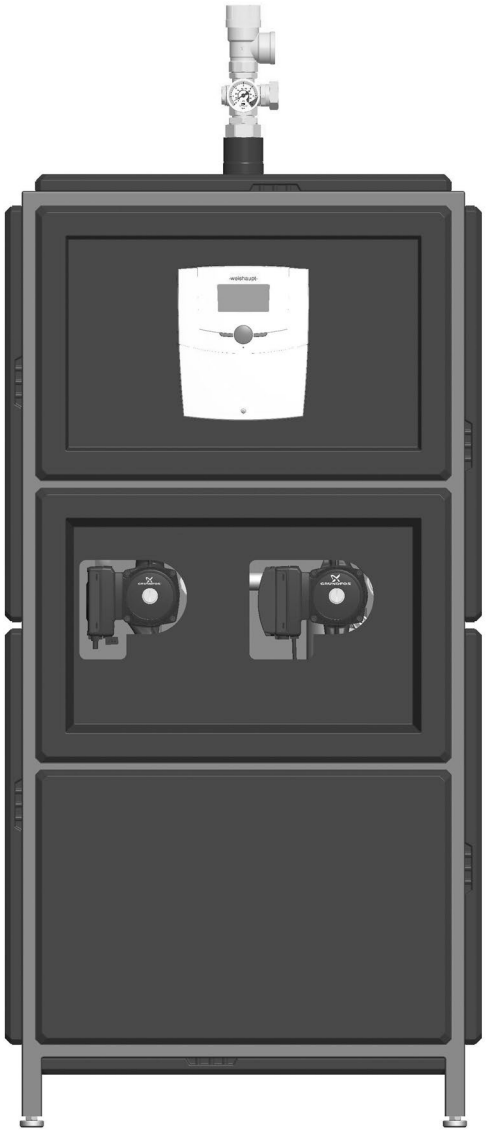
–weishaupt–

manual

Installation and operation instructions



Solar station WHI sol-heat 60 #3
Solar station WHI sol-aqua 60 #3

83290502 · 1/2025-08

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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 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 solar station between the solar circuit and the heating circuit (in the case of WHI sol-heat) or the drinking 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!

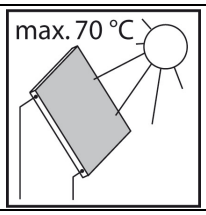
- The ball valves may only be closed by skilled personnel when service is required, after the system has been switched off.
  When the system is recommissioned, all locks must be opened again.
- When closing the ball valves in case of servicing, also put the pumps out of operation and close the ball 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 silicone- or polyalkylene-based lubricants free of mineral oil, such as Unisilikon L250L and Syntheso Glep 1 from the company Klüber 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.

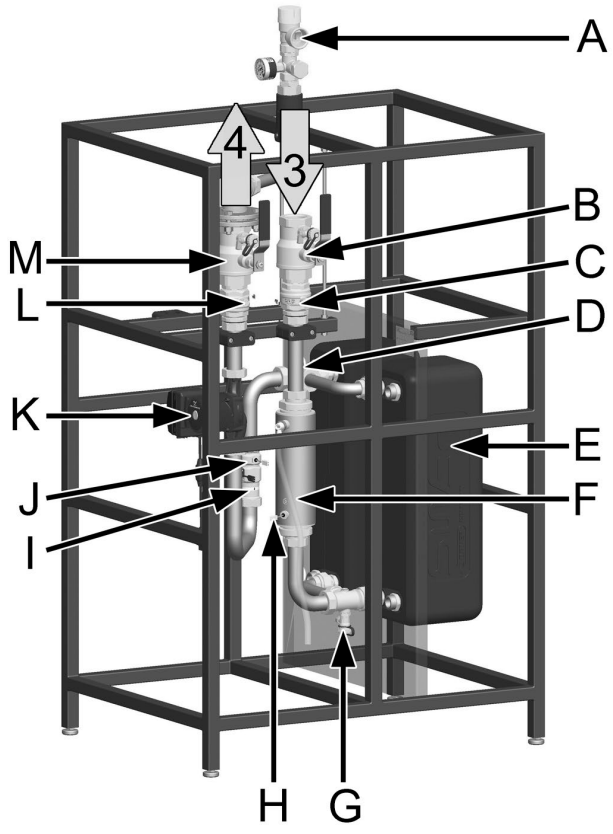
3 Product description

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 / drinking 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 drinking water circuit (flow and return) of the WHI sol-aqua modules
- Check valves to prevent unwanted gravity circulation in the flow and return lines of the primary circuit and the storage tank circuit or in the flow line of the drinking water circuit.
- Pressure relief 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 below the pressure gauge.

WHI sol-heat 60 #3 and WHI sol-aqua 60 #3



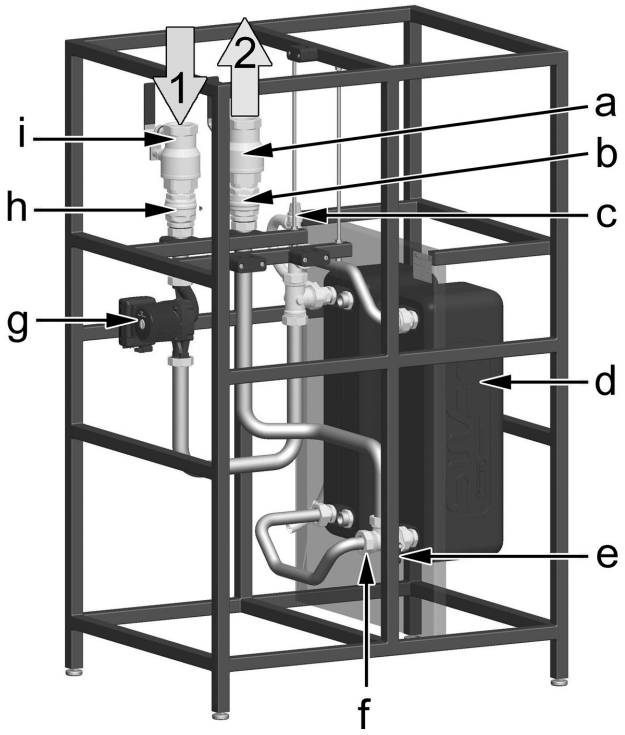
Connections primary circuit

3	Flow from the collector
4	Return to the collector

Equipment primary circuit

A	Safety group with pressure relief valve 6 bar, 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 #3



