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RBC 200 - 3000

Installation and Operation Manual
HOT WATER STORAGE TANKS
RBC 200, RBC 300, RBC 400, RBC 500, RBC 750,
RBC 1000, RBC 1500, RBC 2000, RBC 2500 a RBC 3000

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RBC 200 - 3000

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1 - Description

RBC Hot Water Storage Tank (further "tank") with one enameled heat exchanger with a G 5/4" connection (e.g. for connecting a solar thermal system), enabling installation of an electric heating element and also another el. heating element or a finned tube heat exchanger into the flange of the lateral inspection hole.

In order to reach proper working of the tank, it is necessary to design optimum hydraulics of the whole system, i.e. position of circulation pumps for sources and heating circuits, valves, non-return valves etc.

1.1 - Models

Ten models of 214, 297, 408, 515, 767, 887, 1492, 2006, 2509 a 2841 l capacity enabling installation of an electric heating element or another heat source.

1.2 - Tank protection

Enameled inner surface and coil guarantee long service life. Enamel is done according to DIN 4753 standard. Further qualitative improvement is reached thanks to a magnesium anode installed inside the tank (even more anode rods are installed in tank of a bigger volume). From RBC 400 upwards each tank has 2 anode rods. The RBC 3000 tank has 3 anodes.

1.3 - Thermal insulation

RBC 200 to 500 tanks are supplied with a hard polyurethane insulation 55 mm thick with a white PVC surface. RBC 750 and 1000 tanks are supplied with a hard polyurethane insulation 75 mm thick with a white PU leather surface. RBC 1500, 2000, 2500 and 3000 tanks have the insulation 100 mm thick. The insulation can be detached for easier handling.

1.4 - Connection points on the tank

2× lateral with G 5/4" inner thread, of the heating heat exchanger circuit

2× lateral with G 5/4" inner thread (RBC 200, RBC 300 and RBC 400 with G 1" inner thread, RBC 1500 - 3000 with G 2" inner thread) for cold water inlet and hot water outlet

2× lateral with G 1/2" inner thread, for a temperature sensor and thermometer

1× lateral with G 1" inner thread (RBC 200, RBC 300 and RBC 400 with G 3/4" inner thread), for circulation

1× top with G 5/4" inner thread, for a magnesium anode rod

1× lateral with G 6/4" inner thread, for an el. heating element

1× flange for the lateral inspection hole

1.5 - Packaging

Tanks are delivered standing, each screwed to its pallet, packed in bubble wrap. It is forbidden to transport and/or store the storage tanks in a horizontal position.

2 - General Information

The appliance shall be installed by a qualified person according to valid rules and Manufacturer's Instructions.

This Manual is an integral and important part of the product and must be handed over to the User. Read carefully the instructions in this Manual as they contain important information concerning safety, installation, operation and maintenance. Keep this Manual for later reference.

