



English

Installation and Operation Instructions DrainBloC® - DN 20

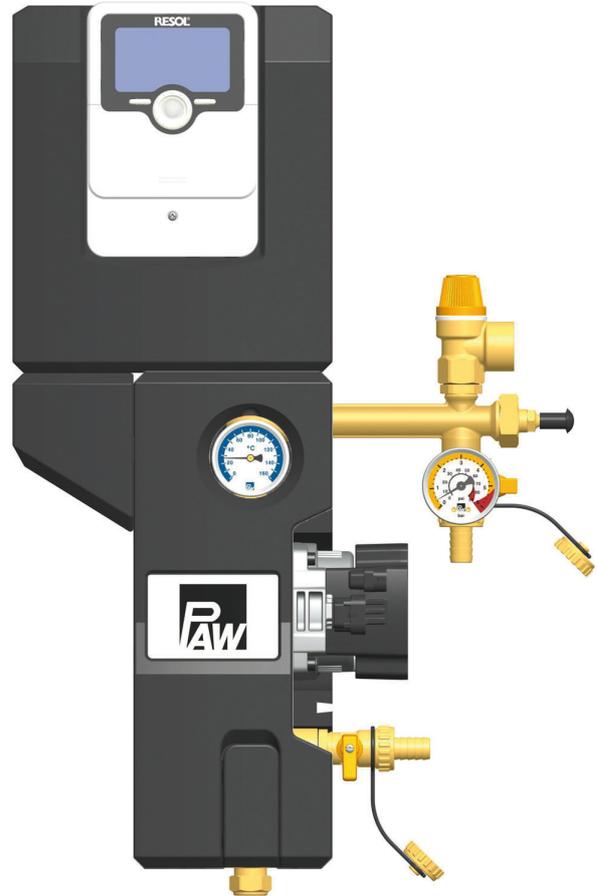


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1 General Information



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 DrainBloC® drain-back station for self-draining collector fields.

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

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

1.2 About this product

The station is a premounted group of fittings checked for tightness, with integrated controller for draining the solar circuit. It is mounted on a wall bracket and fixed with clips.

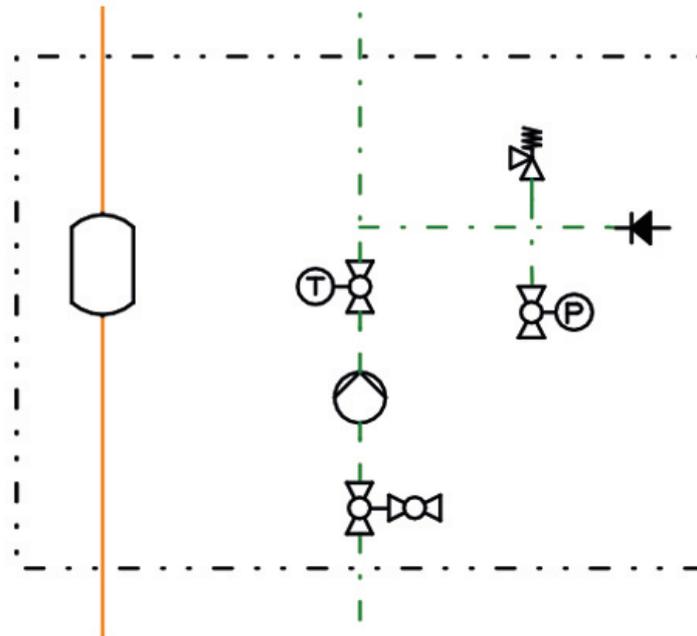
The station contains important valves, fittings and safety devices for the operation of the installation:

- Ball valve with exchangeable spindle
- Thermometer
- Pressure gauge to display the installation pressure
- Solar pressure relief valve
- Flush and fill valves

1 General Information

1.3 Designated use

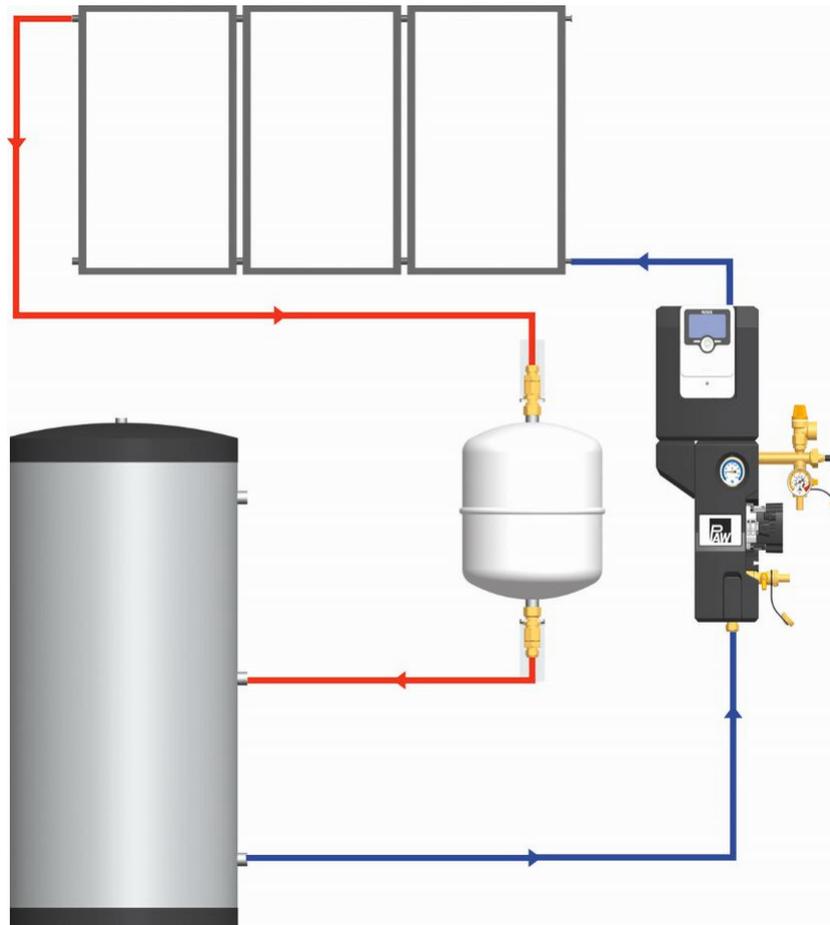
The station may only be used in solar thermal systems with an automatic draining (Drainback installations) as a pump station in the solar circuit while taking into consideration the technical limit values indicated in these instructions. Due to its design, the station may only be installed and operated as described in this manual!



