Airedale by MODINE

Microchannel Condenser

CR012M - CR165M

Technical, Installation, Maintenance and Commissioning Manual

CE

bsi. ISO 9001 Quality Management FM00542 ISO 14001 Environmental Management 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 or telephone:

UK Sales Enquiries	+ 44 (0) 113 239 1000	enquiries@airedale.com
International Enquiries	+ 44 (0) 113 239 1000	enquiries@airedale.com
Spares Hot Line	+ 44 (0) 113 238 7878	spares@airedale.com
Airedale Service	+ 44 (0) 113 239 1000	service@airedale.com
Technical Support	+ 44 (0) 113 239 1000	tech.support@airedale.com
Training Enquiries	+ 44 (0) 113 239 1000	training@airedale.com

For information, visit us at our web site: www.airedale.com

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.

CAUTION ⚠	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. 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. A full hazard data sheet in accordance with COSHH regulations is available should this be required.

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 40.7 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).

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.

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.

Contents

Introduction

Nomenclature

Example:	C	R	165	M	-	P	V	4	E	-	0

C	Condenser Unit
R	R410A Refrigerant
012-165	Nominal Total Heat Rejection in kW
M	Microchannel Coil
-	Separator
P	Painted Unit
V	Vertical Air Discharge
H	Horizontal Air Discharge
1 - 4	Number of fans
A	AC Fans
E	EC Fans
-	Separator
0	400V/ 3PH + N / 50Hz
1	380V / 3PH + N / 60Hz
7	230V / 1PH + N / 50Hz
8	220V / 1PH + N / 60Hz
9	220V / 2PH /60Hz

Introduction

Construction

Unit Nomenclature	CR012M-P***_*	CR016M-P***_*	CR022M-P***_*	CR026M-P***_*	CR030M-P***_*	CR035M-P***_*	CR050M-P***_*	CR060M-P***_*	CR065M-P***_*	CR075M-P***_*	CR080M-P***_*	CR095M-P***_*	CR105M-P***_*	CR130M-P***_*	CR140M-P***_*	CR165M-P***_*
Galvanised Sheet Steel Case	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Painted Case	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Dual Position Legs	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Coil Guards	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Coil Filtration	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● Standard Features ○ Optional Features – Feature Not Available

Painted Galvanised Unit Case

The unit shall be coated with epoxy baked powder paint to provide a durable finish. The optional paint colour shall be Light Grey (RAL 7035).

Dual Position Legs

Dual position fixing legs shall be supplied attached to the unit via captive bolts and shake proof washers.

Coil Guard

Protective mesh guards can be fitted to each of the outer coils to protect against damage.

Coil Filtration

The coil filtration media shall be heavy duty commercial grade polycarbonate that can be removed for maintenance purposes.

Introduction

Refrigeration

Unit Nomenclature	CR012M-P***_*	CR016M-P***_*	CR022M-P***_*	CR026M-P***_*	CR030M-P***_*	CR035M-P***_*	CR050M-P***_*	CR060M-P***_*	CR065M-P***_*	CR075M-P***_*	CR080M-P***_*	CR095M-P***_*	CR105M-P***_*	CR130M-P***_*	CR140M-P***_*	CR165M-P***_*
R410A Refrigerant	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Microchannel Coil (Epoxy coated)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Head Presure Control	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Standalone Head Pressure Control	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Low Ambient Kit (-32°C)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Extra Low Ambient Kit (-40°C)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● Standard Features ○ Optional Features – Feature Not Available

Microchannel Condenser Coil

Large surface area coil ideally positioned to optimise airflow and heat transfer, shall be manufactured from microchannel coil, epoxy coated aluminium fin.The factory test pressure shall not be less than 45Barg. Sweat copper pipe for brazed connection shall be provided. Shall be available in either horizontal or vertical air discharge orientation, please specify at order.

Head Pressure Control

Variable head pressure control shall be provided by the indoor unit.

Standalone Head Pressure Control

For standalone units, head pressure control shall be fitted to the condenser.

Inert Holding Charge

The unit shall be shipped with a holding charge of inert gas.

Introduction

Airflow

Unit Nomenclature	CR012M-P***_*	CR016M-P***_*	CR022M-P***_*	CR026M-P***_*	CR030M-P***_*	CR035M-P***_*	CR050M-P***_*	CR060M-P***_*	CR065M-P***_*	CR075M-P***_*	CR080M-P***_*	CR095M-P***_*	CR105M-P***_*	CR130M-P***_*	CR140M-P***_*	CR165M-P***_*
AC Fans	●	●	●	-	●	-	●	-	●	-	●	-	●	-	●	-
EC Fans	○	○	○	●	○	●	○	●	○	●	○	●	○	●	○	●
Horizontal Air Discharge*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Vertical Air Discharge*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● Standard Features ○ Optional Features – Feature Not Available

* One air discharge configuration must be selected.

Fan & Motor Assembly

CR012M - CR016M

Axial flow fan assembly with low noise sickle type blades shall be supplied.

CR022M - CR165M

Axial flow fan assembly with low noise sickle type blades and bellmouth.

AC Fans

The external rotor AC motor shall allow the use of a low power output, single phase, and speed controllable motor to power the fan. The motor shall have inbuilt thermal overload protection and the assembly shall be supplied complete with a finger guard for protection.

Electronically Commutated (EC) Fan Motor

Shall incorporate external EC rotor motor technology to provide highly accurate discreet speed control. The fans offer maximum air flow performance while keeping sound levels to a minimum. Each fan shall incorporate electronically commutated DC motor control using semi-conductor modules responding to a signal from the Airedale indoor unit or from an independent control module for standalone units. EC motors are DC motors with integrated AC to DC conversion; this gives the flexibility of connecting to AC mains with the efficiency and simple speed control of a DC motor. The EC fan shall offer significant power reduction in comparison with equivalent AC fan at both full and modulated fan speeds. The inbuilt EC fan control module shall allow for fan speed modulation from 15-100%, the modulating range of a standard AC fan is typically 40-100% of full fan speed.

Horizontal Air Discharge

As standard, unit legs are attached and delivered in the horizontal air discharge mode as are the isolator and fan speed controller.

IMPORTANT ⚠	The legs attached to the top of the unit are for lifting and stacking and shall be removed and stored safely if not required. Only 2 units may be stacked together.

Vertical Air Discharge

As standard, unit legs shall be attached and delivered in the horizontal air discharge mode and shall be repositioned on site to offer vertical air discharge mode.

Introduction

Electrical

Unit Nomenclature	CR012M-P***_*	CR016M-P***_*	CR022M-P***_*	CR026M-P***_*	CR030M-P***_*	CR035M-P***_*	CR050M-P***_*	CR060M-P***_*	CR065M-P***_*	CR075M-P***_*	CR080M-P***_*	CR095M-P***_*	CR105M-P***_*	CR130M-P***_*	CR140M-P***_*	CR165M-P***_*
400V / 3Ph / 50Hz (-0)	-	-	-	●	-	●	-	●	-	●	-	●	-	●	-	●
230V / 1Ph + N / 50Hz (-7)	●	●	●	-	●	-	●	-	●	-	●	-	●	-	●	-
380V / 3Ph / 60Hz (-1)	-	-	-	○	-	○	-	○	-	○	-	○	-	○	-	○
220V / 1Ph + N / 60Hz (-8)	○	○	○	-	○	-	○	-	○	-	○	-	○	-	○	-
220V / 2Ph / 60Hz (-9)	○	○	○	-	○	-	○	-	○	-	○	-	○	-	○	-
Mains Electric Isolator	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● Standard Features ○ Optional Features – Feature Not Available

All electrical components shall be rated for all year round outdoor use.
All wiring shall be colour coded and numbered for identification. All units shall be wired in accordance with current local and European standards.

Main Electric Isolator

A weatherproof mains isolator shall be fitted to ensure complete unit isolation of the electrical panel during adjustment and maintenance.

Technical Data

Performance Data

Condensing Temperature °C		Ambient Temperature					
		25°C	30°C	35°C	40°C	45°C	52°C
		THR (kW)	THR (kW)	THR (kW)	THR (kW)	THR (kW)	THR (kW)
CR012M	35	13.5	6.6	-	-	-	-
	40	20.4	13.5	6.5	-	-	-
	45	27.2	20.3	13.3	6.4	-	-
	50	34.1	27.1	20.2	13.2	6.3	-
	55	40.9	33.9	27.0	20.0	13.1	-
	60	47.7	40.7	33.8	26.8	19.8	10.1
CR016M	35	14.6	7.1	-	-	-	-
	40	22.0	14.5	7.0	-	-	-
	45	29.4	21.9	14.4	6.9	-	-
	50	36.7	29.2	21.7	14.3	6.8	-
	55	44.1	36.6	29.1	21.6	14.1	-
	60	51.4	43.9	36.4	28.8	21.3	10.8
CR022M	35	18.8	9.2	-	-	-	-
	40	28.3	18.7	9.1	-	-	-
	45	37.8	28.2	18.5	8.9	-	-
	50	47.3	37.7	28.0	18.4	8.7	-
	55	56.8	47.1	37.5	27.8	18.1	-
	60	66.2	56.6	46.9	37.2	27.5	14.0
CR026M	35	23.4	11.4	-	-	-	-
	40	35.2	23.3	11.3	-	-	-
	45	47.1	35.1	23.1	11.1	-	-
	50	58.9	46.9	34.9	22.8	10.8	-
	55	70.7	58.6	46.6	34.6	22.6	-
	60	82.4	70.4	58.3	46.3	34.3	17.4
CR030M	35	20.2	9.9	-	-	-	-
	40	30.4	20.1	9.7	-	-	-
	45	40.7	30.3	19.9	9.6	-	-
	50	50.8	40.5	30.1	19.7	9.4	-
	55	61.0	50.6	40.3	29.9	19.5	-
	60	71.2	60.8	50.4	40.0	29.6	15.0
CR035M	35	25.7	12.6	-	-	-	-
	40	38.7	25.5	12.4	-	-	-
	45	51.7	38.5	25.3	12.2	-	-
	50	64.6	51.4	38.3	25.1	11.9	-
	55	77.5	64.4	51.2	38.0	24.8	-
	60	90.5	77.3	64.0	50.8	37.6	19.1

Performance data using EC fans at maximum fan speed.

