



Authorised User No. 00007



INSTALLATION, OPERATING & MAINTENANCE MANUAL

Ultima Compact FreeCool Free-Cooling Chiller 75 – 450 kW



ISO 14001
EMS52086



ISO 9001
FM00542

About Airedale Products & Customer Services

WARRANTY, COMMISSIONING & MAINTENANCE

The equipment carries Airedale's standard **Parts** (non consumable) & **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. (Excludes the cost of any specialist access or lifting equipment.) Commissioning will be carried out by Airedale International Air Conditioning Ltd or an approved Airedale commissioning company.

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 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 on 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.

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CUSTOMER SERVICES

For further assistance, please e-mail: enquiries@airedale.com or telephone:

UK Sales Enquiries	+ 44 (0) 113 238 7789	uk.sales@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	marketing@airedale.com

For information, visit us at our Web Site: www.airedale.com

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General Statement

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**  1 **Service and maintenance of Airedale equipment should only be carried out by Technically trained competent personnel.**
- CAUTION**  2 **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.**
- 3 Also ensure that there are no other power feeds to the unit such as fire alarm circuits, BMS circuits etc
- 4 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.
- 5 Refrigerant used in this range of products is classified under the COSHH regulations as an irritant, with set Occupational Exposure Levels (OEL) for consideration if this plant is installed in confined or poorly ventilated areas.
- 6 A full hazard data sheet in accordance with COSHH regulations is available should this be required.

Warranty

GENERAL

To be read in conjunction with Airedale International Air Conditioning Ltd standard Conditions of Sale and any related quotation.

The equipment carries Airedale's standard **Parts** (non consumable) & **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. Commissioning must be carried out by Airedale or an approved Airedale company.

WARRANTY IS ONLY VALID IN THE EVENT THAT:

- 1 In the period between delivery and commissioning the equipment:
is properly protected & serviced
water flow safety devices are in place and fully operational
- 2 The equipment is serviced & maintained by Airedale or an approved Airedale company in accordance with the Installation & Maintenance manual provided, during the Warranty Period.

In the event of a problem being reported, Airedale will cover the full cost of rectification (excluding costs for any specialist access or lifting equipment) if warranty is valid under these conditions.

Any spare part supplied by Airedale under the warranty shall be warranted for the unexpired period of the warranty or 3 months from delivery whichever period is the longer, with the exception of compressors on which a further 12 months warranty is granted.

PROCEDURE

- The on site contractor or service company place an official order on Airedale for the replacement part including site labour if required. Airedale will acknowledge this order with detailed prices for components, travel and labour rates.
- Should warranty be accepted, following inspection of the faulty component, a credit note will be issued against the invoice raised in line with the acknowledgement.
- Should warranty be refused the invoice raised against the acknowledgement becomes payable on normal terms.
- Airedale reserves the right to carry out site warranty labour work using their own direct labour or by sub contracting to an approved company of their choice.

EXCLUSIONS

Warranty may be refused for the following reasons:

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

GENERAL

Dead on arrival or manufacturing defects are the responsibility of Airedale and should be reported immediately.

In the event of a warranty failure, dead on arrival or manufacturing defect, the Airedale Service department should be contacted and on receipt of an order, an Airedale engineer (or representative) will be directed to site as soon as possible.

RETURNS ANALYSIS

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

General Description

UNIT IDENTIFICATION

ULTIMA COMPACT FREE-COOLING CHILLER	
UCFC	Ultima Compact FreeCool
75 - 450	Model Size (Expressed as Nominal Cooling in kW)
D-	Double Circuit - Standard Chiller
DQ-	Double Circuit - Q uiet Chiller
DSQ-	Double Circuit - S uper Q uiet Chiller
2 - 16	Number of Fans
/1 or /2	Single or Double Row of Fans
Example	UCFC75DQ-2/1

INTRODUCTION

The Airedale range of Ultima Compact FreeCool air cooled liquid chillers covers the cooling capacity range 75kW to 450kW in 45 model sizes incorporating Standard **D**, Quiet **DQ** and Super Quiet **DSQ** variations.

Attention has been placed on maximising the unit's cooling and energy performance while keeping the sound, vibration levels and footprint to an absolute minimum.

Refer to the **Technical Manual** for further details.

CE DIRECTIVE



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

Electromagnetic Compatibility Directive (EMC)	89/336/EEC
Low Voltage Directive (LVD)	73/23/EEC
Machinery Directive (MD)	89/392/EEC in the version 98/37/EC
Pressure Equipment Directive (PED)	97/23/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.

REFRIGERANTS

The range has been designed and optimised for operation with the ozone benign R407C refrigerant.

STANDARD FEATURES

Standard Chiller - D

The Standard Ultima Compact FreeCool chiller comes complete with:

- **AIRETronix** Microprocessor Control
- Condenser Coil & integral Free-cooling Coil Assembly
- Plate Evaporator
- Evaporator Pad Heater
- Multiple Scroll Compressors
- Dual Independent Refrigeration Circuits
- Intelligent Head Pressure Control
- Compressor Enclosures
- Electronic Expansion Valve (EEV)
- 3 way modulating valve to control free-cooling operation
- Butterfly shut off valve for Free-cooling coil isolation to allow for maintenance
- Water Flow Switch & Water Filter
- Pressure Relief Valve
- Sickle Bladed fans with Long Bellmouth 900 rpm
- Condenser Fan Discharge Plenum
- Connections for External Trace Heating (240V/500W available)
- A set of 4 collared eye bolts to BS4278

General Description

STANDARD FEATURES

With all the features of the Standard range, the Quiet and Super Quiet chillers are available with additional features:

Quiet Chiller - DQ

- Fan speed reduced to 750 rpm

Super Quiet Chiller - DSQ

- Fan speed reduced to 570 rpm
- Acoustically lined compressor compartment
- Enhanced Refrigeration Condenser Coils

Refrigeration

Each refrigeration circuit is supplied with the following:

- Full operating charge of R407C
- Electronic Expansion Valve (EEV)
- Liquid line ball valve
- Discharge line ball valve
- Large capacity filter drier with replaceable cores
- Liquid line sight glass
- Low pressure switch with manual reset via microprocessor controller
- High pressure switch with manual reset
- Suction and liquid pressure transducers
- Pressure relief valve with integral rupture disc and indicator gauge, complying with Pressure Regulations
- Valves for refrigeration head pressure control
- Compressor minimum differential pressure protection

Water / Glycol

Each water glycol circuit is supplied with the following:

- Water Flow switch
- 3 way modulating valve to control free-cooling operation
- Strategically placed automatic air vents
- Strategically placed drain valves
- Butterfly shut off valve for Free-cooling coil isolation to allow for maintenance
- Pressure transducers across evaporator to monitor water pressure drop
- Inlet water filter 20 mesh

Controls

As standard, the **AIRETronix** microprocessor controller can provide 2, 4 or 6 stages of capacity control, dependent upon model type.

Optionally, the controller is designed to provide capabilities for;

- Building Management Systems
- Networking
- Sequencing (Master/Slave and Run/Standby)

to meet all your system requirements, please confirm at time of order.

Unit initial set up details can be found in the **Controls** section.

Electrical

Dedicated weatherproof electrical power and controls panels are situated at the end of the unit and contain:

- Emergency Stop fitted to controls compartment door
- Separate, fully accessible, controls compartment, allowing adjustment of control set points whilst the unit is operational
- Circuit breakers for protection of all major unit components
- Separate, permanent supply for controls/trace heating, 230v/50Hz/1ph

The electrical power and control panel is wired to the latest European standards and codes of practice.

Mains supply is 3 phase and a neutral is not required. Refer to **Interconnecting Wiring**.

General Description

OPTIONAL EXTRAS – ENERGY SAVING

Power Factor Correction When applied to the motors of each compressor, the compressor power factor is controlled to a minimum operating value of 0.95 at the full operating capacity. This satisfies many supply authorities that may impose surcharges on equipment with power factor less than 0.95.

