

# OPERATING AND INSTALLATION MANUAL

## TANK-TYPE WATER HEATER FOR VERTICAL MOUNTING

Electric water heaters

OKCE 125 2/6 kW

OKCE 160 2/6 kW

OKCE 200 2/6 kW



Družstevní závody Dražice-strojírna s.r.o.  
(Works Cooperative - Dražice - Machine Plant, Ltd.)  
Dražice 69, 294 71 Benátky nad Jizerou  
tel.: +420 / 326 370 911  
fax: +420 / 326 370 980  
e-mail: [export@dzd.cz](mailto:export@dzd.cz)

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

Dear Customer,

The Works Cooperative of Dražice - Machine Plant, Ltd., 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.

### 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 TECHNICAL SPECIFICATION

## 1.1 FUNCTION DESCRIPTION

Tank type water heater (the **heater** hereinafter) is designed for the accumulation heating of service water by electric energy. Water is heated by an electric element in an enamelled thermally insulated tank. The element is at the time of heating controlled by a thermostat the temperature of which can be adjusted continuously (within the range between 5 °C and 75 °C). Once the selected temperature is reached, heating interrupts automatically. Water accumulated in the tank is then used for the consumption. The tank keeps constant pressure of water from the water main. If the combination faucet hot water valve is opened, water from the water supply conduit pressed out by cold water pressure flows out of the heater. How water drains off the upper part, and coming water stays in the bottom part of the heater. Pressure principle allows hot water withdrawal at any place from the heater.

## 1.2 ADVICE FOR CUSTOMERS

### 1.2.1 HOT WATER CONSUMPTION



Consumption of hot water in households depends on the number of people, amount of sanitary equipment, length, diameter and insulation of piping in the flat, or on individual habits of users. The cheapest option of water heating comes at the time when the electricity rate is reduced.



Find out in what time intervals your electricity supplier provides reduced tariff and, depending on that information, select relevant volume and power input of the heater so that your hot water consumption covered the needs of your household.

### 1.2.2 ENERGY SAVING



The heater is insulated with quality polyurethane Freon free foam. Set the temperature of the heater's thermostat to that level only that you need to run your home. Thus you will reduce electricity consumption, as well as the amount of lime sediments on the walls of the receptacle and on the electric element's pit.

### 1.2.3 EMERGENCY POWER CONSUMPTION



If no heated water is taken from the tank, a small amount of heat leaks. This loss is measured for a period of 24 hours at the temperature of 65 °C in the heater, and at 20 °C in its ambient area. The resulting value is expressed in units [kWh/24h] and indicates the amount of power needed to maintain the set temperature.

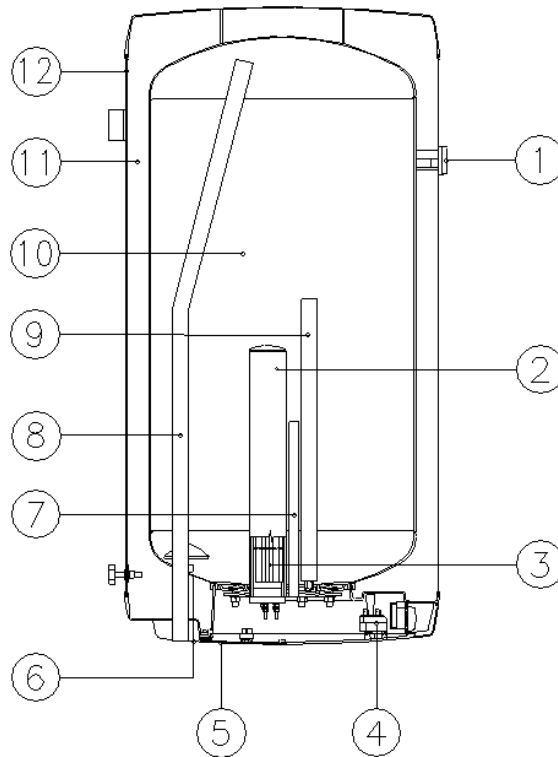
TYPE		OKCE 125 2/6 kW	OKCE 160 2/6 kW	OKCE 200 2/6 kW
VOLUME	l	125	152	200
MAX WEIGHT OF THE HEATER WITHOUT WATER	kg	43	49	70
MAX OPERATING OVERPRESSURE IN THE TANK	MPa		0.6	
ELECTRICAL CONNECTION	V		3/N/PE ~ 400V/50Hz	
RECOMMENDED BREAKER			3x16 A	
INPUT	W		2000 / 6000	
EL. PROTECTION			IP 44	
MAX OPERATING TEMPERATURE IN THE TANK	°C		80	
RECOMMENDED HOT WATER (HW) TEMPERATURE	°C		60	
HEIGHT OF THE HEATER	mm	1067	1255	1290
DIAMETER OF THE HEATER	mm	524	524	584
TIME OF EL. HEATING FROM 10°C TO 60°C	hrs	3.3 / 1.1	4.0 / 1.4	5.3 / 1.8
LOAD PROFILE		M	L	L
DAILY ELECTRICITY CONSUMPTION	kWh	6.59	12.03	12.06
MIXED WATER V40	l	231.1 *	242.83 *	331.26 *

\* The data is valid for 2 kW

Table 1

## 1.3 DESIGN AND GENERAL HEATER DIMENSIONS

The heater tanks are made of a steel plate and tested by 1.5 MPa multiple of operation pressure value. The inside of the receptacle is enamelled. A flange is welded onto the bottom of the tank with a flange lid screwed to it. A sealing ring is inserted between the flange lid and the flange. Thermowells for placing a heating element, thermostat sensors and safety fuses are located in the flange lid. An anode rod is mounted onto the M8 nut. Electric wiring is placed underneath the plastic removable cover. Description of the basic parts of the heater - Figure 1. Heater dimensions - Figure 2, Table 2 and Figure 3, Table 3.



