

Ergo-Pro Three Line Solar Station for Two Collector Fields Installation and Operating Instructions

**Solar Pump Station DN 16 with
air-jet, drain valve and flow meter
for 2 collector circuits**

Description:	Pump Station (3-Line)
Pump type	WILO ST 15/6
Connection:	thread Rp 3/4

Technical Data

Working pressure:: max. 6 bar
 Working temperature: Flow: max. 140°C
 Return: max. 120°C
 Medium: Water with max. 50% glycol
 Nominal size: DN 16
 Connections: flat seal screw-cap G1
 Materials:
 Sealings: EPDM
 Housing: CW 617 N (2.0402)
 Connecting pieces: CW 614 N (2.0401)
 Isulation: EPP foam
 Thermal conductivity: 0,038 W/mK

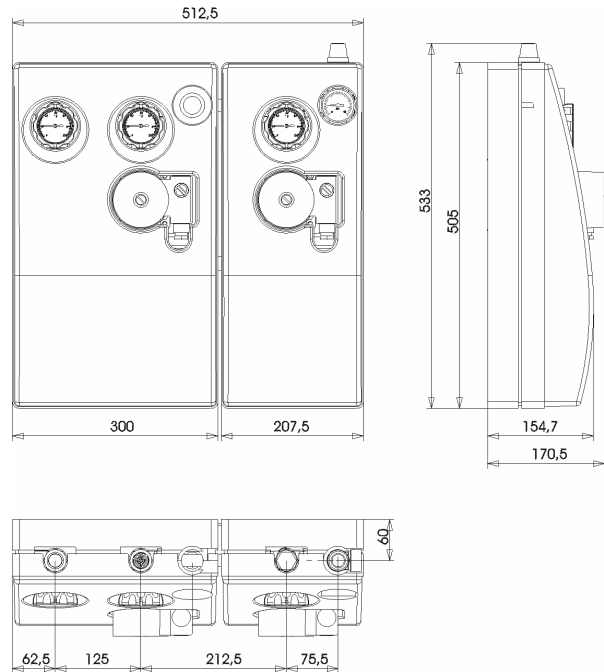


Fig. 1: Dimensions

Included in the package

Pos.	Benennung	Pos.	Benennung
1	Flow ball valve with integrated check valve	13	Front insulation shell (2-line)
2	Return ball valve with integrated check valve	14	Rear insulation shell (1-line)
3	Pressure gauge	15	Front insulation shell (1-line)
4	Solar safety valve, 6 bar	16	Cap G 3/4"
5	Pump: WILO ST 15/6	17	Thermometer
6	Cleaning and filling valve	18	Screen for isolation
7	Flow meter 1-13 l/min	19	Reduction piece Rp3/4"xG1"
8	Air-jet	20	T-Fitting
9	Manual ventilation nipple	21	Reduction piece Rp3/4"xG1"
10	Immersion sleeve G 1/2"	22	Connecting Pipe
11	Membrane Expansion Vessel connection	23	Double nipple Rp3/4"x G3/4"
12	Rear insulation shell (2-line)		