OPTIONAL EXTRAS – GENERAL


Loose Item

- Anti Vibration Mounts
- Condenser Fan Discharge Air Plenum Extension

} Instructions supplied with item

Factory Fitted

- Epoxy Coated Condenser Coils
- Coil Guards
- Sequence Control

CAUTION  **It is only possible to set up sequencing following completion of interconnecting communication wiring. Airedale Service can arrange Sequence setup on request.**

- BMS Interface Card
- Dual Pressure Relief Valve
- Leak Detection Kit
- Electronic Soft Start
- Power Factor Correction
- Differential Pressure Switch
- Remote Setpoint Adjust
- Flushing Bypass Kit (Incl. Shut off & Water Regulating Valve)
- Integral Pump Packages
- Mini Pressurisation Package
- Alternative Refrigerant (Outside EU)

OPTIONAL UNIT COVER

- Commissioning
- Chillerguard® Maintenance

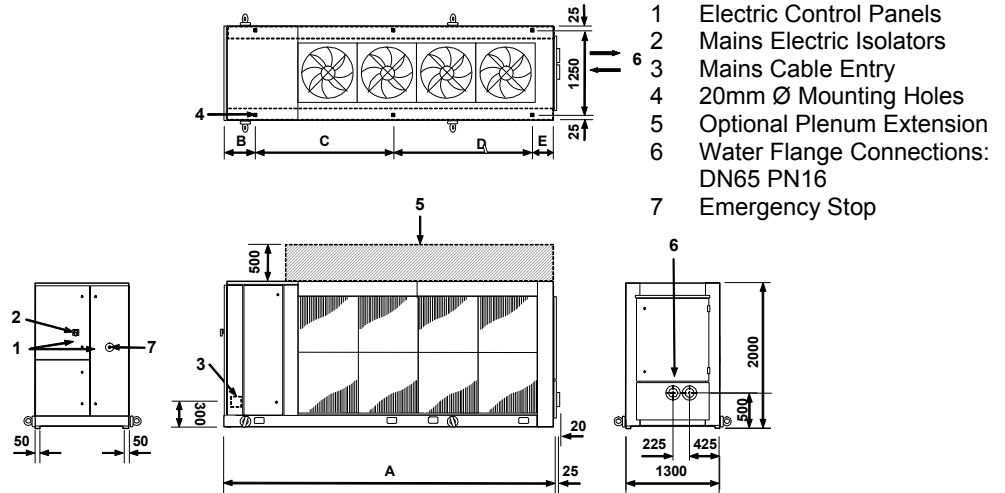
} For details and a competitive quotation, contact Airedale Service.

Installation Data

DIMENSIONS

SINGLE ROW FANS - /1

UCFC75 - UCFC150



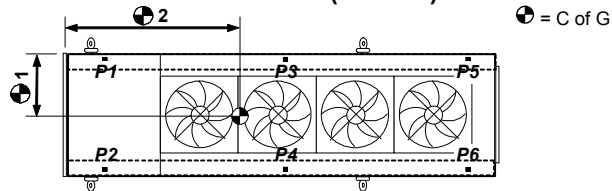
- 1 Electric Control Panels
- 2 Mains Electric Isolators
- 3 Mains Cable Entry
- 4 20mm Ø Mounting Holes
- 5 Optional Plenum Extension
- 6 Water Flange Connections: DN65 PN16
- 7 Emergency Stop

Model D		A	B	C	D	E
UCFC75D-2/1	mm	2775	390	1900	(1)	485
UCFC100D-2/1	mm	2775	390	1900	(1)	485
UCFC125D-3/1	mm	3625	390	1825	1135	275
UCFC150D-3/1	mm	3625	390	1825	1135	275

Model DQ		A	B	C	D	E
UCFC75DQ-2/1	mm	2775	390	1900	(1)	485
UCFC100DQ-3/1	mm	3625	390	1825	1135	275
UCFC125DQ-3/1	mm	3625	390	1825	1135	275
UCFC150DQ-4/1	mm	4475	390	1900	1900	285

Model DSQ		A	B	C	D	E
UCFC75DSQ-2/1	mm	2775	390	1900	(1)	485
UCFC100DSQ-3/1	mm	3625	390	1825	1135	275
UCFC125DSQ-4/1	mm	4475	390	1900	1900	285
UCFC150DSQ-4/1	mm	4475	390	1900	1900	285

POINT LOADINGS, WEIGHTS & CENTRE OF GRAVITY (C OF G)



Model D		P1	P2	P3	P4	P5	P6	Operating Weight	C of G1 (mm)	C of G2 (mm)
UCFC75D-2/1	kg	365	365	(1)	(1)	295	295	1320	640	265
UCFC100D-2/1	kg	380	380	(1)	(1)	305	305	1370	640	265
UCFC125D-3/1	kg	405	385	255	245	240	240	1770	640	1450
UCFC150D-3/1	kg	410	410	255	255	250	250	1830	640	1435

Model DQ		P1	P2	P3	P4	P5	P6	Operating Weight	C of G1 (mm)	C of G2 (mm)
UCFC75DQ-2/1	kg	365	365	(1)	(1)	295	295	1320	640	265
UCFC100DQ-3/1	kg	385	385	240	240	230	230	1710	640	1440
UCFC125DQ-3/1	kg	410	390	255	245	235	235	1770	640	1450
UCFC150DQ-4/1	kg	415	415	360	360	340	340	2230	640	1670

Model DSQ		P1	P2	P3	P4	P5	P6	Operating Weight	C of G1 (mm)	C of G2 (mm)
UCFC75DSQ-2/1	kg	375	375	(1)	(1)	295	295	1340	640	265
UCFC100DSQ-3/1	kg	390	390	240	240	235	235	1730	640	1440
UCFC125DSQ-4/1	kg	430	410	350	340	335	335	2200	640	1690
UCFC150DSQ-4/1	kg	430	430	355	355	340	340	2250	640	1670

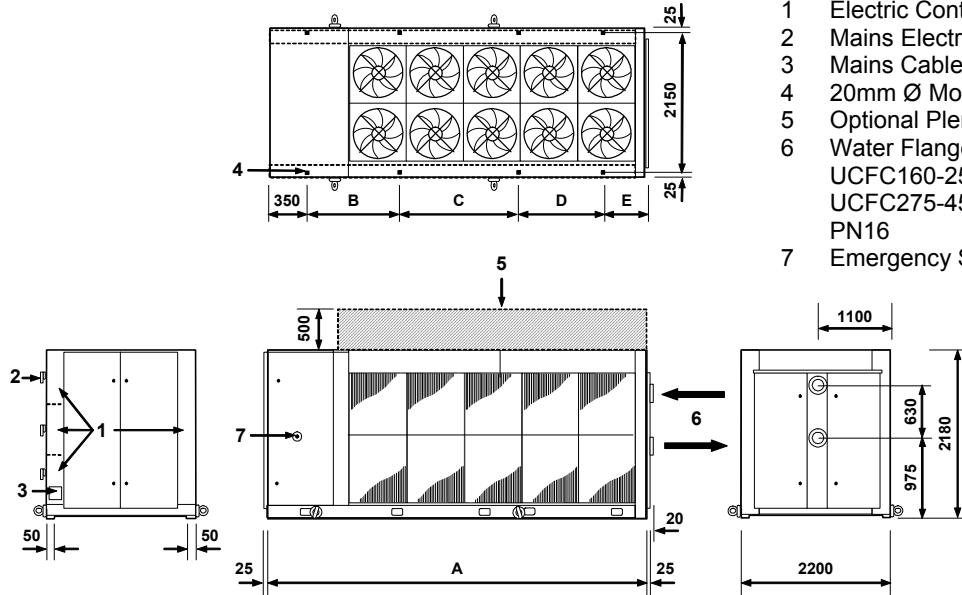
- (1) Have only 4 fixing and 4 point loadings.
- (2) Based on standard unit, for units fitted with pump options, please contact Airedale.

Installation Data

DIMENSIONS

DOUBLE ROW FANS - /2

UCFC160 - UCFC450



- 1 Electric Control Panels
- 2 Mains Electric Isolators
- 3 Mains Cable Entry
- 4 20mm Ø Mounting Holes
- 5 Optional Plenum Extension
- 6 Water Flange Connections:
UCFC160-250 DN80 PN16
UCFC275-450 DN100
PN16
- 7 Emergency Stop

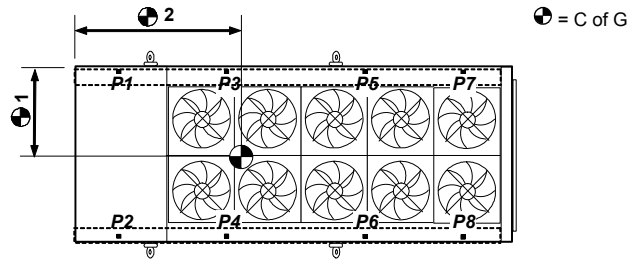
Model D		A	B	C	D	E
UCFC160D - UCFC225D	mm	3800	1750	1925	(1)	625
UCFC250D - UCFC300D	mm	4650	1750	1925	(1)	625
UCFC330D - UCFC360D	mm	5500	1350	1350	1925	525
UCFC400D - UCFC450D	mm	6350	1700	1925	1925	450
Model DQ		A	B	C	D	E
UCFC160DQ - UCFC200DQ	mm	3800	1750	1925	(1)	625
UCFC225DQ - UCFC250DQ	mm	4650	1750	1925	(1)	625
UCFC275DQ - UCFC300DQ	mm	5500	1350	1350	1925	525
UCFC330DQ - UCFC360DQ	mm	6350	1700	1925	1925	450
UCFC400DQ - UCFC450DQ	mm	7200	1700	2700	2000	450
Model DSQ		A	B	C	D	E
UCFC160DSQ - UCFC200DSQ	mm	4650	1750	1925	(1)	625
UCFC225DSQ - UCFC250DSQ	mm	5500	1350	1350	1925	525
UCFC275DSQ - UCFC300DSQ	mm	6350	1700	1925	1925	450
UCFC330DSQ - UCFC450DSQ	mm	8050	1700	2800	2725	525

(1) Have only 6 fixing and 6 point loadings.

