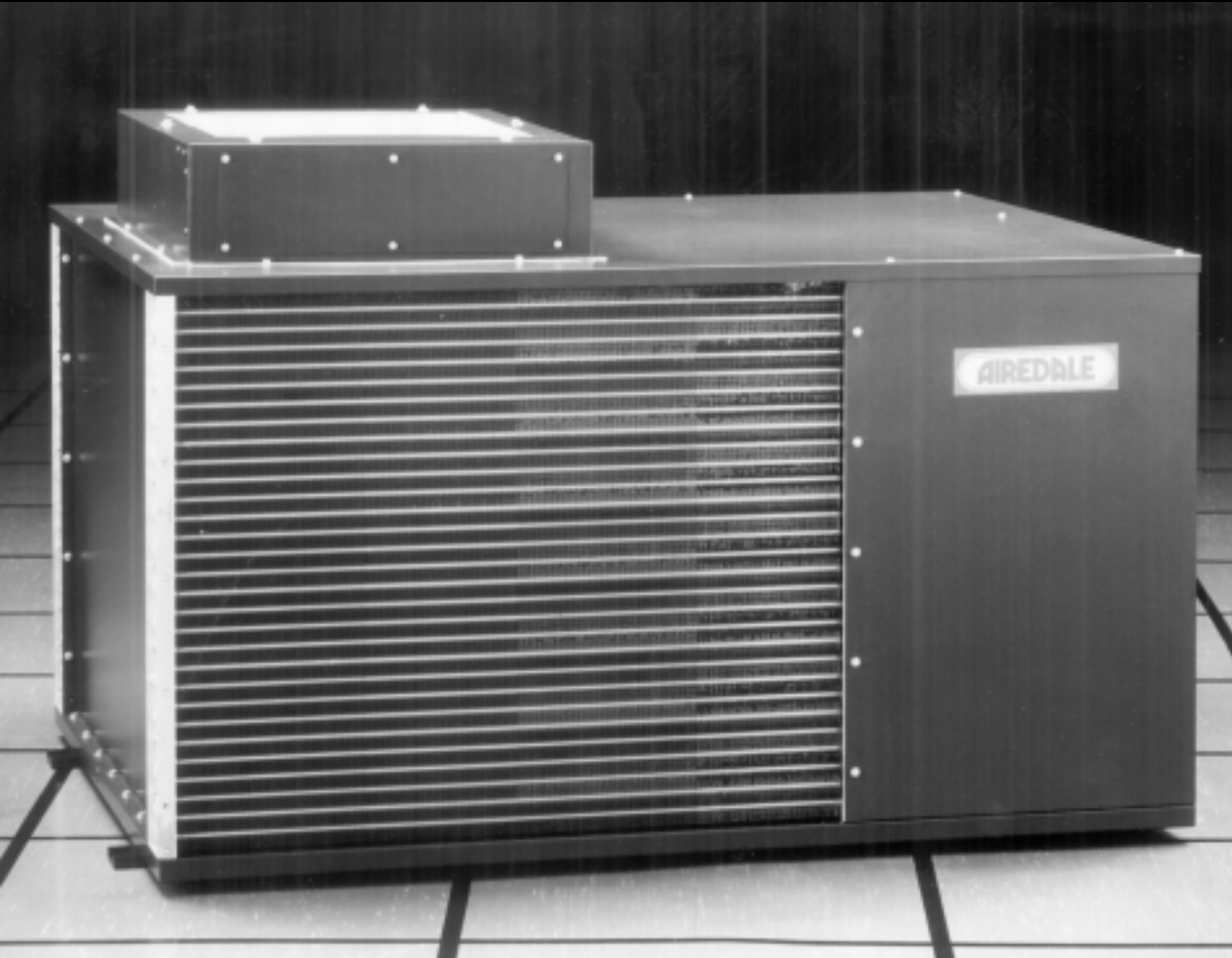


AIREDALE

air conditioning for every environment



TECHNICAL MANUAL

Condensing Units CFCUS 5-10



Cert. No. FR00542
Registered November 1995

Controls

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General Description

UNIT IDENTIFICATION

AIR COOLED CONDENSING UNIT RANGE	
CFCUS ..	Condensing Unit with Centrifugal Fan
S	Scroll Compressor
5-10	Model Size
e.g.	Model CFCUS 6

INTRODUCTION

This range of air cooled condensing units covers the 15-32kW requirement, in centrifugal fan cooling only.

The range is custom designed for use with Airedale's comprehensive range of close control units and Comfort Modular units. They can also be used in conjunction with other cooling applications, eg air handling units. All units are leak tested and carry a holding charge of inert gas.