Technical Data

Performance Data

	Condensing Temperature °C	Ambient Temperature					
		25°C	30°C	35°C	40°C	45°C	52°C
		THR (kW)	THR (kW)	THR (kW)	THR (kW)	THR (kW)	THR (kW)
CR050M	35	42.0	20.5	-	-	-	-
	40	63.2	41.7	20.2	-	-	-
	45	84.4	62.9	41.4	19.9	-	-
	50	105.6	84.0	62.5	41.0	19.4	-
	55	126.7	105.1	83.6	62.0	40.5	-
	60	147.8	126.2	104.6	83.0	61.4	31.2
CR060M	35	53.4	26.1	-	-	-	-
	40	80.4	53.1	25.7	-	-	-
	45	107.4	80.0	52.6	25.3	-	-
	50	134.3	106.9	79.5	52.1	24.7	-
	55	161.2	133.8	106.3	78.9	51.5	-
	60	188.0	160.6	133.1	105.6	78.2	39.7
CR065M	35	44.7	22.4	-	-	-	-
	40	67.1	44.7	22.4	-	-	-
	45	89.5	67.1	44.7	22.4	-	-
	50	111.9	89.5	67.1	44.7	22.4	-
	55	134.3	111.9	89.5	67.1	44.7	-
	60	156.6	134.3	111.9	89.5	67.1	35.8
CR075M	35	58.0	29.0	-	-	-	-
	40	87.0	58.0	29.0	-	-	-
	45	116.0	87.0	58.0	29.0	-	-
	50	145.0	116.0	87.0	58.0	29.0	-
	55	174.1	145.0	116.0	87.0	58.0	-
	60	203.1	174.1	145.0	116.0	87.0	46.4
CR080M	35	67.5	33.0	-	-	-	-
	40	101.6	67.0	32.5	-	-	-
	45	135.6	101.1	66.5	31.9	-	-
	50	169.6	135.0	100.4	65.8	31.2	-
	55	203.6	169.0	134.3	99.7	65.0	-
	60	237.5	202.8	168.1	133.4	98.7	50.1
CR095M	35	87.7	42.9	-	-	-	-
	40	132.1	87.2	42.3	-	-	-
	45	176.4	131.4	86.5	41.5	-	-
	50	220.6	175.6	130.6	85.6	40.6	-
	55	264.8	219.7	174.7	129.6	84.6	-
	60	308.9	263.7	218.6	173.5	128.4	65.2

Performance data using EC fans at maximum fan speed.

Technical Data

Performance Data

	Condensing Temperature °C	Ambient Temperature					
		25°C	30°C	35°C	40°C	45°C	52°C
		THR (kW)	THR (kW)	THR (kW)	THR (kW)	THR (kW)	THR (kW)
CR105M	35	72.2	35.2	-	-	-	-
	40	108.6	71.7	34.8	-	-	-
	45	145.1	108.1	71.1	34.2	-	-
	50	181.4	144.4	107.4	70.4	33.4	-
	55	217.8	180.7	143.7	106.6	69.6	-
	60	254.1	216.9	179.8	142.7	105.6	53.7
CR130M	35	94.8	46.3	-	-	-	-
	40	142.8	94.2	45.7	-	-	-
	45	190.6	142.1	93.5	44.9	-	-
	50	238.4	189.8	141.2	92.5	43.9	-
	55	286.2	237.5	188.8	140.1	91.4	-
	60	333.8	285.0	236.3	187.5	138.7	70.5
CR140M	35	96.2	47.0	-	-	-	-
	40	144.9	95.6	46.3	-	-	-
	45	193.5	144.2	94.9	45.5	-	-
	50	242.0	192.6	143.3	93.9	44.6	-
	55	290.4	241.0	191.6	142.2	92.8	-
	60	338.8	289.3	239.8	190.3	140.8	71.6
CR165M	35	127.0	62.0	-	-	-	-
	40	191.1	126.1	61.1	-	-	-
	45	255.2	190.2	125.1	60.1	-	-
	50	319.2	254.1	189.0	123.9	58.8	-
	55	383.1	317.9	252.7	187.5	122.4	-
	60	446.9	381.6	316.4	251.1	185.8	94.4

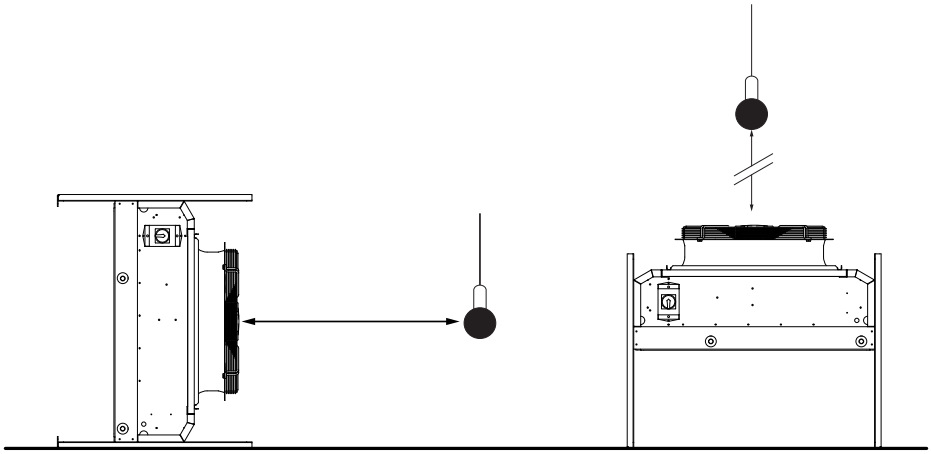
Performance data using EC fans at maximum fan speed.

Method of 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 EN ISO9614 Part 1: 2009. All Sound Power Levels quoted are calculated from measured sound intensity according BS EN ISO9614 Part 1: 2009. Resultant performance figures obtained from test will be proven to not differ from the claimed figures by more than the allowable deviations specified in table 7 of section VII of Eurovent RS 6/C/003-2016 (A-weighted sound power; +3dBA).

Semi hemispherical

Sound Pressure Levels are calculated from sound power using the semi-hemispherical method where the noise source is in junction with 2 boundaries i.e. the floor and 1 wall.



CAUTION ⚠	The sound data quoted is based on the unit having the EC UPGRADED FAN running at FULL SPEED under normal operating conditions. For sound data of optional fan selections, please contact Airedale.

Technical Data

Noise Data

Horizontal

	Sound Measurement	Overall dB(A)	Frequency (Hz) dB							
			63	125	250	500	1000	2000	4000	8000
CR012M	Power	79	68	69	71	70	72	72	72	62
	Pressure @10m	54	43	44	46	45	47	47	47	37
CR016M	Power	79	69	69	71	70	72	72	71	62
	Pressure @10m	54	44	44	46	45	47	47	46	37
CR022M	Power	76	67	65	69	68	68	68	60	56
	Pressure @10m	51	42	40	44	43	43	43	35	31
CR026M	Power	85	74	72	78	79	79	75	71	64
	Pressure @10m	60	49	47	53	54	54	50	46	39
CR030M	Power	76	67	66	69	69	69	69	61	56
	Pressure @10m	51	42	41	44	44	44	44	36	31
CR035M	Power	86	75	74	80	79	79	76	71	65
	Pressure @10m	61	50	49	55	54	54	51	46	40
CR050M	Power	78	69	68	71	70	70	70	63	58
	Pressure @10m	53	44	43	46	45	45	45	38	33
CR060M	Power	86	75	73	79	80	80	77	73	66
	Pressure @10m	61	50	48	54	55	55	52	48	41
CR065M	Power	78	70	68	71	71	71	70	63	59
	Pressure @10m	53	45	43	46	46	46	45	38	34
CR075M	Power	87	76	74	80	81	80	77	73	66
	Pressure @10m	62	51	49	55	56	55	52	48	41
CR080M	Power	79	71	70	72	71	71	71	64	60
	Pressure @10m	54	46	45	47	46	46	46	39	35
CR095M	Power	87	76	74	80	81	80	78	74	67
	Pressure @10m	62	51	49	55	56	55	53	49	42
CR105M	Power	79	71	70	72	72	72	71	64	60
	Pressure @10m	54	46	45	47	47	47	46	39	35
CR130M	Power	87	76	75	80	81	81	78	74	67
	Pressure @10m	62	51	50	55	56	56	53	49	42
CR140M	Power	81	72	71	73	73	73	73	66	61
	Pressure @10m	56	47	46	48	48	48	48	41	36
CR165M	Power	88	78	76	81	83	82	79	75	68
	Pressure @10m	63	53	51	56	58	57	54	50	43

Sound data quoted is based on the unit have the EC FAN running at max fan speed under normal operating conditions.

