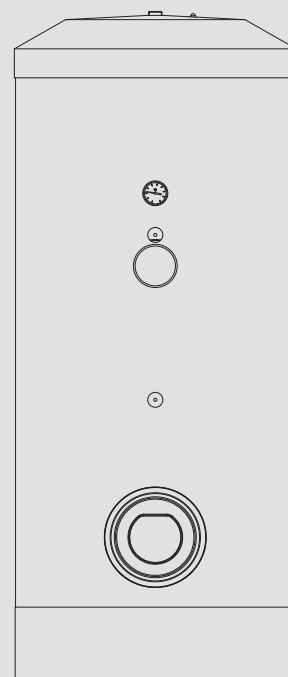


OPERATING AND INSTALLATION

DHW TANK FOR SOLAR SYSTEMS

- » SBB 300 plus (GB)
- » SBB 400 plus (GB)



STIEBEL ELTRON

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1. Operating instructions for Users and Technicians



Stiebel Eltron hot water heaters should only be installed by licensed installers. These are not do-it yourself appliances.

Please hand this Operating and Installation Manual and hand over to the home or buildings owner when the installation is completed.

1.1 Start-up

The solar collectors, the boiler, the tank, and the pumping/control station form a complete system.

Hot water is generated throughout the year by the solar collectors.

The entire heater and hot water system must be filled with water and have adequate air ventilation. Please, refer to the solar collector's and the boiler's installation instructions.

1.2 Maintenance and Cleaning

Routine care and maintenance extends the life expectancy and operating safety of the hot water storage unit.

The outer casing should be cleaned with a slightly damp cloth and commercially available neutral cleaning agent, this should be done on a regular basis

T&P valve

The proper function of the T&P valve is required to prevent damage to the hot water storage unit. The T&P valve needs to be open during cold-water addition. The water has to flow from the relief line at full stream.



The discharging water can be hot.

- » Regularly vent the safety valve on the safety assembly until a full water jet is discharged.
- » Close the safety valve when the check is complete.
- » Check the T&P valve for tightness.

Decalcification

With hard tap water, a deposit of scale will form on the inside of the storage unit. Based on professional experience, it is necessary to decalcify with commercially available solvents at timely intervals. Follow the manufacturers instructions for solvent use. The hot water storage unit needs to be emptied. The inspection cover must be removed and sediments on the tank bottom must be flushed.

Replacement of the Sacrificial Anode

Depending on the composition of the tap water, an inspection of the sacrificial anode (Pos. 1, Diagram A) timely intervals is recommended. The sacrificial anode turns red when the anode has been spent. Please notify your local contractor who will replace the anode.

With heavy wear, an original equipment replacement anode must be installed to protect the inner container from corrosion. An inspection should be performed at least once a year.

1.3 Failures – Causes – Correction

Failures	Causes	Correction
Inadequate water pressure	Shut-off valve is not completely open.. Cold or hot water line is obstructed.	Open Shut-off valve. Clean or exchange pipes
Hot water flow inadequate	Boiler temperature is set too low. Recommended 80 - 85 °C The heat exchanger is calcified.	Set boiler to recommended temperature. Clean the heat exchanger
Hot water storage tank not being heated	Program selection at the heater control is not properly selected.	Select and set program per instructions.
Outlet quantity	Aerator at the extraction point blocked.	Unscrew aerator and clean.
Hot water supply too fast exhausted	Flow rate too high. Recommended 10 - 15 l/min	Restrict Spigot valve rate.

