

OPERATING AND INSTALLATION MANUAL

STATIONARY HOT WATER TANKS

OKC 160 NTR/BP
OKC 200 NTR/BP
OKC 250 NTR/BP
OKC 200 NTRR/BP
OKC 250 NTRR/BP

OKC 300 NTR/BP
OKC 300 NTRR/BP
OKC 400 NTR/BP
OKC 400 NTRR/BP
OKC 500 NTR/BP
OKC 500 NTRR/BP

OKC 750 NTR/BP
OKC 750 NTRR/BP
OKC 1000 NTR/BP
OKC 1000 NTRR/BP



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

Dear Customer,

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



The product is not intended to be controlled by

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

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

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

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

Made in the Czech Republic.

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

Thanks to their construction and number of variants, the OKC 160 - 1000 NTR(R)/BP series water tanks enable economic preparation of hot service water (HSW) by means of various power sources. Their nominal performance provides sufficient amount of hot water for flat units, premises, restaurants, and similar establishments. For HSW reheat, electricity, various types of central heating boilers, recoverable energy sources (heat pumps, solar collectors) and combination of those can be chosen.

Service water heating via thermal energy through heat exchanger

Closing valves of the heat exchanger must be opened which ensures heating water flow from the hot water heating system. Together with a closing valve, it is recommended to install an air outlet valve at the inlet to the heat exchanger in order to bleed the heat exchanger as needed, in particular before the beginning of the heating season. The time it takes to heat up using the heat exchanger depends on the temperature and flow of water in the hot water heating system.

1.2 OPERATING AND INSTALLATION MANUAL FOR TYPES: **OKC 160 NTR/BP, OKC 200 NTR/BP, OKC 250 NTR/BP, OKC 200 NTRR / BP, OKC 250 NTRR / BP**

1.2.1 PRODUCT DESCRIPTION

The tank receptacle is welded from a steel plate; the exchangers from a steel tube and, as a unit, it is entirely coated with hot water resistant enamel. For additional corrosion protection a magnesium anode is mounted in the upper part of the tank to adjust the electric potential inside the tank, reducing the risk of corrosion. The vessels have outlets of hot and cold water and a circulation opening welded to them. At the tanks on the side under the plastic cover, there is a cleaning and revision opening ended with a flange; various performance heating units may be mounted into the opening. The tank 200 - 250 l includes opening G 6/4" which enables the assembly of heating unit series TJ G 6/4". Such version is used when the tank is connected in solar system or a system with a heat pump, to heat water in the upper part of the tank to the temperature required. The tank is placed on the ground, next to the heating water source, or in its vicinity. The tank and heat exchanger are made of a steel plate and tested by 1.5 multiple of the operating pressure values. Temperature indicator is placed on the heater's housing. The tank is insulated with 42 mm of polyurethane foam. The heater housing is made of steel sheet provided with a powder coating.

The NTR version has a heat exchanger located in the bottom part of the tank, and one heating water source is used for heating.

The NTRR version is equipped with two exchangers for an optional combination of two heating water sources; both exchangers can be combined in a series. The NTR/BP and NTRR/BP series do not have a heating element. The tank cannot be used for flow heating of hot water in an exchanger.

1.2.2 CONSTRUCTION AND BASIC DIMENSIONS OF TANK

OKC 160 NTR/BP

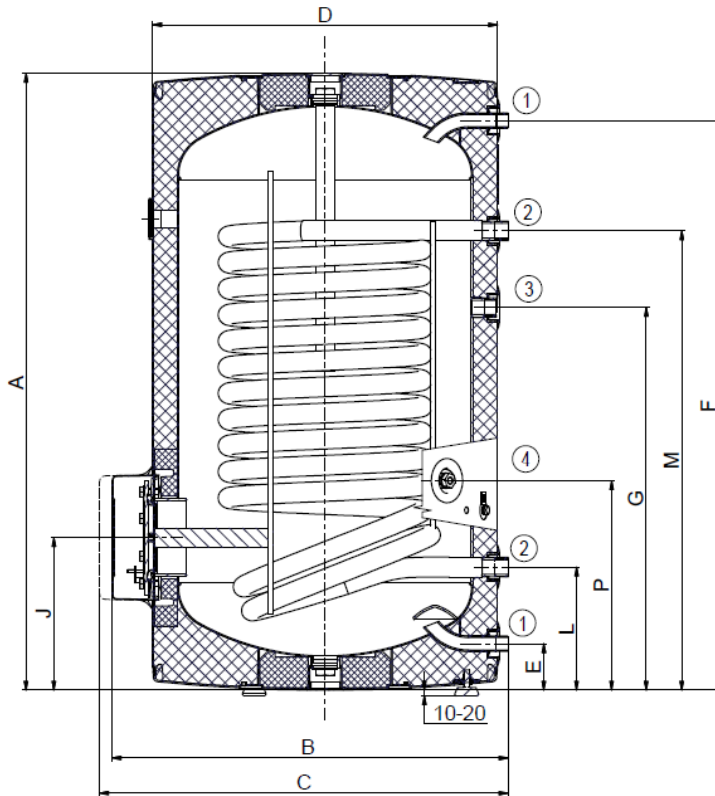


Figure 1

OKC 160 NTR/BP	
A	1047
B	660
C	705
D	584
E	80
F	966
G	649
J	259
L	209
M	779
P	355

①	3/4" outer
②	1" outer
③	3/4" inner
④	1/2" inner

Table 1

OKC 200 NTR/BP, OKC 250 NTR/BP, OKC 200 NTRR/BP, OKC 250 NTRR/BP

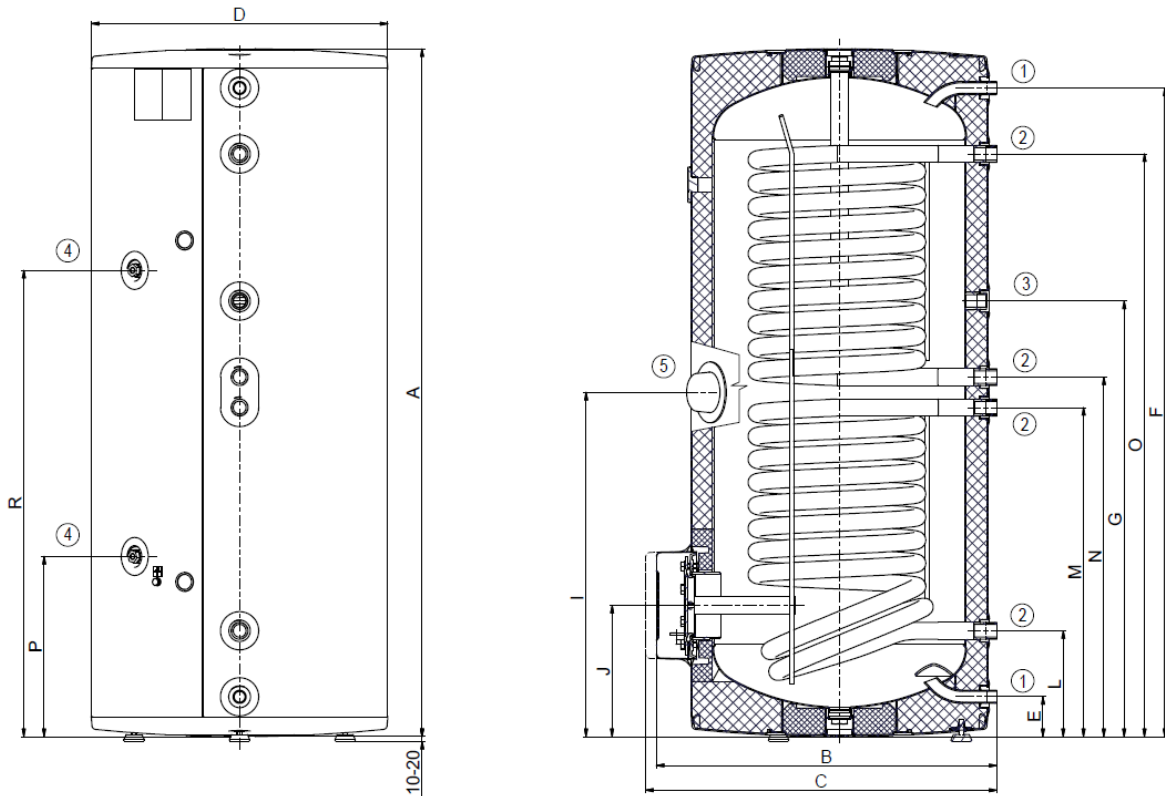


Figure 2

①	3/4" outer
②	1" outer
③	3/4" inner
④	1/2" inner
⑤	6/4" inner

	OKC 200 NTR/BP	OKC 200 NTRR/BP	OKC 250 NTR/BP	OKC 250 NTRR/BP
A	1357	1357	1537	1537
B	660	660	660	660
C	705	705	705	705
D	584	584	584	584
E	80	80	80	80
F	1280	1280	1460	1460
G	949	859	1060	1060
I	813	680	813	680
J	259	259	259	259
L	209	209	209	209
M	779	649	779	649
N	-	709	-	889
O	-	1149	-	1329
P	355	355	355	355
R	-	920	-	1100