Intentionally Blank

Technical Data

CR012M, CR016M

Mechanical Data

Condenser		CR012M	CR016M
Capacity - Nominal			
Total Heat of Rejection	(1) kW	12.0	16.0
EER		75.3	57.3
Dimensions - Horizontal	(2)		
H x W x D	mm	973 x 902 x 895	973 x 902 x 895
Dimensions - Vertical	(2)		
H x W x D	mm	1065 x 902 x 973	1065 x 902 x 973
Weights			
Machine	kg	68	71
Operating	kg	69	72
Construction			
Material/Colour		Galvanised Sheet Steel, Non Painted or Epoxy Baked Powder Paint - Light Grey (RAL 7035)	
Condenser		Epoxy Coated Aluminium Microchannel	
Total Face Area	m^2	0.56	0.56
Nominal Airflow	m^3/s	1.01	1.31
Discharge		**-H** Horizontal or **-V** Vertical (***Please Specify at Order***)	
Fan & Motor		Axial EC	
Quantity		1	1
Diameter	mm	500	500
Power Consumption	kW	0.16	0.28
Maximum Speed	rpm	1431	1430
Refrigeration		Single Circuit	
Refrigerant Type		R410A	
GWP		2088	
Holding Charge		Inert Gas	
Coil Volume	l	2.3	3.1
Refrigerant Charge	(3) kg	0.9	1.2
Refrigerant Charge	(3) t/CO_2	1.8	2.4
Connection			
Liquid Line - Sweat	in	7/8	7/8
Discharge Line - Sweat	in	7/8	7/8

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan. All performance data is supplied in accordance with BS EN 14511-1:2013.
(2) Overall dimensions.
(3) For guidance only.

Technical Data

CR012M, CR016M

Electrical Data

Condenser			CR012M	CR016M
Unit Data	(1)			
Nominal Run Amps		A	2.9	2.9
Maximum Start Amps		A	2.9	2.9
Recommended Mains Fuse		A	6	6
Max Mains Cable Incoming		mm²	6	6
Mains Supply @ 50Hz			230V/1Ph	230V/1Ph
EC Condenser Fan - Per Fan				
Quantity			1	1
Motor Size		kW	0.65	0.65
Full Load Amps		A	2.9	2.9
AC Condenser Fan - Per Fan				
Quantity			1	1
Motor Size		kW	0.22	0.22
Full Load Amps		A	0.97	0.97
Locked Rotor Amps		A	1.7	1.7

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan

Technical Data

CR022M, CR026M, CR030M, CR035M

Mechanical Data

Condenser		CR022M	CR026M	CR030M	CR035M
Capacity - Nominal					
Total Heat of Rejection	(1) kW	22.0	26.0	30.0	35.0
EER		62.9	45.7	41.1	28.5
Dimensions - Horizontal	(2)				
H x W x D	mm	1168 x 1095 x 895	1168 x 1095 x 895	1168 x 1095 x 895	1168 x 1095 x 895
Dimensions - Vertical	(2)				
H x W x D	mm	1120 x 1095 x 1168	1105 x 1095 x 1168	1120 x 1095 x 1168	1105 x 1095 x 1168
Weights					
Machine	kg	90	105	94	117
Operating	kg	92	106	96	110
Construction					
Material/Colour		Galvanised Sheet Steel, Non Painted or Epoxy Baked Powder Paint - Light Grey (RAL 7035)			
Condenser		Epoxy Coated Aluminium Microchannel			
Total Face Area	m^2	0.87	0.87	0.87	0.87
Nominal Airflow	m^3/s	1.94	2.41	2.57	3.17
Discharge		**-H** Horizontal or **-V** Vertical (***Please Specify at Order***)			
Fan & Motor		Axial EC			
Quantity		1	1	1	1
Diameter	mm	630	710	630	710
Power Consumption	kW	0.35	0.57	0.73	1.23
Maximum Speed	rpm	1023	1175	1023	1175
Refrigeration		Single Circuit			
Refrigerant Type		R410A			
GWP		2088			
Holding Charge		Inert Gas			
Coil Volume	l	3.2	3.2	4.2	4.2
Refrigerant Charge	(3) kg	1.2	1.2	1.6	1.6
Refrigerant Charge	(3) t/CO_2	2.5	2.5	3.3	3.3
Connection					
Liquid Line - Sweat	in	7/8	7/8	7/8	7/8
Discharge Line - Sweat	in	7/8	7/8	7/8	7/8

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan. All performance data is supplied in accordance with BS EN 14511-1:2013.
(2) Overall dimensions.
(3) For guidance only.

Technical Data

CR022M, CR026M, CR030M, CR035M

Electrical Data

Condenser		CR022M	CR026M	CR030M	CR035M
Unit Data (1)					
Nominal Run Amps	A	3.1	2.7	3.1	2.7
Maximum Start Amps	A	3.1	2.7	3.1	2.7
Recommended Mains Fuse	A	6	6	6	6
Max Mains Cable Incoming	mm²	6	6	6	6
Mains Supply 50Hz		230V/1Ph	400V/3Ph	230V/1Ph	400V/3Ph
EC Condenser Fan - Per Fan					
Quantity		1	1	1	1
Motor Size	kW	0.71	1.72	0.71	1.72
Full Load Amps	A	3.1	2.7	3.1	2.7
AC Condenser Fan - Per Fan					
Quantity		1	n/a	1	n/a
Motor Size	kW	0.6	n/a	0.6	n/a
Full Load Amps	A	2.62	n/a	2.62	n/a
Locked Rotor Amps	A	9.17	n/a	9.17	n/a

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan

Technical Data

CR050M, CR060M, CR065M, CR075M

Mechanical Data

Condenser			CR050M	CR060M	CR065M	CR075M
Capacity - Nominal						
Total Heat of Rejection	(1)	kW	50.0	60.0	65.0	75.0
EER			68.5	50.4	48.9	37.7
Dimensions - Horizontal	(2)					
H x W x D		mm	1168 x 2177 x 895	1168 x 2177 x 895	1168 x 2177 x 895	1168 x 2177 x 895
Dimensions - Vertical	(2)					
H x W x D		mm	1120 x 2177 x 1168	1105 x 2177 x 1168	1120 x 2177 x 1168	1105 x 2177 x 1168
Weights						
Machine		kg	160	189	169	198
Operating		kg	162	191	172	201
Construction						
Material/Colour			Galvanised Sheet Steel, Non Painted or Epoxy Baked Powder Paint - Light Grey (RAL 7035)			
Condenser			Epoxy Coated Aluminium Microchannel			
Total Face Area		m^2	2.03	2.03	2.03	2.03
Nominal Airflow		m^3/s	4.26	5.35	5.30	6.35
Discharge			**-H** Horizontal or **-V** Vertical (***Please Specify at Order***)			
Fan & Motor			Axial EC			
Quantity			2	2	2	2
Diameter		mm	630	710	630	710
Power Consumption		kW	0.73	1.19	1.33	1.99
Maximum Speed		rpm	1023	1175	1023	1175
Refrigeration			Single Circuit			
Refrigerant Type			R410A			
GWP			2088			
Holding Charge			Inert Gas			
Coil Volume		l	5.6	5.6	7.2	7.2
Refrigerant Charge	(3)	kg	2.1	2.1	2.7	2.7
Refrigerant Charge	(3)	t/CO_2	4.4	4.4	5.7	5.7
Connection						
Liquid Line - Sweat		in	1 1/8	1 1/8	1 1/8	1 1/8
Discharge Line - Sweat		in	1 1/8	1 1/8	1 1/8	1 1/8

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan. All performance data is supplied in accordance with BS EN 14511-1:2013.
(2) Overall dimensions.
(3) For guidance only.

