

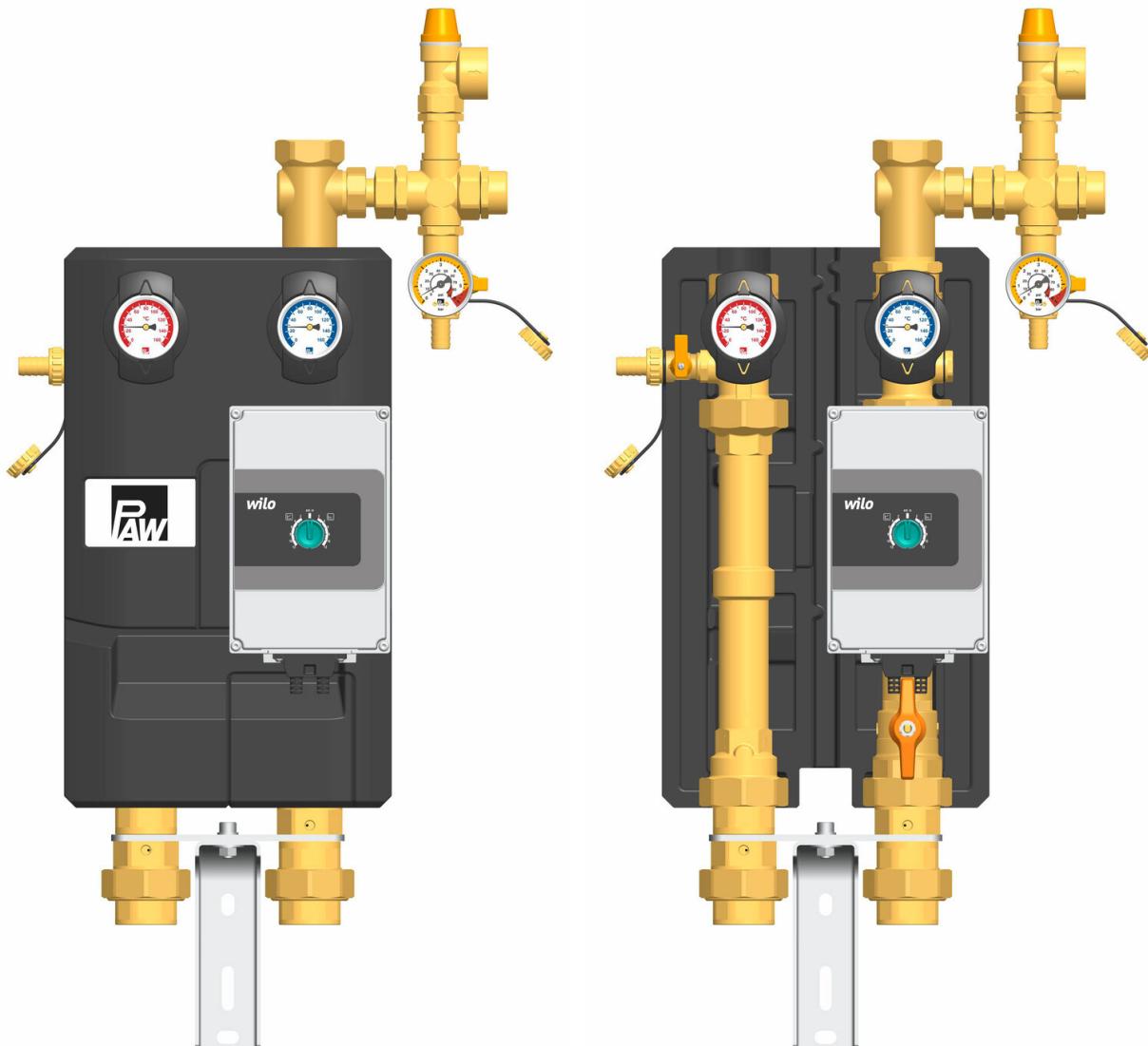


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English

## Installation and Operation Instructions Solar Station SolarBloC® mega - DN 32



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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® mega. For other components of the solar system, such as collectors, tanks, expansion tanks and controllers, please observe the instructions of the corresponding manufacturer.

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

## 1.2 About this product

The SolarBloC® mega is a premounted group of fittings checked for leakage to be installed in the primary or solar circuit. The station contains important valves, fittings and safety devices for the operation of the installation:

- Ball valves with integrated thermometers in the solar circuit (flow and return)
- Check valves in the screw connections of the mounting plate, in the flow and return line
- Pressure relief valve to prevent inadmissible overpressure
- Pressure gauge to display the installation pressure in the solar circuit
- Connection for an expansion tank
- Pump group which can be completely isolated

The expansion tank required for operation is not a part of this station and must be ordered separately.