Table 2

1.2.3 TECHNICAL PARAMETERS

MODEL		OKC 160 NTR/BP	OKC 200 NTR/BP	OKC 200 NTRR/BP	OKC 250 NTR/BP	OKC 250 NTRR/BP
VOLUME	l	148	208	200	242	234
WEIGHT WITHOUT WATER	kg	76	92	103	94	107
MAXIMUM TANK PRESSURE	bar			6		
OPERATING EXCHANGER PRESSURE	bar			10		
MAX. TEMPERATURE OF HEATING WATER	°C			110		
WARM WATER MAXIMUM TEMPERATURE	°C			80		
HEATING SURFACE OF UPPER EXCHANGER	m ²	-	-	1	-	1
HEATING SURFACE OF BOTTOM EXCHANGER	m ²	1.45	1.45	1	1.45	1
OUTPUT OF UPPER / LOWER EXCHANGER AT HEATING WATER TEMPERATURE OF 80 °C AND FLOW 720 l/h	kW	- /32	- /32	24/24	- /32	24/32
PERMANENT OUTPUT OF WARM WATER ¹ OF UPPER / LOWER EXCHANGER	l/h	- /990	- /990	650/670 *1080	- /990	650/670 *1080
TIME OF HEATING BY UPPER / LOWER EXCHANGER FROM 10°C TO 60 °C	min	- /16	- /23	14/14	- /26	14/17
ENERGY EFFICIENCY CLASS		C	C	C	C	C
STATIC LOSSES	W	75	82	82	87	87

¹ Warm water 45 °C

² The data do not relate to NTR/BP types without the unit

* Exchanger connected to series

Table 3

1.3 OPERATING AND INSTALLATION MANUAL FOR TYPES: OKC 300 NTR/BP, OKC 400 NTR/BP, OKC 500 NTR/BP, OKC 300 NTRR/BP, OKC 400 NTRR/BP, OKC 500 NTRR/BP

1.3.1 PRODUCT DESCRIPTION

The tank receptacle is welded from a steel plate; the exchangers from a steel tube and, as a unit, it is entirely coated with hot water resistant enamel. For additional corrosion protection a magnesium anode is mounted in the upper part of the tank to adjust the electric potential inside the tank, reducing the risk of corrosion. The vessels have outlets of hot and cold water and a circulation opening welded to them. At the tanks on the side under the plastic cover, there is a cleaning and revision opening ended with a flange; various performance heating units may be mounted into the opening. The tank includes opening G 6/4" which enables the assembly of heating unit series TJ G 6/4". Such version is used when the tank is connected in solar system or a system with a heat pump, to heat water in the upper part of the tank to the temperature required. The tank is placed on the ground, next to the heating water source, or in its vicinity. The tank and heat exchanger are made of a steel plate and tested by 1.5 multiple of the operating pressure values. Temperature indicator is placed on the heater's housing. The tank is insulated with 50 mm of polyurethane foam. The plastic housing (reinforced with polystyrene) is fitted on the tank.

The NTR version has a heat exchanger located in the bottom part of the tank, and one heating water source is used for heating.

The NTRR version is equipped with two exchangers for an optional combination of two heating water sources; both exchangers can be combined in a series. The NTR/BP and NTRR/BP series do not have a heating element. The tank cannot be used for flow heating of hot water in an exchanger.

1.3.2 DESIGN AND BASIC DIMENSIONS OF TANK

OKC 300 NTR/BP, OKC 300 NTRR/BP

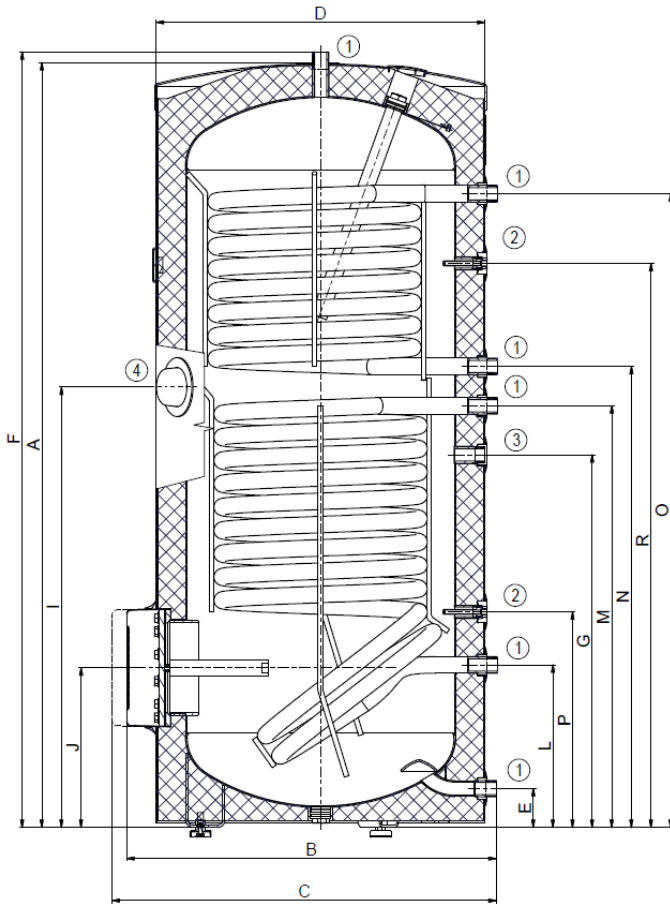
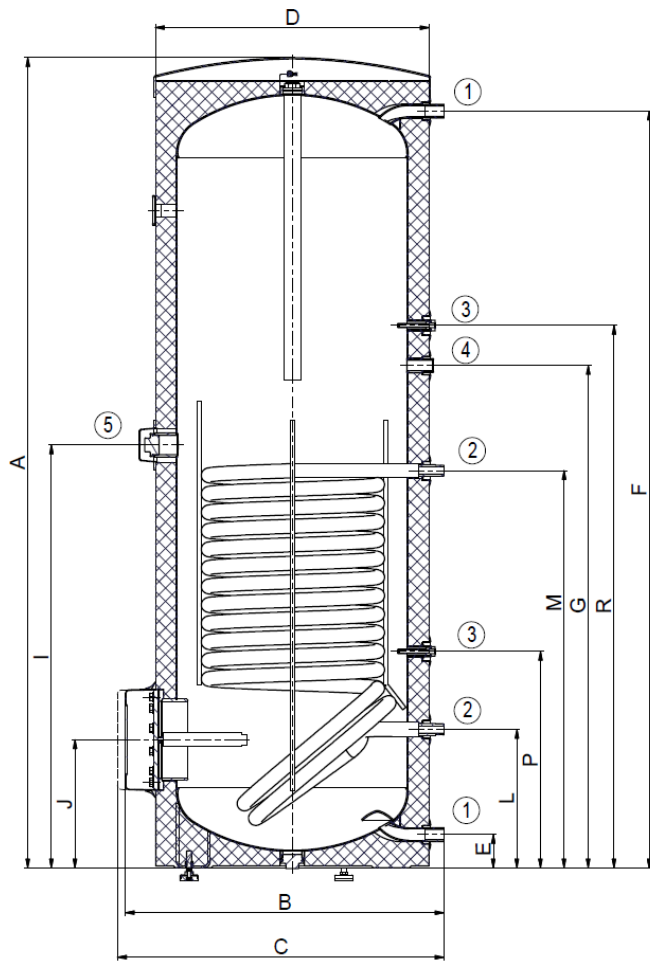


Figure 3

	OKC 300 NTR/BP	OKC 300 NTRR/BP		
			①	1" outer
A	1558	1558	②	1/2" inner
B	750	750	③	3/4" inner
C	810	810	④	6/4" inner
D	670	670		
E	77	77		
F	1579	1579		
G	760	760		
I	895	895		
J	325	325		
L	330	330		
M	858	858		
N	-	939		
O	-	1291		
P	438	438		
R	1148	1148		

Table 4

OKC 400 NTR/BP, OKC 400 NTRR/BP, OKC 500 NTR/BP, OKC 500 NTRR/BP



①	1" outer
②	3/4" outer
③	1/2" inner
④	3/4" inner
⑤	6/4" inner

* at NTR neck ③ 3/4" inner, neck ④ 1/2" inner

Figure 4

	OKC 400 NTR/BP	OKC 400 NTRR/BP	OKC 500 NTR/BP	OKC 500 NTRR/BP
A	1920	1920	1924	1924
B	750	750	800	800
C	810	810	860	860
D	650	650	700	700
E	79	79	55	55
F	1799	1799	1790	1790
G	1194	1194	1264	1264
I	1005	1005	1040	1040
J	304	304	288	288
L	329	329	220	220
M	944	944	965	965
N	-	1094	-	1114
O	-	1446	-	1604
P	514	514	380	380
R	1289	1289	1409	1409

Table 5

1.3.3 TECHNICAL PARAMETERS

MODEL		OKC 300 NTR/BP	OKC 300 NTRR/BP	OKC 400 NTR/BP	OKC 400 NTRR/BP	OKC 500 NTR/BP	OKC 500 NTRR/BP
VOLUME	l	296	285	373	363	447	433
WEIGHT WITHOUT WATER	kg	108	126	139	153	149	158
MAXIMUM TANK PRESSURE	bar				10		
OPERATING EXCHANGER PRESSURE	bar				10		
MAX. TEMPERATURE OF HEATING WATER	°C				110		
WARM WATER MAXIMUM TEMPERATURE	°C				80		
HEATING SURFACE OF UPPER EXCHANGER	m ²	-	1	-	1	-	1.4
HEATING SURFACE OF BOTTOM EXCHANGER	m ²	1.5	1.5	2	2	2	2
OUTPUT OF UPPER / LOWER EXCHANGER AT HEATING WATER TEMPERATURE OF 80 °C AND FLOW 720 l/h *	kW	- /35	24/35	- /58	26/58	- /58	37/58
PERMANENT OUTPUT OF WARM WATER ¹ OF UPPER / LOWER EXCHANGER	l/h	- /1100	670/1100	- /1423	638/1423	- /1448	908/1448
TIME OF HEATING BY UPPER / LOWER EXCHANGER FROM 10°C TO 60 °C	min	- /30	16/24	- /22	22/23	- /26	26/27
ENERGY EFFICIENCY CLASS		C	C	C	C	C	C
STATIC LOSSES	W	83	83	99	102	110	111