OPERATING TECHNICAL DATA

1.4 Technical Data

Type		SBB 300 plus (GB) Set	SBB 400 plus (GB) Set
Part no.		228941	228942
Storage capacity	l	305	410
Standby volume - upper third of the tank	l	approx. 130	approx. 160
Volume of heat exchanger, top	l	7.3	8.2
Volume of heat exchanger, bottom	l	10.1	11.3
Working pressure	MPa	1	1
Tested to pressure	MPa	2	2
Max. pressure of boiler loop	MPa	1	1
Max. water temperature	°C	95	95
Heat exchanger (top)			
Surface area heat exchanger top	m ²	1.1	1.3
Performance factor	N _L	10.4	12.0
Constant DHW delivery	l/h	804	927
DHW output	kW	32	38
Heating water flow rate	m ³ /h	1.92	2.71
Pressure drop	kPa	27.6 at 2.5 m ³ /h	30.5 at 2.5 m ³ /h
Heat exchanger (bottom)			
Surface area heat exchanger bottom	m ²	1.5	1.7
Flow rate	m ³ /h	0.75	0.75
Pressure drop	kPa	37.5 at 2.5 m ³ /h	41.6 at 2.5 m ³ /h
Constant DHW delivery heat exchanger (bottom)	l/h	1081	1181
Standby losses in 24 hours	BTU/kWh	6,500/1.9	7,500/2.2
Tank weight empty	kg	154	187
Tank weight full	kg	477	618
Response pressure, safety relief valve	MPa	0.6	0.6
Response pressure, T&P valve	MPa	0.7	0.7
Temperature setting, T&P valve	°C	90	90
Pressure reducing valve	MPa	0.35	0.35
Expansion vessel	l	80	80

A Dimensions and connection dimensions

Type		SBB 300 plus	SBB 400 plus
A	Height of unit with insulation	1679	1848
B	Height of unit without insulation	1609	1781
C	Height thermometer	1239	1298
D	Height of well for temperature sensor	1179	1238
E	Height spare port	1025	1078
F	Height of well for temperature sensor	557	560
G	Height inspection flange	365	367
H	Height cold water feed	73	65
I	Height solar hot return	280	282
J	Height solar cold feed	865	867
K	Height heater hot boiler return	975	1130
L	Height circulation port	1339	1600
M	Height cold boiler feed	1239	1298
N	Overall height	1704	1873
O	Width without thermal insulation	550	600
P	Width with thermal insulation	700	750

2. Installation instructions for the installer



Only qualified contractors should carry out installation, commissioning, maintenance and repair of the appliance.

Diagram A is referenced for explanation of the following text.

2.1 Description of the Appliance

Application

The Stiebel Eltron Vertical Solar Storage tank SBB ... Plus, in combination with Stiebel Eltron's Solar Collector is an economical hot water generator.

