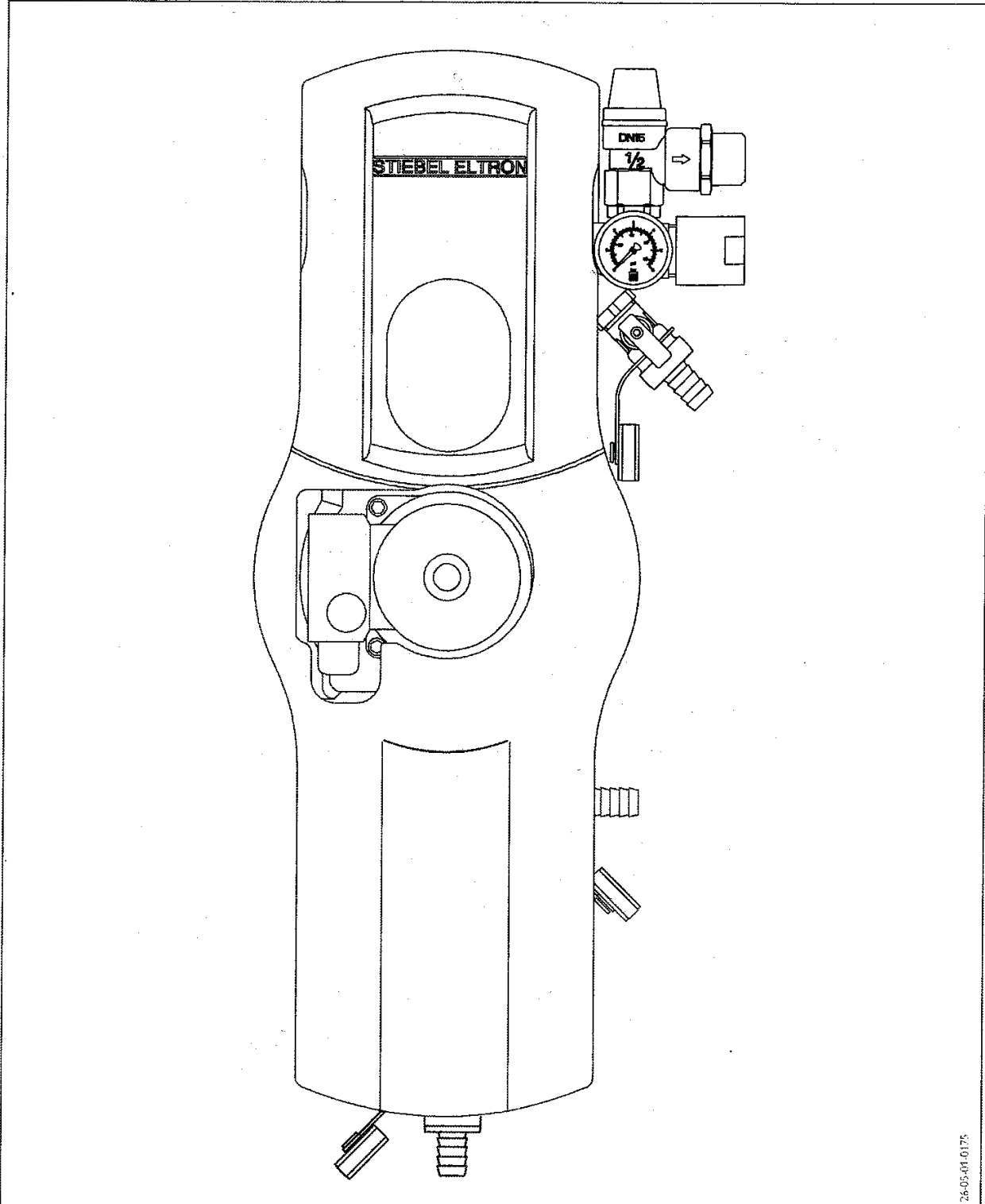


# Flowstar

Compact solar installation  
Installation and operating instructions



26-05-01-0175  
272802



## 1.1 Equipment description

The Flowstar compact solar assembly enables the simple installation of a solar heating system and provides an optimum connection between the solar collector array and the solar buffer tank.

