

Installation of the Hot Water Station WWS-24

In the SolvisDirekt System with WK-WWS-24 Wall Console



- **Installation**
- **Start-up**
- **Maintenance**



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Contents

1	Notes	3
1.1	General Information	3
1.2	Intended use	3
2	Scope of Delivery	4
3	Installation	5
3.1	Wall-Mounted Installation	5
3.2	Hydraulic connection	5
3.2.1	Connection to the storage tank	5
3.2.2	Cold water and hot water connection	6
3.3	Electrical connection	6
3.3.1	General information	6
3.3.2	Electrical connection and sensor installation	7
4	Start-Up	8
4.1	Hot water station	8
4.2	Thermal mixing valve	8
5	Maintenance	9
5.1	General maintenance	9
5.2	Flushing the hot water heat exchanger	9
6	Technical Data	10
7	Appendix	11
7.1	Installation diagrams	11
7.2	Connection to SolvisDirekt	12
8	Index	13

1 Notes

1.1 General Information

**Observe the safety notes**

This is for your own safety.

- Make sure that you are familiar with the safety notes before beginning work.
- Observe and adhere to the relevant safety regulations and the valid accident prevention regulations.
- You should also follow the safety notes and any other notes from the available system documentation.

Functional description

The hot water station enables the central, hygienic and economical production of hot water in direct flow. During this process, the inlet temperature is limited by a thermostatic mixing valve.

Solvis fresh water systems offer:

- **Best protection against calcification:** The heat exchanger is protected against calcification, which extends its service life.
- **Greater safety:** No temperature peaks at the taps thanks to fast adjustment.
- **More comfort:** You can accurately set the desired hot water temperature.
- **More efficiency:** Components designed to work together in perfect harmony (storage tank, stations and control).

Applications

This hot water station is usually used in small systems, where it is integrated under the protective cover of the SolvisMax. These installation instructions describe the installation of the hot water station using the wall console in the SolvisDirekt system in combination with the SolvisStrato stratified buffer tank.

For the specifications of the hot water station, see → section "Technical Data", p. 10).

1.2 Intended use

Solvis hot water stations are to be used solely for the heating of drinking water in accordance with German water regulations [TrinkwV]. The use of these systems for other purposes is not permitted.

2 Scope of Delivery

Hot water station (WWS-24)

Delivery up to 24 l/min (at 45 °C).

Consisting of:

- Stainless steel plate heat exchanger, copper brazed
- Circulation pump
- Thermostatic mixing valve
- Gravity brake
- Manual bleeder
- Temperature sensor (S2) for hot water production
- Heat insulation
- Volume flow encoder (VSG-W).

WK-WWS-24 Wall Console

Bracket made of galvanised steel for mounting the WWS-24 hot water station onto the wall, measuring approx. 34 x 63 x 22 cm. The following parts are included in the kit:

- 1 x frame
- 2 x mounting brackets
- 4 x cross braces
- 1 x fixing bracket with 2 x hexagon screws
- 4 x hexagon screws, long with washers and nuts
- 4 x hexagon screws, long with nuts
- 4 x hexagon screws, short with nuts
- 1 x cable harness: pump
- Cable binder
- Installation instructions (P50).

3 Installation

3.1 Wall-Mounted Installation

Assembling the wall console

1. Assemble the wall console as shown in → Fig. 9, page 11.

Attaching the wall console

1. Mark the positions of the drilling holes in the correct positions as shown in → Fig. 10, page 11.
2. Drill drilling holes with a diameter of 10 mm and insert the supplied wall plugs.
3. Screw on the wall console.

Installing the hot water station

1. Attach the supplied mounting bracket (1) to the console using the screws (2) that are included.
 2. Install the ball valves on the hot water station (on-site, 3).
 3. Insert the hot water station into the console so that the hot water pipe (4) is in front and the cold water pipe (5) is behind the cross brace (6) of the console.
- Make sure that the mounting bracket locks properly into the recesses of the rear insulation.
4. Push the hot water station firmly into the mounting bracket (1) as far as it will go.
 5. Slide the lower pipe bracket (7) onto the pipe ends right side up (observe labelling) and fasten to the console using the screws that are supplied.

