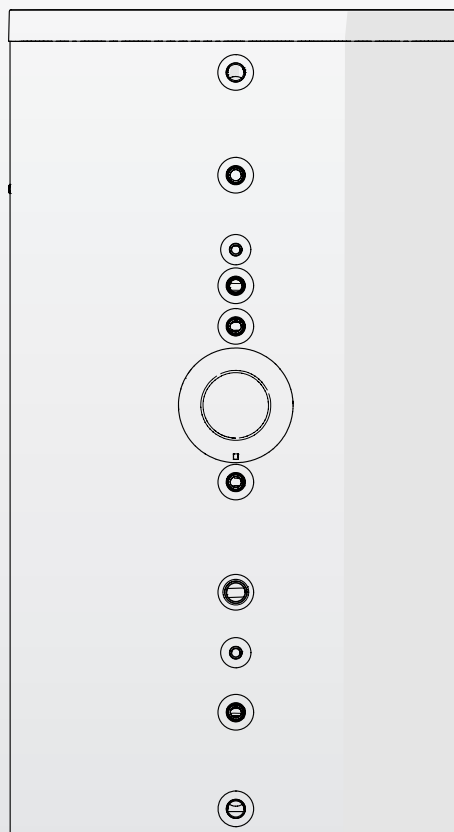


**RBS 200-300-430-550 2S**



**RBS 800-1000 2S**

## **RBS 2S**

**EN** INSTALLATION, OPERATION AND MAINTENANCE MANUAL

# **RIELLO**

## RANGE

MODEL	CODE
RBS 200 2S	20116675
RBS 300 2S	20116335
RBS 430 2S	20117339
RBS 550 2S	20116587
RBS 800 2S	20132268
RBS 1000 2S	20132269

## ACCESSORIES

For a complete list of accessories and details of their compatibility, refer to the Catalogue.

*Dear heating engineer,*

*We would like to congratulate you on having recommended a **RIELLO** solar storage cylinder unit: a modern product that's capable of ensuring a high degree of reliability, efficiency, quality and safety.*

*While your technical skills and knowledge will certainly be more than sufficient, this booklet contains all the information that we have deemed necessary for the device's correct and easy installation.*

*Thank you again, and keep up the good work,*

*Riello S.p.A.*

## CONFORMITY

The **RIELLO** solar heaters comply with DIN 4753-3 and UNI EN 12897.

## CONTENTS

## GENERAL INFORMATION

1	General Safety Information	2
2	Precautions	3
3	Description of the appliance	3
4	Identification	3
5	System layout	3
6	Technical specifications	4


## INSTALLATION

7	Unpacking the product	6
8	Assembly of the insulation and the lining (models 800 - 1000)	6
9	Place of installation	6
10	Installation in older systems and systems requiring modernisation	6
11	Water quality requirements	6
12	Water connections	7
13	Recycling and disposal	8

## END USER


14	Start-up	8
15	Temporary shutdown	8
16	Preparing for extended periods of disuse	8
17	External maintenance	8


The following symbols are used in this manual:


 **CAUTION!** = Identifies actions that require caution and adequate preparation.


 **STOP!** = Identifies actions that you **MUST NOT** do.


## 1 GENERAL SAFETY INFORMATION

 Check that the product is complete, undamaged and as ordered as soon as you receive it. Report any discrepancies or damage to the **RIELLO** dealer who sold it.


 This product must be installed by a legally qualified heating engineer. On completion of the installation, the installer must issue the owner with a declaration of conformity confirming that the installation has been completed to the highest standards in compliance with the instructions provided by **RIELLO** in this instruction manual, and that it conforms to all applicable laws and standards.

 This product must only be used for the purpose for which it is designed and made, as specified by **RIELLO**. **RIELLO** declines all responsibility, contractual or other, for damage to property or injury to persons or animals caused by improper installation, adjustment, maintenance or use.


 The product must be serviced at least once a year. Servicing must be arranged in advance with the **RIELLO** Technical Assistance Service.


 All servicing and repairs must be performed by a qualified heating engineer.

 If water leaks from the storage cylinder, turn off the water supply and contact **RIELLO's** Technical Assistance Service or a qualified heating engineer immediately.

