

Condensers

C11HI – C45HI

11 - 45 kW

CS50 – CS105

50 – 105kW



INSTALLATION AND MAINTENANCE MANUAL



FM00542

EMS52086

About Airedale Products & 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, we have introduced Airedale Service, who 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 our Airedale Service 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.

Where applicable, effective removal of condensate is achieved by gradient drainage to outlets and where used, humidification systems produce sterile, non-toxic steam during normal operation.

For effective prevention of such risk it is necessary that the equipment is maintained in accordance with Airedale recommendations.

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) 113 238 7789	enquiries@airedale.com
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Warranty	<p>All AIAC products or parts (non consumable) supplied for installation within the UK mainland and commissioned by an AIAC 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.</p> <p>Parts or Equipment supplied by AIAC for installation within the UK or for Export that are properly commissioned in accordance with AIAC standards and specification, not commissioned by an AIAC 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.</p> <p>Parts or equipment installed or commissioned not to acceptable AIAC standards or specification invalidate all warranty.</p>
Warranty is only valid in the event that	<p>In the period between delivery and commissioning the equipment: is properly protected & serviced as per the AIAC installation & maintenance manual provided where applicable the glycol content is maintained to the correct level.</p> <p>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).</p> <p>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.</p> <p>To be read in conjunction with the Airedale Conditions of Sale - Warranty and Warranty Procedure, available upon request.</p>
Procedure	<p>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.</p> <p>Full description of part required, including Airedale's part number, if known The original equipment serial number An appropriate purchase order number</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Exclusions	<p>Warranty may be refused for the following reasons:</p> <ul style="list-style-type: none">• 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	<p>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.</p>

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General Description

UNIT IDENTIFICATION

AIR COOLED CONDENSER UNIT	
C / CS	Condenser
11-105	Model Size (Expressed as Total Heat Rejection in kW)
HI	Head Pressure Control & Mains Isolator Fitted (C Condensers only)
H	Horizontal Air Discharge
V	Vertical Air Discharge
Example:	C45HI-H CS50H-0

INTRODUCTION

This range of Air Cooled Condensers is available in 10 model sizes with heat of rejection 11 - 105kW.

Custom designed for a small footprint, low sound level, slimline and aesthetically pleasing appearance.

Available in either horizontal or vertical air discharge orientation, *please specify at order.*

Airedale has a comprehensive range of air cooled direct expansion indoor units available to provide a matched system, please contact Airedale for further details.

All units are despatched following extensive leak and pressure testing and carry a holding charge of inert gas.

The unit is designed for the use of R407C; please refer to **Optional Extras** for alternative refrigerants.

CE Directive



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

Electromagnetic Compatibility Directive (EMC)	2014/30/EU
Low Voltage Directive (LVD)	2014/35/EU
Machinery Directive (MD)	89/392/EEC in the version 2006/42/EC
Pressure Equipment Directive (PED)	97/23/EC Article 13 of 2014/68/EU

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

Maximum and Minimum Operation Temperature (TS) and Pressure (PS)	
Operating Temperature (TS),	TS = Min -20°C to Max 120°C *
Maximum Operating Pressure (PS)	PS = High Side 26 Barg

*Based upon the maximum machine running temperatures

General Description

STANDARD FEATURES

Construction	<p>Unit cabinets are manufactured from galvanised sheet steel coated with epoxy baked powder paint to provide a durable finish.</p> <p>Standard unit colour is Light Grey (RAL 7035).</p>
Condenser	<p>Large surface area coil(s) ideally positioned to optimise airflow and heat transfer, manufactured from refrigeration quality copper tube with mechanically bonded aluminium fins.</p> <p>The copper tube is internally rifled for improved heat transfer.</p> <p>Factory pressure tested to 40Bar.</p> <p>Sweat copper pipe for brazed connection as standard.</p>
Fan & Motor Assembly	<p>Axial flow fan assembly with low noise sickle type blades and inlet ring.</p> <p>The external rotor motor allows the use of a low power output, single phase, speed controllable motor to power the fan.</p> <p>The motor has inbuilt thermal overload protection and the assembly is supplied complete with a finger guard for protection.</p>
Refrigeration	<p>Each unit features as standard:</p> <ul style="list-style-type: none">• Filter drier (loose)• Holding Charge of inert gas
Electrical	<p>All electrical components are rated for all year round outdoor use.</p> <p>All wiring is colour coded and numbered for identification. All units are wired in accordance with current local and European standards.</p>
Head Pressure Control (C11 – 45)	<p>Head pressure control is maintained via a factory fitted on/off pressure switch rated to IP54 for outdoor use as standard. This fan switching offers control with ambients down to 0°C, below this temperature variable speed controllers are recommended. Refer to Optional Extras for further information.</p>
Head Pressure Control (CS50 – 105)	<p>Head pressure control is maintained via a factory modulating head pressure control Good control with ambient down to 0°C.</p>
Main Electric Isolator	<p>A weatherproof mains isolator is fitted to ensure complete unit isolation of the electrical panel during adjustment and maintenance.</p>

General Description

OPTIONAL EXTRAS

Corrosion Resistant Coated Coils In atmospheres where high corrosion is anticipated, epoxy coated aluminium finned coils can be supplied.

Head Pressure Control - Variable Speed (Standard on CS50 - 105) Head pressure control is maintained via fan speed modulation. This is a more accurate form of control and will prolong the life of the fan. The controller is rated to IP54 for outdoor use and will operate accurately in ambients down to -20°C.

Shut Off Valves Where unit isolation for easier maintenance is required, shut off valves can be supplied loose for on site fitment.

Short Case Axial Fans Short case axial fans can be supplied for indoor installations where discharge air requires to be ducted to an outdoor location. The fans will meet duty plus 75Pa of external static pressure.

