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R2BC 200 - 3000

Installation and Operation Manual  
**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

**EN**

**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 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. From R2BC 400 upwards each tank has 2 anode rods. The R2BC 3000 tank has 3 anodes.

## 1.3 - Thermal insulation

R2BC 200 to 500 tanks are supplied with a hard polyurethane insulation 50 mm thick with a white PVC surface. Tanks of 750 and 1000 l volume 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

4× lateral with G 5/4" inner thread, to the heating coils

2× lateral with G 5/4" inner thread, for cold water inlet and hot water outlet (R2BC 1500-3000 2× G 2")

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

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

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

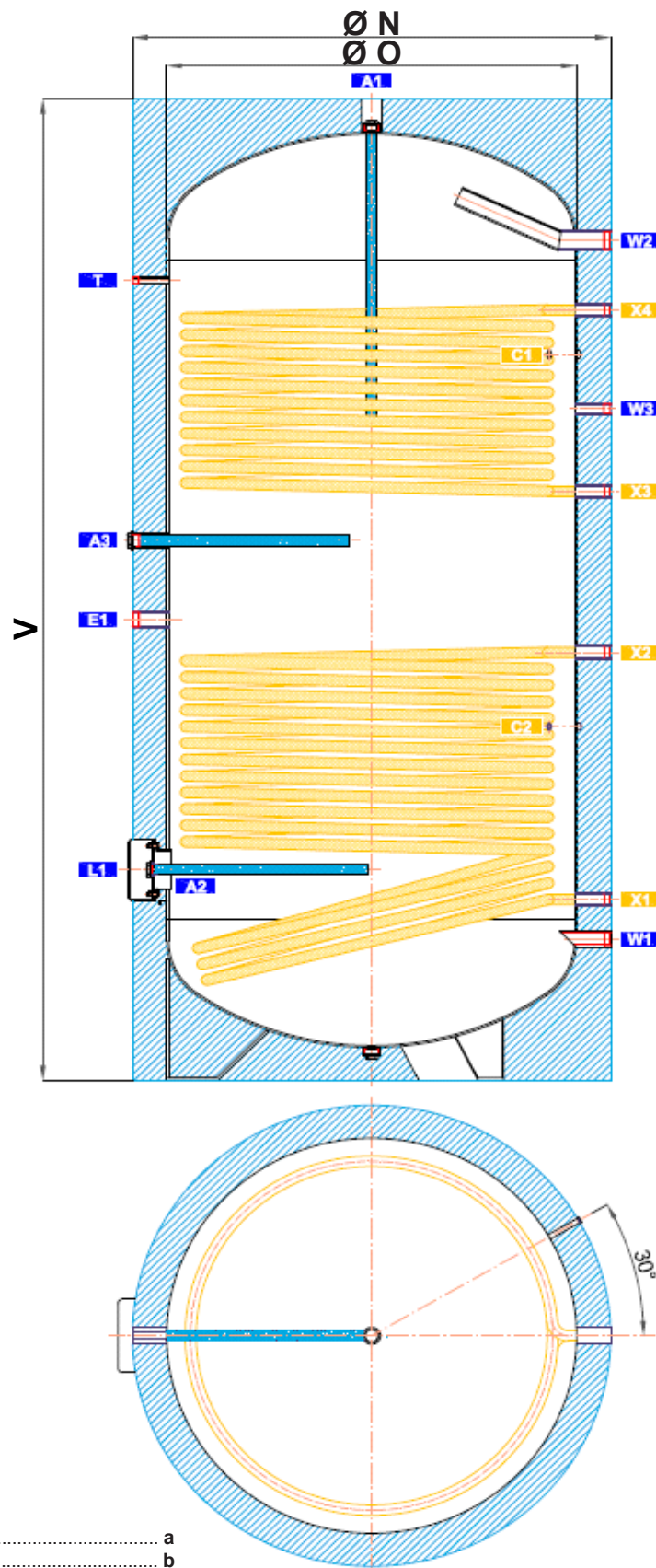
Tanks are delivered standing, each screwed to its pallet, packed in bubble wrap. It is forbidden to transport and/or store the storage tanks in a horizontal position.

