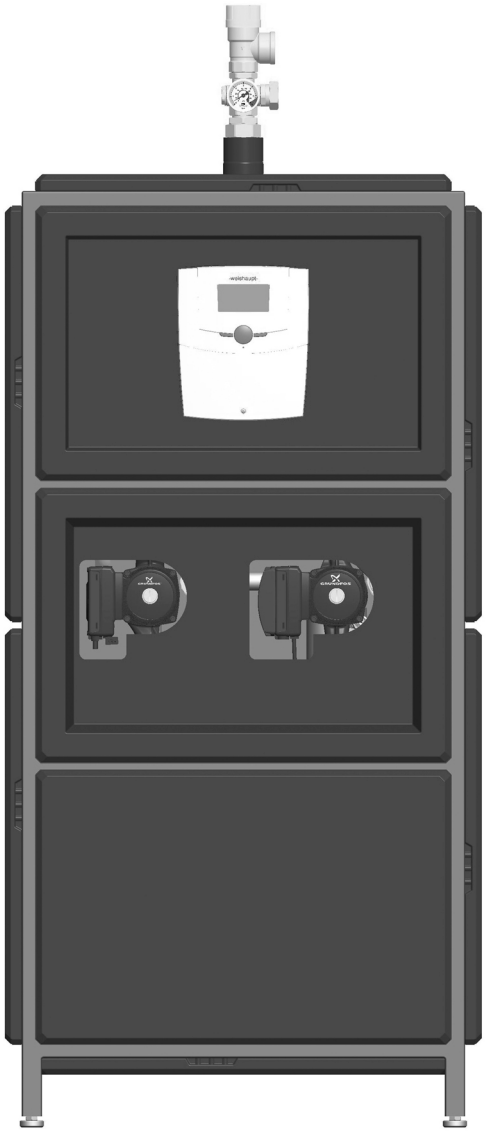
–weishaupt–

manual

Mounting and operating instructions



Separating station WHI sol/heat 60 #2
Separating station WHI sol/aqua 60 #2

83290502 · 1/2020-02

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 can lead to environmental damage, severe physical injuries or death.
 CAUTION	Danger of low risk. Non-observance may result in property damage or slight to moderate injuries.
NOTICE	Important information.

1.1.2 Target group

These installation and operation instructions are 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 authorised 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 separating station between the solar circuit and the heating circuit (in the case of WHI sol/heat) or the domestic water circuit (in the case of WHI sol/aqua), 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!

Use only original accessories in connection with the separating station.

Using the station contrary to its designated use will invalidate all liability claims.

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

2.2 Safety instructions

The following must be observed during installation and commissioning:

- Relevant local and national regulations
- Accident prevention regulations of the employers' liability insurance association
- Instructions and safety instructions mentioned in these instructions


WARNING

Danger of scalding due to escaping vapour!

With safety valves there is a risk of scalding due to the escape of vapour.
During installation, check the local conditions and check whether a discharge line must be connected to the safety group.

- ➢ Observe the instructions regarding the safety 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, filling and flushing have been completed. This avoids an unintentional start of the motors.
- ➢ 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 and fittings and the pump can become heated up to more than 100 °C during operation.

- ➢ The shell must remain closed during operation.


CAUTION

Personal injuries and material damage due to excess pressure!

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

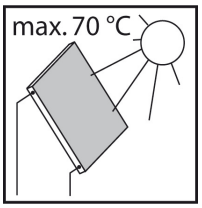
- ➢ The ball valves may only be closed by skilled personnel when service is required, after the system has been switched off. When the system is recommissioned, all locks must be opened again.

NOTICE

Material damage due to mineral oils!

Mineral oil products permanently damage the EDPM sealing elements, resulting in a loss of their sealing characteristics.
We cannot be held liable for damage caused by seals thus damaged, nor will we offer a replacement under warranty.

- ➢ It is imperative to prevent the EPDM 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.



In sunlight the collectors will heat up considerably.
The solar fluid in the solar circuit may heat up to more than 100 °C.

Flush and fill the solar circuit only when the collector temperatures are below 70 °C.

NOTICE

Material damage due to high temperatures!

Since the solar fluid near the collector can be very hot, the group of valves and fittings must be installed at a sufficient clearance from the collector field.
It may be necessary to install an upstream 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

Dispose of the materials used properly and in an environmentally compatible manner.
In doing so, observe local regulations.

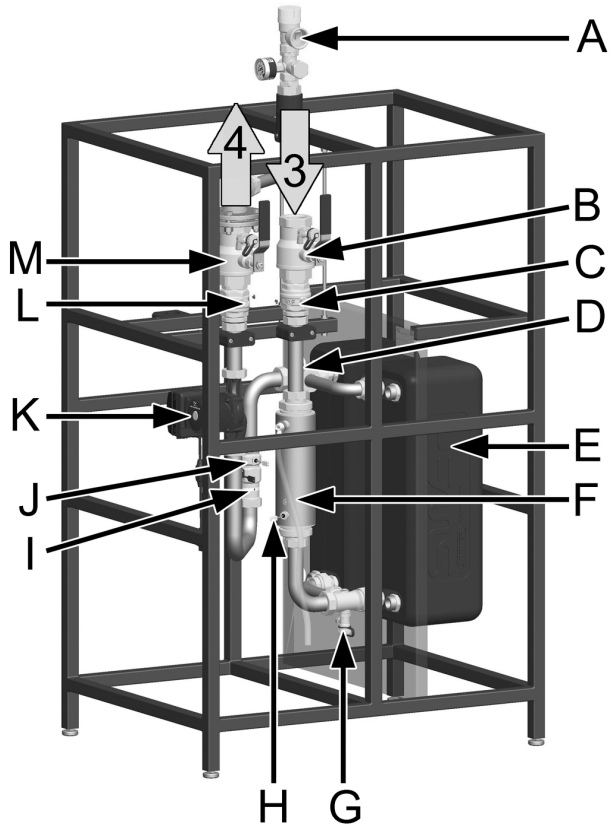
3 Product description

The station is a preassembled valves and fittings group checked for leakage and used to transfer heat from the primary circuit or solar circuit to the secondary circuit or storage tank/domestic 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 (flow and return) of the WHI sol/heat modules
- Piston valves in the domestic water circuit (flow and return) of the WHI sol/aqua modules
- Check valves in the flow and return of the primary circuit and of the storage tank circuit or in the flow of the domestic water circuit to avoid involuntary gravity circulation
- Safety valves for avoiding inadmissible excess pressure
- Pressure gauge to display the installation pressure in the solar circuit
- Vent valves for easy venting of the solar circuit
- Flushing and filling valves and fittings 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 ordered separately. A connection for it is provided below the pressure gauge.

WHI sol/heat 60 #2 and WHI sol/aqua 60 #2



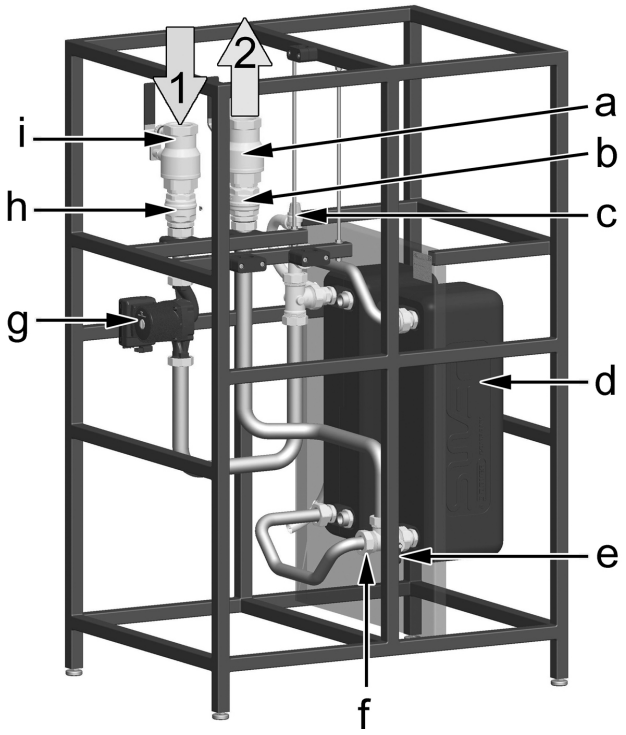
Connections of the primary circuit

3	Flow from the collector
4	Return to the collector

Equipment of the primary circuit

A	Safety group with safety valve 6 bars, pressure gauge and expansion tank connection
B	Flow ball valve with fill and drain valve
C	Check valve
D	Vent plug
E	Heat exchanger
F	Airstop with manual vent valve
G	Drain valve
H + J	Temperature sensor NTC 5K
I	FlowRotor with Hall sensor
K	Primary pump
L	Check valve
M	Return ball valve with fill and drain valve