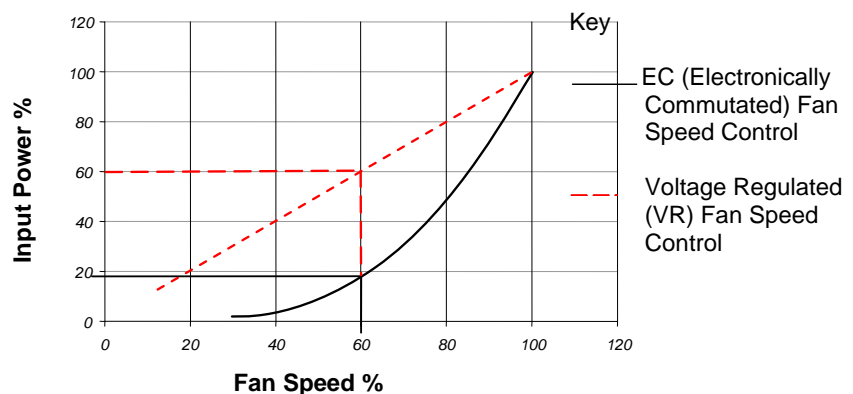
Coil Guards (Sizes 50 - 105 Only) Guards can be fitted to each of the outer coils to protect against damage.

Electronically Commutated (EC) Fan Motor (CS50-105 Only) ES 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 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 fans modulating range is typically 40-100% of full fan speed.

The EC fan presents superior energy efficiency, at part load fan speeds compared to the equivalent ac fan motor, offering typical efficiency savings up to 70%.

Fan speeds are factory set to either 1080 rpm, 980 rpm or 700 rpm depending on sound level variant..

Standard voltage regulated (VR) fan speed controllers offer a linear response. By comparison the EC fan is adjusted on demand via the unit microprocessor with precision, offering substantial energy savings. The following illustration shows a comparison of the typical power input required by each method.



Example: Fan speed of 60%
 VR input power required 60%
 EC input power required 18%

General Specification

MECHANICAL DATA

		C11HI	C15HI	C20HI	C25HI	C35HI
Total Heat of Rejection	(1) kW	11	16.5	20.2	25.6	30.3
Dimensions - Horizontal (2)						
Height	mm	648	648	848	848	1048
Width	mm	550	550	645	645	645
Length	mm	1275	1275	1100	1100	1650
Dimensions - Vertical (2)						
Height	mm	997	997	1092	1092	1092
Width	mm	700	700	900	900	1100
Length	mm	1275	1275	1100	1100	1650
Weight						
Machine	kg	51	63	58	65	97
Construction						
Material/Colour		Galvanised Sheet Steel, Epoxy Baked Powder Paint - Light Grey (RAL 7035)				
Condenser		Air Cooled - Rifled Copper Tube/Turbulated Aluminium Fins				
Quantity		1	1	1	1	1
Total Face Area	m ²	0.675	0.675	0.8	0.8	1.6
Nominal Airflow	m ³ /s	1.2	1.9	2.0	2.25	2.35
Discharge		H Horizontal or V Vertical (<i>Please Specify at Order</i>)				
Fan & Motor		Axial				
Quantity		1	2	1	1	1
Diameter	mm	450	450	630	630	630
Maximum Speed	rpm	930	930	900	900	900
Refrigeration		Single Circuit				
Refrigerant Type		R407C				
Holding Charge		Inert Gas				
Coil Volume	l	5.3	5.3	6.1	8.1	15.7
Refrigerant Charge	(3) kg	2.1	2.1	2.3	3.1	6.1
Connections						
Liquid Line - Sweat	in	1/2	1/2	5/8	5/8	7/8
Discharge Line - Sweat	in	5/8	5/8	7/8	7/8	7/8
OPTIONAL EXTRAS						
Short Case Axial Fan		Designed to 75 Pa ESP				
Dimensions - Horizontal						
Height	mm	648	648	848	848	1048
Width	mm	675	675	735	735	711
Length	mm	1275	1275	1100	1100	1650
Dimensions - Vertical						
Height	mm	1112	1112	1162	1162	1162
Width	mm	700	700	900	900	1100
Length	mm	1275	1275	1100	1100	1650
Weight						
Machine	kg	61	73	70	77	109

- (1) Nominal data based on 35°C ambient and a 50°C mean condensing temperature and using standard fan.
All performance data is supplied in accordance with BS EN 14511-1:2013
- (2) Overall dimensions for clearance; refer to **Dimensional & Installation Data** for detail.
- (3) For guidance only.

General Specification

MECHANICAL DATA

		C45HI	CS50	CS65	CS80	CS105
Total Heat of Rejection	(1) kW	46.1	51.8	69.3	84.5	111.3
Dimensions - Horizontal (2)						
Height	mm	1048	1167	1167	1167	1167
Width	mm	645	1000	1000	1000	1000
Length	mm	1650	2184	2184	3565	3565
Dimensions - Vertical (2)						
Height	mm	1092	1090	1090	1090	1090
Width	mm	1100	1167	1167	1167	1167
Length	mm	1650	2184	2184	3565	3565
Weight						
Machine	kg	110	132	162	208	260
Construction						
Material/Colour		Galvanised Sheet Steel, Epoxy Baked Powder Paint - Light Grey (RAL 7035)				
Condenser		Air Cooled - Rifled Copper Tube/Turbulated Aluminium Fins				
Quantity		1	1	1	1	1
Total Face Area	m ²	1.6	2.11	2.11	3.63	3.63
Nominal Airflow	m ³ /s	4.45	4.8	4.2	7.5	6.6
Discharge		H Horizontal or V Vertical (Please Specify at Order)				
Fan & Motor		Axial				
Quantity		2	2	2	3	3
Diameter	mm	630	630	630	630	630
Maximum Speed	rpm	900	900	900	900	900
Refrigeration		Single Circuit				
Refrigerant Type		R407C				
Holding Charge		Inert Gas				
Coil Volume	L	15.7	10.7	21.5	18.3	36.7
Refrigerant Charge	(3) kg	6.1	4.3	8.5	7.3	14.6
Connections						
Liquid Line - Sweat	in	7/8	3/4	3/4	7/8	7/8
Discharge Line - Sweat	in	7/8	1 1/8	1 1/8	1 3/8	1 3/8
OPTIONAL EXTRAS						
Short Case Axial Fan		Designed to 75 Pa ESP				
Dimensions - Horizontal						
Height	mm	1048	1167	1167	1167	1167
Width	mm	711	1000	1000	1000	1000
Length	mm	1650	2184	2184	3565	3565
Dimensions - Vertical						
Height	mm	1162	1130	1130	1130	1130
Width	mm	1100	1167	1167	1167	1167
Length	mm	1650	2184	2184	3565	3565
Weight						
Machine	kg	134	154	184	242	294