The compact solar assembly can be wall mounted. SOKI comprises all components required for the hydraulic circuit. To minimise thermal losses, the SOKI is equipped with EPP thermal insulation.

The pump assembly includes a thermometer for flow and return, as well as an optical flow meter. An integral non-return valve prevents the undesirable thermo-siphon effect, i.e. the solar buffer tank does not lose its heat when the circulation pump is idle.

## 1.2 Applications

The compact solar assembly can be used with single line lengths of up to 20 m and up to the following number of collectors:

- SOL 20 plus: up to 16 panels
- SOL 25 plus: up to 16 panels
- SOL 23 plus: up to 16 panels
- SOL 27 plus: up to 16 panels

## 1.3 Standard delivery

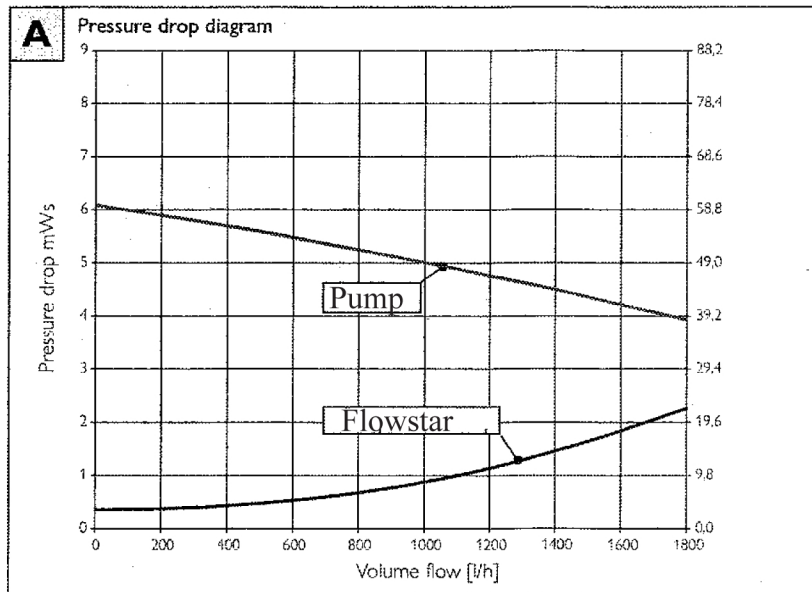
- 1 x compact solar assembly Flowstar
- 1 x hose ferrule with union nut for the fill & drain valve 3/4" and sealing cap 3/4"
- Rawl plugs and fixing screws
- 1 x thermometer with threaded sleeve

## 1.4 Accessories

**Tank connection set TCS (22 24 18)**  
The TCS enables the installation of the compact solar assembly on the tank itself.

## 1.4 Specification

Type		SOKI SI
Part no.		22 13 37
Height	inch / mm	21.65 / 550
Width	inch / mm	7.87 / 200
Depth	inch / mm	7.08 / 180
Weight	lb. / kg	11.2 / 5.1
Safety valve	psi / bar	87.02 / 6
Thermometer display range	°F / °C	32 to 320 / 0 to 160
Pressure gauge display range	psi / bar	0 to 87.02 / 0 to 6
Pump	type	ST 20/6-3 P
Stages		one-stage
Power consumption		44/63/82 W
Max. permiss. pressure	psi / bar	87.02 / 6
Max. permiss. temperature at peak times	°F / °C	248 / 120 356 / 180
Flow meter connection, top		R 1" (union nut)
Flow meter connection, bottom		Rp 3/4" (female thread)
Expansion tank connection		Rp 3/4" (male thread)
Safety assembly connection		Rp 3/4" (female thread)
Fill and flush facility		provided
Thermal insulation		EPP (extruded polypropylen)
Power supply		110/120 V
Flow meter		1 ... 13 l/min (standard)



## Installation instructions (for contractors)

### 2.1 Wall mounting **B**

- Remove the front insulation shell (12).
- Mark the holes to be drilled through the insulation and drill with an 8 mm bit.
- Secure the Flowstar to the wall with the fixing screws and Rawl plugs (58) supplied. For this, use a suitable Phillips screwdriver.
- Join the solar station and the tank or the collectors with suitable pipework.