The DrainBloC® protects the installation against damage from stagnation. A diaphragm expansion tank is not necessary.

When the pump of the DrainBloC® is switched on, the pump fills the collector field with the solar fluid from the integrated collecting container and the solar fluid transfers the heat to the storage tank.

As soon as the pump is switched off, the collector field runs empty and the solar fluid is collected in the collecting container again.



The draining of the installation only works properly if the installation is partly filled with solar fluid and if the piping is carried out such that it can run completely empty.

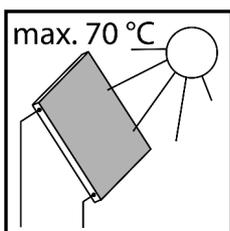
Improper usage excludes any liability claims.

This product complies with the relevant directives and is therefore labelled with the CE mark.

The Declaration of Conformity is available upon request, please contact the manufacturer.

Only use PAW accessories with the product.

NOTICE



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	
	<p>Danger of scalding due to the escape of hot fluids!</p> <p>With pressure relief valves, there is a risk of scalding due to the escape of vapour or hot fluid.</p> <p>Please ensure for each pressure relief valve that no personal injury or material damage may occur due to possibly escaping medium.</p> <ul style="list-style-type: none"> ▶ 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	
	<p>Risk of burns!</p> <p>The valves and fittings and the pumps can become heated up to more than 100 °C during operation.</p> <ul style="list-style-type: none"> ▶ 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.

NOTICE
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.

WARNING
Functional impairment!

- ▶ The enclosed clamping-ring compression fitting must only be used with 15 x 1 mm pipes. When using smaller pipes, the automatic draining of the installation will not work properly.
- ▶ Use a Teflon sealing tape for sealing. Using hemp for sealing facilitates oxygen injection into the installation.

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.

NOTICE

Damage to property!

The installation site must be dry, stable, frost-proof and protected against ultraviolet radiation in order to prevent material damage of the installation.

The DrainBloC® will only work flawlessly if the installation meets certain requirements. Please take some time to plan the installation.

3.1 Calculation of installation volume

Please note that the maximum usable volume of the collecting container is 15 litres.

Calculate the total volume of the installation before the assembly by using the following table:

Data for the calculation of the installation volume				
	Ø in mm	Volume in l/m	m in the installation	Sum in l
Copper pipe	15 x 1	0.13		
	18 x 1	0.2		
Collector	according to the indications of the manufacturer (typical: 0.5-1 l/m ²)			
Total volume				
Usable volume of the DrainBloC® collecting container				15 l

3.2 Note regarding the piping

WARNING

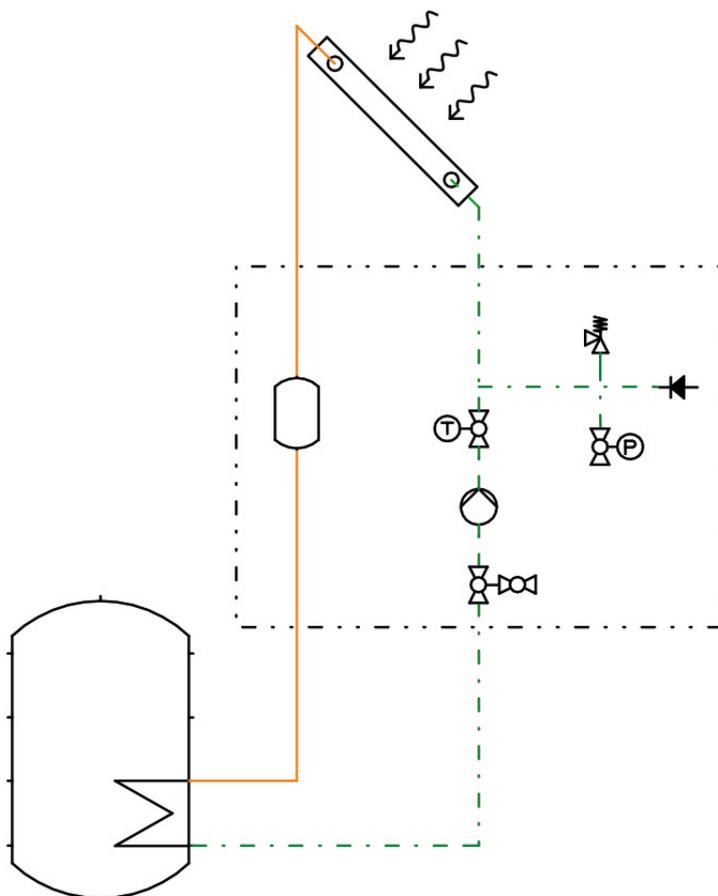
Frost damage!

If the piping and the collector field may not be completely drained or if there may be a risk of frost in the piping, we recommend to operate the installation with an appropriate water propylene glycol mixture (maximum 50 % glycol) in order to prevent damage to the installation.

WARNING

Functional impairment!

- ▶ The enclosed clamping-ring compression fitting must only be used with 15 x 1 mm pipes. When using smaller pipes, the automatic draining of the installation will not work properly.



