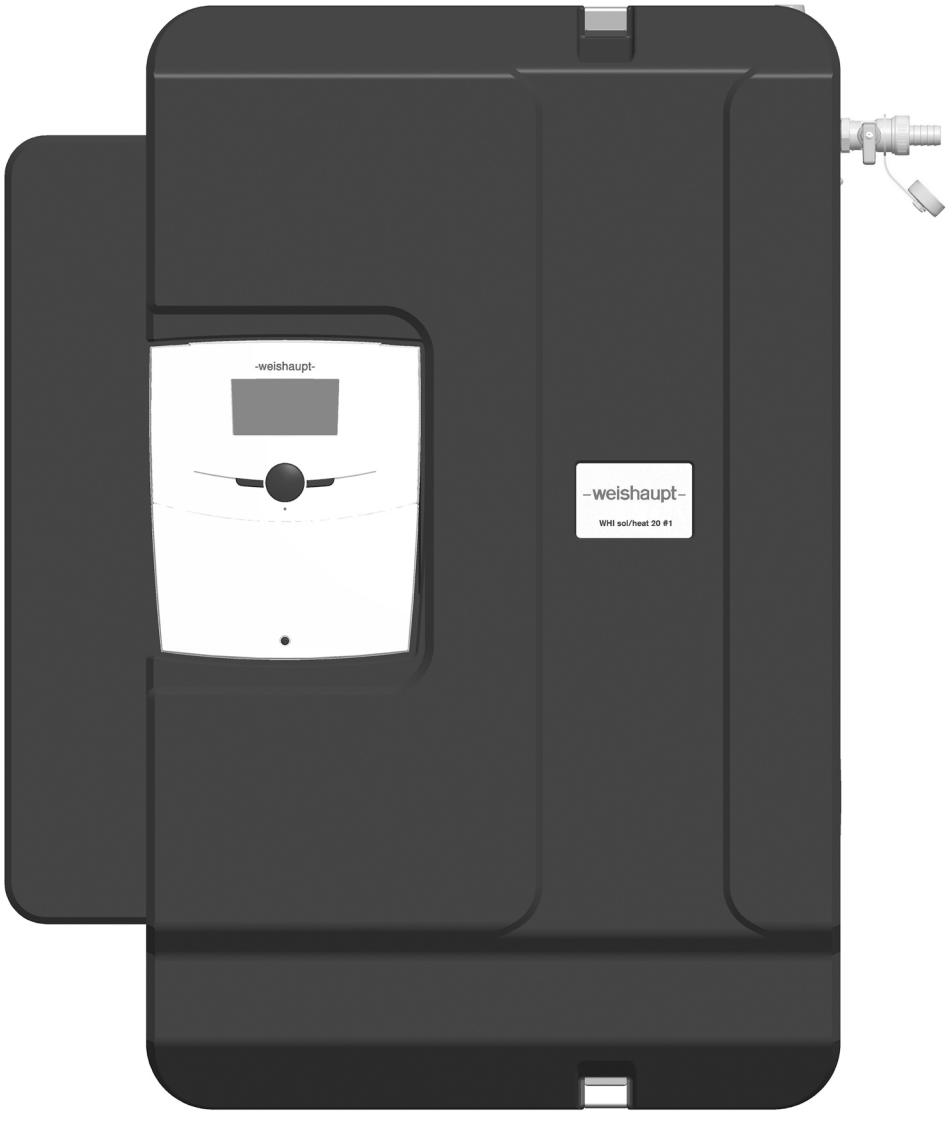
-weishaupt-

manual

Installation and Operation Instructions



Separation station WHI sol/heat 20 #1 / 40 #2
Separation station WHI sol/aqua 20 #1 / 40 #1

83514202 · 1/2019-10

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.
NOTICE	Important information.

1.1.2 Target group

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

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

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

Children may not play with the machine.

1.2 Warranty and liability

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

2 Safety

2.1 Designated use

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

Use only original accessories in connection with the separation station.

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

The wrapping 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, flushing and filling 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 pumps can become heated up to more than 100 °C during operation.

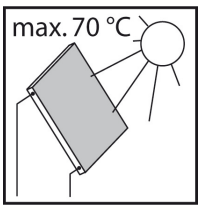
- ➢ The insulating shell must remain closed during operation.

CAUTION

Personal injuries and material damage due to overpressure!

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 cause permanent damage in the material, resulting in its sealing characteristics getting lost. We cannot be held liable for damage caused by seals damaged in this way, and nor will we give warranty replacement for such parts. ➢ 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 fittings must be installed at a sufficient distance from the collector field. It may be necessary to install an intermediate tank in order to protect the expansion tank.

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

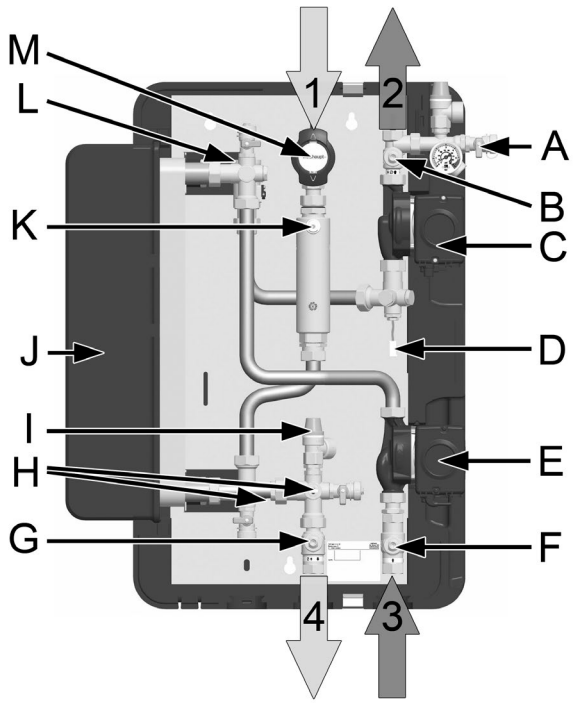
Dispose of the materials used properly and in an environmentally compatible manner. In doing so, observe local regulations.

3 Product description

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

- Ball valves in the solar circuit and storage tank circuit (supply and return) of the WHI sol/heat modules
- Piston valves in the potable water circuit (supply and return) of the WHI sol/aqua modules
- Check valves in the supply and return of the primary circuit and in the supply of the secondary circuit to avoid involuntary gravity circulation
- Safety valves for avoiding inadmissible overpressure
- 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.



Example: WHI sol/heat 20 #1

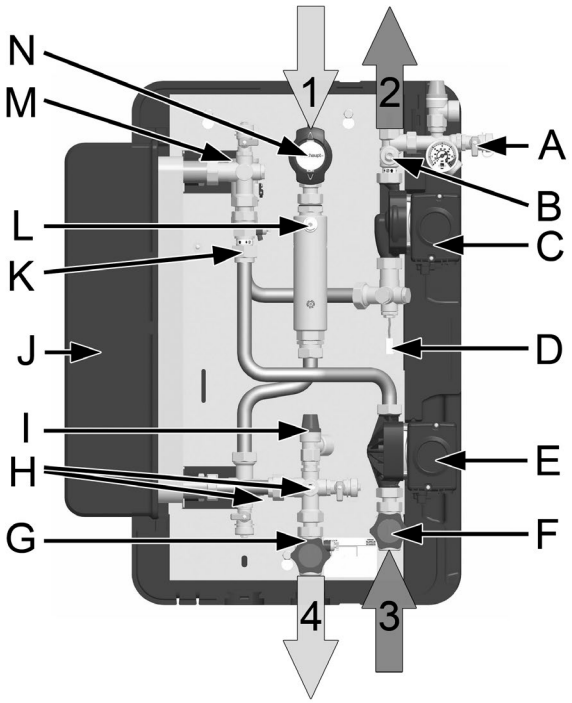
WHI sol/heat 20 #1 and 40 #2

Connections

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

Equipment

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



Example: WHI sol/aqua 20 #1

WHI sol/aqua 20 #1 and 40 #1

Connections

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

Equipment

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

3.1 Function

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

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

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

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

The operating conditions in the heat exchanger vary, due to variations in radiation, buffer temperatures and different system requirements.

For optimum operation of the overall system, the flow rates in the heat exchanger must be adapted to the relevant control target and current situation.

