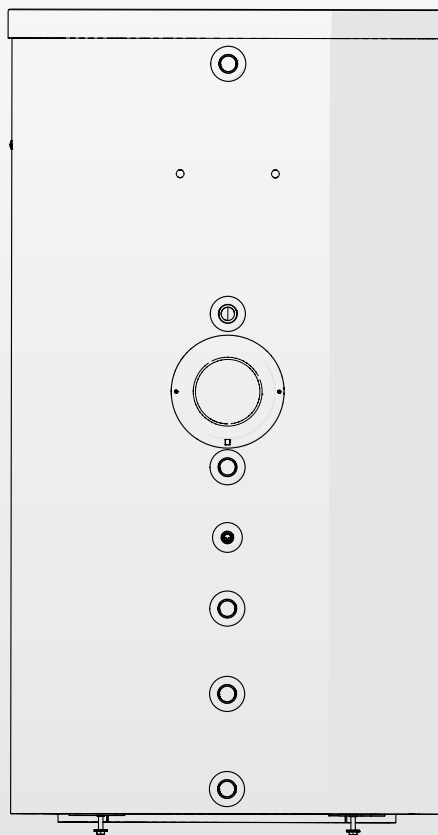


**RBC 150-200-300-430-550 1S**



**RBC 800-1000 1S**

## RBC 1S

EN INSTALLATION, OPERATION AND MAINTENANCE MANUAL

# RIELLO

## RANGE

MODEL	CODE
RBC 150 1S	20124167
RBC 200 1S	20124168
RBC 300 1S	20124169
RBC 430 1S	20124170
RBC 550 1S	20124171
RBC 800 1S	20132270
RBC 1000 1S	20132271

## 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** 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

**RIELLO** storage cylinders conform to DIN 4753-3 and UNI EN 12897 standards.

## 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	Water quality requirements	6
11	Water connections	7

## TECHNICAL ASSISTANCE SERVICE

12	Putting into service	8
13	Temporary shutdown	8
14	Preparing for extended periods of disuse	8
15	Maintenance	9
16	Cleaning and removing internal components	9
17	Recycling and disposal	10

## END USER

18	Start-up	11
19	Temporary shutdown	11
20	Preparing for extended periods of disuse	11
21	External maintenance	11



At the end of its life, the product should be not be disposed of as solid urban waste, but rather it should be handed over to a differentiated waste collection centre.

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.

## 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.
- ⊖ 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 RBC 1S** boilers produce domestic hot water for storage purposes and are available in seven different models.

Their most important technical features are:

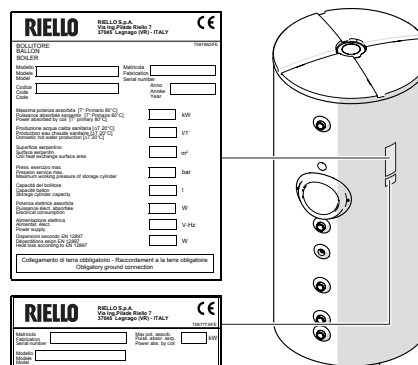
- the storage cylinder and coil are specially designed and shaped for optimum performance in terms of stratification, heat exchange and replenishment times
- internal glazing, bacteriologically inert, to ensure the maximum hygiene of treated water, reduce limescale deposits and make cleaning operations easier
- CFC-free polyurethane insulation and an elegant external casing reduce heat loss
- a flange is provided for easy cleaning and maintenance of the anti-corrosion magnesium anode.

## 4 IDENTIFICATION

The **RIELLO RBC 1S** solar heaters can be identified by:

### Data plate

This lists the technical specifications and performance of the product.