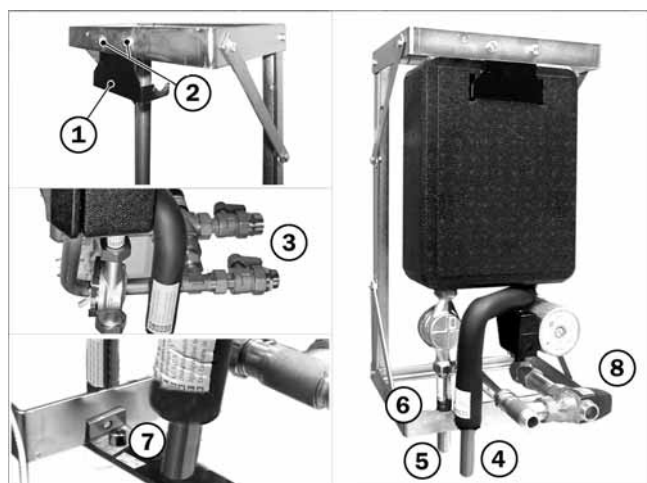


Fig.1: Installing the hot water station

 The “thermal mixing valve”, → Fig. 1 (8), is preset at the factory. If it needs resetting, refer to → section “Setting the thermal mixing valve”.

3.2 Hydraulic connection



For detailed system diagrams, see → *Operating Instructions for System Operators and Installers* (P32).

3.2.1 Connection to the storage tank

Pipe dimensions:

The nominal diameter must be at least 20 DN and the pipe line must not exceed 3 m (basic length).

Connecting the hot water station

1. Connect the G1“ connection of the HWS return (1) of the hot water station with the appropriate connection (HW Return) on the storage tank. To do so, also mount a T-piece with boiler filling and emptying valve and a shut-off valve.
2. On-site, lay the pipes between the G3“ connection of the HWS return (2) of the hot water station with the appropriate connection (HW Return) on the storage tank. To do so, also mount a T-piece with boiler filling and emptying valve and a shut-off valve.
3. Insulate pipe lines in accordance with German Energy Conservation regulations EnEV.

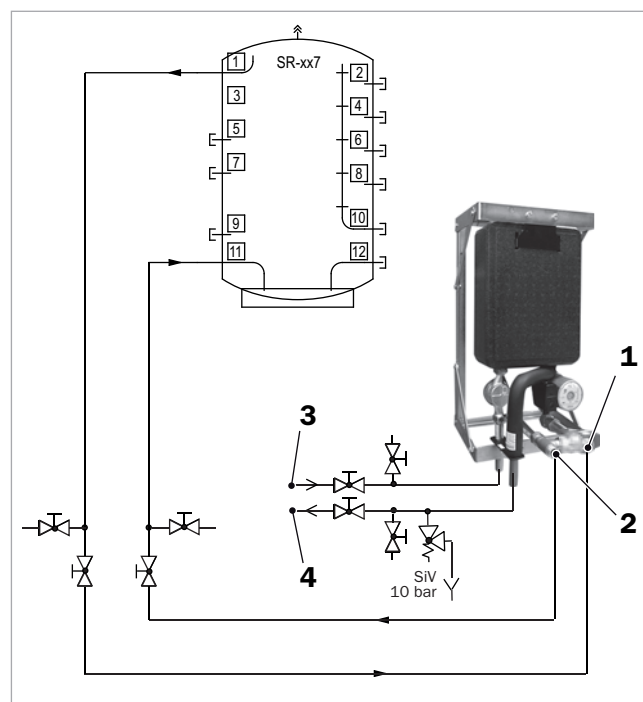


Fig.2: Lay the hot water piping on-site

- 1 Flow connection of storage tank
- 2 Return connection of storage tank
- 3 Cold drinking water connection
- 4 Hot drinking water connection

3 Installation

3.2.2 Cold water and hot water connection



CAUTION

Observe the connection rules

- Install the cold water connection according to "Specifications for installations inside buildings conveying water for human consumption" in compliance with DIN EN 806 and DIN 1988.
- A drinking water filter must be provided for metal pipes according to DIN 1988.
- A suitable safety valve must be provided in the cold water line to protect the expansion volume of the heated drinking water.

Connecting cold and hot water

1. Lead the cold and hot water connection under the station with the 22 mm clamp ring brackets (included in the hot water station).
2. Lay the pipes between the cold water connection and the drinking water line on site-, using a T-piece with a boiler filling and emptying valve and a shut-off valve.
3. On-site, lay the pipes between the hot water connection and the hot water distribution network, mounting a safety valve (10 bar), a T-piece with boiler filling and emptying valve and a shut-off valve.
4. Insulate pipe lines in accordance with German Energy Conservation regulations EnEV.

