Owners Manual

STORAGE WATER HEATERS

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

CE

Regulus

EN
v. 1.6

CONTENTS

1 - Description

R2BC Storage water heater (further “tank“) with two enameled heating coils with G 5/4” connections (e.g. for connecting a solar 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 200, 300, 400, 500, 750, 1000, 1500, 2000, 2500 and 3000 l capacity enabling installation of an electric heating rod 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 the volume of 400 l upwards each tank has 2 anode rods. The 3000l tank has 3 anodes.

1.3 - Thermal insulation

Tanks of volume up to 500 l 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 leatherette surface. Tanks of 1500, 2000, 2500 and 3000 l volume 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
3× lateral with G 1/2“ inner thread, for temperature probes 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 rod
1× flange for the lateral inspection hole

1.5 - Packing

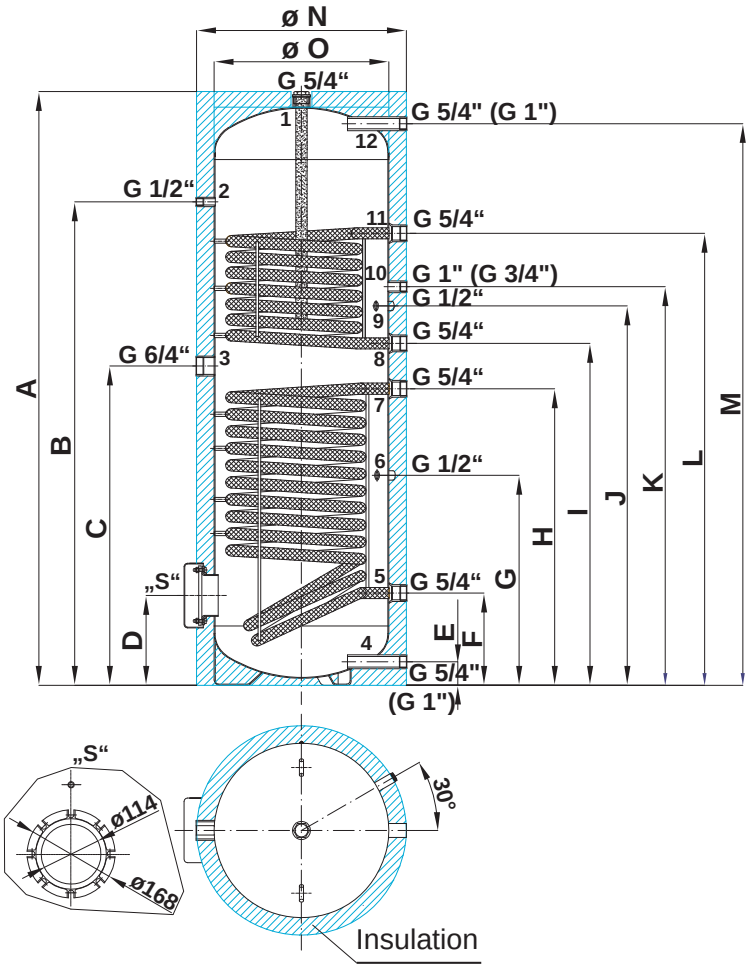
Tanks are delivered standing, each screwed to its pallet, packed in bubble wrap. It is forbidden to transport and/or store the storage tanks in a horizontal position.

