



## AIR SOURCE HEAT PUMP UNIT

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5 & 9kW

### Installation and Service Manual



# Safety Precautions and Warnings

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## IMPORTANT



Before installing the unit make sure you read all the "Safety precautions". After installation work has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in the Installation Manual and perform the test run to ensure normal operation. Please leave this manual with the customer for future reference

## Symbol Meanings



### **WARNING** (Risk of fire)

This mark is for R32 refrigerant only. Refrigerant type is written on nameplate of outdoor unit. In case that refrigerant type is R32, this unit uses a flammable refrigerant. If refrigerant leaks and comes in contact with fire or heating part, it will create harmful gas and there is risk of fire.



Read the INSTALLATION MANUAL carefully before operation.



Service personnel are required to carefully read the INSTALLATION MANUAL before operation.



Further information is available in the INSTALLATION MANUAL, and the like.

# Safety Precautions and Warnings

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## WARNING

- The unit must be installed according to the instructions in order to minimize the risk of damage from earthquakes, tornados, or strong winds. An incorrectly installed unit may fall down and cause damage or injuries.
- The unit must be securely installed on a structure that can sustain its weight. If the unit is mounted on an unstable structure, it may fall down and cause damage or injuries.
- All electric work must be performed by a qualified technician according to local regulations and the instructions given in this manual. The units must be powered by dedicated power lines and the correct voltage and circuit breakers must be used. Power lines with insufficient capacity or incorrect electrical work may result in electric shock or fire.
- Use only specified cables for wiring. The wiring connections must be made securely with no tension applied on the terminal connections. Also, never splice the cables for wiring (unless otherwise indicated in this document). Failure to observe these instructions may result in overheating or a fire.
- The appliance shall be installed in accordance with national wiring regulations.
- When installing or relocating, or servicing the outdoor unit, use only the specified refrigerant (R32) to charge the refrigerant lines. Do not mix it with any other refrigerant and do not allow air to remain in the lines. If air is mixed with the refrigerant, then it can be the cause of abnormal high pressure in the refrigerant line, and may result in an explosion and other hazards. The use of any refrigerant other than that specified for the system will cause mechanical failure or system malfunction or unit breakdown. In the worst case, this could lead to a serious impediment to securing product safety.
- Use only accessories authorized by Ebac Ltd and ask a dealer or an authorized technician to install them. If accessories are incorrectly installed, water leakage, electric shock, or fire may result.
- The user should never attempt to repair the unit or transfer it to another location. If the unit is installed incorrectly, water leakage, electric shock, or fire may result. If the outdoor unit must be repaired or moved, ask a dealer or an authorized technician.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- Compliance with national gas regulations shall be observed.
- Keep any required ventilation openings clear of obstruction.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance.
- Cleaning and user maintenance shall not be made by children without supervision.

# Safety Precautions and Warnings

## Installation



### WARNING

- If the outdoor unit is installed in areas exposed to steam, volatile oil (including machine oil), sulfuric gas, or areas where the unit will be covered by snow, the performance can be significantly reduced and the internal parts can be damaged.
- Coastal erosion protection be used in areas exposed to high salt content such as the coast
- Do not install the unit where combustible gases may leak, be produced, flow, or accumulate. If combustible gas accumulates around the unit, fire or explosion may result.
- The outdoor unit produces condensation during the heating operation. Make sure to provide drainage around the outdoor unit if such condensation is likely to cause damage or freezing over of walkways etc.
- When the unit is running, vibrations or the noise of refrigerant running may be heard from the extension piping. Try to avoid installing the piping to thin walls, etc. as much as possible and provide sound insulation with the piping cover, etc.



### CAUTION

- Be extremely careful when transporting or installing the units. Two or more persons are needed to handle the unit, as it can weigh over 100 kg. Do not grasp the packaging bands. Wear protective gloves to remove the unit from the packaging and to move it, as you can injure your hands on the fins or the edge of other parts.
- Be sure to safely dispose of the packaging materials. Packaging materials, such as nails and other metal or wooden parts may cause cuts or other injuries.

## Before Electrical Work



### CAUTION

- Be sure to install circuit breakers. If not installed, electric shock may result.
- For the power lines, use standard cables of sufficient capacity. Otherwise, a short circuit, overheating, or fire may result.
- When installing the power lines, do not apply tension to the cables. If the connections are loosened, the cables can snap or break and overheating or fire may result.
- The base and attachments of the outdoor unit must be periodically checked for looseness, cracks or other damage. If such defects are left uncorrected, the unit may fall down and cause damage or injuries.
- Do not clean the outdoor unit with water. Electric shock may result.



Where you see this symbol on any of our electrical products or packaging, it indicates that the relevant electrical products should not be disposed of as general household waste in Europe. To ensure the correct waste treatment of the product, please dispose of it in accordance with any applicable local laws or requirements for disposal of electrical and electronic equipment in so doing, you will help to conserve natural resources and improve standards of environmental protection in treatment and disposal of electrical waste.

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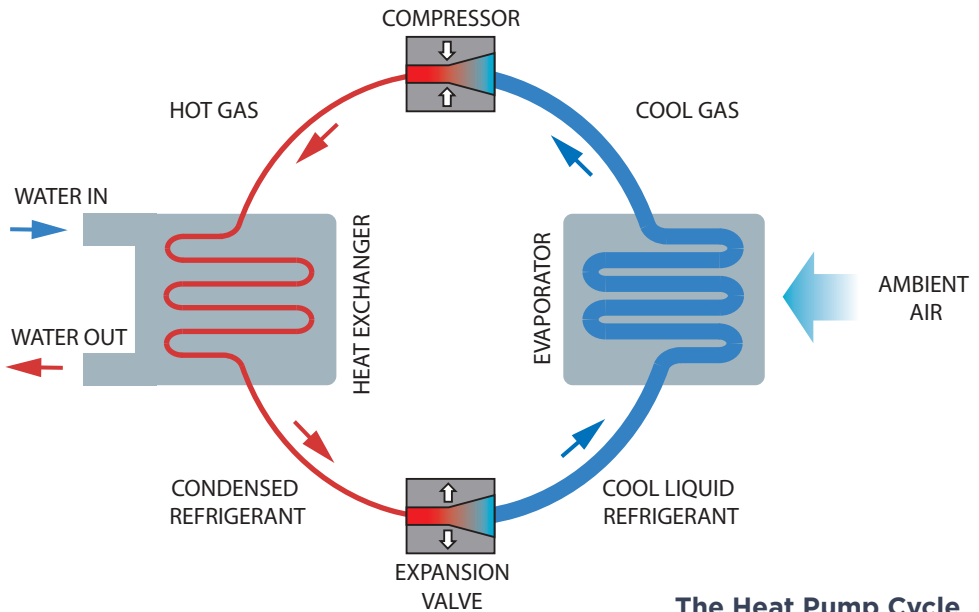
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## Product Description

### 1.1 Function

- Liquid refrigerant (R32) passes through an expansion device, changing it into a low pressure liquid / vapour mix.
- It then passes through an evaporator coil. The liquid absorbs the heat from the air being passed over the coil by means of a fan. The temperature of the refrigerant rises and it boils changing it to a low temperature vapour.
- The vapour then passes through a compressor, reducing its volume and causing it to heat.
- The reversing valve sends the hot gas into the heat exchanger. The heat from the hot gas is transferred to the water.
- Once the refrigerant has given up its heat it condenses back to a liquid. The liquid returns to the expansion device and the cycle is repeated.
- The heat pump is fitted with a series of sensors to monitor its performance. The intelligent defrost system will operate at the optimum time to reduce the build up of ice on the evaporator and minimise any disruption to the output of the heat pump.



## Product Description

### 1.2 Features



- Available in 5kW and 9kW
- Low noise unit
- Designed for the UK climate
- High efficiency, ERP of A+++
- R32 Refrigerant
- Compact, stylish design

### 1.3 Box Contents

- Heat Pump Unit
- Heat Pump Controller
- Drain Outlet
- Flow Meter & cable
- Temperature Sensor
- Lifting Straps
- Installation Manual

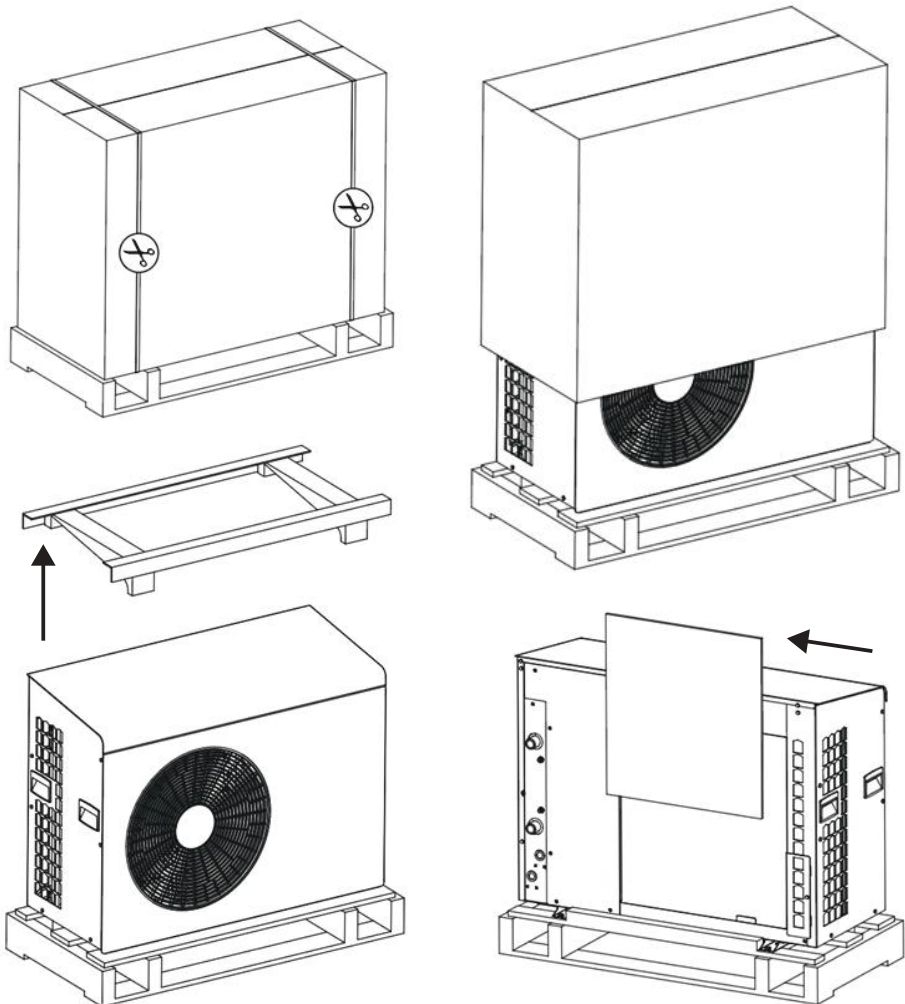


## Unit Installation

### 2.1 Initial Setup

#### 2.1.1 Unboxing of Unit

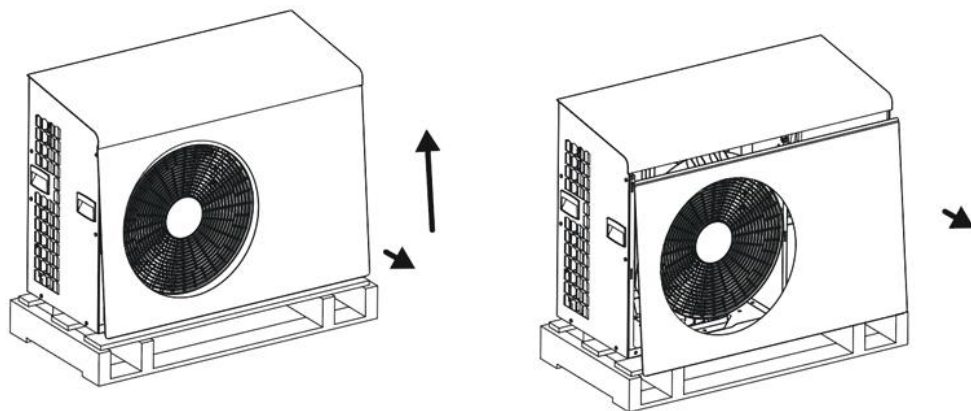
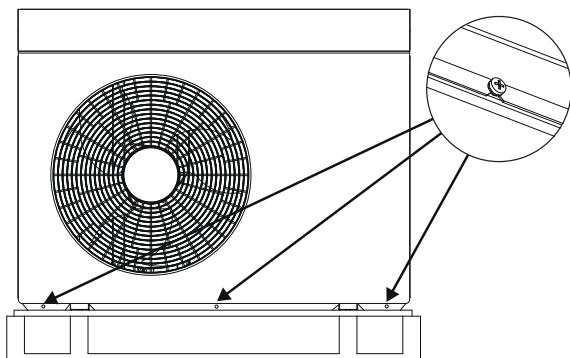
To unbox the unit cut the straps and slide up the carton sleeve. Remove the top packing pieces and rear coil cover. These parts are all made from carboard and can be recycled accordingly.



## Unit Installation

### 2.1.2 Removal of Front Panel

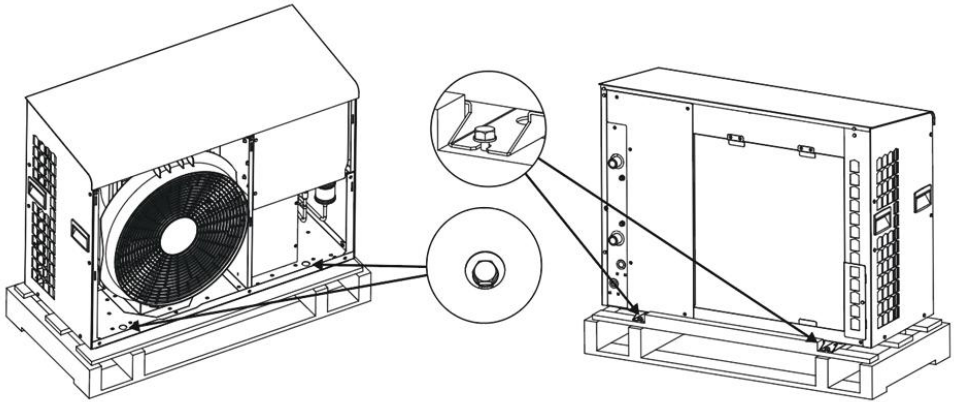
Loosen the 3 panel fixing screws located under the front lip of the heat pump using a 8mm socket or spanner. Pull the bottom of the front panel out slightly. Push the panel up on both sides and it will unclip as you pull it towards you.



## Unit Installation

### 2.1.3 Remove from Pallet

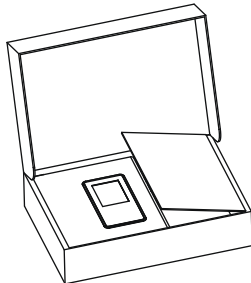
To remove the heat pump from the pallet unscrew the coach screws (x4) using 13mm socket or spanner.