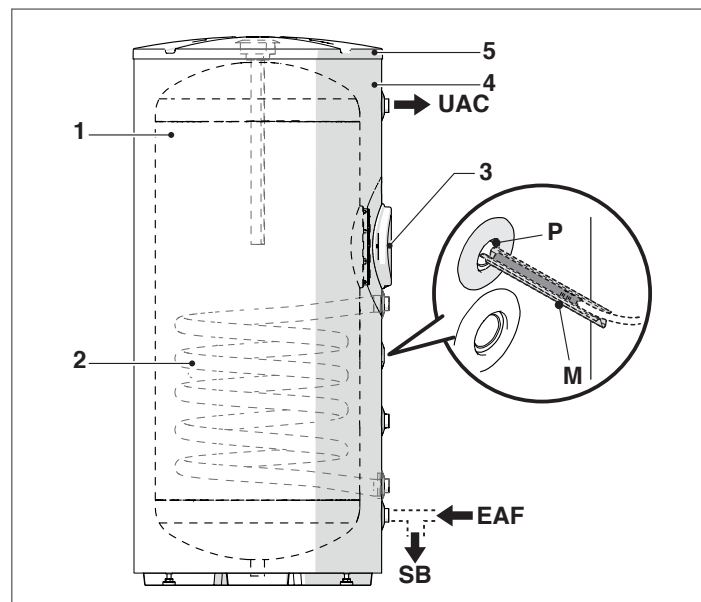


### Serial number plate

This specifies the serial number and model.

- ⚠ Technical data plate and Serial number plate are to be applied (by the installer) after installation is complete.
- ⚠ 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.

## 5 SYSTEM LAYOUT



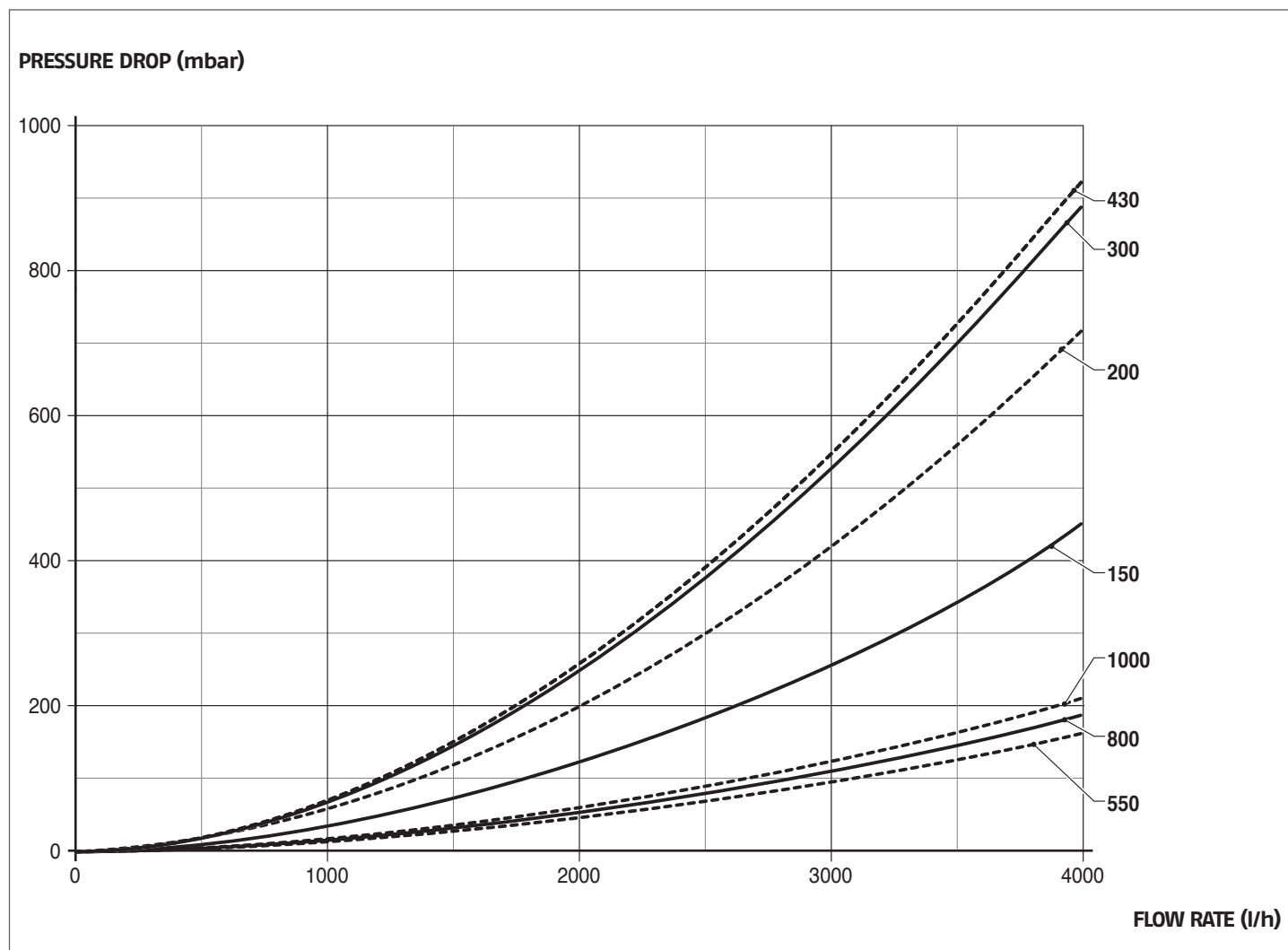
- |     |                              |     |                           |
|-----|------------------------------|-----|---------------------------|
| 1   | Storage cylinder             | EAF | Domestic cold water inlet |
| 2   | Coil                         | SB  | Storage cylinder drain    |
| 3   |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