2 - General Information

This Owners 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 heating coil ..... **c**
Volume of the lower heating coil ..... **d**
Surface of the upper heating coil ..... **e**
Surface of the lower heating coil ..... **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 Δt =35 °C (80/60 - 10/45) - upper coil ..... **h**
DHW heating Δt =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	8478	8479	12432	8474
Tank volume [l]	**b**	200	300	400	500	750	1000	1500	2000	2500	3000
Volume of the upper heating coil [l]	**c**	4.9	5.6	5.6	5.6	13.4	14	14	19	21.5	22.5
Volume of the lower heating coil [l]	**d**	4.9	9.5	11	11	13.4	14	26.5	28.5	29.5	31.5
Surface of the upper heating coil [m²]	**e**	0.8	0.9	0.9	0.9	2.4	2.5	2.5	3	3.5	3.8
Surface of the lower heating coil [m²]	**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 Δt=35 °C (80/60 - 10/45) - upper coil [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 Δt=35 °C (80/60 - 10/45) - lower coil [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]	**A**	1265	1710	1690	1780	1870	2120	2285	2550	2680	2980
	B	929	1384	1411	1480	1460	1680	1825	2090	2130	2430
	C	629	914	891	949	890	890	1255	1310	1400	1400
	D	258	257	268	335	400	400	520	550	640	640
	E	67	67	79	175	220	220	315	340	430	430
	F	264	264	286	305	385	385	470	460	550	550
	G	474	657	660	685	685	685	582	985	1075	1075
	H	579	849	846	865	835	835	1180	1160	1250	1300
	I	679	979	1011	985	990	990	1330	1450	1540	1790
	J	914	1214	1245	1285	1340	1340	1500	1825	1905	2205
	K	884	1141	1163	1235	1235	1235	1460	1650	1740	2040
	L	994	1294	1361	1335	1440	1440	1735	2000	2040	2340
	M	1164	1608	1581	1595	1590	1840	1935	2210	2240	2550
	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 without insulation [mm]						2012	2188	2281	2548	2640	2979

4 - Operation

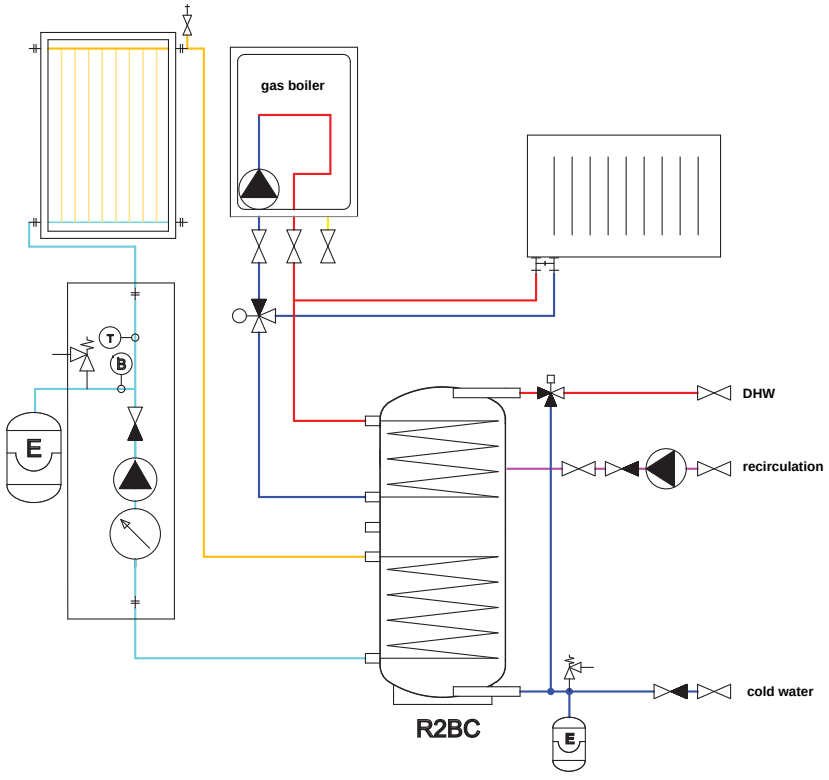
This tank is designed for operation in closed pressure circuits. Hot water is heated in the integrated hot-water heat exchangers (heating coils) inside the tank from several possible heat sources like various kinds of heating boilers, renewable energy sources (heat pumps, solar collectors).
Hot water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

