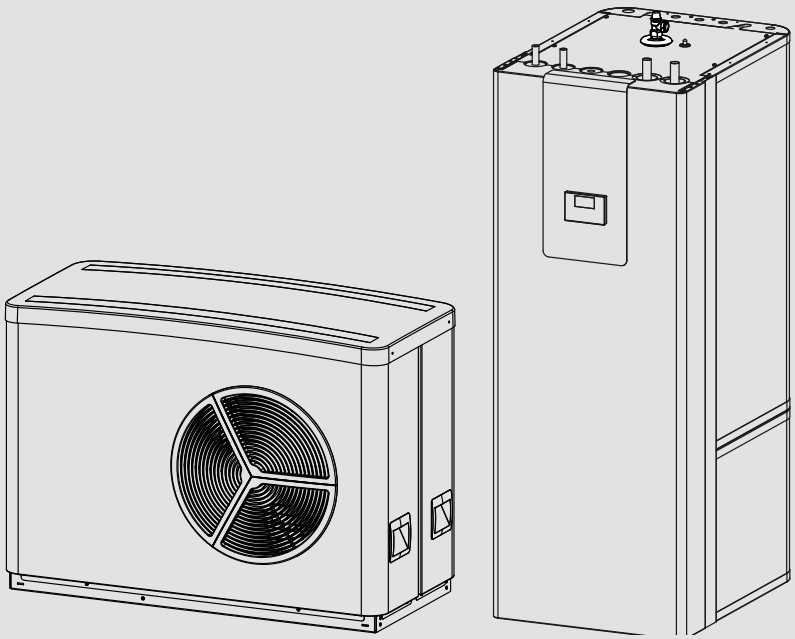
QUICK-START GUIDE

Air-to-water Heat Pump with Integral Tank

» WPL 15/25 A2W Premium & HSBC 300 Integral



STIEBEL ELTRON

1. Overview

This document provides the necessary information for installing a Stiebel Eltron WPL A2W premium heat pump in conjunction with the HSBC 300 Integral. It includes the most critical details on the installation process. Some steps have been left out or only briefly explained to maintain the brevity of this document. For extended explanation on the components discussed in this document, consult the manual dedicated to the specific component.

1.1 WPL 15 A2W Premium & WPL 25 A2W Premium

The WPL is an air to water monobloc heat pump. The refrigerant circuit is self-contained within the unit itself. There are two sizes available: WPL 15 A2W Premium & WPL 25 A2W Premium. These devices are in the 2 and 4 ton size classes, respectively.

The WPL is capable of heating or cooling a water/glycol mixture flowing to the unit. There are two water connections on the unit that must be connected to the HSBC 300 Integral. A 6.75 kW back-up element is included inside the WPL to supplement the heating capacity.

1.2 HSBC 300 Integral

The HSBC 300 Integral integrates a system buffer, a DHW tank, circulation pumps, and system controller into one package. The buffer is a steel 26 gallon tank and the DHW tank is a 72 gallon glass-lined tank heated by an indirect coil. The HSBC contains the necessary pumps and diverter valves to use the WPL heat pump to heat or cool the buffer tank, and to heat the DHW tank, with the DHW tank having priority.

1.3 FET

The FET is an optional room thermostat which includes functionality for temperature control from within the conditioned space. It also allows for adjustment of other basic system settings.

1.4 AF PT Outdoor Sensor

The AF PT outdoor sensor is a PT1000 sensor in a housing designed for mounting on an exterior wall. This sensor is needed for ambient temperature feedback to the system controller.

