

**Ecotel™ Outdoor  
Downflow Telecom Unit  
5-15kW  
R410A**



**Technical Manual**



FM00542

EMS52086

## Customer Services

### Warranty, Commissioning & Maintenance

As standard, Airedale guarantees all non consumable parts only for a period of 12 months, variations tailored to suit product and application are also available; please contact Airedale for full terms and details.

To further protect your investment in Airedale products, Airedale can provide full commissioning services, comprehensive maintenance packages and service cover 24 hours a day, 365 days a year (UK mainland).

For a free quotation contact Airedale or your local Sales Engineer.

All Airedale products are designed in accordance with EU Directives regarding prevention of build up of water, associated with the risk of contaminants such as legionella. For effective prevention of such risk it is necessary that the equipment is maintained in accordance with Airedale recommendations.

### SafeCool

In addition to commissioning, a 24 hour, 7 days a week on-call service is available throughout the year to UK mainland sites. This service will enable customers to contact a duty engineer outside normal working hours and receive assistance over the telephone. The duty engineer can, if necessary, attend site, usually within 24 hours or less.

Full details will be forwarded on acceptance of the maintenance agreement.

### CAUTION ▲

Warranty cover is not a substitute for maintenance. Warranty cover is conditional to maintenance being carried out in accordance with the recommendations provided during the warranty period. Failure to have the maintenance procedures carried out will invalidate the warranty and any liabilities by Airedale International Air Conditioning Ltd.

### Spares

A spares list for 1, 3 and 5 years will be supplied with every unit and is also available from our Spares department on request.

### Training

As well as our comprehensive range of products, Airedale offers a modular range of Refrigeration and Air Conditioning Training courses, for further information please contact Airedale.

### Customer Services

For further assistance, please e-mail: [enquiries@airedale.com](mailto:enquiries@airedale.com) or telephone:

UK Sales Enquiries	+ 44 (0) 113 239 1000	<a href="mailto:enquiries@airedale.com">enquiries@airedale.com</a>
International Enquiries	+ 44 (0) 113 239 1000	<a href="mailto:enquiries@airedale.com">enquiries@airedale.com</a>
Spares Hot Line	+ 44 (0) 113 238 7878	<a href="mailto:spares@airedale.com">spares@airedale.com</a>
Airedale Service	+ 44 (0) 113 239 1000	<a href="mailto:service@airedale.com">service@airedale.com</a>
Technical Support	+ 44 (0) 113 239 1000	<a href="mailto:tech.support@airedale.com">tech.support@airedale.com</a>
Training Enquiries	+ 44 (0) 113 239 1000	<a href="mailto:training@airedale.com">training@airedale.com</a>

For information, visit us at our web site: [www.airedale.com](http://www.airedale.com)

Airedale Ltd. endeavours to ensure that the information in this document is correct and fairly stated, but none of the statements are to be relied upon as a statement or representation of fact. Airedale Ltd. does not accept liability for any error or omission, or for any reliance placed on the information contained in this document. The development of Airedale products and services is continuous and the information in this document may not be up to date. It is important to check the current position with Airedale Ltd. at the address stated. This document is not part of a contract or licence unless expressly agreed. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or information storage and retrieval systems, for any purpose other than the purchaser's personal use, without the express written permission of Airedale Ltd.

©2019 Airedale International Air Conditioning Limited. All rights reserved. Printed in the UK.

## Health and Safety

### IMPORTANT

The information contained in this manual is critical to the correct operation and maintenance of the unit and should be read by all persons responsible for the installation, commissioning and maintenance of this Airedale unit.

### Safety

The equipment has been designed and manufactured to meet international safety standards but, like any mechanical/ electrical equipment, care must be taken if you are to obtain the best results.

<b>CAUTION</b> ⚠	<p>When working with any air conditioning units ensure that the electrical isolator is switched off prior to servicing or repair work and that there is no power to any part of the equipment. Also ensure that there are no other power feeds to the unit such as fire alarm circuits, BMS circuits etc.</p> <p>Electrical installation commissioning and maintenance work on this equipment should be undertaken by competent and trained personnel in accordance with local relevant standards and codes of practice.</p> <p>A full hazard data sheet in accordance with COSHH regulations is available should this be required.</p>
------------------	---

### Personal Protective Equipment

Airedale recommends that personal protective equipment is used whilst installing, maintaining and commissioning equipment.

### Manual Handling

Some operations when servicing or maintaining the unit may require additional assistance with regard to manual handling. This requirement is down to the discretion of the engineer. Remember do not perform a lift that exceeds your ability.

### Refrigerant Warning

The Airedale unit uses R410A refrigerant which requires careful attention to proper storage and handling procedures. Use only manifold gauge sets designed for use with R410A refrigerant. Use only refrigerant recovery units and cylinders designed for high pressure refrigerants. R410A must only be charged in the liquid state to ensure correct blend makeup. The refrigerant must be stored in a clean, dry area away from sunlight. The refrigerant must never be stored above 50°C.

### Pressure Equipment Directive (2014/68/EU)

#### Minimum and Maximum Allowable Temperature (TS) and Pressure (PS)

##### Refrigeration

Allowable Temperature Range (TS) = Min -20°C\* to Max 120°C\*\*

Maximum Allowable Pressure (PS) = High Side 40.5 Barg, Low Side N/A Barg

\*Based on the refrigerant temperature in the unit off state in the lowest permitted ambient temperature.

\*\*Based on the maximum allowable super heated refrigerant temperature.

### Pressure System Safety Regulations 2000

Refrigeration assemblies/systems may constitute a Pressure System as defined in the Pressure System Safety Regulations 2000.

### Global Warming Potential

The R410A refrigerant has a GWP of 2088 (based on EN378-1:2016, 100 year life).

### Ecodesign Directive

In accordance with eco design directive 2009/125/EC this unit has been designed for the intended use of process applications only, and therefore should not be used in a comfort environment.

Products sold outside of the EU are exempt from this directive.

**Environmental Policy**

It is our policy to:

- Take a proactive approach to resolve environmental issues and ensure compliance with regulatory requirements.
- Train personnel in sound environmental practices.
- Pursue opportunities to conserve resources, prevent pollution and eliminate waste.
- Manufacture products in a responsible manner with minimum impact on the environment.
- Reduce our use of chemicals and minimise their release to the environment.
- Measure, control and verify environmental performance through internal and external audits.
- Continually improve our environmental performance.

**CE Directive**

Airedale certify that the equipment detailed in this manual conforms with the following EC Directives:

Electromagnetic Compatibility Directive (EMC)	2014/30/EU
Machinery Directive (MD)	89/392/EEC version 2006/42/EC
Pressure Equipment Directive (PED)	2014/68/EU
Ecodesign	2009/125/EC

To comply with these directives appropriate national & harmonised standards have been applied. These are listed on the Declaration of Conformity, supplied with each product.

## Contents

Environmental Policy	4
<b>Specifier's Guide</b>	<b>7</b>
Nomenclature	7
Introduction	7
System Configurations	9
Unit Overview	12
Case Sizes	13
Operating Limits	13
Refrigeration Components	14
Airflow Components	16
Electrical	18
Controls	21
External	25
<b>Installation Data</b>	<b>26</b>
Lifting/Positioning	26
Installation	26
Electrical	26
Product Application	27
Condenser Fan Fitment	28
Dimensions	29
Cabin Mount and Incoming Services Detail	31
Supply and Return Deflection Grille	33
Actuated Exhaust Damper	34
Pressure Relief Exhaust Damper	34
Pipework Schematics	35
Interconnecting Wiring	37
pLAN Termination	38

<b>Technical Data</b>	<b>39</b>
Free Cooling Performance Data	39
Sound Measurement	42
<b>Technical Data - 400V 50Hz</b>	<b>43</b>
Performance Data	43
ET05D	44
ET08D	46
ET12D	48
ET15D	50
<b>Technical Data - 230V 50Hz</b>	<b>52</b>
Performance Data	52
ET05D	54
ET08D	56
ET12D	58
ET15D	60
<b>Technical Data - 380V 60Hz</b>	<b>62</b>
Performance Data	62
ET12D	64
ET15D	66
<b>Technical Data - 220V 60Hz</b>	<b>68</b>
Performance Data	68
ET08D	70
ET12D	72
ET15D	74
<b>Commissioning</b>	<b>76</b>
Pre Start Checks	76
Full Free Cooling	77
Mechanical DX Cooling	77
Concurrent Mode	77
Electric Heating (Optional Extra)	77
Free Heating Mode	77
Damper Position	77
Airflow Switch	77
Filter Change Switch	77
<b>Maintenance</b>	<b>78</b>
General Inspections	79
Electrical Inspections	80
Controls	81
<b>Troubleshooting</b>	<b>82</b>
<b>Alarms</b>	<b>85</b>
Alarm Menu Display	85
<b>After Sales</b>	<b>89</b>
Warranty	89

# Specifier's Guide Nomenclature

ET	EcoTel Unit	15	D	-	H	X	2	F	1	-	7
05-15	Nominal cooling capacity in kW										
D	Downflow										
-	Separator										
H	High Efficiency										
X	DX Cooling										
1	Single Circuit, Single Compressor										
2	Dual Circuit, Single Compressor										
F	Free Cooling										
0	No Emergency Backup										
1	Emergency Backup (-48VDC)										
-	Separator										
0	400V / 3PH + N / 50Hz										
7	230V / 1PH + N / 50Hz										
1	380V / 3PH + N / 60Hz										
2	220V / 3PH / 60Hz										

## Introduction

The Ecotel is a self contained packaged outdoor unit designed to cool areas such as outdoor cabins, shelters and telecom base stations. There are 2 case sizes in the Ecotel product range; each case in the range shares a common design. The unit range shall be available with single circuit 5kW, 8kW,12kW and 15kW and dual circuit 12kW and 15kW. Various modes of operation including:

- Mechanical Cooling.
- Free Cooling Mode.
- Concurrent Mode (mechanical and Free cool).
- Heating Mode.
- Attend Mode.

The unit shall control by a temperature setpoint as standard.

The Ecotel 5-15kW range shall offer the following:

**Standard features:**

- Fresh air free cooling ability with 100% mechanical backup and concurrent cooling stage.
- R410A refrigerant.
- Fixed speed scroll compressors.
- Efficient EC evaporator fans.
- Cost effective AC condenser fan.
- Electronic expansion valve(s).
- ISO-C-80 air filtration.
- Spring return actuator (230V / -48VDC).
- 400V / 3PH+N / 50Hz.
- High temperature cabin alarm.
- Remote PGD1 display.
- Return air temperature control.

**Optional features:**

- Low and high ambient capability (-40°C / +45°C).
- DC emergency backup option.
- 230V / 1PH + N / 50Hz.
- 380V / 3PH + N / 60Hz.
- 220V / 3PH / 60Hz.
- Upgraded EC evaporator fans.
- EC condenser fan.
- Electric heating.
- ISO-C-95 air filtration.
- Compressor soft start.
- Filter change switch.
- Refrigerant leak detection.
- Power monitoring.
- Alarm code display.

**Construction**

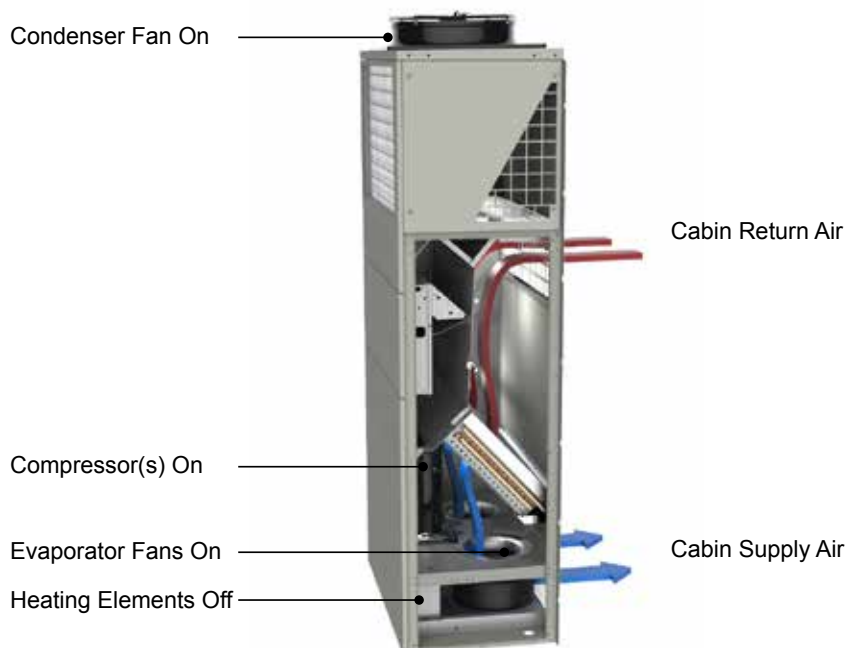
The cabinet shall be manufactured using a steel frame. Panels shall be manufactured from galvanised sheet steel, coated with an durable epoxy baked powder paint finish. Standard unit colour shall be RAL 7038 (Agate Grey) or RAL 6014 (Yellow Olive). All unit panels are secured using tamper proof fixings. Panels shall be removable to allow access to both the front and sides of the unit. A secondary internal panel, situated over the control panel, is hinged and key lock secured. This panel provides additional protection and a weather hood once accessed.

The unit shall be lined internally with various thickness fire resistant foam (BS 476) for thermal and acoustic insulation. The insulation density shall not be less than 75kg/m<sup>3</sup>. A propriety rubberised door seal shall reduce sound breakout and eradicate air leakage. In-seal type foam based door seals shall not be acceptable.

## System Configurations

### Mechanical Cooling Mode

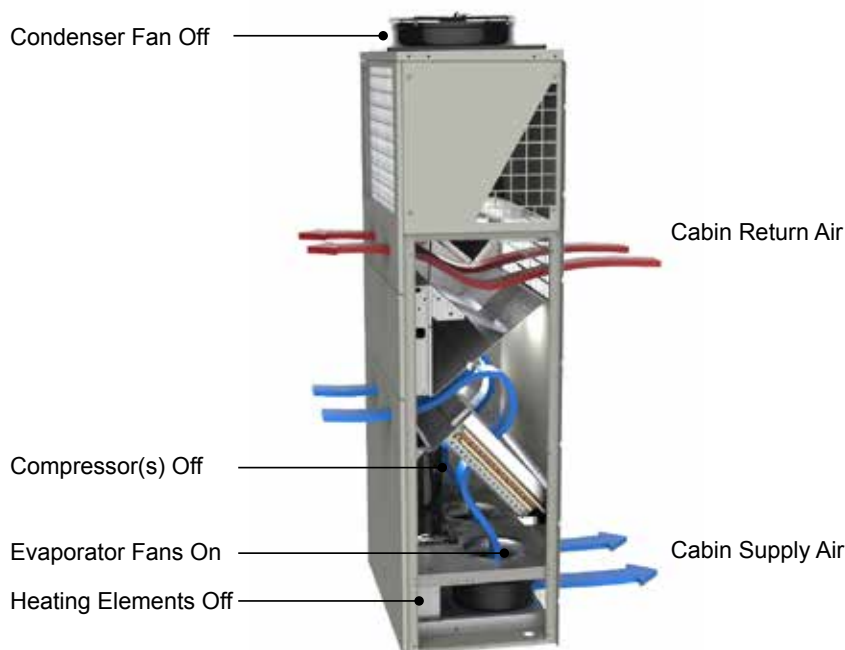
When the ambient temperature is above the set point of the cabin space, the fresh air damper switches into the vertical position and cycles the cabin air through the unit and evaporator coil. The mechanical circuit is switched on providing 100% mechanical cooling.



### Free Cooling Mode

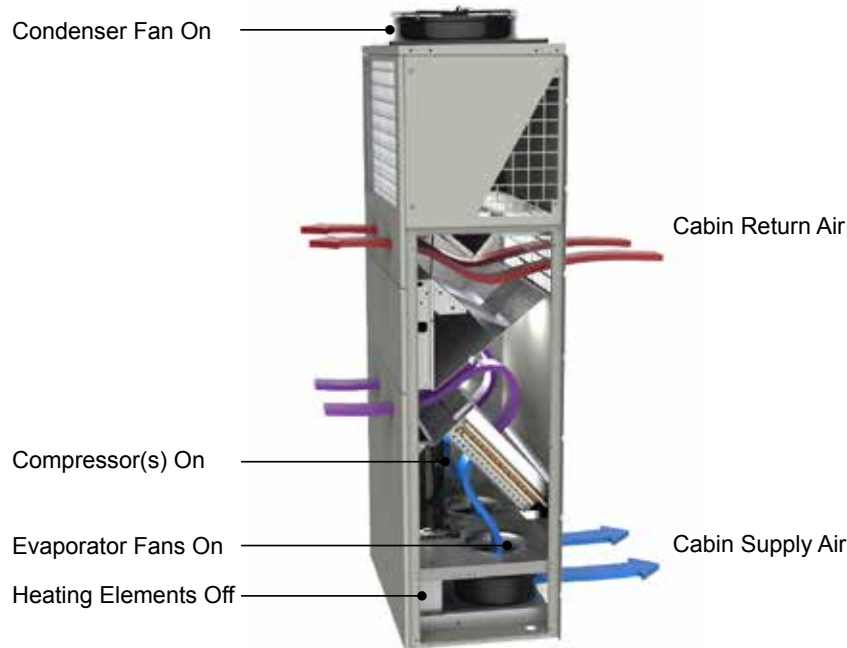
When the ambient temperature is low enough to provide full free cooling duty, the refrigeration circuit is switched off and the damper is positioned horizontally. The EC evaporator fan speed modulates based upon the difference between the ambient temperature and the cabin set point. This allows the unit to draw the correct volume of ambient air into the cabin space, pressurising the cabin and exhausting air through the extract louvre.

In the event of a power cut, the damper actuator spring returns into the free cooling position to allow fresh air to drift into the cabin space, or with the DC backup unit the DC evaporator fans provide a controlled air flow in to the cabin until the battery supply is used up, the power returns, or an engineer arrives on site and rectifies any faults.

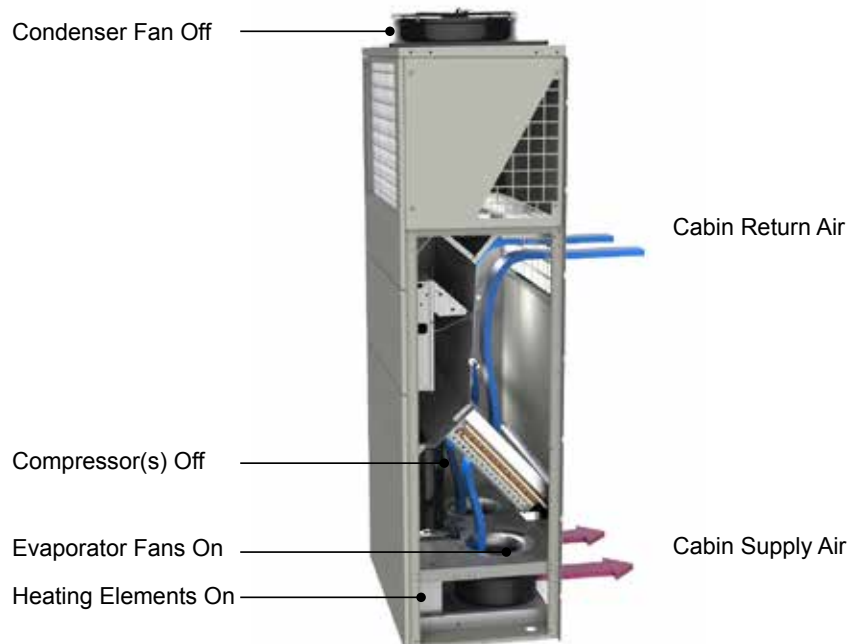


**Concurrent Mode**

When the ambient temperature is below the set point of the cabin space, but not low enough to provide full free cooling duty, the unit can cycle the compressor on and off to cool the ambient fresh air and provide the required cooling duty, whilst saving energy by the unit not being in full mechanical cooling mode.

**Heating Mode**

In low ambient conditions the space within the cabin may drop below a lower threshold if the internal equipment is not generating enough heat and the thermal properties of the cabin is not sufficient to sustain a suitable operating environment. At this point the unit damper is positioned in the vertical position, the cabin air is cycled through the unit and the electric heat is turned on, heating the return air and supplying it to the cabin space. This will be provided until an appropriate temperature is seen in the return duct.



### Attend Mode

Attend mode is intended for situations where it is necessary for an engineer to work inside the cabin. Attend mode is activated by pressing the attend button on entry to the cabin. In attend mode, the temperature setpoint within the cabin will be changed to attend setpoint, and the evaporator fan speed will be limited. Once the attend button is pressed, attend mode will remain active for 30 minutes before the unit automatically goes back into normal operation.

### Control Mode Temperature

The Ecotel units shall control the return air temperature in order to keep it from exceeding the setpoint. The critical minimum and maximum temperatures within the cabin will default to 5°C and 40°C respectively. An alarm will be triggered if the return air temperature reaches or exceeds these extremities. The unit will use heating and full mechanical cooling respectively to ensure that these temperatures are never reached.

### Low Ambient Operation

<b>IMPORTANT</b> ⚠	<p>AC power must be provided to the unit in all applications where the ambient temperature can be less than 0°C.</p> <p>The control panel design consists of a thermostat controlled electric heater fitted to maintain a given minimum control panel temperature. Without AC mains power this function will become redundant and components can be taken outside of their operating/storage temperature range.</p>
--------------------	---

The Ecotel 5-15kW shall always prioritise freecooling mode, never performing any cooling or heating unless absolutely necessary. The Ecotel 5-15kW constantly measures ambient and return temperature conditions to determine which mode to use. If a specific set of conditions required to enable a different running mode are maintained for 60 seconds, the unit will switch to the appropriate mode.

## Unit Overview Features

RAL 7038 (Agate Gray) or  
RAL 6014 (Yellow Olive)  
painted panels

Exhaust Louvre

Inlet Louvre

450mm AC Axial Condenser  
Fan (ErP compliant)

Condenser Coil protected  
by punched panels. "V"  
block coil for increased  
surface area

Tamper Proof Fixings

Control Panel Access

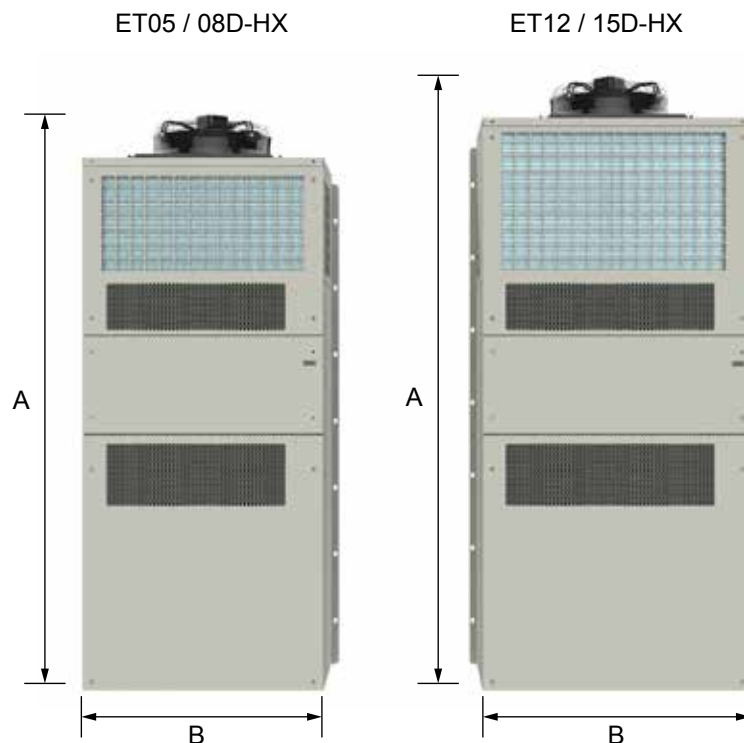
Customer Connection Points  
for Wiring  
(Controls Point above,  
Power Point below)

Return Air Aperture

Supply Air Aperture

**Case Sizes**

The Ecotel 5-15kW range has a total of two case sizes. The 5kW & 8kW units shall utilise the same case dimensions, as shall the 12kW & 15kW units, which results in two case widths. The unit depth remains constant throughout the range. The difference in capacities shall be dependent on component sizing within the unit case.



	ET05/08D-HX	ET12/15D-HX
Height (mm) (A)	2219	2368
Width (mm) (B)	910	1020
Depth (mm)	580	580
Cooling Capacity* (kW)	5-8	12-15
Number of Evaporator Fans	1/1	2/2
Number of Compressors	1/1	1/2

\* At 30°C / 30% RH Air On, 35°C Ambient conditions.

**Operating Limits**

	Temperature Range
Return Air Temperature	+16°C to +30°C
Outdoor Temperature - Low	-40°C to +40°C
Outdoor Temperature - Standard	-20°C to +40°C
Outdoor Temperature - High Ambient	-20°C to +48°C

Refrigeration Components



Evaporator Coil



Fixed Speed Scroll Compressor

Features		System Configuration	
		ET05/08D-HX	ET12/15D-HX
Refrigeration	Fixed Speed Scroll Compressor	●	●
	Hydrophilic Coated Evaporator Coil	●	●
	Condenser Coil	●	●
	Epoxy Coated Condenser Coil	○	○
	Electronic Expansion Valves (EEV)	●	●
	Refrigerant Leak Detection	○	○

● Standard Features      ○ Optional Features      — Feature Not Available

**Fixed Speed Scroll Compressor**

The unit shall use a scroll type compressor. The larger capacity units shall be available in both single and dual circuit configurations.

**Evaporator Coil**

A round tube plate fin heat exchanger shall be used as the evaporator. The aluminium fins shall have a hydrophilic coating as standard.

**Condenser Coil**

As with the evaporator, the round tube plate fin heat exchanger shall be used as the coil type for the condenser. The standard finish will be aluminium fins with the option for an epoxy coating to ensure a higher level of corrosion resistance.

