

Smart E

130 - 160 - 210 - 240 - 300

Smart E Plus

210 - 240 - 300

INSTALLATION, OPERATION & MAINTENANCE

Instructions for the User
and the Installer



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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 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. Please check for an updated version of this manual on the website www.acv.com.
- 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

Groupe Atlantic Manufacturing Belgium
Rue Henry Becquerel, 1
7180 Senefels
Belgium



Product Model

- Smart E 130
- Smart E 160
- Smart E 210
- Smart E 240
- Smart E 300
- Smart E Plus 210
- Smart E Plus 240
- Smart E Plus 300

General purpose hot water storage tank



	Smart E				
	130	160	210	240	300
Energy efficiency class	B	B	B	B	B
Standing Loss *	40 W	47 W	54 W	59 W	69 W
Hot water storage volume	130L	161L	203L	242L	293L

	Smart E Plus		
	210	240	300
Energy efficiency class	B	B	B
Standing Loss *	54 W	59 W	69 W
Hot water storage volume	203L	242L	293L

* According to EN12897:2016

RATING PLATE


 Groupo Industrie Manufacturing Belgium
 Rue Nevele Enclos 1
 7180 Seneffe
 Belgium
 www.acv.be
 Made in Belgium

Type: Smart E Plus 210

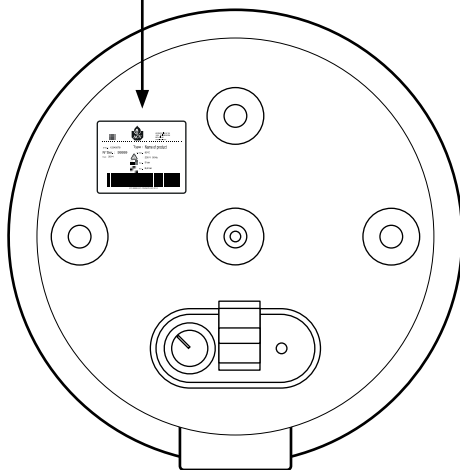
 P/N: 06627301 Prod. Date: 09-09-2022
 S/N: A198063 Year: 2022

Measured acc. to EN 12897:2018

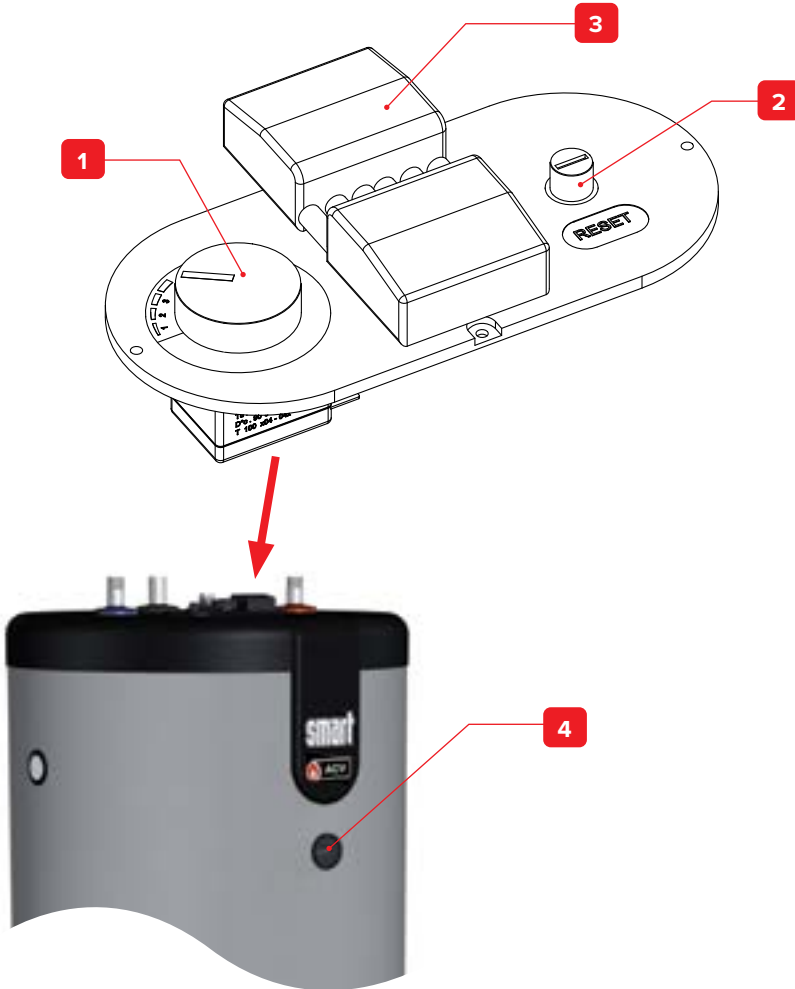
Sanitary Operating Pressure	8.6 bar	UK CA
Primary Operating Pressure	3 bar	
Maximum Design Pressure	10 bar	
Primary Heating Power Input	32 kW	
Primary Flow Rate	1.25 L/s	
Actual Capacity	126 L	
Standing Heat Loss	1.30 kWh/24h	
Maximum Sanitary Temperature	80°C	
Operating Voltage	230 V 50 Hz	