 If the product is not going to be used for an extended period of time, contact the manufacturer's Technical Assistance Service to have at least the following operations performed:

- Close the shut-off cocks for the domestic hot water circuit
- Shut down the boiler connected to the storage cylinder as instructed in its own manual
- Switch the storage cylinder OFF at the control panel (if fitted) and at the mains power switch
- Drain the central heating circuit and domestic hot water circuit if there is any risk of freezing.

 This instruction manual is an integral part of the product. It must be kept safe and must **ALWAYS** accompany the product, even if it is sold to another owner or transferred to another user or to another installation. If you lose this manual, order a replacement immediately. Keep the product purchase documents to be presented to the **RIELLO** authorised Technical Assistance Service to request a service call under warranty.

 Size the solar expansion tank so as to ensure complete absorption of the expansion of the fluid contained within the system, with reference to the prevailing regulations on the matter. In particular, consider fluid characteristics, considerable fluctuation of service temperature and vapour that might be generated during solar collector stagnation stage. Proper size of expansion tank ensures setting off of all volume changes of the heat transfer fluid, avoiding excessive pressure increase. Limited pressure changes avoid reaching safety valve opening pressure and the consequent fluid drainage.

This manual, Code 20116337 - Rev. 8 (02/2020) comprises 8 pages.

## 2 PRECAUTIONS

The operation of any appliance that uses electrical power demands that a number of fundamental safety precautions be respected. In particular:

- ⊖ Never attempt to install the system without using suitable personal protection equipment and without following all applicable occupational safety standards.
- ⊖ Do not touch the product when barefoot or wet if it has any electrical accessories installed in it.
- ⊖ Never clean or service the storage cylinder without first turning the mains power switch OFF to disconnect all electrical accessories (if fitted) from the mains electricity supply.
- ⊖ Never pull, disconnect, or twist any electrical cables coming from the appliance even if it is disconnected from the mains electricity supply.
- ⊖ Do not expose the storage cylinder to the elements. It is not designed for use outdoors.
- ⊖ If solar plant pressure decreases, it is forbidden to top up with only water as there is a danger of freezing and overheating.
- ⊖ Do not use connections or safety devices or fittings (expansion vessels, pipes, insulation) that are not specifically designed and tested for use in solar water heating systems.
- ⊖ Do not allow children or infirm persons to operate the system unsupervised.
- ⊖ Do not dispose of packaging material into the environment, or leave it within the reach of children, since it can become a potential hazard. Dispose of packaging material in compliance with applicable legislation.

## 3 DESCRIPTION OF THE APPLIANCE

**RIELLO RBS 2S** double-coil solar heaters, available in six different models, can be integrated in solar systems for the production of domestic hot water.

**RIELLO RBS 2S** solar heaters can be equipped with a solar regulator and can be easily used in solar systems where **RIELLO** boilers or heating groups serve as an integration.

The most important technical features of these solar storage cylinders are:

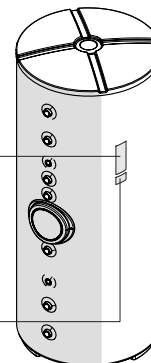
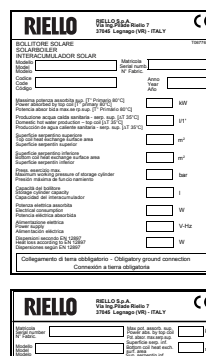
- the accurate study of tank and coil geometry
- internal glazing, bacteriologically inert, to ensure the maximum hygiene of treated water, reduce limescale deposits and make cleaning operations easier
- insulation made of expanded polyurethane free from CFC (chlorofluorocarbons)
- a flange is provided for easy cleaning and maintenance of the anti-corrosion magnesium anode.

## 4 IDENTIFICATION

The **RIELLO RBS 2S** solar heaters can be identified by:

### Data plate

This lists the technical specifications and performance of the product.