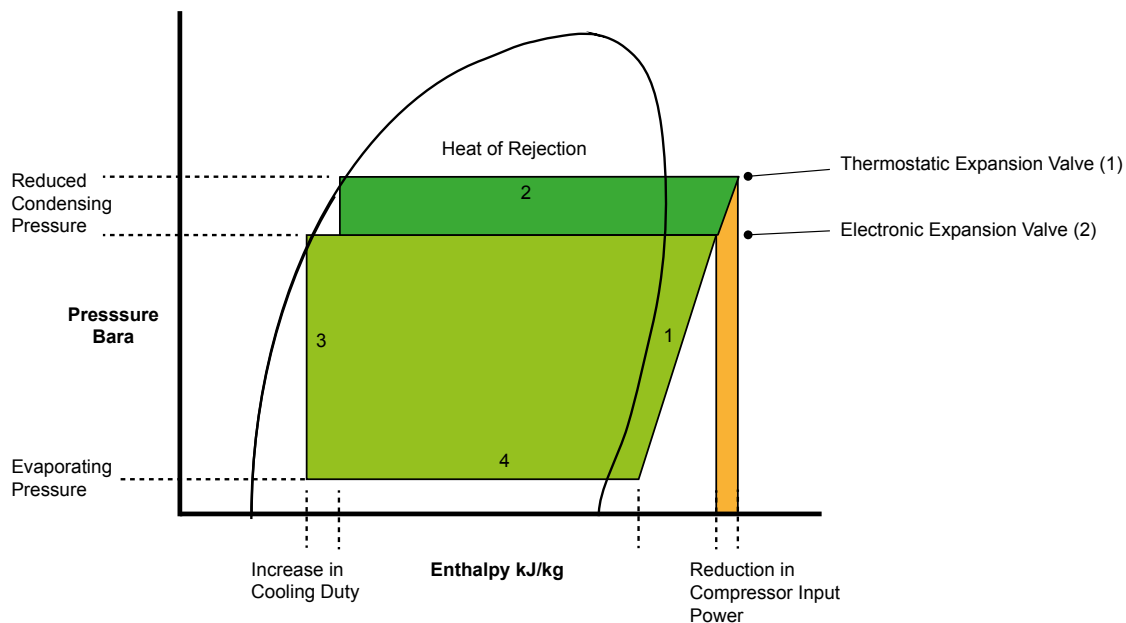
### Electronic Expansion Valves (EEV)

Electronic expansion valves differ to the normal thermostatic expansion valves in their ability to maintain control of the suction superheat at reduced head pressures. This can lead to significant energy savings particularly at reduced loading and low ambient temperatures. Electronic expansion valve step position, superheat setpoint, head pressure set point and other features can be viewed and adjusted via the microcontroller display.

Whilst offering versatile control at the full design duty of the unit, thermostatic expansion valve's (TEV) do not automatically optimise themselves to all operating conditions. Therefore, if the refrigeration system is operating at 40% or 50% of full load, especially at a lower ambient temperature than that for which the valve was sized, the conventional TEV must have the design head pressure available to ensure good refrigerant control. Maintaining an artificially high condensing pressure is normal in conventional systems. Using an EEV allows for good refrigeration control whilst operating at part load and lower ambient conditions with a reduced condensing pressure. An increase in the system EER (Energy Efficiency Ratio) of up to 30% can typically be seen by fitting an EEV and adjusting the head pressure control setting lower.

The Mollier diagram shown below helps to illustrate how this increase in efficiency is achieved.

EEVs differ to normal thermostatic expansion valves in their ability to maintain control of refrigerant flow and the suction superheat at reduced head pressures. The turn-down rate of a typical EEV is superior to that of its thermostatic equivalent, such that a reduced optimum condensing pressure can be maintained at low compressor load. However low the load is on the compressor, from 10 to 100%, there will not be a problem with turn down, even down to 10% of the valve's rated capacity.



Key:

(1) Cooling Cycle @ 22°C ambient with a conventional TEV fitted.

(2) Cooling cycle @ 22°C ambient, demonstrating a typical EEV condensing temperature taking full advantage of lower ambient air temperatures (below 35°C).

### Refrigerant Leak Detection

If the leak detector reaches the alarm set point, a leak alarm will be set and a message displayed (if display is fitted). By default after detecting a leak, the unit will give an alarm and will disable the mechanical cooling. Freecooling will then be enabled if available.

## Airflow Components



EC Centrifugal Fan



Spring Return Air Damper Actuator



Fire Rated Damper

Features		System Configuration	
		ET05/08D-HX	ET12/15D-HX
Airflow	EC Centrifugal Evaporator Fans	●	●
	Upgraded EC Centrifugal Evaporator Fans	○	○
	-48VDC Centrifugal Evaporator Fans	○	○
	AC Axial Condenser Fan	●	●
	EC Axial Condenser Fan	○	○
	230VAC Air Damper Actuator - Spring Return	●	●
	-48VDC Air Damper Actuator - Spring Return	○	○
	ISO-C-80 Filtration	●	●
	ISO-C-95 Filtration	○	○

● Standard Features    ○ Optional Features    — Feature Not Available

### Evaporator Fans

The evaporator fans used in the Ecotel units shall be backward curved, centrifugal EC plug fans. They shall be speed regulated via a 0-10V signal supplied as an analogue output from the controller. The evaporator fans shall operate differently depending on which mode the unit is in. An upgraded evaporator fan shall be available if additional freecooling is required.

- In **freecooling mode**, the speed of the evaporator fans shall be regulated to determine the amount of outdoor air supplied into the cabin, and therefore used to maintain the temperature setpoint.
- In **concurrent mode**, the evaporator fan speed shall be fixed at a design speed to help maintain the temperature setpoint without causing moisture carryover from the evaporator coil.
- In **mechanical mode** and **heating mode**, the evaporator fan speed shall be fixed at a design speed. This is to prevent moisture carryover in mechanical mode, and to ensure sufficient airflow over the heating elements in heating mode.

### Condenser Fan

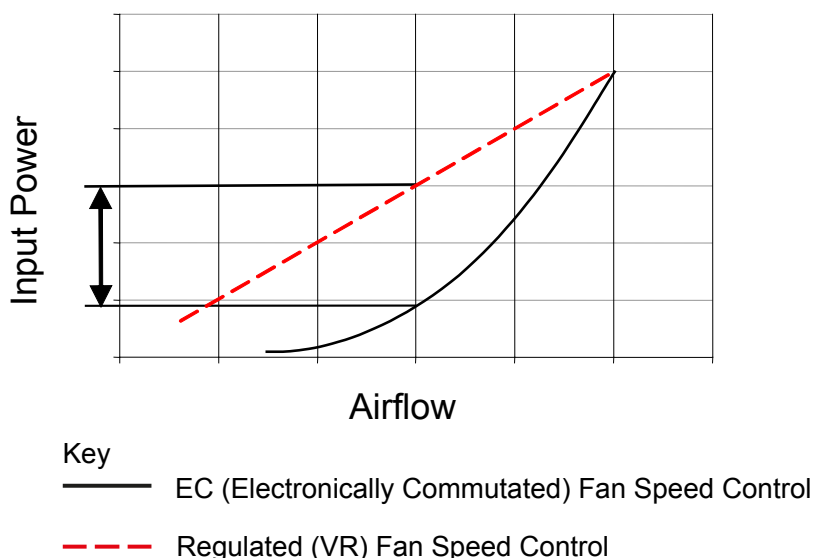
The condenser fan used in the Ecotel units shall be an axial fan. As standard an AC fan will be used, however, an optional EC variant shall be available to aid in increasing the overall unit efficiency (EER). In both circumstances, the speed of the fan is to be controlled via a 0-10V signal which is sent from the controller as an analogue output. The air path for the condenser fan and coil is isolated from any other part of the system. Neither supply nor return air is used to cool the condenser coil. The speed of the condenser fan shall be regulated to control head pressure when the refrigeration circuit(s) are being used in concurrent and mechanical modes.

### Electronically Commutated (EC) Fan Motor

EC motors incorporate integrated electronics to convert AC power to DC for efficient and accurate speed control and are adjustable via the microprocessor display keypad.

The fans offer maximum air flow performance while keeping sound levels to a minimum. This gives the flexibility of connecting to AC mains with the efficiency and simple speed control of a DC motor. The EC fan offers significant power reduction in comparison with equivalent AC fan at both full and modulated fan speeds. The inbuilt EC fan control module allows for fan speed modulation from 15-100%. A standard AC fan's modulating range is typically 40-100% of full fan speed.

Standard voltage regulated (VR) fan speed controllers offer a linear response. The following illustration shows a comparison of the typical power input required by each method:



### Spring Return Air Damper Actuator

A spring return air damper actuator shall be fitted. Manual override with integrated position stop.

### ISO-C-080 Filtration

Pleated disposable panel filters in a galvanised sheet frame. Conform to ISO16890. Access and removal from either side. As standard the microprocessor provides an alarm following a pre set run time limit being exceeded.

### ISO-C-95 High Efficiency Filters

45mm, pleated disposable panel filters conforming to ISO16890 shall be provided.

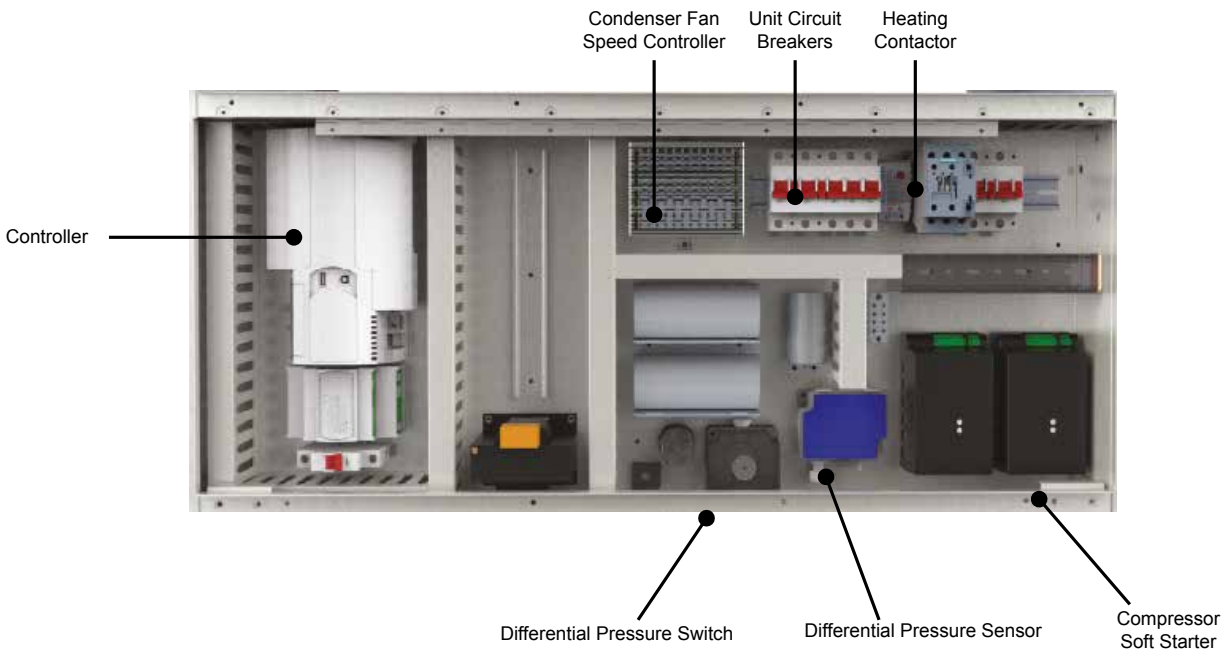
To maintain design external static pressure (ESP), fan selection may alter with high efficiency filters.

Access and removal from either side of unit. As standard the microprocessor provides an alarm following a pre set run time limit being exceeded.

### Air Flow Switch

An adjustable differential pressure switch shall activate a visual alarm at the status panel. The airflow fail alarm causes the unit to go off by alarms until the airflow switch is made again or the alarm is reset.

Electrical



Features		System Configuration	
		ET05/08D-HX	ET12/15D-HX
Electrical	Mains Isolator	●	●
	Compressor Soft Start	○	○
	-48VDC Emergency Back-Up Supply	○	○
	Phase Rotation/Phase Failure Relay	○	○
	Electric Heating	○	○
	Energy Manager	○	○

● Standard Features    ○ Optional Features    — Feature Not Available

The control panel contains the necessary compressor contactors, transformer, sub circuit protection, volt free contacts for a common alarm and mains and inter-connecting terminals. The panel is situated within the cabinet and can be opened to allow for essential maintenance of other components within the unit. The electrical control panels are wired to the latest European standards and codes of practice.

**Electrical**

Image shows typical isolator placement. For illustration purposes only.

**Mains Isolator**

To comply with BS EN 6024-1:2006 Safety of Machinery – Electrical Equipment Machines, each unit shall have an accompanying isolator (switch disconnecting device). The supply disconnecting device shall isolate the electrical equipment of the telecoms unit from the electrical supply when required.

The isolator shall be easily accessible and mounted between 0.6m and 1.9m above the service level. An upper limit of 1.7m is recommended. The isolator part has been configured as a de-selectable component to allow the user the option of supplying an isolator part of their choosing.

**Compressor Soft Start**

The electronic soft start enables the chiller compressor motor to be ramped to speed with the minimum full load current. Further benefits include removal of nuisance tripping, supply voltage dips and motor overheating.

**DC Power Backup Supply**

The new Ecotel range has been designed to include the option of connecting a -48VDC (2 wire positive earthed) backup power supply. When this option is selected, DC evaporator fans are fitted so that the controls circuit, evaporator fans and free cooling damper can still operate from the DC supply allowing the unit to continue free cooling if there is a power failure on the AC mains supply. The condenser fan, compressors and heaters require mains AC power to operate therefore no other modes are available when running on the DC battery backup.

**Phase Rotation/Phase Failure Relay**

The phase sequence feature of the above option is available on all 3-phase units and is selected to ensure the correct rotation of all AC motor type components. Permanent damage can occur if a compressor motor is run in the wrong direction. The phase fail feature of the above option is available on all 1-phase and 3-phase units. When selected the relay informs the unit controller of any loss of phases. The option of Phase Rotation/Phase Failure relay is a standard feature with -48VDC configured units.

**Energy Manager**

Analysis of system energy consumption shall be monitored via a dedicated LCD display. Unit parameters can be adjusted via the unit microprocessor control to affect energy usage in line with the system need.

**Electric Heating**

These shall be multi-stage finned electric heating elements complete with auto and manual reset overheat cut-out protection, elements shall be phase balanced for increased efficiency.

**IMPORTANT** ⚠

When the emergency -48VDC option is selected the power meter will only measure power drawn from the 1PH/3PH AC power supply.

**Voltage Options**

Due to limited compressor selections for particular 60Hz voltages, some units shall not be available.

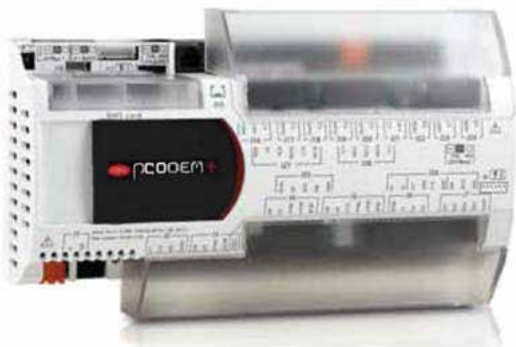
The table below outlines which voltages are available for each unit configuration:

Unit	Unit Voltage			
	400V/3PH/50Hz (-0)	230V/1PH/50Hz (-7)	380v/3PH/60Hz (-1)	220V /3PH/60Hz (-2)
ET05D- _X1F- _-	●	●	—	—
ET08D- _X1F- _-	●	●	—	●
ET12D- _X1F- _-	●	●	●	●
ET15D- _X1F- _-	●	●	●	●
ET12D- _X2F- _-	●	●	—	—
ET15D- _X2F- _-	●	●	—	●

● Available    — Not Available

-48VDC emergency back-up can be selected in conjunction with any of the above AC electrical power supplies.

Controls



pCO OEM+ controller



pGD1 Display

Features		System Configuration	
		ET05/08D-HX	ET12/15D-HX
Controls	pCO OEM+ Controller	●	●
	pGD1 Remote Display	●	●
	Evaporator Fan Control	●	●
	Return Air Temperature Control	●	●
	Constant air Volume	○	○
	Alarm Code Display	○	○
	BMS Interface Cards	○	○
	Humidity Monitoring	○	○
	Filter Change Switch	○	○
	Attend Switch	○	○

● Standard Features    ○ Optional Features    — Feature Not Available

**IMPORTANT** ⚠

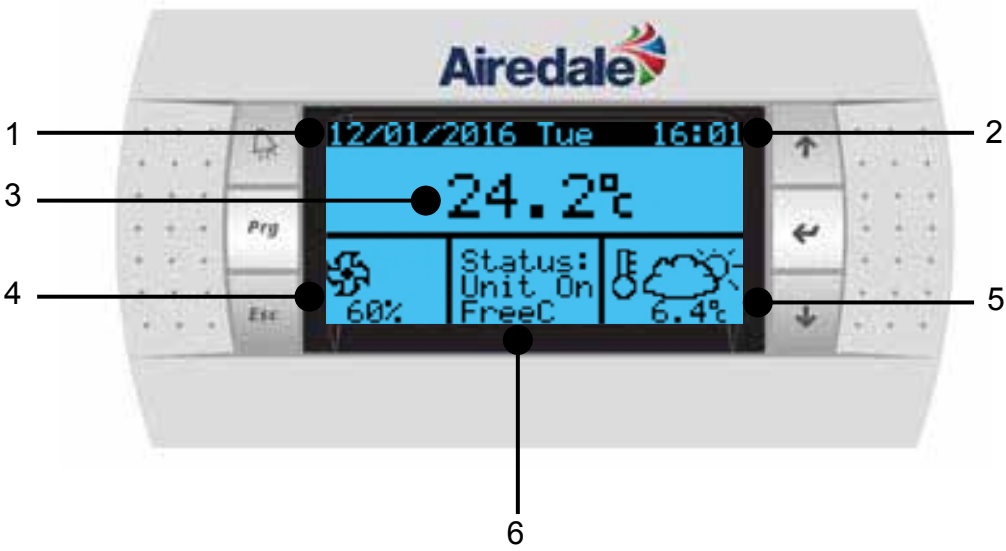
The Ecotel is not fitted with a display terminal as standard. This is to prevent unauthorised access to the controls software on units which can be targets for vandalism and are often installed at remote and rarely attended locations. A pGD1 display is supplied loose with the unit as standard.

The units shall be supplied with a European ROHS Directive 2002/95/EC compatible microprocessor controller connected to an 8 x 22 back-lit LCD keypad display. LEDs shall not be acceptable. The microprocessor controller offers powerful analogue and digital control to meet a wide range of monitoring and control features including a real time clock and industry standard communication port and network connections.

All the boards feature a 16 bit microprocessor, and consequently the calculation power and operation processing speed have been significantly increased. Also featured are a visual alarm and the facility to adjust and display control settings by local operator for information and control.

Display/Keypad

The display keypad features a simple array of keys to navigate through the in-built menus. With an 8 x 22 character (132 x 64 pixel) screen size, back lit in white for improved contrast, the larger screen shall provide for user friendly viewing and easy status recognition by displaying a combination of text and icons. The default screen shall show the unit status without the need for interrogation and an easy to navigate menu structure for further interrogation and adjustment shall be provided. The pGD1 display can be connected within the control panel to the controller using an RJ11 cable.























No.	Description
1	Date
2	Time
3	Cabin Temperature (max./avg.)
4	Fan Speed & Heating Status
5	Additional Information (ambient temp./setpoint/humidity)
6	Unit Status

### Display Icons

To ensure the software is easy to read at a glance, the Ecotel 5-15kW user interface is largely graphical, containing a large number of icons to represent different modes, actions or components.

The following table is a glossary of icons to use as a reference:

Icon	Name/Description	Used To Represent
	Ticked box	Yes, enabled, active, on etc.
	Unticked box	No, disabled, inactive, off etc.
	Setpoint	Setpoint
	Alarm	Alarm, off by alarm
	Unit Off	Unit off by external factor (i.e. PLAN, digital input)
	Unit On/Off	Off by display
	Unit Standby	Standby – on but no action required
	Unit Sleep	Unit off by timer
	Service	Manual mode, overrides, attend mode
	Fan	Fans, freecooling mode
	Concurrent	Concurrent mode
	DX	Mechanical mode
	DX circuit 1	Circuit 1, single circuit
	DX circuit 2	Circuit 2, dual circuit
	Heating	Heating mode, electric heaters
	Freeheating	Freeheating mode
	Compressor 1	Compressor 1, Compressor 1 fault
	Compressor 2	Compressor 2, Compressor 2 fault
	Compressor(s) paused	Compressors held off, no DX cooling, oil preheat timer
	Humidity	Current return air humidity

**Temperature Control**

A temperature sensor shall be mounted in the return air side of the unit to sense the return dry bulb condition. A combined temperature and humidity sensor shall be supplied. The temperature sensor shall be an NTC type thermistor with an accuracy of not less than  $\pm 5\%$  at  $25^{\circ}\text{C}$  at the sensor.

The microprocessor shall sense the return air conditions and maintain the return air temperature by controlling cooling outputs accordingly.

The microprocessor shall monitor and display the following values as a minimum:

- Return Air Temperature.
- Fan Run Hours.

The maintenance of key components such as air filters shall be monitored via a service indicator which visually shows the status relative to the component run hours.

**Constant Air Volume**

When CAV is installed, the unit measures the differential pressure across the evaporator fans to calculate the air volume in  $\text{m}^3/\text{s}$ . The unit modulates evaporator fan speed in order to maintain a constant air volume irrespective of other environmental conditions (such as a dirty filter). Air volume setpoints can be programmed for each operating mode of the unit.

**Alarm Display**

This display cycles through the codes of all active alarms on the unit at 5 second intervals, negating the requirement to connect the pGD1 display in order to diagnose a faulty system. The alarm display is to be mounted on the outside of the unit in a visible location protected behind the control panel cover.

**Standard Network Features**

As standard the controller shall be capable of providing a platform for the following and shall be enabled on request for 2 to 4 units, please specify at order:

**Networking**

A Local Area Network (pLAN) shall be used to connect up to 4 units to offer intercommunication and Duty/Standby control. This also allows the connection of computers, printers and modems on the same communications ring. For further details, please contact Airedale Controls.

**BMS Interface Cards**

BMS Interface Card controlled units can be interfaced with most BMS which are factory fitted, please contact Airedale for more information.

A wide range of protocols shall be accommodated through the use of interface devices. Available as a standard option are: ModBus/Jbus, and Carel. For interfaces such as SNMP, LonWorks, Metasys and BACnet, please contact Airedale. Also available shall be Airedale's own supervisory plug-in BMS card pCOWEB, based on Ethernet TCP/IP secure technology with SNMP features. It shall require no proprietary cabling or monitoring software and be supplied pre-programmed with an IP address for ease of set up. Cables to the BMS to be supplied by others.

**Remote On/Off**

Terminals for interlocking shall be provided to enable or disable the unit remotely.

**Filter Change Alarm**

Filter change shall be managed by the software, and shall be based on fan(s) hours run with an alarm being generated when the pre-set run time limit has been exceeded. The set-point value shall be adjusted to suit each application and is factory set to 4000 hours. Hours run log or visual service indicator shall be provided.

**Password Protection**

The control system integrity shall be maintained by restricting access with a password PIN number. To change the PIN, please contact Airedale at time of order with the preferred 4 digit number.

## External

Features		System Configuration	
		ET05/08D-HX	ET12/15D-HX
External	Integrated Mounting Flanges	●	●
	Tamper Proof Fixings	●	●
	Wooden Pallet Mounting	●	●
	Ambient Weather Louvres	●	●
	Fire Rated Damper	○	○
	Acoustic Plenum	○	○

● Standard Features    ○ Optional Features    — Feature Not Available

**Integrated Mounting Flanges**

The unit shall come with integrated mounting flanges as standard. Fixings supplied by others.

**Tamper Proof Fixings**

The unit shall have vandal proof fixings employed to all externally removable service panels.

**Wooden Pallet Mounting**

For specific markets units shall be shipped, mounted on wooden pallet and covered with polythene. The pallet shall be mechanically fixed to the unit for transportation only (Please contact Airedale for this option). Add 50mm to depth and width, 160mm to height.

**Ambient Weather Louvres**

A weatherproof louvre shall be fitted at the ambient air of the unit, to protect internal components. Complete with bird mesh.

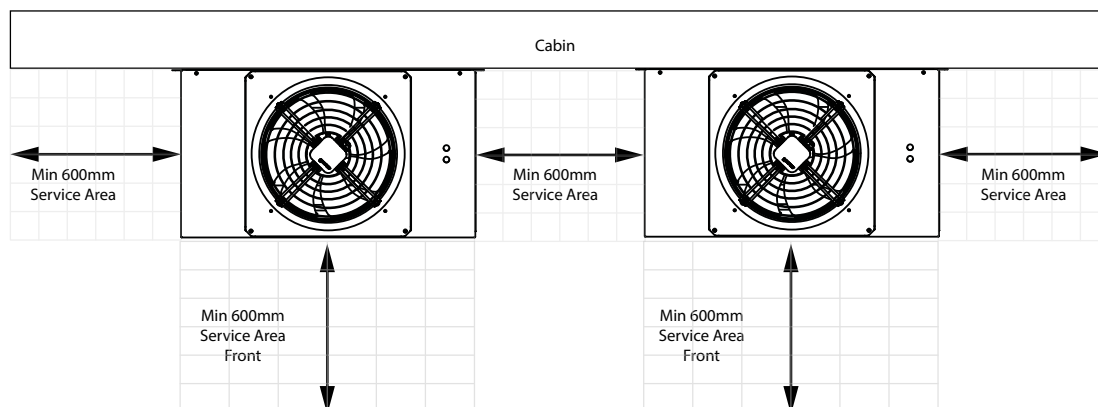
**Fire Rated Damper**

Optional curtain type fire dampers shall be fitted to supply and exhaust, with galvanised steel construction as standard. Fire tested to BS EN 1366-2:1999 and classified to BS EN 13501-3:2005 + A1:2009.

## Installation Data

### Lifting/Positioning

- Remove packing and check that the unit is exactly as ordered. Any discrepancy to order, or transit damage, should be reported to Airedale immediately.
- Airedale recommends that whenever possible, the packaging is left covering the unit, to protect it from damage and general site debris.
- Care should be taken during handling and lifting, that the unit is well supported and properly balanced.
- Care should be taken that there are no obstructions to free airflow, particularly in the vicinity of the condenser fan discharge (outdoor) (minimum of 800mm is required) and also the return/discharge air (indoor).
- Clearance of 600mm must be allowed for maintenance purposes between any obstructions or other units.



