

OPERATION AND INSTALLATION MANUAL

TANK-TYPE WATER HEATERS FOR VERTICAL MOUNTING

Electric water heaters

OKCE 50

OKCE 80

OKCE 100

OKCE 125

OKCE 160

OKHE 80

OKHE 100

OKHE 125

OKHE 160



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READ CAREFULLY THE BELOW INSTRUCTIONS PRIOR TO THE INSTALLATION THE 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 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.

Meaning of pictograms used in Manual



Important information for heater users.



Recommendations of manufacturer, observance of which will ensure trouble-free operation and long service life of the product.



CAUTION!

Important notice to be observed.

1 TECHNICAL SPECIFICATION OF PRODUCT

1.1 FUNCTION DESCRIPTION

The heater is designed for accumulation heating of service water using electricity. Water is heated by an electric element in an enamelled thermally insulated tank at the time defined by the power supplier. 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 74°C). Once the selected temperature is reached, heating interrupts automatically. Water accumulated in the tank is then used for 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. Hot water flows out through the top part, and water flowing in remains 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



Hot utility water reservoir is insulated by means of top-quality polyurethane foam with zero CFCs content. Adjust 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



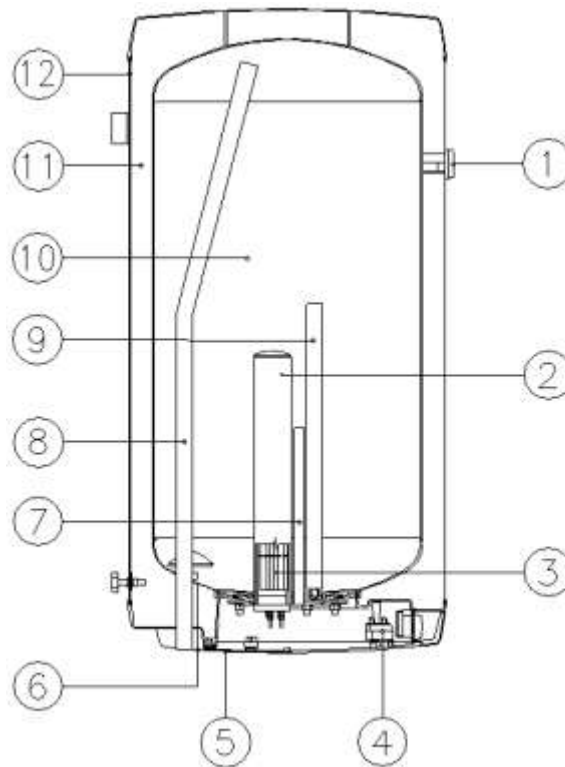
If no heated water is taken from the tank, a small amount of heat leaks. This loss is measured for a period of 24 hours at the temperature of 65°C in the heater, and at 20°C in its ambient area. The resulting value is expressed in [kWh/24h] and indicates the amount of power needed to maintain the set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

TYPE		OKCE 50	OKCE 80/ 80	OKCE 100/ 100	OKCE 125/ 125	OKCE 160/ 160	OKCE 180	OKCE 200
CAPACITY	l	51	80	100	125	152/155	180	200
MAX OPERATING OVERPRESSURE IN THE TANK	MPa	0.6						
MAX OPERATING OVERPRESSURE IN EXCHANGER*	MPa	-	1					
ELECTRIC CONNECTION	V	1 PE-N 230V/50Hz						
INPUT	W	2000					2200	
EL.PROTECTION		IP 45						
MAX HSW TEMPERATURE	°C	80						
RECOMMENDED HSW TEMPERATURE	°C	60						
HEIGHT OF THE HEATER	mm	561	736	881	1046	1235	1187	1287
DIAMETER OF THE HEATER	mm	524	524	524	524	524	584	584
MAX WEIGHT OF THE HEATER WITHOUT WATER	kg	30	36/37	42	48/49	58	72	76
EL.HEATING TIME FROM 10°C to 60°C	hour	1.5	2.5	3	3.8	5	5	5.5

