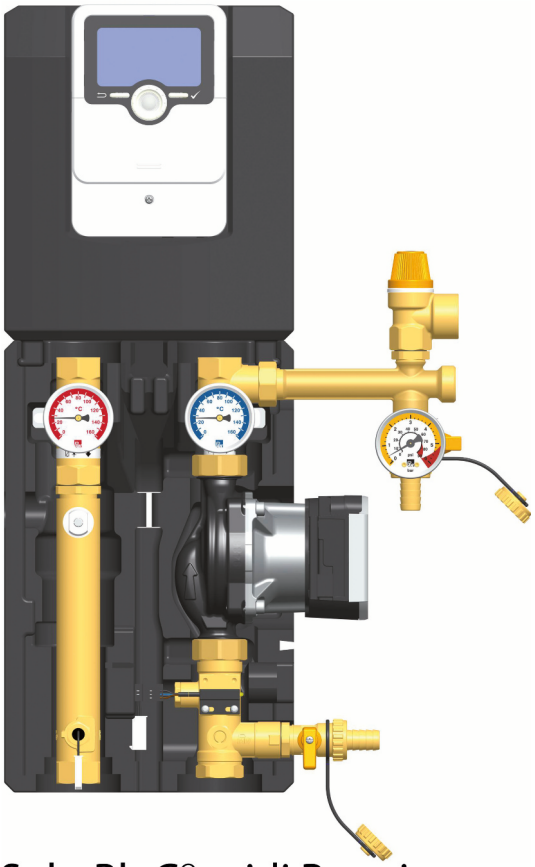
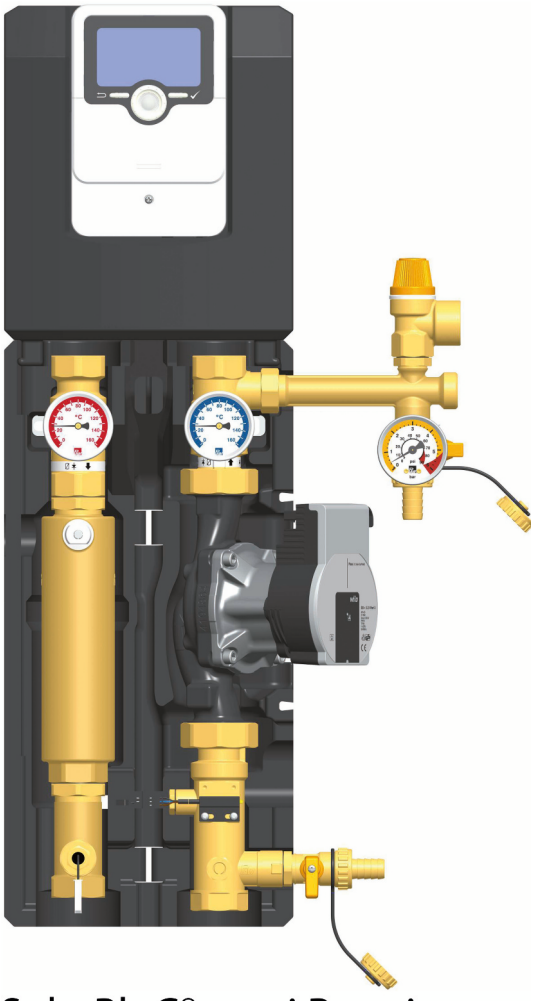
PAW GmbH & Co. KG
Böcklerstraße 11, 31789 Hameln, Germany
Phone: +49-5151-9856-0, Fax: +49-5151-9856-98
E-mail: info@paw.eu, Web: www.paw.eu

English

Installation and Operation Instructions
Solar stations
SolarBloC® midi Premium - DN 20
SolarBloC® maxi Premium - DN 25
with controller SC3.5



SolarBloC® midi Premium
DN 20



SolarBloC® maxi Premium
DN 25

Table of Contents

1 General Information

Carefully read these instructions before installation and commissioning. Save these instructions in the vicinity of the installation for future reference.

1.1 About these instructions

These instructions describe the installation, commissioning, function and operation of the solar station SolarBloC®.

The chapters called [specialist] are intended for specialists only.

For other components of the solar installation, such as pumps, collectors, storage tanks, expansion tanks and controllers, please observe the instructions of the corresponding manufacturer.

1.2 About this product

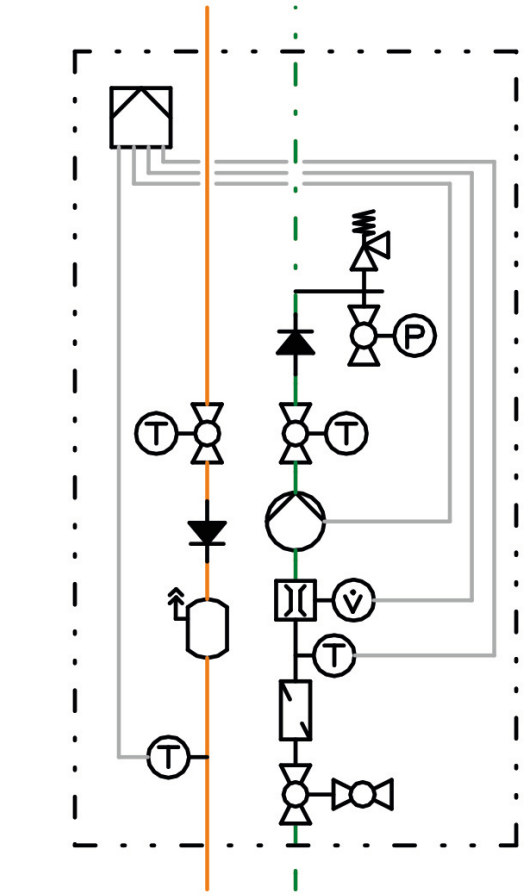
The station is a group of fittings checked for tightness and preset (apart from the versions with the Wilo Maxo pump and Grundfos Solar PML pump) used to circulate the solar fluid in the solar circuit. It is mounted on a wall bracket and fixed with clips. The station is equipped with a preset controller which can be adjusted for diverse systems. Further, the station contains important valves, fittings and safety devices for the operation of the installation:

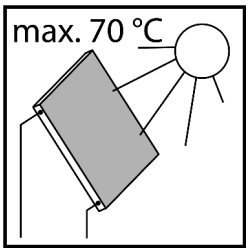
- Ball valves in the flow and return line with exchangeable spindle
- Check valves in the flow and return ball valves
- Thermometers in the flow and return
- FlowRotor (measuring device with Hall sensor)
- Temperature sensors in the flow and return
- Pressure gauge to display the installation pressure in the solar circuit
- Airstop to easily vent the solar circuit
- Flush and fill valves with caps
- Solar pressure relief valve
- High-efficiency pump

1.3 Designated use

The solar station may only be used in solar thermal systems as a pump station in the solar circuit, taking into consideration the technical limit values indicated in these instructions. Due to its design, the station must be mounted and operated in a vertical position with upward flow direction of the pump!

Only use PAW accessories with the solar station. Improper usage excludes any liability claims.





Under the influence of solar radiation, the collectors will heat up considerably.

The solar fluid in the solar circuit may heat up to more than 100 °C.

Only flush and fill the solar circuit when the collector temperatures are below 70 °C.

2 Safety instructions

The installation and commissioning as well as the connection of electrical components require technical knowledge commensurate with a recognised vocational qualification as a fitter for plumbing, heating and air conditioning technology, or a profession requiring a comparable level of knowledge [specialist].

The following must be observed during installation and commissioning:

- relevant local and national regulations
- accident prevention regulations of the professional association
- instructions and safety instructions mentioned in these instructions

WARNING	
	**Danger of scalding due to the escape of hot fluids!** With pressure relief valves, there is a risk of scalding due to the escape of vapour or hot fluid. Please ensure for each pressure relief valve that no personal injury or material damage may occur due to possibly escaping medium. ► Install a discharge line. ► Observe the instructions regarding the pressure relief valve. ► The pressures for the expansion tank calculated by the plant designer and the operating pressure of the installation must be set.

⚠ CAUTION	
	**Risk of burns!** The valves and fittings and the pumps can become heated up to more than 100 °C during operation. ► The insulating shell must remain closed during operation.

⚠ CAUTION

Personal injury and material damage due to overpressure!

Closing both ball valves in the primary circuit will separate the safety group from the heat exchanger. A rise in temperature in the storage tank may result in high pressures, which may lead to personal injury and material damage!

- ► Only close the ball valves for service and maintenance.

WARNING

Material damage due to mineral oils!

Mineral oil products cause lasting damage to seals made of EPDM, whereby the sealant properties are lost. We do not assume liability nor provide warranty for damage to property resulting from sealants damaged in this way.

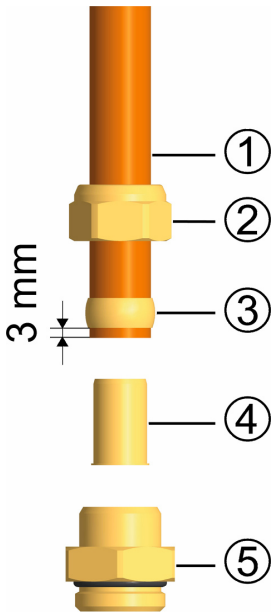
- ► It is imperative to prevent the EPDM sealing elements from making contact with substances containing mineral oils.
- ► Use a silicone- or polyalkylene-based lubricant free of mineral oil such as Unisilikon L250L and Syntheso Glep 1 from Klüber or a silicone spray.