## 6 TECHNICAL SPECIFICATIONS

DESCRIPTION	RBC 1S							
	150	200	300	430	550	800	1000	
Type of storage cylinder	Vertical, glazed							
Heat exchanger layout	Vertical, with elliptical section				Vertical, with circular section			
Storage cylinder capacity	162	207	305	445	555	735	890	l
Diameter of storage cylinder with insulation	604	604	604	755	755	974	974	mm
Diameter of storage cylinder without insulation	-	-	-	-	-	790	790	mm
Height with insulation	1088	1338	1838	1644	1988	1835	2155	mm
Height without insulation	-	-	-	-	-	1745	2070	mm
Insulation thickness	52	52	52	52	52	92	92	mm
Total net weight	62	78	103	131	157	203	225	kg
Quantity/diameter/length of magnesium anode	1/33/300	1/33/300	1/33/450	1/33/450	1/33/520	1/40/600	1/40/600	mm
Flange internal diameter	130	130	130	130	130	130	130	mm
Diameter/length of sensor sockets	16/180	16/180	16/180	16/180	16/180	16/180	16/180	mm
Coil water capacity	4,25	6,9	8,5	10,0	19,3	21,0	24,4	l
Coil heat exchange surface area	0,85	1,38	1,7	2	2,3	2,5	2,9	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)	55	58	68	73	84	94	101	W
Discharges according to UNI 11300	1,22	1,31	1,51	1,62	1,87	2,09	2,24	W/K
Energy class	B	B	B	B	B	B	B	
Continuous availability of domestic water (DHW 10–45°C) at the different coil inlet temperatures and with the indicated delta (Δ) T°.								
Coil delivery temperature								
80°C    ΔT 20°C	27	39	49	56	66	69	75	kW
	660	950	1185	1380	1645	1728	1860	l/h
70°C    ΔT 20°C	19	28	37	40	49	53	57	kW
	480	690	921	955	1207	1300	1403	l/h
60°C    ΔT 10°C	11	17	22	24	35	37	39	kW
	280	410	528	580	860	910	960	l/h
50°C    ΔT 10°C	8	9	13	15	17	19	21,7	kW
	190	200	319	370	408	460	534	l/h
Set-up time required to heat the boiler to 60°C (coil probe point reference) with primary exchanger at the indicated delivery temperature and with the indicated delta (Δ) T°.								
Coil delivery temperature								
80°C    ΔT 20°C	35	34	38	37	32	50	52	min
70°C    ΔT 20°C	39	40	42	43	48	74	77	min
Set-up time required to heat the boiler to 55°C (coil probe point reference) with primary exchanger at the indicated delivery temperature and with the indicated delta (Δ) T°.								
Coil delivery temperature								
60°C    ΔT 10°C	45	43	48	52	50	76	82	min
Set-up time required to heat the boiler to 45°C (coil probe point reference) with primary exchanger at the indicated delivery temperature and with the indicated delta (Δ) T°.								
Coil delivery temperature								
50°C    ΔT 10°C	56	53	55	60	58	80	94	min
NL thermal efficiency coefficient according to DIN 4708. The NL index indicates a number of apartments having 3.5 people that can be fully supplied, with a 140 l bathtub and two other drawing points.								
Coil delivery temperature								
80°C	1,84	2,6	3,28	4,06	4,87	5,9	6,83	
70°C	1,44	2,01	2,63	3,12	3,86	4,9	5,67	
60°C	1	1,36	1,81	2,2	2,5	3,7	4,23	
50°C	0,75	0,86	1,26	1,59	2,01	2,37	2,68	