Insulating pipe lines

1. Insulate pipe lines in accordance with German Energy Conservation regulations EnEV.

3.3 Electrical connection

3.3.1 General information



DANGER

Risk of electrical shock

Damage to health up to and including cardiac arrest possible.

- Disconnect the system from the mains before carrying out work on it and ensure that it cannot be turned on again



WARNING

In the event of incorrect mains connection

Contact voltages can be extremely hazardous.

- All mains connection work must be performed by authorised technicians.
- Work must be done in compliance with relevant regulations, especially DIN VDE 0100/IEC 60364 (Erection of power installations), accident prevention regulations and the guidelines of the responsible power supply company.
- Before connection, the current type and the mains voltage must be compared with the specifications on the unit nameplate.
- The minimum cross section of all connection lines must be designed in accordance with the power consumption of the unit.
- Only operate the unit while observing the prescribed safety measures and information in these instructions.
- Incorporate the unit into the local equipotential bonding while observing the minimum cross section.
- Ensure that the phase is correct during multi-phase mains connection.



CAUTION

Country-specific regulations

Country-specific regulations can differ depending on the country and the region.

- These are to be observed and adhered to in order to ensure safe and faultless operation.
- If certain laws and regulations do not apply in a particular country, they are to be replaced by the country's own specific laws and regulations.



CAUTION

Prevent the system from being influenced by electromagnetic fields.

Risk of heating system malfunction or failure.

- Prevent electrostatic discharges.
- Keep strong electrical fields such as those created by mobile phones away from the heating system. These fields can cause sensitive electronic components to malfunction.

**CAUTION****Criteria for line installation**

Malfunction or failure of heating system possible.

- Check that all cable and plug connections are connected correctly.
- The bus and sensor lines must be routed separately from lines over 50 V to prevent the controller from being influenced by electromagnetic fields.
- Do not install control devices directly adjacent to control cabinets or electrical devices.
- The electrical lines must not come into contact with hot parts.
- If possible, run all lines in a cable channel and, if necessary, secure with strain relief devices.

**CAUTION****Criteria for line length**

Risk of heating system fault or failure.

- The overall cable resistance for the sensor cables may not exceed 2.5 Ohms. For cables with a diameter of 0.25 mm², this corresponds to a length of up to 5 m.
- For diameters of 0.5 or 0.75 mm², the maximum cable length is 15 or 50 m.
- The sensor cable may not be longer than necessary. For very long cables, sensor correction can be performed to minimise systematic deviation errors.

**CAUTION****Observe ambient conditions**

Malfunction or failure of system possible.

- Avoid ambient temperatures outside of the permitted range of 0 °C to +50 °C.
- Avoid dew condensation and an annual mean relative humidity higher than 75% (briefly 95%).

3.3.2 Electrical connection and sensor installation

Connecting the hot water pump

1. Connect the cable harness of the hot water pump to connection A2 of the mains module of the SolvisControl 2; lengthen the cable if necessary.
2. Attach the plug to the hot water pump.



Fig. 3: Connecting the hot water pump

Connect hot water sensor S2

1. Cut off the plug on the white cable and lengthen the cable up to the controller.
2. Connect the cable to S2 on the mains module.

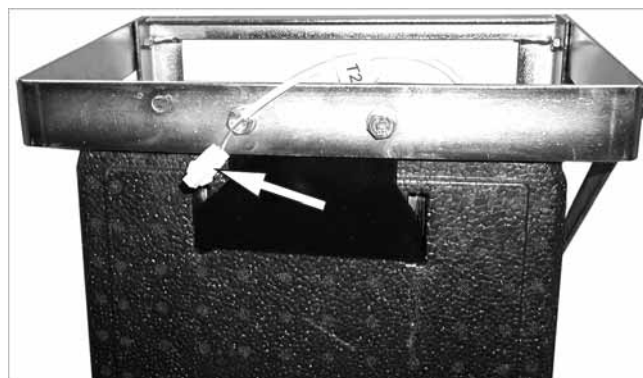


Fig. 4: Connecting the sensor cable

Connecting the volume flow encoder (VSG-W)

1. Position the line of the volume flow encoder (see arrow) along up to the mains module and route the line to the terminals (S18) on the socket board (polarity is not important).



Fig. 5: Routing the VSG-W line

4 Start-Up

i The current sensor values are indicated on the SolvisControl in the “System status” window.