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

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

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

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

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

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

3.2 Technical Data Separation stations

Dimensions	Separation station WHI sol/heat 20 #1 Separation station WHI sol/aqua 20 #1	Separation station WHI sol/heat 40 #2 Separation station WHI sol/aqua 40 #1
Total height	795 mm	829 mm
Total width	674 mm	676 mm
Total depth	298 mm	298 mm
Center distance, supply/return	120 mm	120 mm
Pipe connection prim	G ¾" female thread	G 1" female thread
Pipe connection sec: WHI sol/heat	G ¾" female thread	G 1" female thread
Pipe connection sec: WHI sol/aqua	G 1" male thread, flat sealing	G 1¼" male thread, flat sealing
Connection for expansion tank	G ¾" male thread, flat sealing	
Safety valve outlet:	G ¾" female thread	
Operating data		
Max. admissible pressure	prim.: 6 bars sec. sol/heat: 6 bars; sol/aqua: 10 bars	
Max. operating temperature	120 °C	
Max. stagnation temperature	140 °C	
Max. propylene glycol content	50 %	
Max. power Q_{max}	30 kW at $SUP_{prim.}$ 120°C / RET_{prim} 100°C	60 kW at $SUP_{prim.}$ 120 °C / $RET_{prim.}$ 100°C
Flow rate at Q_{max}	prim.: 1250 l/h, sec.: 1290 l/h	prim.: 2500 l/h, sec. sol/heat: 2500 l/h; sol/aqua: 2600 l/h
Operating temperature sensors	-25 °C to +120 °C	
Equipment		
Safety valve WHI sol/heat	prim: 6 bars / sec: 6 bars	
Safety valve WHI sol/aqua	prim: 6 bars / sec: 10 bars	
Pressure gauge	prim: 0-6 bars	
Heat exchanger	30 plates	60 plates
Flow meter	FlowRotor, measuring range: 2-50 l/min, 55 pulses/litre	
Sensors	3 NTC 5 K (built-in)	
Check valves (in ball valves)	prim: 2 x 200 mm wc, can be opened sec: 1 x 200 mm wc, can be opened	
Material		
Valves and fittings	Brass	
Seals	EPDM	
Check valves	Brass	
Pipes	1,4404 (AISI 316 L)	
Insulation	EPP, λ = 0.038 W/(m K), fire class B2	
Heat exchanger	Plates + connecting pieces: 1,4401 (AISI 316) / Solder: 99.99% pure copper	
Admissible medium	Prim.: Propylene glycol (max. 50%) Sec. sol/heat: Heating water according to VDI 2035 / Austrian standard H 5195-1 Sec. sol/aqua: Chloride content <80 ppm	

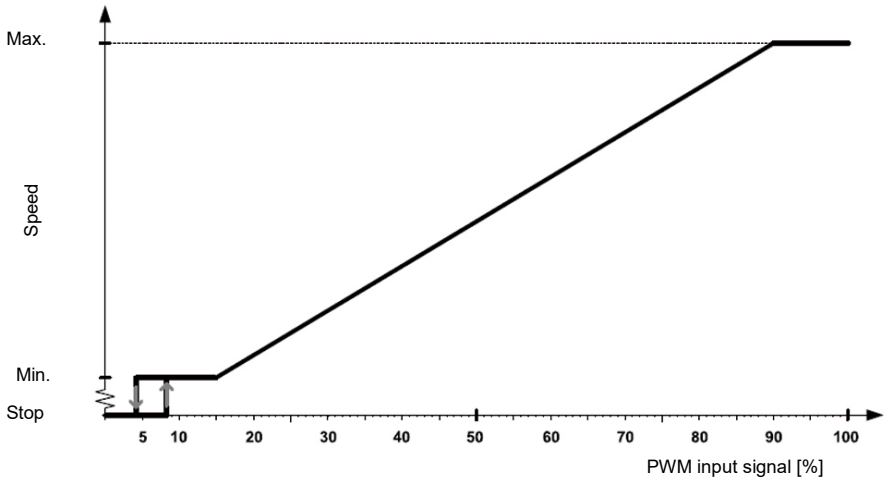
3.3 Technical Data Pumps

	UPM2 15-75 CIL	Solar PM2 15-65	Solar PM2 15-145	Solar PML 25-145	Wilo Para ST 25/8	UPML GEO 25-105 N
Length	130 mm			180 mm		
Connections	1" male thread			1½" male thread		
Protection class	IP 44					
Max. pressure	1.0 MPa (= 10 bars)					
Max. temperature	95 °C TF 95					
I (1/1)	0.04-0.52 A	0.04-0.40 A	0.06-0.68 A	0.07-1.18 A	0.06-0.71 A	0.06-1.16 A
P1	3-70 W	3.5-48 W	7-69 W	6-140 W	2-75 W	6-140 W
Use in:						
WHI sol/heat 20 #1		Sec	Prim			
WHI sol/aqua 20 #1	Sec		Prim			
WHI sol/heat 40 #2				Prim	Sec	
WHI sol/aqua 40 #1				Prim		Sec
Prim = primary side (solar) / Sec = secondary side (heating / potable water)						

3.4 PWM input signal (solar profile)

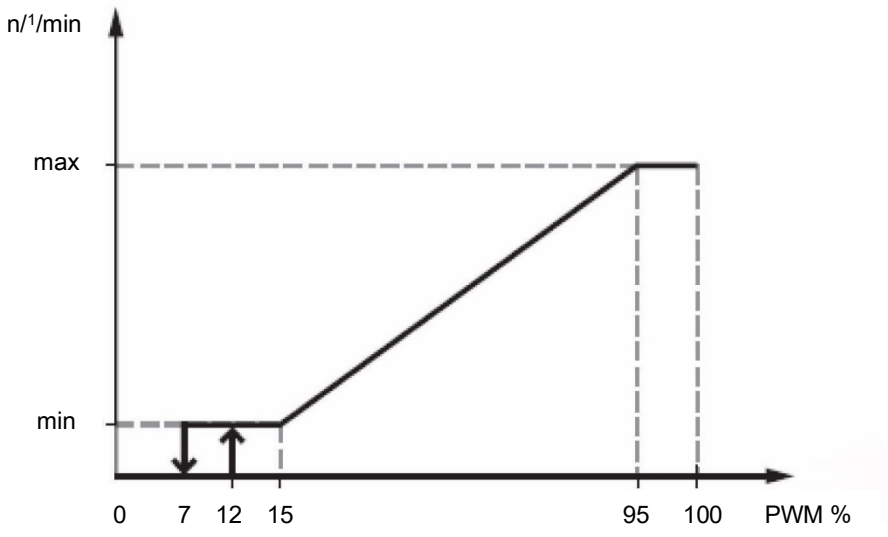
For Grundfos pumps:

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



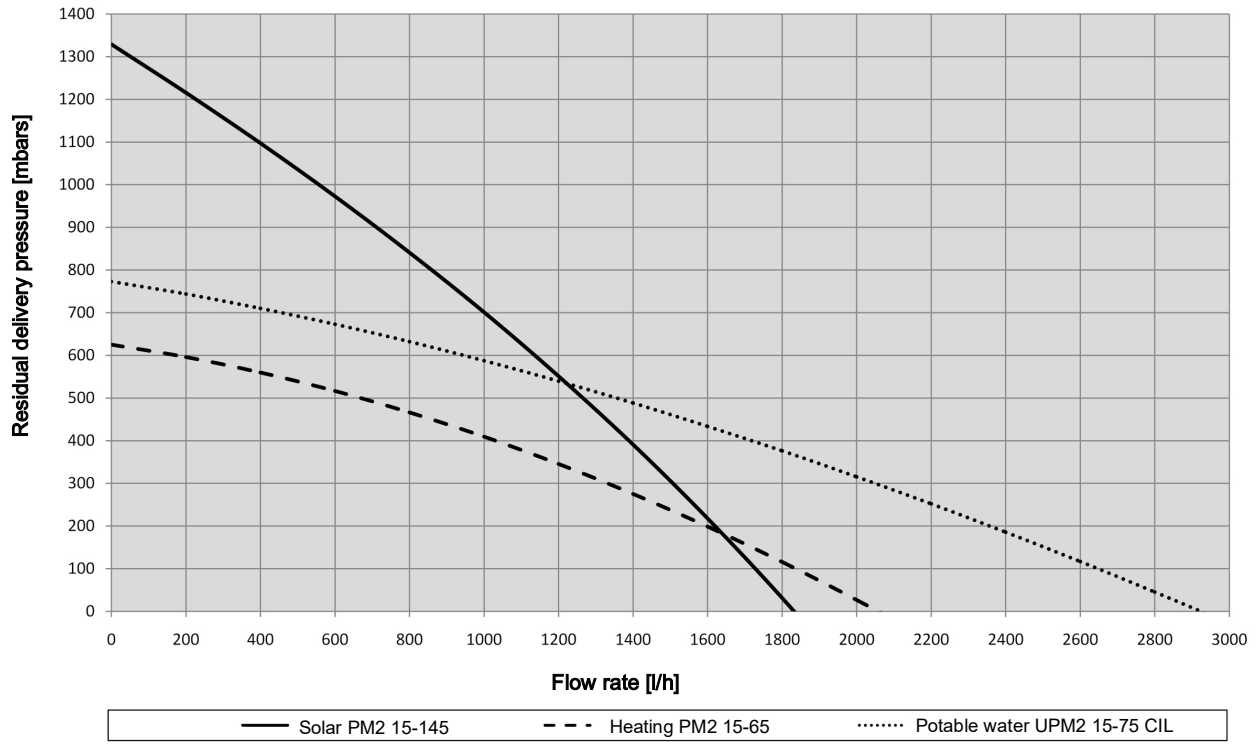
For Wilo Para ST 25/8 pump:

