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R0BC 200 - 5000

Installation and Operation Manual

HOT WATER STORAGE TANKS

R0BC 200, R0BC 300, R0BC 400, R0BC 500, R0BC 750, R0BC 1000, R0BC 1500, R0BC 2000, R0BC 2500 a R0BC 3000, R0BC 4000 a R0BC 5000

EN

R0BC 200 - 5000

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1 - Description

R0BC Hot Water Storage Tank (further “tank“) without heat exchangers, permitting to connect further 2 circuits through external heat exchangers. The tank also enables 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

Twelve models of 212, 297, 420, 513, 763, 885, 1494, 2013, 2508, 2841, 3940 and 4927 capacity enabling installation of an electric heating rod 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.

1.3 - Thermal insulation

Tanks of 200 l volume come with a 50 mm thick insulation, tanks of volume from 300 to 500 l are supplied with a hard polyurethane insulation 55 mm thick with a white PVC surface. Tanks of 750 and 1000 l are supplied with a hard polyurethane insulation 75 mm thick with a white PU leather surface. Tanks of volume of 1500 l and more have the insulation 100 mm thick. The insulation can be detached for easier handling.

1.4 - Connection points on the tank

4× lateral with G 5/4“ inner thread, for 2 circuits with external heat exchangers
2× lateral with G 5/4“ inner thread, for cold water inlet and hot water outlet (from 100 l upwards G 2”)
3× lateral with G 1/2“ inner thread, for temperature sensor and a thermometer
1× lateral with G 1“ inner thread, for recirculation (in tanks of 200, 300, 400 l volume G 3/4“)
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.

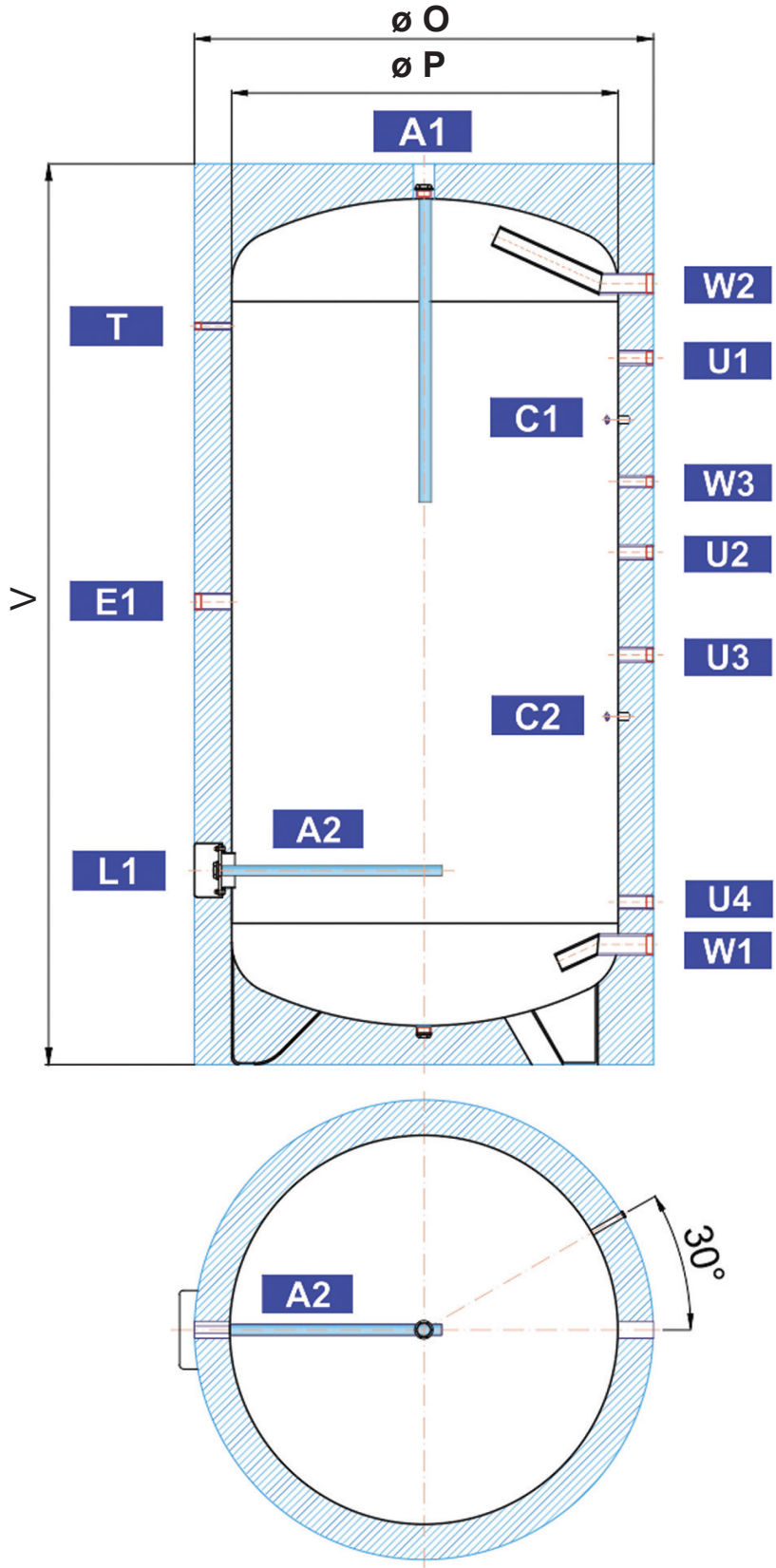
Using the tank for other purposes than stated in this Manual is forbidden and the manufacturer accepts no responsibility for damage caused by improper or wrong use.