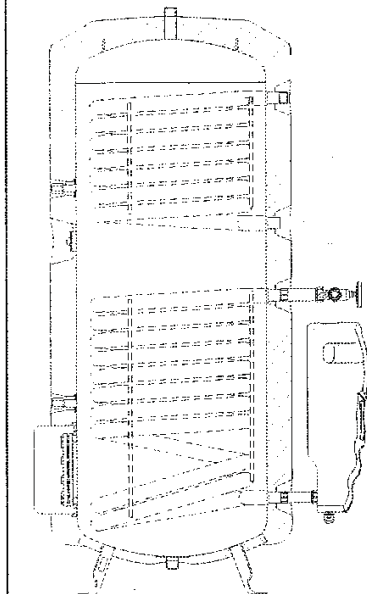
All fittings are tightened at the factory, making re-tightening generally unnecessary. Nevertheless, check the system for leaks during commissioning (pressure test).

### 2.2 Tank installation **C**

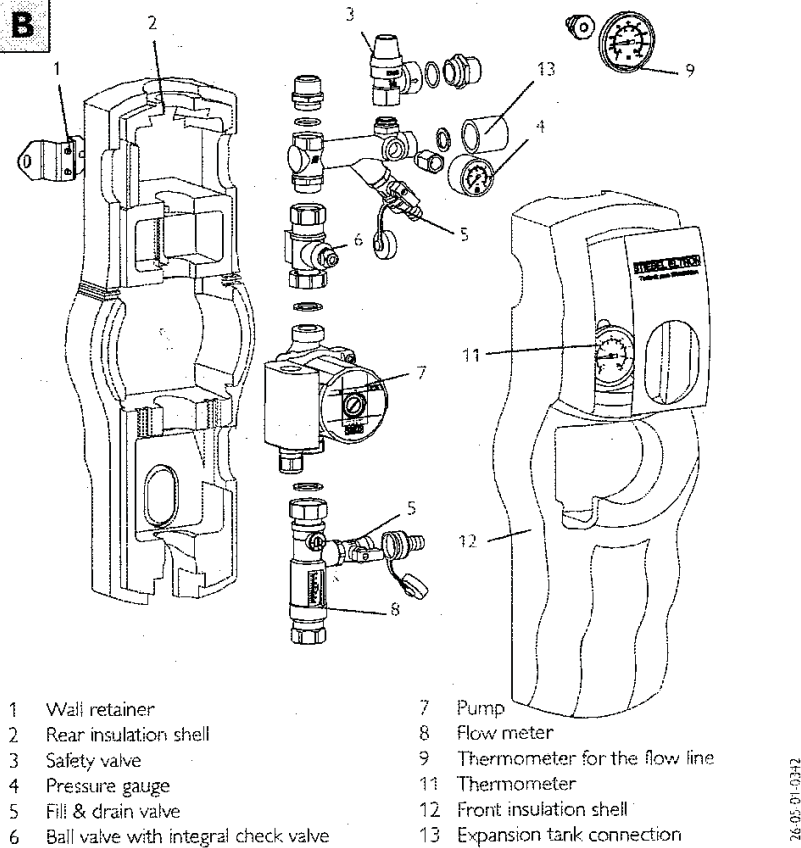
With the TCS tank connection set (order separately 22 24 18), the Flowstar can be installed on the SBB ... plus tank itself.

The 1" twin nipple (13) of the TCS for flow and return are sealed into the connections of the indirect solar coil of the cylinder. The flow line of the TCS (thermometer, gravity brake) is secured with a union nut. To secure the return line to Flowstar initially remove the flow meter (8) from Flowstar. Then join the flow meter (8) and the fill & drain valve (5) of the SAS. Finally, refit the flow meter (8) to the pump assembly. Then secure Flowstar (with fitted fill & drain valve) with the union nut (1") to the 1" twin nipple (14) sealed into the cylinder.