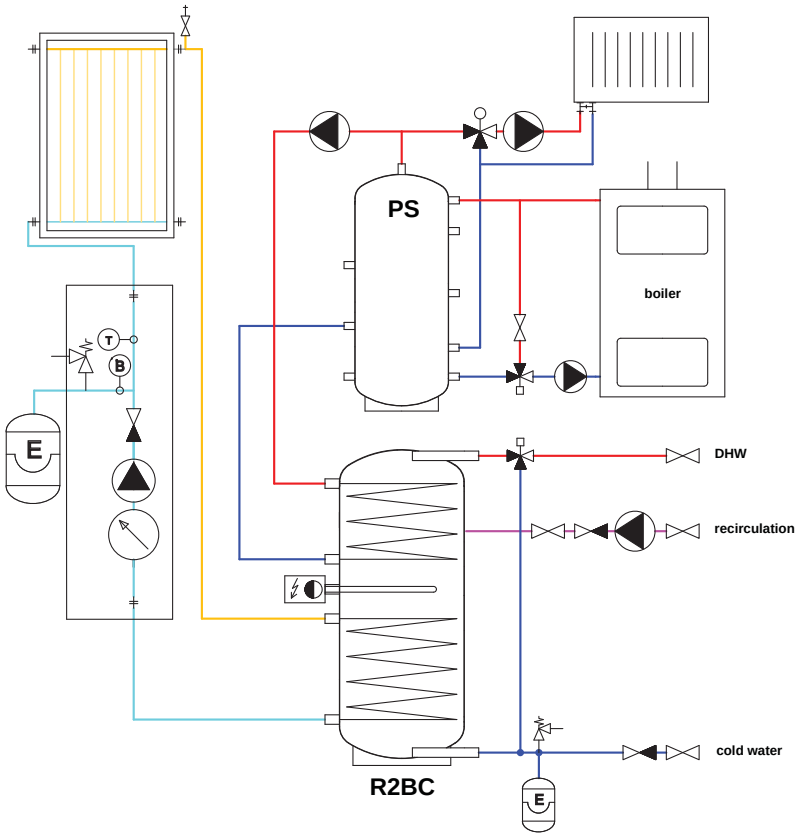
Connection point	Example I. with a gas boiler	Example II. with a boiler and accumulation tank	Example III. with a heat pump
1	magnesium anode	magnesium anode	magnesium anode
2	thermometer	thermometer	thermometer
3	plug	electric heating rod	electric heating rod
4	cold water inlet	cold water inlet	cold water inlet
5	outlet to a solar system	outlet to a solar system	return line to a heat pump
6	temperature probe, thermostat	temperature probe, thermostat	temperature probe, thermostat
7	inlet from a solar system	inlet from a solar system	inlet from a heat pump
8	return line to a gas boiler	return line to an accumulation tank	return line to a fireplace
9	temperature probe, thermostat	temperature probe, thermostat	temperature probe, thermostat
10	recirculation	recirculation	recirculation
11	inlet from a gas boiler	inlet from an accumulation tank	inlet from a fireplace
12	hot water outlet	hot water outlet	hot water outlet
flange	blinded	blinded	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 system.



Example II.
With a solid fuel boiler, solar system and accumulation tank.