- (1) Nominal data based on 35°C ambient and a 50°C mean condensing temperature and using standard fan. All performance data is supplied in accordance with BS EN 14511-1:2013
- (2) Overall dimensions for clearance; refer to **Dimensional & Installation Data** for detail.
- (3) For guidance only.

General Specification

ELECTRICAL DATA

		C11HI	C15HI	C20HI	C25HI	C35HI
Unit Data (1)						
Nominal Run Amps	A	0.65	1.3	2.8	2.8	2.8
Maximum Start Amps	A	2.6	5.2	5.6	5.6	5.6
Recommended Mains Fuse	A	10	10	10	10	10
Max Mains Cable Incoming	mm ²	10	10	10	10	10
Mains Supply		230V / 1Ph + N / 50Hz				
Fan - Per Fan						
Quantity		1	2	1	1	1
Motor Size	kW	0.15	0.15	0.59	0.59	0.59
Full Load Amps	A	0.65	0.65	2.8	2.8	2.8
Locked Rotor Amps	A	2.6	2.6	5.6	5.6	5.6
OPTIONAL EXTRAS						
Short Case Axial Fan - Per Fan						
Quantity		1	2	1	1	1
Motor Size	kW	0.61	0.61	1.4	1.4	1.4
Full Load Amps	A	2.8	2.8	6.0	6.0	6.0
Locked Rotor Amps	A	7	7	18	18	18
Recommended Mains Fuse	A	10	10	10	10	10
EC Fans						
Quantity		N/A	N/A	N/A	N/A	N/A
Motor Size	kW	N/A	N/A	N/A	N/A	N/A
Full Load Amps	A	N/A	N/A	N/A	N/A	N/A
Recommended Mains Fuse	A	N/A	N/A	N/A	N/A	N/A

		C45HI	CS50	CS65	CS80	CS105
Unit Data (1)						
Nominal Run Amps	A	5.6	5.24	5.24	7.86	7.86
Maximum Start Amps	A	11.2	18.34	18.34	27.51	27.51
Recommended Mains Fuse	A	10	10	10	16	16
Max Mains Cable Incoming	mm ²	10	6	6	6	6
Mains Supply		230V / 1Ph + N / 50Hz				
Fan - Per Fan						
Quantity		2	2	2	3	3
Motor Size	kW	0.59	0.6	0.6	0.6	0.6
Full Load Amps	A	2.8	2.62	2.62	2.62	2.62
Locked Rotor Amps	A	5.6	9.17	9.17	9.17	9.17
OPTIONAL EXTRAS						
Short Case Axial Fan - Per Fan						
Quantity		2	2	2	3	3
Motor Size	kW	1.4	1.4	1.4	1.4	1.4
Full Load Amps	A	6.0	6.0	6.0	6.0	6.0
Locked Rotor Amps	A	18.0	18.0	18.0	18.0	18.0
Recommended Mains Fuse	A	16	16	16	25	25
EC Fans						
Quantity		N/A	2	2	3	3
Motor Size	kW	N/A	0.72	0.72	0.72	0.72
Full Load Amps	A	N/A	3.2	3.2	3.2	3.2
Recommended Mains Fuse	A	N/A	10	10	16	16

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

INTERCONNECTING WIRING

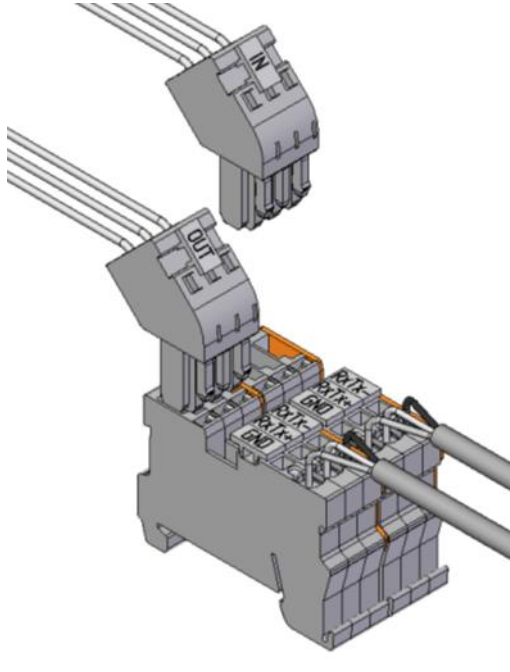
C11 - 45	L1	○
	N	○
	E	○

Mains Incoming 230V / 1Ph + N / 50Hz

CS50 - 105	L1	○
	N	○
	PE	○

Mains Incoming 230V / 1Ph + N / 50Hz

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.