Connections

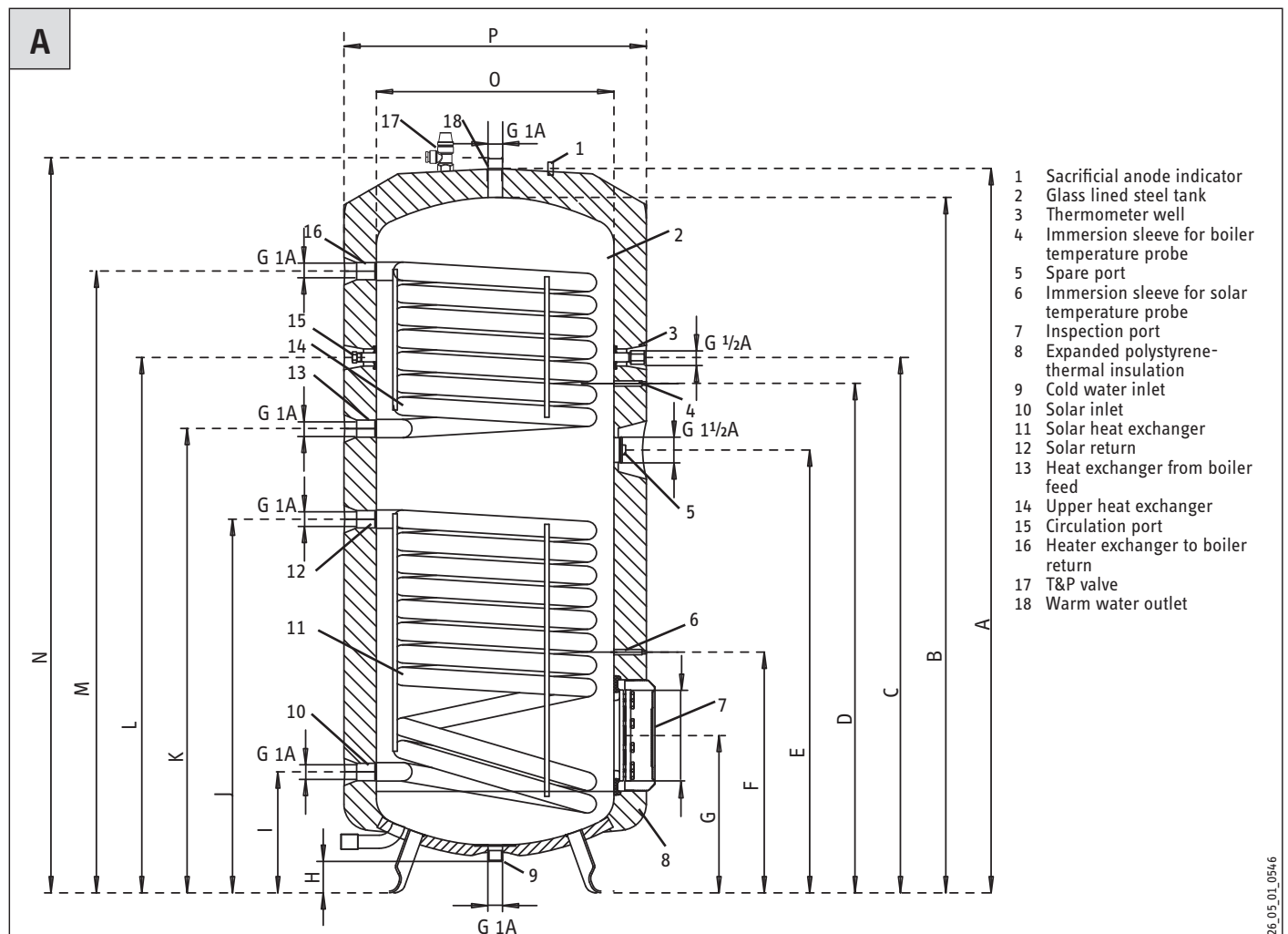
All connections (cold and hot) are readily accessible and allow for easy installation.

Delivered condition

The hot water storage tank SBB ... Plus is wrapped in plastic and is delivered on a one-way pallet. The storage tank has foam insulation, a ABS outer casing and ABS cover.

Equipment level

- Storage unit with two welded steel plain-ended pipe heat exchangers
- Hot water corrosion protection with special enamel coating
- Thermometer 0 - 120 °C
- Three immersion sleeves for housing of temperature probe and thermometer
- Magnesium Sacrificial Anode
- Circulation Socket
- Attached Flange inspection cover
- PU Foam insulation 70 mm thick
- ABS outer casing with zipper in protective pouch
- ABS Cover and Flange cover
- Tundish
- Expansion vessel
- Safety assembly
- Bracket



2.2 Regulations and standards

Refer to: Local Construction regulations, fire-code and trade control regulations.

2.3 Layout and function

Casing

The tank is delivered with a pre-assembled outer casing and a lid. These parts can be dismantled prior to handling and can be re-fitted at the designated location prior to the installation. The casing can be fitted after the pipework has been connected

B At the designated location, the side panels (18) are secured to the tank with three fixing straps (19) and a lock (20).

Internal components

Subject to type, the tank has a nominal capacity of 305 or 410.