 For more detailed information on operating the controller, see → *Operation Instructions for System Operators and Installers (P32)*.

4.1 Hot water station

 Start-up the system as described → *in the installation instructions (P20)*.

Bleeding the hot water station

1. Open the ball valves from and to the storage tank.
 2. On the SolvisControl, switch the hot water pump (output A2) to manual mode.
- The hot water pump starts and pushes the air out of the pipe lines.
3. After several minutes of flushing, open the two valves on the top of the connections to the plate heat exchanger and then firmly close them again once the air has escaped out.
 4. Check all connections for leaks.
 5. Switch output A2 on the SolvisControl back to automatic mode.

Testing the hot water temperature

1. Test the hot water temperature at a tap.

Troubleshooting:

If the hot water temperature is too low, check the following:

- Is the hot water line insulated according to German Energy Conservation regulations EnEV?
- Is the hot water target temperature set at max. 48 °C?
- Is the thermal mixing valve set correctly?
- Is there air in the storage tank or heat exchanger (bleed if required)?
- Is the non-return valve in the circulation pipe properly operational?

4.2 Thermal mixing valve

The thermal mixing valve (TMV) on the hot water supply is preset at the factory. It should only be optimised if the system is being operated in areas with hard drinking water from 14 °dH (calcium carbonate content > 2.5 mol/m³). This minimises lime deposits.

Setting the thermal mixing valve

1. Heat up the storage tank to ≥ 65 °C, as measured on sensor S1 (storage tank, top).
2. Remove the cap from the “thermal mixing valve” (see arrow).
3. Once a storage tank temperature of ≥ 65 °C has been reached, switch the hot water pump (output A2,

primary circuit of the plate heat exchanger) on the SolvisControl to “ON” (manual mode).

4. Set the hot water delivery volume to 3 litres/min on a nearby tap.
5. Vary the setting of the “thermal mixing valve” so that the hot water temperature is 60 °C at the sensor (S2).
6. Shut off the hot water delivery and attach the cap of the “thermal mixing valve”.
7. Switch the hot water pump (output A2, primary circuit of the plate heat exchanger) on the SolvisControl to “Auto” (automatic mode).



Fig. 6: Removing the cap from the TMV



Fig. 7: Setting the TMV

- i** • This setting ensures that a temperature of 60 °C is not exceeded on the drinking water side (even with small delivery volume flows) and lime deposits are thereby kept to a minimum.
- The maximum performance of the hot water station is somewhat impaired at this setting, however this only very rarely results in a lower degree of comfort.

5 Maintenance

5.1 General maintenance

Maintenance and cleaning work must be performed once a year in accordance with German Energy Conservation Regulations (EnEV) and to maintain warranty claims.

Do not flush the heat exchanger unless there are problems with the hot water supply.



For a description of maintenance, see → sec. "Maintenance" in the installation instructions (P20).

5.2 Flushing the hot water heat exchanger

Prepare the hot water heat exchanger

1. Switch the system off, remove the insulation shells and remove the hot water heat exchanger from the hot water station.
2. Connect the pressure and flushing hose on the flushing side so that they system can flush counter to the direction of operation.

Flushing the hot water heat exchanger

Only flush if contamination or calcification leads to an interruption in the hot water supply.

1. Flush the hot water heat exchanger on the drinking water/heating side in the opposite direction of operation using 20% formic acid for approx. 15 mins.
2. To remove any acidic residue, flush the hot water heat exchanger with water for approx. 5 mins.

For flushing on the drinking water side, also:

3. Check and clean the aerators on the taps.
4. Carefully flush the taps after cleaning.

Setting up hot water standby

1. After the system has finished flushing, disconnect the pressure and flushing hose.
2. Install the hot water heat exchanger into the hot water station and attach the insulation shells.
3. Start up the system.

6 Technical Data

WWS-24 hot water station installed on WK-WWS-24 wall console

Technical Data	WWS-24
Maximum output quantity (TWK = 10 °C, TWW = 45 °C, flow = 65 °C)	24 l/min
Rated discharge output	59 kW
Hot water heat exchanger (Alfa Laval)	CB 18 - 49
Hot water pump (Wilo)	RS 15/7
W x H x D (incl. insulation)	250 x 355 x 226 mm
Weight (not filled, with console)	approx. 16 kg
Hot water station clearance to wall	approx. 40 mm
Cold and hot water connections	22 mm clamp ring screw connection
Cold water connection (centre) clearance to wall	145 mm
Hot water connection (centre) clearance to wall	295 mm
Pipe connections to storage tank	Flat sealing fitting; flow: 1" male thread, return: ¾" male thread
Clearance between wall and connections to storage tank	400 mm
Permitted media temperature (at max. 40 °C ambient temperature)	95 °C
Maximum permitted operating pressure, heating side	3 bar
Maximum permitted operating pressure, drinking water side	10 bar
Insulation	Heat insulation shell made from EPP
Control	SolvisControl 1 system controller
Electrical voltage supply and maximum power consumption	230 V AC/50 Hz, 120 W