¹ Warm water 45 °C

² The data do not relate to NTR/BP types without the unit

* Calculated value

Table 6

1.4 OPERATING AND INSTALLATION MANUAL FOR TYPES: OKC 750 NTR/BP, OKC 1000 NTR/BP, OKC 750 NTRR/BP, OKC 1000 NTRR/BP

1.4.1 PRODUCT DESCRIPTION

The tank receptacle is welded from a steel plate; the exchangers from a steel tube and, as a unit, it is entirely coated with hot water resistant enamel. For additional corrosion protection a magnesium anode is mounted in the upper part of the tank to adjust the electric potential inside the tank, reducing the risk of corrosion. The vessels have outlets of hot and cold water and a circulation opening welded to them. At the tanks on the side under the plastic cover, there is a cleaning and revision opening ended with a flange; various performance heating units may be mounted into the opening. The tank includes opening G 6/4" which enables the assembly of heating unit series TJ G 6/4". Such version is used when the tank is connected in solar system or a system with a heat pump, to heat water in the upper part of the tank to the temperature required. The tank is placed on the ground, next to the heating water source, or in its vicinity. The tank and heat exchanger are made of a steel plate and tested by 1.5 multiple of the operating pressure values. Temperature indicator is placed on the heater's housing. The tank is insulated with NEODUL 80 mm.

The NTR version has a heat exchanger located in the bottom part of the tank, and one heating water source is used for heating.

The NTRR version is equipped with two exchangers for an optional combination of two heating water sources; both exchangers can be combined in a series. The NTR/BP and NTRR/BP series do not have a heating element. The tank cannot be used for flow heating of hot water in an exchanger.

1.4.2 DESIGN AND BASIC DIMENSIONS OF TANK

OKC 750 NTR/BP, OKC 1000 NTR/BP

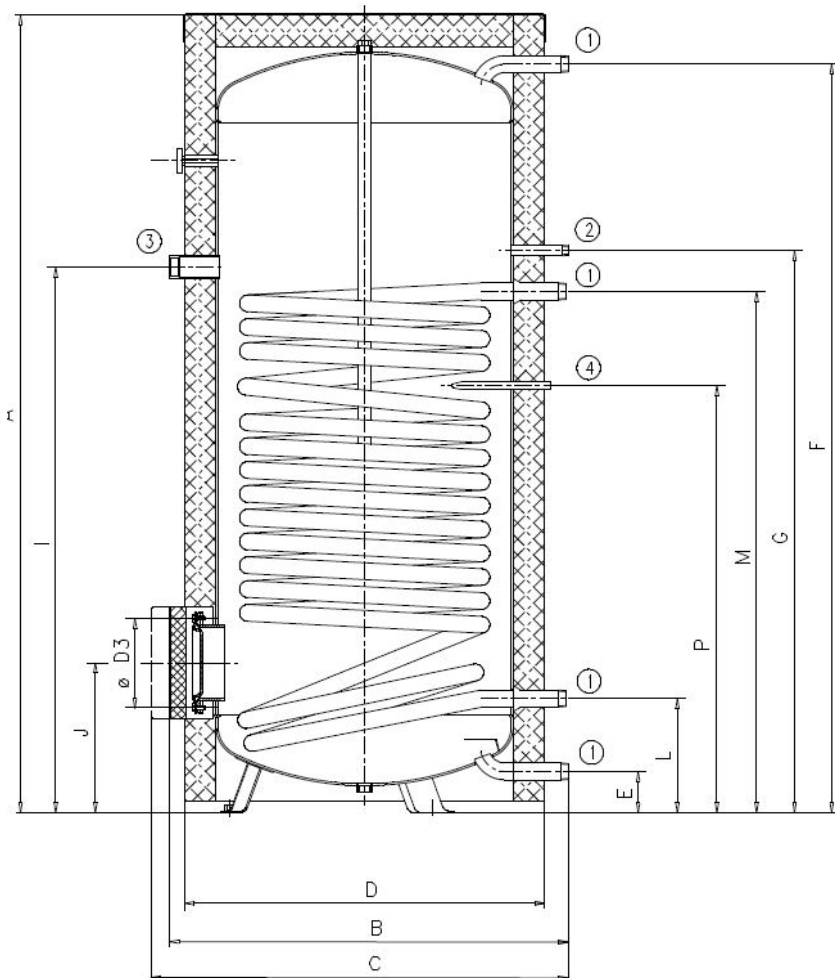


Figure 5

	OKC 750 NTR/BP	OKC 1000 NTR/BP		
			①	5/4" outer
A	2030	2050	②	3/4" outer
B	1030	1130	③	6/4" inner
C	max. 1140	max. 1240	④	1/2" inner
D	910	1010		
D3	225	225		
E	106	103		
F	1890	1900		
G	1422	1490		
I	1380	1375		
J	383	386		
L	293	296		
M	1319	1324		
P	1081	1088		

Table 7

OKC 750 NTRR/BP, OKC 1000 NTRR/BP

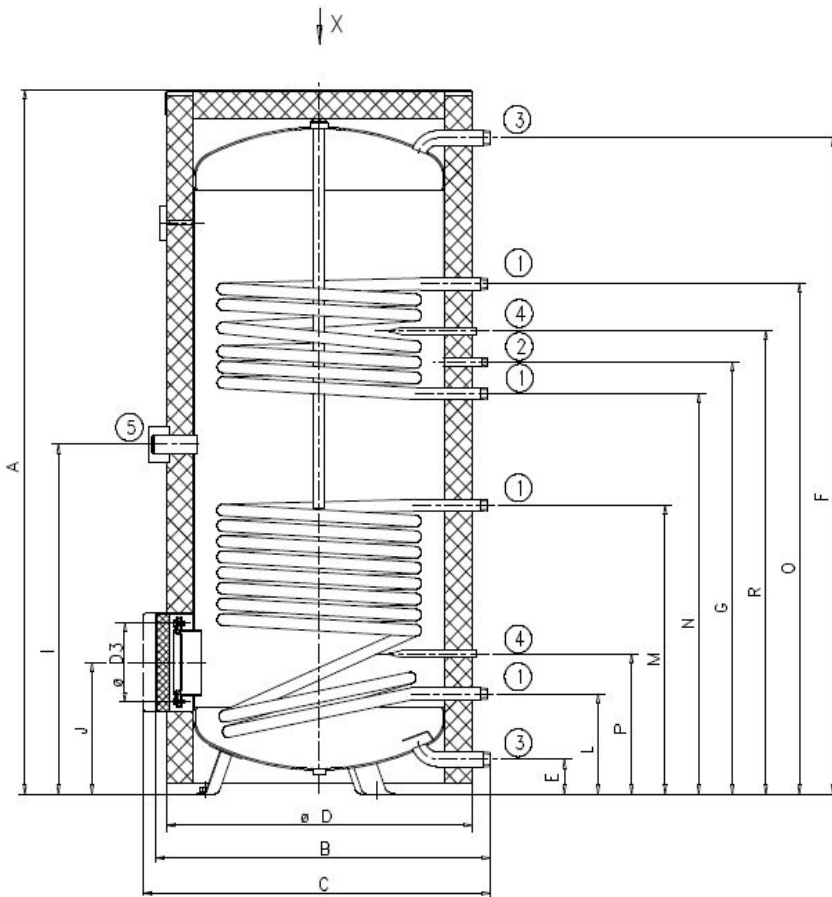


Figure 6

	OKC 750 NTRR/BP	OKC 1000 NTRR/BP		
			①	1" outer
A	2030	2050	②	3/4" outer
B	1030	1130	③	5/4" outer
C	max. 1140	max. 1240	④	1/2" inner
D	950	1010	⑤	6/4" inner
D3	225	225		
E	106	103		
F	1890	1900		
G	1246	1243		
I	1009	1024		
J	383	386		
L	293	296		
M	835	884		
N	1156	1153		
O	1471	1423		
P	407	411		
R	1336	1333		

Table 8

1.4.3 TECHNICAL PARAMETERS

MODEL		OKC 750 NTR/BP	OKC 750 NTRR/BP	OKC 1000 NTR/BP	OKC 1000 NTRR/BP
VOLUME	l	725	710	945	930
DIAMETER	mm	910	910	1010	1010
WEIGHT	kg	208	197	260	248
HOT WATER OPERATING PRESSURE	bar			10	
HEATING WATER OPERATING PRESSURE	bar			10	
MAX TEMPERATURE OF HEATING WATER	°C			110	
MAX TEMPERATURE OF HOT WATER	°C			95	
HEATING SURFACE OF UPPER EXCHANGER	m ²	-	1.17	-	1.12
HEATING SURFACE OF BOTTOM EXCHANGER	m ²	3.7	1.93	4.5	2.45
POWER NUMBER OF UPPER EXCHANGER PURSUANT TO DIN 4708	NL	-	6.2	-	7.1
POWER NUMBER OF BOTTOM EXCHANGER PURSUANT TO DIN 4708	NL	30.5	21	38.8	26
OUTPUT OF UPPER / LOWER EXCHANGER AT HEATING WATER TEMPERATURE OF 80 °C AND FLOW 720 l/h *	kW	- /99	33/60	- /110	32/76
PERMANENT OUTPUT OF WARM WATER ¹ OF UPPER / LOWER EXCHANGER	l/h	- /2440	815/1460	- /2715	780/1490
TIME OF HEATING BY UPPER / LOWER EXCHANGER FROM 10°C TO 60 °C	min	- /24	28/37	- /26	37/43
ENERGY EFFICIENCY CLASS		C	C	C	C
STATIC LOSSES	W	127	127	140	142

¹Warm water 45 °C

* Calculated value

Table 9

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. The cold water inlet of each individually closable heater must be fitted with a seal, test tap or plug to check the non-return valve, as well as a non-return valve and safety valve. Heaters with a volume of more than 200 liters must also be fitted with a pressure gauge. Besides the legally acknowledged national regulations and standards, also conditions for connection defined in the local electric and water works have to be adhered to, as well as the installation and operation manual.

