

# INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS, for the User and the Installer

## HR i

320 - 600 - 800



<b>GENERAL RECOMMENDATIONS .....</b>	<b>3</b>
<b>PRODUCT INFORMATION .....</b>	<b>4</b>
Energy Labelling .....	4
Rating Plate.....	5
<b>USER'S GUIDE .....</b>	<b>6</b>
Control Panel.....	6
<b>APPLIANCE DESCRIPTION .....</b>	<b>7</b>
Models - HR i 320 – 600 - 800 .....	7
<b>TECHNICAL CHARACTERISTICS .....</b>	<b>8</b>
Dimensions.....	8
Electrical Characteristics.....	10
Hydraulic Characteristics.....	10
Performances.....	11
<b>INSTALLATION .....</b>	<b>12</b>
Packing Contents.....	12
Tools .....	12
<b>INSTALLATION .....</b>	<b>13</b>
Safety instructions.....	13
Connection .....	15
Parallel Tank Assembly.....	17
<b>STARTING UP .....</b>	<b>18</b>
Safety Instructions to Fill the Tank .....	18
Filling .....	19
Checks before Starting up .....	21
<b>MAINTENANCE .....</b>	<b>22</b>
Periodic Checks by the User .....	22
Annual Maintenance.....	22
Draining.....	22
Bringing back into Service after Maintenance .....	24

## NOTES

This manual contains important information with respect to the installation, the starting up and the maintenance of the appliance.

This manual must be provided to the user, who will read it carefully and keep it in a safe place.

We accept no liability should any damage result from the failure to comply with the instructions contained in this technical manual.



### Essential recommendations for safety

- It is strictly prohibited to carry out any modifications to the appliance without the manufacturer's prior and written agreement.
- The product must be installed by a qualified engineer, in accordance with applicable local standards and regulations.
- The installation must comply with the instructions contained in this manual and with the standards and regulations applicable to domestic hot water tanks.
- Failure to comply with the instructions in this manual could result in personal injury or a risk of environmental pollution.
- The manufacturer declines all liability for any damage caused as a result of incorrect installation or in the event of the use of appliances or accessories that are not specified by the manufacturer.



### Essential recommendations for the correct operation of the appliance

- In order to ensure that the appliance operates correctly, it is essential to have it serviced by a certified installer or maintenance contractor every year.
- In case of anomaly, please call your installer for advice.
- Faulty parts may only be replaced by genuine parts.
- Our water heaters are designed and manufactured for the exclusive purpose of heating and storing domestic hot water.
- The domestic hot water heaters must only be heated using hot water in a closed circuit.



### General remarks

- The availability of certain models as well as their accessories may vary according to markets.
- The manufacturer reserves the right to change the technical characteristics and features of its products without prior notice.
- The part number (P/N) and serial number (S/N) of the appliance are indicated on its rating plate and must be provided to ACV in case of warranty claim. Failure to do so will make the claim void.
- In spite of the strict quality standards that ACV applies to its appliances during production, inspection and transport, faults may occur. Please immediately notify your approved installer of any faults.

## ENERGY LABELLING

## PRODUCT FICHE

## ACV International

Oude Vijverweg 6

B-1653 Dworp

Belgium






Product Models    HR i 320  
                               HR i 600  
                               HR i 800

*General purpose hot water storage tank***D**

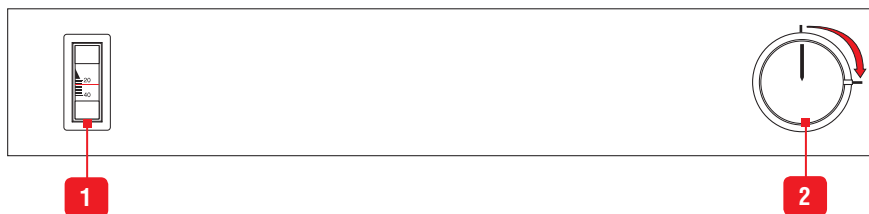
	HR i 320	600	800
Energy efficiency class	D	-	-
Standing Loss *	124W	153W	167W
Storage volume	318L	606L	800L