CONSTRUCTION

Units are fabricated from galvanised steel, epoxy baked powder coated to form a durable weatherproof finish.

Standard unit colour is Light Grey (RAL 7035).

CONDENSER

Large surface area condenser coil(s) manufactured from refrigeration quality copper tubes, with mechanically bonded aluminium fins.

FAN

A double inlet, double width forward curved centrifugal fan which is statically and dynamically balanced for quiet operation. Impellers and casings are galvanised for protection against corrosion. Fan shafts are mild steel and run in lifetime lubricated ball bearings. The fan(s) are driven via a heavy duty 'V' belt and pulley system by a totally enclosed fan cooled motor which is mounted on a moveable platform to facilitate belt tensioning and servicing. In applications where motors of 4kW and above are utilised both plummer blocks with lead bearings are fitted together with twin belt drives.

COMPRESSOR

All units utilise hermetic scroll compressors

The CFCUS 7.5 and 10 models are fitted with a crankcase heater to guard against floodback and oil foaming on start up. Other features include internal motor protection, internal spring isolators and muffler to reduce noise and vibration.

REFRIGERATION

Each unit is fitted with a liquid and suction line shut off valve for ease of maintenance and installation. Factory set HP/LP pressure switches are also fitted, with manual reset high pressure cut-out and automatic reset low pressure cut-out.

A large capacity filter drier is supplied loose for on site installation.

CONTROLS

All units have terminals supplied for the interconnecting wiring required.

ELECTRICAL

Weatherproof control panels are accessed via a lockable panel and contain the necessary contactors, sub-circuit protection and terminals.

All wiring is colour coded and numbered for identification. All units are wired in accordance with current local and European standards.

OPTIONS

Head Pressure Control

Head pressure is maintained by a factory fitted, pressure actuated head pressure controller to provide optimum head pressure control under varying ambient conditions. Recommended for European climates and year round 24 hour applications.

Mains Isolator

A weatherproof mains isolator can be fitted to ensure mains isolation of the electrical panel.

Phenolic Condenser Coils

In atmospheres where high corrosion is anticipated phenolic coated aluminium finned coils can be supplied.

Hot Gas Bypass

To achieve capacity control during low load conditions, a hot gas bypass valve will modulate down to 40% of full capacity. This is supplied loose on models CFCUS 5 and 6 and factory fitted on models CFCUS 7.5 and 10.

Compressor Anti-Cycle Timer

To prevent short cycling and subsequent additional wear on the compressor, this option can be factory fitted to limit compressor starts to six per hour. Not required on Airedale equipment featuring start delay timers inbuilt into the Air Handling unit.

Capacity Data

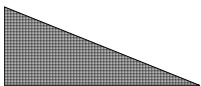
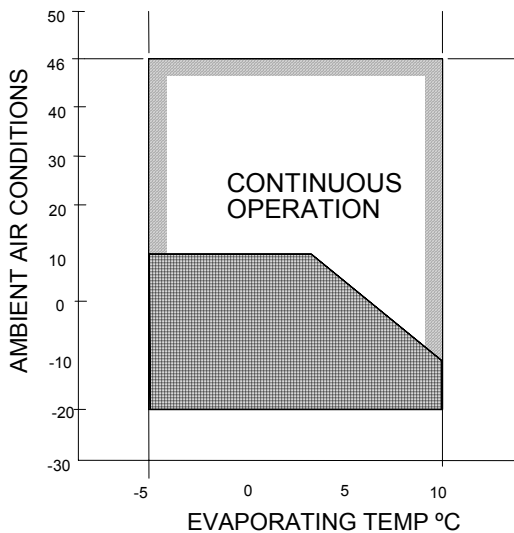
	Evaporating Temperature °C	Ambient									
		25°C		30°C		35°C		40°C		45°C	
		Output kW	Input kW	Output kW	Input kW	Output kW	Input kW	Output kW	Input kW	Output kW	Input kW
CFCUS 5	-5	10.83	2.65	10.21	3.07	9.62	3.49	8.95	3.93	8.35	4.36
	0	12.99	2.89	12.28	3.28	11.58	3.67	10.84	4.10	10.14	4.54
	5	15.26	3.13	14.49	3.51	13.73	3.89	12.88	4.31	12.11	4.76
	10	17.64	3.43	16.82	3.80	15.99	4.16	15.15	4.54	14.27	5.04
CFCUS 6	-5	14.36	3.97	13.65	4.50	12.94	5.04	12.21	5.58	11.27	6.16
	0	17.17	4.25	16.23	4.77	15.29	5.28	14.35	5.80	13.40	6.42
	5	19.94	4.56	18.95	5.06	17.98	5.57	16.94	6.13	15.86	6.71
	10	22.97	4.88	21.93	5.38	20.87	5.88	19.67	6.46	18.52	7.02
CFCUS 7.5	-5	16.67	4.81	15.79	5.47	14.86	6.12	13.96	6.77	12.98	7.49
	0	19.85	5.08	18.83	5.71	17.84	6.36	16.84	7.00	15.64	7.76
	5	23.39	5.39	20.21	6.00	21.04	6.60	19.81	7.26	18.57	7.99
	10	27.19	5.67	25.89	6.24	24.58	6.82	23.14	7.54	21.78	8.19
CFCUS 10	-5	21.60	5.67	20.38	6.60	19.13	7.53	17.91	8.46	16.61	9.44
	0	25.50	6.01	24.24	6.92	23.03	7.83	21.78	8.73	20.38	9.73
	5	31.98	6.41	28.83	7.17	25.67	7.93	22.57	8.69	21.86	9.97
	10	35.04	6.71	33.76	7.57	32.49	8.42	31.09	9.33	29.49	10.28

