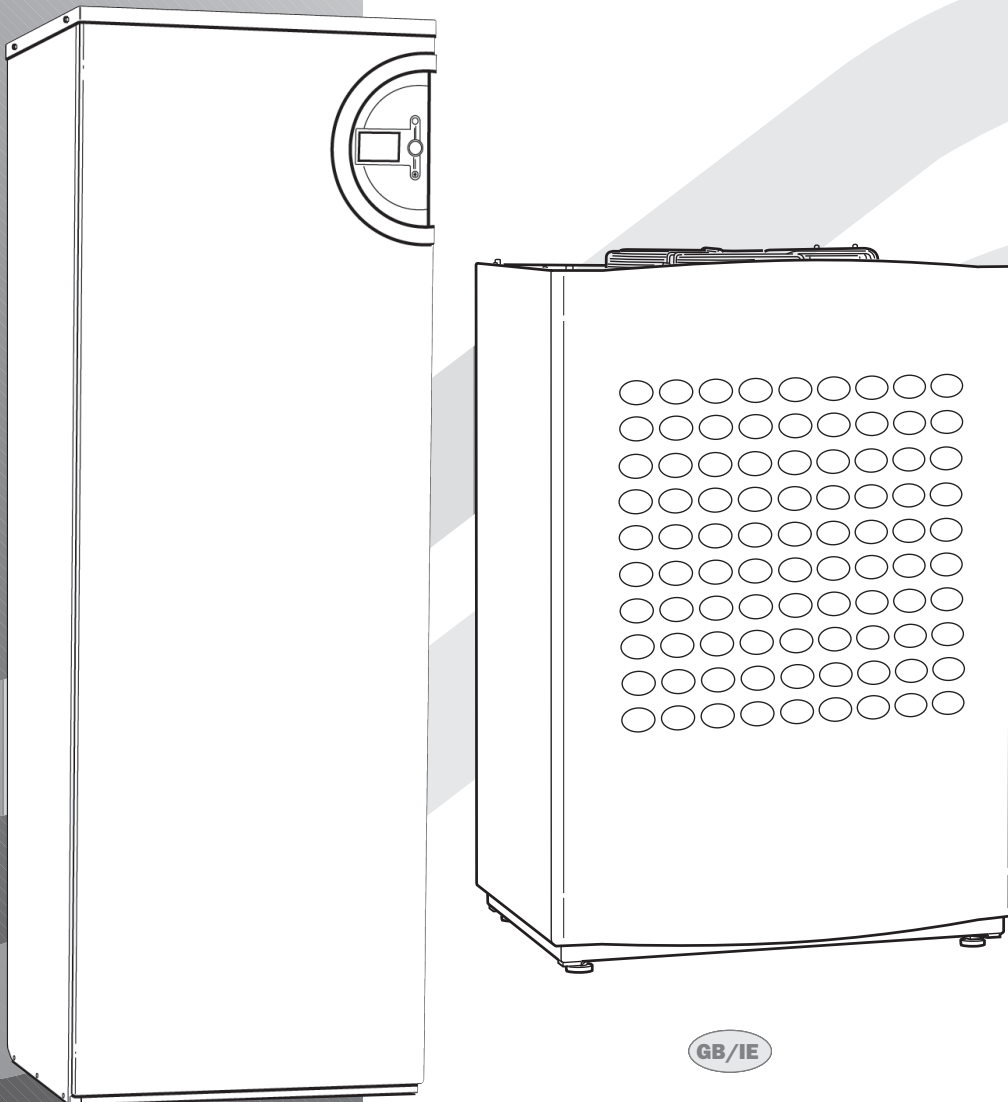


WORCESTER GREENSOURCE

6 kW, 7 kW & 9.5 kW

HEAT PUMP WITH HOT WATER DISTRIBUTION UNIT



INSTALLATION MANUAL

Please read carefully prior to
installation and user guide

 **WORCESTER**
Bosch Group

 *benchmark*

BUILDING REGULATIONS

This appliance must be installed and serviced only by a competent person in accordance with the current: IEE Regulations, Building Regulation, Building Standards (Scotland) (Consolidation), Building Regulations (Northern Ireland), local water by-laws, Health & Safety Document 63S (The Electricity at Work Regulations 1989), IS 813 (Eire) and other local requirements.

The relevant Standards should be followed, including:

BS7074:1 : Code of practice for domestic and hot water supply

EN:12828 : Central heating for domestic premises

BS7593 : Treatment of water in domestic hot water central heating systems

BS EN 14511 : Requirements heat pumps for space heating and cooling

BS EN 378 : Safety and environmental requirements for heat pumps

The Health and Safety at Work Act 1974

The Management of Health and Safety at Work Regulations 1999

The Construction (Health, Safety and Welfare) Regulations 1996

The Construction (Design and Management) Regulations 1994

The Lifting Operations and Lifting Equipment Regulations 1998

Where no specific instruction is given, reference should be made to the relevant codes of Practice.

Potable water:

All seals, joints, compounds (including flux and solder) and components used as part of the secondary domestic water system must be approved for use with potable water supplies.

This is to certify that the above ranges of products manufactured by Bosch Thermotechnology have been tested and found to comply with –

1. the requirements of the (Water Fittings) Regulations 1999 for England and Wales, the Water Byelaws 2000, Scotland and the Water Regulations Northern Ireland.
2. the requirements of the UK Building Regulations:

The Building Regulations 1991 (England & Wales) Requirements G3, L1 and Regulation 7. The Building Standards (Scotland) Regulations 1990. Regulation 10 (B2), 22 (J3.3a and J3.4), 27 and 28 (P2.6 and P3). The Building Regulations (Northern Ireland) 2000.

Installation manual for the Worcester Greensource heat pump with hot water distribution unit

Worcester, 16.06.08

Part number: 8-716-115-330

Issue: a

Copyright © 2008

Contents

FOR THE INSTALLER	5
Important information to the installer	6
Checklist.....	6
What the delivery includes	7
General.....	8
<i>Transporting and storage</i>	<i>8</i>
<i>Positioning the heat pump.....</i>	<i>8</i>
<i>Minimum and maximum working temperatures.....</i>	<i>9</i>
<i>Different methods of heating control.....</i>	<i>9</i>
<i>Defrosting method</i>	<i>9</i>
<i>Location of the temperature sensors.....</i>	<i>10</i>
<i>CANbus.....</i>	<i>11</i>
<i>Components identification.....</i>	<i>12</i>
Dimensions, clearance and plumbing connections.....	13
<i>Greensource Air to water heat pump (outdoor)</i>	<i>13</i>
<i>Hot water distribution unit.....</i>	<i>13</i>
<i>Fit the filter valve.....</i>	<i>14</i>
Connecting to the heating system	15
<i>Fitting the unvented kit.....</i>	<i>15</i>
<i>Use in hard water areas.....</i>	<i>15</i>
<i>Flushing the heating system.....</i>	<i>18</i>
<i>Connecting the heat pump, HWDU and heating system.....</i>	<i>18</i>
<i>Pump diagram - Available pump head.....</i>	<i>18</i>
<i>Principle method of operation.....</i>	<i>19</i>
<i>Filling the heating system.....</i>	<i>20</i>
Connecting to the power supply	20
<i>Sensors.....</i>	<i>20</i>
<i>Isolation switch and residual current device.....</i>	<i>21</i>
<i>Emergency operation.....</i>	<i>21</i>
<i>Wiring diagram Greensource heat pump.....</i>	<i>22</i>
<i>Wiring diagram Greensource HWDU.....</i>	<i>23</i>
<i>Terminal diagram Greensource heat pump - HWDU.....</i>	<i>24</i>
<i>External connections Greensource heat pump.....</i>	<i>25</i>
<i>External connections Greensource HWDU.....</i>	<i>26</i>
Installer and service menu (I/S).....	27
Menu overview.....	28
Commissioning.....	31
<i>Start the heat pump.....</i>	<i>31</i>
<i>Start up.....</i>	<i>31</i>
<i>Other settings.....</i>	<i>34</i>
<i>Important points to check after commissioning.....</i>	<i>34</i>
Timers.....	35
Alarm functions.....	36
Technical information	39
<i>Factory settings.....</i>	<i>39</i>
<i>Technical information.....</i>	<i>42</i>
<i>Sound levels.....</i>	<i>43</i>
<i>Sensor table.....</i>	<i>43</i>
<i>Supplimentary technical information.....</i>	<i>44</i>

PRODUCT CONTENTS LIST

Greensource Heat Pump.

Components included in delivery:

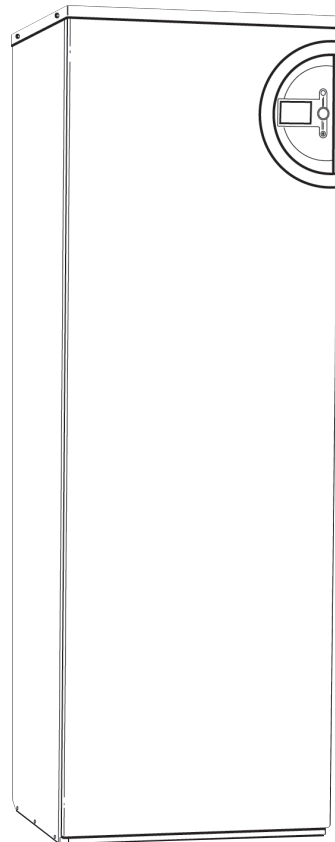
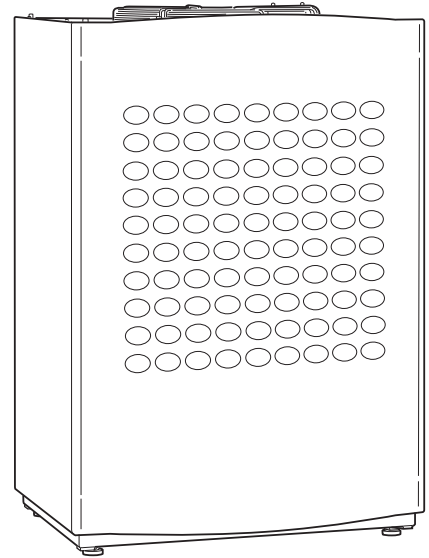
Rubber feet
Outdoor sensor T2 with cable
Room sensor T5
Valve with filter
Circlip pliers
Flexible connection hoses
Tundish (factory fitted)

Literature pack:

User manuals
Installation manual
Guarantee card

Unvented cylinder kit:

DHW expansion vessel
Expansion Vessel Hose
Wall mounting kit for expansion vessel
High flow rate inlet control set
Blending valve
Tundish 15 mm x 22 mm
Filling loop and valve
Waste coupler



For the Installer

This guide provides the heat pump installer with a description of how the heat pump and the Hot water distribution unit (HWDU) are installed and commissioned. The installation section consists of a plumbing part and an electrical part. It also provides technical data such as measurements, wiring diagrams and installer menus. We hope that you read through this guide carefully and that you respect all notes and warning texts.

Contents:

- Important information to the installer
- Checklist
- What the shipment includes
- General
- Dimensions, clearance and plumbing connections
- Connecting the heat pump and HWDU to the heating system
- Connecting the heat pump and HWDU to the power supply
- External connections
- Commissioning
- Technical information



Note

It is important that as the installer you also read through the User guides for our Greensource products. Here you will find the information necessary to get a comprehensive understanding of the heating unit.

Important information to the installer

This manual gives you all the information necessary to install the heat pump and HWDU. The guide is divided into several parts in the order in which installation and commissioning must be carried out.

Before starting the installation:

- The heat pump may be temporarily tilted with the compressor downwards. It must never laid down or transported horizontally. (See *Transport and storage*)
- Check that the plumbing connections in the heat pump and the HWDU are intact and have not shaken loose during transport.
- Before the commissioning the heating system must be filled up and completely vented.



