AEC Air Source Heat Pump
Installation Manual
Legislation

The installation of these models must comply with the standards listed below:

Building Regulations
I.E.E. Requirements for Electrical Installations (BS7671)
Water Regulations
Manual Handling Operations Regulations

British Standards
BS6798, BS5449, BS5546, BS5440:1, BS5440:2, CP331:3,
BS6700, BS7593 and BS7671.
Health and Safety Document No 635

MCS Accreditation

AEC9e -  BSI KM 620657/03
AEC 9 -  BSI KM 620657/02
AEC 5 -  BSI KM 620657/01

The information in this manual is provided to assist with the selection of equipment and installation of the heat pump. The responsibility for final selection and specification of the equipment must remain that of the Designers or Consultants concerned with design and installation.

Please Note: Responsibility will not be accepted for design or installation related matters, unless advice has been specifically given.

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 application 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.
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Introduction and General Information

Air Source Heat Pumps use basic thermodynamic principles to convert heat (contained within the ambient air) into heat energy that can be used to provide heating and hot water. In this respect the device can be classified as a renewable energy source because the heat in the ambient air is replenished by the sun.

Function

1. Liquid refrigerant (R410A) passes through an expansion device, changing it into a low pressure liquid/vapour mix.
2. 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.
3. The vapour then passes through a compressor, reducing its volume and causing it to heat.
4. The reversing valve sends the hot gas into the heat exchanger. The heat from the hot gas is transferred to the water.
5. 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.
6. 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.
Introduction and General Information

The AEC Heat Pump

This manual covers the three models of air source heat pump available.

The **standard** version is available in 5kW or 9kW output and can be used where space is at a premium, or when fitted to existing heating and hot water system.

The **enhanced** unit is available in 9kW and is fitted with an internal water module including an 8ltr expansion vessel and integral circulation pump.
System Design

Positioning the Heat Pump

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 AEC 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 (at time of writing). A calculation should been made, taking into account positioning and distance from neighbouring properties (use MCS standard MCS020).

- An external temperature sensor is fitted to the rear of the unit, care must be taken to ensure this sensor is not influenced by direct sunlight.

- Select a location where easy wiring and pipe access is available.

- To prevent the possibility of the unit vibrating and causing annoyance, the unit should be fitted on Anti-vibration mounts.

- The unit should be installed on a flat, stable base, with adequate provision for the condensate to drain away.
System Design

Positioning the Heat Pump

- 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.
- Taking the above into account the unit should be securely installed on a structure that can sustain its weight at a minimum distance of 300mm from the nearest wall (fig.1).
System Design

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 AEC 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.

Connection

Anti-vibration hoses should be fitted to the flow and return to prevent excessive noise or any joints being broken due to vibration.

Two spanners should always be used for loosening and tightening water connections.

*** Do not overtighten fittings***

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 thickness should be 19mm*. 
System Design

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..

Flow Meter

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.

To ensure correct operation a straight section of pipe should be fitted before and after the flow meter.

Inlet – 10 x Pipe diameter  Outlet = 5 x Pipe diameter
System Design

Ensure the 'o' rings are fitted as shown below. Ensure that a 1” female to 28mm compression fitting is used for connecting the flow meter to the pipework.

Flow Meter Wiring

The brown wire from the flow meter should be fitted in the left hand communication terminal. The White and blue wires should be fitted to input 6 of the auxiliary PCB as shown below.

……. White wire
AEC 5 Technical Specification

Dimensions (mm)
- Height 706mm
- Depth 395mm
- Width 980mm

Weight (kg) 65kg

Electrical Supply
- 220-240v, 50Hz
- Phase Single
- Running Current (A) [MAX] 13
- Fuse Rating (A) 16

Refrigerant
- Type R410A
- Quantity 1.7kg
- Control Emerson EXM-BOE

Compressor
- Type Hermetic twin rotary
- Model TNB220FLHMT

Heat Exchanger
- Air Finned Foil
- Water Plate Exchanger

Operating Temperature Range
- Outdoor Temp. -20°C to +35°C

Noise Level (dBA)
- Sound Power Level 54dBA
- Sound Pressure at 1 metre 45dBA

Air Flow (m³/min)
- Max (variable) 72.6

Primary Flow Rate
- Maximum (L/min) 16
- Minimum (L/min) 6.5

Unit Capacity (A2/W35)
- Capacity (kW) 5.4
- CoP 3.4
- Power Input (kW) 1.6
- Nominal Flow Rate (L/min) 15.72