**Figure 1**

1. temperature indicator
2. heating element well
3. ceramic heating element 3 x 2000 W
4. service thermostat with external control and safety fuse
5. electric installation cover
6. cold water supply pipe
7. thermowell
8. hot water withdrawal pipe
9. Mg anode
10. enamelled steel receptacle
11. polyurethane insulation
12. heater shell

OKCE 125 2/6 kW, 160 2/6 kW

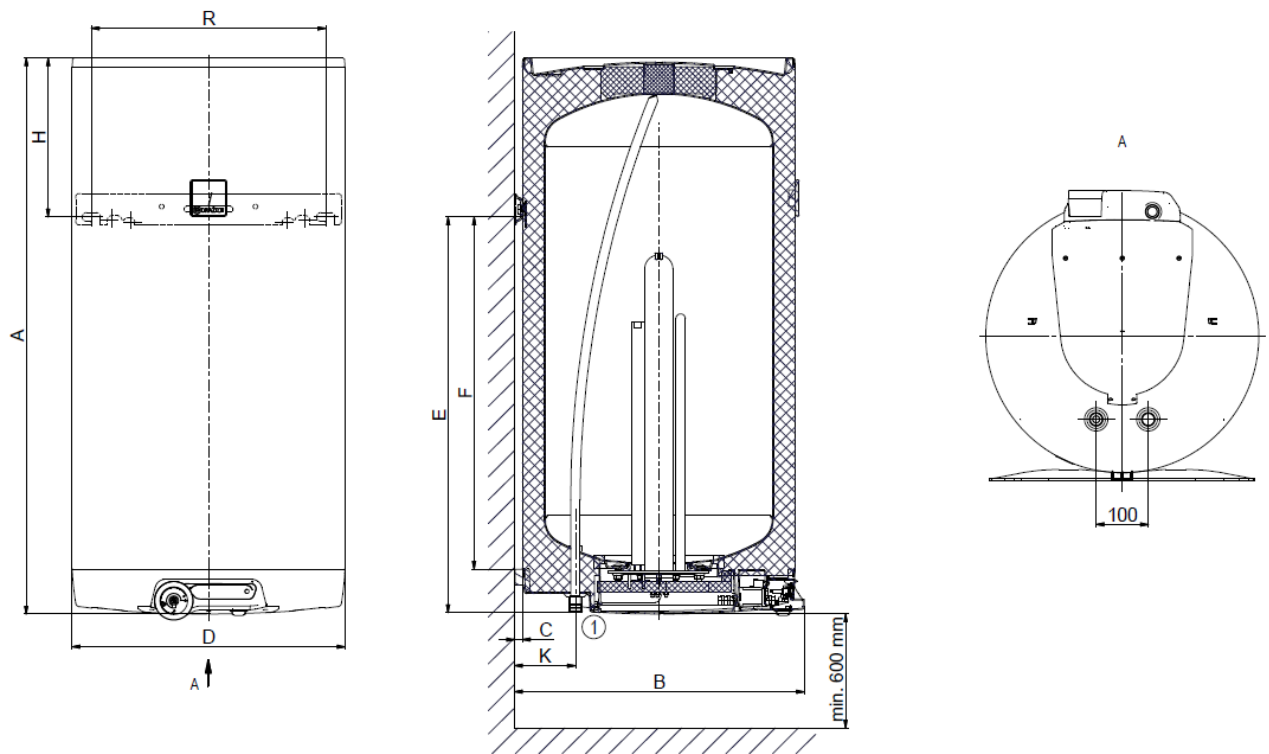


Figure 2

① 3/4" outer

	OKCE 125 2/6 kW	OKCE 160 2/6 kW
A	1067	1255
B	562	562
C	14	14
D	524	524
E	760	1000
F	682	925
H	297	245
K	116	116
R	450	450

Table 2

OKCE 200 2/6 kW

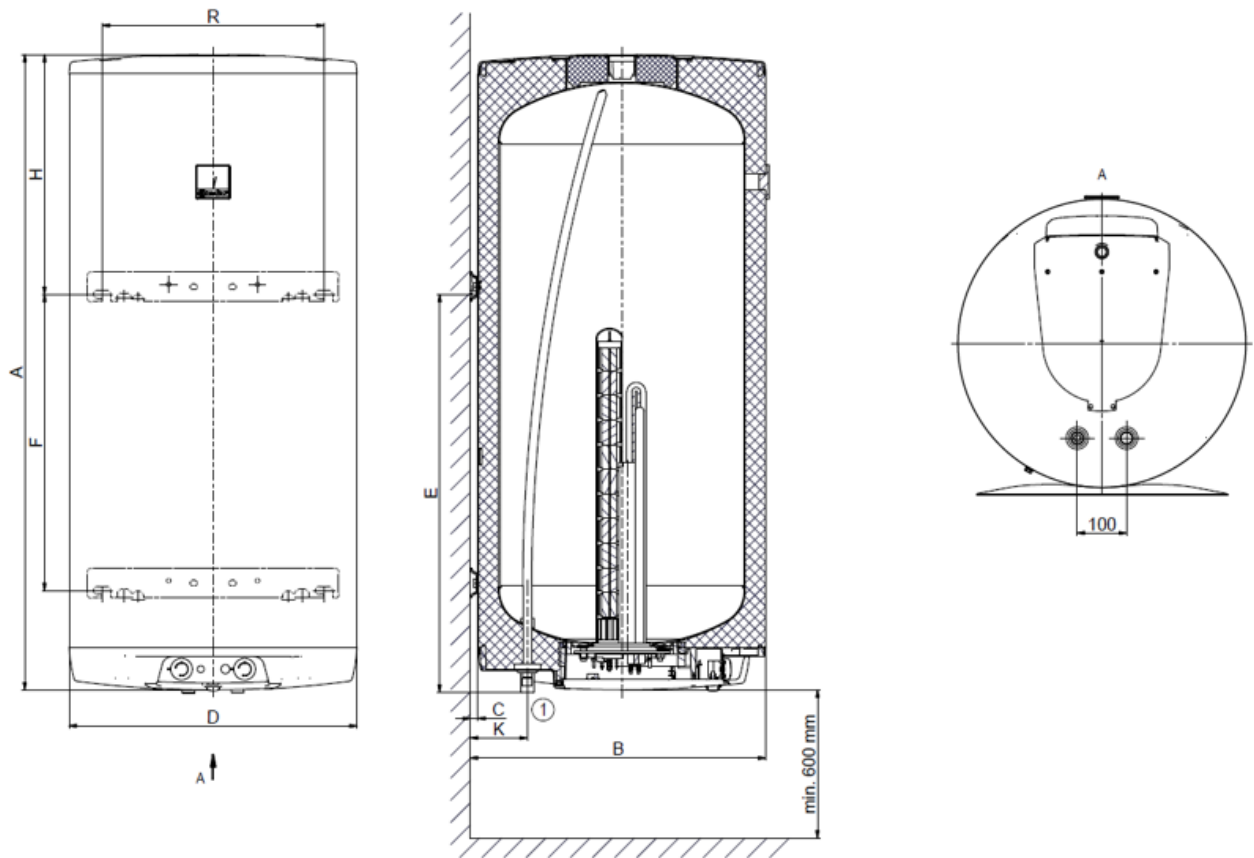


Figure 3

OKCE 200 2/6 kW		①
A	1290	3/4" outer
B	599	
C	15	
D	584	
E	806	
F	600	
H	486	
K	115	
R	450	