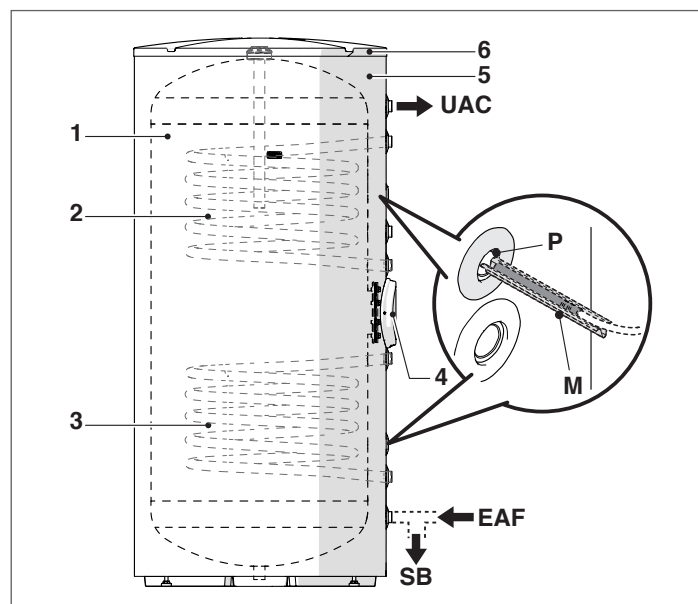


### Serial number plate

This specifies the serial number and model.

- ⚠ If these plates or any other means of clearly identifying the product are defaced, removed or lost, proper installation and servicing may be rendered difficult.
- ⚠ On models 800 and 1000 the technical data plate and serial number plate must be applied (by the installer) after the insulation has been fitted.

## 5 SYSTEM LAYOUT



- |   |                              |     |                           |
|---|------------------------------|-----|---------------------------|
| 1 | Storage cylinder             | P   | Socket                    |
| 2 | Top coil                     | M   | Guide                     |
| 3 | Bottom coil                  | UAC | Domestic hot water outlet |
| 4 | Flange for heater inspection | EAF | Domestic cold water inlet |
| 5 | Insulation                   | SB  | Storage cylinder drain    |
| 6 | Cover                        |     |                           |

## 6 TECHNICAL SPECIFICATIONS

DESCRIPTION	RBS 2S						
	200	300	430	550	800	1000	
Type of storage cylinder	Vertical, glazed						
Heat exchanger layout	Vertical, with elliptical section						
Storage cylinder capacity	208	301	430	551	731	883	l
Useful non-solar volume (Vbu)*	68	117	182	175	251	312	l
Solar usable volume (Vsol)**	140	184	260	376	480	570	l
Diameter of storage cylinder with insulation	604	604	755	755	1000	1000	mm
Diameter of storage cylinder without insulation	-	-	-	-	790	790	mm
Height with insulation	1338	1838	1644	1988	1846	2171	mm
Height without insulation	-	-	-	-	1745	2070	mm
Insulation thickness	50	50	50	50	100	100	mm
Total net weight	86	108	146	171	222	245	kg
Quantity/diameter/length of magnesium anode	1/33/450	1/33/450	1/33/520	1/33/520	1/40/600	1/40/600	mm
Flange internal diameter	130	130	130	130	130	130	mm
Diameter/length of sensor sockets	16/180	16/180	16/180	16/180	16/180	16/180	mm
Top coil water capacity	3,5	4,0	5,0	5,0	8,0	8,0	l
Top coil heat exchange surface area	0,7	0,8	1,0	1,0	1,6	1,6	m²
Bottom coil water capacity	3,5	5,0	7,0	9,0	11,5	13,5	l
Bottom coil heat exchange surface area	0,7	1,0	1,4	1,8	2,3	2,7	m²
Maximum operating pressure of storage cylinder	10				7		bar
Maximum operating pressure of coils	10				7		bar
Maximum operating temperature	99						°C
Discharges according to EN 12897:2006 ΔT=45 °C (am- bient 20°C and storage at 65°C)	62	69	75	85	94	101	W
Discharges according to UNI 11300	1,38	1,53	1,67	1,89	2,09	2,24	W/K
Energy class	B	B	B	B	B	B	
PERFORMANCE RELATING TO INTEGRATION COIL							
Upper coil continuous efficiency (ACS 10–45°C) (Vbu reference volume)							
Upper coil delivery temperature							
80°C     ΔT 20°C	16,1	23	31,4	31,4	50	50	kW
	400	572	774	774	1240	1240	l/h
70°C     ΔT 20°C	10,3	17	20,7	20,7	38	38	kW
	247	425	505	505	930	930	l/h
60°C     ΔT 20°C	6,5	11	15,5	15,5	25	25	kW
	160	277	375	375	620	620	l/h
50°C     ΔT 20°C	2,4	5	7	7	15	15	kW
	57	130	170	170	380	380	l/h
Set-up time required to heat the heater to 60°C, referred to the integration coil probe, to the different upper coil inlet tem- peratures with a coil outlet/inlet delta (Δ) of 20°C (Vbu reference volume)							
Upper coil delivery temperature							
80°C     ΔT 20°C	25	27	24	24	26	28	min
70°C     ΔT 20°C	33	34	32	32	34	40	min
60°C     ΔT 20°C	66	65	65	65	65	67	min
NL thermal efficiency coefficient according to DIN 4708. The NL index, referred to the integration exchanger, indicates a num- ber of apartments having 3.5 people that can be fully supplied, with a 140 l bathtub and two other drawing points.							
Upper coil delivery temperature							
80°C	1,12	1,64	2,2	2,23	3,63	3,79	
70°C	0,86	1,34	1,66	1,69	2,88	3,19	
60°C	0,65	1,04	1,37	1,42	2,17	2,47	

