

Envirosorb 5

Installation and Servicing

Air / Water Heat Pump



TABLE OF CONTENTS

INTRODUCTION

1	Instructions guidance	3
	1.1 Product documentation.....	3
	1.2 Associated documents	3
	1.3 Explanation of symbols.....	3
	1.4 Guarantee registration.....	3
2	Appliance description.....	3
	2.1 Safety devices	3
	2.2 Data label	4
	2.3 Regulation and statutory requirements	4
	2.4 Concept of operation	5
	2.5 Hydraulic and refrigerant schematic.....	6
3	Safety instructions and regulations	7
	3.1 Safety instructions	7
	3.2 Regulations	8
4	Recycling	8
	4.1 Appliance.....	8
	4.2 Packaging.....	8
	4.3 Refrigerant.....	8

TECHNICAL DATA

5	Envirosorb 5.....	9
---	-------------------	---

INSTALLATION

6	Appliance location.....	10
	6.1 Location.....	10
	6.2 Clearances	11
7	Appliance installation	11
	7.1 Scope of delivery.....	11
	7.2 Recommendations before installing	12
	7.3 Dimensions.....	12
	7.4 Mounting	12
	7.5 Positioning the appliance	13
8	Opening the appliance.....	13
9	Hydraulic connection.....	14
10	Evacuation of condensates.....	14
11	Electrical connections	14
	11.1 Main board.....	15
	11.2 Access to main board	15
	11.3 Electrical wiring.....	15
	11.4 Wiring diagram	16
12	Commissioning	17
13	Specific adjustment	17
14	User information.....	17

TABLE OF CONTENTS

MAINTENANCE

15	Trouble-shooting	18
	15.1 Fault diagnosis	18
	15.2 Fault codes	18
16	Servicing	23
	16.1 Annual Maintenance	24
	16.2 Draining	24
17	Replacement of Parts	24
18	Spare parts	24

INTRODUCTION

1 Instructions guidance

1.1 Product documentation

The instructions are an integral part of the appliance and must be handed to the user on completion of the installation in order to comply with the current regulation.

- Carefully read the manual, to understand all the information to enable safe installation, use and servicing. No liability can be accepted in the event of damage for not complying with the guidance in this instruction manual.

These instructions consist of, Installation, Servicing, Fault Finding and Replacement of Parts. The instructions are an integral part of the appliance and must be handed to the user on completion of the installation.

1.2 Associated documents

- 1 Instructions for user
- Instructions for other system components
- The commissioning request form (obtainable from G-w Group Service - tel 01773-828300)
- Commissioning checklist to be filled out by the installer or the commissioning engineer.

1.3 Explanation of symbols



DANGER: Risk of injuries.



DANGER: Risk of electric shock.



ATTENTION: Risk of damage to the appliance or to its surroundings.



IMPORTANT: Important information.

1.4 Guarantee registration

Thank you for installing a new Glow-worm appliance in your home. Glow-worm appliances are manufactured to the very highest standard so we are pleased to offer our customers a Comprehensive Guarantee.

This product is guaranteed for 24 months from the date of installation or 30 months from the date of manufacture, whichever is the shorter, for parts and labour.

The second year of guarantee, from the beginning of the 13th month onwards after installation or manufacture, is conditional upon the heat pump having been serviced by a **competent person** approved at the time by the Health and

Safety Executive, in accordance with the manufacturer's recommendations. We strongly recommend regular servicing of your appliance, but where the condition is not met, any chargeable spare parts or components issued within the applicable guarantee period still benefit from a 12 month warranty from the date of issue by the manufacturer.

We recommend you complete and return as soon as possible your guarantee registration card (delivered with the hydraulic module). If your guarantee registration card is missing you can obtain a copy or record your registration by telephoning the Glow-worm Customer Service number 01773 828100.

2 Appliance description

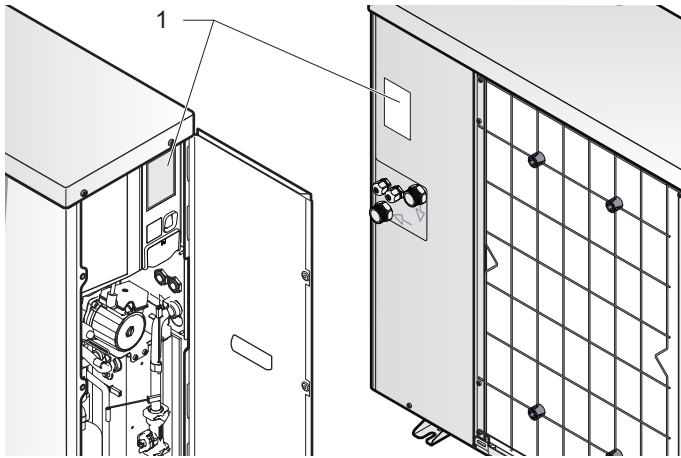
2.1 Safety devices

- The appliance is designed to function in heating with an exterior temperature of -7°C to 25°C. At temperatures beyond this range, the appliance ceases functioning until the outside temperature is returns to between -5°C and 25°C.
- The appliance is designed to function in cooling with an exterior temperature of 16°C to 48°C. At temperatures beyond this range, the appliance ceases functioning until the outside temperature is returns to between 18°C and 47°C.
- Prior to each start-up, the heat pump's electronics ensure that the sensors are connected.
- A high pressure switch limits the operation of the appliance when the refrigerant fluid pressure exceeds 42 bars (42 x 10⁵ Pa).
- A low-temperature compressor protection device checks the outdoor temperature prior to switching on the heat pump. If below 12C, the compressor case heater is activated, to avoid compressor damage.
- A compressor output temperature sensor limits the operation of the heat pump when the temperature measured by the sensor exceeds 105°C.
- A temperature sensor located on the heat exchanger tube enables the functioning of the fan.
- A water flow sensor ensures correct water circulation. If the flow is too low (<500 l / h), the unit stops and restarts once the flow has returned to within the normal range of operation.
- The maximum output temperature for the water circuit is 55°C. When this temperature is exceeded, the appliance stops. The heat pump restarts when the temperature drops below 42°C.

2.2 Data label







The data label certifies the country where the appliance is intended to be installed.

Data label location:



Key
1 Data label

The data label contains the following data:

- The name of the manufacturer
 - The commercial name of the appliance and its serial number
 - The electrical protection class
 - The pump + compressor + regulatory devices supply voltage
 - The maximum absorbed power (P max)
 - The maximum current (I max)
 - The type of refrigerant fluid, the amount necessary for filling, the maximum working pressure (PS) at low and high pressure
 - The coefficient of performance (COP) for an air temperature of 7°C and heating flow temperature of 35°C
 - The coefficient of performance (COP) for an air temperature of 7°C and heating flow temperature of 45°C
 - The coefficient of performance (COP) for an air temperature of -7°C and heating flow temperature of 35°C
 - The coefficient of performance (COP) for an air temperature of -7°C and heating flow temperature of 45°C
 - The heating power  for an air temperature of 7°C and heating flow temperature of 35°C
 - The heating power  for an air temperature of 7°C and heating flow temperature of 45°C
 - The heating power  for an air temperature of -7°C and heating flow temperature of 35°C
 - The heating power  for an air temperature of -7°C and heating flow temperature of 45°C
 - The CE number and logo
- The Energy Efficiency Ratio (EER) for an air temperature of 35°C and cooling flow temperature of 18°C
 - The Energy Efficiency Ratio (EER) for an air temperature of 35°C and cooling flow temperature of 7°C
 - The refrigerating power  for an air temperature of 35°C and cooling flow temperature of 18°C
 - The refrigerating power  for an air temperature of 35°C and cooling flow temperature of 7°C

2.3 Regulation and statutory requirements

CE Mark

The CE mark indicates that the appliances described in this manual are in compliance with the following directives:

- European directive n°2004-108 from the European Parliament and Council relative to electromagnetic compatibility
- European directive n°2006-95 from the European Parliament and Council relative to low voltage
- European directive No. 97-23 of the European Parliament and the Council regarding pressure equipment
- European directive No. 2007-1494 of the Commission, dated December 17, 2007, determining, in accordance with Directive No. 2006-842 of the European Parliament and the Council, the label type and the additional requirements as regards the labelling of products and equipment containing certain fluorinated greenhouse effect gas.
- European directive No. 2006-842 of the European Parliament and the Council of May 17, 2006 on certain fluorinated greenhouse gasses (OJEU of June 14, 2006)

2.3.1 Local regulations

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by a competent person approved at the time by the Health and Safety Executive and that it meets the requirements of the appropriate Building Regulations.

The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme.

- Visit www.centralheating.co.uk for more information.



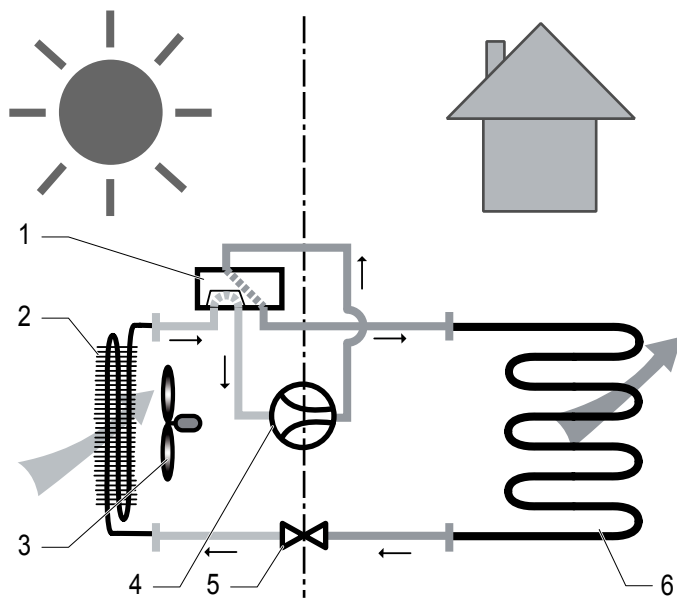
2.4 Concept of operation

A heat pump (HP) is a thermodynamic machine which transfers heat from one location to another. To do so, it employs the characteristics of a refrigerant fluid.

The system is composed of the following circuits:

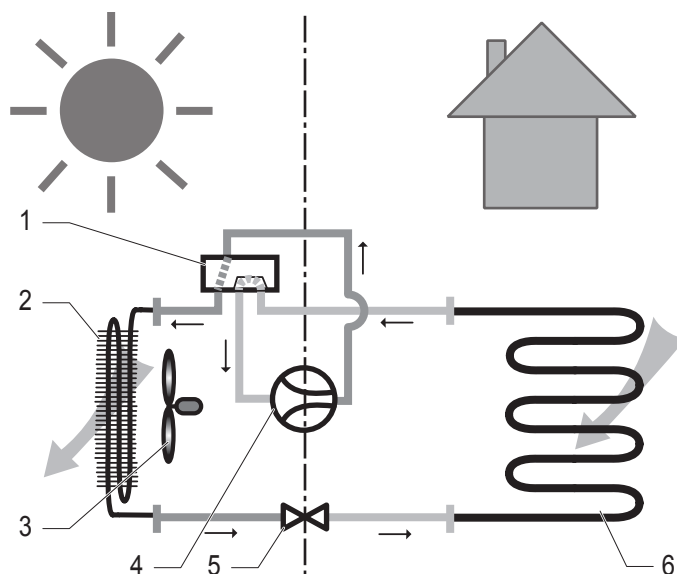
- The refrigeration circuit which transfers heat to the water circuit following the evaporation, compression, condensation and expansion of the fluid.
- The heating circuit.