3 - Operation

This tank is designed for operation in pressure circuits. Hot water is heated inside the tank via external hot--water heat exchangers from 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 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



The lower flange contains an anode rod in tanks: R0BC 1500 - R0BC 3000

Total tank volume:	a [l]
Max. working temperature - tank:	95 °C
Max. working pressure - tank:	10 bar
Empty weight:	b [kg]

	R0BC 200	R0BC 300	R0BC 400	R0BC 500	R0BC 750	R0BC 1000	R0BC 1500	R0BC 2000	R0BC 2500	R0BC 3000	R0BC 4000	R0BC 5000
code	10586	10571	10587	8795	10364	10365	16715	16716	10501	8901	21422	21423
a [l]	212	297	420	513	763	885	1494	2013	2508	2841	3940	4927
b [kg]	52	59	80	120	192	213	342	404	523	576	845	985
V [mm]	1265	1710	1690	1780	1870	2120	2285	2550	2680	2980	2415	2915
øO [mm]	600	610	710	760	950	950	1200	1300	1400	1400	1800	1800
øP [mm]	500	500	600	650	790	790	1000	1100	1200	1200	1600	1600
Static loss [W]	74	88	105	116	121	125	146	172	330	354	387	432
anode code	4025 13112*	4025 13112*	448 13112*	448 13112*	464 13112*	3698 13112*	464 13112* 448**	3698 13112* 464**	3698 13112* 464**	3698 13112* 464**	3x464	2x21614 3698
tipping height [mm]]	1405	1820	1830	1940	2100	2330	2590	2870	3030	3300	3020	3430