The cap-type valve (item no. 5301), which is also separately available, allows the expansion tank to be easily mounted and separated from the solar thermal system.

### 1.3 Designated use

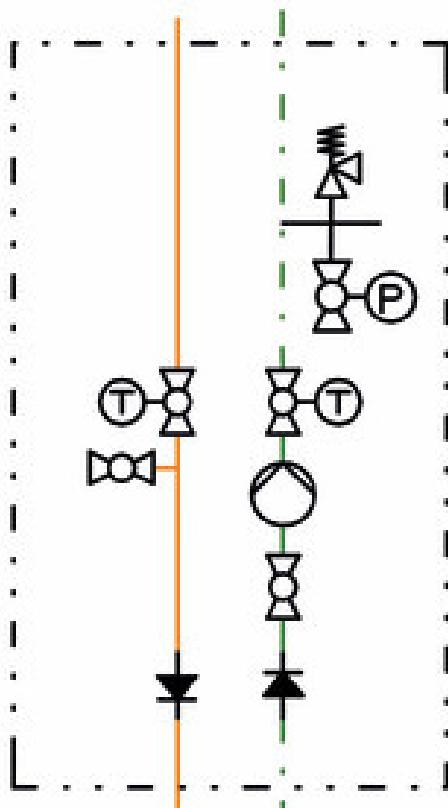
The SolarBloC® mega may only be used between the solar and storage tank circuits in solar thermal systems taking into consideration the technical limit values indicated in these instructions. Due to its design, the station may only be installed and operated as described in these instructions!

Improper usage excludes any liability claims.

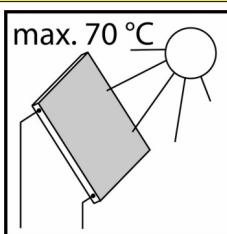
This product complies with the relevant directives and is therefore labelled with the CE mark.

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**

#### **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**



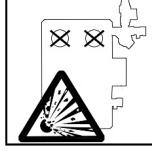
#### **Risk of burns!**

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.

**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.

**3 Mounting and installation [specialist]****NOTICE****Material damage due to high temperatures!**

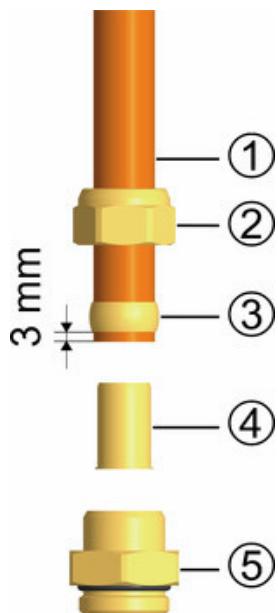
Since the solar fluid near the collector can be very hot, the group of fittings must be installed at a sufficient distance from the collector field. It may be necessary to install an intermediate tank in order to protect the expansion tank.

**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. Furthermore, access to the controller and safety equipment must be guaranteed at all times during operation!

**NOTICE****Damage to property!**

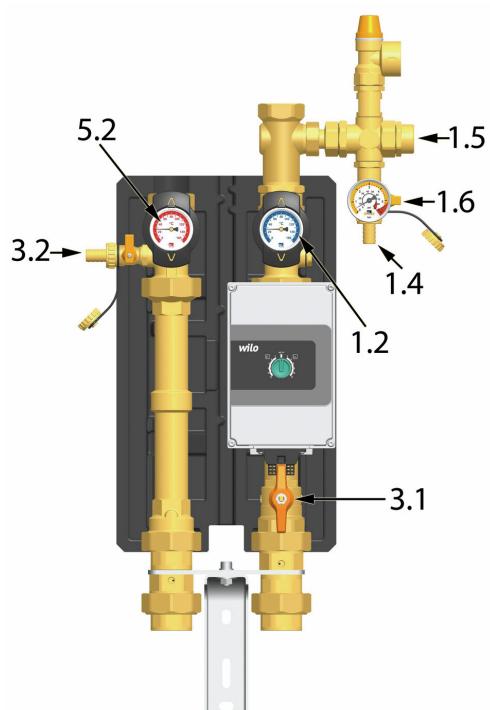
The discharge line of the pressure relief valves must be conducted into heat-resistant collecting containers of corresponding size. This prevents uncontrolled discharging into the environment and enables the circuits to be refilled!



