

Hamworthy Trigon  
**ST1 Dual Aspect / Field Solar Pump Station**  
**Installation, Commissioning,  
Operation & Service Instructions**

**IMPORTANT NOTE**

**THESE INSTRUCTIONS MUST BE READ  
AND UNDERSTOOD BEFORE INSTALLING,  
COMMISSIONING, OPERATING OR  
SERVICING EQUIPMENT**



Heating *at work.*

# Customer After Sales Services

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## **Technical Enquiries**

To supplement the detailed technical brochures, technical advice on the application and use of products in the Hamworthy Heating range is available from our technical team in Poole and our accredited agents.

## **Site Assembly**

Hamworthy offer a service of site assembly for many of our products where plant room access is restricted. Using our trained staff we offer a higher quality of build and assurance of a boiler built and tested by the manufacturer.

## **Commissioning**

Commissioning of equipment by our own engineers, accredited agents or specialist sub-contractors will ensure the equipment is operating safely and efficiently.

## **Service Contracts**

Regular routine servicing of equipment by Hamworthy service engineers inspects the safety and integrity of the plant, reducing the risk of failure and improving performance and efficiency. Service contracts enable you to plan and budget more efficiently.

## **Breakdown service, repair, replacement**

Hamworthy provide a rapid response breakdown, repair or replacement service through head office at Poole and accredited agents throughout the UK.

## **Spare Parts**

We offer a comprehensive range of spare parts, providing replacement parts for both current and discontinued products. Delivery options are available to suit you. Please refer to our website for more details.

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THE TRIGON ST1 DUAL ASPECT / FIELD SOLAR PUMP STATION COMPLIES WITH ALL RELEVANT EUROPEAN DIRECTIVES.

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# HAMWORTHY TRIGON INSTALLATION AND OPERATION MANUAL

## DUAL PUMP STATION FOR USE WITH SOLAR PUMP STATION ST1

**Dual pump station for  
installations with two collector fields**



Customer Service Centre  
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Fleets Corner, Poole,  
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## 1 General information

### 1.1 About these instructions

These instructions describe the installation, commissioning, function and operation of the Solerio Transfert ST1 TOP.

The chapters called [specialist] are intended for specialists only. For other components of the solar thermal system such as collectors, storage tanks, expansion tanks and controllers please observe the instructions of the corresponding manufacturer.

### 1.2 About this product

The solar station is a premounted group of valves and fittings checked for leakage used to circulate the solar fluid in the solar circuit. It may only be used in connection with a solar station including safety devices. The station is mounted on a wall bracket and fixed with clips. It contains important fittings and safety devices for the operation of the installation:

- Ball valve
- Check valve
- Thermometer
- Flowmeter to display the flow rate
- Ball valve to restrict the flow rate
- Flush and fill valve with hose connector

### 1.3 Designated use

The solar station may only be used 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 as described in these instructions!

Improper usage excludes any liability claims.

## 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 this manual

**Danger: danger of scalding due to vapour escape!**



With pressure relief valves there is risk of scalding due to vapour escape. During installation, check the local conditions and if a discharge line must be connected to the safety group. Observe the instructions regarding the pressure relief valve.

**Attention: material damage due to high temperatures!**



Install the solar station at a sufficient distance from the collector field, since the solar fluid may be very hot near the collector. It may be necessary to install an intermediate tank in order to protect the expansion tank.

**Notice: material damage due to mineral oils!**



It is imperative to avoid that the EPDM sealing elements of the station get in contact with substances containing mineral oils. Mineral oil products cause lasting damage to the material, whereby its sealant properties are lost. If necessary, ask the manufacturer whether the solar fluid, greases or installation aids contain mineral oils.

We do not assume liability nor provide warranty for damage to property resulting from sealants damaged in this way.

### 3 Assembly and installation [specialist]



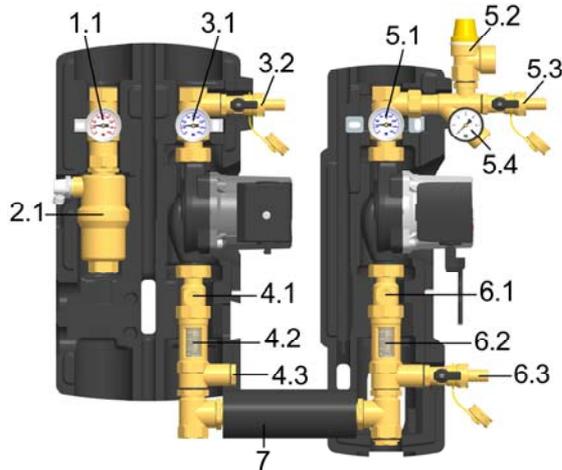
1. Take off the front shell of the solar station.
2. To remove the solar station from the mounting plate, push the clips upwards using a screwdriver. The station can then be pulled forwards (after disconnecting the tubes!).