WHI sol/heat 60 #2



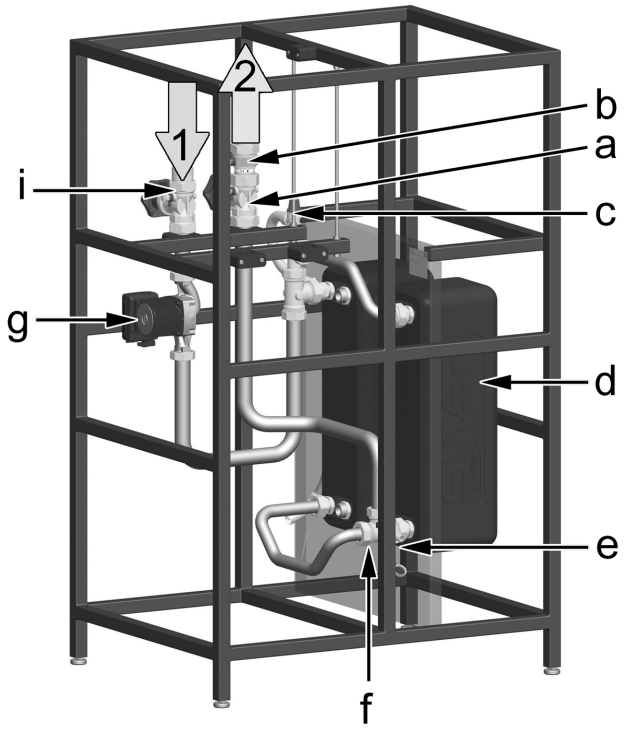
Connections of the secondary circuit

1	Return from storage tank (cold)
2	Flow to storage tank (hot)

Equipment of the secondary circuit

a	Flow ball valve with fill and drain valve
b	Check valve
c	Safety valve 6 bars, (Only for securing the station. Does not replace the safety valve that must be installed on site.)
d	Heat exchanger
e	Temperature sensor NTC 5K
f	Drain valve
g	Secondary pump
h	Check valve
i	Return ball valve with fill and drain valve

WHI sol/aqua 60 #2



Connections of the secondary circuit

1	Return from storage tank (cold)
2	Flow to storage tank (hot)

Equipment of the secondary circuit

a	Piston valve with drain valve
b	Non-return valve
c	Safety valve 10 bars, suitable for domestic water (Only for securing the station. Does not replace the safety valve that must be installed on site.)
d	Heat exchanger
e	Temperature sensor NTC 5K
f	Drain valve
g	Secondary pump
i	Piston valve with drain 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 domestic water mains.

In small-sized systems, the function of transferring the heat energy collected in the collectors to the heating water circuit or to the domestic water mains is in most cases performed 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-sized systems, this function is performed by separating stations.

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 closed-loop control target and the 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 closed-loop control to adapt the pumps optimally to the momentarily required flow rates 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.

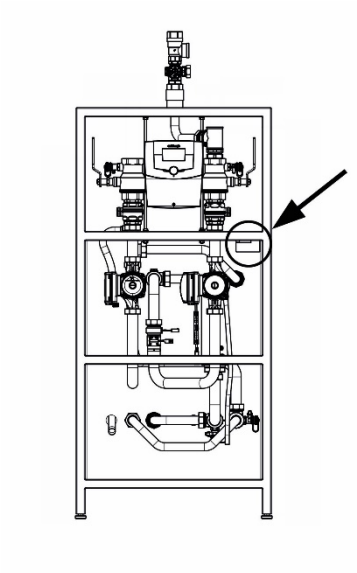
The closed-loop control is delivered preset, assembled and wired, thus ensuring easy adjustment to the real system.

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

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 domestic water mains.

3.2 Serial number



The serial number on the type plate clearly identifies each product. The serial number is necessary for the Weishaupt after-sales service. In case of a complaint, please send us the serial number of the product concerned and the completed commissioning report (see page 31). The serial number is placed in the upper right corner of the support sheet of the station.

Serial number: _____

3.3 Technical Data Separating Stations

Dimensions	WHI sol/heat60 #1 WHI sol/aqua 60 #1
Height (with insulation)	1649 mm + adjustment of the rack legs approx. 15 mm
Width (with insulation)	710 mm
Depth (with insulation)	920 mm
Centre distance, primary circuit	158 mm
Centre distance, secondary circuit	158 mm
Pipe connection prim. (solar circuit)	G 1½" female thread
Pipe connection sec. WHI sol/heat	G 1½" female thread
Pipe connection sec. WHI sol/aqua	1¾" male thread, flat sealing, with transition screw connection to 1½" male thread, flat sealing
Connection for expansion tank	G 1" male thread, flat sealing
Safety valve outlet	G 1¼" female thread
Operating data	
Max. admissible pressure	primary: 6 bars, secondary: WHI sol/heat: 6 bars, WHI sol/aqua: 10 bars
Max. operating temperature	120 °C
Max. stagnation temperature	140 °C
Max. propylene glycol content	50 %
Max. power Q_{max}	90 kW at $Flow_{prim.}$ 120 °C / $Return_{prim.}$ 100 °C
Flow rate at Q_{max}	primary: 3750 l/h, secondary: 4000 l/h
Operating temperature sensors	-25 °C to +120 °C
Equipment	
Safety valve WHI sol/heat	primary: 6 bars, secondary: 6 bars
Safety valve WHI sol/aqua	primary: 6 bars, secondary: 10 bars
Pressure gauge	0-6 bars
Heat exchanger	2 x 60 plates
Flow meter	FlowRotor, measuring range: 5-130 l/min, 55 pulses/litre
Sensors	3 x NTC 5 K (built-in)
Check valve	primary: 2 x 250 mm wc, can be opened secondary: WHI sol/heat: 2 x 250 mm wc, WHI sol/aqua: 1 x 150 mm wc

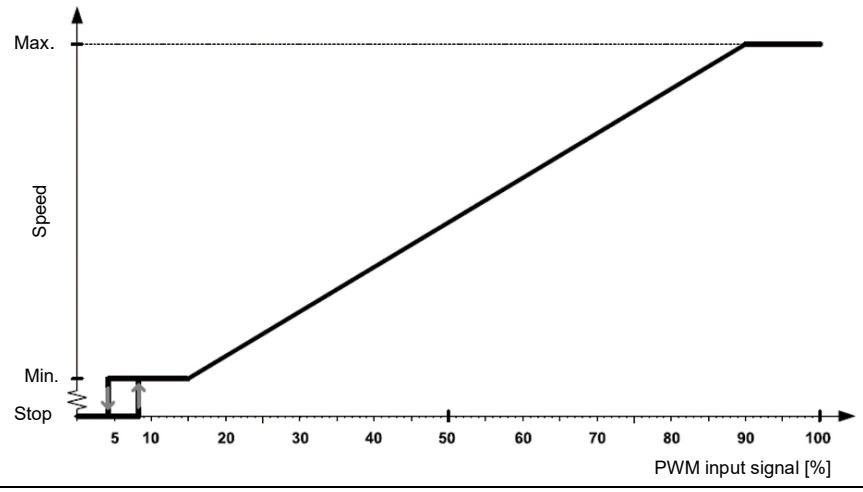
Material	WHI sol/heat 60 #2 WHI sol/aqua 60 #2
Valves and fittings	Brass
Seals	EPDM or AFM 34/2, free of asbestos
Check valve	WHI sol/heat: brass; WHI sol/aqua: plastic
Pipes	1.4404 (AISI 316 L)
Shell, station	EPP, λ = 0.039 W/(m K), fire class B2
Shell, heat exchanger	EPP, λ = 0.035 W/(m K), fire class B2
Heat exchanger	Plates + connecting pieces: 1.4401 (AISI 316) Solder: 99.99% pure copper
Admissible medium	Primary: propylene glycol (max. 50%) Secondary WHI sol/heat: heating water according to VDI 2035 / Ö-Norm H 5195-1 Secondary WHI sol/aqua: domestic water with a max. chloride content: < 80 ppm

