

OPERATION AND INSTALLATION MANUAL

STORAGE TANKS

OKH 100 NTR/HV
OKH 125 NTR/HV

OKH 100 NTR
OKH 125 NTR
OKH 160 NTR



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CAREFULLY READ THIS MANUAL BEFORE INSTALLING THE STORAGE TANK!

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 storage tanks.



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 the Manual



Important information for storage tank 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

Storage tanks of NTR and NTR/HV series are used for hot service water preparation in conjunction with another source of heating water, most often a gas boiler. Their nominal performance provides sufficient amount of hot water for large flat units, premises, restaurants, and similar establishments. **In case of increased hot water consumption, these tanks heat water continuously, operating similarly to flow heaters.**

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.

1.2.2 ENERGY SAVING



Hot utility water reservoir is insulated by means of a top-quality polyurethane foam with zero CFCs content. Adjust the temperature of the storage tank'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.

Advantages of using storage tank:

- easy installation and connection to hot water supply,
- very fast hot water heating system,
- enamelled steel vessel ensures all hygienic requirements on the quality of hot utility water,
- built-in Mg anode increases resistance to corrosion,
- good quality polyurethane insulation ensures minimum thermal losses,
- connection of multiple withdrawal points,
- accurate check of hot service water temperature,
- possibility of connecting hot service water circulation.

1.3 DESIGN AND GENERAL DIMENSIONS

The storage tank vessel is made of a steel plate and tested by 0.9 MPa overpressure. The inside of the vessel is enamelled. A flange is welded onto the upper bottom of the receptacle with a flange lid is screwed to it. A sealing ring is inserted between the flange lid and the flange. Thermowells for thermostat sensors and thermometer installation are placed in the flange lid. Anode rod is mounted on M8 nut. The water reservoir is insulated by means of polyurethane foam. Electric wiring is placed underneath the plastic removable cover. The temperature of water can be set using the thermostat. Heat exchanger is **welded** in the pressure tank.