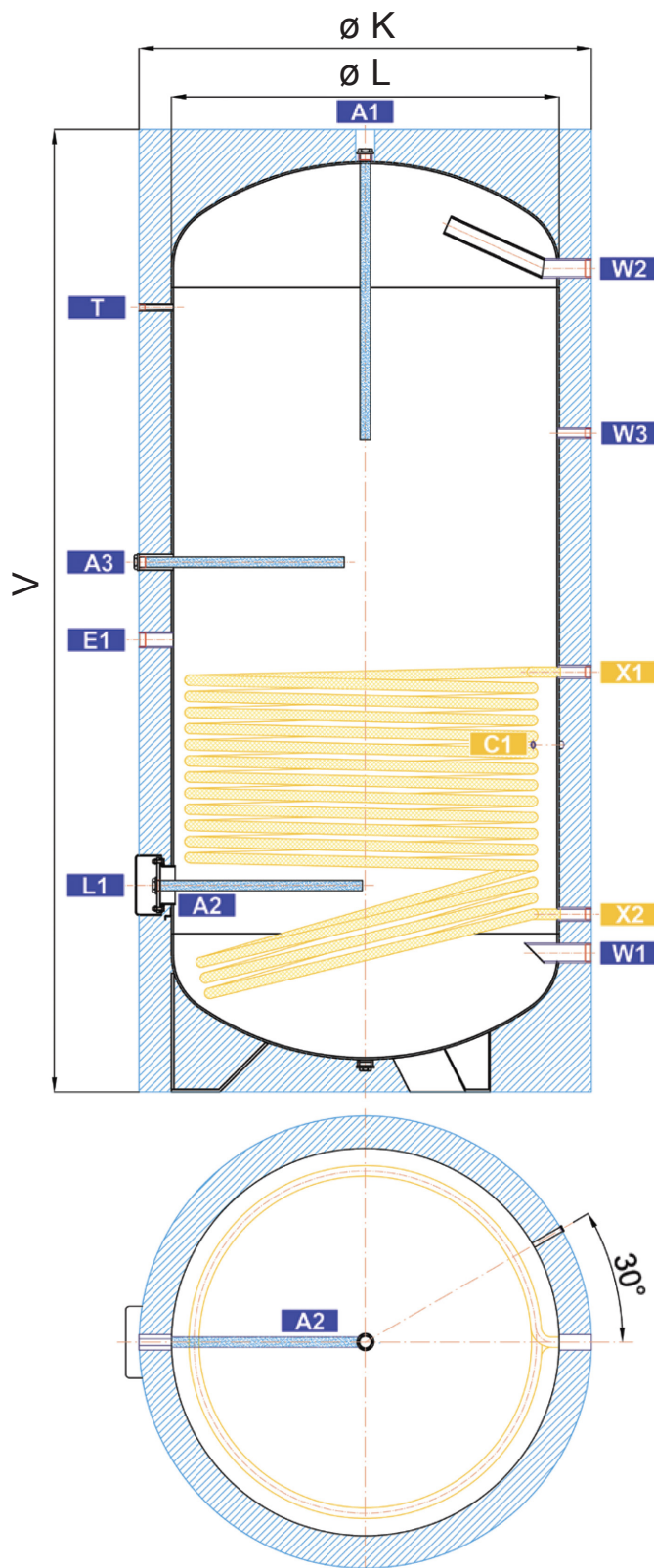
Using the tank for other purposes than stated in this Manual is forbidden and the manufacturer accepts no responsibility for damage caused by improper or wrong use.

3 - Operation

This tank is designed for operation in closed pressure circuits. Hot water is heated in the integrated hot-water heat exchanger inside the tank by several possible heat sources like various kinds of heating boilers, renewable energy sources (heat pumps, solar collectors). An electric heating element can be installed into the tank for DHW auxiliary heating.

Hot water temperature should be set to 60-65 °C. This temperature guarantees the best operation and at the same time, it prevents formation of Legionella bacteria.