Installation Data

POINT LOADINGS, WEIGHTS & CENTRE OF GRAVITY (C OF G)

UCCU160 - UCCU450



Model D		P1	P2	P3	P4	P5	P6	P7	P8	Operating Weight	C of G1 (mm)	C of G2 (mm)
UCFC160D-6/2	kg	590	590	340	340	(1)	(1)	235	235	2330	1100	1460
UCFC180D-6/2	kg	630	630	350	350	(1)	(1)	240	240	2440	1100	1450
UCFC200D-6/2	kg	630	630	350	350	(1)	(1)	245	245	2450	1100	1460
UCFC225D-6/2	kg	680	680	360	360	(1)	(1)	250	250	2580	1100	1440
UCFC250D-8/2	kg	700	700	440	440	(1)	(1)	360	360	3000	1100	1900
UCFC275D-8/2	kg	715	715	455	455	(1)	(1)	370	370	3080	1100	1900
UCFC300D-8/2	kg	730	730	460	460	(1)	(1)	375	375	3130	1100	1900
UCFC330D-10/2	kg	680	680	450	450	420	420	350	350	3800	1100	2200
UCFC360D-10/2	kg	680	680	450	450	420	420	350	350	3800	1100	2200
UCFC400D-12/2	kg	700	700	520	520	490	490	425	425	4270	1100	2770
UCFC450D-12/2	kg	720	720	530	530	500	500	430	430	4360	1100	2760

Model DQ		P1	P2	P3	P4	P5	P6	P7	P8	Operating Weight	C of G1 (mm)	C of G2 (mm)
UCFC160DQ-6/2	kg	650	650	370	370	(1)	(1)	245	245	2530	1100	1440
UCFC180DQ-6/2	kg	685	685	390	390	(1)	(1)	250	250	2650	1100	1430
UCFC200DQ-6/2	kg	685	685	390	390	(1)	(1)	250	250	2650	1100	1430
UCFC225DQ-8/2	kg	730	730	500	500	(1)	(1)	360	360	3180	1100	1860
UCFC250DQ-8/2	kg	740	740	505	505	(1)	(1)	360	360	3210	1100	1850
UCFC275DQ-10/2	kg	655	655	440	440	410	410	340	340	3690	1100	2200
UCFC300DQ-10/2	kg	675	675	445	445	410	410	340	340	3740	1100	2190
UCFC330DQ-12/2	kg	790	790	530	530	465	465	415	415	4400	1100	2670
UCFC360DQ-12/2	kg	790	790	530	530	465	465	415	415	4400	1100	2670
UCFC400DQ-14/2	kg	830	830	585	585	545	545	485	485	4890	1100	3090
UCFC450DQ-14/2	kg	865	865	590	590	545	545	485	485	4970	1100	3060

Model DSQ		P1	P2	P3	P4	P5	P6	P7	P8	Operating Weight	C of G1 (mm)	C of G2 (mm)
UCFC160DSQ-8/2	kg	675	675	415	415	(1)	(1)	380	380	2940	1100	1950
UCFC180DSQ-8/2	kg	695	695	435	435	(1)	(1)	395	395	3050	1100	1950
UCFC200DSQ-8/2	kg	700	700	440	440	(1)	(1)	395	395	3070	1100	1950
UCFC225DSQ-10/2	kg	640	640	420	420	400	400	335	335	3590	1100	2210
UCFC250DSQ-10/2	kg	640	640	420	420	405	405	340	340	3610	1100	2220
UCFC275DSQ-12/2	kg	685	685	485	485	465	465	420	420	4110	1100	2790
UCFC300DSQ-12/2	kg	700	700	490	490	465	465	420	420	4150	1100	2770
UCFC330DSQ-16/2	kg	815	815	640	640	605	605	550	550	5220	1100	3390
UCFC360DSQ-16/2	kg	815	815	640	640	605	605	550	550	5220	1100	3390
UCFC400DSQ-16/2	kg	825	825	650	650	615	615	555	555	5290	1100	3390
UCFC450DSQ-16/2	kg	845	845	660	660	625	625	560	560	5380	1100	3380

- (1) Have only 4 fixing and 4 point loadings.
- (2) Based on standard unit, for units fitted with pump options, please contact Airedale.

Installation Data

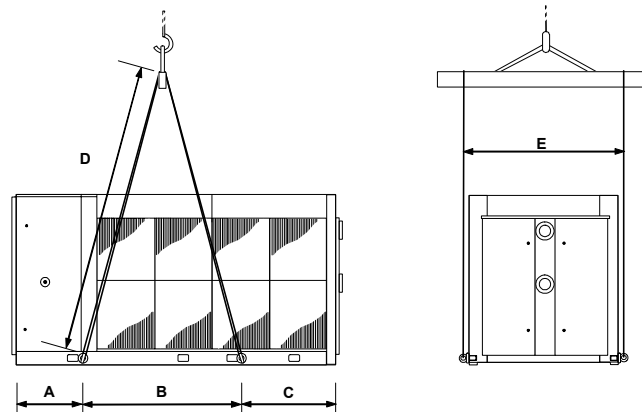
UNIT LIFTING

- Employ lifting specialists.
- Local codes and regulations relating to the lifting of this type of equipment should be observed.
- Use the lifting eye bolts provided.
- Use the appropriate spreader bars/lifting slings with the holes/lugs provided.
- Attach lifting chains to the 4 lifting eye bolts/lifting lugs provided, each chain and eye bolt must be capable of lifting the whole chiller.
- Lift the unit slowly and evenly.
- If the unit is dropped, it should immediately be checked for damage and reported to Airedale Service.

CAUTION  Only use lifting points provided.

The unit should be lifted from the base and where possible, with all packing and protection in position. 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.

LIFTING DIMENSIONS



UCFC75 - UCFC450		A	B	C	D	E
2 FANS /1	mm	290	1900	585	2500	1450
3 FANS /1	mm	290	2015	1320	2500	1450
4 FANS /1	mm	290	2870	1315	3000	1450
6 FANS /2	mm	465	2195	1140	2500	2350
8 FANS /2	mm	465	2560	1625	2500	2350
10 FANS/2	mm	465	3135	1900	3500	2350
12 FANS/2	mm	465	3610	2275	3500	2350
14 FANS/2	mm	465	4385	2350	4000	2350
16 FANS/2	mm	465	5035	2550	5000	2350

Date: 18/10/05

MANUAL AFFECTED: TECHNICAL & INSTALLATION

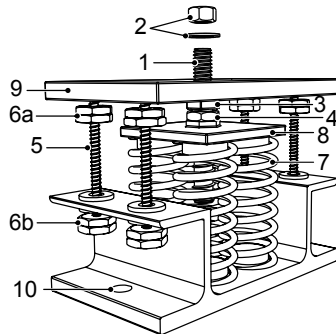
ULTIMA: UCC/UCCU 30-450
UCFC/URAC/UWC75-450
UFC/USC200-750

MANUAL PART NO: 901-108 TM E 02/05/A

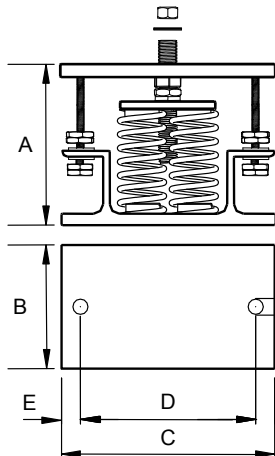
CHANGE: ANTI-VIBRATION MOUNT (SPRING TYPE) SPECIFICATION & INSTALLATION INSTRUCTIONS:

COMPONENTS:

- 1 Locating Screw
- 2 Retaining Nut & Washer
- 3 Levelling Screw
- 4 Levelling Lock Nut
- 5 Retaining Studs
- 6a Upper Retaining Nuts
- 6b Lower Retaining Nuts
- 7 Spring assembly
- 8 Pressure Plate
- 9 Top Plate
- 10 Bolting-down holes



DIMENSIONS:



		A ⁽¹⁾	B	C	D	E	FØ
UCC30-70 UCC75, 80, 100, 125 & 150 UCCU30-70 UCCU75, 80, 100, 125 & 150 UCFC75-150	2 SPRING	136	110	180	148	16	11
UCC110, 130, 160-450 UCCU110, 130, 160-450 UCFC160-450 UFC200-750 URAC75-450 USC200-750 UWC75-450	4 SPRING	180	130	225	186	20	16

- (1) Unloaded dimension
- (2) Refer to relevant **Loose Parts Instructions** sheet for positioning of each mount.