### 2.1.4 Open Installation Kit

The installation kit (including controller) will be shipped in a separate box from the heat pump. It contains the following items:

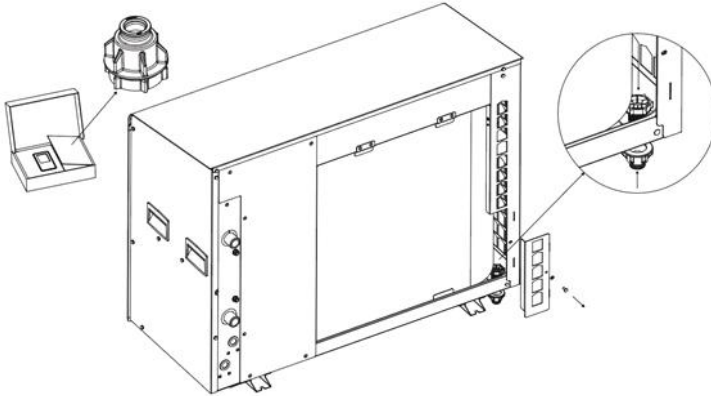
- Installation Manual
- Drain Outlet
- Flow Meter & cable
- Heat Pump Controller
- Lifting Straps
- Temperature Sensor



## Unit Installation

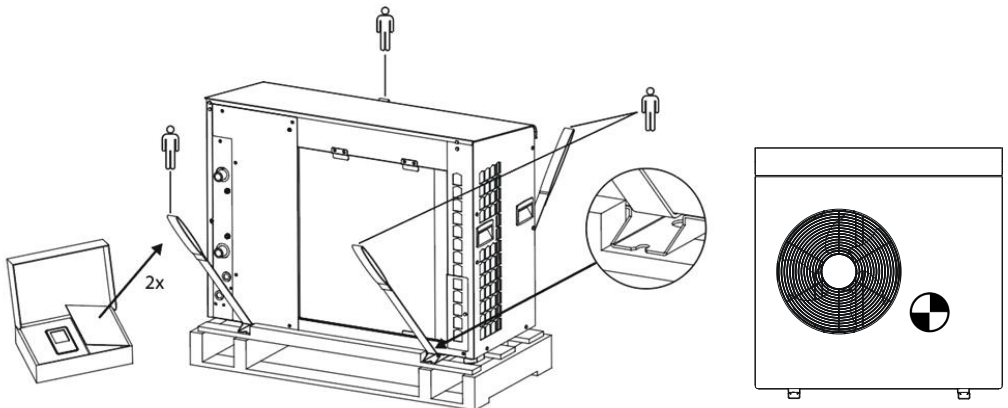
### 2.1.5 Install Drain Outlet

The drain outlet is located in the installation pack. Unscrew and remove the drain outlet cover as shown to gain access. Unscrew the flare nut from the drain outlet body. Install the drain outlet body into the drain tray hole and screw on the flare nut by hand from below. Replace and secure the drain outlet cover.



### 2.2 Positioning

The lifting straps are located in the installation kit. Thread the lifting straps through the feet as shown so that there is an equal length on each side. 2 persons should lift the heavy compressor side of the unit and 1 person the back. Wear gloves and take care not to damage the rear coil when moving the unit.



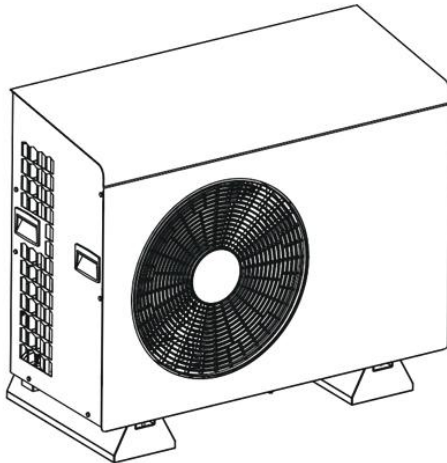
## Unit Installation

### 2.2 Positioning

The heat pump should be kept upright at all times, as oil from the compressor could flow into the refrigeration circuit and cause damage to the unit.

Care must be taken when installing the Ebac heat pump to ensure that the unit operates effectively. The following variables need to be taken into consideration when positioning the unit:

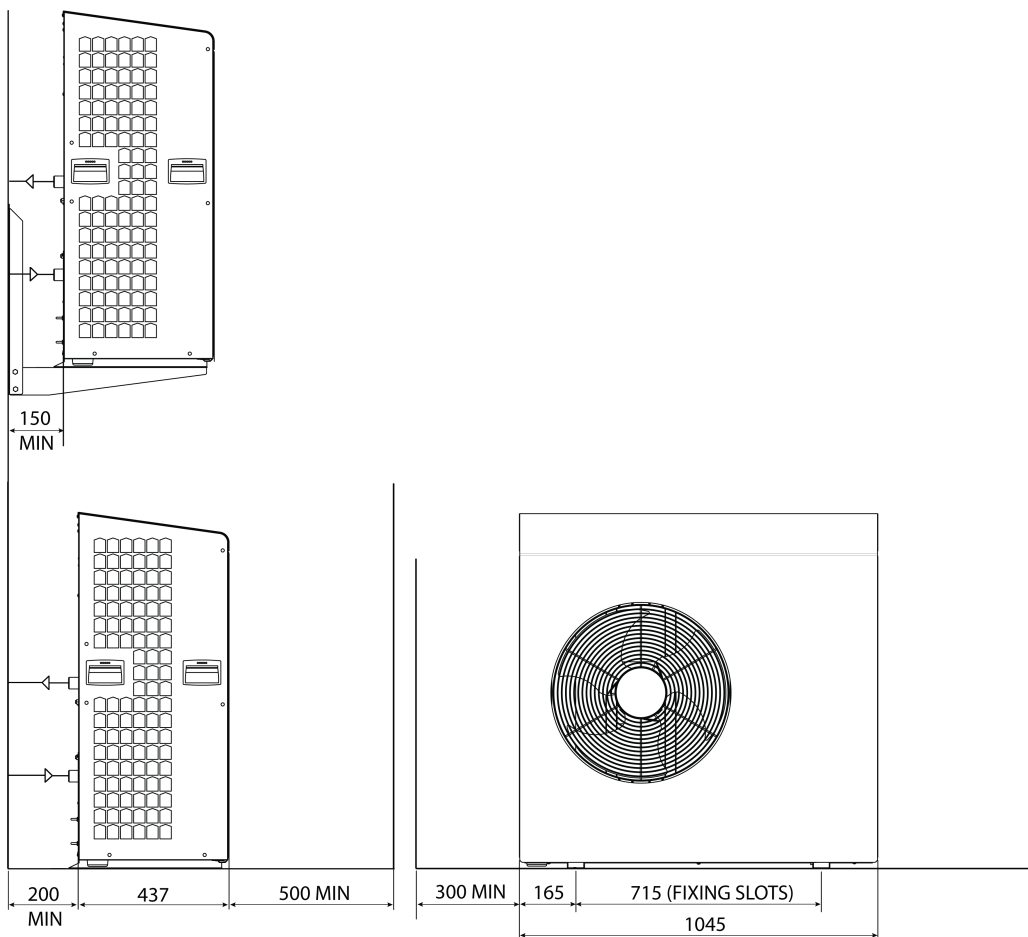
- The heat pump emits cool air from the front through the fan, this should be taken into consideration before installation so as not to cause a problem.
- All heat pumps do produce some noise. The potential nuisance factor should be discussed with the end user when considering the position of the heat pump. The planning standard limit is 42dBA. A calculation should be made, taking into account positioning and distance from neighbouring properties (use MCS standard MCS020).
- Select a location where easy wiring and pipe access is available.
- If the heat pump is to be installed in a costal location the unit must be protected against corrosion. For the warranty to not become void the rear coil and pipework must have an additional protective coating applied, contact Ebac for details.
- When installing the unit in a location where it is exposed to strong wind, do not face the air outlet of the unit directly into the prevailing winds.
- Strong wind entering the air outlet may impede the normal airflow and it may affect performance. Position the unit so that the air outlet blows perpendicular to the seasonal wind direction if possible.



## Unit Installation

### 2.2.1 Clearances

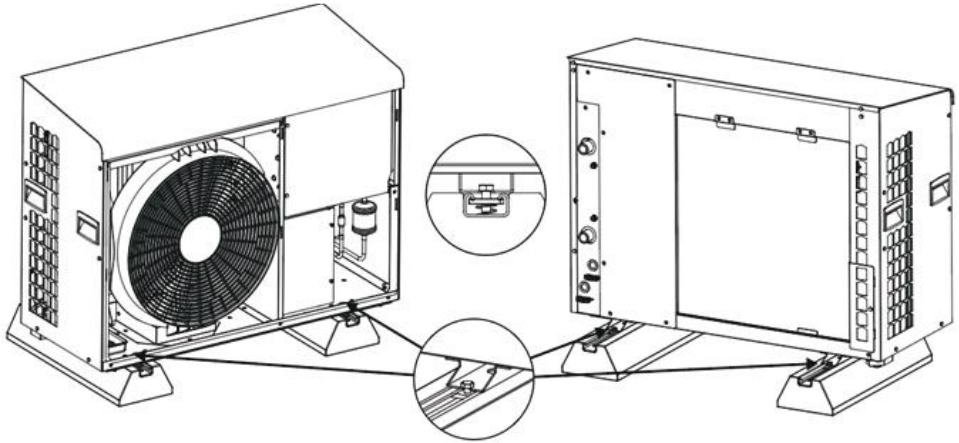
- If floor mounted there should be a minimum clearance behind the unit of 200mm.
- If wall mounted then this clearance can be reduced to 150mm.
- There should always be a minimum clearance in front of the unit of 500mm and 300mm to the sides.



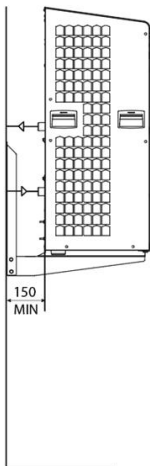
## Unit Installation

### 2.2.2 Floor Installation

The unit should be installed on a flat, stable base, with adequate provision for the condensate to drain away. To prevent the possibility of the unit vibrating and causing annoyance, the unit should be fitted on anti-vibration mounts. The heat pump should be fixed to the mounts using the supplied fixings in the positions shown.



### 2.2.3 Wall Installation



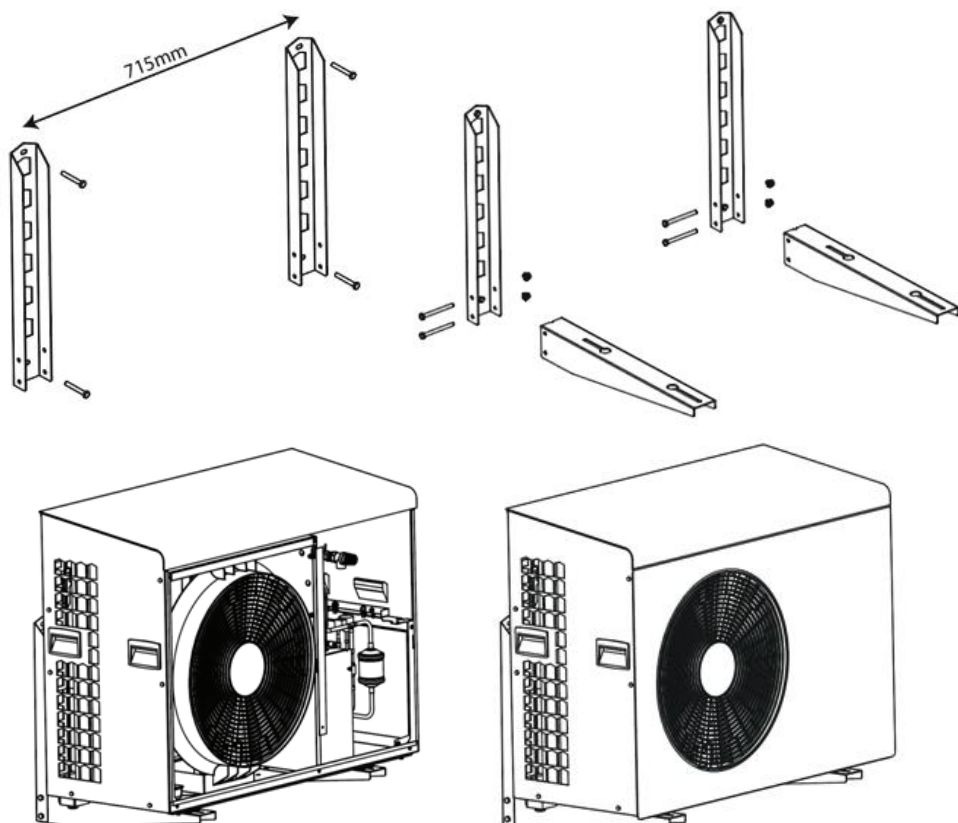
It is not recommended that the heat pump is mounted higher than necessary as maintenance is harder and exposure to the wind is more likely to affect performance.

If wall mounting the heat pump it is recommended that you use the Ebac support bracket kit.

## Unit Installation

### 2.2.4 Support Brackets

Follow the support bracket kit instructions to install. The support brackets should be mounted using the anchor bolts supplied. The brackets should be level and the fixing holes drilled 715mm apart in order to align with the heat pump feet. The support arms can then be attached to the brackets using the fixings supplied.





## Unit Installation

### 2.3 Preparation

Prior to installing the heat pump, the primary heating circuit should be cleansed using a suitable cleaning agent, to clear any contaminants such as flux residue or installation debris out of the circuit. This is also vital when fitting to an existing heating system. Failure to comply could result in poor efficiency or damage to components within the heat pump.

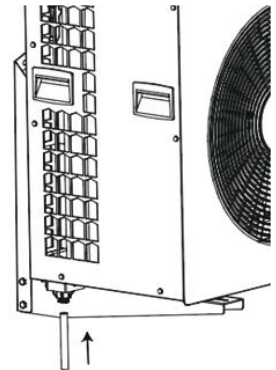
The Ebac heat pump delivers lower temperature water than a conventional boiler, therefore the heat emitters need to have a larger surface area or be fitted with an integral fan. (For a heat emitter sizing guide visit the MCS website).

An accurate heat loss calculation must be made for the property, then the size of the heat pump required can be established.

#### 2.3.1 Condensate Drainage

The underside of the heat pump has a drain outlet that allows any condensate to drain from the heat pump. Provision must be made to dispose of the condensate.

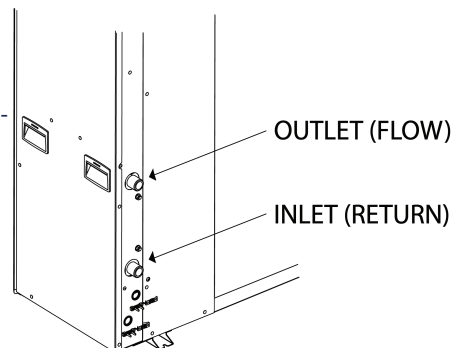
The push fit connection in the drain outlet is suitable for 15mm drainage pipe to form a condensate disposal system into which the condensate can flow into a suitable rainwater gully or soak away. If running drainage tube horizontally ensure there is a slope to allow the condensate to drain away.