(21) A198063 (81) 06627301 (82) 2022



CONTROL PANEL



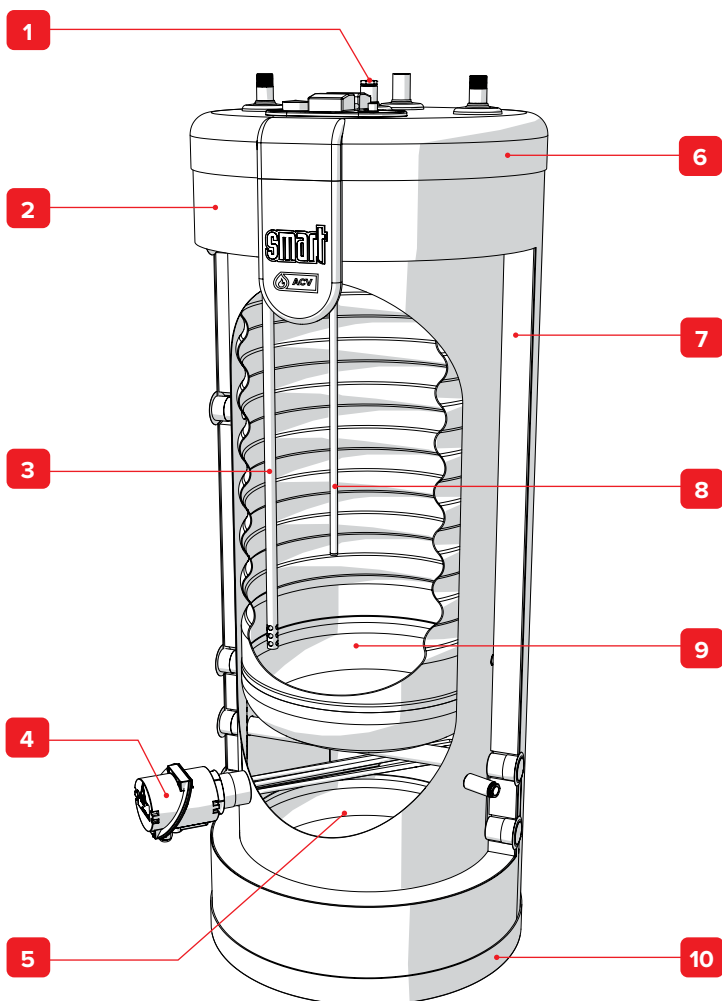
Key :

1. Control thermostat [60/80°C] - to set the domestic hot water (DHW) temperature.
2. Manual reset high limit thermostat - to restart the tank after overheating of the primary circuit.
3. Connection plug - to connect the electrical power supply.
4. Thermometer - indicates the temperature of the DHW.

MODELS : Smart E - Smart E Plus

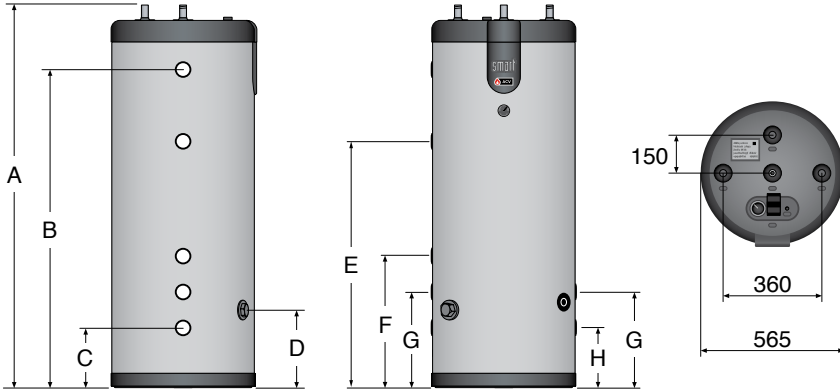
High efficiency storage water tanks, to be installed on the floor. Possibility to heat by transfer fluid or independently with an optional electric resistance.