EMPTYING IN 10'	RBC 1S							
	150	200	300	430	550	800	1000	
Quantity of domestic water obtained in 10' with boiler pre-heated to 60°C (coil probe point reference) 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).								
Coil delivery temperature								
80°C	272	347	440	653	826	1270	1583	l
70°C	250	320	410	585	731	1177	1445	l
Quantity of domestic water obtained in 10' with boiler pre-heated to 55°C (coil probe point reference) 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).								
Coil delivery temperature								
60°C	223	265	370	530	697	975	1163	l
Quantity of domestic water obtained in 10' with boiler pre-heated to 45°C (coil probe point reference) 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).								
Coil delivery temperature								
50°C	170	208	315	428	590	720	812	l

### Pressure drops COIL



## 7 UNPACKING THE PRODUCT

Heaters **RIELLO RBC 1S** 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:

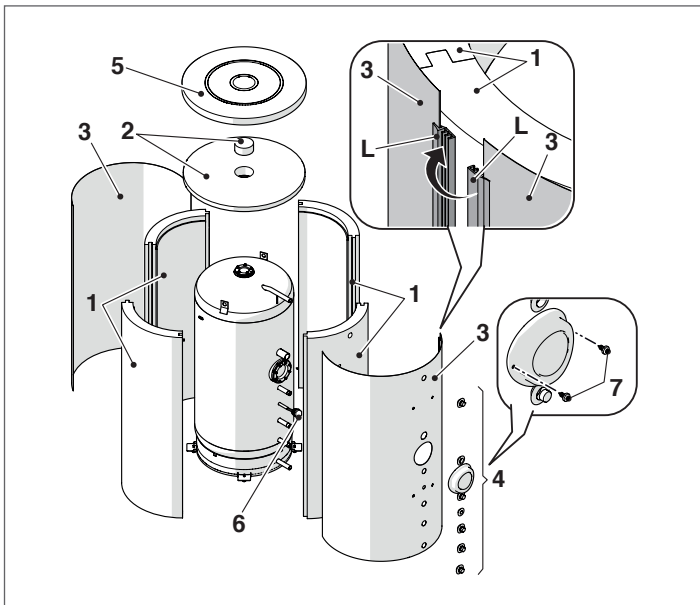
- Instruction manual
- Bar code label
- Hydraulic test certificate
- Energy label (to be applied to device upon installation)
- No. 4 adjustable feet to be mounted during installation (for models 800-1000 only).

**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)

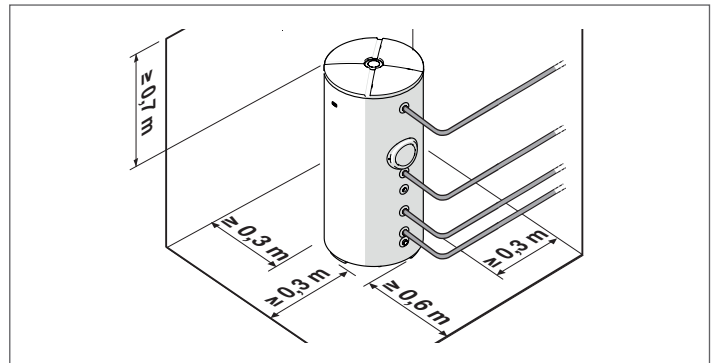
- Close the interlocking flaps (L) completely, which were previously left with an open tooth
- Fit the cover of the inspection flange using the two self-tapping screws (7) provided
- Apply the technical data plate and serial number plate.

If disassembling is required, proceed in reverse order.

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

## 9 PLACE OF INSTALLATION

**RIELLO RBC 1S** storage cylinders can be installed in any room where there is no specific requirement for an electrical protection rating higher than IP X0D.