### 2.4 Plumbing Work

Connect the water pipes to the outlet and inlet pipes. (Parallel male screw for 1-inch water pipe (ISO 228/1-G1B).

- Inlet and outlet pipes positions are as shown.
- Install the hydraulic filter at the water intake.
- Maximum allowable torque at the water piping connection is 50 N/m.
- Check if water leaks after installation.
- Inlet water gauge pressure must be between 0-0.3 MPa.
- The minimum water operating temperature is 5°C.
- Use inlet water with a temperature lower than 55°C.
- The water velocity in pipes should be kept within certain limits of material to avoid erosion, corrosion and excessive noise generation. Be aware, and take care of, that local velocities in small pipes, bends and similar obstructions can exceed the values above (e.g. Copper : 1.5 m/s).



## Unit Installation

- When connecting metal pipes made of different materials, be sure to insulate the joint to prevent electrolytic etching.
- Set up a field system so that the inlet water temperature and water flow rate can be within the allowable range specified in our technical data, etc. If the unit is used out of the allowable range, the parts of unit might be damaged.
- Anti-vibration hoses should be fitted to the flow and return to prevent excessive noise or any joints being broken due to vibration.
- Always cover the end of the pipe when inserting through the wall, to avoid contaminants getting inside.
- All external pipe work and connections should be well insulated to ensure optimum performance and to prevent freezing. \*Minimum insulation thickness should be 19mm\*.

### 2.4.1 Connection



- Ensure the fibre washer is fitted to the flexible hose.
- Screw the hose to the fitting on the rear of the unit.
- Ensure any pipework is insulated.



### CAUTION

DO NOT OVERTIGHTEN FITTINGS



### WARNING

THE OUTLET PIPEWORK TEMPERATURE CAN REACH 60 DEGREES C. DO NOT TOUCH WITH BARE HANDS.

## Unit Installation

### 2.4.2 Water Condition

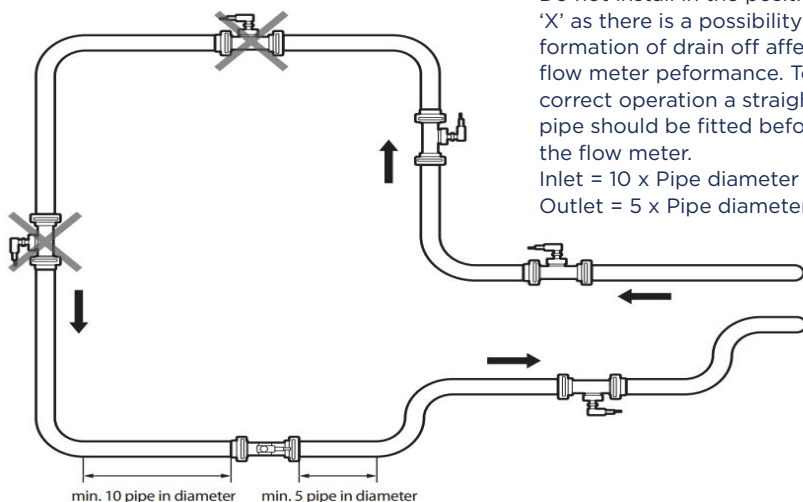
- The water in a system should be clean and with a pH value of 6.5-8.0. The following are the maximum values:
  - Calcium : 100 mg/L
  - Chlorine : 100 mg/L
  - Iron/manganese : 0.5 mg/L.

### 2.4.3 Anti-freeze / Filter

- The outdoor unit, connections and any external pipe work must be protected from freezing. An anti-freeze additive (such as Tyfocor L) of the correct quantity (see manufacturer's guidelines) should be added to prevent any internal damage being sustained by the unit.
- A magnetic filter / strainer must be fitted in the return line of the primary circuit to prevent any contaminants from the circuit reaching the heat pump and potentially damaging components. The filter must be cleaned periodically according to the instructions of the manufacturer.

### 2.4.4 Flowmeter

- The flow meter is not an integrated part of the heat pump but is essential to its operation. It should be fitted to the main water circuit as shown in the diagram below. Ensure the 'o' rings are fitted and ensure that a 1" female to 28mm compression fitting is used for connecting the flow meter to the pipe work.



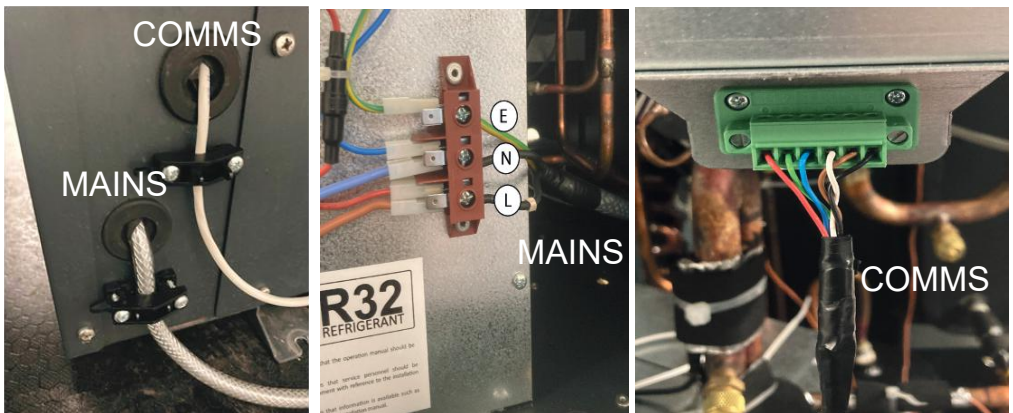
## Unit Installation

### 2.5 Electrical Work

The wiring must be performed by professional technicians in accordance with national wiring regulation and the circuit diagram. An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device (RCD) with the rating not exceeding 30mA RCD shall be incorporated in the fixed wiring in accordance with the wiring rules. The appliance requires a suitable mains supply rated for the units capacity, an isolator should be placed in close proximity (1.5 m) of the unit and easily accessible. This appliance **MUST BE EARTHED**.

Model	5kW	9kW
Maximum Overcurrent Protector (MOP) (A)	20	25
Wiring Size (mm <sup>2</sup> )	2.5	4

- Wiring sizes must comply with the applicable local and national codes and must be suitably protected from damage.
- All electrical work carried out should comply with IEE wiring regulations.
- In the event of an electrical fault after installation of the appliance, the heat pump **MUST BE DISCONNECTED BEFORE** any tests are carried out.
- The 6 core (min 0.25mm<sup>2</sup>) interconnecting cable between the Auxiliary board and heat pump does not carry 240V potential.
- Care should be taken not to run communication cables (flow sensor, interconnecting cable) close to or with mains 240 volt cables. Control equipment (pumps, zone valves, thermostats etc) must have a separate circuit from the actual Ebac heat pump system and should be protected by the required fuse rating.
- Wiring should enter the unit and terminate as shown below.



## Unit Installation

### 2.5.1 Wiring of 5kW Unit

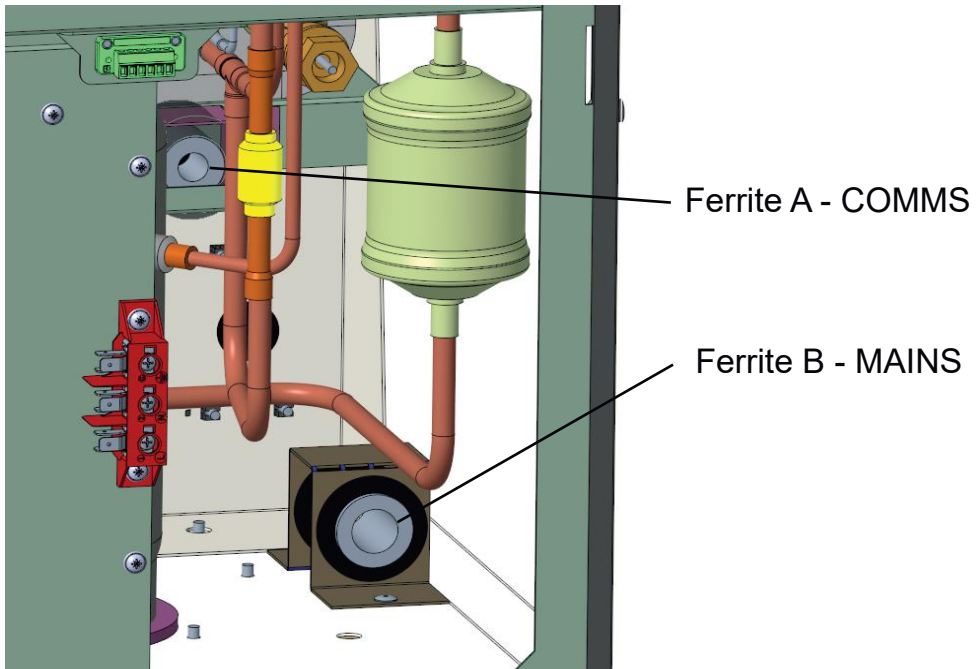
The 5kW unit has 2 extra ferrite ring components through which the incoming wires must be routed before they are connected:

#### **Communications cable**

The communications cable must be routed through Ferrite 'A' which is located close to the comms wire inlet at the back of the unit.

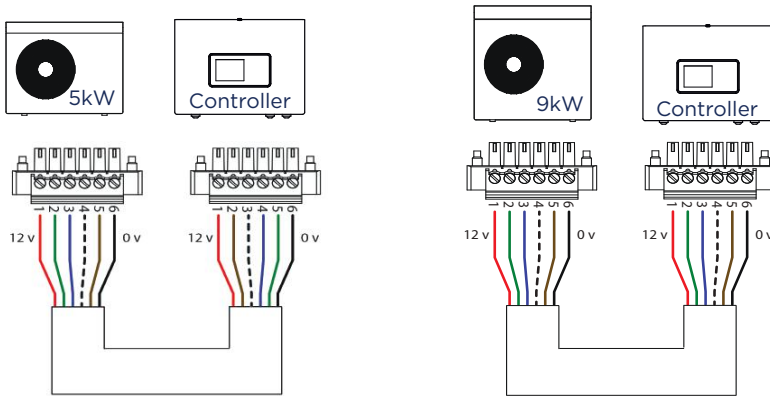
#### **Mains cable**

The mains cable must be routed through Ferrite 'B'. Ferrite 'B' is located on the floor of the unit close to the mains inlet.



## Unit Installation

### 2.5.2 Wiring of Communications Cable



Note: Alternative wire colours can be used.

### 2.6 Controller Installation

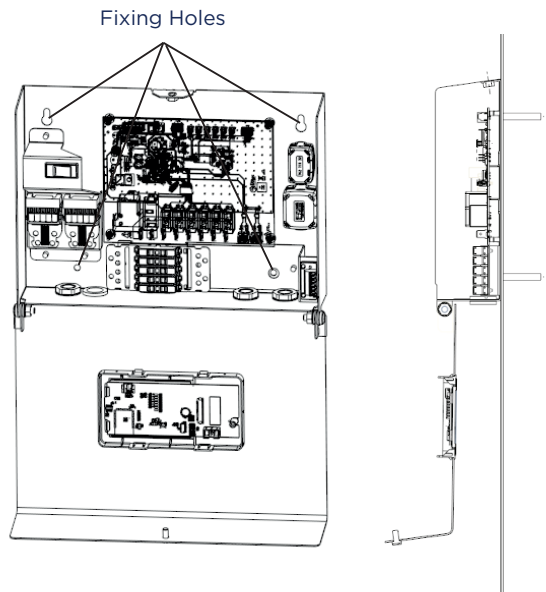
The Auxiliary control board is powered by the outdoor unit. It should be located inside the property, near to the control equipment (zone valves, pump, heating controller).

Do not position the control unit outdoors as it is designed for indoor installation only.

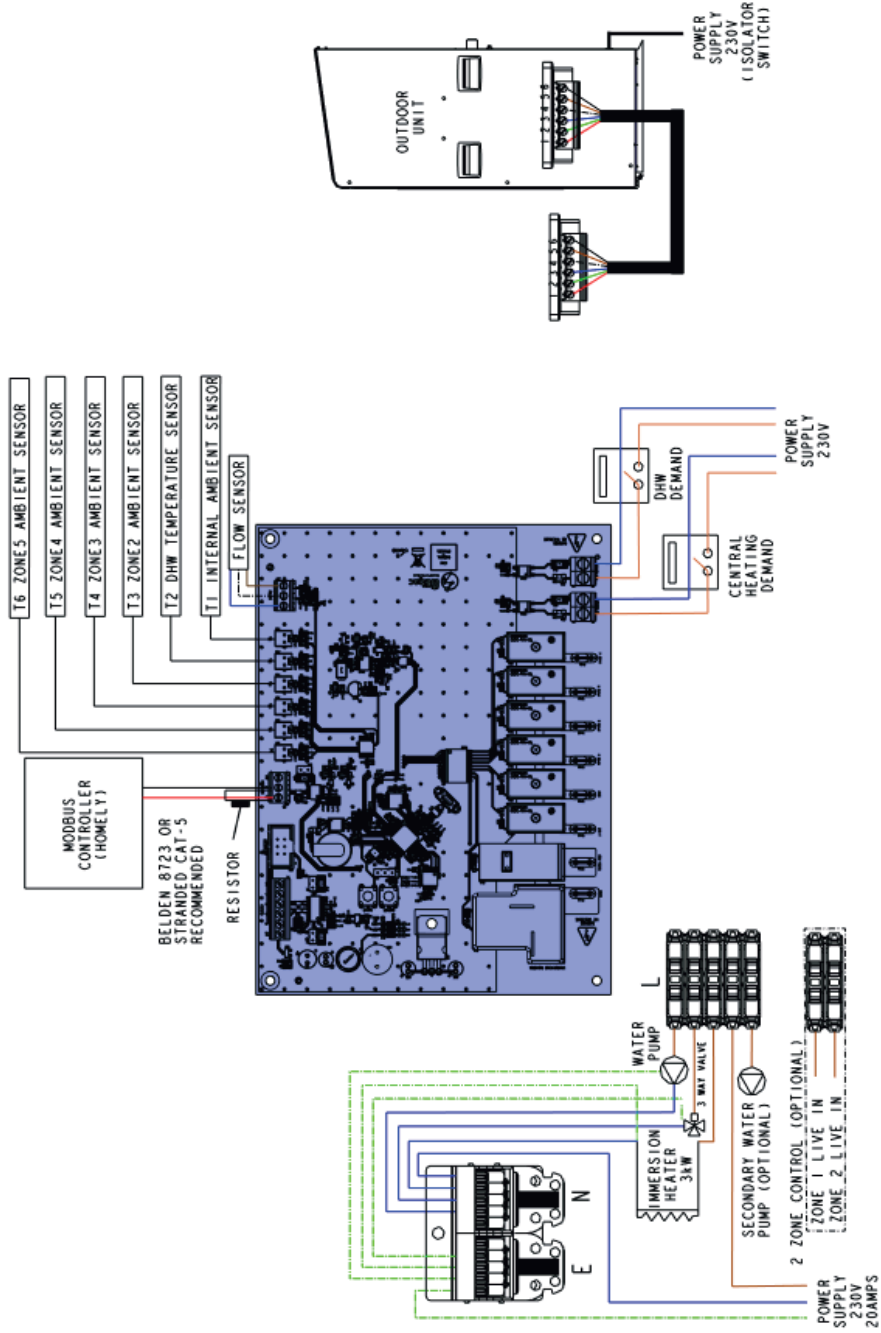
Avoid locations where the unit is exposed to direct sunlight or other types of heat or humidity. Select a location where easy wiring access to the power is possible.