### **C** Tank installation



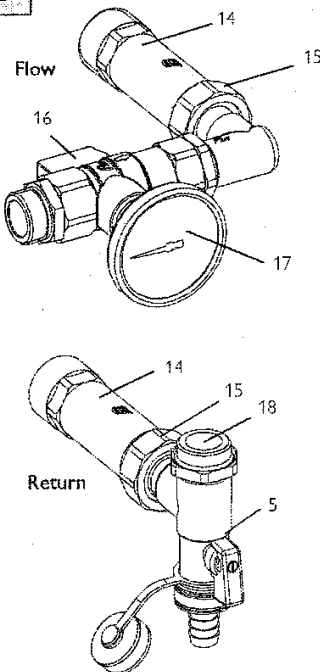
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- |  |                                 |
|--|---------------------------------|
| 1 Wall retainer                        | 7 Pump                          |
| 2 Rear insulation shell                | 8 Flow meter                    |
| 3 Safety valve                         | 9 Thermometer for the flow line |
| 4 Pressure gauge                       | 11 Thermometer                  |
| 5 Fill & drain valve                   | 12 Front insulation shell       |
| 6 Ball valve with integral check valve | 13 Expansion tank connection    |

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### **D** TCS tank connection set



- |  |
|--|
| 14 1" twin nipple for connection to the cylinder |
| 15 Union nut                                     |
| 16 Check Valve & Ball Valve / Isolation Valve    |
| 17 Thermometer                                   |
| 18 Connection at the Flowstar flow meter         |

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### 2.3 Water connections

The Flowstar is installed into the return line (cold side, process medium flows towards the collector) of the solar circuit. In addition, fit the thermometer supplied, together with the sensor sleeve, into the flow line (hot side, process medium flows from the collector).

Observe the solar panel operating and installation instructions, and local regulations.

Seals must be resistant to glycol and temperatures up to 356 °F (180 °C). Use reducers on site to join the lines to pipework with alternative diameters.

## 2.4 Electrical connection



All electrical work must be carried out by authorised, qualified personnel, in accordance with local regulations. Before carrying out any work, isolate the control unit from its power supply.

Install the SOKI permanently to the solar control unit in accordance with the installation and operating instructions of the respective control unit. Secure the electrical interconnecting cable with strain relief.

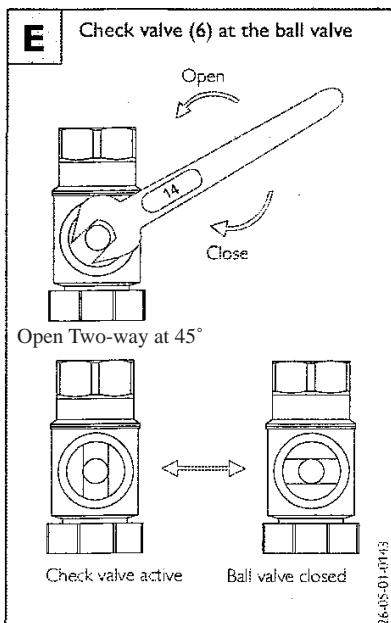
## 2.4 Installing the expansion tank

The Stiebel Etron expansion tank is suitable for H-30 L or H-30 LS and approved for an operating pressure of up to 87 psi (6 bar). The expansion tank inlet pressure must be 43.5 psi (3 bar), when the system has not been filled. Check the inlet pressure in all cases when the system is empty. An adjustment of the inlet pressure subject to height is not

permissible. Connect the expansion tank (connection from below) on site with the SOKI (13).

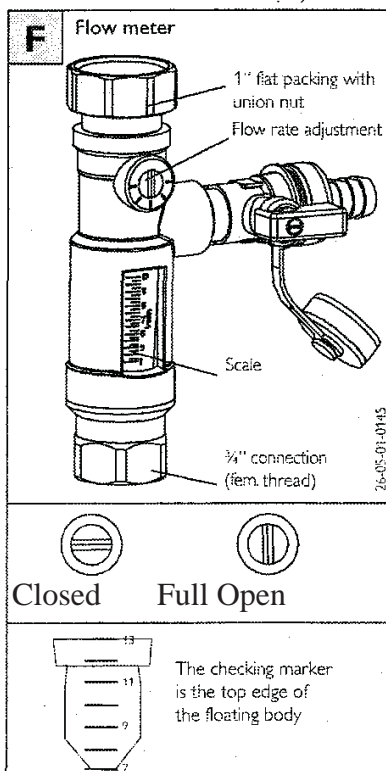
## 2.5 Flushing and filling the system **B**

- Connect the pressure hose to the fill & drain valve (5) below the pressure gauge (4), and open the valve.
- Connect the flushing hose to the fill & drain valve (5) at the flow meter (8), and open the valve.
- **D** The slot in the adjusting screw on the flow meter (8) must be in its horizontal position. This closes the integral ball valve.
- **E** Open the check valve above the pump. For this, position the ball valve with a size 14 open-ended spanner into the 45° position (half-way position).
- Fill the system with neat process fluid H-30 L/LS.