Technical Data

CR050M, CR060M, CR065M, CR075M

Electrical Data

Condenser		CR050M	CR060M	CR065M	CR075M
Unit Data (1)					
Nominal Run Amps	A	6.2	5.4	6.2	5.4
Maximum Start Amps	A	6.2	5.4	6.2	5.4
Recommended Mains Fuse	A	10	10	10	10
Max Mains Cable Incoming	mm²	6	6	6	6
Mains Supply 50Hz		230V/1Ph	400V/3Ph	230V/1Ph	400V/3Ph
EC Condenser Fan - Per Fan					
Quantity		2	2	2	2
Motor Size	kW	0.71	1.72	0.71	1.72
Full Load Amps	A	3.1	2.7	3.1	2.7
AC Condenser Fan - Per Fan					
Quantity		2	n/a	2	n/a
Motor Size	kW	0.6	n/a	0.6	n/a
Full Load Amps	A	2.62	n/a	2.62	n/a
Locked Rotor Amps	A	9.17	n/a	9.17	n/a

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan

Technical Data

CR080M, CR095M, CR105M, CR130M

Mechanical Data

Condenser			CR080M	CR095M	CR105M	CR130M
Capacity - Nominal						
Total Heat of Rejection	(1)	kW	80.0	95.0	104.3	130.0
EER			74.1	58.6	52.4	34.8
Dimensions - Horizontal	(2)					
H x W x D		mm	1168 x 3560 x 895	1168 x 3560 x 895	1168 x 3560 x 895	1168 x 3560 x 895
Dimensions - Vertical	(2)					
H x W x D		mm	1120 x 3560 x 1168	1105 x 3560 x 1168	1120 x 3560 x 1168	1105 x 3560 x 1168
Weights						
Machine		kg	251	295	266	310
Operating		kg	254	298	270	314
Construction						
Material/Colour			Galvanised Sheet Steel, Non Painted or Epoxy Baked Powder Paint - Light Grey (RAL 7035)			
Condenser			Epoxy Coated Aluminium Microchannel			
Total Face Area		m^2	3.48	3.48	3.48	3.48
Nominal Airflow		m^3/s	6.68	8.23	8.36	11.12
Discharge			**-H** Horizontal or **-V** Vertical (***Please Specify at Order***)			
Fan & Motor			Axial EC			
Quantity			3	3	3	3
Diameter		mm	630	710	630	710
Power Consumption		kW	1.08	1.62	1.99	3.74
Maximum Speed		rpm	1024	1177	1024	1177
Refrigeration			Single Circuit			
Refrigerant Type			R410A			
GWP			2088			
Holding Charge			Inert Gas			
Coil Volume		l	8.7	8.7	11.1	11.1
Refrigerant Charge	(3)	kg	3.3	3.3	4.2	4.2
Refrigerant Charge	(3)	t/CO_2	6.8	6.8	8.7	8.7
Connection						
Liquid Line - Sweat		in	1 1/8	1 1/8	1 5/8	1 5/8
Discharge Line - Sweat		in	1 1/8	1 1/8	1 5/8	1 5/8

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan. All performance data is supplied in accordance with BS EN 14511-1:2013.
(2) Overall dimensions.
(3) For guidance only.

Technical Data

CR080M, CR095M, CR105M, CR130M

Electrical Data

Condenser		CR080M	CR095M	CR105M	CR130M
Unit Data (1)					
Nominal Run Amps	A	9.3	8.1	9.3	8.1
Maximum Start Amps	A	9.3	8.1	9.3	8.1
Recommended Mains Fuse	A	16	16	16	16
Max Mains Cable Incoming	mm²	6	6	6	6
Mains Supply 50Hz		230V/1Ph	400V/3Ph	230V/1Ph	400V/3Ph
EC Condenser Fan - Per Fan					
Quantity		3	3	3	3
Motor Size	kW	0.71	1.72	0.71	1.72
Full Load Amps	A	3.1	2.7	3.1	2.7
AC Condenser Fan - Per Fan					
Quantity		3	n/a	3	n/a
Motor Size	kW	0.6	n/a	0.6	n/a
Full Load Amps	A	2.62	n/a	2.62	n/a
Locked Rotor Amps	A	9.17	n/a	9.17	n/a

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan

Technical Data

CR140M, CR165M

Mechanical Data

Condenser			CR140M	CR165M
Capacity - Nominal				
Total Heat of Rejection	(1)	kW	139.1	165.0
EER			52.5	39.8
Dimensions - Horizontal	(2)			
H x W x D		mm	1168 x 4641 x 895	1168 x 4641 x 895
Dimensions - Vertical	(2)			
H x W x D		mm	1120 x 4641 x 1168	1105 x 4641 x 1168
Weights				
Machine		kg	348	407
Operating		kg	354	412
Construction				
Material/Colour			Galvanised Sheet Steel, Non Painted or Epoxy Baked Powder Paint - Light Grey (RAL 7035)	
Condenser			Epoxy Coated Aluminium Microchannel	
Total Face Area		m^2	4.63	4.63
Nominal Airflow		m^3/s	11.14	13.79
Discharge			**-H** Horizontal or **-V** Vertical (***Please Specify at Order***)	
Fan & Motor			Axial EC	
Quantity			4	4
Diameter		mm	630	710
Power Consumption		kW	2.65	4.14
Maximum Speed		rpm	1024	1176
Refrigeration			Single Circuit	
Refrigerant Type			R410A	
GWP			2088	
Holding Charge			Inert Gas	
Coil Volume		l	14.1	14.1
Refrigerant Charge	(3)	kg	5.3	5.3
Refrigerant Charge	(3)	t/CO_2	11.0	11.0
Connection				
Liquid Line - Sweat		in	1 5/8	1 5/8
Discharge Line - Sweat		in	1 5/8	1 5/8

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan. All performance data is supplied in accordance with BS EN 14511-1:2013.
(2) Overall dimensions.
(3) For guidance only.

Technical Data

CR140M, CR165M

Electrical Data

Condenser			CR140M	CR165M
Unit Data	(1)			
Nominal Run Amps		A	12.4	10.8
Maximum Start Amps		A	12.4	10.8
Recommended Mains Fuse		A	16	16
Max Mains Cable Incoming		mm²	6	6
Mains Supply 50Hz			230V/1Ph	400V/3Ph
EC Condenser Fan - Per Fan				
Quantity			4	4
Motor Size		kW	0.71	1.72
Full Load Amps		A	3.1	2.7
AC Condenser Fan - Per Fan				
Quantity			4	n/a
Motor Size		kW	0.6	n/a
Full Load Amps		A	2.62	n/a
Locked Rotor Amps		A	9.17	n/a

(1) Nominal data based on 35°C ambient and a 50°C condensing temperature and using EC fan

Installation Data

Positioning and Clearance

- Unit must be positioned on an even base to ensure correct operation.
- Observe airflow and maintenance clearances.
- Where multiple units are installed, due care should be taken to avoid the discharge air from each unit adversely affecting other units in the vicinity.
- When mounting the units adjacent to a wall or other vertical surface the condenser should be positioned with the coil side facing the wall.
- Check all services are present and accessible.

Mounting

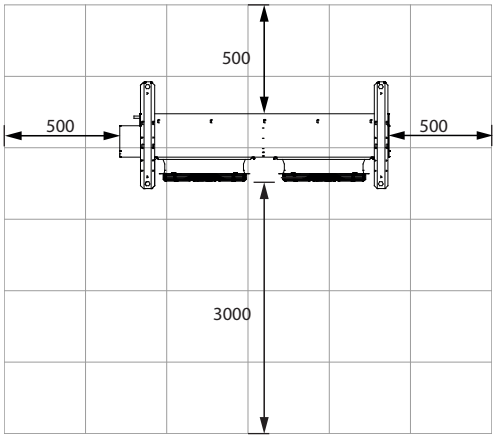
Fix the condenser down using the appropriate bolt holes in the unit fixing legs.

Horizontal Airflow Configuration

Clearance is required as below. Conciderations must be taken into account ensuring air is not recirculated. Recirculated air could cause the unit to malfunction.

- Avoid where possible siting the unit where wind and air re-circulation may interfere with the fan operation.

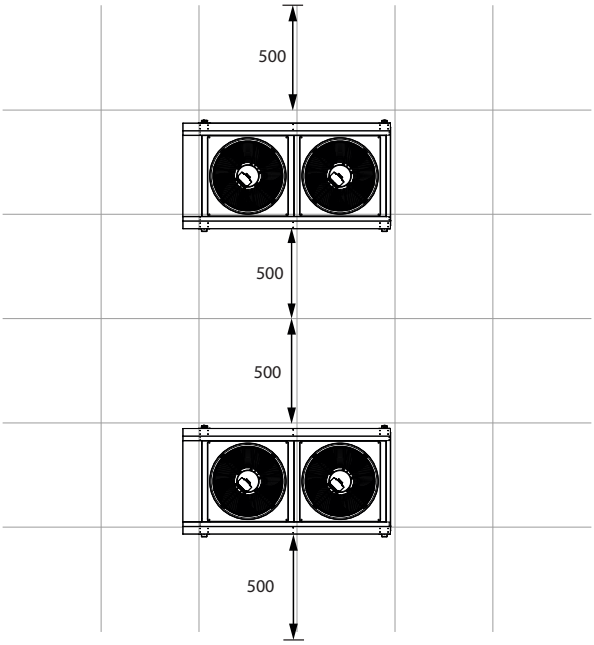
IMPORTANT ⚠	If the unit is installed in particularly windy locations, the provision of wind breaks may be required. For such applications a vertical discharge unit is recommended or where horizontal airflow could be obstructed.



Dimensions in mm

Vertical Airflow Configuration

Clearance is required as below. Conciderations must be taken into account ensuring air is not recirculated by overhead obstructions such as pipe work or ducting. Recirculated air could cause the unit to malfunction.



IMPORTANT ⚠	Illustrations are for a 2 fan unit. The same clearance is applied for other fan configurations.

Installation Data

Unit Lifting

- Employ lifting specialists
- Local codes and regulations relating to the lifting of this type of equipment should be observed.
- Each chain/sling must be capable of lifting the whole unit.

Lift the unit slowly and evenly

- Only use lifting points provided. Do not lift from the pipework connections as this may damage the unit.
- Do not use 1 chain between 2 lifting points to avoid load shift.
- Ensure that chains/slings DO NOT crush the casework, coil or fan assemblies.

If the unit is dropped it should immediately be checked for damage and reported to Airedale.

IMPORTANT ⚠	Airedale will accept no responsibility for mishandling during the positioning of the equipment. Check the unit is as ordered, discrepancies or transit damage should be reported to Airedale immediately.