### CAUTION ⚠

Airedale will accept no responsibility for mishandling during the positioning of the equipment.

### Installation

- Check all services are present and accessible.
- Unpack the fan section and remove securing straps, leaving unit on its pallet.
- Using appropriate lifting equipment, lift the unit on its pallet and ease into position (local codes and regulations should be observed).
- External fixing: Once the unit is flush with the wall, secure with M10 plated bolts, with a washer on the interior and exterior of the wall.
- The discharge air opening has a foam surround to provide a seal between the wall and the fan section. A bead of sealant should be used to provide a air and water tight seal\*.
- Seal evenly around the seam between the fan section and wall, achieving a water tight seal\*.
- The flashing strip should be fixed to the wall using screws (not provided). Seal to the wall and unit top using silicon sealant to prevent moisture ingress\*.
- \*Airedale recommend the use of Dow Corning 794 or equivalent.
- Where a cavity wall exists between the unit and wall, a wall sleeve will be required (not supplied).
- Fix deflection grilles to internal walls with tamperproof fixings. Grille should come supplied with Moving Parts Warning Label mechanically fixed to grille flange.

### Electrical

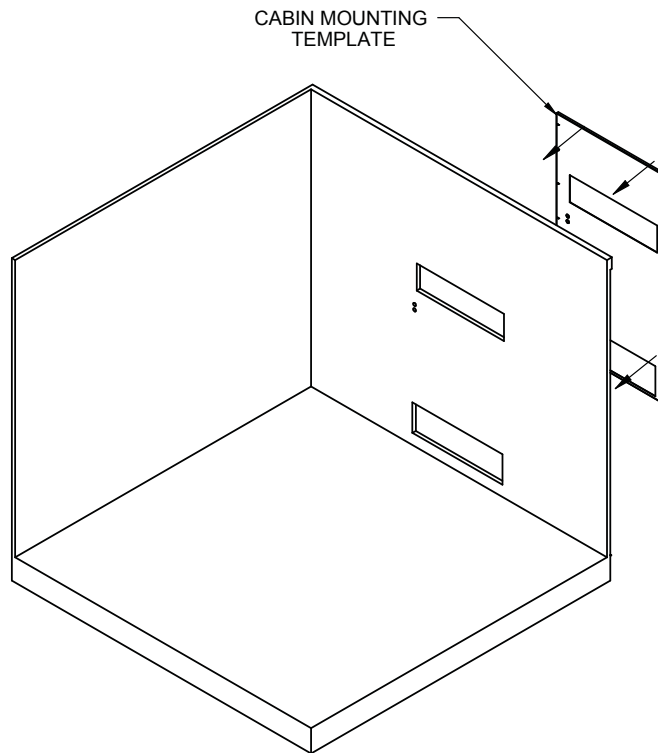
- A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.
- Each unit requires an independently fused and isolated power supply.
- Install the remote room sensor in an appropriate position and run the interconnecting wire back to the unit control panel, refer to Interconnecting Wiring.
- Install mains supply refer to Interconnecting Wiring (and optional -48VDC. NOTE: – Connect the poles correctly).
- Pass through the set holes located on the back of the fan section, feed through the into the electrical control panel
- Route via trunking and terminate in supplied terminals, refer to supplied wiring diagram.

### Airflow Switch

The airflow fail switch is set for the fans to operate at the standard design airflow and external static, as quoted in the technical manual or if customer specified. However the following procedure must be carried out when commissioning the unit on site to ensure the correct operation. It may also be needed to be adjusted if cabin loads change.

- Set airflow to required operating parameter with the use of microprocessor.
- Turn airflow switch to maximum setting to test electrical control. Controls circuit contacts should switch open.
- Adjust switch downwards until the control circuit contact close.
- Switch off fan (1 fan only on twin fan units) controls circuit should open (switch off).
- Turn on fan and re set unit.

If during low cooling demand (free cooling mode) and the airflow is reduced below the standby speed (40%) the controller ignores the alarm. When the unit is operating in DX/heating mode and has a higher cooling demand and an alarm is triggered by the airflow switch (low airflow), the DX is disabled and free cooling is enabled.

**Installation Data**  
**Product Application****CAUTION** ⚠

Units must be supported by a 3 inch cabin mounted angle iron (not supplied).

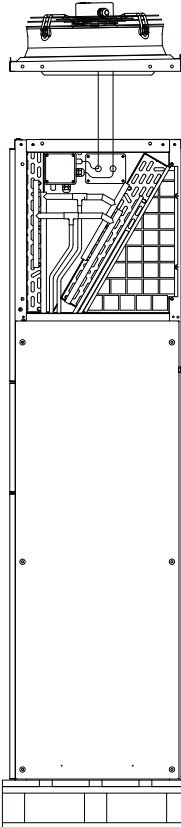
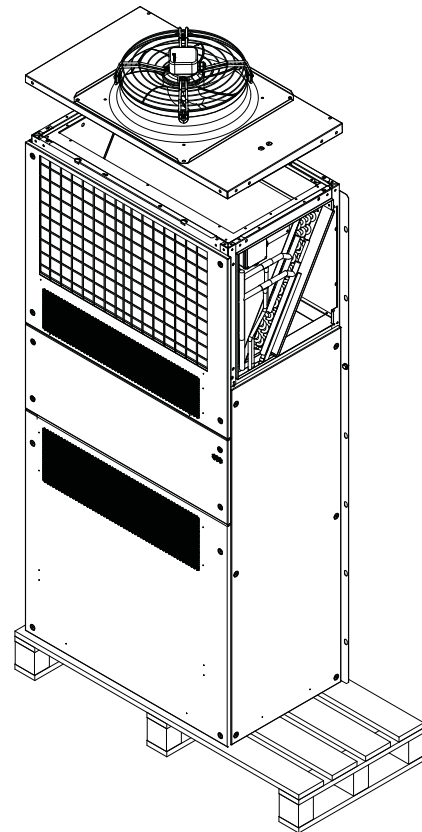
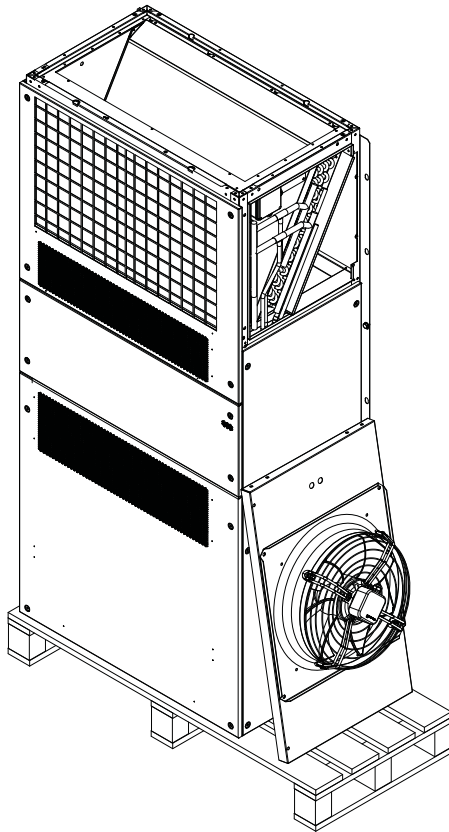


ET12/15D-HX\*F\*-\* on a 3m tall cabin

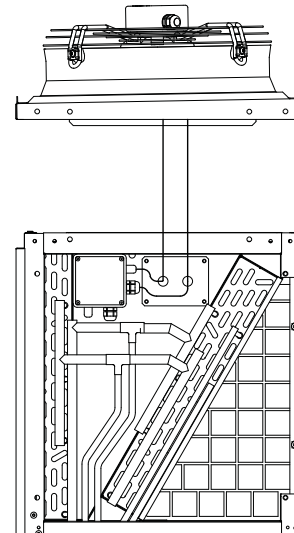
## Installation Data

### Condenser Fan Fitment

Installation



Lift the fan off the pallet and place on top of the unit. Pass the cables through the lid of the unit. Fix the fan assembly with the supplied tamper proof screws.

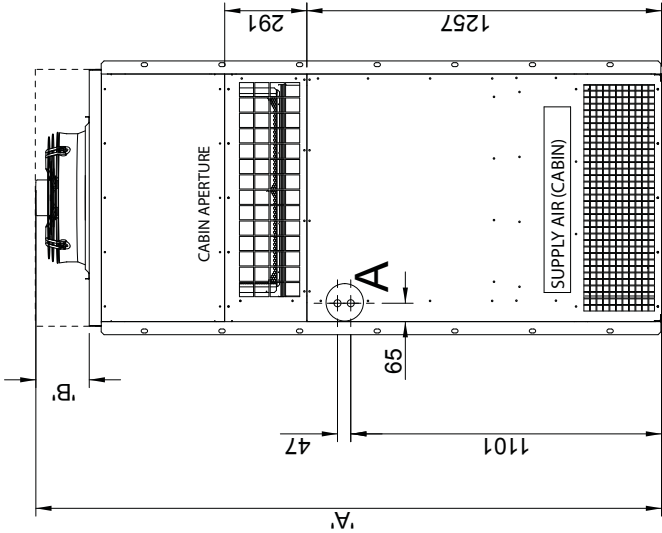
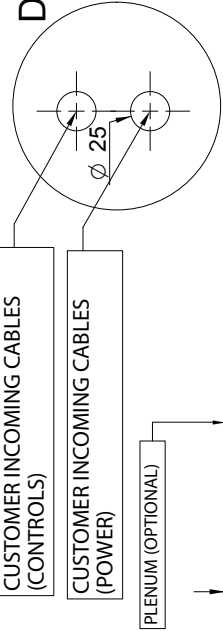


Connect the cables to the terminal box. Check operation of the condenser fans by manually turning the fan on through the controller. Once confirmation that the fans operate correctly return the condenser fan speed back to auto.

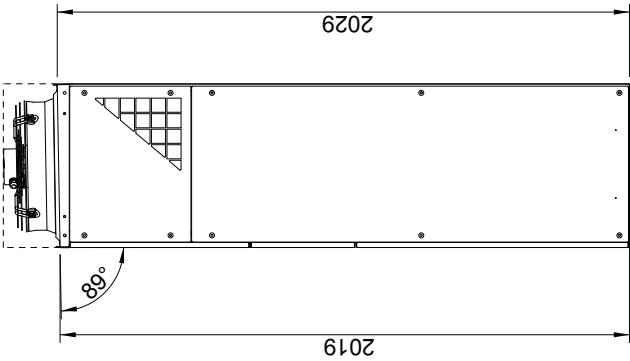
Installation Data  
Dimensions  
ET05/08D-HX1F\*.\*

DIMENSION	AC CONDENSER FAN 50Hz	AC CONDENSER FAN 60 Hz	EC CONDENSER FAN
'A'	2219	2219	2181
'B'	190	190	152

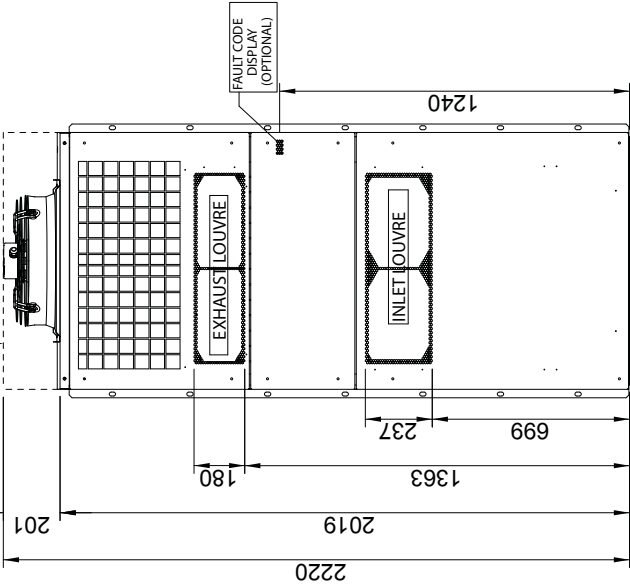
DETAIL A



REAR VIEW



SIDE VIEW



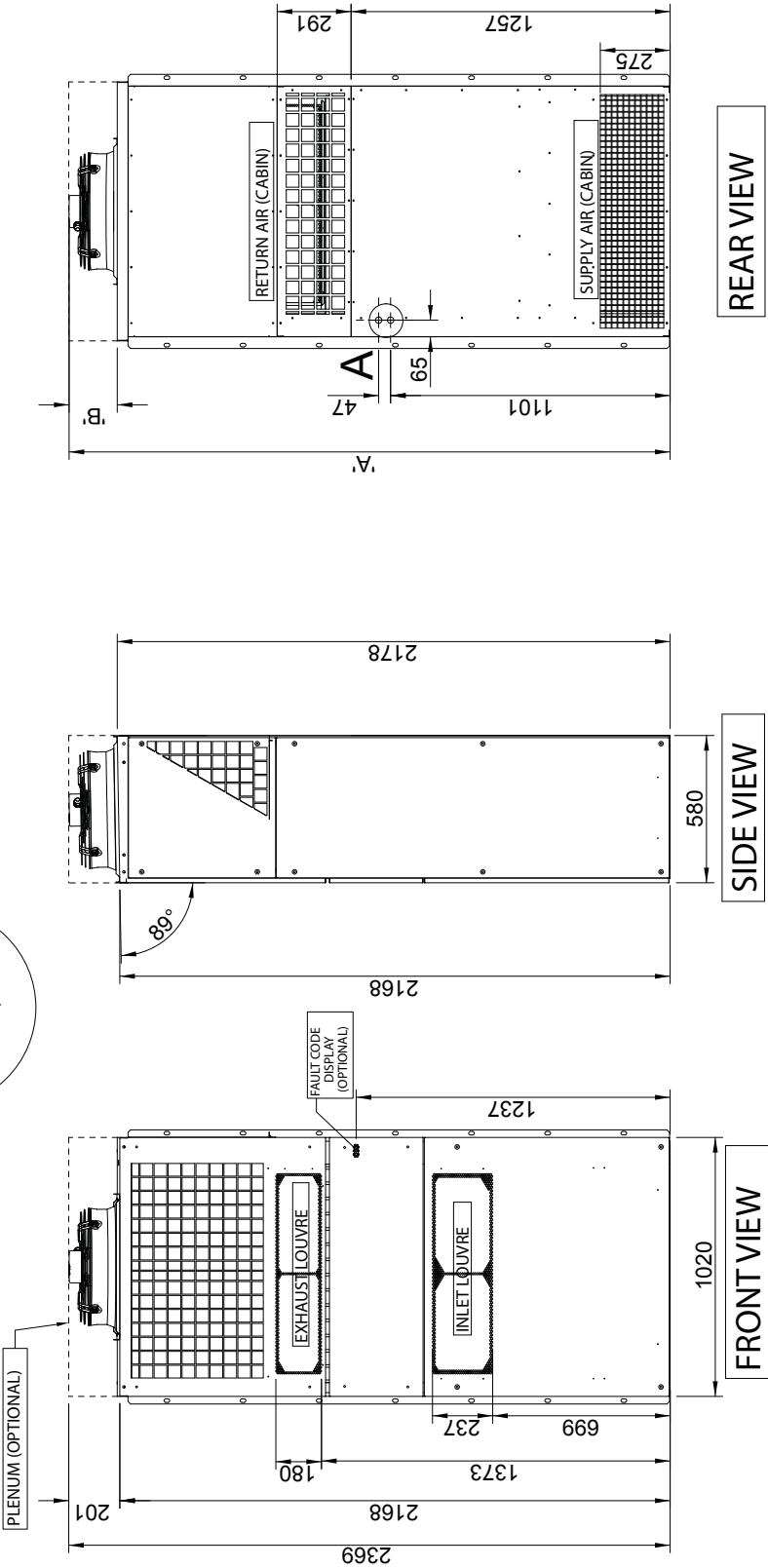
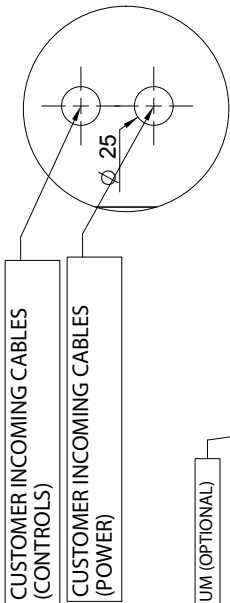
FRONT VIEW

Installation

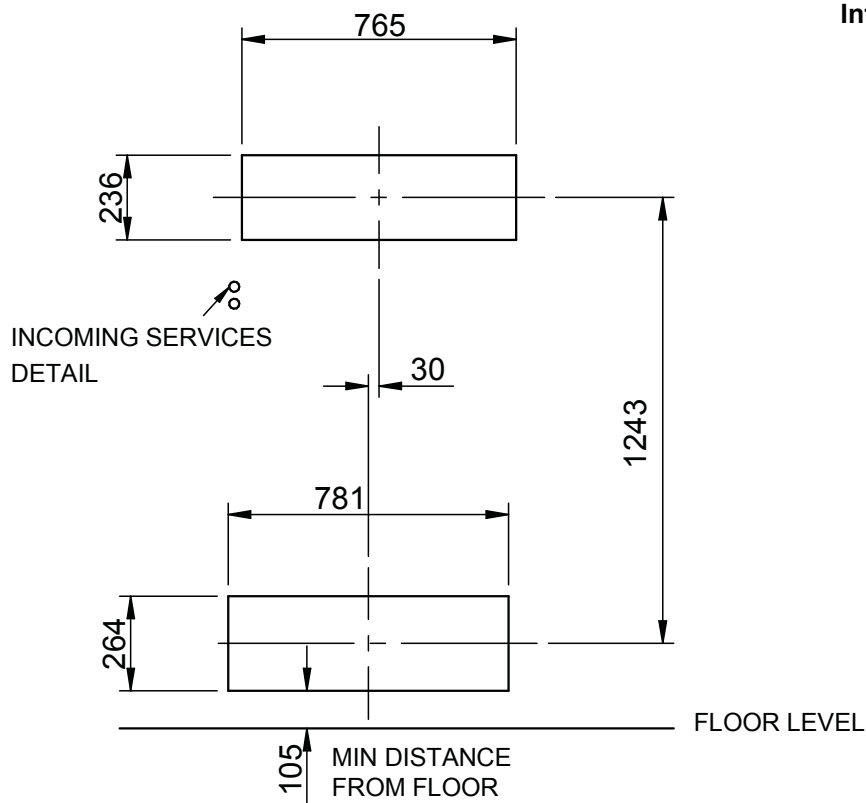
Installation Data  
Dimensions  
ET12/15D-HX1F\*.\*

DIMENSION	AC CONDENSER FAN 50Hz	AC CONDENSER FAN 60 Hz	EC CONDENSER FAN
'A'	2368	2368	2330
'B'	190	190	152

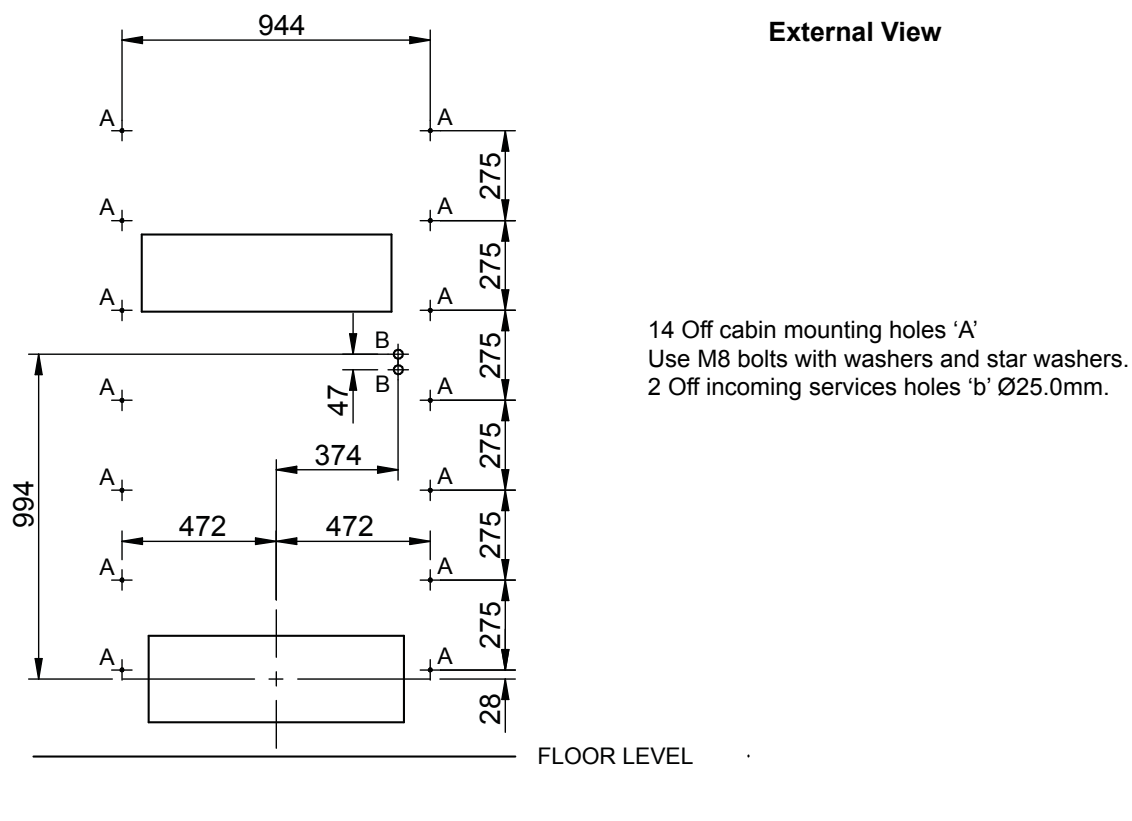
DETAIL A



### Cabin Mount and Incoming Services Detail

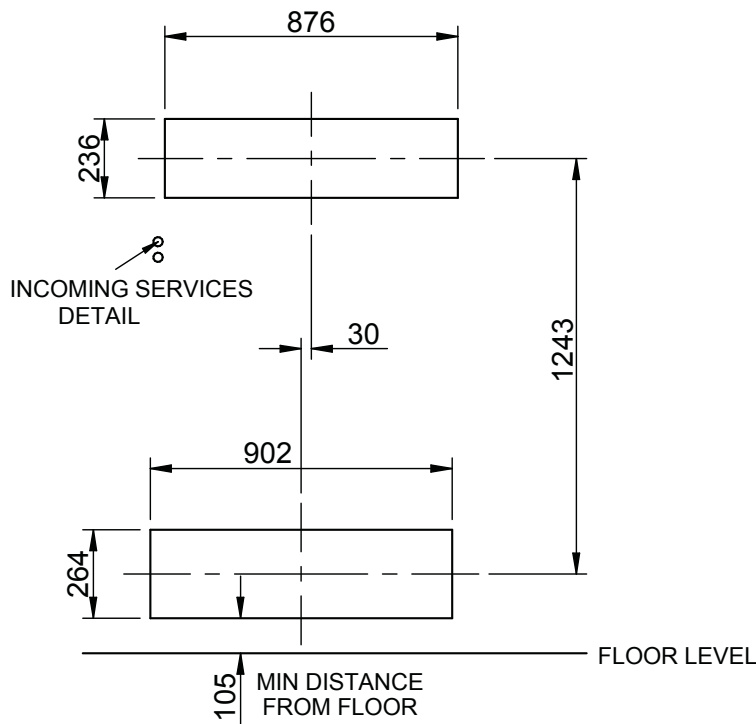


## Cabin Mounting



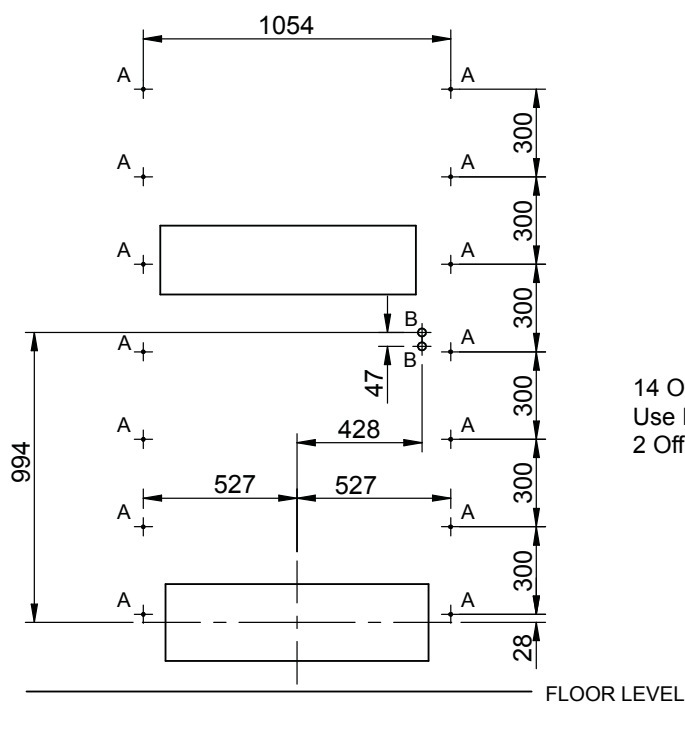
### Cabin Mount and Incoming Services Detail

# Installation

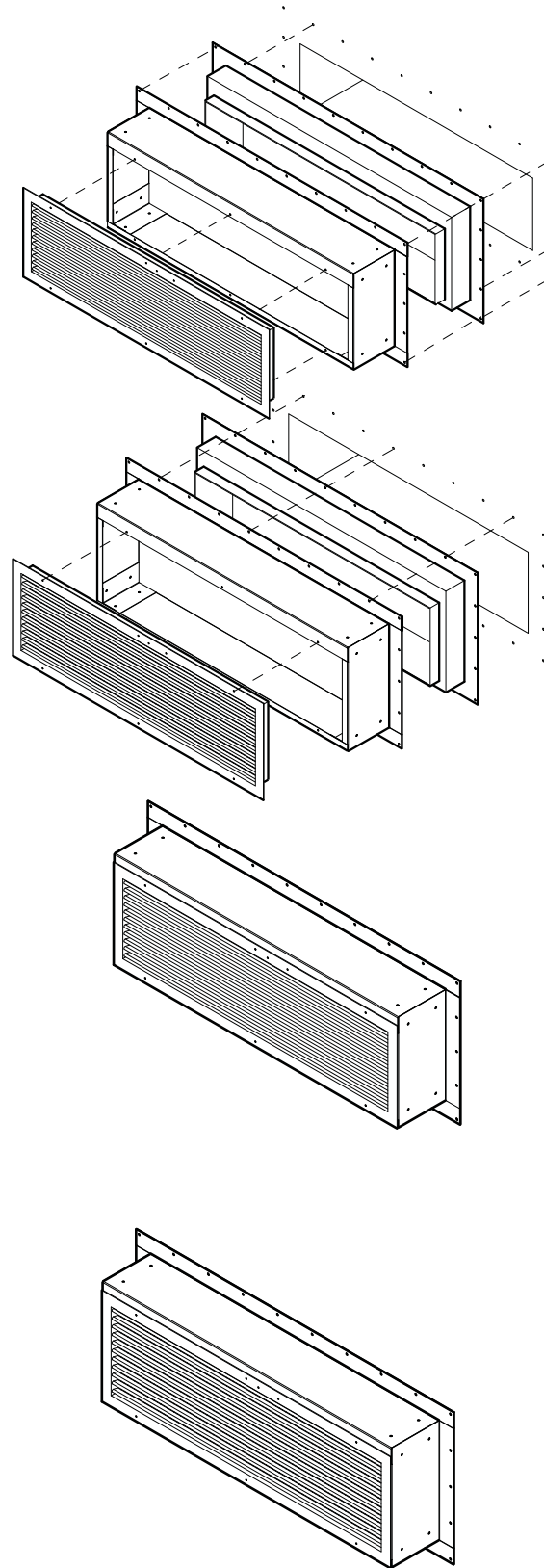


Fire damper and deflection grilles are to be located centrally around the cut-outs and secured using tamper proof fixings.