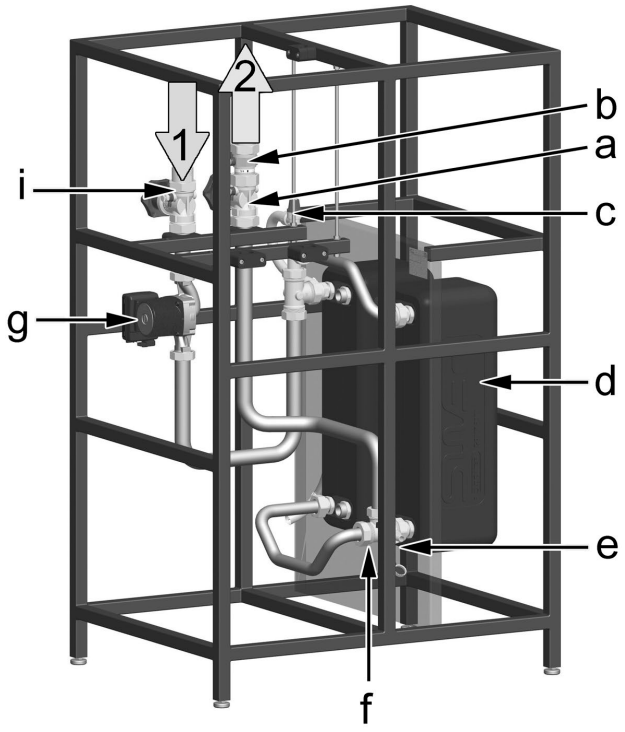
Connections secondary circuit

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

Equipment secondary circuit

a	Flow ball valve with fill and drain valve
b	Check valve
c	Pressure relief valve 6 bar (Only for protection of the station. Does not replace the pressure relief valve that must be installed on-site.)
d	Heat exchanger
e	Drain valve
f	Temperature sensor NTC 5K
g	Secondary pump
h	Check valve
i	Return ball valve with fill and drain valve

WHI sol-aqua 60 #3



Connections secondary circuit

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

Equipment secondary circuit

a	Piston valve with drain valve
b	Non-return valve
c	Pressure relief valve 10 bar, suitable for drinking water (Only for protection of the station. Does not replace the pressure relief valve that must be installed on-site.)
d	Heat exchanger
e	Drain valve
f	Temperature sensor NTC 5K
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 drinking water network.

In small systems, a smooth-tube heat exchanger integrated into the storage tank usually transfers the thermal energy collected in the collectors to the heating water circuit or the drinking water network. With larger collector fields, the heat transfer capacity of those heat exchangers is no longer sufficient.
In large systems, solar stations perform this task.

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 to conventional pumps with asynchronous motors.

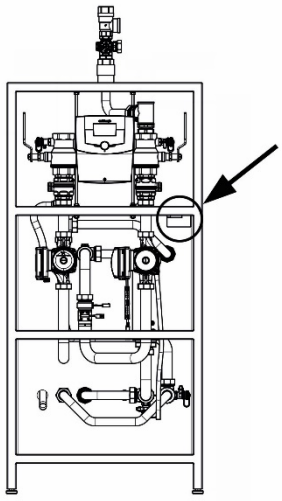
The controller is delivered preset, assembled and wired, thus ensuring easy adjustment to the real system.

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 drinking water network.

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 34). The serial number is placed in the upper right corner of the retaining plate of the station.

Serial number: _____

3.3 Technical data Solar stations

Dimensions	WHI sol-heat 60 #3 WHI sol-aqua 60 #3
Height (with insulation)	1649 mm + adjustment of the stand feet 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" internal thread
Pipe connection sec. WHI sol-heat	G 1½" internal thread
Pipe connection sec. WHI sol-aqua	1¾" external thread, flat sealing, with transition thread connection to 1½" external thread, flat sealing
Connection for expansion tank	G 1" external thread, flat sealing
Outlet of pressure relief valve	G 1¼" internal thread
Operating data	
Max. admissible pressure	primary: 6 bar, secondary: WHI sol-heat: 6 bar, WHI sol-aqua: 10 bar
Max. operating temperature	120 °C
Max. stagnation temperature	140 °C
Max. propylene glycol content	50 %
Max. power Q_{max}	90 kW at $FL_{prim.}$ 120 °C / $RET_{prim.}$ 100 °C
Flow rate at Q_{max}	primary: 3750 l/h, secondary: 4000 l/h
Operating temperature sensors	-25 °C to +120 °C
Equipment	
Pressure relief valve WHI sol-heat	primary: 6 bar, secondary: 6 bar
Pressure relief valve WHI sol-aqua	primary: 6 bar, secondary: 10 bar
Pressure gauge	0-6 bar
Heat exchanger	2 x 50 plates
Flow meter	FlowRotor, measuring range 5-130 l/min, 55 pulses/litre
Sensors	3 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

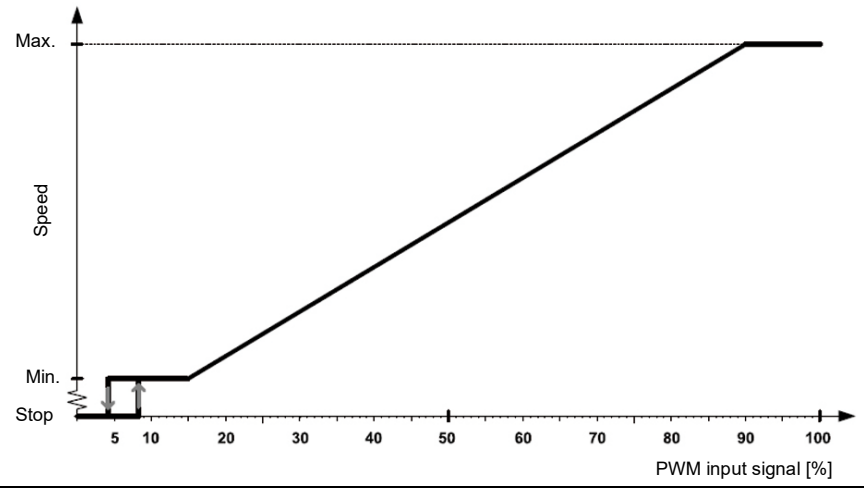
Materials	WHI sol-heat 60 #3 WHI sol-aqua 60 #3
Valves and fittings	Brass
Seals	EPDM or AFM 34/2, asbestos-free
Check valve	WHI sol-heat: brass; WHI sol-aqua: plastic
Pipes	1.4404 (AISI 316 L)
Insulating shell station	EPP, λ = 0.039 W/(m K), fire class B2
Insulating shell heat exchanger	EPP, λ = 0.035 W/(m K), fire class B2
Heat exchanger	Plates + connecting pieces: 1.4401 (AISI 316); Solder: 99.99% copper
Admissible medium	primary: propylene glycol (max. 50%) secondary WHI sol-heat: heating water in accordance with VDI 2035 / Ö-Norm H 5195-1 secondary WHI sol-aqua: drinking water with max. chloride content: < 80 ppm