1.5 System

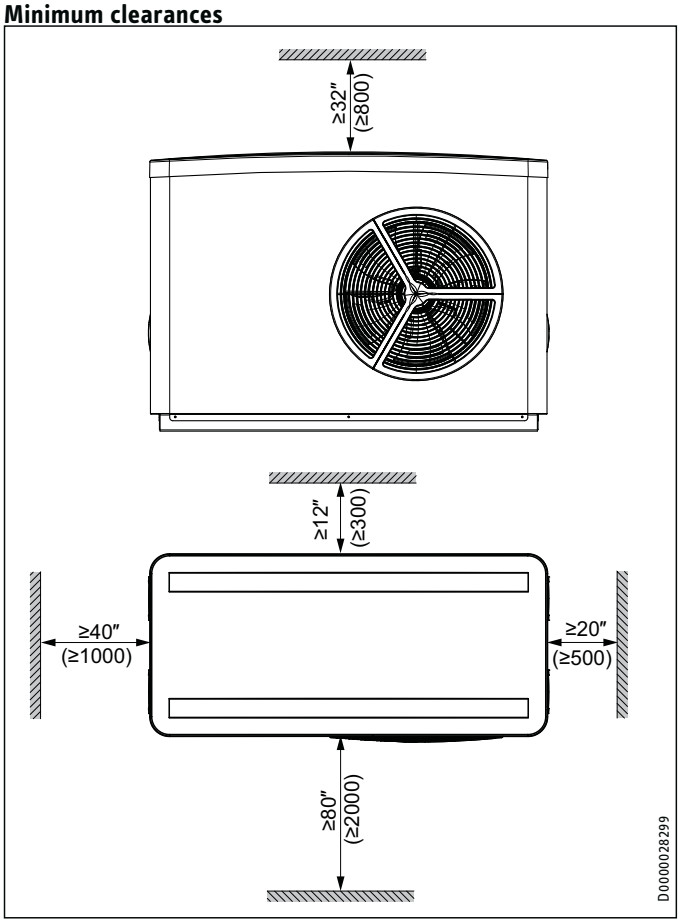
The WPL and HSBC work together as an integrated package. It is a compact means of providing a building's heating, cooling, and DHW demands from a single appliance. This requires piping between the two units, and to the buildings heating/cooling delivery system. For the DHW system, all that is needed is to run the cold water connection to the HSBC, and to run the hot water connection out to the tapping points. Some additional components such as expansion tanks and air vents are necessary just as in traditional systems.

2. Installation

2.1 Mounting/Placement

2.1.1 WPL 15/25 A2W Premium

Minimum clearances



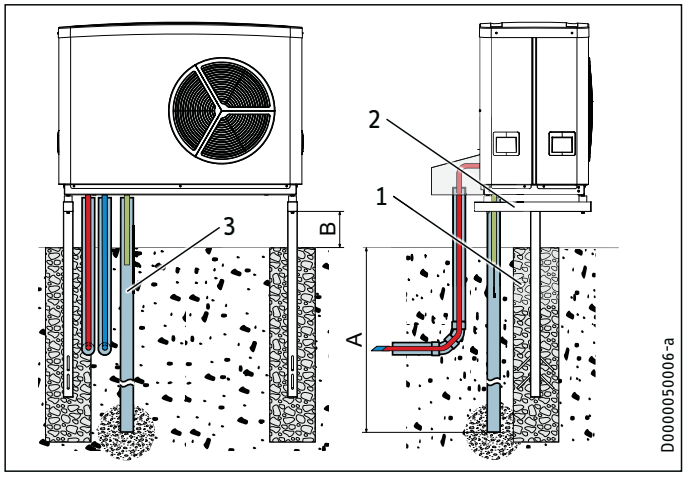
▶ Maintain the minimum clearances to ensure trouble-free operation of the appliance and facilitate maintenance work.

T-support SK 1

The recommended method of mounting the WPL is on the SK 1 T-support kit. For detailed installation instructions, consult the SK 1 installation manual.

Note
▶ Install a ribbon heater when using the T-support.