Notes:

- 1 Output kW refers to the compressor duty.
- 2 Input kW refers to the compressor input power only.

Operating Data

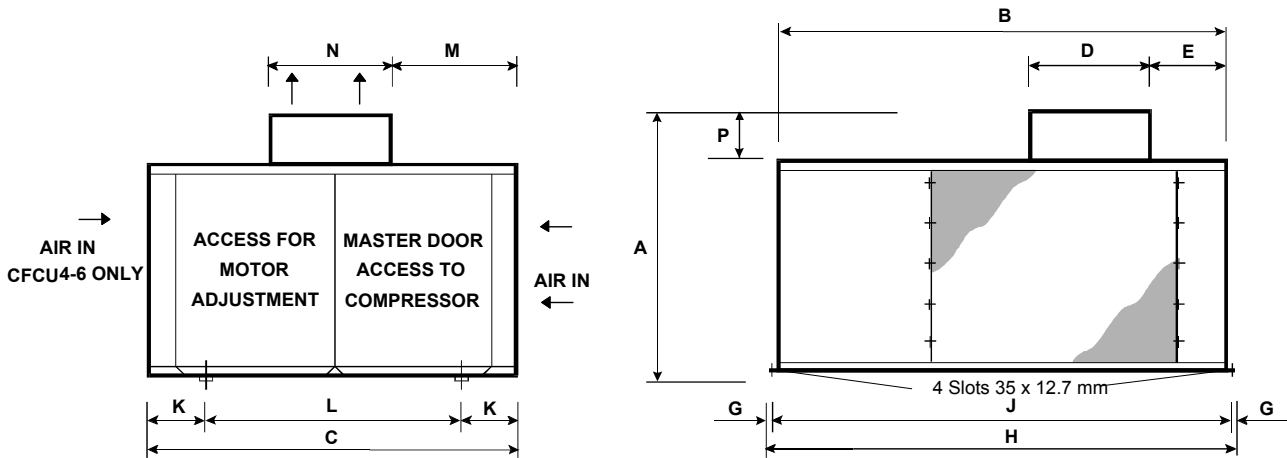
OPERATING LIMITS



Head Pressure control recommended for operation in this area.

Note: For units where operation below -5°C ambient air temperature is envisaged, the unit must be fitted with the optional low pressure start kit for continuous operation.

Dimensions



CFCUS		5	6	7.5	10
A	mm	717	717	985	985
B	mm	1173	1173	1459	1459
C	mm	1016	1016	1148	1148
D	mm	575	575	560	560
E	mm	45	45	30	30
F	mm	557	557	824	824
G	mm	16	16	19	19
H	mm	1238	1238	1524	1524
J	mm	1206	1206	1486	1486
K	mm	203	203	224	224
L	mm	610	610	701	701
M	mm	161	161	194	194
N	mm	560	560	700	700
P	mm	160	160	160	160
D(1)	mm	343	343	450	450
N(1)	mm	397	397	525	525

Notes:

- 1 Aperture size without optional head pressure control damper fitted.
- 2 Incoming Services: Connections to left hand side of unit compressor compartment.
- 3 Airflow and Maintenance Clearance: Please allow 500mm around the unit for airflow and maintenance purpose.
- 4 Dimensions D, E, M, N and P apply for units fitted with Head Pressure Control only, therefore dimensions will vary if Head Pressure Control is not fitted.