3.4 Technical Data Pumps

	Grundfos UPM XL GEO 25-125 with solar PWM signal	Grundfos UPML GEO 25-105 with solar PWM signal	Grundfos UPML GEO 25-105 N with solar PWM signal
Length	180 mm		
Connections	1½" male thread		
Protection class	IPX2D	IPX20	IPX20
Max pressure	1.0 MPa (= 10 bars)		
Max. temperature	95 °C TF 95		
I (1/1)	0.06-1.4 A	0.04-1.1 A	0.04-1.1 A
P1	3-180 W	3-140 W	3-140 W
Use in:			
WHI sol/heat 60 #2	Prim	Sec	
WHI sol/aqua 60 #2	Prim		Sec
Prim = Primary side (collector) / Sec = Secondary side (heating / domestic water)			

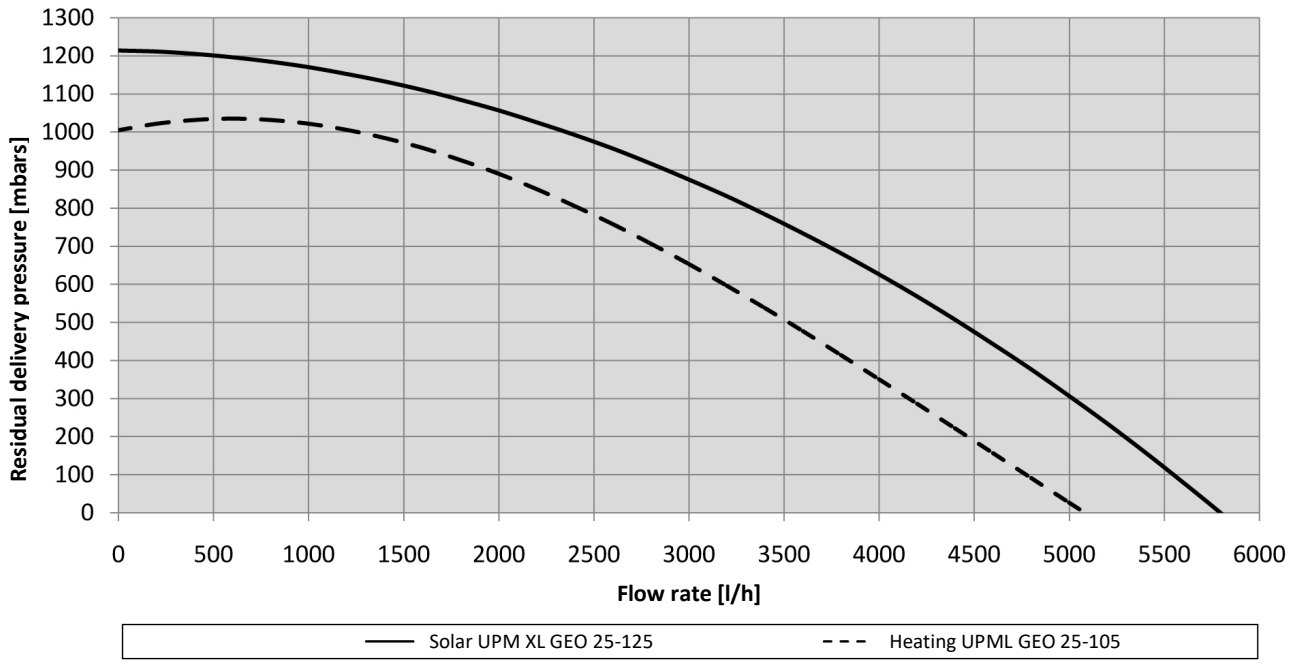
3.5 PWM input signal (solar profile)

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

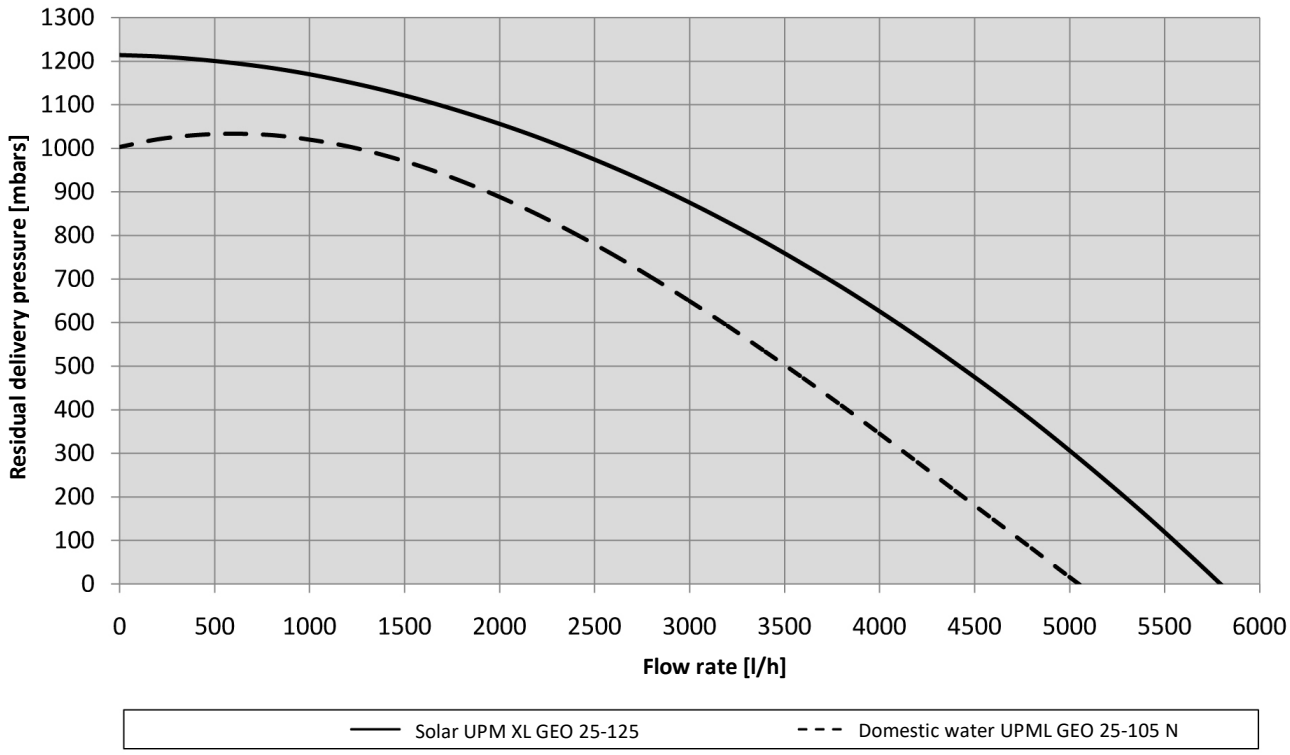


3.6 Hydraulilc performance data

WHI sol/heat 60 #2



WHI sol/aqua 60 #2



4 Installation

Due to their construction, the WHI sol/aqua modules reduce the precipitation of scale in the heat exchanger. For systems with a high total domestic water hardness and/or high temperatures, a water treatment is recommended, in order to prevent scale formation.

