Installation

Buffer charging station PLAS-G

Type sizes PLAS-G-6.3 / PLAS-G-8.0 / PLAS-G-18

- Installation
- Start-up
- Maintenance

Wärme. Leben. Zukunft.

1 Information About These Instructions

These instructions are intended for you as a technician from an installation company. You will find the specifications for installation, start-up and maintenance of the system here.
Please keep these instructions with the system so they can be referred to when necessary.
We recommend that you participate in a Solvis training course to ensure safe and proper installation.
As we are interested in improving our technical documentation, we appreciate feedback of any kind.

Copyright

A list of our international representatives is provided at www.solvis.com.
Please understand that the telephone numbers are reserved for use by our installers.
Interested system operators should contact their installer.

Symbols used

DANGER
Immediate danger, with serious health consequences and even death.

WARNING
Danger, with potentially serious health consequences.

CAUTION
Possible risk of moderate or light injury.

CAUTION
Risk of damage to unit or system.

Useful information, notes and work tips.

Change of document, referring to another document.

Energy-saving tip with suggestions on how to save energy. This reduces costs and helps protect the environment.

Contents

2 Notes

Functional description

The PLAS-G allows the return temperature to be controlled using the integrated return temperature sensor and a 3-way mixing valve in a fashion optimised for the connected heat generator.
The charge volume flow is adjusted to meet the current power requirement of the connected system by the speed-controlled, high-efficiency pump.

Application areas

Buffer charging station	Kvs value	Application range		
		Flow [m³/h]	Power [kW] at	
			ΔT=15 K	ΔT=20 K
		Up to*)	Up to*)	Up to*)
PLAS-G-6,3	6.3	2.5	44	58
PLAS-G-8,0	8.0	3.4	60	80
PLAS-G-18	18	6.2	108	144

*) *at a remaining pump height of 1.5 m WS*

The PLAS-G is used in the SolvisVital 3 system together with the SolvisControl 2 system controller for charging the SolvisStrato buffer tank from an on-site heat generator.

Advantages of modulating condensing boilers:

- The minimised cycle rates reduce pollution emissions and primary energy consumption, in addition to extending the service life of the boiler
- The optimal heat value utilisation reduces primary energy consumption, especially for boilers without limits on the temperature difference.

Advantages of local/district heating:

- The controlled utilisation of the cold buffer volume after hot water delivery allows the desired return temperature to be maintained for a maximum amount of time
- Buffer tank mixing through cooled lines is prevented. Buffer tank is not loaded until temperature is sufficient.

Advantages of combined heat and power plants or solid fuel/pellet boilers:

- Maintenance of the required return temperature.