Table 3



## 2 OPERATION AND FITTING INSTRUCTIONS

### 2.1 OPERATING CONDITIONS



The tank shall only be used in accordance with the conditions specified on the nameplate and in this manual. Besides the legally acknowledged national regulations and standards, also conditions for the connection defined in local electric and water works have to be adhered to, as well as the installation and operation manual.

The temperature at the place of heater installation must be higher than +2 °C; and the room must not freeze. The appliance has to be mounted at a convenient place, it means that the appliance must be easily available for potential necessary maintenance, repair or replacement, as the case may be.



If water is strongly calcareous we recommend that a common decalcifying device was installed with the appliance, or that the thermostat was set to the minimum operating temperature of 60 °C (setting to position "OPTIMUM" or "ECO") - Figure 12, Figure 13. For proper operation, drinkable water of adequate quality shall be used. To avoid potential sediments we recommend that the device was installed together with a water filter.

### 2.2 WALL MOUNTING



Prior to the mounting check the bearing capacity of the wall and the material it is made of, considering the weight of the heater filled with water. Depending on the wall material choose adequate fixtures. Should you have any doubts regarding the wall bearing capacity, consult the suspension with a building specialist. The minimum diameter of the bolts for suspending the heater is 12 mm. **When mounting the anchor bolts follow the guide provided by the anchor bolts' manufacturer.**

**Neither the control knob of the thermostat, nor another part of the control panel is a bearing part which may be used for any handling of the heater!**

Mount the anchors by the dimensional drawing (Figure 2, Figure 3) in a **450 mm** spacing. **Proper verticality of heater can be adjusted by slight turning of the suspension once the connecting screws are loosened.** Double check the torque of the suspension bolts on the heater and suspend the heater. Using the detent support in the bottom part of the heater make sure it runs in parallel with the wall of the 125 - 160 l heaters!



Figure 4

### Universal suspension

Use of suspension even to screw spacing if heater is substituted for another type.

**Proper verticality of heater can be adjusted once the connecting screws are loosened by slight turning of the suspension.**

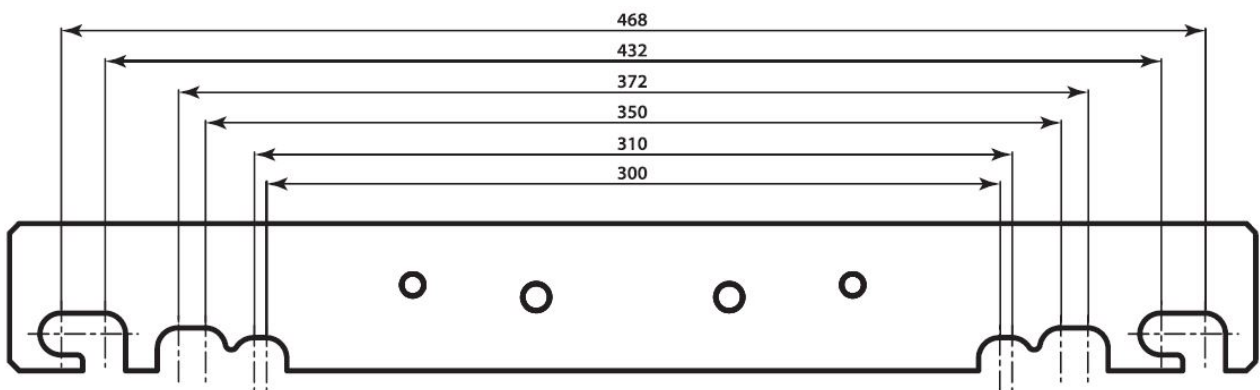


Figure 5



If the hot water heater is mounted in a **tight, smaller space**, or in an intermediate ceiling, etc., you have to make sure that the connecting side of the appliance (connections to water supply, area for electric plugging) remained accessible and no heat accumulation occurs. Free space of up to **600 mm** from the bottom edge of the heater has to be left available under the heater. When mounted directly under the ceiling, the distance from the ceiling has to be **50 mm** at least.

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 600 mm.

## 2.3 PLUMBING FIXTURE



The heater connects to water distribution pipes with 3/4" thread tubes in the bottom part of the heater. Blue - cold water supply, red - hot water outlet. For potential disconnection of the heater, service water inlets and outlets must be provided with screw coupling Js 3/4". The safety valve is mounted on the cold water inlet identified with a blue ring.

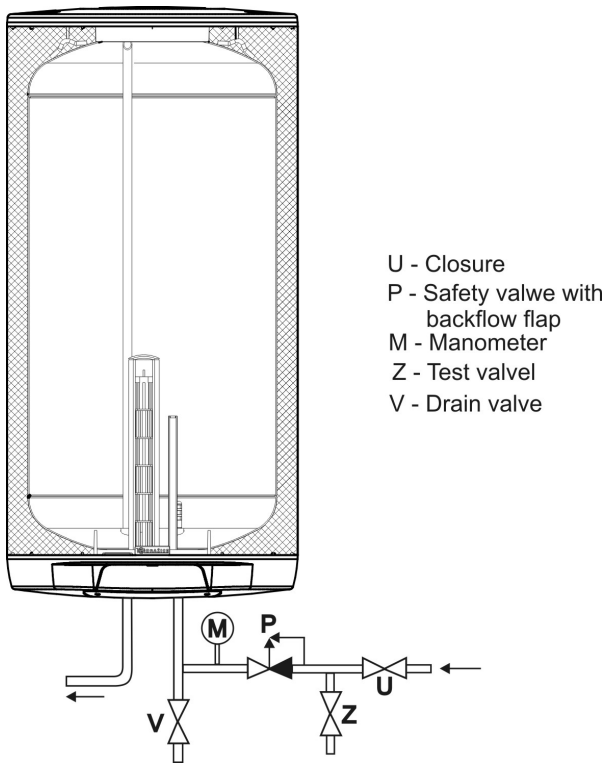


The heater must be equipped with a membrane, spring-loaded safety valve. Safety valves with fixed pressure settings from the manufacturer are used for the assembly. Each individually lockable heater must be fitted with a cap on the cold water inlet, a test valve or a stopper to check the operation of the check valve, with a drain valve, a check valve and a safety valve (Figure 6). **The safety valve with a check valve is supplied with the heater.**



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.