# 2 - General Information

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 - 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 of the upper heat exchanger .....	e
Surface of the lower heat exchanger .....	f
Empty weight (transport) .....	g
Max. working temperature - tank .....	95 °C
Max. working temperature - heating coils .....	110 °C
Max. working pressure - tank .....	10 bar
Max. working pressure - heating coils .....	10 bar
DHW heating $\Delta t = 35$ °C (80/60 - 10/45) - upper coil .....	h
DHW heating $\Delta t = 35$ °C (80/60 - 10/45) - lower coil .....	i

Values in brackets are valid for tanks R2BC200 - R2BC400

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	213	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 [kg]	g	96	124	150	168	270	285	302	465	543	600	
DHW heating $\Delta t=35\text{ }^{\circ}\text{C}$ (80/60 - 10/45) - upper HE [l/h] ([kW])	h	680 (27.7)	760 (31.1)	760 (31.1)	760 (31.1)	2000 (81.3)	2090 (84.7)	1850 (75)	2170 (88)	2612 (106)	2744 (112)	
DHW heating $\Delta t=35\text{ }^{\circ}\text{C}$ (80/60 - 10/45) - lower HE [l/h] ([kW])	i	680 (27.7)	1280 (51.9)	1620 (65.8)	1620 (65.8)	2000 (81.3)	2090 (84.7)	3138 (128)	3362 (137)	3552 (145)	3885 (158)	
Dimensions [mm]	V	1265	1710	1690	1780	1870	2120	2285	2550	2680	2980	
	ø N	610	610	710	760	950	950	1200	1300	1400	1400	
	ø 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"	Code	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

TAPPINGS																				
	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>																				
<b>W1</b>	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
<b>W2</b>	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
<b>W3</b>	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>																				
<b>E1</b>	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>																				
<b>C1</b>	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
<b>C2</b>	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
<b>T</b>	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>Solar thermal system</b>																				
<b>X1</b>	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>X2</b>	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
<b>X3</b>	G 5/4" F	679	G 5/4" F	979	G 5/4" F	1111	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
<b>X4</b>	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
<b>Flange</b>																				
<b>L1</b>	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>																				
<b>A1</b>	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
<b>A2</b>	-	-	-	-	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
<b>A3</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	G 5/4" F	1640

## 4 - Operation

This tank is designed for operation in closed 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 set to 60-65 °C. This temperature guarantees the best operation and at the same time, it prevents formation of Legionella bacteria.

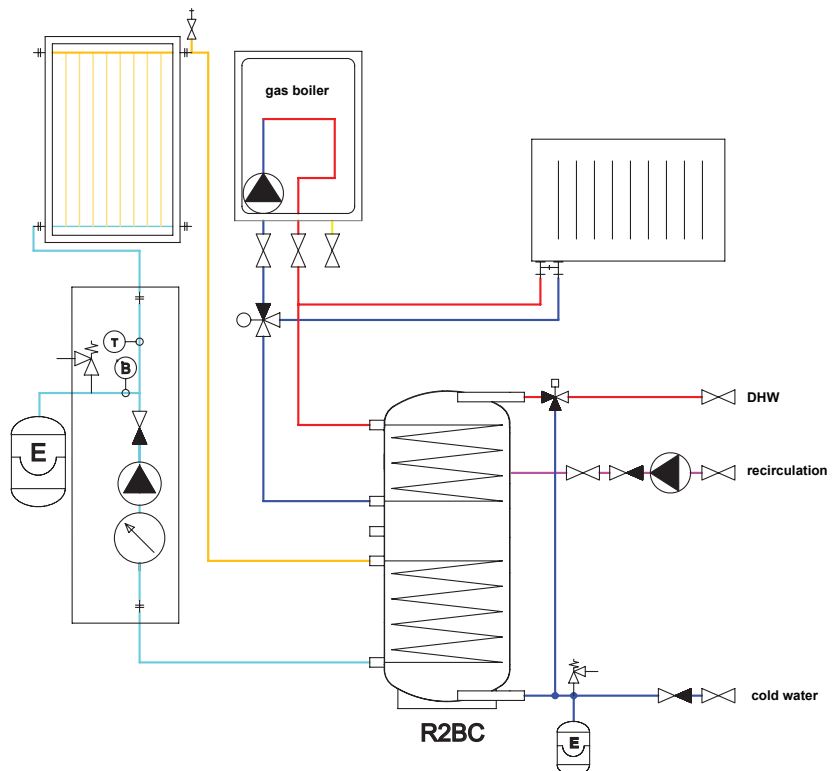
# 5 - Examples of Assigning Connection Points