Note

Only qualified installers may carry out the installation. The installer must follow applicable rules and regulations and recommendations from the manufacturer.



Warning

For reasons of safety the main power supply must be disconnected before working on the heat pump and HWDU.

Checklist

The following checklist will give you a general description of how the installation should be carried out.

1. Position the heat pump on a solid base.
2. Install the incoming and outgoing pipes for the heat pump.
3. Install the drainage pipe for the heat pump.
4. Fit the filter valve.
5. Install the incoming and outgoing pipes for the HWDU.
6. Install the waste water hose for the HWDU.
7. Install the unvented kit and inlet control group external to the unit.
8. Connect the heat pump and HWDU.
9. Connect the heat pump and the HWDU to the heating system.
10. Install the outdoor sensor and room sensor.
11. Connect the CANbus wiring between the heat pump and the HWDU.
12. Fill and vent the heating system before commissioning.
13. Connect any residual current device.
14. Connect the heat pump and HWDU to the power supply.
15. Commission the heating installation by making all the necessary settings on the control panel.
16. Check the heating installation after commissioning.

What the delivery includes

The following components are included in the delivery of the heat pump and HWDU:



Rubber feet
Quantity: 4



Valve with filter
Quantity: 1



Outdoor sensor T2 (GT2) with cable
Quantity: 1



Literature pack
User manual Greensource Heat pump
User manual Hot water distribution unit
Installation manual
Guarantee card



Room sensor T5 (GT5) with cable:
Quantity: 1



Blending valve
Quantity: 1



Circlip pliers
Quantity: 1



Flexible connection hose
Quantity: 2



DHW expansion vessel
Quantity: 1



High flow rate inlet control set
Quantity: 1



Expansion vessel hose
Quantity: 1



Acetal tundish
Quantity: 2
1 x factory fitted 22 mm x 1"
1 x 15 mm x 22 mm



Wall mounting kit for expansion vessel
Quantity: 1



Waste coupler
Quantity: 1



Filling loop with valve
Quantity: 1

General

Transporting and storage

The heat pump should always be transported and stored in an upright position. Otherwise the suspension fittings inside the compressor can be damaged. If the heat pump must be tilted during entry to the installation site, this should be done for as short a time as possible.

The HWDU must not be stored or transported at temperatures below 0°C. The heat pump must not be stored at temperatures below 0°C.

Positioning the heat pump

- The heat pump is located outdoors. It contains a number of sensitive parts. It is important that it stands on a flat and solid base, for example, concrete or similar hard standing. A rubber mat may be fitted to reduce possible noise transmission for uneven surfaces.
- See more information under the heading *Technical information/ Sound levels*.
- The HWDU is placed indoors. Pipe lengths should be kept to a minimum between indoor and outdoor units. Class O insulation should be used to insulate all pipes.
- The heat pump produces condensation in normal operation and melted ice during the defrosting process. It is therefore important to direct waste water from the heat pump to a suitable drain. Note that the discharge pipe must have a continual fall away from the unit to a suitable drain. This will keep the discharge pipe free of frost as air is drawn from inside the house.
- The heat pump must be positioned so that air is not prevented from passing through the evaporator. Minimum distance to a wall is 300 mm. Avoid positions which result in circulation of cold air because this decreases the heat pump output.
- Consideration should be given to siting the outdoor unit directly below eaves and possible snow fall. Any canopy or other cover must not be fitted closer than 2 m as this will effect the heat pumps operation.



Note

The amount of condensation water can amount to 30-40 litres, during days of high humidity. It is non acidic.

Minimum and maximum working temperatures

Maximum working temperatures

The heat pump can work with a maximum return temperature of approximately 59°C. If the temperature rises above this value the heat pump will stop for reasons of technical safety.

In the event of additional heat only, the maximum flow temperature is limited to the factory setting 62°C. This can be changed by the installer to max 70°C. If a value higher than 65°C is set a mixing valve must be installed. See *Commissioning*.

Minimum working temperatures

The heat pump stops if the outdoor temperatures falls below approx -20°C. All heat production then occurs in the HWDU by the additional electric heater. The heat pump starts automatically when the outdoor temperature climbs above approx -20°C.

Different methods of heating control

The control unit uses different methods to control the heating installation. These are: *Control with an outdoor sensor* and *Control with an outdoor sensor supplemented with a room sensor*.

More information about the control methods can be found in the User Guide.

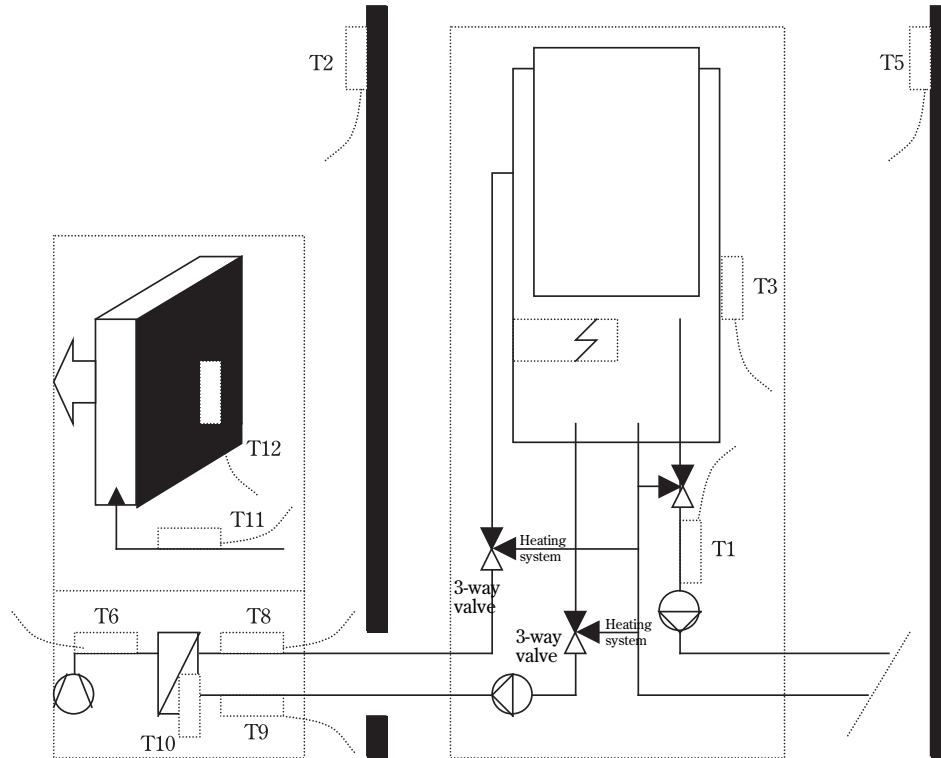
Defrosting method

The principle of defrosting in the heat pump is known as hot gas defrosting. During defrosting, the flow in the refrigerant circuit is reversed by means of an electrically-controlled four-way valve. The compressed gas from the compressor is fed into the top of the evaporator, causing the ice on the outside to melt. During this process, the heating water is cooled slightly. Hot gas is sprayed into the evaporator and sensor T11 ensures that the process functions correctly. The time required for defrosting depends on the amount of ice and the outdoor temperature.

This unit also operates as a fan defrost function, where hot air blows upwards through the fan to prevent freezing.

Location of the temperature sensors

- T1 Flow sensor
- T2 Outdoor sensor
- T3 Hot water sensor
- T5 Room sensor
- T6 Sensor compressor temperature
- T8 Sensor heat transfer fluid out
- T9 Sensor heat transfer fluid in
- T10 Sensor condenser temperature
- T11 Sensor refrigerant temperature evaporator
- T12 Sensor air temperature evaporator



Greensource Air to water heat pump

Hot water distribution unit

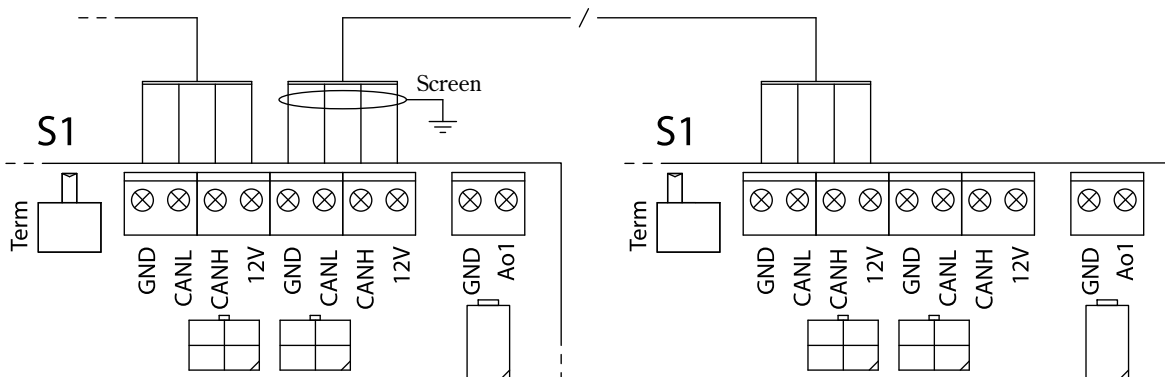
CANbus

The Rego 800 has different circuit boards which are connected by a communications cable, CANbus. CAN is an abbreviation of Controller Area Network and is a two wire system for communication between the micro-processor based modules/circuit boards. These are connected in series. The heat pump has one circuit board (IOB circuit board), other circuit boards are in the HWDU.

Cable ELAQBY 2x2x0.4A is suitable cable for external laying (connection between the circuit boards). The cable must be twisted pair and screened. The screen must only be earthed at one end and to the chassis (not to the circuit board). Maximum cable length is 20 m. CANbus cables must **not** be laid alongside power cables. They may be laid alongside sensor cables.

In the connection area of the heat pump and the HWDU the external CANbus cable must be laid so that it does **not** come into contact high current connections (230/400V).

The connection between the circuit boards is by four wires since the 12V-supply between the circuit boards must also be connected. The circuit boards have markings for both the 12V and CANbus connections.



Switch S1

The switch is used to mark the start and end of a CANbus loop. This means that the display circuit board in the HWDU (marked CPU on the wiring diagram) and the IOB circuit board in the heat pump must be terminated using S1, which must be in position *Term*. If a residual power breaker is used this circuit board must be terminated instead of the CPU circuit board in the HWDU. Ensure that the correct circuit boards are terminated and that all other switches are in the opposite position.

Warning

The CANbus cable must be screened and laid separately from the power cable to prevent interference in the CANbus communication.

