



SOLAR POWERED TANKS

EBS Solar 200

EBS Solar 300



CHAUDIÈRES

la chaleur haute fidélité



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Safety instructions

Installation, modifications

- ▶ The installation and any modifications made to the water tank must only be carried out by an approved installer.
- ▶ The tank must only be used to heat water for domestic purposes

Operation

- ▶ Respect these installation instructions to ensure flawless operation.
- ▶ **Never block the safety valve.**
During the heating phase, water may escape from the safety valve.

Statutory conditions for installation and maintenance in residential buildings

- ▶ **Decree of 23 June 1978 and modifying decree of 30 November 2005**
Heating instructions, hot water supply, layout and safety rules. In particular, ensure that the maximum temperature for distributing hot water is respected.
- ▶ **Decree** from the Ministry of Health relating to protection of water for human consumption. In particular, the need to place a disconnection system on the installation's filling system and to use materials and accessories that benefit from a sanitary conformity certificate for domestic water distribution circuits.

Maintenance

- ▶ **We strongly recommend:** signing a contract with an approved installer. Having the boiler and tank serviced every year.
- ▶ Only use original spare parts!

Meaning of the symbols



The **indications relating to safety** are written on a grey background and are preceded by a warning triangle.

The following words indicate the degree of danger run if the instructions given to avoid this risk are not followed.

- **Caution** : risk of light material damage.
- **Warning** : risk of light physical damage or serious material damage.
- **Danger** : risk of serious physical injury that may represent a mortal danger.



In the text, the information is preceded by the signal opposite. It is contained inside horizontal lines.

The effects that result from the application of this information present no risk of damaging the appliance or endangering the user.

1 Indications concerning the appliance

1.1 Description

EBS Solar tanks are designed to be used in combination with solar sensors and to provide support to a boiler.

The heat output capacity recommended for the boiler is:

tank	Heat output capacity
EBS SOLAR 200	13 to 50 kW
EBS SOLAR 300	13 to 50 kW

Nevertheless, the maximum performances may only be achieved with a boiler with maximum power at least equal to that of the exchanger.

In its casing are:

- a stainless steel tank comprising:
 - two stainless steel coiled pipes:
 - an upper exchanger to heat water using a boiler.
 - a lower exchanger to heat water via solar sensors.
 - an access flap with a pocket for a water overheating safety thermostat and for a domestic hot water temperature adjustment thermostat.
- a thermometer,
- a domestic hot water temperature adjustment thermostat,
- a water overheating safety thermostat (90°C),
- a 7 bar P&T valve,
- an upper pocket for hot water temperature sensor (CTN) with connector to a boiler with a CTN connection (for example electronic regulation - 5 kW domestic hot water sensor: Kromshroder - for FCX boilers - 10 kW domestic hot water sensor: Siemens for THRi.C boilers).
- a lower pocket for the solar tank hot water sensor.
- quality thermal insulation to guarantee very low heat loss:
 - Soft foam coating encased in PVC sheeting with a zip at the back.
 - Polystyrene insulation that can be easily removed.
- 2 insulated tubes and 2 seals, 2 screws and 2 washers to install the transfer control box (delivered as an option) on the tank.
- 4 copper bends with 1" nut
- 1 copper bend with 3/4" nut
- a aperture for the immersion heater

1.2 Conforming use

The accessories must only be used for the installations described below.

Any other use does not conform to the appliances' purpose. Our company declines any responsibility for any damage that may result.

1.3 Operation

- If there is not enough sun, the solar heating (lower exchanger) will not be enough to heat the tank. In this case, the boiler will heat the water using the upper exchanger.
Thanks to stratification, in this case only the upper part is heated.
- During drawing, when the temperature in the upper hot water sensor (T_3) falls from 8 to 10 °C, the boiler is activated and heats the water using the upper exchanger.
- During short draws which follow each other quickly, the adjusted hot water temperature may be exceeded and the heat may be stored in the upper part of the tank. This effect is due to the system and cannot be eliminated.
 - The integrated thermometer indicates the temperature in the upper part of the tank. Due to the natural heat storage that occurs in the tank, the hot water temperature set must be considered as an average. The display of the temperature and the hot water temperature regulator switching points for the boiler circuit and the solar circuit are therefore not identical.

1.4 Options

- Immersion heater kit.
- Transfer control box (GTS) with integrated classic GEM control.
- Transfer control box (GTS) without integrated control.
- Electronic solar regulator (basic, classic or Top GEM).
- 5 kW (T_3) hot water sensor for connection to an FCX (condensation oil) type boiler.
- 10 kW (T_3) hot water sensor with selective valve kit for connection to a THRi type boiler C (Condensation gas).
- Solar clip-in kit integrated into the THRi (REG 152) allowing the control of domestic hot water production by a solar panel for installations equipped with a solar tank with two exchangers.

1.5 Construction and dimension dimensions

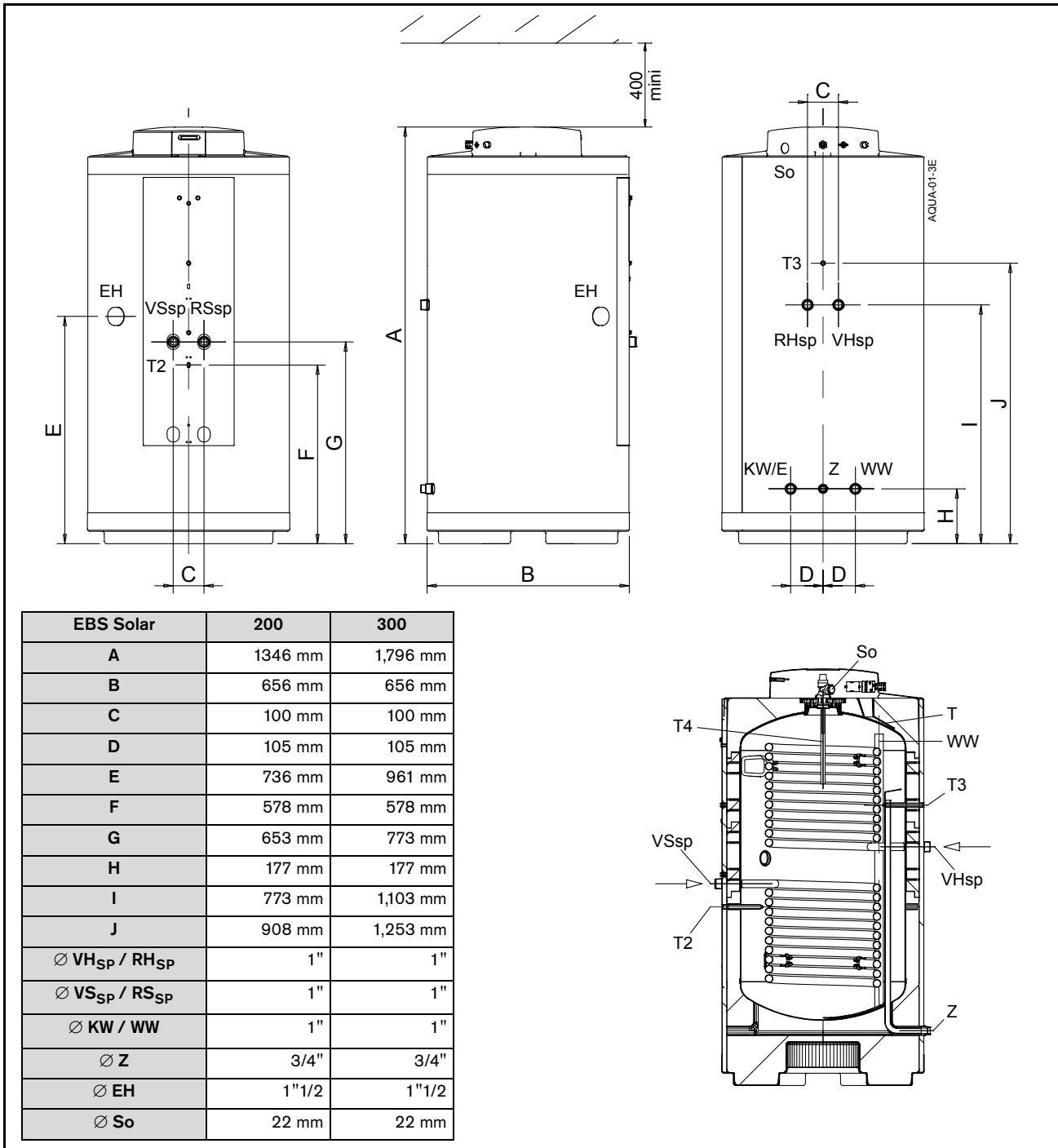


Fig. 1

Connection legend figure 1:

- E** Drain
- EH** Sleeve for electrical resistance (option)
- KW** Domestic cold water intake
- WW** Hot water outlet
- VH_{SP}** Primary intake - (boiler to tank) (upper exchanger)
- VS_{SP}** Primary intake - (solar sensor to tank) (lower exchanger)
- RH_{SP}** Primary output - (tank to boiler) (upper exchanger)
- RS_{SP}** Primary outlet - (tank to solar sensor) (lower exchanger)

- Z** Domestic hot water recycling
- T** Thermometer pocket
- T₂** Domestic hot water temperature sensor pocket - solar
- T₃** Domestic hot water temperature sensor pocket - heating (CTN)
- T₄** Pocket for a water overheating safety thermostat and for a domestic hot water temperature adjustment thermostat.
- So** Safety valve outlet