3 Mounting and installation [specialist]

WARNING

Material damage due to high temperatures!

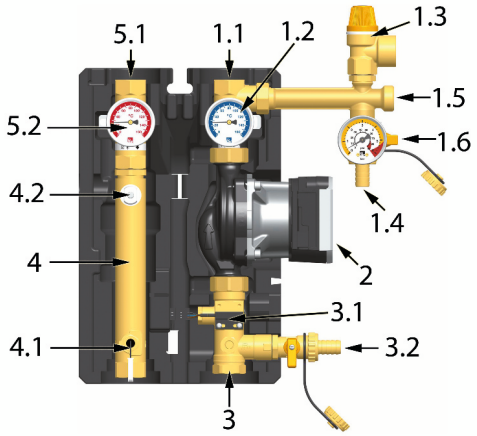
Since the solar fluid near the collector can be very hot, the group of fittings must be installed at a sufficient distance from the collector field. It may be necessary to install an intermediate tank in order to protect the expansion tank.



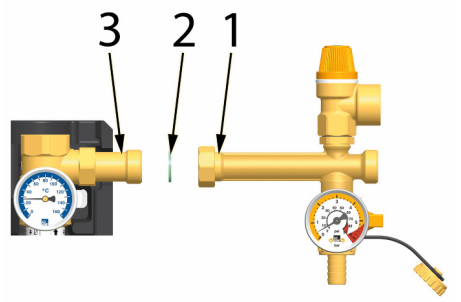
Not included in the scope of delivery!

Accessories: compression fitting

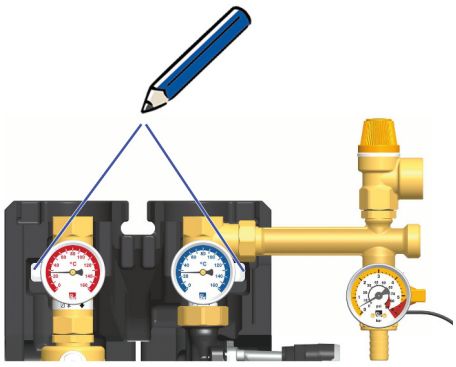
1. Push the union nut ② and the cutting ring ③ onto the copper pipe ①. The pipe must protrude at least 3 mm from the cutting ring in order to ensure the force transmission and the sealing.
2. Insert the support sleeve ④ into the copper pipe.
3. Insert the copper pipe with the plugged-on individual parts (②, ③ and ④) as far as possible into the body of the compression fitting ⑤.
4. First, screw the union nut ② manually.
5. Tighten the union nut ② by rotating one full turn. Secure the body of the compression fitting ⑤ against distort in order to avoid damaging the sealing ring.



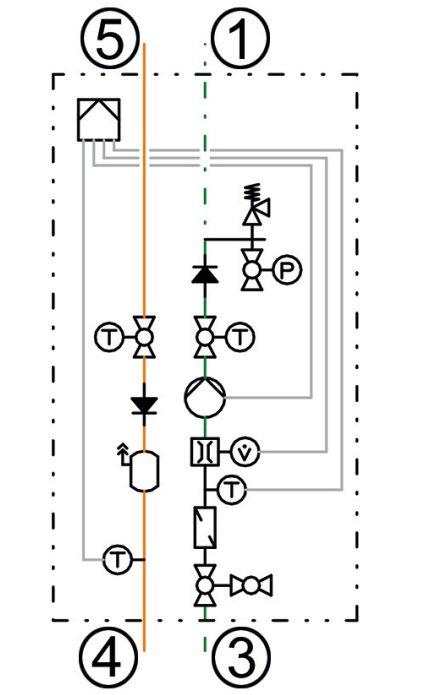
1. Remove the station from the packaging.
2. Remove the insulating front shell.



3. Only for version with Wilo Maxo pump / Grundfos Solar PML pump: Mount the enclosed safety group for completion and prior to commissioning. For this, screw the union nut (1) of the safety bar onto the distance piece (3) by using the corresponding gasket (2).



4. Copy the mounting holes next to the thermometers of the solar station to the mounting surface.
5. Drill the holes and mount the solar station to the wall with appropriate wall plugs and screws.



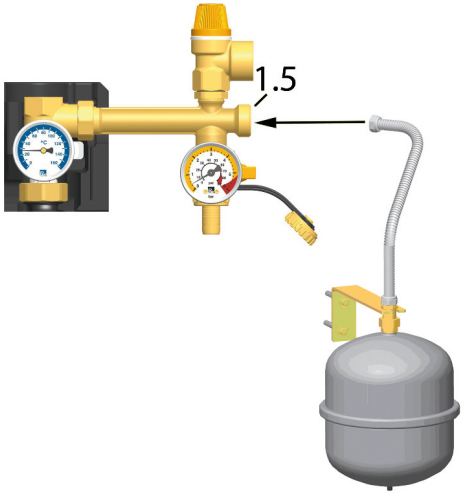
6. Connect the solar station to the installation by using the pipes.

① Return to the collector field

③ Return from the storage tank

④ Flow to the storage tank

⑤ Flow from the collector field



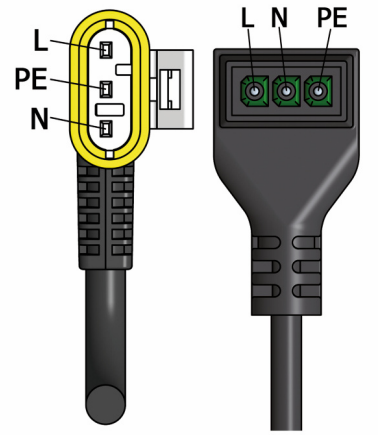
The expansion tank is not included in the scope of delivery!

7. Connect the pipe for the expansion tank [1.5] and fix the bracket for the expansion tank.
8. Adapt the initial pressure of the expansion tank to the system and connect the expansion tank. Observe the separate instructions for the expansion tank!
9. Check all thread connections and tighten them if necessary.

WARNING

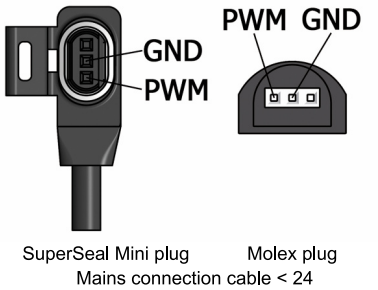
Risk to life and limb due to electric shock!

- ▶ Prior to commencing electrical work on the controller, pull the mains plug!
- ▶ Only after completing all installation work as well as the flushing and filling, the mains plug of the controller can be plugged into a socket. This avoids an unintentional start of the motors.



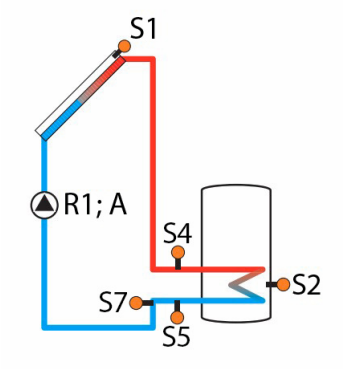
1. Push the controller extension with the premounted controller (optional) onto the station.
2. Connect the mains connection cable according to type to the pump.

L	brown
PE	yellow-green
N	blue



3. In addition, connect the PWM connection cable according to type to the pump.

PWM	brown
GND	blue



4. Connect the sensors to the controller: collector sensor to S1, storage tank sensor to S2, flow sensor to S4, return sensor to S5 and flow rate sensor to S7.

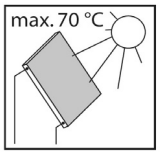
   The assembly of the station is now completed and the station can be put into operation.

Source of image: Resol

4 Commissioning [specialist]

Please observe the following safety instructions regarding the commissioning of the station:

WARNING



Risk of burning and scalding!

The valves and fittings may heat up to more than 100 °C. Therefore, do not clean or fill the system when the collectors are hot (intense sunshine). Please note that hot solar fluid leaks from the pressure relief valves in case of too high system pressure! During venting the solar fluid may escape as vapour and result in scalding!

► Flush and fill the system only when the collector temperatures are below 70 °C.

WARNING

Risk of frost!

It often happens that solar systems cannot be completely drained after flushing. Thus, there is a risk of frost damage later on when flushing with water. Therefore, only use the solar fluid used later on for flushing and filling the solar installation.

► Use a water/propylene glycol mixture with max. 50% of propylene glycol as solar fluid.

WARNING

Note regarding the commissioning sequence

During commissioning, fill the heating circuit first and the solar circuit afterwards. This guarantees that the heat possibly absorbed by the collectors during commissioning can be dissipated.

