-weishaupt-

manual

Installation and operation instructions

Solar station WHI sol-heat 20 #2 or 40 #3
Solar station WHI sol-aqua 20 #2 or 40 #2

83514202 · 1/2025-01

1 Information for the user

These installation and operation instructions form part of the device and must be stored at the place of use.

Carefully read these instructions before installation and commissioning.

1.1 User guidance

1.1.1 Symbols

 DANGER	Immediate danger of high risk. Non-observance will result in serious injuries or death.
 WARNING	Danger of medium risk. Non-observance may result in environmental damage, serious injuries or death.
 CAUTION	Danger of low risk. Non-observance may result in material damage or light to medium injuries.
ATTENTION	Important information.

1.1.2 Target group

This installation and operation manual is addressed to operators and qualified skilled personnel. It must be observed by anyone working on the machine.

Work on the machine may only be performed by persons that have received the required training or instruction.

Persons with restricted physical, sensory or mental abilities may work on the machine if supervised or instructed by an authorized person.

Children may not play with the machine.

1.2 Warranty and liability

Warranty and liability claims for personal and material damage are void if they are due to one or several of the following causes:
Use of the machine contrary to its designated use,
Non-observance of the installation and operation instructions,
Operation of the machine with non-operational safety or protective devices,
Continued use despite the presence of a defect,
Improper assembly, commissioning, operation and maintenance of the machine,
Unauthorised modification of the machine,
Installation of additional components that were not tested together with the machine,
Repairs carried out incorrectly,
Failure to use Weishaupt original parts,
Defects in the supply lines,
Force majeure.

2 Safety

2.1 Designated use

The station may only be used in solar thermal installations as separation station between the solar circuit and the heating circuit (in the case of WHI sol/heat) or the potable water circuit (in the case of WHI sol/aqua), taking into consideration the technical limit values indicated in this manual. Due to its design, the station may only be installed and operated as described in these instructions!

Only use original accessories with the solar station.

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.

2.2 Safety instructions

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.

WARNING

Risk to life and limb due to electric shock!

- ➢ Prior to performing electrical work on the controller, de-energise the system.

  For more information, see enclosed installation and operation instructions of the station controller.
- ➢ Do not connect the controller to the mains until all installation work, flushing and filling have been completed. An unintentional start of the motors is thus avoided.
- ➢ The plug-in pump lines are permanently supplied with a mains voltage of 230 V and cannot be switched off via the controller.

CAUTION

Risk of burns!

The valves, fittings and the pump may heat 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!

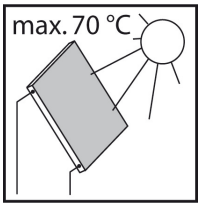
- The ball valves may only be closed by skilled personnel when service is required, after the system has been switched off.
  When the system is recommissioned, all locks must be opened again.
- When closing the ball valves in case of servicing, also put the pumps out of operation and close the ball valves / piston valves of the secondary circuit.

ATTENTION

Material damage due to mineral oils!

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

- It is imperative to avoid that the EPDM sealing elements of the unit get in contact with substances containing mineral oils.
- Use a lubricant based on silicone or polyalkylene and free from mineral oils, such as Unisilikon L250L and Syntheso Glep 1 of the Klüber company or a silicone spray.



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.

ATTENTION

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 to the collector field. It may be necessary to install an intermediate tank in order to protect the expansion tank.

2.3 Safety measures

Immediately eliminate safety-relevant defects and replace safety-relevant components when they have reached the end of their service life due to their construction.

2.4 Electrical connection

When performing any work on live parts:
Observe the accident prevention regulations BGV A3 and local regulations,
Use tools according to EN 60900.

2.5 Structural modifications

Conversion measures are only allowed after prior approval in writing by the Max Weishaupt GmbH.
Additional components may only be installed if they were tested together with the machine.
Use only Weishaupt original parts.

2.6 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

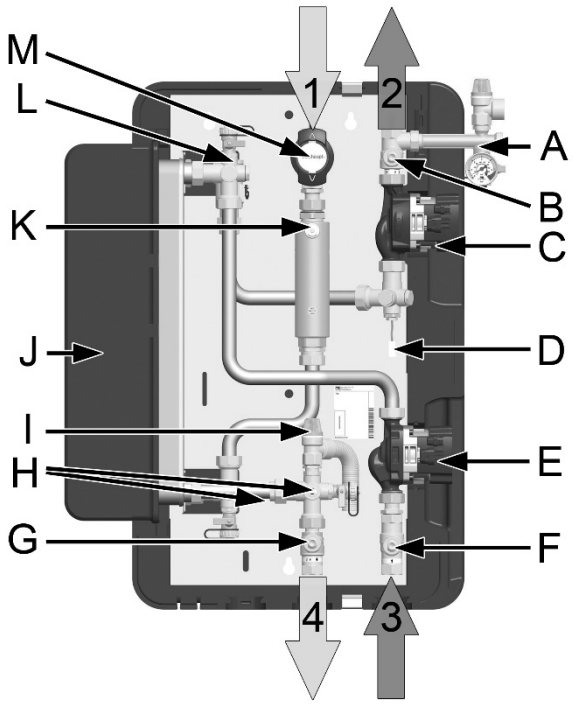
The packaging materials are made of recyclable materials and can be disposed of with recyclable materials.

3 Product description

The station is a preassembled valves and fittings group checked for leakage and used to transfer the heat from the primary circuit or solar circuit to the secondary circuit or storage tank/potable water circuit. It contains a preset controller and important valves and fittings and safety equipment to operate the unit:

- Ball valves in the solar circuit and storage tank circuit (supply and return) of the WHI sol/heat modules
- Piston valves in the potable water circuit (supply and return) of the WHI sol/aqua modules
- Check valves in the supply and return of the primary circuit and in the supply of the secondary circuit to avoid involuntary gravity circulation
- Safety valves to avoid inadmissible overpressure
- Pressure gauge to display the installation pressure in the solar circuit
- Vent valves to easily vent the solar circuit
- Flush and fill valves with sealing caps to flush, fill and drain the solar circuit
- A flow meter (FlowRotor) and temperature sensors for power-dependent speed control of the pumps and heat balance (primary)

The expansion tank necessary for operation must be adjusted to the size and requirements of the installation and must be ordered separately.
A connection for it is provided laterally on the safety group.



Example: WHI sol-heat 20 #2

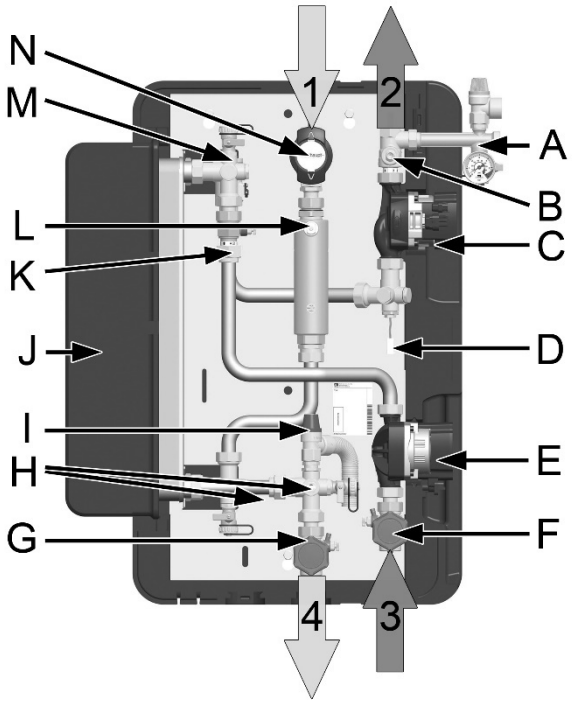
WHI sol-heat 20 #2 and 40 #3

Connections

1	Primary side: flow from collector
2	Primary side: return to collector
3	Secondary side: return from buffer tank (cold)
4	Secondary side: flow to buffer tank (hot)

Equipment

A	Safety group with safety valve 6 bar, pressure gauge and expansion tank connection
B	Return ball valve with check valve
C	Primary pump
D	Temperature sensor NTC 5K
E	Secondary pump
F	Return ball valve
G	Flow ball valve with check valve
H	Temperature sensor NTC 5K
I	Safety valve 6 bar (Only for protection of the station. Does not replace the safety valve that must be installed on-site.)
J	Heat exchanger
K	Airstop with manual vent valve
L	FlowRotor with Hall sensor and vent plug
M	Flow ball valve with check valve



Example: WHI sol-aqua 20 #2

WHI sol-aqua 20 #2 and 40 #2

Connections

1	Primary side: flow from collector
2	Primary side: return to collector
3	Secondary side: return from DHW storage tank (cold)
4	Secondary side: flow to DHW storage tank (hot)

Equipment

A	Safety group with safety valve 6 bar, pressure gauge and expansion tank connection
B	Return ball valve with check valve
C	Primary pump
D	Temperature sensor NTC 5K
E	Secondary pump
F	Piston valve with drain valve, return
G	Piston valve with drain valve, supply
H	Temperature sensor NTC 5K
I	Safety valve 10 bar, suitable for domestic water (Only for protection of the station. Does not replace the safety valve that must be installed on-site.)
J	Heat exchanger
K	Non-return valve with drain valve
L	Airstop with manual vent valve
M	FlowRotor with Hall sensor and vent plug
N	Flow ball valve with check valve

3.1 Function

To protect the solar circuit of a thermal solar system from frost, it is filled with a propylene glycol/water mixture. The heat produced by solar energy is required in the heating circuit or else in the potable water mains.

In small installations, this function is performed in most cases by a plain tube heat exchanger integrated into the storage tank. When the collector fields become larger, the transfer capacity of these heat exchangers is no longer sufficient.

In large systems, the function of solar stations is to transmit the heat energy collected in the collector to the heating water circuit or to the potable water mains.