3.4 Technical Data Pumps

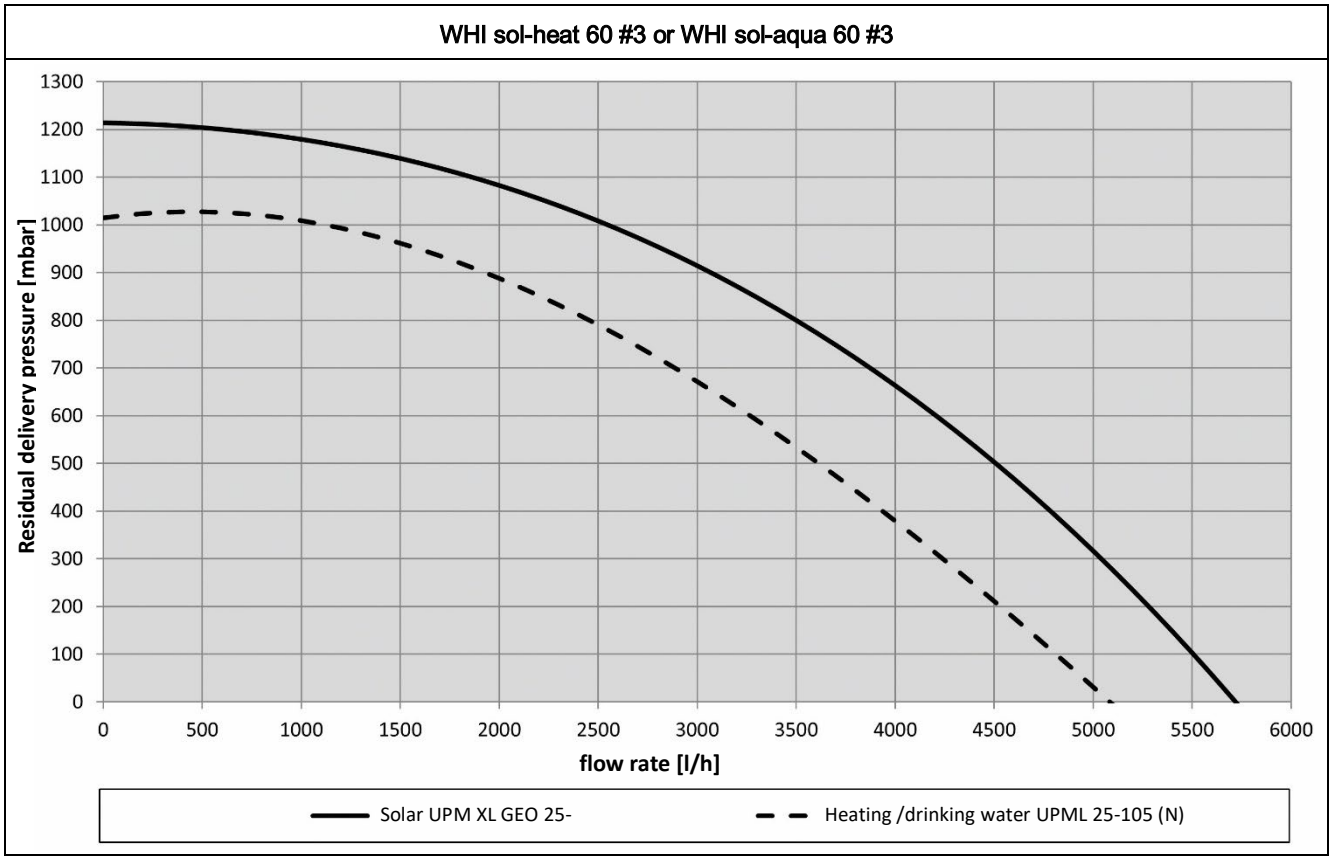
	Grundfos UPM XL GEO 25-125 with solar PWM signal	Grundfos UPML GEO 25-105 with solar PWM signal	Grundfos UPML GEO 25-105 N with solar PWM signal
Length	180 mm		
Connections	1½" ext. thread		
Protection class	IPX2D	IPX20	IPX20
Max. pressure	1,0 MPa (= 10 bar)		
Maximum temperature	95 °C TF 95		
I (1/1)	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 (solar) / Sec = secondary side (heating / drinking 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 Hydraulic performance data



4 Installation

The WHI sol-aqua modules constructively decrease the precipitation of chalk in the heat exchanger. For installations with an elevated total hardness of the drinking 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 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 solder
Maximum chloride content in the drinking water	≤ 80 ppm
pH value	7.5 – 8.5
Zinc-galvanised piping	unsuitable
Maximum pressure at 95 °C	25 bar
Plate material	1.4401 (AISI 316)

4.1 Installation

NOTICE

Damage to property!

- The pressure relief valve integrated in the station does not replace the safety groups of the drinking water connection as per DIN 1988 or of the heating installation.
- The pressure relief 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.

NOTICE

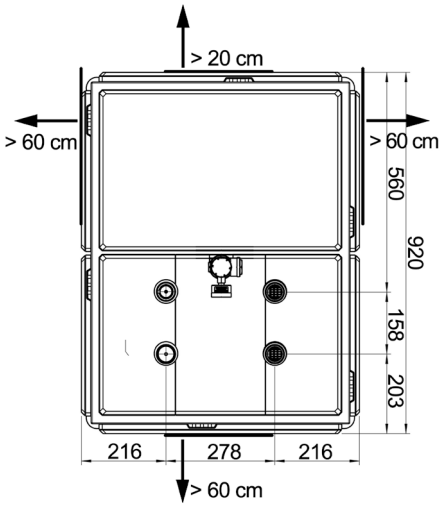
Damage to property!

- The location of installation must be dry, load-carrying, frost-proof and protected against ultraviolet radiation.
- Furthermore, access to the controller and safety equipment must be guaranteed at all times during operation!

NOTICE

Damage to property!

The discharge line of the 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!

