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R2BC 200 - 3000

Installation and Operation Manual EN

**EN**

**HOT WATER STORAGE TANKS**

**R2BC 200, R2BC 300, R2BC 400, R2BC 500, R2BC 750,  
R2BC 1000, R2BC 1500, R2BC 2000, R2BC 2500 and R2BC 3000**

**R2BC 200 - 3000**

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# 1 - Description

R2BC Hot Water Storage Tank (further "tank") with two enameled heat exchangers with G 5/4" connections (e.g. for connecting a solar thermal system and a heat pump), 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 213, 299, 420, 514, 762, 883, 1493, 2007, 2510 a 2841 l capacity enabling installation of an electric heating element or another heat source.

## 1.2 - Tank protection

Enameled inner surface guarantees 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. From R2BC 400 upwards each tank has 2 anode rods. The R2BC 3000 tank has 3 anode rods.

## 1.3 - Thermal insulation

R2BC 200 to 500 tanks are supplied with a hard polyurethane insulation 50 mm thick with a white PVC surface. R2BC 750 and 1000 tanks are supplied with a hard polyurethane insulation 75 mm thick with a white PU leather surface. R2BC 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

4x lateral with G 5/4" inner thread, of the heating heat exchangers circuits

2x lateral with G 5/4" inner thread, for cold water inlet and hot water outlet ( from R2BC 1500 - 2 G")

3x lateral with G 1/2" inner thread, for temperature sensors and a thermometer

1x lateral with G 1" inner thread, for recirculation

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

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

1x 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.

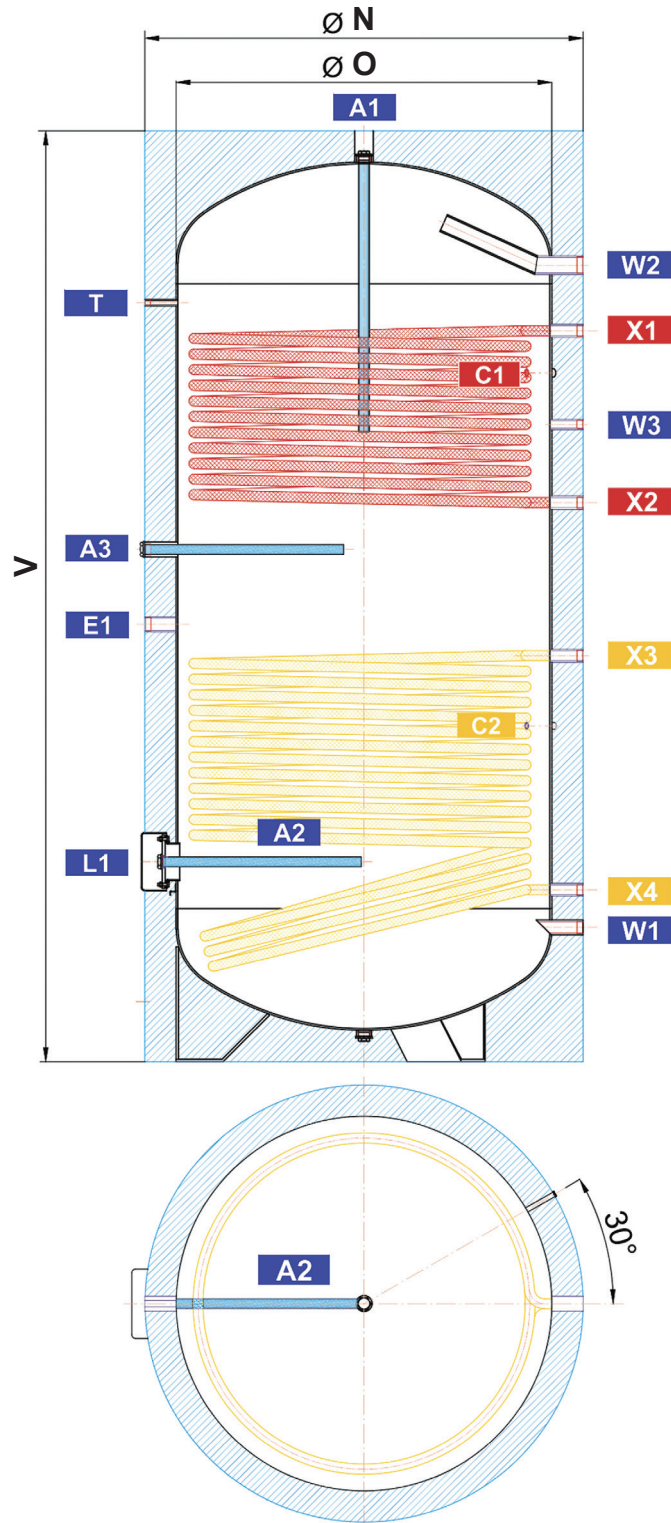
Using the tank for other purposes than stated above is forbidden and the manufacturer accepts no responsibility for damage caused by improper or wrong use.