INSTALLATION

- 1 Locate and secure mount using bolting down holes (10) in base plate.
- 2 Ensure mounts are located in line with the unit base.
- 3 If applicable, remove compressor enclosure covers to allow access to mount fixing holes in the unit base.
- 4 Lock the upper retaining nuts (6a) to the underside of the top plate (9) before a load is applied.
- 5 Remove retaining nut and washer (2), lower the unit onto the mounts and replace retaining nut and washer.
- 6 Beginning with the mount with the largest deflection, adjust the height of each mount using the levelling screw (3).

CAUTION **Mountings must be adjusted incrementally in turn. Do not fully adjust 1 mount at a time as this may overload and damage springs.**

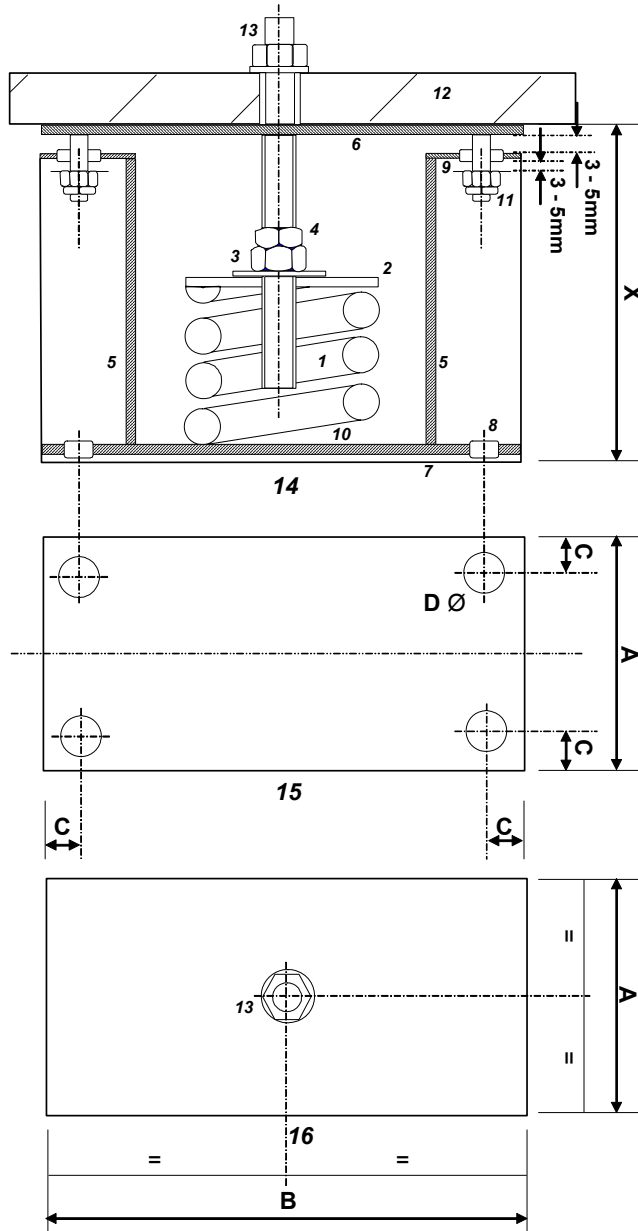
- 7 When all mounts are level, lock each into place using the levelling lock nut (4).
- 8 Lock all retaining nuts (6a and 6b) to the extreme ends of the retaining studs (5).

CAUTION **Do not connect any services until all anti vibration mounts have been fully adjusted.**

Installation Data

ANTI VIBRATION MOUNTING - OPTIONAL

Spring Type (CLS)



- 1 High deflection steel spring
- 2 Spring pressure plate
- 3 Height adjusting nut
- 4 Locking nut
- 5 Load bearing supports
- 6 Load bearing top plate
- 7 High frequency isolation pad
- 8 10 dia holding down bolt holes
- 9 High frequency isolation grommets
- 10 Steel spring location rings
- 11 Transportation/restraining bolts
- 12 Machine frame
- 13 Machine holding M16 stud/nuts
- 14 ELEVATION
- 15 BASE PLATE
- 16 TOP PLATE

Selection:

Model Size	A	B	C	D	X	
75 - 450	mm	100	200	20	14	180 - 210

Installation:

- 1 Locate and secure mount using bolting down holes provided in base plate.
- 2 Ensure mounts are located in line with the chiller base.
- 3 Position the machine using the centrally located stud, which allows the machine to be bolted down securely.
- 4 Loosen transit bolts and turn nut 3 clockwise until top plate 6 lifts clear of support posts. Tighten lock nut 4 when machine is at desired height and level.
- 5 Adjust and lock nuts on transit bolts such that a small (3-5mm) gap is left between washer and grommet. Refer to diagram.

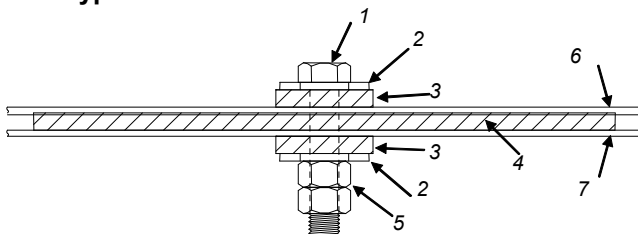
CAUTION

Mountings must be adjusted in increments of no more than 1mm in turn. Do not adjust 1 mount completely at a time as this may overload and damage springs.

Do not connect any services until all anti vibration mounts have been fully adjusted.

FINALLY, recheck/adjust mounts following unit connection to services and system is filled.

Pad Type




- 1 M16 Bolt (Not Supplied)
- 2 Washer (Not Supplied)
- 3 Fixing Pad 506-063
- 4 A V Pad 506-062
- 5 2 x M16 Nut (Not Supplied)
- 6 Unit Base
- 7 Unit Mounting Plinth

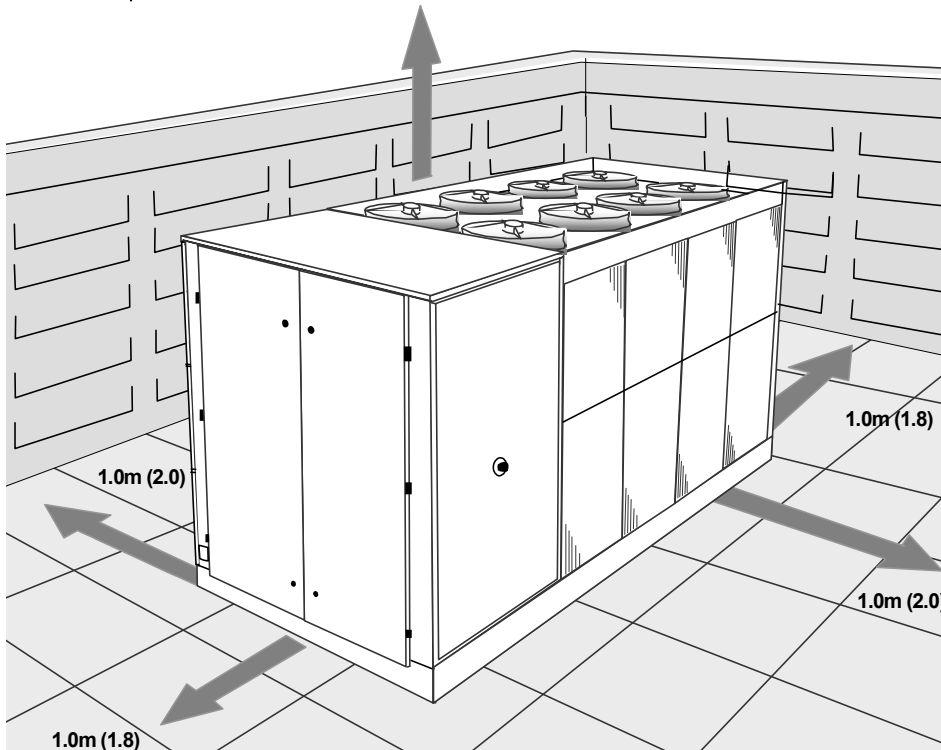
Installation Data

POSITIONING

The installation position should be selected with the following points in mind:

- Position on a stable and even base, levelled to ensure that the compressor operates correctly
- Levelling should be to +/- 5mm
- Where vibration transmission to the building structure is possible, fit spring anti-vibration mounts and flexible water connections
- Observe airflow and maintenance clearances
- Pipework and electrical connections are readily accessible
- 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
- Within a side enclosed installation, the fan MUST be higher than the enclosing structure
- Figures in brackets indicate airflow and maintenance clearances for side-enclosed or multiple chiller applications
- Ensure there are no obstructions directly above the fans
- Allow free space above the fans to prevent air recirculation

CAUTION  Ensure the unit is completely level and secured prior to connecting services.