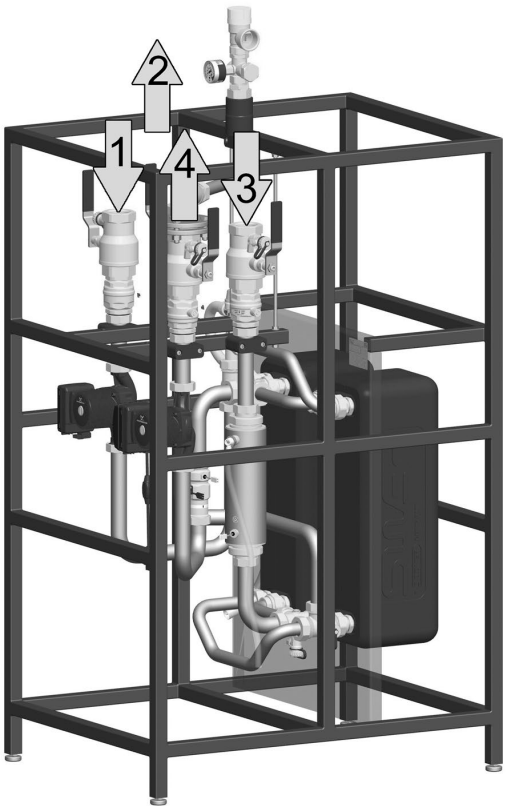


Top view

1. Determine the mounting location of the transfer station near the buffer tank. In long pipes, the transmission performance may be reduced due to higher pressure losses.
2. Remove the station from the packaging.
3. Remove the station from the pallet and position it at the location of installation.
4. Mount the enclosed stand feet to compensate the unevenness of the floor.
5. The station can be placed against the wall on either side.
   If you want to remove the insulation shells, a free space of about 20 cm must be left to the wall (see figure).
6. For the operation of the hydraulics and a subsequent servicing, you have to leave a space of at least 60 cm to the front (controller) and to one side (see figure).

4.2 Connection

1. Connect the transfer station to the installation by using the piping as shown in the figure below. When the station is delivered, the ball valves and piston valves are closed, in order to protect the station against dirt.
   Before connecting the pipes, make sure that the connections are free from dirt.



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

Connection WHI sol-heat: 1½" int. thread

Connection WHI sol-aqua: 1½" ext. thread, flat sealing

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

Connection WHI sol-heat: 1½" int. thread

Connection WHI sol-aqua: 1½" ext. thread, flat sealing

3 **Primary side: flow from collector**

Connection: 1½" int. thread

4 **Primary side: return to collector**

Connection: 1½" int. thread

2. In order to prevent damage at the safety group, it is mounted in the station in factory. For commissioning the safety group, unscrew the union nut at the T piece at the solar return and mount the safety group with the pressure relief valve in a vertical position.
3. Connect the expansion tank below the pressure gauge.
   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.

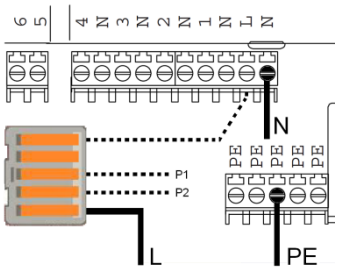
4. Adapt the initial pressure of the expansion tank to the system and connect the expansion tank. Observe the separate instructions for the expansion tank!
5. Check all screw connections and tighten them if necessary.

4.3 Controller connection

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.



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.

4.4 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	Return sensor collector circuit	prewired
20/⊥	TKV	Flow sensor collector circuit	prewired
21/25/⊥	V1	Volume pulse input collector 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

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 pressure relief 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 pressure relief 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.

6.1 Preparation for flushing and filling

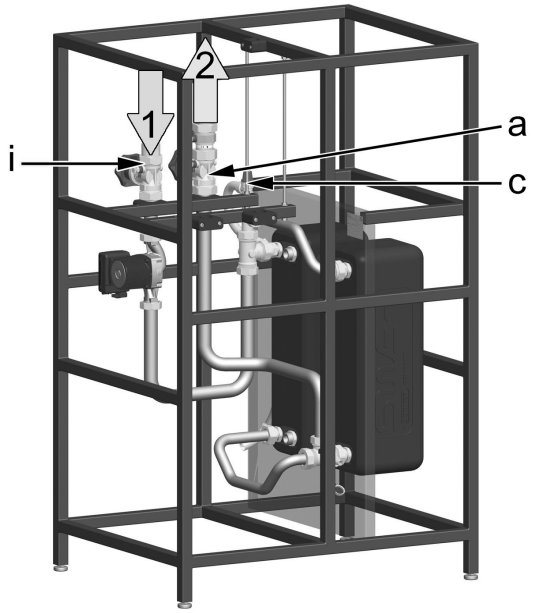
NOTICE

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.

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

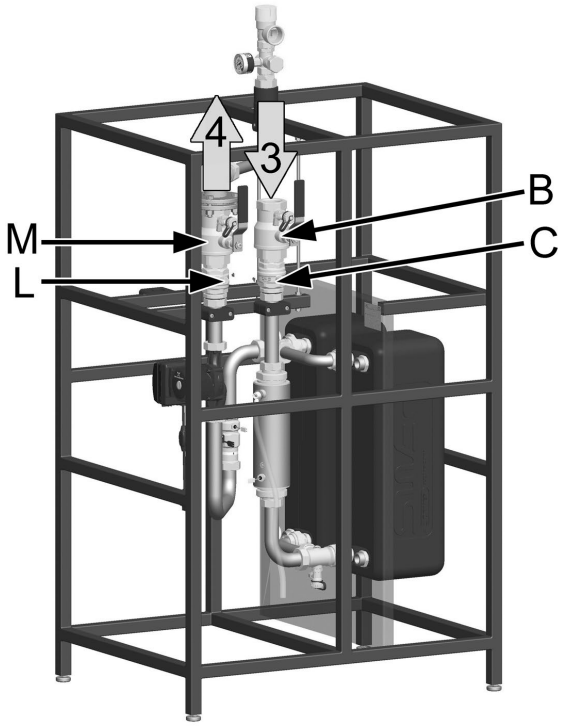
The storage tank circuit and the drinking water circuit is filled by means of the valves and fittings of the heating system. To prevent dirt particles from entering the heat exchanger, shut the ball valves or piston valves of the station and flush dirt particles/scale residues from the storage tank before commissioning. Ensure that only the approved medium mentioned in this manual is used.