4 - Technical Data and Dimensions of RBC Models



Tank code	a
Tank total volume	b
Heat exchanger volume	c
Heat exchanger surface area	d
Empty weight (transport)	e
Max. working temperature - tank	95 °C
Max. working temperature - heat exchanger	110 °C
Max. working pressure - tank	10 bar
Max. working pressure - heat exchanger	10 bar
Output for DHW heating. $\Delta t = 35\text{ °C}$ (80/60 - 10/45) - heat exchanger	f
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Model		RBC200	RBC300	RBC400	RBC500	RBC750	RBC1000	RBC1500	RBC2000	RBC2500	RBC3000
Tank code	a	3252	3253	6479	6480	4037	4038	16710	16711	12420	8477
Tank total volume [l]	b	214	297	408	515	767	887	1492	2006	2509	2841
Volume of the heat exchanger [l]	c	10	11	12	15	19	19	26	29	30	32
Surface area of the heat exchanger [m ²]	d	1.5	1.7	1.9	2.5	3.4	3.5	4.2	4.5	4.8	5.2
Empty weight [kg] (transport)	e	82	109	131	163	240	262	394	461	583	642
Output for DHW heating. Δt=35 °C (80/60 - 10/45) [kW] ([l/h])	f	24 (590)	27 (670)	30 (740)	40 (990)	54 (1340)	56 (1380)	67 (1660)	72 (1780)	77 (1900)	83 (2050)
Static loss [W]		67	81	96	102	113	121	153	180	329	354
Dimensions [mm]	V	1265	1710	1655	1785	1870	2120	2285	2550	2680	2980
	ø K	610	610	710	760	950	950	1200	1300	1400	1400
	ø L	500	500	600	650	790	790	1000	1100	1200	1200
Tipping height	mm	1410	1820	1810	1950	2100	2330	2590	2870	3030	3300
Magnesium anode rod G5/4"	Code	A1	4025	448	4025	4025	464	3698	3698	3698	3698
Magnesium anode rod G5/4"		A2	-	-	4025	4025	448	448	448	464	464
Magnesium anode rod G5/4"		A3	-	-	-	-	-	-	-	-	464
Magnesium anode rod G5/4", chain type		*	-	-	-	-	13112	13112	13112	13112	13112