2.4.1 In heating mode



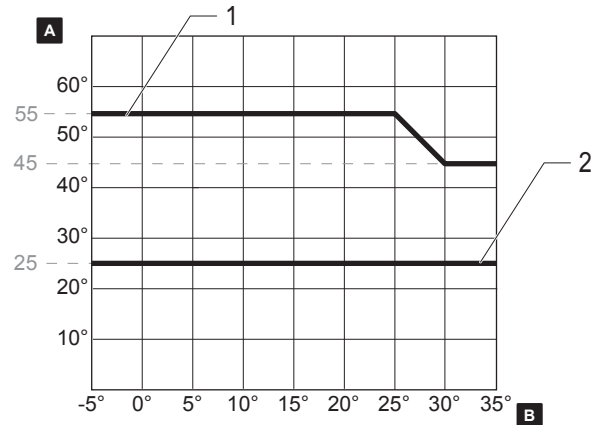
- Key**
- 1 Reverse cycle valve
 - 2 Tubular heat exchanger
 - 3 Ventilating fan
 - 4 Compressor
 - 5 Pressure regulator
 - 6 Exchanger with plates

2.4.2 In defrosting mode



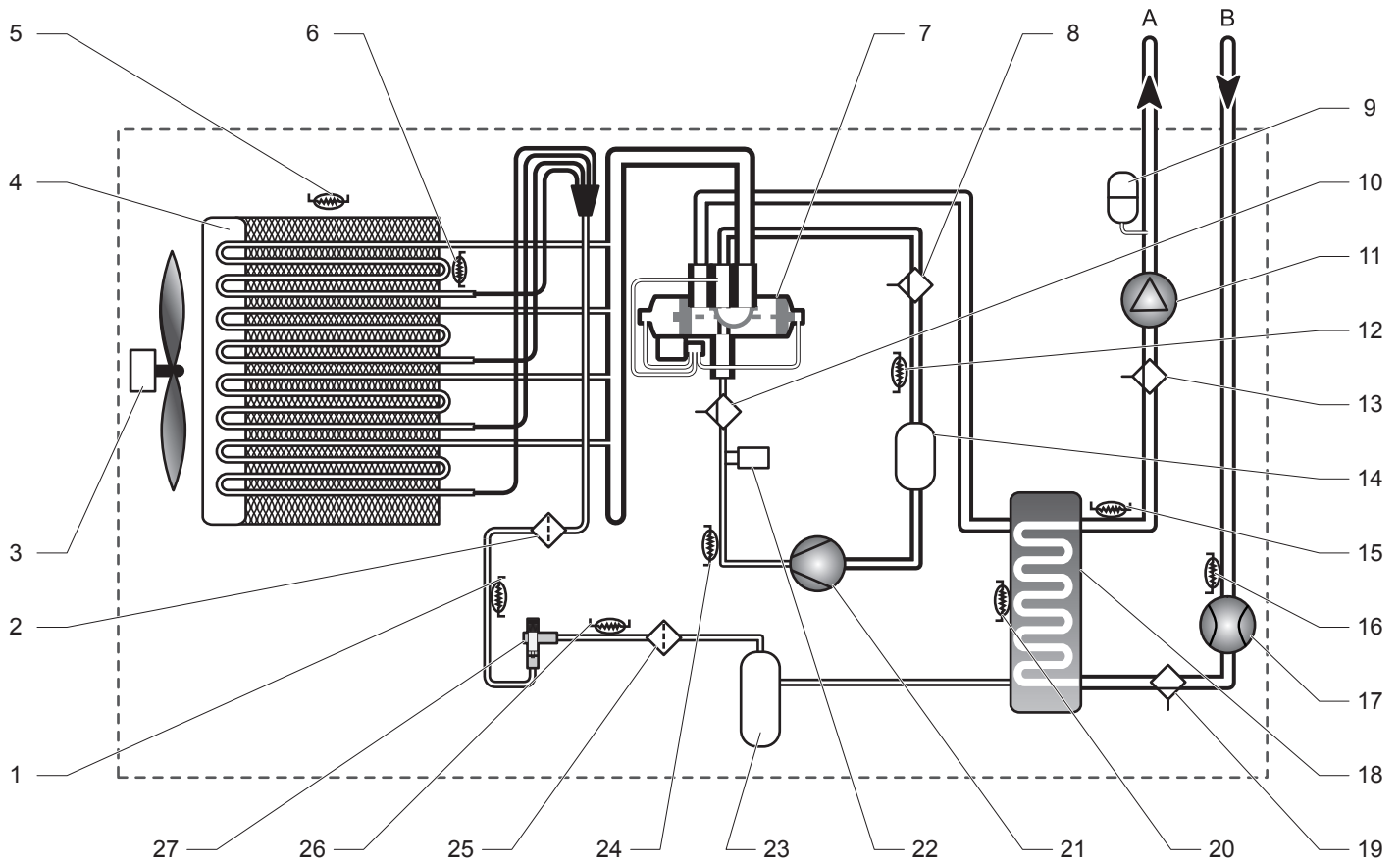
- Key**
- 1 Reverse cycle valve
 - 2 Tubular heat exchanger
 - 3 Ventilating fan
 - 4 Compressor
 - 5 Pressure regulator
 - 6 Exchanger with plates

2.4.3 Min. and Max. temperature settings in heating



- Key**
- 1 Max. temperature
 - 2 Min. temperature
 - A Water temperature
 - B Air temperature

2.5 Hydraulic and refrigerant schematic



Key

- 1 Temperature sensor for detecting end of defrosting
- 2 Filter
- 3 Ventilating fan
- 4 Tubular heat exchanger
- 5 Exterior ambient sensor
- 6 Air/refrigerant thermistor
- 7 4-way reverse cycle valve
- 8 Low-pressure circuit maintenance valve
- 9 Expansion vessel
- 10 High-pressure circuit maintenance valve
- 11 Pump
- 12 Compressor suction temperature sensor
- 13 Air trap
- 14 Suction accumulator
- 15 Outgoing heat pump temperature sensor

- 16 Return heat pump temperature sensor
 - 17 Water flow rate sensor
 - 18 Exchanger with plates
 - 19 Hydraulic circuit venting valve
 - 20 Plate to plate heat exchanger temperature sensor
 - 21 Scroll compressor
 - 22 High pressure cooling circuit sensor
 - 23 Liquid reservoir
 - 24 Compressor discharge temperature sensor
 - 25 Filter
 - 26 Pre-expansion temperature sensor
 - 27 Electronic pressure regulator
- A Heat pump flow
B Heat pump return

3 Safety instructions and regulations

3.1 Safety instructions



Incorrect installation can cause electric shock or appliance damage.

- Never disable security devices and do not try to adjust them.
- Be sure to consider the following handling techniques and precautions:
 - Grip the appliance at its base
 - Use safety clothing where appropriate, e.g. gloves, safety footwear.
- Ensure safe lifting techniques are used:
 - Keep back straight.
 - Avoid twisting at the waist.
 - Avoid upper body/top heavy bending.
 - Always grip using the palm of the hand.
 - Use designated hand holds.
 - Keep load as close to body as possible.
 - Always use assistance if required.
- Under no circumstances must the user interfere with or adjust sealed parts.
- When assembling the connections, correctly position the seals to avoid any leakage of water.
- This appliance contains metal parts (components) and care should be taken when handling and cleaning, with particular regard to edges.

The basic safety instructions must be followed before attempting to maintain or replace spare parts:

- Stop the appliance.
- Electrically isolate the appliance from the power supply.
- Hydraulically isolate the appliance using the isolation valves if provided.
- Should you need to replace hydraulic components, drain the appliance.
- Protect all the electrical components from water while working on the appliance.
- Use only original spare parts.
- Use only new O-rings and gaskets.
- After having completed work on water carrying components, check for their tightness.
- When work on the appliance is completed, perform an operational test and check for safety.

R410A Refrigerant



Important: any action carried out on the refrigerant circuit must be performed by qualified personnel.

- Use only R410A refrigerant.



Evacuating refrigerant into the atmosphere is prohibited. The refrigerant must be properly recovered in a container suitable for recycling.

3.2 Regulations

3.2.1 Statutory requirements

IMPORTANT

Where no British Standards exists, materials and equipment should be fit for their purpose and of suitable quality and workmanship.

The installation of this appliance must be carried out by a competent person in accordance the rules in force in the countries of destination.

Manufacturer's instructions must not be taken as overriding statutory requirements.

Standards

On installing and commissioning the appliance you must adhere to the technical rules, standards and provisions in effect at the time.

Reminder of existing regulatory acts

- EC regulation No. 2037/2000 from the 29th of June 2000
This European regulation repeals regulation No. 3093/94 and presents the elimination schedules of CFC and HCFC. It also deals with the collection of refrigerants, system leaks, particularly systems containing more than 3 kg of CFC or HCFC, as well as the minimum level of qualification required by the technicians.
- EC regulation No. 0842/2006 from the 17th of May 2006 regarding the containment, use, collection and disposal of the fluorinated greenhouse gases, the labelling and elimination of the products and equipment containing these gases, the restriction of use and banning of certain products from the market, as well as the training and certification of personnel and companies operating in the activities targeted by this regulation: refrigeration, air-conditioning, heat pumps and fire protection systems containing greenhouse gases.

3.2.2 Other regulations

Control of Substances Hazardous to Health

Under Section 6 of The Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health. The adhesives and sealants used in this appliance are cured and give no known hazard in this state.

The refrigerant used in this appliance is R410a the use of which is strictly controlled by F Gas regulation EN842/2006.

4 Recycling



The recycling of the packaging must be carried out by the qualified professional who installed the appliance. The recycling of any refrigerant fluid must be carried out by a suitably qualified refrigerant engineer.

4.1 Appliance

Most of the appliance is made of recyclable materials.



This symbol indicates that this appliance must not be disposed of with household waste, that it should be selectively collected for energy recovery, reuse or recycling.

- Take the appliance to an appropriate collection point for the treatment, evaluation and recycling. The collection point must accept appliances containing refrigerant fluids for their recovery via recycling either within the elimination centre or by an authorised service provider.



By complying with this directive, you will contribute to the preservation of natural resources and the protection of human health.

4.2 Packaging

The competent person who installed the appliance must:

- Sort the waste so as to separate those which can be recycled (cardboard, plastics...) from those that cannot.
- Dispose of the waste in compliance with regulations in force.