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 (position 180°, see following page).
2. Vent the storage tank circuit or drinking water circuit by actuating the pressure relief valve [c].
3. Make sure that no water gets into the electrical components.
4. Fill the storage tank circuit or drinking water circuit with heating water or drinking water using the appropriate filling fittings on the system.
5. After filling the storage tank circuit or drinking water circuit is complete, set the required operating pressure.
6. If necessary, vent the station during commissioning at the pressure relief valve [c] to eliminate air still 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)



Function of the check valve

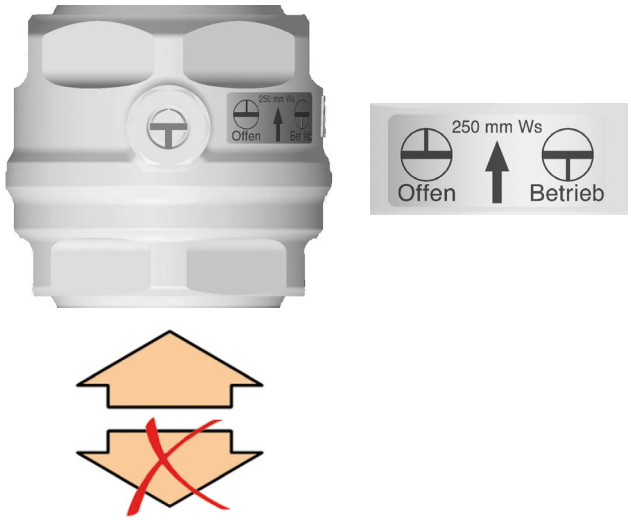
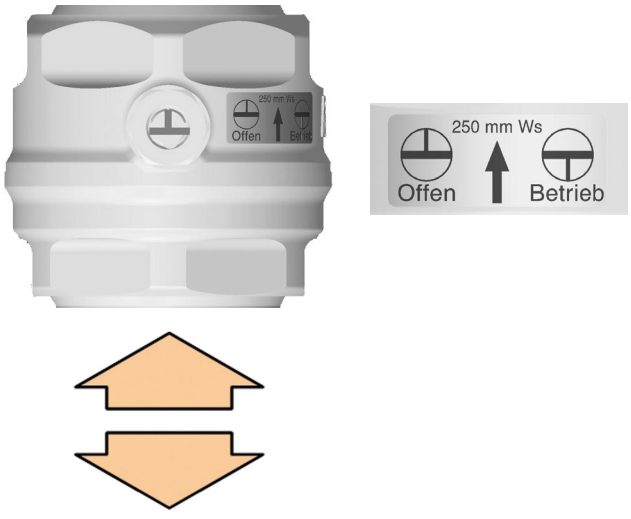
The ball valves (B) and (M) in the primary circuit are equipped with check valves (C) and (L), in order to avoid unwanted gravity circulation.

To vent and flush the installation, the check valves must be open. Turn the opening mechanism of the check valves into position **180°.** The check valve is not operating.

For the operation of the installation, all (ball) valves must be **completely** open and the check valves must be closed again (position **0°**).

Ball valve with mounted check valve

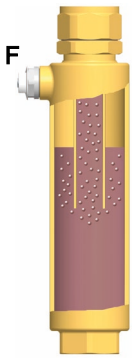
(Flow direction in the figure: upwards)

	
Position 0° Check valve is operating, **flow only in direction of flow.**	**Position 180°** Check valve is not operating, **flow in both directions.**

6 Commissioning

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 must be 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
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!

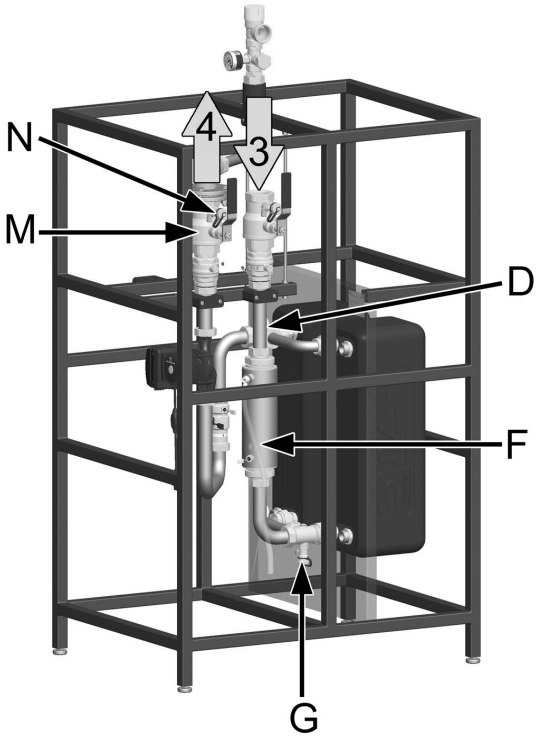
The escaping medium can reach temperatures of more than 100 °C and cause scalding.

- ➢ 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.

6 Commissioning



1. Switch off the solar pump (see controller instructions).
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:

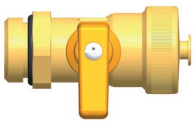
   - pressure hose to the fill and drain valve [G]
   - flush hose to the fill and drain valve [N] at the return ball valve.
4. Open the fill and drain valves [G|N] and put the flush and fill station into operation.
5. Vent the station at the vent valve [D] and at the airstop [F].
6. Close the return ball valve [M] as soon as fluid exits 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. Open and close the return ball valve [M] during flushing in order to vent the pump section.
9. Flush the solar circuit until the solar fluid exits without bubbles (see page 23).
10. Flush the collector fields individually, if possible!
11. Close the fill and drain valve [N] while the filling pump is running and increase the system pressure to about 5 bar.
    The system pressure is displayed 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 the pressure gauge to see if the system pressure decreases and eliminate leaks where necessary.

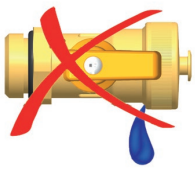
15. Reduce the pressure at the fill and drain valve [N] to the operating pressure if necessary.
16. Connect the expansion tank to the solar circuit and set the operating pressure of the solar installation by means of the flush and fill station (for the required operating pressure, see the instructions of the expansion tank).
17. Close the fill and drain valves [G|N].
18. Open the return ball valve [M] and move the check valves to the operating position (position **0°**, see page 22).

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.

19. Connect the controller to the mains and set the solar circuit pump in manual mode to ON according to the controller instructions.
20. 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 [F] of the Airstop until the solar fluid exits without bubbles (see page 23).
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 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.





23. Mount the insulation elements.
24. 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 34.

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.

Depressurise the system to carry out replacement or maintenance work on the station.


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.

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 make sure that a restart is not possible.
3. Replace the defective part by the new one.
4. Fill the system as described under 6 **Commissioning** (see page 22).

7.1 Draining the solar system

1. Switch off the controller and make sure that a restart is not possible.
2. Open the check valves [C|L] in the flow and return ball valves by turning them into position **180°** (see page 22).
3. Connect a heat-resistant hose to the fill and drain valve [G] of the transfer 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.