Pressure loss

Under the following conditions:

- Medium: drinking water
- Medium temperature: 5 – 50 °C.

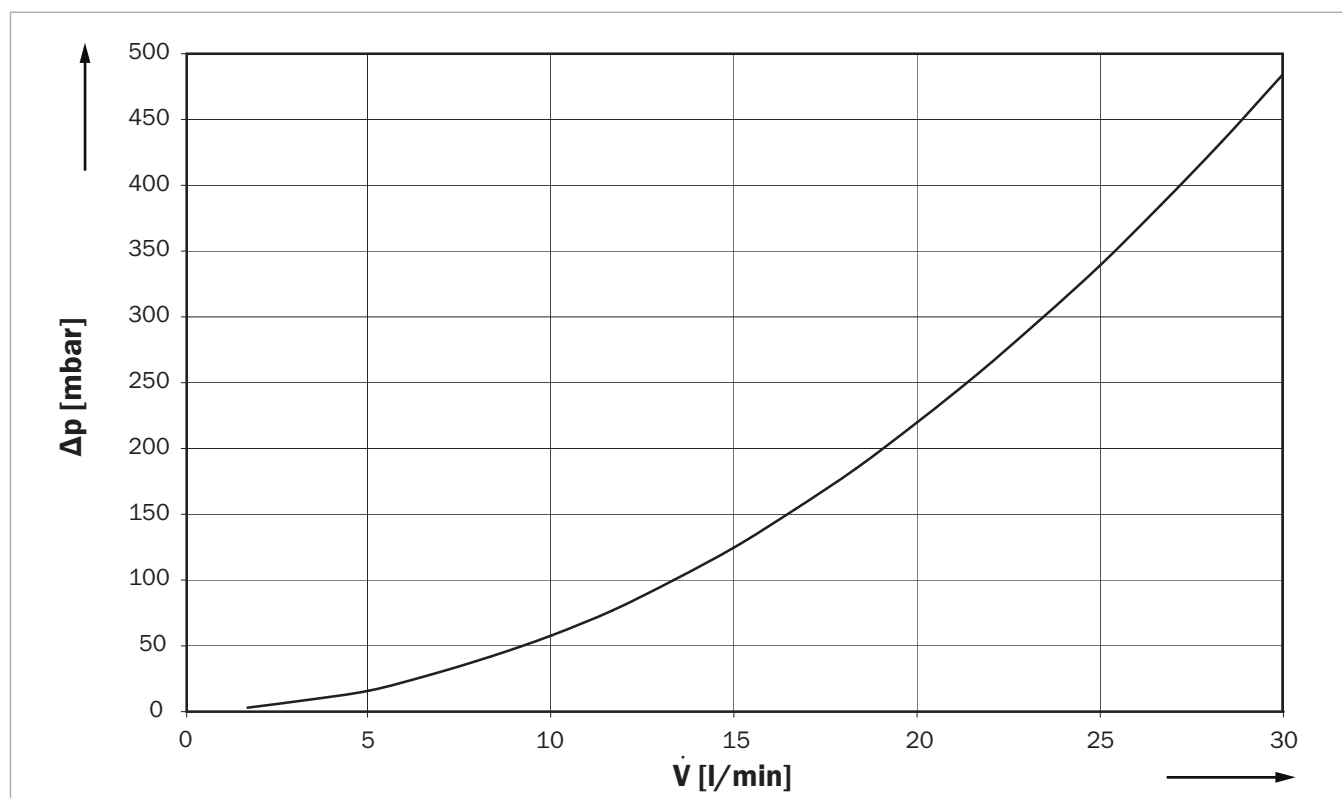


Fig. 8: Pressure loss diagram for the WWS-24 hot water station

$\dot{V}$ Volume flow [l/min]
 Δp Pressure loss [mbar]