Horizontal Air Discharge

The unit is delivered in horizontal air discharge configuration secured to a pallet. Where possible the unit should be moved with the pallet in place.

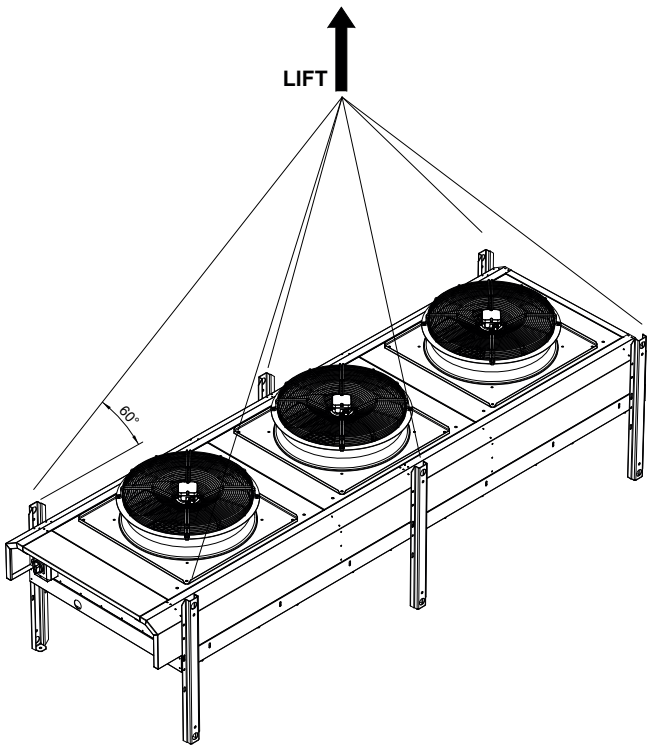
Vertical Air Discharge

The unit is delivered in horizontal air discharge configuration (with the mains isolator and fan speed controller already configured for vertical air discharge) secured to a pallet. Where possible the unit should be moved with the pallet in place.

CAUTION ⚠	Before lifting into final position, the unit legs should be re-orientated, refer to instructions provided at delivery. Care should be taken to ensure the unit does not sustain damage before it is lifted into final position.

Vertical

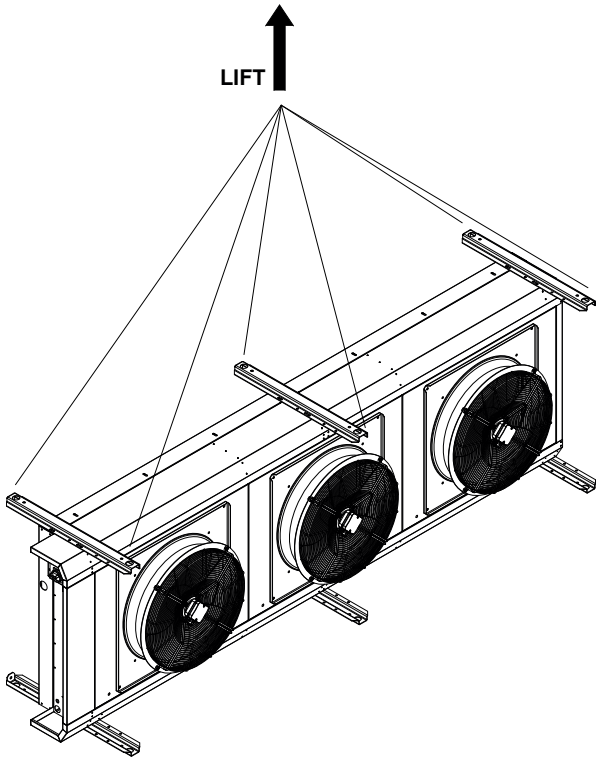
Use lifting eyes attached to individual slings/chains (supplied by others) and attach 1 to the top of every leg using the holes provided as illustrated. Maximum of 8 slings/chains.



Installation Data

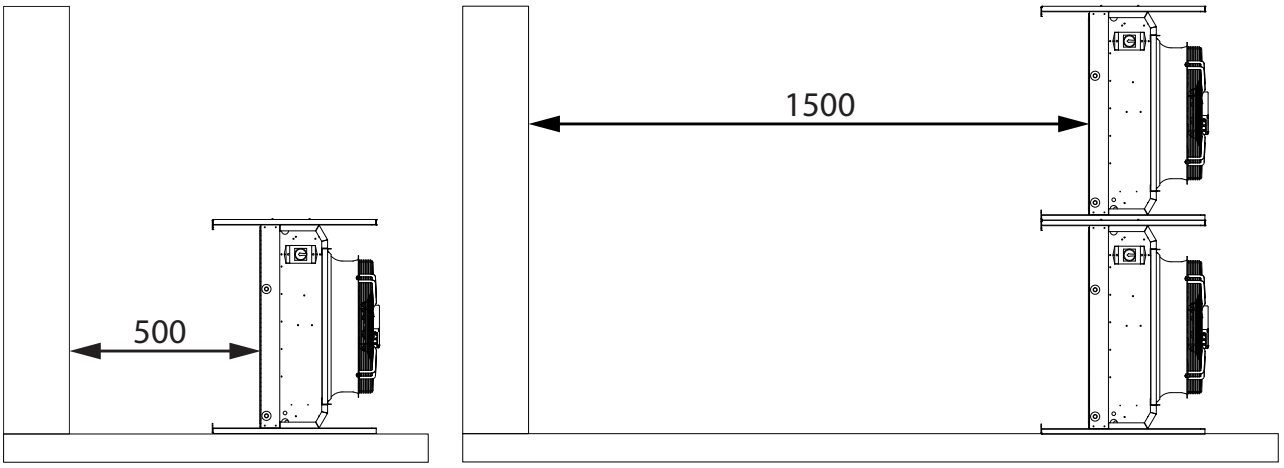
Horizontal Airflow

Use lifting eyes attached to individual slings/chains (supplied by others) and attach 2 to every top leg using the holes provided as illustrated. Maximum of 8 slings/chains.



Stacking Units

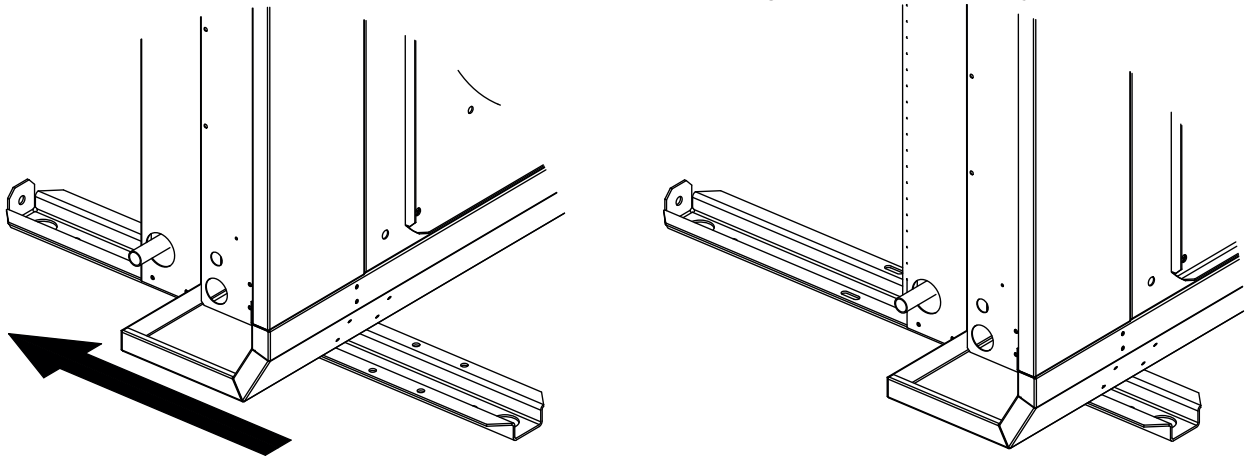
Positioning condensers stacked on top of each other can cause the bottom unit to be starved of air. It is therefore required that additional clearance is allowed.
Single units clearance 500mm, stacked units clearance 1500mm.



Installation Data

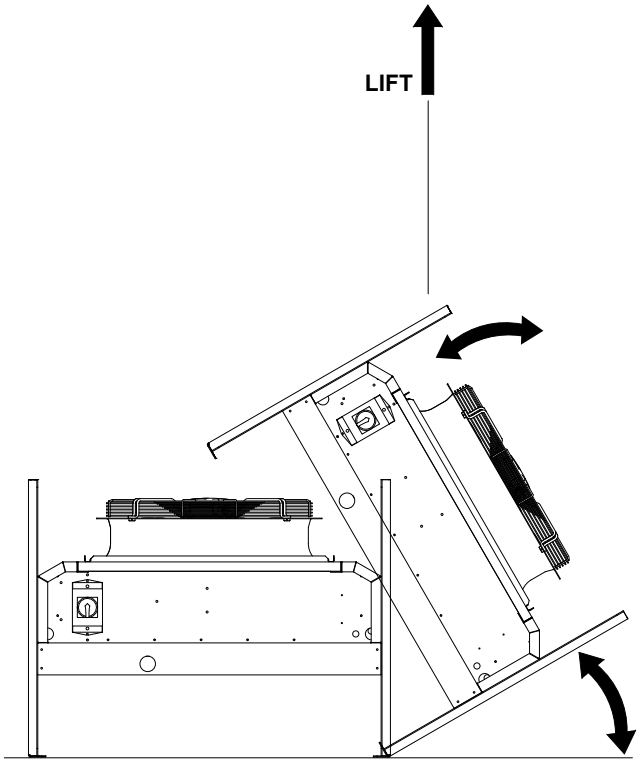
Re-Orientation To Vertical Discharge

Step 1. Remove the fixings securing the unit to the pallet.
Step 2. In line with horizontal discharge lifting instructions, lift the unit sufficiently to gain access to the lower leg fixings.
Step 3. Reposition and secure the lower 2 legs to the corner of the unit using the fixings and hole positions provided to both faces.
Note: model sizes CR080M & CR165M have an additional mid support leg, this should also be adjusted and secured.