4.3 Refrigerant



The appliance contains R410A refrigerant. The refrigerant should only be handled by an approved specialist. Avoid all contact with skin and eyes.

R410A fluorinated greenhouse gases are contained within a fully sealed system (Kyoto Protocol PES 1975).

Under normal use and conditions, the refrigerant is not dangerous.

Prior to disposing of the appliance, the refrigerant must be properly recovered in a container suitable for recycling.

The personnel approved for this recuperation must have an appropriate certification according to the regulations in force.

TECHNICAL DATA
5 Envirosorb 5

Description	Unit	Envirosorb 5
Min. operational range (in heating)	°C	-7
Max. operational range (in heating)	°C	35
Specifications, with radiators		
(flow : 45°C, return : 40°C, outside dry temperature (wet) 7 (6)°C)		
Heating output	kW	4.41
Power input	kW	1.46
Rated electrical current	A	6.34
COP* A7(6) W45-40		3.02
Specifications, with floor heating		
(flow : 35°C, return : 30°C, outside dry temperature (wet) : 7 (6)°C)		
Heating output	kW	4.70
Power input	kW	1.26
Rated electrical current	A	5.48
COP* A7(6) W35-30		3.73
Refrigerant circuit		
Type of refrigerant		R-410A
Quantity of refrigerant	kg	1.8
Type of compressor		Rotary
Type of oil		Polyolester
Type of regulator		Electronic
Fan speed	rpm	180 - 660
Maximum operating pressure (PS) in low pressure	bar	34
	Pa	34 x 10 ⁵
Maximum operating pressure (PS) in high pressure	bar	43.2
	Pa	43.2 x 10 ⁵
Heat pump circuit		
Min. supply pressure	bar	1
	Pa	1 x 10 ⁵
Max. supply pressure.	bar	3
	Pa	3 x 10 ⁵
Minimum static pressure	bar	1
	Pa	1 x 10 ⁵
Nominal water flow rate in heating mode	l/h	800
Minimum water flow rate	l/h	500
Minimum recommended water flow	l/h	750
Maximum recommended water flow	l/h	850
Minimum outlet temperature setting (in heating)	°C	25
Maximum outlet temperature setting (in heating)	°C	55
Heat pump water volume	l	1

Description	Unit	Envirosorb 5
Electrical		
Supply voltage/frequency	V/Hz	1/N/PE 230V 50Hz
Fuse (x2)		T2A / 250V
Maximum absorbed power (P max)	kW	1.45
Real power absorbed by the fan and pump (with heating resistors)	kW	1.48
Real power absorbed by the fan and pump (without heating resistors)	kW	1.35
Maximum absorbed current (I max)	A	6.70
Real current absorbed by the fan and pump (with heating resistors)	A	6.43
Real current absorbed by the fan and pump (without heating resistors)	A	5.88
Starting current (with start-up current limiter)	A	< 20
Index of electrical protection		IPX4
Electrical classification		I
Surge category		II
Pollution rating		2

Description	Unit	Envirosorb 5
Dimensions		
Height	mm	949
Width	mm	880
Depth	mm	345
Ø Water circuit connections	"	1
Nett total weight	kg	82.5
Sound power level : overall exterior noise (according to EN 12102 and EN ISO 9614-1)	dBA	62.6

* Coefficient Of Performance (according to EN 14511)

** Energy Efficiency Ratio (according to EN 14511)



Fluorinated greenhouse gases as identified in the Kyoto protocol, are contained within a fully sealed system.

INSTALLATION



All the drawings dimensions are shown in mm.

6 Appliance location

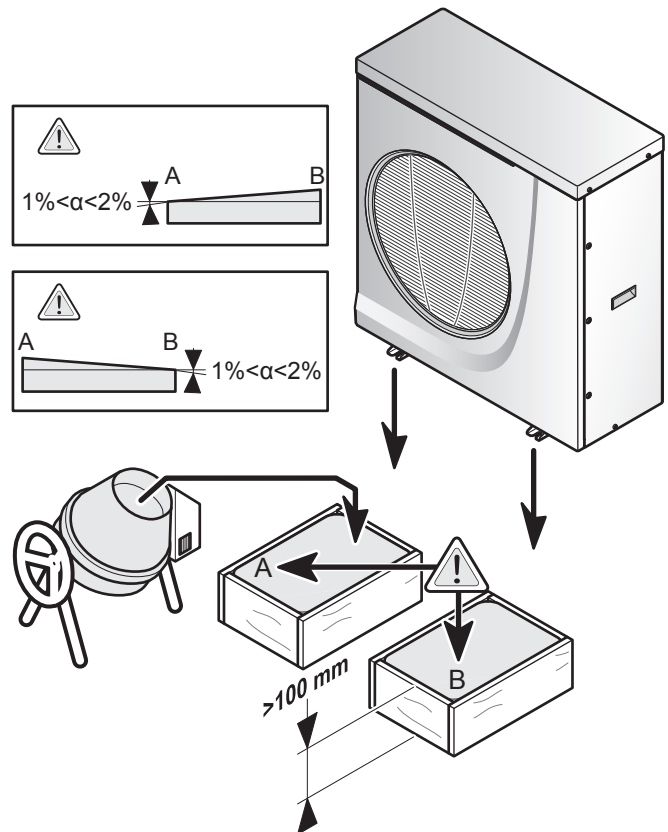
6.1 Location

6.1.1 Instructions

- Before choosing a site for the appliance, carefully read the safety warnings and installation manual.
- Ensure that the wall to which the appliance will be mounted on is structurally safe in order to support the weight of the appliance.
- Ensure there is sufficient space available for the appliance, taking care that minimum clearances are adhered to ensure that the connections to the water, gas and flue can be accessed and inspected (see chapter Clearances).
- Observe current regulations.
- Install the appliance outside.
- Do not install the appliance:
 - near a heat source,
 - near flammable materials,
 - near the ventilation points of adjacent buildings
 - beneath deciduous trees.
- Take into account the following when installing the heat pump:
 - prevailing winds,
 - the noise generated by the fan and the compressor
 - the visual impact on the surrounding neighbourhood.
- Avoid areas exposed to strong winds directed against the appliance's air outlet.
- Set the appliance on one of the following supports:
 - concrete slabs,
 - crane beam,
 - concrete blocks.
- Do not install the fan facing the nearby windows. If necessary, install a noise barrier.
- To avoid transmission of vibrations to the surrounding buildings:
 - use hoses for water connections,
 - install the anti-vibration pads supplied with the appliance.

- Ensure that the appliance is protected from water and from snow.
- Do not expose the heat pump to corrosive or dusty atmospheres (near to dirt roads, for example).
- Do not place near to stale air extraction fans.
- Allow room for electricity cables (high and low voltage).
- Explain these requirements to the appliance user.

6.1.2 Discharge of condensates

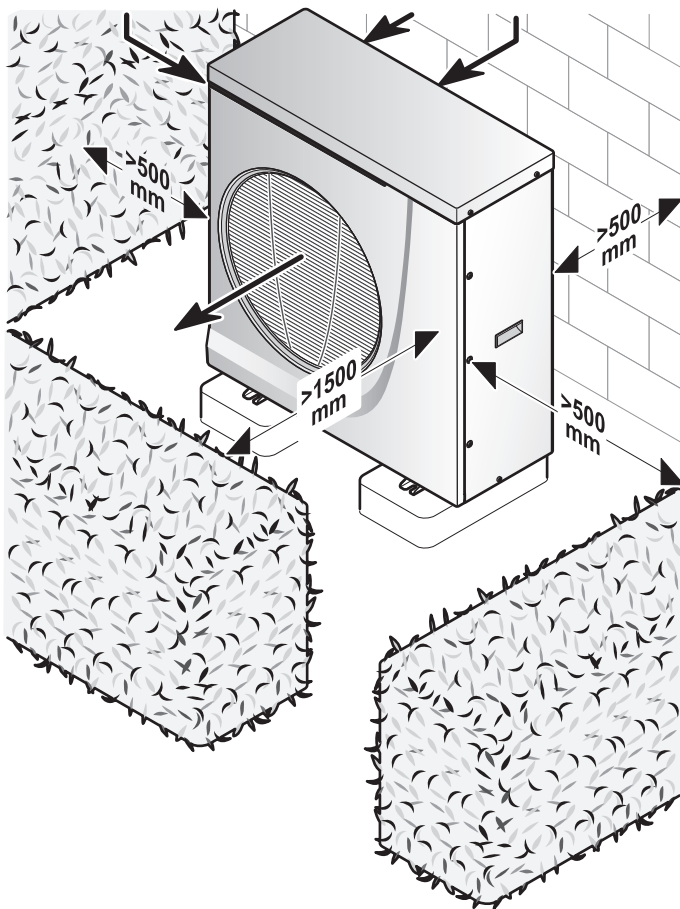


- Depending on the gradient, install the condensate discharge bend at the lowest point and the cap at the highest point.
- Make allowance for a condensate discharge circuit.

6.1.3 Regulations

- Please ensure that all correct permissions have been obtained from the local planning office, prior to siting the appliance.

6.2 Clearances



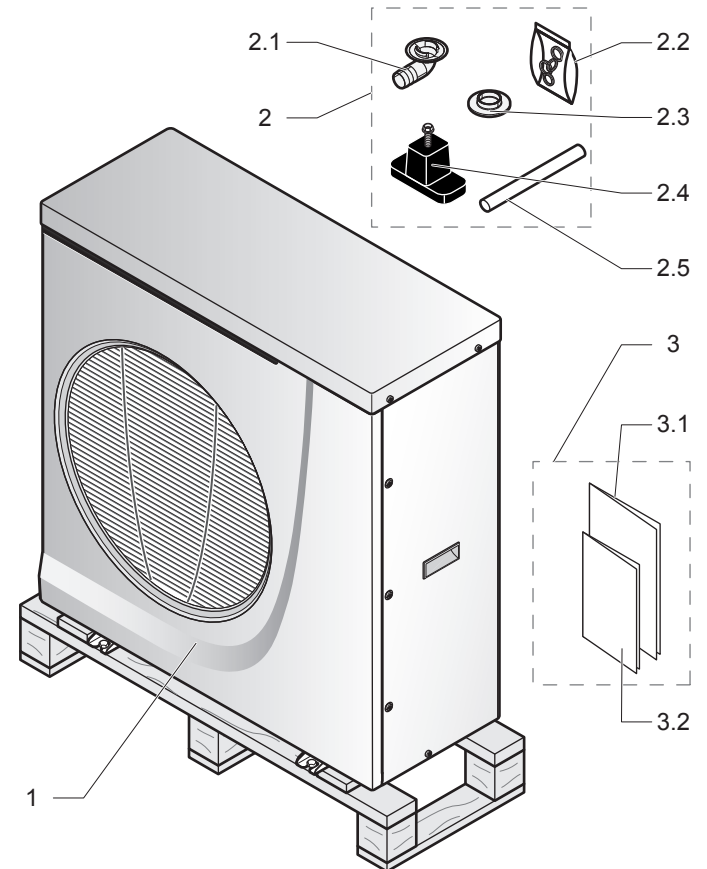
- Respect the minimum dimensions shown in the drawing above in order to ensure a correct air flow and to facilitate maintenance operations.
- Make sure that the available space is sufficient for the installation of the water system piping.