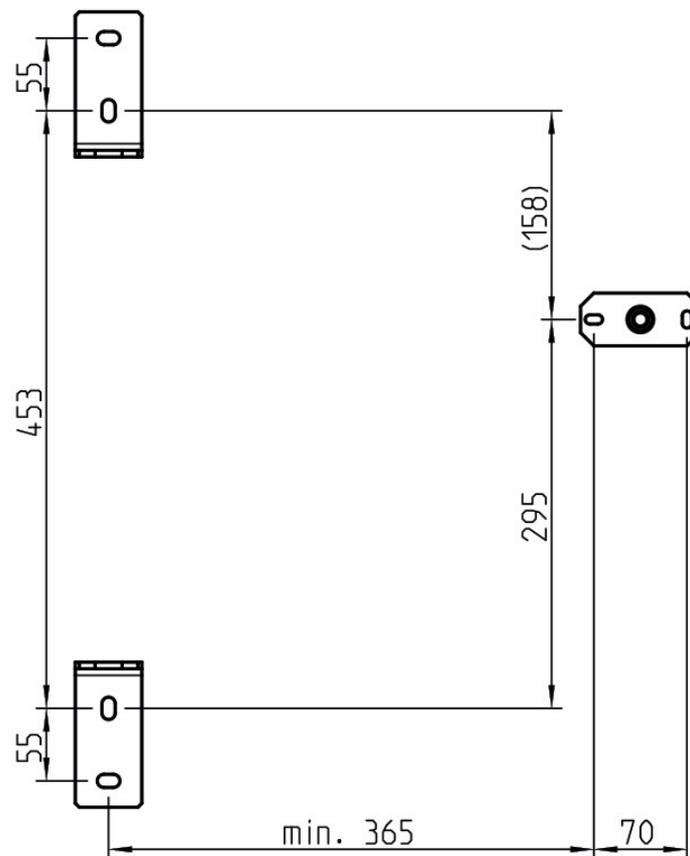
1. Install the piping such that the pipes can run completely empty and that the creation of "water holes" which are susceptible to frost is avoided.
2. The DrainBloC® must always be mounted higher than the upper heat exchanger connection in order to ensure that the heat exchanger in the storage tank is always filled with water or solar fluid.

3.3 Installation

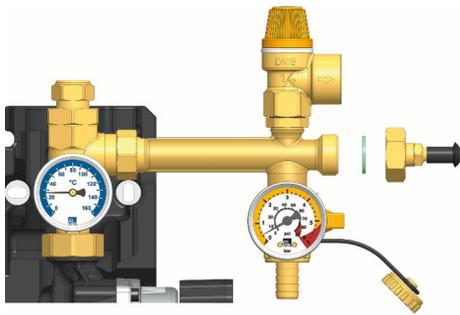
WARNING

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.

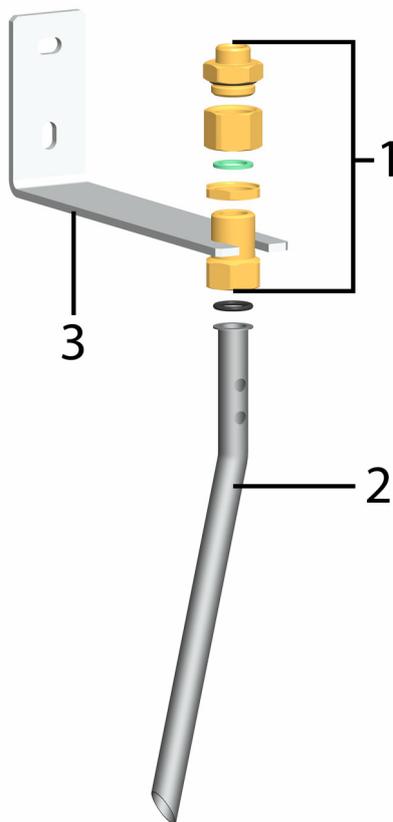


1. Copy the mounting holes to the mounting surface according to the drilling scheme above.
2. Drill the holes and mount the wall brackets to the wall by using appropriate wall plugs and screws.
3. Remove the station from the packaging.
4. Remove the insulating front shell.
5. Hang the station onto the wall bracket.

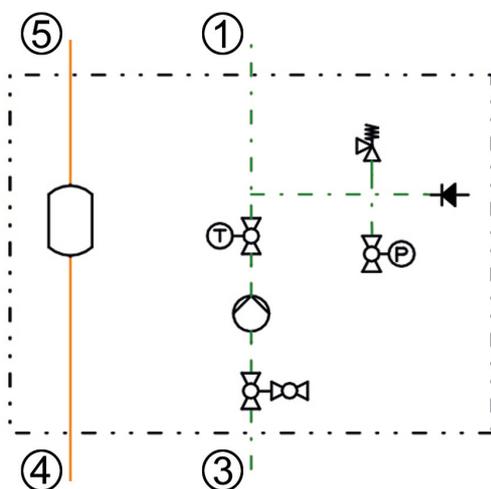


Schrader valve (automatic) and gasket from accessory bag

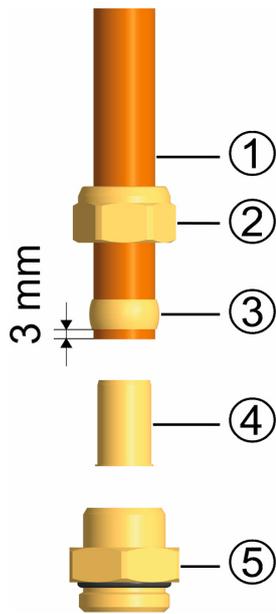
6. Mount the enclosed Schrader valve (automatic) from the accessory bag and screw it to the safety group by using the corresponding gasket, see figure.



7. Insert the enclosed stainless steel pipe [2] into the collecting container.
8. Mount the upper and lower screw connection [1] to the collecting container (see figure). Do not forget to insert the gaskets.
9. Hang the collecting container onto the wall brackets [3].



10. Connect the station to the installation by using the piping:
 - ⑤ Flow from the collector field
 - ① Return to the collector field
 - ④ Flow to the storage tank
 - ③ Return from the storage tank



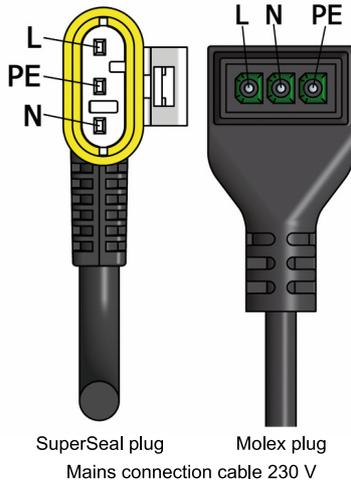
Not included in the scope of delivery!