Performance Data

CAPACITY DATA

Standard Condenser Fan

Mean Condensing Temperature °C	Ambient						
	25°C	30°C	35°C	40°C	45°C	48°C	
	Output kW	Output kW	Output kW	Output kW	Output kW	Output kW	
C11HI	35	6.90	3.24	-	-	-	-
	40	10.81	6.94	3.26	-	-	-
	45	15.05	10.93	6.97	3.27	-	-
	50	19.31	15.11	10.98	6.99	3.28	-
	55	23.66	19.41	15.18	11.02	7.02	4.78
C15HI	35	10.27	4.76	-	-	-	-
	40	16.21	10.37	4.80	-	-	-
	45	22.28	16.36	10.45	4.83	-	-
	50	28.49	22.51	16.49	10.51	4.85	-
	55	34.95	28.81	22.73	16.61	10.57	7.14
C20HI	35	12.52	5.79	-	-	-	-
	40	19.63	12.70	5.86	-	-	-
	45	26.76	19.93	12.84	5.91	-	-
	50	34.70	27.23	20.18	12.96	5.95	-
	55	42.79	35.22	27.65	20.42	13.07	8.82
C25HI	35	15.98	7.41	-	-	-	-
	40	25.35	16.06	7.44	-	-	-
	45	35.17	25.47	16.13	7.47	-	-
	50	45.22	35.31	25.57	16.18	7.49	-
	55	55.50	45.47	35.47	25.66	16.22	10.99
C35HI	35	19.01	8.84	-	-	-	-
	40	29.39	19.02	8.84	-	-	-
	45	40.15	29.54	19.21	8.84	-	-
	50	50.81	40.15	29.66	19.28	8.84	-
	55	61.77	51.08	40.53	29.93	19.34	13.04
C45HI	35	28.88	13.47	-	-	-	-
	40	45.10	29.22	13.60	-	-	-
	45	61.55	45.64	29.47	13.70	-	-
	50	78.93	62.34	46.09	29.69	13.79	-
	55	96.91	79.84	63.05	46.51	29.89	20.28
CS50	35	31.70	13.61	-	-	-	-
	40	50.53	32.16	14.13	-	-	-
	45	69.27	51.15	32.79	14.76	-	-
	50	88.16	70.02	51.84	33.48	15.38	-
	55	107.28	89.08	70.99	52.68	34.29	23.00
CS65	35	44.30	20.92	-	-	-	-
	40	68.27	44.76	21.43	-	-	-
	45	91.99	68.71	45.27	21.88	-	-
	50	115.85	92.51	69.26	45.90	22.51	-
	55	140.04	116.52	93.21	69.98	46.67	32.35
CS80	35	51.98	22.90	-	-	-	-
	40	82.36	52.84	23.88	-	-	-
	45	112.52	83.36	53.79	24.84	-	-
	50	142.90	113.75	84.50	54.89	25.81	-
	55	173.65	144.39	115.16	85.84	56.19	37.96
CS105	35	71.53	34.06	-	-	-	-
	40	109.82	72.21	34.83	-	-	-
	45	147.74	110.49	73.00	35.50	-	-
	50	185.90	148.51	111.32	73.95	36.48	-
	55	224.58	186.90	149.56	112.42	75.14	52.26

(1) Output kW refers to the condenser heat of rejection.

OPERATING LIMITS

Standard On/Off Head Pressure Control	
Minimum Ambient Air DB °C	-0°C
Maximum Ambient Air DB °C	+48
Optional Variable Speed Head Pressure Control	
Minimum Ambient Air DB °C	-20°C
Maximum Ambient Air DB °C	+48

Sound Data

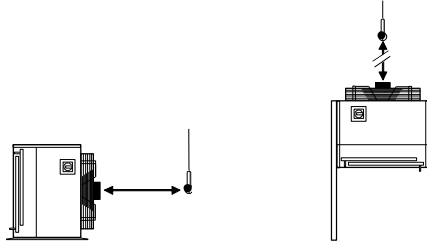
METHOD OF SOUND MEASUREMENT

Measurement of Sound Data 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 : 1995.

All Sound Power Levels quoted are calculated from measured sound intensity according BS EN ISO9614 Part 1 : 1995.

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.



SOUND DATA

Standard Condenser Fan – Horizontal

Sound Measurement	Overall dB(A)	Frequency (Hz) dB								
		63	125	250	500	1000	2000	4000	8000	
C11HI-H Power	67	56	58	63	64	63	61	55	47	
C11HI-H Pressure @ 10m	39	28	30	35	36	35	33	27	19	
C15HI-H Power	70	59	61	66	67	66	64	58	50	
C15HI-H Pressure @ 10m	42	31	33	38	39	38	36	30	22	
C20HI-H Power	79	78	87	76	73	74	70	62	55	
C20HI-H Pressure @ 10m	51	50	59	48	45	46	42	34	27	
C25HI-H Power	79	78	87	76	73	74	70	62	55	
C25HI-H Pressure @ 10m	51	50	59	48	45	46	42	34	27	
C35HI-H Power	79	78	87	76	73	74	70	62	55	
C35HI-H Pressure @ 10m	51	50	59	48	45	46	42	34	27	
C45HI-H Power	82	81	90	79	76	77	73	65	61	
C45HI-H Pressure @ 10m	54	53	62	51	48	49	45	37	33	
CS50H Power	81	84	89	77	77	76	73	66	65	
CS50H Pressure @ 10m	53	56	61	49	49	48	45	38	37	
CS65H Power	81	84	89	77	77	76	73	66	65	
CS65H Pressure @ 10m	53	56	61	49	49	48	45	38	37	
CS80H Power	83	80	89	80	77	79	75	68	67	
CS80H Pressure @ 10m	55	52	61	52	49	51	47	40	39	
CS105H Power	83	80	89	80	77	79	75	68	67	
CS105H Pressure @ 10m	55	52	61	52	49	51	47	40	39	