**Vbu (\*)** The non-solar usable volume indicates the quantity of water (in litres) heated directly by the thermal integration coil. It is calculated as the volume between the upper part of the heater and the lower part of the thermal integration element (integration coil lower turn).

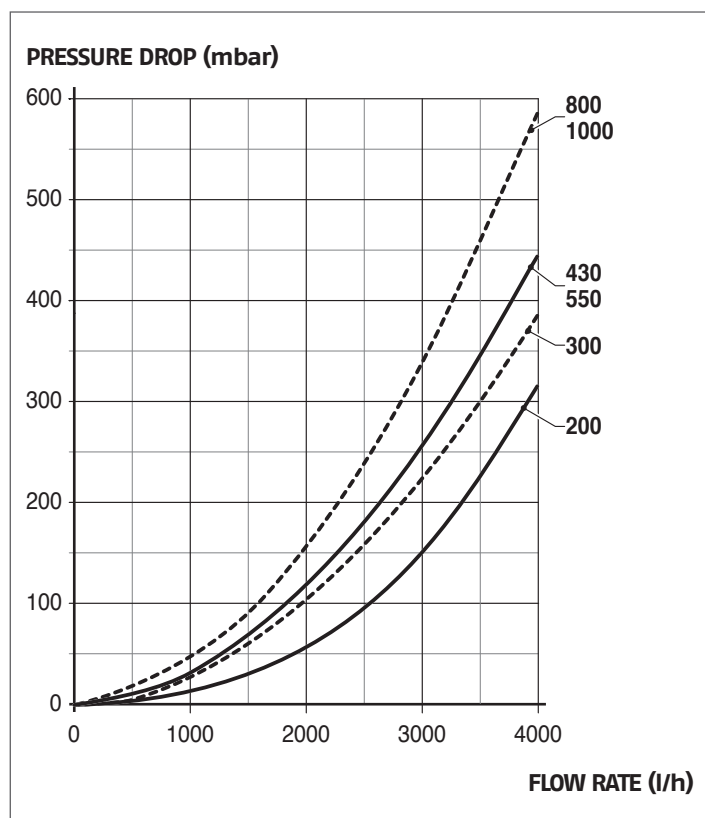
**Vsol (\*\*)** The usable solar volume indicates the quantity of water (in litres) heated directly by the solar coil (placed in the lower part of the heater) minus the non-solar volume (Vbu).