7 Appendix

7.1 Installation diagrams

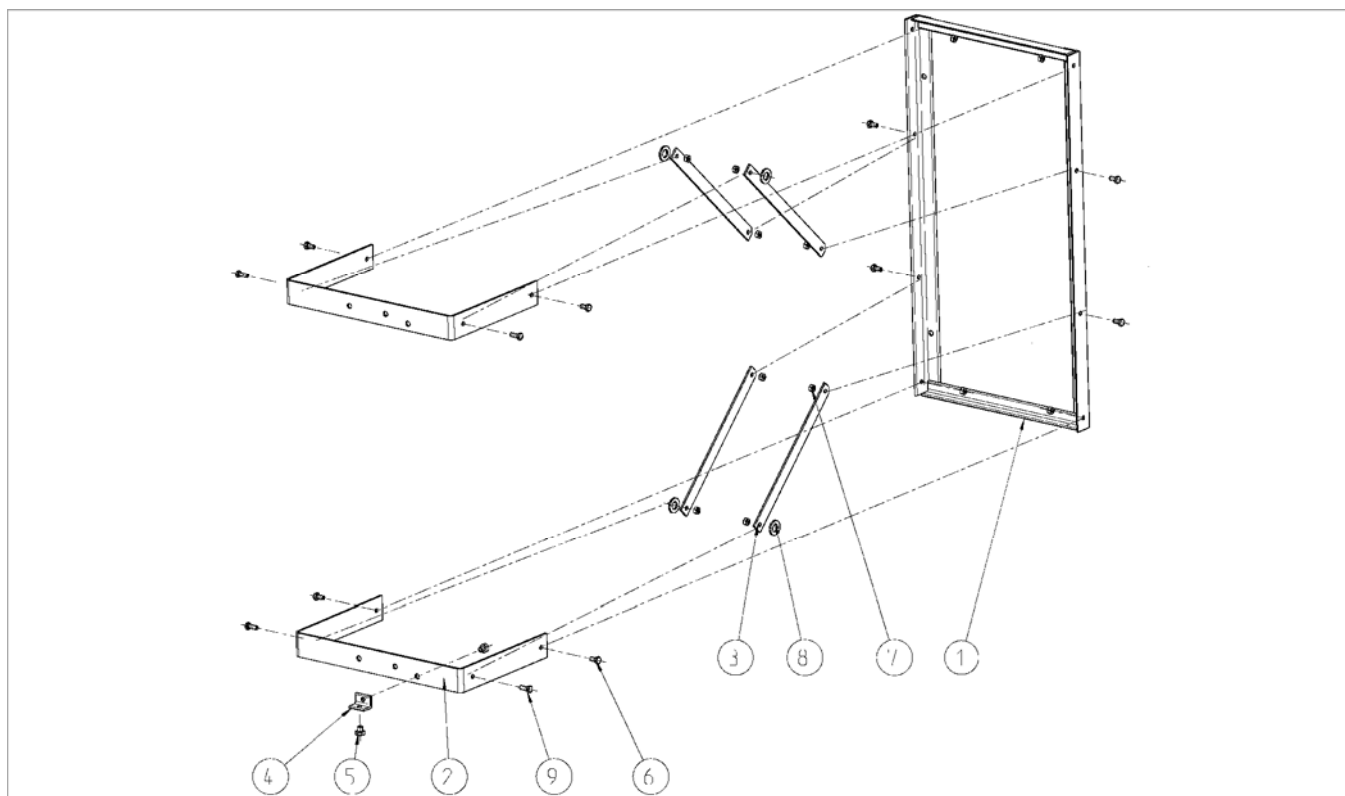


Fig. 9: Assembly diagram for the WK-WWS-24 wall console

- | | | | | | |
|---|------------------|---|----------------------|---|---------------------|
| 1 | Frame | 4 | Fixing bracket | 7 | Hexagon nut |
| 2 | Mounting bracket | 5 | Hexagon screw, short | 8 | Washer |
| 3 | Cross brace | 6 | Hexagon screw | 9 | Hexagon screw, long |