1. Manual air bleed valve
2. Polypropylene shell
3. Dip tube
4. Electrical heating element (optional)
5. Outer steel tank (primary circuit)
6. Polypropylene top lid
7. Polyurethane foam insulation
8. Dry well
9. Stainless steel tank (DHW)
10. Polypropylene bottom lid



DIMENSIONS

	Smart E 130	Smart E 160	Smart E 210	Smart E 240	Smart E 300	Smart E Plus 210	Smart E Plus 240	Smart E Plus 300
A (mm)	1,025	1,225	1,495	1,740	2,045	1,495	1,740	2050
B (mm)	765	960	1,230	1,485	1,780	1,235	1,480	1785
C (mm)	240	240	240	240	235	240	235	235
D (mm)	240	240	290	290	405	260	260	340
E (mm)	—	—	—	—	—	935	920	1280
F (mm)	—	—	—	—	—	430	430	525
G (mm)	—	—	320	320	405	320	320	380
H (mm)	—	—	240	240	230	240	240	235



MAXIMUM OPERATING CONDITIONS

	Smart E 130	Smart E 160	Smart E / Smart E Plus 210	Smart E / Smart E Plus 240	Smart E / Smart E Plus 300
Max. operating pressure - primary bar	3	3	3	3	3
Max. operating pressure - DHW bar	8.6	8.6	8.6	8.6	8.6
Supply pressure (DHW circuit) bar	6	6	6	6	6
Maximum temperature - heating side °C	90	90	90	90	90
Maximum temperature - DHW side °C	80	80	80	80	80

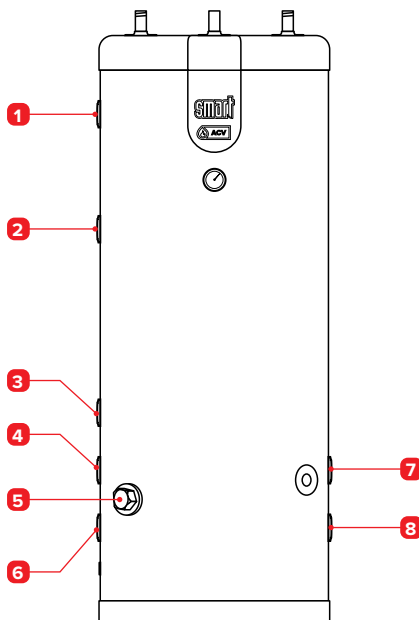
Water quality

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

HEATING CONNECTIONS

Connections dimensions	Smart E / Smart E Plus
Heating connection	Ø 1" [F]
Optional electrical heating element connection	Ø 1"½ [F]

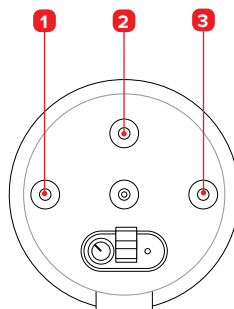
1. Heating flow connection (tank loading)
2. Auxiliary heating return (only Smart E Plus)
3. Auxiliary heating return (only Smart E Plus)
4. Heating flow connection / heat pump (except Smart E 130 - 160)
5. Optional electrical heating element connection
6. Heating return connection / heat pump
7. Flow heating circuit (except Smart E 130 - 160)
8. Return heating circuit (except Smart E 130 - 160)



DOMESTIC HOT WATER CONNECTIONS

Connections dimensions	Smart E / Smart E Plus
Cold / hot water connections	Ø 3/4" [M]
Auxiliary connections	Ø 3/4" [M]

1. Cold water inlet connection
2. Auxiliary connection (DHW)
3. Domestic hot water connection



MAIN CHARACTERISTICS

Main Characteristics		Smart E / Smart E / Smart E /				
		Smart E		Smart E	Smart E	Smart E
		130	160	Plus 210	Plus 240	Plus 300
Total capacity	L	130	161	203	242	293
Primary capacity	L	55	62	77	78	93
DHW capacity	L	75	99	126	164	200
Primary pressure drop*	mbar	26.8	26.8	41.6	47.3	52.4
Heating surface area	m ²	1.03	1.26	1.54	1.94	2.29
Max Design Pressure*	bar	10	10	10	10	10
Reheat Performance - Primary Heating Power Input*	kW	18.4	24.7	32.2	39.2	44.6
Primary flow rate (to achieve Reheat Performance) *	L/sec.	0.7	0.7	1.25	1.25	1.25
Reheat time*	min	10	10	9	9	9
Approx. heating time (with optional heating element) - From 10 to 65°C	3 kW min	80	100	150	180	330
	6 kW min	40	50	75	90	165
Standing Heat Loss*	kWh/24h	0.96	1.13	1.3	1.42	1.66
	W	40	47	54	59	69
Empty Weight	Kg	45	54	66	76	87