EMPTYING IN 10'	RBS 2S						
	200	300	430	550	800	1000	
PERFORMANCE RELATING TO INTEGRATION COIL							
Quantity of domestic water obtained in 10' with heater pre-heated to 60°C (*) and primary exchanger at the indicated delivery temperature, considering an increase of the domestic water temperature of 30°C between inlet and outlet (according to EN 12897).							
Upper coil delivery temperature							
80°C	166	260	330	345	595	673	I
70°C	138	255	323	340	513	666	I
60°C	131	250	308	336	473	626	I
PERFORMANCE RELATING TO SOLAR COIL							
Quantity of domestic water obtained in 10' with heater pre-heated to the indicated temperature (**) considering an increase of the domestic water temperature of 30°C between inlet and outlet (according to EN 12897).							
Temperature of accumulation tank lower part							
70°C	374	438	659	863	1190	1530	I
60°C	284	375	531	675	877	1110	I
50°C	205	310	390	485	762	790	I

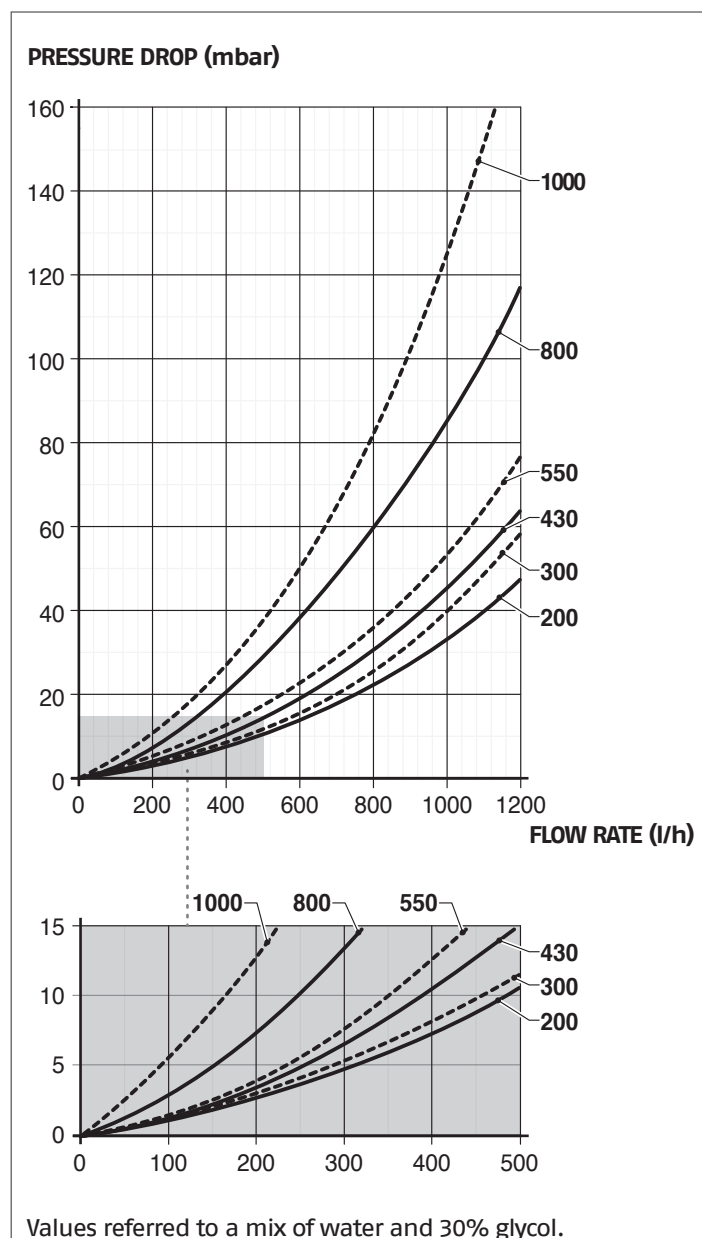
(\*) Integration coil probe point reference, Vbu reference volume.

(\*\*) Solar coil probe reference.

#### Pressure drops TOP COIL



#### Pressure drops BOTTOM COIL



Values referred to a mix of water and 30% glycol.

## 7 UNPACKING THE PRODUCT

**RIELLO RBS 2S** solar heaters are supplied in a single package on a wooden pallet.

The insulation and the lining components of the models 800 and 1000 are supplied separately from the structural work and are to be assembled upon receiving the product as described in the paragraph "Assembly of the insulation and the lining (models 800 - 1000)". For these models the magnesium anode is supplied in a cardboard box.