Warning

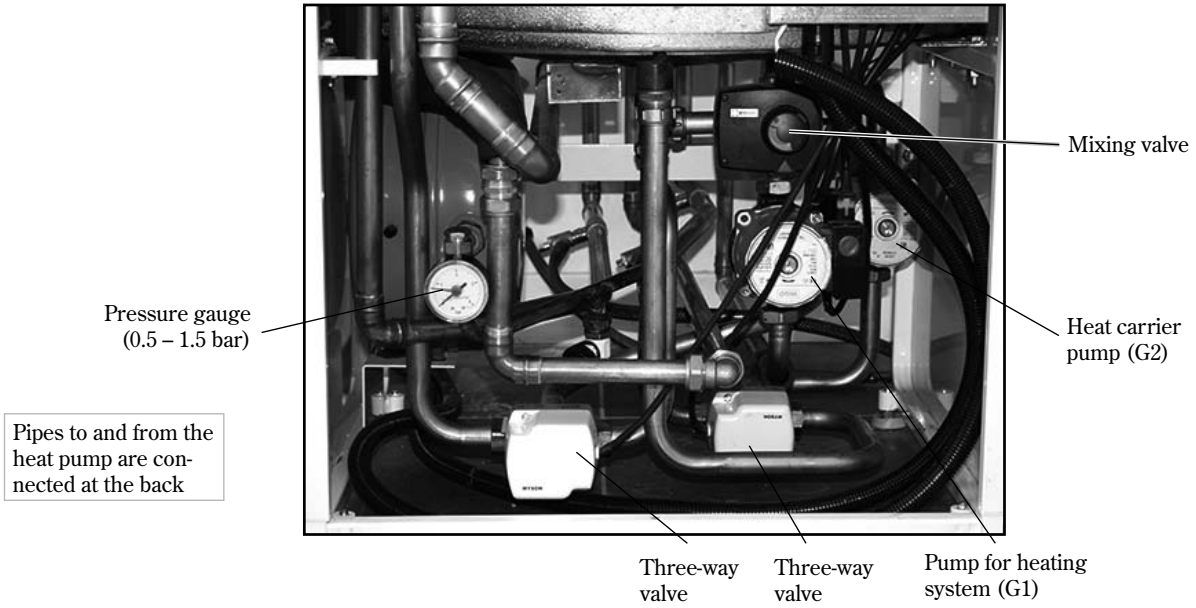
Do not mix up the 12V and CANbus connections! If 12V (or other incorrect voltage) is supplied to the CANbus contacts the processors in the CANbus are destroyed. Check, therefore, that the four cables are connected to the contacts with the corresponding marking on the circuit boards in the HWDU and the heat pump.

Warning

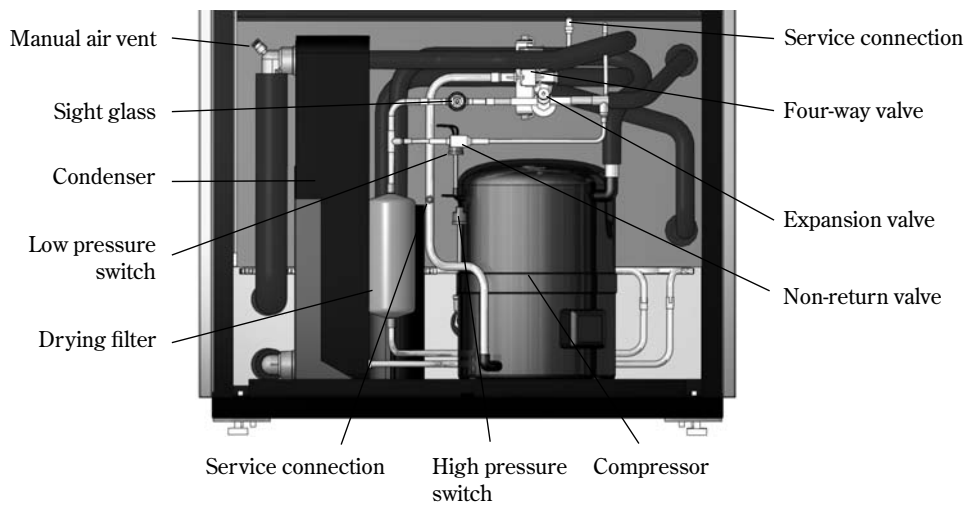
Handle the circuit boards with great care. They are sensitive to ESD (Electrostatic discharge), which can cause faults in electronic components.

Components identification

Hot water distribution unit

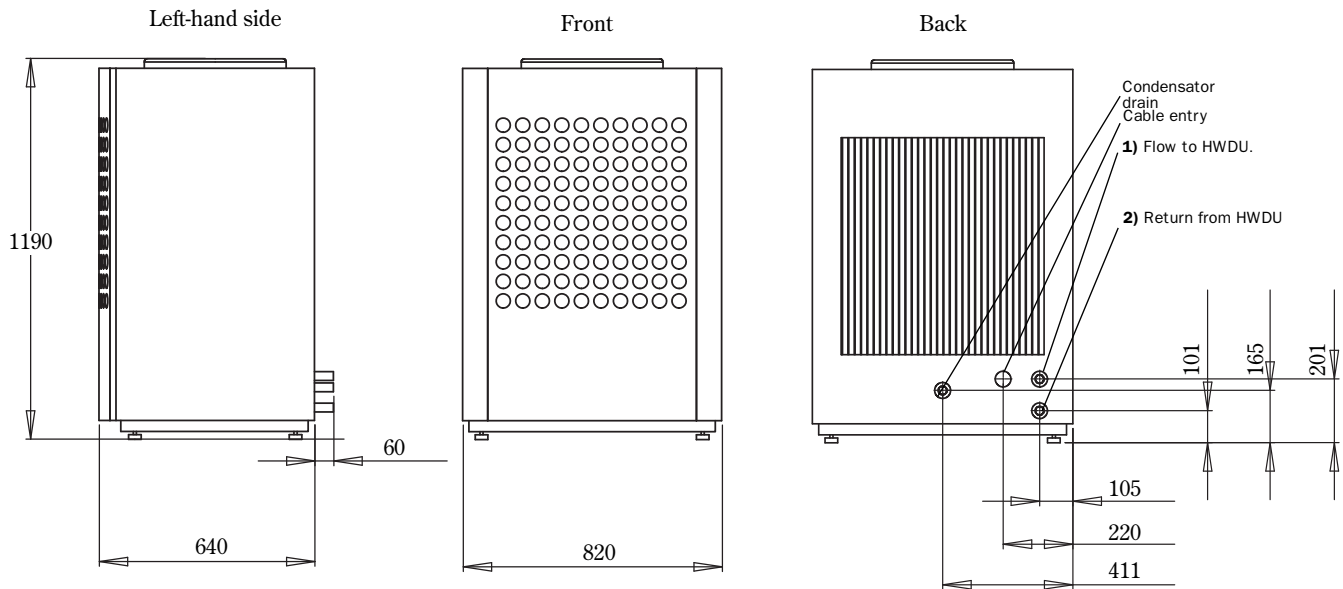


Heat pump



Dimensions, clearance and plumbing connections

Greensource Air to water heat pump (outdoor)



Required installation space for the heat pump.

Minimum distance from the pump to the wall is 300 mm.
 Minimum distance in front of the pump 1000 mm, to the sides 500 mm.

If a roof is installed it must be positioned at least 1.5 m above the heat pump to avoid the recirculation of cold air.



Note

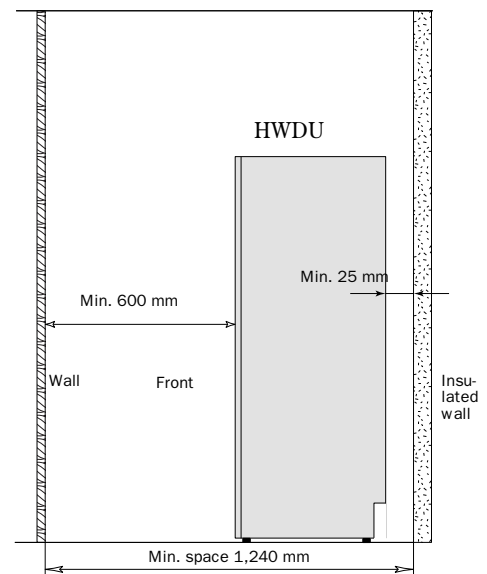
The waste coupler must be fitted to the condensator drain outlet.

Hot water distribution unit

Required installation space for the HWDU.

A free space of 600 mm is required in front of the HWDU. No clearance required at the sides.

A minimum of 25 mm is required from the back of the unit to any permanent fixture: i.e. outer wall or partition wall.



Pipe connections

The following connections are made to the HWDU:

A 32 mm plastic pipe is taken from the waste water pipe to the floor drain. The flow is connected to the inlet marked **Forward flow**. The return is connected to the inlet marked **Return flow**. Cold water and hot water are connected to inlets marked **Cold water** and **Hot water**.

The following connections are made to the heat pump:

A 32 mm plastic pipe is drawn from the drainage pipe to the floor drain.

Pipe dimensions

Flow/return

Clamping ring connection mm $\varnothing 22$

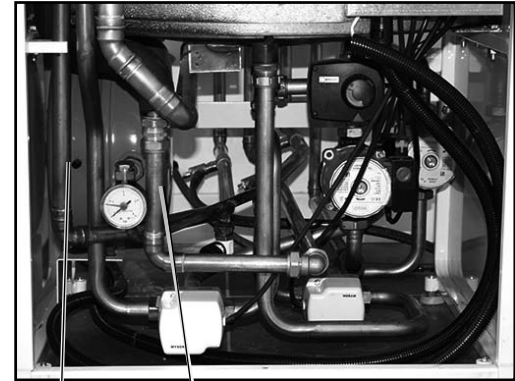
CW and HW

Clamping ring connection mm $\varnothing 22$

To/from connections

Clamping ring connection	mm	$\varnothing 22$	(in the HWDU)
Clamping ring connection	mm	$\varnothing 28$	(n the heat pump)
Waste water/drainage	mm	$\varnothing 32$	(in both)

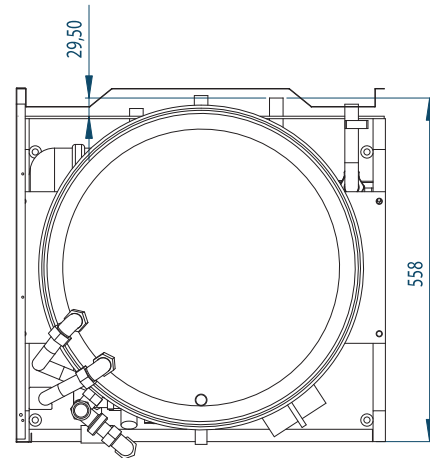
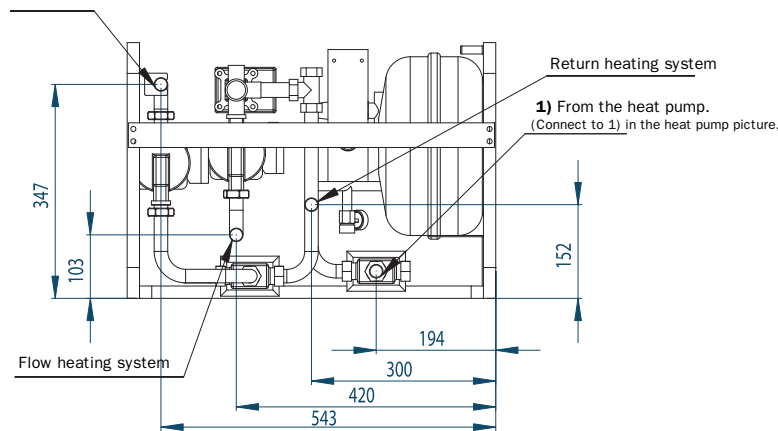
HWDU front view



Hot water Cold water

View connection area HWDU seen from behind

2) To the heat pump.
(Connect to 2) in the heat pump picture.



HWDU top view

Fit the filter valve

The task of the particle filter is to filter out dirt before it can enter the heat pump. Accordingly, the supplied filter valve should **always** be fitted on the return pipe on the hot side, between the HWDU and the outdoor heat pump. It should be fitted as close to the heat pump as possible and be horizontal.

Connecting to the heating system

Fitting the unvented kit

Parts to assemble:



Expansion vessel



High flow rate inlet control set



Expansion vessel hose



Tundish - factory fitted

Tundish - 15mm x 22 mm supplied separately



Wall mounting kit for expansion vessel



Blending valve



Filling loop with valve

Connection:

Mount the expansion vessel with the wall mounting kit. Connect the expansion vessel hose to the expansion vessel.

Connect the expansion vessel and inlet control set externally to the appliance in line with G3 regulations. We recommend that this be positioned above the HWDU.

