switch open electricity and thus the heater activates



Before first use, or after longer periods, it is necessary to ensure flushing, irrigation and ventilation heater before starting the heating. The first heating tank must be monitored.

10 IMPORTANT NOTICE



- Without a confirmation issued by an authorised company about performed electrical and plumbing fixture the warranty certificate shall be void.
- The hot water outlet must be equipped with a combination faucet.
- It is not allowed to handle the thermostat in any manner whatsoever, aside from temperature resetting with a control button.
- All electric installation handling, adjustment and replacement of the regulation elements shall only be performed by an authorised service company.
- **The thermal fuse must not be turned off!** The non-reversible thermal fuse discontinues electric power input to the heating element should the thermostat fail, if the water temperature in the heater exceeds 99 °C.

If the water heater is mounted in enclosed areas, inter-ceilings, built-in structures and recesses, ensure sufficient access to service fittings, electrical terminal boards, anodes and manholes. Minimum spacing from manhole is 200 mm.

10.1 DISPOSAL OF PACKAGING MATERIAL AND FUNCTIONLESS PRODUCT

A service fee for providing return and recovery of packaging material has been paid for the packaging in which the water heater was delivered. Was paid pursuant to Act No. 477/2001 Coll., as amended, at EKO-KOM a.s. The client number of the company is F06020274. Take the product packages to a waste disposal place designated to that purpose by the municipality. When the operation terminates, disassemble and transport the discarded and unserviceable heater to a waste recycling centre (collecting yard), or contact the manufacturer.



11 FUNCTIONAL DEFECTS

DEFECT		FAILURE	
1	Water in the tank is cold	<ul style="list-style-type: none"> • LED is on 	<ul style="list-style-type: none"> • heating element failure
2	Water in the tank is not warm enough	<ul style="list-style-type: none"> • LED is on 	<ul style="list-style-type: none"> • heating element failure
3	Water in the tank is cold	<ul style="list-style-type: none"> • LED is not on 	<ul style="list-style-type: none"> • operating thermostat failure safety thermostat shut off power supply • power supply outside the heater discontinued
4	Water temperature in the tank does not correspond with value set		<ul style="list-style-type: none"> • thermostat failure

Table 3



Do not try to repair the failure yourselves! Seek either expert or service help. It does not take much for an expert to remove the defect. When making a repair appointment, report the type and serial number you find on the performance plate of your water heater.

12 FIRE-FIGHTING REGULATIONS FOR INSTALLATION AND USE OF HEATER



We would like to emphasise that the heater must not be connected to power supply if work involving flammable liquids (petrol, spot remover) or gases, etc., is performed nearby.

13 USE AND MAINTENANCE OF HEATER

Once connected to the water and power supply networks, the heater is ready for use.

The electric heater operation is indicated by an indicator that is on until the water in the heater is heated to the set temperature. As a result of heating, the water volume increases, which causes the dripping of water from the pipes of the mixing tap and for pressure connections it causes dripping from the safety valve. Firm tightening of the handle on the mixing tap does not prevent dripping, but you can damage the tap.

If you do not intend to use the heater constantly, you must protect the water in the heater from frost by not turning off the power completely, just putting the heater in standby mode. In such a condition, the heater keeps water at the approximate temperature of 5-8 °C. If you take the heater off the power supply, you have to drain the water from it if there is a risk of water freezing inside. Clean the outer parts of the appliance with a mild detergent solution. Do not use thinners or other concentrated cleaning agents. Regular service inspections ensure trouble-free operation and long service life of the heater.

Repetitive water heating causes lime scale sediments on both the vessel walls and mainly on the flange lid. The sediments depend on the hardness of heated water, its temperature and on the volume of hot water used.



We recommend that the heater is first inspected by a specialist, approximately after two years after its commissioning.

During the inspection the scale, that accumulates inside the heater, depending on the quality, amount and temperature of the water consumed, will be removed as needed. The service department ensures the inspection of the heater and, taking into account the identified situation, it recommends the date of the next inspection.



CAUTION: Prior to any intervention inside the heating element, disconnect the appliance from the power supply



Do not attempt to repair the heater by yourself, call the nearest authorised service centre to do so.

14 INSTALLATION REGULATIONS



Both the electric and water installation must follow and meet the requirements and regulations relevant in the country of use!