The following items are delivered in a plastic bag inside the packaging:

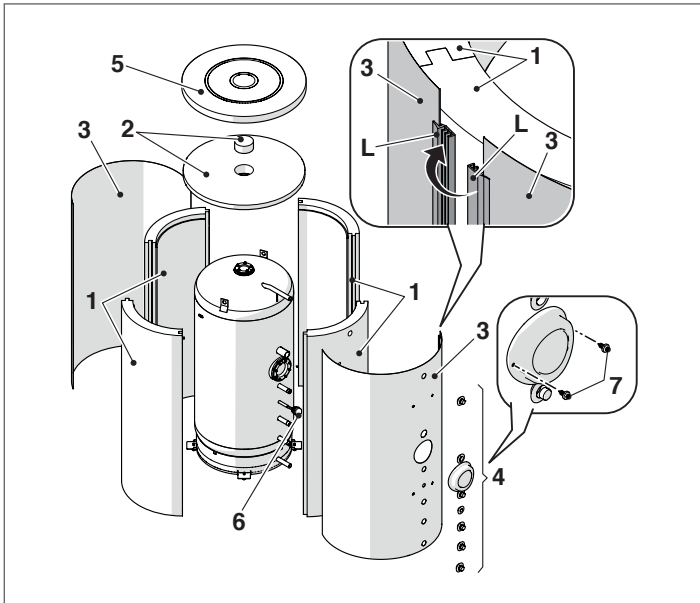
- Instruction manual
- Bar code label
- Hydraulic test certificate
- Energy label (to be applied to device upon installation)
- No. 4 adjustable feet to be mounted during installation (for models 800 - 1000 only).

**A** The instruction manual is an integral part of the solar storage cylinder. Once located, read it thoroughly and keep it safe.

**A** For handling operations, thoroughly follow the instructions on device package label.

## 8 ASSEMBLY OF THE INSULATION AND THE LINING (MODELS 800 - 1000)

The assembly of the insulation and lining components must be performed at the site of installation to facilitate passage through any doors and/or entries to the room.



Proceed as follows:

- Fit the magnesium anode (6) with its seal in the sleeve and fix it in place
- Assemble the insulating covers (1) around the body of the heater, making sure that the engagement points on the edges are positioned correctly. The edges are not required to be closed completely
- Place the front protection plate (3) correctly on the attachments
- Place the washers on the attachments and the protection for the inspection flange (4)
- Place the rear protection plate by closing the interlocking flaps (L) without closing completely (leave one tooth open)
- Apply the upper insulation (2) and the upper cover (5) (in order to insert the cover, exert a light and homogeneous pressure)

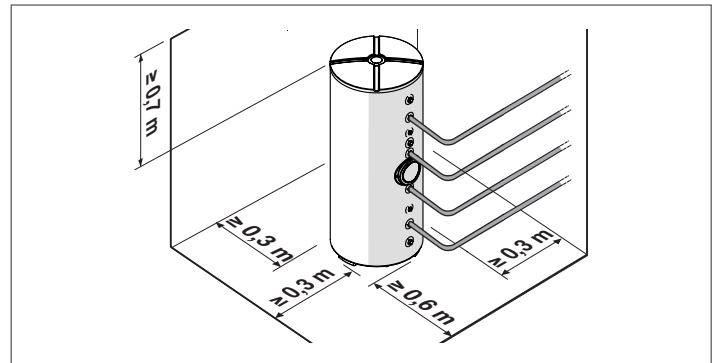
- Close the interlocking flaps (L) completely, which were previously left with an open tooth
- Fit the cover of the inspection flange using the two self-tapping screws (7) provided
- Apply the technical data plate and serial number plate.

If disassembling is required, proceed in reverse order.

**A** Wear suitable personal protective equipment and use suitable safety devices.

## 9 PLACE OF INSTALLATION

**RIELLO RBS 2S** solar heaters can be installed in all rooms not requiring a level of electrical protection of the device greater than IP X0D.