The choice of the heat exchanger depends on the requirements of the installation location. Depending on the chemical composition of the water on the installation location, an appropriate plate heat exchanger must be chosen.
Please observe the following table:

	Heat exchanger with copper soldering
Maximum chloride content in potable water	≤ 80 ppm
pH value	7.0 - 9.0
Zinc-galvanised piping	Unsuitable
Maximum pressure at 95 °C	17 bars
Plate material	1.4401 (AISI 316)

4.1 Assembly

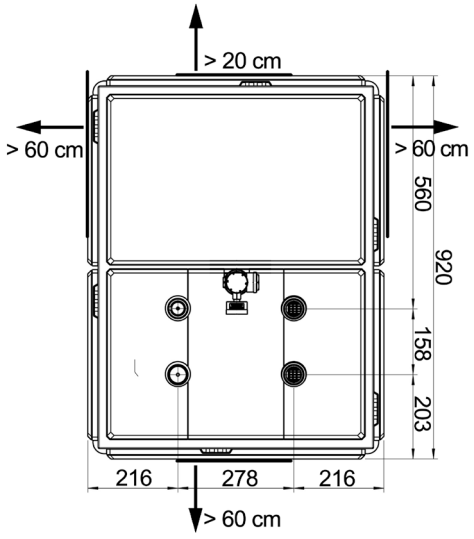
The installation site must be dry, structurally safe, frost-free and protected against ultraviolet radiation. Furthermore, access to the closed-loop control and safety equipment must be guaranteed at all times during operation!

NOTICE **Material damage due to high temperatures!**

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

NOTICE **Material damage!**

- The discharge lines of the pressure relief valves must be conducted into appropriate collecting containers.
  The corresponding norms must be respected.

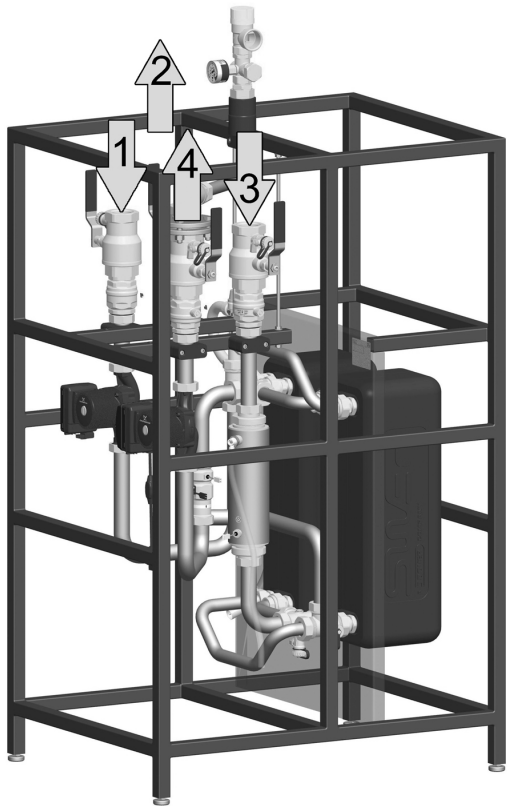


Top view

1. Determine the installation site of the transfer station near to the buffer tank. With long connecting lines, the transfer capacity is reduced due to higher pressure drops.
2. Remove the station from the packaging.
3. Take the station from the pallet and place it at the installation site.
4. Mount the enclosed rack legs to compensate for unevenness of the floor.
5. The station can be placed against the wall on two sides. If you want to take off the insulation, a clearance of approx. 20 cm must be left clear to the wall (see illustration).
6. For operating the hydraulics and for later maintenance, you require a clearance of at least 60 cm to the front panel (controller) and to one side (see illustration).

4.2 Connection

1. Pipe the transfer station with the system as shown in the illustration below.
   As-delivered, the ball valves and piston valves are closed, to prevent the station from becoming dirty.
   Before connecting the pipework, make sure that the connections are free of dirt.



1 **Secondary side: return from storage tank (cold)**

Connection WHI sol/heat: 1½" female thread

Connection WHI sol/aqua: 1½" male thread, flat sealing

2 **Secondary side: flow to storage tank (hot)**

Connection WHI sol/heat: 1½" female thread

Connection WHI sol/aqua: 1½" male thread, flat sealing

3 **Primary side: flow from collector**

Connection: 1½" female thread

4 **Primary side: return to collector**

Connection: 1½" female thread

2. The safety group is mounted in-factory in the station to prevent it from being damaged. To bring the safety group to the operating state, loosen the union nut at the connection T-piece of the solar return and mount the safety group such that the safety valve is vertical.
3. Connect the expansion tank below the pressure gauge.
   For service work on the expansion tank, we recommend assembling 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 retighten them, if necessary.

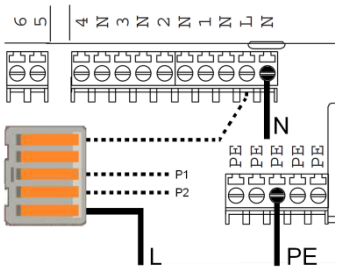
4.3 Controller connection

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, filling and flushing have been completed. This avoids an unintentional start of the motors.
- 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 illustration 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 by 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.

4.4 Electrical connection of the solar controller WRSol2.1

Terminal	Acronym	Description	Execution
L/N	230V	Mains connection 230V	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 flow sensor	prewired
21/25/⊥	V1	Volume pulse input solar circuit	prewired

5 Operation

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

5.1 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 60 #2: 3750 l/h

6 Commissioning

Observe the following safety instructions regarding the commissioning of the station:

WARNING

Risk of burns and scalding!

The valves and fittings may heat up to more than 100 °C. This is why the system may not be flushed or filled while the collectors are hot (intense sunlight). Please note that hot solar fluid will leak from the safety valve if the system pressure is too high! During venting the solar fluid may escape as vapour and result in scalding!

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

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. Therefore, only use the solar fluid used later on for flushing and filling the solar system.

- 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 sequence:

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 solar circuit (total).

This guarantees that no dirt particles are flushed into the heat exchanger and that any heat absorbed can be dissipated.

6.1 Preparation for flushing and filling

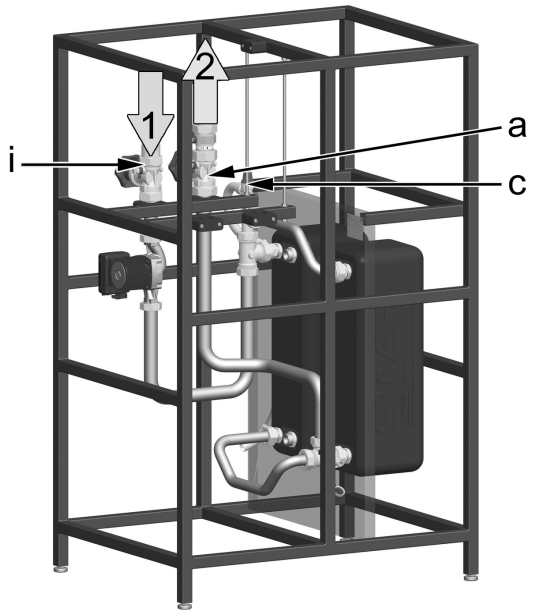
NOTICE

Note regarding the expansion tank

To prevent any dirt particles contained in the solar system 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 manufacturer's instructions.