Unit Capacity (A7/W35)
- Capacity (kW) 5.5
- CoP 4.5
- Power Input (kW) 1.2
- Nominal Flow Rate (L/min) 15.72
AEC 5 Unit Dimensions
# AEC 9 Technical Specification

<table>
<thead>
<tr>
<th><strong>Dimensions (mm)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>1012mm</td>
</tr>
<tr>
<td>Depth</td>
<td>395mm</td>
</tr>
<tr>
<td>Width</td>
<td>1032mm</td>
</tr>
</tbody>
</table>

| **Weight (kg)**             | 85kg   |

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<tr>
<th><strong>Electrical Supply</strong></th>
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<tbody>
<tr>
<td>Phase</td>
<td>Single</td>
</tr>
<tr>
<td>Running Current (A) [MAX]</td>
<td>23</td>
</tr>
<tr>
<td>Fuse Rating (A)</td>
<td>25 (Recommended 32 A)</td>
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</table>

<table>
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<tr>
<th><strong>Refrigerant</strong></th>
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<tbody>
<tr>
<td>Type</td>
<td>R410A</td>
</tr>
<tr>
<td>Quantity</td>
<td>2.4kg</td>
</tr>
<tr>
<td>Control</td>
<td>Emerson EXM-BOE</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Compressor</strong></th>
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</thead>
<tbody>
<tr>
<td>Type</td>
<td>Hermetic twin rotary</td>
</tr>
<tr>
<td>Model</td>
<td>TNB220FLHMT</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Heat Exchanger</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>Finned Foil</td>
</tr>
<tr>
<td>Water</td>
<td>Plate Exchanger</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Operating Temperature Range</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor Temp.</td>
<td>-20°C to +35°C</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Noise Level (dBA)</strong></th>
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<tbody>
<tr>
<td>Sound Pressure Level</td>
<td>57dBA</td>
</tr>
<tr>
<td>Sound Pressure at 1 metre</td>
<td>48dBA</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Air Flow (m³/min)</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Max (variable)</td>
<td>72.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Primary Flow Rate</strong></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Maximum (L/min)</td>
<td>26</td>
</tr>
<tr>
<td>Minimum (L/min)</td>
<td>12</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Unit Capacity (A2/W35)</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Capacity (kW)</td>
<td>9.00</td>
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<tr>
<td>CoP</td>
<td>2.87</td>
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<tr>
<td>Power Input (kW)</td>
<td>3.13</td>
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<tr>
<td>Nominal Flow Rate (L/min)</td>
<td>25.12</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Unit Capacity (A7/W35)</strong></th>
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</thead>
<tbody>
<tr>
<td>Capacity (kW)</td>
<td>9.20</td>
</tr>
<tr>
<td>CoP</td>
<td>3.61</td>
</tr>
<tr>
<td>Power Input (kW)</td>
<td>2.55</td>
</tr>
<tr>
<td>Nominal Flow Rate (L/min)</td>
<td>25.2</td>
</tr>
</tbody>
</table>
AEC 9 Unit Dimensions
## AEC 9e Technical Specification

### Dimensions (mm)
- **Height**: 1012mm
- **Depth**: 395mm
- **Width**: 1300mm

### Weight (kg)
- **100kg**

### Electrical Supply
- **220-240v, 50Hz**
- **Phase**: Single
- **Running Current (A) [MAX]**: 23
- **Fuse Rating (A)**: 25 (Recommended 32A)

### Refrigerant
- **Type**: R410A
- **Quantity**: 2.4kg
- **Control**: Emerson EXM-BOE

### Compressor
- **Type**: Hermetic twin rotary
- **Model**: TNB220FLHMT

### Heat Exchanger
- **Air**: Finned Foil
- **Water**: Plate Exchanger

### Operating Temperature Range
- **Outdoor Temp.**: -20°C to +35°C

### Noise Level (dBA)
- **Sound Pressure Level**: 57dBA
- **Sound Pressure at 1 metre**: 48dBA

### Air Flow (m³/min)
- **Max (variable)**: 72.6

### Primary Flow Rate
- **Maximum (L/min)**: 26
- **Minimum (L/min)**: 12

### Unit Capacity (A2/W35)
- **Capacity (kW)**: 9.00
- **CoP**: 2.87
- **Power Input (kW)**: 3.13
- **Nominal Flow Rate (L/min)**: 25.2

### Unit Capacity (A7/W35)
- **Capacity (kW)**: 9.22
- **CoP**: 3.61
- **Power Input (kW)**: 2.55
- **Nominal Flow Rate (L/min)**: 25.2
AEC 9e Unit Dimensions
System Specification

Internal Wiring Schematic AEC 5 & AEC 9 Standard
System Specification

Internal Wiring Schematic AEC 9e Enhanced
System Specification

Refrigeration Schematic
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 desolved 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 AEC 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.
Pipework Schematic – Multiple Zones

Multiple heating zones can be connected to the AEC 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.