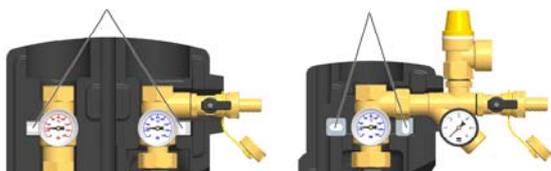
3. Screw off the safety group [5.2] of the ST1 TOP.
4. Mount this safety group to the ball valve [5.1] of the extension station.



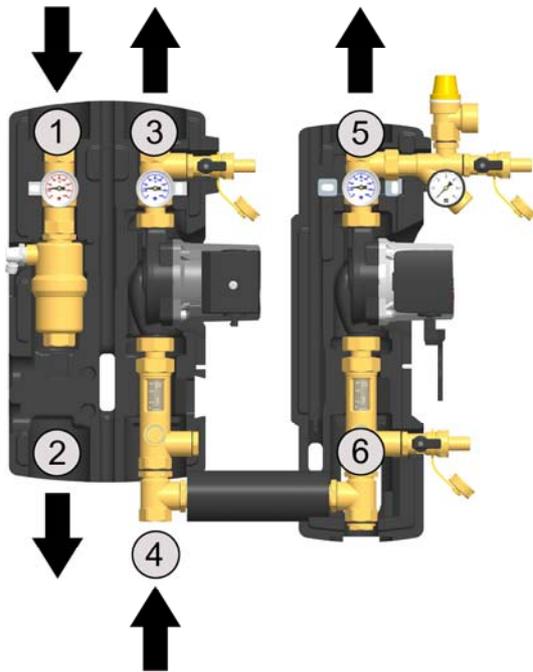
### 3.1 Assembly for installations with two collector fields



1. Screw the connecting piece [7] to the flowmeter [6.2] of the extension station.
  2. Unscrew the fill and drain valve of the flowmeter [4.2] in the ST1 Top. Plug the outlet [4.3] with the enclosed ½" plug.
  3. Dismount the flowmeter of the 2-line station [4.2] and screw it to the connecting piece.
  4. Centre the Flowmeter [4.2|6.2] and tighten the counter nuts.
  5. Mount the insulating front shell of the extension station. To do this, you must cut out the insulation at the connecting piece.
- 
6. Mount the reducer to the outlet of the return ball valve [3.1] of the ST1 Top.
  7. Screw the fill and drain valve dismantled before into this reducer.
  8. Centre the fill and drain valve and tighten the counter nuts.
  9. Mount the extension station with the flowmeter [4.2] below the pump of the ST1 TOP and tighten the screw connections manually.



10. Copy the mounting holes of the solar station (see figure on the left) to the mounting surface.
11. Drill the holes and mount the solar station to the wall with the enclosed wall plugs and screws.

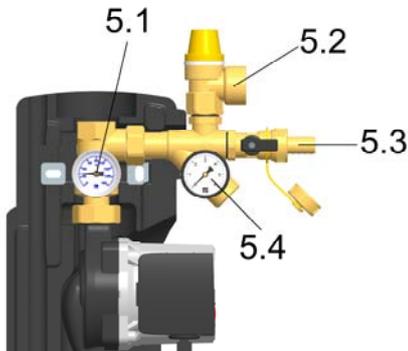


12. Connect the solar station to the system:

- ① flow collector fields
- ② flow storage tank
- ③ return collector field 1
- ④ return storage tank
- ⑤ return collector field 2

All screw connections have  $\frac{3}{4}$ " internal threads. Use a Teflon joint or use a sealing material resistant to high temperatures.

13. Connect the pipe for the expansion tank below the pressure gauge [5.4] and fix the bracket for the expansion tank.



14. Pressurise the expansion tank as specified by the manufacturer and connect the expansion tank.

15. Mount the shut-off valve with integrated flush valve so that you can check the pressure of the expansion tank when servicing the system.

16. Check all screw connections and tighten them if necessary.

The assembly of the solar station is completed and you can put the station into operation.