The centrepiece of these modules is a plate heat exchanger, whose cross-flow operating mode allows excellent heat transfer.

The operating conditions in the heat exchanger vary, due to variations in radiation, buffer temperatures and different system requirements.
For optimum operation of the overall system, the flow rates in the heat exchanger must be adapted to the relevant control target and current situation.

To this end, high-efficiency pumps, which have an extremely wide control range, are used in the WHI sol modules. This allows the controller to adapt the pumps optimally to the momentarily required flow rate within a very broad application range.

Moreover, the pumps used save far more than 50% of the electrical drive energy compared with customary asynchronous pumps.

The controller is delivered preset, assembled and wired, thus ensuring easy adjustment to the real system.

The use of flow rate sensors in the WHI sol modules moreover offers an integrated heat quantity measurement.

The WHI sol modules are equipped with safety, locking and flushing valves and fittings, allowing the solar system to be commissioned safely and quickly.

The WHI sol-heat modules are intended for operation in heating installations.
In contrast, the WHI sol-aqua modules are used for separating the solar circuit from the potable water mains.

3.2 Technical data Solar stations

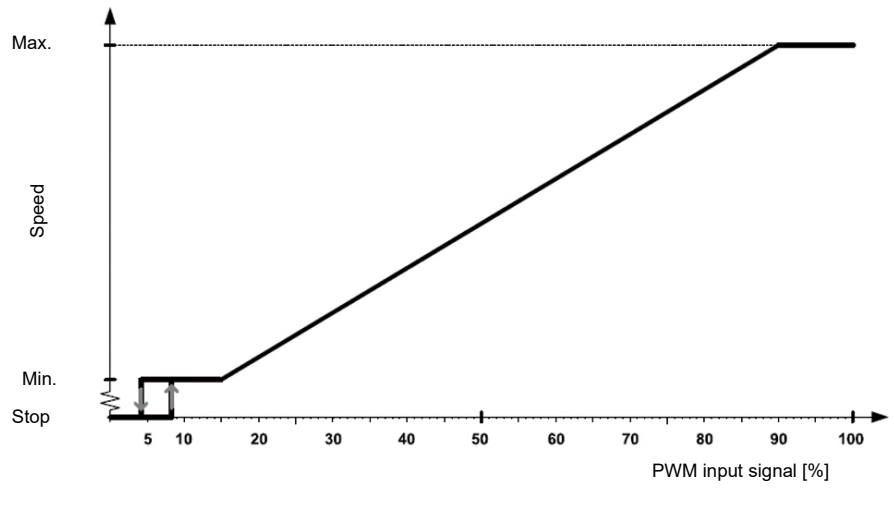
Dimensions	Solar station WHI sol-heat 20 #2 Solar station WHI sol-aqua 20 #2	Solar station WHI sol-heat 40 #3 Solar station WHI sol-aqua 40 #2
Total height	799 mm	829 mm
Total width	662 mm	664 mm
Total depth	298 mm	298 mm
Centre distance flow / return	120 mm	120 mm
Pipe connection prim	G ¾" female thread	G 1" female thread
Pipe connection sec: WHI sol-heat	G ¾" female thread	G 1" female thread
Pipe connection sec: WHI sol-aqua	G 1" male thread, flat sealing	G 1¼" male thread, flat sealing
Connection for expansion tank	G ¾" male thread, flat sealing	
Outlet of pressure relief valve	G ¾" female thread	
Operating data		
Max. admissible pressure	prim.: 6 bar / sec. sol-heat: 6 bar; sol-aqua: 10 bar	
Max. operating temperature	120 °C	
Max. stagnation temperature	140 °C	
Max. propylene glycol content	50 %	
Max. power Q_{max}	30 kW at $FL_{prim.}$ 120 °C / $RET_{prim.}$ 100 °C	60 kW at $FL_{prim.}$ 120 °C / $RET_{prim.}$ 100 °C
Flow rate at Q_{max}	prim.: 1250 l/h, sec.: 1290 l/h	prim.: 2500 l/h, sec. sol-heat: 2500 l/h; sol-aqua: 2600 l/h
Operating temperature sensors	-25 °C to +120 °C	
Equipment		
Safety valve WHI sol-heat	prim: 6 bar / sec: 6 bar	
Safety valve WHI sol-aqua	prim: 6 bar / sec: 10 bar	
Pressure gauge	prim: 0-6 bar	
Heat exchanger	30 plates	60 plates
Flow rate measurement device	FlowRotor, measuring range: 2-50 l/min, 55 pulses/litre	
Sensors	3 NTC 5 K (built-in)	
Check valves (in ball valves)	prim: 2 x 200 mm wc, can be opened / sec: 1 x 200 mm wc, can be opened	
Materials		
Valves and fittings	Brass	
Seals	EPDM	
Check valves	Brass	
Pipes	1.4404 (AISI 316 L)	
Insulation	EPP, λ = 0.038 W/(m K), fire class B2	
Heat exchanger	Plates + connecting pieces: 1.4401 (AISI 316) / Solder: 99.99% pure copper	
Admissible medium	Prim.: Propylene glycol (max. 50%) Sec. sol-heat: Heating water according to VDI 2035 / Austrian standard H 5195-1 Sec. sol-aqua: Chloride content <80 ppm	

3.3 Technical Data Pumps

	UPM3 Solar 15-145	UPM3 Solar 15-75	UPM4 15-70 CIL3	Solar PML 25-145	UPM3 Solar 25-75	UPML 25-105 N
Length	130 mm			180 mm		
Connections	1" male thread			1½" male thread		
Protection class	IPX4D		IP44	IPX2D	IPX4D	IPX2D
Max. pressure	1.0 MPa (= 10 bar)					
Max. temperature	110 °C TF 110			95 °C TF 95	110 °C TF 110	95 °C TF 95
I (1/1)	0.04-0.58 A	0.04-0.48 A	0.03-0.5 A	0.07-1.18 A	0.04-0.48 A	0.06-1.16 A
P1	2-60 W	2-45 W	2-54 W	6-140 W	2-45 W	6-140 W
Use in:						
WHI sol-heat 20 #2	Prim	Sec				
WHI sol-aqua 20 #2	Prim		Sec			
WHI sol-heat 40 #3				Prim	Sec	
WHI sol-aqua 40 #2				Prim		Sec
Prim = primary side (solar) / Sec = secondary side (heating / potable water)						

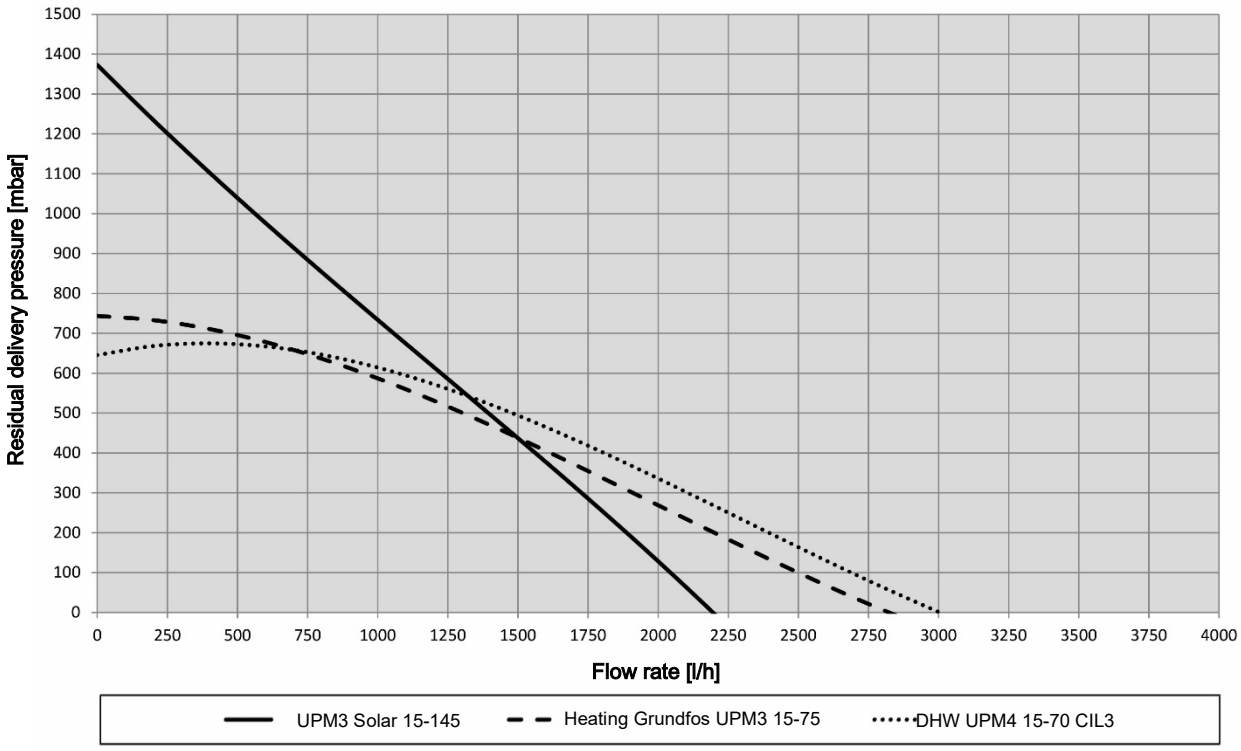
3.4 PWM input signal (solar profile)

PWM input signal [%]	Pump status
< 6	Standby
6-8	Hysteresis
9-15	Min. speed
16-90	Linear increase in speed from rpm min. to rpm max.
91-100	Max. speed