Table 1

1.3 DESIGN AND GENERAL HEATER DIMENSIONS

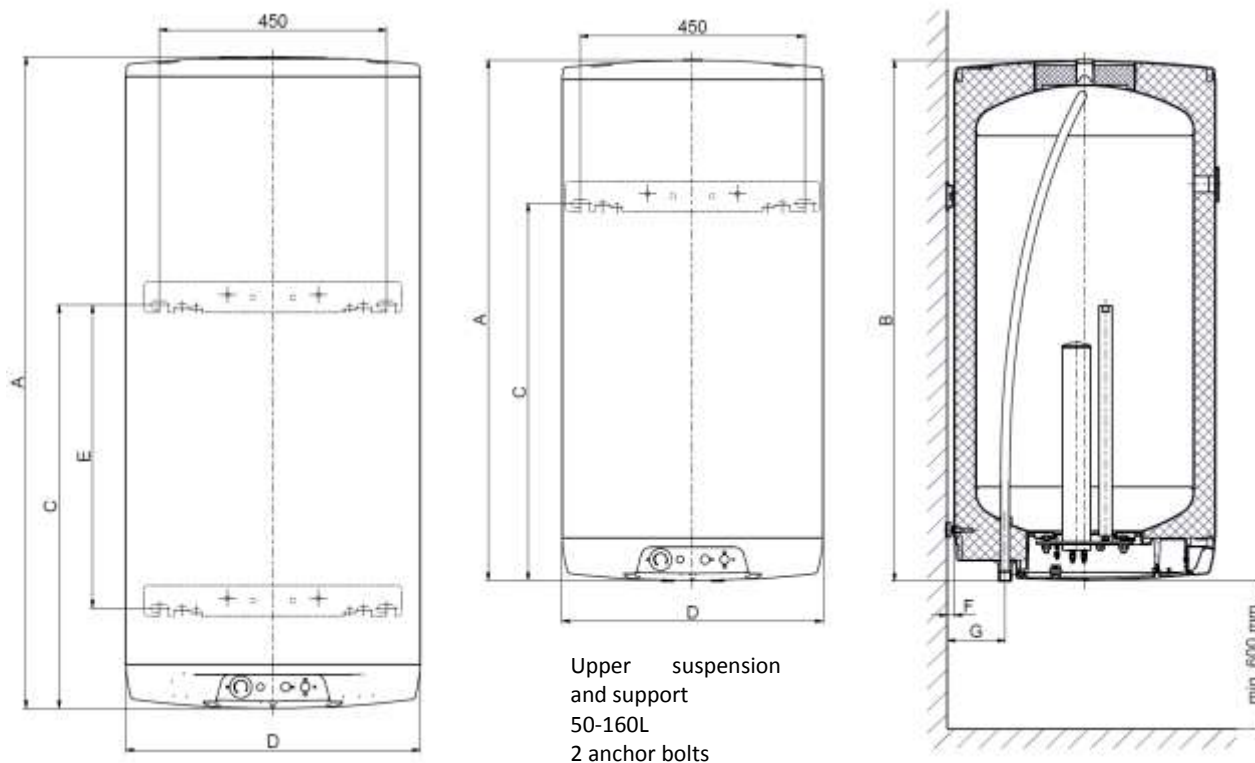
The heater tank is made of a steel plate and tested by 0.9 MPa overpressure. The inside of the tank is enamelled. A flange is welded onto the bottom of the tank with a flange lid screwed to it. A sealing ring is inserted between the flange lid and the flange. Thermowells for placing a heating element, 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 basic parts of the heater -Figure 1. Heater dimensions - Figure 2 and Table 2.



- 1. Thermometer
- 2. heating element well
- 3. ceramic heating element 2000W
- 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

Figure 1

Technical description: OKCE 50 – 200, OKHE 80 - 160



Upper and lower suspension 180, 200 l
4 anchor bolts
Dimensions 450mm and E
Double check before drilling

Figure 2

	OKCE 50	OKCE 80/ OKHE 80	OKCE 100/ OKHE 100	OKCE 125/ OKHE 125	OKCE 160/ OKHE 160	OKCE 180	OKCE 200
A	572	742/740	887/885	1052/1050	1240/1235	1189	1289
B	569	742/741	887/886	1054/1051	1237/1236	1178	1280
C	455	597/581	747/731	762/761	1020/1004	813	798
D	524	524/516	524/516	524/516	524/516	584	584
E	-	-	-	-	-	600	600
F	14	14/15	14/15	14/15	14/15	14	14
G	116	116/115	116/115	116/115	116/115	116	116

Table 2

2 OPERATION AND FITTING INSTRUCTIONS

2.1 OPERATING CONDITIONS



The tank shall only be used in accordance with the conditions specified on the power plate and in instructions for electric wiring. Besides legally acknowledged national regulations and standards, also conditions for 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 any of the common decalcifying devices was installed with the appliance, or that the thermostat was set to the minimum operating temperature of 60°C (setting to position "60") - Figure 8. 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.**

Mount the anchors by the dimensional drawing on Figure 2 in **450 mm** spacing. 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!