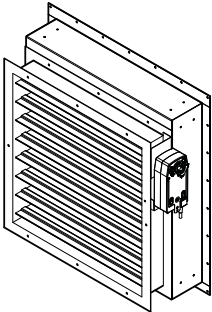
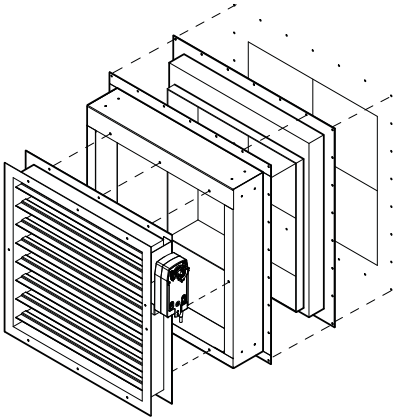
### External View



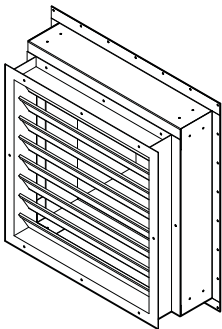
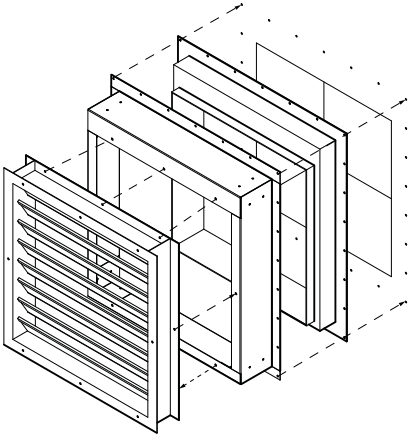
14 Off cabin mounting holes 'A'  
Use M8 bolts with washers and star washers.  
2 Off incoming services holes 'b' Ø25.0mm.

**Installation Data****Supply and Return Deflection Grille**

**Installation Data**  
**Actuated Exhaust Damper**



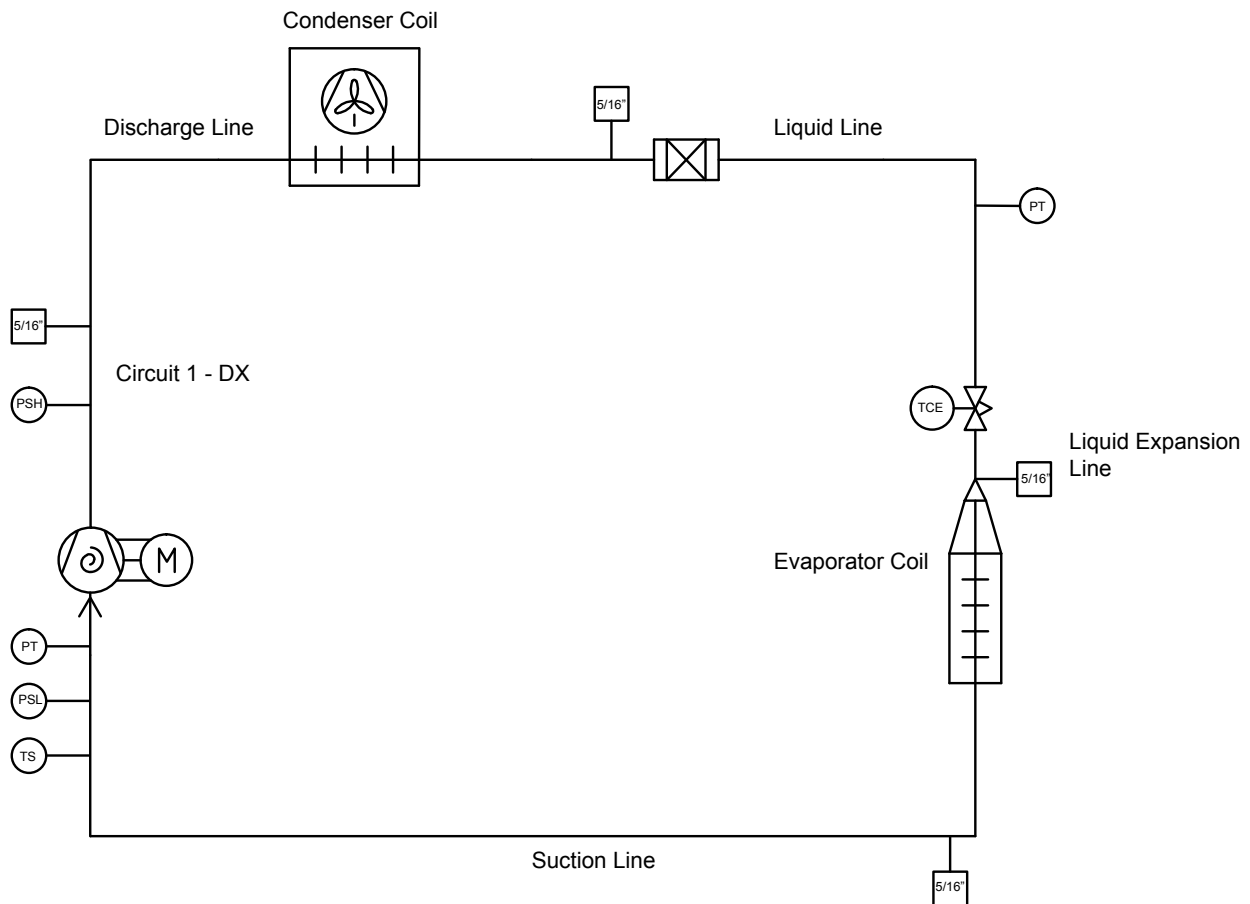
**Pressure Relief Exhaust Damper**



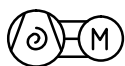
## Installation Data

### Pipework Schematics

#### Single Circuit



Key: All Items



Scroll Compressor



Electronic Expansion Valve



Sight Glass



Filter Drier



Pressure Transducer



R410A 5/16" Schrader Valve



Low Pressure Switch



High Pressure Switch



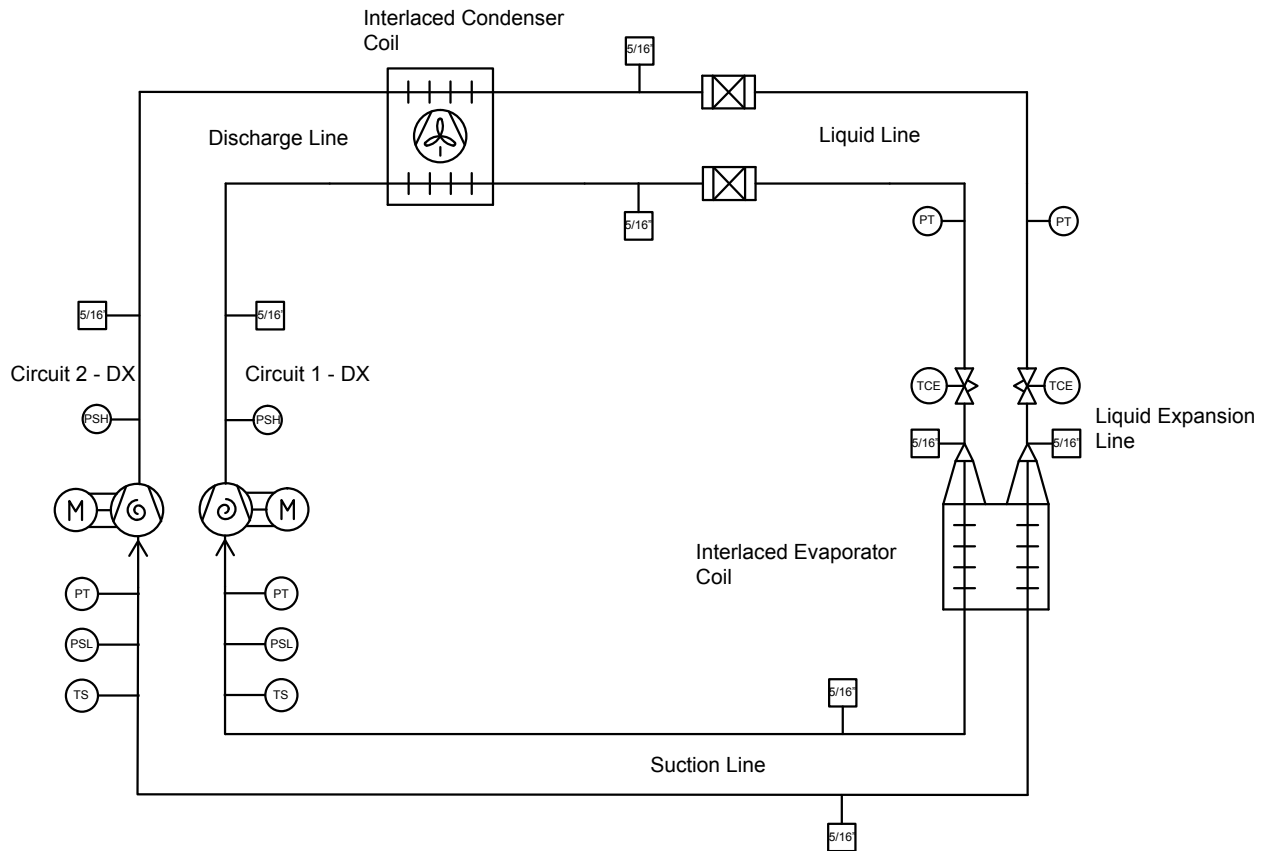
Suction Line Temperature Sensor

## Installation Data

### Pipework Schematics

#### Dual Circuit

Installation



Key: All Items



Scroll Compressor



Electronic Expansion Valve



Sight Glass



Filter Drier



Pressure Transducer



R410A 5/16" Schrader Valve



Low Pressure Switch



High Pressure Switch



Suction Line Temperature Sensor

## Installation Data

### Interconnecting Wiring

#### Power Connections

Indoor Unit	L1	←	Mains Incoming Supply (400V / 3PH / + N / 50Hz or 380V / 3PH / + N / 60Hz)
	L2	←	
	L3	←	
	N	←	
	PE	←	
	L1	←	Mains Incoming Supply (220V / 3PH / 60Hz)
	L2	←	
	L3	←	
	PE	←	
	L	←	Mains Incoming Supply (230V / 1PH / + N / 50Hz)
	N	←	
	PE	←	
	-L	←	Mains Incoming Supply (-48VDC 2-wire positive earthed)
	M	←	

#### Controls Connections

Standard	502 (802)	→	Auxiliary Alarm
	524 (824)	←	

Option	502 (802)	→	Attend Mode / Remote On-Off
	513 (813)	←	

Standard	560	←	Non-Critical Alarm - Common
	561	→	Non-Critical Alarm - N/O
	562	→	Non-Critical Alarm - N/C
	563	←	Critical Alarm - Common
	564	→	Critical Alarm - N/O
	565	→	Critical Alarm - N/C
	566	←	Return Air Alarm - Common
	567	→	Return Air Alarm - N/O
	RX/TX-	←	Network In (pLAN)
	RX/TX+	←	
	GND	←	
	RX/TX-	→	Network Out (pLAN)
	RX/TX+	→	
	GND	→	

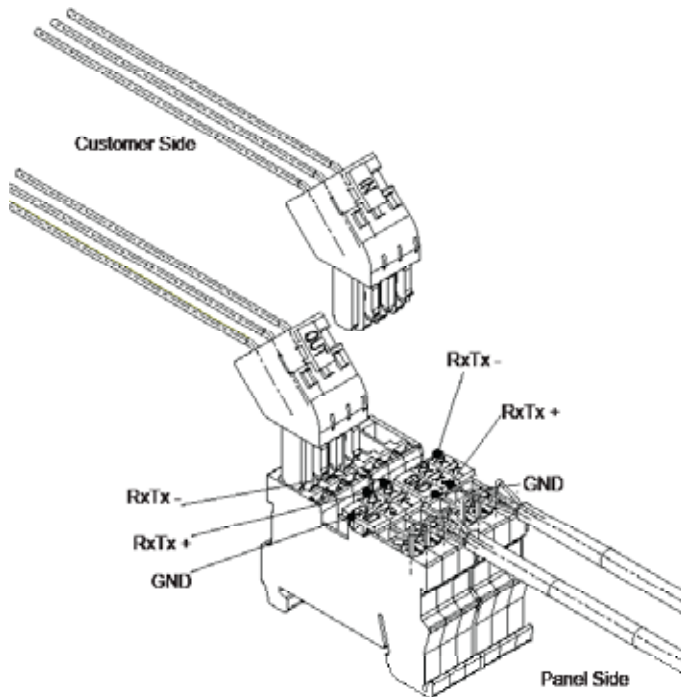
Option	BMS Interface	←	BMS Interface
--------	---------------	---	---------------

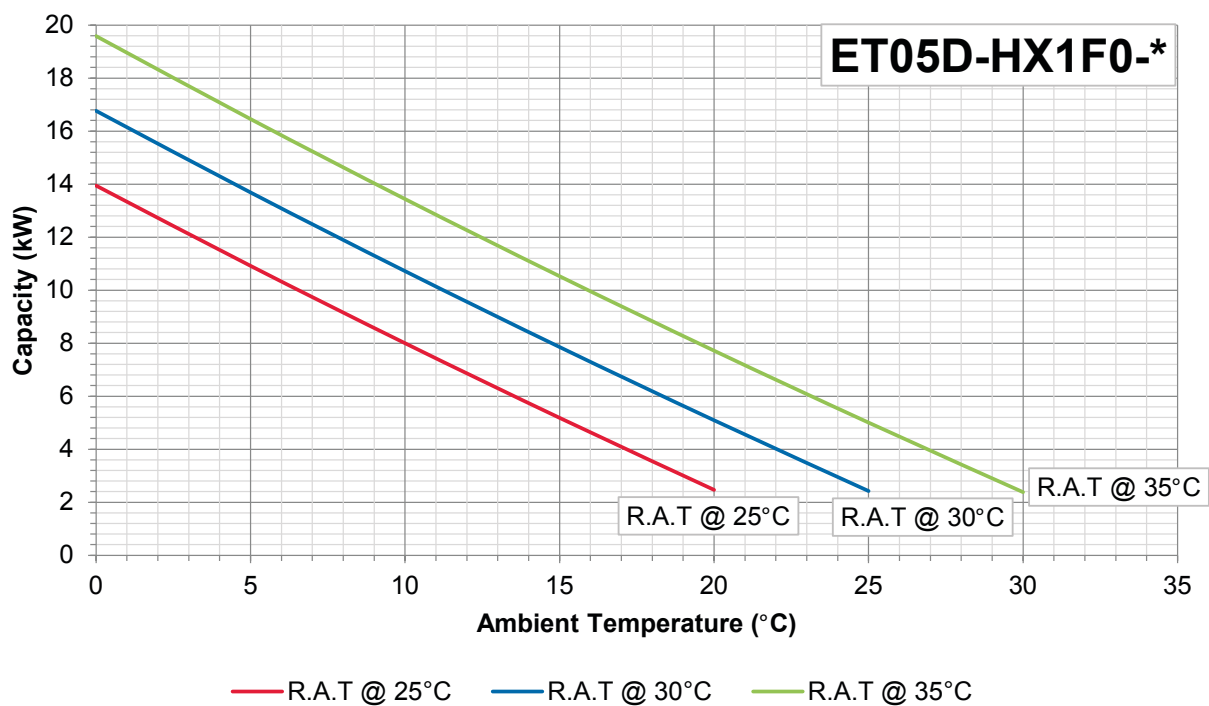
Note: - ( ) Bracketed numbers refer to terminal numbers associated with the -48VDC emergency backup cooling option

## pLAN Termination

The plugged termination ensures that the connections are made simultaneously. Failure to attach the cables this way may cause damage to the controller.

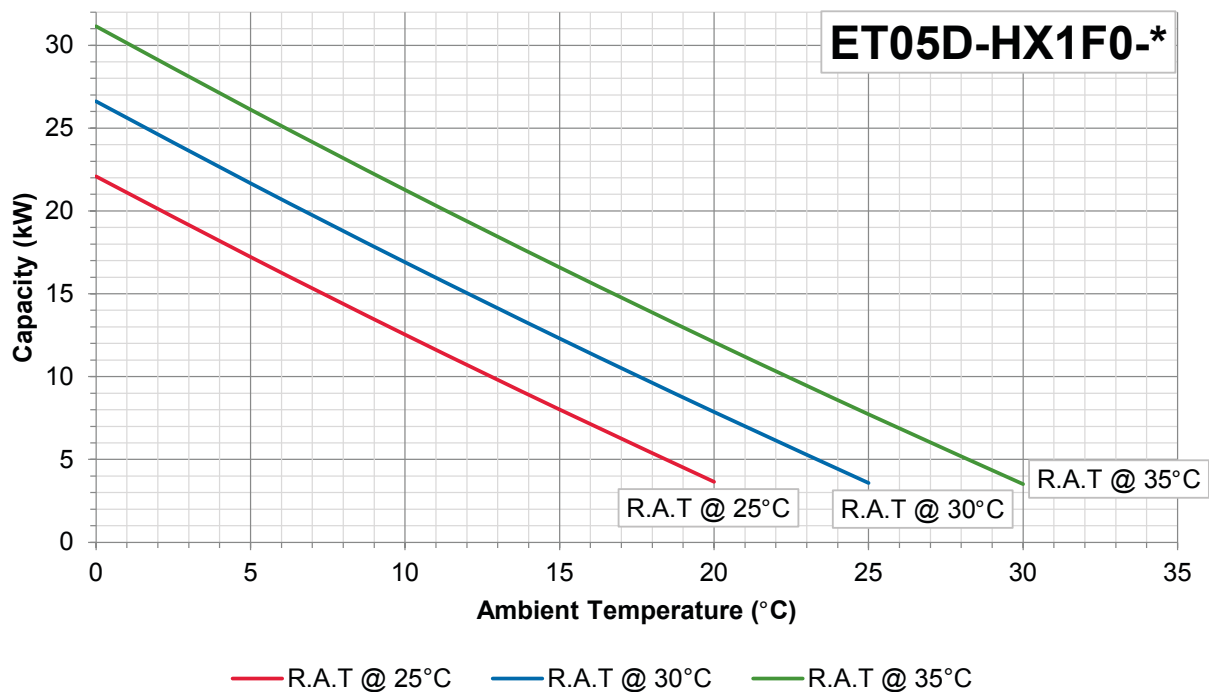
### Installation



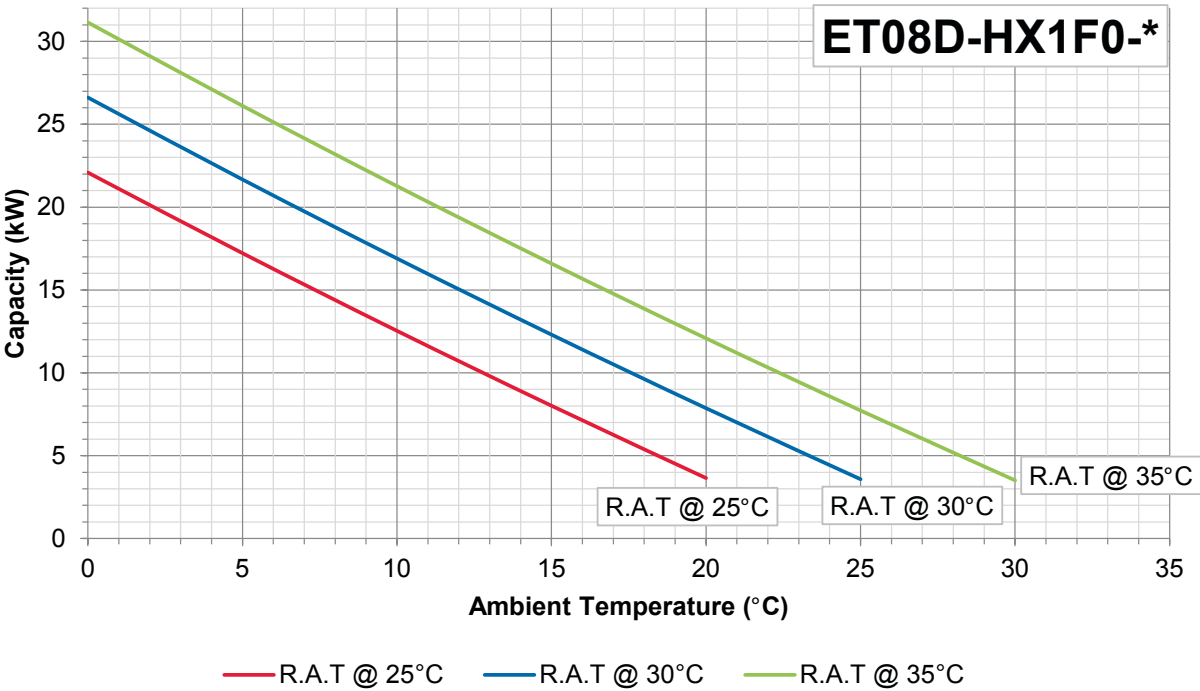
**Technical Data****Free Cooling Performance Data****Standard EC Fans**