WARNING

Note regarding the expansion tank

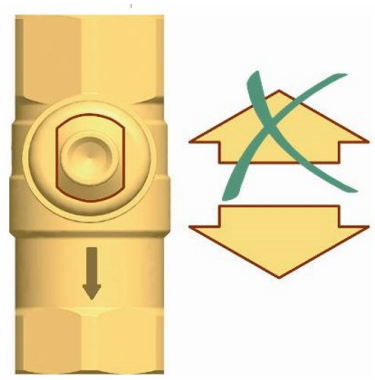
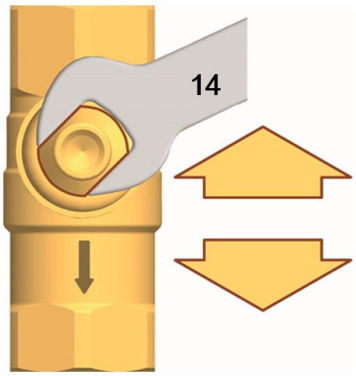
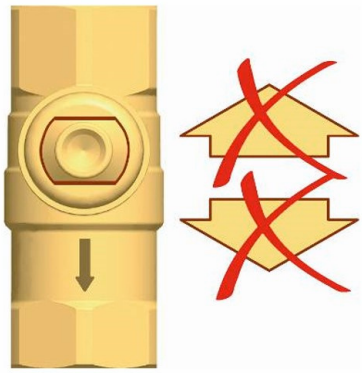
To prevent any dirt particles contained in the solar installation from being flushed into the expansion tank, some manufacturers recommend disconnecting the expansion tank from the solar circuit during flushing and filling. Please observe the instructions of the manufacturer.

4.1 Flushing and filling the solar circuit

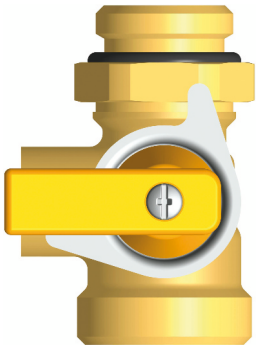
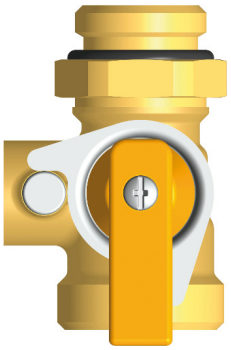
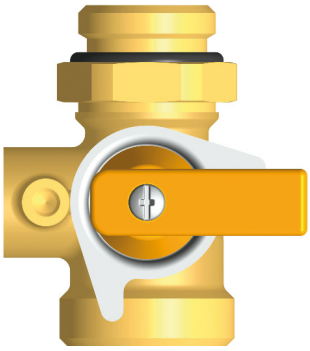
The fill and drain valves necessary to flush and fill the installation are integrated in the solar station. Make sure not to wash dirt particles that may be present in the solar installation into the expansion tank. To do so, it may be necessary to disconnect the expansion tank during flushing and filling and to use only flushing and filling stations that are equipped with suitable microfilters.

Ball valve with integrated flow check valve

(normal flow direction in the figure: downwards)

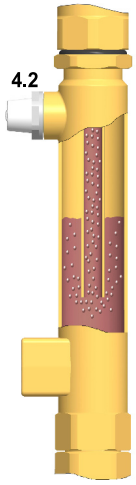
Position 0°	**Position 45°**	**Position 90°**
		
Check valve is operating, **flow only in flow direction.**	Check valve not operating, **flow in both directions.**	Ball valve closed, **no flow.**

Functions of the fill and drain valve within the safety group

Position	Function
	**Position "closed"** (station in operation): Fill and flush circuit is closed. Pressure gauge indicates system pressure.
	**Position "open"** (fill and flush processes): Fill and flush circuit is open. Pressure gauge indicates pressure.
	**Position "maintenance"** (maintenance work): Fill and flush circuit is closed. Pressure gauge indicates, after removal of cap, no pressure. Attention: Remove stop bolt before changing the position!

Airstop

The Airstop (vent valve with manual bleeder) is used to vent the solar system. To ensure a perfect venting of the solar circuit, the flow velocity must be at least 0.3 m/s in the flow line.



Pipe diameter [mm]		Flow rate at 0.3 m/s	
⌀ outside	**⌀ inside**	l/h	**l/min**
15	**13**	~ 143	**~ 2.4**
18	**16**	~ 217	**~ 3.6**
22	**20**	~ 339	**~ 5.7**
28	**25**	~ 530	**~ 8.8**

WARNING

Danger of scalding due to escaping vapour!

The escaping medium can have a temperature of more than 100 °C and cause scalding.

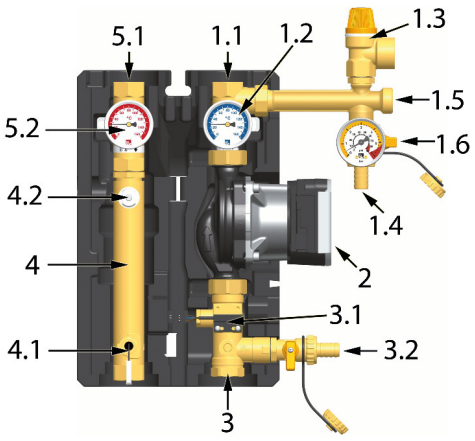
► Carefully open the vent plug and close it again, as soon as medium escapes.

The air separated from the solar fluid is collected in the upper part of the airstop and can be released at the vent plug.

Venting the solar installation after commissioning

At the beginning, vent the solar installation daily and then weekly or monthly, depending on the vented air quantity. Thus, an optimum operation of the solar installation is ensured. Check the system pressure after venting and increase it to the prescribed operating pressure, if necessary.

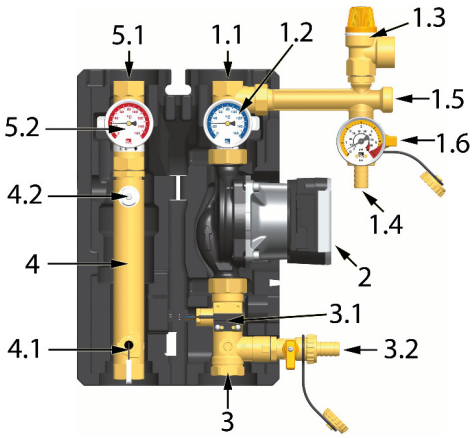
4.2 Preparations before flushing



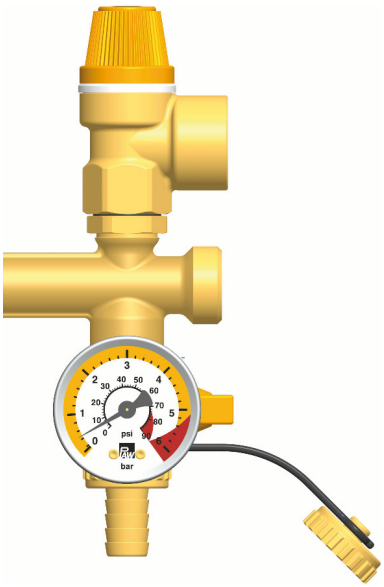
The solar circuit is flushed in the direction of flow.

1. Disconnect the expansion tank from the solar system. Observe the separate instructions for the expansion tank!
2. Turn the check valve in the flow ball valve [5.2] into operating position (0°, see chapter 4.1).
3. Close the return ball valve [1.2] (90°, see chapter 4.1).
4. The ball valve [3] in the FlowRotor must be open.
5. The drain valve [3.2] must be closed.
6. Connect the fill station to the solar station:
   - pressure hose to the fill valve [1.4]
   - flush hose to the drain valve [3.2]
7. Open the fill valve [1.4] and the drain valve [3.2].

4.3 Flushing and filling



1. Put the flush and fill station into operation and flush the solar installation for at least 15 minutes (until clear solar fluid exits).
2. Vent the solar installation several times at the vent plug of the airstop [4.2] until the solar fluid exits clearly and without bubbles (see chapter 4.1).



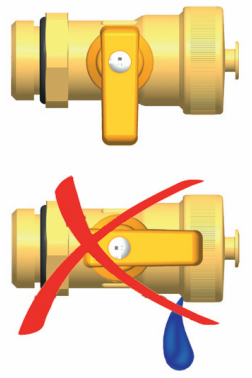
Consider the pressure relief valve (6 bars)!

3. To flush and vent the pump line, slowly open the check valve in the return ball valve [1.2] (0°, see chpater 4.1).
4. Close the drain valve [3.2] while the filling pump is running and increase the system pressure to about 5 bars. The system pressure is displayed on the pressure gauge. Close the fill valve [1.4] by turning the valve in position "closed" (see chapter 4.1) and switch off the pump of the flush and fill station.
5. Check the pressure gauge to see whether the system pressure reduces and eliminate leaks where necessary.
6. Connect the expansion tank to the solar circuit and set the operating pressure of the solar installation by means of the flush and fill station (for the required operating pressure, see instructions of the expansion tank).
7. Reduce the pressure at the drain valve [3.2] to the operating pressure of the installation, if necessary.
8. Close the fill and drain valves [1.4|3.2]. For this, turn the valve [1.4] into position "closed", see chapter 4.1.
9. Turn the check valve in the return ball valve [1.2] into operating position (0°, see chapter 4.1).

WARNING

Risk to life and limb due to electric shock!

► Check whether the sensors and pumps have been connected to the controller and the controller housing is closed. Only then, the mains plug of the controller can be plugged into a socket.



10. Connect the controller to the mains and set the solar circuit pump in the manual mode to Max. according to the controller instructions. Let the solar circuit pump run at maximum rotation speed for at least 15 minutes.