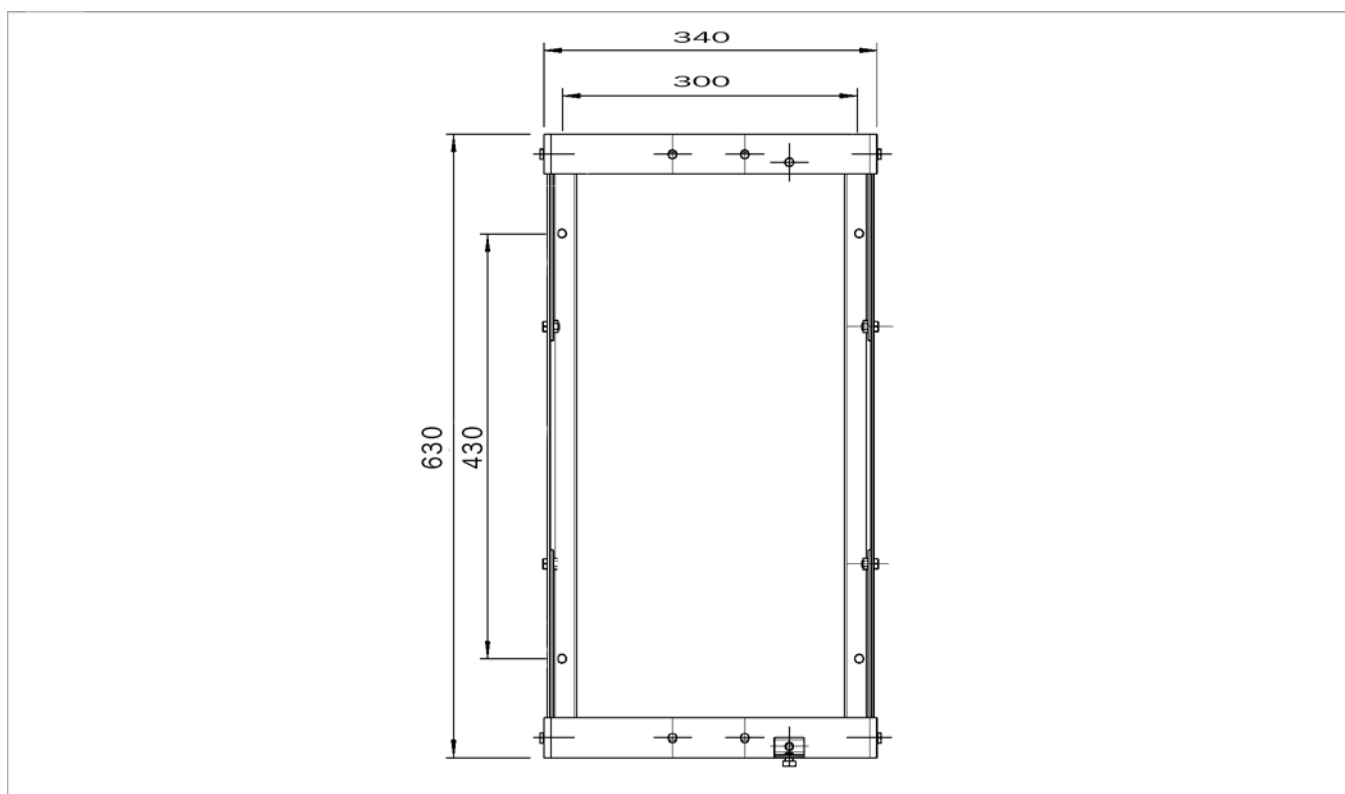


Fig. 10: Drilling diagram for the WK-WWS-24 wall console

7.2 Connection to SolvisDirekt

 For detailed system diagrams, see → document (P36).