* According to EN12897:2016

DOMESTIC HOT WATER PERFORMANCES

DHW performance :			Smart E / Smart E / Smart E /				
			Smart E		Smart E	Smart E	Smart E
Heating source = External boiler connected to tank *			130	160	Plus 210	Plus 240	Plus 300
Peak flow at	40°C [ΔT = 30K]	L/10'	236	321	406	547	800
	60°C [ΔT = 50K]	L/10'	117	161	209	272	370
Constant flow at	40°C [ΔT = 30K]	L/h	658	890	1,132	1,527	2,100
	60°C [ΔT = 50K]	L/h	320	465	576	769	970
Peak flow 1 st hour at	40°C [ΔT = 30K]	L/60'	784	1,063	1,349	1,820	2,360
	60°C [ΔT = 50K]	L/60'	384	549	689	913	1,100
Maximum absorbed power		kW	23	31	39	53	68

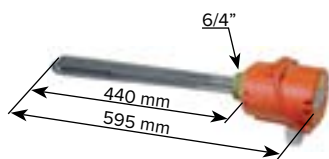
* Conditions : Primary circuit temperature : 85°C, water intake temperature : 10°C

ELECTRICAL CHARACTERISTICS

Main characteristics		Smart E / Smart E Plus
Rated voltage	V [~]	230
Rated frequency	Hz	50

Optional heating element

The models Smart E / Smart E Plus can be installed with a self-controlled heating element with built-in control safety thermostats. The control thermostat of the tank cannot control the heating element. To be mounted with an external box with a switch and a circuit breaker - not included in the delivery.

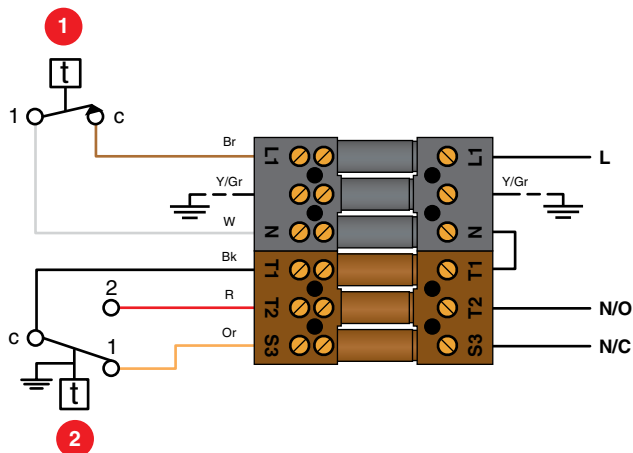


Volt	Amp	Power	Code
1 x 230 V	13	3 kW	10800081
3 x 400 V + N	4.4	3 kW	10800082
1 x 230 V	26	6 kW	10800083
3 x 400 V + N	8.8	6 kW	10800084

Wiring diagram

1. Manual reset high limit thermostat
2. Control thermostat [60/80°C]

Bk. Black
 Br. Brown
 Or. Orange
 R. Red
 W. White
 Y/Gr. Yellow/Green



PACKAGE CONTENTS

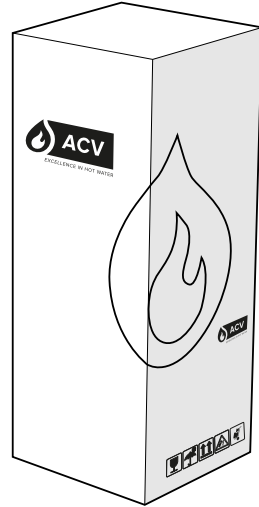
The appliances are delivered assembled, tested and packed.



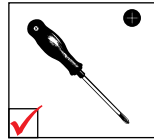
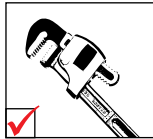
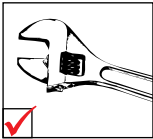
At product reception and after removal of packaging, check the package contents and that the appliance is free of damages.

Contents packaging :

- A domestic hot water tank.
- A technical manual
- One energy label



TOOLS REQUIRED FOR THE INSTALLATION



General remark



Make sure to place the rating plate on the outer casing of the tank, so that it is easily accessible and readable.

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. Use an adjustable earth clamp (see example below) on one of the DHW connections to connect to the earth. Advised copper wire section: 2.5mm².



- 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.
- Make sure that the appliance is connected to the earth.
- 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.

G3 REQUIREMENTS AND GUIDANCE - UK ONLY



Discharge pipe from safety valves

The *Building Regulation G3* requires that any discharge from an unvented system is conveyed to where it is visible, but will not cause danger to persons in or about the building.