6.2 Flushing and filling the storage tank circuit / domestic water circuit (secondary connections)

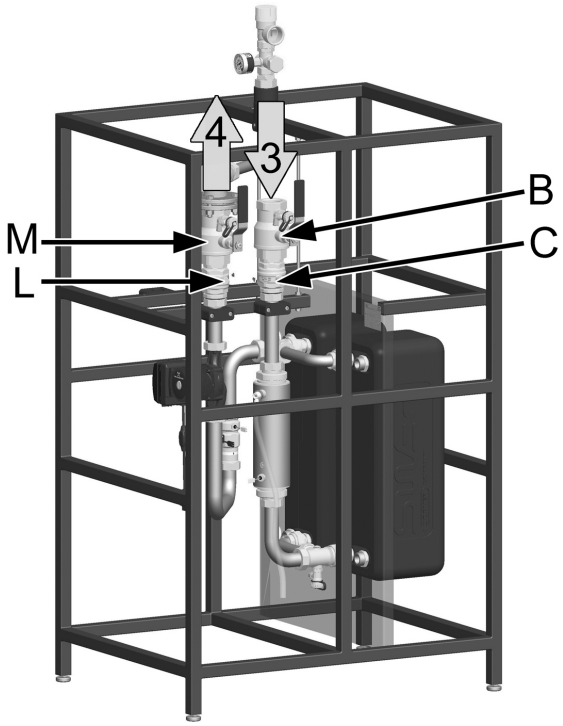
The storage tank and domestic water circuits are filled by means of the valves and fittings of the heating system. To prevent dirt particles from entering the heat exchanger, shut the ball valves or piston valves of the station and flush dirt particles/scale residues from the storage tank before commissioning. Make sure to use only the approved fluid mentioned in this manual.



Secondary side

1. Open the ball valves [a|i] of the WHI sol/heat module or the piston valves of the WHI sol/aqua module [a|i] and disable the check valves (180°, see next page).
2. Vent the storage tank circuit or domestic water circuit by actuating the safety valve [c].
3. Make sure that no water enters the electrical components.
4. Fill the storage tank circuit or domestic water circuit with heating water or domestic water using the corresponding filling valves and fittings of the system.
5. After filling the storage tank circuit or domestic water circuit is complete, set the required operating pressure.
6. If necessary, vent the station during commissioning on the safety valve [c], 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).

6.3 Flushing and filling the solar circuit (primary connections)



Check valve function

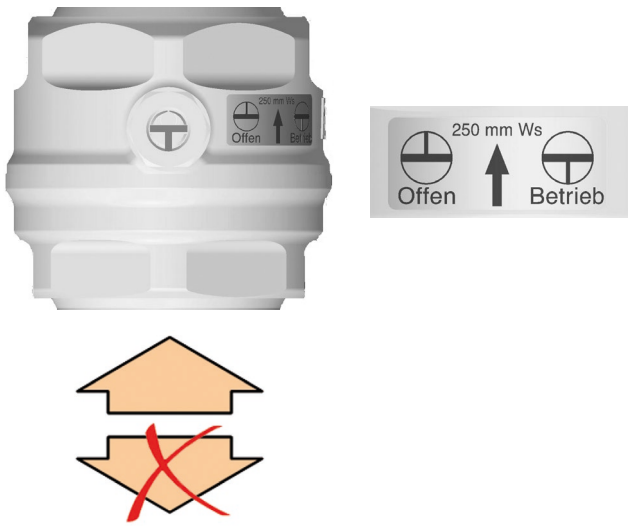
The ball valves (B) and (M) in the primary circuit are equipped with check valves (C) and (L) in order to prevent undesired gravity circulation.

The check valves must be open for venting and flushing the system.
Turn the opening bolts on the check valves to the **180°** position.
The check valve is not in operation.

All ball valves and valves must be **completely** open and the check valves must be closed again for operating the system (**0°** position).

Ball valve with mounted check valve

(Normal direction of flow in the picture: upstream)

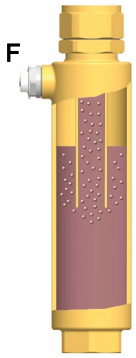


0° position Check valve in operation, **through-flow in flow direction only.**	**180° position** Check valve not in operation, **through-flow in both directions.**

6 Commissioning

Airstop

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



Pipe diameter [mm]		Flow rate at 0.3 m/s	
∅ outside	∅ inside	l/h	l/min
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 [F].

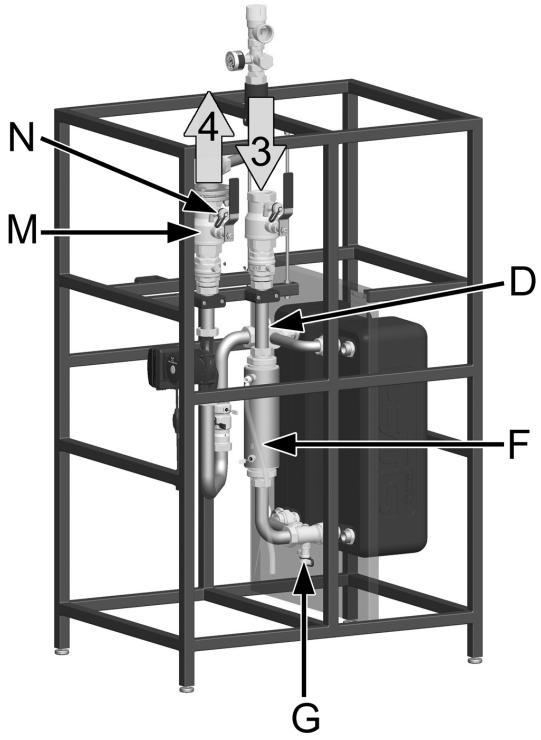
Danger of scalding due to escaping vapour!

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

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

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. This ensures optimum operation of the solar system. Check the system pressure after venting and increase it to the prescribed operating pressure, if necessary.



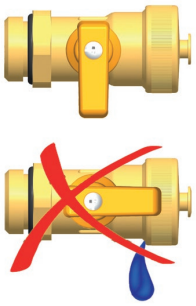
1. Switch off the solar pump (see controller manual).
2. Disconnect the expansion tank from the solar system.
   This prevents dirt particles still present in the pipes from being flushed into the expansion tank. Observe the separate instructions for the expansion tank!
3. Connect the flush and fill station:
   - Pressure hose to the fill and drain valve [G]
   - Flush hose to the fill and drain valve [N] at the return ball valve.
4. Open the fill and drain valves [G|N] and put the flush and fill station into operation.
5. Vent the station at the vent valve [D] and at the airstop [F].
6. Close the return ball valve [M], as soon as fluid escapes from the flush hose.
7. 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.
8. To vent the pump section, open and close the return ball valve [M] during flushing.
9. Keep flushing the solar circuit until the solar fluid escapes without forming bubbles (see page 20).
10. Flush the collector fields individually, if possible!
11. Close the fill and drain valve [N] with the filling pump running and increase the system pressure to approx. 5 bars.
    The system pressure can be read on the pressure gauge.
12. Vent the circulation pump via the vent screw.
13. Close the fill and drain valve [G] and switch off the pump of the flush and fill station.
14. Check at the pressure gauge if the system pressure is being lowered and eliminate any leaks, if present.

15. Reduce the pressure on the fill and drain valve [N] to the system-specific pressure, if necessary.
16. 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 (for the required operating pressure, see instructions of the expansion tank).
17. Close the fill and drain valves [G|N].
18. Open the return ball valve [M] and put the check valve into operating position (**0°** position, see page 19).

Risk to life and limb due to electric shock!

➢ Check whether the sensors and pumps have been connected to the controller and the controller housing is closed.
Do not apply voltage to the controller before that.

19. Connect the controller to the mains and set the solar circuit pump in manual mode to ON as described in the controller manual.
20. Allow the solar circuit pump to run at the maximum rotation speed level for at least 15 minutes.
In the meantime, vent the solar system several times at the vent plug [F] of the airstop until the solar fluid escapes without forming bubbles (see page 20).
21. If necessary, increase the system pressure to the operating pressure.
22. 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.



23. Attach the insulating elements.
24. Set the automatic mode on the controller (see controller manual).

This completes the commissioning of the solar system.
Please fill in completely the commissioning log on page 31.

7 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.

In order to be able to perform replacement or service work on the station, the system must be depressurised.


DANGER

Risk of burns and scalding!