Optionally available!

## 4 Commissioning [specialist]



### **Attention: risk of burns and scalding!**

The valves and fittings can heat to temperatures of more than 100 °C due to the solar fluid. Therefore, do not clean or fill the system with the collectors heated (intense sunshine).

Please note that hot solar fluid can leak from the pressure relief valves in case of too high system pressure!



### **Attention: risk of frost!**

If you flush with water, make sure that the installation is completely drained before filling with solar fluid.

Use the solar fluid Tyfocor L, a mixture of propylene glycol and water with 45% of propylene glycol.



### **Note regarding the commissioning sequence**

When putting the system into operation, first fill the heating circuit and then the solar circuit. This guarantees that heat that may possibly be absorbed by the collectors during commissioning can be dissipated.



### **Note regarding the expansion tank**

Close the shut-off valve of the expansion tank during flushing and filling to prevent that dirt particles are washed from the solar installation into the expansion tank.

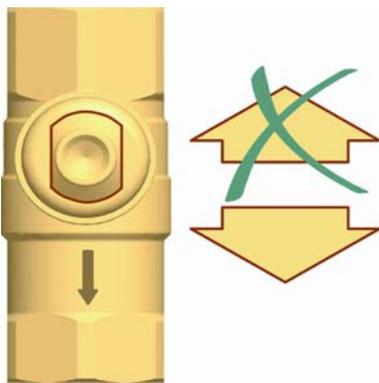
#### 4.1 Flushing and filling the solar circuit

The fill and drain valves required to flush and fill are integrated in the solar station.

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

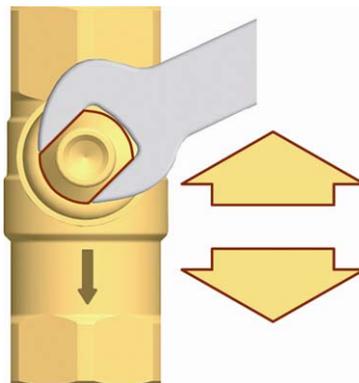
##### Ball valve with check valve

(normal flow direction in the figure below: downwards)



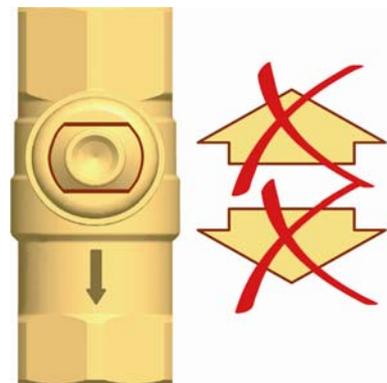
0°

Ball valve open,  
flow only in flow direction.



45°

Ball valve half-closed,  
flow in both directions.



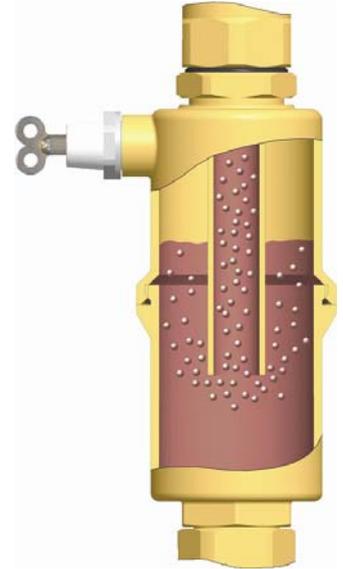
90°

Ball valve closed,  
no flow.

## Airstop

The Airstop with manual vent valve is used to vent the solar system. To ensure perfect deaeration 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



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



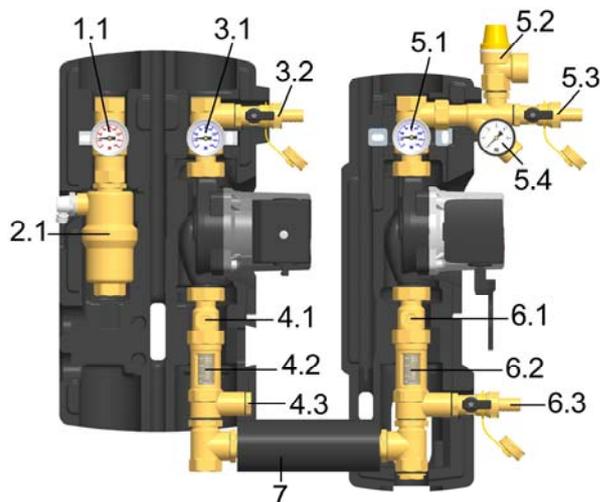
### **Danger: danger of scalding due to vapour escape!**

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



### **Note: venting the solar system after commissioning**

At the beginning, vent the solar system 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 specified operating pressure, if necessary.