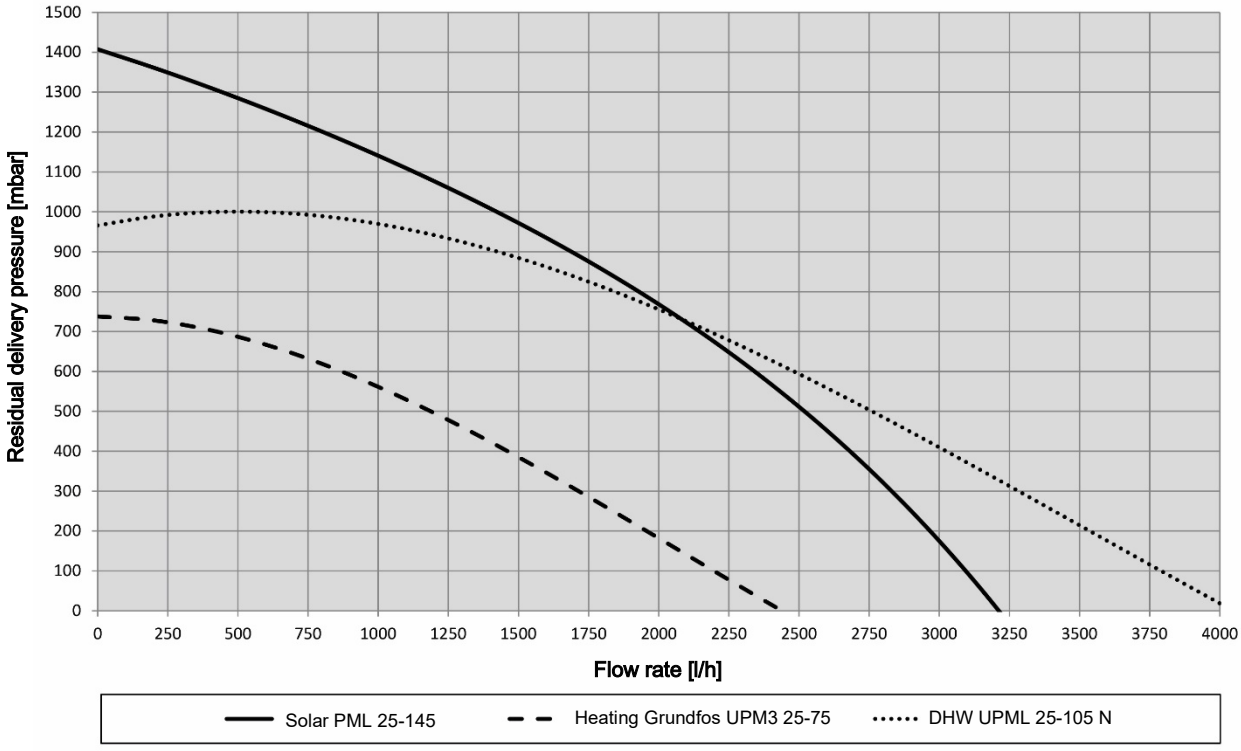


3.5 Hydraulic performance data

WHI sol-heat 20 #2 and WHI sol-aqua 20 #2



WHI sol-heat 40 #3 and WHI sol-aqua 40 #2



4 Dimensioning and planning

For a flawless functioning of the solar station, the installation must meet certain requirements. Please take some time to plan the assembly.

The WHI sol-aqua modules constructively decrease the precipitation of chalk in the heat exchanger.
For installations with an elevated total hardness of the potable water and/or high temperatures, a water treatment is recommended to avoid calcification.

The choice of the heat exchanger depends on the requirements of the installation site. Depending on the chemical composition of the water at the installation site, the adequacy of the plate heat exchanger has to be checked.
Please observe the following table:

Max. chloride content in the potable water	≤ 80 ppm
pH value	7.0 - 9.0
Conductivity	≤ 500 µS/cm
Zinc-galvanised piping	unsuitable
Max. pressure at 95 °C	17 bar
Plate material	1,4401 (AISI 316)

5 Installation

5.1 Assembly

NOTICE

Damage to property!

- The safety valve integrated in the station does not replace the safety groups of the potable water connection as per DIN 1988 or of the heating installation.
- The safety valve only protects the module from overpressures in case of servicing.

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 to the collector field.

- It may be necessary to install an intermediate tank in order to protect the expansion tank.

WARNING

Risk to life and limb due to electric shock!

- Prior to performing electrical work on the controller, de-energise the system. For more information, see enclosed installation and operation instructions of the station controller.
- Connect the station to the power supply system (230 V, 50 Hz) only after completing all installation tasks, flushing and filling.
  An unintentional start of the motors is thus avoided.

5 Installation

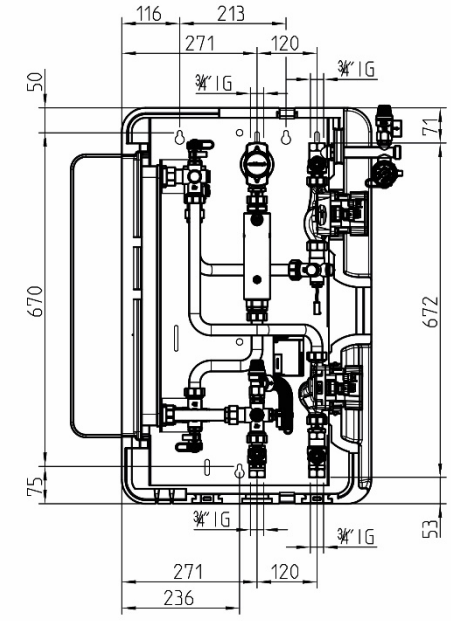
NOTICE

Damage to property!

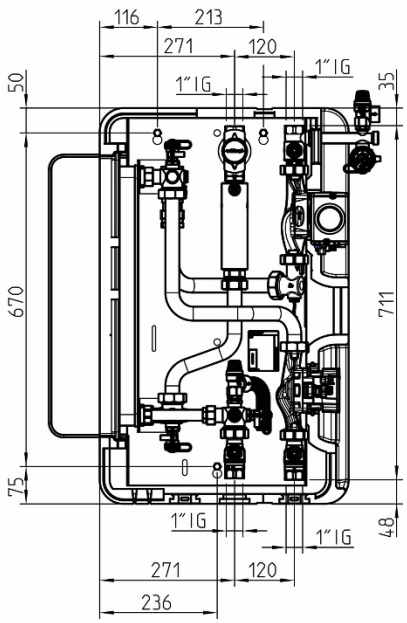
- The installation site must be dry, stable, frost-proof and protected against ultra-violet radiation in order to prevent material damage of the installation.
- Furthermore, access to the controller and safety equipment must be guaranteed at all times during operation!

NOTICE

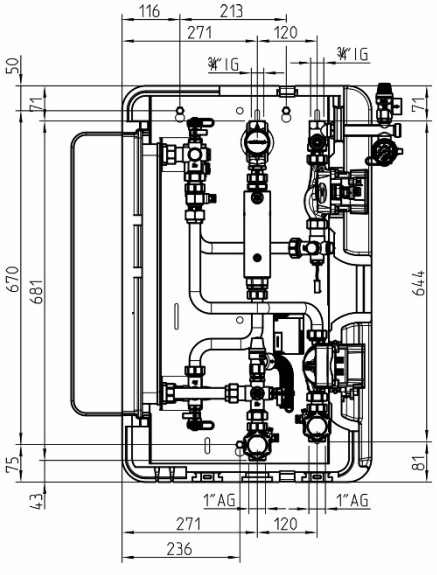
The discharge line of the safety equipment should be guided into heat-resistant collection tanks of suitable size. This prevents uncontrolled discharging into the environment and enables the circuits to be refilled!



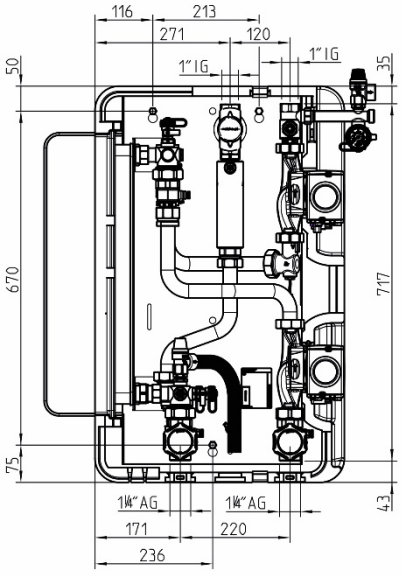
Solar station WHI sol-heat 20 #2



Solar station WHI sol-heat 40 #3



Solar station WHI sol-aqua 20 #2



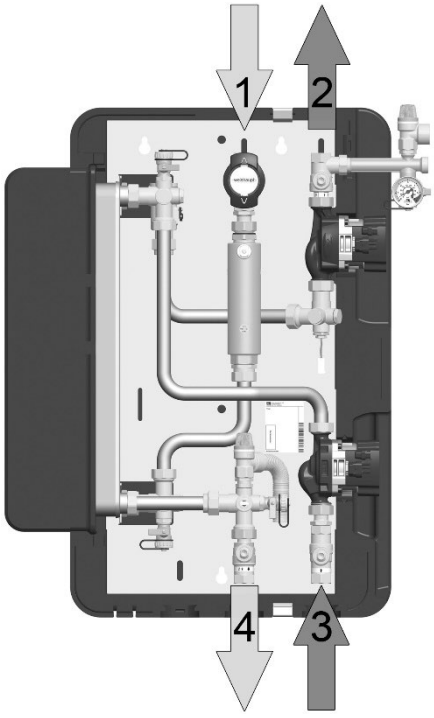
Solar station WHI sol-aqua 40 #2

1. A drilling template can be used in order to facilitate the installation. You will find the drilling template on the station.
2. Copy the dimension for the mounting holes to the mounting surface.
3. Maintain a lateral clearance of 200 mm on the right and left of the station.
4. Drill holes and insert the enclosed wall plugs into the drill holes. Make sure that the ground has sufficient load-carrying capacity.
5. Screw in the screws, allowing them to protrude about 40 mm from the wall.
6. Remove the station from the packaging.
7. Remove the insulating front shell. Hang the station onto the wall and tighten the screws.