The valves and fittings and the solar fluid can have temperatures of more than 100 °C. The solar fluid may escape as vapour and may result in scalding.

- ➢ Perform maintenance work only when the collector temperatures are below 50 °C.
- ➢ Wait until the solar fluid has cooled down to at least 50 °C.

1. Close the station locks and drain the solar fluid. Make sure that the solar fluid is collected in a heat-resistant container.
2. Switch off the controller and secure it against being switched on again.
3. Replace the defective part with a new part.
4. Fill the system as described under 6 **Commissioning** (see page 19).

7.1 Draining the solar system

1. Switch off the controller and secure it against being switched on again.
2. Open the check valves [C|L] in the flow and return ball valves by rotating them to the **180°** position (see page 19).
3. Connect a heat-resistant hose to the fill and drain valve [G]. 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.

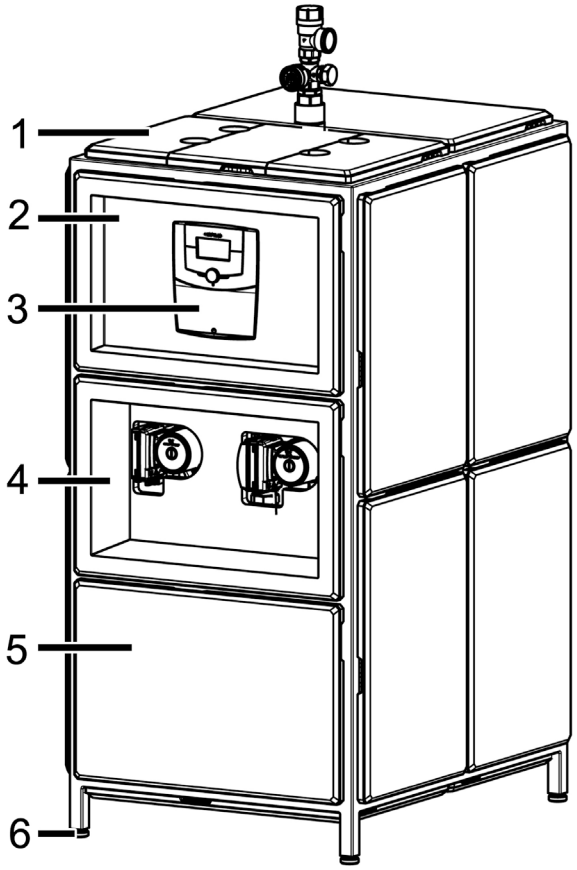
4. Open the fill and drain valve [G] of the transfer station.
5. To accelerate draining of the solar circuit, you can open the vent valve, if present, at the highest point of the solar system.
6. Dispose of the solar fluid observing the local regulations.

8 Spare parts

8.1 Spare parts list Closed-loop control and insulation:

WHI sol/heat 60 #2 (40900019122)

WHI sol/aqua 60 #2 (40900019132)

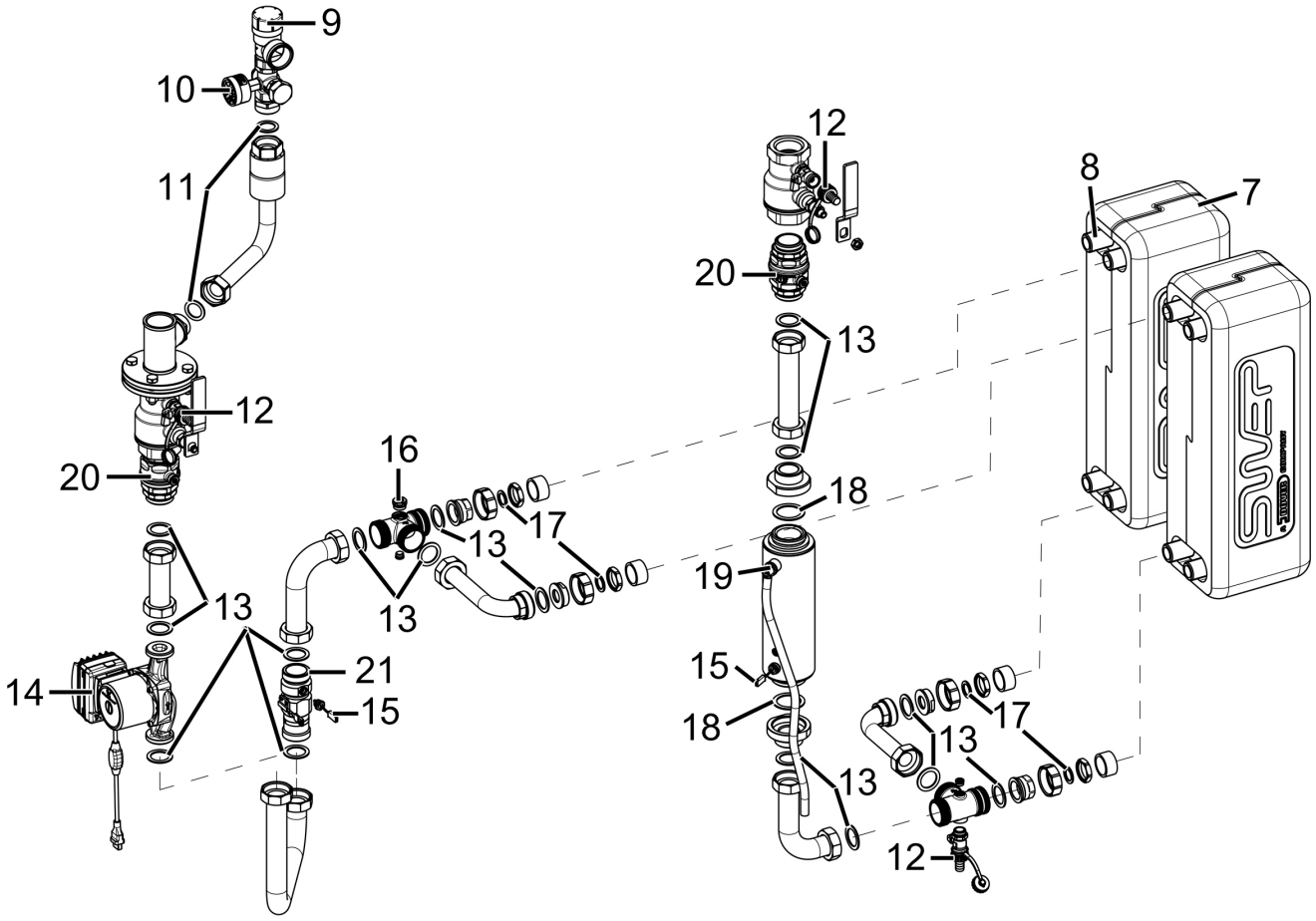


Position number	Spare part	-w- Part number
1	Station insulation EPP line connections	40900015747
2	Station insulation EPP for cut-out - controller	40900015737
3	Solar controller WRSol 2.1	660327
4	Station insulation EPP for cut-out - pumps	40900015717
5	Station insulation module plate EPP	40900015727
6	Unit foot M10	48210102177
Not shown on drawing	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262

8.2 Spare parts list Hydraulics primary circuit:

WHI sol/heat 60 #2 (40900019122)