Technical

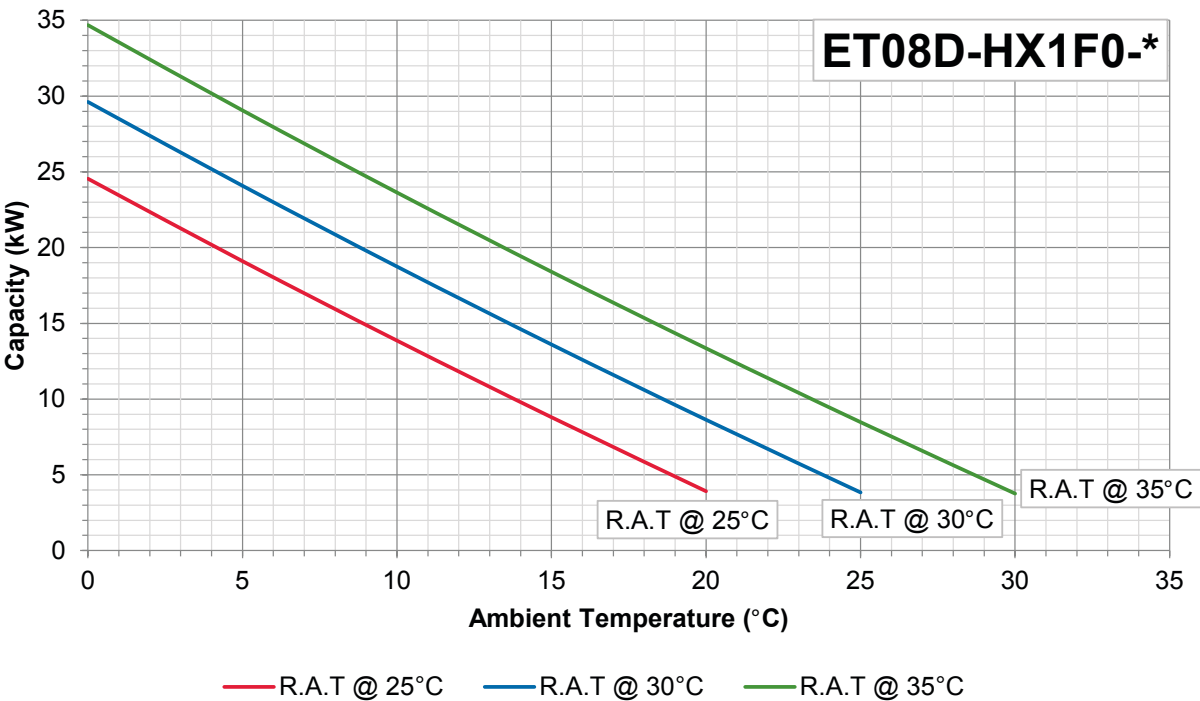
400V

**Upgraded EC Fans**

Technical Data  
Free Cooling Performance Data  
Standard EC Fans



Upgraded EC Fans



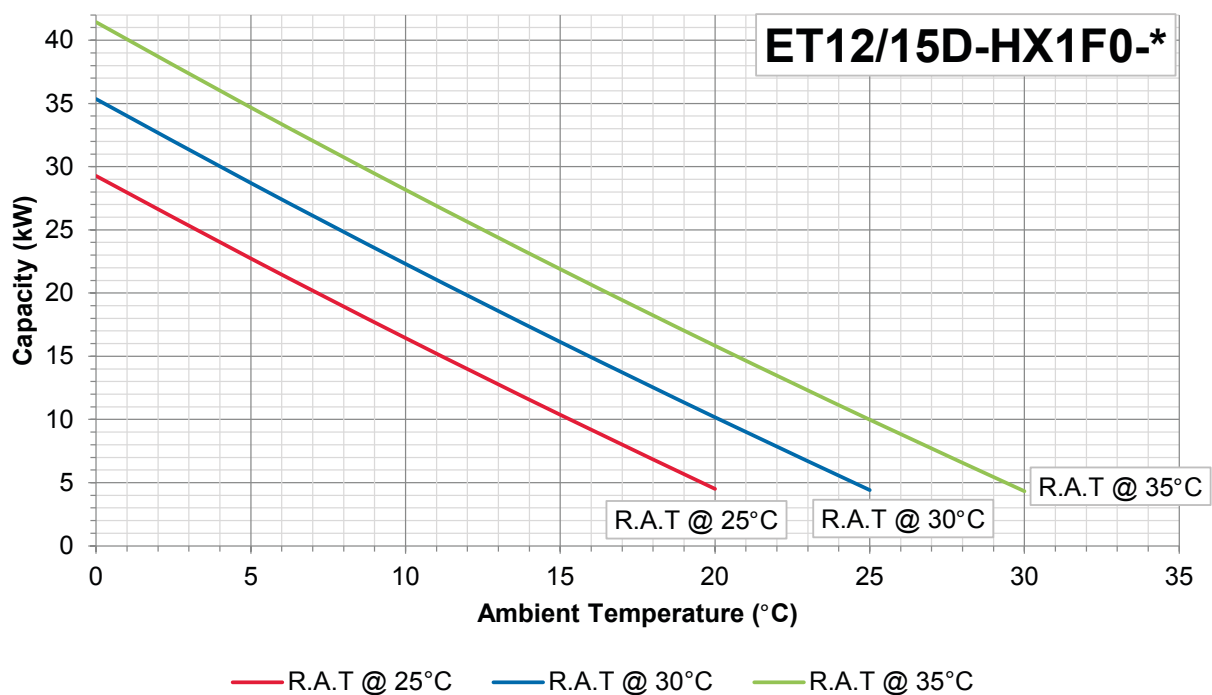
Technical

400V

## Technical Data

## Free Cooling Performance Data

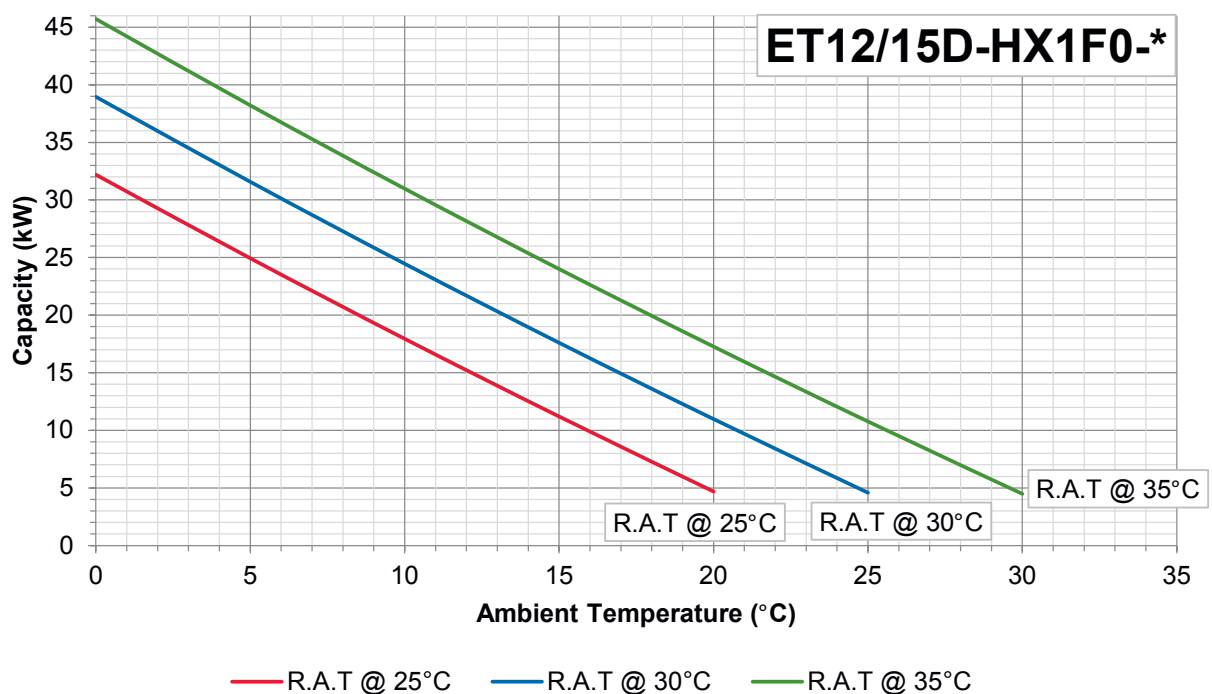
## Standard EC Fans



Technical

400V

## Upgraded EC Fans



### Sound Measurement

All sound data quoted has been measured in the third-octave band, limited values using a Real Time Analyser calibrated sound intensity meter in accordance with BS ISO9614 (Part 1) : 2009.

1. Sound Power Levels calculated from measured sound intensity according to BS EN ISO9614 Part 1: 2009.
2. dB(A) is the overall sound level, measured on the A scale.
3. Sound Pressure Levels calculated from sound power using the semi-hemispherical method according to BS EN ISO1120 : 2009. If the equipment is placed adjacent to a reflective wall, values may vary to those stated in our performance data section, typically you can add 3dB(A) for each side added.
4. The below data is based on unit typical running conditions.

Sound Measurement		Nominal Operation (dBA)	
		Free Cooling	DX
ET05D-HX1F*-*	Power	56	96
	Pressure @ 1m	51	91
	Pressure @ 3m	50	90
	Pressure @ 10m	37	77
ET08D-HX1F*-*	Power	71	91
	Pressure @ 1m	66	86
	Pressure @ 3m	65	85
	Pressure @ 10m	52	72
ET12D-HX1F*-*	Power	77	92
	Pressure @ 1m	72	87
	Pressure @ 3m	71	86
	Pressure @ 10m	58	73
ET12D-HX2F*-*	Power	77	92
	Pressure @ 1m	72	87
	Pressure @ 3m	71	86
	Pressure @ 10m	58	73
ET15D-HX1F*-*	Power	77	92
	Pressure @ 1m	72	87
	Pressure @ 3m	71	86
	Pressure @ 10m	58	72
ET15D-HX2F*-*	Power	77	92
	Pressure @ 1m	72	87
	Pressure @ 3m	71	86
	Pressure @ 10m	58	73

Technical

400V

## Technical Data - 400V 50Hz

## Performance Data

	Air On °C / %RH	Ambient °C									
		25		30		35		40		45	
		TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)
ET05D-HX1F0-0	28°C 33.7%	6.0	6.0	6.0	6.0	5.8	5.8	5.5	5.5	5.1	5.1
	30°C 30%	6.3	6.3	6.3	6.3	6.1	6.1	5.7	5.7	5.3	5.3
	32°C 26.8%	6.5	6.5	6.5	6.5	6.3	6.3	5.9	5.9	5.6	5.6
ET05D-HX1F1-0	28°C 33.7%	6.0	6.0	6.0	6.0	5.8	5.8	5.5	5.5	5.1	5.1
	30°C 30%	6.3	6.3	6.3	6.3	6.1	6.1	5.7	5.7	5.3	5.3
	32°C 26.8%	6.5	6.5	6.5	6.5	6.3	6.3	5.9	5.9	5.6	5.6
ET08D-HX1F0-0	28°C 33.7%	8.4	8.4	8.3	8.3	8.0	8.0	7.5	7.5	6.9	6.9
	30°C 30%	8.8	8.8	8.7	8.7	8.4	8.4	7.9	7.9	7.3	7.3
	32°C 26.8%	9.2	9.2	9.1	9.1	8.8	8.8	8.2	8.2	7.7	7.7
ET08D-HX1F1-0	28°C 33.7%	8.4	8.4	8.3	8.3	8.0	8.0	7.5	7.5	6.9	6.9
	30°C 30%	8.8	8.8	8.7	8.7	8.4	8.4	7.9	7.9	7.3	7.3
	32°C 26.8%	9.2	9.2	9.1	9.1	8.8	8.8	8.2	8.2	7.7	7.7
ET12D-HX1F0-0	28°C 33.7%	12.4	12.4	12.1	12.1	11.7	11.7	10.9	10.9	10.1	10.1
	30°C 30%	13.1	13.1	12.8	12.8	12.3	12.3	11.5	11.5	10.7	10.7
	32°C 26.8%	13.7	13.7	13.4	13.4	12.9	12.9	12.1	12.1	11.3	11.3
ET12D-HX1F1-0	28°C 33.7%	12.4	12.4	12.1	12.1	11.7	11.7	10.9	10.9	10.1	10.1
	30°C 30%	13.1	13.1	12.8	12.8	12.3	12.3	11.5	11.5	10.7	10.7
	32°C 26.8%	13.7	13.7	13.4	13.4	12.9	12.9	12.1	12.1	11.3	11.3
ET12D-HX2F0-0	28°C 33.7%	13.4	13.4	13.0	13.0	12.5	12.5	11.7	11.7	10.8	10.8
	30°C 30%	14.1	14.1	13.7	13.7	13.1	13.1	12.3	12.3	11.4	11.4
	32°C 26.8%	14.7	14.7	14.3	14.3	13.7	13.7	12.8	12.8	12.0	12.0
ET12D-HX2F1-0	28°C 33.7%	13.4	13.4	13.0	13.0	12.5	12.5	11.7	11.7	10.8	10.8
	30°C 30%	14.1	14.1	13.7	13.7	13.1	13.1	12.3	12.3	11.4	11.4
	32°C 26.8%	14.7	14.7	14.3	14.3	13.7	13.7	12.8	12.8	12.0	12.0
ET15D-HX1F0-0	28°C 33.7%	15.2	15.2	14.7	14.7	14.1	14.1	13.1	13.1	12.2	12.2
	30°C 30%	16.0	16.0	15.5	15.5	14.8	14.8	13.9	13.9	12.9	12.9
	32°C 26.8%	16.7	16.7	16.1	16.1	15.5	15.5	14.5	14.5	13.5	13.5
ET15D-HX1F1-0	28°C 33.7%	15.2	15.2	14.7	14.7	14.1	14.1	13.1	13.1	12.2	12.2
	30°C 30%	16.0	16.0	15.5	15.5	14.8	14.8	13.9	13.9	12.9	12.9
	32°C 26.8%	16.7	16.7	16.1	16.1	15.5	15.5	14.5	14.5	13.5	13.5
ET15D-HX2F0-0	28°C 33.7%	15.8	15.8	15.2	15.2	14.5	14.5	13.5	13.5	12.5	12.5
	30°C 30%	16.5	16.5	15.9	15.9	15.3	15.3	14.3	14.3	13.2	13.2
	32°C 26.8%	17.2	17.2	16.6	16.6	15.9	15.9	14.9	14.9	13.9	13.9
ET15D-HX2F1-0	28°C 33.7%	15.8	15.8	15.2	15.2	14.5	14.5	13.5	13.5	12.5	12.5
	30°C 30%	16.5	16.5	15.9	15.9	15.3	15.3	14.3	14.3	13.2	13.2
	32°C 26.8%	17.2	17.2	16.6	16.6	15.9	15.9	14.9	14.9	13.9	13.9

TC (kW) Gross Total Cooling

SC (kW) Gross Sensible Cooling

Technical

400V

## Technical Data - 400V 50Hz

## ET05D

## Mechanical Data

			ET05D-HX1F0-0	ET05D-HX1F1-0
Technical	Capacity - DX Cooling			
	Gross Total	(1) kW	6.09	6.09
	Gross Sensible	(1) kW	6.09	6.09
	EER		2.88	2.86
	Capacity Steps		1	1
	Capacity - Free Cooling			
	Gross Total	(2) kW	5.25	6.59
	Max Airflow	m³/s	0.43	0.55
	Dimensions			
	W x D x H	mm	910 x 580 x 2219	
400V	Weights			
	Machine	kg	278	279
	Operating	kg	280	282
	Construction			
	Material/Colour		Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)	
	Evaporator		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.304	0.304
	Nominal Airflow	m³/s	0.37	0.37
	Discharge		Horizontal	Horizontal
	Condenser		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.616	0.616
	Nominal Airflow	m³/s	1.66	1.66
	Discharge		Vertical	Vertical
	Fan - Evaporator		EC	DC
	Quantity		1	1
	Diameter	mm	310	355
	Maximum Speed	rpm	1525	1760
	Fan - Condenser		AC	AC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1400	1400
	Compressor		Scroll	Scroll
	Quantity		1	1
	Oil Charge Volume (Total)	l	0.74	0.74
	Oil Type		POE	POE
	Refrigeration		Single Circuit	Single Circuit
	Refrigeration Control		EEV	EEV
	Refrigerant Type		R410A	R410A
	GWP		2088	2088
	Charge (Total)	kg	2.36	2.4
	Tonnes equivalent CO <sub>2</sub>	tCO <sub>2</sub>	4.93	5.01
	Filtration		ISO-C-80	ISO-C-80
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Upgraded Fan - Evaporator		EC	-
	Quantity		1	-
	Diameter	mm	310	-
	Maximum Speed	rpm	2360	-
	Upgraded Fan - Condenser		EC	EC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1500	1500
	Filtration		ISO-C-95	ISO-C-95
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Heating	kW	3.0	3.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 400V 50Hz

## ET05D

## Electrical Data

			ET05D-HX1F0-0	ET05D-HX1F1-0
Electrical Supply Data				
Mains Supply		V	400 / 3PH + N / 50Hz	400 / 3PH + N / 50Hz
Clients Backup Power Supply		V	N/A	48VDC
Controls Circuit		V	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm²	10	10
Mechanical Cooling - ARI (AC)	(3)			
Nominal Run Amps		A	8.0	7.5
Maximum Start Amps		A	32.4	30.9
Recommended Mains Fuse		A	10	10
Mechanical Cooling - Max (AC)	(4)			
Nominal Run Amps		A	9.0	8.5
Maximum Start Amps		A	32.4	30.9
Recomended Mains Fuse		A	16	10
Free Cooling mode (AC)				
Nominal Run Amps		A	1.2	1
Clients -48VDC Backup Supply				
Nominal Run Amps		A	N/A	7.1
Recomended Mains Fuse		A	N/A	10
Evaporator Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.15	0.29
Full Load Amps		A	1.2	6.1
Locked Rotor Amps		A	1.2	6.1
Condenser Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.6	0.6
Full Load Amps		A	2.9	2.9
Locked Rotor Amps		A	8.7	8.7
Compressor 1 - per Compressor				
Motor Rating	(1)	kW	2	2
Full Load Amps		A	3.6	3.6
Locked Rotor Amps		A	28	28
Type of Start			Direct on Line	Direct on Line
Compressor 2 - per Compressor				
Motor Rating	(1)	kW	N/A	N/A
Full Load Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
OPTIONAL EXTRAS				
Heating				
Power Rating		kW	3	3
Nominal Run Amps		A	4.3	4.3
No of Stages			1	1
No of Elements			3	3
Electronic Soft Start	(2)			
Nominal Run Amps		A	8.0	7.5
Maximum Start Amps		A	21.2	19.7
Recommended Mains Fuse		A	10	10

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

400V

## Technical Data - 400V 50Hz

## ET08D

## Mechanical Data

			ET08D-HX1F0-0	ET08D-HX1F1-0
Technical	Capacity - DX Cooling			
	Gross Total	(1) kW	8.4	8.4
	Gross Sensible	(1) kW	8.4	8.4
	EER		2.93	2.93
	Capacity Steps		1	1
	Capacity - Free Cooling			
	Gross Total	(2) kW	8.82	7.02
	Max Airflow	m³/s	0.73	0.58
	Dimensions			
	W x D x H	mm	910 x 580 x 2219	
400V	Weights			
	Machine	kg	287	287
	Operating	kg	290	289
	Construction			
	Material/Colour		Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)	
	Evaporator		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.304	0.304
	Nominal Airflow	m³/s	0.70	0.70
	Discharge		Horizontal	Horizontal
	Condenser		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.616	0.616
	Nominal Airflow	m³/s	1.66	1.66
	Discharge		Vertical	Vertical
	Fan - Evaporator		EC	DC
	Quantity		1	1
	Diameter	mm	310	355
	Maximum Speed	rpm	2360	1760
	Fan - Condenser		AC	AC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1400	1400
	Compressor		Scroll	Scroll
	Quantity		1	1
	Oil Charge Volume (Total)	l	0.74	0.74
	Oil Type		POE	POE
	Refrigeration		Single Circuit	Single Circuit
	Refrigeration Control		EEV	EEV
	Refrigerant Type		R410A	R410A
	GWP		2088	2088
	Charge (Total)	kg	2.36	2.4
	Tonnes equivalent CO <sub>2</sub>	tCO <sub>2</sub>	4.93	5.01
	Filtration		ISO-C-80	ISO-C-80
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Upgraded Fan - Evaporator		EC	-
	Quantity		1	-
	Diameter	mm	310	-
	Maximum Speed	rpm	2640	-
	Upgraded Fan - Condenser		EC	EC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1500	1500
	Filtration		ISO-C-95	ISO-C-95
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Heating	kW	3.0	3.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 400V 50Hz

## ET08D

## Electrical Data

			ET08D-HX1F0-0	ET08D-HX1F1-0
<b>Electrical Supply Data</b>				
Mains Supply		V	400 / 3PH + N / 50Hz	400 / 3PH + N / 50Hz
Clients Backup Power Supply		V	N/A	48VDC
Controls Circuit		V	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm <sup>2</sup>	10	10
Mechanical Cooling - ARI (AC)	(3)			
Nominal Run Amps		A	9.0	8.5
Maximum Start Amps		A	42.4	40.9
Recommended Mains Fuse		A	16	10
Mechanical Cooling - Max (AC)	(4)			
Nominal Run Amps		A	10.1	9.6
Maximum Start Amps		A	42.4	40.9
Recommended Mains Fuse		A	16	16
Free Cooling mode (AC)				
Nominal Run Amps		A	2.2	1
Clients -48VDC Backup Supply				
Nominal Run Amps		A	N/A	7.1
Recommended Mains Fuse		A	N/A	10
Evaporator Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.5	0.29
Full Load Amps		A	2.2	6.1
Locked Rotor Amps		A	2.2	6.1
Condenser Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.6	0.6
Full Load Amps		A	2.9	2.9
Locked Rotor Amps		A	8.7	8.7
Compressor 1 - per Compressor				
Motor Rating	(1)	kW	2.58	2.58
Full Load Amps		A	4.6	4.6
Locked Rotor Amps		A	38	38
Type of Start			Direct on Line	Direct on Line
Compressor 2 - per Compressor				
Motor Rating	(1)	kW	N/A	N/A
Full Load Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
<b>OPTIONAL EXTRAS</b>				
Heating				
Power Rating		kW	3	3
Nominal Run Amps		A	4.3	4.3
No of Stages			1	1
No of Elements			3	3
Electronic Soft Start	(2)			
Nominal Run Amps		A	9.0	8.5
Maximum Start Amps		A	27.2	25.7
Recommended Mains Fuse		A	16	10

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

400V

## Technical Data - 400V 50Hz

## ET12D

## Mechanical Data

			ET12D-HX1F0-0	ET12D-HX1F1-0	ET12D-HX2F0-0	ET12D-HX2F1-0
<b>Capacity - DX Cooling</b>						
Gross Total	(1)	kW	12.3	12.3	13.14	13.14
Gross Sensible	(1)	kW	12.3	12.3	13.14	13.14
EER			3.41	3.28	3.03	2.94
Capacity Steps			1	1	2	2
<b>Capacity - Free Cooling</b>						
Gross Total	(2)	kW	12.36	10.24	12.36	10.24
Max Airflow		m³/s	1.02	0.85	1.02	0.85
<b>Dimensions</b>						
W x D x H		mm	1020 x 580 x 2368			
<b>Weights</b>						
Machine		kg	333	333	352	350.9
Operating		kg	339	338	357	356
<b>Construction</b>						
Material/Colour			Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)			
<b>Evaporator</b>			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.348	0.348	0.348	0.348
Nominal Airflow		m³/s	0.95	0.95	0.95	0.95
Discharge			Horizontal	Horizontal	Horizontal	Horizontal
<b>Condenser</b>			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.968	0.968	0.968	0.968
Nominal Airflow		m³/s	1.65	1.65	1.65	1.65
Discharge			Vertical	Vertical	Vertical	Vertical
<b>Fan - Evaporator</b>			EC	DC	EC	DC
Quantity			2	2	2	2
Diameter		mm	310	310	310	310
Maximum Speed		rpm	2360	2020	2360	2020
<b>Fan - Condenser</b>			AC	AC	AC	AC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1400	1400	1400	1400
<b>Compressor</b>			Scroll	Scroll	Scroll	Scroll
Quantity			1	1	2	2
Oil Charge Volume (Total)		l	1.25	1.25	1.48	1.48
Oil Type			POE	POE	POE	POE
<b>Refrigeration</b>			Single Circuit	Single Circuit	Dual Circuit	Dual Circuit
Refrigeration Control			EEV	EEV	EEV	EEV
Refrigerant Type			R410A	R410A	R410A	R410A
GWP			2088	2088	2088	2088
Charge (Total)		kg	5.18	5.18	2.66 , 2.64	2.66 , 2.64
Tonnes equivalent CO <sub>2</sub>		tCO <sub>2</sub>	10.82	10.82	5.55 , 5.51	5.55 , 5.51
<b>Filtration</b>			ISO-C-80	ISO-C-80	ISO-C-80	ISO-C-80
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
<b>Upgraded Fan - Evaporator</b>			EC	-	EC	-
Quantity			2	-	2	-
Diameter		mm	310	-	310	-
Maximum Speed		rpm	2640	-	2640	-
<b>Upgraded Fan - Condenser</b>			EC	EC	EC	EC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1500	1500	1500	1500
<b>Filtration</b>			ISO-C-95	ISO-C-95	ISO-C-95	ISO-C-95
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
<b>Heating</b>			kW			
			6.0	6.0	6.0	6

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 400V 50Hz

## ET12D

## Electrical Data

			ET12D-HX1F0-0	ET12D-HX1F1-0	ET12D-HX2F0-0	ET12D-HX2F1-0
Electrical Supply Data						
Mains Supply		V	400 / 3PH + N / 50Hz	400 / 3PH + N / 50Hz	400 / 3PH + N / 50Hz	400 / 3PH + N / 50Hz
Clients Backup Power Supply		V	N/A	48VDC	N/A	48VDC
Controls Circuit		V	24VAC	24VDC	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm <sup>2</sup>	10	10	10	10
Mechanical Cooling - ARI (AC)	(3)					
Nominal Run Amps		A	10.0	9.5	11.6	11.1
Maximum Start Amps		A	47.4	45.9	36.0	34.5
Recommended Mains Fuse		A	16	16	16	16
Mechanical Cooling - Max (AC)	(4)					
Nominal Run Amps		A	11.7	11.2	13.6	13.1
Maximum Start Amps		A	47.4	45.9	37.0	35.5
Recommended Mains Fuse		A	16	16	16	16
Free Cooling mode (AC)						
Nominal Run Amps		A	4.4	1	4.4	1
Clients -48VDC Backup Supply						
Nominal Run Amps		A	N/A	11.6	N/A	11.6
Recommended Mains Fuse		A	N/A	16	N/A	16
Evaporator Fan - per Fan						
Quantity			2	2	2	2
Motor Rating	(1)	kW	0.5	0.25	0.5	0.25
Full Load Amps		A	2.2	5.3	2.2	5.3
Locked Rotor Amps		A	2.2	5.3	2.2	5.3
Condenser Fan - per Fan						
Quantity			1	1	1	1
Motor Rating	(1)	kW	0.6	0.6	0.6	0.6
Full Load Amps		A	2.9	2.9	2.9	2.9
Locked Rotor Amps		A	8.7	8.7	8.7	8.7
Compressor 1 - per Compressor						
Motor Rating	(1)	kW	3.31	3.31	2	2
Full Load Amps		A	5.6	5.6	3.6	3.6
Locked Rotor Amps		A	43	43	28	28
Type of Start			Direct on Line	Direct on Line	Direct on Line	Direct on Line
Compressor 2 - per Compressor						
Motor Rating	(1)	kW	N/A	N/A	2	2
Full Load Amps		A	N/A	N/A	3.58	3.58
Locked Rotor Amps		A	N/A	N/A	28	28
Type of Start			N/A	N/A	Direct on Line	Direct on Line
OPTIONAL EXTRAS						
Heating						
Power Rating		kW	6	6	6	6
Nominal Run Amps		A	8.7	8.7	8.7	8.7
No of Stages			1	1	1	1
No of Elements			6	6	6	6
Electronic Soft Start	(2)					
Nominal Run Amps		A	10.0	9.5	11.6	11.1
Maximum Start Amps		A	30.2	28.7	24.8	23.3
Recommended Mains Fuse		A	16	16	16	16

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

400V

## Technical Data - 400V 50Hz

## ET15D

## Mechanical Data

			ET15D-HX1F0-0	ET15D-HX1F1-0	ET15D-HX2F0-0	ET15D-HX2F1-0
Capacity - DX Cooling						
Gross Total	(1)	kW	14.84	14.84	15.28	15.28
Gross Sensible	(1)	kW	14.84	14.84	15.28	15.28
EER			3.11	2.99	2.84	2.74
Capacity Steps			1	1	2	2
Capacity - Free Cooling						
Gross Total	(2)	kW	12.41	10.28	12.41	10.28
Max Airflow		m³/s	1.03	0.85	1.03	0.85
Dimensions						
W x D x H		mm	1020 x 580 x 2368			
Weights						
Machine		kg	336	353	353	353
Operating		kg	342	358	359	358
Construction						
Material/Colour			Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)			
Evaporator			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.348	0.348	0.348	0.348
Nominal Airflow		m³/s	1.10	1.10	1.10	1.100
Discharge			Horizontal	Horizontal	Horizontal	Horizontal
Condenser			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.968	0.968	0.968	0.968
Nominal Airflow		m³/s	1.65	1.65	1.65	1.65
Discharge			Vertical	Vertical	Vertical	Vertical
Fan - Evaporator			EC	DC	EC	DC
Quantity			2	2	2	2
Diameter		mm	310	310	310	310
Maximum Speed		rpm	2360	2020	2360	2020
Fan - Condenser			AC	AC	AC	AC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1400	1400	1400	1400
Compressor			Scroll	Scroll	Scroll	Scroll
Quantity			1	1	2	2
Oil Charge Volume (Total)		l	1.24	1.24	1.48	1.48
Oil Type			POE	POE	POE	POE
Refrigeration			Single Circuit	Single Circuit	Dual Circuit	Dual Circuit
Refrigeration Control			EEV	EEV	EEV	EEV
Refrigerant Type			R410A	R410A	R410A	R410A
GWP			2088	2088	2088	2088
Charge (Total)		kg	5.17	5.17	2.65 , 2.64	2.65 , 2.64
Tonnes equivalent CO <sub>2</sub>		tCO <sub>2</sub>	10.79	10.79	5.53 , 5.51	5.53 , 5.51
Filtration			ISO-C-80	ISO-C-80	ISO-C-80	ISO-C-80
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
Upgraded Fan - Evaporator			EC	-	EC	-
Quantity			2	-	2	-
Diameter		mm	310	-	310	-
Maximum Speed		rpm	2640	-	2640	-
Upgraded Fan - Condenser			EC	EC	EC	EC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1500	1500	1500	1500
Filtration			ISO-C-95	ISO-C-95	ISO-C-95	ISO-C-95
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
Heating			kW			
			6.0	6.0	6.0	6.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 400V 50Hz