Remove the top cover screw and hinge down the cover. Position the controller in the chosen position. Ensure it is level and that there is adequate clearance for the lid to hinge down.

Mark the positions of the four fixing holes shown and drill for suitable screw fixings. Use the screws to fix the controller into position. Wire the unit as shown in the electrical schematic in section 2.8.



## 2.0 Unit Installation 2.7 Controller Electrical Schematic

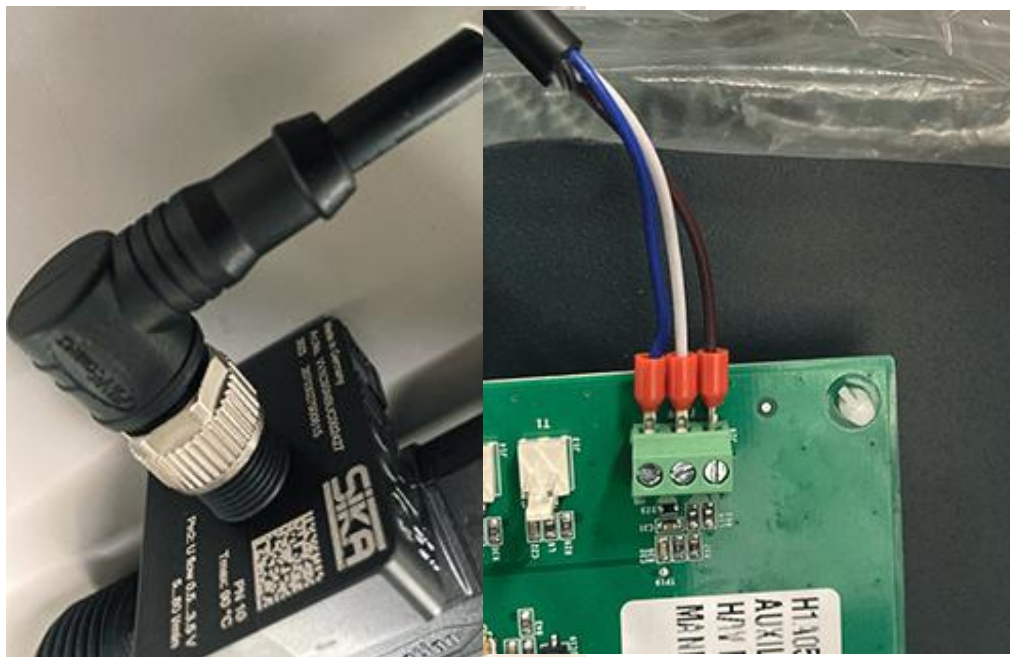


It is recommended that a RCBO is not fitted due to the shared neutrals

## Unit Installation

### 2.8 Flowmeter

The flowmeter is supplied with its own cable. The threaded connector is attached to the flowmeter. The 3 crimped wires at the other end are wired into the screw terminals as shown.



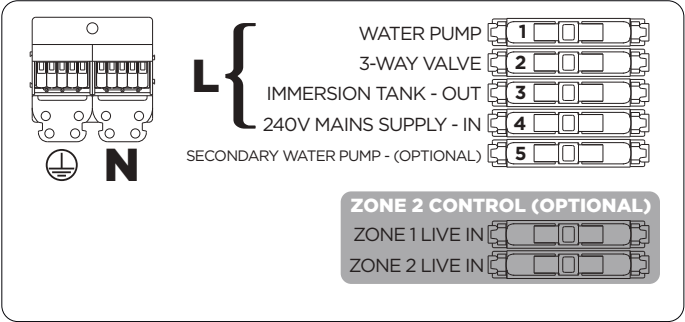
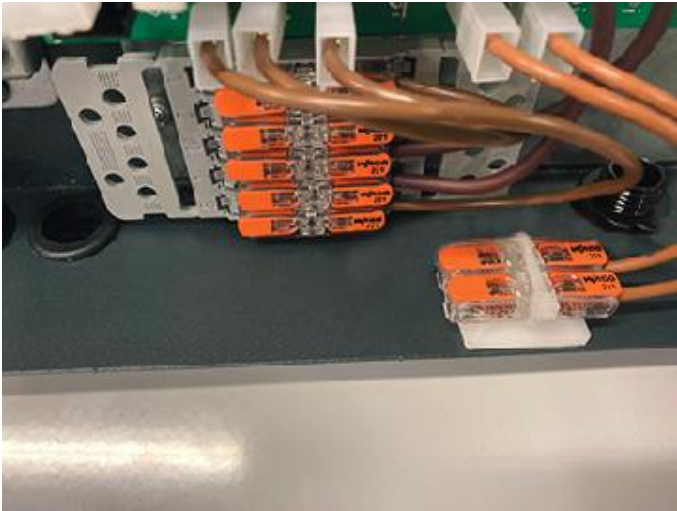


# 2.0

## Unit Installation

### 2.9 Two Zone Control

If two zones are to be controlled two connections are available for the live inputs for zones 1 and 2. A connection is also available for a secondary pump to be used. These optional connections are shown below.



## Commissioning & Setup

### 3.1 Unit Commissioning/ Calibration

The Ebac Heat pump and Controller use conventional controls. There are 3 options to run the heatpump for space heating:

Homely smart controller - this is the most efficient way to run the heat pump.

Room thermostat.

Timer with the Ebac temperature sensor.

A hot water programmer is required for domestic hot water.

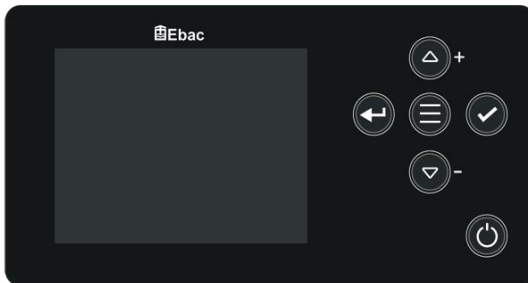
Connections between the heat pump and internal auxiliary control board should contain no intermediate connections, as this may result in communication errors.

Calibration period.

Note that on power up the heatpump enters a 10 minute rest period. The heatpump will appear to be inactive during this phase as it calibrates its sensors. If the heatpump is powered off it will always enter this calibration period on power up.

If the system is to be filled after power up it is recommended that the middle (white) flowmeter wire be disconnected to allow the pump/s to run during the calibration period.

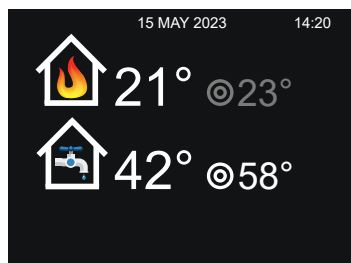
### 3.2 Controller Interface



- |   |  |
|---|--|
|  Power on            |  - Scroll/adjust down |
|  + Scroll/ adjust up |  Back                 |
|  Menu                |  Select/ return       |

## Commissioning & Setup

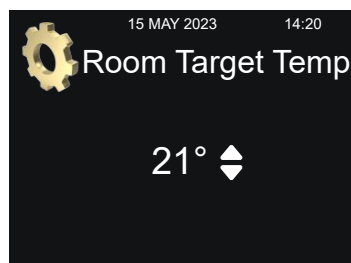
### 3.3 User Menu



1

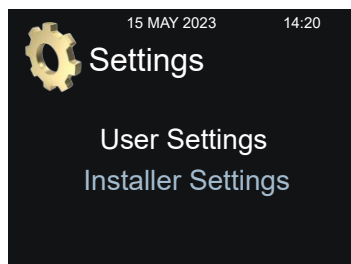
Press the power on button to activate the home screen. The display shows current temperatures and target temperatures for heating and water. The white target icon indicates which target temperature can be adjusted with the up and down keys and this can be altered with the tick button to enter the target temperature menu.

*Note: If an external thermostat is used to control the temperature the temperatures will not be shown.*



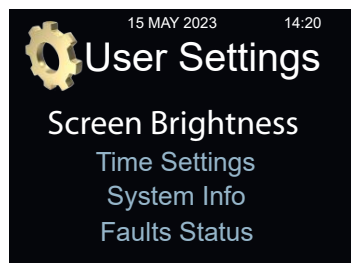
2

Up and down keys can be used to adjust the target temperature. The select button can be used to confirm it and back can be used to return from the menu.



3

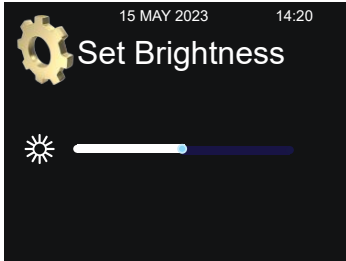
Highlight and select user settings to enter the menu.



4

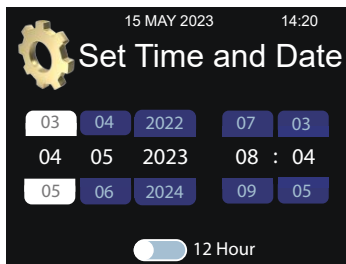
Highlight and select to enter each menu

## Commissioning & Setup



5

Screen brightness can be adjusted as necessary by using the up and down arrows. Use the select button to confirm and back to return from the menu.



6

On first setup the time will need to be set in the clock settings menu. Scroll to adjust, select to set and back to return from the menu.



7

The Legionella Purge screen is used to choose the weekday and time when the purge cycle will take place. Scroll to adjust and select to set the values.

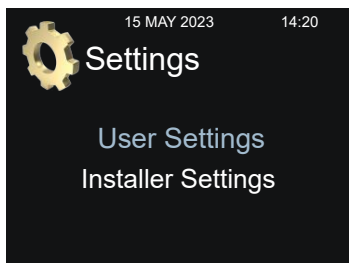


8

The Faults Status screen displays any fault conditions active at the time of selection. If none are active then 'No Fault' is displayed. Select back to return to the User Settings menu.

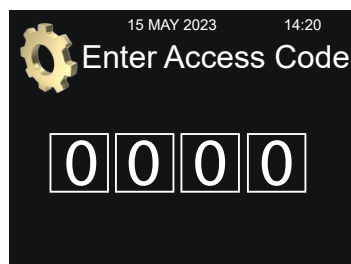
## Commissioning & Setup

### 3.4 Installer Setup Menu



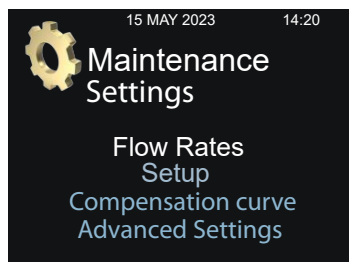
1

After pressing the menu button highlight installer settings.



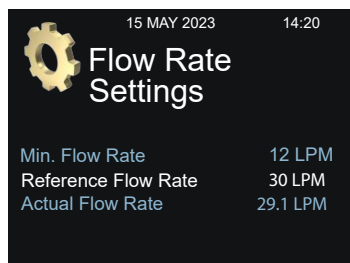
2

Enter the 4 digit access code. **3214**



3

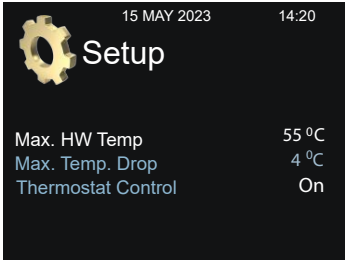
To set flow rates highlight and select the flow rates menu.



4

Modify the reference flow rate (flow rate on setup) as required and return. This can be used to check for deterioration in flow.

## Commissioning & Setup



5

Enter the setup menu to modify hot water settings and return.  
Thermostat control. If an external thermostat or timer is to be used this should be set to On.  
If temperature probes are to be used to regulate the unit this should be set to Off.



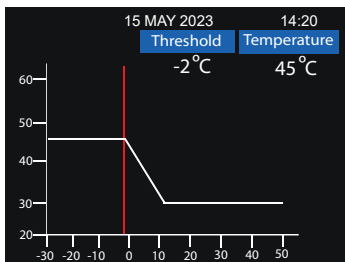
6

Enter the compensation curve menu and modify the temperatures as required. .



7

Select the 'Show Curve' option to display the compensation curve.

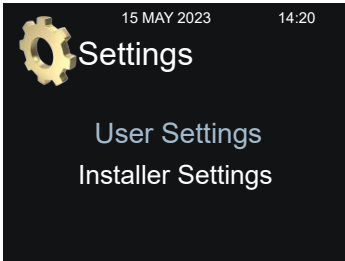


8

The current compensation curve profile is displayed.  
Scroll to see the threshold values displayed

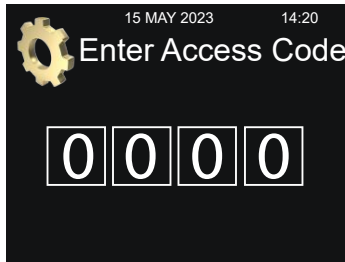
## Commissioning & Setup

### 3.5 Advanced Settings Menu



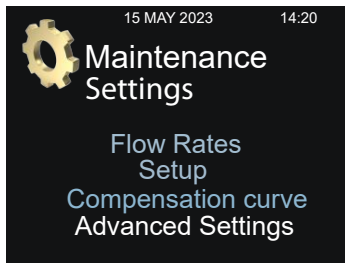
1

After pressing the menu button highlight installer settings.



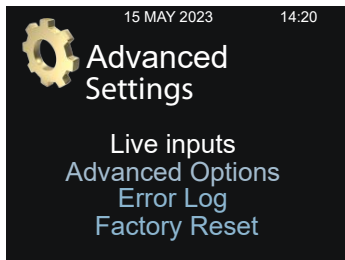
2

Enter the 4 digit access code: 3214



3

Select advanced settings and enter the 4 digit advanced access code: 5214




4

Select live inputs.

## Commissioning & Setup

15 MAY 2023 14:20




### Live inputs

Evap.out	16.9 °C +0
Evan In	16.1 °C +0
Ext. Ambient	17.3 °C +0
Condensor out	16.7 °C +0
Water out	17.1 °C +0

5

All live inputs are displayed in this section. Those with an option to offset can be adjusted if necessary.

15 MAY 2023 14:20



### Advanced Options

DHW Max. Time	01:30 min
Legionella Interval	1 weeks
Legionella Temp.	60 °C
Legionella Duration	00:05 min
Number of Zones	1

6

Go back to select Advanced Options. The DHW max time, legionella settings and number of zones have default settings but can be adjusted if necessary.