\* According to EN12897:2006

## RATING PLATE

	Oude Vijverweg 6, 1853 Dwingelo BEJC0004 www.acv.com	<b>Type :</b> HR I 320 <b>PIN :</b> A1002047 <b>SIN :</b> A001500	 Year: 2015	
	Standard: EN 12897:2005			
	Sanitary Operating Pressure Primary Operating Pressure Maximum Design Pressure Primary Heating Power Input Primary Flow Rate Actual Capacity Standing Heat Loss Maximum Temperature Rated Voltage	8,6 bar 4 bar 10 bar 76 kW 1,81 L/s 318 L 2,93 kWh/24h 90 °C 230V 50 Hz		
	 (21) 00000 (91) 00000000 (92) 9999			

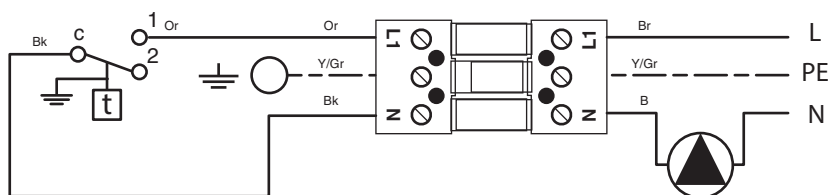
## CONTROL PANEL



### Legend:

1. **Thermometer:** indicates the domestic hot water (DHW) temperature in the tank.
2. **Adjusting knob :** allows to define the DHW preset temperature. It rotates 1/4 turn clockwise to set the temperature between 60°C and 90°C.

## Wiring Diagram



B. Blue  
 Br. Brown  
 Bk. Black  
 Or. Orange  
 Y/Gr. Yellow / Green

**MODELS - HR i 320 - 600 - 800**

Indirectly heated storage water tanks, to be installed on the floor, equipped with a large surface heat exchanger and intended for medium and high power installations. Through the use of a specific kit, these tanks can be set in parallel, allowing the construction of high flow rate assemblies for any type of commercial, residential or industrial facilities.

**HR i 320 - 600 - 800****Legend**

- |   |  |
|---|--|
| 1. Control panel                          | 8. Hand hole                             |
| 2. Manual air bleed valve                 | 9. Cold drink water inlet                |
| 3. Primary circuit inlet                  | 10. Drain valve                          |
| 4. Metal casing                           | 11. Auxiliary DHW loop                   |
| 5. Inner stainless steel tank (not shown) | 12. DHW outlet                           |
| 6. Outer steel tank (primary)             | 13. Primary circuit outlet               |
| 7. 60mm rock wool insulation (not shown)  | 14. Stainless steel dry-well (not shown) |