## ET15D

## Electrical Data

			ET15D-HX1F0-0	ET15D-HX1F1-0	ET15D-HX2F0-0	ET15D-HX2F1-0
Electrical Supply Data						
Mains Supply		V	400 / 3PH + N / 50Hz	400 / 3PH + N / 50Hz	400 / 3PH + N / 50Hz	400 / 3PH + N / 50Hz
Clients Backup Power Supply		V	N/A	48VDC	N/A	48VDC
Controls Circuit		V	24VAC	24VDC	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm <sup>2</sup>	10	10	10	10
Mechanical Cooling - ARI (AC)	(3)					
Nominal Run Amps		A	11.5	11.0	13.0	14.5
Maximum Start Amps		A	55.9	54.4	46.7	54.2
Recommended Mains Fuse		A	16	16	16	20
Mechanical Cooling - Max (AC)	(4)					
Nominal Run Amps		A	13.6	13.1	15.2	17.2
Maximum Start Amps		A	55.9	54.4	47.8	55.6
Recommended Mains Fuse		A	16	16	20	20
Free Cooling mode (AC)						
Nominal Run Amps		A	4.4	1	4.4	1
Clients -48VDC Backup Supply						
Nominal Run Amps		A	N/A	11.6	N/A	11.6
Recommended Mains Fuse		A	N/A	16	N/A	16
Evaporator Fan - per Fan						
Quantity			2	2	2	2
Motor Rating	(1)	kW	0.5	0.25	0.5	0.25
Full Load Amps		A	2.2	5.3	2.2	5.3
Locked Rotor Amps		A	2.2	5.3	2.2	5.3
Condenser Fan - per Fan						
Quantity			1	1	1	1
Motor Rating	(1)	kW	0.6	0.6	0.6	0.6
Full Load Amps		A	2.9	2.9	2.9	2.9
Locked Rotor Amps		A	8.7	8.7	8.7	8.7
Compressor 1 - per Compressor						
Motor Rating	(1)	kW	4.21	4.21	2.38	2.92
Full Load Amps		A	7.1	7.1	4.3	5.3
Locked Rotor Amps		A	51.5	51.5	38	46
Type of Start			Direct on Line	Direct on Line	Direct on Line	Direct on Line
Compressor 2 - per Compressor						
Motor Rating	(1)	kW	N/A	N/A	2.38	2.92
Full Load Amps		A	N/A	N/A	4.29	5.32
Locked Rotor Amps		A	N/A	N/A	38	46
Type of Start			N/A	N/A	Direct on Line	
OPTIONAL EXTRAS						
Heating						
Power Rating		kW	6	6	6	6
Nominal Run Amps		A	8.7	8.7	8.7	8.7
No of Stages			1	1	1	1
No of Elements			6	6	6	6
Electronic Soft Start	(2)					
Nominal Run Amps		A	11.5	11.0	13.0	14.5
Maximum Start Amps		A	35.3	33.8	31.5	35.8
Recommended Mains Fuse		A	16	16	16	20

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

400V

**Technical Data - 230V 50Hz****Performance Data**

	Air On °C / %RH	Ambient °C									
		25		30		35		40		45	
		TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)
ET05D-HX1F0-7	28°C 33.7%	6.1	6.1	6.1	6.1	5.9	5.9	5.5	5.5	5.1	5.1
	30°C 30%	6.3	6.3	6.3	6.3	6.1	6.1	5.8	5.8	5.4	5.4
	32°C 26.8%	6.6	6.6	6.6	6.6	6.4	6.4	6.0	6.0	5.6	5.6
ET05D-HX1F1-7	28°C 33.7%	6.1	6.1	6.1	6.1	5.9	5.9	5.5	5.5	5.1	5.1
	30°C 30%	6.3	6.3	6.3	6.3	6.1	6.1	5.8	5.8	5.4	5.4
	32°C 26.8%	6.6	6.6	6.6	6.6	6.4	6.4	6.0	6.0	5.6	5.6
ET08D-HX1F0-7	28°C 33.7%	8.4	8.4	8.3	8.3	8.0	8.0	7.5	7.5	7.0	7.0
	30°C 30%	8.9	8.9	8.8	8.8	8.4	8.4	7.9	7.9	7.4	7.4
	32°C 26.8%	9.3	9.3	9.1	9.1	8.8	8.8	8.3	8.3	7.7	7.7
ET08D-HX1F1-7	28°C 33.7%	8.4	8.4	8.3	8.3	8.0	8.0	7.5	7.5	7.0	7.0
	30°C 30%	8.9	8.9	8.8	8.8	8.4	8.4	7.9	7.9	7.4	7.4
	32°C 26.8%	9.3	9.3	9.1	9.1	8.8	8.8	8.3	8.3	7.7	7.7
ET12D-HX1F0-7	28°C 33.7%	12.5	12.5	12.2	12.2	11.8	11.8	11.0	11.0	10.2	10.2
	30°C 30%	13.2	13.2	12.9	12.9	12.4	12.4	11.6	11.6	10.8	10.8
	32°C 26.8%	13.8	13.8	13.5	13.5	13.0	13.0	12.2	12.2	11.4	11.4
ET12D-HX1F1-7	28°C 33.7%	12.5	12.5	12.2	12.2	11.8	11.8	11.0	11.0	10.2	10.2
	30°C 30%	13.2	13.2	12.9	12.9	12.4	12.4	11.6	11.6	10.8	10.8
	32°C 26.8%	13.8	13.8	13.5	13.5	13.0	13.0	12.2	12.2	11.4	11.4
ET12D-HX2F0-7	28°C 33.7%	13.6	13.6	13.2	13.2	12.7	12.7	11.8	11.8	11.0	11.0
	30°C 30%	14.3	14.3	13.9	13.9	13.3	13.3	12.5	12.5	11.6	11.6
	32°C 26.8%	14.9	14.9	14.5	14.5	13.9	13.9	13.1	13.1	12.2	12.2
ET12D-HX2F1-7	28°C 33.7%	13.6	13.6	13.2	13.2	12.7	12.7	11.8	11.8	11.0	11.0
	30°C 30%	14.3	14.3	13.9	13.9	13.3	13.3	12.5	12.5	11.6	11.6
	32°C 26.8%	14.9	14.9	14.5	14.5	13.9	13.9	13.1	13.1	12.2	12.2
ET15D-HX1F0-7	28°C 33.7%	15.3	15.3	14.7	14.7	14.1	14.1	13.2	13.2	12.2	12.2
	30°C 30%	16.0	16.0	15.5	15.5	14.9	14.9	13.9	13.9	12.9	12.9
	32°C 26.8%	16.7	16.7	16.1	16.1	15.5	15.5	14.5	14.5	13.5	13.5
ET15D-HX1F1-7	28°C 33.7%	15.3	15.3	14.7	14.7	14.1	14.1	13.2	13.2	12.2	12.2
	30°C 30%	16.0	16.0	15.5	15.5	14.9	14.9	13.9	13.9	12.9	12.9
	32°C 26.8%	16.7	16.7	16.1	16.1	15.5	15.5	14.5	14.5	13.5	13.5
ET15D-HX2F0-7	28°C 33.7%	15.9	15.9	15.3	15.3	14.6	14.6	13.6	13.6	12.6	12.6
	30°C 30%	16.6	16.6	16.0	16.0	15.4	15.4	14.4	14.4	13.3	13.3
	32°C 26.8%	17.3	17.3	16.7	16.7	16.1	16.1	15.0	15.0	14.0	14.0
ET15D-HX2F1-7	28°C 33.7%	15.9	15.9	15.3	15.3	14.6	14.6	13.6	13.6	12.6	12.6
	30°C 30%	16.6	16.6	16.0	16.0	15.4	15.4	14.4	14.4	13.3	13.3
	32°C 26.8%	17.3	17.3	16.7	16.7	16.1	16.1	15.0	15.0	14.0	14.0

TC (kW) Gross Total Cooling

SC (kW) Gross Sensible Cooling

Technical

230V

Intentionally Blank

Technical

230V

## Technical Data - 230V 50Hz

## ET05D

## Mechanical Data

			ET05D-HX1F0-7	ET05D-HX1F1-7
Technical	Capacity - DX Cooling			
	Gross Total	(1) kW	6.15	6.15
	Gross Sensible	(1) kW	6.15	6.15
	EER		2.91	2.89
	Capacity Steps		1	1
	Capacity - Free Cooling			
	Gross Total	(2) kW	5.25	6.59
	Max Airflow	m³/s	0.43	0.55
	Dimensions			
	W x D x H	mm	910 x 580 x 2219	
230V	Weights			
	Machine	kg	278	279
	Operating	kg	280	281
	Construction			
	Material/Colour		Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)	
	Evaporator		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.304	0.304
	Nominal Airflow	m³/s	0.37	0.37
	Discharge		Horizontal	Horizontal
	Condenser		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.616	0.616
	Nominal Airflow	m³/s	1.66	1.66
	Discharge		Vertical	Vertical
	Fan - Evaporator		EC	DC
	Quantity		1	1
	Diameter	mm	310	355
	Maximum Speed	rpm	1525	1760
	Fan - Condenser		AC	AC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1400	1400
	Compressor		Scroll	Scroll
	Quantity		1	1
	Oil Charge Volume (Total)	l	0.74	0.74
	Oil Type		POE	POE
	Refrigeration		Single Circuit	Single Circuit
	Refrigeration Control		EEV	EEV
	Refrigerant Type		R410A	R410A
	GWP		2088	2088
	Charge (Total)	kg	2.36	2.36
	Tonnes equivalent CO <sub>2</sub>	tCO <sub>2</sub>	4.93	4.93
	Filtration		ISO-C-80	ISO-C-80
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Upgraded Fan - Evaporator		EC	-
	Quantity		1	-
	Diameter	mm	310	-
	Maximum Speed	rpm	2360	-
	Upgraded Fan - Condenser		EC	EC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1500	1500
	Filtration		ISO-C-95	ISO-C-95
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Heating	kW	3.0	3.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 230V 50Hz

## ET05D

## Electrical Data

			ET05D-HX1F0-7	ET05D-HX1F1-7
Electrical Supply Data				
Mains Supply		V	230 / 1PH + N / 50Hz	230 / 1PH + N / 50Hz
Clients Backup Power Supply		V	N/A	48VDC
Controls Circuit		V	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm²	10	10
Mechanical Cooling - ARI (AC)	(3)			
Nominal Run Amps		A	14.9	13.2
Maximum Start Amps		A	65.6	63.9
Recomended Mains Fuse		A	20	16
Mechanical Cooling - Max (AC)	(4)			
Nominal Run Amps		A	18.2	16.5
Maximum Start Amps		A	65.6	63.9
Recommended Mains Fuse		A	25	20
Free Cooling mode (AC)				
Nominal Run Amps		A	1.2	1
Clients -48VDC Backup Supply				
Nominal Run Amps		A	N/A	7.1
Recomended Mains Fuse		A	N/A	10
Evaporator Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.15	0.29
Full Load Amps		A	1.2	6.1
Locked Rotor Amps		A	1.2	6.1
Condenser Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.6	0.6
Full Load Amps		A	2.9	2.9
Locked Rotor Amps		A	8.7	8.7
Compressor 1 - per Compressor				
Motor Rating	(1)	kW	2	2
Full Load Amps		A	9.3	9.3
Locked Rotor Amps		A	60	60
Type of Start			Direct on Line	Direct on Line
Compressor 2 - per Compressor				
Motor Rating	(1)	kW	N/A	N/A
Full Load Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
OPTIONAL EXTRAS				
Heating				
Power Rating		kW	3	3
Nominal Run Amps		A	13.0	13.0
No of Stages			1	1
No of Elements			3	3
Electronic Soft Start	(2)			
Nominal Run Amps		A	14.9	13.2
Maximum Start Amps		A	41.6	39.9
Recommended Mains Fuse		A	20	16

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

230V

## Technical Data - 230V 50Hz

## ET08D

## Mechanical Data

			ET08D-HX1F0-7	ET08D-HX1F1-7
Technical	Capacity - DX Cooling			
	Gross Total	(1) kW	8.44	8.44
	Gross Sensible	(1) kW	8.44	8.44
	EER		2.92	2.93
	Capacity Steps		1	1
	Capacity - Free Cooling			
	Gross Total	(2) kW	8.82	7.02
	Max Airflow	m³/s	0.73	0.58
	Dimensions			
	W x D x H	mm	910 x 580 x 2219	
230V	Weights			
	Machine	kg	287	287
	Operating	kg	290	289
	Construction			
	Material/Colour		Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)	
	Evaporator		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.304	0.304
	Nominal Airflow	m³/s	0.70	0.70
	Discharge		Horizontal	Horizontal
	Condenser		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.616	0.616
	Nominal Airflow	m³/s	1.66	1.66
	Discharge		Vertical	Vertical
	Fan - Evaporator		EC	DC
	Quantity		1	1
	Diameter	mm	310	355
	Maximum Speed	rpm	2360	1760
	Fan - Condenser		AC	AC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1400	1400
	Compressor		Scroll	Scroll
	Quantity		1	1
	Oil Charge Volume (Total)	l	0.74	0.74
	Oil Type		POE	POE
	Refrigeration		Single Circuit	Single Circuit
	Refrigeration Control		EEV	EEV
	Refrigerant Type		R410A	R410A
	GWP		2088	2088
	Charge (Total)	kg	2.36	2.36
	Tonnes equivalent CO <sub>2</sub>	tCO <sub>2</sub>	4.93	4.93
	Filtration		ISO-C-80	ISO-C-80
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Upgraded Fan - Evaporator		EC	-
	Quantity		1	-
	Diameter	mm	310	-
	Maximum Speed	rpm	2640	-
	Upgraded Fan - Condenser		EC	EC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1500	1500
	Filtration		ISO-C-95	ISO-C-95
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Heating	kW	3.0	3.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 230V 50Hz

## ET08D

## Electrical Data

			ET08D-HX1F0-7	ET08D-HX1F1-7
Electrical Supply Data				
Mains Supply		V	230 / 1PH + N / 50Hz	230 / 1PH + N / 50Hz
Clients Backup Power Supply		V	N/A	48VDC
Controls Circuit		V	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm²	10	10
Mechanical Cooling - ARI (AC)	(3)			
Nominal Run Amps		A	18.4	15.7
Maximum Start Amps		A	73.6	70.9
Recomended Mains Fuse		A	25	20
Mechanical Cooling - Max (AC)	(4)			
Nominal Run Amps		A	22.9	20.2
Maximum Start Amps		A	73.6	70.9
Recommended Mains Fuse		A	32	25
Free Cooling mode (AC)				
Nominal Run Amps		A	2.2	1
Clients -48VDC Backup Supply				
Nominal Run Amps		A	N/A	7.1
Recomended Mains Fuse		A	N/A	10
Evaporator Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.5	0.29
Full Load Amps		A	2.2	6.1
Locked Rotor Amps		A	2.2	6.1
Condenser Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.6	0.6
Full Load Amps		A	2.9	2.9
Locked Rotor Amps		A	8.7	8.7
Compressor 1 - per Compressor				
Motor Rating	(1)	kW	2.55	2.55
Full Load Amps		A	11.8	11.8
Locked Rotor Amps		A	67	67
Type of Start			Direct on Line	Direct on Line
Compressor 2 - per Compressor				
Motor Rating	(1)	kW	N/A	N/A
Full Load Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
OPTIONAL EXTRAS				
Heating				
Power Rating		kW	3	3
Nominal Run Amps		A	13.0	13.0
No of Stages			1	1
No of Elements			3	3
Electronic Soft Start	(2)			
Nominal Run Amps		A	18.4	15.7
Maximum Start Amps		A	46.8	44.1
Recommended Mains Fuse		A	25	20

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

## Technical Data - 230V 50Hz

## ET12D

## Mechanical Data

			ET12D-HX1F0-7	ET12D-HX1F1-7	ET12D-HX2F0-7	ET12D-HX2F1-7
Capacity - DX Cooling						
Gross Total	(1)	kW	12.4	12.4	13.33	13.33
Gross Sensible	(1)	kW	12.4	12.4	13.33	13.33
EER			3.31	3.2	3.11	3.01
Capacity Steps			1	1	2	2
Capacity - Free Cooling						
Gross Total	(2)	kW	12.36	10.24	12.36	10.24
Max Airflow		m³/s	1.02	0.85	1.02	0.85
Dimensions						
W x D x H		mm	1020 x 580 x 2368			
Weights						
Machine		kg	333	333	352	351
Operating		kg	339	338	357	356
Construction						
Material/Colour			Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)			
Evaporator			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.348	0.348	0.348	0.348
Nominal Airflow		m³/s	0.95	0.95	0.95	0.95
Discharge			Horizontal	Horizontal	Horizontal	Horizontal
Condenser			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.968	0.968	0.968	0.968
Nominal Airflow		m³/s	1.65	1.65	1.65	1.65
Discharge			Vertical	Vertical	Vertical	Vertical
Fan - Evaporator			EC	DC	EC	DC
Quantity			2	2	2	2
Diameter		mm	310	310	310	310
Maximum Speed		rpm	2360	2020	2360	2020
Fan - Condenser			AC	AC	AC	AC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1400	1400	1400	1400
Compressor			Scroll	Scroll	Scroll	Scroll
Quantity			1	1	2	2
Oil Charge Volume (Total)		l	1.25	1.25	1.48	1.48
Oil Type			POE	POE	POE	POE
Refrigeration			Single Circuit	Single Circuit	Dual Circuit	Dual Circuit
Refrigeration Control			EEV	EEV	EEV	EEV
Refrigerant Type			R410A	R410A	R410A	R410A
GWP			2088	2088	2088	2088
Charge (Total)		kg	5.18	5.18	2.66 , 2.64	2.66 , 2.64
Tonnes equivalent CO <sub>2</sub>		tCO <sub>2</sub>	10.82	10.82	5.55 , 5.51	5.55 , 5.51
Filtration			ISO-C-80	ISO-C-80	ISO-C-80	ISO-C-80
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
Upgraded Fan - Evaporator			EC	-	EC	-
Quantity			2	-	2	-
Diameter		mm	310	-	310	-
Maximum Speed		rpm	2640	-	2640	-
Upgraded Fan - Condenser			EC	EC	EC	EC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1500	1500	1500	1500
Filtration			ISO-C-95	ISO-C-95	ISO-C-95	ISO-C-95
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
Heating			kW			
			6.0	6.0	6.0	6.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 230V 50Hz

## ET12D

## Electrical Data

			ET12D-HX1F0-7	ET12D-HX1F1-7	ET12D-HX2F0-7	ET12D-HX2F1-7
Electrical Supply Data						
Mains Supply		V	230 / 1PH + N / 50Hz	230 / 1PH + N / 50Hz	230 / 1PH + N / 50Hz	230 / 1PH + N / 50Hz
Clients Backup Power Supply		V	N/A	48VDC	N/A	48VDC
Controls Circuit		V	24VAC	24VDC	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm <sup>2</sup>	10	10	10	10
Mechanical Cooling - ARI (AC)	(3)					
Nominal Run Amps		A	24.7	19.8	27.4	22.5
Maximum Start Amps		A	136.8	131.9	78.11	73.21
Recommended Mains Fuse		A	32	25	32	32
Mechanical Cooling - Max (AC)	(4)					
Nominal Run Amps		A	29.7	24.8	34.0	29.1
Maximum Start Amps		A	136.8	131.9	81.38	76.48
Recommended Mains Fuse		A	40	32	40	40
Free Cooling mode (AC)						
Nominal Run Amps		A	4.4	1	4.4	1
Clients -48VDC Backup Supply						
Nominal Run Amps		A	N/A	11.6	N/A	11.6
Recommended Mains Fuse		A	N/A	16	N/A	16
Evaporator Fan - per Fan						
Quantity			2	2	2	2
Motor Rating	(1)	kW	0.5	0.25	0.5	0.25
Full Load Amps		A	2.2	5.3	2.2	5.3
Locked Rotor Amps		A	2.2	5.3	2.2	5.3
Condenser Fan - per Fan						
Quantity			1	1	1	1
Motor Rating	(1)	kW	0.6	0.6	0.6	0.6
Full Load Amps		A	2.9	2.9	2.9	2.9
Locked Rotor Amps		A	8.7	8.7	8.7	8.7
Compressor 1 - per Compressor						
Motor Rating	(1)	kW	3.45	3.45	2	2
Full Load Amps		A	15.9	15.9	9.3	9.3
Locked Rotor Amps		A	128	128	60	60
Type of Start			Direct on Line	Direct on Line	Direct on Line	Direct on Line
Compressor 2 - per Compressor						
Motor Rating	(1)	kW	N/A	N/A	2	2
Full Load Amps		A	N/A	N/A	9.31	9.31
Locked Rotor Amps		A	N/A	N/A	60	60
Type of Start			N/A	N/A	Direct on Line	Direct on Line
OPTIONAL EXTRAS						
Heating						
Power Rating		kW	6	6	6	6
Nominal Run Amps		A	26.1	26.1	26.1	26.1
No of Stages			1	1	1	1
No of Elements			6	6	6	6
Electronic Soft Start	(2)					
Nominal Run Amps		A	24.7	19.8	27.4	22.5
Maximum Start Amps		A	85.6	80.7	54.11	49.21
Recommended Mains Fuse		A	32	25	32	32

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

230V

## Technical Data - 230V 50Hz

## ET15D

## Mechanical Data

			ET15D-HX1F0-7	ET15D-HX1F1-7	ET15D-HX2F0-7	ET15D-HX2F1-7
Capacity - DX Cooling						
Gross Total	(1)	kW	14.85	14.85	15.39	15.39
Gross Sensible	(1)	kW	14.85	14.85	15.39	15.39
EER			3.07	2.94	2.9	2.79
Capacity Steps			1	1	2	2
Capacity - Free Cooling						
Gross Total	(2)	kW	12.41	10.28	12.41	10.28
Max Airflow		m³/s	1.03	0.85	1.03	0.85
Dimensions						
W x D x H		mm	1020 x 580 x 2368			
Weights						
Machine		kg	336	336	353	353
Operating		kg	342	341	359	358.1
Construction						
Material/Colour			Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)			
Evaporator			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.348	0.348	0.348	0.348
Nominal Airflow		m³/s	1.10	1.10	1.10	1.100
Discharge			Horizontal	Horizontal	Horizontal	Horizontal
Condenser			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.968	0.968	0.968	0.968
Nominal Airflow		m³/s	1.65	1.65	1.65	1.65
Discharge			Vertical	Vertical	Vertical	Vertical
Fan - Evaporator			EC	DC	EC	DC
Quantity			2	2	2	2
Diameter		mm	310	310	310	310
Maximum Speed		rpm	2360	2020	2360	2020
Fan - Condenser			AC	AC	AC	AC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1400	1400	1400	1400
Compressor			Scroll	Scroll	Scroll	Scroll
Quantity			1	1	2	2
Oil Charge Volume (Total)		l	1.24	1.24	1.48	1.48
Oil Type			POE	POE	POE	POE
Refrigeration			Single Circuit	Single Circuit	Dual Circuit	Dual Circuit
Refrigeration Control			EEV	EEV	EEV	EEV
Refrigerant Type			R410A	R410A	R410A	R410A
GWP			2088	2088	2088	2088
Charge (Total)		kg	5.17	5.17	2.65 , 2.64	2.65 , 2.64
Tonnes equivalent CO <sub>2</sub>		tCO <sub>2</sub>	10.79	10.79	5.53 , 5.51	5.53 , 5.51
Filtration			ISO-C-80	ISO-C-80	ISO-C-80	ISO-C-80
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
Upgraded Fan - Evaporator			EC	-	EC	-
Quantity			2	-	2	-
Diameter		mm	310	-	310	-
Maximum Speed		rpm	2640	-	2640	-
Upgraded Fan - Condenser			EC	EC	EC	EC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1500	1500	1500	1500
Filtration			ISO-C-95	ISO-C-95	ISO-C-95	ISO-C-95
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
Heating			kW			
			6.0	6.0	6.0	6.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 230V 50Hz