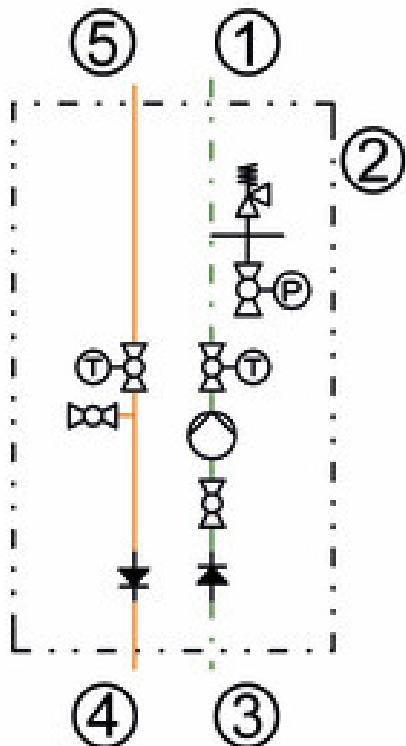
#### Accessories: compression fitting

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.

Not included in the scope of delivery!



1. Remove the station from the packaging.
2. Take off the thermometer handles and remove the insulating front shell.
3. Copy the mounting holes of the wall bracket to the mounting surface.
4. Drill the holes.
5. Fix the wall bracket to the wall using appropriate wall plugs and screws.
6. Push the controller extension with the premounted controller onto the solar station. Screw the mounting plate and the wall bracket together.



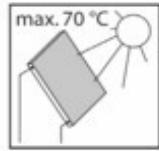
7. Connect the station to the installation by using the piping:

- ① Return to the collector field
- ② Safety group: expansion tank
- ③ Return from the storage tank
- ④ Flow to the storage tank
- ⑤ Flow from the collector field

For continuous venting, we recommend to install a microbubble resorber (for example item no. 52375) into the flow of the solar circuit.

## 4 Commissioning [specialist]

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

| <b>⚠ WARNING</b>   |   |
|--|---|
| <br> | <p><b>Risk of burning and scalding!</b></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! During venting the solar fluid may escape as vapour and result in scalding!</p> <p>► Flush and fill the system only when the collector temperatures are below 70 °C.</p> |

**NOTICE****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.

- ▶ 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.

**NOTICE****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.

**NOTICE****Note regarding the expansion tank**

The expansion tank must not be connected while flushing and filling in order to prevent dirt particles from being flushed in. Please observe the instructions of the manufacturer.

#### 4.1 Flushing and filling the solar circuit

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



Check valve is operating,

**flow only in flow direction.**



Check valve not operating,

**flow in both directions.**

**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.

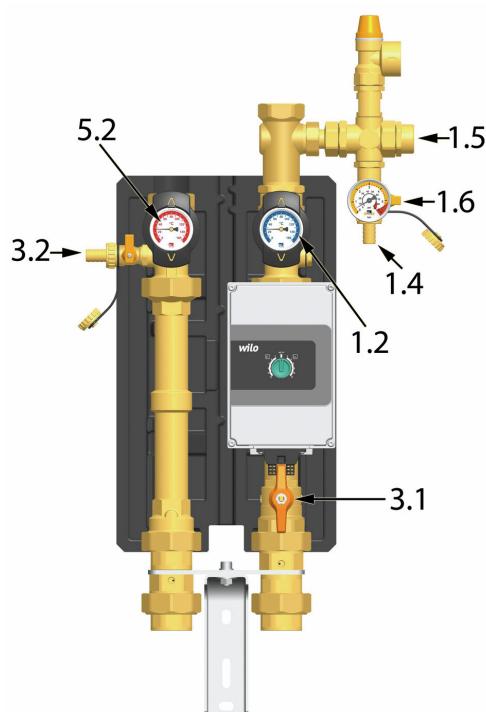
**Position "maintenance" (maintenance work):**

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

Attention: Remove stop bolt before changing the position!