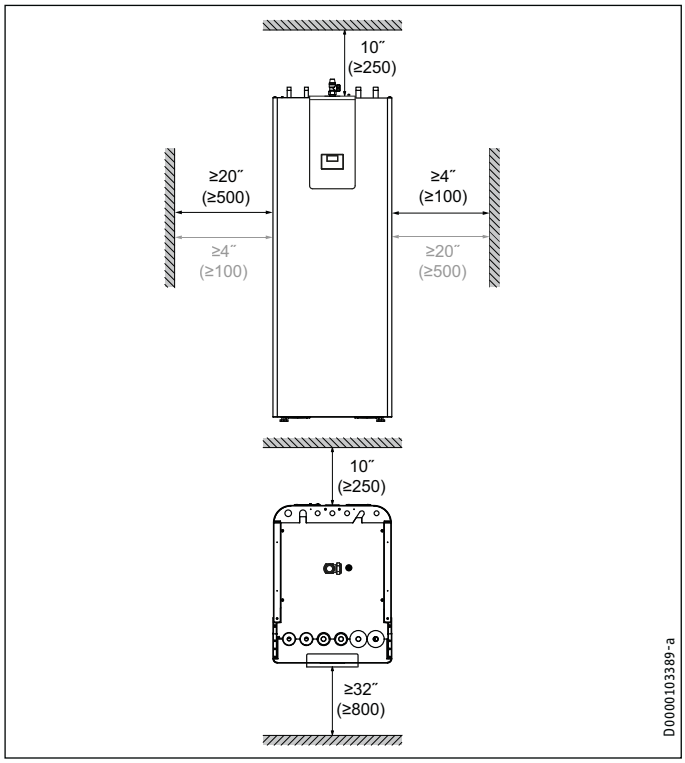
Material losses
Install SK 1 in concrete piles at least 10″ in diameter.



A Depth of frost line
B 12″ (300 mm)
1 Foundation/concrete pile
2 T-support
3 Condensate drain with ribbon heater

2.1.2 HSBC 300 Integral

Minimum clearances

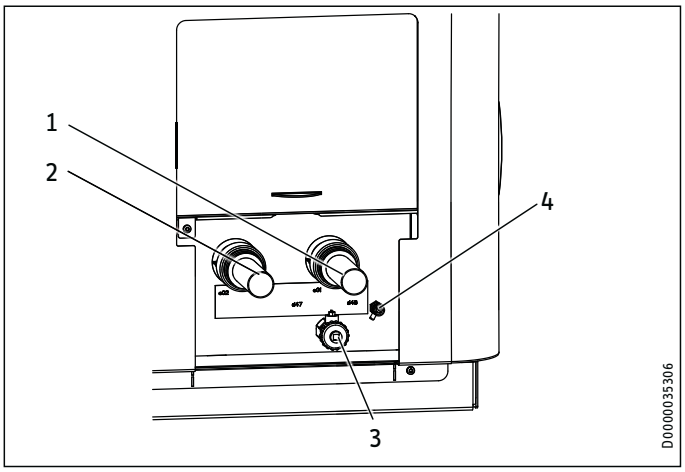


The minimum side clearances can be swapped between left and right.