7 Appliance installation



Do not connect the heat pump directly to a heating circuit. The Heat pump must be connected to the Hydraulic module.

7.1 Scope of delivery



Key

1	Heat pump	(x1)
2	Accessories bag	(x1)
2.1	Drainage elbow	(x1)
2.2	Flat face washer 1"	(x4)
2.3	Drain plug	(x1)
2.4	Anti-vibration pads	(x4)
2.5	Draining hose	(x1)
3	Document package	(x1)
3.1	Installation manual	(x1)
3.2	Instructions for use	(x1)

- Please check the contents.

7.2 Recommendations before installing

Installation pipework must be designed and installed to ensure venting of air from the system is possible.



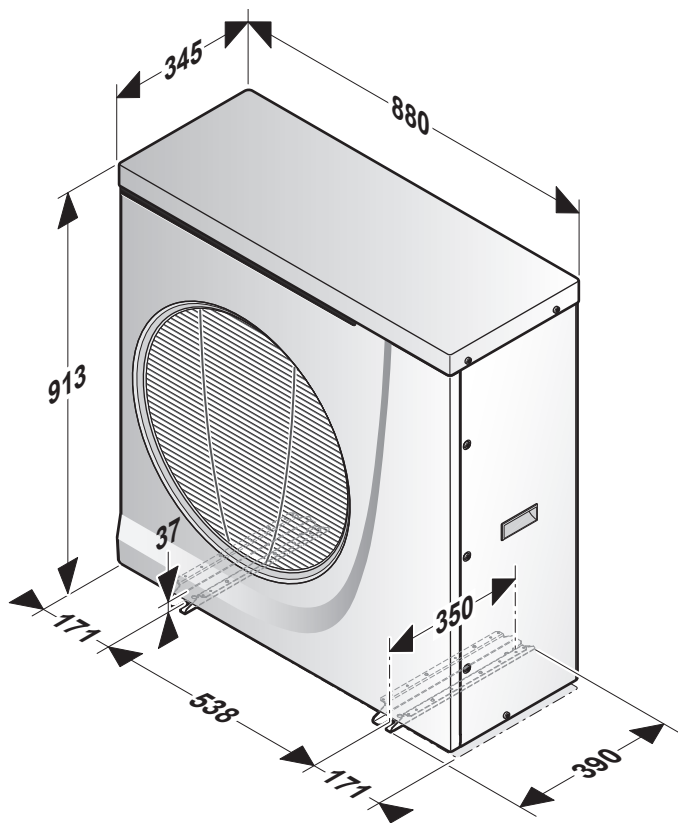
Ensure that the water flow rate of the water circuit corresponds to the nominal water flow rate of the appliance (see "Technical data" chapter).

- Install the following components on the rear section of the heat pump
 - a filter,
 - a ¼ shut-off valve on each side of the filter,
 - a drain valve,
 - an air separator (if necessary)
 - a sludge deposit (if necessary).



Insulate the pipes with a UV- and hightemperature- resistant insulation.

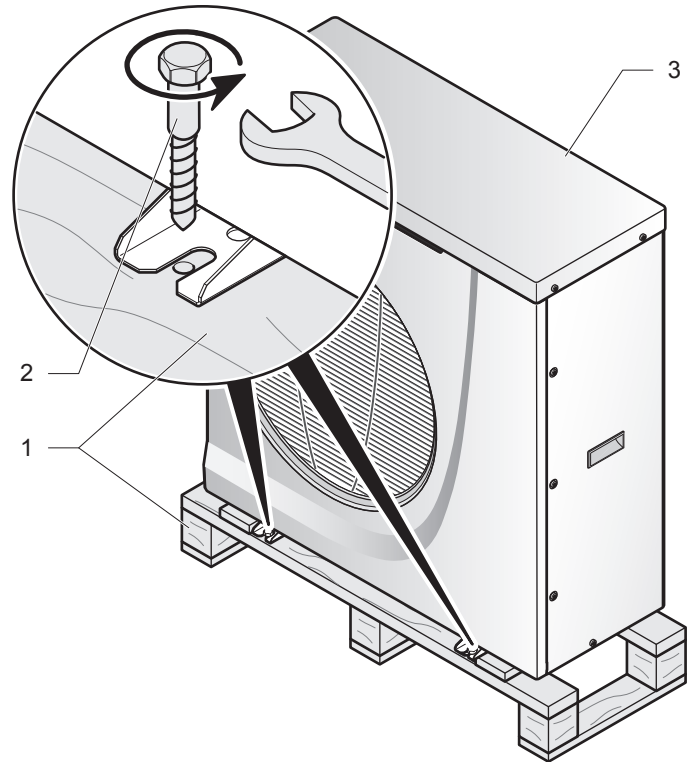
7.3 Dimensions



7.4 Mounting

7.4.1 Unpacking the appliance

- Carefully remove the packaging and protections without damaging the parts of the appliance.



Key

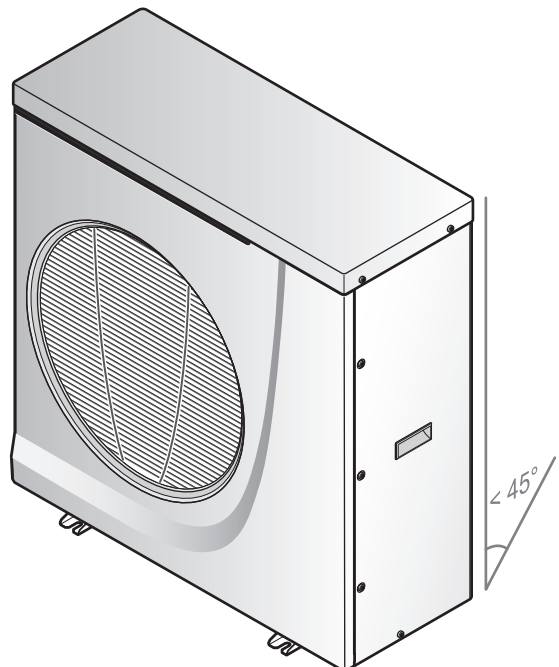
- 1 Transport pallet
- 2 Attachment screws
- 3 Heat pump

- Remove the screws from the transport pallet at the front and rear of the unit.

7.4.2 Transportation of the appliance



With regards to the Manual Handling Operations, 1992 Regulations, the following lift operation exceeds the recommended weight for a one man lift.



Warning! Two people at minimum are necessary to move the appliance.



Warning! Do not lean the appliance more than 45° during transportation as this may damage the refrigeration circuit which could lead to a complete system failure.



We recommend that you move the appliance with a trolley or with suitable handling equipment.

If you move the appliance with a two-wheeled trolley, respect the following regulations:

- Only lift the appliance from the back.
- Attach the appliance to the two-wheeled trolley with a strap.
- Protect surfaces in contact with the trolley to avoid scratching or damaging the appliance.
- Use a sufficiently solid ramp to lower the appliance from the pallet.
- Move the appliance to the installation site.

7.5 Positioning the appliance



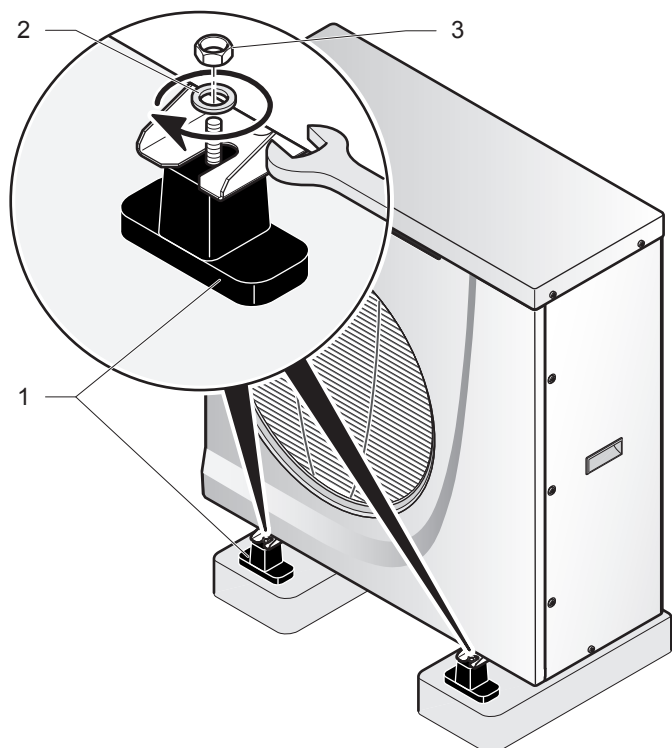
Warning! The heat pump must be installed with the anti-vibration pads supplied.



The anti-vibration pads are used to raise the unit, limit the transmission of vibrations and to facilitate the discharge of condensates.



With regards to the Manual Handling Operations, 1992 Regulations, the following lift operation exceeds the recommended weight for a one man lift.

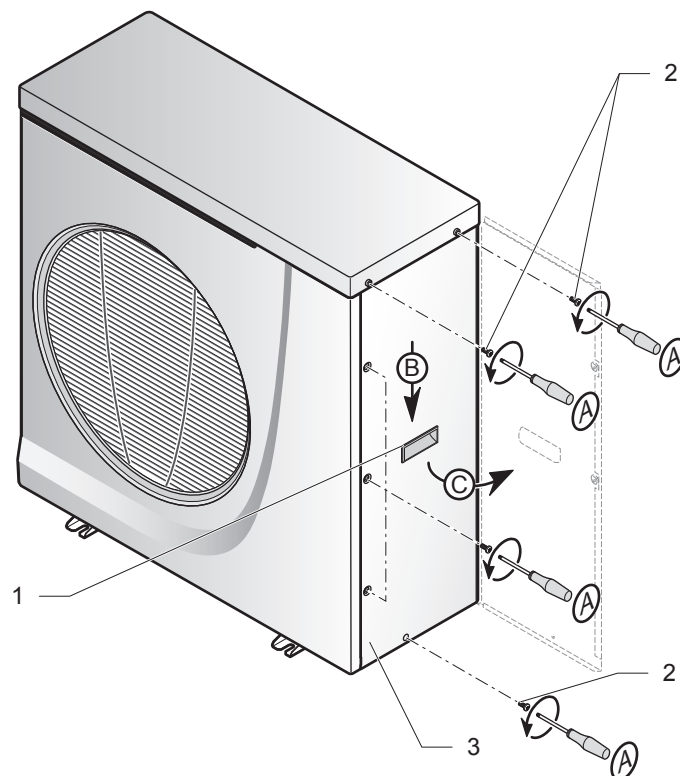


- Key**
- 1 Anti-vibration pads
 - 2 Nut

3 Washer

- Place the heat pump on the 4 anti-vibration pads (1).
- Secure the heat pump to the anti-vibration pads (1) using washers (3) and nuts (2).