5.2 Connection

1. Pipe the solar station with the system according to the diagram below.

Pipe gap from the wall (primary) = 95 mm



Pipe gap from the wall (secondary) = 167 mm

1 **Primary side: flow from collector**

Connection:

WHI sol-heat and sol-aqua 20 #2: ¾" female thread

WHI sol-heat 40 #3 and sol-aqua 40 #2: 1" female thread

2 **Primary side: return to collector**

Connection:

WHI sol-heat and sol-aqua 20 #2: ¾" female thread

WHI sol-heat 40 #3 and sol-aqua 40 #2: 1" female thread

3 **Secondary side: return from buffer tank (cold)**

Connection:

WHI sol-heat 20 #2: ¾" female thread

WHI sol-aqua 20 #2: 1" male thread, flat sealing

WHI sol-heat 40 #3: 1" female thread

WHI sol-aqua 40 #2: 1¼" male thread, flat sealing

4 **Secondary side: Flow to buffer tank (hot)**

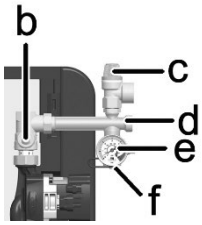
Connection:

WHI sol-heat 20 #2: ¾" female thread

WHI sol-aqua 20 #2: 1" male thread, flat sealing

WHI sol-heat 40 #3: 1" female thread

WHI sol-aqua 40 #2: 1¼" male thread, flat sealing



2. Install the safety group consisting of safety valve [c], fill valve [d] and pressure gauge [e] on the connection of the return ball valve [b].
3. Connect the expansion tank to connection [d].
For service work on the expansion tank, we recommend the installation of a cap valve on the expansion tank.

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.

4. Adapt the initial pressure of the expansion tank to the system and connect the expansion tank. Observe the separate instructions for the expansion tank!
5. Check all screw connections and tighten them if necessary.

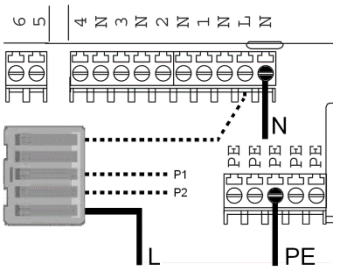
5.3 Controller connection

Risk to life and limb due to electric shock!

WARNING

- Prior to performing electrical work on the controller, de-energise the system.

  For more information, see enclosed installation and operation instructions of the station controller.
- Do not connect the controller to the mains until all installation work, flushing and filling have been completed. An unintentional start of the motors is thus avoided.
- The plug-in pump lines are permanently supplied with a mains voltage of 230 V and cannot be switched off via the controller.



1. Connect the neutral conductor (N) and the protective earth (PE) using the screw terminals shown in the controller manual and in the figure opposite.
2. Connect the outer conductor (L) to the bus bar in the controller housing. To do so, lift the lower lever and clamp the line pressing the lever down. Next check whether the line is firmly clamped.
3. The bus bar has already been connected to the screw terminal (L) of the controller and the pump lines for constant power supply.
   Due to the high power consumption of the pumps, the latter are not supplied with 230 V via relays, but permanently connected to the mains supply.
   The speed control (0-100%) of the pumps is effected via the PWM control signal.

5.4 Electrical connection of the solar controller WRSol2.1

Terminal	Acronym	Description	Type
L/N	230 V	Mains connection 230 V	on site
L/N	PS	Solar circuit pump	prewired
L/N	PWT	Secondary circuit pump	prewired
11/⊥	TK1	Collector sensor	on site
12/⊥	TWT	Secondary circuit outlet sensor	prewired
13/⊥	TU1	Storage tank sensor, bottom	on site
17/⊥	PWM2	PWM control signal for pump PWT	prewired
18/⊥	PWM1	PWM control signal for pump PS	prewired
19/⊥	TKR	Solar circuit return sensor	prewired
20/⊥	TKV	Solar circuit supply sensor	prewired
21/25/⊥	V1	Volume pulse input solar circuit	prewired

6 Operation

A detailed description of the operation of the controller can be found in the enclosed controller manual.

6.1 Pressetting solar controller WRSol2.1

- Hydraulic version 2
- Selected option: TKV, VIZ/TKR
- Pulse rate 55 pulses/litre
- Max. flow rate:
  WHI sol-heat or sol-aqua 20: 1250 l/h
  WHI sol-heat or sol-aqua 40: 2500 l/h

7 Commissioning

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 will leak from the safety valve when the system pressure is too high! During venting, the solar fluid may escape as vapour and result in scalding!

- Flush and fill the installation only if the collector temperatures are below 70 °C.

NOTICE

Risk of frost!

It often happens that solar systems cannot be completely drained after flushing. There is thus a risk of late frost damage when flushing with water. Therefore, flush and fill the solar installation only with the solar fluid used later.

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

NOTICE

Note regarding the commissioning sequence

Flush and fill in the following order:

1. Flush the storage tank (to remove scale residues).
2. Fill the storage tank circuit.
3. Vent the heat exchanger via the safety valve.
4. Flush and fill the solar circuit of the heat exchanger.
5. Flush and fill the collector field.
6. Flush and fill the (entire) solar circuit.

This avoids that dirt particles are washed into the heat exchanger and guarantees that possibly absorbed heat can be dissipated.

7.1 Preparation for flushing and filling

NOTICE

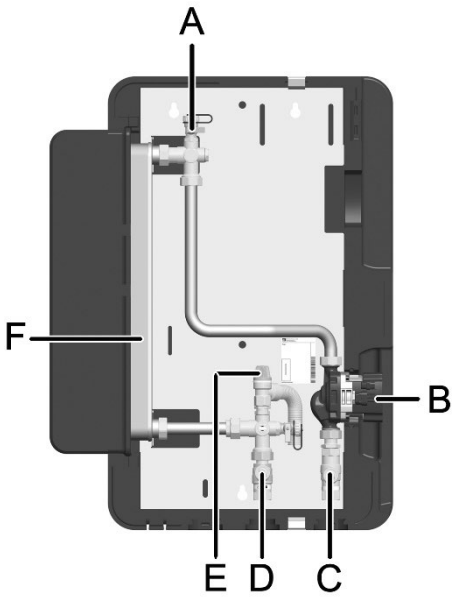
Note regarding the expansion tank

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.

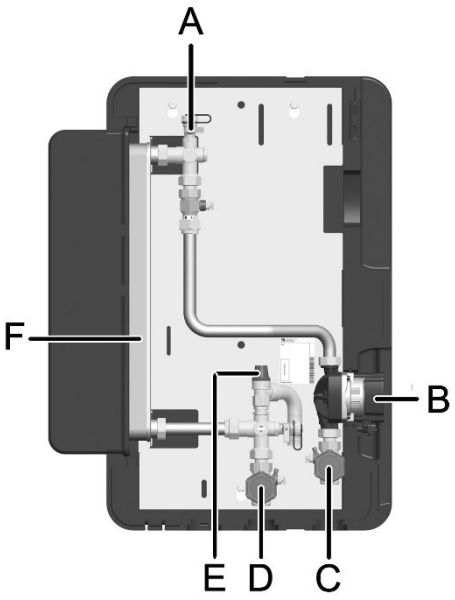
7.2 Flushing and filling the storage tank circuit / potable water circuit (lower connections)

The storage tank and potable water circuits are filled by means of the valves and fittings of the heating system. To prevent dirt particles from entering the heat exchanger, shut the ball valves or piston valves of the station and flush dirt particles/scale residues from the storage tank before commissioning. Make sure to only use admissible medium (see chapter 3.2).

1. Open the ball valves [C|D] of the WHI sol-heat module or the piston valves of the WHI sol-aqua module [C|D] and disable the check valves (45°, see next page).
2. Vent the storage tank circuit or potable water circuit by actuating the fill and drain valve [A].
3. Make sure that no water gets into the electrical components.
4. Fill the storage tank circuit or potable water circuit.
5. After filling the storage tank circuit or potable water circuit is complete, set the required operating pressure.
6. Vent the station during commissioning on the fill and drain valve [A], to remove any air that may still be present in the heat exchanger.
   It may be necessary to vent the pump (unscrew screw on pump head, if existent).



Solar station WHI sol-heat 20



Solar station WHI sol-aqua 20

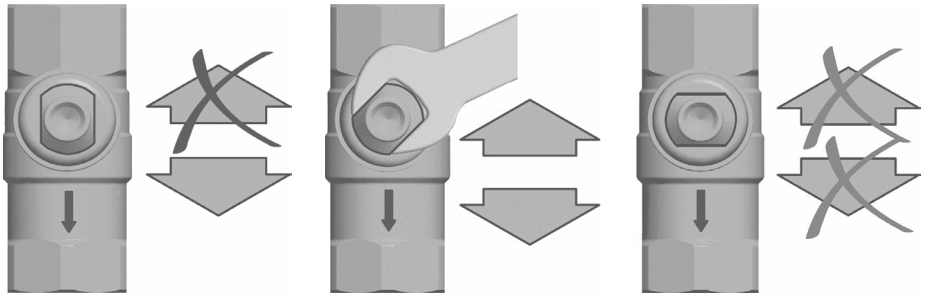
7.3 Flushing and filling the solar circuit (upper connections)

The fill and drain valves necessary to flush and fill the installation are integrated in the solar station. Make sure that dirt particles that may be present in the system are not flushed into the heat exchanger and into the expansion tank. For this purpose, disconnect the expansion tank from the solar circuit during flushing and filling if necessary and only use flush and fill stations with fine filters.

The solar circuit is flushed in the normal direction of flow. Therefore, make sure that the solar circuit pump does not switch on.