The tundish and discharge pipes should be fitted in accordance with the requirements and guidance notes of Building Regulation G3. Please refer to the illustration below and to Building Regulation G3 for more information on pipe sizing and component locations.

For discharge pipe arrangements not covered by G3 Guidance advice should be sought from your local Building Control Officer.

Main characteristics :

- Any discharge pipe connected to the pressure relief devices (Expansion Valve and Temperature/Pressure Relief Valve) must be installed in a continuously downward direction and in a frost free environment.
- Water may drip from the discharge pipe of the pressure relief device.
- This pipe must be left open to the atmosphere.
- The pressure relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked.

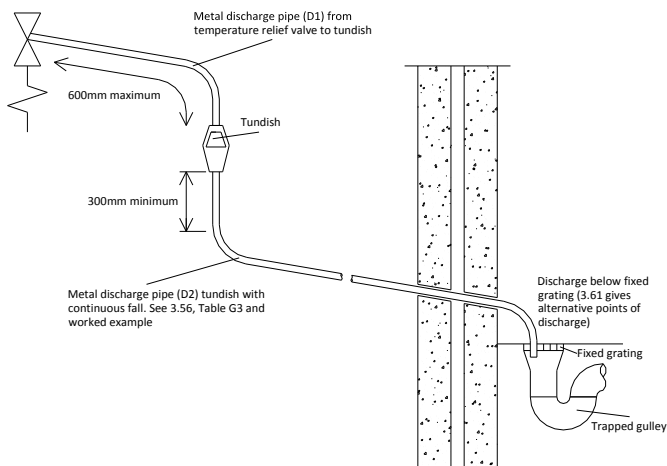


Essential recommendations for safety

- The temperature/pressure relief valve should only be replaced by a competent person.
- No control or safety valves should be tampered with or used for any other purpose.
- The discharge pipe should not be blocked or used for any other purpose.
- The tundish should not be located adjacent to any electrical components



The illustration below is an extract of *The Building Regulation G3*. Please refer to the source document for more information.



G3: Typical discharge pipe arrangement

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 system, 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 system

- 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.

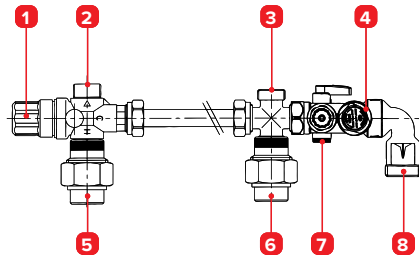


General remarks

- In certain countries the domestic kits must be approved.
- The circuit illustrations are basic principle diagrams only.
- To protect the primary circuit when the stop valves are closed, a safety valve and expansion vessel are imperative between the tank and the stop valves.

Domestic hot water kit (option)

1. Thermostatic mixing valve
2. Mixed water outlet - Ø 3/4" [M]
3. DHW expansion vessel connection - Ø 3/4" [M]
4. Safety unit (7 bar)
5. Outlet hot water tank - Ø 3/4" [F]
6. Inlet cold water tank - Ø 3/4" [F]
7. Cold water inlet - Ø 3/4" [M]
8. Drain connection - Ø 1" [M]

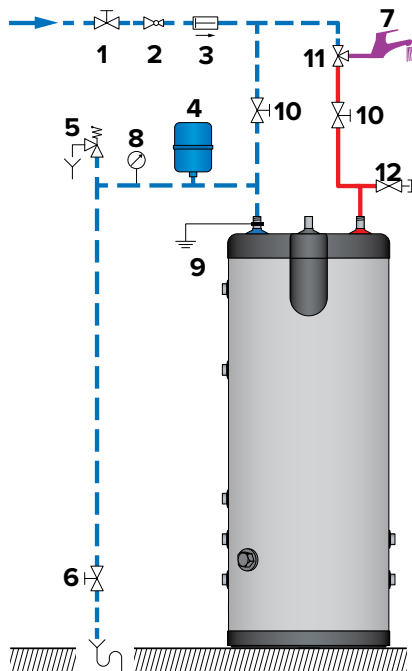


The drain connection **8** must be connected to the sewer system to avoid hot water projections on the top cover of the tank.