- Flush the solar circuit for at least 15 min using the flush and fill station (not part of the standard delivery). To ensure that all air is purged from the system it is necessary to briefly and intermittently open the adjusting screw at the flow meter (8) (slot vertical).

- Close the flushing fill & drain valve (5) (drain cock) with the filling pump switched ON, and raise the system pressure to approx. 72.5 psi (5 bar). Check the system pressure at the pressure gauge (4).
- Close the fill valve and switch the pump on the flushing and fill station OFF, then open the adjusting screw at the flow meter (8) (slot vertical).
- Vent the system above the collectors, until the system liquid is expelled free of bubbles. Raise the pressure again to approx. 6 bar and check the system for leaks. You have to assume that the system leaks if the pressure gauge (4) registers a severe drop.
- Adjust the operating pressure up to 50 psi and less than potable pressure.
- Run the pump (7) at its highest speed and let it operate for at least 15 min.
- Adjust the pump to required flow rate.
- **Optimum flow rate:** 1.3 gpm. 5 litres/min/assembly
- Remove the hoses from the fill station and plug the ports in the flushing and fill valves.
- Check the system once more for possible leaks. Fully open the ball valve (6) above the pump.
- Fit the front insulation shell (12).



## 2.7 Draining the system

- Open the check valve inside the ball valve (6).
- Open the air vent valve at the highest point (above the collectors) of the system.
- Open the fill & drain valve at the lowest point of the system, either at the flushing fill & drain valve (5) (drain cock) or at the TCS (not part of the standard delivery).

## 2.8 Check valve **E**

- The check valve is integrated into the ball valve (6) above the pump (7). It has an opening pressure of 20 mbar.
- Draining the system requires that the check valve is open. For this, move the ball valve handle (6) into a 45° position.
- The ball valve (6) should be fully open for correct operation of the system.
- To prevent incorrect operation it is recommended that an additional check valve is installed in the flow line (from the collector to the tank) (part of the standard delivery of the TCS tank connection set).