## 4.2 Preparations before flushing

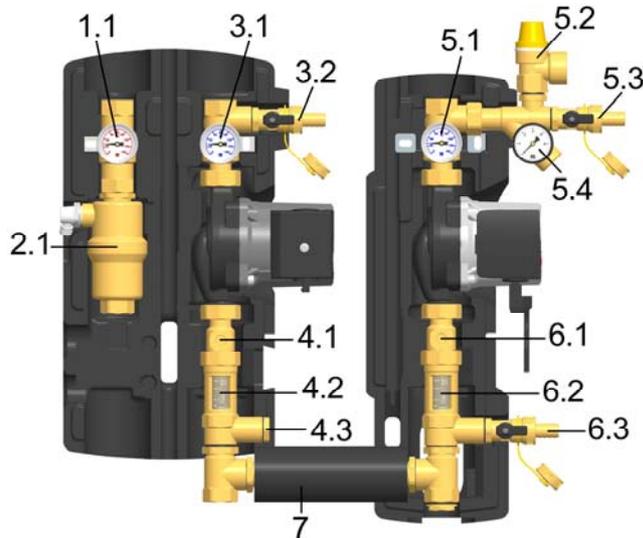
The solar circuit is flushed in the direction of flow.

1. Disconnect the expansion tank from the solar system. Close the return ball valve [3.1|5.1] (90°, see page 9).
2. Connect the fill station to the solar station:
  - Pressure hose to the fill valve [5.3]
  - Flush hose to the drain valve [6.3]

## 4.3 Flushing and filling

1. Open the fill and drain valves [5.3|6.3].
2. Put the flush and fill station into operation and flush the installation until the solar fluid exits without bubbles.
3. Vent the solar system several times at the vent plug of the Airstop [2.1] until clear water exits without bubbles (see page 10).
4. Slowly open the return ball valve [3.1|5.1] (0°, see page 9) to vent the pump section.

### Flushing and filling for installations with two collector fields

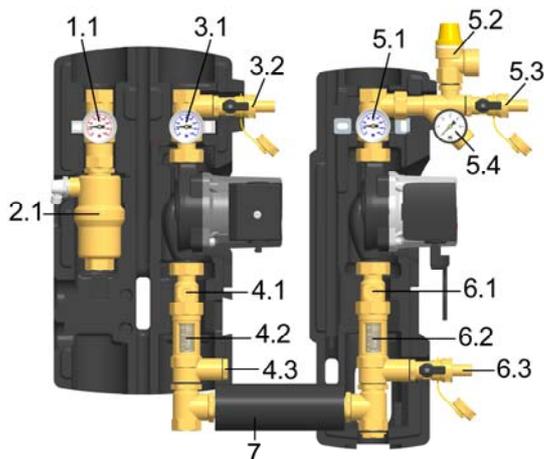


1. Connect the pressure hose to the fill and drain valve of the second collector field [3.2].
2. Repeat steps 1-4 under point **"4.3 Flushing and filling"** and continue with point 3.



Consider the pressure relief valve (6 bars)!

3. Close the drain valves [4.3|6.3] with the filling pump running and increase the system pressure to about 5 bars. The system pressure can be read on the pressure gauge. Close the fill valve [3.2|5.3] and switch off the pump of the flush and fill station.