Standard Condenser Fan – Vertical

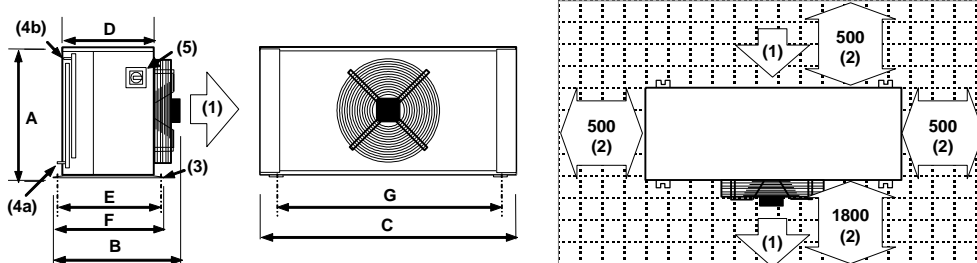
Sound Measurement	Overall dB(A)	Frequency (Hz) dB								
		63	125	250	500	1000	2000	4000	8000	
C11HI-V Power	68	53	61	63	64	64	62	56	48	
C11HI-V Pressure @ 10m	40	25	33	35	36	36	34	28	20	
C15HI-V Power	71	56	64	66	67	67	65	59	51	
C15HI-V Pressure @ 10m	43	28	36	38	39	39	37	31	23	
C20HI-V Power	80	75	92	76	73	75	71	63	56	
C20HI-V Pressure @ 10m	52	47	64	48	45	47	43	35	28	
C25HI-V Power	80	75	92	76	73	75	71	63	56	
C25HI-V Pressure @ 10m	52	47	64	48	45	47	43	35	28	
C35HI-V Power	80	75	92	76	73	75	71	63	56	
C35HI-V Pressure @ 10m	52	47	64	48	45	47	43	35	28	
C45HI-V Power	83	78	95	79	76	78	74	66	62	
C45HI-V Pressure @ 10m	55	50	67	51	48	50	46	38	34	
CS50V Power	83	81	93	77	77	78	74	68	67	
CS50V Pressure @ 10m	55	53	65	49	49	50	46	40	39	
CS65V Power	83	81	93	77	77	78	74	68	67	
CS65V Pressure @ 10m	55	53	65	49	49	50	46	40	39	
CS80V Power	84	76	93	80	78	81	76	70	69	
CS80V Pressure @ 10m	56	48	65	52	50	53	48	42	41	
CS105V Power	84	76	93	80	78	81	76	70	69	
CS105V Pressure @ 10m	56	48	65	52	50	53	48	42	41	

1 Figures quoted using standard condenser fan(s) running at full speed under normal operating conditions.

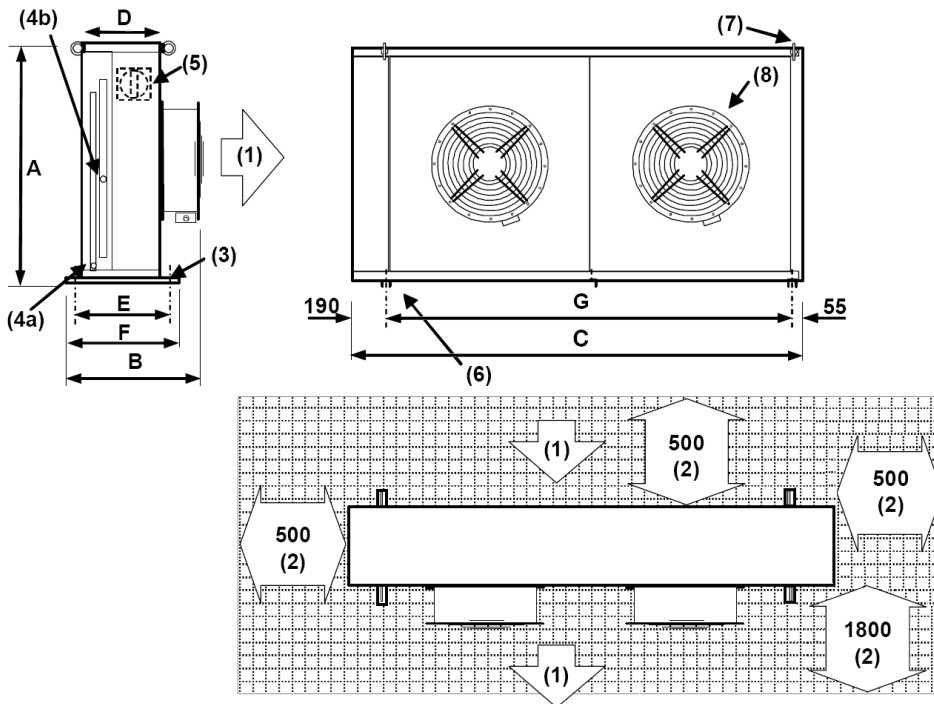
Dimensional & Installation Data

DIMENSIONS / MASSES / POSITIONING - HORIZONTAL

Standard Condenser Fan (mm) (C11 Shown)



Optional Short Case Axial Fan (mm) (SCAF) (C45 Shown)



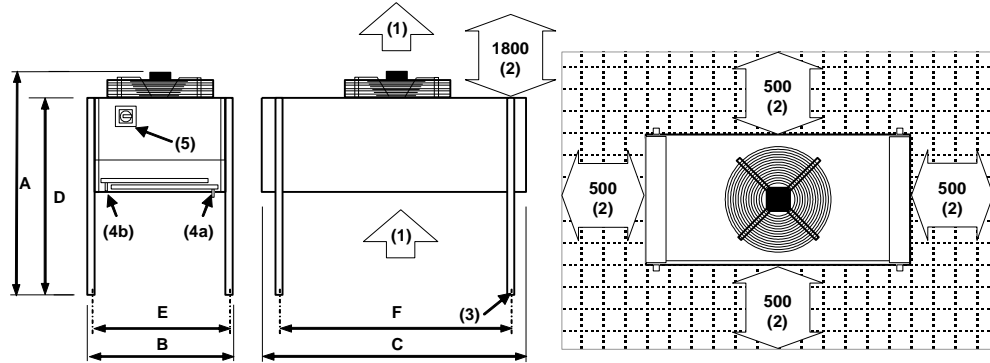
	DIMENSIONS (mm)								MASS (kg)			
	Standard Fan								Optional SCAF		Standard Fan	Optional SCAF
	A	B	C	D	E	F	G	G ₁ (6)	B	F		
C11HI-H	648	550	1275	455	530	550	1118	N/A	675	640	51	61
C15HI-H	648	550	1275	455	530	550	1118	N/A	675	640	63	73
C20HI-H	848	645	1100	455	530	550	944	N/A	735	640	58	70
C25HI-H	848	645	1100	455	530	550	944	N/A	735	640	65	77
C35HI-H	1048	645	1650	455	530	550	1494	N/A	711	640	97	109
C45HI-H	1048	645	1650	455	530	550	1494	N/A	711	640	110	134