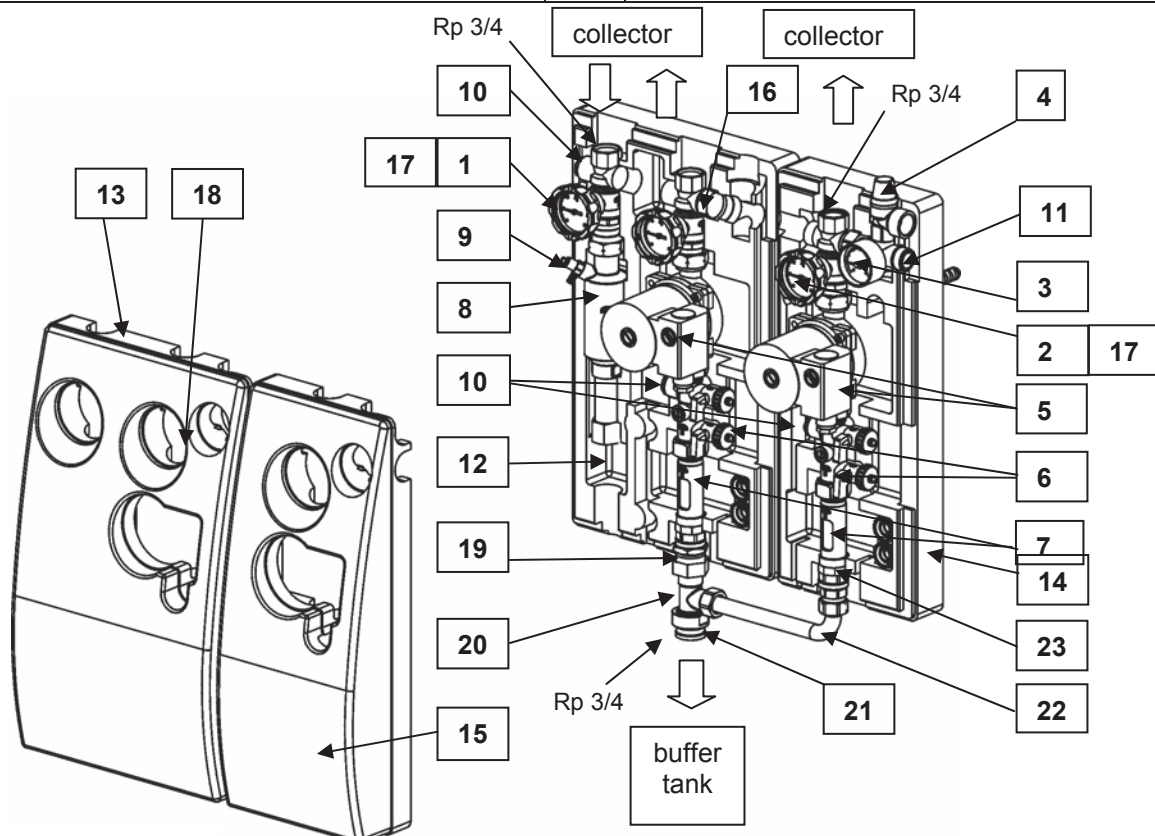


Fig. 2: Components

Advice:

In case of maintenance (e.g. change of pump) all ball valves have to be closed (Fig.2, pos.1 and 2)

Functioning of the check valve

Opening pressure of the check valve: 20 mbar each.

The check valves are integrated in the flow and return ball valves. They are actuated by turning the handles.

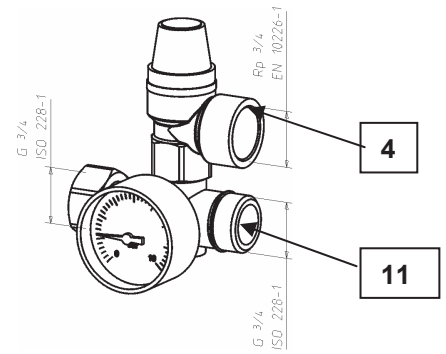
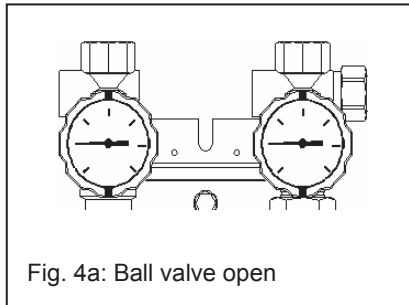
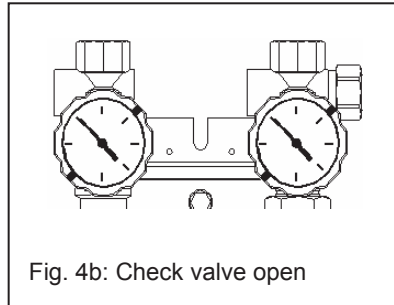