1.6 Technical characteristics

Type of tank		EBS SOLAR 200	EBS SOLAR 300
General characteristics of the tank:			
WRC number		0210132	
Total water capacity	litre	200	300
Maximum storage temperature in boiler or solar mode	°C	80	
Tank cooling constant (Cr) according to EN 625	Wh/24h.l.°C	0,189	0,146
Maintenance consumption	kWh/24h	1,705	1,99
Tank heat loss (ΔT 45K)	W	71,1	82,8
Domestic hot water service pressure	bar	6	
Max boiler and solar exchanger service pressure	bar	10	
Empty weight (without packaging)	kg	50	64,5
Packaged weight	kg	64	82
Upper exchanger - boiler side :			
Total capacity domestic hot water heated by the upper exchanger	litre	85	111
Primary capacity	litre	5,2	5,2
Exchange surface	dm ²	98,5	98,5
Exchanger power for:			
- $t_{dep} = 90^{\circ}\text{C}$ and $t_{ecs} = 45^{\circ}\text{C}$	kW	43,0	43,0
- $t_{dep} = 85^{\circ}\text{C}$ and $t_{ecs} = 60^{\circ}\text{C}$	kW	26,7	26,7
Continuous flow rate for :			
- $t_{dep} = 90^{\circ}\text{C}$ and $t_{ecs} = 45^{\circ}\text{C}$	l/h	1059	1059
- $t_{dep} = 85^{\circ}\text{C}$ and $t_{ecs} = 60^{\circ}\text{C}$	l/h	460	460
Primary flow rate	l/h	1853	1853
Loss of exchanger load at max power	mbar	130	130
Lower exchanger - solar side :			
Total capacity domestic hot water heated by the lower exchanger	litre	189	288
Primary capacity	litre	5,2	7,5
Exchange surface	dm ²	98,5	141,7
Exchanger power for - $t_{dep} = 90^{\circ}\text{C}$ and $t_{ecs} = 45^{\circ}\text{C}$	kW	37,8	51,0
Primary flow rate	l/h	950	1040
Loss of exchanger load at max power	mbar	38	76
Electrical resistance :			
Electrical power maxi*	W	3000	
Volume heated by electrical resistance	litre	95	145
Time for temperature to rise to 65°C	hour	3	4,6
Electrical power supply / frequency		230 V - 50 Hz	
Intensity absorbed	A	8,7	8,7
Protection index		IP 44	

t_{sto} = Storage temperature
 t_{dep} = Primary start temperature
 t_{aef} = Cold water intake temperature (10°C)
 t_{ecs} = Domestic hot water intake temperature

* The electrical power may be reduced to 2000 W or 1000 W if necessary. This choice is made by the installer during electrical connection - refer to the immersion heater kit's manual.



The heat loss stated concerns the tank alone without its connection pipes. You must insulate these thermally with care to maintain as little heat loss as possible on the heating system

Continuous flow rate :

- The continuous flow rate indicated refers to a primary water start temperature of 90°C, an output temperature of 45°C and a cold water intake temperature of 10°C for a maximum load power (heat generator power at least equal to the tank's exchange surface power).
- If the indications concerning the primary flow rate or the primary load power/start temperature are not respected, the performances are reduced.

Loss of load at continuous flow rate

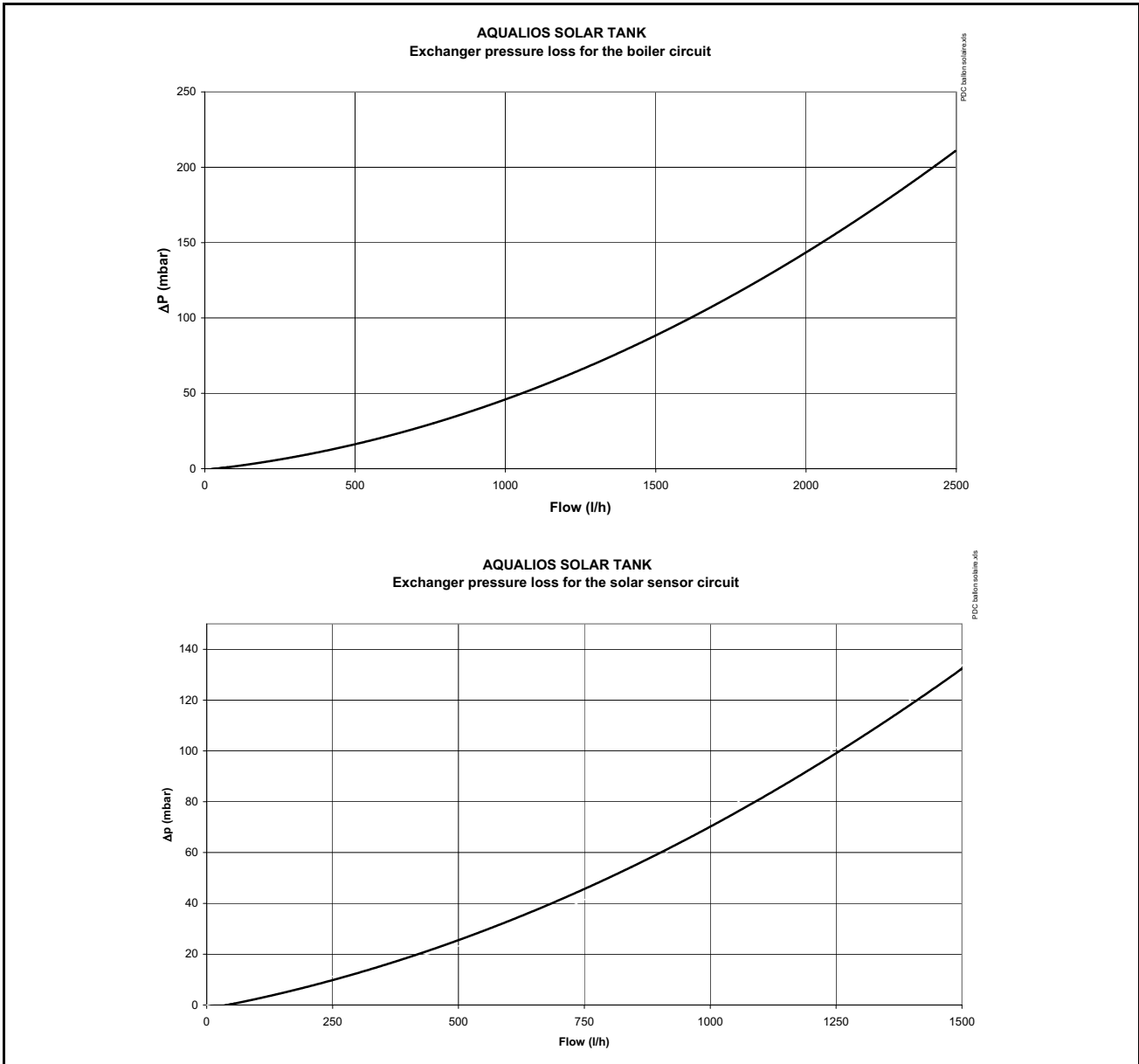


Fig. 2 Exchanger (water)



To calculate the loss of pressure in the solar circuit:

- ▶ take account of the influence of the anti-freeze used and the manufacturer's indications.

Example :

in the case of a water/propylene-glycol mix in proportions of 55/45 (except freezing up to around -30°C), the pressure loss is around 1.2 times greater than that of pure water.



The pressure loss caused on the network side is not taken into account in the diagram.

1.7 Domestic hot water production

Models	Power exchanged at ΔT 30 °K kW	Continuous flow rate at 40 °C (*3) l/min	Specific flow rate (*1) l/min	Time to heat to 60 °C (*2) min	Load time at 60 °C min	Max drawable volume at 40 °C in 10 minutes	Max drawable volume at 40 °C in 1 hour
						storage 65 °C	
EBS Solar 200 associated with boilers							
ZEM 5-25 C	28,4	13,6	19,0	8	14	190	869
THRi 2-17 C	16,9	8,1	13,9	13	24	139	543
THRi 5-25 C	28,1	13,4	18,8	8	14	188	861
THRi 10-50 C	35,0	16,7	22,1	7	12	221	1059
FCX 22 C	22,3	10,7	16,1	10	18	161	694
FCX 30 C	30,5	14,6	20,0	7	13	200	929
EBS Solar 300 associated with boilers							
ZEM 5-25 C	28,4	13,6	20,6	10	19	206	886
THRi 2-17 C	16,9	8,1	17,7	18	31	181	586
THRi 5-25 C	28,1	13,4	20,5	11	19	205	877
THRi 10-50 C	35,0	16,7	23,8	8	15	238	1075
FCX 22 C	22,3	10,7	18,1	13	24	181	715
FCX 30 C	30,5	14,6	21,6	10	17	216	946

Cold water temperature = 10 °C

Primary temperature = 80 °C

(*1) : according to EN 625

(*2) : Heating time after drawing corresponding to the specific flow rate

(*3) : Drawing flow rate to be adjusted on the safety control box during commissioning.

2 Installation

2.1 Current regulations

Respect the recommendations, directives and standards that relate to installation and service:

- EN 12976
- EN 12977
- Local recommendations.