* magnesium anode rod, chain type
** magnesium anode rod for the lower flange

CONNECTIONS

	R0BC200		R0BC300		R0BC400		R0BC500		R0BC750		R0BC1000		R0BC1500		R0BC2000		R0BC2500		R0BC3000		R0BC4000		R0BC5000	
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]	conn.	height [mm]	conn.	height [mm]
DHW heating																								
W1	G 6/4“ F	110	G 6/4“ F	110	G 6/4“ F	120	G 6/4“ F	175	G 6/4“ F	220	G 2“ F	220	G 2“ F	315	G 2“ F	340	G 2“ F	430	G 2“ F	430	G 3“ F	330	G 3“ F	330
W2	G 6/4“ F	1120	G 6/4“ F	1565	G 6/4“ F	1540	G 6/4“ F	1595	G 6/4“ F	1590	G 2“ F	1840	G 2“ F	1935	G 2“ F	2210	G 2“ F	2250	G 2“ F	2550	G 3“ F	2415	G 3“ F	2915
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	G 2“ F	1400	G 2“ F	1760
El. heating elements																								
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	G 2“ F	1160	G 2“ F	1370
Regulace a zabezpečení																								
C1	G 1/2“ F	914	G 1/2“ F	1214	G 1/2“ F	1245	G 1/2“ F	1285	G 1/2“ F	1340	G 1/2“ F	1340	G 1/2“ F	1600	G 1/2“ F	1825	G 1/2“ F	1905	G 1/2“ F	2205	G 1/2“ F	1800	G 1/2“ F	2300
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	G 1/2“ F	1280	G 1/2“ F	1570
C3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G 1/2“ F	760	G 1/2“ F	820
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	G 1/2“ F	1890	G 1/2“ F	2390
Solar thermal system																								
U1	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	G 2“ F	1860	G 2“ F	2360
U2	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	G 1“ F	1700	G 1“ F	2080
U3	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	1250	G 5/4“ F	1300	G 2“ F	1110	G 2“ F	1270
U4	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	G 2“ F	545	G 2“ F	545
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	12 x M12	680	12 x M12	680
Magnesium anode rod																								
A1	G 5/4“ F	1229	G 5/4“ F	1675	G 5/4“ F	1660	G 5/4“ F	1750	G 5/4“ F	1770	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	G 5/4“ F	1860	G 5/4“ F	2360
A2	-	-	-	-	-	-	-	-	-	-	-	-	G 5/4“ F	520	G 5/4“ F	550	G 5/4“ F	640	G 5/4“ F	640	G 5/4“ F	1250	G 5/4“ F	1610
A3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G 5/4“ F	533	G 5/4“ F	533

5 - Typical Installation Examples

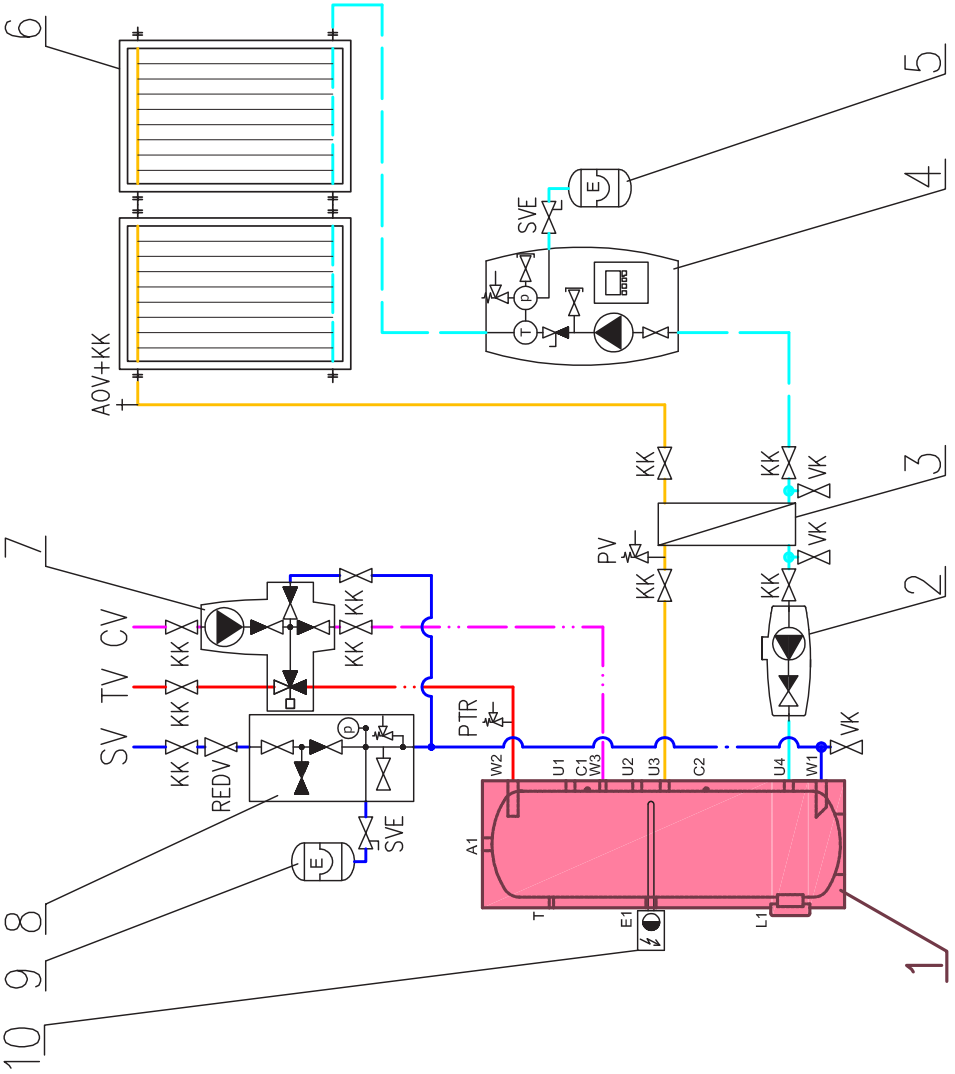
DHW heating by solar collectors, auxiliary heating by an el. heating element