SAFETY VALVE START-UP PRESSURE [MPa]	ALLOWABLE OPERATING OVERPRESSURE OF WATER HEATER [MPa]	MAXIMUM PRESSURE IN COLD WATER PIPES [MPa]
0.6	0.6	to 0,48
0.7	0.7	to 0.56
1	1	to 0.8

Table 4

Figure 6

# TANK TYPE ELECTRIC WATER HEATER HOT WATER DISTRIBUTION

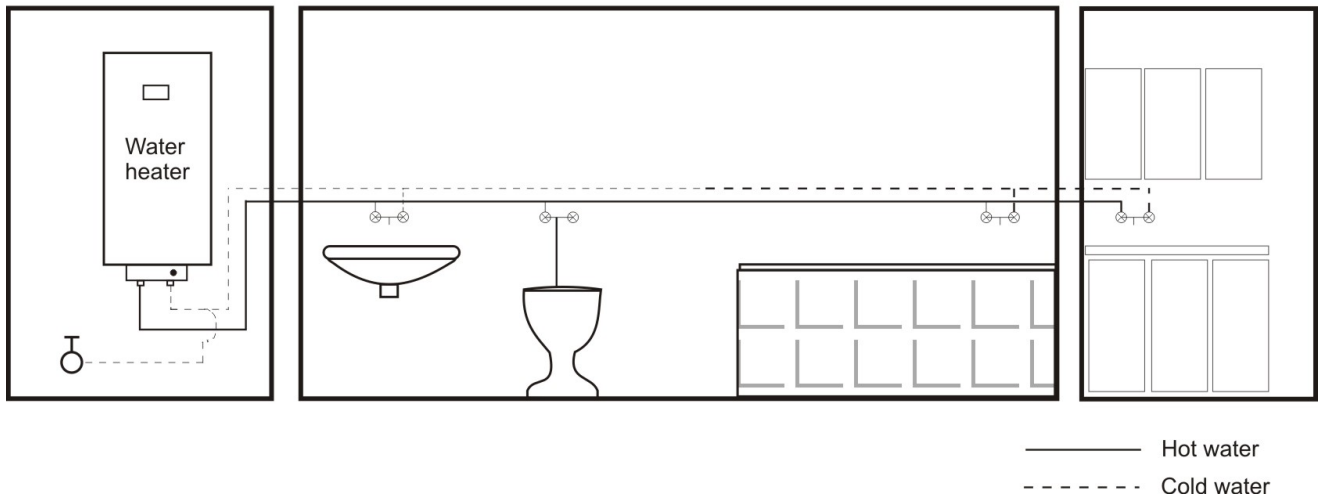


Figure 7

## 2.4 ELECTRICAL INSTALLATION

### 2.4.1 GENERAL INFORMATION FOR ELECTRICAL INSTALLATION

Execute the connection as indicated in the wiring diagram. Factory connection must not be changed! (Figure 9). In the electric wiring cabinet remove the partition corresponding with the input wire diameter of  $\varnothing 8$  or  $\varnothing 10$  (Figure 8). The degree of protection of electric parts of the heater is IP 44. Power input of electric element is  $3 \times 2000$  W. Use pre-installed brackets to hold the lead cable.

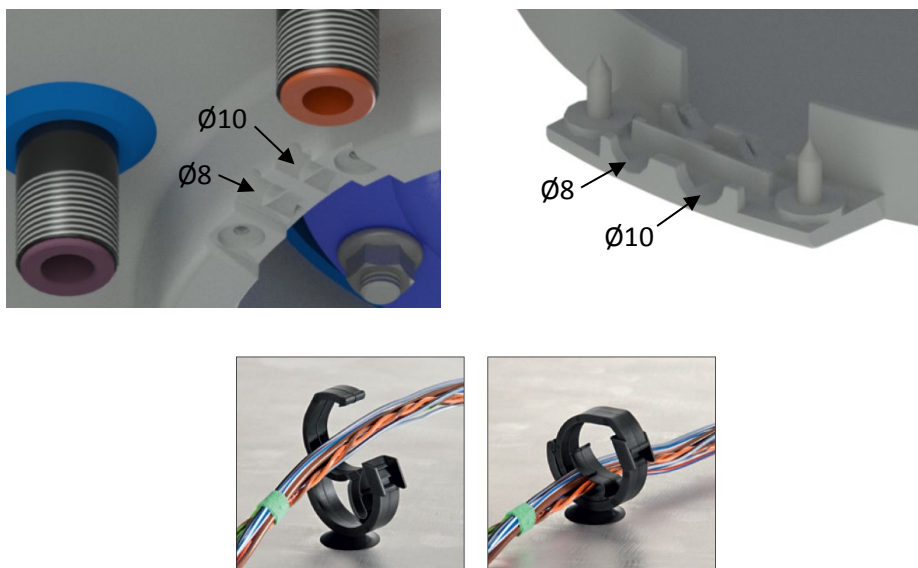


Figure 8

It is necessary to observe the below requirements during the electric wiring.



- The wiring diagram is also attached to the heater on the side of the electrical installation guard (Figure 9).
- The electrical installation may only be connected, repaired and inspected by a person authorised to perform that activity.
- Expert connection must be confirmed on the warranty certificate, or demonstrated by another certificate.
- The heater is connected to the 3x 230 V/50 Hz power grid using a fixed moving conductor with a switch that turns off all the grid poles and the circuit breaker (protector).
- Cable 5 x 2.5 mm<sup>2</sup>, supply protection 3 x 16 A/B
- Installations in bathrooms, laundry rooms, washrooms and showers must be in compliance with the standard.
- The degree of protection of electric parts of the heater is IP 44.
- Adhere to the protection against electric shock injury according to standard.