These rules are specific to the buildings where the appliances are installed.

The appliance must be installed and maintained by a qualified professional, according to current statutory texts and industry standards.

The tanks must be installed by a qualified unvented installer in accordance with G3 Building Regulations.

2.2 Installation location

To install the tank in a damp environment:

- ▶ place the tank on a base.

2.3 Assembly

Recommendations:

- ▶ To avoid any faults due to trapped air: provide an **effective air elimination system** (for example a bleed) at the highest point between the tank and the solar circuit.
- ▶ To avoid heat loss through looping : fit holding flaps or anti-thermosiphon flaps with anti-return valve in all the tank circuits.

-ou-

Install the tank connection conduits so that an independent looping is not possible.

- ▶ Check that the pressure in the primary circuit does not exceed 10 bars.



- ▶ When required by Building control or local bylaws, a thermostatic mixer must be placed on the domestic hot water distribution to **limit the temperature at the drawing point (50 °C)**.

2.3.1 EBS Solar WRC approval amendment

NOTE TO INSTALLER :

Please read fully prior to commencing installation. Leave Manual with householder after installation.

2.3.1.1 Technical information

MODELS	EBS Solar	
	200	300
Operating Pressure	3.5 Bar	
Max Water Supply Pressure	12 Bar	
Exp Relief Valve Setting	6 Bar	
Nominal Storage Capacity (litres)	200	300
Pressure & temperature Relief Valve	7 Bar/90°C	
Expansion Vessel Charge Pressure	3.5 Bar	
Weight without water (kg)	64	82
Connections		
Cold Water Inlet	1"	
Domestic Hot Water Flow	1"	
Hot Water Secondary Returns	3/4"	
Primary Flow from Boiler	1"	
Primary Return to Boiler	1"	

Table 1:

2.3.1.2 Maintenance



Before commencing any maintenance work, isolate all mains electricity supplies to the system

The tank and Cold Water Supply Kit should be inspected annually.

- ▶ Close mains supply cock.
- ▶ Drain down hot water system including the tank (Use drain cock and/or the expansion relief valve).
- ▶ Check pressure in expansion vessel(s) and recharge to 3.5 Bar, if necessary.
- ▶ Remove filter in line strainer. Clean or replace. Reassemble. Refill system.
- ▶ Check all pipework for leaks.
- ▶ Open P&T valve and check that it discharges water.
- ▶ Open expansion relief valve and check that it discharges water.
- ▶ Check operation of all controls.

Every two years, the following additional maintenance should also be carried out after draining down.

- ▶ Remove Electric Immersion Heater cover (if fitted).
- ▶ Disconnect wiring to Immersion Heater Boss (if fitted).
- ▶ Undo securing nuts on heater flange and remove flange complete with Electric Immersion Heater.
- ▶ Inspect heater elements and de-scale if necessary.
- ▶ Inspect interior of tank and clean out any debris.
- ▶ Re-assemble using a new gasket on the flange and tighten bolts.
- ▶ Re-connect Immersion Heater wiring.
- ▶ Refill system and check for leaks around flange.
- ▶ Replace Electric Immersion Heater cover.
- ▶ Carry out annual inspection as above.

2.3.1.3 The opening temperature of the P&T valve is 90 °C

The position of the tundish shall be visible to the occupants and shall be positioned away from any electrical devices.

See fig. 5- page 12 for tundish position and discharge pipe.

The connection details are shown on fig. 5- page 12. The relief valve connections should not be altered or used for any other type of connection.

Details of the discharge pipe and installation requirements can be seen on drawing no. fig. 5- page 12 and Table 2, Page 11.

Before connecting pipework, fit the Siemens safety shut off zone valve to the primary return outlet.

The incoming cold water supply pipe must be fitted with a stopcock before the cold water unvented kit. A drain cock must be fitted between the unvented kit and the tank.

The unit should be carried into position within its packaging and on its pallet.

Once in position, the pallet should be removed.

The tank should be installed on a floor designed to take the weight of the tank when full of water. Each litre of water weighs 1 Kg. The actual water content of each tank should be added to the tank weight to obtain the total weight of the tank when full to ascertain if the floor is of suitable construction.

300mm clearance should be left on the top of the tank for access to the anode and inspection door.

No valve shall be fitted between the tank and the expansion valve.

No other immersion, other than our EBS Solar Immersion Heater should be used on our EBS Solar cylinders.

The EBS Solar range of cylinders is ideally suited for connection to our Geminox boilers to match the coil ratings. However, connection to non - Geminox boilers can be carried out if required. Please contact our Technical Department for installation assistance on + 44 (0)1372 722277.

To flush through the tank, simply open inspection door, disconnect unvented kit and flush through the tank to the drain by using a hose through the inspection door.

	100	300
Results of supply temperature 1-50 - 220	19 mins	26 mins
Results of the reheat time 1-50 - 222	13 mins	16 mins

- ▶ This unit is only to be used with our oil or gas boiler with a thermostatic control. It should not be used with a solid fuel appliance.
- ▶ Please note that if a secondary circuit is used then an additional expansion vessel may be required.
- ▶ In hard water areas you should not exceed 60°C as a store temperature.

Commissioning

- ▶ Check all pipe connections for tightness. Close drain cock.
- ▶ Check pressure(s) in expansion vessel(s) 3.5 bar. Recharge if necessary.
- ▶ Fill primary circuits, vent and check for leaks.
- ▶ Chock open P&T valve on top of tank (by fitting manual lever).
- ▶ Open stopcock and fill tank with water until it freely discharges through the outlet from the P & T valve.
- ▶ Remove chock and close P&T valve.
- ▶ Test delivery of water from tank by opening and running all taps, both hot and cold water and any other water discharges points (showers etc).
- ▶ Check operation of expansion relief valve on Cold Water Supply kit by lifting manual release lever and discharging water.
- ▶ Check all pipework and connections for leaks

Heating of tank by the boiler

Check any programmers are calling for HOT WATER. Set hot water thermostat on tank to Maximum. Run heating boiler until the temperature gauge on the cylinder indicates approximately 50°C. Turn down the hot water thermostat and check that motorised valve closes and loading pump stops.

Check that the boiler shuts down. If the boiler is also feeding a heating circuit, make sure that there is NO demand from the heating circuit (Room Stat,

Programmer, Zone Valve etc).

Heating of tank from electric immersion heater

- ▶ Switch on the power supply to the Electric Immersion Heater.
- ▶ Turn Electric Heater thermostat up and down to check that heater is turning on and off correctly.
- ▶ Select the desired hot water temperature.

The total fuse rating for the immersion heater is 13.04A, a suitable protective device should be selected. The boiler should be protected by a fused spur with a cartridge fuse of no higher than 3A.

Please Note

The Geminox range of products are designed to be used in installations where the complete system is supplied by Geminox therefore when used in conjunction with other products some slight alterations to the Electrical installation may have to be made.

Important Notice

When the system installed is "Unvented" controlling the Zone valve by way of the cylinder and overheat thermostats, follow the steps on section 2.3.1.3 page 9 in this instance the zone valve is called the "Safety shut off zone valve", the valve is supplied with the Unvented Kit and must be installed.

The safety shut off zone valve is an important safety device of the unvented EBS Solar tank and must be installed. Fit the valve to the return connection of the tank connection No. 4. The valve is to be controlled via the brown wire of the tank top cable. Please find the attached photos and fig. 15 how to connect the "Safety shut off zone valve".

Safety Discharge Pipe from Tundish

See Table 2 below for sizing details of safety discharge pipe from our tundish.

Worked example :

The example below is for a G 1/2 temperature relief valve with a discharge pipe (D2) having 4 no. elbows and length of 7m from the tundish to the point of discharge.

From table 2

Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G 1/2 temperature relief valve is 9.0m.

Subtract the resistance for 4 no. 22mm elbows at 0.8m each = 3.2m

Therefore, the maximum permitted length equates to : 5.8m

5.8m is less than the actual length of 7m, therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28mm pipe (D2) from a G1/2 temperature relief valve equates to 18m.