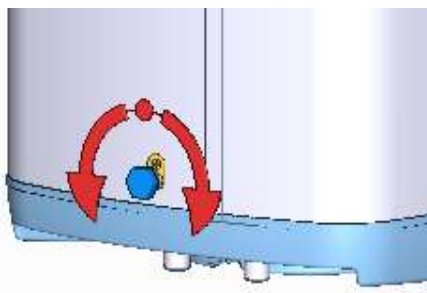


Figure 3



If the hot water heater is mounted in a **tight, small 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 **500 mm** from the bottom edge of the heater has to be 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



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

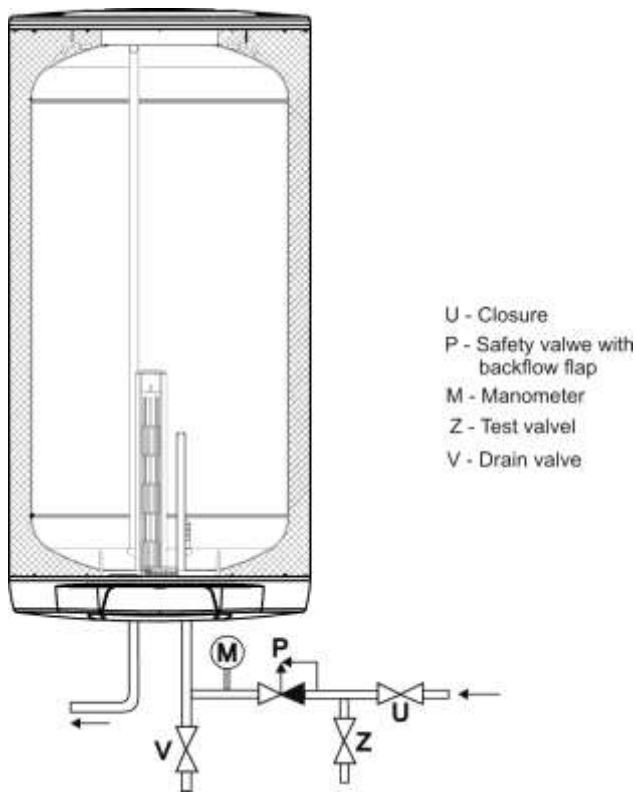


Each hot service water pressure heater must have a safety valve with a membrane spring. Nominal clearance of safety valves is defined by standard. Heaters are not equipped with a safety valve. The safety valve must be easily accessible, as close to the heater as possible. The inlet pipes must have at 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 (Table 3). 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 the recommended drain valve. First, close the water supply into the heater.

Please find necessary pressure values in the below Table 3. For proper safety valve operation, a backflow valve (Figure 4) 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. At least one demountable joint must be mounted between the tank and every supply pipe. Adequate piping and fittings with sufficiently dimensioned maximum temperature and pressure values must be used.



SAFETY VALVE START-UP PRESSURE [MPa]	ALLOWABLE OPERATING OVERPRESSURE OF WATER HEATER [MPa]	MAXIMUM PRESSURE IN COLD WATER PIPES [MPa]
0.6	0.6	up to 0.48
0.7	0.7	up to 0.56
1	1	up to 0.8

Table 3

Heaters **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.**

Figure 4

2.4 ELECTRIC INSTALLATION

2.4.1 GENERAL INFORMATION FOR ELECTRIC INSTALLATION

Perform the connection according to the scheme. Factory connection must not be changed! (Figure 6

).

In the electric wiring casing remove the partition corresponding with the input wire diameter of $\phi 8$ or $\phi 10$ (Figure 5). The degree of protection of electric parts of the heater is IP 45. Power input of electric element is 2000 W.

