

Operation and Installation Manual



TANK-TYPE WATER HEATERS FOR VERTICAL MOUNTING

4000 W / 400 V



Electric water heaters

OKHE 80

OKHE 100

OKHE 125

OKHE 160

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Read carefully the below instructions prior to the installation of 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 indirect water heaters.

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

The manufacturer reserves the right for engineering modification of the product.

The product is designed for permanent contact with drinkable water.



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Environment Type:

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

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.

1.1 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 Energy saving

Hot utility water reservoir is insulated by means of first-class polyurethane foam with zero freon 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 well.

1.3 Emergency power consumption

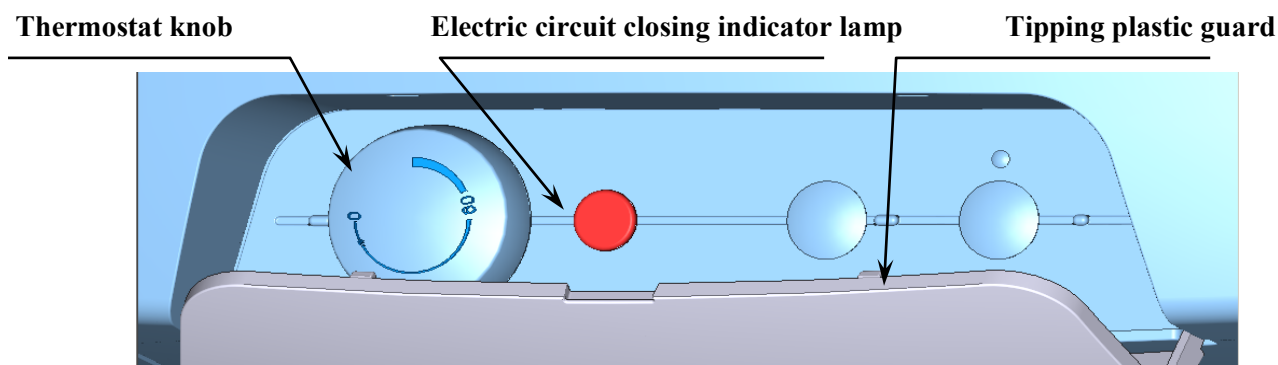
If no heated water is taken from the tank, a small amount of heat leaks. This loss is measured for a period of 24 hours at the temperature of 65°C in the heater, and at 20°C in its ambient area. The resulting value is expressed in kWh/24h and indicates the amount of power needed to maintain the temperature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

Information leaflet pursuant to Directive No. 442/2004 Coll., and Annex No.7 (CHART 1)

Heater types	Energy efficiency class	Heat losses	Nominal capacity (l)	Time of content heating (hours)	Electricity consumption for heating of the contents from 15°C to 65°C in kWh	Heat losses kWh/24hr
		Wh/24hr/l				
OKHE 80			80	1,1	4,8	
OKHE 100			100	1,5	6	
OKHE 125			125	2	8	
OKHE 160			155	3	9,5	

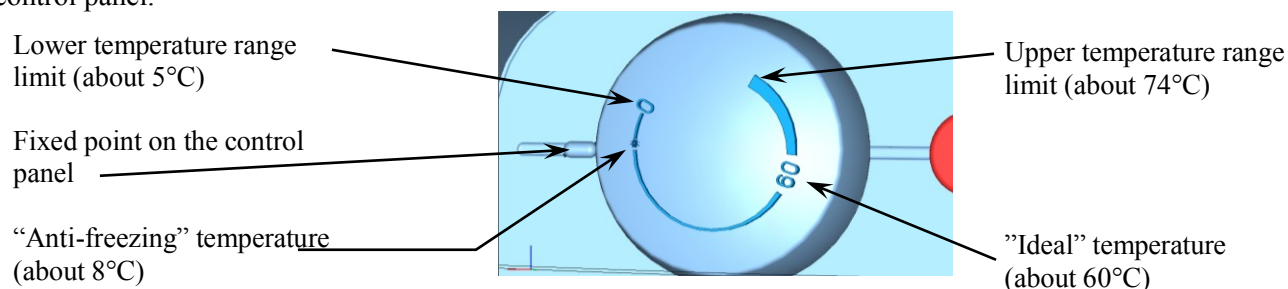
2. Servicing

2.1 The service devices of the heater are located under the plastic guard of the control panel.



2.2 Temperature setting

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



Notice: Adjusting the thermostat selector at 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. The maximum value to select is “60”.