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. The primary system should always be unvented as the loop must contain anti freeze.

IMPORTANT: The above system is a concept drawing and not a detailed engineering drawing. It is not intended to describe a particular system.
Additional Pipework Schematics for Buffer Tanks / Low Loss Headers
System Installation

Electrical

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. The electrical circuit should be protected by a dedicated 32A, 30mA RCD.

This appliance **MUST BE EARTHED.**

Wiring sizes must comply with the applicable local and national codes. 4mm² cable should be the minimum size used, this 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 4 core (1 mm²) interconnecting cable between the Auxiliary board and heat pump does not carry 240V potential.

A Cat 5 ethernet cable should be connected between the heat pump and internal router.

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 AEC heat pump system and should be protected by the required fuse rating.
System Installation

Electrical Schematic – Two Zone & Hot Water
System Installation

Immersion heater

The AEC air source heat pump will produce domestic hot water at 48°C but the temperature should be raised periodically to 65°C for pasteurisation purposes.

The immersion heater will raise the water to 65°C once the heat pump has finished its first hot water cycle and will repeat the process every 7 days after that. This process will restart if the heat pump is powered down for any reason.

The cylinder temperature sensor (included in kit) should be wired to input 7 on the auxiliary PCB. See diagram on page 24.

The DHW heating periods should be timed for when the central heating requirement is lowest. The AEC heat pump has a feature which will ensure that there is sufficient hot water even in the most extreme weather conditions.

Commissioning

The Auxiliary control board should be located inside the property, near to the control equipment (zone valves, pump, heating controller).

The AEC and Flow Temperature Control system require conventional controls. A hot water programmer is required for domestic hot water and a room thermostat for each heating zone.

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

The zone valve for the DHW cylinder should be connected to zone 3 on the auxiliary board.
System Installation

The AEC Dashboard Configuration - Initial Setup

The first time that the heat pump controller is powered on, the dashboard will be visible as a WPA/WPA2 encrypted wireless network. This means that you will be able to connect to it with any wireless enabled device (your PC, laptop, tablet, Smart phone etc).

The network will be visible with the name (SSID) of 'heatpumpdash'. The network will have a default wireless security key of 12345678

Once you have connected your wireless device to the network, you will be able to use the dashboard by pointing your browser to 192.168.10.1

Login

[Image of login screen]

After entering the default username (admin) and password (admin), you will be able to configure certain aspects of your heat pump through the dashboard interface.
System Installation

Password Change

Before continuing, we recommend that you change the default password by clicking on the small profile icon (top right of the dashboard) and entering a new password in to the form provided.
System Installation

Configuring the Dashboard to your Wireless Network

If you wish, the dashboard can be configured to connect to your home wireless network. This is easily enabled from the ‘Network Settings’ page on the dashboard.

You will need to know the following information:

- The name (SSID) of your local router
- The type of security used by your router
- The passphrase/security key to connect to your router

**The heat pump should be connected to the router via an ethernet cable. This allows the most reliable signal.**

Once you have entered the above details, click on the green ‘Submit’ button.

You will be notified that your wireless settings have been saved and instructed to reboot the heat pump for the settings to take effect.

When the heat pump reboots, it will automatically connect to your wireless network and will be visible as a client in your router's web interface.

Once the dashboard is connected to your local wireless network, it may be possible for you to access the dashboard from the internet depending on your home router settings (see page 29 for generic details).
System Installation

Accessing your Dashboard from the Internet

If you wish to access the dashboard from the internet (outside your home network), there are a few steps that may need to be taken.

- Assign a static IP address to the dashboard
- Forward port 80 on your router to your dashboard
- Use a Dynamic DNS service to maintain a hostname for your network (optional)

Assign a Static IP Address to the Dashboard

The process of assigning a static IP Address is usually straightforward but does differ depending on the manufacturer of your router.