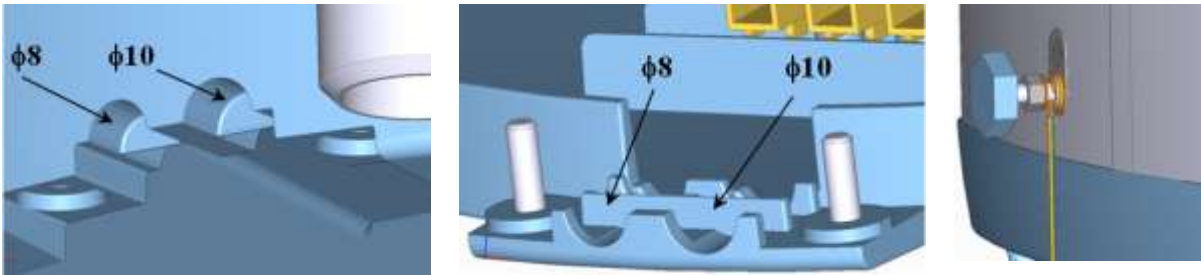


Figure 5

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



- Heater is connected to power supply 3 PEN AC 400V/50Hz via a fixed movable wire. The circuit must contain a breaker disconnecting all poles of the network, and a circuit breaker (protector).
- Installations in bathrooms, lavatories and showers must comply with the standard.
- To adjust the distance from the wall, connect the wire of the external protective bonding!
- Adhere to the rules of protection against electrical injuries as advised in the standard.

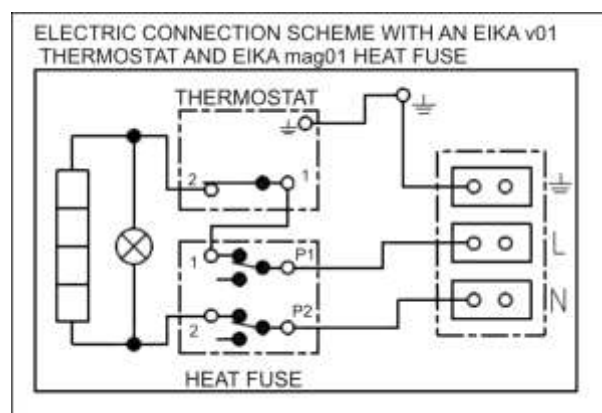


Figure 6

2.5 CONNECTION OF HEATER TO HOT WATER HEATING SYSTEM

After the heater is connected to electric network, the heating element starts heating water. The element is turned on and off by a thermostat. After reaching the temperature set, the thermostat switches off the electric circuit and thus discontinues water heating. The control light signals if the element is in operation (light is on) or if it is off (the light goes out). In case of longer operation without using the heated volume, the thermostat has to be set to position 5°C to 8°C (set the “snowflake” symbol on the thermostat selector) to avoid its freezing, or electricity supply to the heater has to be switched off.