2.2 Hydronic/DHW Connection

2.2.1 WPL 15/25 A2W Premium

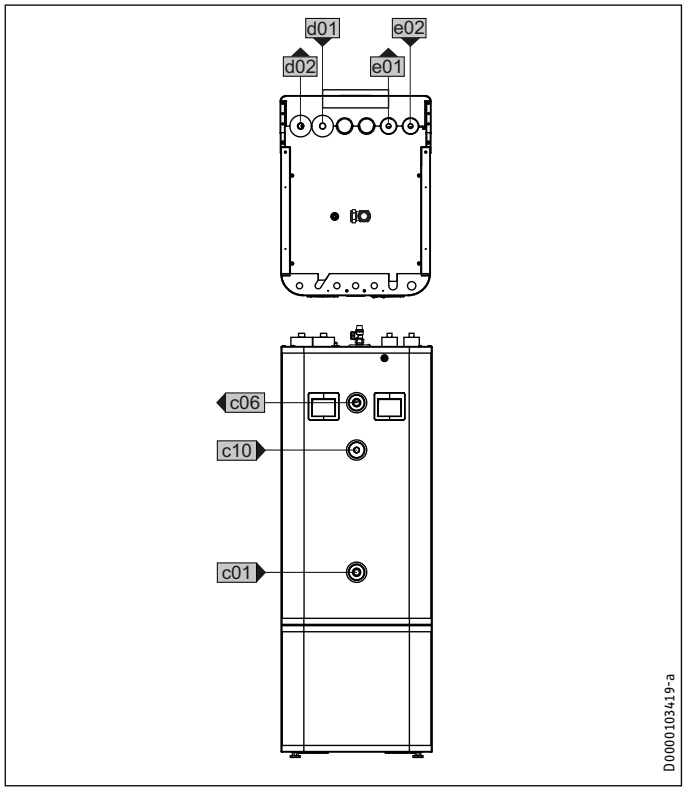
The WPL has a water inlet and a water outlet connection. These are 28 mm quick-connect fittings. Adapters are provided with the WPL to accommodate adapting to 1″ copper pipe.



1 Leaving water port (hot in heating mode)
2 Heating return (cold in heating mode)
3 Drain/fill port
4 Air purge vent

▶ Solder 1″ copper pipe to the provided adapter.
▶ Run the inlet & outlet pipes into the building to the HSBC.
▶ Insulate the pipe run with insulation at least 1″ thick.

2.2.2 HSBC 300 Integral



Name		Type	Nominal Size
c01	Cold water inlet	Male thread	G 1″ (adapter to ¾″ copper incl.)
c06	DHW outlet	Male thread	G 1″ (adapter to ¾″ copper incl.)
c10	DHW circulation	Male thread	G ½″ (adapter to ¾″ copper incl.)
d01	Heat pump supply	Pipe	1″ copper
d02	Heat pump return	Pipe	1″ copper
e01	Heating supply	Pipe	¾″ copper
e02	Heating return	Pipe	¾″ copper

The HSBC 300 Integral includes the hydronic & DHW connections shown above.

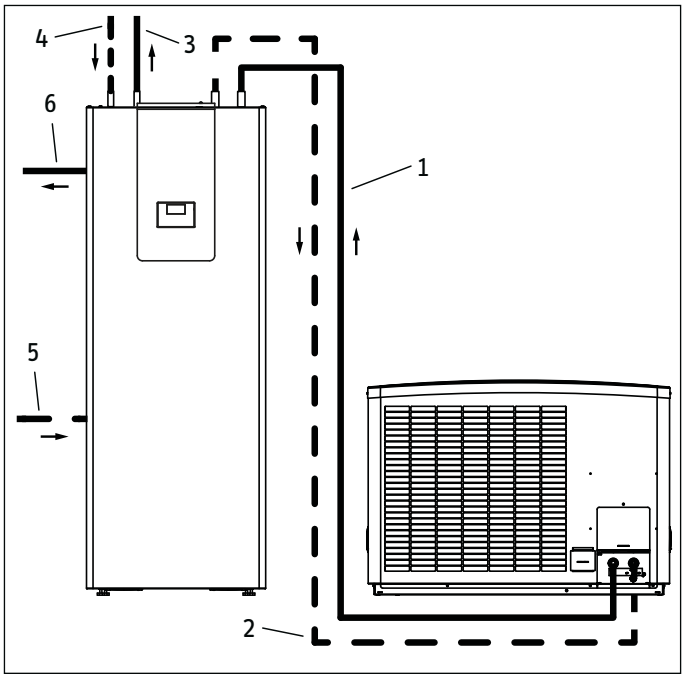
The DHW cold and hot connections have a 1″ G thread and requires a union sweat adapter (included) for ¾″ copper pipe. A connection accessory kit (RBS-SBC Integral) is also available which repositions the DHW connection point to the top of the HSBC. An expansion tank must be installed in the DHW system and must be sized properly for a 72 gallon DHW tank.