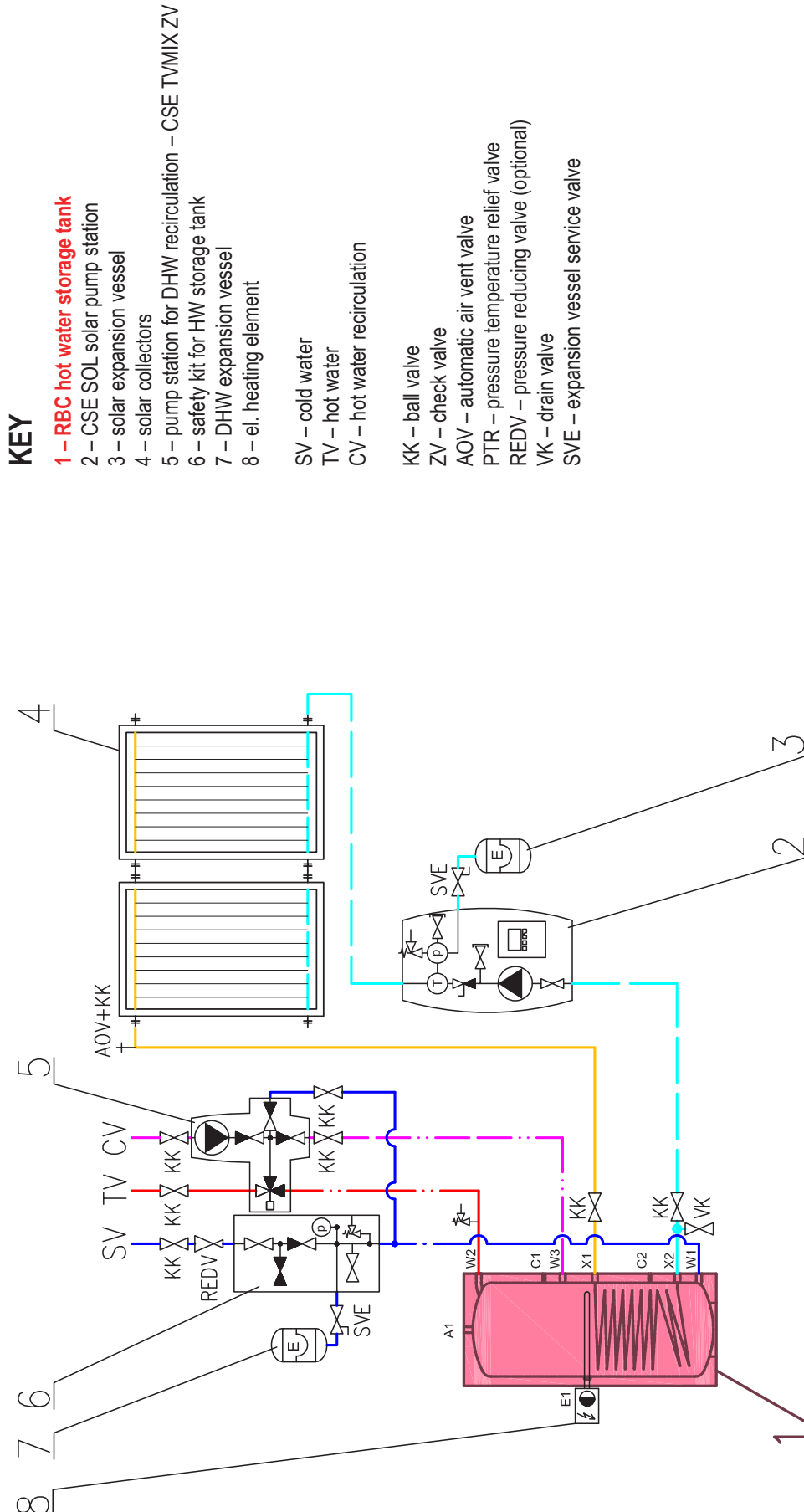
* Possible replacement of anode A1

CONNECTIONS																				
	RBC200		RBC300		RBC400		RBC500		RBC750		RBC1000		RBC1500		RBC2000		RBC2500		RBC3000	
pos.	conn.	height [mm]	conn.	height [mm]	conn.	height [mm]	conn.	height [mm]	conn.	height [mm]	conn.	height [mm]	conn.	height [mm]	conn.	height [mm]	conn.	height [mm]	conn.	height [mm]
DHW heating																				
W1	G 1" F	67	G 1" F	67	G 1" F	79	G 5/4" F	175	G 5/4" F	220	G 5/4" F	220	G 2" F	315	G 2" F	340	G 2" F	430	G 2" F	430
W2	G 1" F	1164	G 1" F	1609	G 1" F	1541	G 5/4" F	1595	G 5/4" F	1590	G 5/4" F	1840	G 2" F	1935	G 2" F	2210	G 2" F	2250	G 2" F	2550
W3	G 3/4" F	915	G 3/4" F	1140	G 3/4" F	1204	G 1" F	1315	G 1" F	1350	G 1" F	1545	G 1" F	1460	G 1" F	1650	G 1" F	1740	G 1" F	2040
El. heating elements																				
E1	G 6/4" F	797	G 6/4" F	986	G 6/4" F	980	G 6/4" F	1150	G 6/4" F	1050	G 6/4" F	1050	G 6/4" F	1255	G 6/4" F	1310	G 6/4" F	1400	G 6/4" F	1400
Control and safety																				
C1	G 1/2" F	593	G 1/2" F	653	G 1/2" F	689	G 1/2" F	825	G 1/2" F	775	G 1/2" F	870	G 1/2" F	943	G 1/2" F	985	G 1/2" F	1075	G 1/2" F	1075
T	G 1/2" F	997	G 1/2" F	1431	G 1/2" F	1385	G 1/2" F	1400	G 1/2" F	1430	G 1/2" F	1680	G 1/2" F	1825	G 1/2" F	2090	G 1/2" F	2130	G 1/2" F	2430
Solar thermal system																				
X1	G 5/4" F	758	G 5/4" F	848	G 5/4" F	874	G 5/4" F	1075	G 5/4" F	970	G 5/4" F	970	G 5/4" F	1180	G 5/4" F	1160	G 5/4" F	1250	G 5/4" F	1300
X2	G 5/4" F	263	G 5/4" F	263	G 5/4" F	314	G 5/4" F	320	G 5/4" F	385	G 5/4" F	385	G 5/4" F	470	G 5/4" F	460	G 5/4" F	550	G 5/4" F	550
Flange																				
L1	8 x M10	257	8 x M10	257	8 x M10	268	8 x M10	335	8 x M10	400	8 x M10	400	8 x M10	520	8 x M10	550	8 x M10	640	8 x M10	640
Magnesium anode rod																				
A1	G 5/4" F	1230	G 5/4" F	1675	G 5/4" F	1620	G 5/4" F	1750	G 5/4" F	1790	G 5/4" F	2040	G 5/4" F	2205	G 5/4" F	2470	G 5/4" F	2600	G 5/4" F	2900
A2	-	-	-	-	G 5/4" F	268	G 5/4" F	335	G 5/4" F	400	G 5/4" F	400	G 5/4" F	520	G 5/4" F	550	G 5/4" F	640	G 5/4" F	640
A3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G 5/4" F	1640