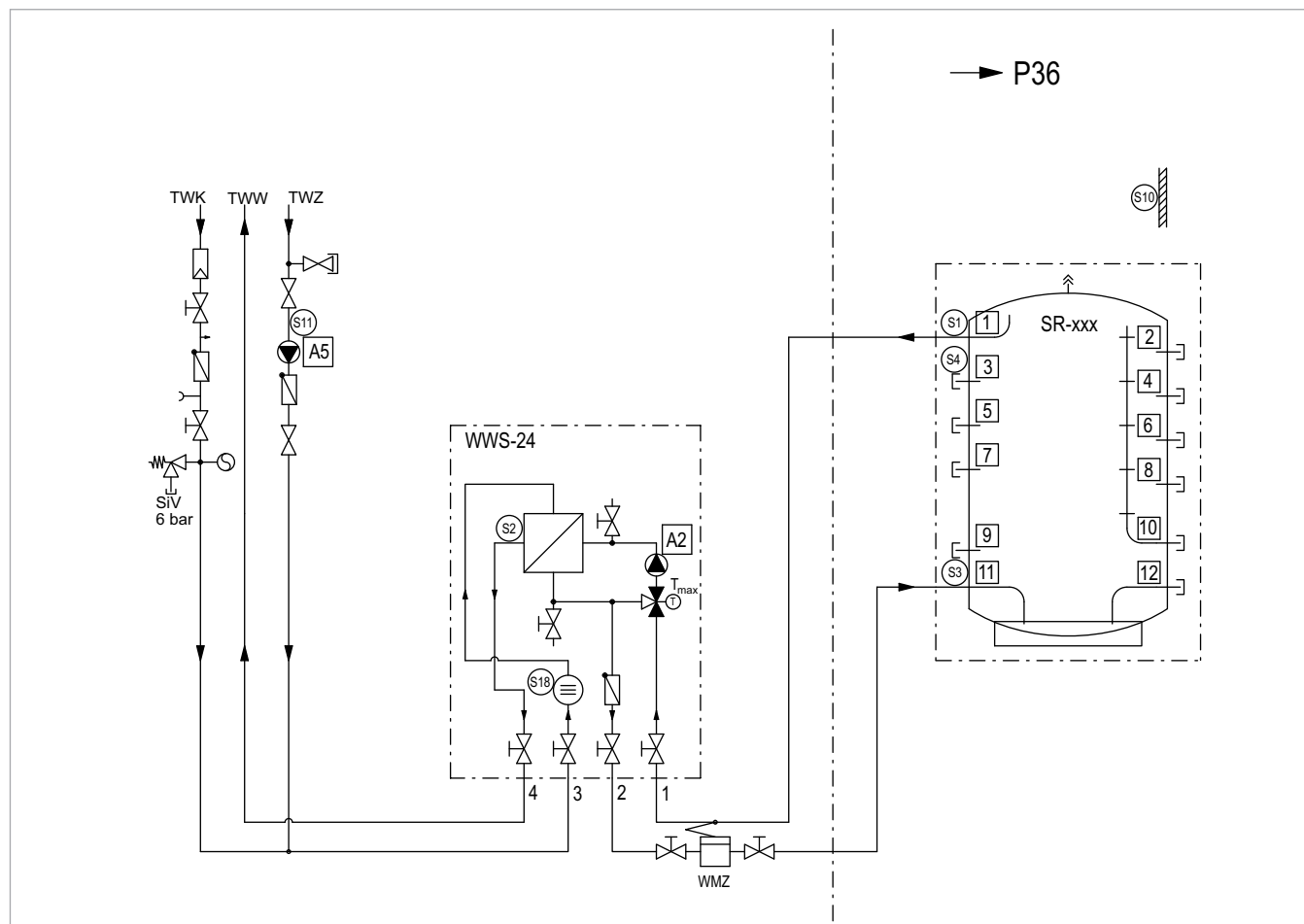


Fig. 11: Connection of the WWS-24 hot water station to the SolvisDirekt 3 system

Sensors

S1	Storage tank, upper
S2	Hot water
S3	Storage tank reference
S4	Heating buffer, upper
S10	Outdoor sensor
S11	Circulation
S18	HW volume flow

Pumps

A2	Hot water production pump
A5	Circulation pump

Abbreviations

TWK	Drinking water network, cold connection
TWW	Drinking water network, warm connection
TWZ	Drinking water network, circulation connection

Modules

SR-xxx	SolvisStrato buffer tank
WWS-24	Hot water station
WMZ	Heat quantity counter

8 Index

A

Applications	3
Assembly diagram	11
Automatic mode	8

B

Ball valves	5, 8
Bracket	4

C

Cable harness	7
Clearance	10
Cold water	6
Cold water connection	10
Connection	12

D

Drilling diagram	11
Drilling holes	5

E

Electrical connection	6
-----------------------------	---

H

Heat exchanger	9
Hot water	6
Hot water connection	10
Hot water pump	7, 8
Hot water sensor	7
Hot water station	5
Hot water temperature	8
Hydraulic connection	5

I

Insulation	10
------------------	----

K

Kit	4
-----------	---

M

Maintenance	9
-------------------	---

P

Pipe connections	10
Plate heat exchanger	8

R

Regulations	6
-------------------	---

S

Sensor cable	7
Small systems	3
SolvisDirekt	3
SolvisDirekt 3	12
Start-up	8

T

Tap	8
Thermal mixing valve	8

V

Volume flow encoder	7
---------------------------	---

W

Wall plugs	5
Wall-mounted installation	5

Note

Note