System

The most basic installation configuration for the HSBC includes two pipes run between the HSBC and WPL, two pipes running to a heating/cooling circuit, and two DHW connections for cold water in and hot water out.

The pipe between the HSBC and WPL must be 1″ or larger copper pipe. PEX with an oxygen barrier with a minimum size of 1¼″ is also permissible. Venting devices must be installed to completely eliminate trapped air during commissioning. The HSBC contains the circulating pump for this circuit, as well as a diverting valve to charge the included DHW tank.

The heating circuit pipes connect to the heat emitter. The circulating pump is included inside the HSBC. The heating circuit should also have vents at the sites likely to trap air. An expansion tank is required and should accommodate the full volume of the system.



1 Heat pump supply
2 Heat pump return
3 Heating supply
4 Heating return
5 Cold water in
6 Hot water out

2.3 Electrical

2.3.1 WPL 15/25 A2W Premium

Note

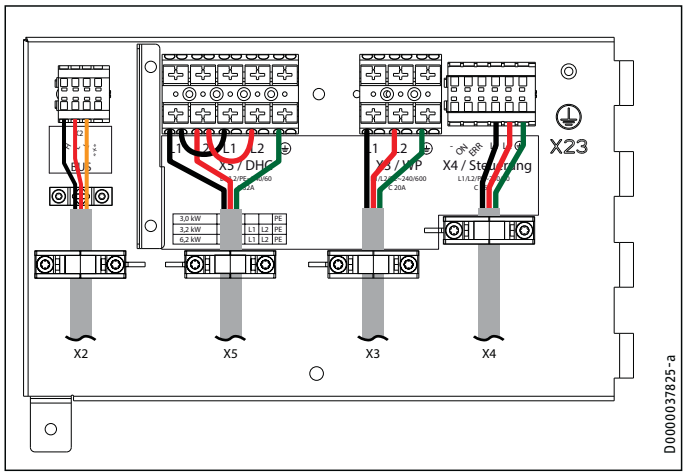
▶ Do not wire the sensor cable for the AF PT in parallel with or in the same conduit as the power cables run to the WPL. If the AF PT cable is not run separately, the system will not operate as intended.

The WPL has 3 - 240 V connection terminals, each for a different purpose.

MCB/fuse rating	Assignment	Wire size
1x B 20 A (WPL 15 A2W Premium)	X3 - Compressor	AWG 10
1x B 35 A (WPL 25 A2W Premium)	X3 - Compressor	AWG 8
1x B 30 A	X5 - Electric backup element	AWG 10
1x B 15 A	X4 - Control unit	AWG 16

The 30 A / 240 V (X5) circuit for the electric backup is optional, and can be installed to enable the 6.75 kW element located inside the WPL.

A shielded 3-wire 18 AWG cable is required for the data bus connection.

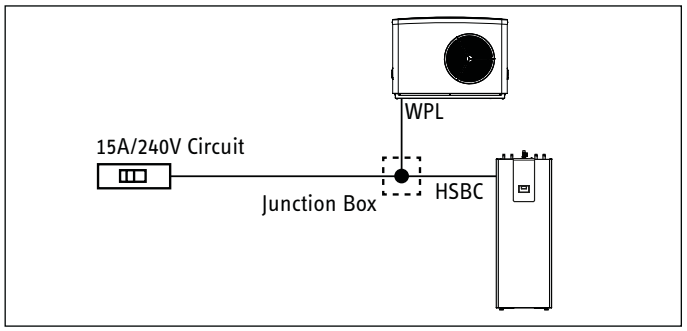


- ▶ Ground the LV lead (X2) by inverting the braided shield over the cable sheath and clamping it under the ground terminal.
- ▶ Then check that the strain relief fittings are working as intended.