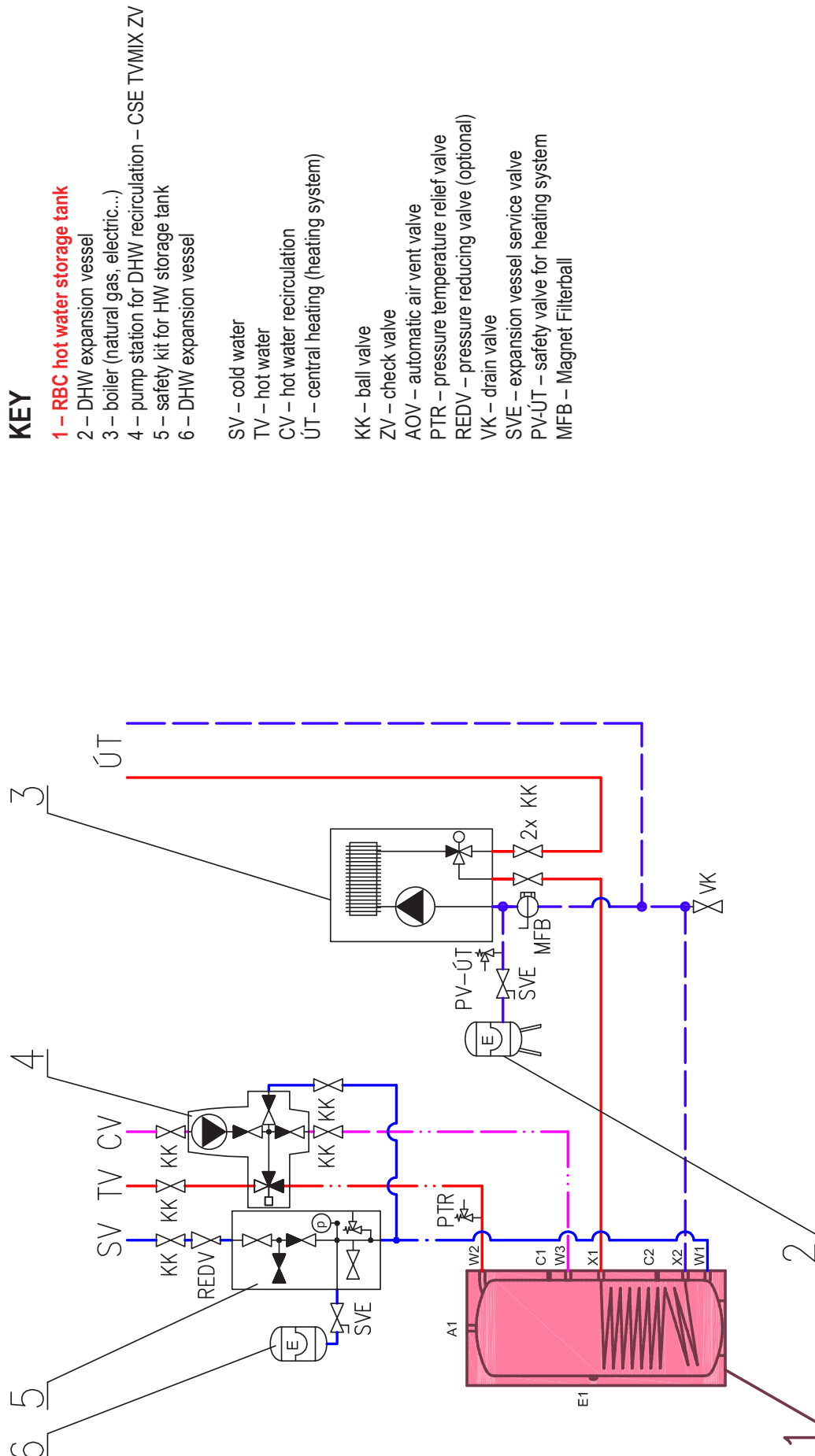
5 - Typical Installation Examples

Example I.