## ET15D

## Electrical Data

			ET15D-HX1F0-7	ET15D-HX1F1-7	ET15D-HX2F0-7	ET15D-HX2F1-7
Electrical Supply Data						
Mains Supply		V	230 / 1PH + N / 50Hz	230 / 1PH + N / 50Hz	230 / 1PH + N / 50Hz	230 / 1PH + N / 50Hz
Clients Backup Power Supply		V	N/A	48VDC	N/A	48VDC
Controls Circuit		V	24VAC	24VDC	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm <sup>2</sup>	10	10	35	35
Mechanical Cooling - ARI (AC)	(3)					
Nominal Run Amps		A	29.6	24.7	30.7	25.8
Maximum Start Amps		A	124.8	119.9	86.76	81.86
Recommended Mains Fuse		A	40	32	40	32
Mechanical Cooling - Max (AC)	(4)					
Nominal Run Amps		A	36.4	31.5	38.9	34.0
Maximum Start Amps		A	124.3	119.4	90.84	85.94
Recommended Mains Fuse		A	50	40	50	40
Free Cooling mode (AC)						
Nominal Run Amps		A	4.4	1	4.4	1
Clients -48VDC Backup Supply						
Nominal Run Amps		A	N/A	11.6	N/A	11.6
Recommended Mains Fuse		A	N/A	16	N/A	16
Evaporator Fan - per Fan						
Quantity			2	2	2	2
Motor Rating	(1)	kW	0.5	0.25	0.5	0.25
Full Load Amps		A	2.2	5.3	2.2	5.3
Locked Rotor Amps		A	2.2	5.3	2.2	5.3
Condenser Fan - per Fan						
Quantity			1	1	1	1
Motor Rating	(1)	kW	0.6	0.6	0.6	0.6
Full Load Amps		A	2.9	2.9	2.9	2.9
Locked Rotor Amps		A	8.7	8.7	8.7	8.7
Compressor 1 - per Compressor						
Motor Rating	(1)	kW	4.32	4.32	2.39	2.39
Full Load Amps		A	20.8	20.8	11.0	11.0
Locked Rotor Amps		A	116	116	67	67
Type of Start			Direct on Line	Direct on Line	Direct on Line	Direct on Line
Compressor 2 - per Compressor						
Motor Rating	(1)	kW	N/A	N/A	2.39	2.39
Full Load Amps		A	N/A	N/A	10.96	10.96
Locked Rotor Amps		A	N/A	N/A	67	67
Type of Start			N/A	N/A	Direct on Line	Direct on Line
OPTIONAL EXTRAS						
Heating						
Power Rating		kW	6	6	6	6
Nominal Run Amps		A	26.1	26.1	26.1	26.1
No of Stages			1	1	1	1
No of Elements			6	6	6	6
Electronic Soft Start	(2)					
Nominal Run Amps		A	29.6	24.7	30.7	25.8
Maximum Start Amps		A	78.4	73.5	59.96	55.06
Recommended Mains Fuse		A	40	32	40	32

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

230V

**Technical Data - 380V 60Hz****Performance Data**

	Air On °C / %RH	Ambient °C									
		25		30		35		40		45	
		TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)
ET12D-HX1F0-1	28°C 33.7%	11.8	11.8	11.6	11.6	11.2	11.2	10.4	10.4	9.7	9.7
	30°C 30%	12.5	12.5	12.3	12.3	11.8	11.8	11.1	11.1	10.3	10.3
	32°C 26.8%	13.1	13.1	12.9	12.9	12.4	12.4	11.6	11.6	10.8	10.8
ET12D-HX1F1-1	28°C 33.7%	11.8	11.8	11.6	11.6	11.2	11.2	10.4	10.4	9.7	9.7
	30°C 30%	12.5	12.5	12.3	12.3	11.8	11.8	11.1	11.1	10.3	10.3
	32°C 26.8%	13.1	13.1	12.9	12.9	12.4	12.4	11.6	11.6	10.8	10.8
ET15D-HX1F0-1	28°C 33.7%	15.6	15.6	14.9	14.9	14.3	14.3	13.3	13.3	12.4	12.4
	30°C 30%	16.4	16.4	15.7	15.7	15.0	15.0	14.0	14.0	13.0	13.0
	32°C 26.8%	17.0	17.0	16.3	16.3	15.6	15.6	14.6	14.6	13.6	13.6
ET15D-HX1F1-1	28°C 33.7%	15.6	15.6	14.9	14.9	14.3	14.3	13.3	13.3	12.4	12.4
	30°C 30%	16.4	16.4	15.7	15.7	15.0	15.0	14.0	14.0	13.0	13.0
	32°C 26.8%	17.0	17.0	16.3	16.3	15.6	15.6	14.6	14.6	13.6	13.6
ET15D-HX2F0-1	28°C 33.7%	15.0	15.0	14.6	14.6	14.0	14.0	13.1	13.1	12.2	12.2
	30°C 30%	15.8	15.8	15.3	15.3	14.8	14.8	13.8	13.8	12.9	12.9
	32°C 26.8%	16.5	16.5	16.0	16.0	15.4	15.4	14.5	14.5	13.6	13.6
ET15D-HX2F1-1	28°C 33.7%	15.0	15.0	14.6	14.6	14.0	14.0	13.1	13.1	12.2	12.2
	30°C 30%	15.8	15.8	15.3	15.3	14.8	14.8	13.8	13.8	12.9	12.9
	32°C 26.8%	16.5	16.5	16.0	16.0	15.4	15.4	14.5	14.5	13.6	13.6

TC (kW) Gross Total Cooling

SC (kW) Gross Sensible Cooling

Technical

380V

Intentionally Blank

Technical

380V

## Technical Data - 380V 60Hz

## ET12D

## Mechanical Data

			ET12D-HX1F0-1	ET12D-HX1F1-1
Technical	Capacity - DX Cooling			
	Gross Total	(1) kW	11.81	11.81
	Gross Sensible	(1) kW	11.81	11.81
	EER		2.7	2.62
	Capacity Steps		1	1
	Capacity - Free Cooling			
	Gross Total	(2) kW	12.36	10.24
	Max Airflow	m³/s	1.02	0.85
	Dimensions			
	W x D x H	mm	1020 x 580 x 2368	
380V	Weights			
	Machine	kg	333	333
	Operating	kg	339	338
	Construction			
	Material/Colour		Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)	
	Evaporator		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.348	0.348
	Nominal Airflow	m³/s	0.95	0.95
	Discharge		Horizontal	Horizontal
	Condenser		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.968	0.968
	Nominal Airflow	m³/s	1.76	1.76
	Discharge		Vertical	Vertical
	Fan - Evaporator		EC	DC
	Quantity		2	2
	Diameter	mm	310	310
	Maximum Speed	rpm	2360	2020
	Fan - Condenser		AC	AC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1600	1600
	Compressor		Scroll	Scroll
	Quantity		1	1
	Oil Charge Volume (Total)	l	1.06	1.06
	Oil Type		PVE	PVE
	Refrigeration		Single Circuit	Single Circuit
	Refrigeration Control		EEV	EEV
	Refrigerant Type		R410A	R410A
	GWP		2088	2088
	Charge (Total)	kg	5.16	5.16
	Tonnes equivalent CO <sub>2</sub>	tCO <sub>2</sub>	10.77	10.77
	Filtration		ISO-C-80	ISO-C-80
	Quantity		1	1
	Size W x D x H	mm	923 x 45 x 430	923 x 45 x 430
	Upgraded Fan - Evaporator		EC	-
	Quantity		2	-
	Diameter	mm	310	-
	Maximum Speed	rpm	2640	-
	Upgraded Fan - Condenser		EC	EC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1500	1500
	Filtration		ISO-C-95	ISO-C-95
	Quantity		1	1
	Size W x D x H	mm	923 x 45 x 430	923 x 45 x 430
	Heating	kW	6.0	6.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 380V 60Hz

## ET12D

## Electrical Data

			ET12D-HX1F0-1	ET12D-HX1F1-1
<b>Electrical Supply Data</b>				
Mains Supply		V	380 / 3PH + N / 60Hz	380 / 3PH + N / 60Hz
Clients Backup Power Supply		V	N/A	48VDC
Controls Circuit		V	24VAC	24VDC
Maximum Mains Incoming Cable Size:		mm <sup>2</sup>	10	10
Mechanical Cooling - ARI (AC)	(3)			
Nominal Run Amps		A	12.0	11.5
Maximum Start Amps		A	64.6	63.1
Recommended Mains Fuse		A	16	16
Mechanical Cooling - Max (AC)	(4)			
Nominal Run Amps		A	13.6	13.1
Maximum Start Amps		A	64.6	63.1
Recommended Mains Fuse		A	16	16
Free Cooling mode (AC)				
Nominal Run Amps		A	4.4	1
Clients -48VDC Backup Supply				
Nominal Run Amps		A	N/A	11.6
Recommended Mains Fuse		A	N/A	16
Evaporator Fan - per Fan				
Quantity			2	2
Motor Rating		kW	0.5	0.25
Full Load Amps		A	2.2	5.3
Locked Rotor Amps		A	2.2	5.3
Condenser Fan - per Fan				
Quantity			1	1
Motor Rating		kW	0.82	0.82
Full Load Amps		A	3.5	3.5
Locked Rotor Amps		A	10.5	10.5
Compressor 1 - per Compressor				
Motor Rating		kW	3.9	3.9
Full Load Amps		A	7.0	7.0
Locked Rotor Amps		A	59.6	59.6
Type of Start			Direct on Line	Direct on Line
Compressor 2 - per Compressor				
Motor Rating		kW	N/A	N/A
Full Load Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
<b>OPTIONAL EXTRAS</b>				
Heating				
Power Rating		kW	5.4	5.4
Nominal Run Amps		A	8.2	8.2
No of Stages			1	1
No of Elements			6	6
Electronic Soft Start	(2)			
Nominal Run Amps		A	12.0	11.5
Maximum Start Amps		A	40.8	39.3
Recommended Mains Fuse		A	16	16

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

380V

## Technical Data - 380V 60Hz

## ET15D

## Mechanical Data

			ET15D-HX1F0-1	ET15D-HX1F1-1	ET15D-HX2F0-1	ET15D-HX2F1-1
Capacity - DX Cooling						
Gross Total	(1)	kW	14.97	14.97	14.76	14.76
Gross Sensible	(1)	kW	14.97	14.97	14.76	14.76
EER			2.45	2.37	2.37	2.3
Capacity Steps			1	1	2	2
Capacity - Free Cooling						
Gross Total	(2)	kW	12.41	10.28	12.41	10.28
Max Airflow		m³/s	1.03	0.85	1.03	0.85
Dimensions						
W x D x H		mm	1020 x 580 x 2368			
Weights						
Machine		kg	339	339	370	369
Operating		kg	345	344	375	374
Construction						
Material/Colour			Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)			
Evaporator			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.348	0.348	0.348	0.348
Nominal Airflow		m³/s	1.10	1.10	1.10	1.100
Discharge			Horizontal	Horizontal	Horizontal	Horizontal
Condenser			Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins			
Quantity			1	1	1	1
Face Area		m²	0.968	0.968	0.968	0.968
Nominal Airflow		m³/s	1.76	1.76	1.76	1.76
Discharge			Vertical	Vertical	Vertical	Vertical
Fan - Evaporator			EC	DC	EC	DC
Quantity			2	2	2	2
Diameter		mm	310	310	310	310
Maximum Speed		rpm	2360	2020	2360	2020
Fan - Condenser			AC	AC	AC	AC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1600	1600	1600	1600
Compressor			Scroll	Scroll	Scroll	Scroll
Quantity			1	1	2	2
Oil Charge Volume (Total)		l	1.57	1.57	2.12	2.12
Oil Type			PVE	PVE	PVE	PVE
Refrigeration			Single Circuit	Single Circuit	Dual Circuit	Dual Circuit
Refrigeration Control			EEV	EEV	EEV	EEV
Refrigerant Type			R410A	R410A	R410A	R410A
GWP			2088	2088	2088	2088
Charge (Total)		kg	5.16	5.16	2.69 , 2.68	2.69 , 2.68
Tonnes equivalent CO <sub>2</sub>		tCO <sub>2</sub>	10.77	10.77	5.62 , 5.60	5.62 , 5.60
Filtration			ISO-C-80	ISO-C-80	ISO-C-80	ISO-C-80
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
Upgraded Fan - Evaporator			EC	-	EC	-
Quantity			2	-	2	-
Diameter		mm	310	-	310	-
Maximum Speed		rpm	2640	-	2640	-
Upgraded Fan - Condenser			EC	EC	EC	EC
Quantity			1	1	1	1
Diameter		mm	450	450	450	450
Maximum Speed		rpm	1500	1500	1500	1500
Filtration			ISO-C-95	ISO-C-95	ISO-C-95	ISO-C-95
Quantity			1	1	1	1
Size W x D x H		mm	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430	923 x 45 x 430
Heating			kW			
			6.0	6.0	6.0	6.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 380V 60Hz

## ET15D

## Electrical Data

			ET15D-HX1F0-1	ET15D-HX1F1-1	ET15D-HX2F0-1	ET15D-HX2F1-1
<b>Electrical Supply Data</b>						
Mains Supply	V		380 / 3PH + N / 60Hz	380 / 3PH + N / 60Hz	380 / 3PH + N / 60Hz	380 / 3PH + N / 60Hz
Clients Backup Power Supply	V		N/A	48VDC	N/A	48VDC
Controls Circuit	V		24VAC	24VDC	24VAC	24VDC
Maximum Mains Incoming Cable Size	mm <sup>2</sup>		10	10	10	10
<b>Mechanical Cooling - ARI (AC)</b>						
(3)						
Nominal Run Amps	A		14.5	14.0	15.0	14.5
Maximum Start Amps	A		86	84.5	62	60.5
Recommended Mains Fuse	A		20	16	20	20
<b>Mechanical Cooling - Max (AC)</b>						
(4)						
Nominal Run Amps	A		16.3	15.8	17.4	16.9
Maximum Start Amps	A		86	84.5	63.2	61.7
Recommended Mains Fuse	A		20	20	20	20
<b>Free Cooling mode (AC)</b>						
Nominal Run Amps	A		4.4	1	4.4	1
<b>Clients -48VDC Backup Supply</b>						
Nominal Run Amps	A		N/A	11.6	N/A	11.6
Recommended Mains Fuse	A		N/A	16	N/A	16
<b>Evaporator Fan - per Fan</b>						
Quantity			2	2	2	2
Motor Rating	kW		0.5	0.25	0.5	0.25
Full Load Amps	A		2.2	5.3	2.2	5.3
Locked Rotor Amps	A		2.2	5.3	2.2	5.3
<b>Condenser Fan - per Fan</b>						
Quantity			1	1	1	1
Motor Rating	kW		0.82	0.82	0.82	0.82
Full Load Amps	A		3.5	3.5	3.5	3.5
Locked Rotor Amps	A		10.5	10.5	10.5	10.5
<b>Compressor 1 - per Compressor</b>						
Motor Rating	kW		5.2	5.2	3.0	3.0
Full Load Amps	A		9.5	9.5	5.0	5.0
Locked Rotor Amps	A		81	81	52	52
Type of Start			Direct on Line	Direct on Line	Direct on Line	Direct on Line
<b>Compressor 2 - per Compressor</b>						
Motor Rating	kW		N/A	N/A	3.04	3.04
Full Load Amps	A		N/A	N/A	5	5
Locked Rotor Amps	A		N/A	N/A	52	52
Type of Start			N/A	N/A	Direct on Line	Direct on Line
<b>OPTIONAL EXTRAS</b>						
<b>Heating</b>						
Power Rating	kW		5.4	5.4	5.4	5.4
Nominal Run Amps	A		8.2	8.2	8.2	8.2
No of Stages			1	1	1	1
No of Elements			6	6	6	6
<b>Electronic Soft Start</b>						
(2)						
Nominal Run Amps	A		14.5	14.0	15.0	14.5
Maximum Start Amps	A		53.6	52.1	41.2	39.7
Recommended Mains Fuse	A		20	16	20	20

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

380V

**Technical Data - 220V 60Hz****Performance Data**

	Air On °C / %RH	Ambient °C									
		25		30		35		40		45	
		TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)
ET08D-HX1F0-2	28°C 33.7%	8.2	8.2	8.1	8.1	7.8	7.8	7.3	7.3	6.8	6.8
	30°C 30%	8.6	8.6	8.6	8.6	8.2	8.2	7.7	7.7	7.2	7.2
	32°C 26.8%	9.0	9.0	8.9	8.9	8.6	8.6	8.1	8.1	7.6	7.6
ET08D-HX1F1-2	28°C 33.7%	8.2	8.2	8.1	8.1	7.8	7.8	7.3	7.3	6.8	6.8
	30°C 30%	8.6	8.6	8.6	8.6	8.2	8.2	7.7	7.7	7.2	7.2
	32°C 26.8%	9.0	9.0	8.9	8.9	8.6	8.6	8.1	8.1	7.6	7.6
ET12D-HX1F0-2	28°C 33.7%	12.4	12.4	12.2	12.2	11.8	11.8	11.0	11.0	10.3	10.3
	30°C 30%	13.1	13.1	12.9	12.9	12.4	12.4	11.6	11.6	10.9	10.9
	32°C 26.8%	13.8	13.8	13.5	13.5	13.0	13.0	12.2	12.2	11.4	11.4
ET12D-HX1F1-2	28°C 33.7%	12.4	12.4	12.2	12.2	11.8	11.8	11.0	11.0	10.3	10.3
	30°C 30%	13.1	13.1	12.9	12.9	12.4	12.4	11.6	11.6	10.9	10.9
	32°C 26.8%	13.8	13.8	13.5	13.5	13.0	13.0	12.2	12.2	11.4	11.4
ET15D-HX1F0-2	28°C 33.7%	14.5	14.5	14.0	14.0	13.3	13.3	12.4	12.4	11.6	11.6
	30°C 30%	15.2	15.2	14.7	14.7	14.1	14.1	13.1	13.1	12.2	12.2
	32°C 26.8%	16.0	16.0	15.3	15.3	14.7	14.7	13.7	13.7	12.8	12.8
ET15D-HX1F1-2	28°C 33.7%	14.5	14.5	14.0	14.0	13.3	13.3	12.4	12.4	11.6	11.6
	30°C 30%	15.2	15.2	14.7	14.7	14.1	14.1	13.1	13.1	12.2	12.2
	32°C 26.8%	16.0	16.0	15.3	15.3	14.7	14.7	13.7	13.7	12.8	12.8

TC (kW) Gross Total Cooling

SC (kW) Gross Sensible Cooling

Intentionally Blank

Technical

380V

## Technical Data - 220V 60Hz

## ET08D

## Mechanical Data

			ET08D-HX1F0-2	ET08D-HX1F1-2
Technical	Capacity - DX Cooling			
	Gross Total	(1) kW	8.24	8.24
	Gross Sensible	(1) kW	8.24	8.24
	EER		2.39	2.39
	Capacity Steps		1	1
	Capacity - Free Cooling			
	Gross Total	(2) kW	8.82	7.02
	Max Airflow	m³/s	0.73	0.58
	Dimensions			
	W x D x H	mm	910 x 580 x 2219	
220V	Weights			
	Machine	kg	289	288
	Operating	kg	291	290
	Construction			
	Material/Colour		Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)	
	Evaporator		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.304	0.304
	Nominal Airflow	m³/s	0.70	0.70
	Discharge		Horizontal	Horizontal
	Condenser		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.616	0.616
	Nominal Airflow	m³/s	1.77	1.77
	Discharge		Vertical	Vertical
	Fan - Evaporator		EC	DC
	Quantity		1	1
	Diameter	mm	310	355
	Maximum Speed	rpm	2360	1760
	Fan - Condenser		AC	AC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1600	1600
	Compressor		Scroll	Scroll
	Quantity		1	1
	Oil Charge Volume (Total)	l	1.06	1.06
	Oil Type		PVE	PVE
	Refrigeration		Single Circuit	Single Circuit
	Refrigeration Control		EEV	EEV
	Refrigerant Type		R410A	R410A
	GWP		2088	2088
	Charge (Total)	kg	2.44	2.44
	Tonnes equivalent CO <sub>2</sub>	tCO <sub>2</sub>	5.09	5.09
	Filtration		ISO-C-80	ISO-C-80
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Upgraded Fan - Evaporator		EC	-
	Quantity		1	-
	Diameter	mm	310	-
	Maximum Speed	rpm	2640	-
	Upgraded Fan - Condenser		EC	EC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1500	1500
	Filtration		ISO-C-95	ISO-C-95
	Quantity		1	1
	Size W x D x H	mm	813 x 45 x 430	813 x 45 x 430
	Heating	kW	3.0	3.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 220V 60Hz

## ET08D

## Electrical Data

			ET08D-HX1F0-2	ET08D-HX1F1-2
<b>Electrical Supply Data</b>				
Mains Supply		V	220 / 3PH / 60Hz	220 / 3PH / 60Hz
Clients Backup Power Supply		V	N/A	48VDC
Controls Circuit		V	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm <sup>2</sup>	10	10
Mechanical Cooling - ARI (AC)	(3)			
Nominal Run Amps		A	12.73	13.53
Maximum Start Amps		A	98.7	96
Recommended Mains Fuse		A	16	16
Mechanical Cooling - Max (AC)	(4)			
Nominal Run Amps		A	14.9	15.7
Maximum Start Amps		A	98.7	96
Recommended Mains Fuse		A	20	20
Free Cooling mode (AC)				
Nominal Run Amps		A	3.7	1
Clients -48VDC Backup Supply				
Nominal Run Amps		A	N/A	7.1
Recommended Mains Fuse		A	N/A	10
Evaporator Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.5	0.29
Full Load Amps		A	2.2	6.1
Locked Rotor Amps		A	2.2	6.1
Condenser Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.82	0.82
Full Load Amps		A	3.5	3.5
Locked Rotor Amps		A	10.5	10.5
Compressor 1 - per Compressor				
Motor Rating	(1)	kW	2.8	2.8
Full Load Amps		A	9.0	9.0
Locked Rotor Amps		A	95	95
Type of Start			Direct on Line	Direct on Line
Compressor 2 - per Compressor				
Motor Rating	(1)	kW	N/A	N/A
Full Load Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
<b>OPTIONAL EXTRAS</b>				
Heating				
Power Rating		kW	3	3
Nominal Run Amps		A	7.9	7.9
No of Stages			1	1
No of Elements			3	3
Electronic Soft Start	(2)			
Nominal Run Amps		A	12.7	13.5
Maximum Start Amps		A	60.7	58
Recommended Mains Fuse		A	16	16

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

## Technical Data - 220V 60Hz

## ET12D

## Mechanical Data

			ET12D-HX1F0-2	ET12D-HX1F1-2
Technical	Capacity - DX Cooling			
	Gross Total	(1) kW	12.42	12.42
	Gross Sensible	(1) kW	12.42	12.42
	EER		2.7	2.62
	Capacity Steps		1	1
	Capacity - Free Cooling			
	Gross Total	(2) kW	12.36	10.24
	Max Airflow	m³/s	1.02	0.85
	Dimensions			
	W x D x H	mm	1020 x 580 x 2368	
220V	Weights			
	Machine	kg	334	333
	Operating	kg	339	339
	Construction			
	Material/Colour		Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)	
	Evaporator		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.348	0.348
	Nominal Airflow	m³/s	0.95	0.95
	Discharge		Horizontal	Horizontal
	Condenser		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.968	0.968
	Nominal Airflow	m³/s	1.76	1.76
	Discharge		Vertical	Vertical
	Fan - Evaporator		EC	DC
	Quantity		2	2
	Diameter	mm	310	310
	Maximum Speed	rpm	2360	2020
	Fan - Condenser		AC	AC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1600	1600
	Compressor		Scroll	Scroll
	Quantity		1	1
	Oil Charge Volume (Total)	l	1.33	1.33
	Oil Type		PVE	PVE
	Refrigeration		Single Circuit	Single Circuit
	Refrigeration Control		EEV	EEV
	Refrigerant Type		R410A	R410A
	GWP		2088	2088
	Charge (Total)	kg	5.17	5.17
	Tonnes equivalent CO <sub>2</sub>	tCO <sub>2</sub>	10.79	10.79
	Filtration		ISO-C-80	ISO-C-80
	Quantity		1	1
	Size W x D x H	mm	923 x 45 x 430	923 x 45 x 430
	Upgraded Fan - Evaporator		EC	-
	Quantity		2	-
	Diameter	mm	310	-
	Maximum Speed	rpm	2640	-
	Upgraded Fan - Condenser		EC	EC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1500	1500
	Filtration		ISO-C-95	ISO-C-95
	Quantity		1	1
	Size W x D x H	mm	923 x 45 x 430	923 x 45 x 430
	Heating	kW	6.0	6.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 220V 60Hz

## ET12D

## Electrical Data

			ET12D-HX1F0-2	ET12D-HX1F1-2
<b>Electrical Supply Data</b>				
Mains Supply		V	220 / 3PH / 60Hz	220 / 3PH / 60Hz
Clients Backup Power Supply		V	N/A	48VDC
Controls Circuit		V	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm <sup>2</sup>	10	10
Mechanical Cooling - ARI (AC)	(3)			
Nominal Run Amps		A	20.05	18.65
Maximum Start Amps		A	120.9	116
Recommended Mains Fuse		A	25	25
Mechanical Cooling - Max (AC)	(4)			
Nominal Run Amps		A	23.4	22.0
Maximum Start Amps		A	120.9	116
Recommended Mains Fuse		A	32	25
Free Cooling mode (AC)				
Nominal Run Amps		A	5.9	1
Clients -48VDC Backup Supply				
Nominal Run Amps		A	N/A	11.6
Recommended Mains Fuse		A	N/A	16
Evaporator Fan - per Fan				
Quantity			2	2
Motor Rating	(1)	kW	0.5	0.25
Full Load Amps		A	2.2	5.3
Locked Rotor Amps		A	2.2	5.3
Condenser Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.82	0.82
Full Load Amps		A	3.5	3.5
Locked Rotor Amps		A	10.5	10.5
Compressor 1 - per Compressor				
Motor Rating	(1)	kW	4.0	4.0
Full Load Amps		A	14.2	14.2
Locked Rotor Amps		A	115	115
Type of Start			Direct on Line	Direct on Line
Compressor 2 - per Compressor				
Motor Rating	(1)	kW	N/A	N/A
Full Load Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
<b>OPTIONAL EXTRAS</b>				
Heating				
Power Rating		kW	6	6
Nominal Run Amps		A	15.8	15.8
No of Stages			1	1
No of Elements			6	6
Electronic Soft Start	(2)			
Nominal Run Amps		A	20.1	18.7
Maximum Start Amps		A	74.9	70
Recommended Mains Fuse		A	25	25

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

Technical

220V

## Technical Data - 220V 60Hz

## ET15D

## Mechanical Data

			ET15D-HX1F0-2	ET15D-HX1F1-2
Technical	Capacity - DX Cooling			
	Gross Total	(1) kW	14.05	14.05
	Gross Sensible	(1) kW	14.05	14.05
	EER		2.54	2.46
	Capacity Steps		1	1
	Capacity - Free Cooling			
	Gross Total	(2) kW	12.41	10.28
	Max Airflow	m³/s	1.03	0.85
	Dimensions			
	W x D x H	mm	1020 x 580 x 2368	
220V	Weights			
	Machine	kg	339	339
	Operating	kg	344	344
	Construction			
	Material/Colour		Panels / Welded Frame: Galvanised Sheet Steel, Epoxy Baked Powder Paint – Agate Grey (RAL 7038)	
	Evaporator		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.348	0.348
	Nominal Airflow	m³/s	1.10	1.10
	Discharge		Horizontal	Horizontal
	Condenser		Rifled Copper Tube/Turbulated Hydrophilic Coated Aluminium Fins	
	Quantity		1	1
	Face Area	m²	0.968	0.968
	Nominal Airflow	m³/s	1.76	1.76
	Discharge		Vertical	Vertical
	Fan - Evaporator		EC	DC
	Quantity		2	2
	Diameter	mm	310	310
	Maximum Speed	rpm	2360	2020
	Fan - Condenser		AC	AC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1600	1600
	Compressor		Scroll	Scroll
	Quantity		1	1
	Oil Charge Volume (Total)	l	1.57	1.57
	Oil Type		PVE	PVE
	Refrigeration		Single Circuit	Single Circuit
	Refrigeration Control		EEV	EEV
	Refrigerant Type		R410A	R410A
	GWP		2088	2088
	Charge (Total)	kg	5.18	5.18
	Tonnes equivalent CO <sub>2</sub>	tCO <sub>2</sub>	10.82	10.82
	Filtration		ISO-C-80	ISO-C-80
	Quantity		1	1
	Size W x D x H	mm	923 x 45 x 430	923 x 45 x 430
	Upgraded Fan - Evaporator		EC	-
	Quantity		2	-
	Diameter	mm	310	-
	Maximum Speed	rpm	2640	-
	Upgraded Fan - Condenser		EC	EC
	Quantity		1	1
	Diameter	mm	450	450
	Maximum Speed	rpm	1500	1500
	Filtration		ISO-C-95	ISO-C-95
	Quantity		1	1
	Size W x D x H	mm	923 x 45 x 430	923 x 45 x 430
	Heating	kW	6.0	6.0

1) The nominal DX capacity is based upon gross total cooling capacity at 30°C / 30%RH return air conditions, 35°C ambient temperature.