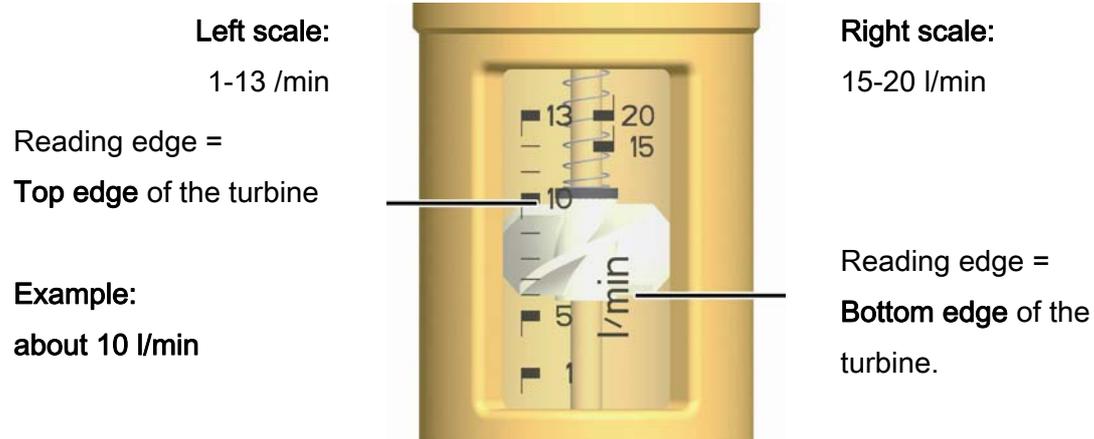
4. Check the pressure gauge to see whether the system pressure reduces and eliminate leaks where necessary.
5. Reduce the pressure on the drain valve [4.3I6.3] to the operating pressure.
6. Connect the expansion tank to the solar circuit and set the operating pressure of the solar system by means of the flush and fill station (see instructions regarding the expansion tank).
7. Close the fill valve [3.2I5.3] and the drain valve [4.3I6.3].
8. Turn the return ball valves [3.1I5.1] to operating position (0°, see page 9).
9. Connect the required controller to the mains and set the solar circuit pump to ON in the manual mode according to the controller instructions.



10. Remove the hoses of the flush and fill station and screw the sealing caps onto the fill and drain valves.  
The sealing caps only serve to protect the valves against dirt. They are not designed to take up high system pressures. The ball valves must be closed.

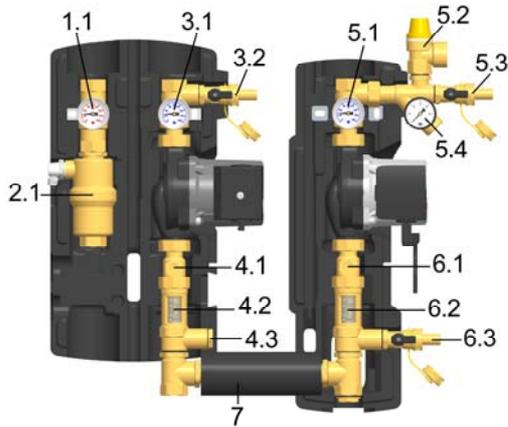
#### 4.4 Setting the solar system

1. Adjust the desired rotation speed of the solar circuit pumps depending on the required flow rate. The equalizing valves mounted to each collector field allow for an exact adjustment of the flow rate. The equalizing valve of the main collector allows you to adjust the overall flow rate in the installation.
2. The flowmeter in the extension station for Solerio Transfert ST1 only serves to display the flow rate.
3. For the correct adjustment, observe the adjustment values of the flow rate.
4. Fix the insulating front shells of the solar stations.
5. Switch the controller to automatic mode (see controller instructions).



## 5 Maintenance [specialist]

### 5.1 Draining the solar system



1. Open the check valves in the return ball valves [3.1|5.1], by turning them to a **45°** position (see page 9).
2. Connect a heat-resistant hose to the lowest drain valve of the solar system (or drain valve [6.3|4.3]).

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



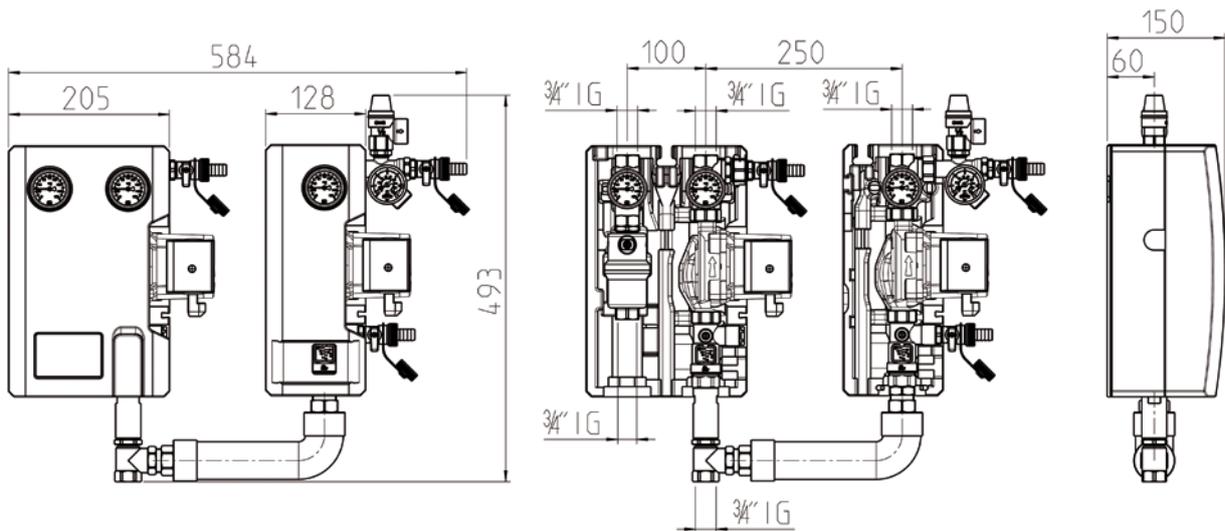
**Danger: danger of scalding due to hot solar fluid!**