    In the meantime, vent the solar system several times at the vent plug of the airstop until the solar fluid exits without forming bubbles (see chapter 4.1).

    If necessary, increase the system pressure to the operating pressure.

11. Remove the hoses of the flush and fill station and screw the sealing caps on the fill and drain valves.

    The closure caps are only for protection against contamination. They are not designed for high system pressures. Their tightness is ensured by the closed ball valves.

12. Mount the insulating front shell.

13. Set the automatic mode on the controller (see controller manual).

The commissioning of the solar installation is now completed. Please fill in completely the commissioning log.

4.4 Commissioning and adjustment of the controller SC3.5

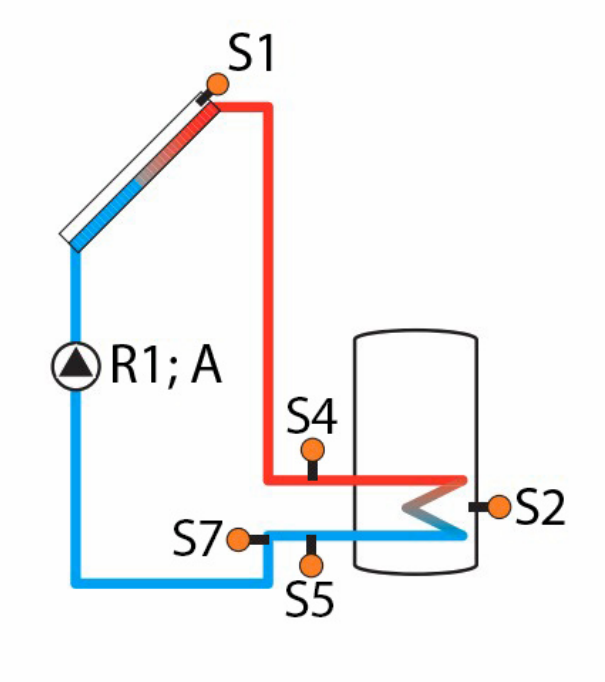
The controller is factory-wired depending on the pump plug:

Pump connection cable	to R1
PWM signal cable	to PWM A
Mains connection	to L, N, protective earth conductor
Connection cable for flow and return temperatures	to S4 and S5
Connection cable for flow rate	to S7

The controller is preassigned for 4 solar basic systems. The factory setting is system 1. A total of 27 pre-configured schemata are available.

By default, the pump is connected to R1 (supply cable) and to PWM A (signal cable).

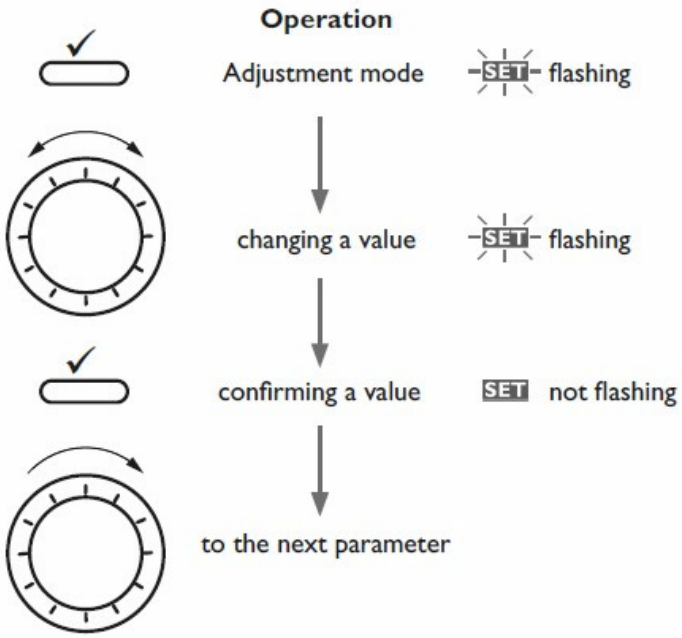
Based on the assembly and installation according to these instructions, the temperature sensors are connected to S1 (collector), S2 (storage tank), S4 (flow) and S5 (return), which corresponds to system 1 (solar thermal system with a storage tank).



Source of image: Resol

If another system is selected, it may be necessary to connect further sensors and switching elements. Please observe the separate instructions of the controller!

The controller first runs through an initialisation phase, subsequently the commissioning starts in which the most important settings are made according to the following schema:



Source of image: Resol

The flow and return sensors (S4 and S5) are not included in the factory setting. They can be selected and added in the expert menu as well as in the HQM menu. For this and also for further settings or modifications related to the system, the options or the functions, please observe the separate instructions of the controller.

4.5 Heat quantity measurement

The controller offers the possibility to carry out a heat quantity measurement of the flow and return sensors (S4 and S5) and of a flow rate sensor (S7).

For this, navigate to the HQM menu and make the following settings:

Adjustment channel	Description	Adjustment range / selection	Factory setting
Flow sen.	Flow sensor selection	system dependent	system dep.
Return sen.	Return sensor selection	system dependent	system dep.
Flow rate sen.	Flow rate sensor option	Yes, No	No
Flow rate sen.	Flow rate sensor selection	S5, S6, S7	-
Flow r...	Flow rate (only if Flow rate sen. = No)	1.0 ... 500.0 l/min	3.0 l/min
Relay	Relay selection	system dependent	-
Fluid type	Heat transfer fluid	Tyfocor LS, Propylene glycol, Ethylene glycol, Water	Water
Ratio	Glycol ratio in the heat transfer fluid (only if Fluid type = Propyl. glycol or Ethyl. glycol)	20 ... 70 %	40 %
Alternative unit	Alternative unit option	Yes, No	No
Unit	Alternative display unit	Coal, Gas, Oil, CO_2	CO_2
Factor	Conversion factor	0.0000001...100.0000000	0.5000000
Funct.	Activation / Deactivation	Activated, Deactivated, Switch	Activated
Sensor	Sensor input allocation	-	-

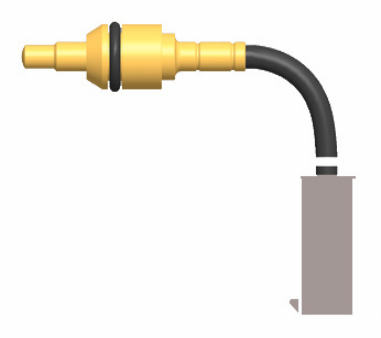
Source of table: Resol

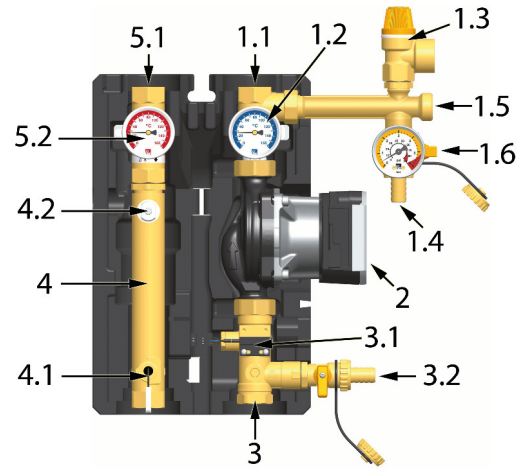
Make sure to select the Flowrotor according to the hydraulics (DN 20, DN 25), see chapter 3 or controller instructions chapter 16.

5 Maintenance [specialist]

WARNING	
	**Risk of burning and scalding!** The valves and fittings and the solar fluid can have temperatures of more than 100 °C. The solar fluid may escape as vapour and result in scalding. ► Perform maintenance work only when the collector temperatures are below 50 °C. ► Wait until the solar fluid has cooled down to at least 50 °C.

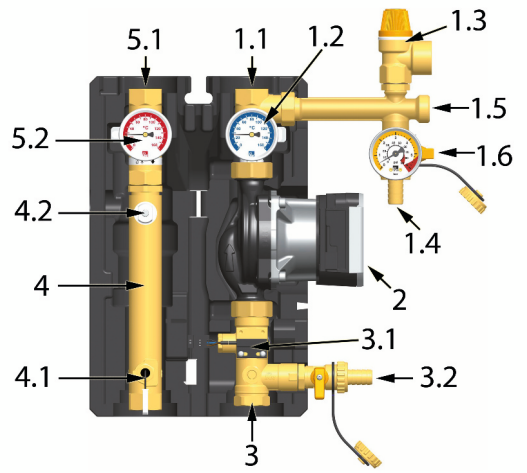
5.1 Replacing the temperature sensor at the airstop





1. Drain the solar circuit as described in chapter 5.3.
2. Pull out the fixation clip of the sensor.
3. Pull the sensor [4.1] to the front out of the airstop.
4. Make sure that there is a sealing ring in the groove of the new sensor. Make sure that the sealing ring is correctly positioned when you insert the sensor.
5. After inserting the sensor, fix it by using the clip.
6. Connect the sensor cable.
7. Close the drain valve [3.2].
8. Fill the solar circuit as described in chapter 4.2 and 4.3.

5.2 Replacement / adjustment of the pressure gauge



1. Switch off the controller and secure it against being switched on again.
2. Make sure that the valve [1.4] is closed with cap.
3. Turn the valve [1.4.] in position "maintenance" by removing the stop screw, see chapter 4.1.