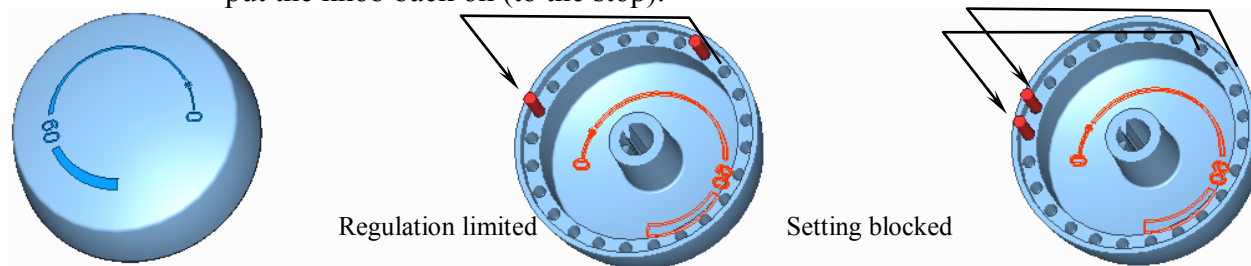
2.3 Limiting the regulation range; locked settings.

For various safety reasons (unintentional scalding, preventing children or unauthorised person from handling), the regulation range can be **limited**, or the setting on the thermostat **blocked**.

Limited regulation – pull off the thermostat knob (it will be hard for the first time), and you will find

two $\phi 2.15\text{mm}$ cylindrical pins on the back side of the knob

- pull off one pin and insert it to the corresponding hole of the selected maximum temperature.
- put the knob back on (to the stop).

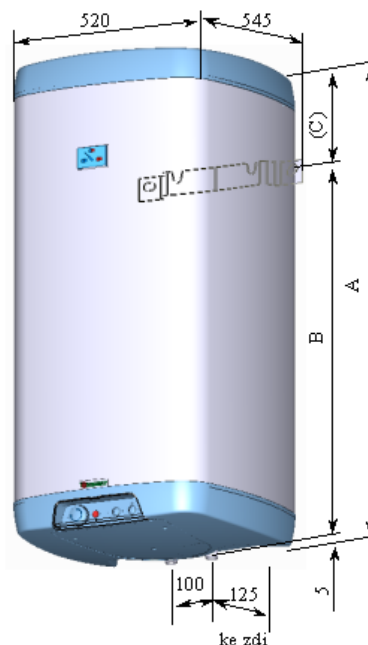
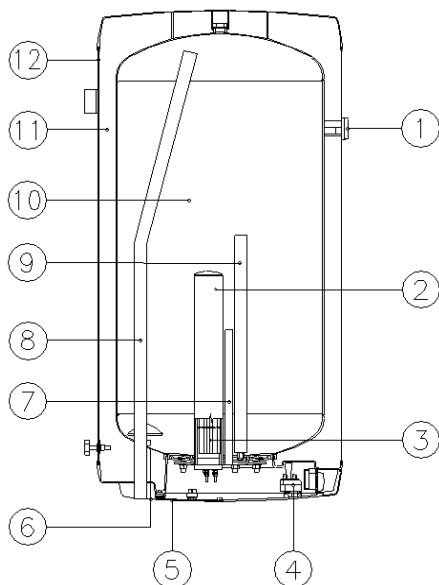


Setting blocked – set the selected temperature

pull off the thermostat knob without changing the setting, there are two pins on the back side of the knob

Pull off both of them and fit them to the holes corresponding with the selected temperature so that the gap between the pins was without a hole, and the position was opposite the set temperature.

3. Structure of the heater



- | | |
|--|-------------------------------|
| 1 thermometer | 7 tank for thermostat sensors |
| 2 heating element well | 8 hot water withdrawal pipe |
| 3 ceramic heating element 4000W | 9 Mg anode |
| 4 operation thermostat with external control and safety thermostat | 10 enamelled steel receptacle |
| 5 electric installation guard | 11 polyurethane insulation |
| 6 cold water filling pipe | 12 heater shell |

CHART 2

Type	OKHE 80	OKHE 100	OKHE 125	OKHE 160
A	742	887	1052	1237
B	610 (560)	700 (650)	850 (800)	1050 (1000)
C	127 (177)	182 (232)	197 (247)	182 (232)
serv.weight	44 kg	50 kg	58 kg	67 kg

4. Operating conditions

4.1 General

The tank shall only be used in accordance with the conditions specified on the performance 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 room in which the appliance will be operated, must be frost-free. Mounting of the appliance must be performed at such place which is convenient, 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 the thermostat set to minimum operation temperature of 60°C (setting to position “60”). 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.