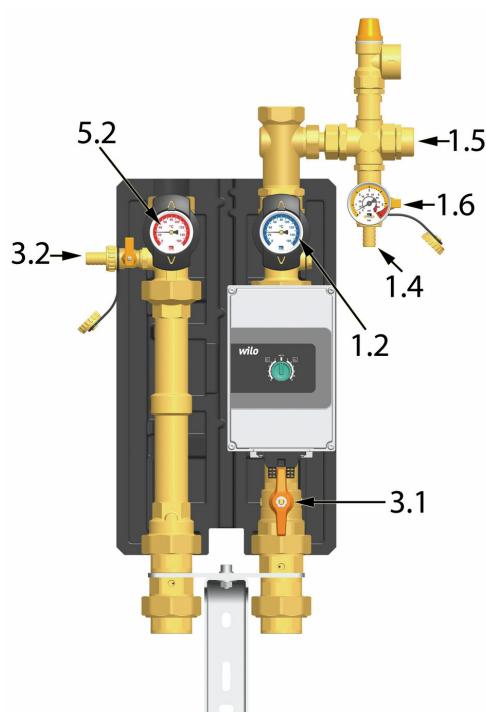
## 4 Commissioning [specialist]

### 4.2 Preparations before flushing



1. Turn both check valves to the operating position "Z" and open the ball valves in the flow and return [1.2|5.2].
2. Close the shut-off valve [3.1]. This guarantees that the dirt particles that may be still present will be washed out of the system and will not access the circuit again.
3. Connect the fill station to the solar station:
  - pressure hose to the fill valve [3.2]
  - flush hose to the drain valve [1.4]
4. Open the fill and drain valves [3.2|1.4].

### 4.3 Flushing and filling



1. Put the flush and fill station into operation.
2. Flush the collector system for at least 15 minutes.
3. In order to eliminate the air from the storage tank, open the shut-off valve [3.1] and close the ball valve in the flow [5.2].
4. Close the drain valve [1.4] while the filling pump is running and increase the system pressure to about 5 bars. The system pressure is displayed on the pressure gauge.
5. Close the fill valve [3.2] and switch off the pump of the flush and fill station.
6. Check the pressure gauge to see whether the system pressure reduces and eliminate leaks where necessary.
7. Reduce the pressure on the drain valve to the operating pressure.

8. 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).
9. Open the ball valve [5.2] in the flow.

 **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 work, plug the mains plug into a socket. This avoids an unintentional start of the motors.



10. Connect the optional controller to the mains and set the solar circuit pump in manual mode to ON as described in the controller manual. Allow the solar circuit pump to run at the maximum rotation speed level for at least 15 minutes.

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

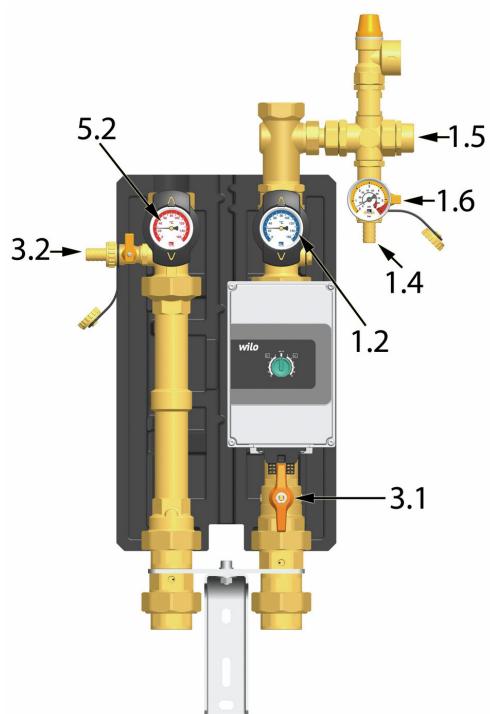
The closure caps are only for protection against contamination. They are not designed for high system pressures. Their tightness is ensured by the closed ball valves.

#### 4.4 Adjustment of the solar installation

1. Set the desired flow rate by adjusting the rotation speed of the solar circuit pump.
2. Mount the insulating front shell of the solar station.
3. Switch the controller to automatic mode (see controller instructions).

## 5 Maintenance [specialist]

### 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 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.

## 5.2 Draining the solar system



Check valve is operating, **flow only in flow direction.**

1. Switch off the controller and secure it against being switched on again.
2. Turn the check valves to position "A" and open the ball valves in the flow and return.
3. Connect a heat-resistant hose to the drain valve [3.1]. Draining completely the solar installation/the storage tank is only possible with a drain valve at the lowest point of the installation which must be ordered separately.  
Make sure that the solar fluid is collected in a heat-resistant container.



Check valve not operating, **flow in both directions**

### **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 [3.1] of the solar station.
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 above.
2. Disconnect the pipe connections to the solar installation.
3. Loosen the screws of from the mounting plate in order to remove the solar station from the wall bracket.
4. Remove the station by pulling it forward.