The blending valve should be fitted between the cold and the DHW outlet to the tap.



Note

The relief valve connections should not be used for other purpose.

Use in hard water areas

Normally there is no need for water treatment to prevent scale formation.

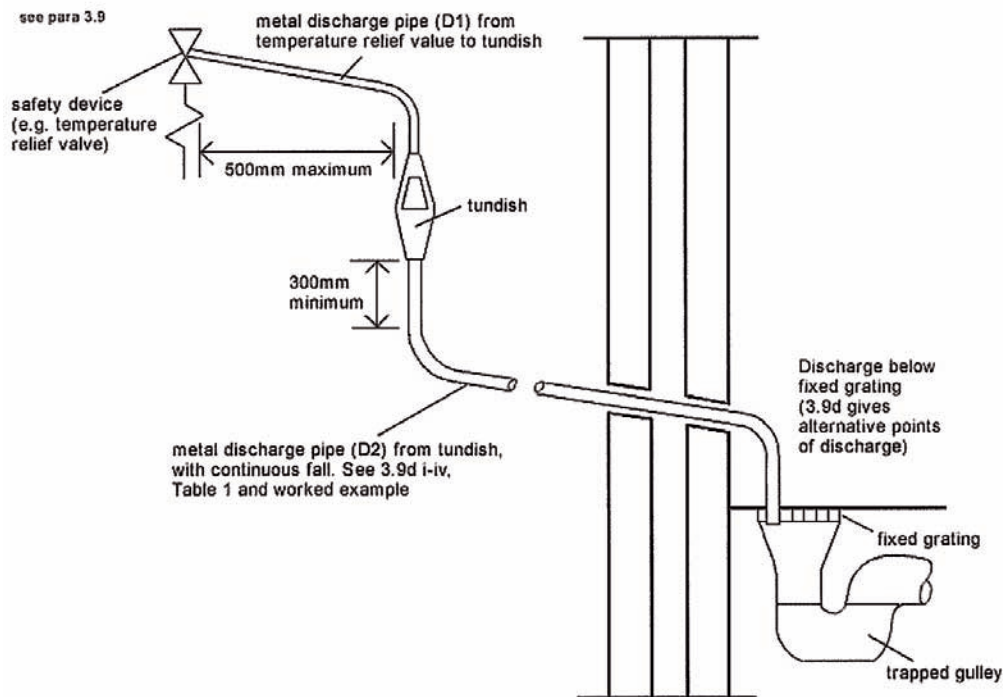
In areas where temporary water hardness exceeds 200ppm, consideration may need to be given to the fitting of a scale prevention device. In such circumstances the advice of the local water authority should be sought.

Detailed discharge pipe installation requirements

The discharge pipework must be routed in accordance with part G3 of schedule 1 of the building Regulations. The tundish should be vertical, located in the same space as the unvented hot water cylinder and be as close as possible and within 500mm of the safety device e.g. the temperature relief valve. The discharge pipe from the tundish should be:

- made of metal
- at least one pipe size larger than the nominal outlet size of the safety device (larger sizes may be required if the equivalent hydraulic resistance exceeds that of a straight pipe 9m long - refer to BS6700)
- terminate in a safe place where there is no risk to persons in the vicinity of the discharge, and position safely from electrical devices.
- have a vertical section of pipe at least 300mm long below the tundish before any elbows or bends in the pipework
- installed with a continuous fall
- visible at both the tundish and the final point of discharge or where this is not possible or practically difficult there should be clear visibility at one or the other of these locations

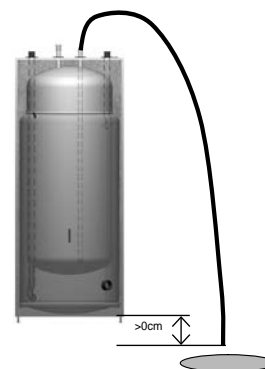
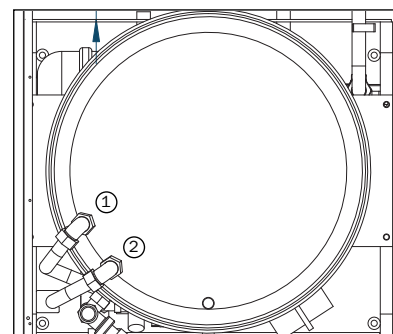
Diagram 1 – Typical discharge pipe arrangement.



Valve outlet size	Size of discharge pipework D1	Size of discharge pipework D2	Maximum length of straight pipe (no bends or elbows)	Deduct the figure below from the maximum length for each bend or elbow in the discharge pipe
		22 mm	Up to 9 m	0.8 m
G1/2	15 mm	28 mm	Up to 18 m	1.0 m
		35 mm	Up to 27 m	1.4 m
		28 mm	Up to 9 m	1.0 m
<G3>/4	22 mm	35 mm	Up to 18 m	1.4 m
		42 mm	Up to 27 m	1.7 m
		35 mm	Up to 9 m	1.4 m
G1	28 mm	42 mm	Up to 18 m	1.7 m
		54 mm	Up to 27 m	2.3 m

How to drain the hot water cylinder

1. Turn off the main water supply to the cylinder.
2. Open a hot water tap with a position as low as possible in the building, in order to reduce the pressure.
3. Remove the pipe connection **1 - Mains cold water in** and connect one end of the hose pipe to the connection. Terminate the other end of the hose to a drain or to outside. Ensure that the drain end of the hose is at a lower level than the bottom of the cylinder. The greater the fall on the hose, the higher the flow rate.
4. Disconnect connection **2 - Domestic hot water out**.
5. Start the siphon effect by pumping or sucking at the drain end of the hose.
6. Let the whole volume drain out.



How to flush the system & tank

To flush the tank use the above proposed setup, add a hose onto the hot water outlet position number 2 (in the above diagram) and then flush the hot water tank.

Flushing the heating system

It is important that all previously mentioned preparations have been carried out before the heat pump is connected to the heating system. Also ensure the heating system has been well flushed before the heat pump is installed. Flushing protects the heat pump from contamination.

Faults in the heat pump can be caused by poor water quality in the radiators/ underfloor coils or that air is penetrating the system continuously. Oxygen causes corrosion products in the form of magnetite and sediment, which is detrimental to the heat pump components and reduces its working life.

Existing heating systems which require regular filling or where the heating water is not clear when drained, requires cleansing and flushing before the installation of a heat pump. Do not use any water treatment additives except agents for raising the pH level.



Note

Only qualified installers may carry out the installation. The installer must follow applicable rules and regulations and recommendations from the manufacturer.

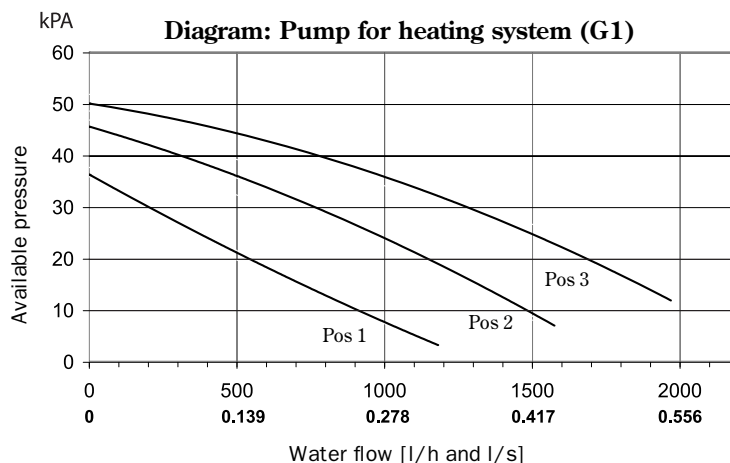
Connecting the heat pump, HWDU and heating system

Use the information in section *Dimensions, clearances and plumbing connections* to connect the different parts of the heating installation.

In addition, to avoid vibration transfer between the heat pump and the pipe system we recommend fitting flexible hoses at the inlet and outlet of the heat pump, which are supplied.

Between the heat pump and the house we recommend 28 mm copper pipe for lengths of less than 20 metres. The pipes must be insulated with a material, such as class 0 Armaflex, which cannot absorb moisture. Venting valves must be provided on the pipes. Short outdoor pipes reduce heat losses.

Pump diagram - Available pump head

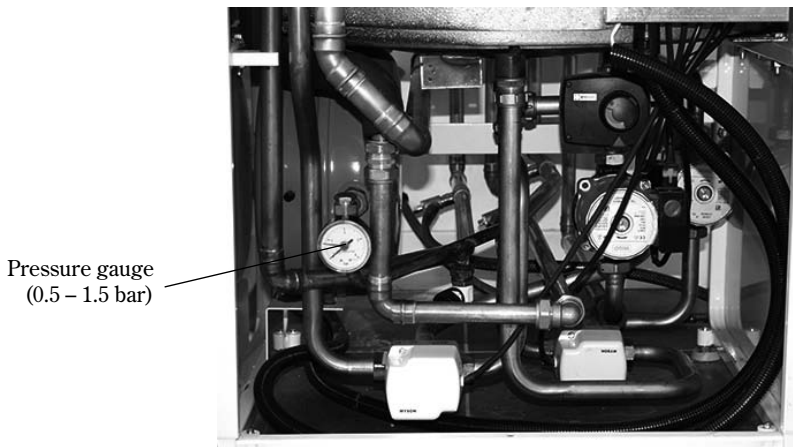


Filling the heating system

After flushing the heating system the hot water cylinder must be filled first and then the heating system can be filled and pressurised.

The filling of the heating system is carried out via the supplied filling loop sited externally to the unit.

It is recommended that the DHW inner tank is filled and pressurised first.



Warning

The hot water cylinder must always be filled and pressurised before the heating system is filled.

The installation must not, under any circumstances, be switched on without water.

Connecting to the power supply

Check that cables and printed circuit boards are intact. High and low current cables should be routed separately in order to avoid interference and give false readings on the sensors.

Sensors

Outdoor sensor T2

Locate the outdoor sensor T2 on a North facing wall approximately 2 m from ground level.

Room sensor T5

Position the indoor sensor T5 to a good reference location inside the house, away from direct sunlight and heating appliances.



Warning

Handle the circuit boards with great care. They are sensitive to ESD (Electrostatic discharge), which can cause faults in electronic components.

Isolation switch and residual current device

Isolation switch

All heating installations must be preceded by a safety switch.

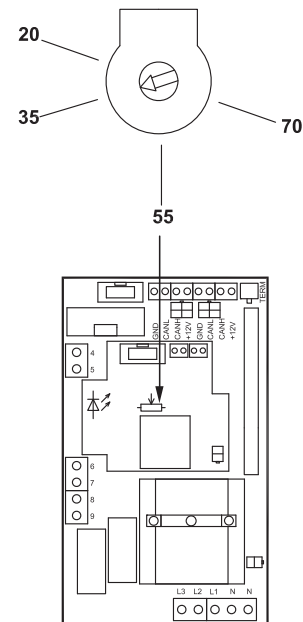
Residual current device

It is recommended that a separate residual current device is fitted to the heating system. Comply with applicable regulations.