8 Opening the appliance



- Key**
- 1 Handle
 - 2 Attachment screws
 - 3 Side panel

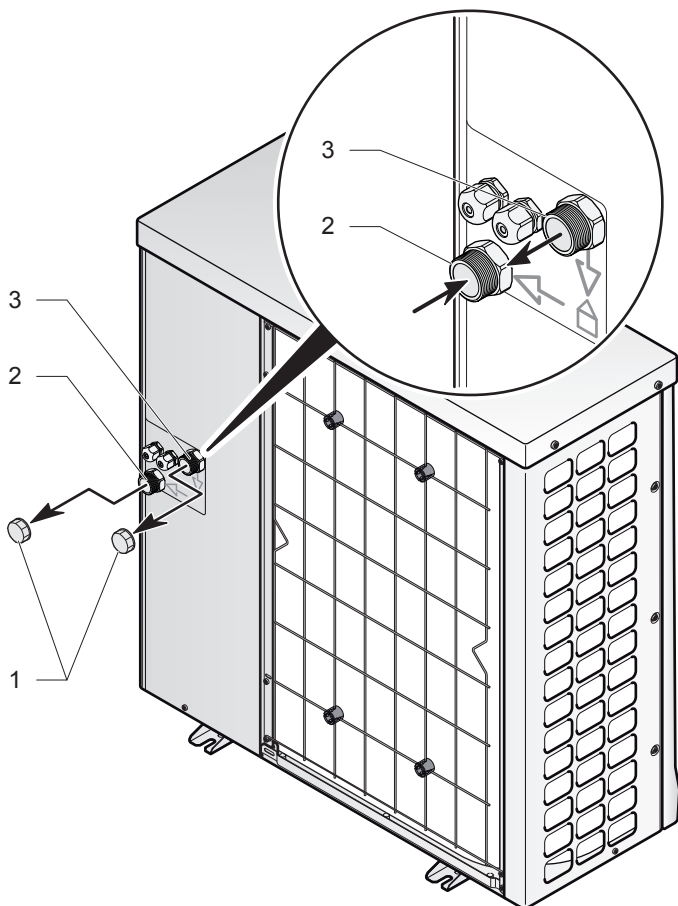
- Remove the attachment screw (2).
- Slide the side panel (3) down and pull it toward you using the handle (1).

9 Hydraulic connection

- Take care to clean the pipes before assembly removing any debris or burrs. Grease and oils may need to be removed they are not possible to remove by cleansing and flushing. Foreign bodies in the system may enter the appliance and interrupt its operation.
- Do not use any solvent products, due to the risk of damaging the circuit.
- Only use original seals supplied with the appliance.



Make sure that mechanical connections are not overtightened.



Key

- 1 Cap
- 2 Return connection (Ø1 ") to the heat pump
- 3 Heat pump flow connection (Ø1 ") to the building

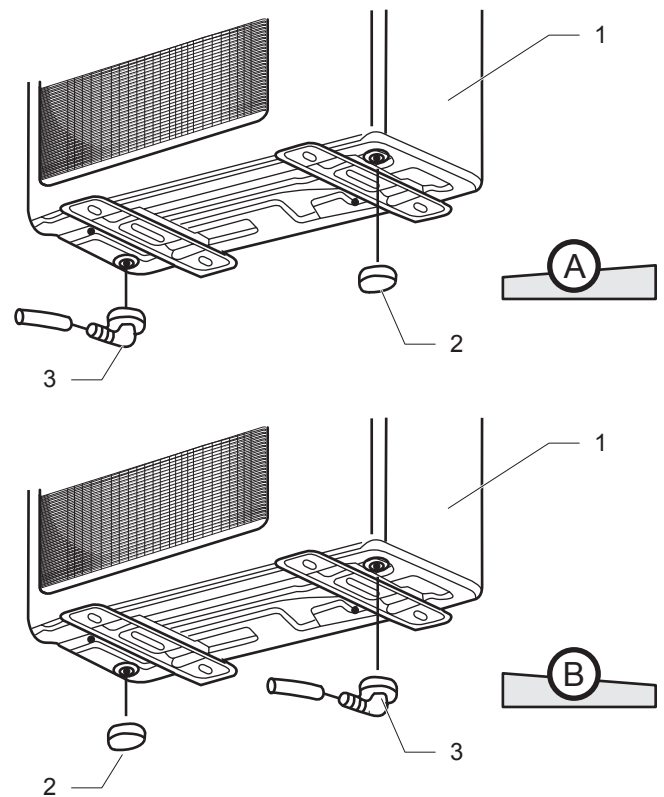
- Remove the protective caps (1) from the heat pump connections.
- Install the filter on the heat pump return pipe. Install it between 2 shut-off valves in order to be able to remove it from the circuit and clean it periodically.
- Install outgoing and return heat pump pipes in the direction of the hydraulic module.

Linear distance (without elbows or additional pressure drops)	Min. diameter of pipe to be installed
≤ 20 m	Ø ¾"
≤ 30 m	Ø 1"

- Check that there are no leaks. Repair if necessary.
- Insulate all exposed pipework.

10 Evacuation of condensates

When the appliance is operational, it will produce condensation that needs to be drained off.



Key

- A Configuration with inclination to the left
- B Configuration with inclination to the right
- 1 Heat pump
- 2 Plug
- 3 Drainage elbow

- Insert the drainage elbow (3) and pipe into the correct opening depending on the angle of the heat pump.
- Seal off the other opening with the supplied plug (2).

11 Electrical connections



Incorrect installation can cause electric shock or appliance damage. The electrical connection of the appliance must be made only by a qualified engineer.

The appliance must be connected directly to an accessible, fixed, switched, electrical outlet.

The manufacturer declines any responsibility for damages to persons or others caused by the incorrect installation of the appliance earthing. This includes failure to comply with current standards.

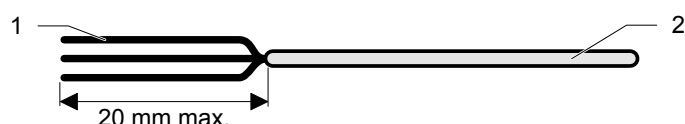
Electrical components have been tested to meet the equivalent requirements of BSEN 7671 and the BEAB regulations.

The cables connecting the switchboard and the heat pump must be:

- Suitable for a fixed installation.
- weather resistant.
- equipped with wires adapted to appliance's power rating.
- Connect the heat pump to an electrical panel via an independent protection system (20A differential breaker with at least 3 mm between each contact).

Additional protection may be required during installation to ensure surge category II.

11.1 Main board

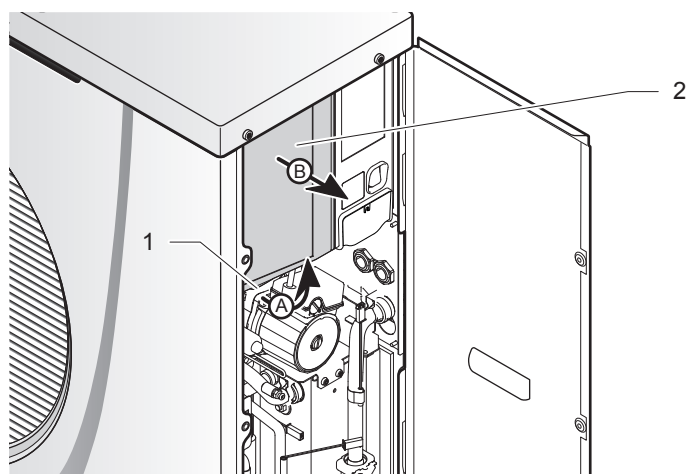


- Key**
- 1 Electrical wires
 - 2 Insulation

When you connect the electrical wires to a connector on the electronic board:

- Keep a distance of a maximum of 20 mm between connector and the start of the insulation (2).

11.2 Access to main board



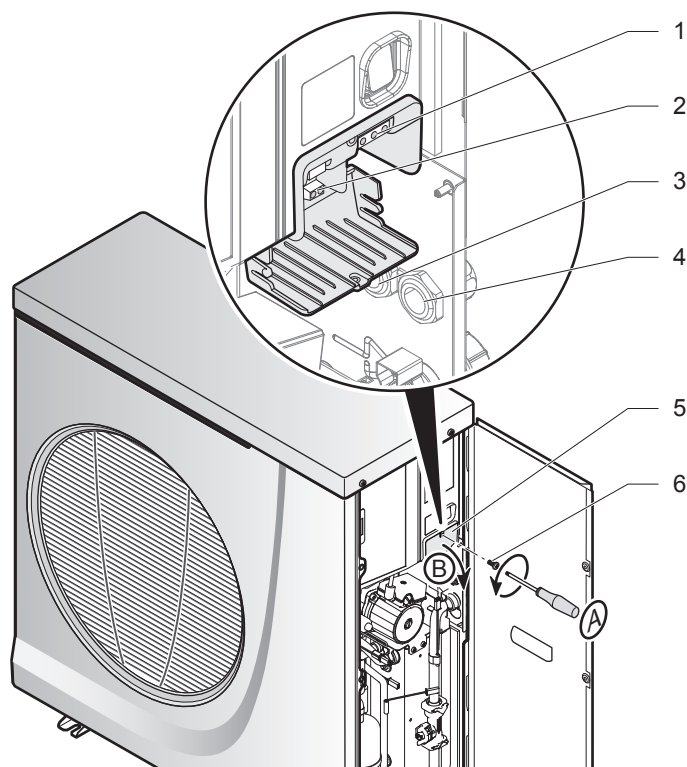
- Key**
- 1 Handle
 - 2 Box

- Remove the box (2) by pulling it toward you using the handle (1).

11.3 Electrical wiring



Insert the Ebus 24V cable and 230V power cable in different casings.



- Key**
- 1 230 V supply connection terminal block
 - 2 BUS connection terminal
 - 3 Gland for Ebus cable
 - 4 Gland for 230 V power cable
 - 5 Access hatch to electrical connections
 - 6 Access hatch screw

- Remove the screw (6) from the access hatch (5).
- Open the access hatch (5).