Technical Data

CFCUS		5	6	7.5	10
Nominal Capacity (1)	kW	14.8	19.7	24.8	32.3
Nominal Input (1)	kW	4.3	6.4	8.1	10.0
Capacity Steps	%	0-100	0-100	0-100	0-100
Construction					
Material		Galvanised Steel			
Colour		Charcoal Grey (RAL 7022)			
Condenser					
Type		Air Cooled			
Quantity		2	2	2	2
Face Area	m ²	0.69	0.69	1.37	1.37
Nominal Airflow	m ³ /s	1.89	2.08	2.89	3.20
Nom External Static	Pa	100	100	100	100
Max External Static	Pa	250	150	100	150
Discharge		Vertical			
Fan					
Type		Belt Driven Centrifugal			
Quantity		1	1	1	1
Standard Motor Size	kW	2.2	2.2	3.0	4.0
Nom Speed @ 100Pa ESP	rpm	937	994	951	1014
Compressor					
Type		Scroll			
Quantity		1	1	1	1
Oil Charge Volume	L	1.55	1.65	3.25	3.8
Refrigeration					
Number of Circuits		1	1	1	1
Refrigerant Type		R22	R22	R22	R22
Refrigerant Charge	kg	2.4	2.4	3.63	4.76
Dimensions/Weights					
Height	mm	717	717	985	985
Width	mm	1238	1238	1524	1524
Depth	mm	1016	1016	1148	1148
Machine Weight (nom)	kg	238	245	320	325
Operating Weight (nom)	kg	241	248	325	330
Connections					
Liquid Line	in	1/2	5/8	5/8	7/8
Suction Line	in	7/8	7/8	1 1/8	1 1/8

- (1) Nominal cooling capacity based on 5°C evaporating temperature and a 30°C ambient.
 (2) External statics higher than the nominally quoted 150Pa may be achievable. Please contact Airedale for further information.

Electrical Data

CFCUS		5	6	7.5	10
Unit Data					
Nominal Run Amps (1)	A	14.0	16.1	19.3	24.5
Maximum Start Amps	A	91.7	124.2	119.9	168.3
Control Circuit	VAC	24	24	24	24
Mains Supply	V		400/3/50		
Rec. Mains Fuse	A	25	32	35	40
Max Incoming Mains	mm ²	10	10	10	10
Compressor					
Motor Rating	kW	4.5	5.9	8.14	9.7
Nominal Run Amps (1)	A	8.9	11.0	12.73	16.1
Locked Rotor Amps	A	62.5	95.0	98	120.0
Crankcase Heater Rating	W	65	65	50	50
Type of Start		Direct on Line			
Condenser Fan					
Motor Rating	kW	2.20	2.20	3.00	4.00
Full Load Amps	A	5.10	5.10	6.70	8.40
Locked Rotor Amps	A	29.15	29.15	41.40	48.30

(1) Nominal data based on 5°C evaporating temperature and a 30°C ambient.

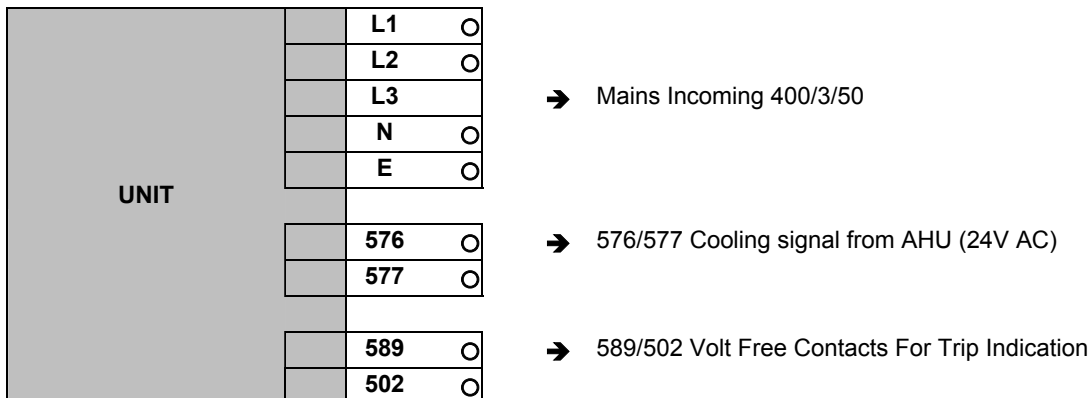
Noise Data

	Sound Measurement	dBa	Frequency (Hz)							
			63	125	250	500	1000	2000	4000	8000
CFCUS 5	Power	83	90	86	83	82	78	73	69	58
CFCUS 6	Power	85	92	88	85	84	80	75	71	60
CFCU 7.5	Power	87	92	89	87	84	83	78	75	-
CFCUS 10	Power	89	94	91	89	86	85	80	78	-

Notes:

- 1 Sound Power Reference Power = 10⁻¹² Watts.
- 2 dBA is the overall noise level, measured on the A scale.
- 3 All data is based on nominal conditions.
- 4 All Sound Power levels measured directly at fan outlet (ducted discharge).