Subtract the resistance for 4 no.28mm elbows at 1.0m each = 4m

Therefore the maximum permitted length equates to : 14m

As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

Sizing of copper discharge pipe D2 for common temperature relief valve outlet sizes				
Valve Outlet size	Minimum Size of Discharge Pipe D1	Minimum Size of Discharge Pipe D2 from tundish	Maximum resistant allowed, expressed as a length of straight pipe (ie. no elbows or bends)	Resistance created by each elbow or bend
G 1/2	15mm	22mm 28mm 35mm	Up to 9m Up to 18m Up to 27m	0.8m 1.0m 1.4m
G 3 /4	22mm	28mm 35mm 42mm	Up to 9m Up to 18m Up to 27m	1.0m 1.4m 1.7m

Table 2:

2.3.2 Hydraulic connections for cylinders

When the system installed is "Unvented" it is necessary to fit the "unvented kit" on the cold water supply. The "Unvented kit" contains pressure reducing valve, non-return valve, pressure relief valve and optional use balanced cold water connector. It is good practice to fit the "unvented kit" above the top level of the EBS Solar tank. In this way if it is required to replace the "unvented kit" it is not necessary to drain all tank. Please find below how to install the "unvented kit"

2.3.2.1 1" Unvented kit for EBS Solar cylinders

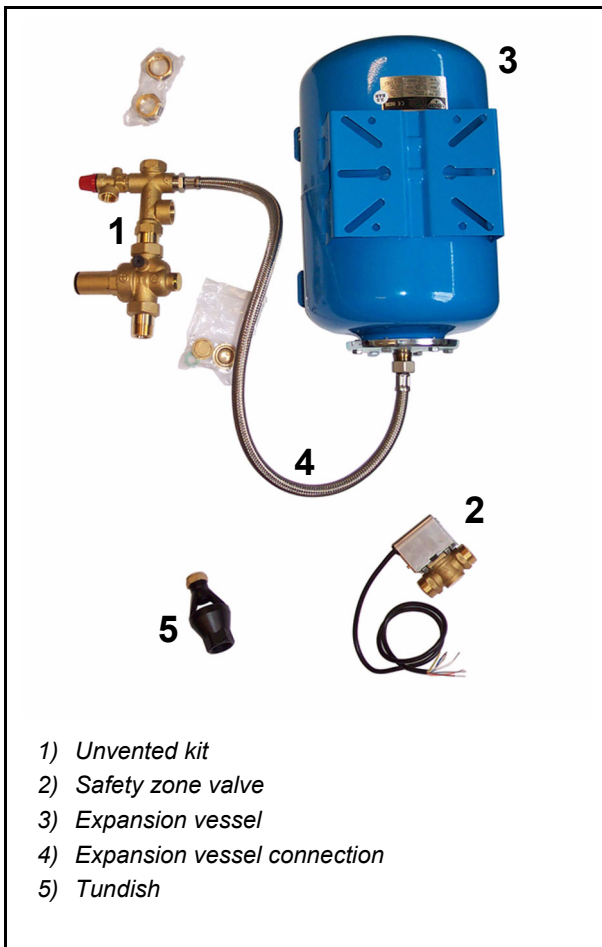


Fig. 3

2.3.2.2 1" Unvented kit for EBS Solar cylinders

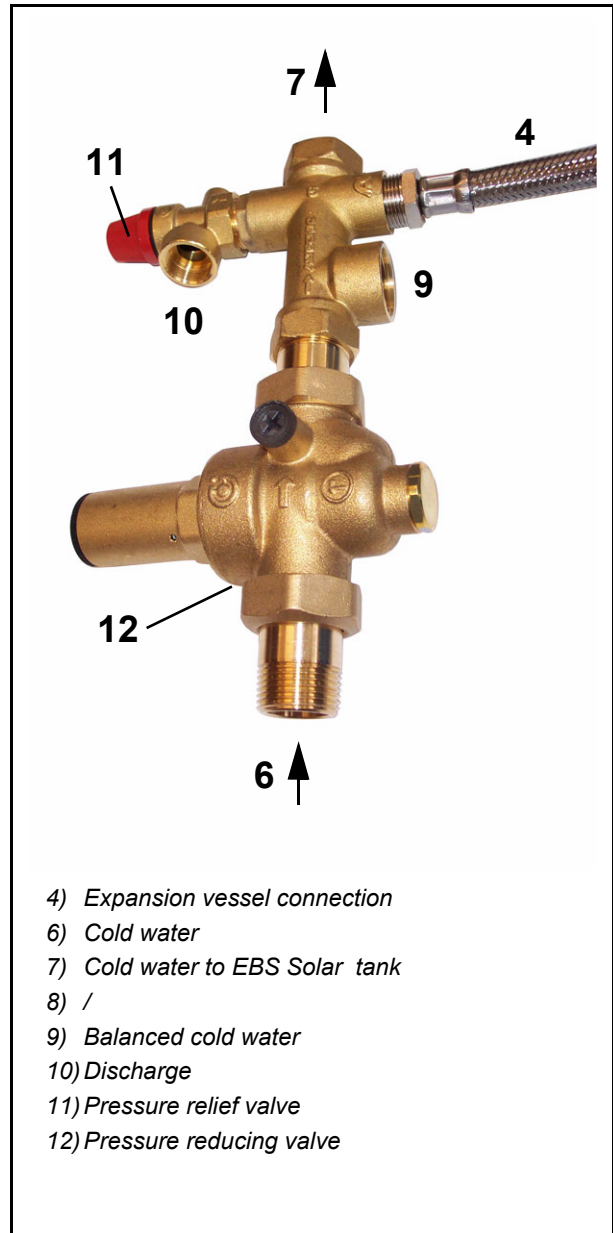
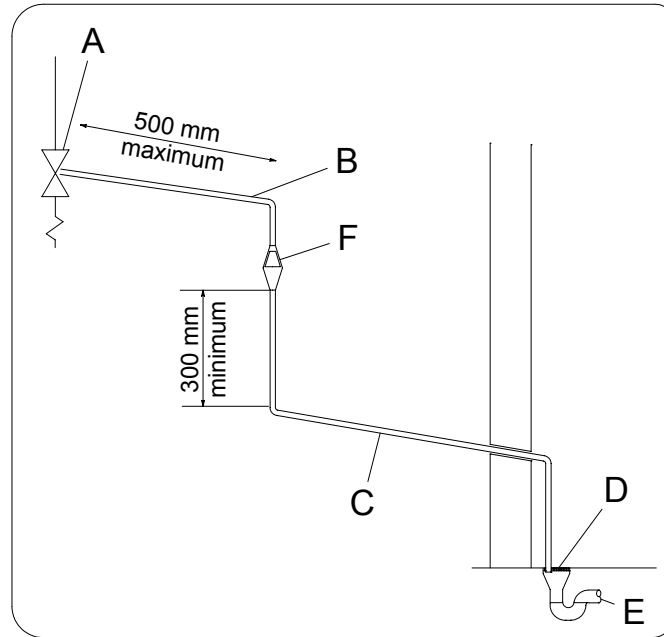


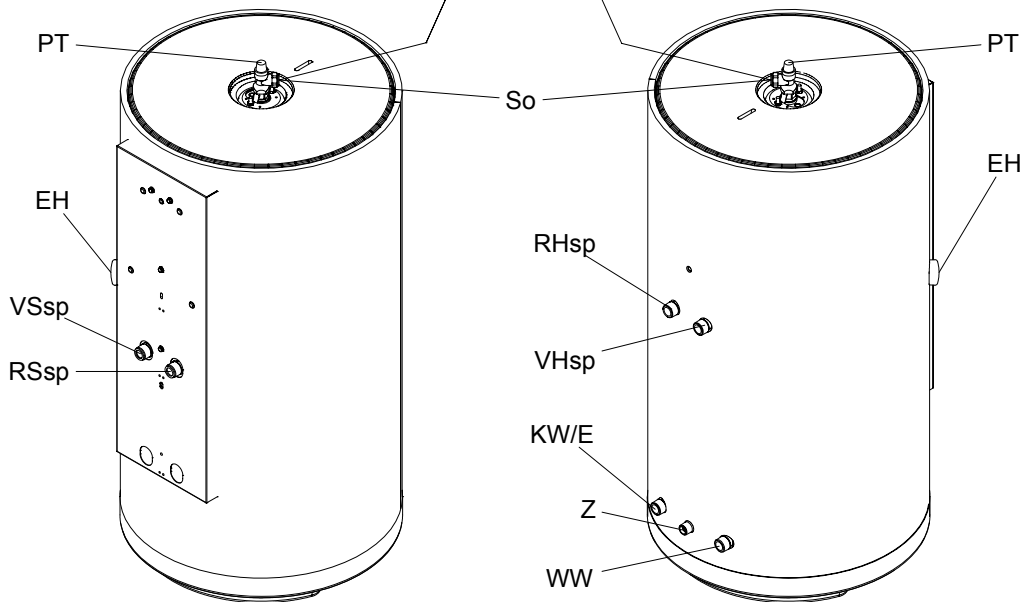
Fig. 4



This drawing has to be read in conjunction with the full installation manuals supplied



AGU-13-3E



- E** Drain
- EH** Sleeve for electrical resistance (option)
- KW** Domestic cold water intake
- WW** Hot water outlet
- VH_{SP}** Primary intake - (boiler to tank) (upper exchanger)
- VS_{SP}** Primary intake - (solar sensor to tank) (lower exchanger)
- RH_{SP}** Primary output - (tank to boiler) (upper exchanger)
- RS_{SP}** Primary outlet - (tank to solar sensor) (lower exchanger)

- Z** Domestic hot water recycling
- PT** P&T valve
- So** P&T valve drain
- A)** Safety device (e.g. temperature relief valve)
- B)** Metal discharge pipe (D1) from temperature relief valve to tundish
- C)** Metal discharge pipe (D2) from tundish with continuous fall. see table section 2.3.1.1 page 8 for sizes
- D)** Fixed grating
- E)** Trapped gully
- F)** Tundish