- (1) Airflow
- (2) Minimum clearances in mm
- (3) 8mm fixing points
- (4) **Service connections to left hand side of the unit: a = Liquid Outlet, b = Discharge Gas Inlet**
- (5) Mains Electric Isolator, (CS50 – C105 located behind open side panel)
- (6) Additional support to sizes C80 – CS105
- (7) 4 lifting eye bolts to unit top, sizes CS50 – CS105
- (8) Optional Short Case Axial Fan with integral duct fixing holes

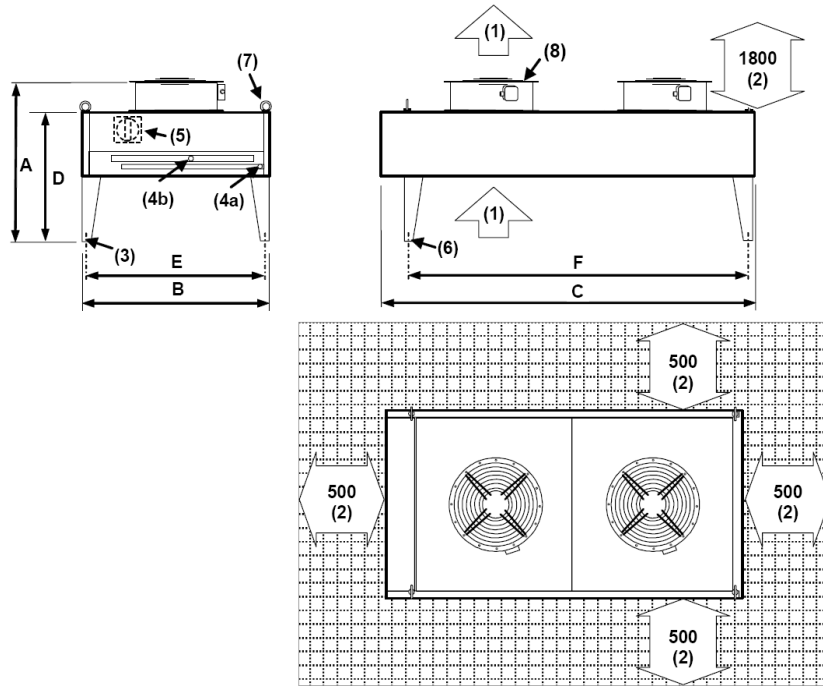
Dimensional & Installation Data

DIMENSIONS / MASSES / POSITIONING - VERTICAL

Standard Condenser Fan (mm) (C11 Shown)



Optional Short Case Axial Fan (mm) (SCAF) (C45 Shown)

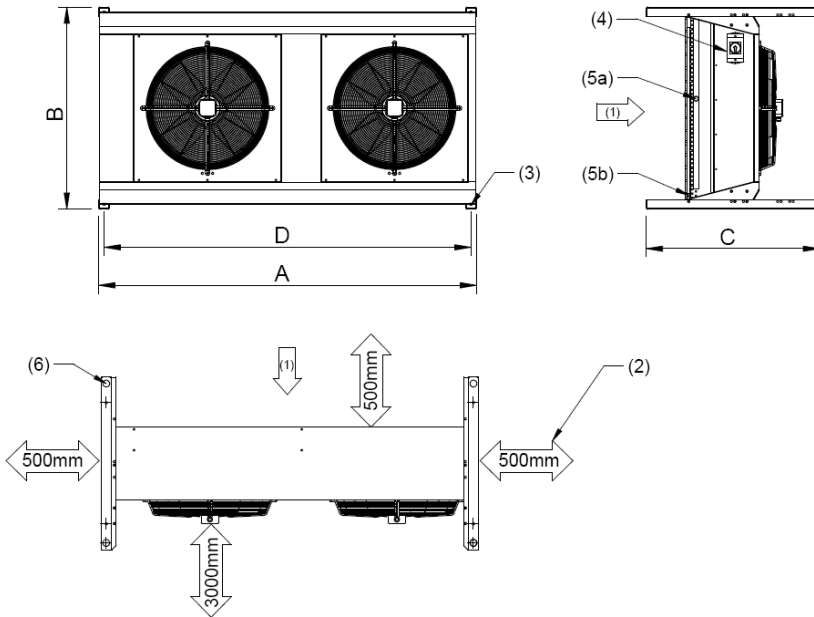


	DIMENSIONS (mm)							MASS (kg)		
	Standard Fan							Optional SCAF	Standard Fan	Optional SCAF
	A	B	C	D	E	F	F1 ⁽⁶⁾	A		
C11HI-V	997	700	1275	952	630	1118	N/A	1112	51	61
C15HI-V	997	700	1275	952	630	1118	N/A	1112	63	73
C20HI-V	1092	900	1100	952	830	944	N/A	1162	58	70
C25HI-V	1092	900	1100	952	830	944	N/A	1162	65	77
C35HI-V	1092	1100	1650	952	1030	1494	N/A	1162	97	109
C45HI-V	1092	1100	1650	952	1030	1494	N/A	1162	110	134

- (1) Airflow
- (2) Minimum clearances in mm
- (3) 8mm fixing points
- (4) **Service connections to left hand side of the unit: a = Liquid Outlet, b = Discharge Gas Inlet**
- (5) Mains Electric Isolator, (CS50 – CS105 located behind open side panel)
- (6) Additional support to sizes CS80- CS105
- (7) 4 lifting eye bolts to unit top, sizes CS50 – CS105
- (8) Optional Short Case Axial Fan with integral duct fixing holes