Technical description: OKH 100 NTR, OKH 125 NTR, OKH 160 NTR

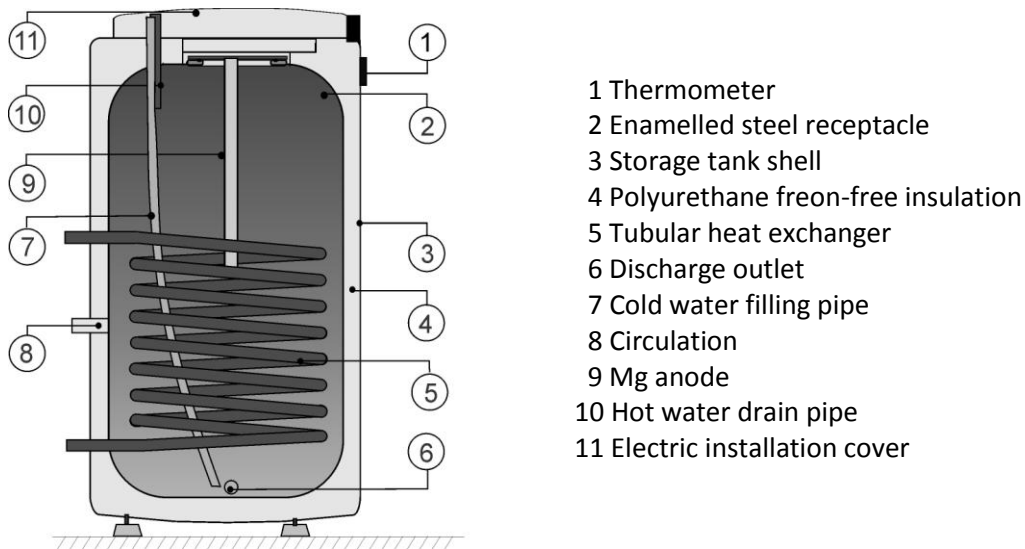


Figure 1

Technical description: OKH 100 NTR/HV, OKH 125 NTR/HV

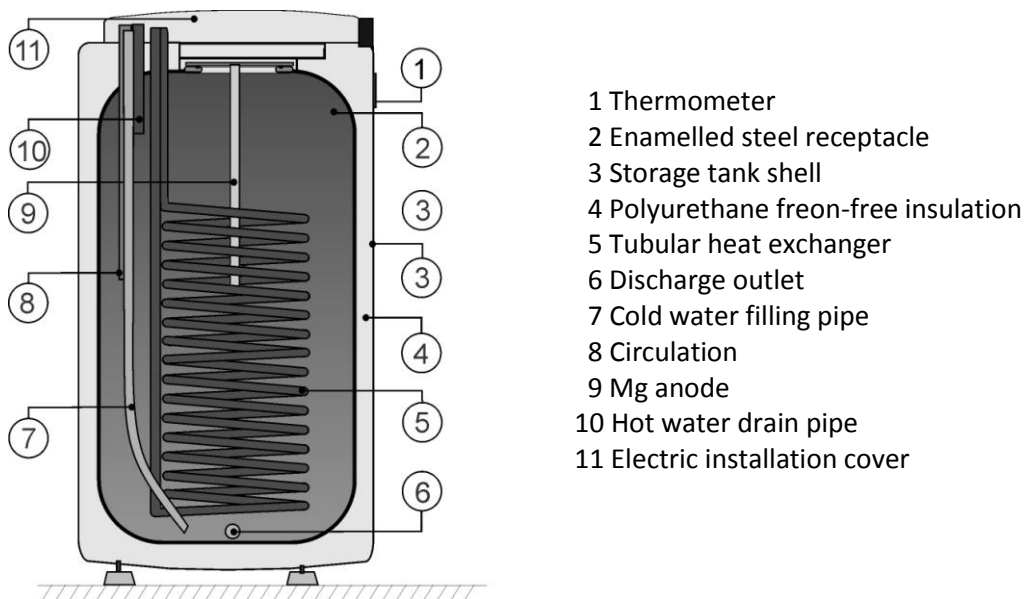
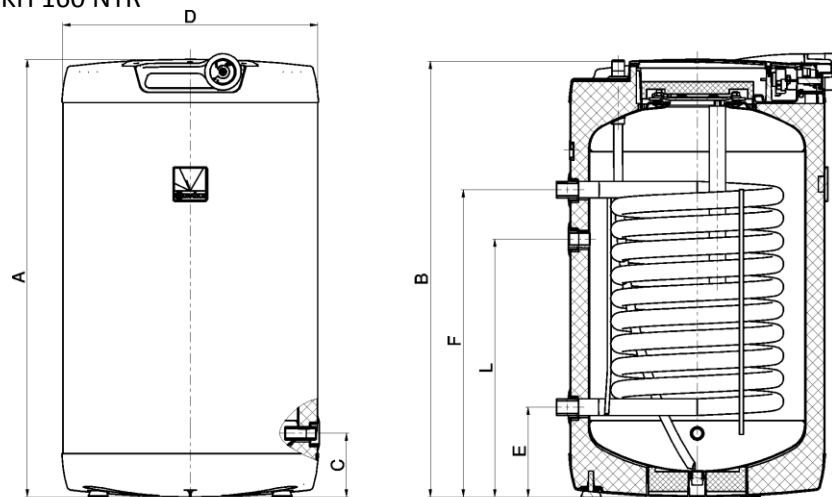


Figure 2

Dimensions of storage tanks

OKH 100 NTR, OKH 125 NTR, OKH 160 NTR



	OKH 100 NTR	OKH 125 NTR	OKH 160 NTR
A	887	1052	1237
B*	882	1047	1232
C	128	128	128
D	516	516	516
E	180	180	180
F	621	750	750
L	521	620	880

*Height from the bottom heater's edge to the end of the water inlet and outlet tubes.