If you have any difficulties performing the above steps, consult the documentation for your router model or check the additional resources listed below.

Forward Port 80 to the Dashboard

Again, like assigning a static IP, port forwarding is usually pretty simple to do but depends on the manufacturer of your router.

If you have any difficulties performing the above steps, consult the documentation for your router model or check the additional resources listed below.

Dynamic DNS Service (optional)

Many home networks are given a dynamic internet IP address from their Internet Service Provider. This IP address can change from time to time, meaning you can't reliably connect to your home network. A Dynamic DNS Service can supply you with a free domain name which points to your home network. The service then monitors your IP address and updates DNS records automatically if there is a change. This means that you can always connect to your home network by pointing your browser to the domain name supplied by the DNS service.

There are many providers of free dynamic DNS services.

- Dyn DNS http://dyn.com/dns/
- No-IP http://www.noip.com/
- FreeDNS http://freedns.afraid.org/
- BUDDYNS http://www.buddyns.com/
System Installation

Additional Resources

The following is a list of useful resources for setting up your local network.

- PortForward.com (A web site dedicated to the subject of port forwarding. It has detailed instructions covering a huge range of router manufacturers and models)
  http://portforward.com/english/routers/port_forwarding/

Troubleshooting

If you have connected the dashboard to your wireless network and the dashboard loses internet connectivity for more than 10 minutes, it will automatically reboot in to the login screen. You will need to connect to the dashboard (described in ‘Initial Set Up’) and reconfirm your network settings before the dashboard can re-connect to your local network.

If the dashboard is in access point mode, it will be visible from your PC, laptop, smart phone etc.
System Installation

Setup & Monitoring

Once connected to the Dashboard it is possible to set up and make adjustments to the AEC air source heat pump.

Flow Curve

The flow curve can be adjusted via this screen on the dashboard. The desired water temperature can be set depending on the outside temperature, with a lower temperature required during warmer periods.

The bivalency values can be set, where the existing heating system will operated depending on ambient temperature.
System Installation

The performance of the heat pump can be monitored, and adjustments can be made to optimise performance.

A record of any faults can be accessed to simplify diagnosis and repair, notifications can be sent via email. Any Firmware updates can be carried out, even with no access to the site.
Service, Maintenance & Troubleshooting

Service and maintenance

The AEC 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 Solfex.

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

Basic Troubleshooting at Installation

<table>
<thead>
<tr>
<th>Fault</th>
<th>Solution</th>
</tr>
</thead>
</table>
| Heat Pump fails to start           | • Check power supply to heat pump  
|                                    | • Check the heat pump has sufficient flow  
|                                    | • Check the thermostats for demand |
| Water is not hot enough            | • Check the heat pump is running continuously  
|                                    | • Check the heat pump has sufficient flow  
|                                    | • Check the temperature set points on flow curve and adjust if required  
|                                    | • Check the heat pump has adequate air flow |
| Water is emitted from outdoor unit | • During operation water may drain from the unit, this is normal |
| RCD trips                          | • Incorrect sizing of RCD  
|                                    | • Incorrect cable size  
|                                    | • A component leaking to earth  
|                                    | • Damage to cable or component |
## Service, Maintenance & Troubleshooting