15 MAY 2023 14:20



### Error Logs

1/5

State idle	16/05 12:16
State Comp. Resting	16/05 12:06
Compressor Failing	16/05 12:04
State Shutting Down	16/05 12:04
State Starting	16/05 12:01

7

The error log menu displays events with timings and is a useful troubleshooting tool.

15 MAY 2023 14:20



### Factory Reset

Are you sure ?

NO  
YES

8

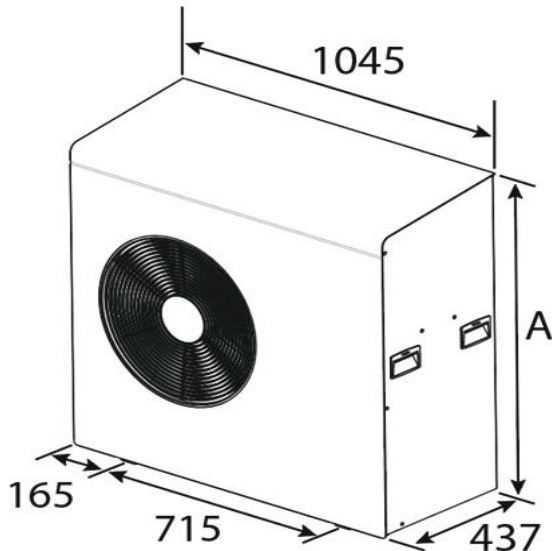
The factory reset option allows the user to return the heat pump to default settings.

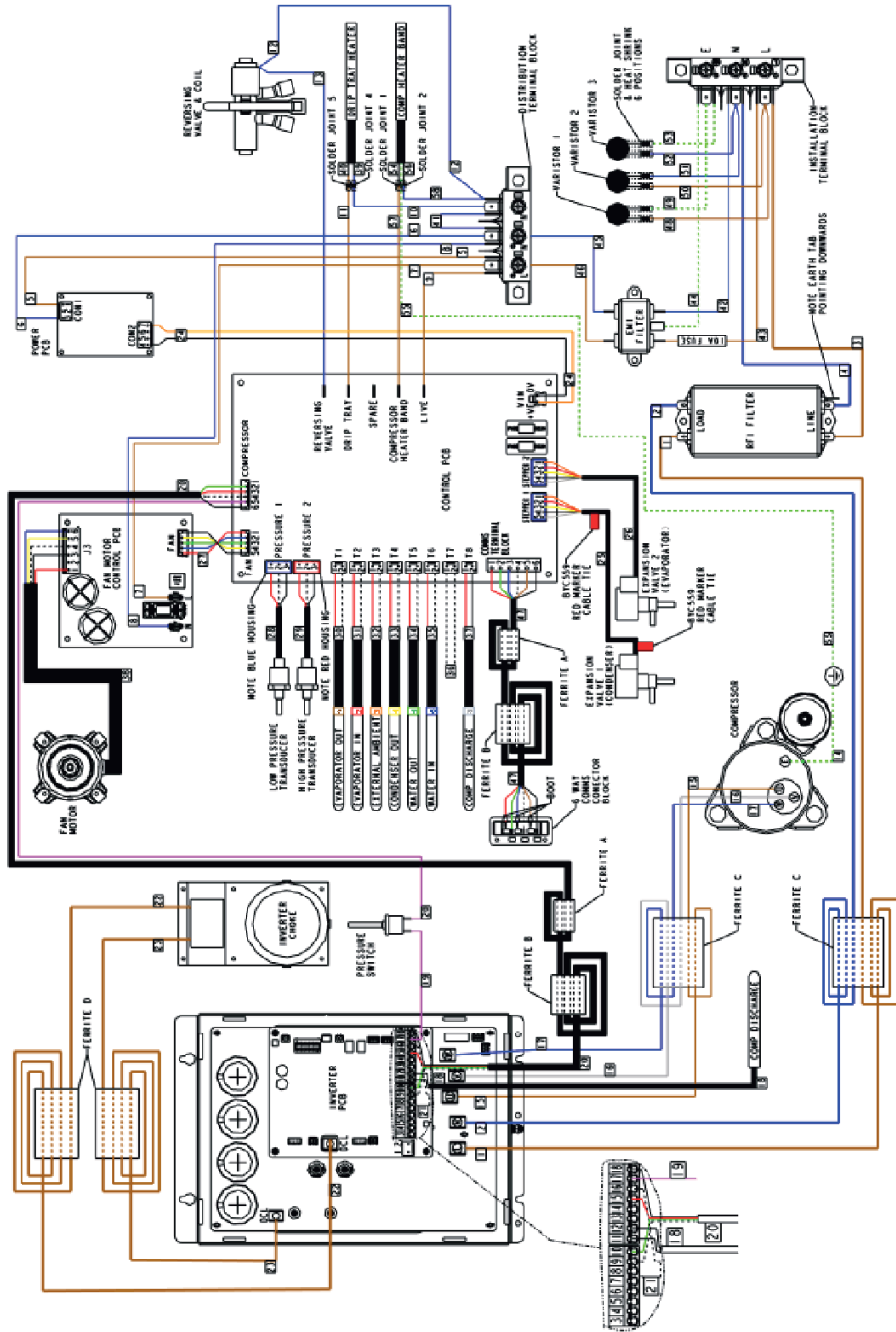


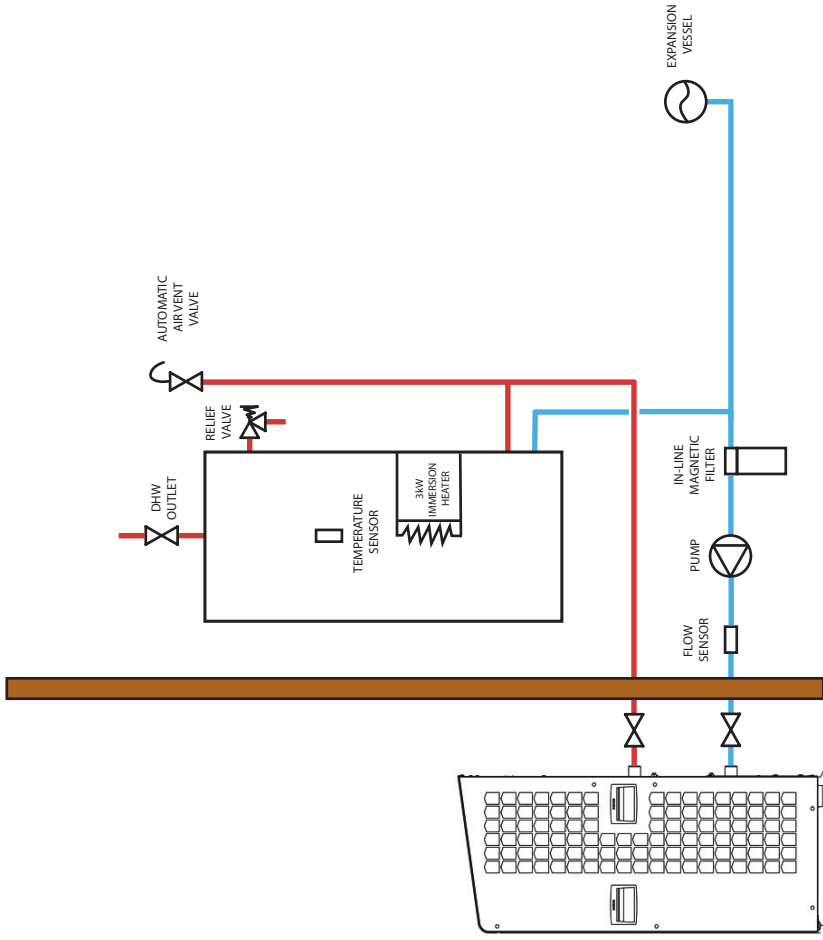
## Technical Data

### 4.1 Technical Data

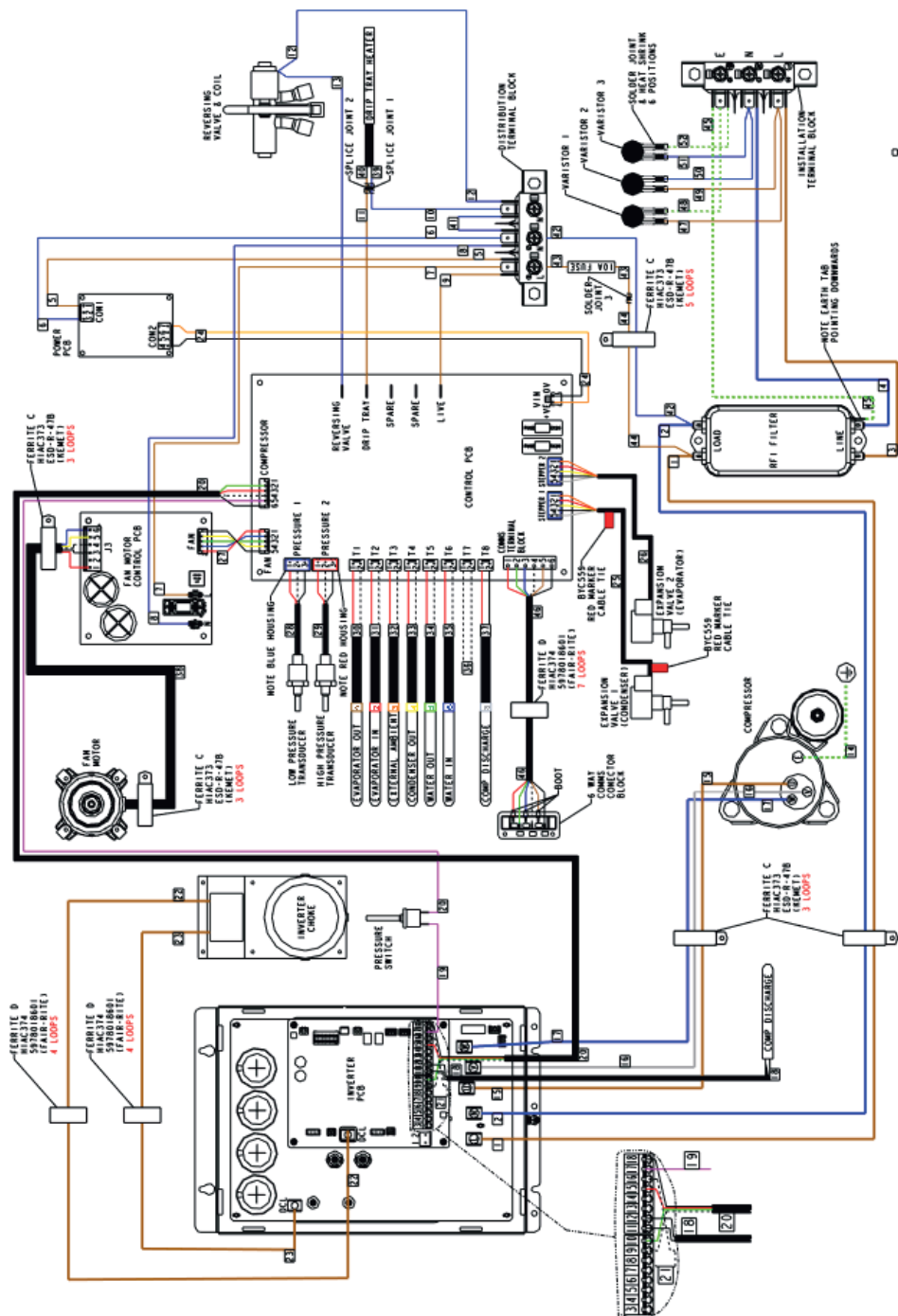
		Ebac 5	Ebac 9
DIMENSIONS	Width (mm)	1042	1042
	Depth (mm)	437	437
	Height (mm) 'A'	800	1030
WEIGHT (Kg)		90	115
ELECTRICAL DATA	Electrical Supply	220-240v, 50Hz	220-240v, 50Hz
	Phase	Single	Single
	Nominal Running Current (MAX)(A)	15	22
REFRIGERANT CHARGE (Kg) / CO <sub>2</sub> EQUIVALENT	R32 (GWP: 677)	2.0 / 1.36	2.2 / 1.50
OPERATING AMBIENT TEMP RANGE		-20°C - +35°C	-20°C - +35°C
WATER DATA	Pipework Size (mm)	28	28
	Flow Rate Max / Min (l/min)	40/10	40/10
	Flow Temperature Max / Min (°C)	60/15	60/15