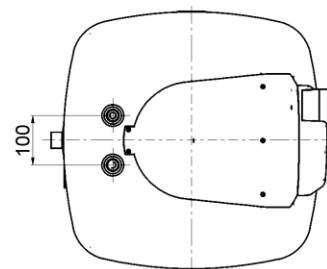
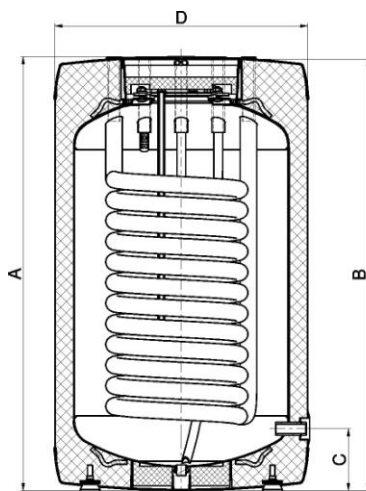


Figure 3

OKH 100 NTR/HV, OKH 125 NTR/HV



	OKH 100 NTR/HV	OKH 125 NTR/HV
A	887	1052
B*	882	1047
C	128	128
D	516	516
E	95	95
F	141	141
G	78	78

*Height from the bottom heater's edge to the end of the water in

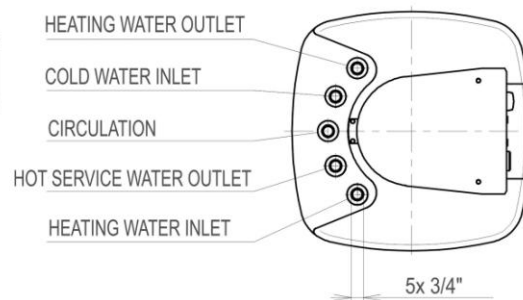
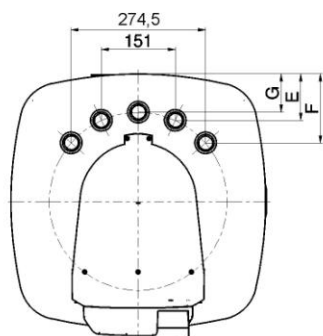


Figure 4

SPECIFICATIONS

TYPE		OKH 100 NTR	OKH 125 NTR	OKH 160 NTR	OKH 100 NTR/HV	OKH 125 NTR/HV
VOLUME	l	95	120	160	95	120
MAX WEIGHT WITHOUT WATER	kg	57	71	78	56	70
HEAT TRANSFER SURFACE	m ²	1,08	1,45	1,45	1,08	1,45
MAX. TANK PRESSURE	MPa			0,6		
MAX. PRESSURE OF EXCHANGER	MPa			1		
MAX. TEMPERATURE OF HSW	°C			80		
RECOMMENDED HSW TEMPERATURE	°C			60		
HSW CONNECTION				G ¾"		
HEATING WATER CONNECTION		G 1"	G 1"	G 1"	G ¾"	G ¾"
EL. PROTECTION				IP 44		
RATED THERMAL OUTPUT AT WATER TEMPERATURE OF 80°C AND FLOW 720 l/h	W	24000	32000	32000	24000	32000
HEATING TIME FROM 10°C TO 60°C BY EXCHAGER	min	14	14	17	14	14
STANDING LOSS	W	42	49	54	42	49

Table 1

2 OPERATION AND FITTING INSTRUCTIONS

2.1 OPERATING CONDITIONS



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. 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 the thermostat to be set to minimum operation temperature of 60°C. 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 PLUMBING FIXTURE



Connecting storage tanks into water system in shown in Figure 5. For potential disconnection of the storage tank, the service water inlets and outlets must be provided with screw coupling Js 3/4". If the hot service water (HSW) distribution is equipped with circulation circuit, the reverse pipe is connected to the inlet identified as CIRCULATION. The 100, 125, 160 NTR and 100, 125, 160 NTR / HV types are equipped with a discharge outlet. For operation, the storage tank must be equipped with a safety valve. Safety valve is mounted on the cold water inlet identified with a blue ring