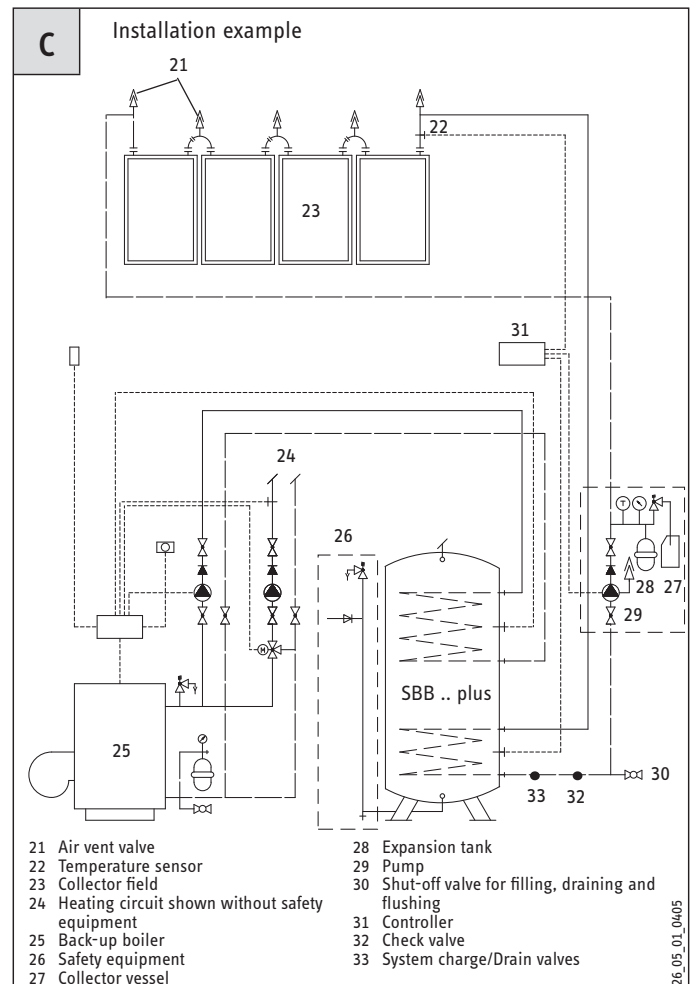
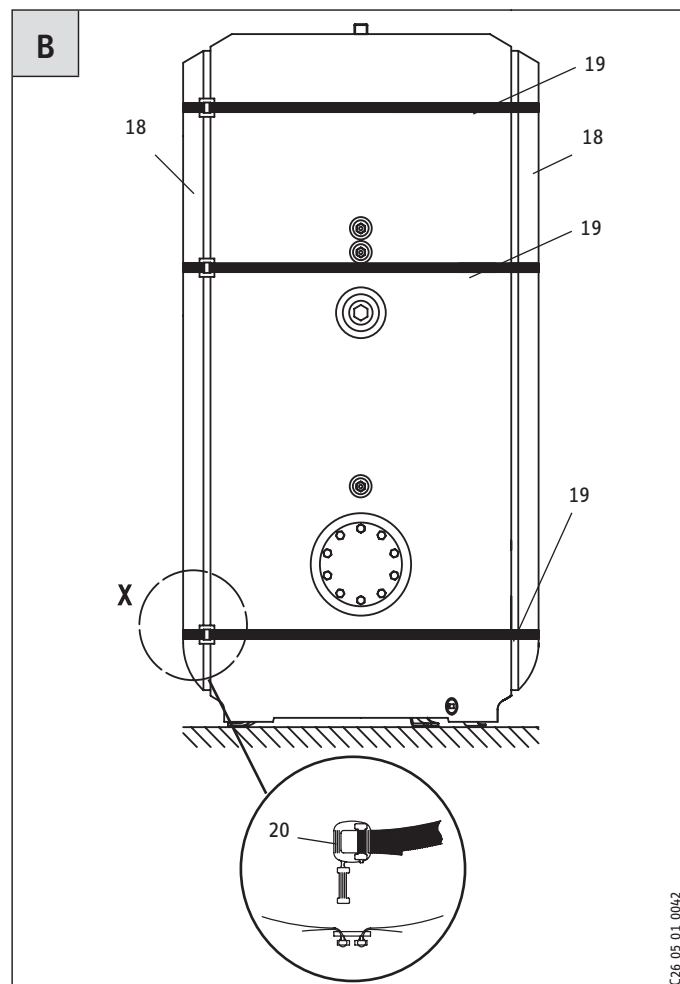
The heat exchanger provides a good heat transfer from the heating water side to the DHW side. The special enamel coating is a particularly effective corrosion protection.