CONNECTION TO THE DHW CIRCUIT

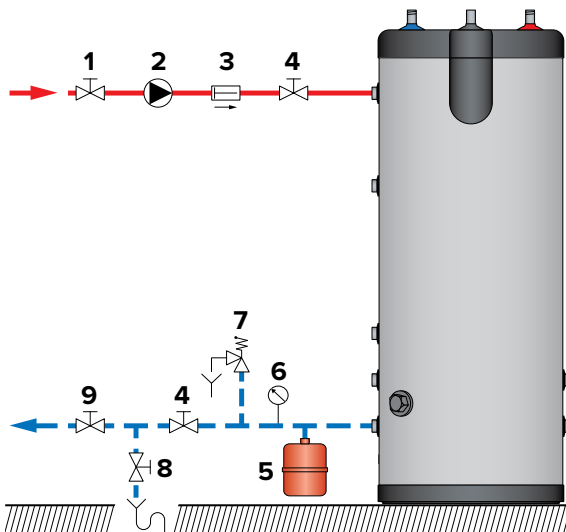
1. Filling valve
2. Pressure reducing valve (set at 4.5 bar)
3. Check valve
4. DHW expansion vessel
5. Safety valve (set at 7 bar)
6. Drain valve
7. Draw-off tap
8. Pressure gauge
9. Grounding
10. Stop valve
11. Thermostatic mixing valve
12. Air vent

— — — Cold water
— — — Hot water

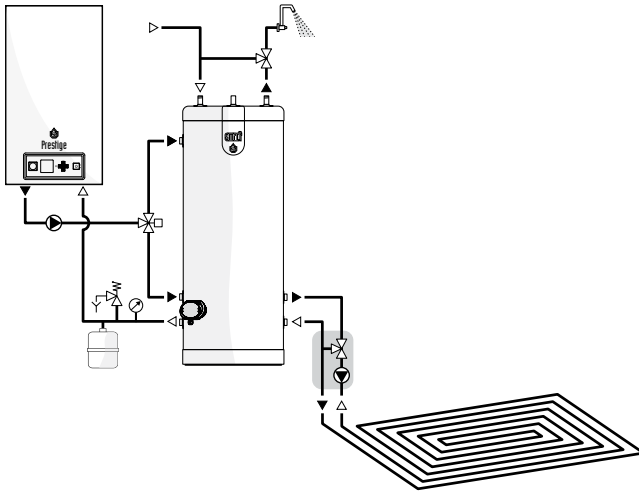


CONNECTION TO THE PRIMARY CIRCUIT

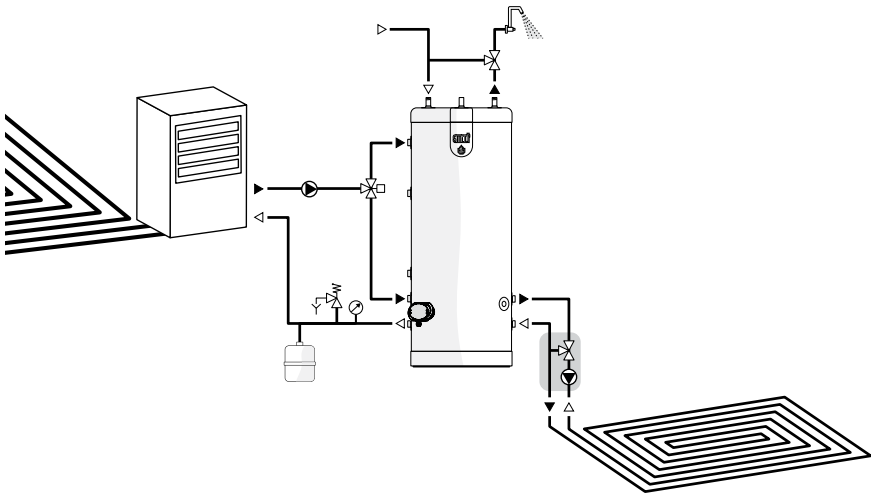
1. Primary circuit filling valve
2. Charging pump
3. Check valve
4. Primary circuit stop valve
5. Expansion vessel
6. Pressure gauge
7. Safety valve (set at 3 bar)
8. Drain valve
9. Stop valve



EXAMPLES OF POSSIBLE COMBINATIONS OF THE SMART E AND SMART E PLUS



Smart E 210 / 240 / 300 combined with a boiler and floor heating system.