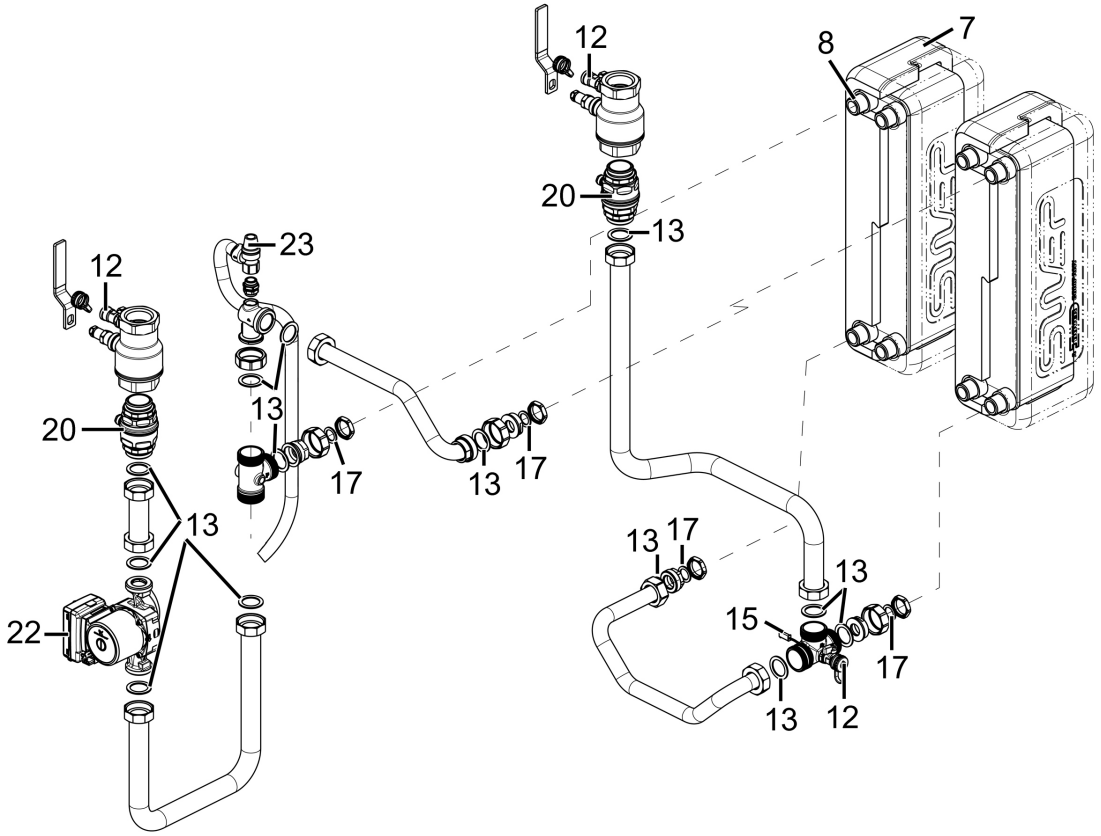
WHI sol/aqua 60 #2 (40900019132)



8 Spare parts

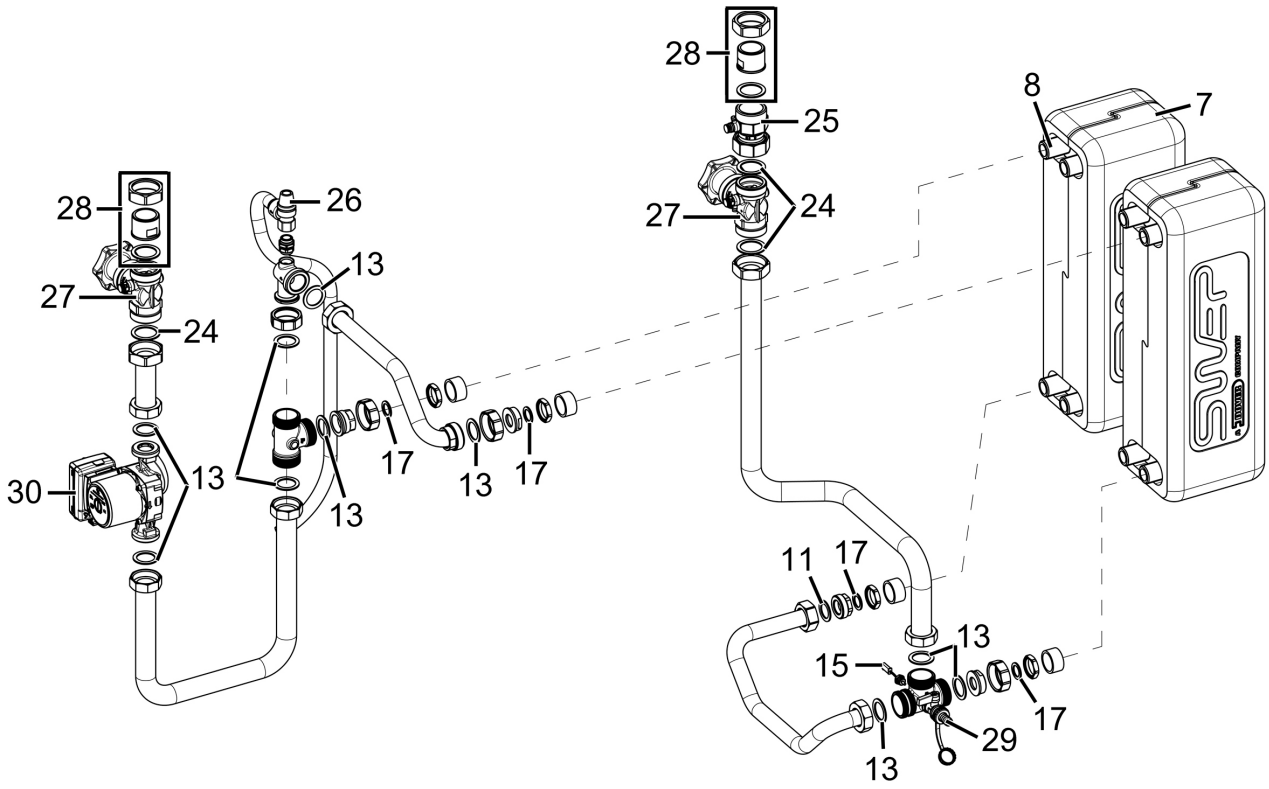
Position number	Spare part	-w- Part number
7	Heat insulation PWT Swep IC25T/60	40900015757
8	Plate heat exchanger Swep IC25T/60	40900015207
9	Safety valve 6 bars 1" solar	48002002877
10	Gauge 6 bar d = 50 mm G¼"	48002002647
11	Seal 27 x 38 x 2 (1¼") AFM-34/2	40900021137
12	Inlet and outlet valve G½" with hex. nut	48002002667
13	Seal 32 x 44 x 2 (1½") AFM-34/2	40900021147
14	Circulation pump UPMXL GEO 25-125 180 PWM	40900019222
15	Temperature sensor NTC 5K G¼A	40900015027
16	Bleed plug G½A	40900015277
17	Seal 21 x 30 x 2 (1") AFM-34/2	40900021117
18	Seal 42 x 55 x 2 (2") AFM-34/2	40900021167
19	Vent valve ⅜" male thread with o-ring with side outlet d = 12,3	48002002887
20	Gravity brake DN 40 2x 1½" male thread, 250 mm wc	40900019297
21	Flow Rotor DN 40 actual value generator 5-100 l/min	48002003142
Not shown on drawing	Plug cable temperature sensor 2500 mm	40900015037
	Hallsensor with LED connection cable	48002002867
	Connection cable for Hallsensor 2500 mm	48002003127
	Connection cable PWM 2500 mm long	48002002617
	Pumpcable 3 x 0.75 2500 mm long	48002002607
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	Hose 10 x 2 550 mm long transparent	48002002897
	O-ring 45 x 3.5 for threaded washer	40900015947
	Screw M12 x 45 mm 8.8 ISO 4042-A2F	40900015507
	Hexagonal screw M12 x 10.8 ISO 4042-A2F	40900015897
	Spring washer A12 DIN 7980-12	40900015937
	Cap for inlet and outlet valve	48002002677
	Hose clamp with nut ¾"	40900015867