4. **Deinstallation of the pressure gauge:**

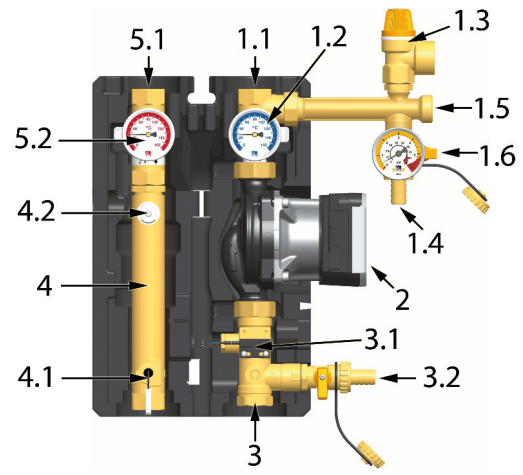
   Dismount the pressure gauge [1.6]. It can happen that a small amount of fluid leaks out (valve content). After that, exchange the pressure gauge.

   Adjustment of the pressure gauge:

   Loosen the counter nut and turn the pressure gauge (from completely screwed in to max. 360°) anti-clockwise. After that, secure it with the counter nut.

5. Turn the valve [1.4.] again in position "closed" (see chapter 4.1.). During this, mount the stop screw.
6. Check the pressure gauge for tightness. Also, check the system pressure [1.6] and increase it to the prescribed operating pressure, if necessary.
7. Vent the installation. Repeat that weekly or monthly, depending on the vented air quantity, see chapter 4.2.

5.3 Draining the solar system



1. Switch off the controller and secure it against being switched on again.
2. Open the check valves in the flow and return ball valve [5.2|1.2] by turning them into position 45° (see chapter 4.1).
3. Connect a heat-resistant hose to the lowest drain valve of the solar installation (possibly drain valve [3.2]).

   Make sure that the solar fluid is collected in a heat-resistant container.

WARNING

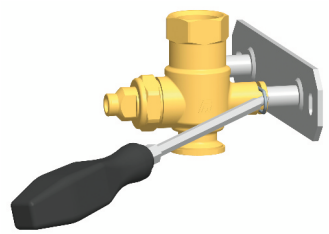
Danger of scalding due to hot solar fluid!

The escaping solar fluid can be very hot!

- ► Position and secure the heat-resistant collecting container such that persons nearby are not put at risk when the solar system is drained.

4. Open the drain valve at the lowest point of the solar installation.
5. To accelerate draining of the solar circuit, you can open the air-bleed valve, if present, at the highest point of the solar system.
6. Dispose of the solar fluid observing the local regulations.

5.4 Deinstallation



1. Drain the solar installation as described above.
2. Disconnect the pipe connections to the solar installation.
3. To remove the solar station from the mounting plate, pull out the clip springs laterally with a screwdriver.
4. Remove the station by pulling it forward.

6 Scope of delivery [specialist]

NOTICE

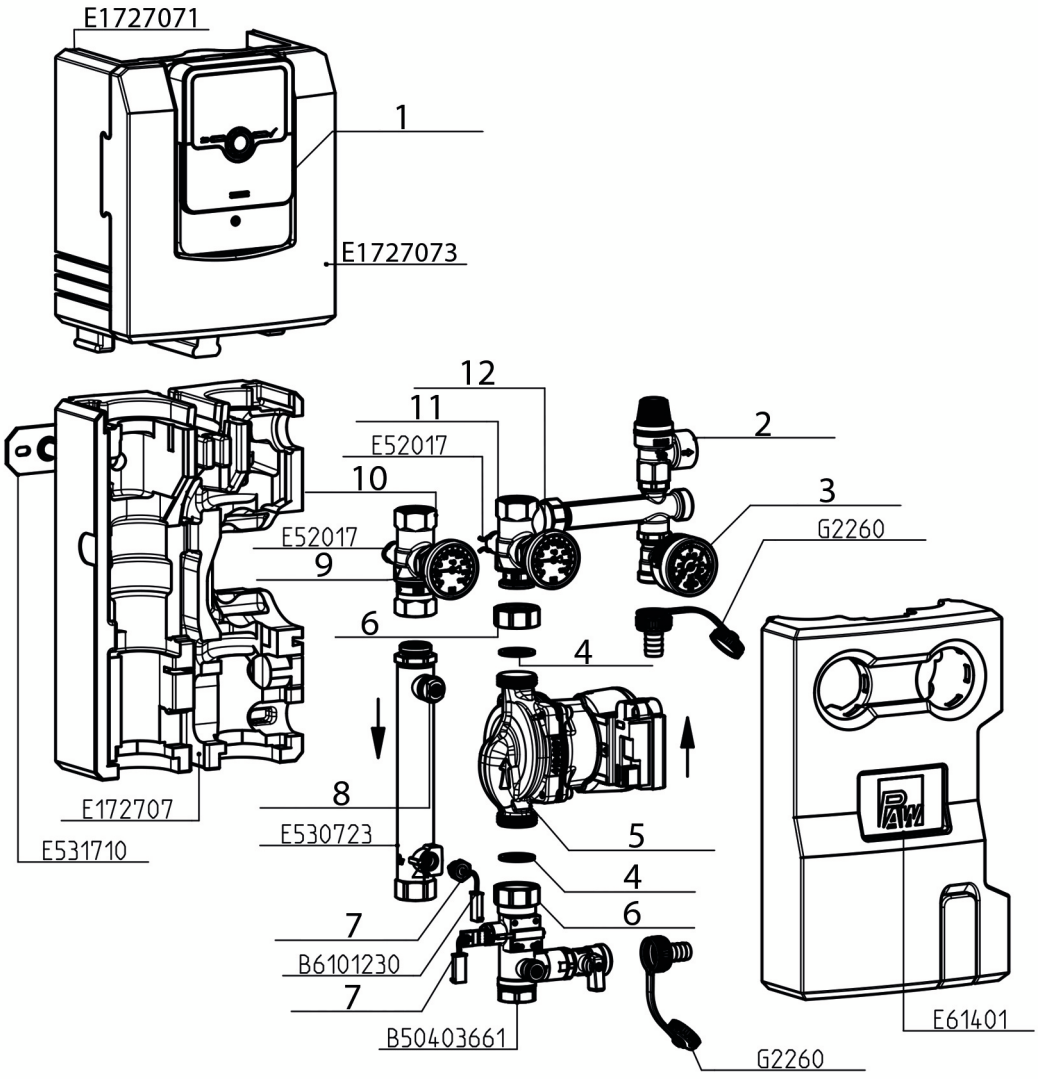
Serial number

Complaints and requests/orders of spare parts will only be processed with information on the serial number!

The serial number is placed on the safety group.

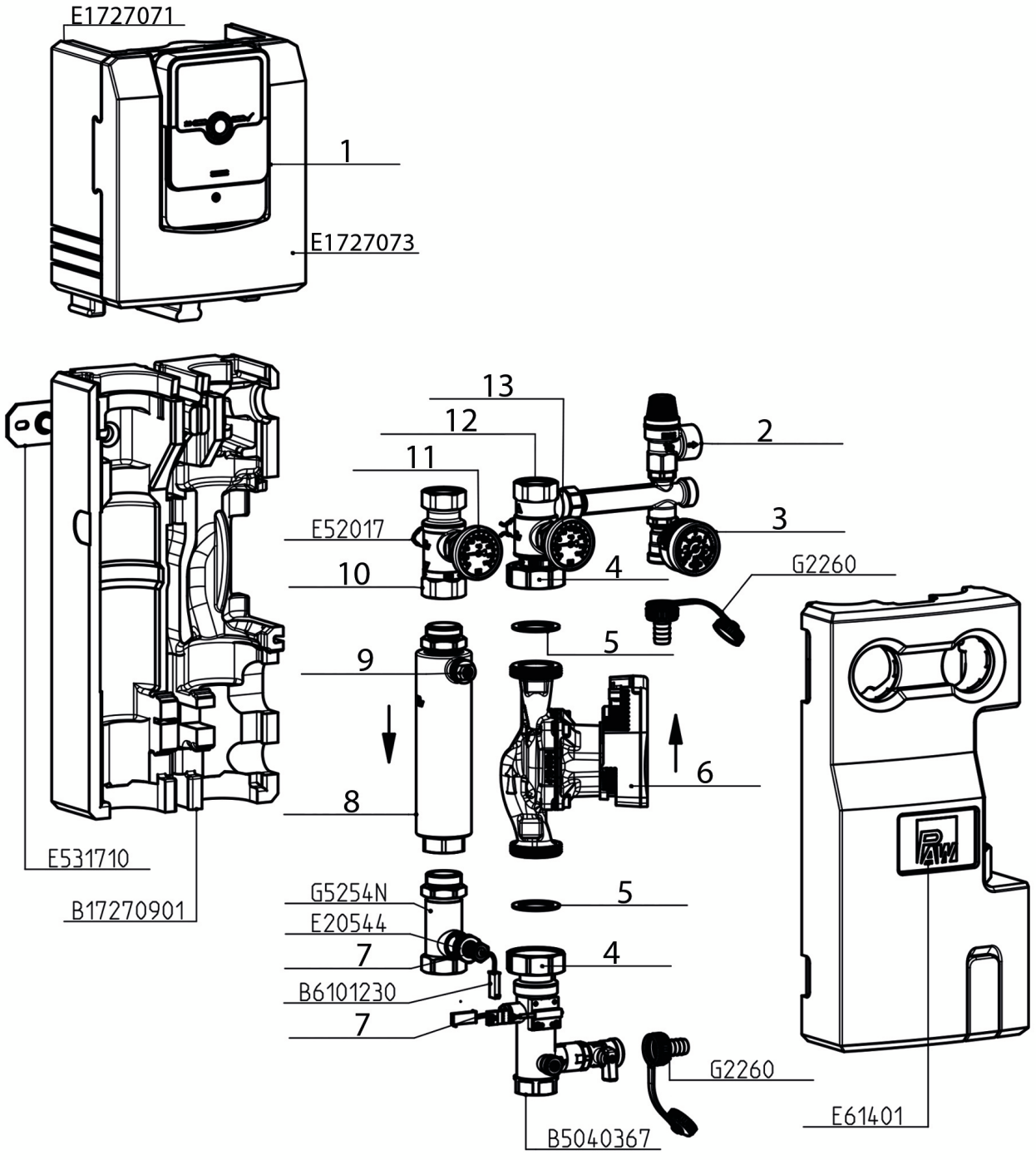
► In case of a complaint, please send us the entirely completed commissioning report.