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

### 9.1 Installation in older systems and systems requiring modernisation

When the **RIELLO RBC 1S** appliance is installed on old systems or ones that need modernising, make sure that:

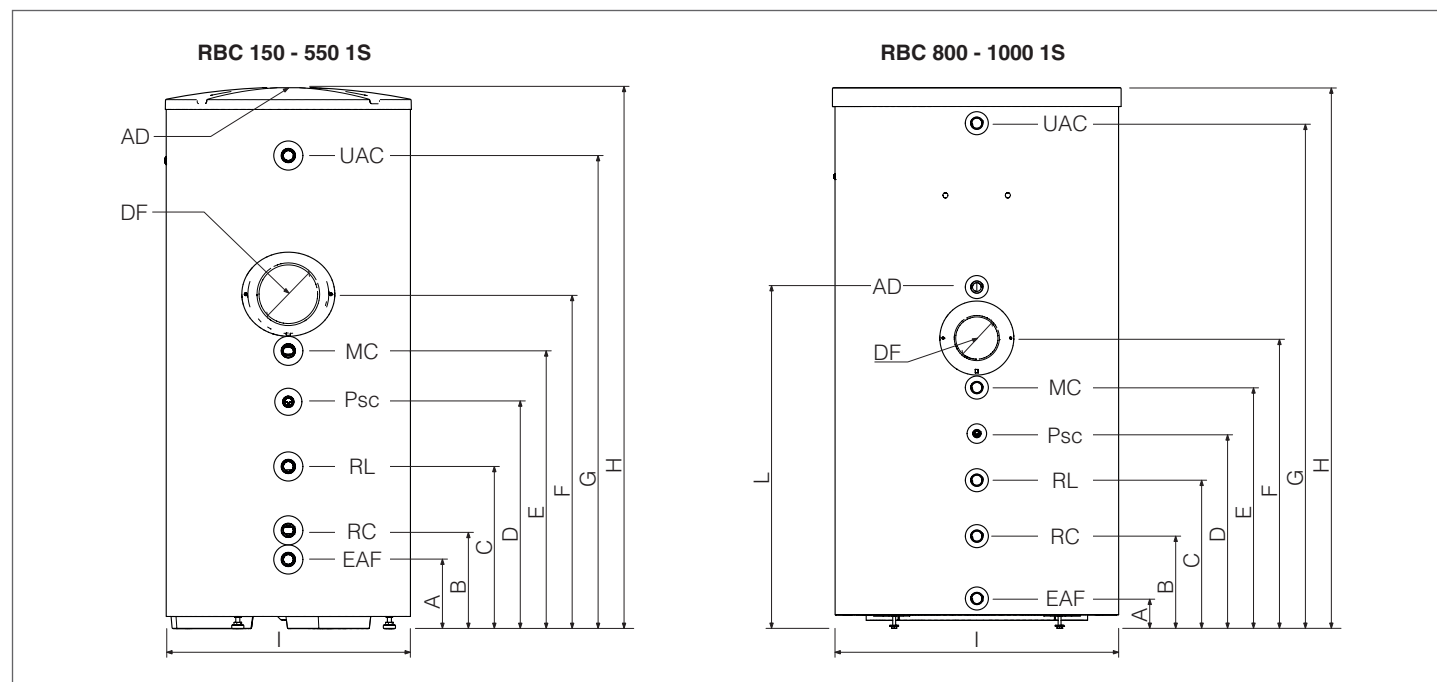
- Make sure that the system is fitted with safety and control devices in accordance with applicable legislation and standards
- Make sure that the central heating circuit has been flushed out to remove all sludge and lime scale, and has been vented and seal tested
- Make sure that a suitable water treatment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

## 10 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.

# 11 WATER CONNECTIONS



DESCRIPTION		RBC 1S							
		150	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
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
AD	Quantity/diameter/length of magnesium anode	1/33/300	1/33/300	1/33/450	1/33/450	1/33/520	1/40/600	1/40/600	mm
DF	Flange internal diameter	130	130	130	130	130	130	130	mm
A		171	171	171	208	207	75	75	mm
B		243	243	253	304	303	289	289	mm
C		323	401	475	462	543	465	529	mm
D		431	561	635	622	717	641	706	mm
E		523	687	793	780	875	799	864	mm
F		663	827	993	980	1075	969	1034	mm
G		920	1170	1670	1440	1784	1707	2032	mm
H		1088	1338	1838	1644	1988	1835	2155	mm
I		604	604	604	755	755	974	974	mm
L		-	-	-	-	-	1144	1209	mm