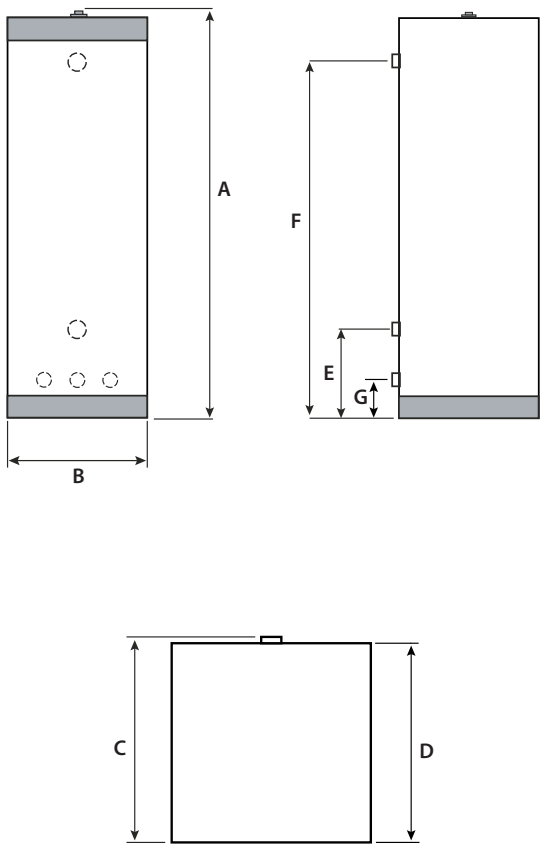


Front view

Rear view, without casing

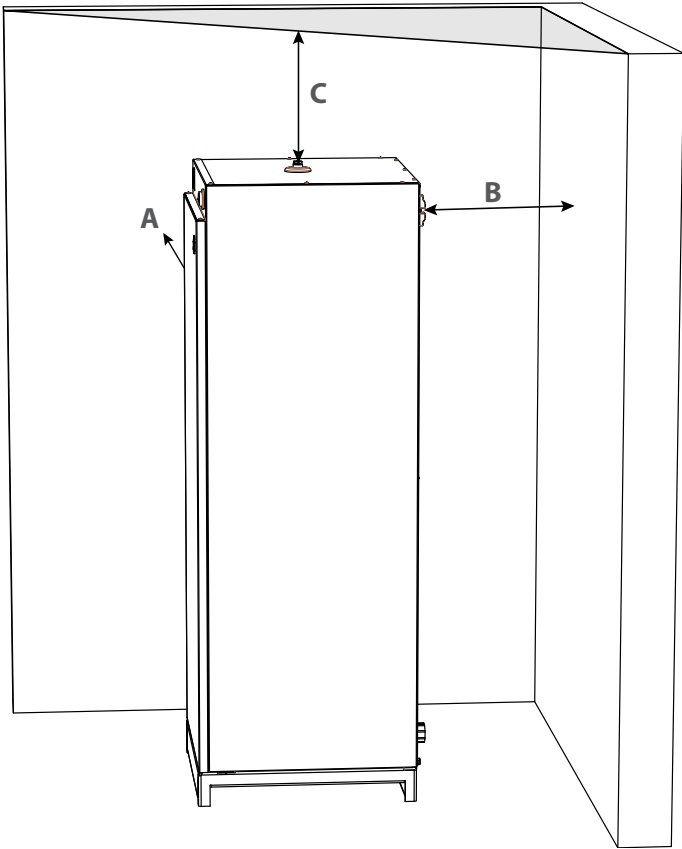
DIMENSIONS

Tank dimensions		HR i		
		320	600	800
A = Height	mm	1820	2120	2100
B = Width	mm	630	780	900
C = Depth	mm	662	815	930
D	mm	630	780	900
E	mm	511	485	510
F	mm	1541	1183	1760
G	mm	176	146	145
Empty weight	Kg	152	273	343





Tank clearance		HR i		
		320	600	800
A (mm)	Recommended	1000	1000	1000
	Minimum	750	750	750
B (mm)	Recommended	1000	1000	1000
	Minimum	800	800	800
C (mm)	Recommended	300	330	330
	Minimum	200	230	230



## ELECTRICAL CHARACTERISTICS

Main characteristics		HR i		
		320	600	800
Rated voltage	V~	230/240	230/240	230/240
Rated frequency	Hz	50	50	50
Max. power	kW	1.3	1.3	1.3
Max. amp. rating (fuse)	A	6	6	6

## HYDRAULIC CHARACTERISTICS

Main characteristics		HR i		
		320	600	800
Total capacity	L	318	606	800
Primary circuit capacity	L	55	161	125
DHW capacity	L	263	445	675
Primary circuit connection [F]	"	2	2	2
DHW connection [M]	"	1 1/2	1 1/2	1 1/2
Auxiliary DHW loop connection [M]	"	3/4	3/4	3/4
Primary pressure drop*	mbar	—	—	—
Heating surface area*	m <sup>2</sup>	2.65	3.58	4.56
Max Design Pressure*	bar	10	10	10
Reheat Performance - Primary Heating Power Input*	kW	60	71	82
Primary flow rate (to achieve Reheat Performance)*	L/s	1.81	2.08	2.08
Standing Heat Loss*	kWh/24h	2.98	3.67	4.06
	W	124	153	169