## 6 Scope of delivery [specialist]

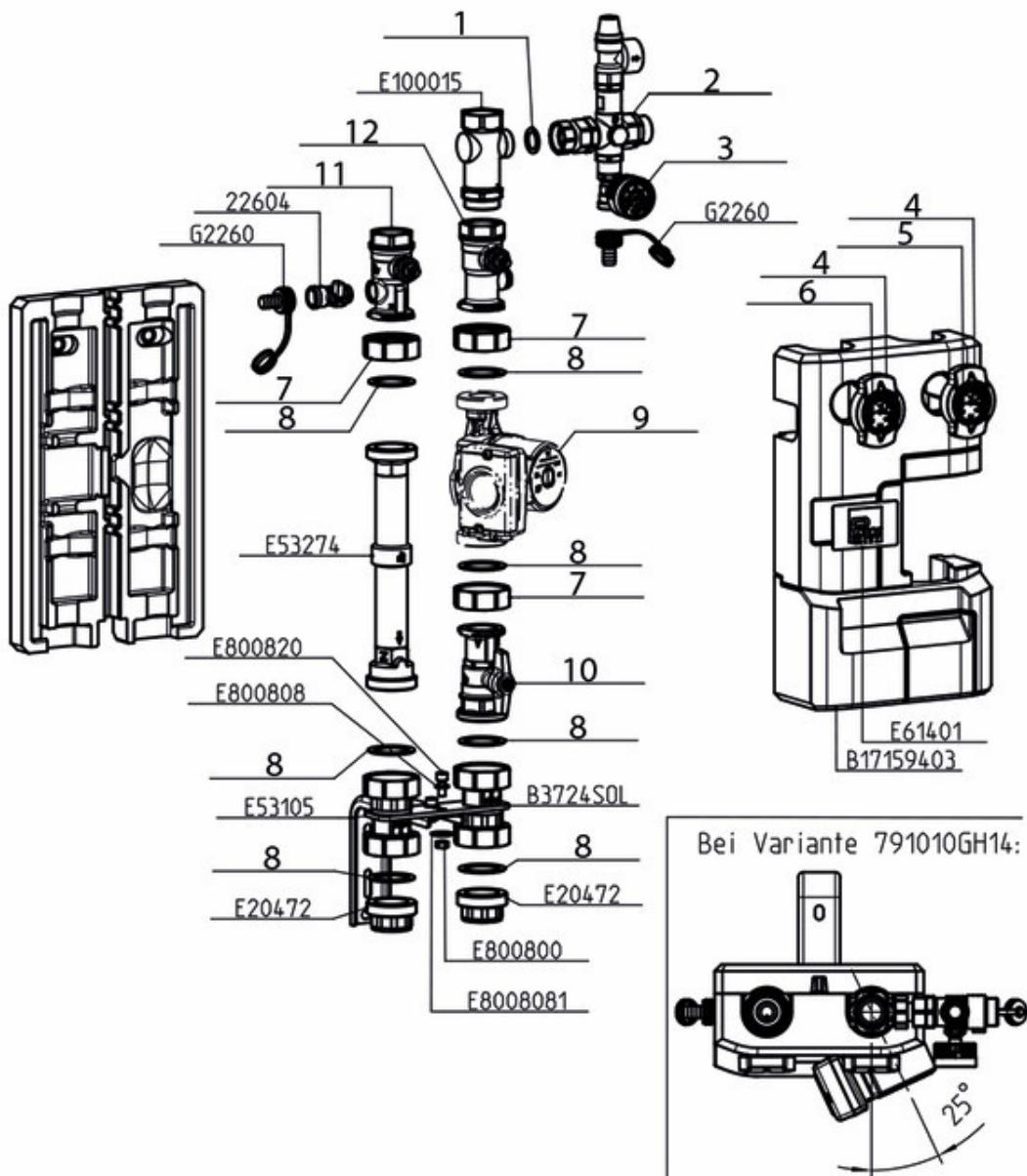
### 6 Scope of delivery [specialist]