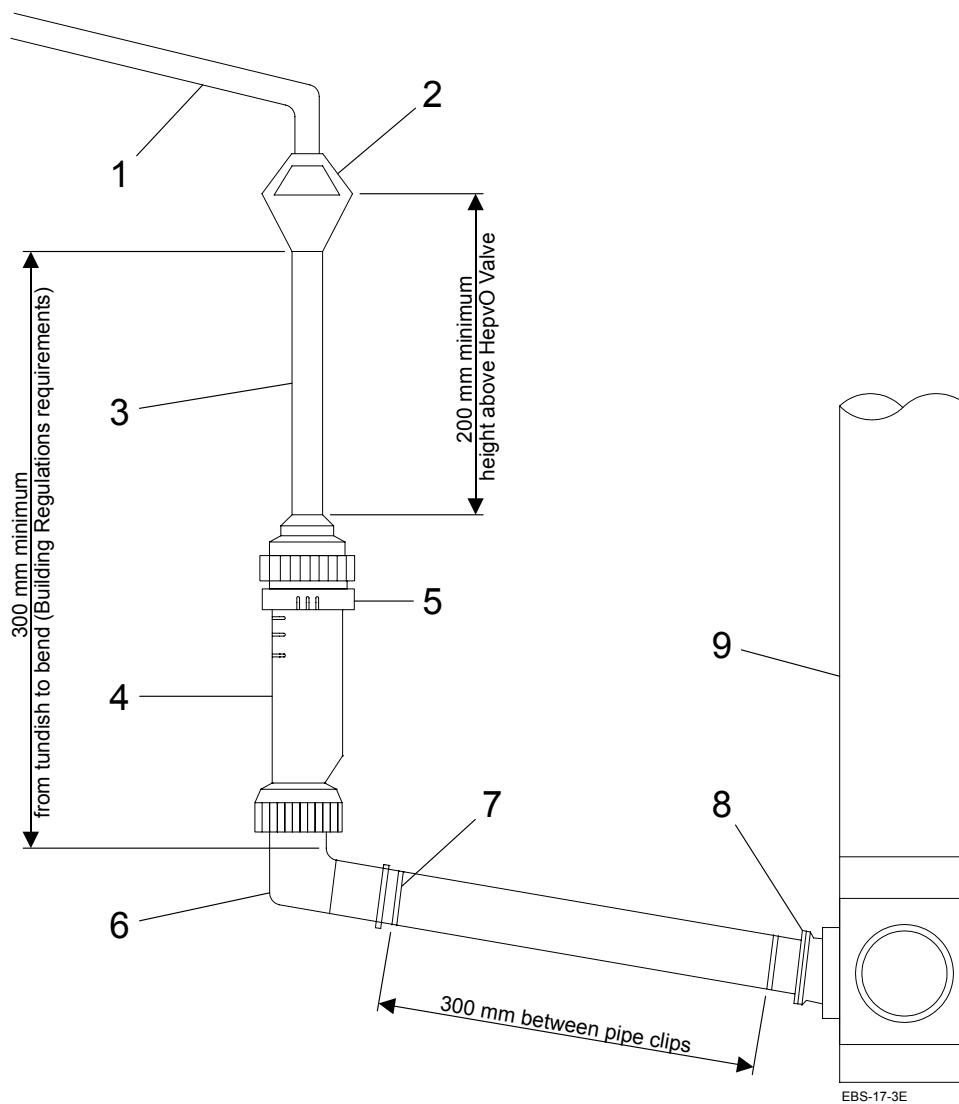
Fig. 5



This drawing has to be read in conjunction with the full installation manuals supplied

Note :

- This detail is only to be used where there is no other alternative. It is strictly subject to local. Dispensation and approval must be sought from NHBC and Building Control inspector prior to installation.



- 1) 22 mm copper discharge pipe
- 2) Tundish - visible point off discharge
- 3) 28 mm copper discharge pipe
- 4) 32 mm HepvO valve
- 5) HepvO valve must be vertical and adjacent to the water unit, to be visible & easily accessible.
- 6) 32 mm polypropylene waste pipe
- 7) Pipe clip to be positioned close to valve to provide additional support
- 8) Waste typically discharged to soil stack through boss adapter
- 9) Soil stack

Fig. 6

2.3.3 Installation of the immersion heater kit



- ▶ Only Geminox immersion part number C70.38447 should be used, no other immersion should be used with the EBS Solar tank.

- ▶ remove the heater aperture (6),
- ▶ Remove the 1"1/2 male plug (7) originally fitted to the sleeve (EH) of the EBS Solar tank.

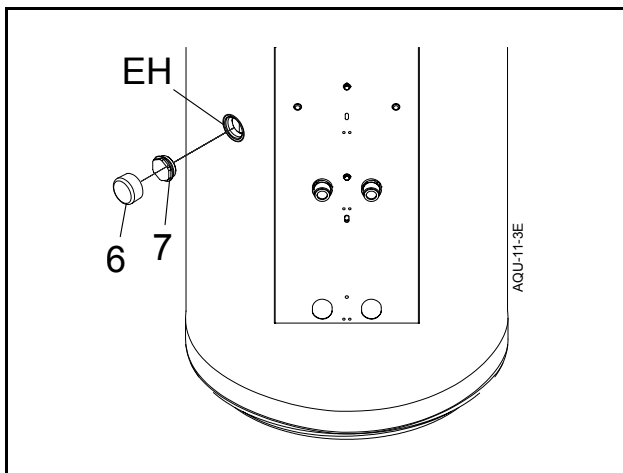


Fig. 7

- ▶ Manually screw the immersion heater kit (8) into the 1"1/2 sleeve (EH) while positioning the flat seal (9).
- ▶ Finish tightening the immersion heater (8) by using a spanner.
- ▶ During this operation, be careful not to twist the electrical power cable if this cable is already connected to the immersion heater.
- ▶ The angle of the cable gland (10) position can vary according to how strongly the immersion heater is tightened on the sleeve (EH).
- ▶ Check that there are no leaks on the installation.
- ▶ And follow the kit assembly instructions delivered with the DHW production system for the electrical connection.

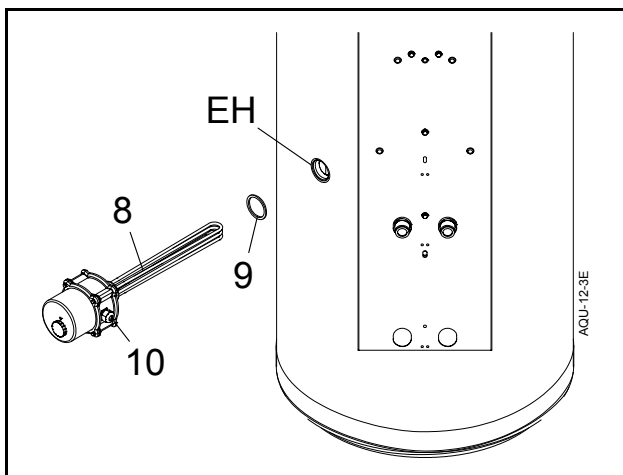


Fig. 8

2.3.4 Installation of the GTS transfer control box

- ▶ Install the transfer control box with its integrated support, using the 2 screws (4) and the 2 washers (5) supplied with the tank, on the tank support plate.



Fig. 9

- ▶ Fit the safety control box (3), supplied with the transfer control box (including a safety valve, a pressure gauge and a filling and drain valve) on the weld provided for this purpose. (refer to the instructions in the technical manual).



Fig. 10

- ▶ Fit the 2 insulated tubes (1) and the 2 seals (2) supplied with the tank on the primary input/output - solar side of the tank (VSsp/RSsp) and on the transfer control box pipes.

i Check that the insulated tubes are assembled correctly and in their specific locations.

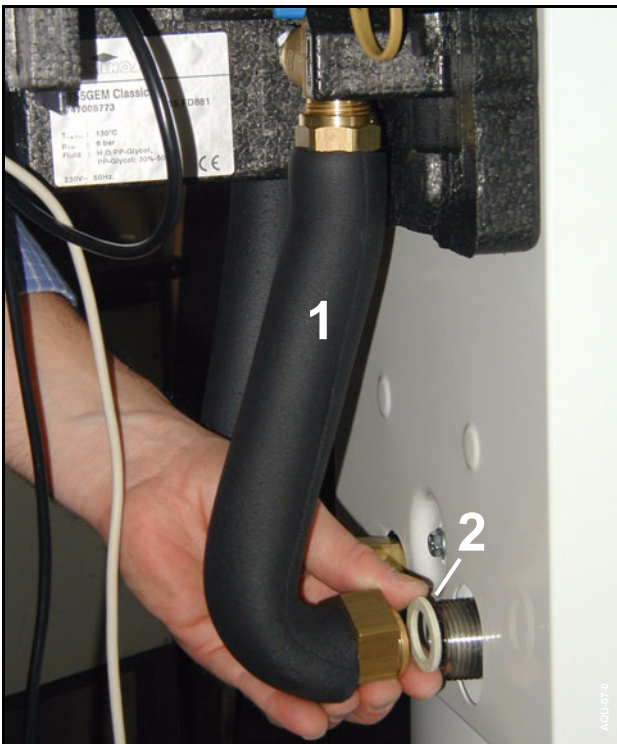
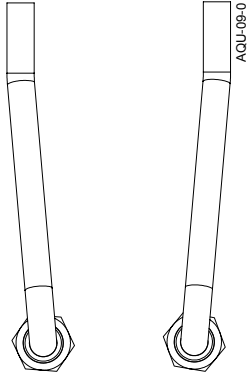