# 3 - Operation

This tank is designed for operation in pressure circuits. Hot water is heated in the integrated hot-water heat exchangers (heating coils) inside the tank from several possible heat sources like various kinds of heating boilers, renewable energy sources (heat pumps, solar collectors).

Hot water temperature should be kept between 60 and 65°C. This temperature guarantees the optimal operation of hot water storage tanks and at the same time, it prevents formation of Legionella bacteria.

# 4 - Technical Data and Dimensions of R2BC Models



Tank code .....	a
Tank total volume .....	b
Volume of the upper heat exchanger .....	c
Volume of the lower heat exchanger .....	d
Surface area of the upper heat exchanger .....	e
Surface area of the lower heat exchanger .....	f
Empty weight (transport) .....	g
Max. working temperature - tank .....	95 °C
Max. working temperature - heat exchangers .....	110 °C
Max. working pressure - tank .....	10 bar
Max. working pressure - heat exchangers .....	10 bar
DHW heating $\Delta t = 35$ °C (80/60 - 10/45) - upper HX .....	h
DHW heating $\Delta t = 35$ °C (80/60 - 10/45) - lower HX .....	i

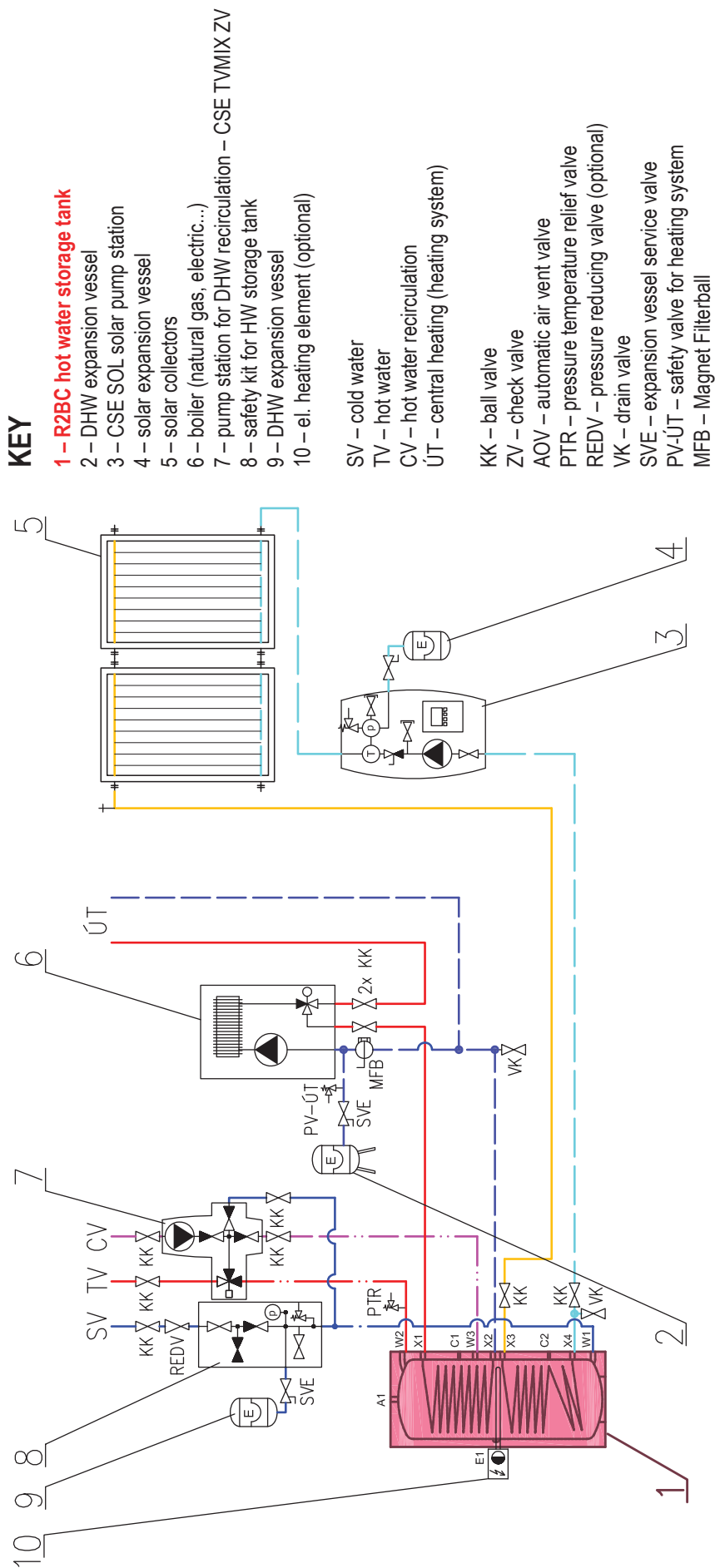
Model		R2BC 200	R2BC 300	R2BC 400	R2BC 500	R2BC 750	R2BC 1000	R2BC 1500	R2BC 2000	R2BC 2500	R2BC 3000
Tank code	a	6481	6482	6483	6484	6485	5758	16712	16713	12432	8474