DIMENSIONS CS50 - 65

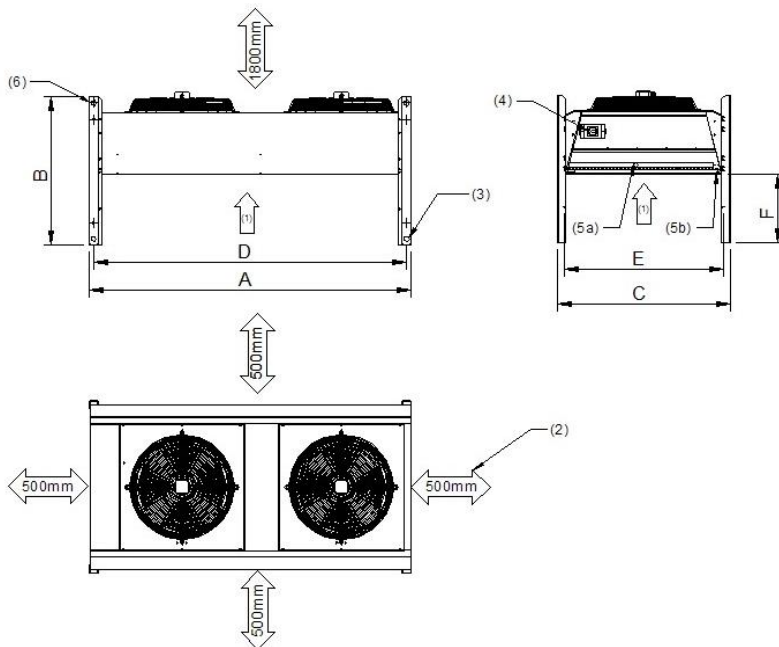
Horizontal Unit (mm)



- (1) Airflow
- (2) Minimum Clearances
- (3) 12.7mm Fixing Holes
- (4) Mains Electric Isolator.
- (5) Service connections
 - a) Liquid Outlet
 - b) Discharge Inlet
- (6) 40mm Lifting Holes

		DIMENSIONS (mm)				MASS (kg)		
		Standard Fan				Standard AC	Optional EC	Optional SCAF
		A	B	C	D			
CS50H-0	mm	2184	1167	1000	2121	132	145	154
CS65H-0	mm	2184	1167	1000	2121	162	175	184

Vertical Unit (mm)

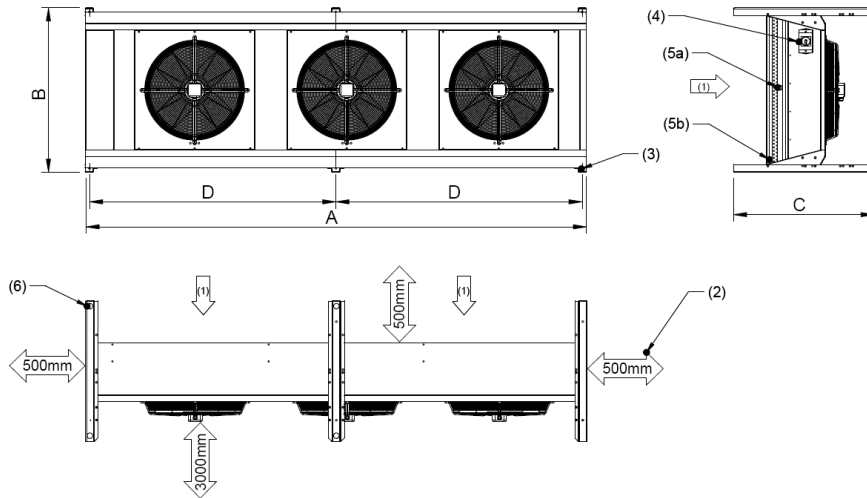


- (1) Airflow
- (2) Minimum Clearances
- (3) 12.7mm Fixing Holes
- (4) Mains Electric Isolator.
- (5) Service connections
 - a) Liquid Outlet
 - b) Discharge Inlet
- (6) 40mm Lifting Holes

		DIMENSIONS (mm)							MASS (kg)					
		Standard Fan							Standard AC	Optional EC	Optional SCAF			
		A	B	C	D	E	F	Fan Options						
								EC Opt.	SCAF Opt.					
CS50V-0	mm	2184	1090	1167	2124	1107	467	B	B	1130	1127	132	145	154
CS65V-0	mm	2184	1090	1167	2124	1107	467	B	B	1130	1127	162	175	184

DIMENSIONS CS80 - 105

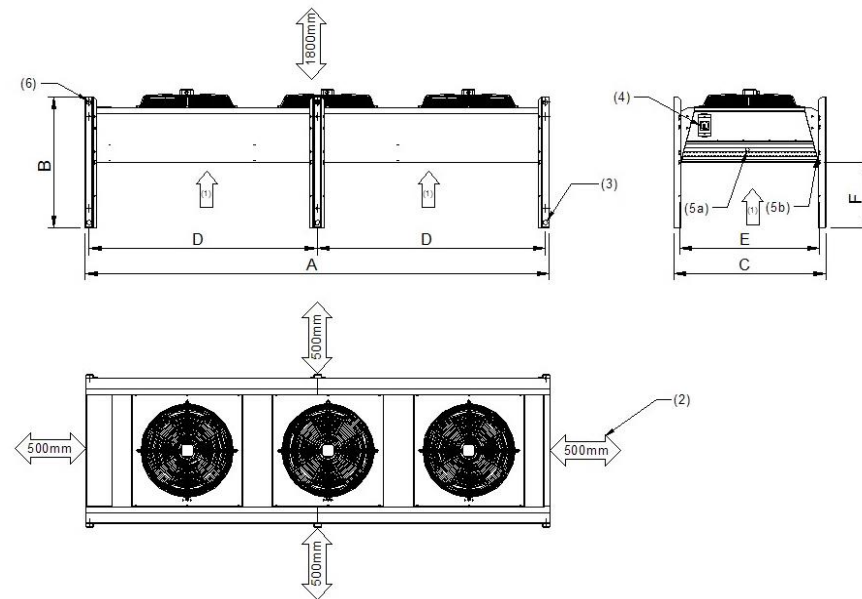
Horizontal Unit (mm)