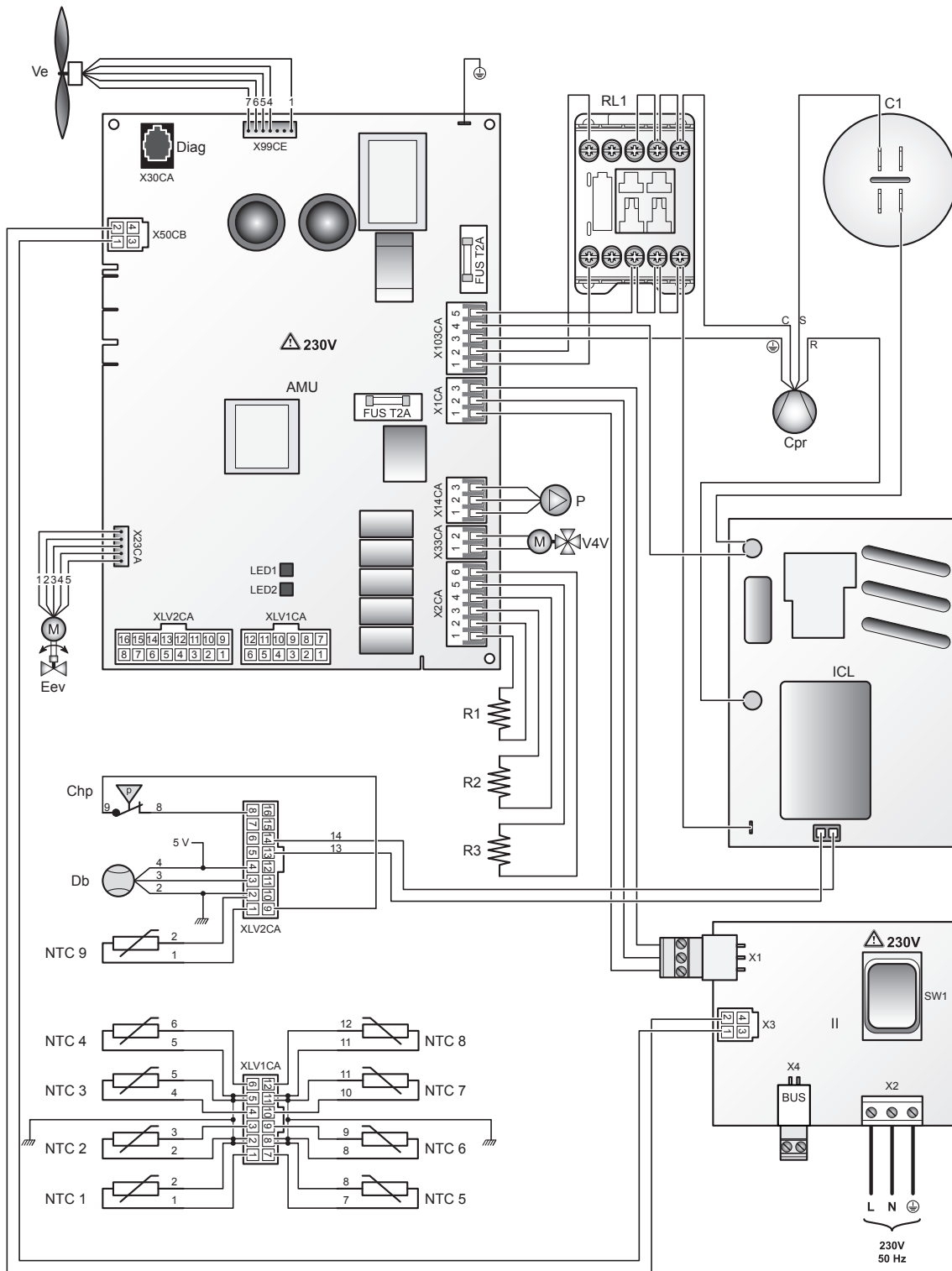
Ebus Connection

- Connect a 2 x 0.75 mm² cable to the appliance's BUS terminal (2).
- Pass the cable through the gland (3).
- Connect the Ebus cable to the system control unit.
- Tighten the gland.

230V Connection

- Connect a 3 x 2.5 mm² cable to the appliance's power terminal 230 (1).
- Pass the cable through the gland (4).
- Connect the appliance's power cable to the installation's electrical panel: single-phase network 230V + neutral + earth.
- Close the access hatch with the screw (6).
- Tighten the gland.

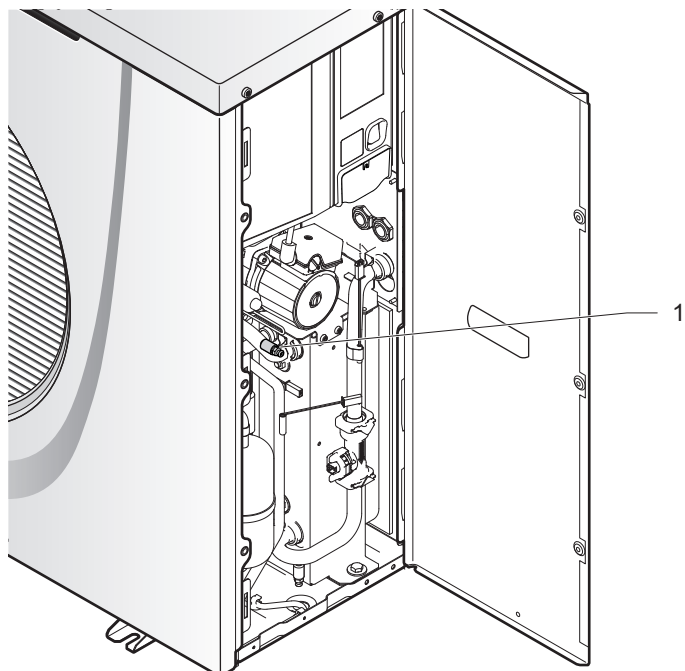
11.4 Wiring diagram



Key			
AMU	Main PCB	NTC4	Compressor discharge temperature sensor
C1	Capacitor	NTC5	Plate to plate heat exchanger temperature sensor
Chp	High pressure cooling circuit sensor	NTC6	Heat pump flow temperature sensor
Cpr	Rotary compressor	NTC7	Heat pump return temperature sensor
Db	Water flow rate sensor	NTC8	Pre-expansion temperature sensor
Diag	Connection terminal for diagnosis tool	NTC9	Temperature sensor for detecting end of defrosting
Eev	Electronic pressure regulator	P	Pump
ICL	Starting current limiter panel	R1	Plate to plate heat exchanger resistance heater
II	Installer interface	R2	Compressor casing resistance heater
LED1	LED green constant (appliance has voltage)	R3	Condensate tray resistance heater
LED2	LED red intermittent (appliance failure)	RL1	Compressor contactor
NTC1	Air input temperature sensor	V4V	4-way reverse cycle valve
NTC2	Tubular heat exchanger temperature sensor	Ve	DC fan
NTC3	Compressor suction temperature sensor	SW1	Start / stop switch

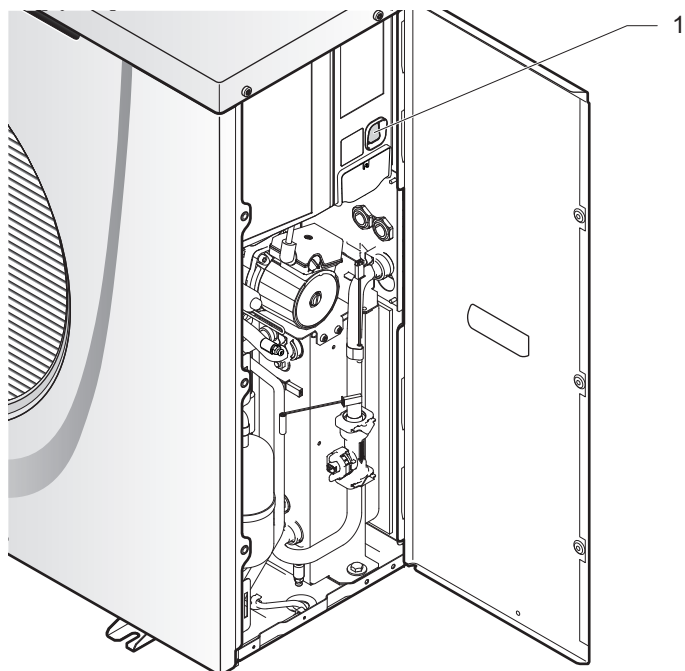
12 Commissioning

- Check that the differential breaker is installed.
- Check that the hydraulic and electrical connections are correct.
- Check that the filter on the heat pump return is installed.
- Check the airtightness of the connections.



Key
1 Venting valve

- Ensure that the hydraulic system is purged.
- Refer to the system installation manual in order to fully activate the installation.



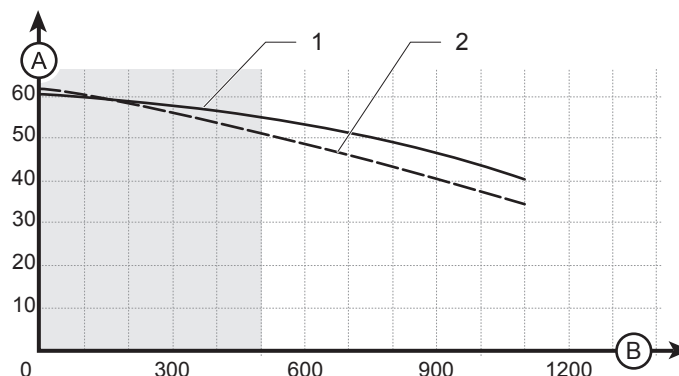
Key
1 ON/OFF button

- To turn on the heat pump, turn the button (1) to ON. Check that the green LED located on the appliance PCB is lit.



To locate the LEDs on the PCB, see the chapter "Wiring diagram".

Available pressure in the heat pump circuit



Key
1 With the water circuit at 20 ° C
2 With a brine water circuit (a mixture of 30%) at 20 ° C
A Available pressure (kPa)
B circuit flow rate (l/h)

13 Specific adjustment

- Refer to the system installation manual to adjust the installation.

14 User information

At the end of the installation, the installer must:

- explain the operation of the appliance and its safety devices to the user, if necessary provide a demonstration and answer any questions;
- hand over to the user all the required documentation,
- fill in the documents where necessary;
- advise the user of the precautions necessary to prevent damage to the system, appliance and the building;
- remind the user to service the appliance annually.
- The user shall not interfere with or adjust sealed components.
- All servicing must be carried out by a competent person approved at the time by the Health and Safety Executive.

MAINTENANCE



Any work carried out on the refrigerant circuit must be conducted by qualified engineers.

The faults described in this chapter require the services of a qualified professional and, if necessary, a Glow-worm Groupservice engineer.

15 Trouble-shooting

15.1 Fault diagnosis

The following checks should be performed before proceeding onto specific diagnostics:

- Make sure that the electricity supply has not been interrupted and that the appliance is connected correctly.
- Ensure that the isolating valves are open.
- Check that all external controls are connected correctly.

15.2 Fault codes



The faults described in this chapter should be carried out by a qualified engineer or a Glow-worm Groupservice engineer.

In this section, you will find the fault codes that may appear and the corrective actions you can take to return the appliance to service.

In the case of a fault, the fault code number is displayed on the control unit.

- Carry out any necessary repairs.
- Restart the heat pump using the ON / OFF button.