The temperature at the place of the tank 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 in front of the tank, or that the thermostat was set to the maximum operating temperature of 60 °C (setting to position "60"). For proper operation, drinkable water of adequate quality shall be used.



300 liter volume tanks are screwed onto the bottom wooden palette with M12 screws. When the tank is released from the pallet and prior to its putting into operation, 3 screw legs supplied have to be installed as the product accessories. With three adjustable legs, the tank may be positioned vertically to the base within 10 mm range.

2.2 ELECTRICAL INSTALLATION

Wiring for: OKC 160 NTR/BP, OKC 200 NTR/BP, OKC 200 NTRR/BP, OKC 250 NTR/BP, OKC 250 NTRR/BP

Water tank must be equipped with a universal electric heating unit with either set or adjustable heating element performance. A heating unit consists of a flange, to which one or three wells for ceramic heating elements and one thermowell are welded (see Figure 7). The unit is fixed with 8 screws M10 with spacing 168 mm.

In the wiring plastic cover, there is a thermostat and a safety fuse; tank operation control light; and a lead-in wire bushing.



The sensors must be inserted all the way in, first the thermostat and then the safety fuse.

The performance of heating unit may be adjusted based on either required heating time or connecting possibilities of electric energy distribution in the place of use.

2.2.1 TECHNICAL PARAMETERS OF ELECTRIC HEATING UNITS

	Heating unit 2.2 kW		Multipurpose heating unit 3 - 6 kW		
OUTPUT [Kw]	2.2	3	3	4	6
VOLTAGE	1 PE-N AC 230 V 50 Hz	1 PE-N AC 230 V 50 Hz	2 PE-N AC 400 V 50 Hz	3 PE-N AC 400 V 50 Hz	3 PE-N AC 400 V 50 Hz
ELECTRICAL PROTECTION	IP 44				
NUMBER OF HEATING UNITS	1	3			
OUTPUT OF ONE UNIT kW	2.2	2			

Table 10

After the tank is connected to electric network, the heating element starts heating water. The element is turned on and off by a thermostat. The thermostat may be set from 5 °C to 74 °C.



We recommend setting the hot water temperature at the maximum of 60 °C. This temperature ensures optimal tank operation, lowers heat loss, and saves electricity.

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). When shutting the tank out for an extended period, in winter you can set the thermostat to the snowflake sign preventing the water from freezing or turn off the current supply to the tank.



Connection, repairs, and wiring inspections may only be implemented by company (person) authorized to such activity. Expert connection must be confirmed on the warranty certificate.

The tank is connected to the electric network using a solid moving conductor with a switch that turns off all network poles and the circuit breaker (protector).

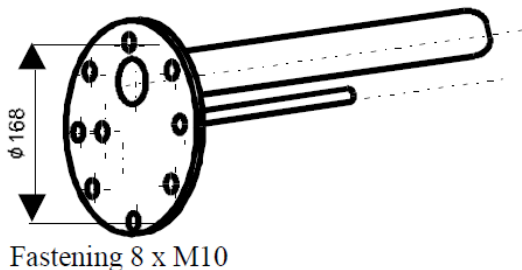
The degree of protection of electric parts of the tank is IP 44.

Adhere to the protection against electric shock injury according to valid standard in the installation location.

2.2.2 HEATING UNIT - FLANGES

OKCE 160 NTR/BP, OKCE 200 NTR/BP, OKCE 250 NTR/BP, OKCE 200 NTRR/BP, OKCE 250 NTRR/BP

Flange 2,2 kW

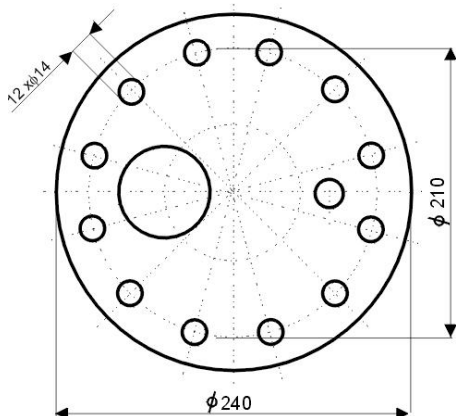


Fastening 8 x M10

Figure 7

OKC 300 NTR/BP, OKC 300 NTRR/BP, OKC 400 NTR/BP, OKC 400 NTRR/BP, OKC 500 NTR/BP, OKC 500 NTRR/BP, OKC 750 NTR/BP, OKC 750 NTRR/BP, OKC 1000 NTR/BP, OKC 1000 NTRR/BP

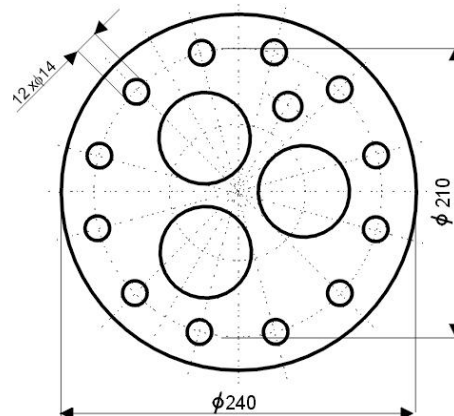
TPK 210-12/2,2 kW



Fastening 12 x M12

Figure 8

TPK 210-12/3-6 kW

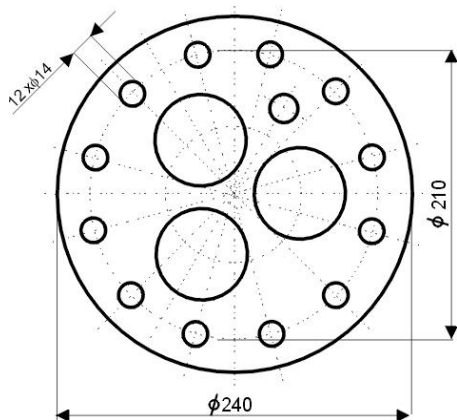


Fastening 12 x M12

Figure 9

TPK 210-12/5-9 kW

TPK 210-12/8-12 kW



Fastening 12 x M12

Figure 10

Wiring scheme

Heating unit 2.2 kW

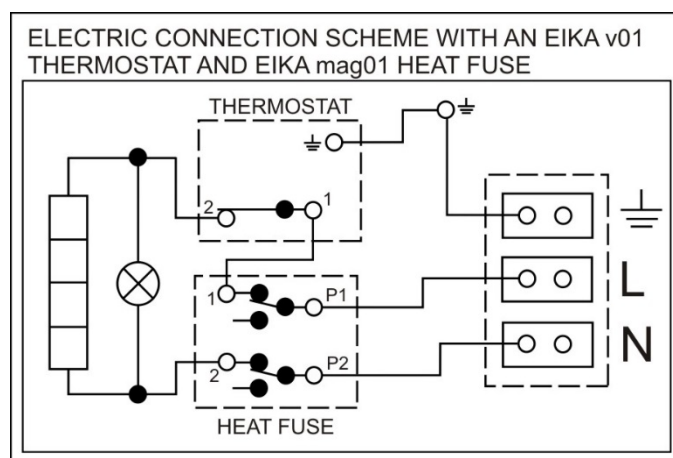


Figure 11

Wiring scheme

Heating unit 3-6 kW

The 3-6 kW heating unit allows 4 types of connection based on either required time of heating or possibilities of electric network in the place of use.

TPK 3-6 kW R ~ 1 kW

To achieve chosen performance of the heating unit, connect the inlet conductor to L1, L2, L3, and N terminal board, and interconnect the clips on the 1-10 terminal board in accordance with the following schemes:

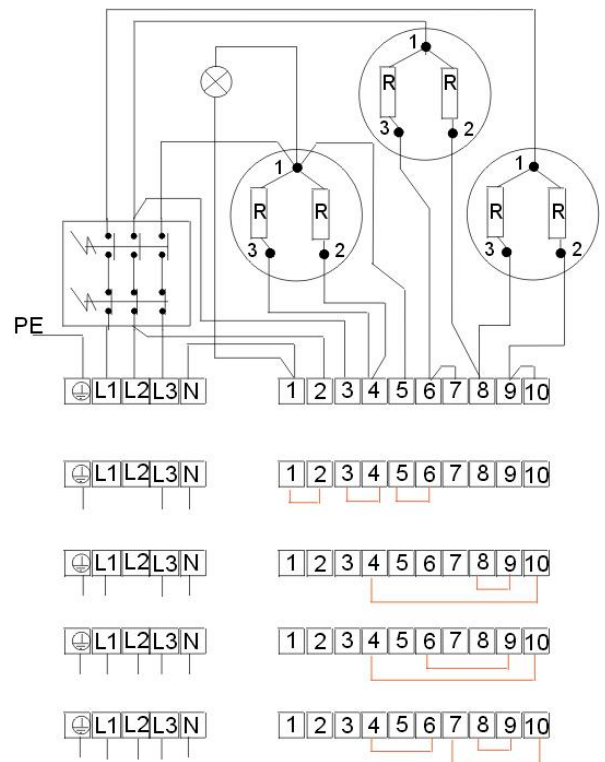


Figure 12

Heating unit:

TPK 210-12/5-9 kW
TPK 210-12/8-12 kW

TPK 5-9 kW R ~ 1 kW
TPK 8-12 kW R ~ 1,33 kW

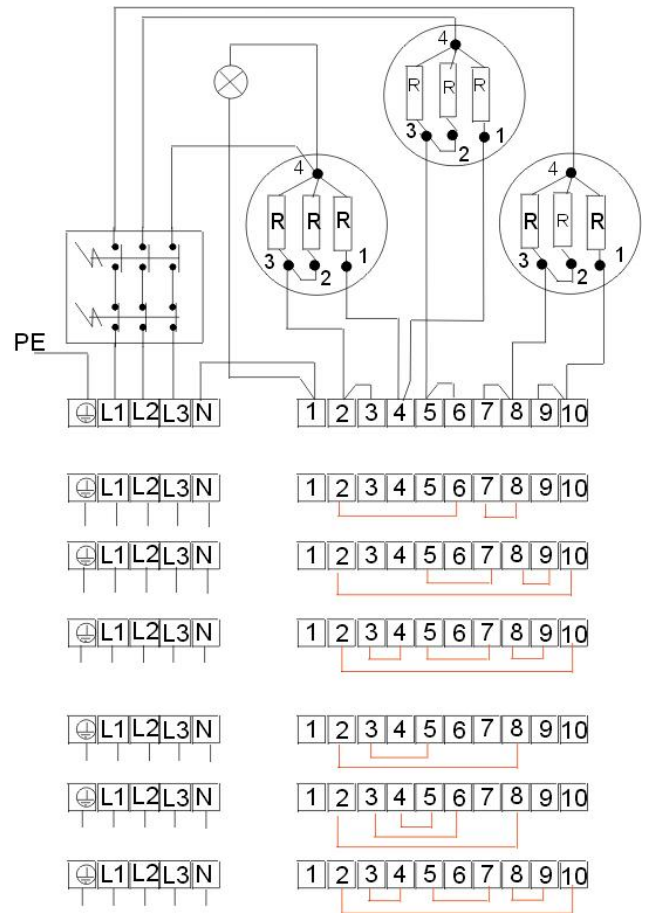


Figure 13

Heating units use

Capacity	Flange size	Time of heating from 10°C to 60°C (hours)							
		8	6	5	4	3	2.5	2	1.5
750	Flange Ø150	RDU 18-6	RDW 18-7.5	RDW 18-10	RSW 18-12	RSW -18 -15			
	flange Ø225		SE 377-8	SE 378-9.5	SE 377-11	SE 378-14	SE 377-16	SE 378-19	
1000	flange Ø150	RDW 18-7.5	RDW 18-10	RSW 18-12	RSW 18-15				
	flange Ø225	SE 377-8	SE 378-9.5	SE 377-11	SE 378-14	SE 377-16	SE 378-19		

Capacity	Flange size	Time of heating from 10°C to 60°C (hours)							
		8	6	5	4	3	2.5	2	1.5
300	flange Ø210	RDU 18-2.5	RDU 18-3	RDU 18-3.8	RDU 18-5	RDU 18-6	RDW 18-7.5	RDW 18-10	
400	flange Ø210	RDU 18-3	RDU 18-3.8	RDU 18-5	RDU 18-6	RDW 18-7.5	RDW 18-10	RSW 18-12	RSW 18-15
500	flange Ø210	RDU 18-3.8	RDU 18-5	RDU 18-6	RDW 18-7.5	RDW 18-10	RSW 18-12	RSW 18-15	

Table 11

Electrical heating units REU, RDU, RDW and RSW can be by reduction flange 210/150 mounted in heaters with 300, 400 and 500 liter volume.

Electrical heating units REU, RDU, RDW and RSW can be by reduction flange 225/150 mounted in heaters with 750 and 1000 liter volume.

Type	Output [kW]	Power connection	Heating element length [mm]	Weight [kg]
REU 18 - 2,5	2,5	1 PE-N AC 230 V / 50 Hz	450	3
RDU 18 - 2,5	2,5	3 PE-N AC 400 V / 50 Hz	450	3,3
RDU 18 - 3	3	3 PE-N AC 400 V / 50 Hz	450	3,4
RDU 18 - 3,8	3,8	3 PE-N AC 400 V / 50 Hz	450	3,5
RDU 18 - 5	5	3 PE-N AC 400 V / 50 Hz	450	3,5
RDU 18 - 6	6	3 PE-N AC 400 V / 50 Hz	450	3,5
RDW 18 - 7,5	7,5	3 PE-N AC 400 V / 50 Hz	450	3,7
RDW 18 - 10	10	3 PE-N AC 400 V / 50 Hz	450	4
RSW 18 - 12	12	3 PE-N AC 400 V / 50 Hz	530	4
RSW 18 - 15	15	3 PE-N AC 400 V / 50 Hz	630	4,2
SE 377*	8,0-11-16	3 PE-N AC 400 V / 50 Hz	610	8
SE 378*	9,5-14-19	3 PE-N AC 400 V / 50 Hz	610	11,5

* For hot water heaters 750 and 1000 liter only

Table 12

Reduction flange 210/150

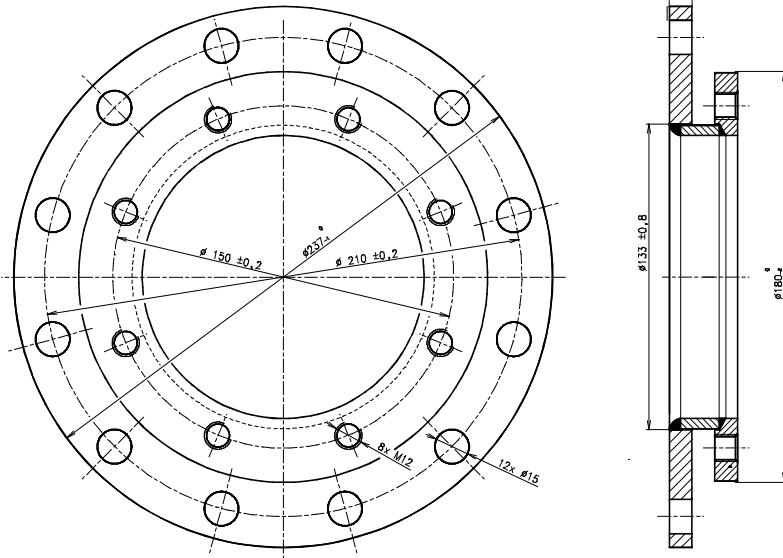


Figure 14

Reduction flange 225/150

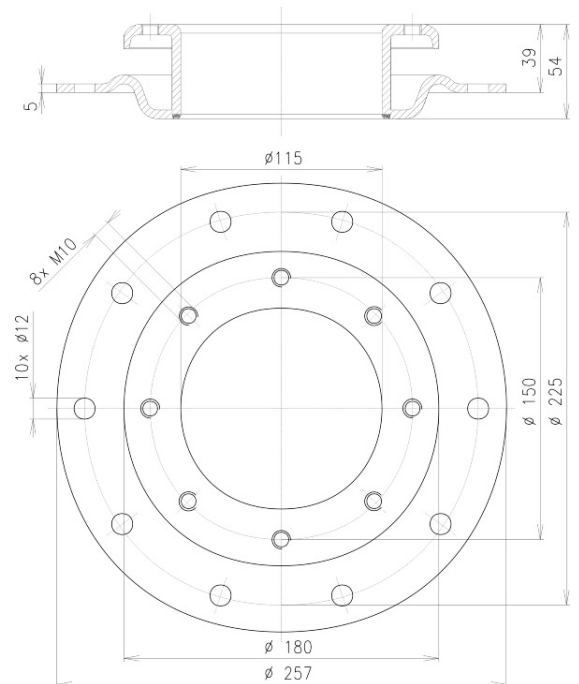


Figure 15

2.3 PLUMBING FIXTURE



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



Every hot utility water pressure tank shall be equipped with membrane spring loaded with safety valve. Nominal clearance of safety valves is defined by standard. Safety valve shall be easily accessible, fitted as close as possible to the tank. The inlet pipes must have at least the same clearance as the safety valve. Safety valve is placed high enough to secure dripping water drain by gravity. We recommend mounting the safety valve onto a branch pipe. Easier exchange without the necessity of draining water from the 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 tank pressure, and at least 20 % higher than the maximum pressure in the water main (Table 13). If the water main pressure exceeds such value, a reduction valve must be added to the system. No closing armature may be mounted between the tank and the safety valve. During 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 regular operation, such a check needs to be carried out at least once a month, and after each shutdown of the tank longer 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 tank, use the recommended drain valve. First of all, close water inlet in the tank.

Find necessary pressure values in the table below - Table 13. For proper safety valve operation, a backflow valve shall be mounted on the inlet pipes, preventing spontaneous heater draining of the tank and hot water penetration back into the water main. We recommend that the hot water distribution from the tank was as short as possible to minimize 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.

The tanks must be provided with a discharge valve mounted on the cold service water inlet to the tank for potential disassembly or repair.

When assembling the security equipment, follow the standard.