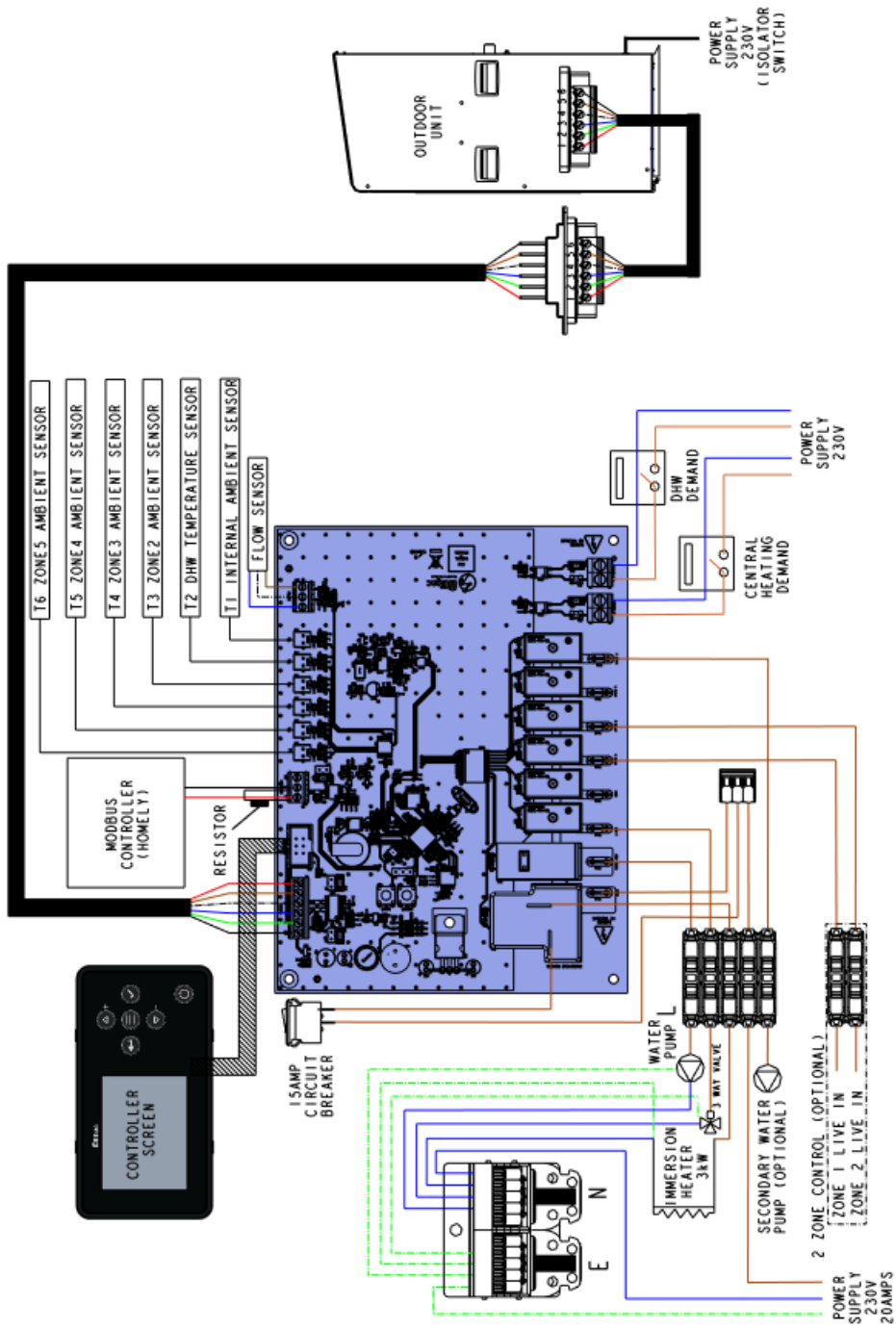


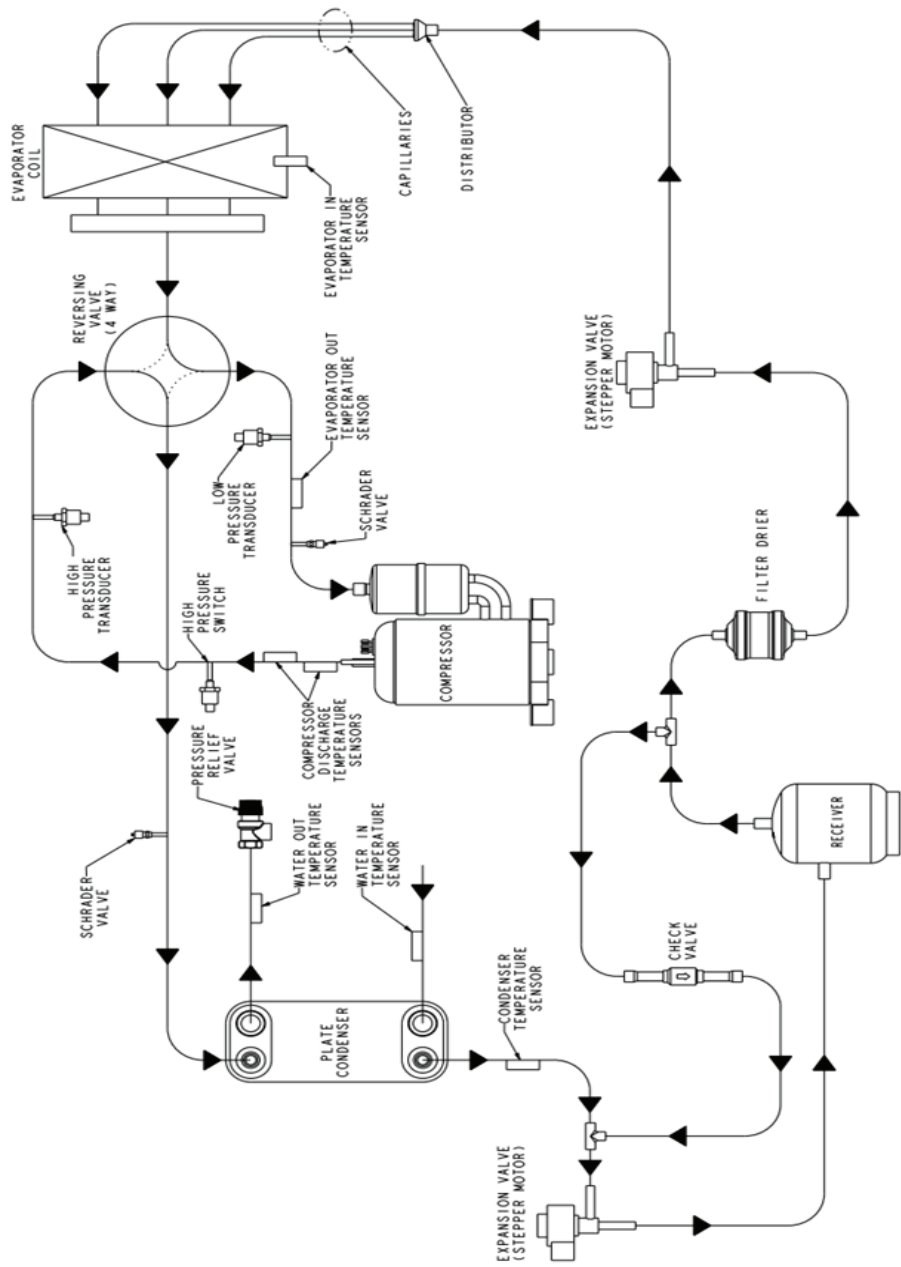


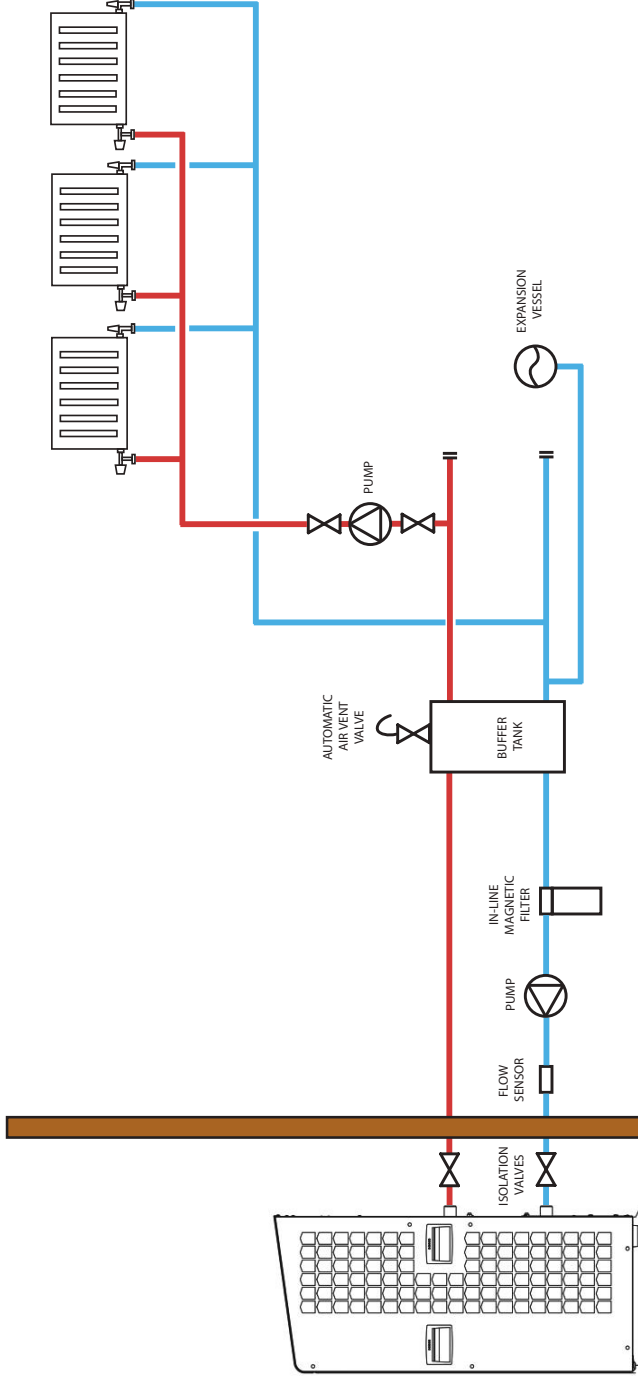


**IMPORTANT:** The above system is a concept drawing and not a detailed engineering drawing. It is not intended to describe a particular system





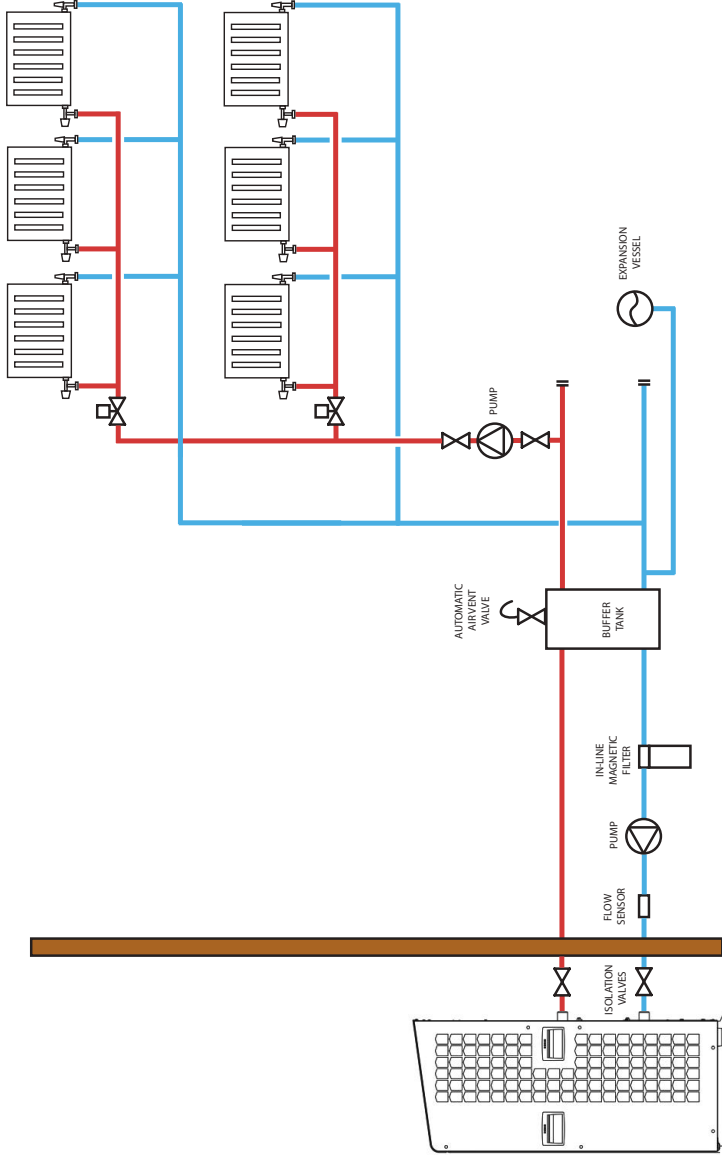




**IMPORTANT:** The above system is a concept drawing and not a detailed engineering drawing. It is not intended to describe a particular system

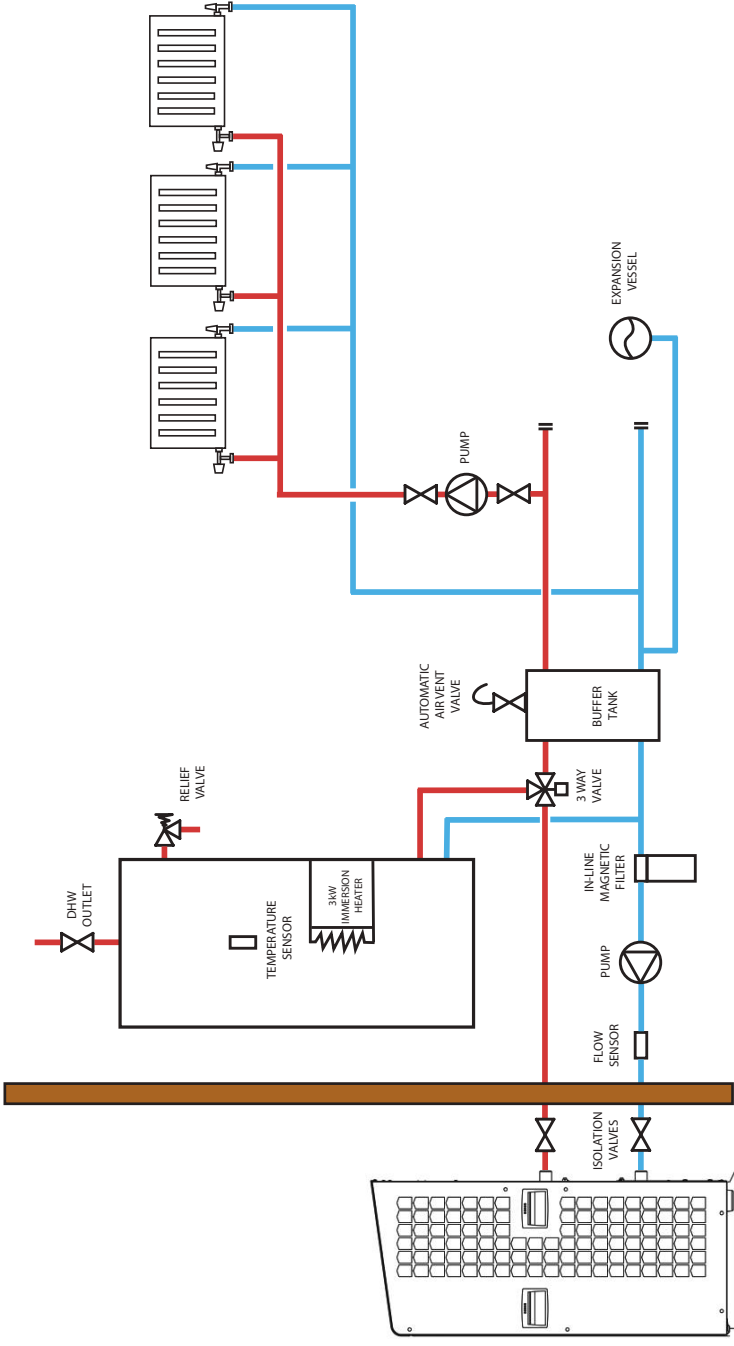
An automatic air vent should be installed at the highest point of the system, as air in the system will significantly reduce performance of the heat pump. Alternatively a micro bubble deaerator can be fitted to remove dissolved air and increase the efficiency of the system. A buffer tank may be fitted to the system to cover any shortfall in the heating during the heat pump defrost cycle during extreme weather conditions. If a standard Ebac heat pump is used then an expansion vessel would need to be fitted in the system (the enhanced unit has an expansion vessel and circulation pump fitted). A filling loop can be sited anywhere in the system. If any items are already installed in an existing system they should be checked for integrity and suitability before being re-used.

Each model requires sufficient primary flow rate for an efficient operation. Depending on the size of the heat pump used and the size of the system it may be necessary to fit two circulators in series to produce the required flow rate ensuring a delta T of 5°C. Pipe diameter may also need to be increased to reduce resistance, so the required flow rate can be achieved.