**NOTE:** the above-indicated dimensions are recommended for a correct maintenance and access to the device.

## 10 INSTALLATION IN OLDER SYSTEMS AND SYSTEMS REQUIRING MODERNISATION

When installing **RIELLO RBS 2S** storage cylinders in old systems or systems requiring modernisation, always perform the following checks.

- Make sure that the system is fitted with safety and control devices in accordance with applicable legislation and standards
- Make sure that the central heating circuit has been flushed out to remove all sludge and lime scale, and has been vented and seal tested
- Make sure that a suitable water treatment system is installed if the quality of the supply/recirculation water so demands (refer to the reference values listed in the table alongside).

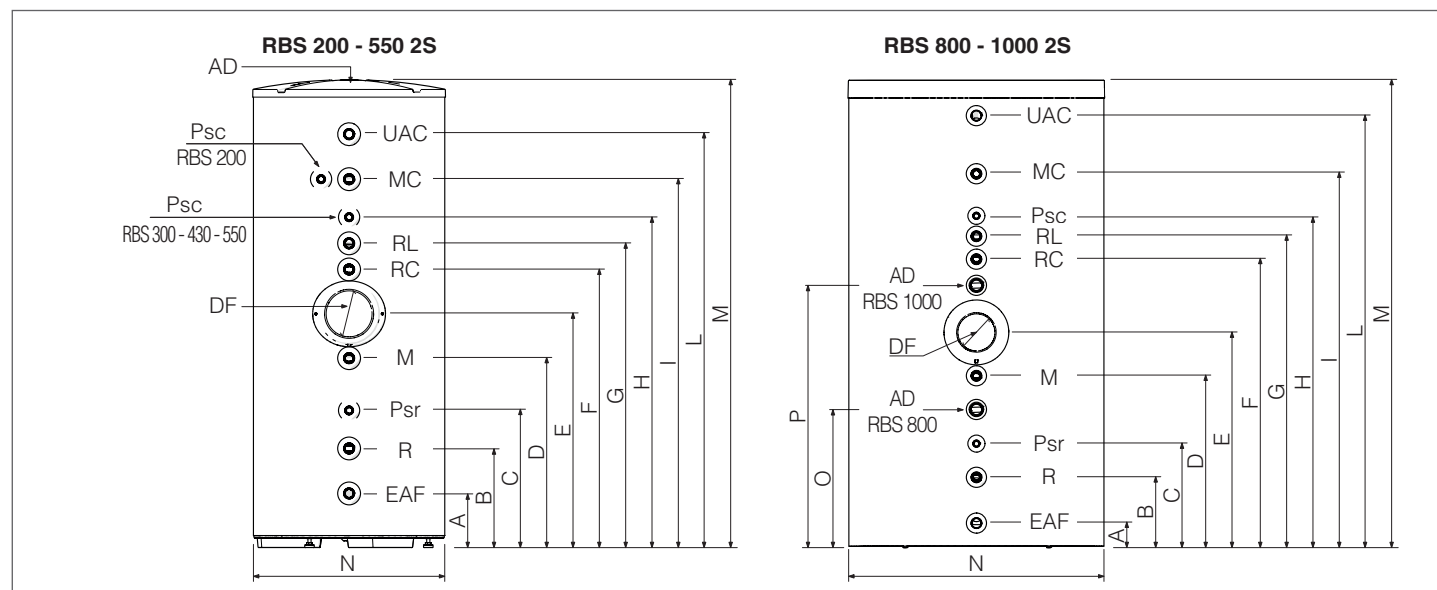
## 11 WATER QUALITY REQUIREMENTS

REFERENCE VALUES	
pH	6-8
Electrical conductivity	less than 200 $\mu\text{S}/\text{cm}$ (25°C)
Chlorine ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 35°F
Sulphur ions	none
Ammonia ions	none
Silicon ions	less than 30 ppm

The values above ensure proper operation of the system. Refer to the limit values specified in the current standards and regulations on the installation site.