The escaping medium may be very hot. Place the collecting container so that people standing nearby are not endangered when the solar system is being emptied.

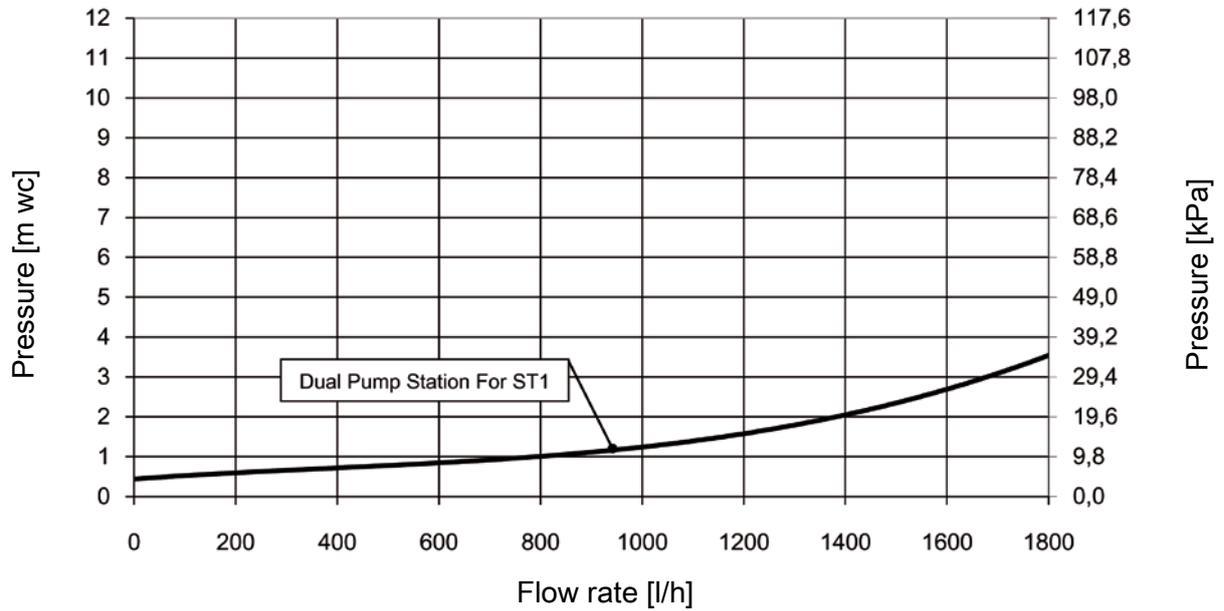
3. Open the drain valve at the lowest point of the solar thermal system.
4. Open a vent valve that may be present at the highest point of the solar system.
5. Dispose of the solar fluid observing the local regulations.