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.

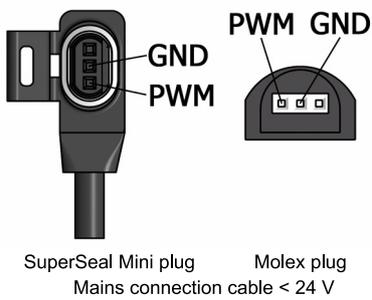
3.4 Mains connection of the pump

WARNING	
	<p>Risk to life and limb due to electric shock!</p> <ul style="list-style-type: none"> ▶ 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

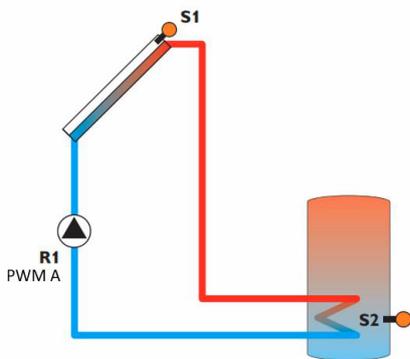


3. In addition, connect the PWM connection cable according to type to the pump.

PWM	brown
GND	blue

4. Connect the sensors to the controller: collector sensor to S1, storage tank sensor to S2.

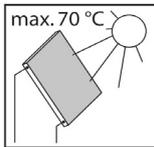
The assembly of the station is now completed and the station can be put into operation.



Source of image: Resol

4 Commissioning [specialist]

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

WARNING	
 	<p>Risk of burning and scalding!</p> <p>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!</p> <p>During venting the solar fluid may escape as vapour and result in scalding!</p> <ul style="list-style-type: none"> ▶ Flush and fill the system only when the collector temperatures are below 70 °C.

WARNING	
<p>Risk of frost!</p> <p>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.</p> <ul style="list-style-type: none"> ▶ Use a water/propylene glycol mixture with max. 50% of propylene glycol as solar fluid. 	

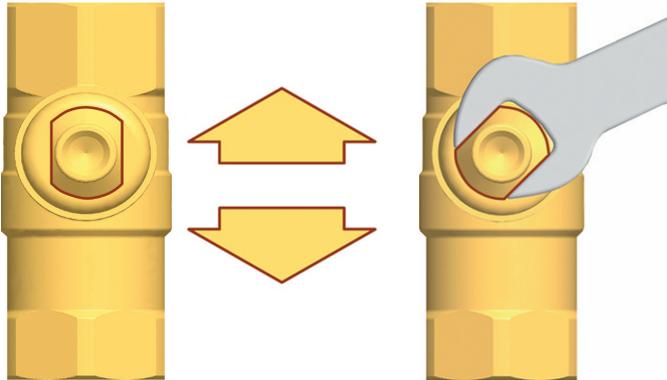
WARNING	
<p>Note regarding the commissioning sequence</p> <p>During commissioning, fill the heating circuit first and the solar circuit afterwards. This guarantees that the heat possibly absorbed by the collectors during commissioning can be dissipated.</p>	

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. To flush the dirt particles out of the installation, only use flush and fill stations with fine filters.

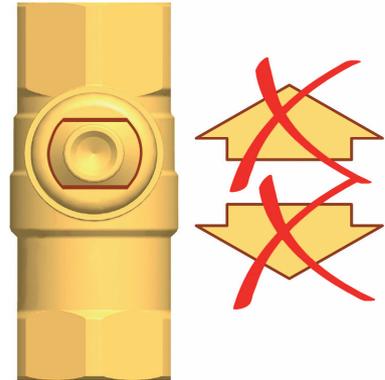
Ball valve

Position 0°



Ball valve open,
flow in both directions.

Position 90°



Ball valve closed,
no flow.

Functions of the fill and drain valve within the safety group

Position

Function



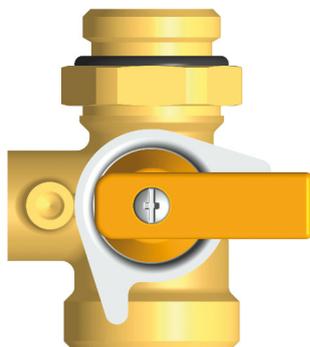
Position "closed" (station in operation):

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.

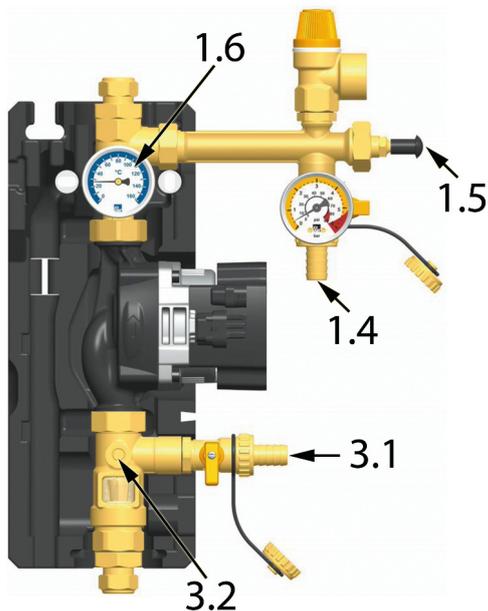


Position "maintenance" (maintenance work):

Fill and flush circuit is closed. Pressure gauge indicates, after removal of cap, no pressure.

Attention: Remove stop bolt before changing the position!

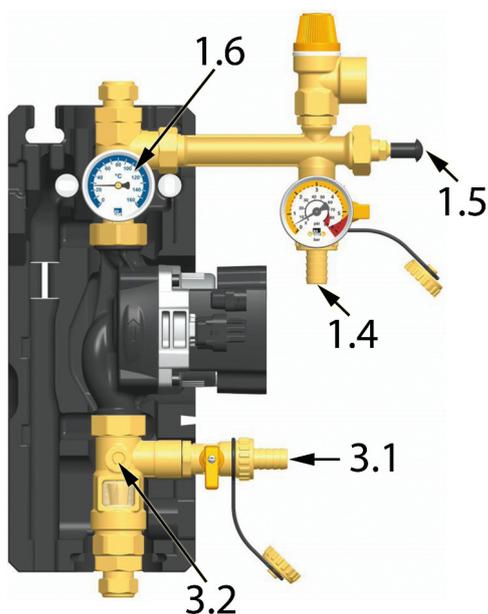
4.2 Preparations before flushing



The solar circuit is flushed in the direction of flow.