\* According to EN12897:2006

## PERFORMANCES

DHW performance		HR i		
Operating conditions at 80 °C		320	600	800
Peak flow at 40 °C	L/10'	922	1345	1881
Peak flow at 45 °C	L/10'	790	1153	1612
Peak flow at 60 °C	L/10'	504	706	961
Peak flow at 40 °C	L/60'	2732	3437	4270
Peak flow at 45 °C	L/60'	2342	2946	3660
Peak flow at 60 °C	L/60'	1402	1733	2124
Constant flow at 40 °C	L/h	2172	2511	2868
Constant flow at 45 °C	L/h	1862	2152	2458
Constant flow at 60 °C	L/h	1077	1232	1395
Coefficient	NL	18	34	67

Maximum Operating Conditions		HR i		
		320	600	800
Max. operating pressure - primary	bar	4	4	4
Max. operating pressure - DHW	bar	8,6	8,6	8,6
Supply pressure (DHW circuit)	bar	6	6	6
Maximum temperature - heating side	°C	90	90	90
Maximum temperature - DHW side	°C	80	80	80

Water quality	-	Chlorides < 150 mg/L
	-	6 ≤ pH ≤ 8
	-	If hardness > 20 °fH, water softener recommended.

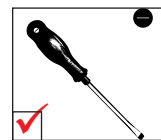
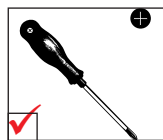
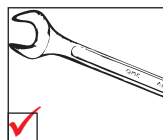
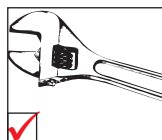
## PACKING CONTENTS

Appliances are delivered assembled, tested and packaged separately.

### Contents

- A fully-assembled tank, ready for use.
- A multilingual Installation, Operation and Maintenance Instruction manual.

### TOOLS



## SAFETY INSTRUCTIONS



### General remarks

- Connections (electrical, hydraulic) must be carried out in accordance with applicable standards and regulations.
- If the water drawing off point is far from the tank, installing an auxiliary DHW loop can allow to get hot water more quickly at all times.



### Essential instructions for the correct operation of the system

- The tank must be installed in a dry and protected area.
- Install the appliance to ensure easy access at all times.
- To avoid any risk of corrosion, connect the stainless steel tank directly to the earth.
- Make sure to install a pressure reducing valve set at 4.5 bar in the DHW circuit if the supply pressure is higher than 6 bar.
- On the DHW circuit, install an approved safety group, comprised of a safety valve set at 7 bar, a check valve and a stop valve.
- Make sure that the outlet of the safety unit goes directly to the sewer to avoid any potential damage.
- Do not install the safety group above the tank to avoid water discharge on to the tank.



### Essential instructions for the safety of persons and the environment

- **Hot water can burn!**  
In the event of small amounts of hot water repeatedly being drawn off, a stratification effect can develop in the tank. The upper hot water layer may then reach very high temperatures.
- ACV recommends using a pre-set thermostatic mixing valve in order to provide hot water at a maximum of 60°C.
- Water heated to wash clothes, dishes and for other uses can cause serious burns.
- In order to avoid exposure to extremely hot water that can cause serious burns, never leave children, old people, disabled or handicapped people in the bath or shower alone.
- Never allow young children to turn on the hot water or fill their own bath.
- Adjust the water temperature in accordance with usage and plumbing regulations.
- The risk of developing bacteria exists, including “*Legionella pneumophila*”, if a minimum temperature of 60°C is not maintained in both the DHW tank and the hot water distribution network.



### Essential instructions for the electrical safety

- Only an approved installer is authorized to carry out the electrical connections.
- Install a 2-way switch and a fuse or circuit breaker of the recommended rating outside the appliance, so as to be able to shut power down when servicing the appliance or before performing any operation on it.
- Shut down external electrical supply of the appliance before performing any operation on the electrical circuit.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless supervised or unless they have been given instruction concerning the use of the appliance by a person responsible for their safety.

## CONNECTION



### Essential instructions for the safety of persons and the environment

- Refer to the safety instructions for the installation. Failure to comply with these instructions can result in damages to the installation, severe injuries or death.
- Hot water can burn! ACV recommends using a pre-set thermostatic mixing valve in order to provide hot water at a maximum of 60°C.