## Wiring scheme

**R1 , R2 , R3** - rating element - 230 VAC, 2000 W, 8.5 A

**1** - blue control lamp - 2000 W

**2** - red control lamp - fast heating 6000 W

**ST** - power relay, inductor 230 VAC

**Re** - power relay, inductor 230 VAC

**Fu** - fuse Ø 5 mm x 20 mm, 500 mA

**TL** - button- fast heating, START

**Te1** - service thermostat - round control button  
on the control knob

**Te2** - thermostat and thermal (emergency) fuse  
- inside the control, under the electrical installation cover

**PE, N, L1, L2, L3** - connecting terminals, power supply

**HDO** - external contact terminal  
- locking / switching with HDO tariff switch  
(contact switches current 8.5 A, 2000 W)

**FVE** - external contact terminal - preferred fast heating  
(contact switches current to 0.5 A)

**TL** - external push button terminal  
(small terminal boards with fuse)

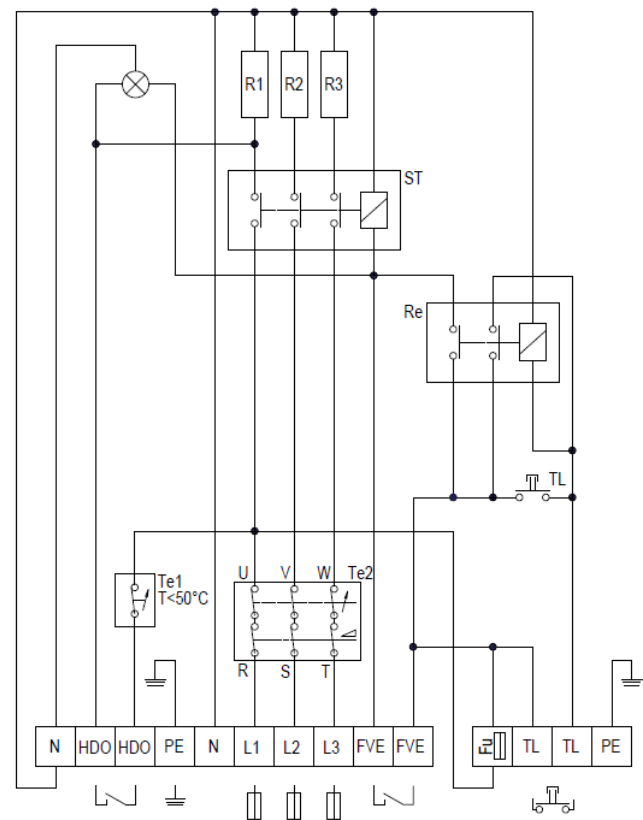


Figure 9

## 2.5 OPERATION

- **Basic heating**, at an output of 2 kW/240 V/8.5 A - 1 phase - controlled by thermostat Te1. The temperature can be set using the panel on the heaters in the range of approx. 5 °C to approx. 75 °C by setting the temperature on the thermostat Te2. Te1 temperature should be set lower than Te2. Operation is indicated by blue indicator light 1. In factory setting, HDO contacts are connected through a terminal. That arrangement does not provide heating during low tariff electricity. To use low rate heating only, it is necessary to connect HDO terminals through an external switch operated by the HDO.
- **Fast heating** at the output of 6 kW / voltage 3 x 240 V (400 V) or 4 kW with the L2 or L3 phase power supply disconnected (breaker off), which is possible only in case of single-phase circuit breakers installation and not in the combined version.

Using the fast heating feature allows heating up the volume of the heater at any time in a third of the basic heating time without affecting the status of HDO blocking.

Press the TL button on the remote control to start fast heating, it will stop automatically upon the reaching of the water temperature set on the thermostat Te2 which is mounted inside the control. From the factory, the thermostat is set to the maximum temperature of approx. 75 °C, lower temperature can be selected followed with adjusting the temperature on thermostat Te1.

The operation is indicated in red with indicator light 1.
- If the fast heating was pressed accidentally, it can be reset by short interruption of the **L1** control phase voltage phase (turn on / off the circuit breaker).
- **Preferred fast heating** - at an output of 6 kW / voltage 3 x 240 V (400 V).

This type of heating can be used for example to use surpluses from photovoltaic panels. Closing an external contact on FVE terminals. The heating only lasts for the time when the contact is closed, or until the Te2 thermostat turned off.

In order to store surpluses, we recommend setting **Te1** to the minimum comfortable temperature of hot water and **Te2** to the maximum. If the **TL** button is pressed at that time - the heating will be switched off only after reaching of the set temperature on the thermostat **Te2**.

The operation is indicated in red with indicator light 2.

The remotely controlled fast heating button, timer and Wi-Fi module2 can be connected in parallel to TL terminals.
- Control phase L1 must always be energized.
- If the fast heating function is used and it turns off automatically after heating up, the appliance is in a state of basic heating.
- Thermostat Te2 also fulfils the function of an emergency safety fuse. When switched off, the wiring cover must be removed and put into operation again by pressing the lock after checking the state of the circuit.
- The fast heating control circuit is protected by a 500 mA safety fuse.
- **Important warning! When fast heating is used as preferred feature, the outlet temperature of water is higher than 65 °C (according to the Te2 setting) - it is recommended to install a thermostatic mixing valve on the hot water outlet!**

## 2.6 FIRST COMMISSIONING



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.



During the heating up process the water that increases its volume during the heating must visibly drip off the safety valve. When heating is finished, the set temperature and the actual temperature of consumed water should be roughly equal. When the heater is connected to a water supply system, power grid and the safety valve tested (accordingly with the manual attached to the valve), the heater can be put in operation.

Before the first putting into service or after a longer shutdown, the appliance has to be rinsed out and flushed yet before the heating is activated. Before the heating starts, the tank must be completely filled with water and the system properly flushed and vented. First heating of the tank has to be watched.