1. Close the return ball valve [1.6] (90°, see chapter 4.1).
2. The ball valve [3.2] at the flow meter must be open.
3. Connect the fill station to the solar station:
 - pressure hose to the fill valve [1.4]
 - flush hose to the drain valve [3.1]

4.3 Flushing and filling

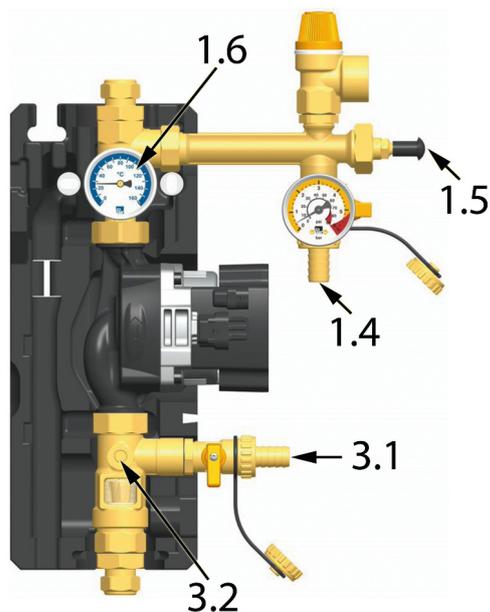


1. Open the fill and drain valves [1.4|3.1]. For this, turn the valve [1.4] into position "open", see chapter 4.1.
2. Put the flush and fill station into operation and flush the installation until the solar fluid exits without bubbles.
3. Close the fill and drain valves and switch the station off again afterwards. For this, turn the valve [1.4] into position "closed", see chapter 4.1.
4. The system is filled via the flushing process. Open the return ball valve [1.6] and wait for about 1 minute until the fluid has "settled", see chapter 4.1.

4 Commissioning [specialist]

- To control the filling height, a transparent hose can be connected to the drain valve [3.1] and can then be opened carefully. The filling height in the hose must be approximately at the same height as the fill valve.

4.4 Setting the pressure



- Set the system pressure via the Schrader valve [1.5] by using an electrical air pump.
Recommended pressure: 1.5 - 2 bars.
- The system pressure can be reduced by pushing the pin of the Schrader valve [1.5] inwards with a screwdriver.

Consider the pressure relief valve (6 bars)!

WARNING

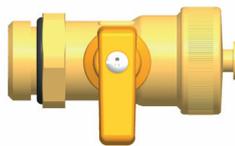


Risk to life and limb due to electric shock!

- ▶ 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.



3. Connect the controller to the mains and activate the drain-back function according to the instruction manual of the controller. Please observe the chapter "menu overview", item 7, of the corresponding controller instructions. Within that, the drain-back function can be activated and the required time parameters can be set.



4. Screw the sealing caps onto 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.

4.5 Commissioning and adjustment of the controller SC2.3

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

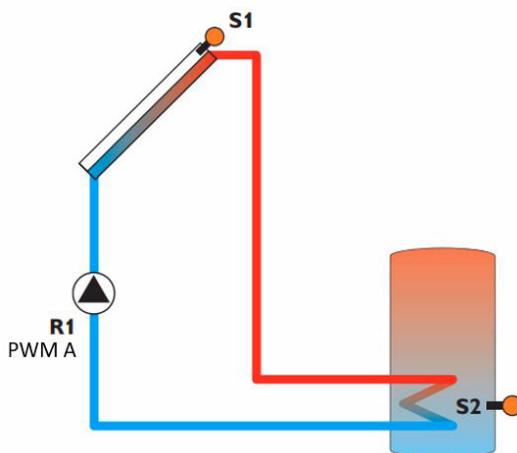
Pump connection cable	to R1
PWM signal cable	to PWM A
Mains connection	to L, N, protective earth conductor

10 preset systems are available.

As a factory setting, the pump is connected to R1 (supply cable) and to PWM A (signal cable). After the assembly and installation according to these instructions, the temperature sensors are connected

4 Commissioning [specialist]

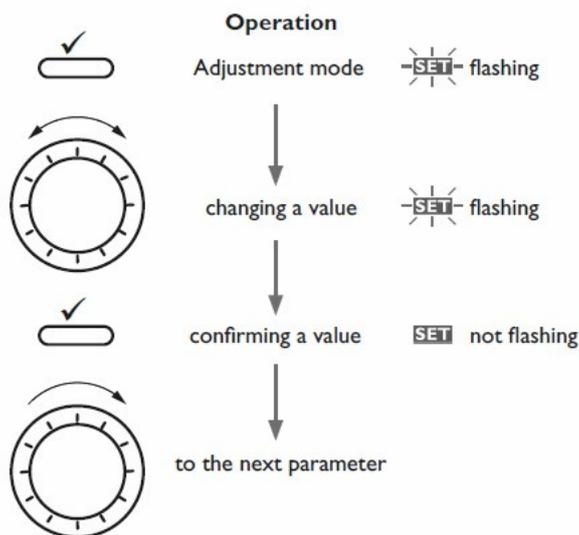
to S1 (collector), and S2 (storage tank). This corresponds to system 1 (solar thermal system with a storage tank).



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

For further settings or modifications related to the system, the options or the functions, please observe the separate instructions of the controller.

4.6 Optimising the control parameters

WARNING	
	<p>Risk of burns!</p> <p>The valves, the pump and the collecting container may heat up to more than 95 °C during operation.</p> <ul style="list-style-type: none"> ▶ Do not touch the DrainBloC® during the optimisation of the control parameters!