### Essential instructions for the correct operation of the installation

- The filling circuit of the DHW tank must be equipped with a safety group, comprised at least of a stop valve, a check valve, a safety valve set at 7 bar, and possibly, an expansion vessel of the appropriate size. Make sure that the circuit between the tank and the safety valve is always open.
- The third DHW tank connection, if any, can be used for the auxiliary DHW loop. If the connection is not used, replace the protective plug by a brass plug of the appropriate size.



### General remarks

- In certain countries the domestic kits must be approved.
- The circuit illustrations are basic principle diagrams only.

## CONNECTION TO THE DHW CIRCUIT

### Legend

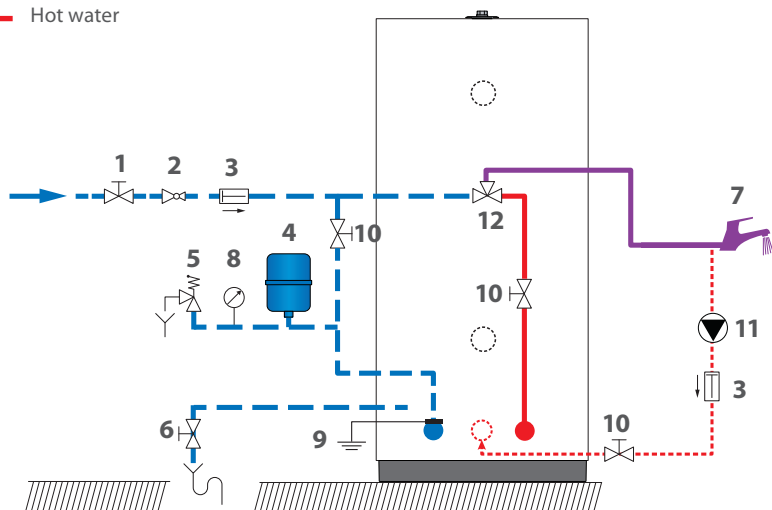
1. Filling valve
2. Pressure reducing valve (set at 4.5 bar)
3. Check valve
4. Expansion vessel
5. Safety valve (set at 7 bar)
6. Drain valve
7. Drawing-off tap
8. Pressure gauge
9. Grounding
10. Stop valve
11. Auxiliary DHW loop circulation pump
12. Thermostatic mixing valve



If there is a risk of low pressure in the hot water circuit (installation of the tank on the roof of a building), it is essential to install a vacuum breaker device onto the cold water supply.

— Cold water

— Hot water



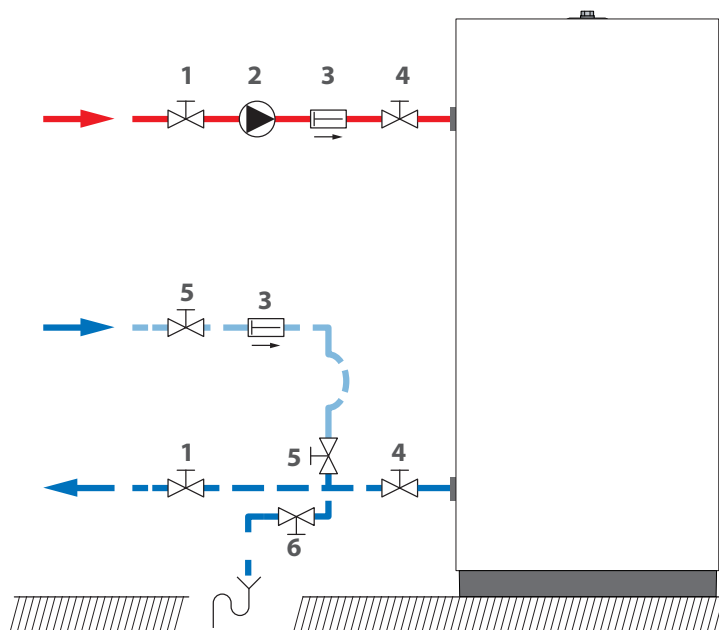


## CONNECTION TO THE PRIMARY CIRCUIT

### Legend

1. Stop valve
2. Charging pump
3. Check valve
4. Primary circuit stop valve
5. Primary circuit filling valve
6. Drain valve

— Cold water  
— Hot water



## PARALLEL TANK ASSEMBLY

Please contact ACV for any specific application.