Installation Data

WATER SYSTEM

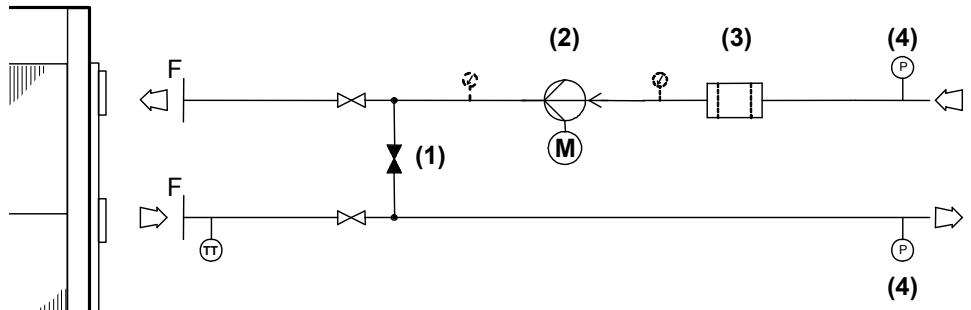
Chilled water pipework and ancillary components must be installed in accordance with:

- National and Local Water supply company standards
- The manufacturer's instructions are followed when fitting ancillary components
- The system liquid is treated to prevent corrosion and algae forming
- Glycol required as standard, with the correction concentration to suit the lowest ambient the equipment will experience
- The schematic is referred to as a guide to ancillary recommendations


CAUTION  The unit water connections are **NOT** designed to support external pipework, pipework should be supported during installation.

STANDARD RECOMMENDED INSTALLATION

CAUTION  The following installation recommendations should be adhered to. Failure to do this will invalidate the chiller warranty.



- (1) Flushing By Pass Leg (Optional Extra)
- (2) Pump (Optional Extra)
- (3) Filter 1/16" (Supplied by Others)
- (4) Pressure Sensor (Optional Extra)

CAUTION  Following components are fitted within the chiller unit as standard:

- Temperature Sensors
- Drain Point
- Auto Air Vent
- Flow Switch
- 20 Mesh Inlet Filter

Component Recommended Requirements

The recommended requirements to allow commissioning to be carried out correctly are:

- The inclusion of Binder Points adjacent to the flow and return connections, to allow temperature and pressure readings.
- A flow switch or equivalent, fitted adjacent to the water outlet side of the Chiller.

CAUTION  Constant water flow **MUST** be maintained. Variable water volume is **NOT** recommended and may invalidate warranty.

CAUTION  The correct operation of the flow switch is critical if the chiller warranty is to be valid.

- A water-flow commissioning valve set fitted to the system.
- In multiple chiller installations, 1 commissioning valve set is required per chiller.
- Air vents are to be installed at all high points and where air is likely to be trapped at intermediate points.
- Drain points are to be installed at all low points in the system and in particular adjacent to the unit for maintenance to be carried out.
- Isolating valves should be installed adjacent to all major items of equipment for ease of maintenance.
- Balancing valves can be installed if required to aid correct system balancing.
- All chilled water pipework must be insulated and vapour sealed to avoid condensation.
- If several units are installed in parallel adjacent to each other, reverse return should be applied to avoid unnecessary balancing valves.

Installation Data

WATER SYSTEM

Pump Statement

When installing circulating water pumps or equipment containing them, the following rules should be applied:


- Ensure the system is filled with liquid then vented and the pump primed with water before running the pump. This is required because the pumped liquid cools the pump bearings and mechanical seal faces.
- To avoid cavitation the NPSH (Net Positive Suction Head) incorporating a safety margin of 0.5m head must be available at the pump inlet during operation.

Pressure Testing

When all the pipework has been connected in the system, proceed as follows:

- Ensure all shut off and control valves are fully open.
- Pressurise system to the operating pressure, hold for 1 hour (a gradual fall in pressure shown on the gauge indicates a leak).
- Leaks should be found and repaired and the unit pressure tested for a further hour.

When the pressure remains at the operating pressure for 1 hour, the system can be considered leak free.

CAUTION  **Although a pressure of 1.5 x working pressure is adequate for testing purposes, most local water authorities require 2 x working pressure.**

Filling

CAUTION  **The whole system MUST be flushed prior to filling to remove debris left in the water pipework by using a flushing bypass as shown to avoid serious damage to the plate evaporator.**

During filling the system should be vented at all high points.

Once the system has been completely vented all vents should be closed.

To prevent air locking in the system it is advisable to fill the systems from the lowest point, ie drain point on pipework.

If auto air vents are used then we strongly recommend an auto pressurisation unit be fitted to the system.

Installation Data

WATER SYSTEM

		UCFC75D-2/1	UCFC100D-2/1	UCFC125D-3/1	UCFC150D-3/1	UCFC160D-6/2
Connections						
Water Inlet / Outlet	(1)	DN65	DN65	DN65	DN65	DN80
Water Drain/Bleed	in	1/2	1/2	1/2	1/2	1/2
Water System						
Min. System Water Volume	(2) l	377	469	419	727	717
Max. System Press	Bar	10	10	10	10	10
OPTIONAL EXTRAS						
Water Pump (3) (4)			In Line Pump			
Nom External Head Std Single / R&S	kPa	143	109	145	122	187
Nom External Head Larger Single/R&S	kPa	184	150	190	185	254
Nom External Head Standard Twin	kPa	100	82	88	89	184
Nom External Head Larger Twin	kPa	146	125	133	152	254
Pressurisation Unit						
Water Inlet Connection	in	1/2	1/2	1/2	1/2	1/2

		UCFC180D-6/2	UCFC200D-6/2	UCFC225D-6/2	UCFC250D-8/2	UCFC275D-8/2
Connections						
Water Inlet / Outlet	(1)	DN80	DN80	DN80	DN80	DN100
Water Drain/Bleed	in	1/2	1/2	1/2	1/2	1/2
Water System						
Min. System Water Volume	(2) l	645	715	811	1156	1004
Max. System Press	Bar	10	10	10	10	10
OPTIONAL EXTRAS						
Water Pump (3) (4)			In Line Pump			
Nom External Head Std Single / R&S	kPa	169	160	151	136	163
Nom External Head Larger Single/R&S	kPa	236	226	217	201	228
Nom External Head Standard Twin	kPa	166	156	147	130	157
Nom External Head Larger Twin	kPa	235	225	215	199	225
Pressurisation Unit						
Water Inlet Connection	in	1/2	1/2	1/2	1/2	1/2

		UCFC300D-8/2	UCFC330D-10/2	UCFC360D-10/2	UCFC400D-12/2	UCFC450D-12/2
Connections						
Water Inlet / Outlet	(1)	DN100	DN100	DN100	DN100	DN100
Water Drain/Bleed	in	1/2	1/2	1/2	1/2	1/2
Water System						
Min. System Water Volume	(2) l	1374	1168	1122	1337	1395
Max. System Press	Bar	10	10	10	10	10
OPTIONAL EXTRAS						
Water Pump (3) (4)			In Line Pump			
Nom External Head Std Single / R&S	kPa	151	138	121	125	108
Nom External Head Larger Single/R&S	kPa	218	206	190	196	182
Nom External Head Standard Twin	kPa	144	129	110	109	87
Nom External Head Larger Twin	kPa	213	198	180	181	161
Pressurisation Unit						
Water Inlet Connection	in	1/2	1/2	1/2	1/2	1/2

(1) Flanged to PN16.


(2) For minimum system volume refer to the **Technical Manual**.

(3) Based on 12/7°C water temperature and 30°C ambient with a 20% Ethylene Glycol Water Concentration.

(4) Figures based on D Model, for DQ & DSQ details, please contact Airedale.

Installation Data

GLYCOL DATA

CAUTION  All free-cooling units should use minimum 20% glycol concentration.