6.1 SolarBloC® midi Premium DN 20



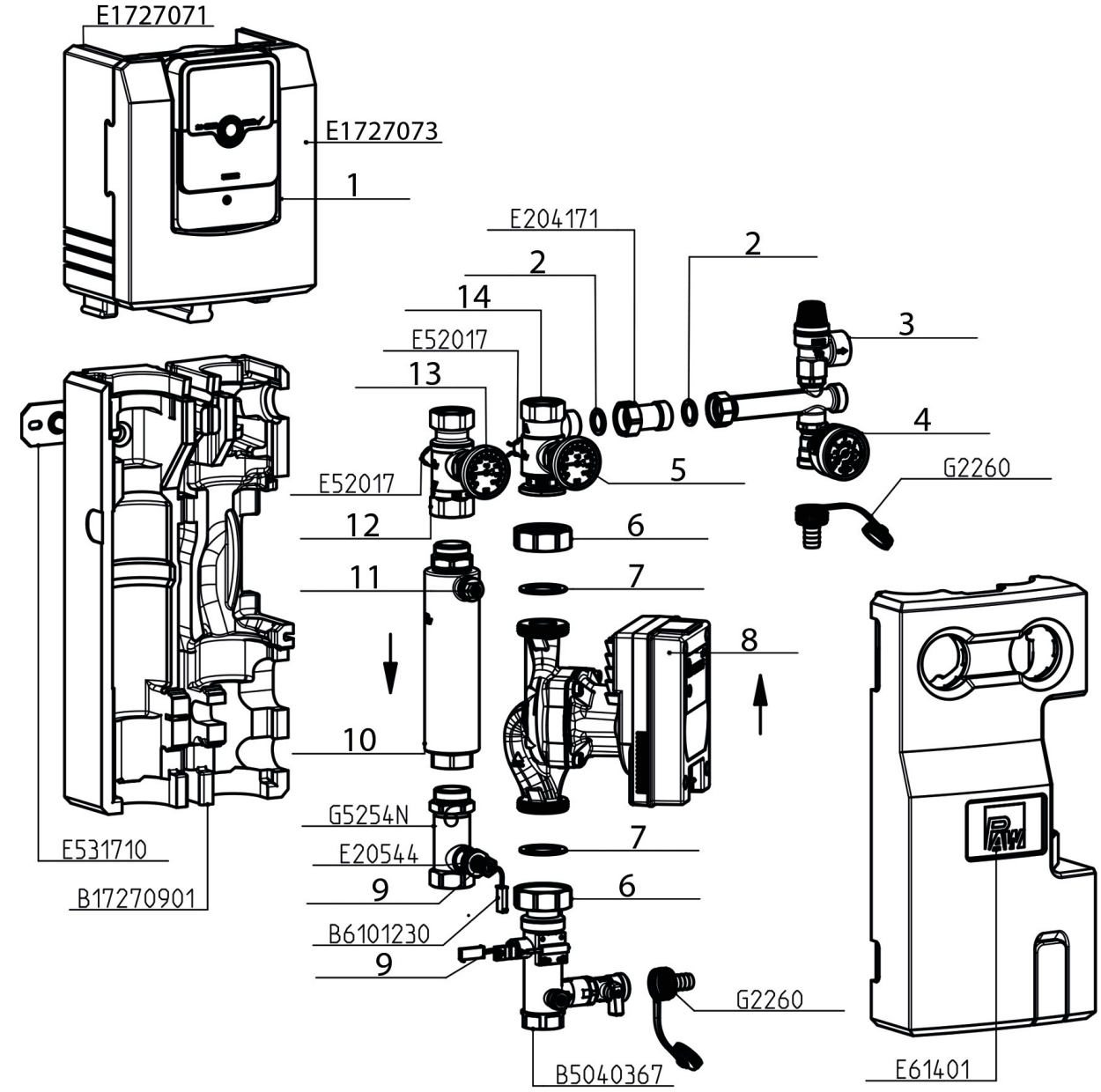
Position	Spare part	Item number
1	Controller SC3.5 with wiring harness, SuperSeal	N00407
	Controller SC3.5 with wiring harness, Molex	N00408
2	Pressure relief valve ½" x ¾", 6 bars	N00300
3	Pressure gauge 0-6 bars, G ¼" axial; d = 50 mm, 130°C	N00337
4	Sealing kit, 30.0 x 21.0 x 2.0, ½", for thread connection 1", 10 pieces	N00024
5	**Alternative pumps:**	
	Wilo Para ST 15/7	N00150
	Wilo Para ST 15/13	N00299
	Grundfos UMP3 Solar 15-75	N00025
	Grundfos UMP3 Solar 15-145	N00215
6	Union nut G1“, passage 28.1 mm, wrench size 37	N00302
7	Temperature sensor Pt1000, 9 mm, to screw in, G¼", MiniFit Jr.	N00230
8	Vent plug, ⅜" ext thread, self-sealing, EPDM o-ring	N00520
9	Dial thermometer, red scale, d = 50 mm, 0-160 °C	N00193
10	Flow ball valve DN 20, ¾" int. thread x ¾" int. thread, with solar check valve	N00291
11	Return ball valve DN 20, ¾" int. thread x F ¾" x ¾" ext. thread on the right	N00290
12	Dial thermometer, blue scale, d = 50 mm, 0-160 °C	N00194

6.2 SolarBloC® maxi Premium DN 25



Position	Spare part	Item number
1	Controller SC3.5 with wiring harness, SuperSeal	N00407
	Controller SC3.5 with wiring harness, Molex	N00408
2	Pressure relief valve ½" x ¾", 6 bars	N00300
3	Pressure gauge 0-6 bars, G ¼" axial; d = 50 mm, 130°C	N00337
4	Union nut G 1½", wrench size 52	N00269
5	Sealing kit, 10 pieces, 1", for thread connection 1½"	N00036
6	**Alternative pumps:**	
	Wilo Para ST 25/8	N00263
	Grundfos UPM3 Solar 25-75	N00035
	Grundfos UPM3 Solar 25-145	N00304
7	Temperature sensor Pt1000, 9 mm, to screw in, G¼", MiniFit Jr.	N00230
8	Airstop DN 25: 1“ ext. thread x 1“ int. thread	565571
9	Vent plug, ⅜" ext thread, self-sealing, EPDM o-ring	N00520
10	Flow ball valve DN 25, 1“ int. thread x 1“ int. thread	N00305
11	Dial thermometer, red scale, d = 50 mm, 0-160 °C	N00193
12	Return ball valve DN 25, F1“ x 1“ int. thread	N00306
13	Dial thermometer, blue scale, d = 50 mm, 0-160 °C	N00194

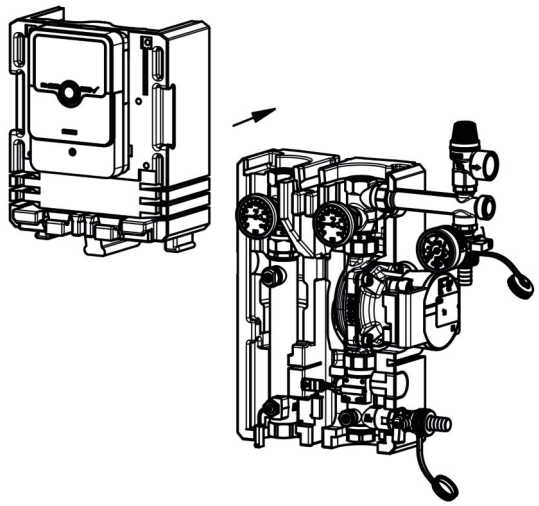
6.3 SolarBloC® maxi Premium DN 25 for Grundfos Solar PML and Wilo Para MAXO