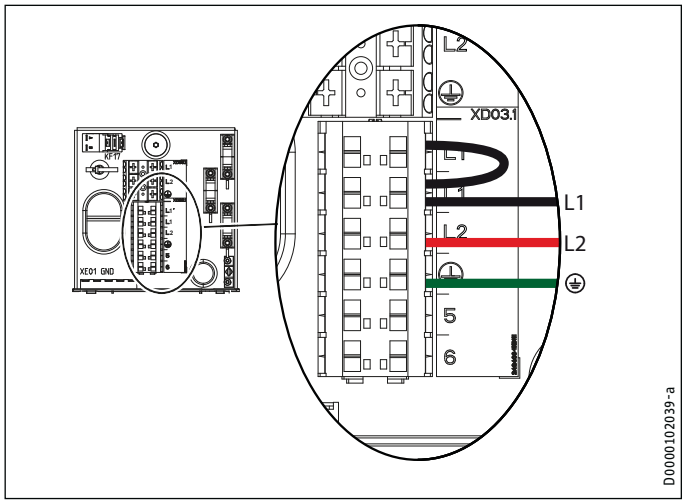
All 240 V circuits running outside require a disconnect switch be installed in an easily accessible location on the exterior wall near the heat pump.

2.3.2 HSBC 300 Integral

The HSBC requires connection to the same 15 A / 240 V circuit as the WPL. We recommend to split the circuit at a junction box where the circuit can be wired both outside and also to the HSBC.



Terminal	Control voltage	Wire size
XD03.1	Power supply - L1,L2, GND	AWG 16



2.3.3 AF PT Outdoor Sensor

Note

- ▶ Do not wire the sensor cable for the AF PT in parallel with or in the same conduit as the power cables run to the WPL. If the AF PT cable is not run separately, the system will not operate as intended.

An outdoor sensor must be installed on a north or northeast facing exterior wall. It must be placed at least 98" off of the ground and at least 39″ away from windows and doors. It must also not be installed in direct sunlight, but it should be freely exposed to the elements.

2.3.4 FET Indoor Thermostat

This device requires a 4-wire AWG 18 connection, and must be connected to terminal X1.2 on the HSBC.

3. Commissioning

3.1 Hydronic

Material losses

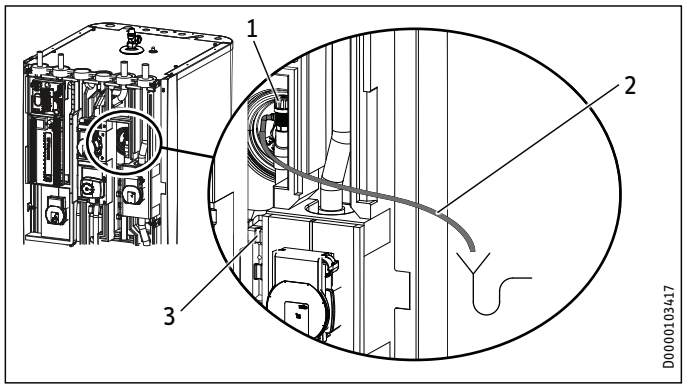
The hydronic system must contain at least 30% glycol. This is necessary to provide adequate freeze protection and to inhibit corrosion on internal components in the WPL and HSBC. Installations that experience low ambient temperatures may require higher glycol amounts to prevent freezing.

Note

Air must be completely eliminated from the system during the commissioning process. The WPL will not operate in the expect manner if air is not completely eliminated.

Using a purge & fill tee in conjunction with a charging pump is recommended to aid in filling and eliminating air during commissioning. A purge & fill tee allows for diversion into a fill reservoir and also to repeatedly build up and release pressure in the system to dislodge remaining trapped air.

- ▶ Fill the system slowly from the lowest point.
- ▶ Open air vents during filling to encourage the escape of air. The HSBC has a fill/drain port on the bottom of the buffer tank, and the WPL has a fill/drain port as well.
- ▶ With the charging pump running, use a valve to intermittently stop flow and allow for pressure to build up. Release the pressure and look for air bubbles in the fill reservoir
- ▶ Operate the air vent in the WPL, as well as the vent on the DHW heat exchanger in the HSBC.