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

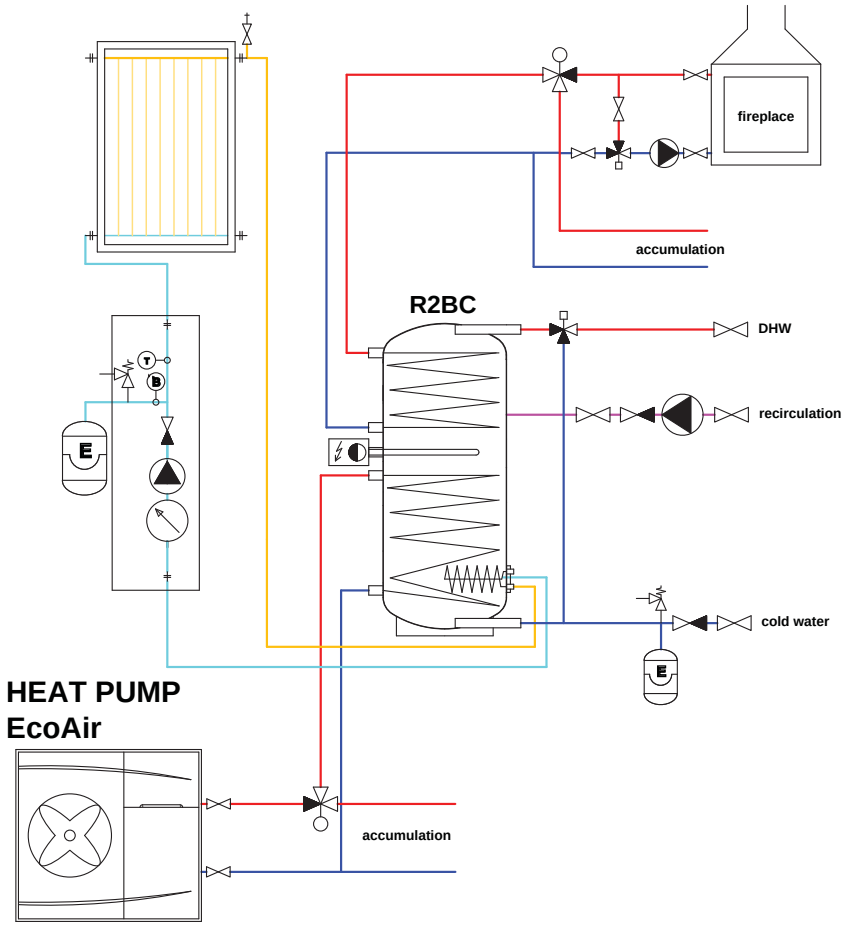


Table of limit values for total dissolved solids in hot water

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 enameled coil - connects with G 5/4” couplings.

6.2 - Connection to a solar system

The tank can be used with a solar system. In such a case, the inlet for hot heat-carrying liquid coming from the solar 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 system. Insulate all the piping between the tank and the solar system.

6.3 - Heating rod installation

The G 6/4“ side sleeve is designed to accommodate an electric heating rod. Heating rods of output up to 12 kW can be used (depending on the tank diameter and rod length), connected either directly to the mains (thermostat-equipped rods), 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. G 5/4” 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.
Please use a G 5/4” to G ½” reducing coupler when installing an electronic anode. 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.

Kit for R2BC storage water heaters

Code	Anode rod length [mm]	For storage water heaters
9173	350 (200/150)	R2BC 200
9174	500 (350/150)	R2BC 300, R2BC 400, R2BC 500
9175	750 (550/200)	R2BC 750, R2BC 1000

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.
The quality of top-up and heating water is set by ČSN 07 7401:1992. **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's Insulation

Product description

Thermal insulation is a component of tanks that prevents heat losses. Thermal insulation of hard 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 hard-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!

11 - Recommended Accessories

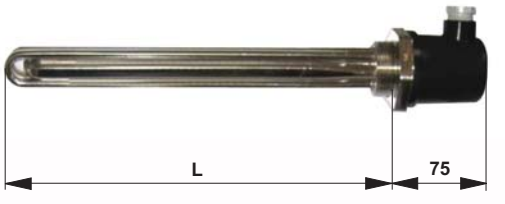
11.1 Expansion vessels for storage water heaters

The inner surface of R2BC hot water tanks as well as the heating coils are enameled. In order to compensate for fluctuations in temperature and pressure, and avoid damage to the enameled surface, installation of a properly sized expansion vessel is necessary. This vessel also saves water escaping through a safety valve during warm-up. A calculation of the expansion vessel volume shall be included in the heating design. The volumes of expansion vessels in the table are informative only. Working pressure 2-8 bar and domestic water temperature inside the tank 10-70 °C are presumed. For tanks of bigger volumes, use of an expansion automat is recommended.

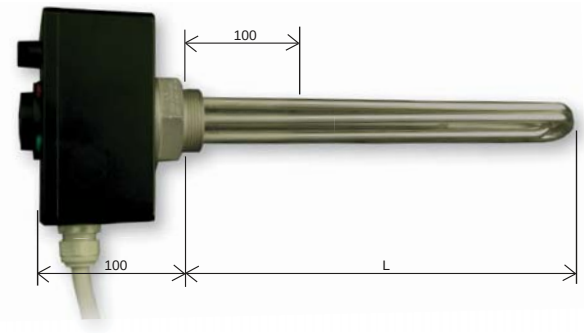
Hot-water tank volume [l]	Expansion vessel volume [l]
200	8
300	12
400	12
500	18
750	24
1000	35

11.2 - Electric heating rods and a mounting flange for the inspection hole

Electric heating rods can be used in storage water heaters and in accumulation tanks. They can be power supplied either by 230V or 3 × 230V/400V. Heating rods of output 2-12 kW can be installed into these tanks, into the sleeves with G 6/4” inner thread (the right type should be selected with respect to its length and the tank diameter). Electric heating rods are currently made of nickel-plated copper. They can be also supplied in a copper or stainless-steel version. Heating rods with an integrated electronic thermostat and a safety thermostat are also available.