15 CONTROL PANEL

15.1 CONTROL PANEL DESCRIPTION

An example of the LITE front panel can be seen in Figure 2. This panel is most often designed in two versions, either horizontal (shown in the figure) or vertical.

There are several indication symbols defining the operating modes of the heater or information or error values. Also, some of the symbols are used as capacitive touch buttons for control. The description and the meaning of each one is described below.

15.2 LITE THERMOSTAT FRONT PANEL

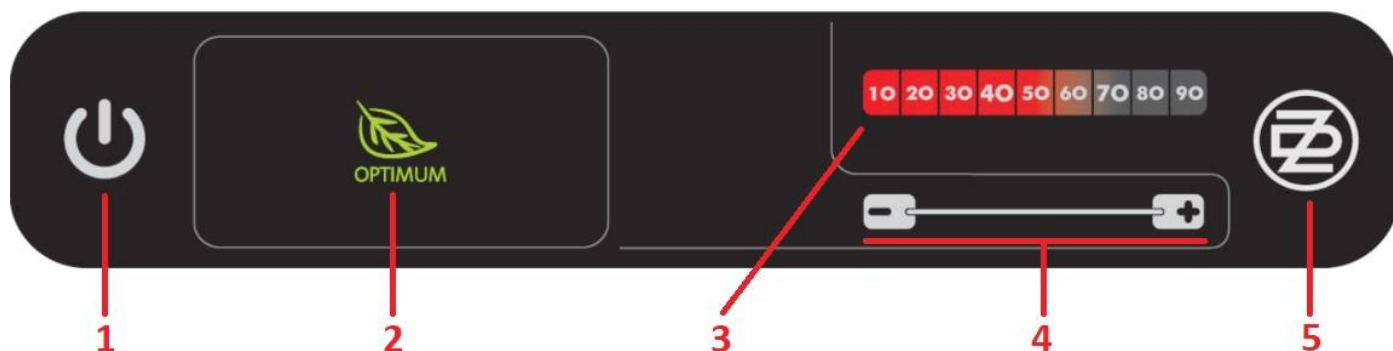


Figure 2

ICON	NAME	FUNCTION DESCRIPTION
1	Switch	Heater On / Off
2	Optimum	Setting of the optimal temperature
3	Thermometer	Display of the current / set temperature and error codes
4	Controller	Setting of the heater temperature
5	Logo	Active heater indication

Table 4



The front panel is equipped with a protective foil which must be removed for proper readability of the panel.

15.2.1 SWITCH

This is an indicator symbol with an integrated button that is used to turn the heater on and off.

If the heater is turned off (but connected to the network), this symbol is slightly backlit to make it easier to find, for example, in dark places. In the on mode, the icon lights up more intensively together with the current water temperature on the thermometer.

If several icons on the thermostat are flashing together, this is an error condition, which is described in detail in Chapter 3.

15.2.2 OPTIMUM

This indicator symbol with a button function is used to quickly set the optimum heater temperature when the heater achieves the highest efficiency. If the thermostat has the optimum temperature set, this symbol is also on. If a different temperature is set, then this symbol is backlit slightly.

15.2.3 THERMOMETER

It consists of a total of 9 segments to display temperatures or error conditions. The temperature is displayed in increments of 5 °C, where the tens of °C (i.e. 10, 20, 30 ...) indicate lighting of only one segment and half temperatures (e.g. 15, 25, 35...) are indicated by lighting of the two closest segments.

If the temperature drops below 10 °C, the lowest segment is flashing. If the temperature exceeds 90 °C, the highest segment is flashing simultaneously with the other icons.

Other error conditions are indicated by a flashing value on the thermometer together with the other icons. For a more detailed description of the error conditions, see Chapter 3.

15.2.4 CONTROLLER

It is outlined by two symbols + and - including the touch sensors. The + and - symbols are backlit and are flashing only in case of an error.

15.2.5 LOGO

The DZD logo is a backlit symbol that indicates active heating. The logo is continuously pulsing as the heater heats the water. Otherwise, it is slightly backlit.

15.2.6 POWER SAVING MODE

In order to save energy, not all symbols are permanently lit when the heater is on. If nothing is set on the front panel for more than 2 minutes, the panel automatically enters the power saving mode, where the + and - symbols go out to adjust the temperature and the intensity of the others decreases. But the functions do not change. If one of the buttons is pressed, the symbol is lit up again.