Function

Heat from the solar circuit is transferred in the lower tank area.

A The actual temperature in the lower tank volume is captured by a solar temperature sensor inside the sensor well (6). The tank will only be heated if the temperature at the collector array (flow) is more than a temperature differential (selected at the solar control unit) higher than the tank temperature (e.g. by 3 K).

A The actual temperature in the upper tank volume is captured by a DHW temperature sensor inside the sensor well (3). Should the actual temperature drop below that selected at the control unit, then the boiler control unit initiates a priority heating of the upper section of the DHW tank by changing over from the heating circuit pump operation to tank primary pump operation. For this, the flow temperature is limited until the required DHW temperature has been reached.



INSTALLATION

SET-UP AND INSTALLATION

2.4 Set-up and installation

Set-up

Inspect the packaging for damage and remove packaging at the installation site. Verify presence of six brass thread to sweat fittings.

The installation site must be structurally capable of supporting the weight of the tank when filled. The location has to be above freezing. The water drainage pipe must be freeze proof.

Connection

A Refer to Diagram A and Diagram C.

Heating installation

C E The installation of the hydronic loop is shown in Diagrams C and E. The circuit must include a T&P Valve, and air-vent, a check valve, and an expansion tank.

Hot Water Installation

Prior to installation check that the local conditions are compatible with the appliance design, especially that the maximum working excess pressure of 150 PSI (1 MPa.) is not exceeded

A steel or a copper pipe with insulation especially suitable due to its low heat loss.

Required combination:

Cold water pipeline	Hot water pipeline
Copper pipe	Copper pipe
Steel pipe	Steel or copper pipe
Plastic	Steel or copper pipe

- » Flush the line thoroughly.
- » Fit the water outlet line.
- » Fit the water inlet line **D**.

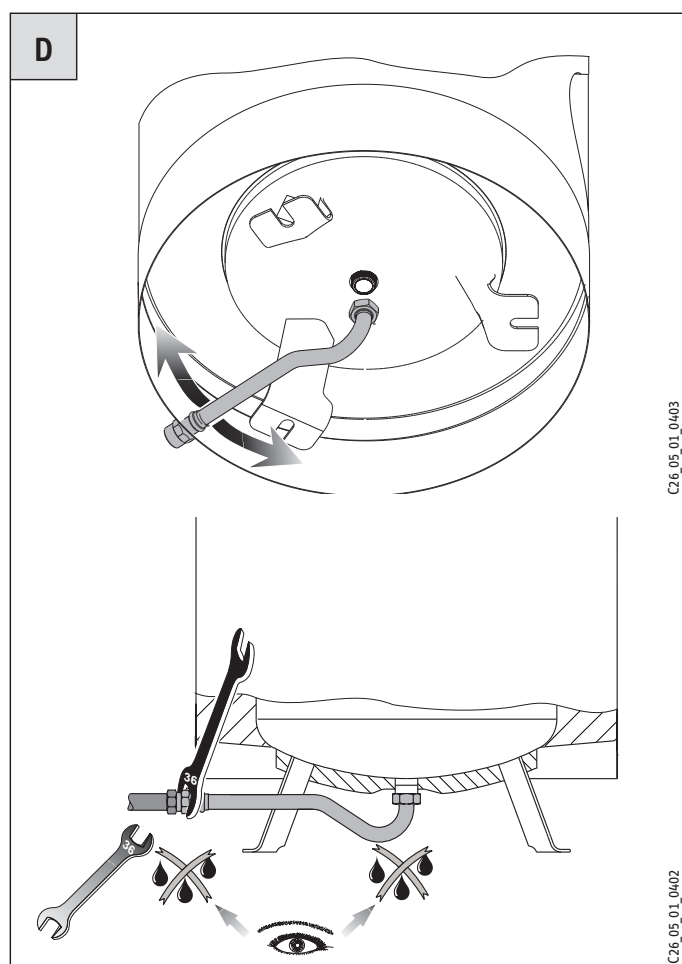
An option, the connection pipe can be fitted between the feet. During insertion, hold with a spanner. Check the stability of the connection pipe and secure additionally on-site, if required. If required, the cold water connection can be fitted directly onto the connector.