## 12 WATER CONNECTIONS



DESCRIPTION		RBS 2S						
		200	300	430	550	800	1000	
UAC	Domestic hot water outlet		1" M				1"1/4 M	Ø
MC	Outlet from boiler		1" M				1" M	Ø
RC	Return to boiler		1" M				1" M	Ø
M	Outlet from solar collector		1" M				1" M	Ø
R	Return to solar collector		1" M				1" M	Ø
RL	DHW recirculation		1" M				1" M	Ø
EAF	Domestic cold water inlet		1" M				1"1/4 M	Ø
Psc	Diameter/length of boiler sensor socket		16/180				16/180	mm
Psr	Diameter/length of solar controller sensor socket		16/180				16/180	mm
AD	Quantity/diameter/length of magnesium anode	1/33/450	1/33/450	1/33/520	1/33/520	1/40/600	1/40/600	mm
DF	Flange internal diameter	130	130	130	130	130	130	mm
A		171	171	208	207	75	75	mm
B		243	253	329	348	289	289	mm
C		403	393	427	443	428	421	mm
D		598	693	684	788	799	834	mm
E		738	903	824	1088	969	1006	mm
F		878	1113	964	1328	1144	1337	mm
G		953	1233	1064	1428	1234	1426	mm
H		-	1323	1174	1538	1321	1506	mm
I		1098	1438	1289	1653	1444	1637	mm
L		1170	1670	1440	1784	1707	2032	mm
M		1338	1838	1644	1988	1846	2171	mm
N		Ø 604	Ø 604	Ø 755	Ø 755	Ø 1000	Ø 1000	mm
O		-	-	-	-	555	-	mm
P		-	-	-	-	-	1237	mm

- It is recommended to install shut-off valves at domestic water inlet and outlet.
- Check the efficiency of the seals when filling/refilling the storage cylinder.
- In case of a probe, any electric junction between probe cable and extensions for the connection to the electric panel must be soldered and protected with a sheath or a suitable electric insulation.
- Install the magnesium anode supplied (for the models 800 and 1000).

13 RECYCLING AND DISPOSAL

The device is primarily composed of:

Material	Component
steel	structural work
PU (polyurethane)	insulation (models 200 - 550)
polystyrene - polyester felt	insulation (models 800 - 1000)
PE (polyethylene)	water connection washers
ABS (acrylonitrile-butadiene-styrene)	lining and covers

At the end of the device's useful life, these components must be separated and disposed of according to current regulations in the country of installation.

END USER INSTRUCTIONS

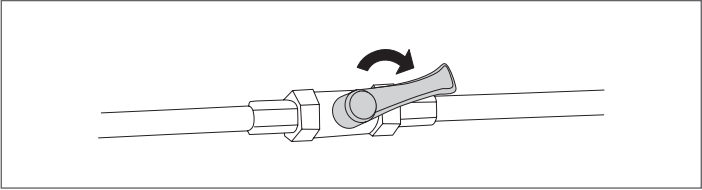
Refer to the GENERAL SAFETY INFORMATION and PRECAUTIONS section for safety-related information.

14 START-UP

The heater commissioning must be performed by Technical Assistance Service personnel.

Under certain circumstances, such as after long periods of disuse, the user may need to re-start it without involving the Technical Assistance Service. Before doing so, perform the following checks and operations.

- Check that the supply cocks in the domestic water circuit are all open
- Switch the electricity supply ON at the mains power switch and at control panel switch (if fitted).



15 TEMPORARY SHUTDOWN

To reduce to the environmental impact and save energy, in case of brief absences, week-ends, short trips, etc., and with external temperatures above 0°C, set the heater temperature control, where available, to the minimum value.

**!** If the temperature to which the heater is exposed can fall below 0°C (frost hazard), perform the operations described in paragraph "Preparing for extended periods of disuse".

16 PREPARING FOR EXTENDED PERIODS OF DISUSE

If the storage cylinder is not going to be used for an extended period of time, ask the manufacturer's Technical Assistance Service to make the system safe.

17 EXTERNAL MAINTENANCE

Clean the outside of the storage cylinder with a soft cloth dampened in soapy water.

**⊘** Do not use abrasive products, petrol or triethylene.

RIELLO

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The manufacturer strives to continuously improve all products. Appearance, dimensions, technical specifications, standard equipment and accessories are therefore liable to modification without notice.