- (1) Airflow
- (2) Minimum Clearances
- (3) 12.7mm Fixing Holes
- (4) Mains Electric Isolator.
- (5) Service connections
 - a) Liquid Outlet
 - b) Discharge Inlet
- (6) 40mm Lifting Holes

		DIMENSIONS (mm)				MASS (kg)		
		A	B	C	D	Standard AC	Optional EC	Optional SCAF
CS80H-0	mm	3565	1167	1000	1752	208	228	242
CS105H-0	mm	3565	1167	1000	1752	260	280	294

Vertical Unit (mm)

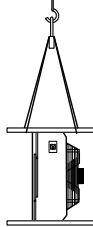


- (1) Airflow
- (2) Minimum Clearances
- (3) 12.7mm Fixing Holes
- (4) Mains Electric Isolator.
- (5) Service connections
 - a) Liquid Outlet
 - b) Discharge Inlet
- (6) 40mm Lifting Holes

		DIMENSIONS (mm)						MASS (kg)				
		Standard Fan				Fan Options		Standard AC	Optional EC	Optional SCAF		
		A	B	C	D	E	F				EC Opt. B	SCAF Opt. B
CS80V-0	mm	3565	1090	1167	1753	1107	501	1130	1127	208	228	242
CS105V-0	mm	3565	1090	1167	1753	1107	501	1130	1127	260	280	294

UNIT LIFTING


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.

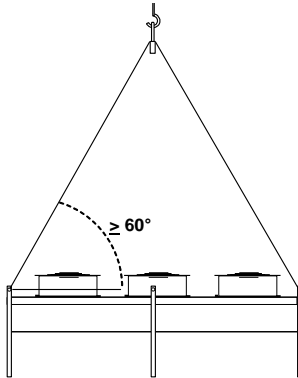


Lift via 4 slings placed over the top corner legs as indicated

Vertical 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.

Before lifting into final position, the unit legs should be re-orientated, instructions for this are provided at delivery


CAUTION  Care should be taken to ensure the unit does not sustain damage before it is lifted into final position.



Lift via 4 slings (provided by others) attached to the lifting holes provided to the 4 corner legs as indicated

General

Employ lifting specialists
Local codes and regulations relating to the lifting of this type of equipment should be observed
Use the lifting holes provided - Vertical air discharge only
Each chain/sling must be capable of lifting the whole unit
Lift the unit slowly and evenly

CAUTION  Only use lifting points provided.
If any other type of slinging is used, due care should be taken to ensure that the slings do not crush the casework or coil.

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

SITING RECOMMENDATIONS


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

A vertical air discharge unit is recommended for installation in windy locations or wherever a horizontal airflow would be obstructed

Commissioning Procedure

GENERAL

To be read in conjunction with the commissioning sheets provided.

CAUTION  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 R407C.

START-UP

Switch on the power supply to the condenser and close the isolator.

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.

General

- 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 side.
- 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 45 to 46°C with an external ambient temperature of 30°C (Condensing is normally 15°C above ambient).

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.

Commissioning Data

OPERATING LIMITS

Standard On/Off Head Pressure Control	
Minimum Ambient Air DB °C	-0°C
Maximum Ambient Air DB °C	+48
Optional Variable Speed Head Pressure Control	
Minimum Ambient Air DB °C	-20°C
Maximum Ambient Air DB °C	+48

CONTROL DEVICES – ADJUSTMENT

The condenser is fitted with a head pressure control device which can be either:

- 1 On/Off pressure switch (standard)
- 2 Variable speed control (option)

The control device is factory pre-set.

To check the setting connect a pressure gauge with scale reading up to at least 30bar to the pressure tapping located in the inlet 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.

CAUTION  **Before carrying out any work, ensure that the isolator is switched off.**

On-Off Pressure Switch

The control device comprises a pressure switch with on/off contact which cycles operation of the fan as a function of the pressure; the contact:

- Closes and feeds the fan motor when the pressure rises and reaches the set point (18 Barg).
- Opens when the pressure falls to a level equal to the set point value, minus the differential pressure pre-set (14 Barg).

This type of control system is suitable where ambient temperatures seldom fall below 0°C.

In cold climates it could cause excessive hunting of the system.

The values of Set and Differential are adjusted by means of the adjusting screws which are accessed by removing the external casing of the pressure switch.

Factory setting: Set = 18 Barg
 Differential = 4 Barg

Variable Speed Control

The fan speed is controlled via alteration of the supply voltage which corresponds to a particular condensing pressure. The output voltage from the controller varies between a maximum of 95% and a minimum of 40% of the mains voltage (ie 220 Volts down to approximately 90 Volts on a 230 Volt supply) as the condensing pressure varies within a band of 5 Bar.

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.

Factory setting: Set = 18 Barg

Troubleshooting

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.	Remove 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 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 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 Fans Runs Only Slowly	Incorrect pressure setting.	Adjust sensor screw as necessary.
	Faulty 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.

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.

GENERAL MAINTENANCE

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 Fan and motor assembly for lateral and end play in the bearings.
- 2 Electrical gland plate to ensure that no water is entering the motor.
- 3 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 a stiff bristled hand brush. If dirt has accumulated over a long period, or tends to be greasy or sticky, then it may be necessary to use a water hose or chemical pressure hose. Take care not to damage the fins and comb out if they have become damaged in any way.

For epoxy coated coils use a suitable cleaning fluid and soft bristle brush.

CAUTION  **Do not use steam for cleaning condenser coils otherwise damage or danger may result from excessive internal pressures**

Cabinet

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

Electrical

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

12 months

As per 3 months plus:

- 1 Check all electrical connections for security.
- 2 Check all refrigeration connections with a leak detector.



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A	01/11/06
B (1.1.0)	10/2011
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V1.5.0	12/2015
V1.6.0	04/2016