Each hot service water pressure storage tank must have a safety valve with a membrane spring. The safety valve must be easily accessible, as close to the storage tank 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 storage tank. 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 storage tank pressure, and at least 20% higher than the maximum pressure in the water main - see (Table 2). 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 storage tank and the safety valve. During the assembly, follow the guide provided by the safety equipment manufacturer



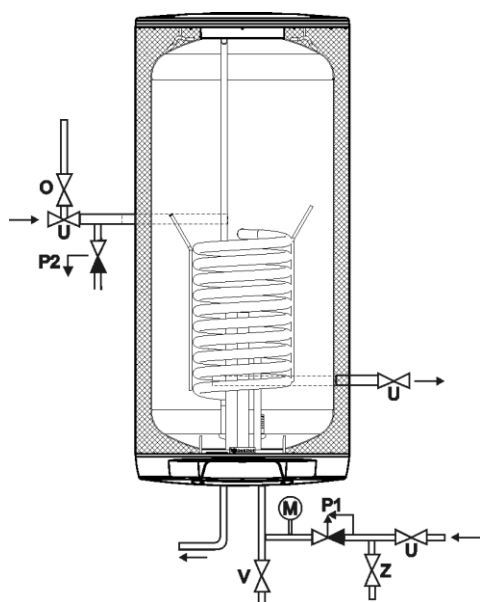
It is necessary to check the safety valve each time before putting it into operation. It is checked by manual moving of the membrane from the seat, turning the make-and-break device button always in the direction of the arrow. After being turned, the button must click back into a notch. Proper function 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 storage tank shutdown for more than 5 days. Water can drip from the safety valve through the drain pipe; the pipe must be freely open to the atmosphere, placed vertically and shall be in an environment free of temperatures below freezing. When draining the storage tank, use a drain valve. You must first close the water supply to the storage tank. Required pressures are in Table 2 below. To ensure correct operation the safety valve must be mounted on the inlet piping return valve, preventing spontaneous storage tank draining and hot water penetrating back into the water main.

Required pressures - Table 2 - We recommend that the hot water distribution from the storage tank was as short as possible to minimize heat losses.

SAFETY VALVE STARTING PRESSURE (MPa)	ADMISSIBLE OPERATING OVER-PRESSURE OF STORAGE TANK (MPa)	MAXIMUM PRESSURE IN COLD WATER PIPES (MPa)
0,6	0,6	do 0,48
0,7	0,7	do 0,56
1	1	do 0,8

Table 2

Connection of the storage tank exchanger (left, right) and fittings at the cold water inlet.



- O - Air outlet valve
- U - Shut-off valve
- P1 - Safety valve with backflow flap
- P2 - Safety valve for heating circuit
- M - Manometer
- Z - Test valve
- V - Drain valve

Connection on the cold water inlet must conform to national standard.

Figure 5

2.3 ELECTRIC WIRING

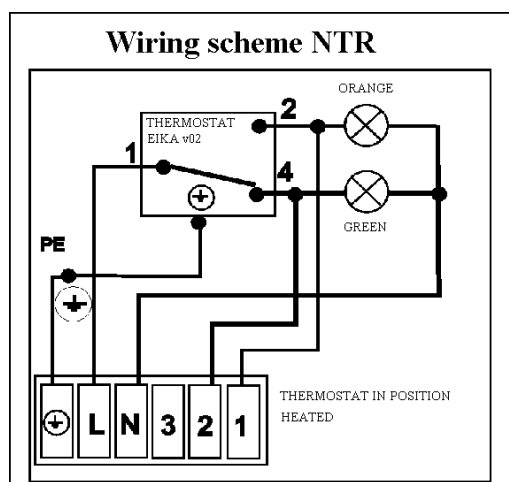
2.3.1 ELECTRIC INSTALLATION GENERAL INFORMATION



- Check the insertion of the thermostat sensor in the thermowell, the so-called insertion all the way.
- The storage tank can be connected to any hot water heating boiler up to the power output of 50 kW.
- Electrically, the storage tank is powered directly by boiler with 230 V/50 Hz control voltage.
- To adjust the distance from the wall, connect the wire of the external protective bonding!
- Elastic cable CYSY 4C x 0.75 can be used for interconnection.
- Connecting terminals are identified on the terminal board of the storage tank.