## 2.9 Safety equipment

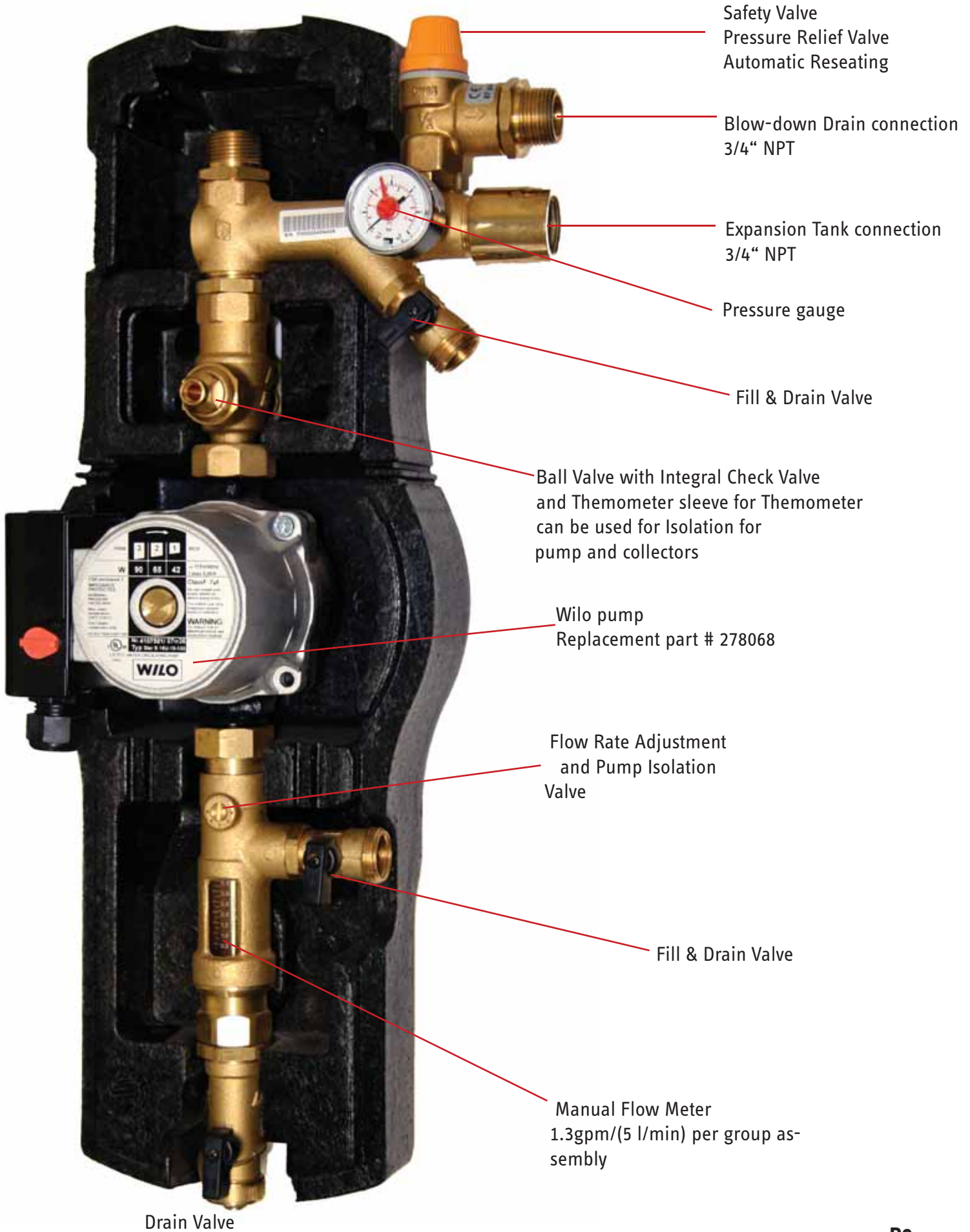
- The Flowstar is equipped with a 87psi /6bar safety valve; this must be easily accessible
- The blow-down line diameter must be identical to the diameter of the valve outlet port; the line may be a max. of 78.7 inch (2 m) long. Select a blow-down line with a diameter which is the next size up if this maximum value is exceeded (2 bends, 78.7 inch long line). Never install more than 3 bends and a 157.4 inch (4 m) long line.
- The drain line must have a diameter twice as large as that of the valve inlet port, if the blow-down line is routed into a blow-down line with funnel. Furthermore ensure that the blow-down line is routed with a slope: the outlet must be open and visible and be routed so that no personnel is put at risk during blow-downs.
- It has proven practical to place a container underneath the blow-down line. When the safety valve responds, fluid is collected and can be returned to the system again (if the pressure inside the system has dropped too low).

## 2.10 Pump settings **B** **F**

The flow meter (8) is a throughput measuring device with an integral and adjustable flow rate limiter. It has a display range of 1 to 13 l/min.

Adjust the flow rate at the rotary selector of the pump (7) (check it at the flow meter). For SOL 20 plus, SOL 23 plus, SOL 25 plus and SOL 27 plus collectors, adjust the flow rate to approx. 5 l/min/ assembly (or 300 l/h/ assembly). For the SOL 20 SI collectors, adjust the flow rate to 80 l/h/collector:





Safety Valve  
Pressure Relief Valve  
Automatic Reseating

Blow-down Drain connection  
3/4" NPT

Expansion Tank connection  
3/4" NPT

Pressure gauge

Fill & Drain Valve

Ball Valve with Integral Check Valve  
and Themometer sleeve for Themometer  
can be used for Isolation for  
pump and collectors

Wilo pump  
Replacement part # 278068

Flow Rate Adjustment  
and Pump Isolation  
Valve

Fill & Drain Valve

Manual Flow Meter  
1.3gpm/(5 l/min) per group as-  
sembly

Drain Valve