Tank volume [l]	b	212	299	420	514	762	883	1493	2007	2510	2841
Volume of the upper heat exchanger [l]	c	6	7	7	7	14	15	15	19	22	23
Volume of the lower heat exchanger [l]	d	6	10	12	12	14	15	27	29	30	32
Surface of the upper heat exchanger [m <sup>2</sup> ]	e	0,8	0,9	0,9	0,9	2,4	2,5	2,5	3	3,5	3,8
Surface of the lower heat exchanger [m <sup>2</sup> ]	f	0,8	1,5	1,9	1,9	2,4	2,5	4,2	4,5	4,8	5,2
Empty weight (transport) [kg]	g	96	124	150	168	270	285	431	505	635	698
DHW heating $\Delta t=35^\circ\text{C}$ (10/45)** - upper HE [l/h] ([kW])	h	320 (13)	350 (14)	350 (14)	350 (14)	940 (38)	990 (40)	990 (40)	1190 (48)	1380 (56)	1510 (61)
DHW heating $\Delta t=35^\circ\text{C}$ (10/45)** - lower HE [l/h] ([kW])	i	320 (13)	590 (24)	740 (30)	740 (30)	940 (38)	990 (40)	1660 (67)	1780 (72)	1900 (77)	2050 (83)
Static loss	W	67	82	96	102	113	121	132	182	329	354
Dimensions [mm]	V	1265	1710	1690	1780	1870	2120	2285	2550	2680	2980
	$\varnothing$ N	610	610	710	760	950	950	1200	1300	1400	1400
	$\varnothing$ O	500	500	600	650	790	790	1000	1100	1200	1200
Tipping height [mm]		1410	1820	1840	1940	2100	2330	2590	2870	3030	3300
Magnesium anode rod G5/4"	A1	448	464	4025	448	3698	3698	3698	3698	3698	3698
Magnesium anode rod G5/4"	A2	-	-	4025	4025	448	448	448	464	464	464
Magnesium anode rod G5/4"	A3	-	-	-	-	-	-	-	-	-	464
Magnesium anode rod, chain type G5/4"	*	-	-	-	-	13112	13112	13112	13112	13112	13112