Ethylene Glycol Nominal Correction Factors

Glycol in System / Freezing Point °C	20% / -9°C	30% / -15°C	40% / -23°C
Cooling Duty	1.00	0.98	0.96
Input Power	1.00	0.98	0.97
Water Flow	1.00	1.09	1.12
Pressure Drop	1.00	1.29	1.48

Catalogue Data x by:

Propylene Glycol Nominal Correction Factors

Glycol in System / Freezing Point °C	20% / -6°C	30% / -12°C	40% / -20°C
Cooling Duty	0.98	0.94	0.91
Input Power	1.00	0.98	0.97
Water Flow	1.00	0.99	0.99
Pressure Drop	1.08	1.22	1.35

Catalogue Data x by:

Example UCFC150DQ-4/1 operating at 7/12, 30°C Ambient, 30% Ethylene Glycol


	Catalogue Figure	Multiplier	Corrected Figure
Cooling kW (refer to the Technical Manual)	146.1	x 0.98	143.2 kW
Input kW (refer to the Technical Manual)	54.1	x 0.98	53.0 kW
Flow l/s (calculated $\frac{DX \text{ (Mechanical Cooling kW)}}{\Delta T \times 3.9}$)	7.49	x 1.09	8.16 l/s
Pressure Drop kPa (refer to Waterside Pressure Drops)	146	x 1.29	188 kPa

Ethylene Glycol = 30%


ELECTRICAL DATA

General

- As standard the equipment is designed for 400V, 3 phase, 3 wire 50Hz and a separate permanent 230V, 1 phase, 50Hz supply, to all relevant IEE regulations, British standards and IEC requirements.
- A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.
- The control voltage to the interlocks is 24V. Always size the low voltage interlock and protection cabling for a maximum voltage drop of 2V.

CAUTION  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.

CAUTION  A separately fused, locally isolated, permanent single phase and neutral supply **must be fitted** for the compressor sump heater, evaporator trace heating and control circuits, **failure to do so could invalidate warranty**.

Interlocks & Protection Always electrically interlock the operation of the chiller with the pump controls.

This safety device prevents the chiller operating with low water flow which can cause serious damage.

CAUTION  Failure to install this safety device will invalidate the chiller warranty.

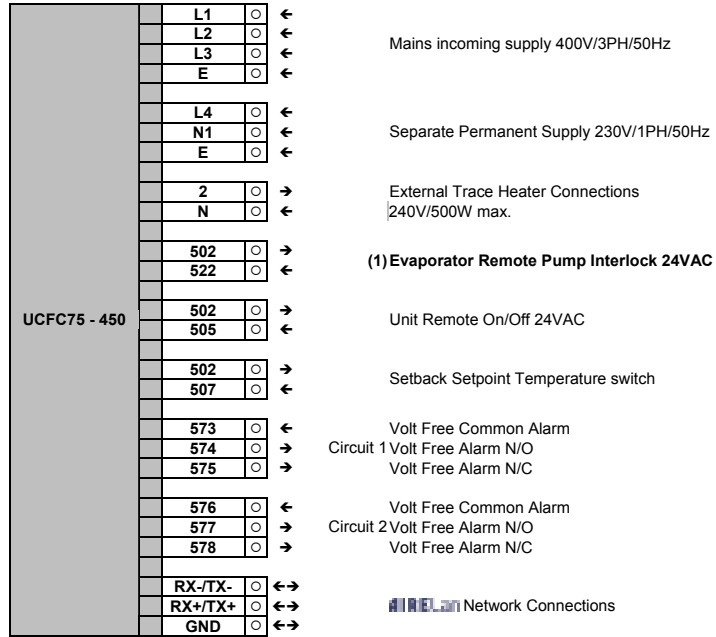
CAUTION  Do not rely solely on the BMS to protect the chiller against low flow conditions.

An evaporator pump interlock **MUST** be directly wired to the chiller, refer to **Interconnecting Wiring** diagram.

Installation Data

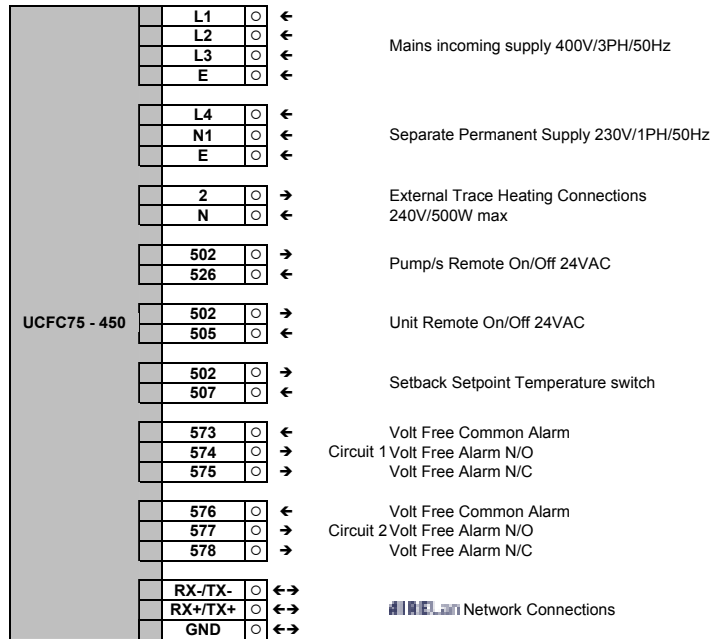
INTERCONNECTING WIRING

No Pumps



CAUTION  **(1) Must be directly wired to the chiller to validate warranty.**

With Pumps



Installation Data

ELECTRICAL DATA		UCFC75D-2/1	UCFC100D-2/1	UCFC125D-3/1	UCFC150D-3/1	UCFC160D-6/2
Unit Data						
Nominal Run Amps	(1) A	50	62	79	93	99
Maximum Start Amps	(2) A	140	167	217	246	252
Permanent Supply	VAC	230 V 1 PH 50 Hz				
Mains Supply	VAC	400 V 3 PH 50 Hz				
Rec Permanent Fuse Size	A	16	16	16	16	16
Rec Mains Fuse Size	A	63	80	125	125	125
Max Permanent Incoming Cable Size	mm ²	4 mm ² terminals				
Max Mains Incoming Cable Size	mm ²	70 (direct to MCCB)				Direct to Bus Bar
Control Circuit	VAC	24V/230VAC				
Evaporator						
Pad Heater Rating	W	40	40	80	80	100
External Trace Heating						
Available (fitted by others)	W	500	500	500	500	500
Condenser Fan - Per Fan						
Full Load Amps	A	1.75	1.75	1.75	1.75	1.75
Locked Rotor Amps	A	6.20	6.20	6.20	6.20	6.20
Motor Rating	kW	0.98	0.98	0.98	0.98	0.98
Compressor - Per Compressor						
Quantity		4	4	2 + 2	4	4
Motor Rating	kW	6.2	8.1	8.1 / 11.7	11.7	11.7
Nominal Run Amps	(1) A	11.7	14.6	14.6 / 22.0	22.0	22.0
Sump Heater Rating	W	65.0	65.0	65.0 / 75.0	75.0	75.0
Start Amps	(2)	98.0	120.0	175.0 / 120.0	175.0	175.0
Type Of Start		Direct on line				
QUIET DQ						
		UCFC75DQ-2/1	UCFC100DQ-3/1	UCFC125DQ-3/1	UCFC150DQ-4/1	UCFC160DQ-6/2
All data as above except:						
Condenser Fan - Per Fan						
Full Load Amps	A	1.15	1.15	1.15	1.15	1.15
Locked Rotor Amps	A	2.10	2.10	2.10	2.10	2.10
Motor Rating	kW	0.68	0.68	0.68	0.68	0.70
SUPER QUIET DSQ						
		UCFC75DSQ-2/1	UCFC100DSQ-3/1	UCFC125DSQ-4/1	UCFC150DSQ-4/1	UCFC160DSQ-8/2
All data as above except:						
Condenser Fan - Per Fan						
Full Load Amps	A	0.83	0.83	0.83	0.83	0.83
Locked Rotor Amps	A	1.50	1.50	1.50	1.50	1.50
Motor Rating	kW	0.32	0.32	0.32	0.32	0.32
OPTIONAL EXTRAS						
Power Factor Correction						
Nominal Run Amps	(1) A	48	55	71	85	91
Maximum Start Amps	(2) A	140	167	217	246	252
Recommended Mains Fuse	A	63	80	125	125	125
Compressor Nominal Run Amps - Per Compressor	A	4 x 11	4 x 13	2 x 20 / 2 x 13	4 x 20	4 x 20
Electronic Soft-Start						
Nominal Run Amps	(1) A	50	62	79	93	99
Maximum Start Amps	(2) A	97	119	147	176	182
Recommended Mains Fuse	A	63	80	125	125	125
Single Head Pump (or Run/Standby)						
Unit Nominal Run Amps	(1) A	55	67	86	98	105
Recommended Mains Fuse	A	80	100	125	160	160
Motor Rating	kW	2.2	2.2	3.0	3.0	7.5
Full Load Amps	A	4.8	4.8	6.8	6.8	14.7
Larger Single Head Pump (Or Run/Standby)						
Unit Nominal Run Amps	(1) A	57	69	85	108	112
Recommended Mains Fuse	A	80	100	125	160	160
Motor Rating	kW	3.0	3.0	7.5	7.5	11
Full Load Amps	A	6.8	6.8	15.5	15.5	21.4
Twin Head Pump						
Unit Nominal Run Amps	(1) A	56	68	85	99	105
Recommended Mains Fuse	A	80	100	125	160	160
Motor Rating	kW	3.0	3.0	3.0	3.0	7.5
Full Load Amps	A	6.1	6.1	6.1	6.1	14.7
Larger Twin Head Pump						
Unit Nominal Run Amps	(1) A	56	70	87	102	112
Recommended Mains Fuse	A	80	100	125	160	160
Motor Rating	kW	3.0	4.0	4.0	4.0	11
Full Load Amps	A	6.1	7.7	7.7	7.7	21.4