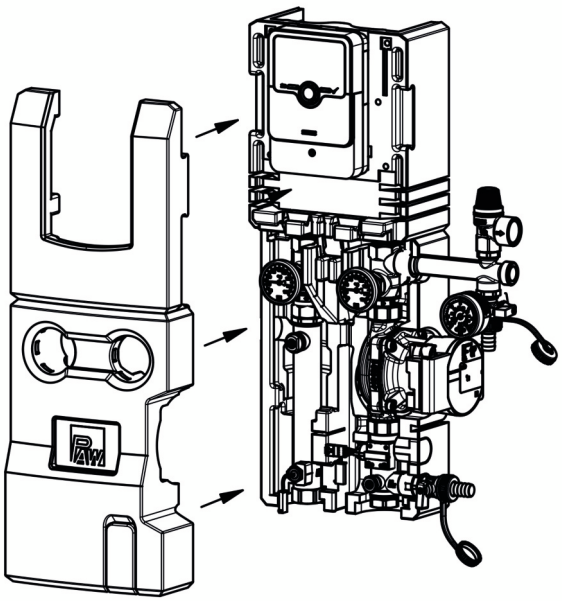
Position	Spare part	Item number
1	Controller SC3.5 with wiring harness, SuperSeal	N00407
	Controller SC3.5 with wiring harness, Molex	N00408
2	Sealing kit 24.0 x 17.0 x 2.0, ¼", for thread connection ¾", 10 pieces	N00030
3	Pressure relief valve ½" x ¾", 6 bars	N00300
4	Pressure gauge 0-6 bars, G ¼" axial; d = 50 mm, 130°C	N00337
5	Dial thermometer, blue scale, d = 50 mm, 0-160 °C	N00194
6	Union nut G 1½", wrench size 52	N00269
7	Sealing kit, 44.0 x 32.0 x 2.0, 1", for thread connection 1½", 10 pieces	N00036
8	**Alternative pumps:**	
	Wilo Para MAXO 25-180-11-F02	N00253
	Grundfos Solar PML 25-145	N00226
9	Temperature sensor Pt1000, 9 mm, to screw in, G¼", MiniFit Jr.	N00230
10	Airstop DN 25: 1“ ext. thread x 1“ int. thread	565571
11	Vent plug, ⅜" ext thread, self-sealing, EPDM o-ring	N00520
12	Flow ball valve DN 25, 1“ int. thread x 1“ int. thread	N00305
13	Dial thermometer, red scale, d = 50 mm, 0-160 °C	N00193
14	Return ball valve DN 25, F1“ x 1“ int. thread	N00306

7 Assembly of the insulation

1.



2.

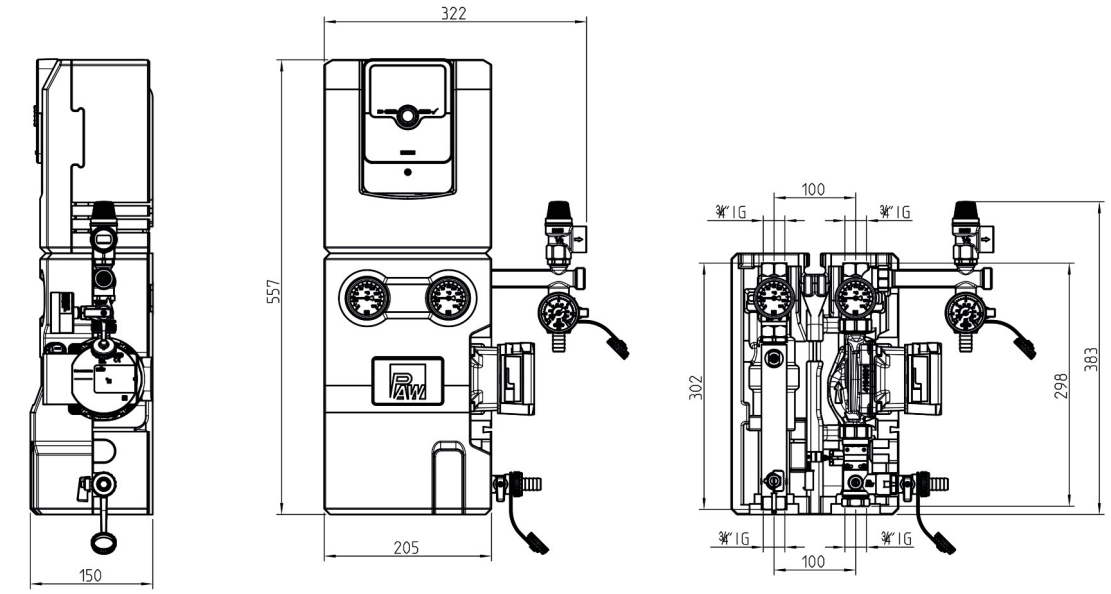


8 Technical data

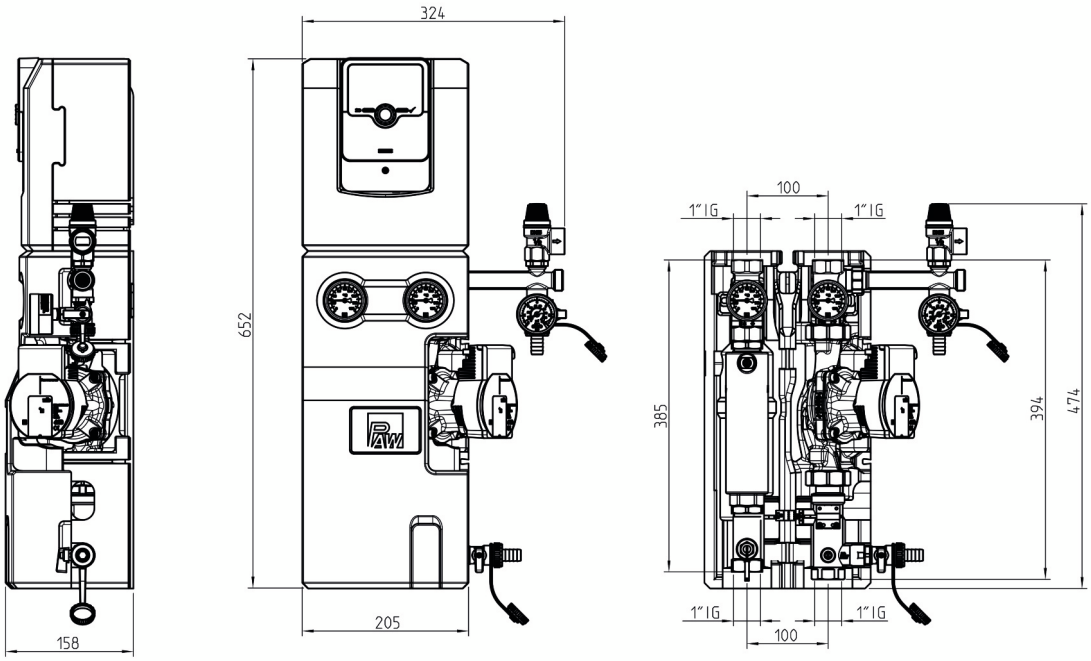
Dimensions	SolarBloC® midi (DN 20)	SolarBloC® maxi (DN 25)
Height (with controller)	557 mm	652 mm
Total width	322 mm	324 mm / 364 mm (Wilo MAXO and Grundfos Solar PML)
Total depth	150 mm	158 mm
Centre distance, flow/return	100 mm	100 mm
Pipe connections	¾" internal thread	1" internal thread
Connection for expansion tank	¾" external thread, flat sealing	
Outlet of safety valve	¾" internal thread	
Operating data		
Max. admissible pressure	6 bars	
Max. operating temperature	120 °C	
Max. stagnation temperature	140 °C	
Max. propylene glycol content	50 %	
Operating temperature sensors	-25 °C to +120 °C	
Equipment		
Safety valve	6 bars	
Pressure gauge	0-6 bars	
FlowRotor	0.5-15 l/min	1-35 l/min
Sensors	1 collector sensor, 2 storage tank sensors	
Check valves (integrated in the ball valves)	2 x opening pressure 200 mm wc, can be opened manually	
Materials		
Valves and fittings	Brass	
Gaskets	EPDM	

Dimensions	SolarBloC® midi (DN 20)	SolarBloC® maxi (DN 25)
Check valves	Brass	
Insulation	EPP, λ = 0.041 W/(m K)	

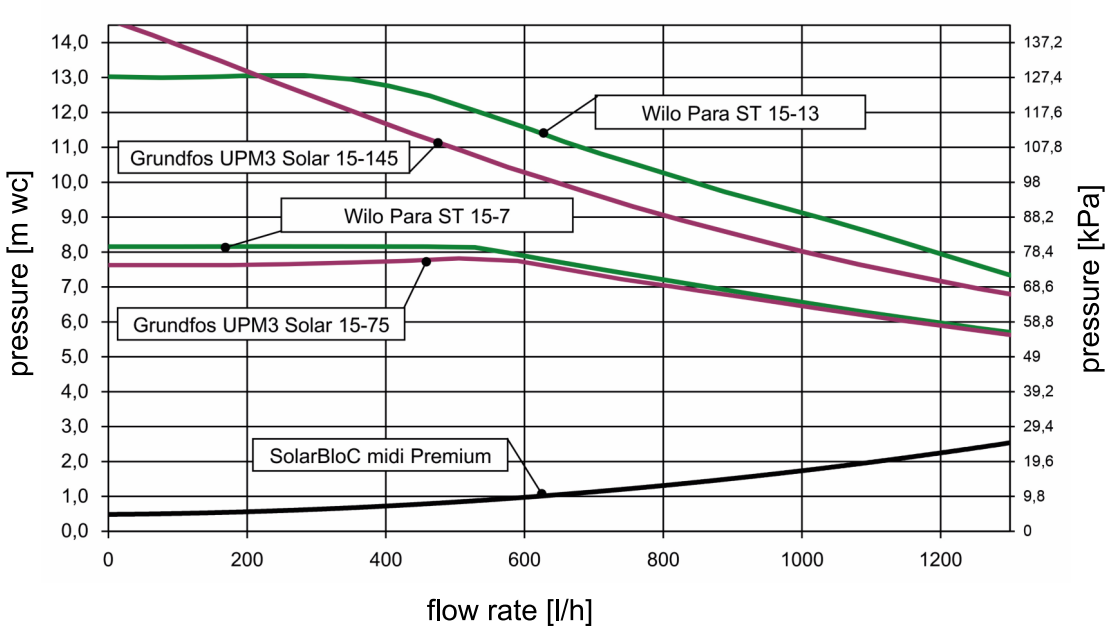
8.1 Dimensional drawing SolarBloC® midi Premium (DN 20)