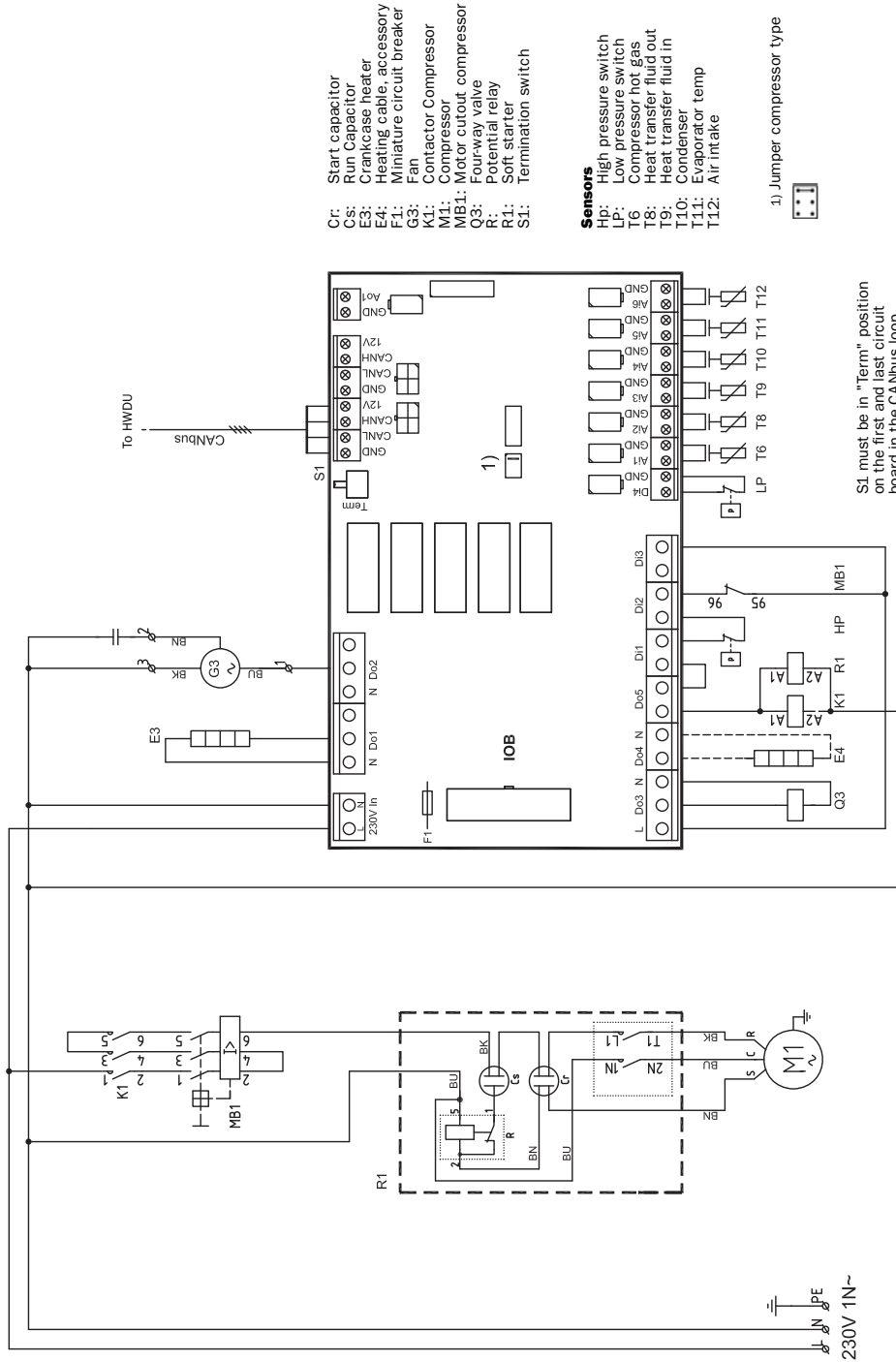
Emergency operation

The heat pump is equipped with emergency operation which means that the additional heat takes over the heating production in the event of faults in the control unit. Read more about emergency operation in the User Guide.

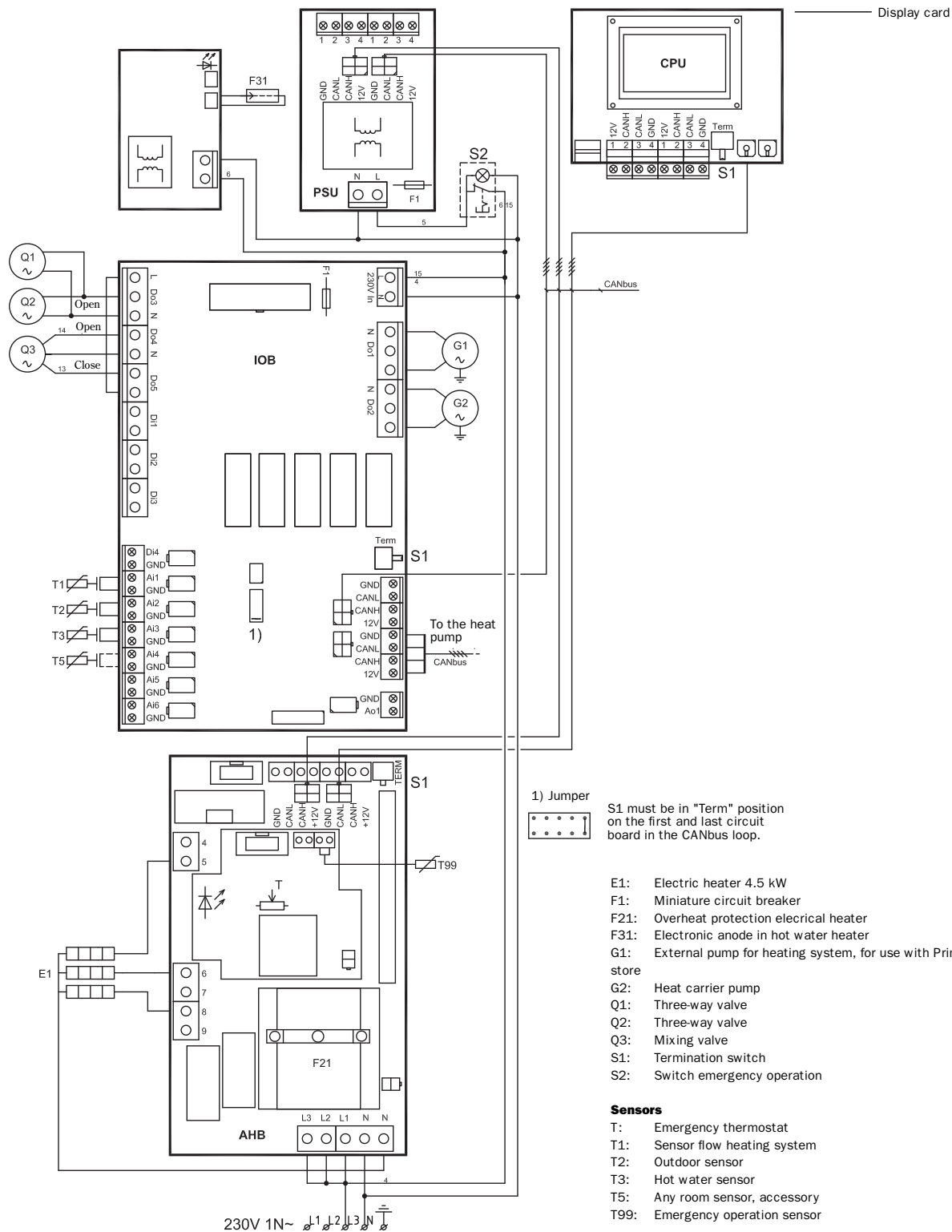
There is a thermostat for flow temperature during emergency operation on the AHB circuit board. It is factory set to 35°C which is the normal setting for the underfloor heating system. If the heating system only has radiators the setting must be increased to 55°C.



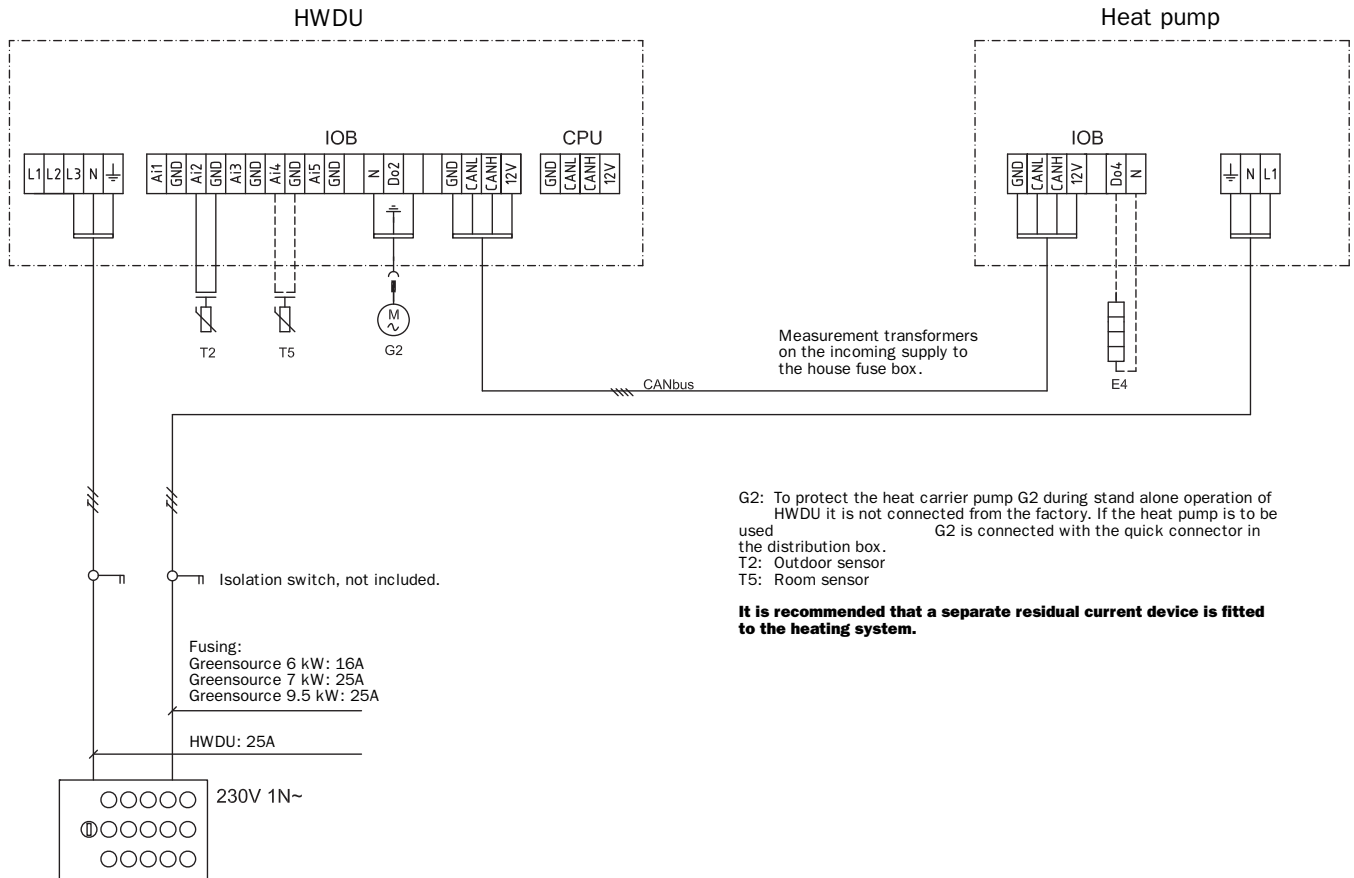
Wiring diagram Greensource heat pump



Wiring diagram Greensource HWDU



Terminal diagram Greensource heat pump - HWDU



External connections Greensource heat pump

Power supply:

Connect to terminals L1, N and PE.