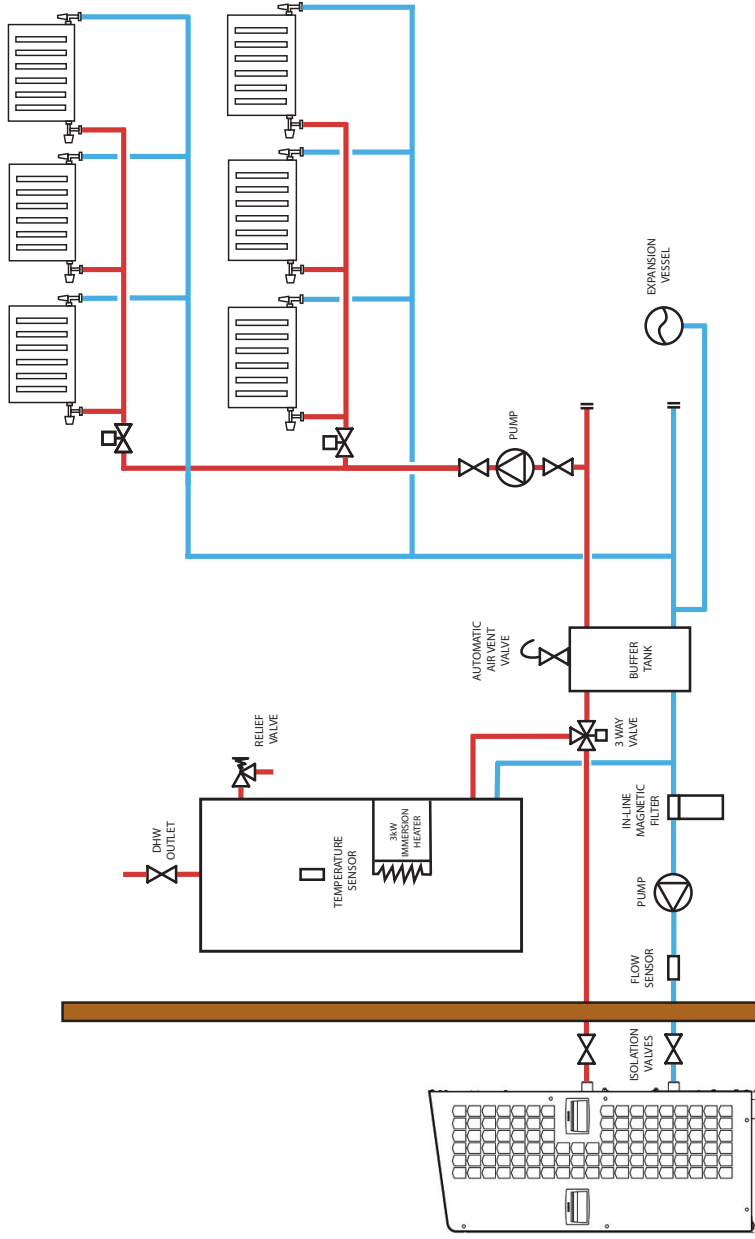


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Two heating zones can be connected to the Ebac unit in the same way as a conventional system. The control equipment will automatically switch between hot water and heating zones as required. Ensure the Domestic hot water zone valve is connected to the correct port on the Auxiliary board.

## Troubleshooting

### 5.1 Troubleshooting at Installation

Problem	Possible Reasons	Troubleshooting
Heat Pump fails to start	No power supply	Ensure the power supply is connected correctly and turned on
	Insufficient flow	Check the heat pump has sufficient flow
	No demand from thermostats	Check the thermostats for demand
Water is not hot enough	The heat pump is not constantly running	Check the heat pump is running continuously
	Insufficient flow	Check the heat pump has sufficient flow
	Set points incorrect/ not set	Check the set points on flow curve and adjust if required
	Low air flow	Check the Heat pump has adequate air flow
Water is emitted from outdoor unit	None	This is normal operation
RCD trips	RCD too small	Size RCD correctly
	Cable too small	Size cable correctly
	Damage to cable or component	Inspect for damage to cable or components
	A component is leaking to earth	

### 5.2 Faults and Solutions

Fault Description	Possible Cause	Solution
Air Flow	Unit incorrectly situated	Check unit has sufficient clearance
	Debris blocking evaporator coil	Check for debris
	Fan blade obstructed	Check fan blade
	Fan not operating	Check fan is functional
	PCB fail	Test PCB connection
Water Flow	Flow rate has dropped below minimum flow rate (unit will attempt to restart automatically)	on installation, have flow and return been connected in reverse?
	Incorrect pump	Is water pump of correct spec/ operational?
	Water loss	Check for leaks
	Air lock/ blockage	Check for air lock or blockage

## Troubleshooting

### 5.2 Faults and Solutions

Fault Description	Possible Cause	Solution
Low Pressure	Disconnection of low pressure transducer	Check connection
	Evaporator frozen	Sensor fail
	Defective circuit board	Replace circuit board
High Pressure	Disconnection of low pressure transducer	Check connection
	Defective part	Check refrigerant pressure and replace
	Defective circuit board	Replace circuit board
	Short water circuit	
	High pressure switch activated	
High Discharge	Defective sensor	Check sensor
	Defective control PCB	Replace control PCB
	Defective expansion valve	Replace expansion valve
Can Bus Error	Connection lost between heat pump and controller	Check 6 core cable for damage and connections at both ends
Difference between high pressure temp and low pressure temp too small	Defective compressor	Compressor fault
	Defective inverter	Inverter fault
	Defective PCB	PCB fault
	Wiring fault	Wiring fault on inverter or PCB
No Zones	No heating zones asking for heat	This is not a fault but will be logged
Compressor Low	Heat pump attempting to run compressor at a lower speed than it is capable	Heat pump will restart automatically
PCB Battery	The battery powers the real time clock inside the unit. It is checked for function periodically so this event can be ignored	

### 5.3 Fault Status

If a fault develops the home screen indicates 'fault present - check fault status'. The fault type can be checked by entering the 'Faults Status' section in the User Settings menu. When selected the page shows a list of the fault conditions which are active at the time of selection. Faults include:

- Compressor discharge over-temperature
- High pressure over-temperature
- Low pressure under-temperature
- Low pressure too far below ambient
- Low water flow
- High pressure sensor failure
- Legionella - unsuccessful cycle
- Low pressure sensor failure
- Other temperature sensor failure
- Compressor discharge sensor failure
- Water out sensor temperature failure
- Compressor failing to make pressure
- Communication to heat pump lost

## Maintenance

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### 6.1 Annual Service



POWER OFF THE POWER SUPPLY PRIOR TO OPENING OR REMOVING THE FRONT PANEL FOR SERVICE/ MAINTENANCE

The Ebac Air Source heat pump must be maintained on an annual basis.

The basic requirements are:

- Remove obstruction from evaporator coil/fan
- Visual inspection for leaks
- Check integrity of pipe work insulation
- Check for loose electrical connections
- Stop the unit and clean the magnetic filter in accordance with manufacturer's instructions
- Test the concentration of anti freeze and acidity level of fluid in system

System checks can be carried out via the dashboard.

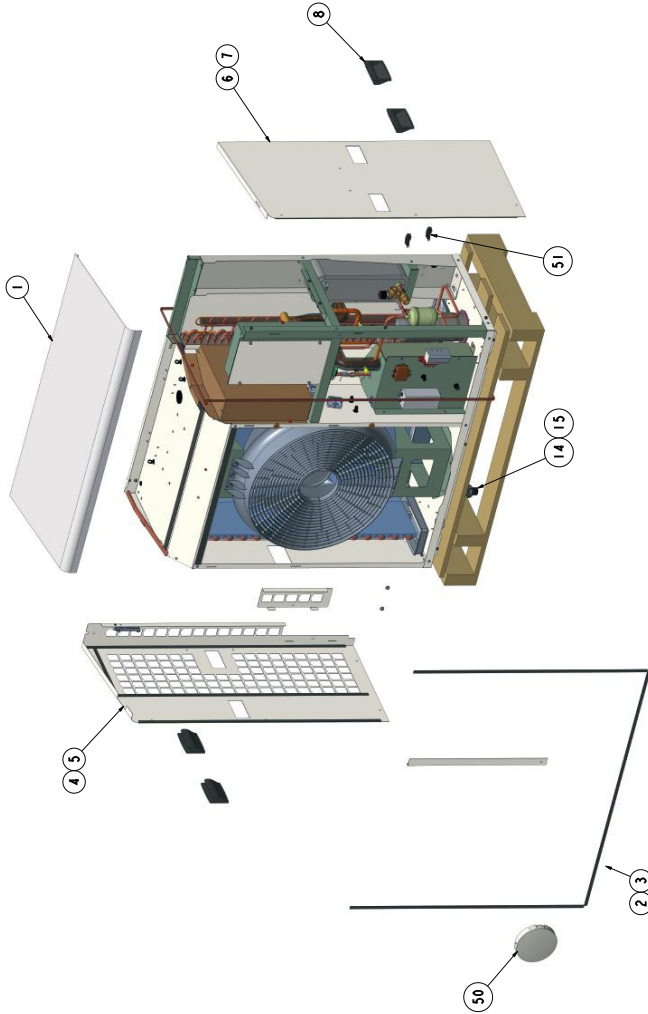
Unvented cylinders should be serviced annually, as per manufacturer's instructions

Servicing should only be carried out by competent installers and any spare parts must only be purchased from Ebac

NEVER bypass safety devices or operate the unit without them being fully operational.

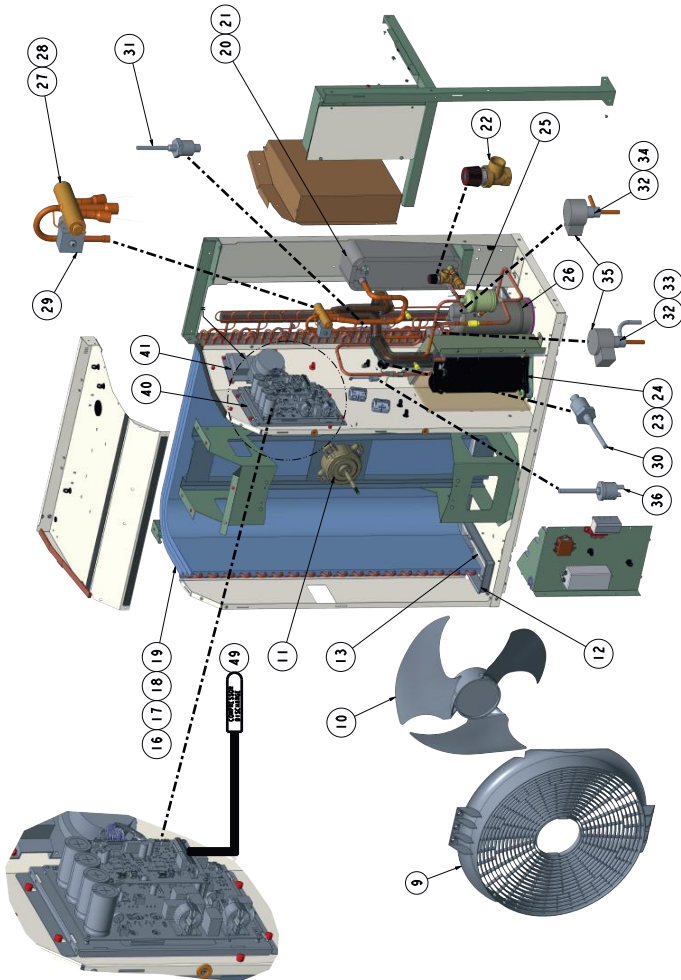
# Maintenance

## 6.2 Spare Parts 5 & 9kW



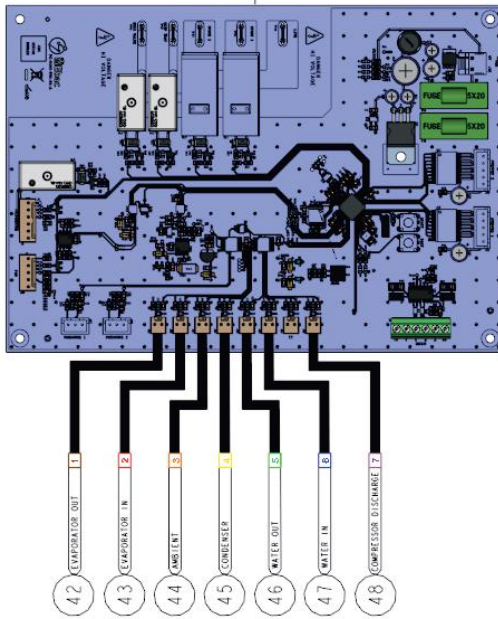
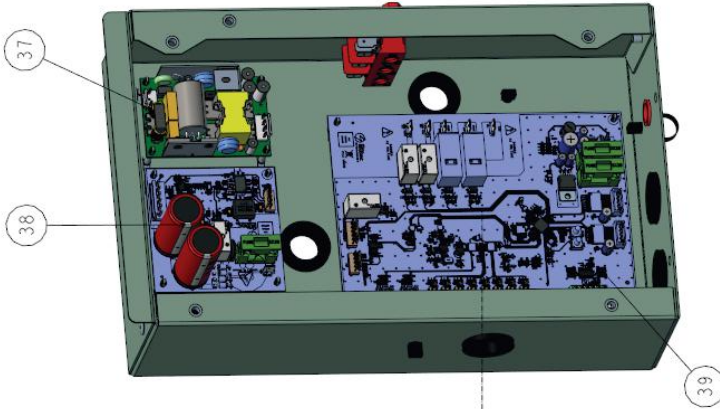
# Maintenance