#### 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 return pipe of the station.

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

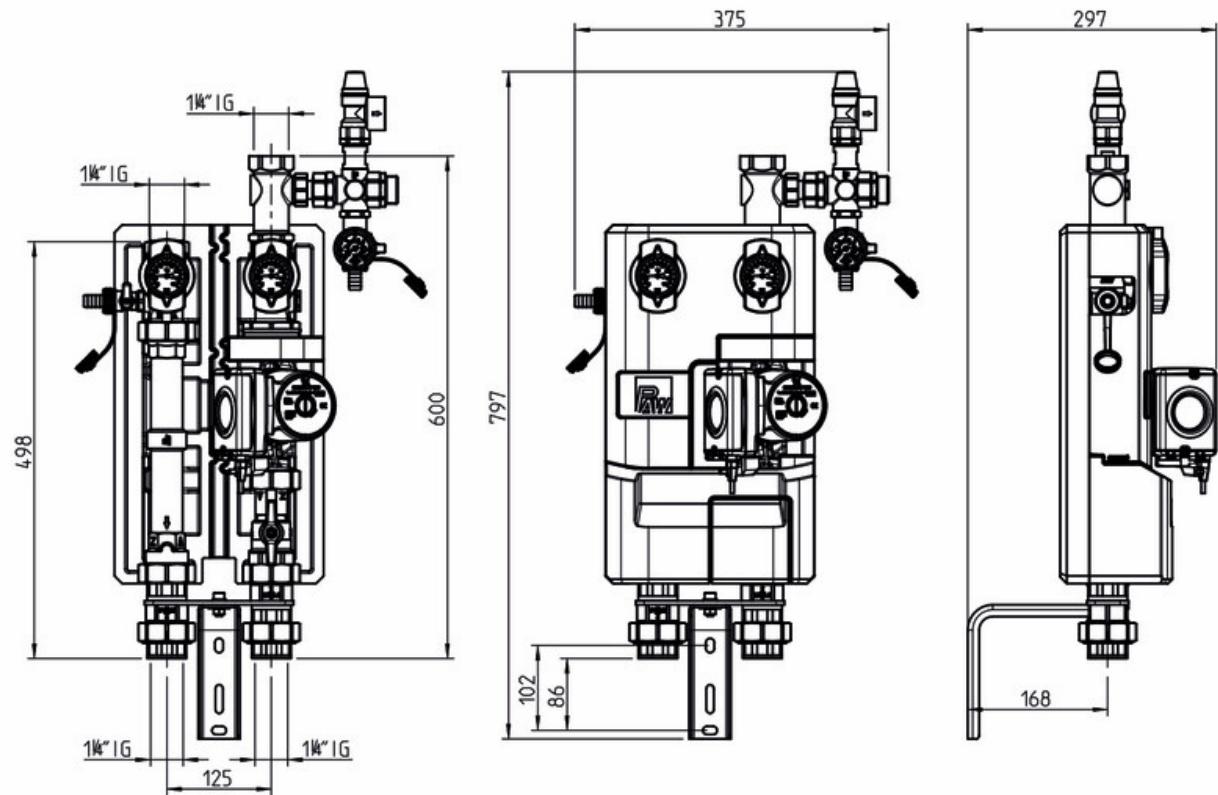


| <b>Position</b> | <b>Spare part</b>  | <b>Item no.</b> |
|-----------------|--|-----------------|
| 1               | Sealing kit, 30.0 x 21.0 x 2.0, 1/2", for thread connection 1", 10 pieces  | N00024          |
| 2               | Thermometer ball valve return DN 32, F1 1/4" x 1 1/4" int. thread<br>Cross, 1" int. thread, self-seal. x 3/4" int. thread x<br>1" ext. thread self-seal., with counter nut | 5251            |
| 3               | Pressure gauge 0-6 bars, G 1/4" axial; d = 50 mm, 130 °C   | N00337          |
| 4               | Thermometer handle for thermometer ball valve 1" and 1 1/4"  | N00248          |
| 5               | Dial thermometer, blue scale, d = 50 mm, 0-160 °C  | N00194          |
| 6               | Dial thermometer, red scale, d = 50 mm, 0-160 °C   | N00193          |
| 7               | Union nut G 2"   | N00270          |
| 8               | Sealing kit, 55.0 x 42.0 x 2.0, 1 1/4", for thread connection 2", 10 pieces  | N00047          |
| 9               | Pump Grundfos Solar PML 32-145   | N00361          |
|                 | Wilo-Stratos PARA 30/1-12 T2   | N00366          |
| 10              | Pump ball valve DN 32, 2" ext. thread x F 1 1/4", with nut and seal  | N00539          |
| 11              | Thermo ball valve TK DN 32, F1 1/4" x 1 1/4" int. thread, 1/2"-sleeve left   | N00446          |
| 12              | Thermo ball valve TK DN 32, F1 1/4" x 1 1/4" int. thread, 1/2"-sleeve right  | N00439          |