Connection point	Example I. with a gas boiler	Example II. with a boiler and thermal store	Example III. with a heat pump
A1	magnesium anode	magnesium anode	magnesium anode
T	thermometer	thermometer	thermometer
E1	plug	electric heating element	electric heating element
W1	cold water inlet	cold water inlet	cold water inlet
X1	outlet to a solar thermal system	outlet to a solar thermal system	return line to a heat pump
C2	temperature sensor, thermostat	temperature sensor, thermostat	temperature sensor, thermostat
X2	inlet from a solar thermal system	inlet from a solar thermal system	inlet from a heat pump
X3	return line to a gas boiler	return line to a thermal store	return line to a fireplace
C1	temperature sensor, thermostat	temperature sensor, thermostat	temperature sensor, thermostat
W3	recirculation	recirculation	recirculation
X4	inlet from a gas boiler	inlet from a thermal store	inlet from a fireplace
W2	hot water outlet	hot water outlet	hot water outlet
L1 - flange	plugged	plugged	solar heat exchanger

Connections depend on the circuit to be connected, the a.m. examples are informative only.

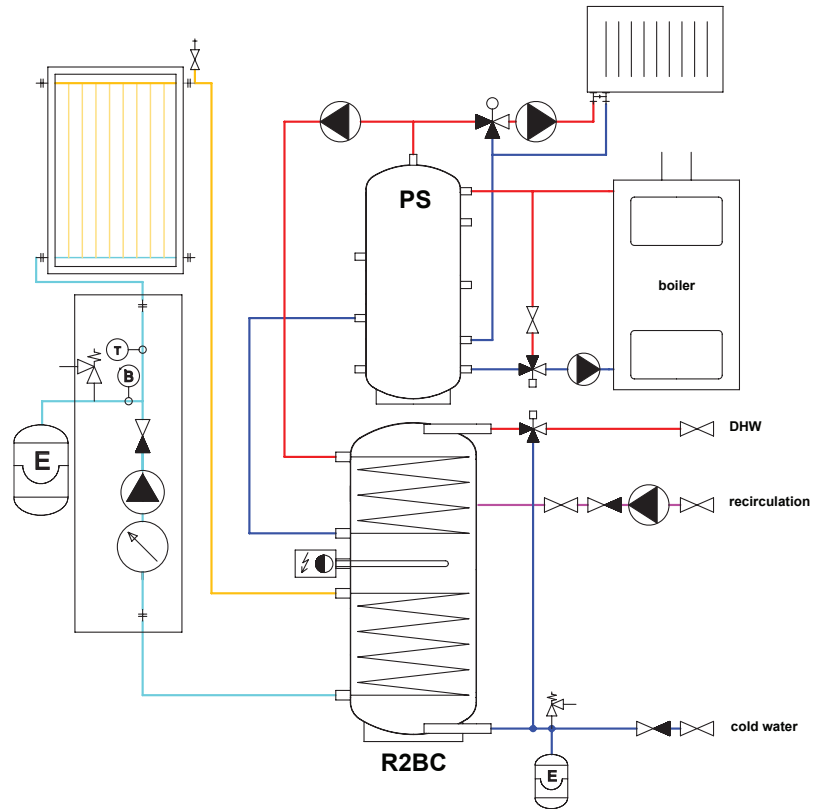
## Example I.

With a gas boiler and a solar thermal system.