15.3 CONTROLS AND SETTINGS

All controls of the heater are carried out using the front panel with the capacitive touch buttons described above.

15.3.1 TURNING THE HEATER ON

On initial start-up, the heater is off by default. This can be recognized by the Switch 1 icon slightly backlit to make it easier to find in dark places.

The heater can be turned on by pressing the switch icon (1). At this moment, the individual segments of the thermometer (3) light up gradually. Then they all go out and if no error is detected, the current water temperature is displayed.

The turned-on heater can also be recognized by the backlit power icon and the current temperature on the thermometer (3) is backlit too.

15.3.2 TURNING OFF THE HEATER

The turn-off procedure is similar to turning on, but here the switch button (1) must be held down longer. When the button is pressed, all segments of the thermometer (3) light up, and then they gradually fade away. After the last segment goes out, the heater is turned off completely. However, if the switch button (1) is released earlier, the heater remains unchanged. This functionality is used to prevent accidental shut-down. The minimum time of the power button being pressed is approximately 1.5 seconds.

When the heater is off, all icons are out, except for the power, which is slightly backlit.

15.3.3 TEMPERATURE SETTINGS

The thermostat temperature is set using the control button (4). It can be operated in two ways. Either briefly press the + and - buttons or swipe the line between the buttons.

The temperature can be set in increments by 5 °C, when the thermometer (3) shows the currently set value by flashing segments. When the setting is finished, the currently set temperature continues to flash for 3 seconds and then it is stored in the thermostat.

15.3.4 SETTING THE OPTIMAL TEMPERATURE

The Optimum icon and button (2) are used to quickly set the optimum temperature. If this button is pressed the thermostat is set to the optimum temperature of 55 °C, when the heater achieves the highest efficiency. The optimum temperature setting is indicated by a green icon.

15.4 ERROR MESSAGES

As part of its operation, the heater is able to detect several error conditions indicated on its front panel. If a critical error occurs, the heating is stopped. The error can be cleared by turning the heater off and on using the switch (1).

Critical errors are indicated by flashing of all icons, except for the DZD logo. The error code is then displayed on the thermometer (3) by flashing the corresponding number.

ERROR VALUE	ERROR NAME	PROBLEM DESCRIPTION / SOLUTION
20 °C	Faulty heater	<ul style="list-style-type: none">The water temperature in the heater does not increase for more than 2 hours when the heater is active.Check the heater connection or replace the heater
40 °C	Faulty temperature sensor	<ul style="list-style-type: none">The temperature cannot be measured.Check the temperature sensor wiring or replace it.
90 °C	Overheated heater	<ul style="list-style-type: none">The water temperature in the heater is higher than 90°C.If the heater is turned on, it should no longer heat the water. If the problem persists, the relay may be faulty.

Table 5 - critical error codes and their meaning

Lower priority errors do not affect the heater function and are only indicated by constant flashing of the value on the thermometer (3).

ERROR VALUE	ERROR NAME	PROBLEM DESCRIPTION / SOLUTION
10 °C	Under-cooled heater	<ul style="list-style-type: none">The water temperature in the heater is lower than 10 °C.If the heater is turned on, it heats itself to the set temperature. If the heater is in standby mode, the anti-freeze function is automatically activated 15.4.2.

Table 6 - low priority error codes and their meaning

15.5 THERMOSTAT MODES

15.5.1 HEATING MODE

Active thermostat mode where the thermostat keeps the temperature of the heated water at the value set by the user with the given hysteresis. The user can set this value on the control panel.

15.5.2 NON-FREEZE TEMPERATURE MODE

This is a mode to prevent the water from freezing in the heater, for example in the winter months. The mode is activated when the thermostat is in standby mode and the water temperature drops below 5 °C. At this point the heating is turned on and the water is heated to 8 °C.

In standby mode, this is indicated in by a flashing LED indicator for 10 °C and by continuously pulsing (breathing) the DZD logo.