iPWM input signal [%]	Pump status
< 7	Stop (standby)
7-15	Min. speed (operation)
12-15	Min. speed (start-up)
15-95	Linear increase in speed from rpm min. to rpm max.
> 95	Max. speed

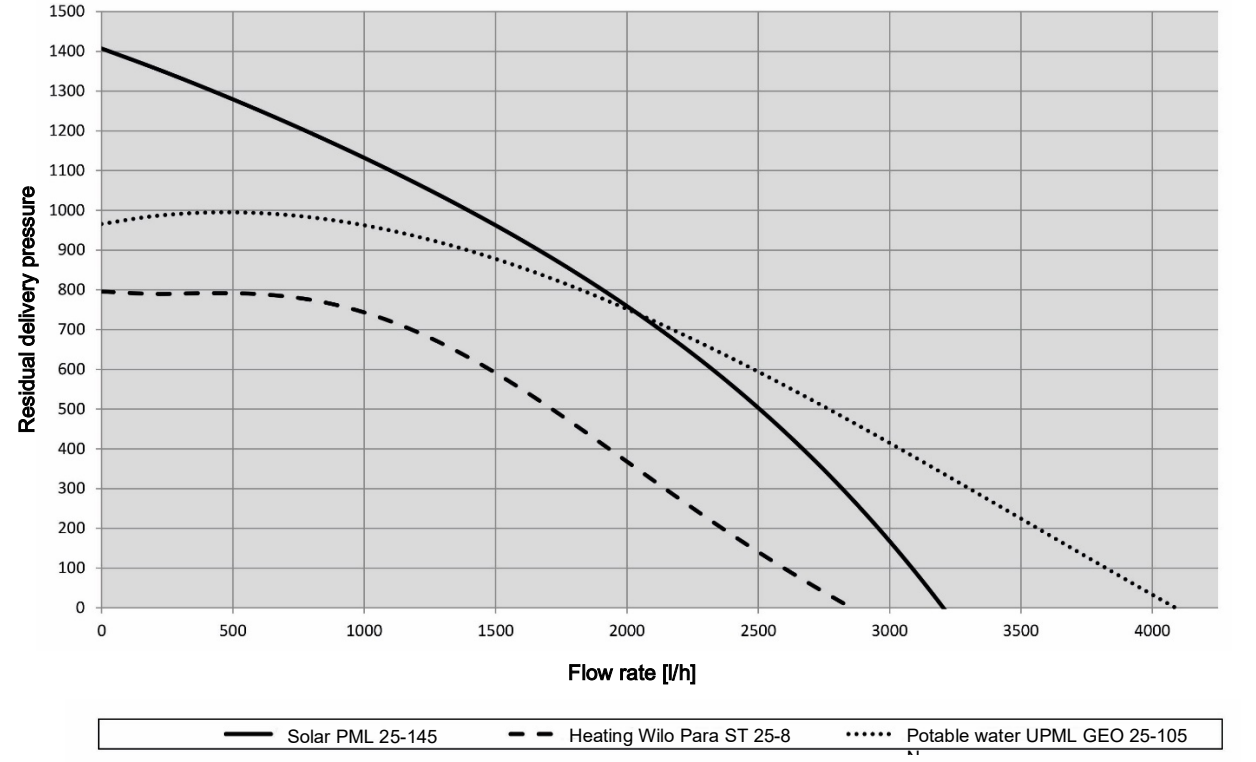


3.5 Hydraulic performance data

WHI sol/heat 20 #1 or WHI sol/aqua 20 #1



WHI sol/heat 40 #2 or WHI sol/aqua 40 #1



4 Dimensioning and planning

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

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

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

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

5 Installation

5.1 Assembly

NOTICE

Damage to property!

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

NOTICE

Material damage due to high temperatures!

Since the solar fluid near the collector can be very hot, the group of fittings must be installed at a sufficient distance from the collector field.

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

WARNING

Risk to life and limb due to electric shock!

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

5 Installation

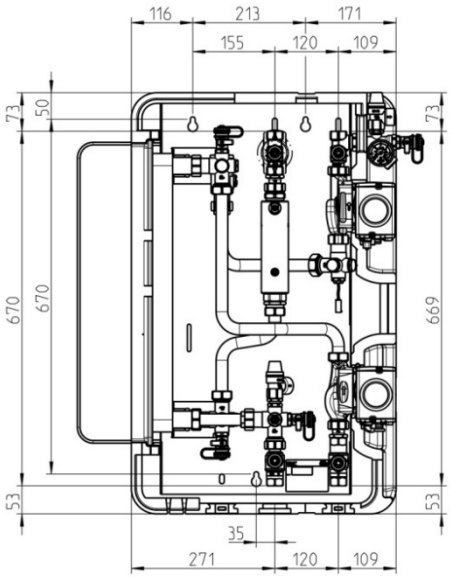
NOTICE

Damage to property!

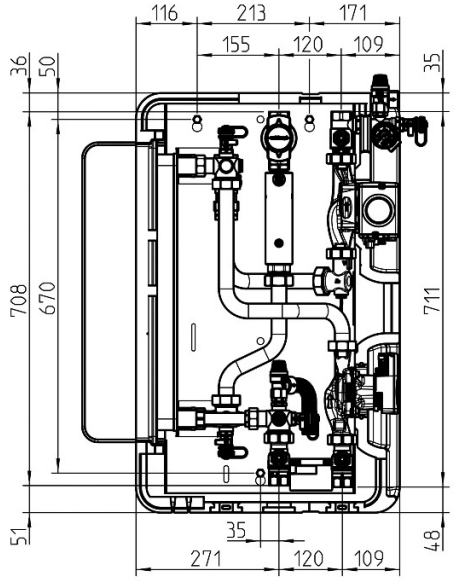
- The installation site must be dry, stable, frost-proof and protected against ultra-violet radiation in order to prevent material damage of the installation.
- Furthermore, access to the controller and safety equipment must be guaranteed at all times during operation!

NOTICE

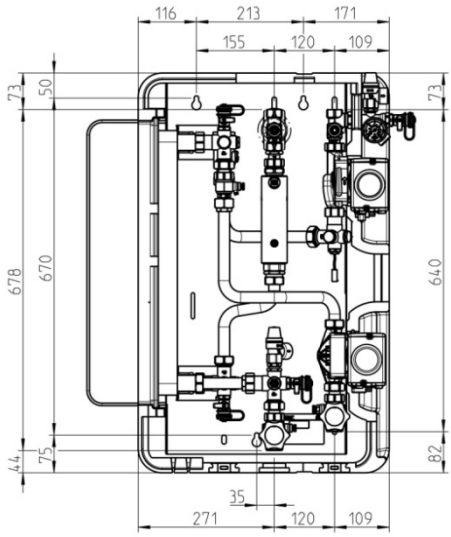
The discharge line of the safety equipment should be guided into heat-resistant collection tanks of suitable size. This prevents uncontrolled discharging into the environment and enables the circuits to be refilled!