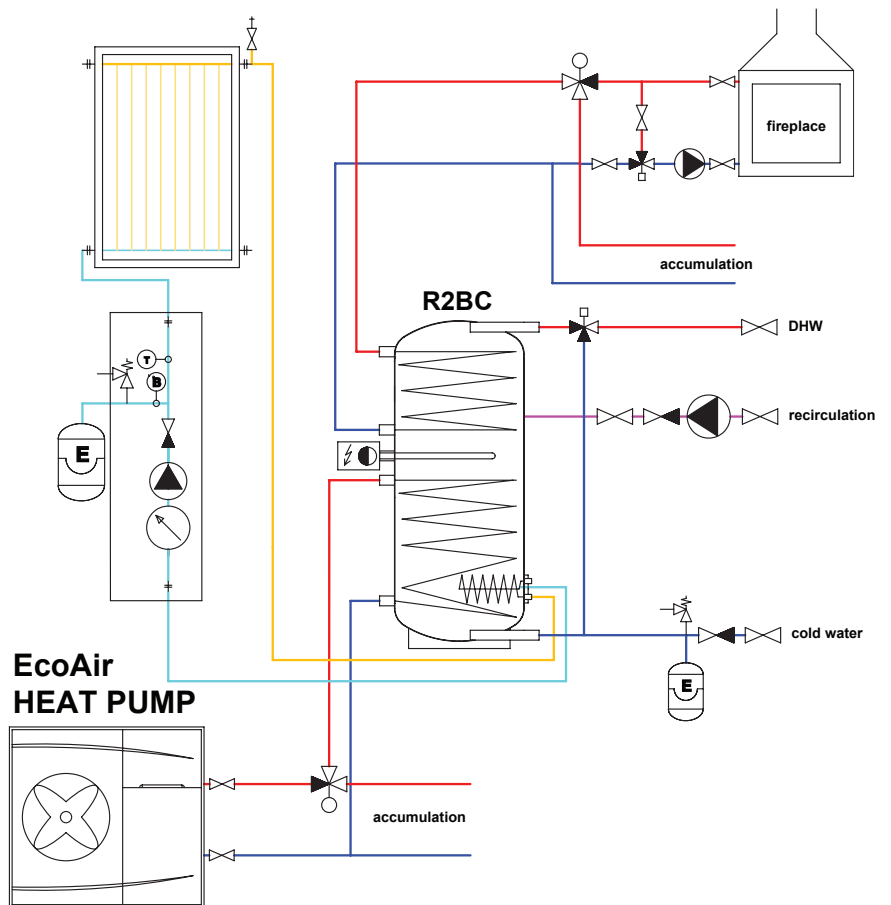
**Example II.**

With a solid fuel boiler, solar thermal system and thermal store.



**Example III.**

With a heat pump, solar thermal system and non-regulated solid-fuel source.



**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

# 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 heating circuits to the inlets to and outlets from heating coils. The heat source for the tank - an enamelled coil - connects with G 5/4" couplings.

## 6.2 - Connection to a solar thermal system

The tank can be used with a solar thermal system. In such a case, the inlet for hot heat-carrying liquid coming from the solar thermal system shall be connected to the upper sleeve of the G 5/4" heating coil and the lower outlet 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 sleeve 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 to 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. Threaded couplers are used to connect the tank to a cold water inlet and hot water outlet. A 6bar safety valve shall be installed at the cold water inlet. Installation of a reducing valve to the tank inlet is recommended. If the pressure from water mains exceeds 6 bar, a reducing valve is necessary. In order to prevent water loss, an expansion tank 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 strainer.

A suitable thermostatic mixing valve should be installed at the hot-water outlet from the tank, preventing 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

A so called electronic anode can be used instead of the magnesium one. Its principle advantage is that its proper function is signaled by a control lamp while a magnesium anode rod needs to be taken out for check. In such a case, just visual check of the indication lamp of the electronic anode is sufficient.

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

Fill the heating circuits with the appropriate fluids and air-bleed the entire system. Check all connections for leaks and verify the system pressure.

**Hot water quality must meet the conditions shown in the Table of limit values for total dissolved solids in hot water, page 7 of this Manual.**

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.

## **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!