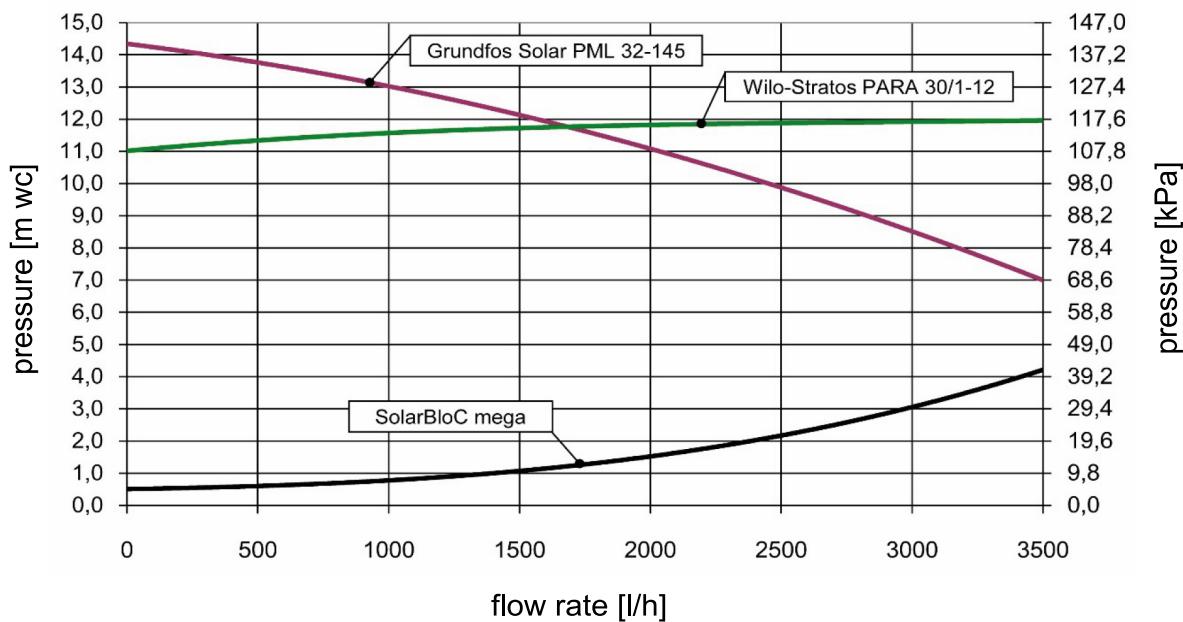
## 7 Technical data

| <b>SolarBloC® mega</b>                   |  |
|--|--|
| <b>Dimensions</b>                        |  |
| Height                                   | 797 mm   |
| Total width                              | 375 mm   |
| Depth                                    | GF Solar PML: 297 mm; Wilo-Stratos PARA: 365 mm            |
| Centre distance (wall – connection pipe) | 168 mm   |
| Centre distance (pipe – pipe)            | 125 mm   |
| Pipe connections                         | 1 1/4" internal thread                                     |
| Outlet of pressure relief valve          | 1" internal thread   |
| Connection for expansion tank            | 1" internal thread   |
| <b>Operating data</b>                    |  |
| Max. admissible pressure                 | 6 bars   |
| Max. operating temperature               | 120 °C   |
| Max. propylene glycol content            | 50 %   |
| <b>Equipment</b>                         |  |
| Safety valve                             | 6 bars   |
| Pressure gauge                           | 0-6 bars, with shutoff valve                               |
| Check valves                             | Opening pressure 2 x 200 mm water column,<br>can be opened |
| Dial thermometer                         | 0-160 °C   |
| <b>Materials</b>                         |  |
| Valves and fittings                      | Brass  |
| Gaskets, o-rings                         | EPDM/Viton   |
| Seals, flat sealings                     | AFM34, asbestos-free                                       |
| Insulation                               | EPP, $\lambda = 0.041 \text{ W}/(\text{m K})$              |