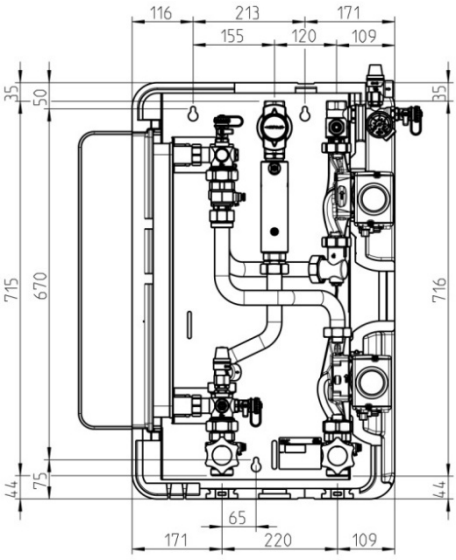
Separation station WHI sol/heat 20 #1



Separation station WHI sol/heat 40 #2



Separation station WHI sol/aqua 20 #1



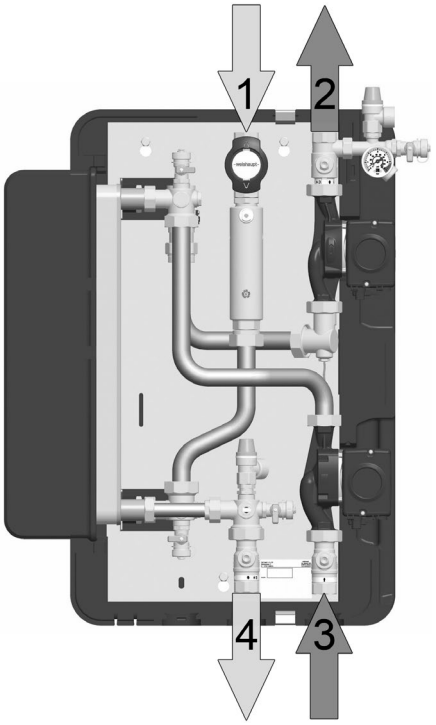
Separation station WHI sol/aqua 40 #1

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

5.2 Connection

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

Pipe gap from the wall (primary) = 95 mm



Pipe gap from the wall (secondary) = 167 mm

1 Primary side: flow from collector

Connection:

WHI sol/heat and sol/aqua 20 #1: ¾" female thread

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

2 Primary side: return to collector

Connection:

WHI sol/heat and sol/aqua 20 #1: ¾" female thread

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

3 Secondary side: return from buffer tank (cold)

Connection:

WHI sol/heat 20 #1: ¾" female thread

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

WHI sol/heat 40 #2: 1" female thread

WHI sol/aqua 40 #1: 1¼" male thread, flat sealing

4 Secondary side: Flow to buffer tank (hot)

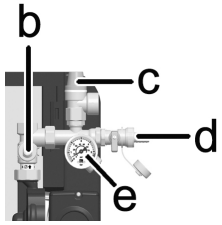
Connection:

WHI sol/heat 20 #1: ¾" female thread

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

WHI sol/heat 40 #2: 1" female thread

WHI sol/aqua 40 #1: 1¼" male thread, flat sealing



2. Assemble the safety group consisting of safety valve [c], fill valve [d] and pressure gauge [e] on the connection of the return ball valve [b].
3. Connect the expansion tank below the pressure gauge [e].
   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.

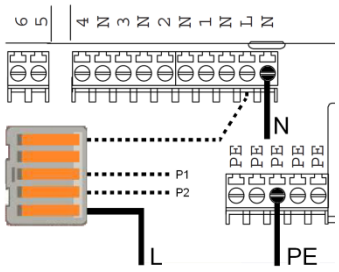
5.3 Controller connection

Risk to life and limb due to electric shock!

WARNING

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

  For more information, see enclosed installation and operation instructions of the station controller.
- ➢ Do not connect the controller to the mains until all installation work, flushing and filling have been completed. 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 figure opposite.
2. Connect the outer conductor (L) to the bus bar in the controller housing. To do so, lift the lower lever and clamp the line pressing the lever down. Next check whether the line is firmly clamped.
3. The bus bar has already been connected to the screw terminal (L) of the controller and the pump lines for constant power supply. Due to the high power consumption of the pumps, the latter are not supplied with 230 V via relays, but permanently connected to the mains supply.
   The speed control (0-100%) of the pumps is effected via the PWM control signal.

5.4 Electrical connection of the solar controller WRSol2.1

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

6 Operation

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

6.1 Pressetting solar controller WRSol2.1

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

7 Commissioning

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 installation may not be flushed or filled while the collectors are hot (intense solar radiation). Please note that hot solar fluid will leak from the safety valve when the system pressure is too high! During venting the solar fluid may escape as vapour and result in scalding!

- Flush and fill the 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.

7.1 Preparation for flushing and filling

NOTICE

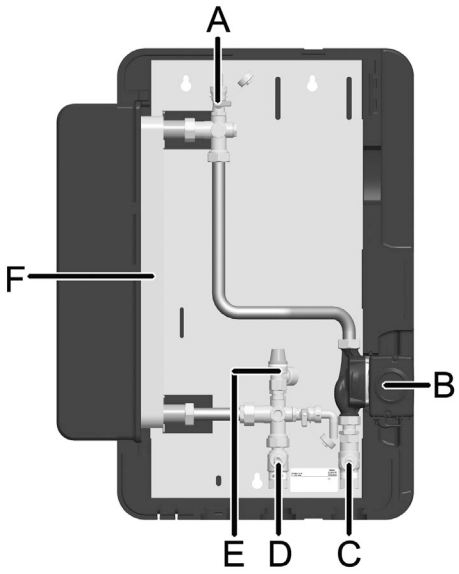
Note regarding the expansion tank

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.

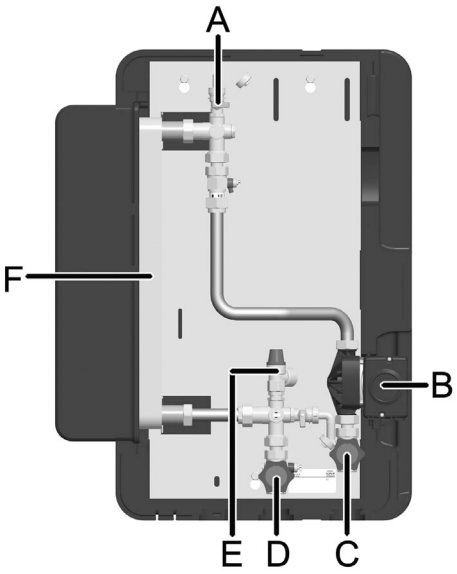
7.2 Flushing and filling the storage tank circuit / potable water circuit (lower connections)

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

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



Separation station WHI sol/heat 20



Separation station WHI sol/aqua 20

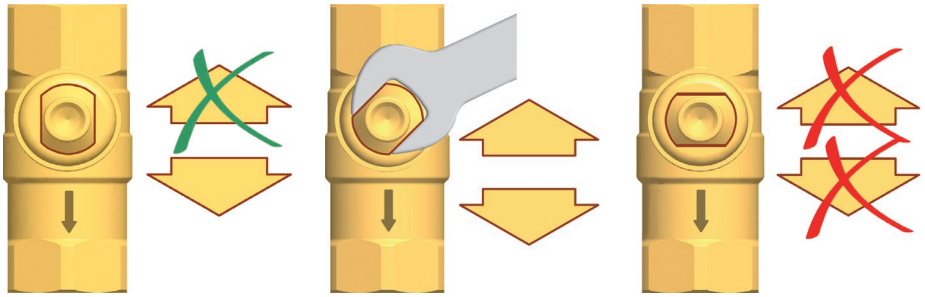
7.3 Flushing and filling the solar circuit (upper connections)

The fill and drain valves required for flushing and filling have been integrated into the separation station. Make sure that dirt particles that may be present in the system are not flushed into the heat exchanger and into the expansion tank. To do so, it may be necessary to disconnect the expansion tank during flushing and filling and to use only flushing and filling stations that are equipped with suitable microfilters.

The solar circuit is flushed in the normal direction of flow. This is why you should make sure that the solar circuit pump is not on.