Field Connections



About Airedale

EUROVENT



Airedale participates in Eurovent Certification as a founder member. The Eurovent Certification programme verifies product performance by managing random independent testing of certified products.

We participate in certification programmes for Air Conditioners, Chillers and Fan Coil units, which enable consultants, specifiers and End Users to compare and select products with assurance that the catalogue data is accurate.

All new products are tested by Eurovent before being Certified. For certified products only the Eurovent symbol appears alongside the certified product performance data.

THE ENVIRONMENT - R407C – THE NATURAL REPLACEMENT FOR R22

Protecting the environment is a priority and we take care to ensure our products are developed and manufactured with this in mind. Airedale introduced R407C refrigerant in 1992 and now has the most extensive in-field experience in the air conditioning industry. R407C is offered on all Airedale products and all new products are developed to provide optimum efficiency with this refrigerant ensuring maximum customer satisfaction.

WARRANTY, COMMISSIONING & MAINTENANCE

As standard, Airedale guarantees all non consumable **parts only** for a period of **24 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.

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 our Training Co-ordinator.

Airedale Departmental Contact Details:

DEPARTMENT	PRINCIPLE ACTIVITIES	CONTACT TELEPHONE	E MAIL CONTACTS
Applications	Technical Sales & Applications enquiries	+ 44 (0) 113 238 7789 & + 44 (0) 113 238 7799	uk.sales@airedale.com
International Sales	Technical Sales & Applications enquiries	+ 44 (0) 113 238 7714	int.sales@airedale.com
Order Processing	Order progress Order Amendments Order Delivery Times	+ 44 (0) 113 238 7751	info@airedale.com
Contracts	Drawing requests - Contractual matters -	+ 44 (0) 113 238 7785 + 44 (0) 113 238 7759	info@airedale.com
Despatch	Shipping & Transport advice: UK - Export -	 + 44 (0) 113 238 7812 + 44 (0) 113 238 7728	info@airedale.com
Spares	PARTS ONLY: Order progress Order Amendments Order Delivery Times	+ 44 (0) 113 238 7723 & + 44 (0) 113 238 7727	spares@airedale.com
Airedale Service	NEW PRODUCTS: Commissioning Enquiries	+ 44 (0) 113 238 7704	service@airedale.com
Technical Service	INSTALLED PRODUCTS: Technical Support & Advice	+ 44 (0) 113 238 7745	tech.support@airedale.com
Airedale Training	Training Course Advice & Booking	+ 44 (0) 113 225 1273	training@airedale.com



Head Office:

Airedale International Air Conditioning Ltd

Leeds Road
Rawdon
Leeds LS19 6JY
United Kingdom

Tel: +44 (0) 113 239 1000
Fax: +44 (0) 113 250 7219

e-mail: info@airedale.com
website: www.airedale.com

Regional Sales Offices:

South	Tel: 01483 751010 Fax: 01483 751090 e-mail: uksouthernsales@airedale.com
Midlands	Tel: 0121 7071010 Fax: 0121 7071069 e-mail: ukmidlandsales@airedale.com
Scotland	Tel: 0141 2044750 Fax: 0141 2044755 e-mail: airesales@email.msn.com

International Sales Offices:

Germany	Tel: + 49 6108 90040 Fax: + 49 6108 77972 e-mail: info@airedale.de
†South Africa	Tel: + 27 11 794 6291 Fax: + 27 11 794 6294 e-mail: aiac@global.co.za
†North America	Tel: + 1 215 639 6030 Fax: + 1 215 639 0777 e-mail: Sales@airedaleusa.com

†Manufacturing Facility Also

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SUBJECT: Global Changes to Airedale range of Air Conditioning Units

The following statements outline global changes made to the full range of Airedale International Air Conditioning Ltd products and supersede ALL other dated material contained within this manual, quotations and posted to the Airedale.com website:

1. The standard unit colour of all Airedale Manufactured products is Light Grey RAL 7035 (This excludes, Aerovent, Ecotel Outdoor and Cassettes).
2. Units constructed with metal panels are made from Galvanised sheet steel coated with a durable and weatherproof finish.
3. ALL units are run on R407C as standard, R22 is only available as an option to Countries outside the EU.

Literature will be updated to reflect these changes in due course.