## 7.1 Dimensional drawing



## 7.2 Pressure drop and pump characteristic curves SolarBloC® mega



## 8 Function of the check valves [Expert]

### 8 Function of the check valves [Expert]

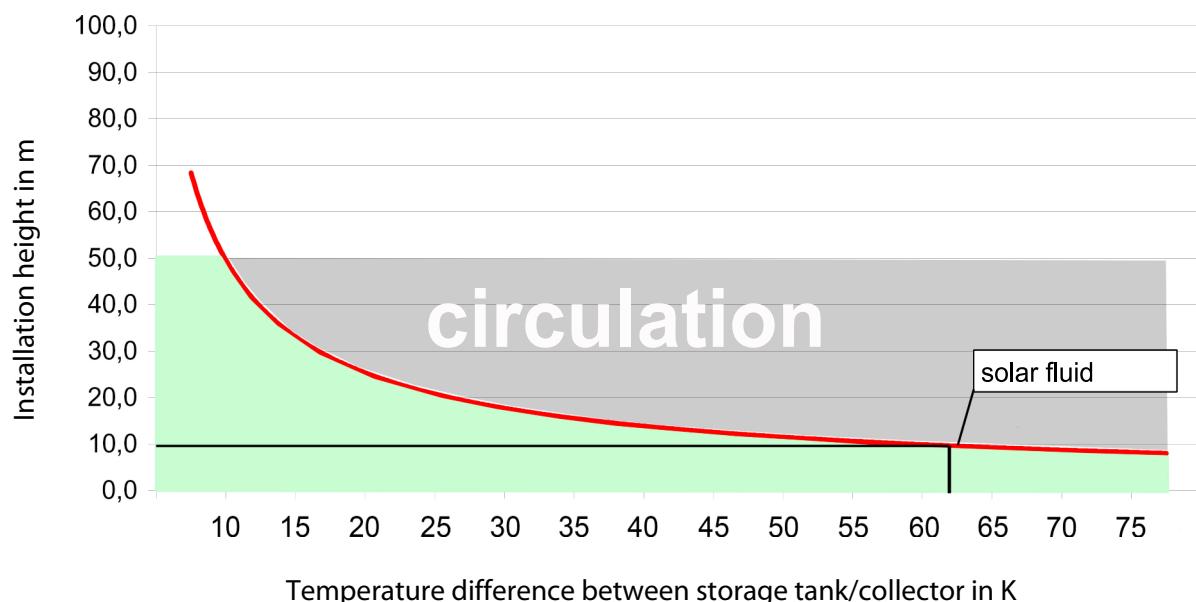
The check valves in this station prevent unwanted gravity circulation within their range of use. The functioning of the check valves depends:

- 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 ( $2 \times 200 \text{ mm wc} = \mathbf{400 \text{ mm wc}}$ ).
- You use a mixture of water and 40% strength propylene glycol 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  $\rho_1 = 1042 \text{ kg/m}^3$

Storage tank temperature: 67 °C: Solar fluid density  $\rho_2 = 1002.5 \text{ kg/m}^3$

$$\Delta \rho = \rho_1 - \rho_2 = 39.5 \text{ kg/m}^3$$

$$g = 9.81 \text{ m/s}^2$$

$$\text{Installation height } h = 10 \text{ m}$$

$$\Delta p = 3875 \text{ Pa} = 395 \text{ mm wc}$$

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.

## 9 Disposal

### 9 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.

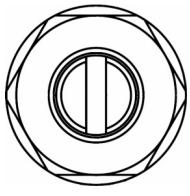
#### NOTICE



#### 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 <sup>2</sup>   |   |  |
| System height                 | m (height difference between the station and the collector field)                        |   |  |
| Pipeline                      | Diameter = mm; length = m  |   |  |
| Venting (collector field)     | <input type="checkbox"/> manual vent valve <input type="checkbox"/> automatic vent valve |   |  |
|                               | <input type="checkbox"/> no  | <input type="checkbox"/> vented   |  |
| Bleeding device (station)     | <input type="checkbox"/> vented  |   |  |
| Solar fluid (type)            | % glycol   |   |  |
| Antifreeze (checked up to):   | °C   | <b>Serial numbers</b>   |  |
| Flow rate                     | l/m  | <ul style="list-style-type: none"> <li>• Station</li> </ul>   |  |
| Pump (type)                   |  |   |  |
| Pump speed level (I, II, III) |  | <ul style="list-style-type: none"> <li>• Controller</li> </ul>  |  |
| System pressure               | mbars  |   |  |
| Expansion tank (type)         |  | <ul style="list-style-type: none"> <li>• Software version</li> </ul>  |  |
| Initial pressure              | mbars  |   |  |
| Safety valve                  | <input type="checkbox"/> checked   | Restrictor position:<br> |  |
| Check valves                  | <input type="checkbox"/> checked   |   |  |
| Installation company          | Date, signature  |   |  |

## 11 Notes

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