Fault codes	Description	Cause	Solution
23	The temperature difference between the output and the return of the brine circuit is too high (> 15K). Non-blocking failure	Misreading of the circuit temperature.	Check the plate to plate exchanger return and outgoing temperature sensor connections. Check that the position and the operation of the sensor are correct. Add thermal grease. Check the sensor's resistance.
		The electronic circuit board is not operating.	Replace the circuit board.
		Faulty indication of water flow.	Check that there is no water flow by closing a valve in the brine circuit. Force the pump and check the flow.
37	<i>The fan speed is too low. (<300 rpm)</i> <i>Blocking failure if produced more than 3 times in the last 10 starts.</i>	The fan speed is too low.	Check the fan connections. Check the fuses in the main PCB. Change the electrical panel. Check the space in front of the fan grill. Replace the fan motor.
514	Compressor suction temperature sensor failure.	The sensor is defective or is not correctly connected to the main PCB.	Check the sensor's connections. Check that the position and the operation of the sensor are correct. Check the sensor's resistance.
517	Compressor discharge temperature sensor failure.		
519	Brine circuit return temperature sensor failure.		
520	Brine circuit output temperature sensor failure.		

Fault codes	Description	Cause	Solution
526	Evaporation/condensation temperature sensor failure	The sensor is defective or is not correctly connected to the main PCB.	Check the sensor's connections. Check that the position and the operation of the sensor are correct. Check the sensor's resistance.
528	Plate to plate heat exchanger temperature sensor failure		
532	The brine circuit flow is too low (<500 l/h) . <i>Blocking failure if produced more than 3 times.</i>	The brine circuit flow is too low.	Force the pump and check the flow. Adjust the water flow by changing the speed of the pump or opening the hydraulic module control valve.
		There is a lack of water.	Check the brine circuit. If the valve leaks, replace the valve, add water and degas the circuit.
		Anti-silt filter missing or clogged in the brine water circuit's backflow.	Install an anti-silt filter. Clean the anti-silt filter.
		The circuit was not properly bled.	Activate the bleeding function and top up the glycol water if necessary.
		The expansion vessel is defective.	Check the pressure of the expansion vessel.Reinflate the expansion vessel. Replace the expansion vessel.
534	The output temperature of the circuit brine is too high (> 57°C). <i>Non-blocking failure.</i>	The sensor is defective or is not correctly connected to the main PCB.	Check the sensor's connections. Check that the position and the operation of the sensor are correct. Check the sensor's resistance.
		Faulty indication of water flow.	Check that there is no water flow by closing a valve in the brine circuit.
		The expansion vessel is defective.	Check the pressure of the expansion vessel. Reinflate the expansion vessel. Replace the expansion vessel.
		Anti-silt filter missing or clogged in the brine water circuit's backflow.	Install an anti-silt filter. Clean the anti-silt filter.
		Air in the brine water circuit	Drain the brine water circuit
536	The compressor discharge temperature is too high (> 105°C). <i>Blocking failure if produced more than 3 times.</i>	There is an excess or a lack of refrigerant.	Measure the air and water's ΔT. If it is very low (<2K), lack of fluid may be the cause (loss of heat output). Measure the real overheating (must be <7K in heating mode). Measure the electrical current with an ammeter. If the current is below 4.5 amps, the cause may be a lack of fluid. Check the pressure with a monometer. Check that there are no leaks, repair them if necessary. Adjust the amount of refrigerant.
		The temperature sensor is defective or is not correctly connected to the main PCB.	Check the connections from the sensor to the discharge. Check that the position and the operation of the sensor are correct. Check the sensor's resistance.
		The water flow sensor is defective.	Check absence of water flow by forcing the pump. Consult the "Adjusting the HP flow circuit" chapter.
		Pre-expansion in the liquid line (load loss)	Check the appearance of the condenser output tubes leading to the evaporator (do not pinch).
		The electronic expansion valve is defective.	Check that the motor is correctly clipped to the regulator. Check that the electronic is working correctly, if this is not the case: Check the winding resistance. Replace the motor. Replace the electronic expansion valve, check that there are no leaks.
		Scale on the plate to plate exchanger.	Clean the heat exchanger plates.
		The heating outlet and return temperature sensors are defective.	Check the sensor connections. Check that the sensor position and operation are correct. Check the sensor resistance.
		The air temperature is too high in cooling mode.	Check the agreement between the outside sensor and heat pump air inlet temperature sensor. Check that the heat pump air inlet temperature sensor is working properly.
		In de-icing mode, the de-icing sensor is defective or misplaced.	Check the sensor connections. Check that the sensor position and operation are correct. Check the sensor resistance.

Fault codes	Description	Cause	Solution
537	The compressor discharge pressure is too high (> 42 bars). Blocking failure	There is an excess or a lack of refrigerant.	Measure the air and water's ΔT . If it is very low (<2K), lack of fluid may be the cause (loss of heat output). Measure the real overheating (must be <7K in heating mode). Measure the electrical current with an ammeter. If the current is below 4.5 amps, the cause may be a lack of fluid. Check the pressure with a monometer. Check that there are no leaks, repair them if necessary. Adjust the amount of refrigerant.
		The pressure switch is defective.	Check the pressure with a monometer, change the pressure switch. Check that there are no leaks, repair them if necessary.
		The pressure switch contact is insufficient.	Check the resistance of the switch.
		The cables are defective.	Check the condition of the switch cables.
		Pre-expansion in the liquid line (load loss)	Check the appearance of the condenser output tubes leading to the evaporator (do not pinch).
		The water flow sensor is defective.	Check absence of water flow by forcing the pump. Consult the "Adjusting the HP flow circuit" chapter.
		The electronic expansion valve is defective.	Check that the motor is correctly clipped to the regulator. Check that the electronic is working correctly, if this is not the case: Check the winding resistance. Replace the motor. Replace the electronic expansion valve, check that there are no leaks.
		Insufficient heat exchange at the plate to plate exchanger.	Clean the heat exchanger plates.
		The heating outlet and return temperature sensors are defective	Check the sensor connections. Check that the sensor position and operation are correct. Check the sensor resistance.
		The air temperature is too high in cooling mode	Check the agreement between the outside sensor and heat pump air inlet temperature sensor. Check that the heat pump air inlet temperature sensor is working properly.
In de-icing mode, the de-icing sensor is defective or misplaced.	Check the sensor connections. Check that the sensor position and operation are correct. Check the sensor resistance.		
539	The pressure of the low pressure circuit is too low in heating mode (> 4.5 bars). Blocking failure if produced more than 4 times.	Lack of refrigerant.	Measure the air and water's ΔT . If it is very low (<2K), lack of fluid may be the cause (loss of heat output). Measure the real overheating (must be <7K in heating mode). Measure the electrical current with an ammeter. If the current is below 4.5 amps, the cause may be a lack of fluid. Check the pressure with a monometer. Check that there are no leaks, repair them if necessary. Adjust the amount of refrigerant.
		Lack of airflow.	Check that no obstacles are blocking the air input and output. Check the condition of the fan blades.
		There is no defrosting.	Check that the 4-way valve is not blocked (switch the heat pump ON / OFF). Force in the defrost mode and check the reverse cycle. Check the position of air exchanger air intake temperature sensor. Check the position and proper operation of the de-icing sensor.
		The condensate tray resistance heater is faulty.	Measure the condensate tray resistance heater. Change the resistance.
		The electronic expansion valve's motor is defective or the connection is defective.	Check that the electronic expansion valve is working correctly, if this is not the case: Check the winding resistance. Clip the electronic expansion valve back on. Replace the motor. Replace the electronic expansion valve, check that there are no leaks.
		The heating outlet and return temperature sensors are defective.	Check the sensor connections Check that the sensor position and operation are correct. Check the sensor resistance.
		The compressor casing resistance heater is defective.	Check the compressor's electric resistance power supply.

Fault codes	Description	Cause	Solution
554	<p>Operation outside the compressor shell</p> <p>- in heating mode : (BP > 15 Bar or HP < 11 bar or HP > 40 Bar).</p> <p>- in cooling mode : (BP < 4.5 Bar or BP > 15 Bar or HP < 11 Bar or HP > 40 Bar).</p> <p>Non-blocking failure.</p>	An excess or a lack of refrigerant.	<p>Measure the air and water's ΔT. If it is very low (<2K), lack of fluid may be the cause (loss of heat output). Measure the real overheating (must be <7K in heating mode). Measure the electrical current with an ammeter. If the current is below 4.5 amps, the cause may be a lack of fluid.</p> <p>Check the pressure with a monometer.</p> <p>Check that there are no leaks, repair them if necessary.</p> <p>Adjust the amount of refrigerant.</p>
		Presence of incondensables.	<p>Measure the discharge temperature. High temperatures (> 90 ° C in cool environmental conditions from 0 to 12 ° C) may be due to the presence of incondensables. Use a manometer to check the presence of incondensables. Following prolonged periods of inactivity of the compressor, ensure that the temperatures indicated correspond to those of the fluid temperature (environmental or condenser or evaporator).</p>
		The electronic expansion valve is defective.	<p>Check that the electronic expansion valve is working correctly, if this is not the case:</p> <p>Check the winding resistance.</p> <p>Clip the electronic expansion valve back on.</p> <p>Replace the motor.</p> <p>Replace the electronic expansion valve, check that there are no leaks.</p>
		Pre-expansion in the liquid line (load loss)	Check the appearance of the condenser output tubes leading to the evaporator (do not pinch).
		Insufficient heat exchange at the plate to plate exchanger or tube exchanger.	<p>Check for accumulation of dirt in the heat exchanger plates.</p> <p>Check for obstruction of the fan grille.</p>
		The 4-way valve is defective.	<p>Check the power supply to the valve. Force in the defrost mode and check the reverse cycle.</p> <p>If the reverse cycle does not work, change the valve. If the problem persists:</p> <p>Check the temperatures of the 4-way valve's input and output tubes. Those of the suction tubes must be identical, but lower than those of the discharge. If this is not the case, the 4-way valve's slide is stuck in an intermediate position, change the 4-way valve. Check for leaks and repair if necessary.</p>
		The heating outlet and return temperature sensors are defective	<p>Check the sensor connections.</p> <p>Check that the sensor position and operation are correct.</p> <p>Check the sensor resistance.</p>
		The air temperature is too high in heating mode	<p>Check the agreement between the outside sensor and heat pump air inlet temperature sensor.</p> <p>Check that the heat pump air inlet temperature sensor is working properly.</p>
	The air temperature is too high in cooling mode	<p>Check the agreement between the outside sensor and heat pump air inlet temperature sensor.</p> <p>Check that the heat pump air inlet temperature sensor is working properly.</p>	
581	Failure of the defrosting temperature sensor.	The sensor is defective or is not correctly connected to the main PCB.	<p>Check the sensor's connections. Check that the position and the operation of the sensor are correct.</p> <p>Check the sensor's resistance.</p>
582	Failure of motor regulator.	The regulator's motor or its connection is faulty	<p>Check the winding resistance.</p> <p>Check the condition of the regulator's cables.</p> <p>Check the regulator's 24 V power supply at the main PCB.</p> <p>Replace the motor.</p>
583	<p>The temperature of the plate heat exchanger is too low (<0°C).</p> <p>Non-blocking failure</p>	Incorrect setting.	Check the control unit settings.
		A temperature sensor is poorly positioned.	<p>Check the position of the external temperature sensors.</p> <p>Ensure an optimum thermal contact.</p>

Fault codes	Description	Cause	Solution
584	The compressor discharge temperature does not rise (<5k in 2 minutes). <i>Blocking fault if it occurs 3 times in 10 compressor starts.</i>	Failure in compressor power supply.	Check the compressor's connections. Check the condition of the compressor's cables. Check the compressor's 230 V power supply at the main PCB. Check that the compressor's electrical resistance is working properly. Replace the compressor, make sure there are no leaks. Add oil to the compressor if necessary.
		The compressor's bimetallic strip is open.	Check that the 4-way valve is not blocked (switch the heat pump ON / OFF). Check that the electronic expansion valve is working properly. If it not working correctly, check the winding resistance. Replace the motor. Clip the electronic expansion valve back on. Replace the electronic expansion valve, check that there are no leaks.
		Lack of refrigerant.	Measure the air and water's ΔT . If it is very low (<2K), lack of fluid may be the cause (loss of heat output). Measure the real overheating (must be <7K in heating mode). Measure the electrical current with an ammeter. If the current is below 4.5 amps, the cause may be a lack of fluid. Check the pressure with a monometer. Check that there are no leaks, repair them if necessary. Adjust the amount of refrigerant.
		Failure of the compressor discharge temperature sensor.	Check the position of the compressor discharge temperature sensor. Add thermal grease.
585	Failure of the air exchanger air intake temperature sensor.	The sensor is defective or is not correctly plugged in to the main PCB.	Check the sensor's connections. Check that the position and the operation of the sensor are correct. Check the sensor's resistance.
774	Air intake temperature sensor fault.	The sensor is defective or not correctly connected to the main circuit board.	Check the sensor connections. Check that the sensor position and operation are correct. Check the sensor resistance.