Water connection

The system is designed to operate with mains water pressure, and a set of fittings is provided for this purpose. See **E** for general arrangement in schematic form.

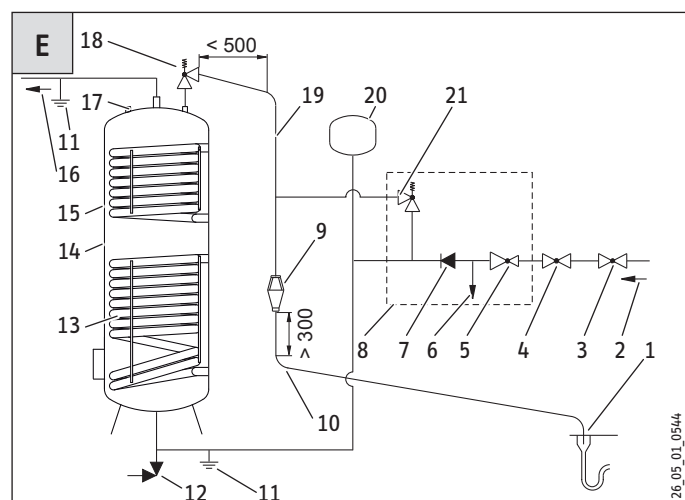
You can fit the safety assembly in various positions to suit the space available but it must be placed in the same order as shown. The safety assembly provided in the pack is fitted to the cold water supply with the exception of the T&P valve which is fitted at the top of the DHW cylinder.

- » To obtain a balanced water pressure in the cold water and DHW lines, position the cold water outlet directly on the outlet side of the pressure relief valve.
- » The T&P valve should not respond under normal operating conditions as the expansion vessel will accommodate the water as it expands during the heating process.
- » Run the safety valve outlet and that of the T&P valve to a drain via a tundish. The purpose of the tundish is to let water be seen should these valves respond. The outlet pipe should not exceed 9 metres in length without forming an air break, i.e. tundish. The pipe must fall continuously throughout its length with no additional 90° bends. It must be heat resistant and discharge to a safe visible position. The pipe diameter must not be smaller than the valve outlet. The two discharge pipes can be joined together at the point of discharge into a single tundish if required



INSTALLATION

CONNECTION TO THE SOLAR UNIT | HOT WATER TEMPERATURE PROBE



Prior to filling all screws must be tight.

Drainage of the hot water tank is via the drain valve

- » Install dirt strainers or other restrictions in the safety valve supply line.
- » Only fill the device with water by opening the DHW fitting and flush thoroughly.
- » Carry out a leak test.

A **re-circulator** can be attached to a separate socket across the thermometer. Drill the outer casing with a hole saw Ø 50 where marked and remove insulation from the socket in that area.

For energy conservation, use of a circulator is not recommended.