## SAFETY INSTRUCTIONS TO FILL THE TANK



### Essential instructions for the safety of persons and the environment

- The DHW tank must always be filled and pressurised before filling and pressurising the primary circuit.
- Do not use vehicle antifreeze. This can cause serious injury or death, or damage facilities.
- If antifreeze is needed in the primary circuit, it must comply with Public Hygiene Regulations and must be non-toxic. A food-grade Propylene Glycol is recommended. It must be diluted according to the ratio recommended in the local regulations.
- Consult the manufacturer to determine the compatibility of the antifreeze with the tank's construction materials.



### Essential instructions for the correct operation of the system

- Before bringing the tank into service, check the connections to avoid any risk of leaks during filling.
- Only use drinking water to check that the DHW tank is watertight. The on-site test pressure must not exceed a pressure surge of 8,6 bar.
- Using antifreeze in the primary circuit will lead to a reduction in the heating performance. The higher the concentration of antifreeze in the circuit, the lower the performance.

## FILLING

### Essential instructions for the correct operation of the installation

- The DHW tank must always be filled and pressurised before filling and pressurising the primary circuit.

## FILLING THE DHW TANK (Figure 1)



### General remark

- Connect the safety valve outlet to the sewer.
1. To fill the tank, open a hot water tap (2) located at the highest point of the installation. It enables to bleed the air from the installation.
  2. Close the stop valve (3) of the auxiliary DHW loop if it is installed.
  3. Open the filling valve (1) and the stop valves (4) to fill the DHW tank.
  4. Close the hot water tap (2), after the water flow has stabilised and the air has been completely evacuated.
  5. Check all the connections of the installation for leaks.

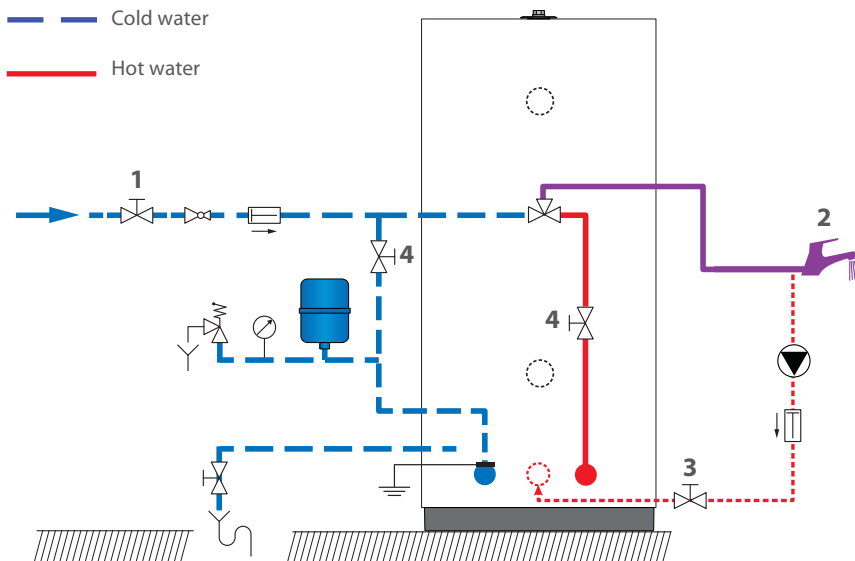


Figure 1

## FILLING THE PRIMARY CIRCUIT (Figure 2)

1. Check that the drain valve (3) of your primary circuit is tightly closed.
2. Open the stop valves (1) and (2) of the primary circuit connected to the heating boiler.
3. Open the air bleed valve (4).
4. In addition, follow the filling instructions provided with the heating boiler.
5. Open the valves (5) to start filling, making sure not to exceed a pressure of 2 bar in the primary circuit.
6. When the air is eliminated, first close the air bleed valve (4), then the filling valves (5).