\*Possible replacement anode A1    \*\* heating water inlet temperature 60 °C

CONNECTIONS																					
		R2BC200		R2BC300		R2BC400		R2BC500		R2BC750		R2BC1000		R2BC1500		R2BC2000		R2BC2500		R2BC3000	
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]	
<b>DHW heating</b>																					
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	1608	G 1" F	1581	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	884	G 3/4" F	1141	G 3/4" F	1163	G 1" F	1235	G 1" F	1235	G 1" F	1235	G 1" F	1460	G 1" F	1650	G 1" F	1740	G 1" F	2040	
<b>El. heating elements</b>																					
E1	G 6/4" F	629	G 6/4" F	914	G 6/4" F	891	G 6/4" F	949	G 6/4" F	890	G 6/4" F	890	G 6/4" F	1255	G 6/4" F	1310	G 6/4" F	1400	G 6/4" F	1400	
<b>Control and safety</b>																					
C1	G 1/2" F	884	G 1/2" F	1141	G 1/2" F	1163	G 1/2" F	1235	G 1/2" F	1235	G 1/2" F	1235	G 1/2" F	1460	G 1/2" F	1650	G 1/2" F	1740	G 1/2" F	2040	
C2	G 1/2" F	474	G 1/2" F	654	G 1/2" F	660	G 1/2" F	685	G 1/2" F	685	G 1/2" F	685	G 1/2" F	945	G 1/2" F	985	G 1/2" F	1075	G 1/2" F	1075	
T	G 1/2" F	929	G 1/2" F	1384	G 1/2" F	1411	G 1/2" F	1480	G 1/2" F	1460	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	
<b>Control and safety</b>																					
X1	G 5/4" F	994	G 5/4" F	1294	G 5/4" F	1361	G 5/4" F	1335	G 5/4" F	1440	G 5/4" F	1440	G 5/4" F	1735	G 5/4" F	2000	G 5/4" F	2040	G 5/4" F	2430	
X2	G 5/4" F	679	G 5/4" F	979	G 5/4" F	1011	G 5/4" F	985	G 5/4" F	990	G 5/4" F	990	G 5/4" F	1330	G 5/4" F	1450	G 5/4" F	1540	G 5/4" F	1790	
X3	G 5/4" F	579	G 5/4" F	849	G 5/4" F	846	G 5/4" F	865	G 5/4" F	835	G 5/4" F	835	G 5/4" F	1180	G 5/4" F	1160	G 5/4" F	2050	G 5/4" F	1300	
X4	G 5/4" F	264	G 5/4" F	264	G 5/4" F	286	G 5/4" F	305	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	
<b>Flange</b>																					
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	
<b>Magnesium anode rod</b>																					
A1	G 5/4" F	1245	G 5/4" F	1690	G 5/4" F	1665	G 5/4" F	1760	G 5/4" F	1830	G 5/4" F	2095	G 5/4" F	2285	G 5/4" F	2550	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 Example

With a boiler and solar thermal system



# 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.

**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 inlet and outlet of the heat exchanger 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 heating heat exchanger marked X1, and the lower outlet X4 connects to the return piping to the solar thermal system. Insulate all the piping between the tank and the solar thermal system.

## 6.3 - Heating element installation

The G 6/4" side connection marked E1 is designed to accommodate an electric heating element. 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 at the cold water inlet 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 R2BC 200, 12 l volume for R2BC 300 and 400, 18 l volume for R2BC 500, 24 l volume for R2BC 750, 35 l volume for R2BC 1000, 60 l volume for R2BC 1500, 80 l volume for R2BC 2000, 100 l volume for R2BC 2500 and 2×60 l volume for R2BC 3000).

Should the water be too hard, install a water softener before the tank. In case the water contains mechanical impurities, install a filter.

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

An electronic anode rod can be installed instead of the magnesium one. Its principle advantage is that it is not necessary to dismantle it from the tank to determine 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 R2BC Hot Water Storage Tanks

For tanks	El. Anode Kit code - replacement	Anode rod length	El. Anode Kit code w. lower flange*	Anode rod length
R2BC 200, R2BC 300	9174	500 (350/150)	-	-
R2BC 400, R2BC 500	17368	500 (350/150) + 350 (200/150)	17432	500 (350/150) + 350 (200/150)
R2BC 750, R2BC 1000	17369	600 (350/250) + 450 (200/250)	17433	600 (350/250) + 450 (200/250)
R2BC 1500, R2BC 2000 R2BC 2500	14429	800 (550/250) + 600 (350/250)	17435	800 (550/250) + 600 (350/250)
R2BC 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 the tank 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.

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

## **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 are equipped with an anti-corrosion sacrifice magnesium anode rod.

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.

Proper working of the Electronic Anode is described in its User's Manual.

If damage to a tank occurs due to neglected substitution of a magnesium anode rod or a non-working electronic anode, 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!