3 Scope of Delivery

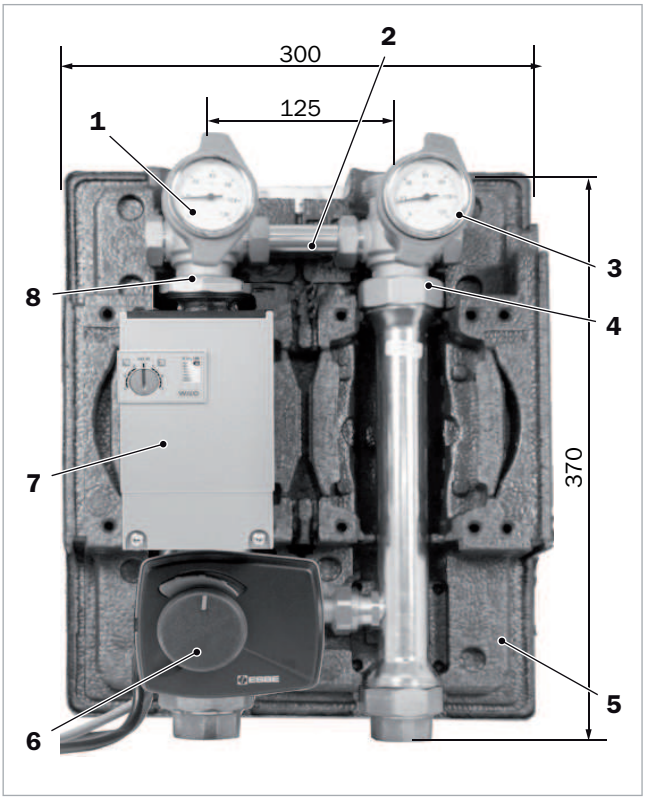

Fig. 1: Structure of the PLAS-G-6,3 / PLAS-G-8,0 / PLAS-G-18 buffer charging station

1 *Blue return thermometer with integrated ball valve and adjustable gravity brake (20 mbar)*
2 *Lateral stabiliser (not a bypass, closed internally)*
3 *Red flow thermometer with integrated ball valve*
4 *Flow from heat generator*
5 *Insulation shell made from EPP*
6 *3-way mixing valve with servomotor (0-10 V)*
7 *Heating pump (0-10V), PLAS-G-6,3: Wilo-Stratos PARA 25/1-7 / PLAS-G-8,0: Wilo-Stratos PARA 25/1-8 / PLAS-G-18: Wilo-Stratos PARA 30/1-8*
8 *Return to heat generator*

Also included in the scope of delivery:

- Wall bracket and attachment material
- Return temperature sensor
- Insulation shell made from EPP

Instructions:

- Pump operating instructions
- Assembly Instructions MAL-PLAS-G (this document)

4 Installation

4.1 System diagrams

For detailed system diagrams, see ➔ *document (ALS-SV-3-HE).*

4.2 Wall-Mounted Installation

Install the buffer charging station as close to the buffer tank as possible to keep the connection lines between the station and the tank short.

- Together with the station's return mixing function, this ensures that during the start phase of the heat generator only a minimal volume of water enters the tank from the flow line, which may have cooled off.

Installing the station

1. Hold the station against the surface it is to be installed on and mark the fastening holes.
2. Drill holes and insert the wall plugs supplied.
3. Insert the screws supplied in the holes in the wall bracket, put on the foam rings supplied and fasten everything to the wall.

The foam rings must be positioned between the wall and the wall bracket in order to reduce transmission of structure-borne noise.

Fig. 2: Foam rings

4.3 Hydraulic Connection

CAUTION

Prevent impermissible pressure

Expansion due to heating can lead to high pressure, which can cause the system to burst.

- The customer must ensure the safety of the heat generator by installing a suitable safety valve.

- Lay pipes between the buffer tank, the buffer charging station and the heat generator according to the system diagram.

For detailed system diagrams, see ➔ *document (ALS-SV-3-HE).*

- To fill the system, open the valves in the flow and return lines. To do this, turn all handles on the ball valves to the vertical position.
- When the buffer tank is being filled, the pipe lines between the boiler and the tank must be bled. For this purpose, open the gravity brake by rotating the ball grip to 45°.
- Perform a pressure test. Next, attach the front insulation shell. Insulate the pipe lines in accordance with the German Energy Conservation regulations (EnEv).

4.4 Electrical connection

Important:

- All electrical connections must be installed by an authorised technician according to the wiring plan contained in the installation and startup instructions of the pellet/solid fuel boiler.

DANGER

Risk of electrical shock

Damage to health, cardiac arrest possible.

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

CAUTION

Country-specific regulations

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 total cable resistance for the sensor cables must not exceed 2.5 ohms. For cables with a cross section of 0.25 mm², this corresponds to a length of up to 5 m.
- For cross sections of 0.5 or 0.75 mm², the maximum cable length is 15 or 50 m.
- Sensor cables for temperature sensors should not be unnecessarily long. For very long cables, sensor correction can be performed to minimise the systematic variance errors.
- The sensor cable for volume flow encoders should not be longer than 10 m.

CAUTION

Observe ambient conditions

Malfunction or failure of system possible.