Ball valve with integrated check valve

(normal flow direction in the figure: downwards)



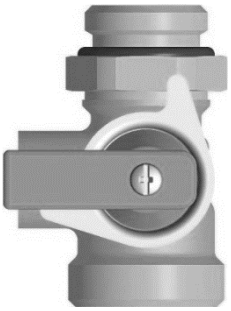
0°	45°	90°
Check valve is operating, **flow only in flow direction.**	Check valve is not operating, **flow in both directions.**	Ball valve closed, **no flow.**

To actuate the ball valve, a handle is included in the delivery.

7 Commissioning

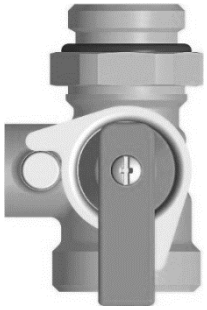
Functions of the fill and drain valve within the safety group

Position | **Function**



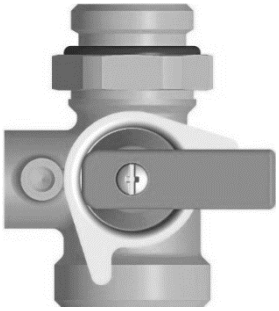
Position "closed" (station in operation):

Fill and flush circuit is closed. The pressure gauge indicates the system pressure.



Position "open" (fill and flush processes):

Fill and flush circuit is open. The pressure gauge indicates the system pressure.



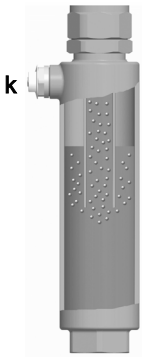
Position "maintenance" (maintenance work):

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

Attention: Remove the stop bolt before changing the position!

Airstop

The Airstop (with manual vent valve) is used to vent the solar system. To ensure proper operation of the Airstop, a flow velocity of at least 0.3 m/s maintained. Otherwise, the solar system must be vented on the collector field.



Pipe diameter [mm]		Flow rate at 0.3 m/s	
Ø outside	Ø inside	l/h	l/min
15	**13**	**143**	2.4
18	**16**	**253**	4.2
22	**20**	**452**	7.5
28	**26**	**860**	14.3
35	**32.6**	**1502**	25.0
42	**39.6**	**2437**	40.6
54	**51**	**4410**	73.5

The air liberated from the solar fluid is collected in the upper area of the Airstop and can be discharged via the vent plug [k].

7 Commissioning

WARNING

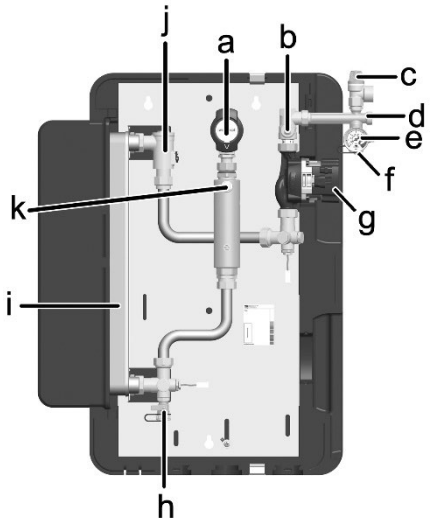
Danger of scalding due to escaping vapour!

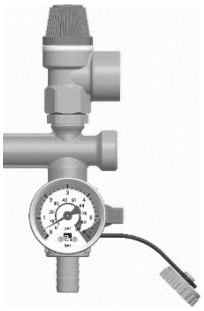
The escaping medium can reach temperatures of more than 100 °C and cause scalding.

- Carefully open the vent plug and close it again as soon as fluid escapes.

Venting the solar installation after commissioning

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





1. Switch off the solar pump.
2. Disconnect the expansion tank from the solar system. This prevents dirt particles still present in the pipes from being flushed into the expansion tank. Observe the separate instructions for the expansion tank!
3. The return ball valve [b] must be closed (90° position, see page 21).
4. Connect the flush and fill station:

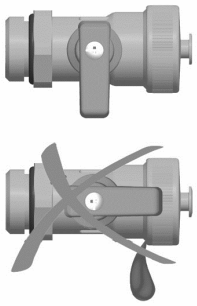
   - Pressure hose to the fill valve [f]
   - Flush hose to the drain valve [h].
5. Open the fill and drain valves [f|h] (see section "Functions of the fill and drain valve within the safety group", see page 22) and put the flush and fill station into operation.
6. Since the air can escape only slowly, the system must be filled slowly and vented on the collector. Otherwise, the air/water mixture will be distributed over the entire circuit. Once the filling process is finished, flushing is started.
7. Open and close the return ball valve [b] during flushing in order to vent the pump section.
8. Flush the solar circuit until the solar fluid exits without bubbles (see page 22).
9. Flush the collector fields individually, if possible!
10. Close the drain valve [h] with the filling pump running and increase the system pressure to approx. 5 bar. The system pressure is displayed on the pressure gauge [e].
11. Vent the circulation pump via the vent screw, if existent.
12. Close the fill valve [f] (see page 22) and switch off the pump of the flush and fill station.
13. Check the pressure gauge to see if the system pressure decreases and eliminate leaks where necessary.
14. Reduce the pressure on the drain valve [h] to the system-specific pressure, if necessary.
15. 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 the instructions of the expansion tank).
16. Close the fill and drain valves [f|h] (see page 22).
17. Put the ball valve [b] into position **0°** (see page 21).

WARNING

Risk to life and limb due to electric shock!

- ➢ Check if the sensors and the pumps are properly connected to the controller and if the controller housing is closed.
  Do not apply voltage to the controller before that.

18. Connect the controller to the mains and set the solar circuit pump in manual mode to ON according to the controller instructions.
19. Let the solar circuit pump run at maximum rotation speed for at least 15 minutes.
    Meanwhile, vent the solar system several times at the vent plug [k] of the Airstop until the solar fluid exits without bubbles (see page 22).



20. If necessary, increase the system pressure to the operating pressure.
21. 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 for high system pressures. Their tightness is ensured by the closed ball valves.
22. Mount the insulating front shell.
23. Switch the controller to automatic mode (see controller instructions).

    The commissioning of the solar installation is now completed.
    Please fill in completely the commissioning report on page 36.

8 Maintenance

The WHI sol modules are low in maintenance. However, as part of the annual inspection of the domestic water system, the following items should be checked/observed:

- Check all connections for leaks
- Check the safety equipment
- Perform a functional check and check the setting parameters
- Plausibility check of the control parameters and nominal values
- Check the heat exchanger for dirt and functioning

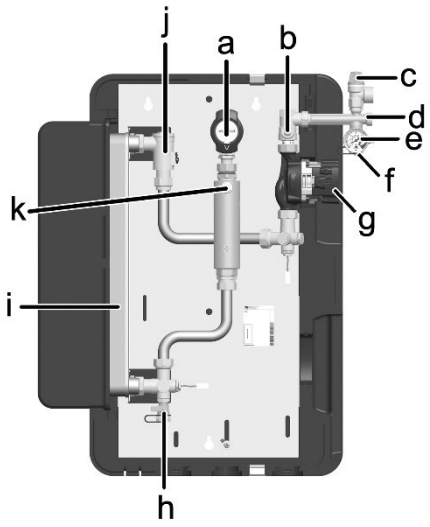
We recommend concluding a maintenance agreement.

DANGER

Risk of burning and scalding!

The valves, fittings and the solar fluid can heat up to more than 100 °C. The solar fluid may escape as vapour and result in scalding.

- ➢ Only carry out maintenance work if the collector temperatures are below 50 °C.
- ➢ Wait until the solar fluid has cooled down to at least 50 °C.



8.1 Replacement / Alignment of the pressure gauge

1. Switch off the controller and make sure that a restart is not possible.
2. Make sure that the valve [f] is closed with a cap.
3. Turn the valve [f] in position "maintenance" by removing the stop screw (see page 22).
4. **Replacement of the pressure gauge:**

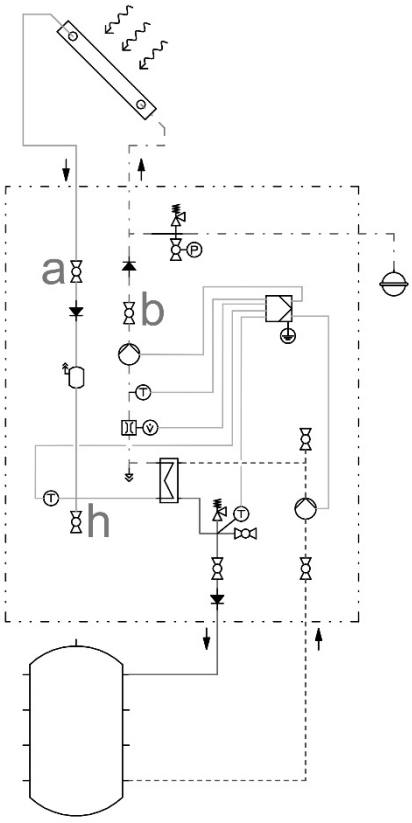
   Dismount the pressure gauge [e]. It may happen that a small amount of liquid (content of valve) escapes.
   Afterwards, replace the pressure gauge.

   Adjustment of the pressure gauge:

   Loosen the counter nut and turn the pressure gauge (from completely screwed in to max. 360°) anti-clockwise.
   Afterwards, secure it with the counter nut.
5. Turn the valve [f] again in position "closed" (see chapter 22). During this, mount the stop screw.
6. Check the pressure gauge [e] for tightness. Also, check the system pressure and increase it to the prescribed operating pressure, if necessary.
7. Vent the installation and repeat this procedure weekly or monthly, depending on the quantity of vented air.

8.2 Maintenance work

Depressurise the installation for all replacement or service work on the station. This does not apply to the replacement of the pressure gauge.