SAFETY VALVE START-UP PRESSURE [bar]	ACCEPTABLE OPERATING OVER-PRESSURE OF WATER TANK [bar]	MAXIMUM PRESSURE IN COLD WATER PIPES [bar]
6	6	up to 4,8

Table 13

2.4 PRESSURE LOSSES

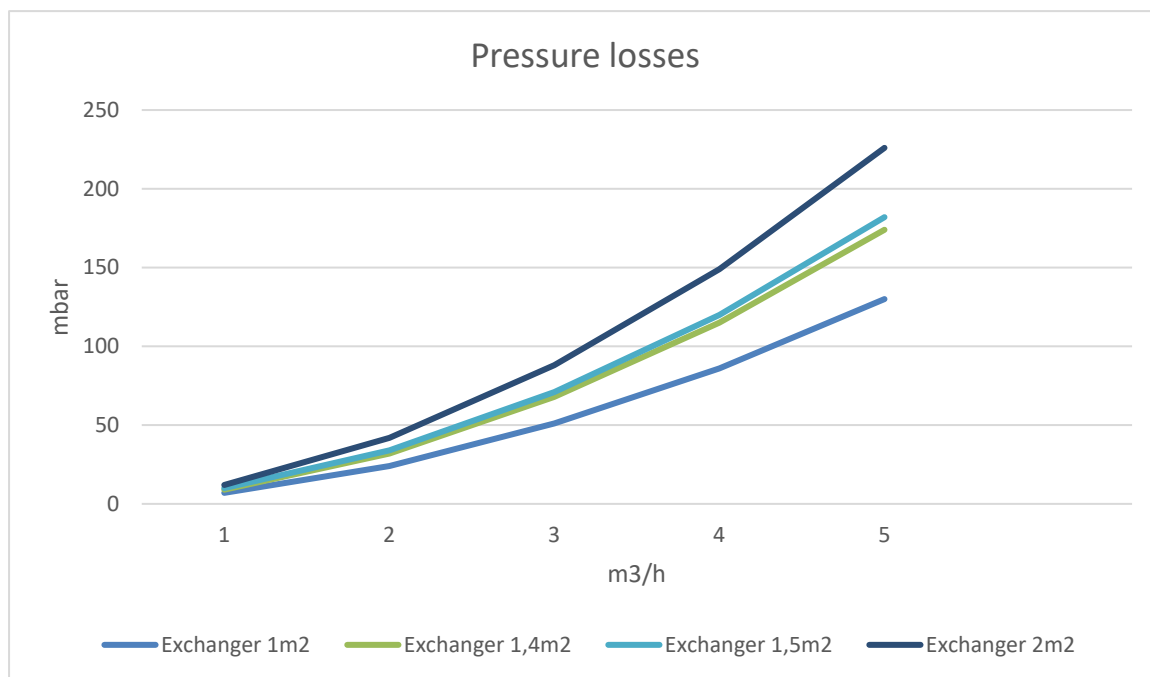


Figure 16

Type	Pressure loss [mbar] t _{HV} = 60 °C				
	Amount of heating water in m³/h				
	1	2	3	4	5
Exchanger 1m ²	7	24	51	86	130
Exchanger 1.4m ²	9	32	68	115	174
Exchanger 1.5m ²	10	34	71	120	182
Exchanger 2m ²	12	42	88	149	226

Table 14

2.5 EXAMPLES OF TANKS CONNECTION

Connecting a tank to the heating circuit:

The tank is placed on the ground, next to the heating source, or in its vicinity. The heating circuit shall be connected to marked tank exchanger inputs and outputs, and bleeder valve installed at the highest point. It is necessary to install a filter into the circuit in order to protect pumps, three-way valve, 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 TUV (warm utility water) using a three-way valve, always follow the installation instructions of the three-way valve's manufacturer.

Connecting the tank to a Hot Water Distribution

Cold water shall be connected to an inlet marked with a blue ring and writing "HSW INLET". Hot water shall be connected to an outlet marked with a red ring or writing "HSW INLET". If the hot sanitary water (HSW) distribution is equipped with circulation circuit, it shall be connected to the outlet marked with "CIRCULATION". For potential drain of the tank, the HSW inlet has to be provided with a "T" plumbing with a drain valve. Each individually lockable tank must be on the cold water inlet provided with a stop gate, test tap, safety valve with a reverse flap and a pressure gauge.

An example of a group tank connection for steady hot water consumption from all tanks using Tichelmann's method