G 6/4” thread, nickel-plated copper	power output (kW)	voltage (V)	length L (mm)	code
	2	230	245	8935
	3	230	305	8936
	4.5	3 × 230	370	8937
	6	3 × 230	495	8938
	7.5	3 × 400	585	8939
	9	3 × 400	680	8940
	12	3 × 400	815	8941



G 6/4” thread, stainless steel, thermostatic head, adjustable by a knob	power output (kW)	voltage (V)	length L (mm)	code
	2	230 V	315	11783
	3	230 V	350	11784
	2	3 × 230 V	225	11787
	3	3 × 230 V	285	11788
	4.5	3 × 230 V	383	11789
	6	3 × 400 V	478	11216
	7.5	3 × 400 V	570	11215
	9	3 × 400 V	665	11214

Flange enabling installation of an electric heating rod into the lower inspection hole.	flange diameter	flange thread	code
	170 mm	inner G 6/4“	7376

11.3 - Tube heat exchangers and their mounting flange

When needed, a finned tube heat exchanger may be installed into the appropriate flange (code 8375), into the lateral inspection hole instead of a plug.

Picture	surface [m²]	coil length [mm]	coil diameter [mm]	connection	code
	0.94	400	110	3/4“	8377
	1.51	700	110	3/4“	8378*
	**Flange dimensions:** diameter: 170 mm, diameter of holes for the heat exchanger: 30 mm, center-to-center distance: ca 55 mm				8375

** due to its length, the heat exchanger can be used for tanks of 750 l volume and over.*

11.4 - Watersoft N electromagnetic water treatment device

The device for electromagnetic water treatment, Watersoft N, uses no chemicals. It softens water, prevents scale formation and dissolves existing sediments. It is particularly suitable for use with devices with thermally stressed spots like heat exchangers and storage water heaters. Among its advantages is a quick and easy installation, no need for plumber’s intervention and min. operation costs (consumption of el. energy 2W).

Model	WATERSOFT N
Operation indication	green LED
Version	wall mount
Power supply	230V / 50Hz
Power input	max. 2W
El. protection	IP 65
Dimensions	70 × 50 × 34 (mm)
Max. pipe diam.	1 ½“
Max. water flow	4m³/h

11.5 - Additives for heating systems

MR-501/F

Protective liquid made of organic compounds, intended for use in heating and cooling systems, solar collectors and heat pumps. It prevents corrosion of metals (iron, copper, aluminum etc.) and their alloys by creating a film on the surface that is in touch with the heating liquid. It can be mixed with antifreeze fluids. Recommended use: after cleaning the system with M 501/R.

MR-501/96P

Liquid agent of balanced efficiency for underfloor heating, solar panels and plastic piping. It creates a protective film and prevents growth of algae and gas formation. The system is also protected against calcareous sediments. This well-balanced mixture of corrosion inhibitors and protective film creating compounds ensures a max. protection of underfloor heating and solar panel circuits.

MR-501/R (1kg)

Concentrated alkaline anti-corrosion liquid removing scale and calcareous sediments from heating systems. It dissolves scale and rust and makes it possible to remove them by flushing the system. 2 liters of MR-501/R shall be added to every 80-100 l of heating water and let to act for 2-3 weeks depending on the degree of sedimentation. Then the heating system shall be drained and flushed. When filling new water, it should be treated by adding the protective liquid MR 501/F.

WARRANTY CERTIFICATE

for R2BC Storage Water Heaters

Model: .....

Serial number: .....

WARRANTY CONDITIONS

1. The warranty period is 60 months from the date of purchase.
2. When claiming warranty, this Warranty Certificate must be submitted together with the purchase receipt.
3. The warranty is valid only when the technical conditions set by this Manual are maintained and installation is done by an authorized person (confirmed in the Warranty Certificate).
4. The claimed defect must not be caused by tampering, improper installation and operation, using the product for other purposes than intended, placing the product in improper environment, or by a natural disaster.
5. Claims shall be settled by your dealer at the address shown below.

Date of purchase:.....

Stamp print, signature of the salesman and address of the shop:

Date of a professional installation by plumber: .....

Stamp print, signature and address of the authorized person:

12/2014

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