2.3.2 METHODS OF ELECTRONIC THERMOSTAT CONNECTION

Electric connection to storage tanks of the below types: OKC 100 NTR, OKC 125 NTR, OKC 160 NTR, OKC 200 NTR, OKC 200 NTRR, OKC 250 NTRR, OKC 100 NTR/HV, OKC125 NTR/HV, OKC160 NTR/HV



- there is voltage on connecting terminal 2 when storage tank is heated
- there is voltage on connecting terminal 1 when storage tank is not heated

Figure 6



Touch thermometer is installed on the control panel to control the temperature of water, additionally there is a capillary thermostat to set the desired water temperature and two signal lights: “green” – storage tank heated, and “orange” – heating in process.

2.4 CONNECTION OF STORAGE TANK TO HOT WATER HEATING SYSTEM



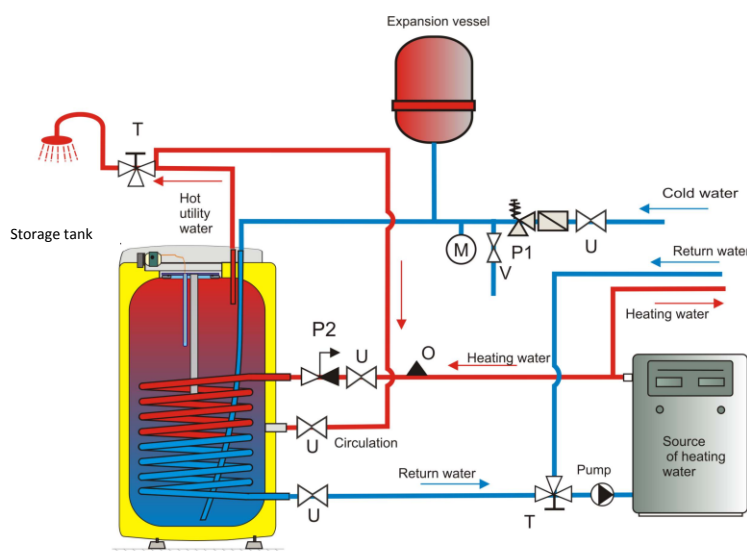
It is recommended to install stop valves on the heating water inlet and outlet (for possible dismantling of the storage tank). The valves have to be as close to the storage tank as possible to avoid higher thermal losses

The heating circuit is connected to marked inputs and outputs of the storage tank exchanger; the deaerating valve is mounted in the highest place. It is necessary to install a filter into the circuit in order to protect the pumps, the three-way valve, and backflow flaps, and the exchanger from sedimentation. It is recommended to flush the heating circuit before the assembly. All wiring connections must be properly insulated from heat. If the system works with priority heating of HSW using a three-way valve, always follow the installation instructions of the three-way valve's manufacturer.



After connecting the storage tank to the water supply, the hot water heating system, the electric network, and after testing its safety valve (based on the valve manual attached), the storage tank may 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.

Example of connection of the storage tank to water and heating system



- U - Shut-off valve
- P1 - Pressure relief valve with backflow valve
- P2 - Pressure relief valve for rating circuit
- V - Drain valve
- M - Manometer
- T - Three-way valve
- O - Bleeder valve

* Use of an expansion vessel is not a condition correct connection only an alternative solution.