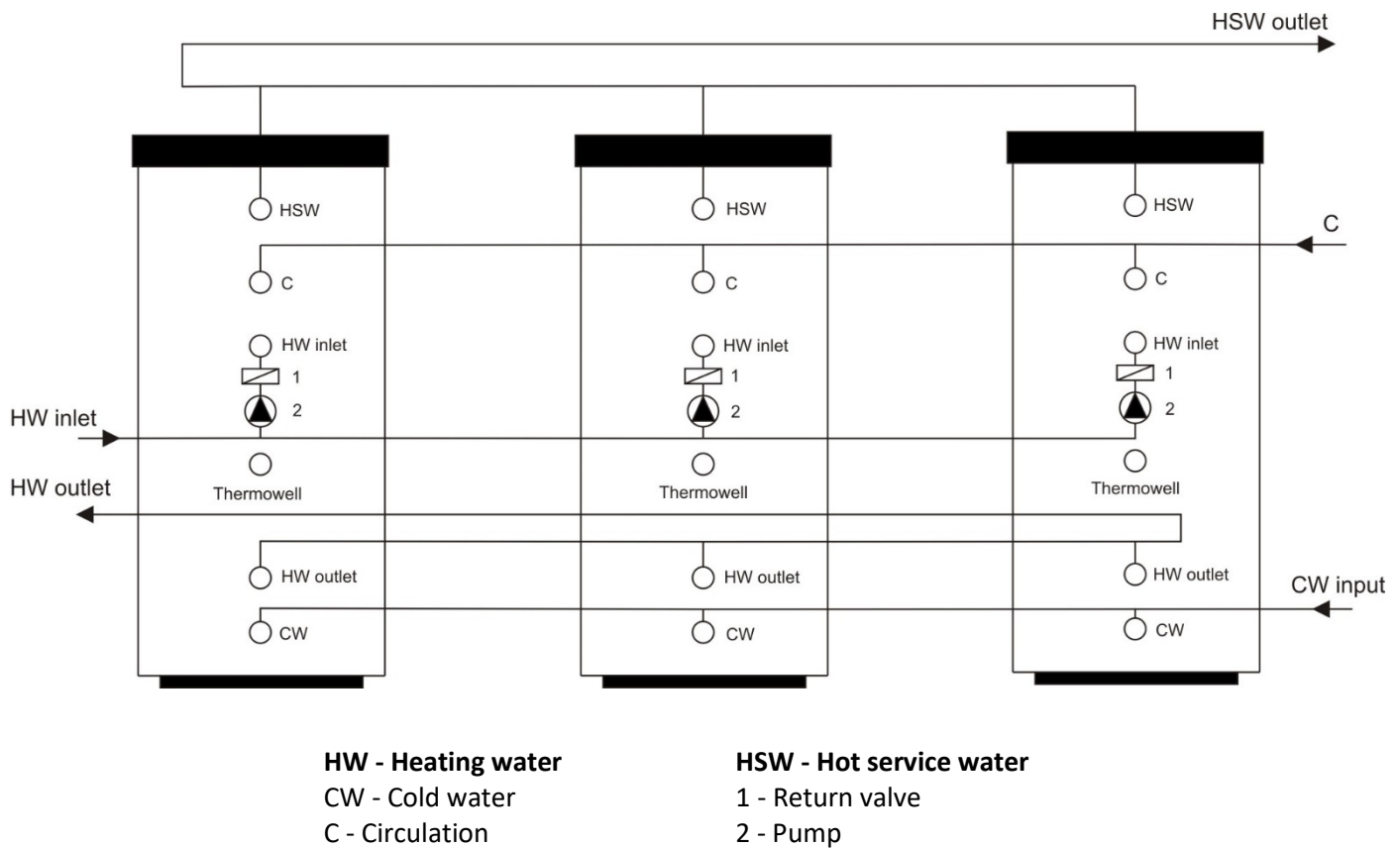


Figure 17

OKC 160 - 300 NTR

Heated by gas boiler with two pumps

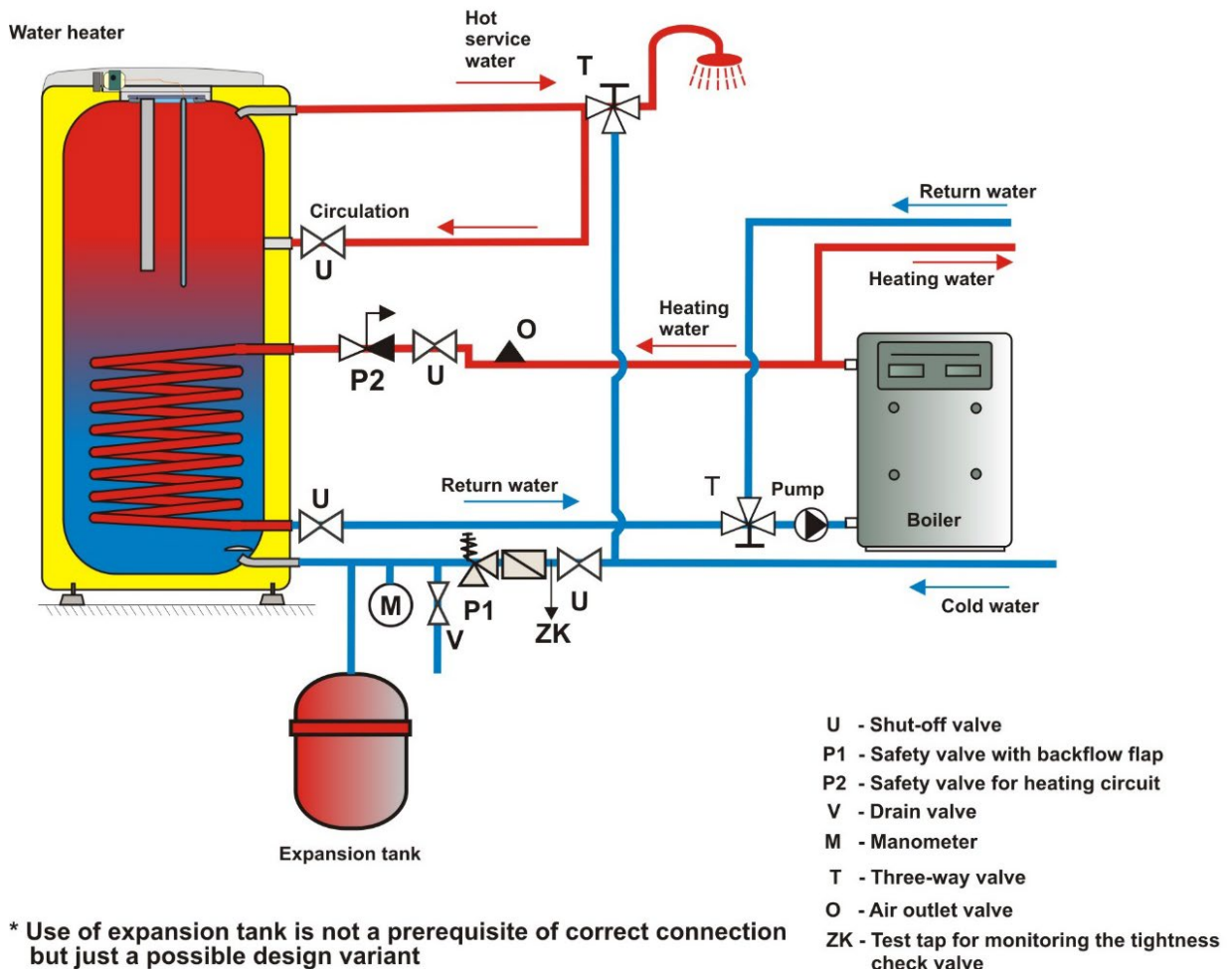


Figure 18

OKC 200-300 NTRR

Heated by gas boiler and solar collectors, controlled by three-way valve

Two heating water sources

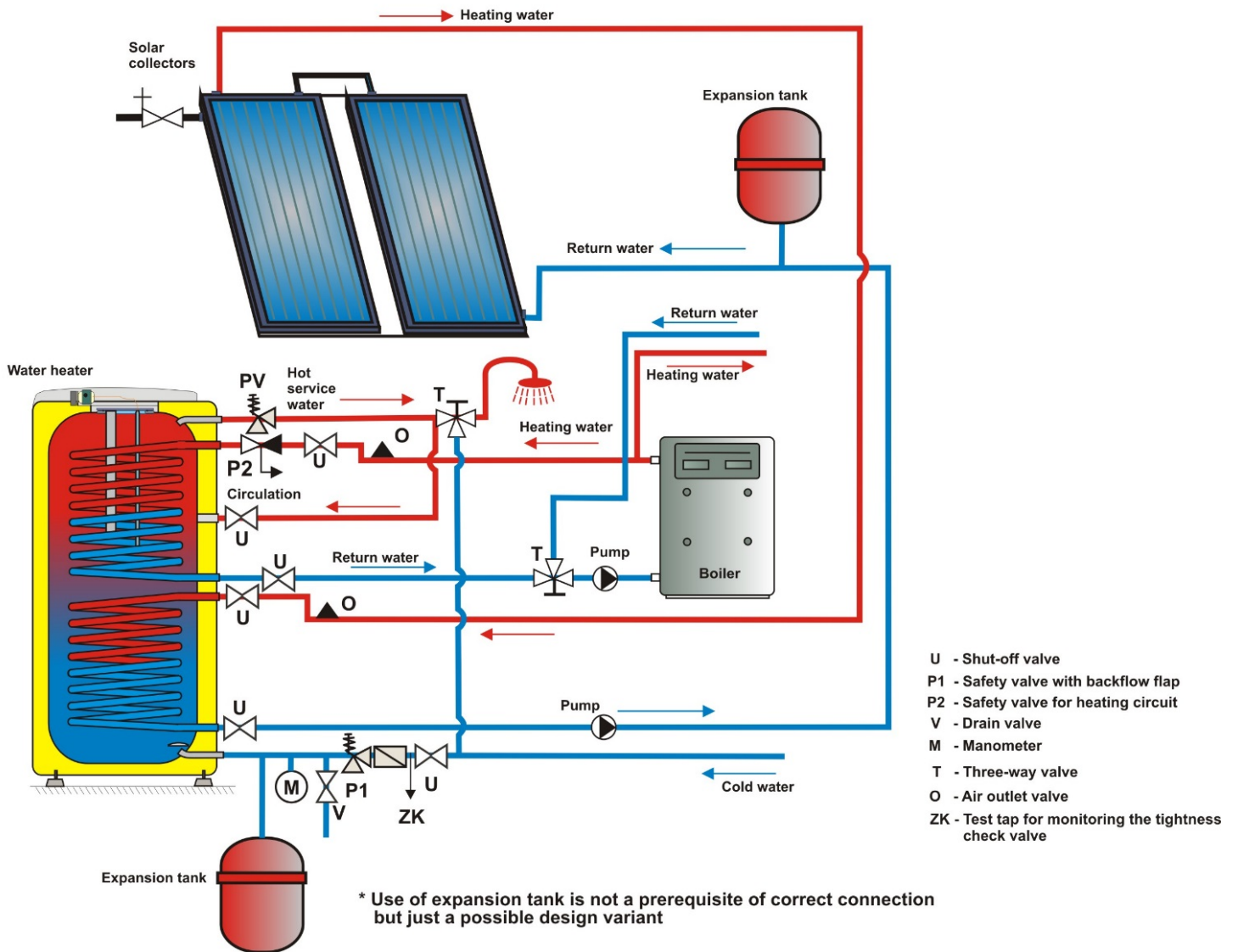


Figure 19

Exchangers combined in a series

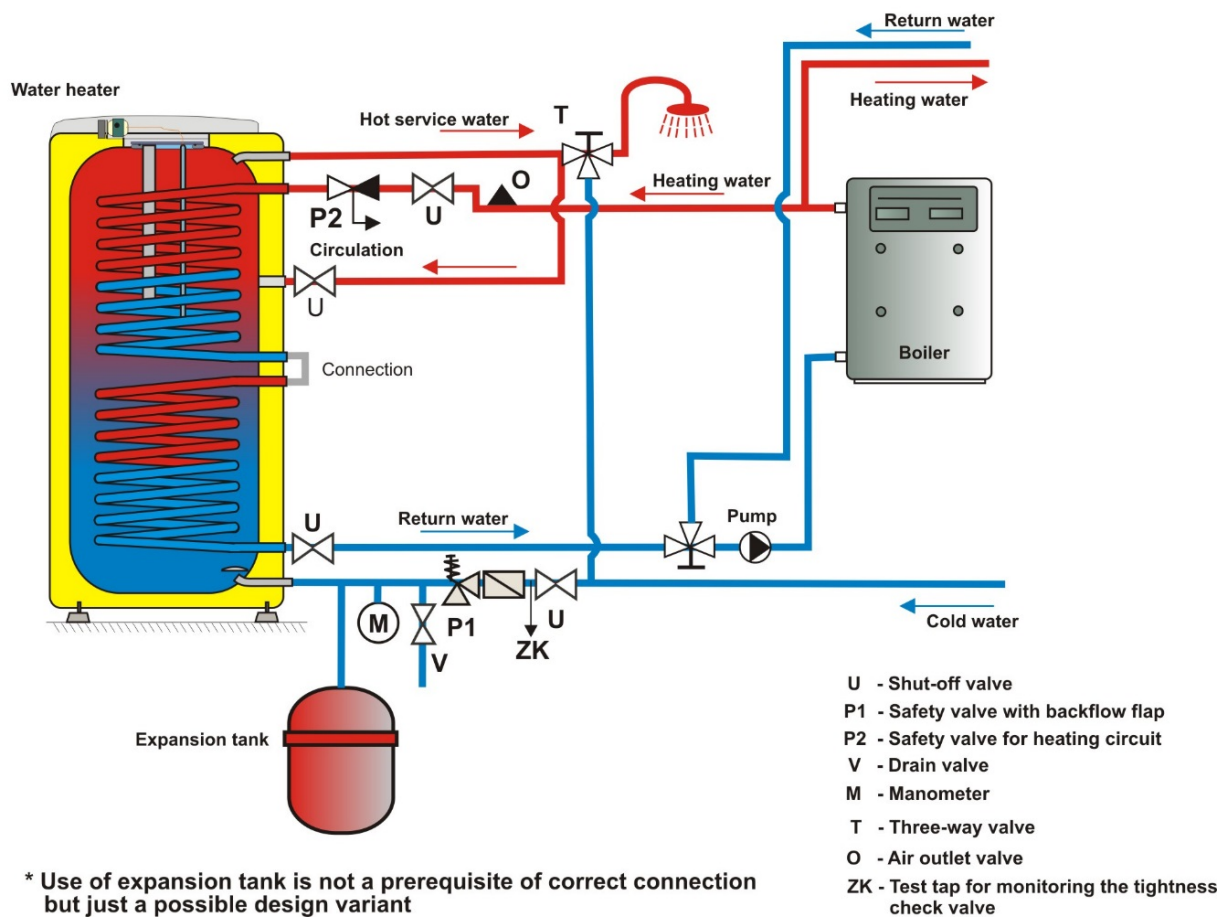


Figure 20

Heater with volume exceeding 200 liters at the outlet hot water piping provide combined temperature and pressure safety fittings according to ČSN EN 1490, or the temperature safety fittings fitted with water temperature sensor placed in the heater or other safety valves DN 20, and the opening overpressure compliant with the maximum operating overpressure of the heater vessel. The safety valve does not replace the safety valve on the cold water inlet. No closing, return armature, and filter may be mounted between the heater and the safety valve.