1. Close the ball valves [a|b] and release the solar fluid at the fill and drain valve [h]. Make sure that the solar fluid is collected in a heat-resistant container.
2. Replace the defective part by the new one.
3. Fill the solar circuit (see page 21).

8.3 Draining the solar system

1. Switch off the controller and make sure that a restart is not possible.
2. Open the check valves in the flow and return ball valves [a|b] by turning them into **45°** position (see page 21).
3. Connect a heat-resistant hose to the fill and drain valve [] of the solar station. Make sure that the solar fluid is collected in a heat-resistant container.

DANGER

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 fill and drain valve [h] of the solar station.
5. To accelerate the draining of the solar circuit, the vent valve possibly present at the highest point of the solar installation can be opened.
6. Dispose of the solar fluid observing the local regulations.

9 Accessories

Sampling valve (item no. -w- 40900015017) on WHI sol-aqua optionally available as accessory: Inflammable valves for germ-free sampling of water samples according to German Drinking Water Ordinance. Mounted laterally on the piston valves.

10 Function of the check valves

Within their application range, the check valves of this station prevent unwanted gravity circulation. The functioning of the check valves depends on:

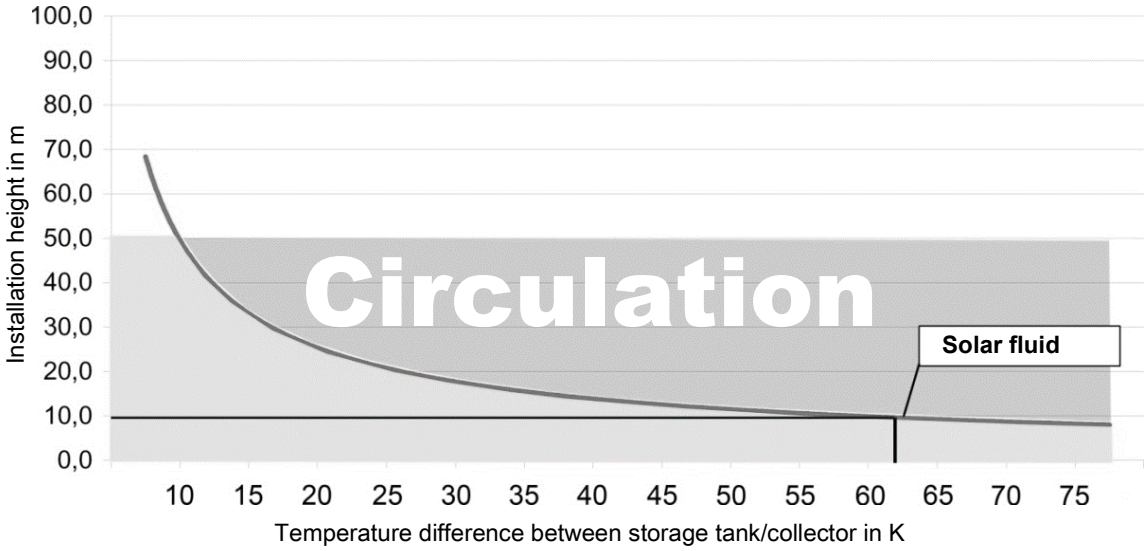
- the system height
- the temperature difference between storage tank and collector
- the heat transfer fluid used

The following diagram 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 in order to prevent gravity circulation. Components such as siphons ("heat traps"), 2-way valves (zone valves) or additional check valves can be installed for this purpose.

10 Function of the check valves

Example:

- The station is equipped with two check valves (2 x 200 mm wc = 400 mm wc).
- You use a mixture of water and 40 % of 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 approx. 62 K. At a higher temperature difference between collector and storage tank, the difference in density of the solar fluid is so large that the check valves are pressed open.

Do you wish to get further information?

The density of the solar fluid decreases considerably with increasing temperature. In the case of high installations and large temperature differences, the difference in density causes gravity circulation. This circulation can lead to a cooling down of the storage tank.

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

Collector temperature: 5 °C → Solar fluid density ρ1 = 1042 kg/m³

Storage tank temperature: 67 °C → Solar fluid density ρ2 = 1002.5 kg/m³

$\Delta \rho = \rho 1 - \rho 2 = 39.5$ kg/m³

$g = 9.81$ m/s²

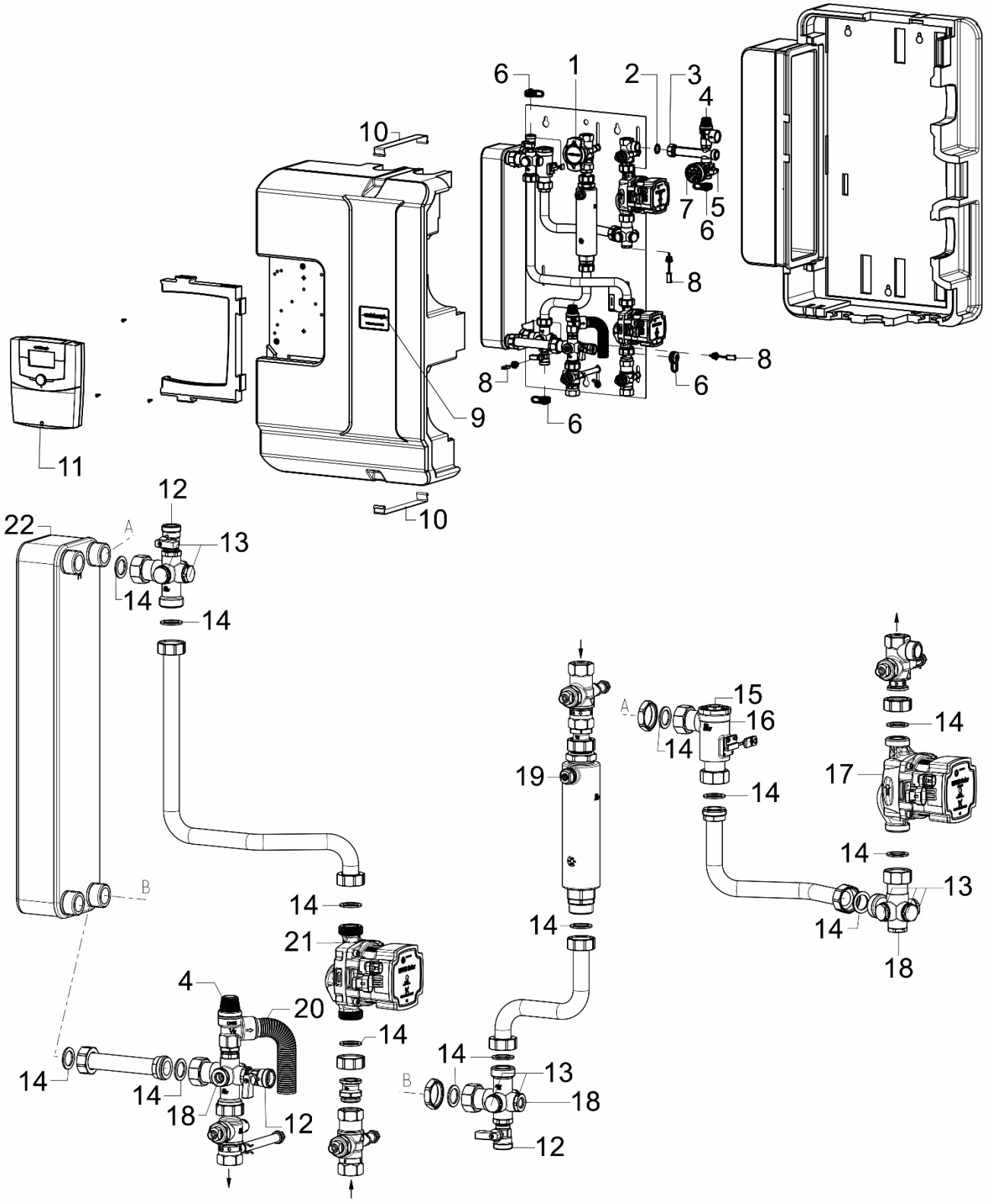
Installation height h = 10 m

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

At a system height of 10 m and a temperature difference between collector and storage tank of 62 K, the two check valves in the station (2 x 200 mm wc) are sufficient.