- Avoid ambient temperatures outside of the permitted range of 5°C to +50°C.
- Avoid dew condensation and an annual mean relative humidity higher than 75% (briefly 95%).

4.4.1 Connecting the buffer charging station

For the wiring diagram, see the → *document (ALS-SV-3-HE).*

Connecting the pump cables

1. Connect the mains connection cable to connection A13 on the mains circuit board. Extend the cable if necessary.
2. Connect the control cable to connections 0-7 on the additional board. Observe the correct polarity:
   - Brown: 0-10 V signal earth line (GND)
   - White: 0-10 V
   - Blue and black are not needed and are therefore not connected.

Installing the return sensor

1. Slide the return sensor into the sensor immersion tube on the ball valve of the buffer charging station and secure it using the screw.

Fig. 3: Installing the return temperature sensor

2. Connect the cable to terminal S16.

Connecting the servomotor

1. Connect the servomotor of the PLAS-G to the 24 V output and to 0 – 5.

System controller	24 V transformer	0 – 5	
	+ V	+	–
Servomotor	Brown	Black	Blue

4.5 Final Tasks

Attaching the insulation shell

1. Tighten all connections.
2. After installing and filling the system and checking it for leaks, (see → *Start-Up, S.8*) complete the station by attaching the front insulation shell.

For detailed specifications of the control parameters, refer to the operating instructions for your system controller.

5 Start-Up

CAUTION

Damage can result from limescale formation and corrosion in the system

If the system fails or if water leaks out:

- Treat the fill water in accordance with the requirements of VDI directive 2035.

Filling the system

1. Set the ball valve handles, with integrated thermometers, for shutting off the flow and return to 45° (gravity brakes deactivated).
2. Fill the tank according to the installation instructions for the relevant system, bleed the system and perform a pressure test.
3. Set the handles of the ball valve for shutting off the flow and return in the vertical position to 0° (gravity brakes activated).

5.1 Gravity brake

Description

A spring-loaded gravity brake, which closes noiselessly, is built into the return ball valve.

Fig. 4: Ball valve with built-in thermometer

Handling

- At 0° (vertical position), the line is open and the gravity brake is activated.
- When the ball valve handle is at a 45° angle (dashed line in → *Fig. 4*), the gravity brake is open.
- When it is at 90° (handle horizontal), the line is shut off.

- To fill the system, set the ball valve to 45°.
- Afterwards, reset it to 0°.

5.2 Setting the pump

The speed of the pump is controlled by the SolvisControl via the 0 - 10 V connection so that the volume flow to the heat generator is adjusted according to the current load on the system.

Set the pumps to “ext. in”

1. Set the pumps to “ext in.” using the red operating knob in order to activate automatic speed control via Solvis-Control.

Fig. 5: Setting the pump to “ext. in”

5.3 Checking the mixing valve

For example, if the servomotor was removed during installation, correct adjustment can be checked as follows. (In principle, the station can be rebuilt so that the flow and return flow are reversed. Other positions apply for the shaft and servomotor in this case).

Checking the bypass open position

1. Set output signal O-5 to 0 V; see ➔ *"SolvisVital 3 – Operating Instructions for Installers" (BAL-SV-3-I).*
2. Pull the servomotor off the shaft and check the position of the shaft.

The flat side of the shaft must point in the direction of 0 on the scale or downwards.