Ball valve with integrated check valve

(Normal direction of flow in the picture: downstream)

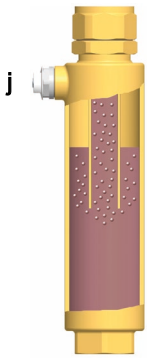


0°	45°	90°
Check valve in operation, **through-flow in flow direction only.**	Check valve not in operation, **through-flow in both directions.**	Ball valve closed, **no through-flow.**

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

Airstop

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



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

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

7 Commissioning

WARNING

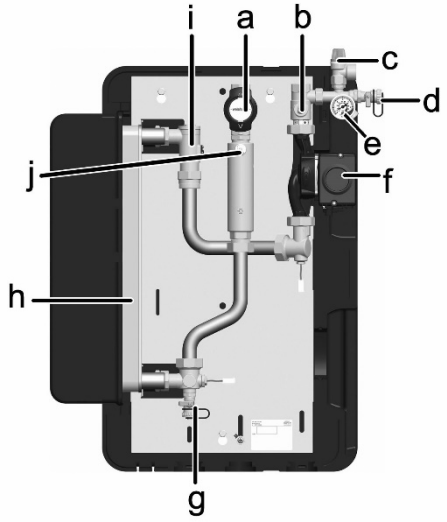
Danger of scalding due to escaping vapour!

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.

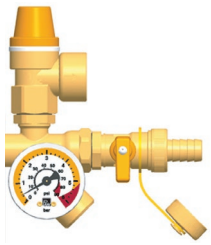
Venting the solar system after commissioning

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



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

   - Pressure hose to the fill valve [d]
   - Flush hose to the drain valve [g].
5. Open the fill and drain valves [d|g] and put the flush and fill station into operation.
6. Since the air can escape only slowly, the system must be filled slowly and vented on the collector. Otherwise the air/water mixture will be distributed over the entire circuit. Once the filling process is finished, flushing is started.
7. To vent the pump stroke, open and close the return ball valve [b] during flushing.
8. Keep flushing the solar circuit until the solar fluid exits without forming bubbles (see page 21).
9. Flush the collector fields individually, if possible!
10. Close the drain valve [g] with the filling pump running and increase the system pressure to approx. 5 bars. The system pressure can be read on the pressure gauge [e].



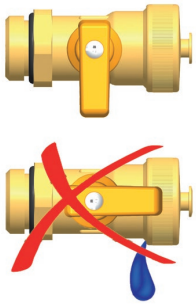
11. Vent the circulation pump via the vent screw.
12. Close the fill valve [d] and switch off the pump of the flush and fill station.
13. Check at the pressure gauge if the system pressure is being lowered and eliminate any leaks, if present.
14. Reduce the pressure on the drain valve [g] to the system-specific pressure, if necessary.
15. 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).
16. Close the fill and drain valves [d|g].
17. Take the ball valve [b] to the **0°** position (see page 21).

WARNING

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.

18. Connect the controller to the mains and set the solar circuit pump in manual mode to ON as described in the controller manual.
19. 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 [j] of the airstop until the solar fluid exits without forming bubbles (see page 21).



20. If necessary, increase the system pressure to the operating pressure.
21. Remove the hoses of the flush and fill station and screw the sealing caps 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.
22. Attach the front insulation shell.
23. 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 34.

8 Maintenance

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

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

We recommend concluding a maintenance agreement.

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 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. Replace the defective part with a new part.
3. Fill the system as described under 7 **Commissioning** (see page 19).

8.1 Draining the solar system

1. Switch off the controller and secure it against being switched on again.
2. Open the check valves in the supply and return ball valves [a|b] by rotating them to the **45°** position (see page 21).
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 draining of the solar circuit, you can open the air-bleed valve, if present, at the highest point of the solar system.
6. Dispose of the solar fluid observing the local regulations.

9 Accessories

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

10 Function of the check valves

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

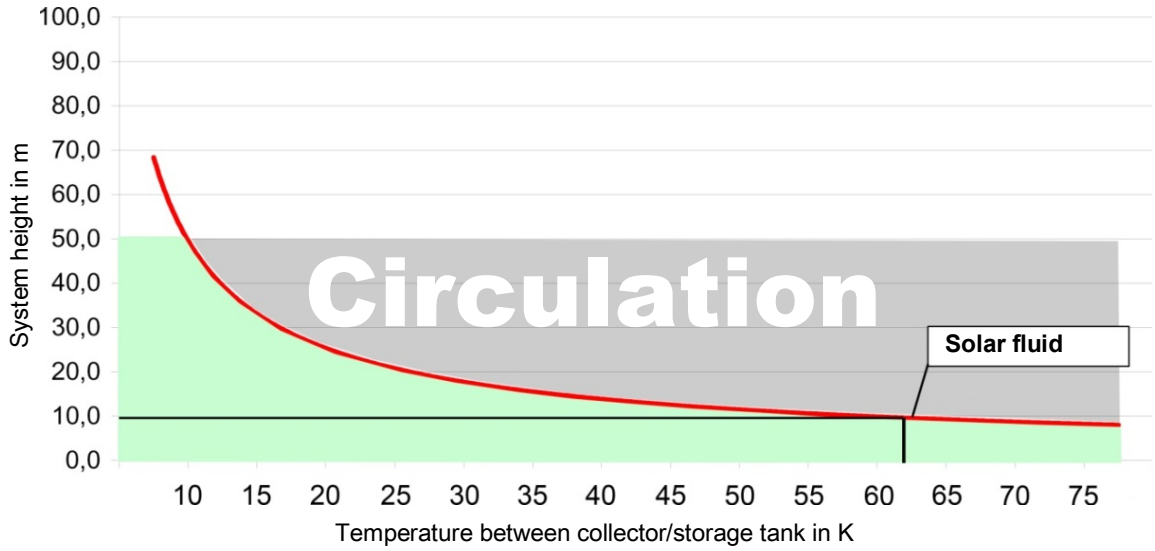
- on the system height
- on the temperature difference between storage tank and collector
- on the solar fluid used

On the following diagram, 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.

10 Function of the check valves

Example:

- The station is equipped with two check valves (2 x 200 mm wc = 400 mm wc).
- You use a mixture of water and 40% strength propylene glyclol as the solar fluid.
- The system height between collector and storage tank is 10 m.



Result:

The check valves prevent gravity circulation up to a temperature difference of approx. 62 K. At a higher temperature difference between collector and storage tank, the difference in density of the solar fluid is so large that the check valves are pressed open.

Do you need to know it exactly?

The density of the solar fluid strongly decreases with increasing temperature. In systems of high system heights and with large temperature differences, the difference in density causes gravity circulation. This circulation can result in the storage tank cooling down.

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

Collector temperature: 5 °C → Solar fluid density 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