## 6.3 Spare Parts 5 & 9kW



# Maintenance

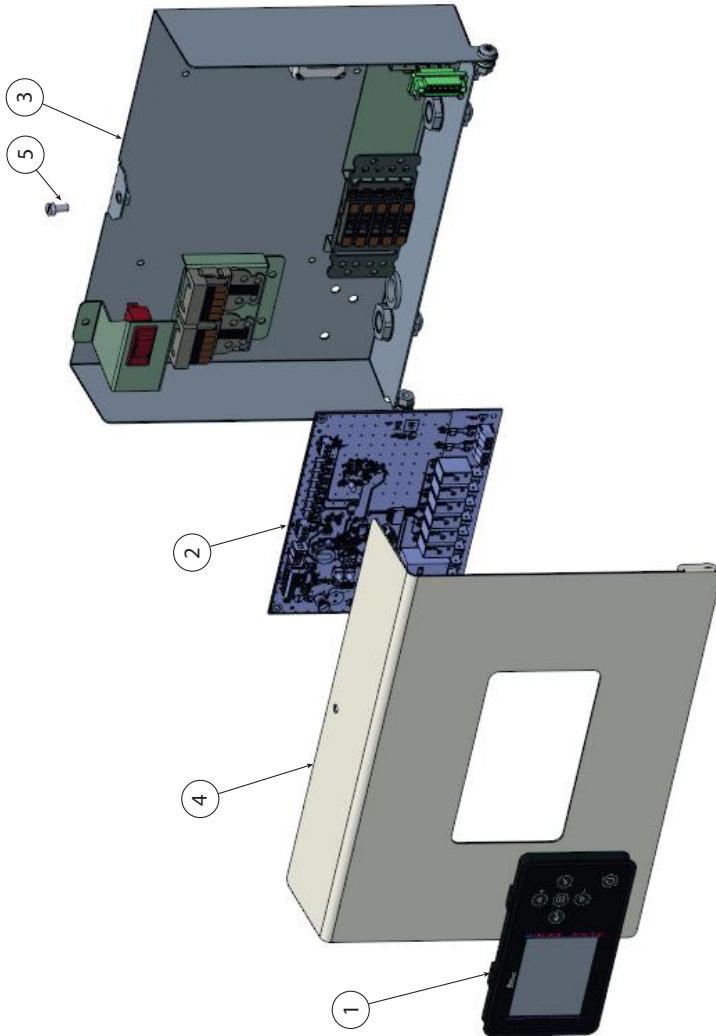
## 6.4 Spare Parts 5 & 9kW





## Maintenance

### 6.5 Spare parts Controller



## Maintenance

### 6.6 Spare Parts List

Ref #	Description	Part No.	Section No.
1	Lid - White	H1DA343-WH	6.2
	Lid - Anthracite grey	H1DA343-GY	
2	Front panel assembly (5kw) - White	H1AA323-WH	6.2
	Front panel assembly (5kw) - Anthracite grey	H1AA323-GY	
3	Front panel assembly (5kw) - White	H1DA323-WH	6.2
	Front panel assembly (5kw) - Anthracite grey	H1DA323-GY	
4	Side grille assembly (Left panel) (5kw) - Anthracite grey	H1AA328-GY	6.2
	Side grille assembly (Left panel) (5kw) - Black	H1AA328-BK	
5	Side grille assembly (Left panel) (9kw) - Anthracite grey	H1DA328-GY	6.2
	Side grille assembly (Left panel) (9kw) - Black	H1DA328-BK	
6	Side panel assembly (Right panel) (5kw) - Anthracite grey	H1AA327-GY	6.2
	Side panel assembly (Right panel) (5kw) - Black	H1AA327-BK	
7	Side panel assembly (Right panel) (9kw) - Anthracite grey	H1DA327-GY	6.2
	Side panel assembly (Right panel) (9kw) - Black	H1DA327-BK	
8	Side grille / panel handle	H1DC386	6.2
9	Fan grille	H1DC356	6.3
10	Fan Blade	H1DC355	6.3
11	Fan Motor	H1DC354	6.3
12	Drain tray	H1DC330	6.3
13	Drain tray heater	H1DA341	6.3
14	Drain tray Bulkhead (15mm push-fit)	H1DC385	6.2
15	Drain tray Bulkhead (22mm)	H1DC482	6.2
16	Evaporator coil assembly (5kw)	H1AA305	6.3
17	Evaporator coil assembly (5kw) - Coastal protection version	H1AA305-CP	6.3
18	Evaporator coil assembly (9kw)	H1DA305	6.3
19	Evaporator coil assembly (9kw) - Coastal protection version	H1DA305-CP	6.3
20	Plate Heat Exchanger (5kw)	H1AC333	6.3
21	Plate Heat Exchanger (9kw)	H1DC345	6.3
22	PRV	H1DC376	6.3
23	Compressor (5kw)	H1AC302	6.3
24	Compressor (9kw)	H1DC301	6.3
25	Filter Drier	H1DC324	6.3
26	Receiver	H1DC485	6.3
27	4 way reversing valve (5kw)	H1AC326	6.3
28	4 way reversing valve (9kw)	H1DC327	6.3
29	4 way reversing valve coil (5 & 9kW)	H1DA339	6.3
30	LP Transducer Assembly	H1DC329	6.3
31	HP Transducer Assembly	H1DC328	6.3
32	Expansion valve (5kw)	H1AC325	6.3

## Maintenance

### 6.6 Spare Parts List

33	Expansion valve (9kw)	H1DC325	6.3
34	Expansion valve (9kw)	H1DC412	6.3
35	Expansion valve coil (5 & 9kW)	H1DC326	6.3
36	Pressure switch	H1DC387	6.3
37	12v Power PCB	H1DC389	6.4
38	Fan Controller PCB	H1DC390	6.4
39	Control PCB	H1DC353-5&9KW	6.4
40	Inverter PCB	H1AC303	6.3
41	Inverter RFI Filter	H1AC303-01	6.3
42	Evaporator out temperature sensor (5kW)	H1DC492-09	6.4
	Evaporator out temperature sensor (9kW)	H1DC492-02	
43	Evaporator in temperature sensor (5kW)	H1DC492-08	6.4
	Evaporator in temperature sensor (9kW)	H1DC492-01	
44	Ambient temperature sensor (5kW)	H1DC492-07	6.4
	Ambient temperature sensor (9kW)	H1DC492-06	
45	Condenser temperature sensor (5kW)	H1DC492-12	6.4
	Condenser temperature sensor (9kW)	H1DC492-05	
46	Water out temperature sensor (5kW)	H1DC492-11	6.4
	Water out temperature sensor (9kW)	H1DC492-04	
47	Water in temperature sensor (5kW)	H1DC492-10	6.4
	Water in temperature sensor (9kW)	H1DC492-03	
48	Compressor discharge temperature sensor (Large sensor) (5kW)	H1DC493-03	6.4
	Compressor discharge temperature sensor (Large sensor) (9kW)	H1DC493-01	
49	Compressor discharge temperature sensor (Small sensor) (5kW)	H1AA350	6.3
	Compressor discharge temperature sensor (Small sensor) (9kW)	H1DA373	
50	Fan grille centre piece - White (Printed Ebac logo)	H1DA376	6.2
	Fan grille centre piece - Anthracite grey (Printed Ebac logo)	H1DA376-GY	
51	Mains / comms cable clamp	H1DC368	6.2
52	Flow sensor	H1DC402	Not shown
53	Flow sensor wire assembly	H1DC404	Not shown
54	Lifting Straps	H1DC405	Not shown

Ref #	Controller Spares	Part No.	Section No.
1	Interface housing assembly	H1DA347	6.5
2	Auxiliary PCB	H1DC403	6.5
3	Auxiliary control box	H1DC404	6.5
4	Auxiliary control box cover	H1DC405	6.5
5	Cheese head screw M5 x 10mm	H1DC461	6.5

## Maintenance

### 6.6 Spare Parts List

Ref #	Installation Kit Spares	Part No.	Section No.
50	Mains / comms cable clamp	H1DC368	
51	Flow sensor	H1DC402	
52	Flow sensor wire assembly	H1DC404	
53	Lifting Straps	H1DC405	
54	Control box assembly	H1DC461	
55	Control PCB	H1DC403	
56	Drain tray connector	H1DC385	

## Maintenance

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### 6.7 Ancillary Parts

Ref #	Description	Part Number
1	Anti-vibration feet	H1DC249
2	Flexi insulated hoses	H1DC250
3	Wall bracket kit (Including anti-vibration mounting bolts)	H1DC520
4	Heat transfer fluid - ProTek-Plus - Gallon Pail	H1DC521
5	Magnetic Filter - Fernox TF1 Sigma - 22mm	H1DC406
6	Inline Volumiser / Buffer Tank (25 LTR) - UK.INLINE.25	H1DC522
7	Inline Volumiser / Buffer Tank (50LTR) - UK.INLINE.50	H1DC523
9	Ebac pre plumbed cylinder (150 LTR)	H1DC524
10	Ebac pre plumbed cylinder (200 LTR)	H1DC525
11	Ebac pre plumbed cylinder (250 LTR)	H1DC526
12	Homely thermostat Kit	H1DC527

**ITEMS SUPPLIED BY EBAC (PRICES AVAILABLE ON REQUEST)**

## Maintenance

### 6.8 Commissioning Report

CUSTOMER NAME	
SITE ADDRESS	
HEAT PUMP ID	
INSTALLATION CONTRACTOR	
COMMISSIONING ENGINEER	
COMMISSIONING DATE	
EBAC APPROVED INSTALLER NO	

#### BEFORE RUNNING THE HEAT PUMP CHECK THE FOLLOWING POINTS

Ensure antifreeze is added in accordance with manufacturer's instruction.

Check air charge is in expansion vessel.

Pressurise primary circuit to 1.5 bar.

Open all isolating valves.

Bleed ALL air from the system.

#### COMMISSIONING ENGINEER'S COMMENTS

## Maintenance

### 6.8.1 Pre-commissioning Check sheet

System Checks	PASS	FAIL	Comments
Installation Location (Outdoor unit)			
Maintenance Access (Outdoor unit)			
Maintenance Access (Cylinder)			
Acceptable air flow (Outdoor unit)			
Standard of Pipework			
Standard of Insulation			
Standard of Electrical Installation (Auxiliary PCB and Outdoor unit)			
Flow meter fitted on main circuit			
Electrical Isolation 1.5 m from Heat Pump			
Connection to mains power source	Type		
	Size		
Connection of Control wiring (Outdoor unit)			
Connection of Control wiring (Auxiliary board)			
Control wire	Type		
Commission and setup menus complete			
Magnetic filter fitted in system			
Anti-vibration mounts fitted			
Flexible hoses fitted to flow and return			
Flow setting device fitted to main circuit			
Anti-freeze added to system			
Check air charge in expansion vessel			
Bleed air from system			
Pressurise primary circuit to 1.5 bar			

#### Operation Status

Heat Pump Model No.							
Serial No.							
	PASS	FAIL	COMMENTS				
Noise level from compressor excessive							
Noise level from Fan excessive							
Provision made for condensate removal							
Legionella settings recorded			<table border="1"> <thead> <tr> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Temperature	Duration		
Temperature	Duration						

**NOTE: if a fail is identified above then the fault should be rectified at the commissioning stage.**

# Maintenance

## 6.8.2 Maintenance Check sheet

**Maintenance should be carried out annually. Failure to maintain the system may result in the warranty becoming null and void.**

Customer Name	
Site Address	
Installation Contractor	
Heat pump ID	
Serial Number of Unit	
Model Number of Unit	
Commissioning Date	

### Brief Description of System

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Check expansion vessel charge pressure (top up if required)	
Check and Clean the magnetic filter	
Open primary/ heating safety valve and check it discharges safely	
Check and if necessary top up system inhibitor / glycol antifreeze	
Check and release any air from the system	
Check for loose external electrical connections	
Check correct rating and type of fuse fitted to the electrical supply	
Check the correct setting and operation of thermostats	
Check the operation of motorised valves	
Check and clean the evaporator	
Check for signs of oil leaks indicating a refrigerant leak	
Check integrity of pipework and insulation	
Carry out system checks via the dashboard	

### Comments

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# Servicing

## 7.1 Servicing Information

### 1) Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

### 2) Work procedure

Works shall be undertaken under a controlled procedure to minimise the risk of a flammable gas or vapour being present while the work is performed.

### 3) General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the work space shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

### 4) Checks for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed or intrinsically safe.

### 5) Presence of fire extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

### 6) No ignition sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition as it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. NO SMOKING signs shall be displayed.

### 7) Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

### 8) Checks to the refrigeration equipment

Refrigerant components should be changed by an F-Gas qualified engineer using only genuine Baxi parts. At all times the manufacturers maintenance and service guidelines shall be followed. If in doubt consult the manufacturers technical department for assistance. The following checks shall be applied to installations using flammable refrigerants.

- The ventilation machinery and outlets are operating adequately and are not obstructed.
- If an indirect refrigerating circuit is being used, the secondary circuits shall be checked for the presence of refrigerant; marking to the equipment continues to be visible and legible.
- Marking and signs that are illegible shall be corrected.
- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being corroded.

### 9) Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
- That there is no live electrical components and wiring are exposed while charging, recovering or purging the system.
- That there is continuity of earth bonding

# Servicing

## 7.1 Servicing Information

### 10) Repairs to sealed components

- a) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- b) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- Ensure that apparatus is mounted securely.
  - Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturers specifications.

Note: The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

### 11) Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

### 12) Cabling

Check that cabling will not be subjected to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

### 13) Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

### 14) Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants. Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed. Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed or extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

### 15) Removal and evacuation

When breaking into the refrigerant circuit to make repairs for any other purpose, conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- Remove refrigerant;
- Purge the circuit with inert gas;
- Evacuate;
- Purge again with inert gas;
- Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be flushed with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

## Servicing

### 7.1 Servicing Information

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system.

When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place. Ensure that the outlet for the vacuum pump is not closed to any ignition sources and there is ventilation available.

#### 16) Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

#### 17) Decommissioning

Before carrying out this procedure it is essential

that the technician is completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken.

In case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) Before attempting the procedure ensure that:

Mechanical handling equipment is available if required for handling refrigerant cylinders.

All personal protective equipment is available and being used correctly.

The recovery process is supervised at all times by a competent personnel.

Recovery equipment and cylinders conform to the appropriate standards.

- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with manufacturers instructions.
- h) Do not overfill cylinders. (No more than 80% volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

#### 18) Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

#### 19) Recovery

When removing refrigerant from a system either for service or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct numbers of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and if possible cooled before recovery occurs. The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order.

## Servicing

### 7.1 Servicing Information

Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt. The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system it shall be carried out safely.

#### **20) Transportation, marking and storage for units**

##### **Transport of equipment containing flammable refrigerants**

Compliance is required with the applicable transport regulations. The maximum number of pieces of equipment permitted to be transported together will also be determined by applicable transport regulations.

##### **Marking of equipment using signs**

Compliance is required with the local regulations which give the minimum requirements for the provision of safety and/or health signs for a work location. All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs. The effectiveness of signs should not be diminished by too many signs being placed together. Any pictograms used should be as simple as possible and contain only essential details.

##### **Disposal of equipment using flammable refrigerants**

Compliance is required with national regulations.

##### **Storage of equipment/appliances**

The storage of equipment should be in accordance with the manufacturer's instructions.

**Storage of packed (unsold) equipment.** Protection should be provided such that mechanical damage to the equipment inside the package will not cause any leak of the refrigerant charge.

The maximum number of pieces of equipment permitted to be stored together will be determined by applicable transport regulations.

## End of Life Information & Liabilities

### 8.1 End of Life Information

The heatpump contains components contaminated by the refrigerant and oil contained in the compressor. In order for the heatpump to be recycled or disposed of it must be taken to a suitably licenced waste facility. You can contact a qualified refrigeration engineer to do this for you.



## WARNING

#### Disassembly

**This heat pump unit may only be disassembled by a suitably qualified (F-gas) refrigeration engineer.**

**Under no circumstances can the refrigeration contained within the heat pump be released into the atmosphere.**

### 8.2 Liabilities

#### Manufacturer's liability

Our products are manufactured in compliance with the requirements of various regulations. They are therefore delivered with the marking and any documents necessary. In the interests of the quality of the products, we strive constantly to improve them. We therefore reserve the right to modify the specifications given in this document. Our liability as manufacturer may not be invoked in the following cases.

- Failure to abide by the instructions on installing the appliance.
- Failure to abide by the instructions on using the appliance.
- Faulty or insufficient maintenance of the appliance.

#### Installer's liability

The installer is responsible for the installation and initial commissioning of the appliance. The installer must observe the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Install the appliance in compliance with prevailing legislation and standards.
- Carry out initial commissioning and any checks necessary.
- Explain the installation to the user.
- If maintenance is necessary, warn the user of the obligation to check the appliance and keep it in good working order.
- Give all the instruction manuals to the user.

#### User's liability

To guarantee optimum operation of the system, you must abide by the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Call on a qualified professional to carry out installation and initial commissioning.
- Get your installer to explain your installation to you.
- Have the required inspections and maintenance carried out by a qualified installer.







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