Step 4. Lower and rest the unit down to floor and reposition and secure the upper legs as described in Step 3.
Step 5. In line with vertical discharge lifting instructions lift the unit slowly into vertical orientation. Care should be taken to ensure the unit does not drop into position and that damage is not sustained prior to lifting the unit into final position.
Step 6. The unit may be lifted into its final position.

Horizontal Airflow to Vertical



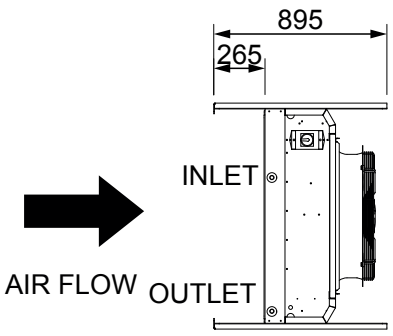
CAUTION ⚠	It is strictly prohibited to use the connections, which are delicate parts of the Coil, as anchoring points when lifting or handling the unit. This would cause serious damage to the Coil and serious risks for the safety of persons and goods.

Installation Data

General Arrangement Drawings

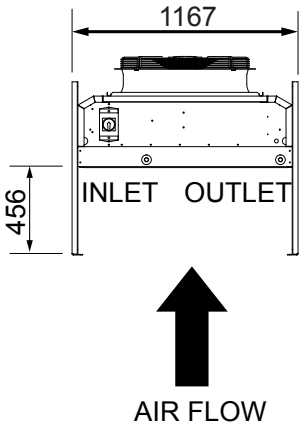
End Elevations

Horizontal Airflow



Inlet (Top) = Discharge Line
Outlet (Bottom) = Liquid Line

Vertical Airflow



IMPORTANT ⚠	The Inlet (Discharge) and Outlet (Liquid) connection in the horizontal air discharge orientation must be located at the top and bottom of the unit respectively, and that in no circumstances should the unit be turned upside down. Doing so will invalidate warranty.

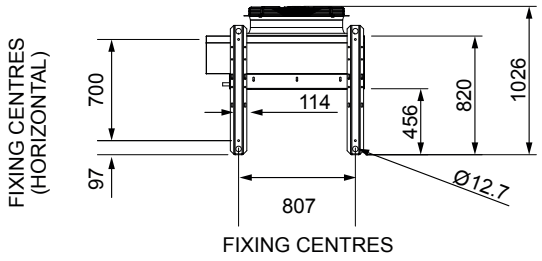
Installation Data

General Arrangement Drawings

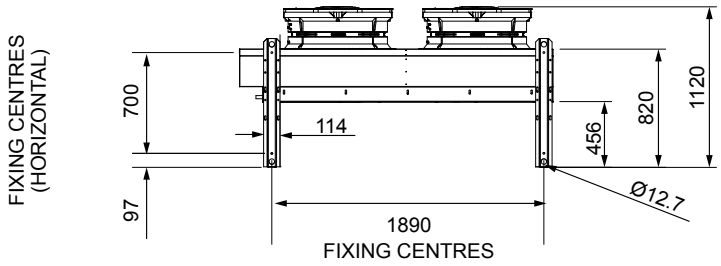
Side Elevations

Fan type illustrated

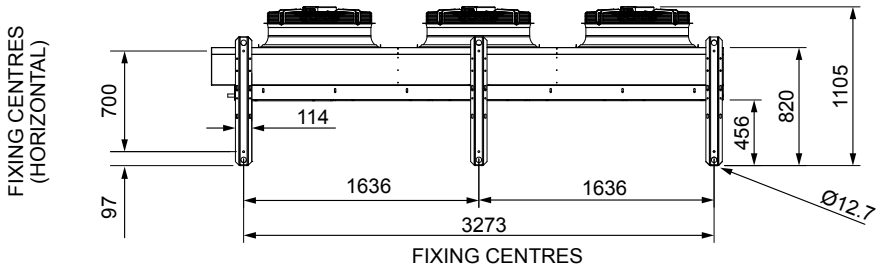
1 Phase AC Fan



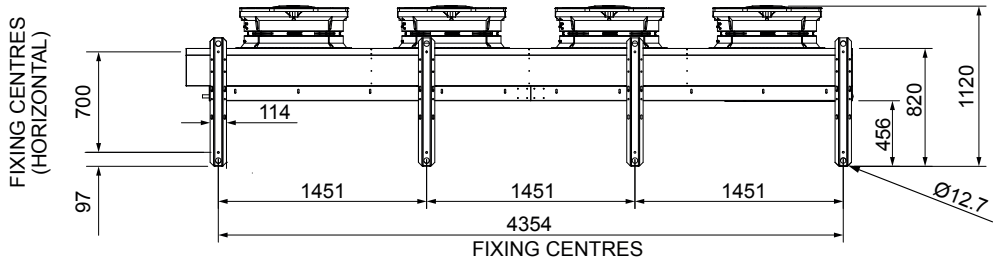
1 Phase EC Fan



3 Phase EC Fan



1 Phase AC Fan



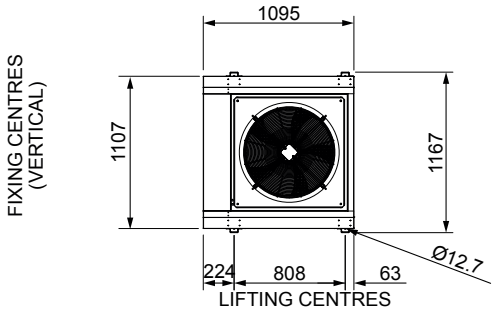
Installation Data

General Arrangement Drawings

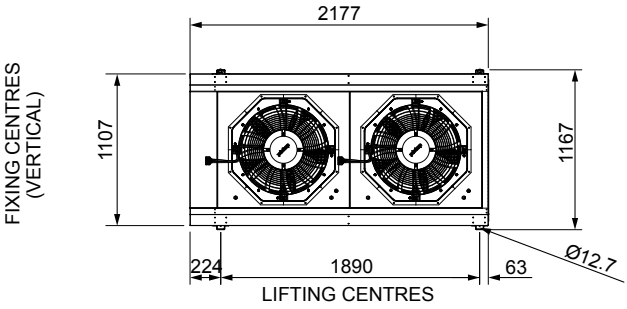
Plan Elevations

Fan type illustrated

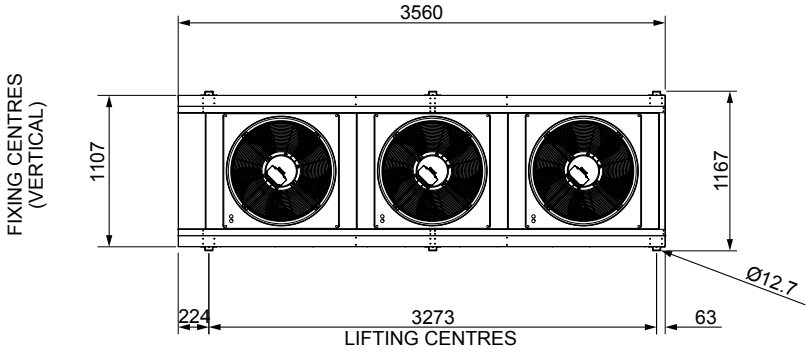
1 Phase AC Fan



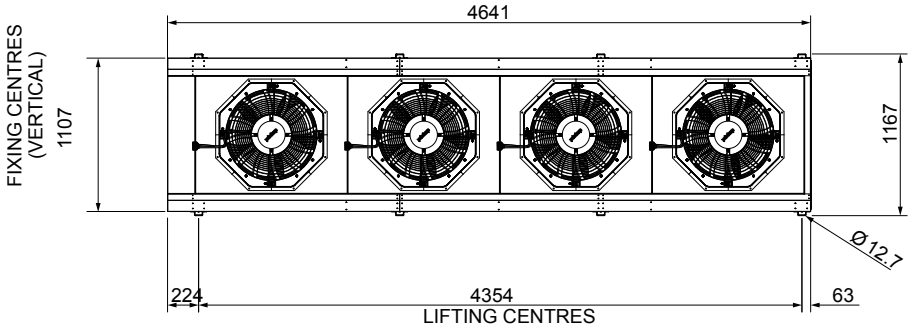
1 Phase EC Fan



3 Phase EC Fan



1 Phase AC Fan



Installation Data

Holding Charge

The units are shipped with a holding charge of inert gas to guard against contamination or moisture during shipping and storage. The charge should be checked to indicate if leaks are present prior to evacuation. If the charge appears to be either partially or totally lost, then the unit should be carefully checked for signs of physical damage.