### Faults and Solutions

<table>
<thead>
<tr>
<th>Fault Description</th>
<th>Possible cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Flow</strong></td>
<td>1. Unit incorrectly situated</td>
<td>1. Check unit has correct air flow</td>
</tr>
<tr>
<td></td>
<td>2. Disruption to air flow due to debris blocking the evaporator coil</td>
<td>2. Check for debris</td>
</tr>
<tr>
<td></td>
<td>3. Fan blade obstructed</td>
<td>3. Check fan blade</td>
</tr>
<tr>
<td></td>
<td>4. Fan not operating</td>
<td>4. Check fan is functional</td>
</tr>
<tr>
<td></td>
<td>5. PCB fail</td>
<td>5. Test PCB connection</td>
</tr>
<tr>
<td><strong>Water Flow</strong></td>
<td>1. Flow rate has dropped below the minimum acceptable flow rate (unit will attempt to restart automatically)</td>
<td>1. On installation, have flow and return been connected in reverse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Is water pump of correct spec and operational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Water leak</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Blockage or air lock</td>
</tr>
<tr>
<td><strong>Low Pressure</strong></td>
<td>1. Disconnection of low pressure transducer (16)</td>
<td>1. Check connection (J16)</td>
</tr>
<tr>
<td></td>
<td>2. Evaporator frozen</td>
<td>2. Sensor fail</td>
</tr>
<tr>
<td></td>
<td>3. Defective outdoor unit circuit board</td>
<td>3. Change outdoor unit circuit board</td>
</tr>
<tr>
<td><strong>High Pressure</strong></td>
<td>1. Disconnection of high pressure transducer (15)</td>
<td>1. Check connection (J15)</td>
</tr>
<tr>
<td></td>
<td>2. Fault due to defective part</td>
<td>2. Check refrigerant pressure, replace (15)</td>
</tr>
<tr>
<td></td>
<td>3. Defective outdoor unit circuit board</td>
<td>3. Change outdoor unit circuit board</td>
</tr>
<tr>
<td></td>
<td>4. Short water circuit</td>
<td></td>
</tr>
<tr>
<td><strong>High Discharge</strong></td>
<td>1. Defective sensor (7)</td>
<td>1. Check sensor</td>
</tr>
<tr>
<td></td>
<td>2. Defective control PCB</td>
<td>2. Test PCB</td>
</tr>
<tr>
<td></td>
<td>3. Faulty expansion valve</td>
<td>3. Check expansion valve</td>
</tr>
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# Service, Maintenance & Troubleshooting

## Faults and Solutions Cont...

<table>
<thead>
<tr>
<th>Fault Description</th>
<th>Possible cause</th>
<th>Solution</th>
</tr>
</thead>
</table>
| Can Bus Error     | 1. Connection lost between heat pump and auxiliary | 1. Check 4 core cable for damage  
                  | 2. Check connections on both heat pump and temperature controller | |
| Pressure Difference | 1. Difference between high pressure temp and low pressure temp too small | 1. Compressor fail  
                      | 2. Inverter fault  
                      | 3. PCB fault  
                      | 4. Wiring fault on inverter or PCB | |
| No Zones          | 1. No heating zones asking for heat | 1. This is not a fault but will be logged |
| Compressor Low    | 1. Heat pump attempting to run compressor at a lower speed than it is capable | 1. The heat pump will restart automatically |
| PCB Battery       | 1. The battery powers the real time clock inside the unit. This is checked periodically for function so this event can be ignored. | |


Spare Parts
Spare Parts

Electrical Box (Indoor unit)
# Spare Parts

## 5Kw and 9Kw Compact/Standard

<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
<th>PART NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 Kw COMPRESSOR SNB130FGBMT ASSEMBLY</td>
<td>H1AA006</td>
</tr>
<tr>
<td></td>
<td>9 Kw COMPRESSOR TNB220FLHMT ASSEMBLY</td>
<td>H1DA006</td>
</tr>
<tr>
<td>2</td>
<td>5 Kw INVERTER CIMR-VCBA0010BAA</td>
<td>H1AC036</td>
</tr>
<tr>
<td></td>
<td>9 Kw INVERTER CIMR-VCBA0012BAA</td>
<td>H1DC036</td>
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<tr>
<td>3</td>
<td>FAN MOTOR ASSEMBLY - 5kW</td>
<td>H1AA016</td>
</tr>
<tr>
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<td>FAN MOTOR ASSEMBLY - 9kW</td>
<td>H1DA016</td>
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<tr>
<td>4</td>
<td>EVAPORATOR COIL - 5kW</td>
<td>H1AC011</td>
</tr>
<tr>
<td></td>
<td>EVAPORATOR COIL - 9kW</td>
<td>H1DC011</td>
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<tr>
<td>5</td>
<td>HEAT EXCHANGER - 5kW</td>
<td>H1AC230</td>
</tr>
<tr>
<td></td>
<td>HEAT EXCHANGER - 9kW</td>
<td>H1DC002</td>
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<tr>
<td>6</td>
<td>MAIN PCB</td>
<td>H1DC022</td>
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<tr>
<td>7</td>
<td>ECS25US12 PCB - XP POWER (FARNELL 1821517)</td>
<td>H1DC023</td>
</tr>
<tr>
<td>8</td>
<td>DISTRIBUTION PCB</td>
<td>H1DC031</td>
</tr>
<tr>
<td>9</td>
<td>INSTALLATION TERMINAL BLOCK PCB</td>
<td>H1DC191</td>
</tr>
<tr>
<td>10</td>
<td>RASPBERRY PI ASSEMBLY</td>
<td>H1DA065</td>
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<tr>
<td></td>
<td>WIFI USB DONGLE FOR RASPBERRY PI (2133900)</td>
<td>H1DC239</td>
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<tr>
<td></td>
<td>SDHC 16GB 200X CLASS 10 CARD (PREMIUM SERIES)</td>
<td>H1DC178</td>
</tr>
<tr>
<td></td>
<td>AUXILIARY PCB</td>
<td>H1DC171</td>
</tr>
<tr>
<td></td>
<td>LOW PRESSURE TRANSDUCER WIRE ASSEMBLY - 730mm</td>
<td>H1DA034</td>
</tr>
<tr>
<td></td>
<td>HIGH PRESSURE TRANSDUCER WIRE ASSEMBLY - 650mm</td>
<td>H1DA035</td>
</tr>
<tr>
<td></td>
<td>EVAPORATOR IN TEMP SENSOR</td>
<td>H1AC074-01</td>
</tr>
<tr>
<td></td>
<td>EVAPORATOR OUT TEMP SENSOR</td>
<td>H1AC074-02</td>
</tr>
<tr>
<td></td>
<td>WATER IN TEMP SENSOR</td>
<td>H1AC074-03</td>
</tr>
<tr>
<td></td>
<td>WATER OUT TEMP SENSOR</td>
<td>H1AC074-04</td>
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<tr>
<td></td>
<td>CONDENSER TEMP SENSOR</td>
<td>H1AC074-05</td>
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<tr>
<td></td>
<td>AMBIENT TEMP SENSER</td>
<td>H1AC074-06</td>
</tr>
<tr>
<td></td>
<td>COMPRESSOR DISCHARGE TEMP SENSOR</td>
<td>H1AC081-01</td>
</tr>
<tr>
<td></td>
<td>HANDLE RS 2455660</td>
<td>H1DC026</td>
</tr>
</tbody>
</table>
Installation Parts