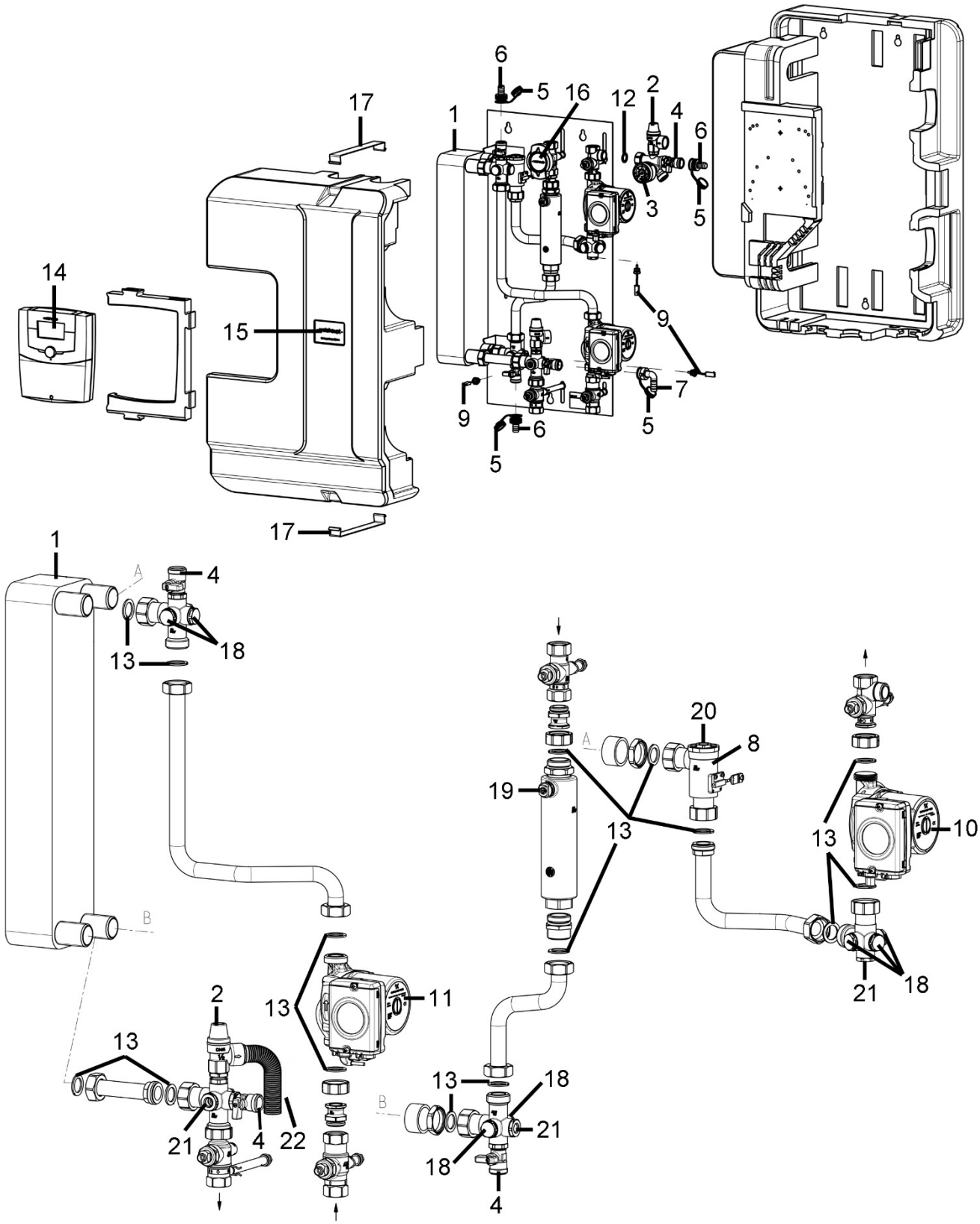
System height h = 10 m

Δp = 3875 Pa = 395 mm wc

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

11 Spare parts

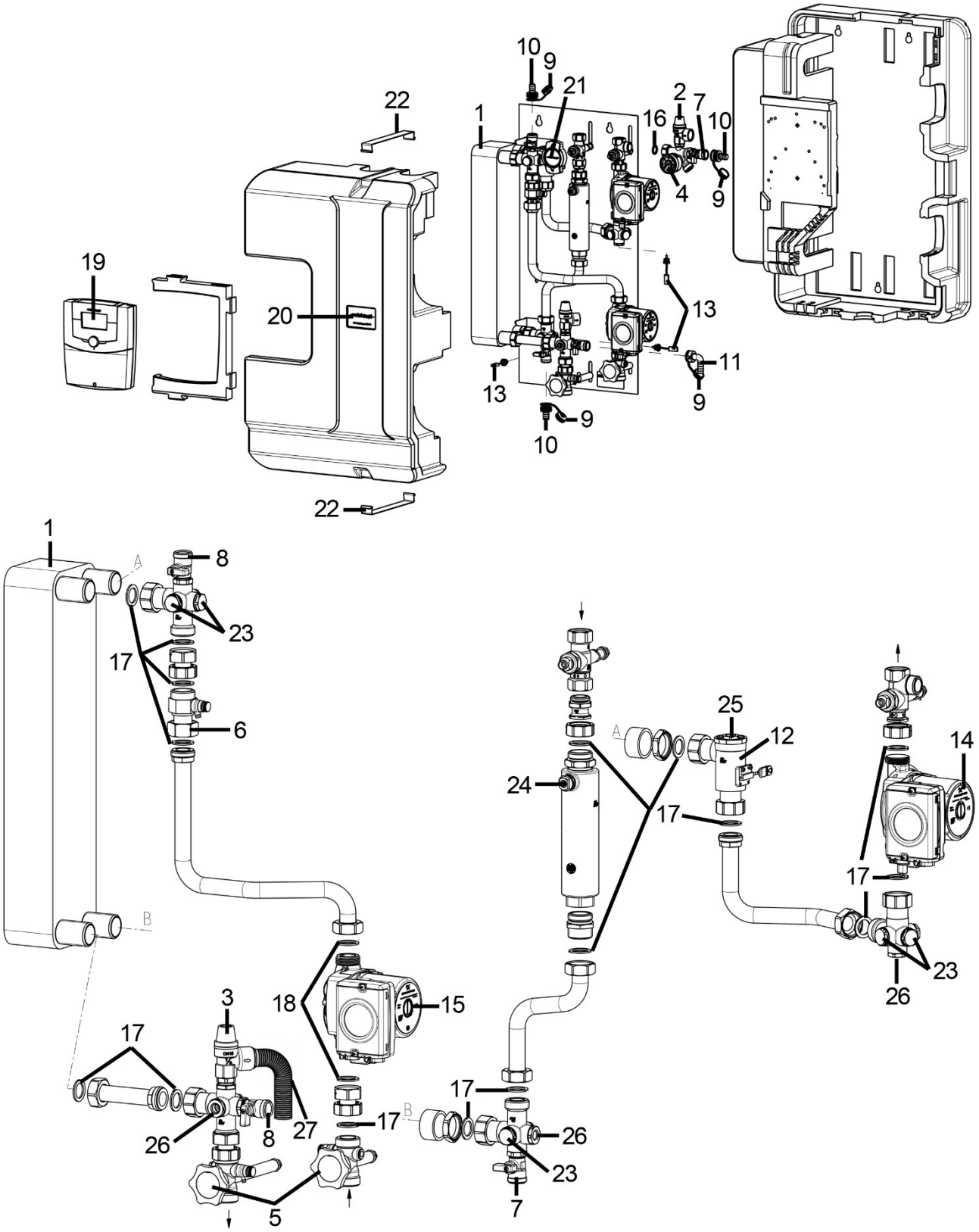
11.1 Spare parts separation station WHI sol/heat 20 #1 (40900015252)



11 Spare parts

Position number	Spare part	-w- Part number
1	Plate heat exchanger Swep IC25T/30	40900015847
2	Safety valve 6 bars ½" solar	48002002637
3	Pressure gauge 6 bars, diameter 50 / G¼"	48002002647
4	Inlet and outlet valve G½" with hex. nut	48002002667
5	Cap for inlet and outlet valve	48002002677
6	Union nut ¾" knurled for KFE valve ½", with hose sleeve	40900015867
7	Hose sleeve 90° with G¾ union nut	40900015447
8	FlowRotor DN 25 90°	40900015572
9	Temperature sensor NTC 5K G¼A	40900015027
10	Circulation pump Grundfos Solar PM2 15-145	40900019322
11	Circulation pump Grundfos Solar PM2 15-65	40900019312
12	Seal 17 x 24 x 2 (¾") AFM34	48002002857
13	Seal 21 x 30 x 2 (1") AFM34	48002002847
14	Solar controller WRSol 2.1	660327
15	Name plate WHI sol/heat 20 #1	40900015827
16	Thermo handle -weishaupt-	48002003132
17	Retaining clip insulation	40900015247
18	Cover screw G½A	40900015257
19	Vent valve ⅜" male thread with O ring	48002002537
20	Vent plug G½A	40900015277
21	Reducer G½A X G¼I	40900015267
22	Drain hose G¾ x 1000 with o-ring	51150202422
Not shown in drawing	Connection cable for Hallsensor 2500 mm	48002003127
	Connection cable PWM 2500 mm long	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Plug cable temperature sensor 2500 mm	40900015037
	Hallsensor with LED connection cable	48002002867
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	Safety assembly	48002002632