With solar thermal collectors



Example II.
With a boiler.



6 - Installation and Commissioning

Installation must meet valid rules and may be done only by qualified staff. The tank shall be placed on the floor, as close to the heat source as possible.

Warning: *Defects caused by improper installation, use or handling are not covered by warranty.*

6.1 - Connection to heat sources

Connect the heat source to the inlets and outlets of X1 and X2 heat exchangers using G 5/4" fittings.

6.2 - Connection to a solar thermal system

This tank can also be used with a solar thermal system. In such a case, the inlet from a solar thermal system connects to the upper G 5/4" sleeve of the heat exchanger marked X1, and the lower outlet X2 connects to the return piping to the solar thermal system. Insulate all the piping between the tank and the solar thermal system using insulation suitable for solar applications.

6.3 - Heating element installation

The G 6/4" side connection marked E1 is designed to accommodate an electric heating element. Tanks of all sizes can be retrofitted with another heating element installed in the L1 lower flange. The precondition for this is replacing magnesium anode rods with an electronic one, and replacing the factory-supplied flange with a new flange containing a G 6/4" for the installation of an el. heating rod and a G 1/2" connection for an electronic anode rod. Codes of Electronic Anode Kits w. flanges needed for installation of another heating element can be found in the table in Chap. 6.5. Heating elements of output up to 12 kW can be used (depending on the tank diameter and element length), connected either directly to the mains (thermostat-equipped elements), or via a heating system controller. The installation may be done by qualified staff only.

Warning: *Electric heating elements shall be protected by a safety thermostat.*

6.4 - Connection to water mains

DHW piping shall be done according to valid rules. Pipe fittings are used to connect the tank to a cold water inlet and hot water outlet. Install a safety group that meets the requirements of ČSN 06 0830 - e.g. code 17387 or 18678 depending on the tank volume. Installation of a pressure reducing valve to the tank inlet is recommended. If the pressure from water mains exceeds 6 bar, a pressure reducing valve is necessary. In order to prevent water loss, an expansion vessel should be installed at the cold water inlet as well (8 l volume for RBC 200, 12 l volume for RBC 300 and 400, 18 l volume for RBC 500, 24 l volume for RBC 750, 35 l volume for RBC 1000, 60 l volume for RBC 1500, 80 l volume for RBC 2000, 100 l volume for RBC 2500 and 2×60 l volume for RBC 3000). Should the water be too hard, install a water softener before the tank. In case the water contains mechanical impurities, install a filter.

A pressure temperature relief valve (PTR) shall be installed at the hot-water outlet from the tank - e.g. code 17240 with a connection kit 17526. It is also recommended to install a corresponding anti-scald valve that prevents too hot water from entering the taps.

Install a drain valve to the lowest point of the tank.

Complete DHW piping shall be properly insulated.

6.5 - Electronic anode rod installation

Instead of the magnesium anode rod, an electronic anode rod can be installed in the hot water tank, which is maintenance-free and does not need to be removed from the tank to check its function. In such a case, just visual check of the electronic anode rod is sufficient.

A space equal to the el. anode length is needed between the tank top and ceiling to install/replace the electronic anode rod, see the table below. In order to protect the tank properly and meet its warranty conditions, select the proper electronic anode rod from the table below.