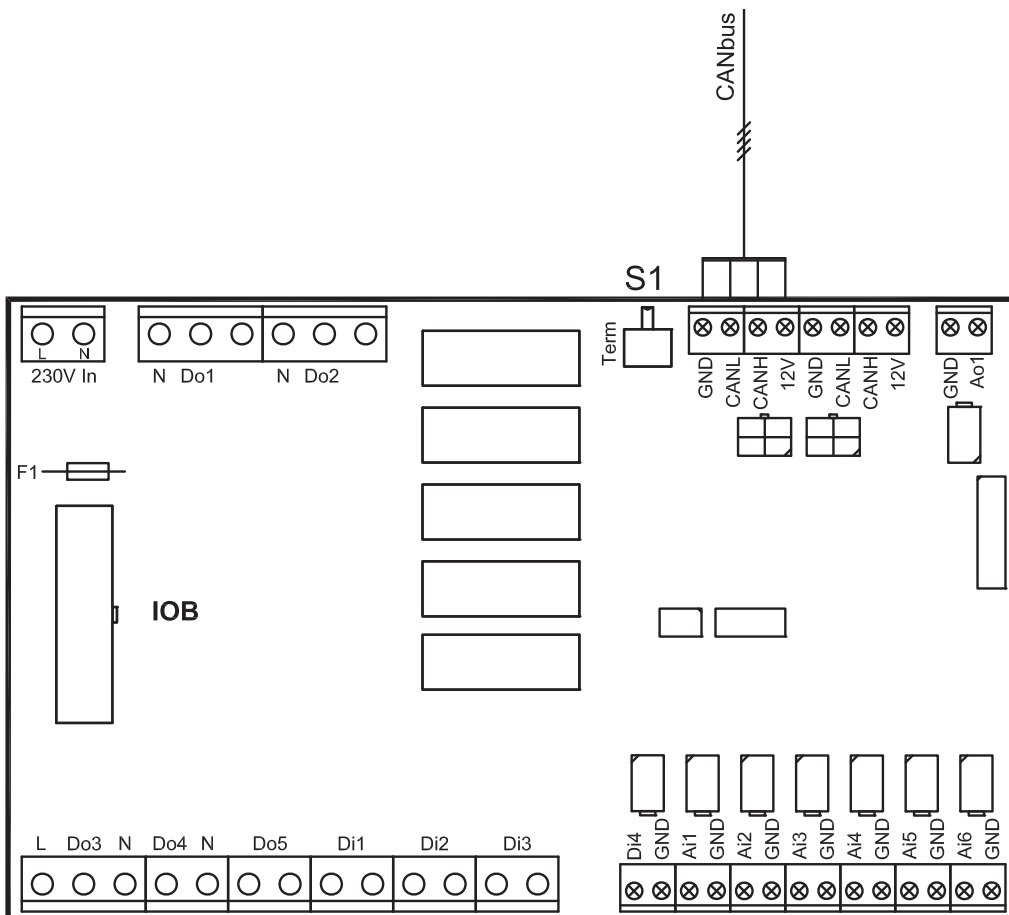
CANbus:

Communication cable between the heat pump and HWDU. Connect to terminals GND, CANL, CANH and 12V. See more under section *CANbus*.



Warning

Do not mix up the 12V and CANbus connections! If 12V (or other incorrect voltage) is supplied to the CANbus contacts the processors in the CANbus are destroyed.



External connections Greensource HWDU

Power supply:

Connect to terminals L3, N and PE.

CANbus:

Communication cable between the heat pump and HWDU. Connect to terminals GND, CANL, CANH and 12V. See more under section *CANbus*.

T2, Outdoor sensor:

Connect to terminals Ai2 and GND.

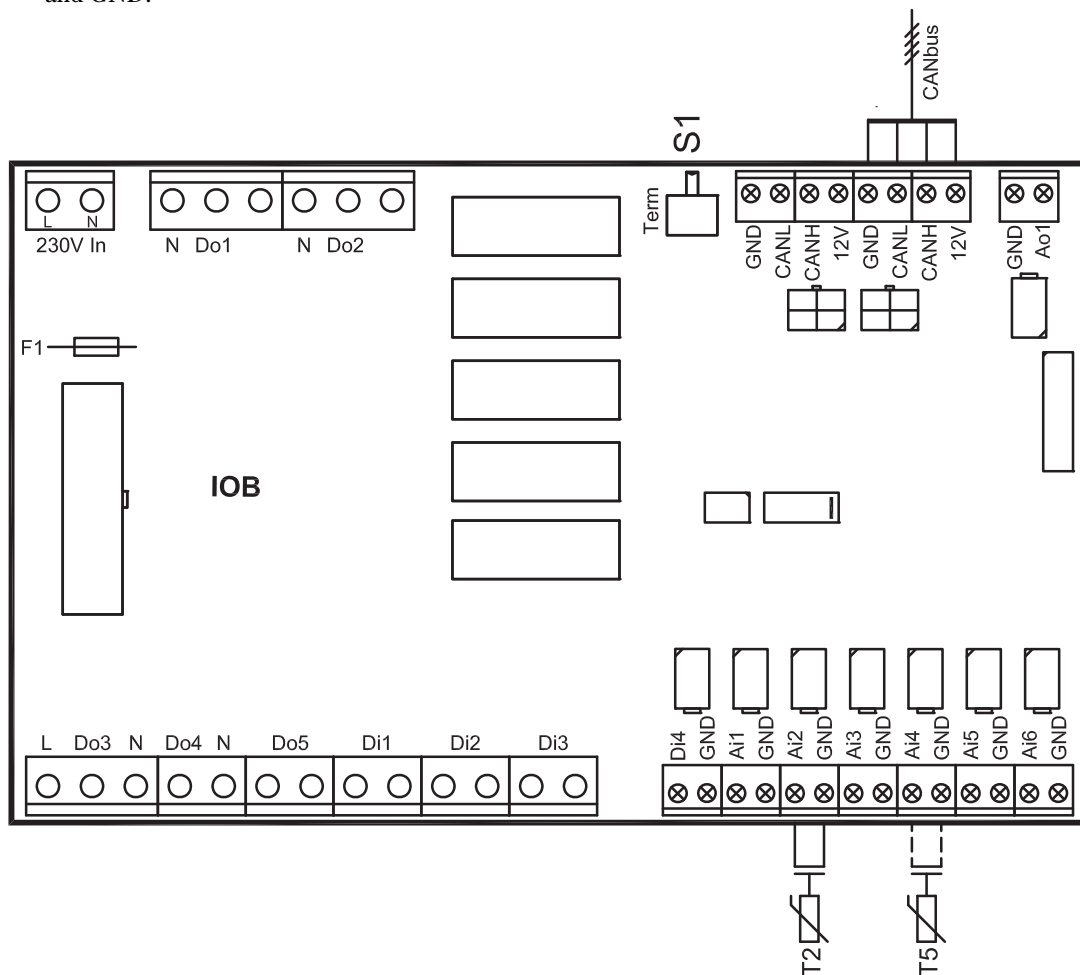
T5, Room sensor:

Connect if room sensor influence is required. Connect to terminals Ai4 and GND.



Warning

Do not mix up the 12V and CANbus connections! If 12V (or other incorrect voltage) is supplied to the CANbus contacts the processors in the CANbus are destroyed.



Installer and service menu (I/S)

First read about *Commissioning*.

As the installer you have your own section of menus for settings, e.g. for commissioning and maintenance.

The User Guide for the heat pump contains a complete description of how the control panel functions and of all customer functions under *Menu* and *Advanced menu*. Read it before you start.

A four digit access code is required to access the I/S menus. This is what to do:

1. Press the menu dial for approximately five seconds to get to *Advanced menu*.
2. Select *Access level*.
3. Enter your four digit access code using the menu dial and press the menu dial to confirm. The access code is the present date given as two digits for the month and two digits for the date (for example 0920). Access = service is shown in the display. Press the dial to get to *Menu*. Under *Menu* there are now both customer functions and I/S functions. To reach *Advanced menu* press the menu dial for approximately five seconds.
4. Return to customer level by selecting *Access level* in *Advanced menu* and enter 0000 as access code.

The control unit automatically returns to customer level after approximately 120 minutes.



Warning

The installer and service menu (I/S) is only for installers. Under no circumstances may the user access this level.



Menu overview

Here you find the upper levels for all functions under *Menu* and *Advanced menu*. All setting functions can also be found in the table *Factory settings*, see *Technical information*.

Menu

Start up	Setting the clock	I/S
	Connected extra sensors	I/S
	Connection capacity	I/S
	Manual operation	I/S
	Additional heat options	I/S
	Language	I/S
	Correct sensor	I/S
	Fan defrost interval	I/S
	Fan defrost time	I/S
	Forced defrost	I/S
	Block crankcase heater at high outdoor temperature	I/S
	Anti-jamming mode time	I/S
	Alarm buzzer signal length	I/S
	T1 Set point value maximum	I/S
	Display	I/S
Room temperature setting (T5)		K
Temperature increase/decrease (no T5)		K
Temperature increase/decrease settings (no T5)		I/S
	Limit value for V or H	
	Much colder/warmer, change	
	Colder/warmer, change	
Temperatures		K

Advanced menu

Temperature

Heating system temperature	K
Room sensor settings (T5)	K
Time limited settings	K
Heating season	K
Heating, maximum operating time at hot water requirement	K
Shut down protection, change over hot water to heating	I/S
Compressor working area settings	I/S

Hot water

Extra hot water	K
Hot water peak	K, I/S
Hot water temperature	K, I/S
Time control hot water	K
Hot water additional heat	I/S

Temperatures

Shows temperatures, inputs, outputs. Correct sensor	I/S
--	-----

Defrost settings

T12 - T11 settings	I/S
Maximum outdoor temperature	I/S
T11 Maximum temperature	I/S
Maximum time	I/S
Delay after compressor start	I/S
Minimum time between defrosts	I/S
Compressor pressure equalisation time	I/S
4-way valve pressure equalisation time	I/S
Forced defrost	I/S
Heating cable time after defrost	I/S
Fan defrost	

Timers

Shows timers	K, I/S
--------------	--------

Additional heat settings

Start delay	I/S
Time control additional heat	I/S
Additional heat options	I/S
Electric additional heat settings	I/S
Mixing valve settings	I/S
Connected electrical capacity (shows present value)	I/S

Setting the clock

- Set date
- Set time

Alarm

- Alarm log K, I/S
- Alarm history I/S
- Warning log I/S

Access level

K, I/S

Return to factory settings

K, I/S

Deactivate alarm buzzer

K

Program version

K, I/S

Commissioning

Before commissioning the heating system must be filled up and completely vented. Check that there are no leaks.

As many radiators as possible should be fully open when connecting to an existing water system. When connecting to an underfloor heating system at least half of all the floor coils should be open. When connecting a fan-assisted radiator system the fans are started first and then the taps on the fan-assisted radiators are opened fully.

Start the heat pump

1. Connect the mains and press the ON/OFF switch on the control panel. A language selection window is shown.
2. Start by selecting the language to be applied to the menu windows. The selected language automatically becomes the factory setting, that is, is not changed by *Return to factory settings*. To change language go to *Language* under *Start up*.
3. Electrical connection 230V/400V
Check that the correct voltage is set to 230V.
4. Size of heatpump 6-11 kW/12-17kW
Check that the correct size is set to 6-11kW.
5. Select *Setting the clock*.

Select *Set date* to adjust the date (yy-mm-dd) if it is not correct.
Select *Set time* to adjust the time if it is not correct.
6. Activate the installer and service menu, see *Installer and service menu (I/S)*.

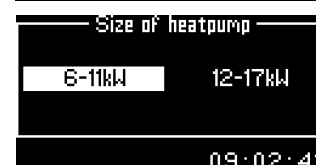
Start up

When you have entered the access code and are in *Menu* select the function *Start up*.

All functions to carry out the basic settings for the heating installation are gathered in this menu. Carry out/go through these in turn.