### **Procedure of putting the heater into operation:**

1. Check the water main and wiring. Check proper placement of the operating and safety thermostat sensors. The sensors must be inserted all the way in the thermowell; first the service thermostats Te2, Te1 and then the safety thermostat.
2. Open the hot water valve on the mixing faucet.
3. Open the cold water inlet valve to the tank.
4. As soon as the water starts running through the hot water valve, the heater is filled and the valve can be closed.
5. In case of leakage (of flange lid), we recommend that the flange lid bolts are fastened.
6. Screw down the electric installation guard.
7. Turn on the power supply.
8. When commencing operation, flush the heater until the cloudiness in the water is gone.
9. Make sure to fill in properly the warranty certificate.

## 2.7 PUTTING OUT OF SERVICE, EMPTYING



If hot water tank is put out of service for longer period, or is not going to be used for some time, we recommend it is disconnected from the power grid on all poles. The switch for the supply lead or the fuse cut-outs have to be shut off.

In locations that are permanently exposed to frost, hot water tank shall be emptied prior to the beginning of the cold season, if the appliance is not used for several days, and if the power supply is disconnected.



Drainage of service water shall be performed after closing the shut-off valve in the cold water supply piping (through the discharge valve for a combination of safety valves) and with simultaneous opening of all hot water valves of connected fittings (water can be also drained through the safety valve. **Hot water may outflow during the drainage!** If there is a risk of frost, be aware that not only the water in the hot water tank and the water in the hot water piping may freeze, but also the water in the entire cold water supply piping. It is therefore advisable to drain all fittings and piping that carry water, up to the part where the house water meter is installed (connection of the house to water main) which is not jeopardised by frost. When the tank is to be used again, it has to be filled with water and one needs to make positively sure that the **water flowing out of the hot water valves does not contain any bubbles.**

## 2.8 INSPECTION, MAINTENANCE & CARE FOR THE APPLIANCE



During the heating process the water that increases its volume during the heating must visibly drip off the safety valve drain. In full heating (about 75 °C) the volumetric water gain is approx. 3.5 % of the tank capacity. The function of the safety valve has to be checked regularly. If the safety valve control knob is lifted or turned to the “Control” position, the water must flow out easily, without any obstacles, from the safety valve element to the outfall line. 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.



**Attention!** In doing so, the cold water supply pipe and the connection fitting of the tank may get heated! If hot water heater is not in operation, or hot water is not going to be withdrawn, no water may drip off the safety valve. If water drips, then the water pressure in the supply piping is either too high (if higher than 5.5 bars, a pressure control valve has to be fitted), or the safety valve is defective. Please call a specialised plumber immediately!



Repeated heating causes lime scale settling on the receptacle walls and mostly on the lid of the flange. Lime scale settling depends on hardness of heated water, its temperature and on the volume of hot water used. If water contains too many minerals, an expert has to come to remove the scale that forms inside the tank, as well as free sediments. This has to be performed after one or two years of operation. Cleaning takes place through the hole in the flange - dismantle the flange lid and cleaning the heater. A new sealing has to be used for re-fitting. Since the inside of the heater has special enamel which must not get in contact with the scale removing agent - do not work with decalcification pump. Remove the calcerous buildup with timber or plastic tool, and Hoover or wipe it with a cloth. Then the appliance must be thoroughly flushed and the heating process checked as on the first putting in operation. Do not use any aggressive cleaning agents (such as liquid sand, chemicals - acid, alkaline) or thinners to clean the outer shell of the heater. For cleaning use a wet cloth and add a few drops of liquid cleaning agent for household applications.



**We recommend checking and cleaning the tank from lime scale and eventual replacement of the anode rod after two years of operation.** The anode life is theoretically calculated for two years of operation; however, it changes with water hardness and chemical composition in the place of use. Based on such an inspection, the next term of anode rod exchange may be determined. If the anode is only blocked with sediments clean its surface and, if used up, mount a new one. Have a company in charge of service affairs deal with the cleaning and exchanging of the anode.

## 2.9 MOST FREQUENT FUNCTION FAILURES AND THEIR CAUSES

FAILURE SYMPTOM	INDICATOR	SOLUTION
<b>Water is cold</b>	<ul style="list-style-type: none"> <li>• Light on</li> </ul>	<ul style="list-style-type: none"> <li>• low temperature set on the thermostat</li> <li>• heating element failure</li> </ul>
<b>Water is cold</b>	<ul style="list-style-type: none"> <li>• Light off</li> </ul>	<ul style="list-style-type: none"> <li>• No supply voltage!</li> <li>• Thermostat failure</li> <li>• Safety thermostat shut off probably due to failed operation thermostat</li> </ul>
<b>Water is not warm enough</b>	<ul style="list-style-type: none"> <li>• Light on</li> </ul>	<ul style="list-style-type: none"> <li>• failure of one of the coils in the element (2 x 2000 W + 1 x 2000 W)</li> </ul>
<b>Temperature of water is not corresponding with the temperature set on the control</b>		<ul style="list-style-type: none"> <li>• Defective thermostat</li> </ul>
<b>Water is constantly dripping off the safety valve</b>	<ul style="list-style-type: none"> <li>• Light off</li> </ul>	<ul style="list-style-type: none"> <li>• high input pressure</li> <li>• defective safety valve</li> </ul>