5. 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.**

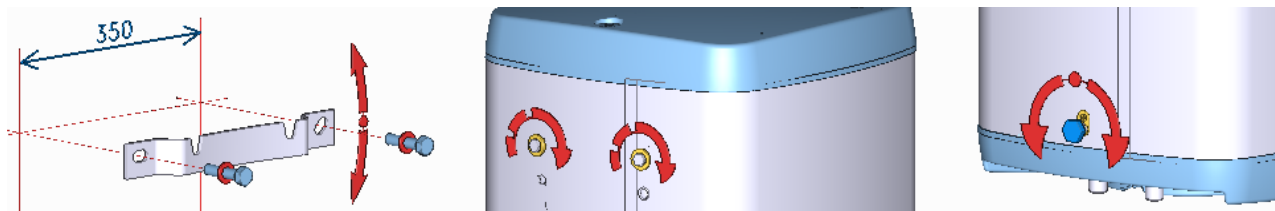
Mount the anchors by the dimensional drawing in 350 mm spacing, and screw firmly a steel hinge onto the wall.

Check its proper vertical positioning.

Recheck the torque of the suspension bolts on the heater and suspend the heater.

If needed, the suspension bolts can be shifted by 50 mm in vertical direction.

Using the detent support in the bottom part of the heater make sure it runs in parallel with the wall!



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.

5.1 Connection to power water

Power water connects to pipes with 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 3/4". 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 heaters are not equipped with a safety valve. The safety valve must be easily accessible, as close 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 manually moving of the membrane from the seat, turning the make-and-break device button always to the right. 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.

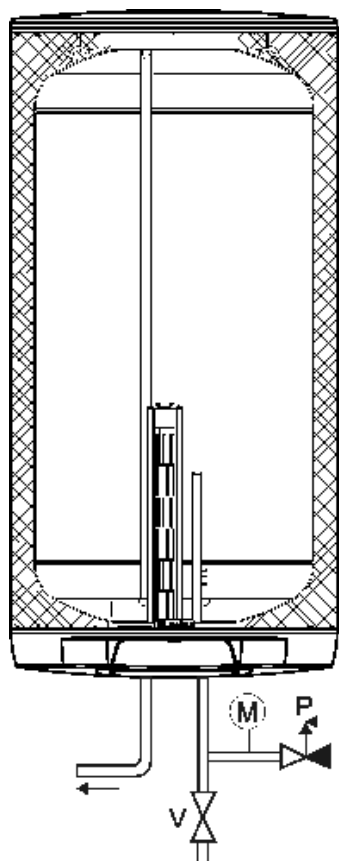
Find necessary pressure values in the following table.

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.

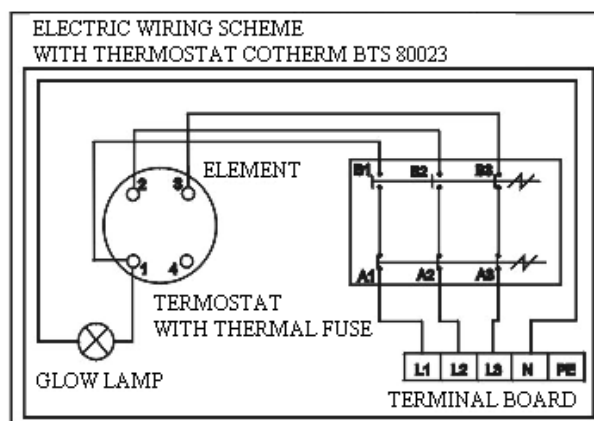
Safety valve starting pressure (MPa)	Admissible operating water heater pressure (MPa)	Max pressure in the cold water pipe (MPa)
0.6	0.6	up to 0.48
0.7	0.7	up to 0.56
1	1	up to 0.8

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 ČSN 06 0830.