NOTICE
<p>Damage to property!</p> <p>Do not modify the controller parameters if there is a risk of frost or stagnation.</p> <p>During optimisation the outside temperature must not fall below 10 °C and the collector temperature must not exceed 90 °C.</p>

Conditions:

The collector field must be completely empty. Therefore check the filling level of the collecting container **before** the optimisation of the controller parameters.

After activating the drain-back function "ODB" (see instruction manual of the controller, chapter "menu overview", item 7), the factory settings of the following parameters are adjusted to an optimised value:

Parameters	Optimised value
dT on	10 K
dT off	4 K
dT nominal	15 K

5 Maintenance [specialist]

WARNING

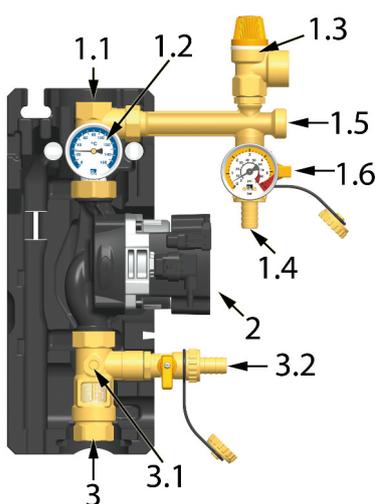


Risk of burning and scalding!

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 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. Replacement of the pressure gauge:

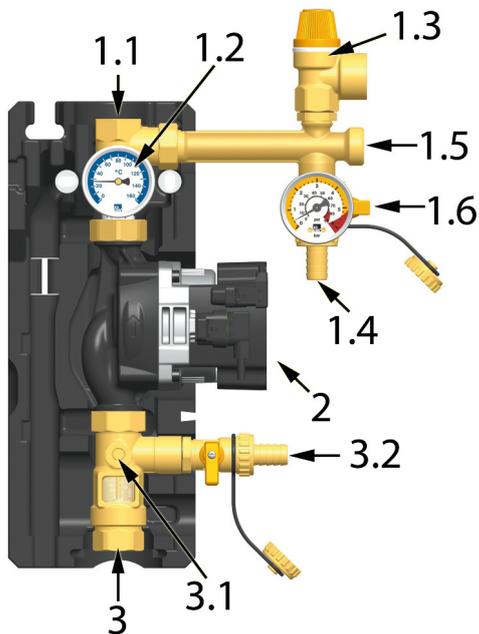
Dismount the pressure gauge [1.6]. It can happen that a small amount of fluid leaks out (valve content). After that, exchange the pressure gauge.

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 [1.6] for tightness. Also, check the system pressure 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.

5.2 Draining the solar system



1. Switch off the controller and secure it against being switched on again.
2. Turn the valve [1.4] into position "open", see chapter 4.1, and open the return ball valve [1.2].
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. Open the vent valve possibly present at the highest point of the solar installation.
6. Dispose of the solar fluid observing the local regulations.

5.3 Deinstallation



1. Drain the solar installation as described in the previous chapter.
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]

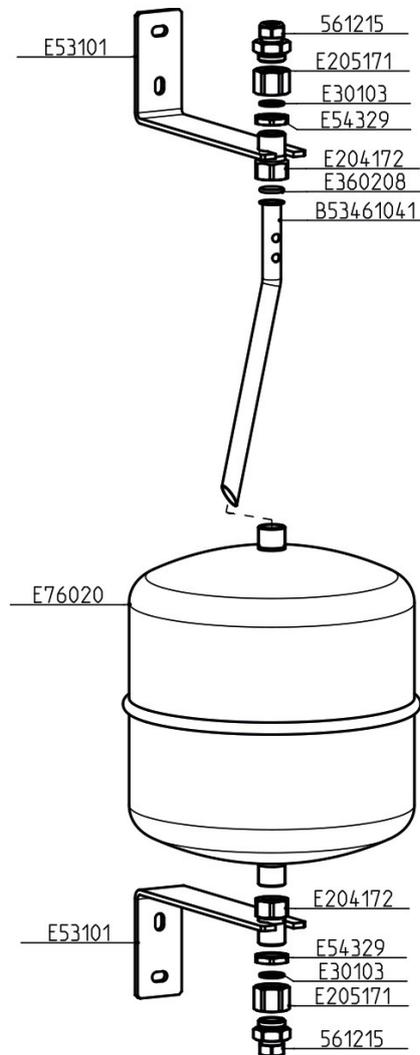
NOTICE

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.

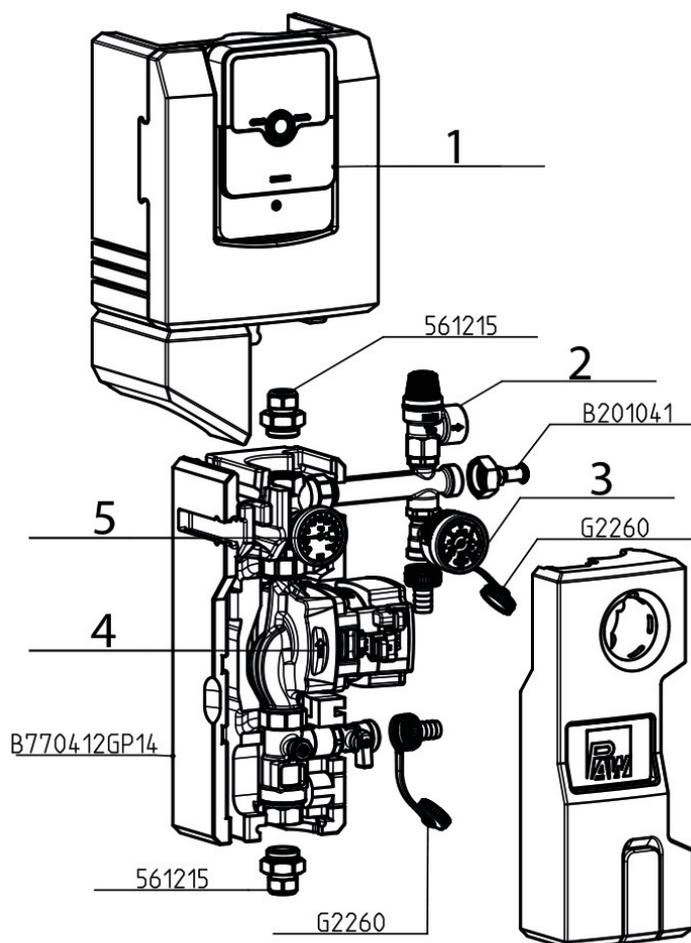
- ▶ In case of a complaint, please send us the entirely completed commissioning report.