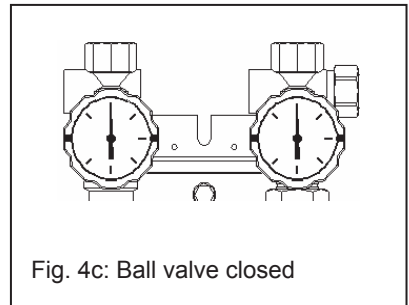
Fig. 3: SIV / MAG connection



To avoid gravity circulation the check valve may not be open. The check valve is in operating position (closed). The slots in the handle are in a vertical position.



To fill and completely empty the solar station, turn the handle to the right and open the check valve. The slots will be in a position of 45°.



Turn the handle to the right by a total of 90°. The ball valve will be closed.

6 – Fill/ Drain Valve

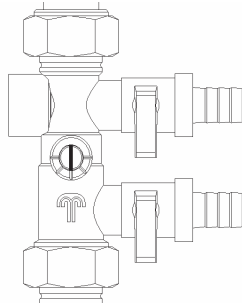


Fig. 5a:
Cleaning valve fully open

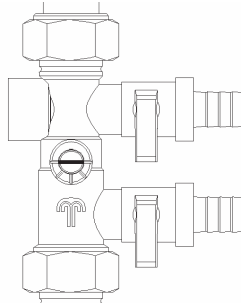


Fig. 5b:
Cleaning valve closed

For cleaning and filling the solar station there are fill and drain valve.

To drain the system, the slot of the spindle must be in a 90° position.

7- Flow meter

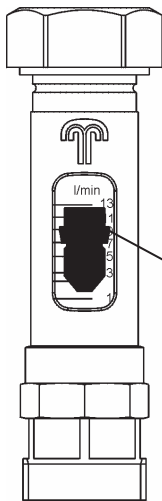
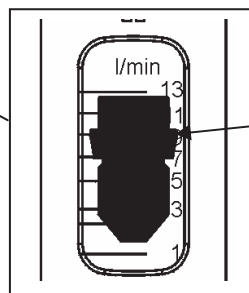


Fig 6: Flow meter

The adjustment of the flow rate of the thermal carrier medium takes place by controlling the speed levels (I, II, III) of the circulation pump and the throttle in the fill/drain valve (Fig.6)

The flow meter displays the set flow rate. The indicator range is between 1 and 13 l/min respectively.



Read volume flow values at this edge of rotameter.

8- Air-jet

Excessive air, which the thermal carrying medium may contain, is collected in the air-jet and can be released manually by the help of the venting nipple. (Fig.2, pos. 9)

Therefore attach a hose on the nozzle and collect the escaping medium in an appropriate vessel.

The process of venting may only be conducted by instructed specialist staff.

Uncontrolled venting will lead to a loss of pressure and malfunction in the solar station.

Caution! Danger of scalding!

The escaping air and the escaping medium may reach temperatures of over 100°C.

Afterwards close the nipple firmly. Please check the operating pressure while venting. If necessary, refill the solar station with the thermal carrying medium.

10- Connecting pieces

In An immersion sleeve with a G $\frac{1}{2}$ male thread for integrating a temperature sensor may be installed in the flow ball valve (fig.2, pos.1) and in the fill/drain valve. (Fig.2, pos.6)