Fig. 11

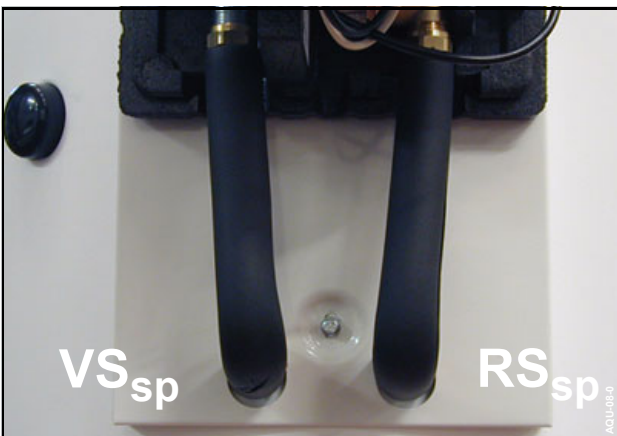


Fig. 12

- ▶ Position the casing of the transfer control box, taking care to pass the temperature sensor cables (T1 and T2) via the cut out made for this purpose in the

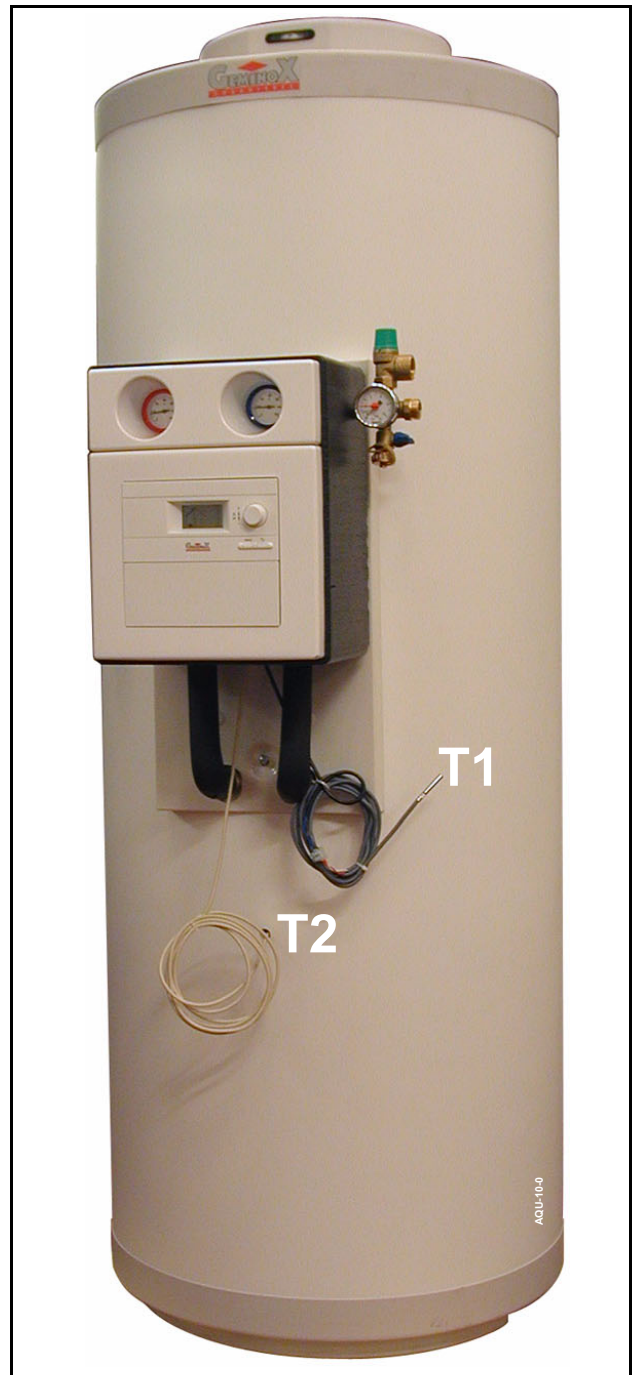


Fig. 13

2.4 Connection diagram

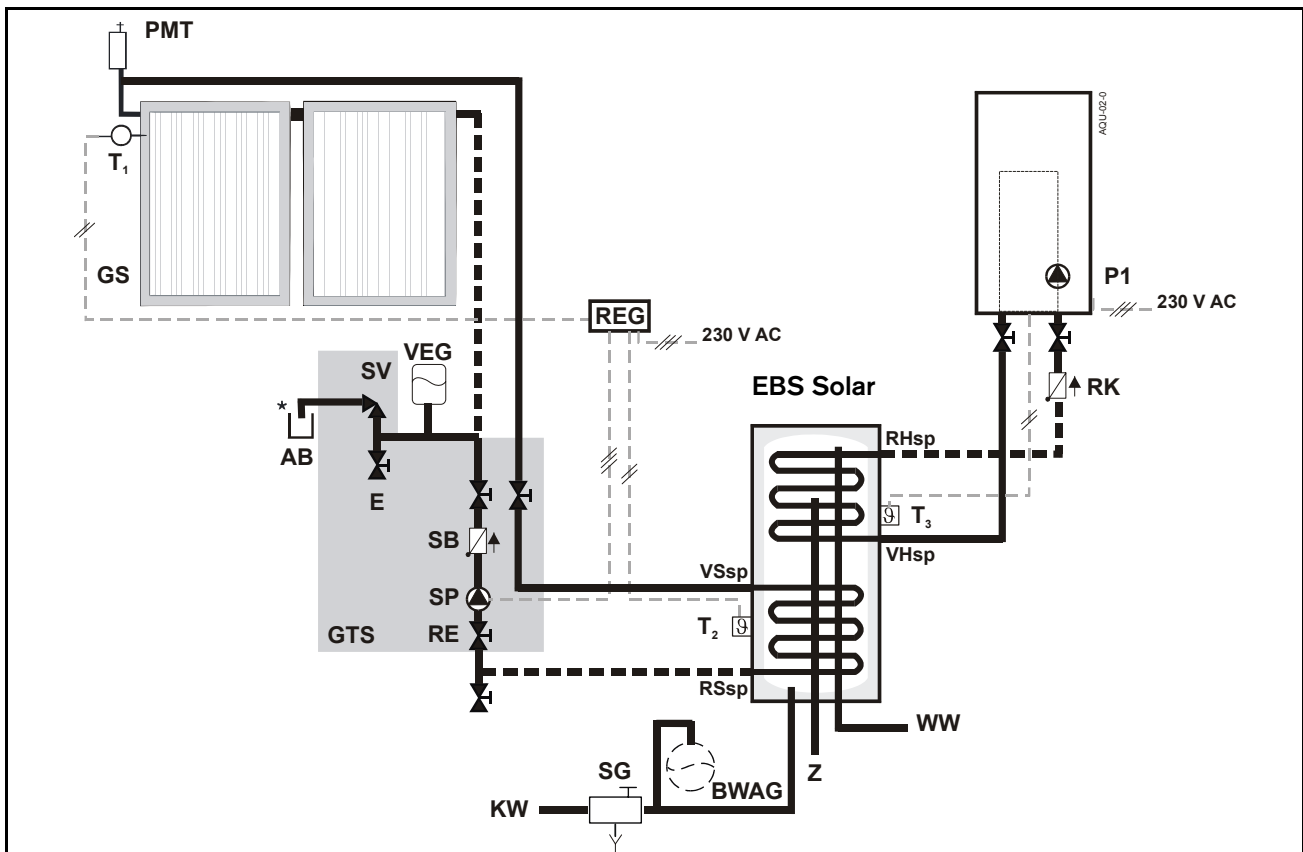


Fig. 14

- PMT** Bleed/air bleed - solar side
- GS** Solar sensor
- AB** Capture tank
- E** Drain/filling - solar side
- GTS** Transfer control box
- SB** Anti-return flap
- SP** Solar circuit pump
- RE** Flow rate regulator with display
- SV** Safety valve
- P₁** Circulation pump (heating circuit/domestic hot water load)
- RK** Anti-thermosiphon flap
- VEG** Solar expansion vessel
- REG** Solar regulator Basic/Classic/Top GEM
- EBS Solar** Solar tank
- KW** Cold water intake/solar tank drain
- WW** Domestic hot water outlet
- BWAG** Domestic expansion vessel
- SG** Safety control box
- Z** Domestic hot water recycling
- T₁** Solar sensor temperature sensor (delivered with the GEM or REG 152 specific boiler THRe)
- T₂** ECS temperature sensor solar (delivered with the GEM or REG 152 specific boiler THRe)
- T₃** ECS temperature sensor - heating (CTN) (to be ordered separately)

* According to EN 12975, the bleed and flow outlet must lead into an open tank to capture the whole content of the solar sensors.

2.4.1 Connection to the upper exchanger (primary heating)

- ▶ Connect the boiler's VH weld_{sp} - primary intake for the tank's upper exchanger.
This lets you obtain a regular domestic hot water load in the upper part of the tank.
- ▶ Connect the boiler's heating return to the VH weld_{sp} - primary outlet for the tank's upper exchanger.
- ▶ Check that the load conduits are as short as possible and well insulated.
This lets you avoid any unnecessary pressure loss and the cooling of the tank through looping.
- ▶ Fit a drain tap to the load conduit.
This must enable the drain of the upper exchanger.
- ▶ Place the installation's domestic hot water temperature sensor on the boiler side in the upper pocket (T₃).

2.4.2 Connection to the lower exchanger (solar primary-)

- ▶ Connect the solar sensor heating start to the VS weld_{sp} on the transfer control box - primary intake for the tank's lower exchanger.
- ▶ Connect the solar sensor heating return to the RS weld_{sp} on the transfer control box tank's lower exchanger primary output.
Therefore, the lower solar exchanger supports the additional upper exchanger for continuous heat storage in the tank.
- ▶ Check that the load conduits are as short as possible and well insulated.
This lets you avoid any unnecessary pressure loss and the cooling of the tank through looping.