6.1 Collecting container



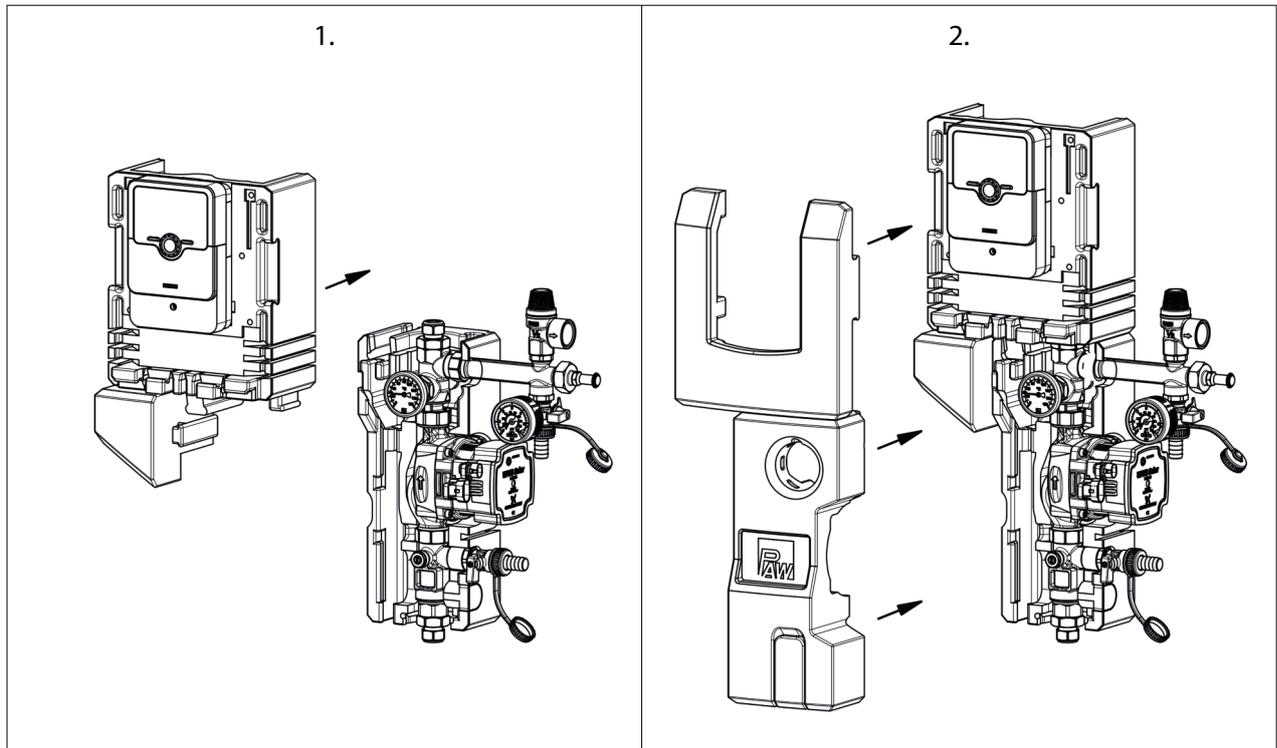
6 Scope of delivery [specialist]

6.2 Solar station



Position	Spare part	Item number
1	Controller SC2.3 with wiring harness, SuperSeal	N00409
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	Grundfos UMP3 Solar 15-145	N00215
5	Dial thermometer, blue scale, d = 50 mm, 0-160 °C	N00194