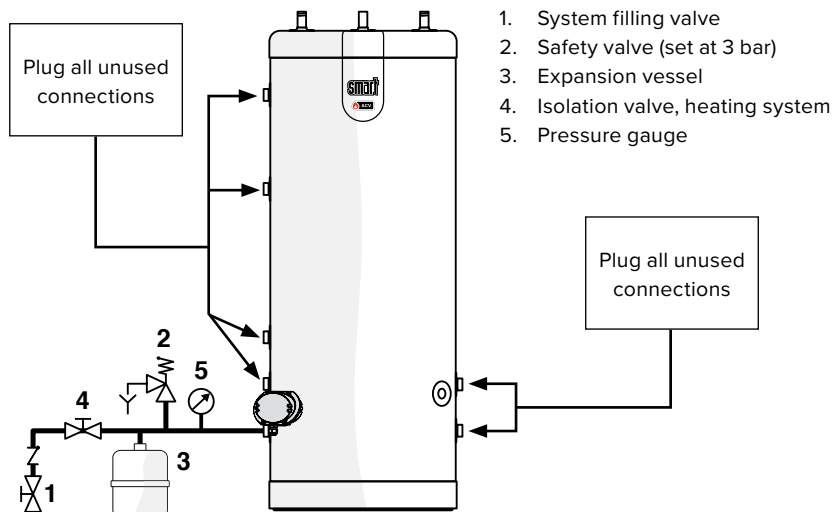


Smart E Plus combined with a heat pump and floor heating system.

TANK USED AS ELECTRIC DHW TANK ONLY



Do not power the heating element if the outside tank is not filled and bled.



Essential instruction for the correct operation of the installation

- Connections must be carried out in accordance with applicable standards and regulations.

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 instruction for the correct operation of the system

- 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 system. It enables to bleed the air from the system.
 2. Open the filling valve (1) and the stop valves (3) to fill the DHW tank.
 3. Close the hot water tap (2), after the water flow has stabilised and the air has been completely evacuated.
 4. Check all the connections of the system for leaks.

FILLING THE PRIMARY CIRCUIT (Figure 2)



General remark

- If the tank is used within a heating system, refer to the heating boiler manual.
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) located on the top of the hot water tank.
 4. Connect the filling pipe to the valve (3) and open the valve to start filling the heating circuit.
 5. Once the system is bled from air, close the air bleed valve (4). Make sure the air bleed valve is tight.
 6. Once the desired pressure is reached, close the valve (3) and disconnect the filling pipe from the valve (3).

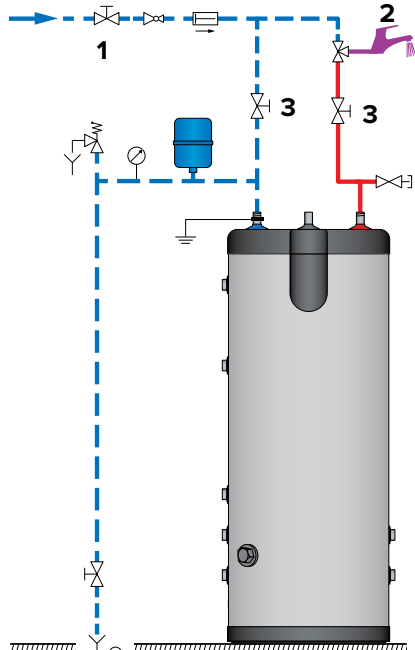


Figure 1

--- Cold water
--- Hot water

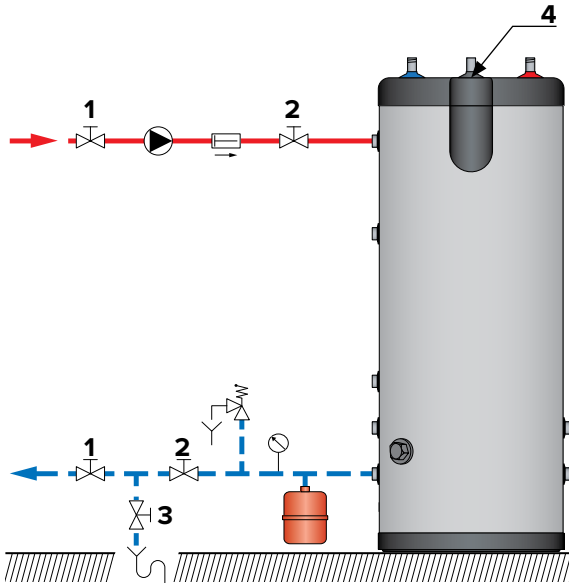
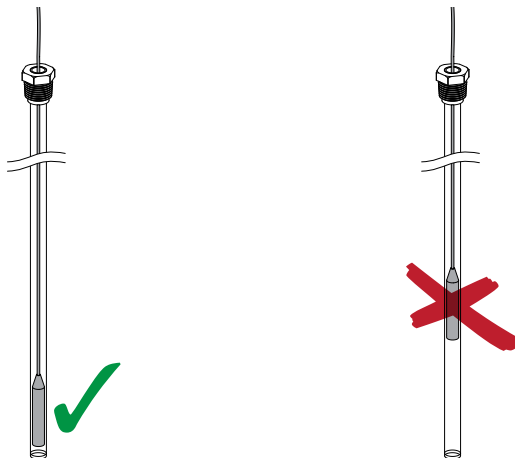


Figure 2

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.
- Check that the sensor of the thermostat is correctly positioned in the dry well (see figures below).