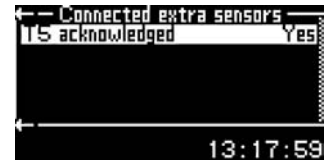
Setting the clock

See *Start the heat pump*.



Connected extra sensors

Yes must apply for *T5 acknowledged* when room sensor T5 is used.



Connection capacity

Important and must be changed

State total output: Setting of total connected output on the additional heat. The factory setting is 13.5 kW. **Change this to 4.5 kW.**



Compressor mode, output limitation: Setting permitted output when the compressor is in operation. The factory setting is 50% of the setting in *State total output*, that is 6,75 kW. Min = 0.25 kW, max = the value set in *State total output*. **Change this to 4.5 kW.**

Additional heat only, output limitation: Setting permitted output when the compressor is not in operation. Factory setting is the setting in *State total output*, that is 13,5 kW. Min = 0.25 kW, max = the value set in *State total output*.

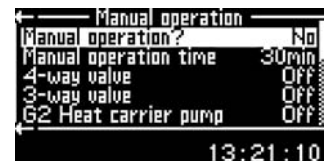


Note

For single phase units, change the connection capacity which speeds up the additional electric heater ramp up time.

Manual operation

Make a check of all the functions before you commission the heating installation. You can manually start and stop the pumps and valves from the menu *Manual Operation*. Select *Yes* to activate.



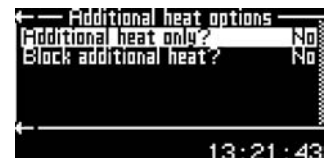
NOTE! The function is deactivated by selecting *No* in *Manual Operation*.

Additional heat options

Additional heat only blocks the start of compressor and fan. Heating and hot water is supplied via the additional heat.

Block additional heat blocks the additional heat function, but not during alarm mode, hot water peak, extra hot water or operation with additional heat only.

NOTE! Normally this is not recommended.



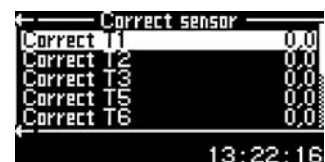
Language

This allows you to change the language to one other than that selected when the heat pump was first started. The selected language automatically becomes the factory setting, that is, is not changed by *Return to factory settings*.



Correct sensor

All sensors can be corrected here. The correction value is stated directly in °C. Normally one should avoid correcting a sensor. The value that is given without correction is most often the correct one. Correction of maximum 5°C up or down is possible.



Fan defrost interval and Fan defrost time

Because weather conditions vary from place to place some factory settings for defrosting may need adjustment. This particularly applies to locations with high humidity where there is a risk that the fan will ice up. Fan defrost means that warm air is blown upwards through the fan.

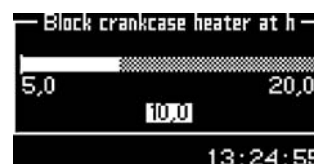
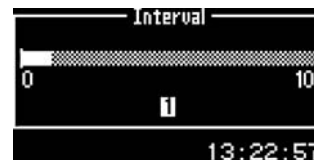
The fan defrost function is active when the value *Fan defrost interval* is between 1 and 10, factory setting is 1. The value 1 states that fan defrosting will occur at each ordinary defrosting. If the value is set to 3 then fan defrost occurs every third defrost.

Select how long fan defrost should last. The factory setting is 1 min.

Min = 1 and max = 5.

The function is deactivated by selecting 0 in *Fan defrost interval*.

Temperature limit for fan defrost is set to -5°C. No fan defrost occurs below this temperature. This setting can be changed under *Fan defrost* in the *Advanced menu*.



Forced defrost

Forced defrost is used to by-pass the timer and temperature conditions for defrost. Temperature T11 (refrigerant temperature evaporator) must be below the set stop level for defrosting.

Disable compressor pre heater at high outdoor temperature

Checked by outdoor sensor T2. When the outdoor temperature exceeds the set value the crankcase heating in the compressor is deactivated. The compressor pre heater is active when the compressor is idle and the outdoor temperature is below the set value. Factory setting = 10°C. Min = 5°C and max = 20°C.

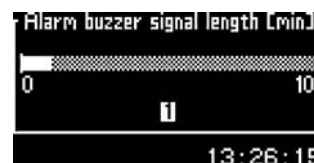


Anti-jamming mode time

At the set time each day the circulation pumps G1 and G2, three-way valve VXV and fan are run for one minute each, provided that they have not been in operation during the previous twentyfour hours. Factory setting = 2, which means 02:00. Min = 0, max = 23.

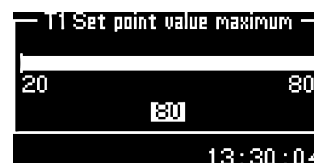
Alarm buzzer signal length

In event of an alarm the alarm signal is sounded for the set time if the signal is not deactivated. The factory setting is 1 minute, max setting is 10 minutes.



T1 Set point value maximum

This value is set to max, that is 80°C, on delivery. The value may need to be reduced if only underfloor heating is used.



Display

The function affects the window contrast and brightness. On delivery the max setting 10 is set on both.



Alarm during start up

During start up there may be an alarm regarding *Low temperature in condenser*. The cause is that the filled water is too cold (colder than +5°C).

Check the sight glass inside the heat pump. Bubbles may appear in the sight glass for a few minutes during start up. The bubbles should then stop. If it bubbles continuously this is a fault symptom which is probably due to insufficient refrigerant.

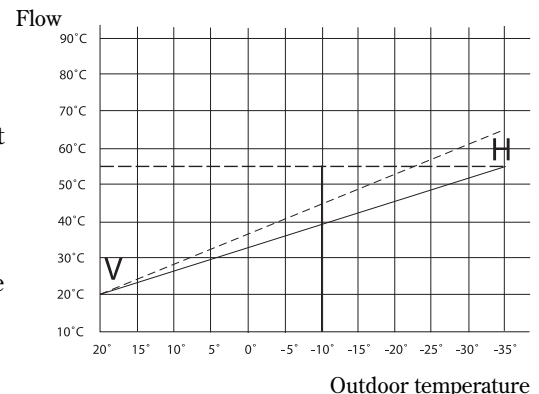


Other settings

Go through the heating and hot water settings in the *Menu* and *Advanced menu* and make the necessary adaptations. For example the temperature settings for underfloor heating must be lower than the factory settings. Set appropriate V and H values.

In the event of too low outdoor temperature, the compressor in the heat pump is switched off and all heating and hot water heating is via the electric element in HWDU. The flow temperature will now be based on the hot water temperature (sensor T3).

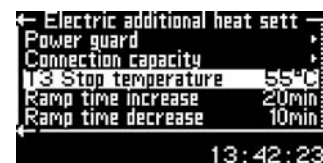
If the H value is set so that it is higher than 55°C the max temperature for T3 must be checked and changed.



To permit higher flow temperatures go to *Advanced menu* on I/S-level. Select *Additional heat settings*.

Then select *Electric additional heat settings* and *T3 Stop temperature*. Factory setting is 62°C. You can change this to max 70°C.

NOTE! At settings above 65°C a mixing valve must be installed. The *Factory settings* table lists all functions, which can be changed by the customer and installer. Go through the list to see if any other settings need to be changed.



Important points to check after commissioning

For the installation to perform at its best, it is important to check the flow on the hot side of the heat pump. Usually, the heat carrier pump has a speed selector switch. This must be set correctly for the pressure drop in the system. A recommended temperature difference across the heat pump on the hot side is between 5-10°C. The nominal flows provided in *Technical information* shows a difference of 7°C in operating mode +7/45°C. Check this by reading the sensors T9 (heat transfer fluid in) and T8 (heat transfer fluid out).

When commissioning is carried out at a low outdoor temperature (below 0°C) the temperature difference should be between 5°C and 7°C.

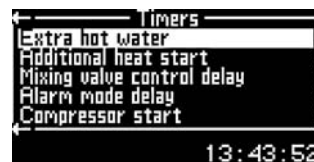
When commissioning is carried out at an outdoor temperature above 15°C the temperature difference must be between 8°C and 10°C.

The flow through the heating system should be sufficient to keep the whole radiator warm and thereby increase the heat emitting surface. This means that the flow temperature is kept low.

After testing, vent the heating system again and top up with cold water if necessary. See *Filling the heating system*.

Timers

There are a number of timers in the control unit.
The status for these are shown in the menu *Timers*.



Extra hot water

Displays the remaining time for requested extra hot water.

Additional heat start

Displays the countdown of the timer for delay of additional heat.

Mixing valve control delay

Displays the time that the mixing valve function is delayed after the additional heat timer has counted down.

Alarm mode delay

Displays the remaining time until the additional heat is activated when an alarm is triggered.

Compressor start

Displays remaining time of compressor start delay

Delay before defrost

Displays the remaining time before defrosting is permitted.

T12-T11 reached temperature difference

The heat pump regularly calculates the difference between T12 and T11. The result is compared to the set point value which is calculated based on actual outdoor temperature and settings in *Defrost settings*\T12-T11 settings\Difference at +10°C /0°C /-10°C. The timer starts when the difference exceeds the set point value and, if it lies above the set point value continuous defrosting is permitted to start when the timer has counted down.

PLEASE NOTE: For defrosting to start the *Delay before defrost* must have also counted down.

Defrost

Displays the remaining time before defrosting the evaporator.

Heating, maximum operating time at hot water requirement

Displays the remaining time before the maximum time in heating mode is reached if there is a simultaneous hot water requirement.

Hot water, maximum operating time at heating requirement

Displays the remaining time before the maximum time for hot water operation is reached if there is a simultaneous heating requirement.

Heating season change delay

Displays the remaining time until the heating season is activated in the heat pump.

Blocking low pressure switch

Displays the time remaining when the low pressure switch is blocked.

Blocking room sensor influence

Displays the time remaining when the room sensor is blocked.

Hot water peak

Displays the remaining time for the hot water peak to be active.

Hot water peak interval

Displays the time remaining to the next hot water peak.

Alarm functions

Functions under *Alarm*:

- Alarm log
- Alarm history
- Warning log

All alarms and warnings are described in the User guide.

At Customer level you have access to alarm information in the alarm log.

As installer you can also:

- Delete the *Alarm log*
- Read information in *Alarm history*
- Read information in *Warning log*
- Delete the *Warning log*



Alarm history

Alarm information

Alarms are stored in chronological order. Turn the menu dial to read off all information about the most recent alarm, continuing to turn will show the previous alarms.

Alarm information consists of a heading and then detailed information about the time, temperatures of all sensors and status for each output when the alarm occurred.



Warning log

The alarm log stores alarms in chronological order.

Deleting *Warning log* and *Alarm log* can be appropriate when commissioning has been completed.

Commissioning report

Client / Installation address:

Installer:

Heat pump description:

Commissioning date:

Heat pump serial number:

HWDU serial number:

Other components of the installation:

Outdoor sensor T2 Room sensor T5

Hot water cylinder temperature sensor T3

Others:

Points to be checked prior to commissioning

Heating system filled checked Notes:

(pressurised and vented):

Electric heater set to 4.5 kW: set checked Notes:

Filters: checked cleaned Notes:

Sight glass (green): checked Notes:

Heating system pump G2 working correctly:

Heat carrier pump G3 working correctly:

Temperatures after 10 minutes heating or hot water mode:

Heat flow out T8:/..... °C

Heat return in T9:/..... °C

Sensor condensor temp T10:/..... °C

Refrigerant temp T11:/..... °C

Defrost sensor T12:/..... °C

Commissioning report

System pressure levels checked

Functional test carried out

Ensure that primary circuit has been correctly flushed

Check fan operation on outdoor unit

Check for insulation of pipe work

Check that CANbus is fitted correctly

Check term switches positioned correctly

Check condensation drain operates

Electricity reading on the house taken

The instructions about how to use the heat pump have been given to the client / to the user

Documentation about the heat pump has been handed over

Date and signature of the installer:

Technical information

Factory settings

The table displays the factory values (F value) of the settings that you, as a customer, (K) can change via the customer menus *Menu* and *Advanced menu*. *The functions of Installer/Service level (I/S) under Menu and Advanced menu* in the table are accessed by the installer after changing the access level.