11 Spare parts

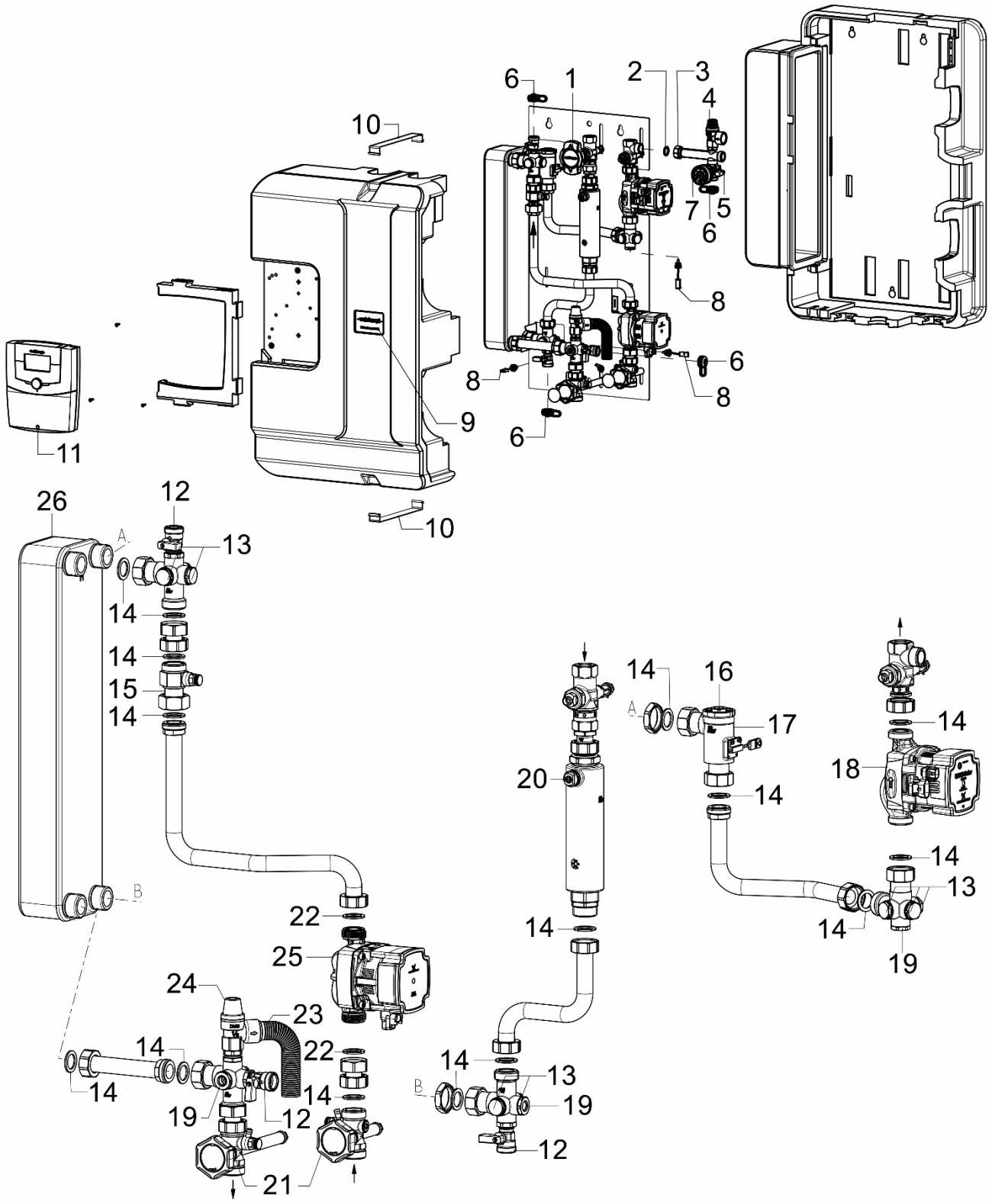
11.1 Spare parts Solar station WHI sol-heat 20 #2 (40900019382)



11 Spare parts

Position number	Spare part	-w- Part number
1	Thermo handle -weishaupt-	48002003132
2	Gasket Ø17 X Ø24 X 2 (¾")	40900021107
3	Safety bar DN 20 WHPSol 20-EA	48002003407
4	Safety valve 6 bar ½" solar	48002002637
5	Fill and drain valve ½" for pressure gauge	48002003417
6	Cap for inlet and outlet valve	48002002677
7	Pressure gauge 0-6 bar, d=50 mm / G¼"	48002003467
8	Temperature sensor NTC 5K G¼" male thread	40900015027
9	Name plate WHI sol-heat 20 #2	40900019467
10	Retaining clip insulation	40900015247
11	Solar controller WRSol 2.1	660327
12	Inlet and outlet valve G½" with hex. nut	48002002667
13	Cover screw G½" male thread	40900015257
14	Gasket Ø21 X Ø30 X 2 (1")	40900021117
15	Vent plug G½" male thread	40900015277
16	FlowRotor DN 25 90 degrees	40900015572
17	Circulation pump UPM3 Solar 15-145 130 9 h	48002003192
18	Reducer G½" male thread x G¼" female thread	40900015267
19	Vent valve ⅜" male thread with o-ring	48002002537
20	Drain hose G¾" x 1000 with o-ring	51150202422
21	Circulation pump UPM3 Solar 15-75 130 9 h	48002003182
22	Plate heat exchanger Danfoss XB37H40-Cu	40900031507
Not shown in drawing	Connection cable for Hallsensor 2500 mm	48002003127
	Connecting cable mini superseal 2500 mm long	48002003177
	Pump cable superseal 3 x 0.75 2500 mm long	48002003187
	Plug cable for temperature sensor 2500 mm	40900015037
	Hallsensor with LED connection cable	48002002867
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	EPP insulating shell WHI sol-heat	40900019482
	Hose connector with nut ¾"	40900015867
	Hose connector 90° with G¾" union nut	40900015447

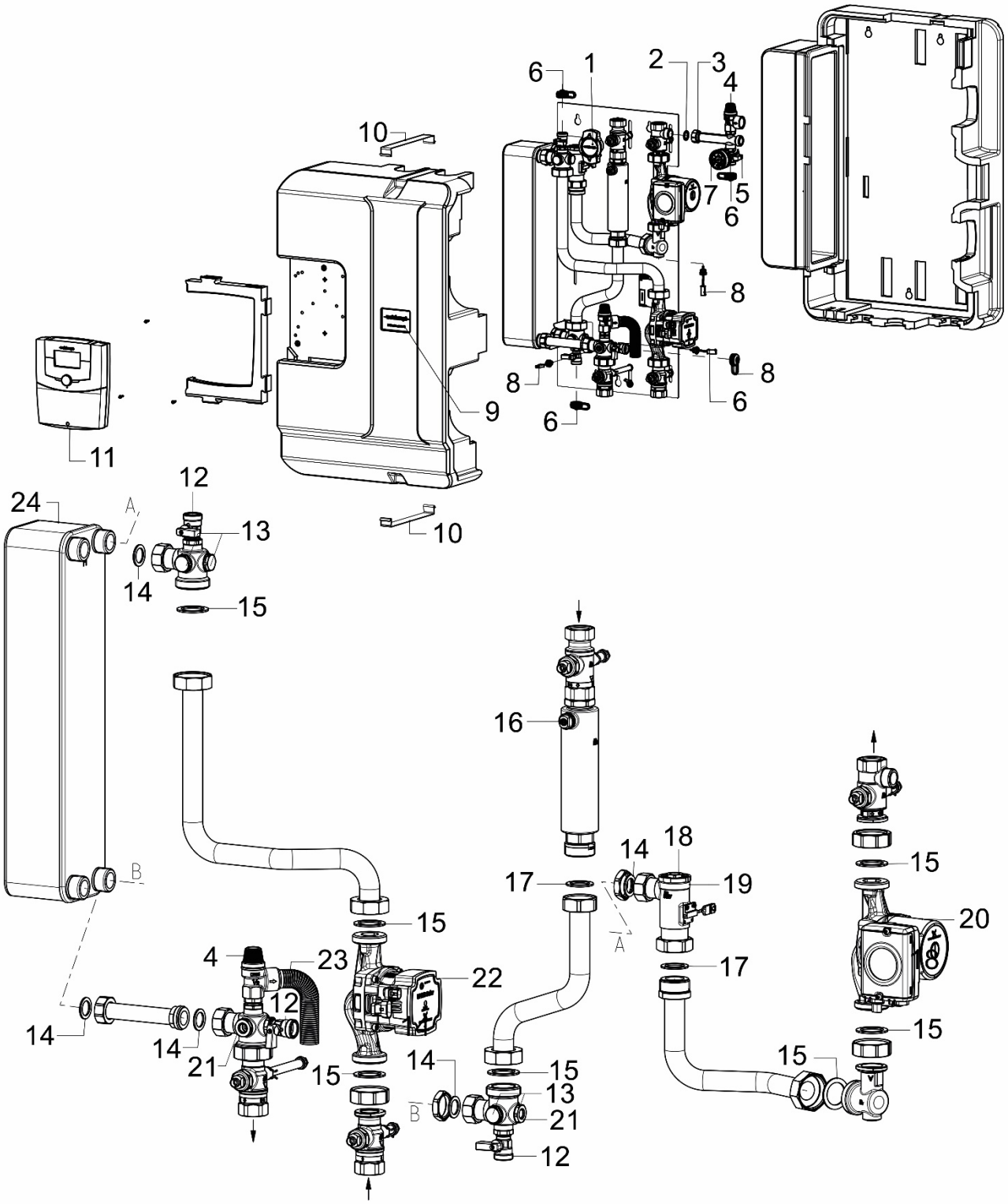
11.2 Spare parts Solar station WHI sol-aqua 20 #2 (40900019412)



11 Spare parts

Position number	Spare part	-w- Part number
1	Thermo handle -weishaupt-	48002003132
2	Gasket Ø17 X Ø24 X 2 (¾")	40900021107
3	Safety bar DN 20 WHPSol 20-EA	48002003407
4	Safety valve 6 bar ½" solar	48002002637
5	Fill and drain valve ½" for pressure gauge	48002003417
6	Cap for inlet and outlet valve	48002002677
7	Pressure gauge 0-6 bar, d=50 mm / G¼"	48002003467
8	Temperature sensor NTC 5K G¼" male thread	40900015027
9	Name plate WHI sol-aqua 20 #2	40900019677
10	Retaining clip insulation	40900015247
11	Solar controller WRSol 2.1	660327
12	Inlet and outlet valve G½" with hex. nut	48002002667
13	Cover screw G½" male thread	40900015257
14	Gasket Ø21 X Ø30 X 2 (1")	40900021117
15	Non return valve DN 20 G1" flange x G1" male thread	40900015227
16	Vent plug G½" male thread	40900015277
17	Flow-Rotor DN 25 90 degrees	40900015572
18	Circulation pump UPM3 Solar 15-145 130 9 h	48002003192
19	Reducer G½" male thread x G¼" female thread	40900015267
20	Vent valve ⅜" male thread with o-ring	48002002537
21	Piston valve DN 20 G1" male thread with drainage	40900015092
22	Gasket 21 x 30 x 2 (1") EPDM 90	40900015167
23	Drain hose G¾" x 1000 with o-ring	51150202422
24	Pressure relief valve ½", 10 bar	40900015057
25	Circulation pump UPM4 15-70 CIL3 130 9 h	40900019682
26	Plate heat exchanger Danfoss XB37H40-Cu	40900031507
Not shown in drawing	Connection cable for Hallsensor 2500 mm	48002003127
	Connecting cable mini superseal 2500 mm long	48002003177
	Pump cable superseal 3 x 0.75 2500 mm long	48002003187
	Plug cable for temperature sensor 2500 mm	40900015037
	Drain valve with o-ring G¼" male thread	40900015097
	Closing plug G¼" male thread	40900015107
	Hallsensor with LED connection cable	48002002867
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	EPP insulating shell WHI sol-heat	40900019482
	Hose connector with nut ¾"	40900015867
	Hose connector 90° with G¾" union nut	40900015447