— Cold water

— Hot water

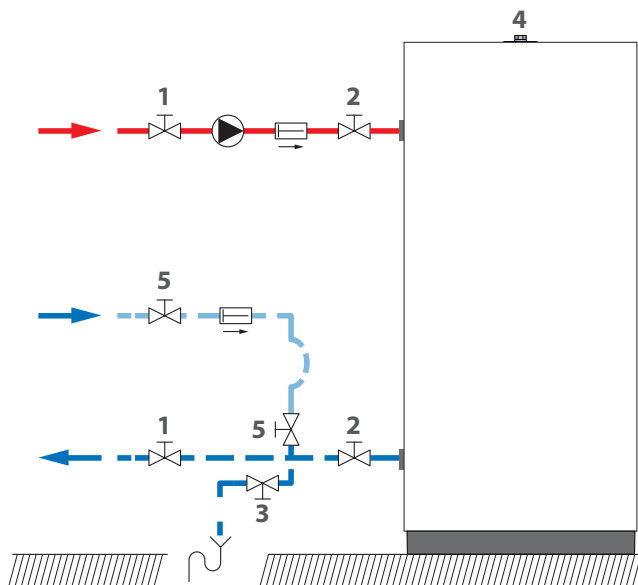


Figure 2

## CHECKS BEFORE STARTING UP

- Check that the safety valves (DHW and primary) are correctly installed and that the outlets are connected to the sewer.
- Check that the DHW tank and the primary circuit are filled with water.
- Check that the air has been correctly bled from both circuits.
- Check that the tank's upper air bleed valve is tight.
- Check that the water side and heat source side pipes are correctly connected and not leaking.

## STARTING UP



To put the installation into service, refer to the heating boiler manual.

## PERIODIC CHECKS BY THE USER

- Check the pressure of the primary circuit pressure gauge: it should be between 0.5 and 1.5 bar.
- Visually inspect, on a regular basis, the valves, connections and accessories in order to detect any leaks or malfunction.
- Periodically check the air bleed valve located on the tank top to ensure that it is not leaking.
- Check that the DHW water circuit safety valves are in good operating condition.
- In the event of a problem, please contact an engineer or your installer.

## ANNUAL MAINTENANCE



### Essential instructions for the correct operation of the appliance

- The discharge pipe of the safety unit must be open to the outside. If the safety unit drips periodically, it may be due to an expansion problem or clogging of the valve.
- For internal inspections, the hand hole can be used. If there is none, use one of the water connections to insert the appropriate inspection equipment. If necessary, drain the tank before inspection.

The annual maintenance service, performed by an engineer, must include:

- A check of the air bleed valve: the bleeding of air can lead to the need for adding water to the system.
- A check of the primary and DHW circuit pressure gauges.
- The manual activation of the storage water circuit safety valve once a year. This operation will lead to a discharge of hot water.
- A check of the correct operation of valves, taps, control units and accessories that are possibly installed [refer to the manufacturer's instructions if necessary].

## DRAINING



### Essential instruction for the safety of persons and the environment

- The water coming out of the drain valve is very hot and can cause very severe burns. Make sure the area around the hot water flow is clear of people.



### Essential instructions for the electrical safety


- Shut down the external electrical supply of the installation before draining.



### Essential instructions for the correct operation of the installation

- Drain the tank if it is not used in winter and is at risk from exposure to ice. If the primary circuit water contains antifreeze, only the DHW tank must be drained. If the heating circuit does not contain antifreeze, the heating circuit and domestic water must be drained.

## DRAINING THE PRIMARY CIRCUIT (Figure 3)

 Before draining the DHW circuit, isolate the tank and lower the pressure of the primary circuit to 1 bar, in order to prevent the DHW tank from being crushed.

To drain the primary circuit of the hot water heater:

1. Isolate the water primary circuit by closing the stop valves (1).
2. Connect the drain valve (3) to the sewer using a flexible hose.
3. Check that valve (5) is open, then open the drain valve (3) and drain the water from the primary circuit to the drain.
4. Open the tank's air bleed valve (4) to accelerate drainage.
5. Close the drain valve (3), valve (5) and air bleed valve (4) after draining the primary tank.