8.3 Spare parts list Hydraulics secondary circuit: WHI sol/heat 60 #2 (40900019122)



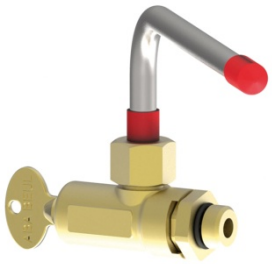
Position number	Spare part	-w- Part number
7	Heat insulation PWT Swep IC25T/60	40900015757
8	Plate heat exchanger Swep IC25T/60	40900015207
12	Inlet and outlet valve G½" with hex. nut	48002002667
13	Seal 32 x 44 x 2 (1½") AFM-34/2	40900021147
15	Temperature sensor NTC5K G¼A	40900015027
17	Seal 21 x 30 x 2 (1") AFM-34/2	40900021117
20	Gravity brake DN 40 2x 1½" male thread, 250 mm wc	40900019297
22	Circulation pump UPML 25-105	40900019232
23	Safety valve 6 bars ½" solar	48002002637
Not shown on drawing	Plug cable temperature sensor 2500 mm	40900015037
	Connection cable PWM 2500 mm long	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Cap for inlet and outlet valve	48002002677
	Outlet hose G¾ x 1000 with o-ring	51150202422
	Hose clamp with nut ¾"	40900015867

8.4 Spare parts list Hydraulics secondary circuit: WHI sol/aqua 60 #2 (40900019132)



Position number	Spare part	-w- Part number
7	Heat insulation PWT Swep IC25T/60	40900015757
8	Plate heat exchanger Swep IC25T/60	40900015207
11	Seal 27 x 38 x 2 (1¼") AFM-34/2	40900021137
13	Seal 32 x 44 x 2 (1½") AFM-34/2	40900021147
15	Temperature sensor NTC 5K G¼A	40900015027
17	Seal 21 x 30 x 2 (1") AFM-34/2	40900021117
24	Seal 38 x 50 x 2 (1¾") AFM-34/2	40900021157
25	Non return valve DN 40	40900015517
26	Safety valve ½" 10 bars	40900015057
27	Piston valve DN 40 G1¾A with drain	40900015112
28	Adapter set	40900015762
29	Inlet and outlet valve G½"	40900015857
30	Circulation pump UPML 25-105 N	40900019302
Not shown on drawing	Plug cable temperature sensor 2500 mm	40900015037
	Connection cable PWM 2500 mm long	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Cap for inlet and outlet valve	48002002677
	Outlet hose G¾ x 1000 with o-ring	51150202422
	Hose clamp with nut ¾"	40900015867

9 Accessories



Withdrawal valve (-w-item no. 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

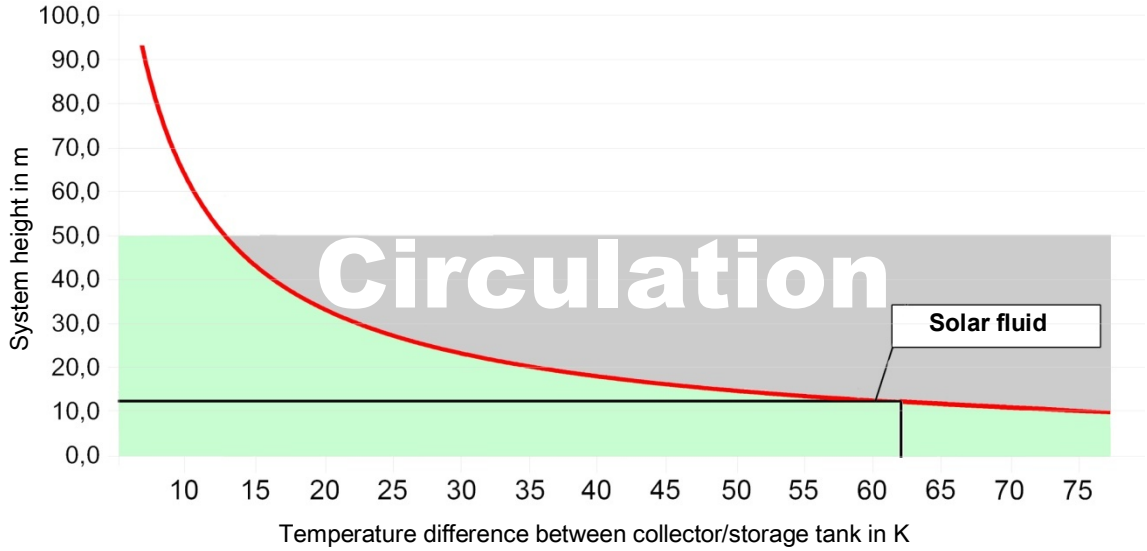
The check valves in this station prevent undesirable gravity circulation within their range of use. The functioning of the check valves depends:

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

On the diagram shown below, you can see whether the integrated check valves of the station are sufficient for your system. If the check valves are not sufficient, further structural measures must be taken to prevent gravity circulation. You can install, for example, syphons ("heat traps"), 2-way valves (zone valves) or additional check valves.

Example:

- The station is equipped with two check valves (2 x 250 mm wc = 500 mm wc).
- You use a mixture of water and 40% strength propylene glyclol as solar fluid.
- The system height between collector and storage tank is 12 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.

10 Function of the check valves

You want 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 densisty 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 ρ_1 = 1042 kg/m³

Storage tank temperature: 67 °C → Solar fluid density ρ_2 = 1002.5 kg/m³

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

g = 9.81 m/s²

System height h = 12 m

Δp = 4650 Pa = 475 mm wc

At a system height of 12 m and a temperature difference between collector and storage tank of 62 K, the two check valves in the station (2 x 250 mm wc) are sufficient.

11 Commissioning log

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

System operator

System site

Collectors
(number / type)

Collector surface area m²

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

Pipeline ⌀ = mm l = m

Venting (collector field) ☐ Not available ☐ Vented
☐ Manual vent valve ☐ Automatic vent valve

Airstop (station) ☐ Vented

Solar fluid (type) % of 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

–weishaupt–

Change of legal form from 22.11.2024: Max Weishaupt SE
Max Weishaupt GmbH · 88475 Schwendi

Weishaupt close by? Addresses, telephone numbers etc. can be found at www.weishaupt.de

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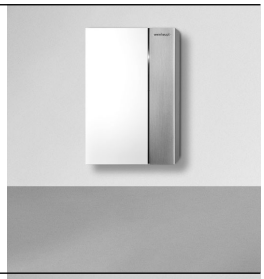
Weishaupt customers can be assured that specialist knowledge and tools are available whenever they are needed. Our service engineers are fully qualified and have extensive product knowledge, be it for burners, heat pumps, condensing boilers or solar collectors.

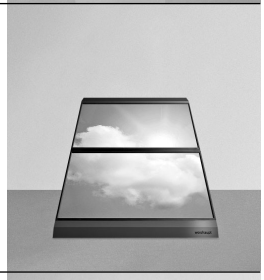


Wall-hung condensing boilers for gas **up to 240 kW**

The wall-hung condensing boilers WTC-GW have been developed to meet the highest demands in ease of operation and efficiency. Modulating operation means these units operate quietly and economically.

Floor-standing condensing boilers for oil and gas **up to 1,200 kW**

The floor-standing condensing boilers WTC-GB (up to 300 kW) and WTC-OB (up to 45 kW) are efficient, low in pollutants and versatile in use.
Even the largest capacities can be covered by cascading up to four gas condensing boilers.



Solar systems

The stylish flat-plate collectors are the ideal complement for any Weishaupt heating system. They are suitable for solar water heating and for combined heating support. With versions for on-roof, in-roof and flat roof installations, solar energy can be utilised on almost any roof.

Water heaters/Energy storage

The diverse program of potable water and energy storage for various heat sources includes storage volumes of 70 to 3,000 litres. In order to minimize storage losses, potable water cylinders from 140 to 500 litres are available with highly efficient insulation using vacuum insulation panels.

Heat pumps **up to 180 kW**

The heat pump range offers solutions for the utilisation of heat from the air, the soil or ground water.
Some systems are also suitable for cooling buildings.

Geothermal probe drilling

With its daughter company, BauGrund Süd, Weishaupt also offers geothermal probe and well drilling. With the experience of more than 10,000 systems and more than 2 million meters of drilling, BauGrund Süd offers a comprehensive service program.