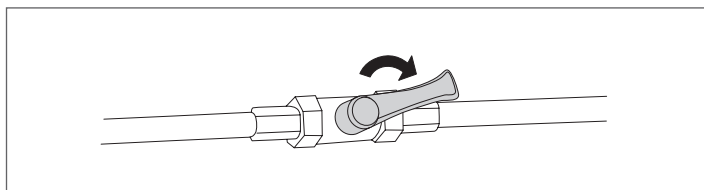
- We recommend that you install isolating valves in the outlet and return lines.
- Check the efficiency of the seals when filling/refilling the storage cylinder.
- In case of a probe, any electric junction between probe cable and extensions for the connection to the electric panel must be soldered and protected with a sheath or a suitable electric insulation.
- Install the magnesium anode supplied (for the models 800 and 1000).



## 12 PUTTING INTO SERVICE

It is essential to perform the following checks before starting up or testing the functioning of the storage cylinder. In particular, check that:

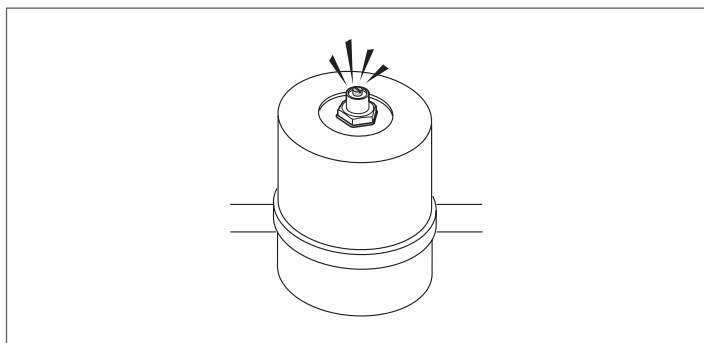
- The supply cocks in the domestic water circuit are all open



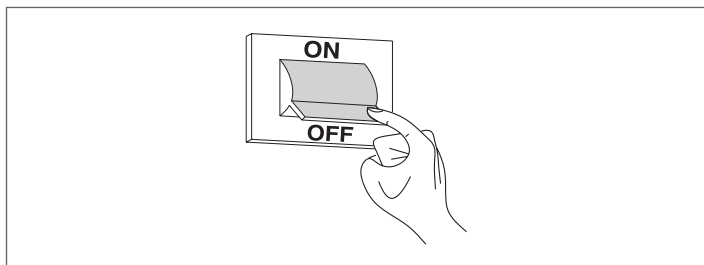
- The water connections to the boiler and solar collectors have been made correctly
- All the pipes in the water circuit have been insulated in conformity to relevant standards
- The solar collector circuit has been correctly flushed out and filled with water-glycol mix, and all air has been bled out of the circuit (see the manual for the solar collectors)
- Start up the boiler (if installed) as instructed in its own manual.
- Put the solar collectors into service. See the manuals for the solar collectors and associated accessories.

Once the system has been started up, perform the following checks.

- Make sure that all pumps are free and rotate in the right direction
- Make sure that all circuits have been bled.



- Make sure that the boiler and solar collectors connected to the system shut down correctly when their mains power switches are turned OFF.



Provided the above checks have been completed satisfactorily, restart the system and verify its performance.

## 13 TEMPORARY SHUTDOWN

If you are going away for a short period of time like a weekend or a short holiday, etc., and outdoor temperatures are going to remain above ZERO, proceed as follows.

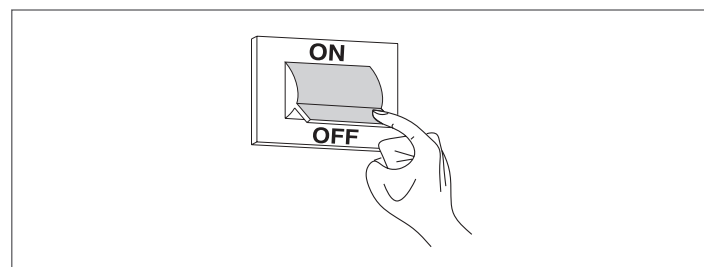
- Adjust the storage cylinder thermostat to its minimum setting.