15.2.1 Status of the heat pump



All blocking statuses relative to the heat pump must be resolved. Once resolved, switch the heat pump On / Off to reset and make sure that the status is no longer displayed on the control unit screen.

Status	Description
0	Waiting status: no requests, no defects.
1	Waiting status pending a request (pending a correct brine circuit return temperature, waiting time of 5min OFF, compressor cycle waiting time).
3	Pre-fan scan (between 10s and 2min).
4	Pre-brine circuit pump scan (30s).
6	In heating mode, start-up of the compressor and regulator control in accordance with the air temperature (1 min.).
7	Expansion valve check depending on evaporation temperature. In heating mode, compressor operational (overheating control, pending end of request).
8	Post-scan following heating (30s).
9	Failure of compressor output temperature, too high (blocking failure after 3 attempts).
10	Pump cleansing (every 24 hours during 20s).
12	Failure in heating output temperature, too high (temporary blockage of 10min).
13	Pressure failure in heating mode, low pressure too low (blocking failure after 4 attempts).
14	Pressure failure (temporary blockage of 10min).
15	High pressure failure (high pressure sensor open 42bar, blocking failure).
16	40s pre-scan of the hydraulic pump before defrosting.
17	Defrosting in operation (duration 1 to 10min).

Status	Description
18	40s post-scan of the hydraulic pump after defrosting.
19	Failure of outgoing and return temperature difference > 15°C (temporary blockage 10min).
20	Water flow failure, too low (temporary blockage 10min).
21	Fan failure: speed too low (temporary blockage 15min).
23	Failure of compressor output temperature: does not surpass 2K in less than 2 minutes upon start-up of compressor (blockage 10min).
24	Bad flow rate in the heat pump circuit (refer to the following table for details of this status).
25	Temperature sensor failure.
26	Heat pump circuit return temperature too high (refer to the following table for details of this status).
27	Heat pump circuit pump pre-sweep in cooling mode.
28	Fan pre-flush in cooling mode (between 10s and 2 min).
29	Compressor start in cooling mode (1 minute wait for temperature stabilisation).
30	Compressor operating in cooling mode (overheat control, waiting for end of request or setting reached).
31	Post-sweep of the pump after cooling.
32	Air temperature not suitable for heat pump start (refer to the following table for details of this status).
33	Degassing of pump (30s ON).

Status	Description
34	Degassing of pump (20s OFF).
35	Failure of current to the motor's electronic expansion valve (blocking failure).
36	The 4-way cycle inversion valve is in the cooling position for 5 seconds.
37	Failure of compressor output temperature: does not surpass 2K upon start-up of compressor (blocking failure after 3 attempts).
38	Fan failure, speed too low (blocking failure after 3 attempts).

Status	Description
39	Wait after pre-sweep of a return temperature (refer to the following table for details of this status).
40	Flow rate fault (blocking fault after 3 attempts).
41	Compressor outlet temperature fault (> 105°C) (10min temporary block).
42	De-icing request while reheating water tank.
43	In cooling mode, return temperature too high (> 47°C) (10 min temporary block)



The status' described in the table below must be dealt with by a qualified professional and, if necessary, by the after-sales service.

Status	Description	Cause	Solution
24	Poor flow in the brine circuit following the pre-scan of brine circuit pump (D < 500 l/h).	The brine circuit flow is too low.	Force the pump and check the flow. Adjust the water flow by changing the speed of the pump or opening the hydraulic module control valve.
		The brine circuit flow is too high or there is a faulty indication of flow.	Check that there is no water flow by closing a valve in the brine circuit. Force the pump and check the flow.
		The water pump is defective.	Is the water pump hot? Measure the coil resistance. Replace the pump motor. Check the 230 V power supply to the pump. Change the electrical panel. Check the reading of the water flow when stopping the pump.
		There is a lack of water.	Check the brine circuit. If the valve leaks, replace the valve, add water and degas the circuit.
		Anti-silt filter missing or clogged in the brine water circuit's backflow.	Install an anti-silt filter. Clean the anti-silt filter.
		The circuit was not properly bled	Activate the bleeding function and top up the glycol water if necessary.
		The expansion vessel is defective.	Check the pressure of the expansion vessel. Reinflate the expansion vessel. Replace the expansion vessel.
26	Brine circuit return temperature too high (>42°C in heating and >34°C in cooling).	La température du circuit pompe à chaleur est trop élevée.	Vérifiez le circuit pompe à chaleur et le circuit chaudière.
39	Waiting following pre-scan of return temperature (<42°C in heating and <34°C in cooling).	Il y a une mauvaise lecture de la température.	Vérifiez les connexions du capteur. Vérifiez que la position et le fonctionnement du capteur sont corrects. Vérifiez la résistance du capteur.
		Il y a une mauvaise indication du débit d'eau.	Vérifiez qu'il n'y a pas de débit d'eau en fermant une vanne sur le circuit pompe à chaleur. Forcez la pompe et vérifiez le débit.
32	Air temperature incompatible with the start-up of heat pump (between -7 and 25°C in heating, and between 18 and 48°C in cooling).	The air temperature is too low or too high.	Check the outside temperature. Move the heat pump.
		Incorrect temperature reading.	Check the sensor's connections. Check that the position and the operation of the sensor are correct. Check the sensor's resistance.

16 Servicing

To ensure the continued efficient and safe operation of the appliance it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage.

- Servicing/maintenance should be carried out by a competent person approved at the time by the Health and Safety Executive in accordance with the rules in force in the countries of destination.
- To obtain service, please call your installer or Glow-worm's own service organisation.



IMPORTANT: any action carried out on the refrigerant circuit must be performed by qualified authorised personnel.

The refrigerant fluid contains gases that, when released into the atmosphere, may affect the environment by depleting the ozone layer, contributing to the greenhouse effect and an increase in temperature. The risk of leakage cannot be excluded for devices intended to operate for many years and subject to the effects of the environment.

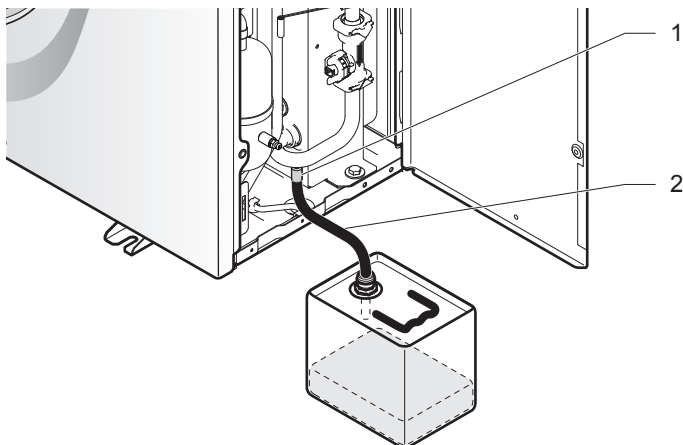
- See the "Safety instructions" chapter for a list of operations to be performed prior to the maintenance of the application.
- Once the maintenance operations have been completed, consult the "Start Up" chapter to restart the appliance.

16.1 Annual Maintenance

- Check the proper functioning of safety devices.
- Check the pressure of the water system.
- Check the airtightness of the cooling circuit.
- Check that there are no traces of rust or oil around the cooling circuit's components.
- Ensure that the appliance's components are neither worn nor broken.
- Check that the wires are firmly attached to the electrical terminals.
- Check the appliance's grounding.
- Check the starting temperature of the heat pump and the adjustment points.
- Check the absence of ice in the compressor.
- Remove any dust from the power supply.
- Clean the air / refrigerant battery and make sure that air circulates between the fins and around the unit.
- Check that the fan rotates freely.
- Check the pressure of the expansion vessel.

16.2 Draining

- Cut off the appliance's electricity supply.



Key

- 1 Hydraulic circuit venting valve
- 2 Draining hose

Draining the hydraulic circuit

- Engage a hose (2) to the venting valve (1) or place a container under the venting valve (1) to drain the hydraulic circuit.
- Open the venting valve (1) with an Ø 14 mm wrench.

Draining the appliance

- Close the shut-off valves located behind the heat pump.
- Engage a hose (2) to the venting valve (1) or place a container under the venting valve (1) to drain the hydraulic circuit.
- Open the venting valve (1) with an Ø 14 mm wrench.

17 Replacement of Parts

- Do not use reconditioned or copy parts, only use original parts supplied by Glow-worm.
- If a part is required, contact the Glow-worm service organisation.
- Please quote the name and serial number of the appliance, this information will be on the data plate on the side of the appliance.
- If in doubt seek advice from the local gas company or Glowworm's own service organisation.



Replacement of parts must be carried out by a competent person approved at the time by the Health and Safety Executive.

17.2.1 Mains supply cable



The main supply cable must be replaced by a qualified and competent electrician.

- If the main supply cable is damaged, replace it referring to the chapter "Electrical connection".

18 Spare parts

In order to guarantee the safe and prolonged life of the product, manufacturers genuine spare parts must be used.



This appliance displays a CE Mark of conformity. Only use the manufacturer's genuine, new spare parts.

- Ensure that spare parts are correctly mounted in the right position and direction. After fitting any spare part or servicing, the appliance must be tested for its safe operation.



0020096879_01 - 06/10

Because of our constant endeavour for improvement, details may vary slightly from those shown in these instructions.

Glow-worm, Nottingham Road, Belper, Derbyshire. DE56 1JT