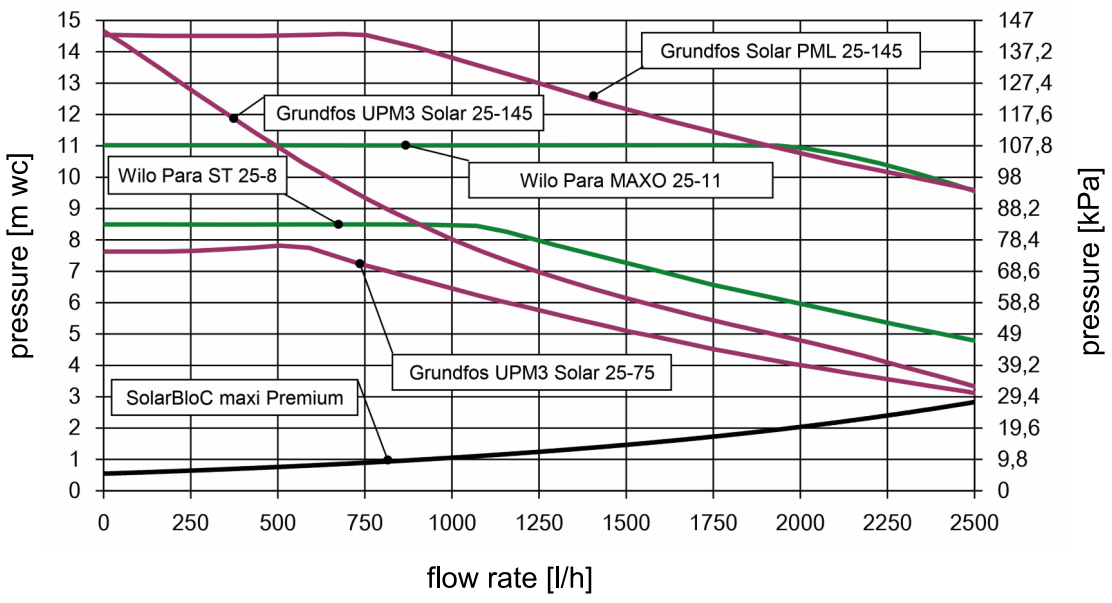
8.2 Dimensional drawing SolarBloC® maxi Premium (DN 25)



8.3 Pressure drop and pump characteristic curves SolarBloC® midi Premium (DN 20)



8.4 Pressure drop and pump characteristic curves SolarBloC® maxi Premium (DN 25)



9 Function of the check valves [Expert]

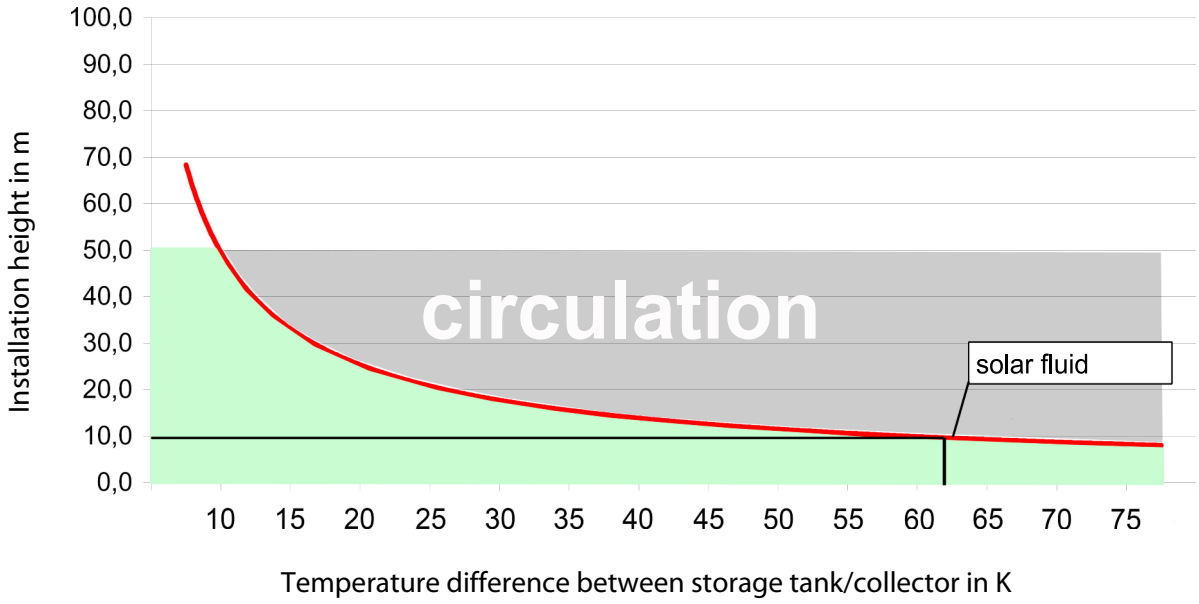
The check valves in this station prevent unwanted gravity circulation within their range of use. The functioning of the check valves depends:

- on the system height
- on the temperature difference between storage tank and collector
- on the solar fluid used

The diagram below indicates if the check valves integrated in the station are sufficient for your installation. If the check valves are not sufficient, additional components must be installed to prevent gravity circulation. You can install, for example, syphons ("heat traps"), 2-way valves (zone valves) or additional check valves.

Example:

- The station contains two check valves (2 x 200 mm wc = **400 mm wc**).
- You use a mixture of water and 40% strength propylene glyclol as **solar fluid**.
- The installation height between collector and storage tank is **10 m**.



Result:

The check valves prevent gravity circulation up to a temperature difference of **about 62 K**. If the temperature difference between the collector and the tank is larger, the difference in density of the solar fluid will be so large that the check valves are pushed open.

Do you need to know it exactly?

The density of the solar fluid strongly decreases with increasing temperature. In systems of high system heights and with large temperature differences, the difference in density causes gravity circulation. This circulation can result in the storage tank cooling down.

Calculation example: $\Delta p = \Delta \rho * g * h$

Collector temperature: 5 °C: Solar fluid density $\rho_1 = 1042$ kg/m³

Storage tank temperature: 67 °C: Solar fluid density $\rho_2 = 1002.5$ kg/m³

$\Delta \rho = \rho_1 - \rho_2 = 39.5$ kg/m³

$g = 9.81$ m/s²

Installation height h = 10 m

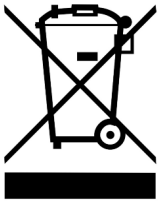
$\Delta p = 3875$ Pa = 395 mm wc

The two check valves of the station (2 x 200 mm wc) are sufficient for an installation height of 10 m and a temperature difference of up to 62 K between the collector and the tank.

10 Disposal

NOTICE

Electrical and electronic devices must not be disposed of in the household waste.



For your return, there are free collection points for electrical appliances and, if necessary, additional points of acceptance for the reuse of the devices in your area. The addresses can be obtained from your city or communal administration.

If the old electrical or electronic device contains personal data, you are responsible for deleting it before returning the device.

Batteries and rechargeable batteries must be removed prior to the disposal of the product. Depending on the product equipment (partly with optional accessories), single components can also contain batteries and rechargeable batteries. Please observe the disposal symbols on the components.

Disposal of transport and packaging materials

The packaging materials are made of recyclable materials and can be disposed of with recyclable materials.

11 Commissioning report

System operator			
Location of installation			
Collectors (number / type)			
Collector surface	m^2		
System height	m (height difference between the station and the collector field)		
Pipeline	diameter = mm; length = m		
Venting (collector field)	☐ not available	☐ vented	
	☐ manual vent valve	☐ automatic vent valve	
Airstop (station)	☐ vented		
Solar fluid (type)	% glycol		
Antifreeze (checked up to):	°C	**serial numbers**	
Flow rate	l/m	• station	
Pump (type)			
		• flow rate sensor	
Pump speed level			
System pressure	mbars	• temperature sensors	
Expansion tank (type)			
Initial pressure	mbars	• controller	
Safety valve	☐ checked		
Check valves	☐ checked	• software version	
Installation company		Date, signature	

Item no. 997x3313x-mub-en
Translation of the original instructions

PAW GmbH & Co. KG
Böcklerstraße 11
31789 Hameln, Germany
www.paw.eu
Phone: +49-5151-9856-0
Fax: +49-5151-9856-98