## 6 Technical data

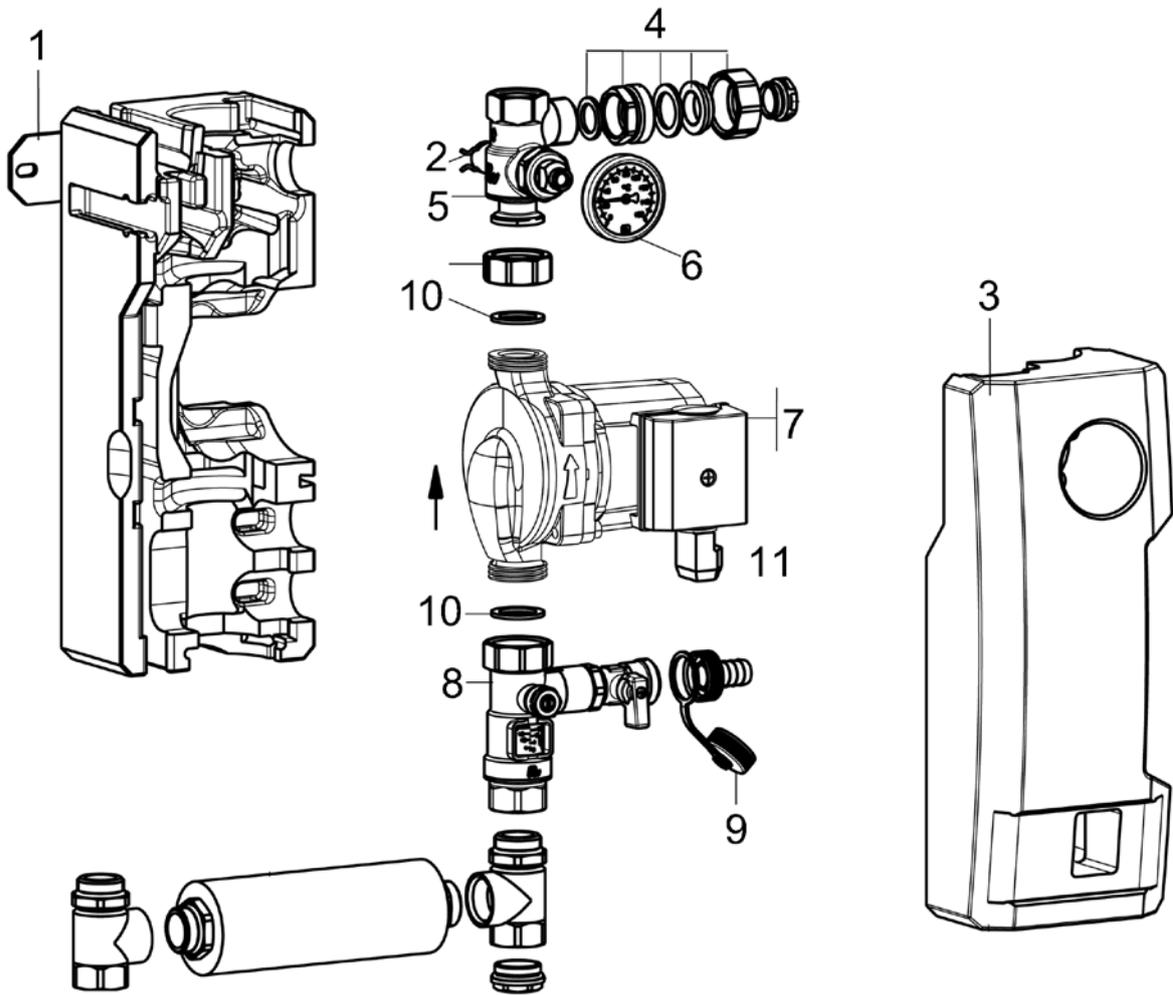
<b>Dimensions</b> (without equipment):	Total height:	433 mm
	Width (with 2-line station ST1):	547 mm
	Depth (with insulation):	150 mm
	Pipe connections:	¾" internal thread
	Connection for expansion vessel:	¾" external thread, flat sealing
<b>Operating data:</b>	Outlet pressure relief valve:	¾" internal thread
	Max. admissible pressure:	PN 10
	Max. operating temperature:	120 °C
	Max. short-time temperature:	160 °C, < 15 minutes
<b>Equipment:</b>	Max. propylene glycol concentration:	40 %
	Pressure relief valve:	6 bars
	Pressure gauge:	0-6 bars
<b>Materials:</b>	Check valve:	200 mm wc, can be opened
	Valves and fittings:	Brass
	Seals:	EPDM
	Check valves:	Brass
	Insulation:	EPP, I = 0.041 W/(m K)



### 6.1 Pressure drop characteristics Dual Pump Station



7 Spare parts [installer]



\*The bold item numbers correspond to the item numbers of the station ST1.