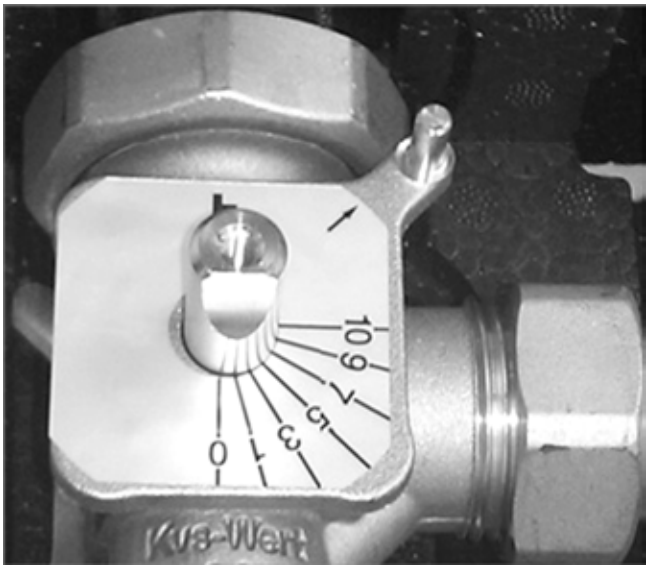

Fig. 6: Shaft pointing down (open)

3. Refit the servomotor and check the wheel position.

The mark on the servomotor wheel must be facing towards the top right.

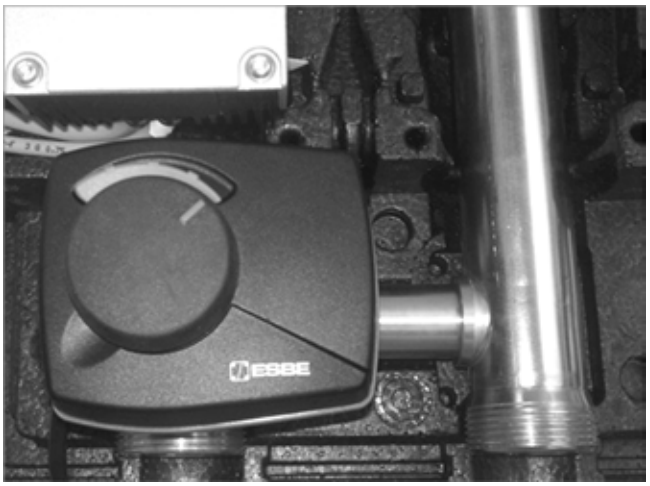

Fig. 7: Mark pointing towards the top right (open)

Check the bypass closed position

1. Set output signal O-5 to 10 V; see ➔ *"SolvisVital 3 – Operating Instructions for Installers" (BAL-SV-3-I).*
2. Pull the servomotor off the shaft and check the position of the shaft.

The flat side of the shaft must point in the direction of 10 on the scale or in the direction of the bypass.

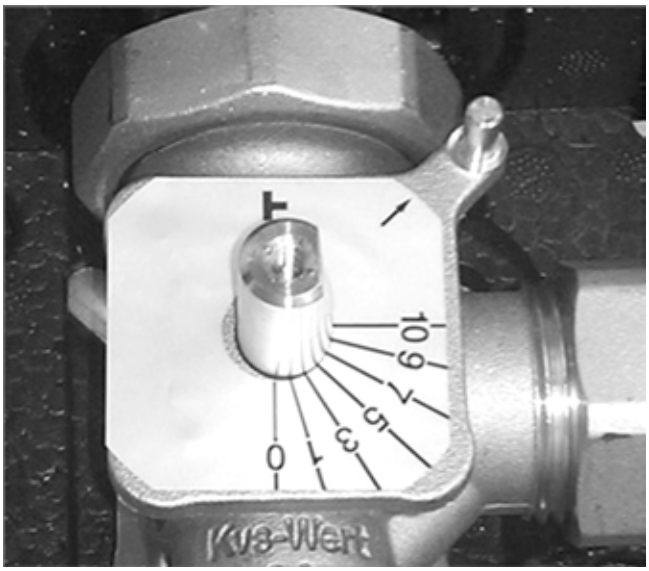

Fig. 8: Shaft pointing towards bypass (closed)

3. Refit the servomotor and check the wheel position.

The mark on the servomotor wheel must be facing towards the top left.