**⚠** 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".

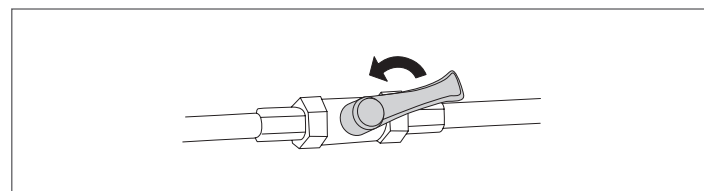
## 14 PREPARING FOR EXTENDED PERIODS OF DISUSE

If the storage cylinder is not going to be used for an extended period of time, perform the following operations:

- Switch the electricity supply to the storage cylinder's valve group and to any associated boiler OFF at the main switch and at the control panel



- Close the shut-off cocks for the domestic hot water circuit.



**⚠** Drain the central heating circuit and domestic hot water circuit if there is any risk of freezing.

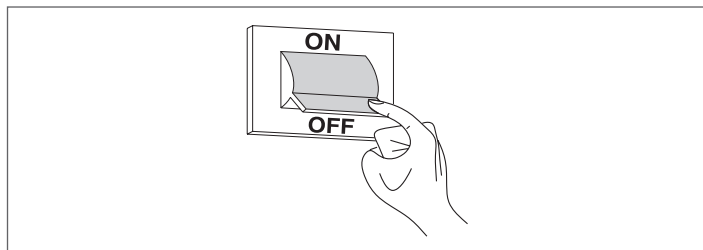


## 15 MAINTENANCE

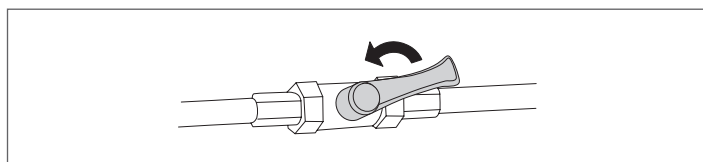
Scheduled maintenance is essential for the safety, efficiency and long working life of your storage cylinder. Proper maintenance also reduces energy consumption and ensures reliability over time. Have your storage cylinder serviced either by the manufacturer's Technical Assistance Service or by a qualified heating engineer at least once a year.

Perform the following operations before beginning any maintenance:

- Switch the electricity supply to the storage cylinder's valve group and to any associated boiler OFF at the main switch and at the control panel



- Close the shut-off cocks for the domestic hot water circuit



- Drain the storage cylinder's DHW (secondary) water circuit.

## 16 CLEANING AND REMOVING INTERNAL COMPONENTS

### EXTERNAL CLEANING

Clean the outside of the storage cylinder with a soft cloth dampened in soapy water. To remove stubborn marks, use a cloth dampened in a 50% mix of water and denatured alcohol or a suitable cleaning product. Dry the storage cylinder after cleaning it.

 Do not use abrasive products, petrol or triethylene.

### INTERNAL CLEANING

#### Removing and checking the first magnesium anode

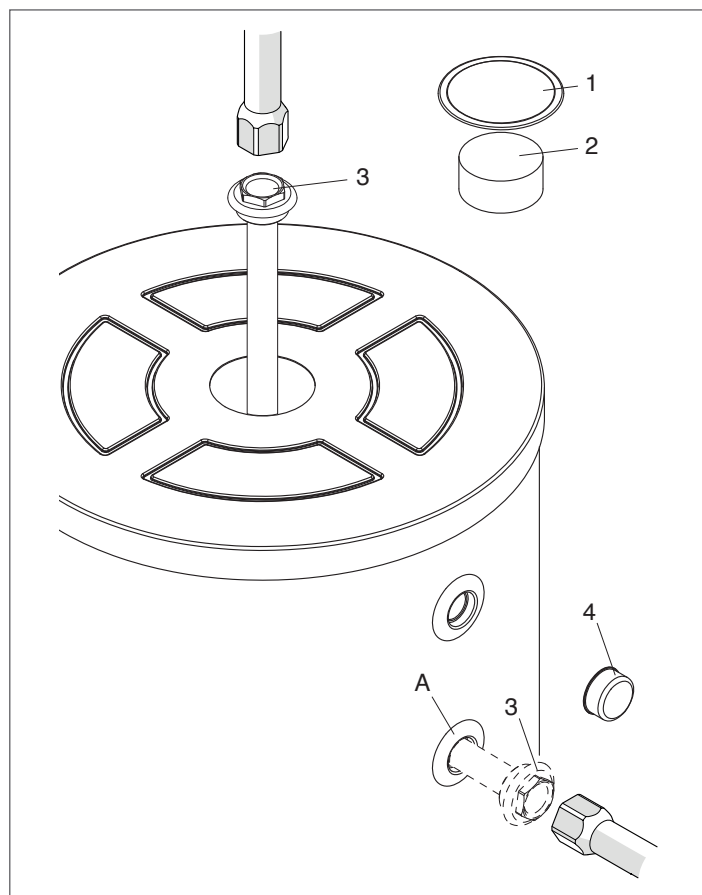
If the magnesium anode is fitted in the top of the storage cylinder, remove the cover (1) and insulation (2), and use a suitable wrench to unscrew the anode holder (3).