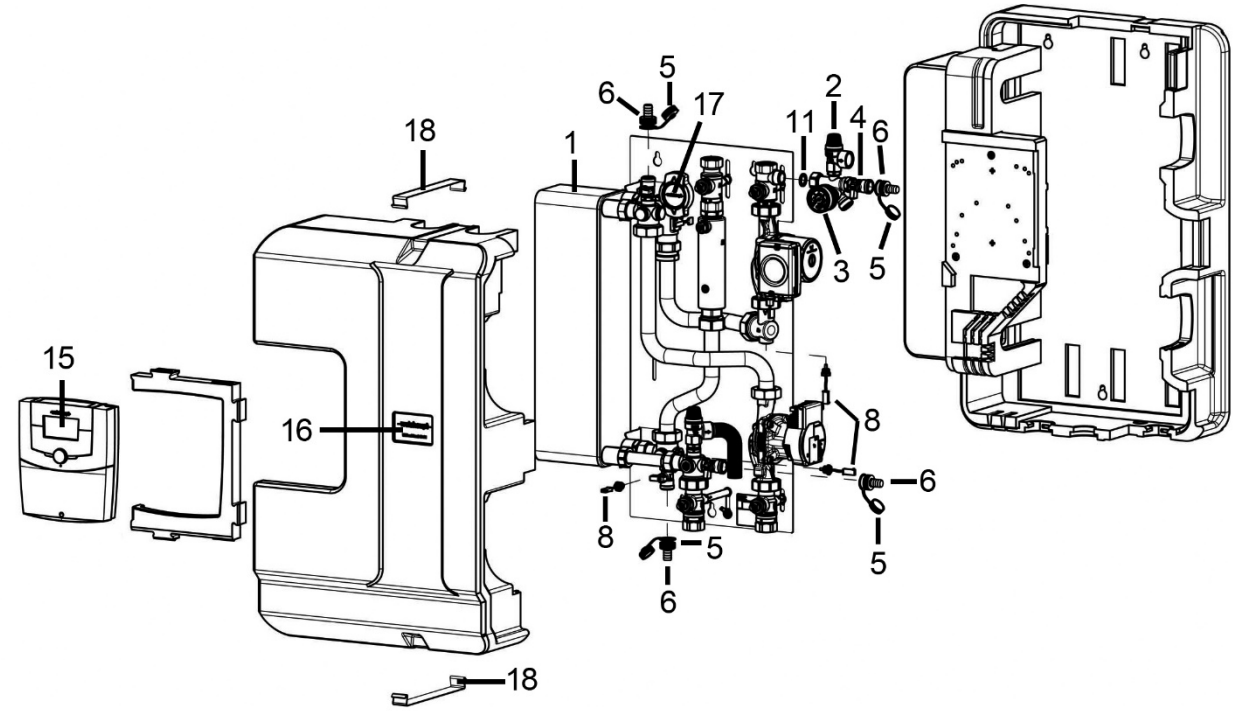
11.2 Spare parts separation station WHI sol/aqua 20 #1 (40900015302)

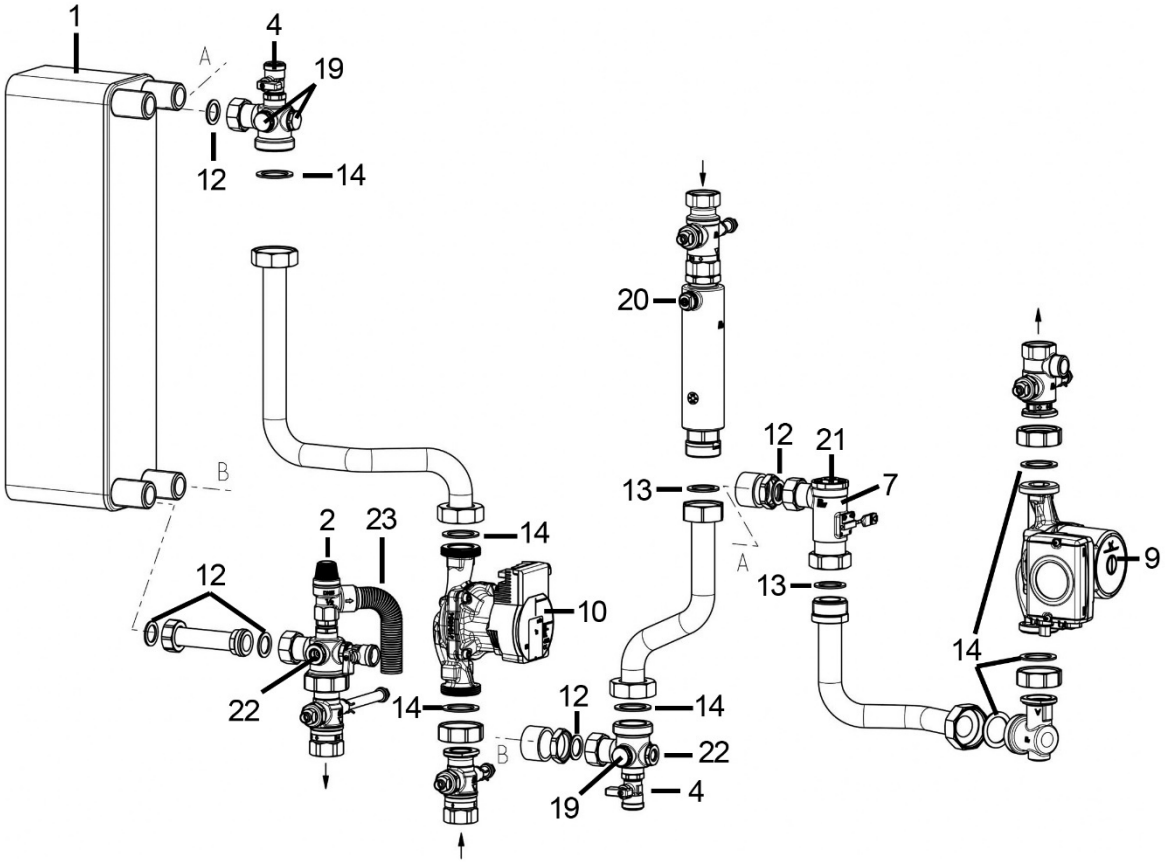


11 Spare parts

Position number	Spare part	-w- Part number
1	Plate heat exchanger Swep IC25T/30	40900015847
2	Safety valve 6 bars ½" solar	48002002637
3	Safety valve 10 bars ½"	40900015057
4	Pressure gauge 6 bars diameter 50 / G¼"	48002002647
5	Piston valve DN 20 G1A with drainage	40900015092
6	Non return valve DN 20 G1Fl.xG1A	40900015227
7	Inlet and outlet valve G½" with hex. nut	48002002667
8	Inlet and outlet valve G½, suitable for domestic water	40900015857
9	Cap for inlet and outlet valve	48002002677
10	Union nut ¾" knurled for KFE valve ½", with hose sleeve	40900015867
11	Hose sleeve 90° with G¾ union nut	40900015447
12	FlowRotor DN 25 90°	40900015572
13	Temperature sensor NTC 5K G¼A	40900015027
14	Circulation pump Grundfos Solar PM2 15-145	40900019322
15	Circulation pump Grundfos UPM2 15-75 CIL	40900019342
16	Seal 17 x 24 x 2 (¾") AFM34	48002002857
17	Seal 21 x 30 x 2 (1") AFM34	48002002847
18	Seal 21 x 30 x 2 (1") EPDM 90	40900015167
19	Solar controller WRSol 2.1	660327
20	Name plate WHI sol/aqua 20 #1	40900015807
21	Thermo handle -weishaupt-	48002003132
22	Retaining clip insulation	40900015247
23	Cover screw G½A	40900015257
24	Vent valve ⅜" male thread with O ring	48002002537
25	Vent plug G½A	40900015277
26	Reducer G½A X G¼I	40900015267
27	Drain hose G¾ x 1000 with o-ring	51150202422
Not shown in drawing	Connection cable for Hallsensor 2500 mm	48002003127
	Connection cable PWM 2500 mm long	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Plug cable temperature sensor 2500 mm	40900015037
	Drainage valve with O ring G¼A	40900015097
	Closing plug G¼A	40900015107
	Hallsensor with LED connection cable	48002002867
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	Safety assembly	48002002632