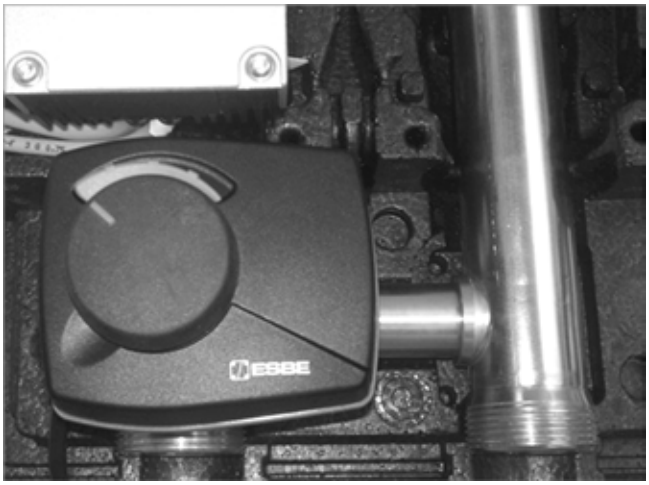

Fig. 9: Mark pointing towards the top left (closed)

For manual adjustment, pull the adjustment wheel out slightly. To check that the servomotor is adjusted correctly and for automatic mode, push the adjustment wheel in completely.

5.4 Additional procedure

For the procedure, see ➔ *SolvisControl SC 2: System SolvisVital - Operation system operator (BAL-SV-3-K) and installer (BAL-SV-3-I).*

6 Maintenance

During system maintenance, check that the following is true:

- The buffer charging station functions without faults
- The connected pipes have no leaks
- The insulation is attached correctly
- Function check on the pump:
  On the SolvisControl, manually switch on the output corresponding to the load pump and check for correct circulation.

For the procedure, see ➔ *SolvisControl SC 2: System SolvisVital - Operation system operator (BAL-SV-3-K) and installer (BAL-SV-3-I).*

7 Technical Data

Station

Dimensions	PLAS-G-6,3	PLAS-G-8,0	PLAS-G-18
W x H x D (incl. insulation)	300 x 370 x 245 mm		
Height measurement from male thread to male thread	370 mm		
Distance from piping (centre) to wall	68 mm		
Distance VL- / RL-Strang	125 mm		
Pipe connections	1" male thread with 2 x 1" female thread fitting, flat sealing		1¼" male thread with 2 x 1¼" female thread fitting, flat sealing
Insulation	Heat insulation shell made from EPP		

High-efficiency pump

Specification	PLAS-G-6,3	PLAS-G-8,0	PLAS-G-18
Type	Wilo-Stratos PARA 25/1–7 with 0 - 10 V interface	Wilo-Stratos PARA 25/1-8 with 0 - 10 V interface	Wilo-Stratos PARA 30/1–8 with 0 - 10 V interface
Number of levels	Continuous speed control via SC 2		
Maximum permitted operating pressure	6 bar		
Permitted media temperature	+15 °C to 110°C with max. ambient temperature of 25°C		
Ambient temperature	Max. +40°C permitted with max. media temperature of 90°C		
Mains connection	230 V~/50 Hz		
Power consumption	5 - 70 W	8 - 140 W	
Maximum pump height	7 m water column	8 m WS	
Maximum pump output	4,5 m³/h	8 m³/h	

Mixing valve

Specification	PLAS-G-6,3	PLAS-G-8,0	PLAS-G-18
Function	Three-way		
Type	MG 20-6,3	MG 20-8,0	MG 20-18
Maximum temperature	110 °C		
Maximum operating pressure	10 bar		
Maximum differential pressure	2 bar		
Valve opening angle	0 – 90°		
Torque	Max. 3 Nm		
Leakage loss	1%		
Kvs value	6.3	8.0	18