The anti-freeze used increases the pressure loss according to the mix used.

- ▶ Position the solar installation's domestic hot water temperature sensor in the lower pocket (T₂).

2.4.3 Domestic hot water side connection



Caution: Never place the insulation valve between the safety control box and the tank.

- ▶ Connect the cold water conduit according to EN 1491 using adapted pipes.
- ▶ The domestic hot water expansion vessel:
The table below provides help for sizing the expansion vessel. The dimensions may be modified if the useful content of the different types of vessel is different. The indications are based on a domestic hot water temperature of 60° C.

Type of tank EBS Solar		Upstream tank pressure = cold water pressure	Dimension of the vessel in litres according to the safety valve operating pressure 7 bars ¹⁾
Version 10 bars	200	3 bars	18
	300		18

1) In accordance with standard EN 1491 the valve must be calibrated to 7 bars

- ▶ The safety valve:
Approved, this must be able to evacuate at least the limited volume flow rate for the cold water supply (cf. chapter 3.3.3, page 19).
It must be connected to the evacuation of used water via a siphoned funnel.
The safety valve discharge conduit must lead to an area protected from frost and which is visible.
The discharge conduit must correspond at least to the safety valve output section.



Caution: Damage due to excessive pressure!
Do not block the safety valve's evacuation pipe.

2.4.4 Circulation

- ▶ If connected to a loop conduit:
fit an ECS loop pump authorised for drinking water and an adapted holding flap.

Insulate the domestic hot water and recycling start pipes thermally.
- ▶ With no loop conduit:
close and insulate the connector.



Due to cooling loss, a loop may only be accepted with a time and/or thermal programming ECS loop pump.

2.5 Electrical connection



Danger: of electrocution!
Before carrying out the electrical connection, disconnect the heating installation's current supply (230 V AC).



For a detailed description of the electrical connection, see the heating appliance's installation manual.

2.5.1 EBS Solar electrical diagram

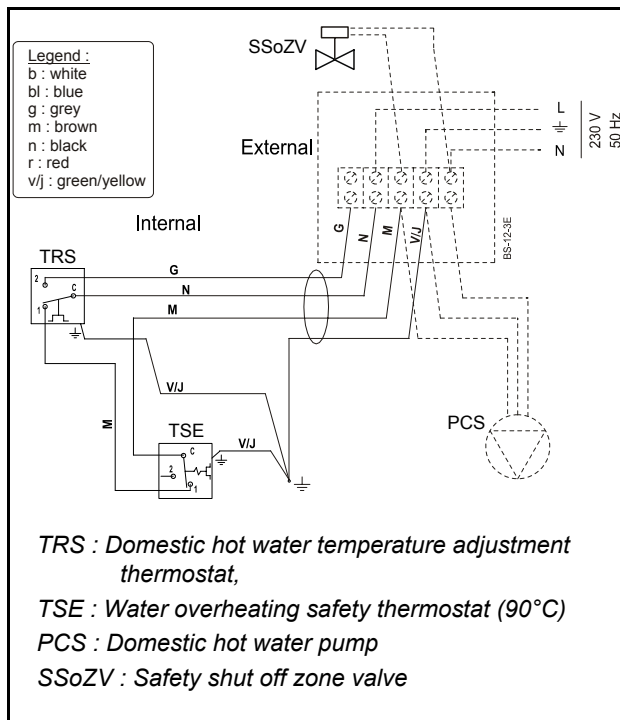


Fig. 15 Electrical diagram

2.5.2 Boilers with electronic regulation

2.5.2.1 FCX boilers

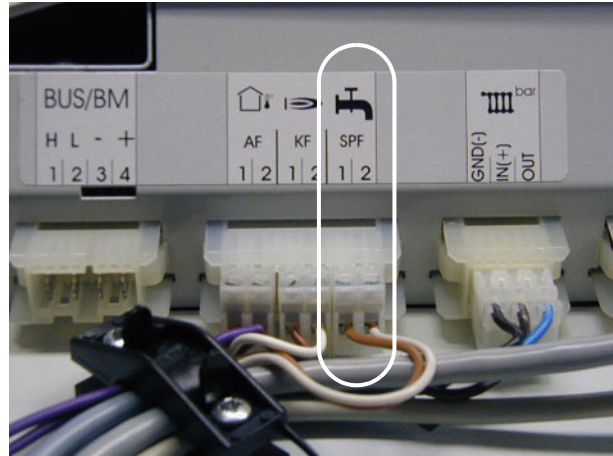


Fig. 16 Connection of the domestic hot water sensor connector T3 - 5 kW
Sensor from the FCX domestic hot water sensor kit delivered as an option.

2.5.2.2 THRI boilers

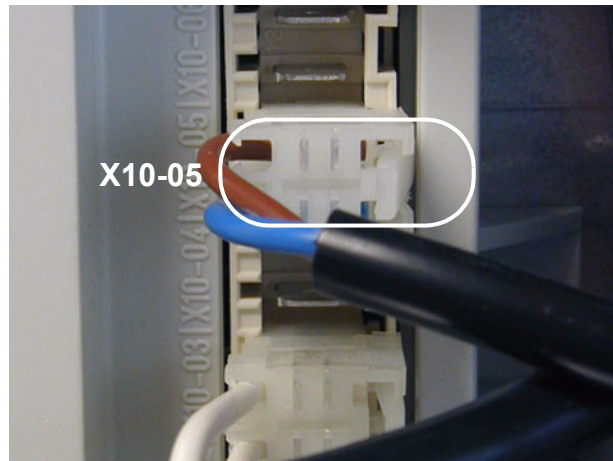


Fig. 17 Connection of the domestic hot water sensor connector T3 - 10 kW to the LMU management unit X10-05 terminal
Sensor from the selective valve kit delivered as an option.

3 Commissioning

3.1 Information for the user provided by the installer

The specialist explains to the customer how to operate and handle the boiler and hot water tank.

- ▶ The user must be informed of the fact that maintenance is necessary at regular intervals given that the correct operation and lifetime of their installation depend on it.
- ▶ During the heating phase, water leaks out of the safety valve. **Do not block the safety valve!**
- ▶ Empty the hot water tank if there is a risk of frost or when it is taken out of service.
- ▶ Hand over all the documentation to the user.

3.2 Verification before commissioning

- ▶ Check that the tank access flap is tight and waterproof.
- ▶ Check the waterproofing of the various seals and connectors in the installation.
- ▶ Check that the boiler and solar circuits are drained,
- ▶ Check that the electrical connection is correct.
- ▶ To guarantee the performances stated, check that the safety control box's cold water tap is set to obtain a maximum flow rate of hot water at the value indicated in the technical characteristics table (cf. chapter 1.6, page 5),
- ▶ check that the solar and boiler regulators are correctly set to limit the domestic hot water storage temperature to 80°C.

3.3 Commissioning

3.3.1 General information

The tank must be carried out by the person who installs the installation or by an expert responsible for this.

- ▶ Commission the heating appliance and the solar installation according to the manufacturer's explanations, the installation manual and the user manual.
- ▶ Commission the hot water tank according to the corresponding installation instructions.

3.3.2 Filling the hot water tank

- ▶ Before you fill the hot water tank:
Rinse the pipes except for the hot water tank.
- ▶ Fill the tank with the hot water outlet open until the water comes out.

3.3.3 Limiting the flow rate

- ▶ In order to best use the capacity of the hot water tank and to prevent early mixing, we recommend you to limit the cold water intake into the hot water tank to the flow quality indicated below:
 - EBS SOLAR 200 = 15 l/min.
 - EBS SOLAR 300 = 20 l/min.

3.4 Setting the tank temperature

- ▶ Set the temperature you want for the hot water tank according to the boiler usage instructions.

4 Maintenance

4.1 Recommendations for the user

- ▶ We strongly recommend that you sign a maintenance contract with an approved installer. Having the boiler and tank serviced every year.

WARNING TO THE USER

- ▶ Do not remove or adjust any component part of unvented water heater :contact the installer.
- ▶ If this unvented water heater develops a fault, such as flow of hot water from the discharge pipe, switch the heater off and contact the installer.

4.2 Maintenance and repair work

- ▶ Only use original spare parts!

4.2.1 Drain

- ▶ Before you clean or repair the tank, disconnect the electricity network and drain the tank.
- ▶ Drain the upper exchanger where applicable.

4.2.2 Scaling/cleaning



Caution: Water damage ! Defective or damaged seals may cause water damage. If the tank is inspected through the access flap: replace the flap seal each time it is removed and check that it is waterproof once pressure is re-applied.

For hard water

The degree of scaling depends on how long the tank is used, the service temperature and the water hardness. Exchange surfaces that are heavily scaled reduce the quantity of water contained, reduce heating power, increase energy needs and extend the heating time required.

- ▶ Scale the tank regularly according to the quantity of scale.

For soft water

- ▶ You must still check the tank at regular intervals and remove any deposits.

4.2.3 Return to operation

- ▶ Rinse the hot water tank carefully after cleaning it or carrying out repair work.
- ▶ Bleed the primary side, solar side and secondary side.