Menu	Level	F value
Start up		
-"\Setting the clock		
-"-\Set date	I/S	yy-mm-dd
-"-\Set time	I/S	hh:mm:ss
-"-\Connected extra sensors		
-"-\T5 acknowledged (T5)	I/S	No
-"-\Connection capacity (Electric element)		
-"-\State total output	I/S	13,5 kW
-"-\Compressor mode, output limitation	I/S	4,5/6,75 kW
-"-\Additional heat only, output limitation	I/S	9,0/13,5 kW
-"-\Manual operation		
I/S		No
-"-\Additional heat options		
-"-\Additional heat only?	I/S	No
-"-\Block additional heat?	I/S	No
-"-\Language		
I/S		Selected
-"-\Correct sensor		
I/S		0
-"-\Fan defrost interval		
I/S		1 time
-"-\Fan defrost time		
I/S		1,0 min
-"-\Forced defrost		
I/S		No
-"-\Block crankcase heater at high outdoor temperature		
I/S		10,0°C
-"-\Anti-jamming mode time		
I/S		02:00
-"-\Alarm buzzer signal length		
I/S		1 min
-"-\T1 Set point value maximum		
I/S		80°C

Menu	Level	F value
-"-\Display		
-"-\Contrast	I/S	10
-"-\Brightness	I/S	10
Room temperature setting (T5)		
K		20,0°C
Temperature increase/decrease (ej T5)		
K		=
Temperature increase/decrease settings (ej T5)		
-"-\Limit value for V or H	I/S	10°C
-"-\Much colder/warmer, change	I/S	8%
-"-\Colder/warmer, change	I/S	3%
Extra hot water		
K		0 h

Advanced menu	Level	F value
Temperature		
--\Heating system temperature		
--\--\Heat curve	K	V=20,0°C, H=55,2C°
--\--\Hysteresis		
--\--\--\Maximum	K	16,0°C
--\--\--\Minimum	K	4,0°C
--\--\--\Time factor	K	10
--\Room sensor settings (T5)		
--\--\Room temperature setting	K	20,0°C
--\--\Room sensor influence		
--\--\--\Change factor	K	5,0
--\--\--\Blocking time	K	4 h
--\Time limited settings		
--\--\Time control heating		
--\--\--\Day and time	K	Off
--\--\--\Change in temperature	K	-10°C
--\--\Holiday		
--\--\--\Date	K	Off
--\--\--\Change in temperature	K	-10°C
--\Heating season		
--\--\--\Heating season limit	K	18°C
--\--\--\Delay	K	4 h
--\--\--\Direct start limit	K	10°C
--\Heating, maximum operating time at hot water requirement	K	20 min
--\Shut down protection, change over hot water to heating	I/S	300 s

Advanced menu	Level	F value
Hot water		
--\Extra hot water		
--\--\Number of hours	K	0
--\--\Stop temperature	K	65,0°C
--\Hot water peak		
--\--\Interval	K	0 days
--\--\Start time	K	03:00
--\--\Stop temperature	I/S	65,0°C
--\Hot water temperature		
--\--\T3 Start temperature	I/S	49,0°C
--\--\T9 Stop temperature	I/S	54,0°C
--\--\T8 Stop temperature	I/S	59,0°C
--\--\Hot water, maximum operating time at heating requirement	K	30 min
--\Time control hot water	K	Off
Temperatures		
--\Correct sensor	I/S	0,0
Defrost settings		
--\T12 - T11 settings		
--\--\Time for reached temperature difference	I/S	60 s
--\--\Difference at +10°C	I/S	12°C
--\--\Difference at 0°C	I/S	8°C
--\--\Difference at -10°C	I/S	6°C
--\Maximum outdoor temperature	I/S	13°C
--\T11 Maximum temperature	I/S	20°C
--\Maximum time	I/S	15 min
--\Delay after compressor start	I/S	10 min
--\Minimum time between defrosts	I/S	30 min
--\Compressor pressure equalisation time	I/S	0 s
--\4-way valve pressure equalisation time	I/S	0 s
--\Forced defrost	I/S	No
--\Heating cable time after defrost	I/S	15 min

Advanced menu	Level	F value
--\Fan defrost		
--\--\Fan defrost interval	I/S	1 time
--\--\Fan defrost time	I/S	1,0 min
--\--\Temperature limit	I/S	-5°C
Additional heat settings		
--\Start delay	I/S	60 min
--\Time control additional heat	I/S	Off
--\ Additional heat options		
--\--\Additional heat only?	I/S	No
--\--\Block additional heat?	I/S	No
--\Electric additional heat settings		
--\--\Power guard		
--\--\--\Power guard	I/S	Off
--\--\--\Supply voltage	I/S	400 V
--\--\--\Main fuse	I/S	16 A
--\--\--\Display/Correction of current transformer	I/S	0,0 A
--\--\--\Current margin	I/S	0,5 A
--\--\--\Time from tripped power guard to possible reconnection	I/S	60 s
--\--\--\Time between possible reconnections	I/S	60 s
--\--\Connection capacity (Electric element)		
--\--\--\State total output	I/S	13,5 kW
--\--\--\Compressor mode, output limitation	I/S	4,5/6,75 kW
--\--\--\Additional heat only, output limitation	I/S	9,0/13,5 kW
--\--\T3 Stop temperature	I/S	55°C
--\--\Ramp time increase	I/S	20 min
--\--\Ramp time decrease	I/S	10 min

Advanced menu	Level	F value
--\Mixing valve settings		
--\--\Neutral zone	I/S	1,0°C
--\--\Running time extension		
--\--\--\Increase signal extension	I/S	1 time
--\--\--\Decrease signal extension	I/S	1 time
--\--\Additional heat maximum temperature		
--\--\--\Mixing valve limitation start temperature	I/S	47°C
--\--\--\Mixing valve force close	I/S	48°C
--\--\Limitation at temperature increase	I/S	Yes
--\--\Limitation time	I/S	20 s
Setting the clock		
--\Set date	K	yy-mm-dd
--\Set time	K	hh:mm:ss
Alarm		
--\Alarm log		
--\--\Delete alarm log?	I/S	No
--\Warning log		
--\--\Delete warning log?	I/S	No
Access level	K, I/S	K (0)
Return to factory settings	K, I/S	No
Deactivate alarm buzzer	K	No

Technical information

Greensource		6 kW	7 kW	9.5 kW
Emitted/Supplied output at +7/35°	kW	5,5 / 1,5	7,1 / 2,1	8,8 / 2,3
Emitted/Supplied output at +7/45°	kW	5,1 / 1,7	6,9 / 2,5	8,5 / 2,8
Heat carrier flow nominal	l/s	0,19	0,29	0,34
Internal pressure drop heat carrier	kPa	5	6	7
Air flow	m ³ /h	2200	2200	2200
Electrical consumption fan	A	0,44	0,44	0,44
Electrical supply		230V 1N~		
Fuse size ¹⁾	AT	16	25	25
Compressor		Scroll		
Highest outgoing heat carrier temperature	°C	65	65	65
Refrigerant filling R-407C	kg	2	2,3	2,4
HTF connection, clamping ring	mm	Hose 1 inch internal thread		
Defrost system		Hot gas with four-way valve		
Operating temperature	°C	-20 – +35		
Dimensions (WxDxH) ²⁾	mm	820x640x1190		
Weight	kg	140	145	155
Outer casing		Galvanised enamelled plate		

Greensource Hot water distribution unit		
Control unit		Rego 800
Output electric element	kW	4,5
Output circulation pump	kW	0,2
Electrical supply		230V 1N~
Max. power consumption	kW	4,7
Fuse size ¹⁾	AT	25
Max working pressure	bar (MPa)	2.5 (0.25)
DHW volume	l	151
CH Buffer volume	l	55
Expansion tank	l	12
Overheat protection	°C	90
Min. flow heating system	l/s	0
Pump for heating system G1	Wilo Star RS 25/6-3	
Heat carrier pump G2	Wilo Star RS 25/6-3	
Dimensions (WxDxH)	mm	600/615/1660
Weight, excluding water	kg	122
Weight, including water	kg	347

Output data at +7/35° and +7/45° are stated according to the European standard EN 14511.

¹⁾ aM type fuse, D characteristic MCB. Both units require a means of electrical isolation.

²⁾ Dimensions excl. feet, supplied min 20 mm - max 30 mm depending on adjustment.

Sound levels

Sound pressure level:

Sound pressure level is defined as the sound level, which at an ear level of 1.8 metres, is perceived one metre from the heat pump.

Measured in a sound measurement room without echo at an outdoor temperature of +7°C and 50°C flow temperature.

Example:

When the heat pump is installed outside with free sound propagation the sound level drops by 6dBa with each doubling of distance.

Heat pump	Sound pressure level Lp - ear (dBa)
Greensource 6 kW	49
Greensource 7 kW	49
Greensource 9.5 kW	53

Example	Greensource 6 kW
Distance	Lp - ear (dBa)
1 metres	49
2 metres	43
4 metres	37
8 metres	31

Sensor table

The table shows all sensor resistance at different temperatures.

Temperature (°C)	kΩ
-40	154.300
-35	111.700
-30	81.700
-25	60.400
-20	45.100
-15	33.950
-10	25.800
-5	19.770
0	15.280
5	11.900
10	9.330
15	7.370
20	5.870
25	4.700
30	3.790
35	3.070
40	2.510
45	2.055
50	1.696
55	1.405
60	1.170
65	0.980
70	0.824
75	0.696
80	0.590
85	0.503
90	0.430

Supplementary technical information

Maximum water supply pressure to the pressure reducing valve	16 bar
Operating pressure DHW	3 bar
Expansion vessel charge pressure	3 bar
Expansion valve setting	6 bar
Maximum primary working pressure	2,5 bar
Set opening pressure of the combined temperature and pressure relief valve	7 bar / 95°C
Expansion vessel, 19 Litres	3 bar

Cylinder reheat times, Inner cylinder 151 Litres of DHW

Full volume heat-up from 15°C to 55°C with a primary flow temperature of 60°C takes 2 hours and 15 minutes

Full volume re-heat to 55°C after 70% of the cylinders contents were drawn off takes 1 hour and 50 minutes

Manufacturer

Appliance: IVT Industrier AB, part of Bosch Thermotechnik GmbH
Box 1012, SE-57343 Tranås, Sweden

Cylinder: BoRö Pannan AB
Bangårdsv. 1, SE-95231 Kalix, Sweden

Important note

Only genuine Bosch Thermotechnology spare parts can be used with these products.

Part no: 8-716-115-330 Issue a
14658, Issue 1.0

EXCELLENCE COMES AS STANDARD

Worcester, Bosch Group

Cotswold Way, Warndon, Worcester WR4 9SW.

Tel. 01905 754624 Fax. 01905 754619

Worcester, Bosch Group is a brand name of
Bosch Thermotechnology Ltd.

www.worcester-bosch.co.uk

CONTACT INFORMATION

WORCESTER, BOSCH GROUP:

TE C H N I C A L : 08705 266241

S E R V I C E : 0845 7 256206

S P A R E S : 01905 752571

L I T E R A T U R E : 01905 752556

T R A I N I N G : 01905 752526

S A L E S : 01905 752640

W E B S I T E : www.worcester-bosch.co.uk