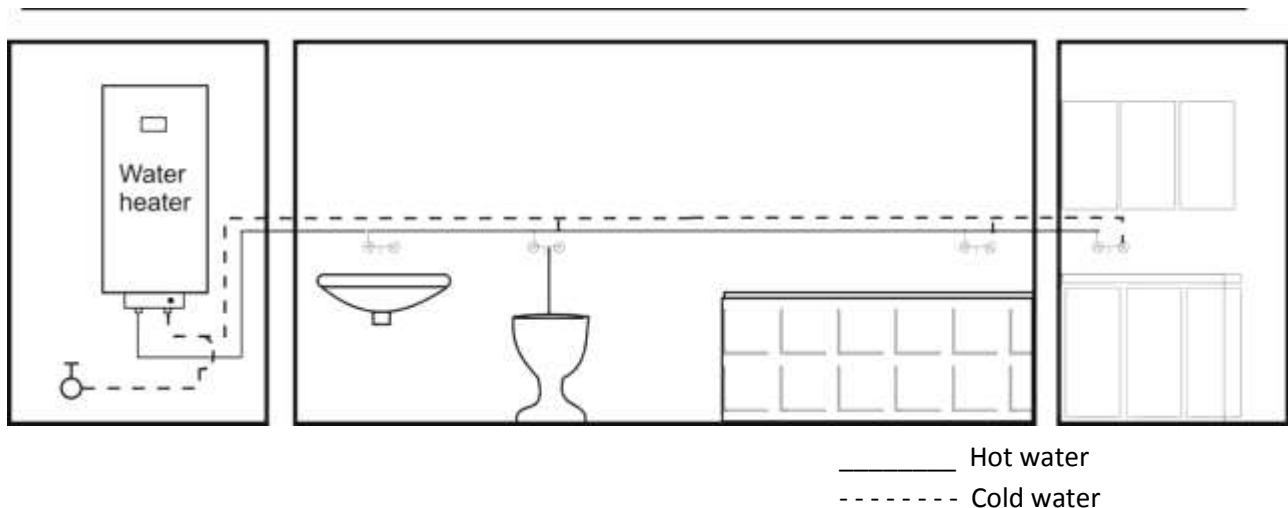


Figure 7

2.6 FIRST HEATER 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 process the pressurised connection water that increases its volume due to heating must drip off the safety valve. In non-pressurised connection water drips off the overflow combination faucet. When heating is finished, the set temperature and the actual temperature of consumed water should be roughly equal. After connecting the heater to the water main and electrical power system, and after checking the safety valve (following the instructions attached to the valve), the heater can be put into operation.

Before fist putting into service or after a longer shutdown the appliance has to be rinsed out and flushed yet before heating is activated. Before 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 operating and safety thermostat sensors. The sensors must be inserted all the way in; first the operating and then the safety thermostat.
2. Open the hot water valve on the combination faucet.
3. Open the cold water inlet valve to the heater.
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 a leakage (flange lid), we recommend fastening the flange lid bolts.
6. Screw down the electric installation guard.
7. When hot service water is heated by electric energy, switch 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, DISCHARGE



If the hot water heater is put out of service for a longer time, or if it is not going to be used it has to be drained and disconnected from the electric supply network on all poles. The switch for the supply lead or the fuse cut-outs have to be shut off.

At places with permanent risk of frost the hot water heater must be drained before the cold season starts if the appliance remains out of service 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 safety valve combination), and with simultaneous opening of all hot water valves of connected fittings (water can be also drained through safety valve; for that purpose, the safety valve is turned to the "Check" position). **Hot water may outflow during the drainage!** If there is a risk of frost it has to be considered that not only the water in the hot water heater and in the hot water piping may get frozen 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 put in service again, it has to be ensured that it is filled with water **and the water flowing out at the hot water valves is free of 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 outlet (in non-pressurised connection this water drips off the combination faucet valve). In full heating (about 74°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 carried out at least once a month, and after each heater shutdown that exceeds 5 days.

Caution! In doing so, the cold water supply pipe and the connection fitting of the tank may get heated! If the hot water heater does not work, or if hot water is not withdrawn, no water shall 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!



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. The cleaning is carried out through the hole in the flange – dismantle the flange lid and clean the tank. 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 a lime pump. Remove the lime layer with a timber and suck it off, or wipe it off with a clout. After that, the appliance must be rinsed thoroughly and the heating process is checked the same as during the initial putting in operation. Do not use any abrasive cleaning agents (such as liquid sand, chemicals - acid, alkaline) or dye thinners (such as cellulose thinner, trichlor, and the like) to clean the outer shell of the heater. For cleaning use a wet clout and add a few drops of liquid cleaning agent for household applications. Repetitive water heating causes limestone sediment on both the tank walls and chiefly the flange lid. The sedimentation depends on the hardness of water heated, its temperature, and amount of hot water consumed.

We recommend checking and cleaning the tank from 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 the company in charge of service affairs clean and exchange the anode. When draining water from the heater, the combination faucet valve for hot water must be open, preventing occurrence of under-pressure in the heater tank which would stop water from draining.

2.9 MOST FREQUENT FUNCTION FAILURES AND THEIR CAUSES

FAILURE SYMPTOM	CONTROL LIGHT	SOLUTION
Water is cold	<ul style="list-style-type: none"> light on 	<ul style="list-style-type: none"> The temperature set on the thermostat is too low; heating element failure
Water is cold	<ul style="list-style-type: none"> light off 	<ul style="list-style-type: none"> No supply voltage; Thermostat failure Safety thermostat shut off probably due to failed operation thermostat
Water is not warm enough	<ul style="list-style-type: none"> light on 	<ul style="list-style-type: none"> Failure of one of the coils in the element (2x 1000W)
Temperature of water is not corresponding with the temperature set on the control		<ul style="list-style-type: none"> Defective thermostat
Water is constantly dripping off the safety valve	<ul style="list-style-type: none"> light off 	<ul style="list-style-type: none"> high input pressure defective safety valve

Table 4



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.

3 OPERATION OF THERMOSTAT

3.1 SERVICING

3.1.1 SERVICE HEATER DEVICES

The service devices are located under the plastic guard of the control panel (Figure 8).