Connecting the Valve Coupling for Membrane Expansion Vessels

Anschluß- Set für MAG: Art.-Nr.: 686.21.50.00

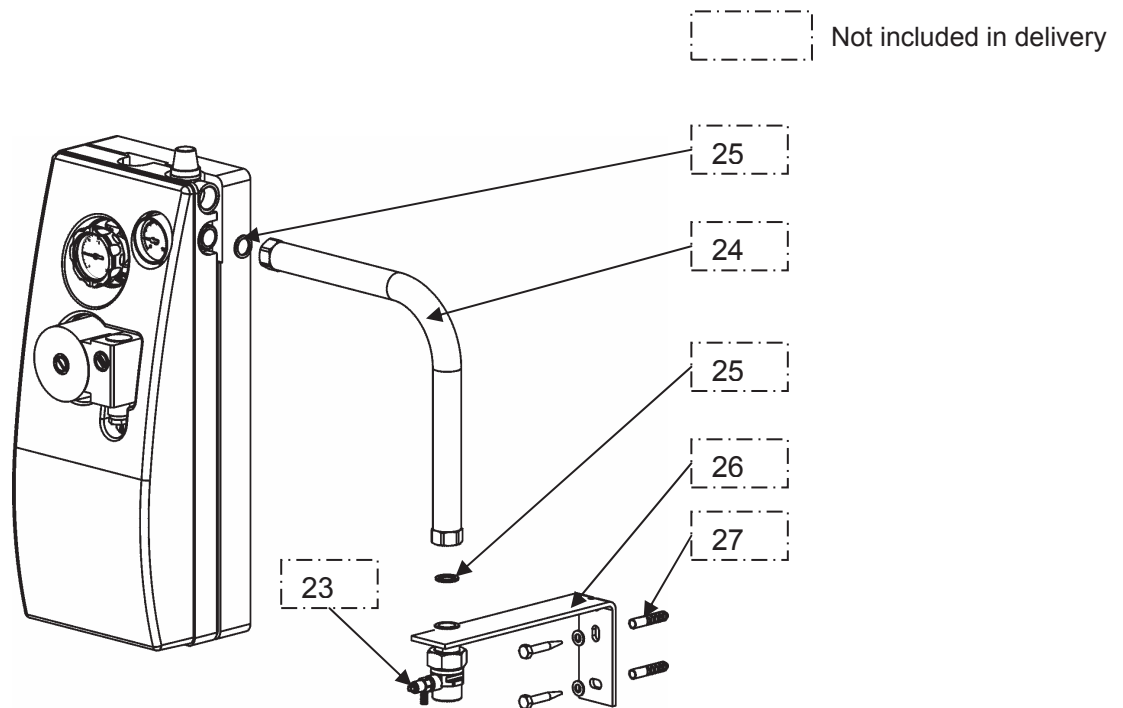


Fig. 7: Connecting the valve coupling

Pos.	Benennung
23	Valve coupling
24	Hose 2xÜWM G $\frac{3}{4}$
25	Sealing set $\frac{3}{4}$ " , 2-parts
26	Wall bracket
27	Fastening material