1 Air vent valve
2 Vent hose
3 Hose attachment

It is critically important to purge as much air as possible from the hydronic system. The WPL will not operate as expected if the system is not sufficiently purged.

3.2 DHW

Fill the DHW system from the cold water inlet. Open all downstream fixtures to allow for the quick venting of air within the hot water piping.

3.3 Electrical

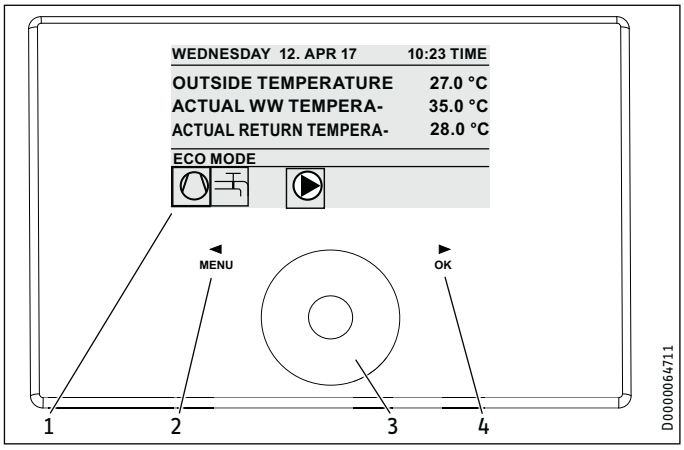
Material losses
Do not power on the HSBC or the WPL until the system has been properly filled and purged of air.

▶ Once the system has been properly filled and purged of air, power on all circuits wired to the WPL and HSBC. The screen on the front of the HBSC should illuminate and show the Stiebel Eltron logo. Once fully booted, you will be prompted with a few setup prompts.

3.4 WPM Controller

The controller mounted on the front of the HSBC is called the WPM. Detailed information on this controller can be found in the manuals specific to the WPM.

Initial setup



1 Display
2 “MENU” key
3 Touch-Wheel
4 “OK” key

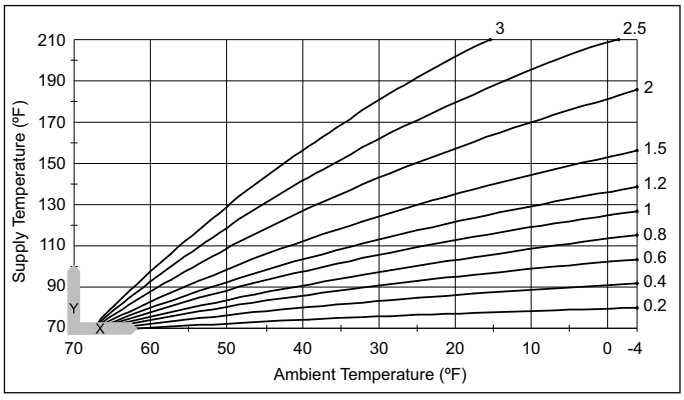
On the first power-up, the WPM will prompt the user to select the preferred menu language, time, & date.

▶ Enter the setup information when prompted. When complete, the main screen of the WPM will be shown.

Heating curve optimization

Based on the design temperature and insulation value of the building, the user may want to change the parameter HEATING CURVE RISE.

▶ Using the following chart, calculate the heating curve value by finding matching the ambient design temperature on the x-axis and the heat emitter delivery temperature on the y-axis. Interpolate this point between the closest heating curve lines on the chart.



X Outside temperature, °F (°C)
Y Heating circuit 1, heat pump return temperature, °F (°C)

▶ Enter this number into the parameter HEATING CURVE RISE by navigating to Settings > Heating > Heating Circuit 1.