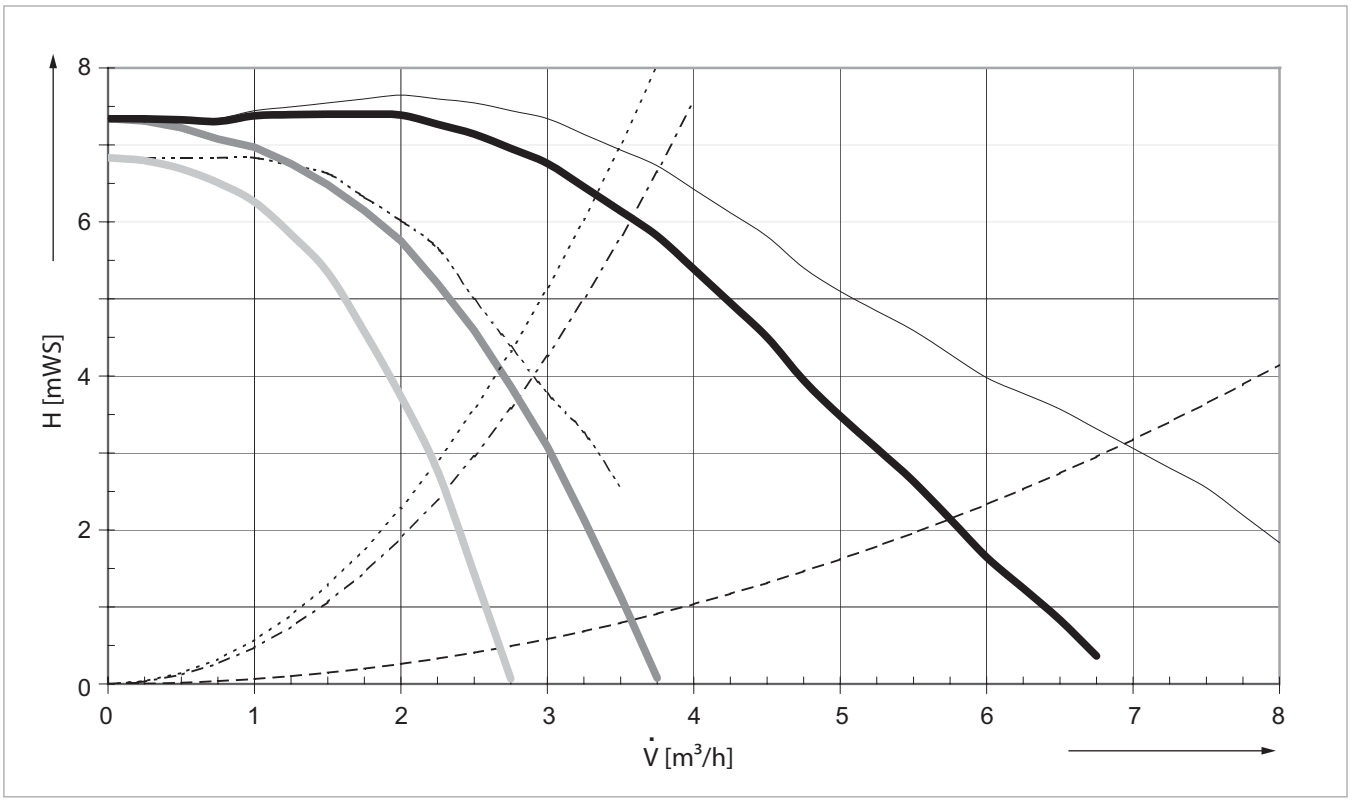

Fig. 10: Remaining pump height of PLAS-G-2.6, PLAS-G-8.0 and PLAS-G-18

H *Delivery height [mWS]*
V̇ *Volume flow [m³/h]*
Pump characteristic curve of Wilo-Stratos PARA 25/1-7
System characteristic curve of PLAS-G-6.3
Remaining pump height of PLAS-G-6.3
Pump characteristic curve of Wilo-Stratos PARA 25/1-8 and PARA 30/1-8
System characteristic curve of PLAS-G-8.0
Remaining pump height of PLAS-G-8.0
System characteristic curve of PLAS-G-18
Remaining pump height of PLAS-G-18

Notes

Notes

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