**Table 5**

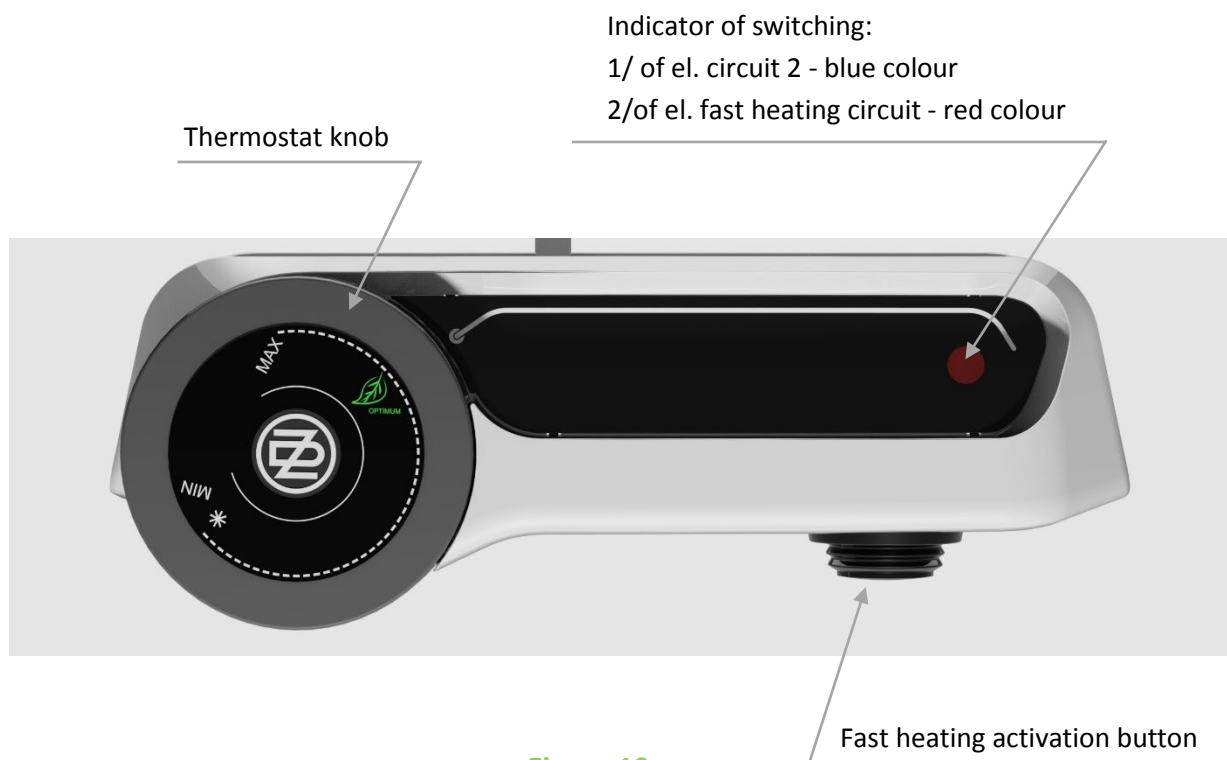


Do not attempt to repair the failure yourselves. Seek either expert or service help. It does not take much for an expert to remove the defect. When making a repair appointment, report the type and serial number you find on the performance plate of your water heater.

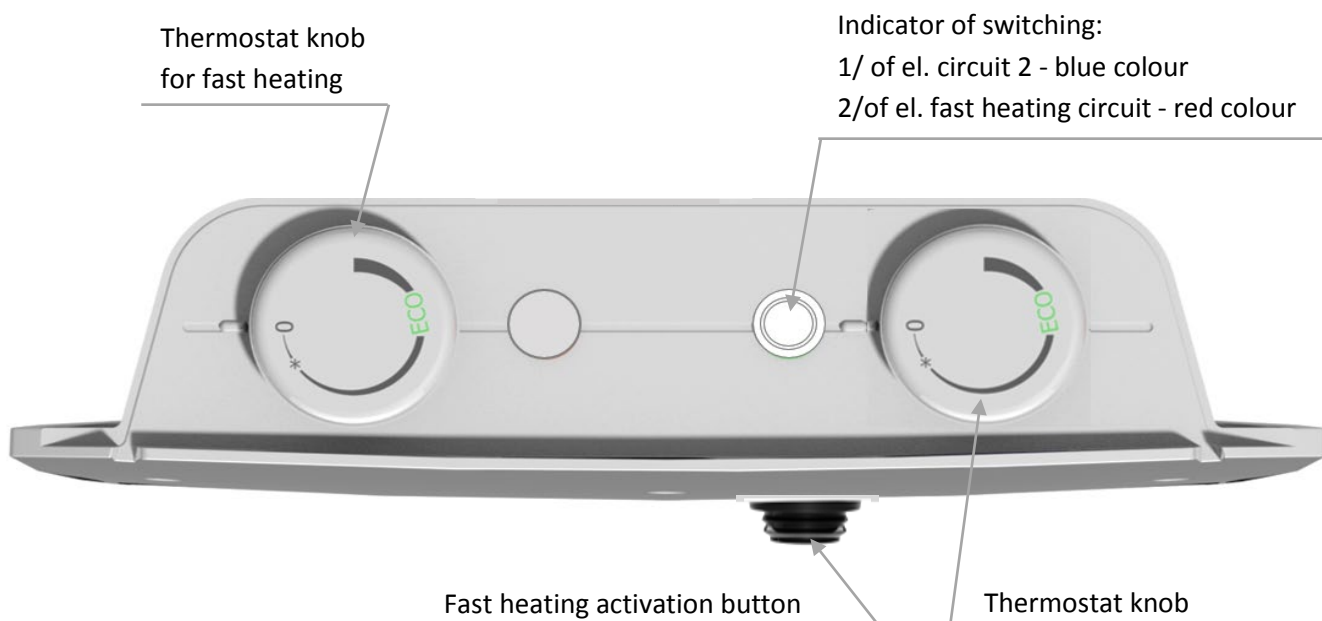
### 3 OPERATION OF THERMOSTAT

#### 3.1 OPERATING DEVICES OF THE HEATER

##### Electrical installation cover for OKCE 125 2/6 kW, OKCE 160 2/6 kW heaters



##### Electrical installation cover for OKCE 200 2/6 kW





Thermostat and no other part of the control panel is not a bearing part which can be used for any handling with the heater.

### 3.1.1 TEMPERATURE SETTING

Water temperature is set by turning the thermostat knob. The required symbol is adjusted against the fixed point on the control panel (Figure 12, Figure 13).