- U - Closure
- P - Safety valve with backflow valve
- M - Manometer
- Z - Test valve
- V - Drain valve

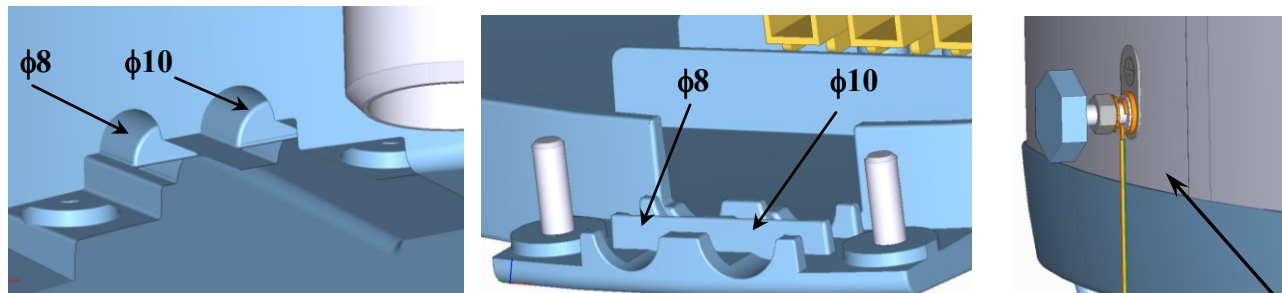


5.2 Electric connection

Perform the connection according to the scheme.

Factory connection must not be changed!

In the electric wiring casing remove the partition corresponding with the input wire diameter of $\phi 8$ or $\phi 10$.



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 obey the ČSN33 2000-7-701 standard.

To adjust the distance from the wall, connect the wire of the external protective equipotential bonding!!!

The degree of protection of electric parts of the heater is IP 45.

The electric element power input is 4000 W. Respect the rules of protection against electricity injuries in accordance with ČSN 33 2000-4-41.

6. First putting in service

Before opening the power supply, the tank must be filled with water.

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 it drips off the overflow combination faucet.

Warning: 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.

When heating is finished, the set temperature and the actual temperature of consumed water should be roughly equal.

6.1 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 unless it is operated in a position protecting from frost.

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 fitting. Water can also be drained through the safety valve. To do so, the safety valve knob shall be turned to the “control” position.

Be careful: 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) which is not jeopardised with frost.

When the tank is to be used again, it has to be filled with water and one needs to make sure that the water **flowing out at the hot water valves did not contain any bubbles.**

7. Inspection, maintenance & care for the appliance

During the heating process the water that increases its volume during the heating must 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 content. 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.

Warning: 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 pressure in the supply piping is either too high, 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 or dye thinners to clean the outer shell of the heater (such as cellulose thinner, trichlor, and the like.). For cleaning use a wet clout and add a few drops of liquid cleaning agent for household applications.

8. Most frequent function failures and their causes

Water is cold	LED is on	The temperature set on the thermostat is too low Heating element failure
	LED is not on	No supply voltage; thermostat failure; Safety thermostat shut off probably due to failed operation thermostat
Water is not warm enough	LED is on	Failure of one of the coils in the element (2x 1000W)
Temperature of water is not corresponding with the temperature on the control		Defective thermostat
Water is constantly dripping of the safety valve	LED is not on	Input pressure too high; faulty safety valve

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.

9. Installation regulations

Regulations and instructions that must be obeyed connect the heater

- a) to the electrical network
 - ČSN 33 2180 - Connecting of electric devices and appliances
 - ČSN 33 2000-4-41 - Low voltage electric installations Protective measures to ensure safety – Protection against electric shock
 - ČSN 33 2000-7-701 - Low voltage electric installations Single-purpose devices and devices in special premises - Premises with tub or shower
- b) to the hot water heating system
 - ČSN 06 0320 - Thermal systems in buildings - Hot water preparation – Design and Project Engineering
 - ČSN 06 0830 - Thermal systems in buildings – Protecting devices
 - ČSN 73 6660 - Internal water conduits
 - ČSN 07 7401 - Water and steam for heat energy device with steam over-pressure up to 8 MPa
 - ČSN 06 1010 - Tank water heaters with water and steam heating; and combined with electric heating. Technical requirements. Testing.
 - ČSN EN 12897 – Water supply – Indirectly heated closed tank-type water heaters

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