Pipework Installation - Good Practices

- Installation and brazing of interconnecting pipework should be carried out by qualified personnel only.
- Use straight line routes where ever possible.
- When cutting tubes to length, ensure that the ends are cut square using dedicated copper tube cutters.
- Remove burrs to the ends of the copper tube, holding the tube downward to avoid allowing dirt to contaminate the tube.
- Ensure the mating surfaces to be brazed are cleaned and free from debris.
- To prevent oxide particle build up, an inert gas (e.g. nitrogen) should flow freely through the piping system during the brazing operation at an appropriate flow rate, following an initial purge of all air from the pipe being brazed.
- The coil must be adequately protected from heat when brazing work is carried out. Do not swage the Coil. The pipework must only be swaged to avoid additional stress and heat on the coil. Brazing must be done away from the coil. An appropriate thermos-isolating gel is recommended to protect the aluminium coil from heat. Failure to do so may damage the coil and invalidate warranty.
- Refrigerant lines should be insulated in areas of high/low temperature or when exposed to direct sunlight.
- When insulating refrigerant lines, cut approximately 30 - 50cm longer than the distance between the units to ensure the insulation goes right upto the unit, leave connections uncovered for leak testing.
- When clamping, avoid any contact between the discharge line and the liquid line.

Pipe Supports

IMPORTANT ⚠	Weight of pipework must not be supported by the unit. Three planes of movement must be allowed between the coil the first pipe clamp. If this is not possible a vibration eliminator (anaconda) must be fitted. The following table identifies the maximum distance between system pipe supports on vertical and horizontal pipe runs. All pipework should be clamped prior to insulation being applied.

Pipe O/D (inches)	Support distance (m)
3/8 - 7/8	1.0
1 1/8 - 2 1/8	2.0

Pipe Lengths

Discharge Line

Maximum pressure loss for discharge pipework 42 kPa. Minimum velocity for discharge risers 5 m/s, to ensure good oil return.

Liquid Line:

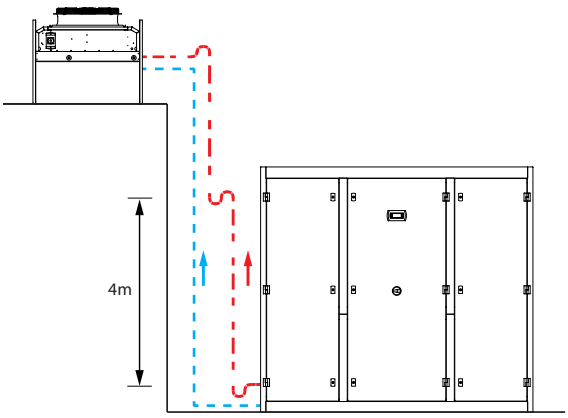
Maximum pressure loss for liquid line pipework 21 kPa. Minimum velocity for liquid line 0.5 m/s, to ensure good oil return.

Installation Data

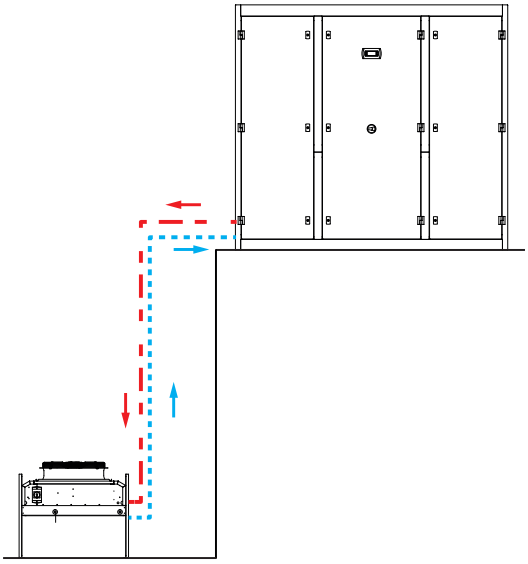
Oil Traps

For long vertical rises in discharge lines, it is essential that oil traps are located every 4m to ensure proper oil movement/ entrapment. In addition there should be an oil trap at the exit of the air handling unit before a vertical riser is applied (refer to example below).

Condenser above indoor unit



Condenser below indoor unit



IMPORTANT ⚠	It is the responsibility of the installing contractor/site engineer to check the pipe size/refrigerant charge is correct for each system installation and application. Split systems may require additional oil which should be added to the low pressure side of each compressor. Design should be in accordance with accepted refrigeration practice to ensure good oil return to the compressor(s) under all normal operating conditions. REMEMBER excessive pressure loss in interconnecting pipework will impair system performance; this should be factored in during the design of the system and where necessary oil traps employed.

Installation Data

Pressure Testing

In accordance with PED 2014/68/EC, a strength test should be carried out in order to ensure that all interconnecting joints, pipework and components are sufficiently strong to cater for maximum permissible operating pressures.

CAUTION ⚠	Once installation is completed, the high pressure side of the system should be strength tested with dry nitrogen. To comply with the PED directive, the unit is factory pressure tested and recorded on the test certificate provided.

SPLIT SYSTEMS: Ensure additional in line system components will withstand the intended system PED recommendation test pressure. If not, we recommend isolation where possible, eg in-line HP/LP switches, pressure transducer(s) and compressor(s).

Pressure testing can be dangerous if not properly conducted; personnel undertaking pressure testing MUST be technically competent and suitably qualified.

- Record the pressure over a minimum of 60 minutes to detect major leaks (a 24 hour period should preferably be allowed), on the commissioning sheet provided.
- If a reduction in pressure is detected, trace the leak and repair before conducting a further pressure test and charging.

Evacuation

Evacuation for systems operating on R410A refrigerant should be carried out as follows: (for other refrigerants refer to Airedale for advice).

- Use a high vacuum pump and connect to the high and low pressure sides of the system via a gauge manifold fitted with compound gauges, a high vacuum gauge should be fitted to the system at the furthest point from the vacuum pump.
- The system should be evacuated to 0.5 Torr and if achieved no further evacuation steps are required.
- Triple evacuation should be used to ensure that all contaminants are removed if initially 0.5 Torr could not be achieved.
- Operate the vacuum pump until a pressure of 1.5 Torr (200 Pa) absolute pressure is reached, then stop the vacuum pump to break the vacuum using oxygen free Nitrogen until the pressure rises above zero. The above operation should be repeated a second time.
- The system should then be evacuated a third time but this time to 0.5 Torr absolute pressure.

Installation Data

Electrical

CAUTION ⚠	The following information is for general guidance; refer to the certified drawings provided for installation. ALL work MUST be carried out by technically trained competent personnel. The equipment contains live electrical and moving parts, ISOLATE prior to maintenance or repair work.

General

- Once the refrigeration pipework is complete the electrical supply can be connected as per the wiring diagram supplied with each unit.
- A fused and isolated electrical supply of the appropriate rating should be installed.
- As standard the equipment is designed for 230V, 1 Phase, 50Hz or 400V, 3 Phase, 3 wire 50Hz to all relevant IEE regulations, British standards and IEC requirements.
- All mains and interconnecting wiring should be carried out to National and Local codes.
- Wires should be capable of carrying the maximum load current under non-fault conditions at the stipulated voltage.
- Avoid large voltage drops on cable runs, particularly low voltage wiring.
- Each unit requires an independently fused and isolated power supply.

Interconnecting Wiring

CR26,35,60,75,95,130,165	L1 L2 L3 PE	← ← ← ←	Mains Incoming Supply 400V / 3PH / 50Hz

CR12,16,22,30,50,60,65,80,105,140	L1 N PE	← ← ←	Mains Incoming Supply 230V / 1PH + N / 50Hz

IMPORTANT ⚠	This system has been designed to be connected to a TN type distribution system. For alternate distribution type systems, contact Airedale.

Commissioning

General

CAUTION ⚠	To be read in conjunction with the commissioning sheets provided. Please ensure all documents have been completed correctly and return to Airedale Technical Support immediately to validate warranty.

Pre Commissioning Checklist

CAUTION ⚠	ALL work MUST be carried out by technically trained competent personnel. The equipment contains live electrical and moving parts, ISOLATE prior to maintenance or repair work.

CAUTION ⚠	The following commissioning information is based on a complete matched Airedale system using R410A.

Start-Up

Switch on the power supply to the condenser and switch the isolator to the ON position.
The fan motor starts automatically when the refrigerant condensing pressure reaches the pre-set value of the pressure regulator (factory set). Therefore to check operation of the condenser the indoor unit to which it is linked must be running.

Unit Checks

1 The unit condition is satisfactory.
2 All pipework is complete and insulated where necessary.
3 All fans are able to rotate freely.

Electrical

1 All electrical connections (both mains and control) are properly terminated.
2 The power supply is of the correct voltage and frequency.
3 External fuses/circuit breakers are of the correct rating.
4 The units are properly earthed in accordance with current regulations.
5 All pipework is earth bonded as required.

Refrigeration

1 Check for the presence of a refrigerant charge in the condenser.
2 The system has been evacuated correctly.

Commissioning Checklist

System Readings

Condensing temperature (as read on the discharge gauge) should be in the region of 40 to 41°C with an external ambient temperature of 30°C (condensing is normally 10°C above ambient) at full fan speed.

Running Checks

Once the system has been charged, the following running checks should be carried out:
Check the operation of the fan speed controller by observing an increase in fan speed if the outdoor coil is temporarily partially blocked.