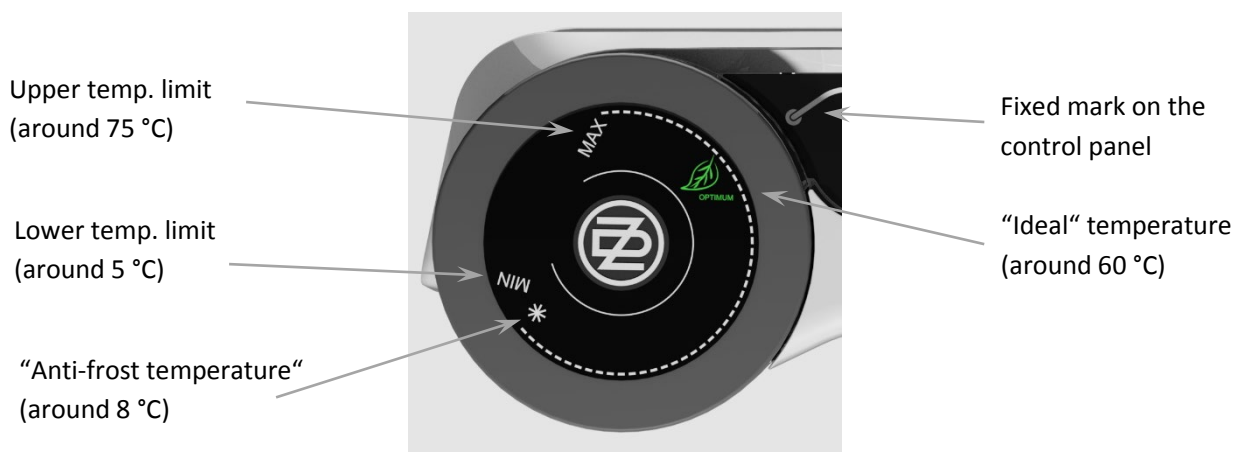


Figure 12

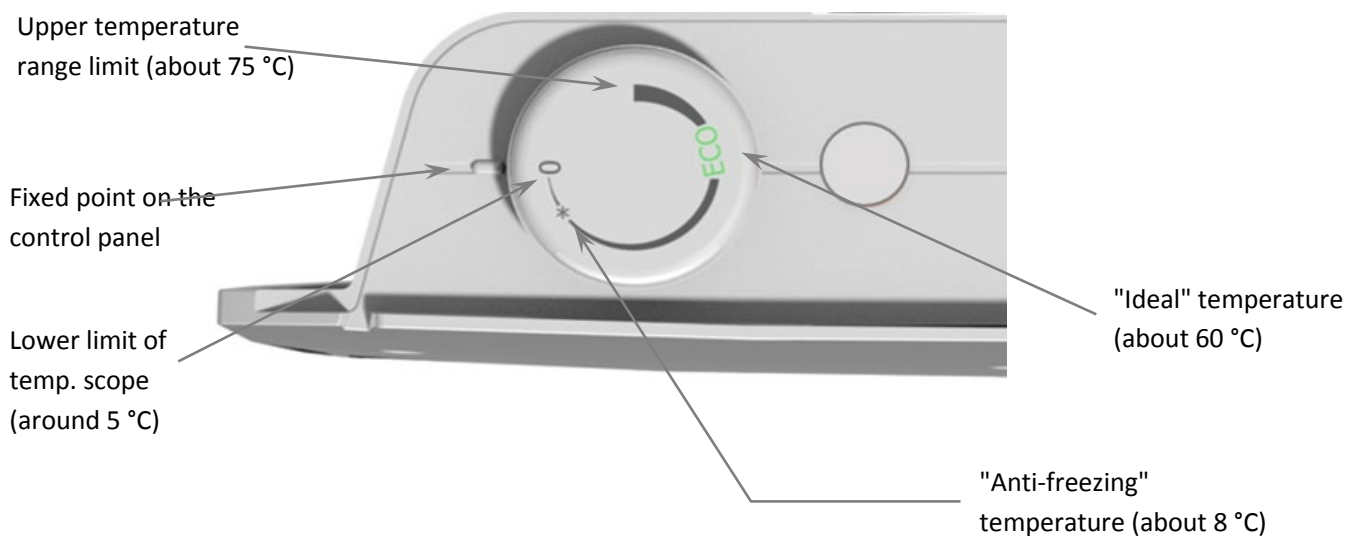


Figure 13



Adjusting the thermostat knob to the left backstop does not mean permanent shutoff of the heating element. When the heater is in use without blocking the daily rate, we do not recommend the temperature to be set above 60 °C. Select the "OPTIMUM" or "ECO" symbol as the maximum.

## 4 IMPORTANT NOTICES

### 4.1 INSTALLATION REGULATIONS

- **Without a confirmation of performed electrical installation issued by an authorized company, the warranty certificate shall be void.**
- Check and exchange the Mg anode regularly.
- Please make sure that for the connection of your heater you don't need an approval of the local electricity supplier.
- **No stop valves can be put between the heater and the safety valve.**
- With overpressure in the water distribution system higher than 0.48 MPa, it is recommended that a reduction valve is fitted before the safety valve.
- All hot water outputs must have a combination faucet.
- It is not allowed to handle the thermostat, 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 authorized service company.
- **The thermal fuse must not be turned off!** In case of thermostat defect, the thermal fuse interrupts electric power input to the heating element if the water temperature in the heater exceeds 90 °C.
- If you don't use the heater (hot water tank) for longer than 24 hours, or if the facility with heater is unattended, close the cold water inlet to the heater. Empty the heater if there is a risk of frost.
- The heater may only be used in accordance with the conditions specified on the nameplate and the instructions contained in this manual.
- The recommended operating pressure in the hot water circuit is 0.48 MPa. At the hot water discharge we recommend that a reverse flap and an expansion tank are installed (at least 4% of hot water volume in the manifold) to eliminate reverse pressure shocks.



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

### 4.2 TRANSPORT & STORAGE INSTRUCTIONS

The device shall be transported and stored in dry place and protected from weather effects with temperature range from -15 to +50 °C. During loading and unloading the instructions stated on the packaging shall be observed.

## 4.3 DISPOSAL OF PACKAGING MATERIAL AND NON-FUNCTIONING PRODUCT

The packaging that the product was delivered in has been paid for in form of a service fee for the provision of the return and recovery. The service fee 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 water heater packaging to a waste disposal place determined by the municipality. Disassemble the discarded and unserviceable product after the operation terminates, and transport it to a waste recycling centre (collecting yard), or contact the manufacturer.



## 5 PRODUCT ACCESSORIES

The product is supplied with a safety valve, a rectifying (spacer) screw M8, a fan-shaped washer of  $\phi$  8.4 - 2 pieces, nuts M8. The above parts are packed and placed in the packaging in the top part of the heater.

**It is in your own interest to check the completeness of the accessories.**

8-3-2019