16 FIGURES

16.1 HEATER DIMENSIONS

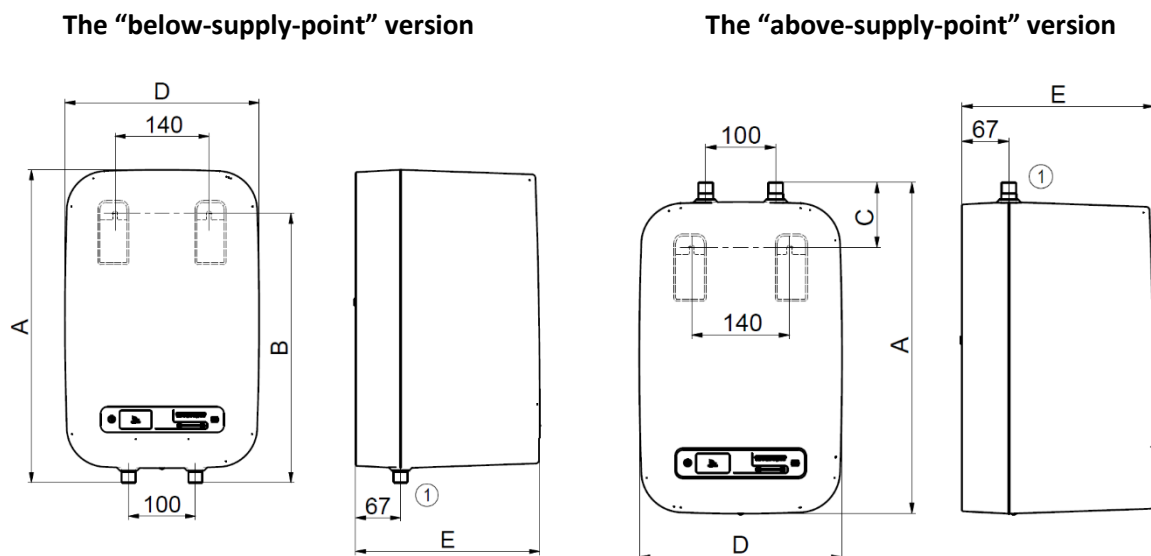


Figure 3

	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
TO/E 5.1 UP	330	265	-	290	275
TO/E 5.1 IN	338	-	93	290	275
TO/E 10.1 UP	465	400	-	290	275
TO/E 10.1 IN	473	-	93	290	275

①	1/2" outer
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Table 7

16.2 ELECTRICAL WIRING DIAGRAM

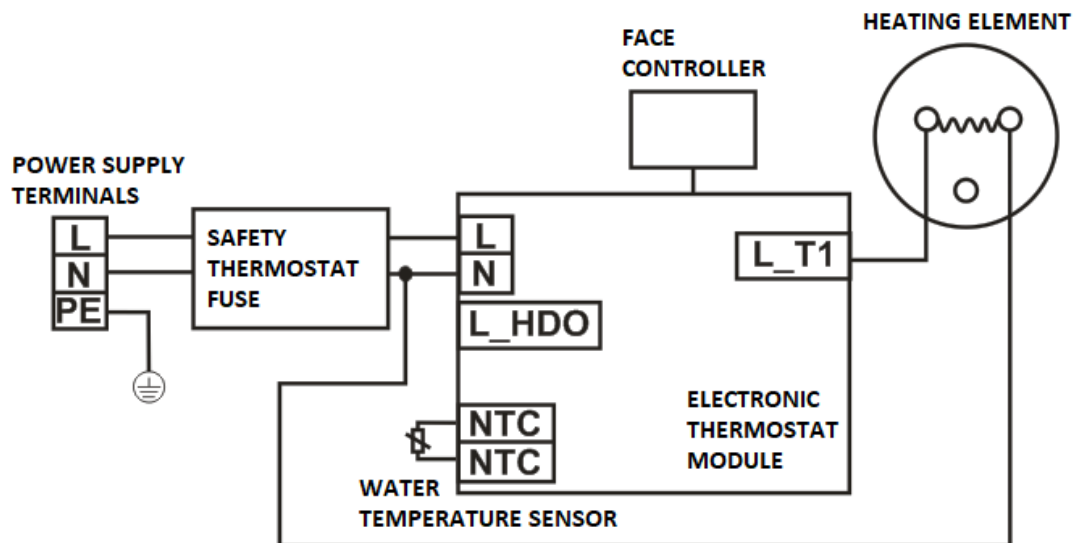


Figure 4

15-9-2021