STARTING UP

If the tank is used as electric DHW tank only:

1. Put the electric plug into the mains socket
2. Adjust the required temperature using the control thermostat integrated in the electrical resistance.

If the tank is used within a heating installation:



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

1. Adjust the required temperature using the control thermostat of the tank.

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 instruction for the electrical safety

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



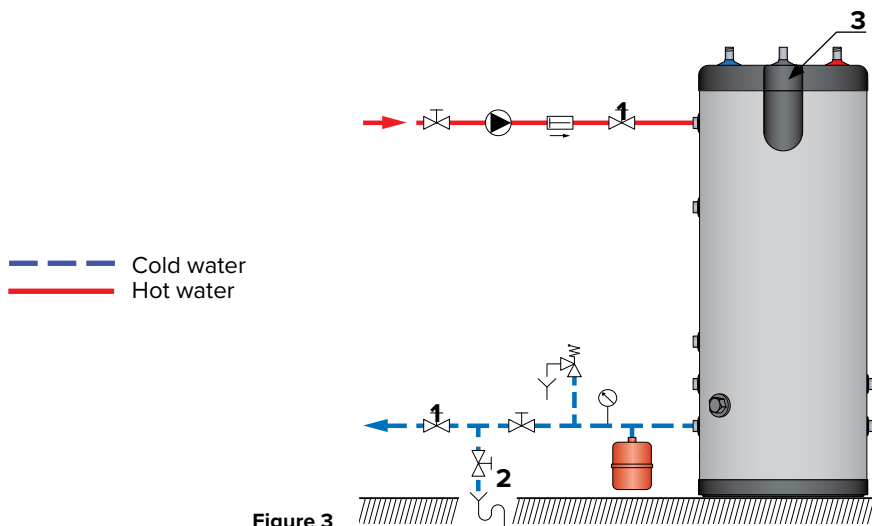
Essential instructions for the correct operation of the system

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

DRAINING THE PRIMARY CIRCUIT (Figure 3)

To drain the primary circuit of the hot water heater:

1. Stop the charging pump.
2. Isolate the primary circuit by closing the stop valves (1).
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 primary circuit to the drain.
5. Open the tank's air bleed valve (3) to accelerate drainage.
6. Close the drain valve (2) and air bleed valve (3) after draining the tank.



DRAINING THE DHW TANK (Figure 4)

To drain the hot water heater's DHW tank:

1. Open fully the 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 valve (4).
3. Connect the drain valve (2) to the sewer using a flexible hose.
4. Open the drain valve (2) and the air vent (5) to drain the water from the DHW tank to the sewer.
5. Close the drain valve (2) and the air vent (5) after having drained the DHW tank.

— — — Cold water
— — — Hot water

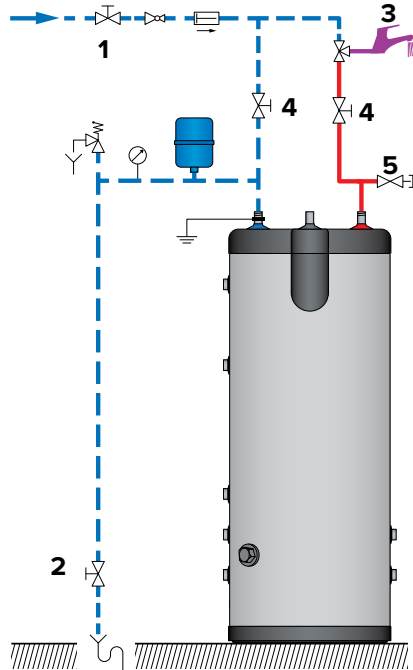


Figure 4

BRINGING BACK INTO SERVICE AFTER MAINTENANCE

Refer to chapter "Starting up", page 25

TROUBLESHOOTING

What to do if the domestic hot water is not heated anymore?

1	Check the power supply, when the tank operates as electric DHW tank only (electrical resistance activated).				
2	Check the proper operation of the boiler and the control thermostat of the tank.				
3	Check if the charging pump works properly and replace if necessary				
4	Check the safety thermostat on the tank and/or the electric heating element and reset or replace if necessary.				
5	Check the electric heating element and replace if necessary.				
Models					
Smart E / Smart E Plus		●	●	●	
Smart E / Smart E Plus + electric heating element		●	●	●	●



Handwriting practice lines consisting of multiple horizontal dotted lines for writing.



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