2) The nominal free cooling capacity is based upon a maximum airflow and 10°C ΔT between ambient and return air.

Standard EC Fan. Upgraded EC Fan is available, see performance Graphs

## Technical Data - 220V 60Hz

## ET15D

## Electrical Data

			ET15D-HX1F0-2	ET15D-HX1F1-2
<b>Electrical Supply Data</b>				
Mains Supply		V	220 / 3PH / 60Hz	220 / 3PH / 60Hz
Clients Backup Power Supply		V	N/A	48VDC
Controls Circuit		V	24VAC	24VDC
Maximum Mains Incoming Cable Size		mm <sup>2</sup>	10	10
Mechanical Cooling - ARI (AC)	(3)			
Nominal Run Amps		A	22.27	20.87
Maximum Start Amps		A	125.9	121
Recommended Mains Fuse		A	32	25
Mechanical Cooling - Max (AC)	(4)			
Nominal Run Amps		A	25.7	24.3
Maximum Start Amps		A	125.9	121
Recommended Mains Fuse		A	32	32
Free Cooling mode (AC)				
Nominal Run Amps		A	5.9	1
Clients -48VDC Backup Supply				
Nominal Run Amps		A	N/A	11.6
Recommended Mains Fuse		A	N/A	16
Evaporator Fan - per Fan				
Quantity			2	2
Motor Rating	(1)	kW	0.5	0.25
Full Load Amps		A	2.2	5.3
Locked Rotor Amps		A	2.2	5.3
Condenser Fan - per Fan				
Quantity			1	1
Motor Rating	(1)	kW	0.82	0.82
Full Load Amps		A	3.5	3.5
Locked Rotor Amps		A	10.5	10.5
Compressor 1 - per Compressor				
Motor Rating	(1)	kW	4.7	4.7
Full Load Amps		A	16.4	16.4
Locked Rotor Amps		A	120	120
Type of Start			Direct on Line	Direct on Line
Compressor 2 - per Compressor				
Motor Rating	(1)	kW	N/A	N/A
Full Load Amps		A	N/A	N/A
Locked Rotor Amps		A	N/A	N/A
Type of Start			N/A	N/A
<b>OPTIONAL EXTRAS</b>				
Heating				
Power Rating		kW	6	6
Nominal Run Amps		A	15.8	15.8
No of Stages			1	1
No of Elements			6	6
Electronic Soft Start	(2)			
Nominal Run Amps		A	22.3	20.9
Maximum Start Amps		A	77.9	73
Recommended Mains Fuse		A	32	25

(1) Stated motor power values are based on absorbed electrical input power

(2) Electronic soft start figures are based on a 40% reduction in Compressor DOL starting current, nominal run amps at ARI condition

(3) Mechanical Cooling - ARI data is at nominal design conditions

(4) Mechanical Cooling - Max is worst case compressor loadings

## Commissioning

Each Ecotel Outdoor unit leaves Airedale's manufacturing facility fully charged and pre-commissioned.

### Pre Start Checks

Once the whole system has been installed it is most important that the following pre-start checks are made:

- The equipment is exactly as ordered.
- All electrical terminals are tight.
- Power is available to the unit, via customers isolator and is at the correct voltage.
- Filters are of the correct grade and size.
- Check that the condensate drain lines are precharged, not obstructed in any way and water flows away freely.

### Electrical

Once the above installation and pre-start checks have been carried out satisfactorily, the main electrical checks can commence.

- Measure voltage (400 VAC 3 phase) L1 to L2, L2 to L3, L1 to L3.
- Measure voltage (230 VAC 1 phase) L1 & N (where applicable).
- Measure control transformer secondary voltage (24 VAC) Note: - tolerance +/- 10%.
- Optional Extra (-)48VDC primary and secondary (24VDC) voltages. Note: - tolerance +/- 10%.
- Check phase rotation before switching supply to the unit. Failure to do so will cause damage to the scroll Compressor(s).
- Check operation of auxiliary fire shutdown alarms on volt free contacts (if appropriate).

Note: - A test procedure and training is available on request.

### Operating Data

#### Control - General

The microprocessor controller has been specifically designed to provide the control information necessary to operate the unit in an energy efficient manner.

The unit will operate in 1 of 5 modes:

1. Free Cooling - using outside air only.
2. DX Cooling - mechanical cooling with room return air.
3. Concurant Cooling.
4. Electric Heating (Optional Extra).
5. Free Heating Mode.

When the outside ambient temperature is low enough the fresh air damper will modulate between 0-100% using full fresh air to cool the room.

As a further consideration to energy efficiency, the condenser fan is off during free cooling mode.

## Commissioning

### Full Free Cooling

When the ambient is low enough and free cooling can totally satisfy the cooling requirement of the exchange, the damper will open and the fan will modulate to maintain the design room set point. On low supply temperatures, the damper will modulate closed.

### Mechanical DX Cooling

When free cooling is unavailable, the DX cooling system will maintain the temperature in the room.

### Concurrent Mode

When the ambient temperature is below the cabin setpoint yet not low enough to satisfy demand both freecooling and mechanical cooling shall be enabled to trim the remainder of the required cooling performance. The control setpoints are configurable through the controller.

### Electric Heating (Optional Extra)

When heating is required, the unit will control as follows:

When the return air temperature drops below the room set point, the microprocessor will select the stage of electric heating to satisfy the heating requirement of the room. Once the room conditions have been satisfied, the electric heating will turn off to leave just the indoor fan recirculating the room air.

### Free Heating Mode

In freeheating mode, the freecooling damper is closed and the evaporator fan speed is fixed at design speed. No cooling or heating is enabled, and the unit attempts to use the heat load from within the cabin to reheat the room and prevent the return temperature from reaching the critical low temperature by simply recirculating cabin air.

### Damper Position

In the event of a fire alarm signal (from the master BMS system), the damper will be driven shut and the unit will switch off.

### Airflow Switch

As standard the airflow fail switch is set for the fans to operate at the standard design airflow and external static, as quoted in the technical manual or if customer specified. However in instances where the operating conditions are to be varied from the standard then the following procedure to set up the switch(s) must be followed:

- Set airflow to required operating parameter with the use of microprocessor.
- Turn airflow switch to maximum setting to test electrical control. Controls should switch off.
- Adjust switch downwards until the control circuit is reactivated.
- Switch off fan (controls should switch off).
- Turn on fan and re set unit.

### Filter Change Switch

To set the filter change switch the following procedure is carried out:

- Adjust the filter change switch until the alarm activates.
- If the alarm is not generated the switch is faulty.
- Turn the filter change switch back to 1.5.

Maintenance

Owner’s Responsibility

It is the owner’s responsibility to ensure that the unit can be maintained correctly ensure the following requirements are met, and maintain a safe working environment around the unit, free from obstructions and debris.  
The unit shall adhere to the following maintenance regime as a minimum.

CAUTION ⚠	The equipment contains live electrical and moving parts, ISOLATE prior to maintenance or repair work. Ensure lock off procedures are carried out accordingly.
CAUTION ⚠	Inputs or outputs not required will not be connected nor will they appear on the display keypad.

SERVICE INDICATOR

The maintenance of key components such as compressors, fans and air filters can be monitored via a service indicator which visually demonstrates the status relative to the component service intervals, the number of hours that the unit or component has operated for, and generates an alarm when the run time exceeds the maintenance limit.

Inputs and outputs can be determined by the labels to the microprocessor controller.

**Maintenance****General Inspections**

	Task	Frequency		
		3 Mths	12 Mths	60 Mths
General Inspections	Check for visible mechanical damage to unit.	•		
	Visually inspect the unit for general wear and tear, treat metalwork.	•		
	Rust should be inhibited, primed and touched up with matching paint.			•
	Check for excess vibration from other rotating equipment.	•		

**Service Tools/Test Equipment**

- Touch up paint
- Stiff Brush

**Safety Equipment**

- Safety Glasses/Goggles

**Maintenance****Electrical Inspections**

	Task	Frequency		
		3 Mths	12 Mths	60 Mths
Electrical Inspections	Check main power supply voltages		•	
	Check electrical terminals are tight.		•	
	Check for signs of hot spots/discolouration on power cables.		•	
	Check operation of electric trace heating	•		
	Check correct operation of control panel heater & thermostat	•		
	Check operating currents are as per design.	•		

**Service Tools/Test Equipment**

- Voltmeter
- Screwdrivers/Allen Keys (4mm tamper proof)
- Ammeter

**Safety Equipment**

- Safety Glasses/Goggles

**Procedures****Electrical Connections**

Ensure all electrical connections are tight and correctly terminated.

**Electrical Earthing**

Check that the unit is correctly earthed.

**Voltage**

Measure the voltage at the following points and record on the maintenance sheet:

- Voltage at busbar/isolator.
- Dedicated power supply.
- Voltage at permanent supply.
- Emergency Backup supply (-48VDC).
- Control voltage at transformer 24V (min 21.6V, max 26.4V).

The voltage measurements should be carried out with the unit MCBs turned off.

**Maintenance****Controls**

	Task	Frequency		
		3 Mths	12 Mths	60 Mths
Controls	Change controller battery.*		•	

\*The controller will keep the strategy for a short period of time with no battery.

**Service Tools/Test Equipment**

- Small Terminal Screwdriver

**Safety Equipment**

- Electrostatic Wristband

**Procedures**

The following controller settings are to be recorded on the maintenance sheet:

- Head pressure differential (Bar)
- Minimum suction pressure (Bar)

## Troubleshooting

FAULT	POSSIBLE CAUSE	REMEDY/ACTION
Unit not operating - Power Off.	Main/local isolator off.	Check all isolators from mains to unit.
	Mains Fuse(s) failed.	Check all mains fuses. Replace after correcting fault. Check for loose wire.
Unit not operating - Power On.	Fault Alarm.	Check volt free contacts, investigate and clear fault.
	Fire detection or external interlock fault no feed on wire.	Investigate and correct.
	Control MCB tripped.	Re-set after investigating and correcting fault.
	Loose wire in control circuit	Investigate and tighten connector.
	Motor/Fan Assembly jammed.	Isolate unit and check free rotation of motor/fan assembly. If faulty - replace.
	Fan internal protection tripped.	Investigate internal protection, which is self-resetting. Check fan for correct operation. Replace if faulty.
	Faulty motor windings/capacitor.	Motor humming would indicate fault in motor or capacitor.
	Safety device or internal relay switch open circuit.	Check through circuitry starting at control MCB - action faults. Check primary and secondary voltage.
Unit operating - No Cooling/Heating	Anti cycling timer.	Wait until timer times out and try again. Limited to 10 starts/hour.
	Overheat cut-out operation (optional).	If auto reset has tripped – heaters will reset automatically – Check fan and filters for sufficient airflow. If manual reset has tripped – heaters can only be reset manually - Check fan and filters for sufficient airflow.
	Loose connection in control circuit.	Check and tighten connections.

## Troubleshooting

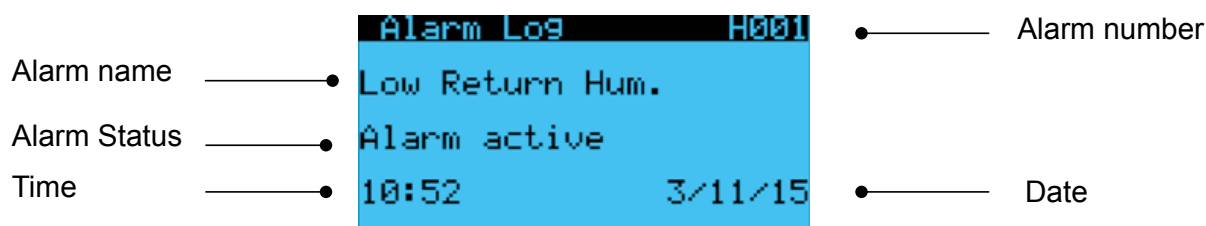
FAULT	POSSIBLE CAUSE	REMEDY/ACTION
High room temperature.	Damper not operating correctly.	Damper jammed in free cooling position during high ambient conditions.
	Compressor(s) not operating.	See unit not operating power off - power on.
	Compressor(s) not operating efficiently.	Important: Check electrical phase rotation. Fit gauges and investigate.
	Heatload too great for system.	High ambient affecting condenser performance. Investigate design and loads - clean coil fins.
	Low airflow.	Dirty filters - replace.
	Control malfunction.	Check transformer/secondary supply - replace if faulty. Recalibrate controls if necessary. Check motor and wiring from controller. Check sensor not short-circuited - repair/replace.
Compressor not operating.	No power to compressor.	Check electrical connectors, isolator, MPCBs, contactor and control circuit wiring action. Always investigate fuse/contacter problem before replacements.
	Compressor discharge gas temperature protection device open.	Allow time to reset. Internal device, change compressor if it does not reset.
	Defective compressor motor.	Check windings resistance. If burnt out follow burn out procedure using drier in suction line. Always replace the contactor.
	Klixon tripped and does not reset.	Sometimes it takes up to 4 hours to reset. Replace compressor if necessary.
	Low pressure switch operated (large or complete loss of refrigerant charge).	Repair leak and recharge system. Evacuate before charging using good refrigeration practice.
Fan tripped.	Fan motor seized. Fan jammed.	Free motor or replace. Remove obstruction.
Low evaporating temperature.	Low refrigerant charge.	Recharge refrigerant. (R410A)
	Expansion valve faulty or incorrectly set. Insufficient airflow through evaporator coil.	Replace or adjust expansion valve. Check filter for clogging and fan speed.
Excessively high evaporating temperature.	Expansion valve faulty.	Replace valve.
Noisy compressor.	Start-up: Brief period of mechanical noise may be noticed on start up due to initial contacting of the spirals. This will quickly disappear.	No detrimental effect - no action necessary.

## Troubleshooting

	Shut down: Compressor reverses momentarily as internal pressure equalises.	No detrimental effect - no action necessary.
	Check refrigeration charge.	If low, locate and repair leak and charge to correct design conditions adding Ester oil if necessary.
	Lack of oil.	Repair leaks if any, add oil if required but not too much - remember too much is as bad as too little.
	Expansion valve stuck in open position (abnormally cold suction line).	Ensure temperature bulb is tight on suction. Replace power assembly or valve if necessary.
	Broken or scored compressor bearings.	Replace compressor.
	Compressor (3 phase) rotation incorrect	Check electrical supply for correct phase rotation.
	Low superheat allowing liquid into compressor.	Check superheat.

## Alarms

### Alarm Menu Display



### Alarm Log

The alarm page offers a log of the last 150 alarm messages in a scrolling log, pressing the alarm button will enter the alarm page.


Consequently the most recent alarm has the lowest log number (001) and will be displayed upon entering the alarm page. As another alarm occurs, the alarm number increases until 150 alarms have occurred. From this point on, alarm 001 moves to 002 and any new alarm will reside in position 001.

As new alarms are generated and cleared, the highest number logs (150) in the scroll will be lost.

### Viewing the Alarm Log


By using the arrow keys, the last 150 alarms generated can be reviewed in chronological order. The display provides the alarm type information and the time and date of each alarm occurrence.

### Alarm Detection

When the controller detects an alarm an output is generated to the relevant alarm relay which in turn illuminates the button. To see which alarm has accrued press the  button and the most recent alarm will be displayed. If the alarm light is on, the alarm page can be interrogated to identify which alarm is active.

### Resetting the Alarm

The auto reset alarms will automatically reset once the conditions are within the set parameters.

To clear a manual alarm press the  button twice and the red LED will disappear.

## Alarms

The following lists display all alarms available in the Ecotel 5-15kW. Some of these alarms may not be available depending on unit type and selected options.

Code	Name	Description	Action	Reset	Importance
01	Power Restart	Mains power restarted	For information	Auto	Non-Critical
02	Airflow Fail	No airflow detected	Force Free cooling		Critical
03	Phase Failure /AC Power Fail	Issue with AC power supply			Critical
04	Filter Change	Dirty filter	For information	Manual	Non-Critical
05	Auxiliary Alarm	User alarm	Set By User		Set By User
06	Attend Mode Active	Cabin occupied	Switch to attend mode		Non-Critical
07	Probe Failure U1	Probe reading error on U1	Ignore reading from probe		Critical
08	Probe Failure U2	Probe reading error on U2			
09	Probe Failure U3	Probe reading error on U3			
10	Probe Failure U4	Probe reading error on U4			
11	Probe Failure U5	Probe reading error on U5			
12	Probe Failure U6	Probe reading error on U6			
13	Probe Failure U7	Probe reading error on U7			
14	Probe Failure U8	Probe reading error on U8			
15	Probe Failure U9	Probe reading error on U9			
16	Probe Failure U10	Probe reading error on U10			
18	High Return Air Temperature	Return air temperature above critical threshold	Force cooling mode	Auto	Non-Critical
19	Low Return Air Temperature	Return air temperature below critical threshold	Force heating mode		
20	High Ambient Temperature	Ambient temperature above	For information	Non-Critical	
21	Low Ambient Temperature	Ambient temperature below			
22	High Return Air Humidity	Return air humidity above			
23	Low Return Air Humidity	Return air humidity below			
24	High Panel Temperature Warning	Panel temperature above			
25	Low Panel Temperature Warning	Panel temperature below			
26	Critical High Panel Temperature	Panel temperature above	Switch unit off by alarm	Critical Shutdown	
27	Critical Low Panel Temperature	Panel temperature below		Critical Shutdown	
28	High Pressure Circuit 1	High condensing pressure circuit 1	Disable circuit 1		Critical
29	High Pressure circuit 2	High condensing pressure circuit 2	Disable circuit 2		
30	Compressor 1 MCB Trip	Compressor 1 MCB is open circuit	Disable circuit 1		

## Alarms

Code	Name	Description	Action	Reset	Importance
31	Compressor 2 MCB Trip	Compressor 2 MCB is open circuit	Disable circuit 2	Auto	Critical
32	Circuit 1 Low Pressure Trip	Low suction pressure circuit 1	Disable circuit 1		
33	Circuit 2 Low Pressure Trip	Low suction pressure circuit 2	Disable circuit 2		
34	Circuit 1 Low Pressure Equalisation	Equalising pressure on circuit 1	Disable circuit 1		
35	Circuit 2 Low Pressure Equalisation	Equalising pressure on circuit 2	Disable circuit 2		
36	Circuit 1 Low Pressure Equalisation Critical	Maximum equalisation attempts reached circuit 1	Disable circuit 1	Manual	
37	Circuit 2 Low Pressure Equalisation Critical	Maximum equalisation attempts reached circuit 2	Disable circuit 2		
38	Circuit 1 Low Pressure Equalisation Failed	Circuit 1 failed to equalise	For information		
39	Circuit 2 Low Pressure Equalisation Failed	Circuit 2 failed to equalise			
40	Oil Pre-Heat Timer Active	Compressors held off by pre-heating timer	Disable DX cooling		
41	Circuit 1 Compressor Status	Error with compressor 1 status signal	Disable circuit 1		
42	Circuit 2 Compressor Status	Error with compressor 2 status signal	Disable circuit 2		
43	Fan MCB Trip	One of the fan MCBs are open circuit	Disable DX cooling		
44	Overheat Cut-Out	Overheat prevention active	Disable heating		
45	Expansion Board Offline	Communications failure with expansion board	For information	Auto	Critical
46	Expansion Board Probe Failure	Probe reading error on expansion board			
47	Expansion Board Configuration Error	Configuration error on expansion board			

## Alarms

Code	Name	Description	Action	Reset	Importance	
48	Expansion Valve Driver Probe Failure	Probe reading error on expansion valve driver	Disable affected circuit	Auto	Critical	
49	Expansion Valve Driver Low Superheat	Low superheat value on circuit 1 or 2				
50	Expansion Valve Driver Low Evap Temperature	Low evaporating temperature on circuit 1 or 2				
51	Expansion Valve Driver High Evap Temperature	High evaporating temperature on circuit 1 or 2				
52	Expansion Valve Driver High Cond Temperature	High condensing temperature on circuit 1 or 2	Disable affected circuit	Auto	Critical	
53	Expansion Valve Driver Low Suction Temperature	Low suction temperature on circuit 1 or 2				
54	Expansion Valve Driver Autotune	Autotune feature active on expansion valve	For information			Non-Critical
55	Modbus Leak Detector Offline	Communications error with leak detector				
56	Refrigerant Leak Detected	High levels of refrigerant detected	Disable DX cooling	Manual	Critical	
57	Refrigerant Sensor Fault	Refrigerant probe reading error	For information	Auto		
58	Leak Detector Maintenance Alarm	Leak detector running for over 1 year			Manual	Non-Critical
59	No DX Cooling	Unable to start any mechanical cooling	Force freecooling	Auto	Critical	
60	Compressor 1 Maintenance Alarm	Compressor 1 maintenance run time reached	For information	Manual	Non-Critical	
61	Compressor 2 Maintenance Alarm	Compressor 2 maintenance run time reached				
62	Condenser Fan Maintenance Alarm	Condenser fan maintenance run time reached				
63	Evaporator Fan Maintenance Alarm	Evaporator fan maintenance run time reached				
64	Heater Maintenance Alarm	Heater maintenance run time reached				
65	Modbus Power Meter Offline	Communications error with power meter				Auto

## After Sales

### Warranty

All Airedale products or parts (non consumable) supplied for installation within the UK mainland and commissioned by an Airedale engineer, carry a full Parts & Labour warranty for a period of 12 months from the date of commissioning or 18 months from the date of despatch, whichever is the sooner.

Parts or Equipment supplied by Airedale for installation within the UK or for Export that are properly commissioned in accordance with Airedale standards and specification, not commissioned by an Airedale engineer; carry a 12 month warranty on non consumable Parts only from the date of commissioning or 18 months from the date of despatch, whichever is the sooner.

Parts or equipment installed or commissioned not to acceptable Airedale standards or specification invalidate all warranty.

### Warranty is only valid in the event that

In the period between delivery and commissioning the equipment:

- is properly protected & serviced as per the Airedale installation & maintenance manual provided
- where applicable the glycol content is maintained to the correct level.

In the event of a problem being reported and once warranty is confirmed\* as valid under the given installation and operating conditions, the Company will provide the appropriate warranty coverage (as detailed above) attributable to the rectification of any affected Airedale equipment supplied (excluding costs for any specialist access or lifting equipment that must be ordered by the customer).

\*Once warranty is confirmed, maintenance must be continued to validate the warranty period.

Any spare part supplied by Airedale under warranty shall be warranted for the unexpired period of the warranty or 3 months from delivery, whichever period is the longer. To be read in conjunction with the Airedale Conditions of Sale - Warranty and Warranty Procedure, available upon request.

### Procedure

When a component part fails, a replacement part should be obtained through our Spares department. If the part is considered to be under warranty, the following details are required to process this requirement. Full description of part required, including Airedale's part number, if known. The original equipment serial number. An appropriate purchase order number.

A spares order will be raised under our warranty system and the replacement part will be despatched, usually within 24 hours should they be in stock. When replaced, the faulty part must be returned to Airedale with a suitably completed and securely attached "Faulty Component Return" (FCR) tag. FCR tags are available from Airedale and supplied with each Warranty order.

On receipt of the faulty part, suitably tagged, Airedale will pass to its Warranty department, where it will be fully inspected and tested in order to identify the reason for failure, identifying at the same time whether warranty is justified or not.

On completion of the investigation of the returned part, a full "Report on Goods Returned" will be issued. On occasion the release of this complete report may be delayed as component manufacturers become involved in the investigation. When warranty is allowed, a credit against the Warranty invoice will be raised. Should warranty be refused the Warranty invoice becomes payable on normal terms.

### Exclusions

Warranty may be refused for the following reasons.

- Misapplication of product or component
- Incorrect site installation
- Incomplete commissioning documentation
- Inadequate site installation
- Inadequate site maintenance
- Damage caused by mishandling
- Replaced part being returned damaged without explanation
- Unnecessary delays incurred in return of defective component

### Returns analysis

All faulty components returned under warranty are analysed on a monthly basis as a means of verifying component and product reliability as well as supplier performance. It is important that all component failures are reported correctly.







Head Office  
Airedale International Air Conditioning Ltd  
Leeds Road  
Rawdon  
Leeds LS19 6JY  
Tel: +44 (0) 113 2391000  
Fax: +44 (0) 113 2507219  
E-mail [enquiries@airedale.com](mailto:enquiries@airedale.com)  
Web [www.airedale.com](http://www.airedale.com)



TM\_Ecotel\_5-15kW\_9321381\_V1.6.0\_04\_2019