Operating limits

Standard Variable Speed Head Pressure Control	
Minimum Ambient Air DB °C	-20°C
Maximum Ambient Air DB °C	+52°C

Low Ambient Kit	
Minimum Ambient Air DB °C	-32°C
Maximum Ambient Air DB °C	+52°C

Extra Low Ambient Kit	
Minimum Ambient Air DB °C	-40°C
Maximum Ambient Air DB °C	+52°C

Control Device Adjustment

AC Type Fans

When the condenser is matched to an Airedale indoor unit, head pressure control is provided by the indoor unit. Unmatched condensers are supplied with a Variable speed head pressure control device. The control device is factory pre-set.To check the setting connect a pressure gauge with scale reading up to at least 45bar to the pressure tapping located in the outlet manifold of the condenser and watch the operation of the fan as the pressure changes. If the settings require adjustment, follow the instructions set out below and check new settings as explained above.
Before carrying out any work, ensure that the isolator is switched off.

Variable Speed Control

The fan speed is controlled via alteration of the supply voltage which corresponds to a particular condensing pressure. The control system is suitable for temperatures down to -20°C. The pressure set point corresponding to the maximum output voltage can be adjusted by means of a potentiometer internal to the case of the controller.

EC Fans

When the condenser is matched to an Airedale indoor unit, head pressure control is provided by the indoor unit.
The fan speed of unmatched condensers is controlled by the onboard EC fan electronics connected to a pressure transducer on the outlet manifold.All fans are supplied pre-programmed to a head pressure setpoint of 26 barg and proportional band setpoint of 5 barg unless otherwise specified at order.

Refrigerant Charging

It is important that the system is charged with the correct amount of refrigerant. Remember, a seriously over or undercharged system may lead to major component failure. The final refrigerant charge level should be set by the design evaporating and condensing pressures, together with a full or nearly full sight glass. The suction and discharge pressures should be constantly monitored whilst charging is in progress. To calculate the system refrigeration charge, please refer to the indoor unit data.

		CR012M	CR016M	CR022M	CR026M	CR030M	CR035M
Refrigerant Type		R410A					
Coil Volume	l	2.3	3.1	3.2	3.2	4.2	4.2
Refrigerant Charge	kg	0.9	1.2	1.2	1.2	1.6	1.6

		CR050M	CR060M	CR065M	CR075M	CR080M	CR095M
Refrigerant Type		R410A					
Coil Volume	l	5.6	5.6	7.2	7.2	8.7	8.7
Refrigerant Charge	kg	2.1	2.1	2.7	2.7	3.3	3.3

		CR105M	CR130M	CR140M	CR165M
Refrigerant Type		R410A			
Coil Volume	l	11.1	11.1	14.1	14.1
Refrigerant Charge	kg	4.2	4.2	5.3	5.3

Maintenance

CAUTION ⚠	ALL work MUST be carried out by technically trained competent personnel. The equipment contains live electrical and moving parts, ISOLATE prior to maintenance or repair work.

IMPORTANT ⚠	Ensure relevant F-Gas Regulation checks are carried out at the appropriate period.

GENERAL
The maintenance schedule indicates the time period between maintenance operations.

3 MONTHS
At every service visit the following checks should be carried out:

Fan & Motor Assembly
1 Examine the fan and motor assemblies for lateral and end play in the bearings.
2 Ensure that no water is entering the motor via the electrical gland plate.
3 Check fan blades for damage and corrosion.

Refrigeration Circuits
1 Visually examine pipework and components for damage, wear and tear and oil patches, the latter being indicative of a system leak.
2 Ensure the fan head pressure controller is controlling the head pressure at the required setting as indicated on the commissioning sheets provided.
The gauges can then be removed from the system. Do not forget to replace the security caps on the Schrader valves.

Condenser Coil
Clean the condenser coil with pressurised air, following the same direction as the fins. Ensure the pressure does not exceed 10 bar and that a minimum distance of 300mm is maintained. Take care not to damage the fins and comb out if they have been knocked from their correct alignment. Ensure that any cleaning solution has a PH value between 7 and 8.2.

CAUTION ⚠	Do not use steam or harsh chemicals for cleaning condenser coils as this may damage the coils or cause excessive internal pressures.

Electrical
1 Check all electrical connections for signs of overheating or arcing.
2 Check all cables for signs of chafing or physical damage.

Cabinet
1 Clean the cabinets using a mild detergent.
2 Treat any paint damage or rust as necessary.

12 MONTHS
As per 3 months plus the following:
1 Check all electrical connections for security.
2 Check all refrigeration connections with a leak detector.

Troubleshooting

Matched Airedale units

FAULT	POSSIBLE CAUSE	REMEDY/ACTION
Unit will not start.	No power.	Check power supply to the controller.
	Wired incorrectly.	Check wire connections in accordance with wiring diagram on control box lid.
	Loose wires.	Check all wires, connections, terminals etc.
Head pressure too high.	Condenser coil clogged or dirty.	Clean condenser.
	Overcharge of refrigerant, normally troublesome in warm weather.	Reclaim excess refrigerant from system.
	Air or other non-condensable gas in system.	Evacuate system and re-charge with new refrigerant.
	Head pressure controller faulty.	Refer to indoor unit.
	Fan not operating or operating inefficiently.	Refer to indoor unit.
Head pressure too low.	Fan operating too fast in low ambient conditions.	Refer to indoor unit.
Condenser fan(s) not operating - power on.	Power supply failure.	Check power supply at circuit breaker.
	Wiring to motor.	Check voltage at motor terminals.
	Motor / fan assembly jammed.	Isolate unit and check free rotation of motor/fan assembly, if faulty - replace motor.
	Motor internal overheat protector tripped.	Carry out continuity check at terminals “TK” in motor terminal box, if tripped and motor hot - check bearings, if tripped and motor cold - replace motor.
	Faulty motor windings/capacitor.	Motor humming would indicate fault in motor or capacitor, check windings for continuity and if OK replace capacitor.
	Minimum speed set too low.	Refer to indoor unit.
	Faulty pressure sensor.	Check electrical connections are secure at controller and pressure sensor, replace controller and sensor (as they are matched sets).
	Faulty fan speed controller.	Refer to indoor unit.
Condenser fan(s) runs too fast.	High ambient condition or excessive re-circulation of air around condenser coil.	Check installation against design.
	Minimum set speed setting incorrect.	Adjust as necessary.
	Incorrect pressure sensor setting.	Adjust sensor screw as necessary.
	Faulty fan speed controller.	Refer to indoor unit.
	Faulty pressure sensor.	Refer to indoor unit.
Condenser fan(s) runs only slowly.	Incorrect pressure setting.	Adjust sensor screw as necessary.
	Faulty fan speed controller.	Refer to indoor unit.
	Faulty pressure sensor.	Refer to indoor unit.
	Motor/capacitor faulty.	Replace.

Troubleshooting

Standalone Units

FAULT	POSSIBLE CAUSE	REMEDY/ACTION
Unit will not start.	No power.	Check power supply to the controller.
	Wired incorrectly.	Check wire connections in accordance with wiring diagram on control box lid.
	Loose wires.	Check all wires, connections, terminals etc.
Head pressure too high.	Condenser coil clogged or dirty.	Clean condenser.
	Overcharge of refrigerant, normally troublesome in warm weather.	Reclaim excess refrigerant from system.
	Air or other non-condensable gas in system.	Evacuate system and re-charge with new refrigerant.
	Head pressure controller faulty.	Check fan speed controller - if faulty - replace.
	Fan not operating or operating inefficiently.	Check motor - if faulty - replace.
Head pressure too low.	Fan operating too fast in low ambient conditions.	Check fan speed controller adjustment - if faulty - replace.
Condenser fan(s) not operating - power on.	Power supply failure.	Check power supply at circuit breaker.
	Wiring to motor.	Check voltage at motor terminals.
	Motor / fan assembly jammed.	Isolate unit and check free rotation of motor/fan assembly, if faulty - replace.
	Motor internal overheat protector tripped.	Carry out continuity check at terminals “TK” in motor terminal box, if tripped and motor hot - check bearings, if tripped and motor cold - replace motor.
	Faulty motor windings/capacitor.	Motor humming would indicate fault in motor or capacitor, check windings for continuity and if OK replace capacitor.
	Minimum speed set too low.	Adjust head pressure controller to suit.
	Faulty pressure sensor.	Check electrical connections are secure at controller and pressure sensor, replace controller and sensor (as they are matched sets).
	Faulty fan speed controller.	Link wires “line” and “load” to bypass controller, if motor runs full speed - replace unit.
Condenser fan(s) runs too fast.	High ambient condition or excessive re-circulation of air around condenser coil.	Check installation against design.
	Minimum set speed setting incorrect.	Adjust as necessary.
	Incorrect pressure sensor setting.	Adjust sensor screw as necessary.
	Faulty fan speed controller.	Replace controller and sensor (as they are matched sets).
	Faulty pressure sensor.	Replace controller and sensor (as they are matched sets).
Condenser fan(s) runs only slowly.	Incorrect pressure setting.	Adjust sensor screw as necessary.
	Faulty fan speed controller.	Replace controller and sensor (as they are matched sets).
	Faulty pressure sensor.	Replace controller and sensor (as they are matched sets).
	Motor/capacitor faulty.	Replace.

Intentionally Blank

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
Web www.airedale.com