11.3 Spare parts separation station WHI sol/heat 40 #2 (40900015292)

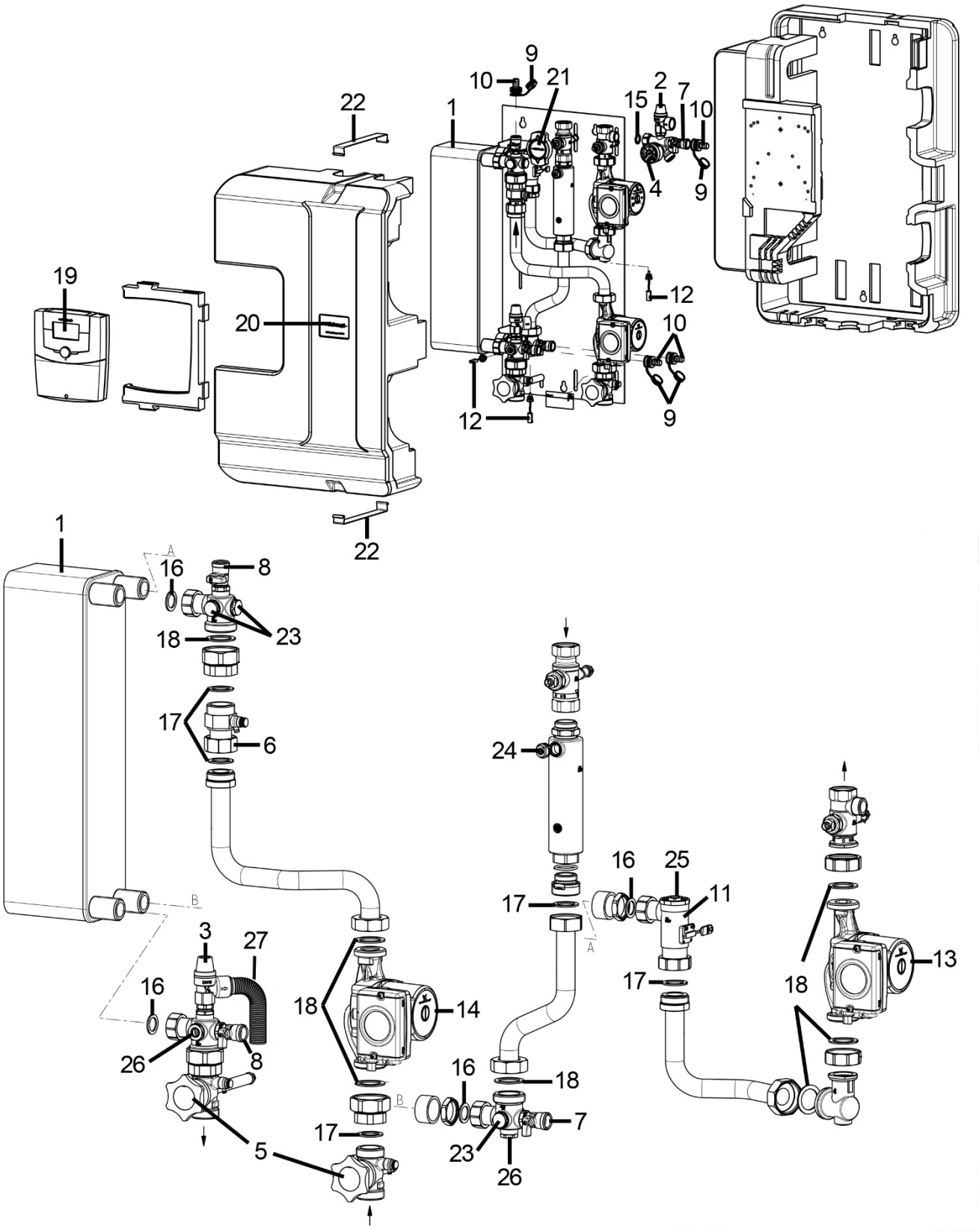




11 Spare parts

Position number	Spare part	-w- Part number
1	Plate heat exchanger Swep IC25T/60	40900015207
2	Safety valve 6 bars ½" solar	48002002637
3	Pressure gauge 6 bars diameter 50 / G¼"	48002002647
4	Inlet and outlet valve G½" with hex. nut	48002002667
5	Cap for inlet and outlet valve	48002002677
6	Union nut ¾" knurled for KFE valve ½", with hose sleeve	40900015867
7	FlowRotor DN 32 90°	40900015602
8	Temperature sensor NTC 5K G¼A	40900015027
9	Circulation pump Grundfos Solar PML2 25-145	40900019332
10	Circulation pump Wilo Para ST 25-180 / 8-75 / iPWM2-12	40900019372
11	Seal 17 x 24 x 2 (¾") AFM34	48002002857
12	Seal 21 x 30 x 2 (1") AFM34	48002002847
13	Seal 27 x 38 x 2 (1¼") AFM34	40900015127
14	Seal 32 x 44 x 2 (1½") AFM34	40900014097
15	Solar controller WRSol 2.1	660327
16	Name plate WHI sol/heat 40 #2	40900015527
17	Thermo handle -weishaupt-	48002003132
18	Retaining clip insulation	40900015247
19	Cover screw G½A	40900015257
20	Vent valve ⅜" male thread with O ring	48002002537
21	Vent plug G½A	40900015277
22	Reducer G½A X G¼I	40900015267
23	Drain hose G¾ x 1000 with o-ring	51150202422
Not shown in drawing	Connection cable for Hallsensor 2500 mm	48002003127
	Connection cable PWM 2500 mm long	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Plug cable temperature sensor 2500 mm	40900015037
	Hallsensor with LED connection cable	48002002867
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	Safety assembly	48002002632

11.4 Spare parts separation station WHI sol/aqua 40 #1 (40900015312)



11 Spare parts

Position number	Spare part	-w- Part number
1	Plate heat exchanger Swep IC25T/60	40900015207
2	Safety valve 6 bars ½" solar	48002002637
3	Safety valve 10 bars ½"	40900015057
4	Pressure gauge 6 bars diameter 50 / G¼"	48002002647
5	Piston valve DN 25 G1¼A with drain	40900015102
6	Non return valve DN 25	40900015327
7	Inlet and outlet valve G½" with hex. nut	48002002667
8	Inlet and outlet valve G½, suitable for domestic water	40900015857
9	Cap for inlet and outlet valve	48002002677
10	Union nut ¾" knurled for KFE valve ½", with hose sleeve	40900015867
11	FlowRotor DN 32 90°	40900015602
12	Temperature sensor NTC 5K G¼A	40900015027
13	Circulation pump Grundfos Solar PML2 25-145	40900019332
14	Circulation Grundfos UPML 25-105 N	40900019302
15	Seal 17 x 24 x 2 (¾") AFM34	48002002857
16	Seal 21 x 30 x 2 (1") AFM34	48002002847
17	Seal 27 x 38 x 2 (1¼") AFM34	40900015127
18	Seal 32 x 44 x 2 (1½") AFM34	40900014097
19	Solar controller WRSol 2.1	660327
20	Name plate WHI sol/aqua 40 #1	40900015817
21	Thermo handle -weishaupt-	48002003132
22	Retaining clip insulation	40900015247
23	Cover screw G½A	40900015257
24	Vent valve ⅜" male thread with O ring	48002002537
25	Vent plug G½A	40900015277
26	Reducer G½A X G¼I	40900015267
27	Drain hose G¾ x 1000 with o-ring	51150202422
Not shown in drawing	Connection cable for Hallsensor 2500 mm	48002003127
	Connection cable PWM 2500 mm long	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Plug cable temperature sensor 2500 mm	40900015037
	Drainage valve with O ring G¼A	40900015097
	Closing plug G¼A	40900015107
	Hallsensor with LED connection cable	48002002867
	Temperature sensor NTC 5K ZTF 222.2	660228
	Temperature sensor NTC 5K STF 225	660262
	Safety assembly	48002002632

12 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 the station and the collector field)

Pipeline ⌀ = mm l = m

Venting (collector field) ☐ Not available ☐ Vented

☐ Manual bleeder ☐ Automatic bleeder

Airstop (station) ☐ Vented

Solar fluid (type) % of glycol

Antifreeze (checked up to): °C

Flow rate l/m

Pump (type)

System pressure mbars

Expansion tank (type)

Initial pressure mbars

Safety valve ☐ Checked

Check valves ☐ Checked

Serial numbers	
Station	
Temperature sensor	
Controller	
Software version	

Installation company

12 Commissioning log

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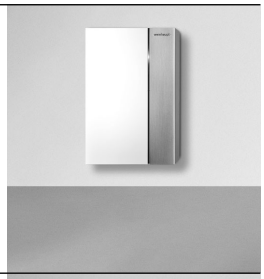
Weishaupt customers can be assured that specialist knowledge and tools are available whenever they are needed. Our service engineers are fully qualified and have extensive product knowledge, be it for burners, heat pumps, condensing boilers or solar collectors.

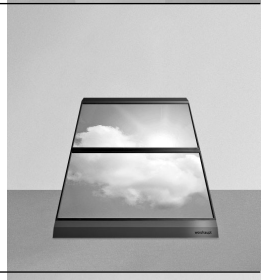


Wall-hung condensing boilers for gas **up to 240 kW**

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.