2.6 FIRST COMMISSIONING

Once the tank is connected to water supply system and power supply, and the safety valve tested (accordingly with the manual attached to the valve), the tank can be put in operation.

Procedure:

- a) Check the water main and wiring; Check proper placement of thermostat sensors. The sensors must be inserted all the way in; first the thermostat and then the safety fuse;
- b) Open the hot water valve on the combination faucet;
- c) Open the cold water inlet valve to the tank.
- d) When the water starts flowing through the hot water valve, the filling of the tank is finished and the valve needs to be closed;
- e) If a flange lid leak is discovered, the flange lid bolts need to be tightened;
- f) Fasten the electric installation cover;
- g) When heating service water heating by electric energy, turn on the electricity (for combined tanks, the heating water inlet to the heating insert must be closed);
- h) When heating the water with thermal energy from a hot water heating system, turn off the electricity and open the valves at the inlet and outlet of heating water or bleed the exchanger.
- i) Once the operation restarts, keep flushing the tank until the cloud disappears.
- j) Make sure to fill in properly the warranty certificate.

2.7 TANK CLEANING AND ANODE ROD EXCHANGE

Repetitive water heating causes limestone sediment on both the enameled tank walls and chiefly the flange lid. Lime scale settling depends on hardness of heated water, its temperature and on the volume of hot water used.



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 a company in charge of service affairs deal with the cleaning and exchanging of the anode. When draining water from the tank, the combination faucet valve for hot water must be open, preventing the occurrence of under-pressure in the tank receptacle which would stop water from draining.



To prevent the occurrence of bacteria (e.g. Legionella pneumophila) within stack heating it is recommended, if absolutely necessary, to increase the temperature of hot service water (HSW) periodically for a transitional period of time to at least 70 °C. It is also possible to make use of another way of disinfecting HSW.

PROCEDURE OF EXCHANGING ANODE ROD IN UPPER HEATER PART

1. Turn off control voltage to the tank
2. Drain water from 1/5 tank.
PROCEDURE: Close water inlet in the tank
Open the hot water valve on the combination faucet.
Open the drain tap of the tank
3. Anode is screwed in under the plastic cover in the upper lid of the tank
4. Unscrew the anode using adequate wrench
5. Pull the anode out and follow reversed steps to install a new one
6. During the fitting, make sure the grounding cable (300 - 500l) is connected properly; this is the condition of the anode's proper functioning
7. Fill the tank with water

PROCEDURE OF EXCHANGING ANODE ROD IN SIDE FLANGE

1. Turn off control voltage to the tank
2. Drain water from the tank.
PROCEDURE: Close water inlet in the tank
Open the hot water valve on the combination faucet.
Open the drain tap of the tank
3. One anode is screwed in under the plastic cover in the upper lid of the tank, and the other one is screwed in on the side flange
4. Unscrew the anode using adequate wrench
5. Pull the anode out and follow reversed steps to install a new one
6. Fill the tank with water

The list of heaters with anode in the side flange:

OKC 200 NTR/BP
OKC 200 NTRR/BP
OKC 250 NTR/BP
OKC 250 NTRR/BP
OKC 300 NTR/BP
OKC 300 NTRR/BP
OKC 400 NTR/BP
OKC 400 NTRR/BP
OKC 500 NTR/BP
OKC 500 NTRR/BP

2.8 SPARE PARTS

- | | | |
|-------------------------------|-------------------------------------|-------------------------------------|
| - flange lid | - flange lid seal | - insulation flange lid |
| - thermostat and thermal fuse | -magnesium anode | - control button for the thermostat |
| - control lights with wires | - orientation temperature indicator | - set of M12 (or M10) bolts |

When ordering spare parts always state the name of the part, the type and type number from the tank's plate.

3 IMPORTANT NOTICES

3.1 INSTALLATION REGULATIONS



Without a proof issued by a professional company about performed electrical and plumbing fixture the warranty shall be void.

It is necessary to check the protective magnesium anode periodically and replace it if necessary.

No closing armature may be mounted between the tank and the safety valve.

If the overpressure in the eater main exceeds 0.48 MPa, a reduction valve must be mounted before the safety valve.

All outlets of hot water must be equipped with combination faucets.

Prior to the first filling the tank with water we recommend that the receptacle's flange connection nuts are tightened.

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.

The thermal fuse must not be turned off! In case of a thermostat defect, the thermal fuse interrupts electric power supply to the heating element if the water temperature in the tank exceeds 95 °C.

As an exception, the thermal fuse may also switch off due to water overheating caused by overheating the hot water heating system boiler (in case of a combined tank).

We recommend that the tank is only operated on one energy source.

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.

The heater (hot water tank) shall be used exclusively in accordance with the conditions specified on the performance plate and in the instructions for electric wiring



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

3.2 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.



Due to the transport and thermal dilating, excessive enamel may fall of the heaters with exchangers on the tank bottom. This occurrence is common and has no effects on the heater's service life and quality. The decisive enamel layer which remains in the vessel. DZD has many years of experience with this occurrence and it is not a reason for complaints.

3.3 DISPOSAL OF PACKAGING MATERIAL AND NON-FUNCTIONING PRODUCT

A service fee for providing return and recovery of packaging material has been paid for the packaging in which the product 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 tank packages to a waste disposal place determined by the municipality. When the operation terminates, disassemble and transport the discarded and unserviceable heater to a waste recycling center (collecting yard), or contact the manufacturer.



21-5-2020

4 ASSEMBLY GUIDE FOR ZIP-FASTENER INSULATION

(Only concerns heaters with the capacity of 750 and 1000 liters)

Two people are enough to implement the insulation assembly; three people are required for larger boilers; the assembly must be implemented in areas with the temperature of at least 18°C.

If the insulation includes tank bottom insulation, the latter must be mounted first. The insulation is then inserted around the boiler (heater), respecting the pre-pressed insulation openings. By slight pull in the direction of the arrows, pull both sides of the zip-fastener insulation (Figure 21) so that the insulation does not slide and the insulation holes sit on the boiler inlets and outlets. It must be secured that, before closing, both halves of the zip-fastener are not further than 20 mm (Figure 22) apart. No foam must get into the zip - fastener on closing.

After the insulation coat is properly mounted and the zip-fastener closed, insert the top lid made of foam material and cover it with either a foil cover or a plastic lid. Alternatively, outlet caps can be glued on the connecting points (as indicated in Figure 23).

The insulation must be stored in dry areas only.

We take no responsibility for damages caused by not respecting this guide.

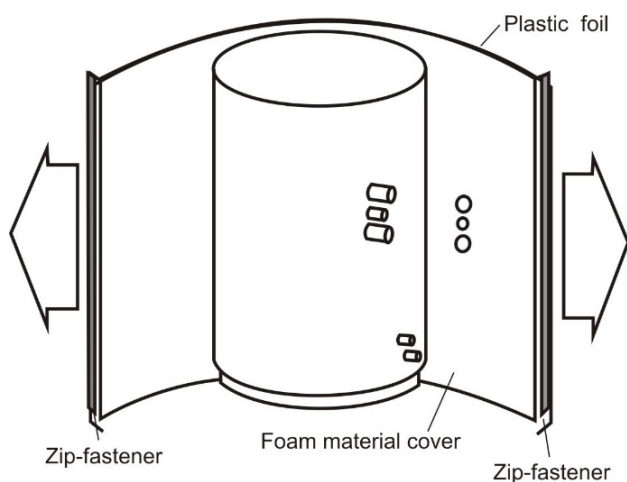


Figure 21

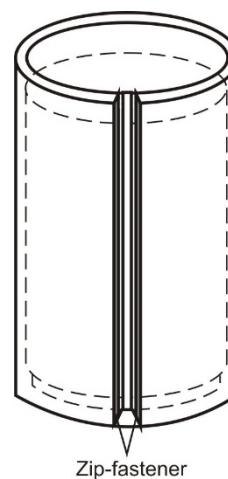


Figure 22

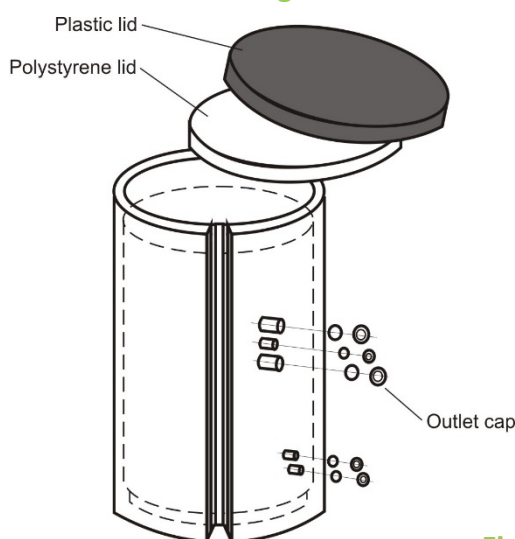


Figure 23