Electronic Anode Kits for RBC Hot Water Storage Tanks

For tanks	El. Anode Kit code - replacement	Anode rod length	El. Anode Kit code w. lower flange*	Anode rod length
RBC 200	9173	350 (200/150)	-	-
RBC 300	9174	500 (350/150)	-	-
RBC 400, RBC 500	17368	500 (350/150) + 350 (200/150)	17432	500 (350/150) + 350 (200/150)
RBC 750, RBC 1000	17369	600 (350/250) + 450 (200/250)	17433	600 (350/250) + 450 (200/250)
RBC 1500, RBC 2000, RBC 2500	14429	800 (550/250) + 600 (350/250)	17435	800 (550/250) + 600 (350/250)
RBC 3000	17371	800 (550/250) + 750 (550/200) + 800 (550/250)	17436	800 (550/250) + 750 (550/200) + 800 (550/250)

* The Kit shall be used when an electric heating element needs to be installed in the lower flange.

6.6 - Commissioning

Ground the tank before commissioning.

Hot water quality must meet the conditions shown in the Table of limit values for total dissolved solids in hot water.

Table of limit values for total dissolved solids in hot water

Description	pH	Total dissolved solids (TDS)	Ca	Chlorides	Mg	Na	Fe
Max. value	6.5 - 9.5	600 mg/l	40 mg/l	100 mg/l	20 mg/l	200 mg/l	0.2 mg/l

Fill the heating circuits with the appropriate fluids and air-bleed the entire system. Check all connections for leaks and verify the system pressure. Set the heating controller in compliance with the documentation and manufacturer's recommendations. Check regularly a proper function of all control and adjusting elements.

7 - Tank Insulation

Product description

Thermal insulation is a component of tanks that prevents heat losses. Thermal insulation of polyurethane foam with zipped PVC layer is used.

Warning

Insulation dismantling and installation shall be done in two or three persons, depending on its size. The foam insulation with zipper **must not be dismantled/installed at temperatures below 20 °C**. If this cannot be avoided, the insulation shall be pre-warmed in another room to at least 20 °C. It is impossible to install insulation of lower temperature, there is a risk of damage, esp. to the zipper.

Do not use any tools for installation.

Keep away from open fire.

Warranty on insulation

☐ Warranty shall become null and void if:

- the product was used for other purposes than intended.

☐ Warranty does not cover:

- usual wear and tear,
- damage caused by fire, water, electricity or a natural disaster,
- defects caused by failure to use the product in compliance with its intended purpose, by improper use and insufficient maintenance,
- defects caused by mechanical damage to the product,
- defects caused by tampering or incompetent repair.

8 - Maintenance, Replacement of Magnesium Anode Rod

If the tank is fitted with a heating element, disconnect it from the mains first. Clean the exterior of the tank with a soft cloth and a mild detergent. Never use abrasive cleaners or solvents

Check all connections for leaks. The tanks come equipped with an anti-corrosion sacrifice magnesium anode rod as standard; it protects its inner parts against corrosion. The anode rod shall be checked within 12 months after commissioning and subsequently always not later than 12 months after the last check. In locations where water contains more ferrites or calcites, it is recommended to check the anode every 6 months. If more than 1/3 of its total volume is consumed, the anode shall be replaced with a new one. Disregarded of its state, the anode rod shall be replaced with a new one within 24 months from commissioning. In case an electronic anode is used, the above described procedures are not necessary. Then only a visual check of the indication lamp is necessary every 3 months. Indication of the proper working of the electronic anode rod is described in its Installation and Operation Manual.

If damage to a tank occurs due to neglected substitution of a magnesium anode rod or a non-working electronic anode, the warranty cannot be claimed.

9 - Disposal

Packing shall be disposed of in compliance with the valid rules. When the product reaches the end of its life, it shall not be disposed of as household waste. It shall be dropped off at a Local Waste Recycling Center. Insulation shall be recycled as plastic and the steel vessel as scrap iron.

10 - Warranty

This product is covered by warranty according to the conditions described in this Manual and according to the Warranty Certificate. A Warranty Certificate is an integral part of the supply. Tank transport or storing in a horizontal position is considered a warranty violation!