KEY

1 – R0BC hot water storage tank
2 – pump station for DHW heating – CSE OTS ZV
3 – DV stainless-steel plate heat exchanger
4 – CSE SOL solar pump station
5 – solar expansion vessel
6 – solar collectors
7 – pump station for DHW recirculation – CSE TVMIX ZV
8 – safety kit for HW storage tank
9 – DHW expansion vessel
10 – el. heating element

SV – cold water
TV – hot water
CV – hot water recirculation

KK – ball valve
ZV – check valve
AOV – automatic air vent valve
PTR – pressure temperature relief valve
PV – safety valve
REDV – pressure reducing valve (optional)
VK – drain valve
SVE – expansion vessel service valve



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 inlet and outlet of the external heat exchanger*. The heat source for the tank - external heat exchanger - connects to two pipe sleeves marked U1, U2 or U3, U4 using G 5/4“ fittings.

** external heat exchangers are not included in the scope of supply of R0BC tanks.*

6.2 - Connection to a solar 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 two lower G 5/4“ pipe sleeves marked U3 and U4 via the external heat exchanger. The lower sleeve U4 connects to the return piping from the external solar heat exchanger, the upper sleeve U3 connects to the incoming heated fluid from the external heat exchanger (see Chap. 5). Insulate all the piping between the tank and the solar thermal system.

6.3 - Heating rod installation

The G 6/4“ side connection marked E1 is designed to accommodate an electric heating element. A 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 6 bar safety valve at the cold water inlet. 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 R0BC 200, 12 l volume for R0BC 300, 18 l volume for R0BC 400, 24 l volume for R0BC 500, 35 l volume for R0BC 750, 50 l volume for R0BC 1000, 80 l volume for R0BC 2000, 100 l volume for R0BC 2500, 2×60 l volume for R0BC 3000, 2×80 l volume for R0BC 4000 and 2×100 l volume for R0BC 5000). 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 R0BC Hot Water Storage Tanks

For tanks	El. Anode Kit code - replacement	Anode rod length	El. Anode Kit code w. lower flange*	Anode rod length
R0BC 200, R0BC 300	9174	21635	21637	500
R0BC 400, R0BC 500	9174	17432	-	500 + 350
R0BC 750, R0BC 1000	17372	17428	-	600 + 450
R0BC 1500, R0BC 2000 R0BC 2500, R0BC 3000	14429	17435	-	800 + 600
R0BC 4000, R0BC 5000	21613	-	-	800 + 800 + 800

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	Na
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 rod, 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!

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