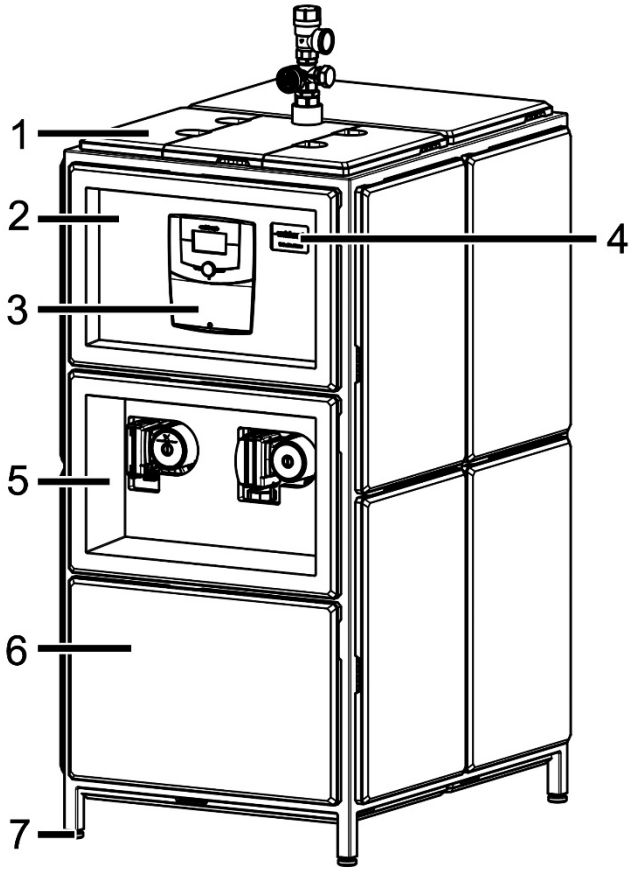
4. Open the fill and drain valve [G] of the transfer station.
5. To accelerate the draining of the solar circuit, the vent valve possibly present at the highest point of the solar installation can be opened.
6. Dispose of the solar fluid observing the local regulations.

8 Spare parts

8.1 Spare parts list controller and insulation:

WHI sol-heat 60 #3 (40900019402)

WHI sol-aqua 60 #3 (40900019432)

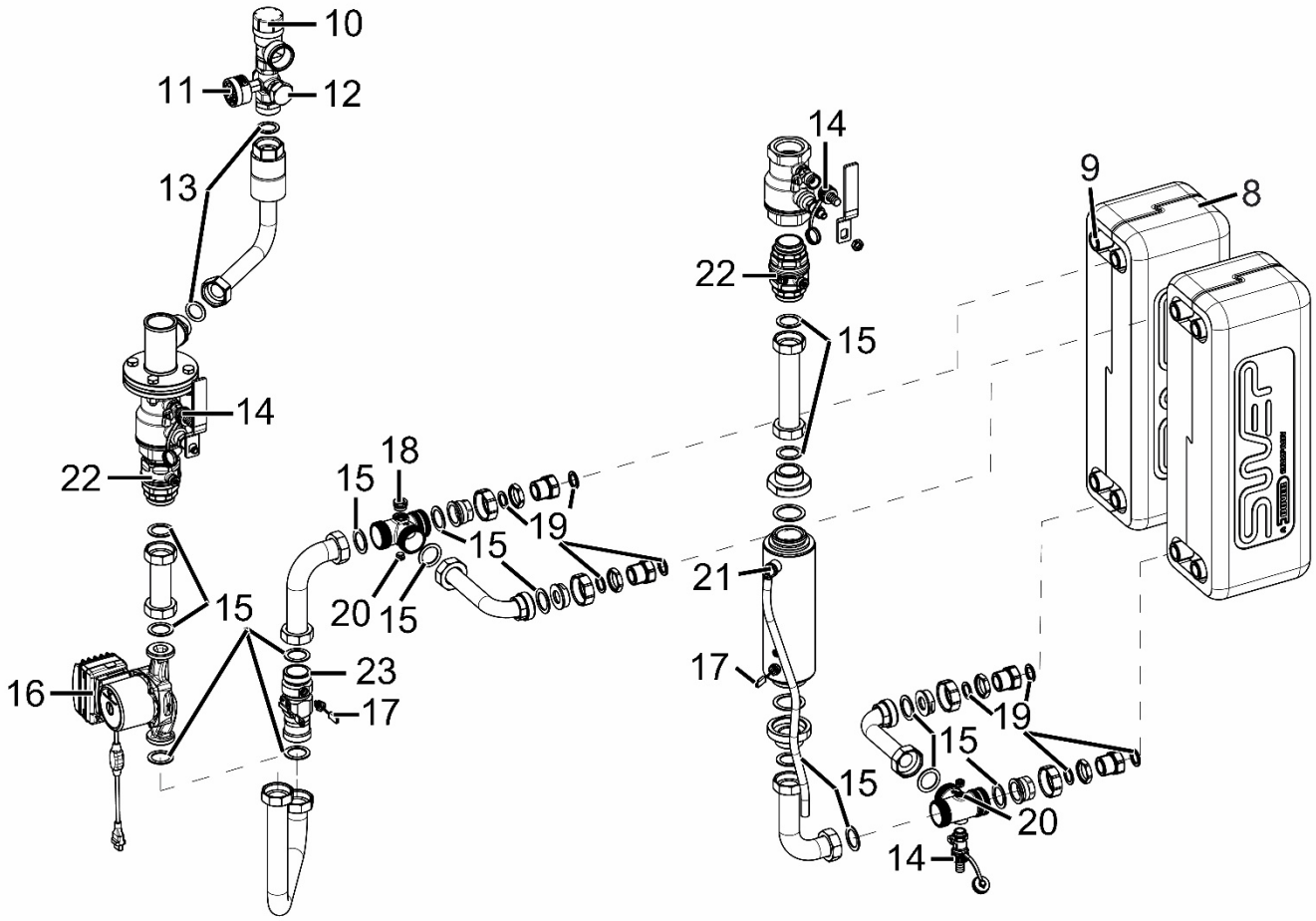


Position number	Spare part	-w- part number
1	EPP insulation for station, for pipe connections	40900015747
2	EPP insulation for station, for controller cut-outs	40900015737
3	Solar controller WRSol 2.1	660327
4	Name plate WHI sol-heat 60 #3	40900032697
	Name plate WHI sol-aqua 60 #3	40900032787
5	EPP insulation for station, for pump cut-outs	40900015717
6	EPP insulation for station, module plate	40900015727
7	Stand foot M10	48210102177
Not shown in 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 #3 (40900019402)