4.3 Operating check



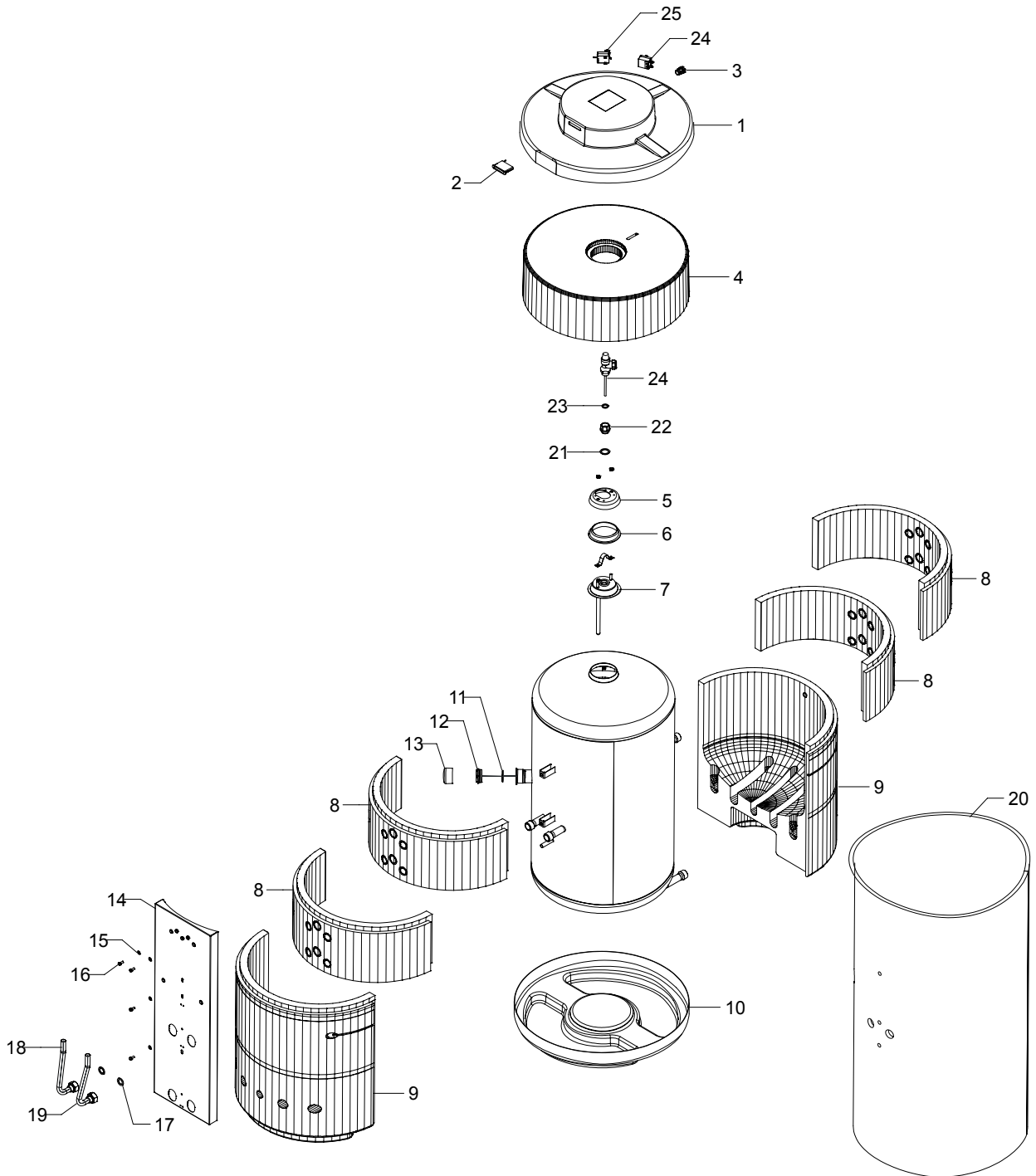
Caution: A safety valve that is not working correctly may cause damage due to excessive pressure!
Check the operation of the safety valve every year and rinse it by briefly bleeding it several times.
Do not block the safety valve's evacuation pipe.

5 Rating plate abbreviations

Abbreviation	Description
Vt	Total volume of the tank
Vu	Useful volume of the tank in solar mode
Vech sup/inf	Internal volume for upper and lower heat exchangers
Pn ech sup/inf	Rated power of upper and lower heat exchangers
T max	Maximum domestic hot water storage temperature
PMS	Maximum operating pressure of the tank and 2 heat exchangers
Qst	Static heat losses of the tank

6 Parts list

AQUALIOS 200/300



PLBASO3904-00

Item.	Reference	Description
1	A90.32732	UPPER THERMOFORMED BOTTOM
2	L60.01135	THERMOSTAT RECT HORIZ 69X14 LG CAPIL.1500 MM
3	C91.20704	CABLE BUSHING; GLAND N° 11 + NUT
4	D20.32730	UPPER INSULATION
5	I10.29477	FLANGE FOR CLEANING DOOR
6	E20.10187	SEALING / CLEANING DOOR
7	V90.39427	CLEANING DOOR EQUIPPED (EBS SOLAR)
8	D20.32729	INTERMEDIATE INSULATION
9	D20.32728	LOWER INSULATION
10	A90.32733	LOWER THERMOFORMED BOTTOM
11	E00.39026	O'RING Ø 44,5X3,5
12	K20.38355	CAP MALE 1"1/2 HEAD Ø 55 + 6 SIDES
13	A00.38358	NOZZLE FOR Ø 55
14	Y22.38309	UPPER PRINT - WHITE - PUMP STATION
15	B50.04207	GASKET ZINC M D.6X14X1,2
16	B30.03054	ZINC H SCREW M6X40
17	E20.03889	SEALING AFM34D 30X21X3
18	U22.39173	FLOW PIPE - RIGHT ; ASSEMBLED - PUMP STATION
18	U22.39223	OUTLET PIPE ; ASSEMBLED
19	U22.39174	FLOW PIPE ; LEFT ; ASSEMBLED ; PUMP STATION
19	U22.39224	INLET PIPE ; ASSEMBLED
20	A90.37863	PLASTIC CASING SOLAR TANK 300L
20	A90.37865	PLASTIC CASIN SOLAR TANK 200L
21	E20.18103	SEALING AFM34 D.36X26X2
22	I20.36990	BRASS CONNECTION MALE 3/4" FEM. 3/4"
23	E20.03890	SEALING AFM34 D 24X17X3
24	L90.37687	VALVE PTEM 575 901 3/43 22MM 7 BAR
25	L71.10492	JAEGER THERMOSTAT 30/90 CAP 1,6M
26	L71.37019	SAFETY THERMOSAT LIM. 90°C CAP.1,5M TG400
*	K20.16621	ELBOW CB 3/4 OPENEND OUT END D.22
*	K20.37049	ELBOW CUPPER NUT 1" - Ø22
*	W00.25016	EARTH WIRE
*	W49.38571	INTERNAL WIRING
*	W49.39027	WIRING SAFETY THERMOSTAT EBS-1 GB

7 Warranty terms

From commissioning, GEMINOX type EBS Solar appliances are guaranteed against all manufacturing faults and material defects for a period of:

- ▶ five years for the stainless steel tank and its integrated exchange.
- ▶ two years for accessories.

This guarantee is strictly limited to the supply, free of charge, of parts acknowledged as being defective after inspection by our technical departments, with the exclusion of labour and transport costs arising from this. These parts once again become the property of GEMINOX and must be returned to them without delay.

In addition to the factory warranty, the distributor, Evinox, also provides a further 5-year warranty on the tank. Labour warranty applies for the 1st year only. To validate the warranty, annual checks must be carried out in accordance with G3 Building Regulations.

The warranty is applicable under the following conditions:

- ▶ Our appliances must have been installed by a qualified professional, according to the rules of good practice and current standards and taking into account the special instructions given in this technical manual.
- ▶ The warranty must become effective within a maximum of SIX MONTHS following the date of delivery by GEMINOX.
- ▶ The warranty is subject to use of conditioning products in the heating circuit water (inhibitor and anti-freeze) as recommended by the manufacturer, or equivalent.
- ▶ Maintenance must be carried out annually by a qualified company from the first year of use.

The warranty excludes all compensation for any reason whatever.

The warranty is not applicable in the event of replacement and repair resulting from normal wear and tear of appliances, deterioration following operation at greater outputs than those recommended, accidents arising from negligence or interventions by third parties, monitoring or maintenance faults and faults due to improper use of appliances, particularly by the use of inappropriate fuels or electrical voltages.

The repair, modification or replacement of parts during the warranty period may not have the effect of extending the original warranty period of the equipment.

EXCLUSIONS FROM THE WARRANTY

The following are not covered by the warranty :

- ▶ damage to electrical parts resulting from installations and connections to the mains where the measured input voltage to the equipment is 10% lower or greater than the rated voltage of 230 volts,
- ▶ damage to parts originating from elements external to the appliance (storm effect, humidity, flashback, frost etc),
- ▶ the seals,
- ▶ all incidents resulting from failure to check safety elements,
- ▶ scale formation and its consequences,
- ▶ corrosion due to chloride concentrations in domestic hot water greater than 60 mg/L or a pH below 7,
- ▶ damage to parts resulting from silting in the heating circuits.

SHIPMENT COSTS FOR PARTS, LABOUR AND TRAVELLING COSTS

Note: As we are constantly trying to improve our equipment, any modification considered useful by our technical and sales departments may be made without notice.

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