(1) Based at 12/7°C water and 30°C ambient

(2) Starting amps refers to the direct on line connections.

Installation Data

ELECTRICAL DATA		UCFC180D-6/2	UCFC200D-6/2	UCFC225D-6/2	UCFC250D-8/2	UCFC275D-8/2
Unit Data						
Nominal Run Amps	(1) A	109	121	131	146	160
Maximum Start Amps	(2) A	297	358	368	383	440
Permanent Supply	VAC	230 V 1 PH 50 Hz				
Mains Supply	VAC	400 V 3 PH 50 Hz				
Rec Permanent Fuse Size	A	16	16	16	16	16
Rec Mains Fuse Size	A	160	160	200	200	200
Max Permanent Incoming Cable Size	mm ²	4 mm ² terminals				
Max Mains Incoming Cable Size	mm ²	Direct to Bus Bar				
Control Circuit	VAC	24V/230VAC				
Evaporator						
Pad Heater Rating	W	100	100	100	100	100
External Trace Heating						
Available (fitted by others)	W	500	500	500	500	500
Condenser Fan - Per Fan						
Full Load Amps	A	1.75	1.75	1.75	1.75	1.75
Locked Rotor Amps	A	6.20	6.20	6.20	6.20	6.20
Motor Rating	kW	0.98	0.98	0.98	0.98	0.98
Compressor - Per Compressor						
Quantity		2 + 2	2 + 2	2 + 2	4	2 + 2
Motor Rating	kW	15.0 / 11.7	18.2 / 11.7	18.2 / 15.0	18.2	22.8 / 18.2
Nominal Run Amps	(1) A	27.0 / 22.0	33.0 / 22.0	33.0 / 27.0	33.0	40.0 / 33.0
Sump Heater Rating	W	130.0 / 75.0	130.0 / 75.0	130.0 / 130.0	130.0	130.0 / 130.0
Start Amps	(2)	215.0 / 175.0	270.0 / 175.0	270.0 / 215.0	270.0	320.0 / 270.0
Type Of Start		Direct on line				
QUIET DQ						
		UCFC180DQ-6/2	UCFC200DQ-6/2	UCFC225DQ-8/2	UCFC250DQ-8/2	UCFC275DQ-10/2
All data as above except:						
Condenser Fan - Per Fan						
Full Load Amps	A	1.15	1.15	1.15	1.15	1.15
Locked Rotor Amps	A	2.10	2.10	2.10	2.10	2.10
Motor Rating	kW	0.70	0.70	0.70	0.70	0.70
SUPER QUIET DSQ						
		UCFC180DSQ-8/2	UCFC200DSQ-8/2	UCFC225DSQ-10/2	UCFC250DSQ-10/2	UCFC275DSQ-12/2
All data as above except:						
Condenser Fan - Per Fan						
Full Load Amps	A	0.83	0.83	0.83	0.83	0.83
Locked Rotor Amps	A	1.50	1.50	1.50	1.50	1.50
Motor Rating	kW	0.32	0.32	0.32	0.32	0.32
OPTIONAL EXTRAS						
Power Factor Correction						
Nominal Run Amps	(1) A	99	111	119	134	146
Maximum Start Amps	(2) A	290	351	359	374	430
Recommended Mains Fuse	A	125	160	160	200	200
Compressor Nominal Run Amps - Per Compressor	A	2 x 24/2 x 20	2 x 30/2 x 20	2 x 30/2 x 24	4 x 30	2 x 36 / 2 x 30
Electronic Soft-Start						
Nominal Run Amps	(1) A	109	121	131	146	160
Maximum Start Amps	(2) A	211	250	260	275	312
Recommended Mains Fuse	A	160	160	200	200	200
Single Head Pump (or Run/Standby)						
Unit Nominal Run Amps	(1) A	113	125	133	133	161
Recommended Mains Fuse	A	160	200	200	200	250
Motor Rating	kW	7.5	7.5	7.5	7.5	7.5
Full Load Amps	A	14.7	14.7	14.7	14.7	14.7
Larger Single Head Pump (Or Run/Standby)						
Unit Nominal Run Amps	(1) A	120	132	140	155	167
Recommended Mains Fuse	A	160	200	200	200	250
Motor Rating	kW	11	11	11	11	11
Full Load Amps	A	21.4	21.4	21.4	21.4	21.4
Twin Head Pump						
Unit Nominal Run Amps	(1) A	113	125	133	133	161
Recommended Mains Fuse	A	160	200	200	200	250
Motor Rating	kW	7.5	7.5	7.5	7.5	7.5
Full Load Amps	A	14.7	14.7	14.7	14.7	14.7
Larger Twin Head Pump						
Unit Nominal Run Amps	(1) A	120	132	140	155	167
Recommended Mains Fuse	A	160	200	200	200	250
Motor Rating	kW	11	11	11	11	11
Full Load Amps	A	21.4	21.4	21.4	21.4	21.4

- (1) Based at 12/7°C water and 30°C ambient
 (2) Starting amps refers to the direct on line connections.

Installation Data

ELECTRICAL DATA		UCFC300D-8/2	UCFC330D-10/2	UCFC360D-10/2	UCFC400D-12/2	UCFC450D-12/2
Unit Data						
Nominal Run Amps	(1) A	173	198	216	240	260
Maximum Start Amps	(2) A	454	435	453	520	540
Permanent Supply	VAC			230 V 1 PH 50 Hz		
Mains Supply	VAC			400 V 3 PH 50 Hz		
Rec Permanent Fuse Size	A	16	16	16	16	16
Rec Mains Fuse Size	A	250	250	315	315	355
Max Permanent Incoming Cable Size	mm ²			4 mm ² terminals		
Max Mains Incoming Cable Size	mm ²			Direct to Bus Bar		
Control Circuit	VAC			24V/230VAC		
Evaporator						
Pad Heater Rating	W	100	100	100	100	100
External Trace Heating						
Available (fitted by others)	W	500	500	500	500	500
Condenser Fan - Per Fan						
Full Load Amps	A	1.75	1.75	1.75	1.75	1.75
Locked Rotor Amps	A	6.20	6.20	6.20	6.20	6.20
Motor Rating	kW	0.98	0.98	0.98	0.98	0.98
Compressor - Per Compressor						
Quantity		4	3 + 3	6	3 + 3	6
Motor Rating	kW	22.8	18.2 / 15.0	18.2	22.8 / 18.2	22.8
Nominal Run Amps	(1) A	40.0	33.0 / 27.0	33.0	40.0 / 33.0	40.0
Sump Heater Rating	W	130.0	130.0 / 130.0	130.0	130.0 / 130.0	130.0
Start Amps	(2)	320.0	270.0 / 215.0	270.0	320.0 / 270.0	320.0
Type Of Start				Direct on line		
QUIET DQ						
		UCFC300DQ-10/2	UCFC330DQ-10/2	UCFC360DQ-12/2	UCFC400DQ-12/2	UCFC450DQ-14/2
All data as above except:						
Condenser Fan - Per Fan						
Full Load Amps	A	1.15	1.15	1.15	1.15	1.15
Locked Rotor Amps	A	2.10	2.10	2.10	2.10	2.10
Motor Rating	kW	0.70	0.70	0.70	0.70	0.70
SUPER QUIET DSQ						
		UCFC300DSQ-12/2	UCFC330DSQ-14/2	UCFC360DSQ-14/2	UCFC400DSQ-16/2	UCFC450DSQ-16/2
All data as above except:						
Condenser Fan - Per Fan						
Full Load Amps	A	0.83	0.83	0.83	0.83	0.83
Locked Rotor Amps	A	1.50	1.50	1.50	1.50	1.50
Motor Rating	kW	0.32	0.32	0.32	0.32	0.32
OPTIONAL EXTRAS						
Power Factor Correction						
Nominal Run Amps	(1) A	158	180	198	219	237
Maximum Start Amps	(2) A	442	420	438	503	521
Recommended Mains Fuse	A	250	250	250	250	315
Compressor Nominal Run Amps - Per Compressor	A	4 x 36	3 x 30 / 3 x 24	6 x 30	3 x 36 / 3 x 30	6 x 36
Electronic Soft-Start						
Nominal Run Amps	(1) A	158	180	198	219	237
Maximum Start Amps	(2) A	442	420	438	503	521
Recommended Mains Fuse	A	250	250	315	315	355
Single Head Pump (or Run/Standby)						
Unit Nominal Run Amps	(1) A	173	194	212	234	252
Recommended Mains Fuse	A	250	315	315	315	355
Motor Rating	kW	7.5	7.5	7.5	7.5	7.5
Full Load Amps	A	14.7	14.7	14.7	14.7	14.7
Larger Single Head Pump (Or Run/Standby)						
Unit Nominal Run Amps	(1) A	179	201	219	240	258
Recommended Mains Fuse	A	250	315	315	315	355
Motor Rating	kW	11	11	11	11	11
Full Load Amps	A	21.4	21.4	21.4	21.4	21.4
Twin Head Pump						
Unit Nominal Run Amps	(1) A	173	194	212	234	252
Recommended Mains Fuse	A	250	315	315	315	355
Motor Rating	kW	7.5	7.5	7.5	7.5	7.5
Full Load Amps	A	14.7	14.7	14.7	14.7	14.7
Larger Twin Head Pump						
Unit Nominal Run Amps	(1) A	179	201	219	240	258
Recommended Mains Fuse	A	250	315	315	315	355
Motor Rating	kW	11	11	11	11	11
Full Load Amps	A	21.4	21.4	21.4	21.4	21.4