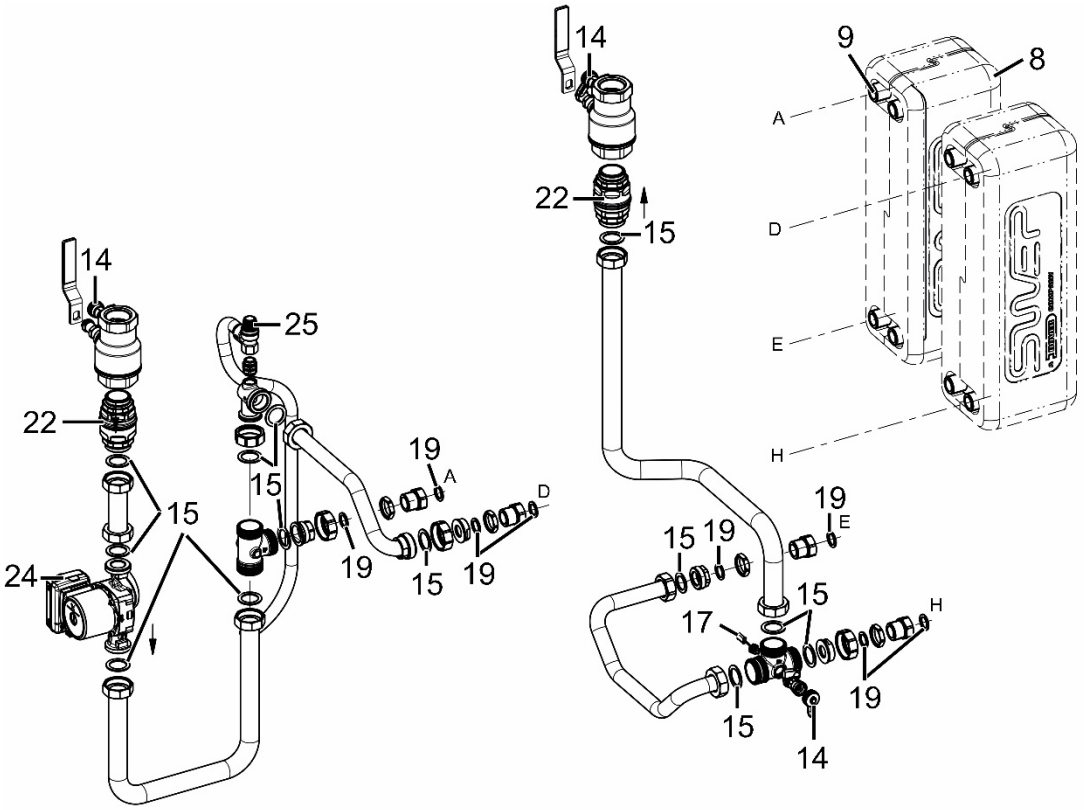
WHI sol-aqua 60 #3 (40900019432)



8 Spare parts

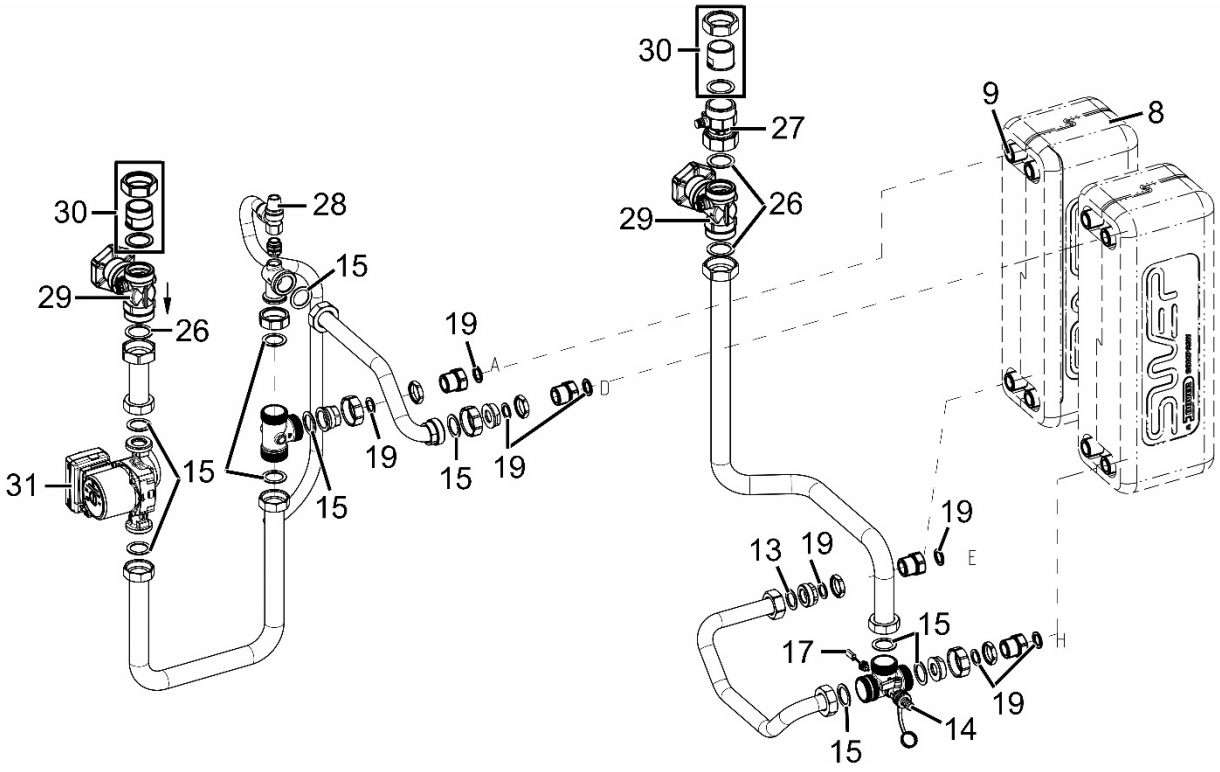
Position number	Spare part	-w- part number
8	Insulation PWT Swep IC25T/60	40900015757
9	Plate heat exchanger Danfoss XB37M-1-50	40900032667
10	Pressure relief valve 6 bar 1" solar	48002002877
11	Pressure gauge 6 bar rear mounting, diameter 50 / G¼"	48002002647
12	Brass cap 1"	40900031197
13	Seal Ø27 X Ø38 X 2 (1 ¼")	40900021137
14	Fill and drain valve G½" with hexagonal nut	48002002667
15	Seal Ø32 X Ø44 X 2 (1 ½")	40900021147
16	Circulation pump UPMXL GEO 25-125 180 PWM	40900019222
17	Temperature sensor NTC 5K G¼" A	40900015027
18	Vent plug G½"A	40900015277
19	Seal Ø21 X Ø30 X 2 (1")	40900021117
20	Closing plug G¼"A	40900015107
21	Vent valve ⅜" external thread with o-ring	48002002887
22	Check valve DN 40 2 x 1½" external thread	40900019297
23	Flow-Rotor DN40 impulse sensor 5-100 l/min.	48002003142
Not shown in drawing	Plug cable for temperature sensor NTC5K	40900015037
	Hallsensor with LED connection cable	48002002867
	Connection cable 2500 mm for Hallsensor	48002003127
	Connecting cable PWM 2 x 0.35 2500 mm br/bl	48002002617
	Pump cable 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, clear	48002002897
	Cap for fill and drain valve	48002002677
	Hose connector with nut ¾"	40900015867