— Cold water

— Hot water

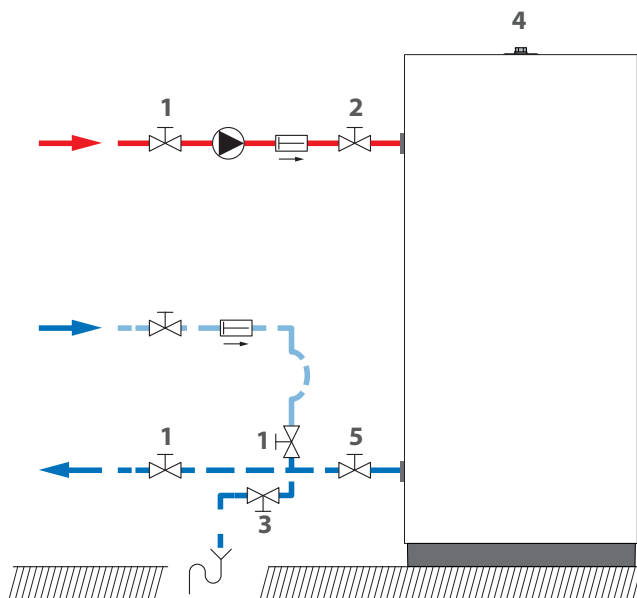


Figure 3

## DRAINING THE DHW TANK (Figure 4)

To drain the hot water heater's DHW tank:

1. Open fully a hot water tap (3) for at least 60 minutes to make sure the DHW tank has cooled down sufficiently.
2. Close the filling valve (1) and the stop valves (5).
3. Connect the drain valve (2) to the sewer using a flexible hose.
4. Open the drain valve (2) and drain the water from the DHW tank to the sewer.
5. To accelerate the tank's drainage, open a hot water tap located in the DHW circuit.
6. Opening the safety group valve (4) might help accelerate drainage.
7. Close the drain valve (2), the hot water tap (3) and safety valve (4) after having drained the DHW tank.

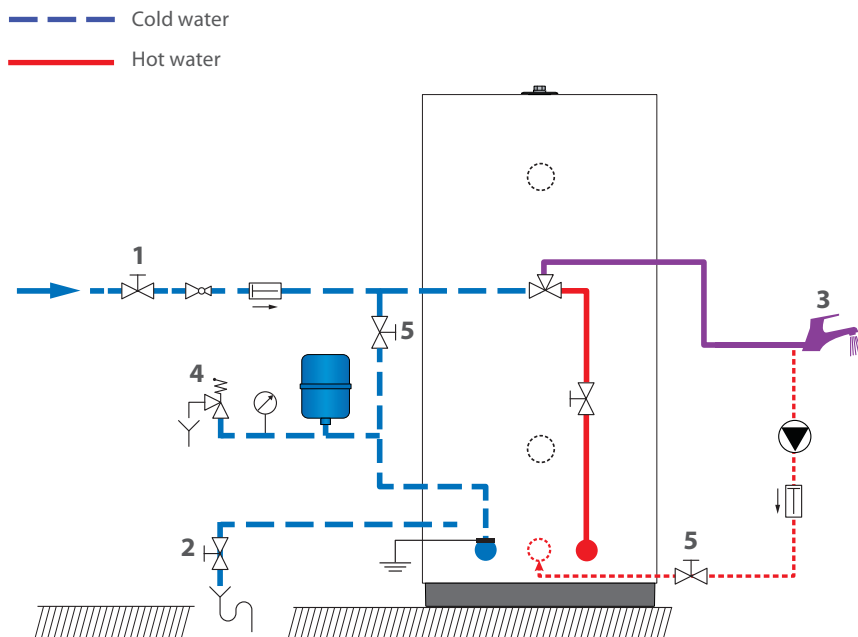


Figure 4

## BRINGING BACK INTO SERVICE AFTER MAINTENANCE

Refer to chapter "Starting Up"