Wall installation

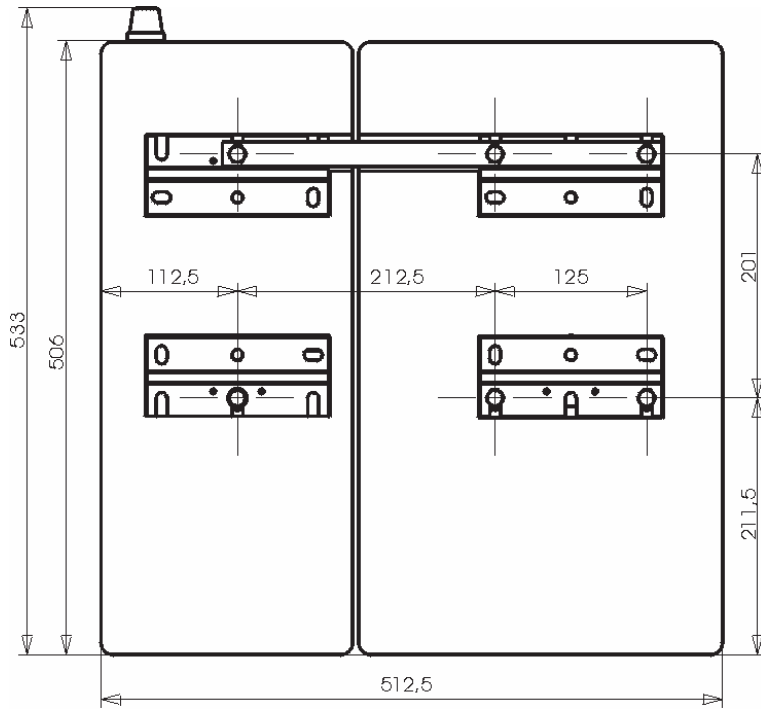


Fig. 8: Dimensions for drilling

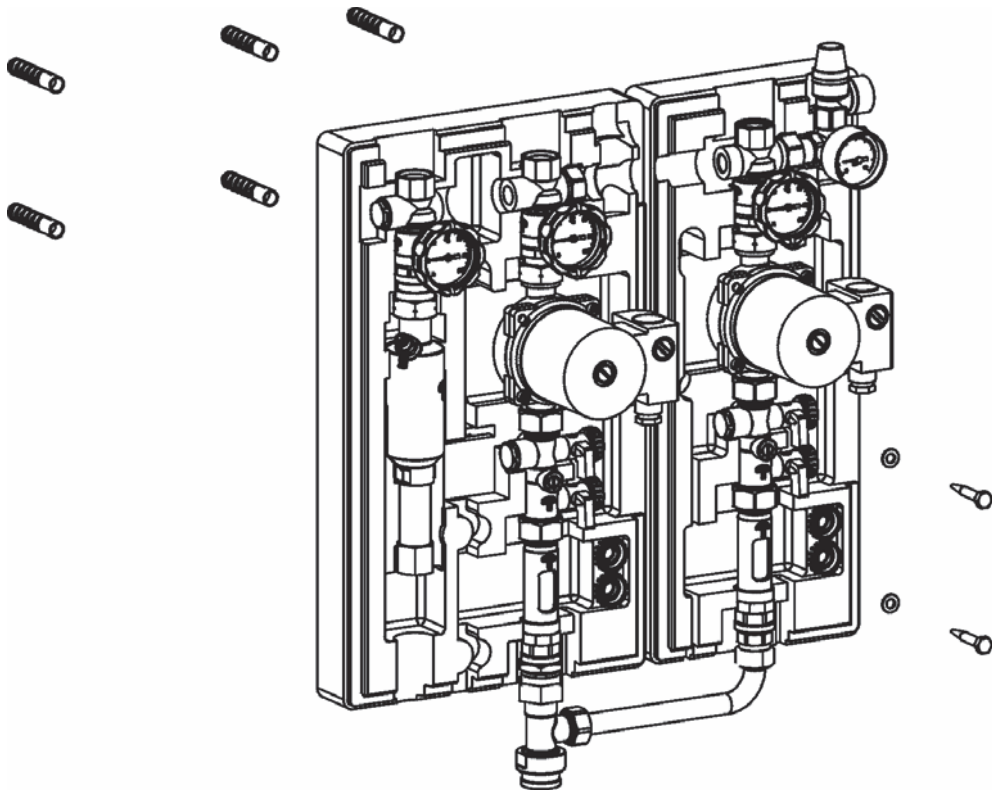


Fig. 9: Wall installation

Extract from the Installation and Maintenance Instructions of the pump

EC declaration of conformity

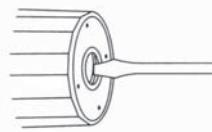
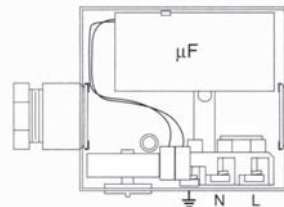
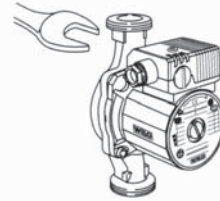
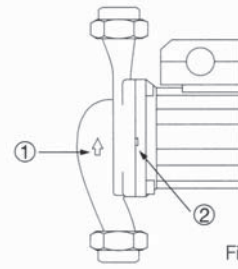
We hereby declare that this unit complies with the following relevant provisions:

EG machinery directive
89/392/EWG in this version,
91/368/EWG, 93/44/EWG,
93/68/EWG

Resistance to electromagnetism
89/336/EWG in this version
92/31/EWG, 93/68/EWG

Applied harmonized standards in particular:

EN 809, EN 50 081-1, EN 50 082-1,
EN 50 081-2, EN 50 082-2.