8.3 Spare parts list hydraulics secondary circuit: WHI sol-heat 60 #3 (40900019402)



Position number	Spare part	-w- part number
8	Insulation PWT Swep IC25T/60	40900015757
9	Plate heat exchanger Danfoss XB37M-1-50	40900032667
14	Fill and drain valve G½" with hexagonal nut	48002002667
15	Seal Ø32 X Ø44 X 2 (1 1½")	40900021147
17	Temperature sensor NTC 5K G¼" A	40900015027
19	Seal Ø21 X Ø30 X 2 (1")	40900021117
22	Check valve DN 40 2 x 1½" external thread	40900019297
24	Circulation pump UPML 25-105 with seal	40900019232
25	Pressure relief valve 6 bar ½" solar	48002002637
Not shown in drawing	Plug cable for temperature sensor NTC5K	40900015037
	Connecting cable PWM 2 x 0.35 2500 mm br/bl	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Cap for fill and drain valve	48002002677
	Drain hose G¾" x 1000 with o-ring	51150202422
	Hose connector with nut ¾"	40900015867

8.4 Spare parts list hydraulics secondary circuit: WHI sol-aqua 60 #3 (40900019432)



Position number	Spare part	-w- part number
8	Insulation PWT Swep IC25T/60	40900015757
9	Plate heat exchanger Danfoss XB37M-1-50	40900032667
13	Seal Ø27 X Ø38 X 2 (1 ¼")	40900021137
14	Fill and drain valve G½" with hexagonal nut	48002002667
15	Seal Ø32 X Ø44 X 2 (1 ½")	40900021147
17	Temperature sensor NTC 5K G¼" A	40900015027
19	Seal Ø21 X Ø30 X 2 (1")	40900021117
26	Seal Ø38 X Ø50 X 2 (1 ¾")	40900021157
27	Non-return valve DN 40	40900015517
28	Pressure relief valve ½", 10 bar	40900015057
29	Piston valve DN40 G1 ¾A with drainage	40900015112
30	Transition thread connection set	40900015762
31	Circulation pump UPML 25-105 N with seal	40900019302
Not shown in drawing	Plug cable for temperature sensor NTC5K	40900015037
	Connecting cable PWM 2 x 0.35 2500 mm br/bl	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Cap for fill and drain valve	48002002677
	Drain hose G¾" x 1000 with o-ring	51150202422
	Drain valve with o-ring G¼"A	40900015097
	Hose connector with nut ¾"	40900015867

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

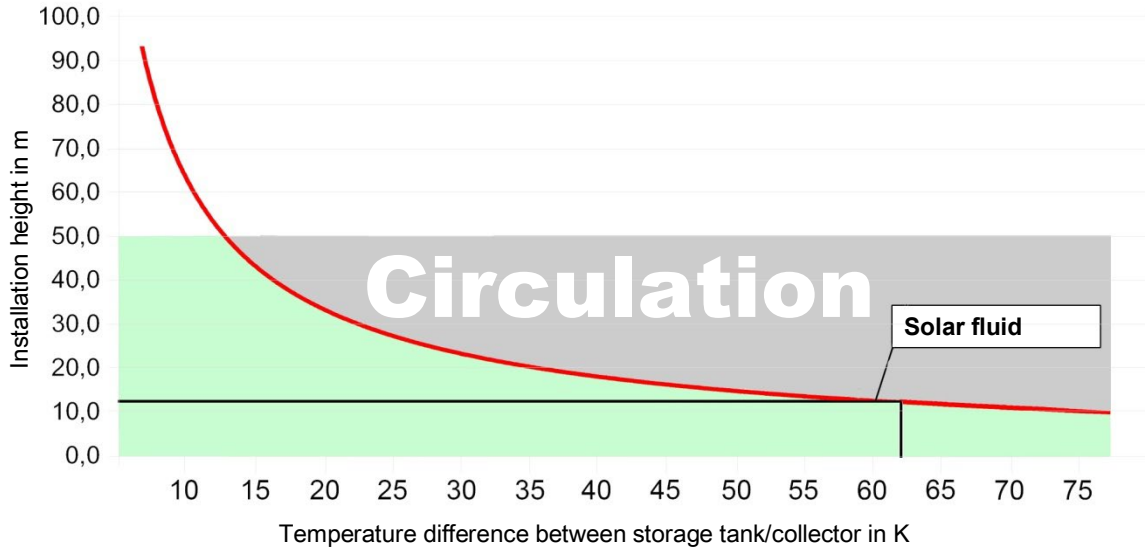
Within their application range, the check valves of this station prevent unwanted gravity circulation. The functioning of the check valves depends on:

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

The diagram below indicates if the check valves integrated in the station are sufficient for your installation. If the check valves are not sufficient, additional components must be installed 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.

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 % of propylene glycol as solar fluid.
- The installation 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

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 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

Installation 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 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			
Pressure relief valve	☐ checked				
Check valves	☐ checked				

Serial numbers	
Station	
Temperature sensor	
Controller	
Software version	

Installation company	

11 Commissioning report

–weishaupt–

Max Weishaupt SE · 88475 Schwendi

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

Das ist Zuverlässigkeit. C'est la fiabilité. That's reliability. Questa è affidabilità. 信頼性とは、ころいろものです。Това е надеждност. Ez a megbízhatóság. Đó là sự đáng tin cậy. تسا نانیمطلا تدابقر نیا To je zanesljivost. Güvence budur. Αυτό σημαίνει αξιοπιστία. 그것은 바로 신뢰성입니다. To je spoľahlivosť. Dat is betrouwbaarheid. Tämä on luotettavuutta. ةيقوقوثلا يه هذه See on usaldusväärsus. Pouzdana tvrtka. To jest niezawodność. นั่นคือความเชื่อถือได้ Це надійність. Isto é fiabilidade. To je spolehlivost. यही वश्विसनीयता है. Det är pålitlighet. .זאת אמינות Esto es fiabilidad. Это надежность. Itulah kepercayaan. 值得信赖。 Is é sin iontaofacht. Iyan ang maaasahan. Aceasta este fiabilitatea. ۔ہے وشوسنیتا یہ Tai - patikimumas. Det er pålitelighet. Tā ir uzticamība. Sa se fyab. To je pouzdanost. La fiabilité avant tout. Det er pålidelighed.

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