- 1 Discharge below fixed grate
- 2 Cold water supply
- 3 Shut-off valve
- 4 Line strainer
- 5 Pressure relief valve
- 6 Balanced pressure; cold water outlet
- 7 Check valve
- 8 Safety assembly
- 9 Tundish
- 10 Metal discharge pipe (D2) from tundish, with continuous fall
- 11 Equipotential bond
- 12 Drain valve
- 13 Solar heat exchanger
- 14 Glass lined steel tank
- 15 Upper heat exchanger
- 16 DHW outlet
- 17 Anode
- 18 T&P valve
- 19 Metal discharge pipe (D1) from T&P valve to tundish
- 20 Expansion vessel
- 21 Safety relief valve

Minimum size of discharge pipe D1	mm			22
Minimum size of discharge pipe D2 from tundish	mm	28	35	42
Maximum resistance allowed, expressed as a length of straight pipe (i. e. no elbows or bends)	m	9	18	27
Resistance by each elbow or bend	m	1.0	1.4	1.7

E Connection dimensions

Inlet connection, male, BSP	mm (")	G 38.10 (1½)
Outlet connection, male, BSP	mm (")	G 50.80 (2)
Safety assembly connection	mm (")	G 38.10 (1½)
Safety relief valve	mm (")	G 31.75 (1¼)
Inlet connection T&P valve	mm (")	G 19.05 (¾)
Outlet connection T&P valve	mm	15
Inlet connection tundish	mm	22
Outlet connection tundish	mm	28

INSTALLATION

SACRIFICIAL ANODE | THREADED IMMERSION HEATER BGC

2.5 Connection to the Solar Unit

C The installation of the solar loop is shown in picture C. The solar loop must include an air-vent (21), a check valve (32) and an expansion tank (28).

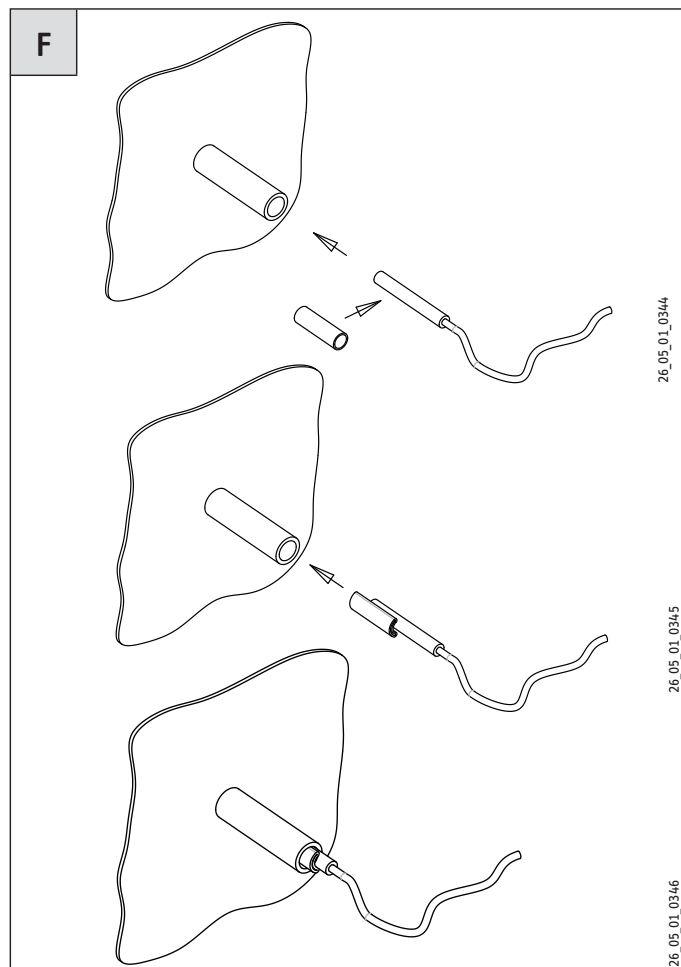


Test operation after installation. Start up must follow the approval of the installer (refer operation and use).

2.6 Hot water temperature probe

A F The hot water temperature probe is to be installed into the upper immersions sleeve (Pos. 3).