If the magnesium anode is fitted in position (A), remove the cover (4) and use a suitable wrench to unscrew the anode holder (3).

Check the magnesium anode for wear and replace it if necessary.

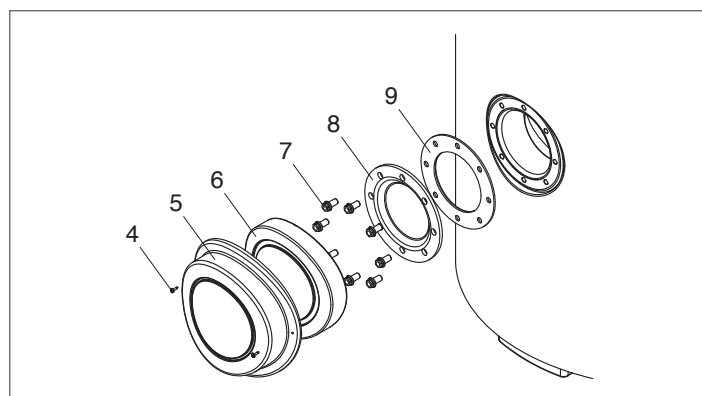
On completion of cleaning, follow the above steps in the reverse order to refit all removed parts.


**NOTE:** Tighten the anode plug to a torque of 25–30 Nm.




#### Cleaning inside the storage cylinder

- Remove the screws (4)
- Remove the flange cover (5)
- Remove the insulation (6)
- Unscrew the bolts (7) and remove the cover (8)
- Remove the seal (9)
- Clean inside the storage cylinder and remove any residues through the access hole.



 Check the seal for wear and replace it if necessary. On completion of cleaning, follow the above steps in the reverse order to refit all removed parts.

 Tighten the bolts (7), proceeding diagonally around the flange to apply pressure uniformly around the seal.

- Fill the storage cylinder's DHW (secondary circuit) and check that there are no leaks from any of the seals
- Check the performance of the storage cylinder.

## 16.1 Troubleshooting

FAULT	CAUSE	SOLUTION
<b>The storage cylinder functions incorrectly or irregularly</b>	Flow rate too high	- Fit a pressure limiter
		- Fit a flow reducer
	There are blockages or deposits in the domestic hot water circuit	- Check and clean as necessary
	Filling pump	- Check the pump
	The water temperature from the boiler is too low	- Check the setting
	There is air in the primary circuit	- Bleed the circuit

## 17 RECYCLING AND DISPOSAL

The device is primarily composed of:

Material	Component
steel	structural work
PU (polyurethane)	insulation (models 150 - 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.

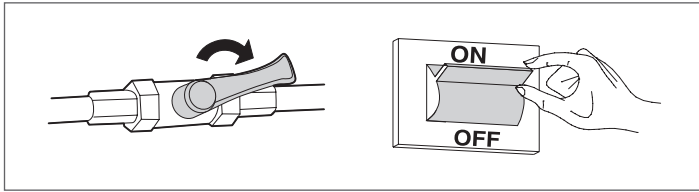
## END USER INSTRUCTIONS

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

### 18 START-UP

The storage cylinder must be put into service for the first time by personnel from the manufacturer's Technical Assistance Service. 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).



### 19 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".

### 20 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.

### 21 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.