Safety precautions for the operator

1. General

Installation and service by qualified personnel only

1.1 Fields of application

Type: ST: for solar thermal systems

1.2 Connection and output data

Minimum input pressure at the air intake*

at temperatures + 50°C:	0,05 bar
at temperatures + 95°C:	0,3 bar
at temperatures +110°C:	1,0 bar
Permissible temperature range:	-10°C up to + 110°C
Maximum permissible ambient temperature:	+40°C

*These values are valid up to 300m above sea level.

For higher elevations add: 0,01 bar/100m .

The minimum inlet pressure must be maintained in order to avoid cavitations' noise.

Permissible fluids:

Water and water/glycol mixtures up to a ratio of 1:1. Glycol mixtures require a reassessment of pump hydraulic data in line with the increased viscosity and depending on mixing ratios. Only approved marks of additives with corrosion inhibitors must be used in strict compliance with manufacturers' instructions.

2. Safety Rules**2.1 Safety Rules For The Operator**

Local regulations for the prevention of accidents must be observed. Danger from electrical energy must be excluded (conforming to local or general regulations such as IEC, VDE, etc.)

2.2 Safety Rules for Inspections and Installation Work

It is the operator's responsibility to ensure that inspections and installation work are carried out by authorized and qualified personnel only, having themselves made fully conversant with these instructions. Work must principally be carried out only with the plant switched off and at complete standstill.

2.3 Abnormal Operating Conditions

Operational safety of the plant is only ensured if used in accordance with these instructions. The limits stated there must not be exceeded under any circumstances.

3. Description of Product and Accessories

The pump ST/STL is a solar thermal pump with special hydraulic (pump housing coated) for using in solar thermal systems. Motor overload protection is not required. The motor operates non-overloading. Speed setting: All pumps are equipped with a rotary switch in the terminal box to enable manual 3-speed control (1 = min) (2-3 = max). At minimum speed the maximum speed is reduced to approx. 40...50%. The power input is reduced to approximately 50%.

4. Sitting/Installation**4.1 Installation**

- Direction of fluid flow must correspond with the arrow on the pump housing (Fig. 2, pos. 1).
- If using pump housings with integrated exhaust cavity it must be observed that the connection for the vent or the vent pipe is vertical (12h position).
- When connecting the pump to the conduit of pipes, the pump can be secured against twisting using a spanner on the key surfaces which have been created for this purpose (Fig. 3)

4.2 Electrical wiring

- Cable leads to be routed in such a way to avoid any contact with pipe work and/or pump or stator housings.
- Check that the mains current and voltage comply with the data on the rating plate.
- Effect all wiring according to Wiring diagram (Fig. 4).
- Pump/installation must be earthed in compliance with regulations.

5. Commissioning

5.1 System filling and venting

The pump is normally vented automatically after a short operational period. Short-term dry-running will not harm the pump. Direct venting of the pump, if necessary, is done according to the following procedure:

- Switch off the pump,
- close discharge isolating valve,
- carefully slacken and remove the vent plug (Fig. 5).



Beware of possibly released hot liquid or vapour, depending on fluid temperature and system pressure.

Danger of scalding exists!

- Carefully move pump shaft several times by means of screwdriver, - protect electrical parts from leaking water
- Switch-on the pump
- After 15...30 sec close vent plug again,
- open isolating valve again.

ATTENTION!



It is possible that the pump shaft jams with the vent plug open, depending on system pressure. The pump can become extremely hot, depending on the operational state of the pump or the pipe system (fluid temperature).

Danger of scalding exists when touching the pump!