Figure 7

2.5 FIRST COMMISSIONING



After connecting the storage tank to the water supply, the hot water heating system, the electric network, and after testing its safety valve (based on the valve manual attached), the storage tank may 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.



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 storage tank to the water main and electrical power system, and after checking the safety valve (following the instructions attached to the valve), the storage tank can be put into operation.

Procedure of putting the storage tank into operation:

1. Check both water and electric installation; for combined storage tanks, check also the installation to the hot water heating system. Check proper placement of thermostat sensors; The sensors in the thermo well have to be inserted all the way.
2. Open the hot water valve on the combination faucet.
3. Open the cold water inlet valve to the storage tank.
4. As soon as the water starts running through the hot water valve, the storage tank is filled and the valve closes.
5. In case of a leakage (flange lid), we recommend fastening the flange lid bolts.
6. Fasten the electric installation cover.
7. When heating service water with electric energy from the hot water heating system, open the heating water inlet and outlet valves, possibly de-aerate the heat exchanger.
8. When commencing operation, flush the storage tank until the cloudiness in the water is gone.
9. Make sure to fill in properly the warranty certificate.

2.6 PUTTING OUT OF SERVICE, DISCHARGE



If the hot storage tank 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.

At places with permanent risk of frost the hot storage tank 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- only if an external thermostat is connected.



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. **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 storage tank 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 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.**

2.7 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 65°C) the volumetric water gain is approx. 3% of the tank capacity. The function of the safety valve has to be checked regularly (based on the information contained in the attached safety valve manual). In common operation, such a check needs to be implemented at least once a month, and after each storage tank 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 storage tank 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. 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. Have the company in charge of service affairs clean and exchange the anode.

When discharging water from the storage tank, the combination faucet valve for hot water must be open in order to avoid creating under pressure that would prevent water discharge. This has to be performed after one or two years of operation. The cleaning is carried out through the hole in the flange by: draining the boiler, dismantling the flange lid and cleaning the tank. A new sealing has to be used for re-fitting. Since the inside of the vessel has special enamel, the surface of which must not get in contact with a 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 storage tank (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.

2.8 MOST FREQUENT FUNCTION FAILURES AND THEIR CAUSES

FAILURE SYMPTOM	LED	SOLUTION
Water is constantly dripping off the safety valve	• LED is not on	• input pressure is too high • faulty safety valve

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 storage tank.

3 OPERATION OF THERMOSTAT

3.1 SERVICING

3.1.1 OPERATING DEVICES

Service devices are located in the upper part of the storage tank (Figure 8).

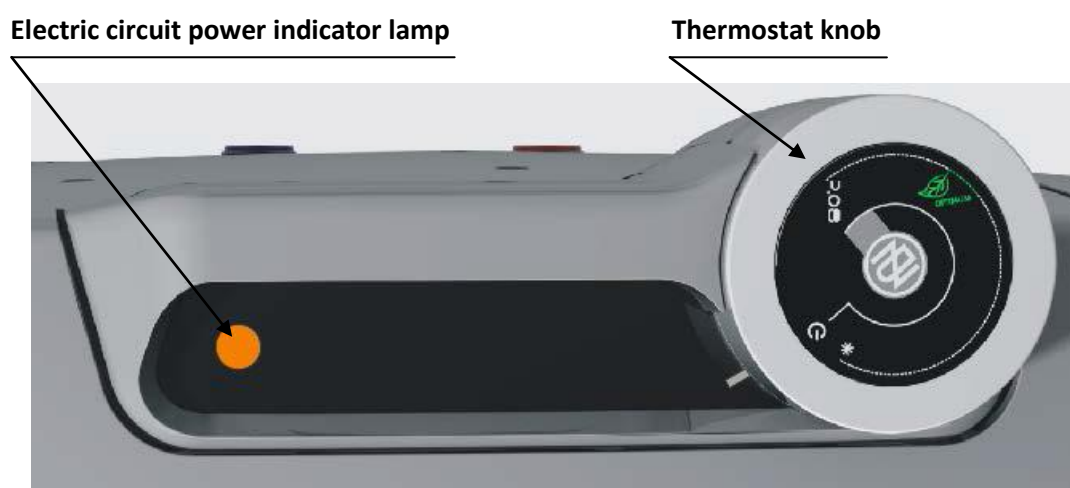


Figure 8

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).