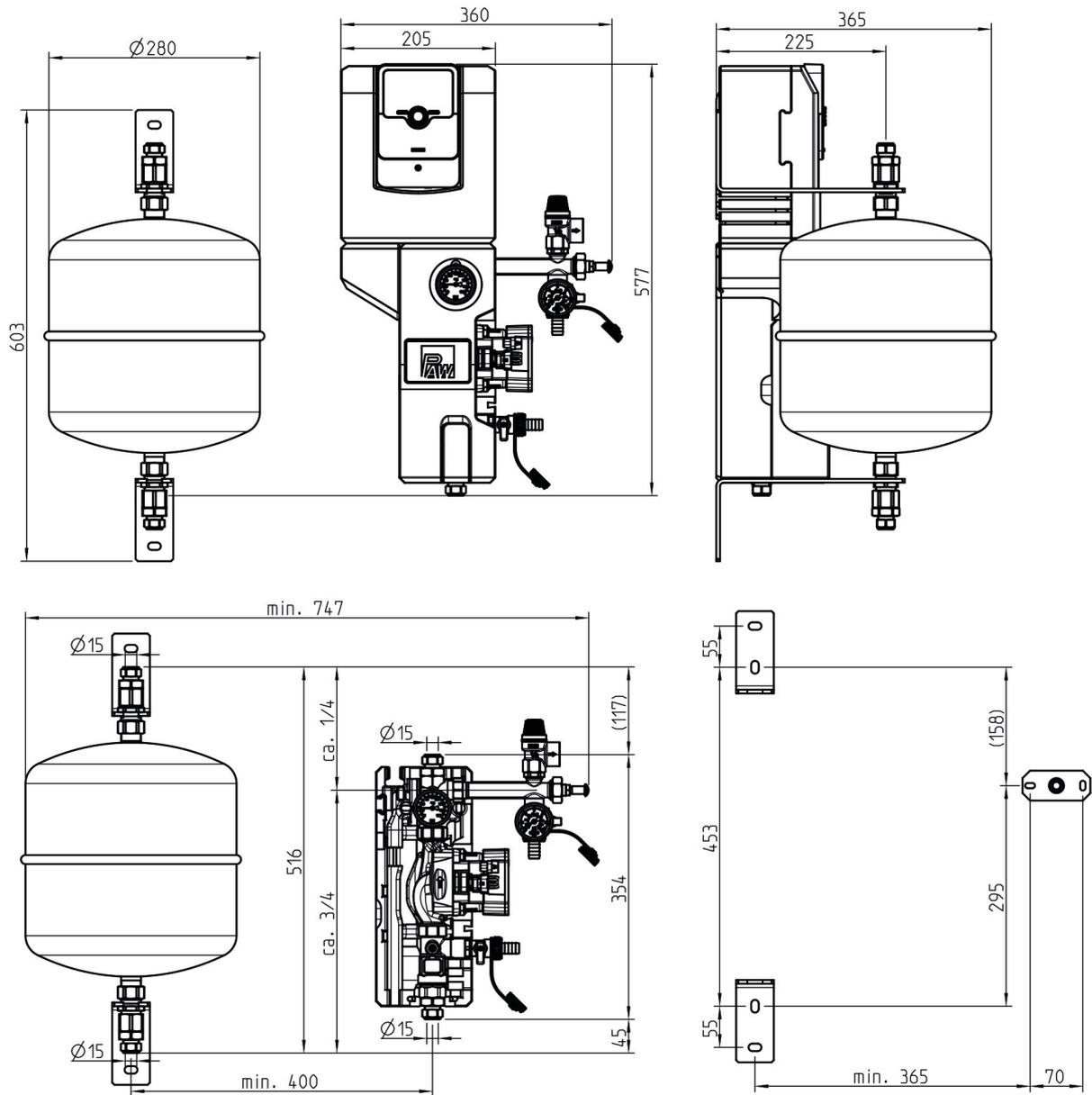
7 Mounting of the insulation



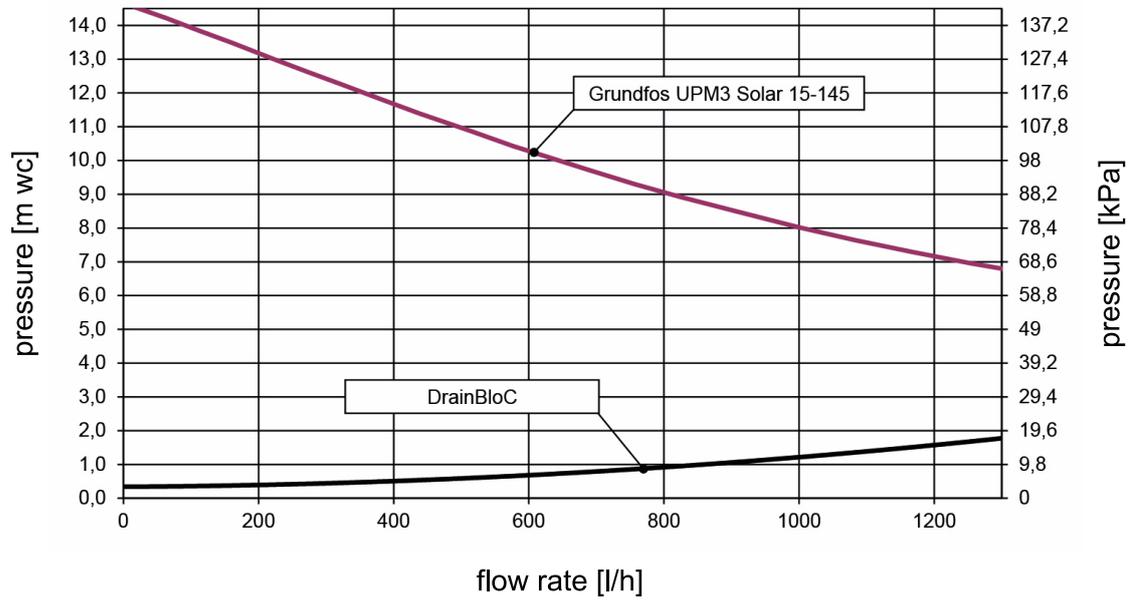
8 Technical data

	DrainBloC®
Dimensions	
Installation length DrainBloC®	354 mm
Height DrainBloC® + expansion set	665 mm
Depth (with insulation + expansion tank)	365 mm
Connections	Clamping ring 15 mm
Centre distance	min. 400 mm
Operating data	
Max. admissible pressure	6 bars
Max. operating temperature	95 °C
Max. short-time temperature	120 °C, < 15 minutes
Max. propylene glycol content	50 %
Equipment	
Safety valve	6 bars
Pressure gauge	0-6 bars
Collecting container	Total volume: 20 l
Materials	
Valves and fittings	Brass
Gaskets	EPDM
Collecting container	Steel
Insulation	EPP, $\lambda = 0.041 \text{ W/(m K)}$

8.1 Dimensional drawing



8.2 Pressure drop and pump characteristic curves



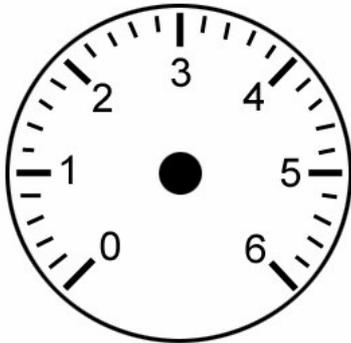
9 Disposal

NOTICE	
	<p>Electrical and electronic devices must not be disposed of in the household waste.</p> <p>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.</p> <p>If the old electrical or electronic device contains personal data, you are responsible for deleting it before returning the device.</p> <p>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.</p> <p>Please observe the disposal symbols on the components.</p>

Disposal of transport and packaging materials

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

10 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
Installation volume	l		
Solar fluid (type)	% glycol		
Antifreeze (checked up to):	°C	Serial numbers	
<p>System pressure</p> 	• Station		
	• Controller		
	• Software version		
Safety valve	<input type="checkbox"/> checked		
Installation company	Date, signature		



11 Notes



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Translation of the original instructions

We reserve the right to make technical changes without notice!

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