If the user prefers a fixed delivery temperature in the buffer tank, this value can be selected in the menu at Settings > Heating >

Heating Circuit 1. By setting a value in the parameter Fixed Value Operation, the heating curve will be disabled.

Dual mode operation

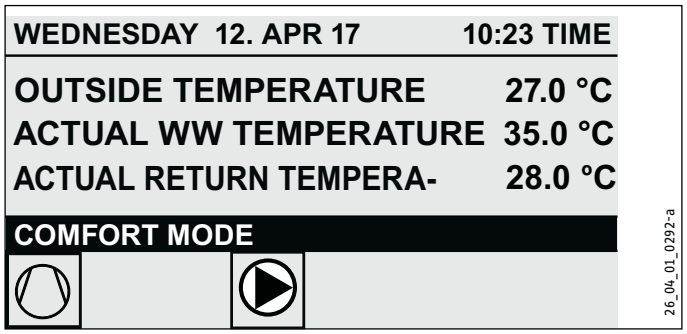
With the parameter DUAL MODE TEMP HZG, you can specify the dual mode temperature of the heat pump. Below this set outside temperature, the emergency/booster heater may back up the heat pump if the heating output has not been reached. The electric emergency/booster heater assumes responsibility for heating demand jointly with the heat pump.

- ▶ Enter the temperature where the backup element should work in conjunction with the heat pump into the parameter DUAL MODE TEMP HZG by navigating to Settings > Heating > Electric Reheating.

4. Operation

4.1 WPM Controller

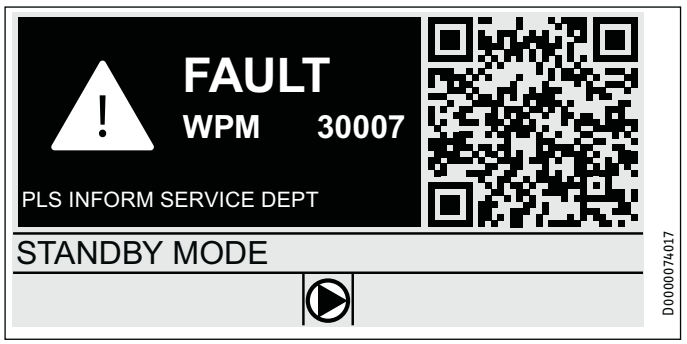
The WPM controller contains a few different operating modes. The modes are fully explained in detail in the WPM controller manual. The mode most typically used is Comfort Mode. This mode keeps the DHW tank and the heating circuit at the Comfort temperature.



If you want to select another operating mode, use the TouchWheel. This takes you through the list of possible operating modes. The current choice (list entry) is shown in the shaded selection field. Setting the WPM to Programmed Operation will allow for scheduling between the Comfort and Eco temperature setpoints at different times and days of the week.

5. Status & Troubleshooting

If the WPM is in a major fault state, a notification will be displayed on the screen. A minor fault that does not affect normal operation may not be displayed. The fault state of the system can be checked by navigating to Diagnosis > Heat Pump Status.



If more than one fault occurs, it is always the most recently occurring fault that is displayed.

Additional operating parameters for the system and the heat pump can be found by navigating to Info > System and to Info > Heat Pump > Process Data, respectively.

If you are not able to resolve a problem please contact us toll free at 800.582.8423. Stiebel Eltron is happy to provide technical assistance. In most instances, we can resolve the problem over the phone.

6. Fahrenheit to Celsius Conversion

°F	°C	°F	°C	°F	°C
-5	-20.6	45	7.2	100	37.8
0	-17.8	50	10.0	105	40.6
5	-15.0	55	12.8	110	43.3
10	-12.2	60	15.6	115	46.1
15	-9.4	65	18.3	120	48.9
20	-6.7	70	21.1	125	51.7
25	-3.9	75	23.9	130	54.4
30	-1.1	80	26.7	135	57.2
32	**0**	85	29.4	140	60.0
35	1.7	90	32.2	145	62.8
40	4.4	95	35.0	150	65.6

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