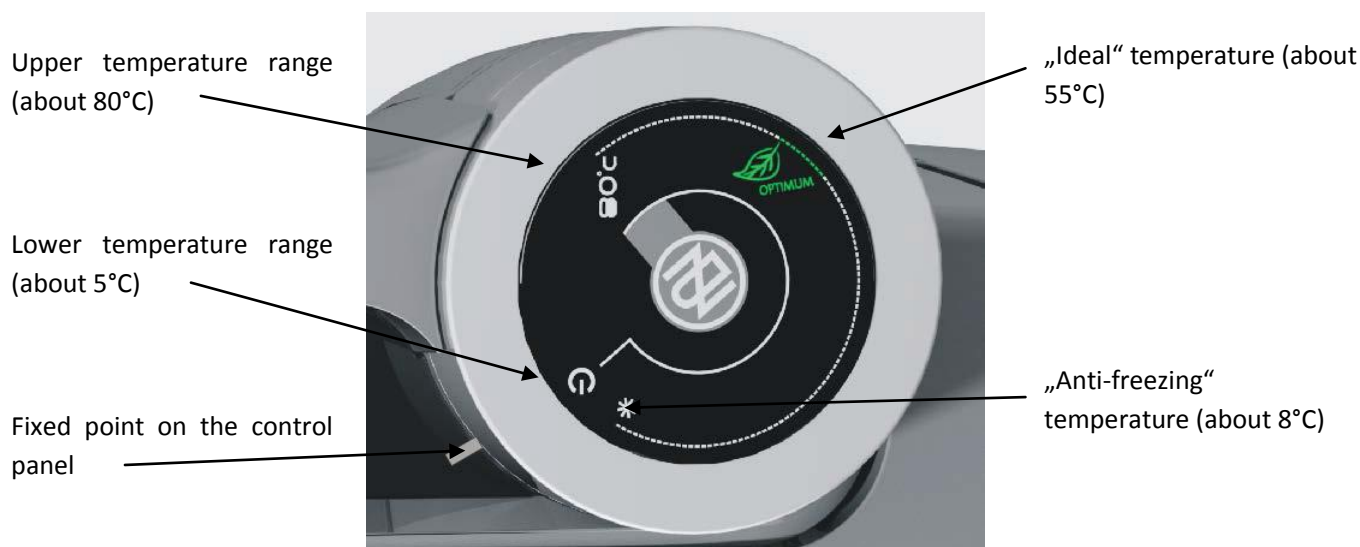


Figure 9



Adjusting the thermostat selector at the left backstop does not mean permanent shutoff of the heating element. When the storage tank 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 „55“.

4 IMPORTANT NOTICES

4.1 INSTALLATION REGULATIONS

- Check and exchange the Mg anode regularly.
- **No stop valves can be put between the storage tank and the safety valve.**
- If the overpressure in the water main exceeds 0.6 MPa, a reduction valve must be mounted before the safety valve.
- All outlets of hot water must be equipped with a combination faucet.
- Before filling the storage tank 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, setting, and regulation feature exchange, may only be implemented by a service company.



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

Please note that the storage tank can't be switched on at the mains when working in the vicinity of flammable liquids (petrol, spot remover) or gases, etc..

4.2 PRODUCT ACCESSORIES

G3/4" safety valve is packed with the product and the OKC 100, 125 NTR and OKC 100, 125, 160 NTR/ HV types are additionally equipped with a discharge valve.

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

4.3 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 storage tank 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 storage tank to a waste recycling centre (collecting yard), or contact the manufacturer.



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