For this, place the spacer at the temperature sensor and push it into the sensor well



2.7 Solar Storage Tank – Temperature Probe

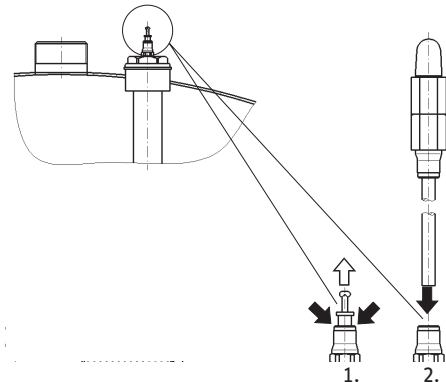
A The solar storage tank temperature probe to lower immersion sleeve (6) of the hot water storage tank.

The temperature probe must be completely inserted into the probe sleeve.

2.8 Sacrificial anode (spare part)

If a sacrificial anode is installed into the SBB ... plus storage tank, the following must be observed:

G



G Installation – sacrificial anode

- » Pull out the red shut-off plug while simultaneously depressing the pressure ring,.
- » Push in the open pipe end of the indicator element until dead-stop.
- » Attach the sticker “Sacrificial Anode wear indication” to a highly visible spot on the insulation.



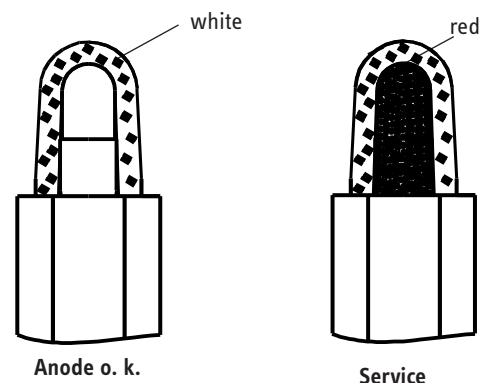
When the storage tank is not operated with a signal display, the red plug must remain in the anode!

H Function – Sacrificial indicator

(protective anode with consumption indication)

- » After degradation of the anode, humidity escapes through the hollow anode core to the signal cartridge and causes a color change there
- » When the cartridge turns red contact the installer to check the anode and if needed replace it.

H



2.9 Threaded immersion heater BGC

The BGC is inserted at the tank front into a 1½" female connection. For this, remove the cover lid from the external casing.

Observe the immersion heater installation instructions.

2.10 SBB plus accessories

Part no.	Type	Flange Ø mm	Description/output/indirect coil area	Version**	Depth of in- sertion	Suitable for
07 60 62	WTW 21/13	210	Indirect coil 1.3 m ²		410 mm	SBB . . plus***
07 21 19	WTFS 21/13	210	Refrigerant safety heat exchanger 1.3 m ²		410 mm	SBB . . plus***
07 13 30	FCR 21/60	210	Heating flange* 2/4 kW 1/N/PE~230 V 2/6, 3/6, 4/6 kW 3/N/PE~400 V	U, Z	400 mm	SBB . . plus***
07 13 31	FCR 21/120	210	Heating flange* 4 kW 1/N/PE~230 V 8 kW 2/N/PE~400 V 12 kW 3/PE~400 V	U, E	400 mm	SBB . . plus***
07 51 15	BGC	G 1½" A	Threaded immersion heater* 1; 2; 3; 4; 5.7 kW 1/N/PE~230 V 3 kW 2/PE~400 V 6 kW 3/PE~400 V	U, Z	455 mm	SBB . . plus for item 5, Fig. A

Spare anode						
14 34 99	Signal chain anode	Ø 33 x 1100 G 1¼" A				SBB . . plus for item 1, Fig. A

* With external temperature adjustment

** Version

E = single circuit version

Z = twin/single circuit version

U = universal flange (connectable models with various ratings)

*** For item 7, Fig. 1

Guarantee

For guarantees please refer to the respective terms and conditions of supply for your country.



The installation, electrical connection and first operation of this appliance should be carried out by a qualified installer.



The company does not accept liability for failure of any goods supplied which have not been installed and operated in accordance with the manufacturer's instructions.

Environment and recycling

Please help us to protect the environment by disposing of the packaging in accordance with the national regulations for waste processing.

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