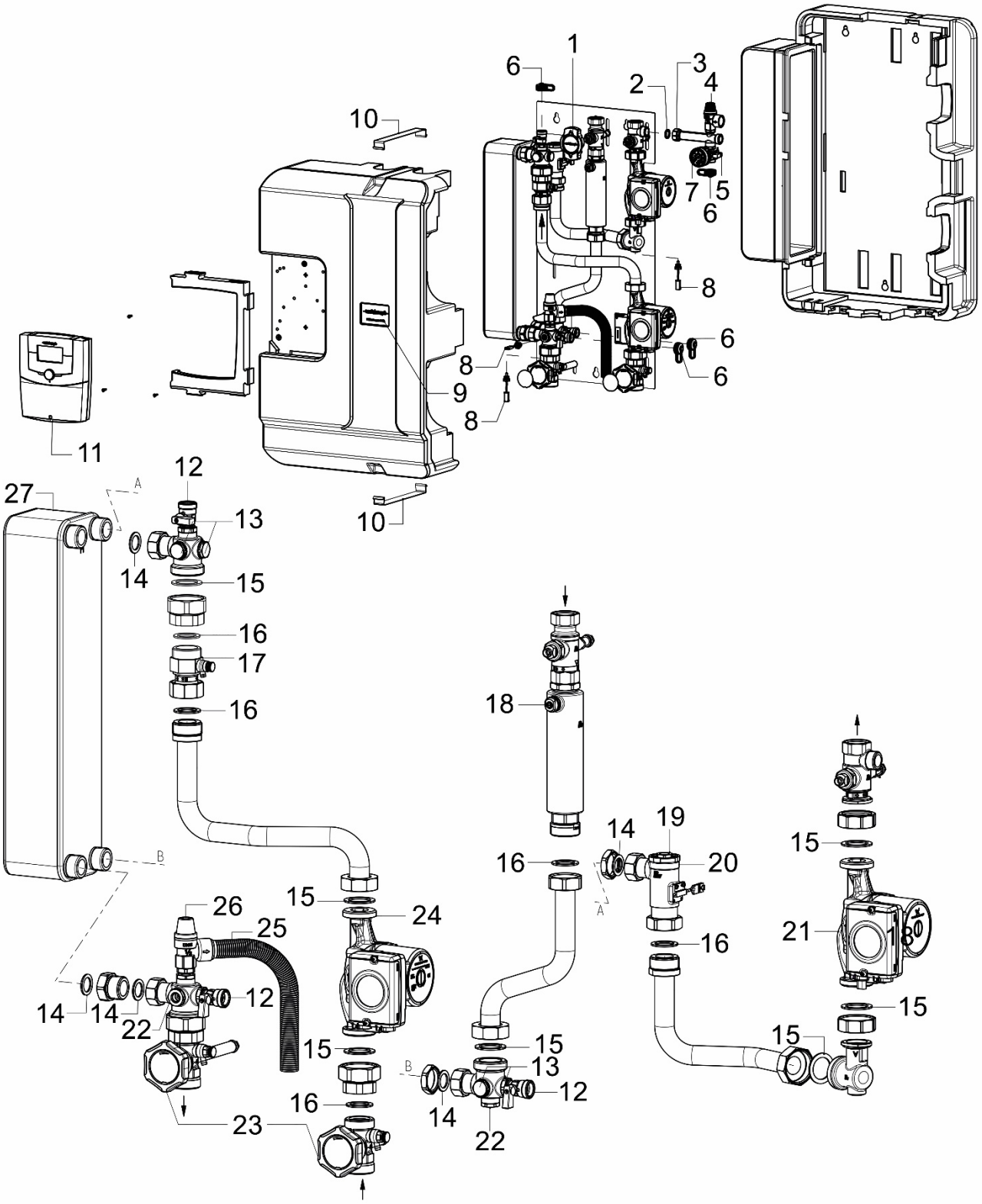
11.3 Spare parts Solar station WHI sol-heat 40 #3 (40900019392)



11 Spare parts

Position number	Spare part	-w- Part number
1	Thermo handle -weishaupt-	48002003132
2	Gasket Ø17 X Ø24 X 2 (¾")	40900021107
3	Safety bar DN 20 WHPSol 20-EA	48002003407
4	Safety valve 6 bar ½" solar	48002002637
5	Fill and drain valve ½" for pressure gauge	48002003417
6	Cap for inlet and outlet valve	48002002677
7	Pressure gauge 0-6 bar, d=50 mm / G½"	48002003467
8	Temperature sensor NTC 5K G¼" male thread	40900015027
9	Name plate WHI sol-heat 40 #3	40900019737
10	Retaining clip insulation	40900015247
11	Solar controller WRSol 2.1	660327
12	Inlet and outlet valve G½" with hex. nut	48002002667
13	Cover screw G½" male thread	40900015257
14	Gasket Ø21 X Ø30 X 2 (1")	40900021117
15	Gasket Ø32 X Ø44 X 2 (1½")	40900021147
16	Vent valve ⅜" male thread with o-ring	48002002537
17	Gasket Ø27 X Ø38 X 2 (1¼")	40900021137
18	Vent plug G½" male thread	40900015277
19	FlowRotor DN 25 90 degrees	40900015572
20	Circulation pump Grundfos Solar PML 25-145	40900019332
21	Reducer G½" male x G¼" female thread	40900015267
22	Circulation pump UPM3 Solar 25-75 180 9 h	40900019792
23	Drain hose G¾" x 1000 with o-ring	51150202422
24	Plate heat exchanger Danfoss XB37H60-Cu	40900031647
Not shown in drawing	Connection cable for Hallsensor 2500 mm	48002003127
	Connecting cable mini superseal 2500 mm long	48002003177
	Connecting cable PWM 2 x 0.35 2500 mm br/bl	48002002617
	Pump cable superseal 3 x 0.75 2500 mm long	48002003187
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Plug cable for temperature sensor 2500 mm	40900015037
	Hallsensor with LED connection cable	48002002867
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	EPP insulating shell WHI sol-heat	40900019482
	Hose connector with nut ¾"	40900015867

11.4 Spare parts Solar station WHI sol-aqua 40 #2 (40900019422)



11 Spare parts

Position number	Spare part	-w- Part number
1	Thermo handle -weishaupt-	48002003132
2	Gasket Ø17 X Ø24 X 2 (¾")	40900021107
3	Safety bar DN 20 WHPSol 20-EA	48002003407
4	Safety valve 6 bar ½" solar	48002002637
5	Fill and drain valve ½" for pressure gauge	48002003417
6	Cap for inlet and outlet valve	48002002677
7	Pressure gauge 0-6 bar, d=50 mm / G¼"	48002003467
8	Temperature sensor NTC 5K G¼" male thread	40900015027
9	Name plate WHI sol-aqua 40 #2	40900019937
10	Retaining clip insulation	40900015247
11	Solar controller WRSol 2.1	660327
12	Inlet and outlet valve G½" with hex. nut	48002002667
13	Cover screw G½" male thread	40900015257
14	Gasket Ø21 X Ø30 X 2 (1")	40900021117
15	Gasket Ø32 X Ø44 X 2 (1½")	40900021147
16	Gasket Ø27 X Ø38 X 2 (1¼")	40900021137
17	Non-return valve DN 25	40900015327
18	Vent valve ⅜" male thread with o-ring	48002002537
19	Vent plug G½" male thread	40900015277
20	FlowRotor DN 32 90 degrees	40900015602
21	Circulation pump Grundfos Solar PML 25-145	40900019332
22	Reducer G½" male x G¼" female thread	40900015267
23	Piston valve DN 20 G1¼" male thread with drainage	40900015102
24	Circulation pump UPML 25-105 N 180 PWM	40900019302
25	Drain hose G¾" x 1000 with o-ring	51150202422
26	Pressure relief valve ½", 10 bar	40900015057
27	Plate heat exchanger Danfoss XB37H60-Cu	40900031647
Not shown in drawing	Connection cable for Hallsensor 2500 mm	48002003127
	Connecting cable PWM 2 x 0.35 2500 mm br/bl	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Plug cable for temperature sensor 2500 mm	40900015037
	Drain valve with o-ring G¼" male thread	40900015097
	Closing plug G¼" male thread	40900015107
	Hallsensor with LED connection cable	48002002867
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	EPP insulating shell WHI sol-heat	40900019482
	Hose connector with nut ¾"	40900015867

12 Commissioning report

For several stations: For commissioning, use the GroSol overall commissioning log.

System operator

Location of installation

Collectors

(number / type)

Collector surface m²

System height m (Height difference between the station and the collector field)

Pipeline ⌀ = mm l = 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

Flow rate l/m

Pump (type)

System pressure mbar

Expansion tank (type)

Initial pressure mbar

Safety valve ☐ Checked

Check valves ☐ Checked

Serial numbers	
Station	
Temperature sensor	
Controller	
Software version	

Installation company

12 Commissioning report

12 Commissioning report

—weishaupt—

Max Weishaupt SE · 88475 Schwendi

Weishaupt in Ihrer Nähe? Adressen, Telefonnummern usw. finden sie unter www.weishaupt.de

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