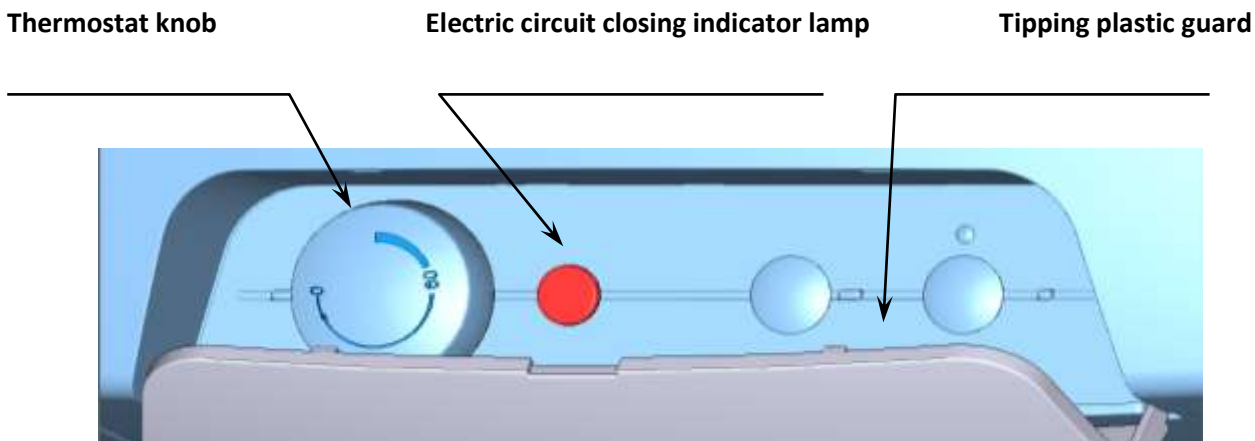


Figure 8

3.1.2 TEMPERATURE SETTING

Water temperature is set by turning the thermostat knob. The desired symbol is adjusted against the fixed point on the control panel (Figure 9).

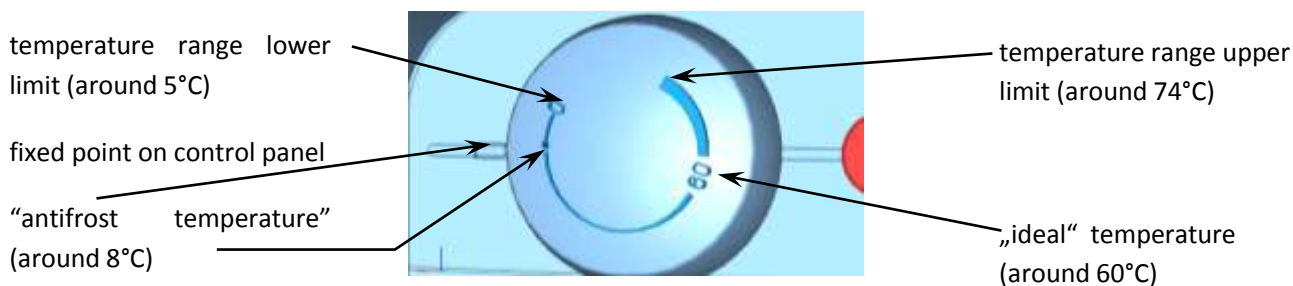


Figure 9



Adjusting the thermostat selector 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 65°C. Select the "60" symbol as the minimum.

4 IMPORTANT NOTICES

4.1 INSTALLATION REGULATIONS

- **Without a confirmation of performed electrical installation issued by an authorised company, the warranty certificate shall be void.**
- Check and exchange the Mg anode regularly.
- You have to apply for approval of a local power supplier to connect the heater.
- **No stop valves can be put between the heater and the safety valve.**
- If the overpressure in the water main exceeds 0.48 MPa, a pressure control valve must be mounted before the safety valve.
- All hot water outputs must have a combination faucet.
- Before filling the heater with water for the first time, it is recommended to fasten the flange connection nuts of the tank.
- 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 authorised 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.



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

4.2 DISPOSAL OF PACKAGING MATERIAL AND MALFUNCTIONING 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. 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 boiler packages to a waste disposal place determined by the town. When the operation terminates, disassemble and transport the discarded and unserviceable heater to a waste recycling centre (collecting yard), or contact the manufacturer.



5 PRODUCT ACCESSORIES

The product is supplied together with a safety valve and a thermometer. 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.

12-2-2015