<b>Spare parts Dual Pump Station For ST1</b>		
<b>Position</b>	<b>Designation</b>	<b>HHL Part no.</b>
<b>1</b>	Wall bracket	073337
<b>2</b>	<b>Fixation clip (x 5)</b>	073071
<b>3</b>	Front and back insulating shell made of EPP	073794
<b>4</b>	Screw connections	N.C.
<b>5</b>	<b>Ball valve with check valve, flow towards collector field 2</b>	073072
<b>6</b>	<b>Thermometer (blue), flow towards collector field 2</b>	073788
<b>7</b>	<b>Pump Wilo Star-ST 15/7 ECO-3</b>	073068
<b>8</b>	Flowmeter 3-22 l/min ST 20*	073792
<b>9</b>	<b>Drain connection</b>	073346
<b>10</b>	<b>Sealing set for ST1</b>	073347
<b>11</b>	<b>Cable for pump*</b>	073348

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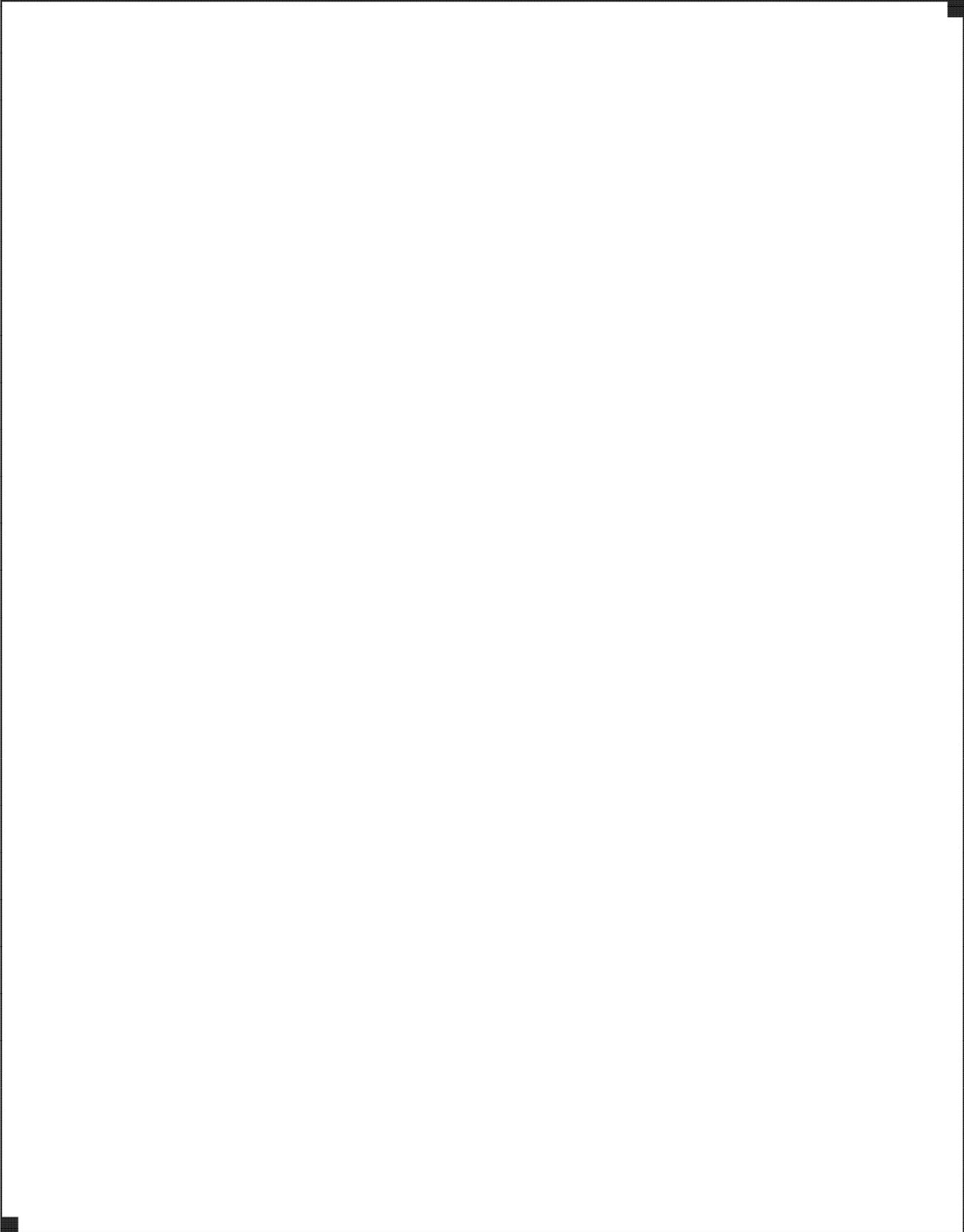
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# Notes



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British engineering excellence from Hamworthy Heating;  
the commercial heating and hot water specialists.



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