Installation Parts List – S Plan ASHP System

Items supplied by Solfex (prices available on request)

- AEC air source heat pump
- Flexible hoses**
- Anti vibration mounts**
- Magnetic filter**
- Anti-freeze inhibitor fluid**
- Flow setter valve
- Isolating valves for heat pump flow and return connections
- Unvented water cylinder (sized correctly for the system and complete with thermostat and pressurisation safety kit)
- Circulating pump (sized to suit system)*
- Expansion vessel for heating system* (Including sealed system kit)
- Air bleed valve(s)*
- Zone valves
- Filling loop
- Insulation for external pipe work
- Hot water programmer
- Room thermostat(s)
- Wiring centre (For circulation pumps / zone valves etc.)
- Local isolator (rated for external fitting)

* The 9Kw standard unit contains a circulating pump, expansion vessel and pressure relief valve.

** Warranty will be invalid if these parts are not fitted.
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

Commissioning Engineer's Signature
### Pre-Commissioning Check Sheet

<table>
<thead>
<tr>
<th>System Checks</th>
<th>PASS</th>
<th>FAIL</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Location (Outdoor unit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Access (Outdoor unit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Access (Cylinder)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable air flow (Outdoor unit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard of Pipework</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard of Insulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard of Electrical Installation (Auxiliary PCB and Outdoor unit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow meter fitted on main circuit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical Isolation 1.5 m from Heat Pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection to mains power source</td>
<td>Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection of Control wiring (Outdoor unit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection of Control wiring (Auxiliary board)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control wire</td>
<td>Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DHW zone valve connected to port 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnetic filter fitted in system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-vibration mounts fitted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexible hoses fitted to flow and return</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Flow setting device fitted to main circuit</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Anti-freeze added to system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check air charge in expansion vessel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleed air from system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressurise primary circuit to 1.5 bar</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

### Operation Status

<table>
<thead>
<tr>
<th>Heat Pump Model No.</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial No.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PASS</th>
<th>FAIL</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise level from compressor excessive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise level from Fan excessive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision made for condensate removal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to Dashboard</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** If a fail is identified above then the fault should be rectified at the commissioning stage.
AEC Heat Pump Maintenance Check Sheet

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

<table>
<thead>
<tr>
<th>Customer Name</th>
<th>Site Address</th>
<th>Installation Contractor</th>
<th>Heat pump ID</th>
<th>Serial Number of Unit</th>
<th>Model Number of Unit</th>
<th>Commissioning Date</th>
</tr>
</thead>
</table>

**Brief Description of System**

- 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**