(1) Based at 12/7°C water and 30°C ambient

(2) Starting amps refers to the direct on line connections.

Controls

CONTROL SCHEME FEATURES

Airedale recognises that all chiller applications are different but fall mainly into 2 application categories; Variable Supply Temperature and Constant Supply Temperature.

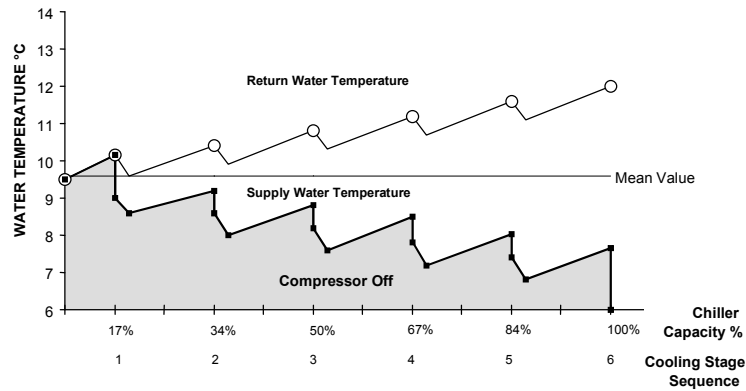
The onboard microprocessor has the capability of satisfying either control requirement as illustrated below. Using the Airedale Variable Supply Temperature control scheme, energy savings are available when compared with previous schemes and that of the Constant Supply Temperature application.

Variable Supply Temperature control schemes offer energy savings where the supply water temperature is not critical to its operation and is recommended for free-cooling applications.

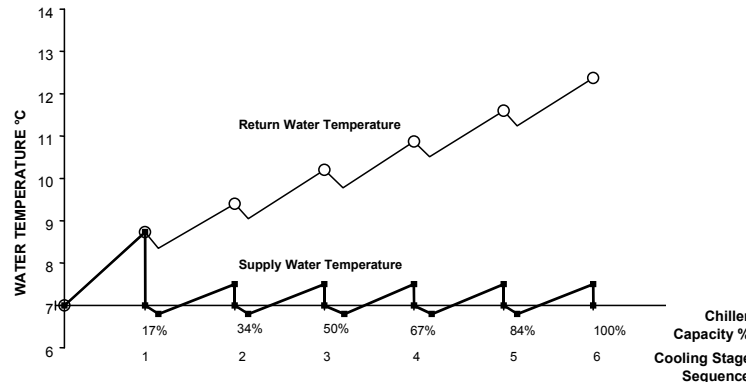
Selection of the best application control scheme can be made via a soft switch in the microprocessor during initial commissioning.

Examples based on Models UCFC125D-3/1 having 6 Stages of Cooling

Variable Supply Temperature Control



Constant Supply Temperature Control



CAUTION Factory set to Variable Supply Temperature Control unless otherwise stated at order.

Only when the mode selection has been set can the unit be enabled.

Free-Cooling Operation

In high ambients where free-cooling is not available the fan speed modulates in the conventional manner to maintain a constant head pressure. Free-cooling is initiated wherever the outdoor ambient is 1°C less than the return water temperature.

When free cooling and DX (mechanical) cooling are operating simultaneously the condenser fan speed will operate at 100% maximising free cooling.

In ambients where the free cooling coil is capable of satisfying the full cooling demand, the condenser fans are modulated to provide the desired duty. The condenser fans are capable of being modulated between 25-100% of airflow to maintain the supply water temperature.

During periods where the condenser fan speed has been reduced to a minimum, the supply water temperature will then be controlled by the 3 way valve.

AIRETronix Controls

GENERAL DESCRIPTION

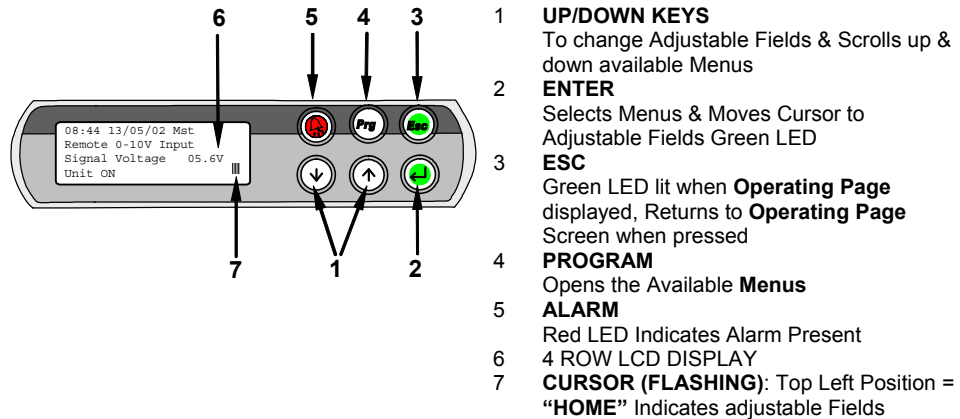
The **AIRETronix** microprocessor controller offers powerful analogue and digital control to meet a wide range of monitoring and control features including a real time clock and Industry standard communication port and network connections.

The controller's inbuilt display is used for viewing the unit operating status and making adjustments to control parameters by allowing the operator access to a series of display pages.

Also featured are a visual alarm and the facility to adjust and display control settings by local operator for information and control.

OPERATION

Display/Keypad



Navigation

The display is used for **Viewing Unit Operating Status** and **Adjusting Customer Control Settings** by allowing the operator access to a series of **Menus & sub-menus**. Viewing information is unrestricted, however set up and adjustment requires password entry, refer to **Password Protection**.

Initially, use the **Prgr** key to **access Menus**, the symbol ← will appear top right and the first menu will appear in CAPITALS, these **indicators** shows which menu is selected.

Use the **↓** **↑** keys to **move the indicator ←** to the desired menu and press **↵** to **open** the menu.

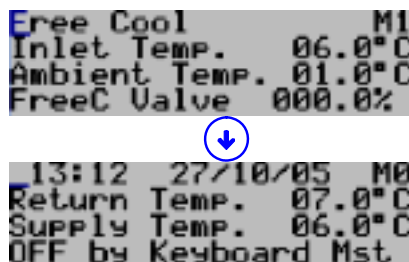
Use the **↵** key to **move the flashing cursor █** to adjustable **fields** and the **↓** **↑** keys to change the values.

Press the **↵** key to **move the cursor** to the next **field** or **Home**.

When the cursor is **Home** either use the **↓** **↑** keys to scroll to next **sub-menu** or the **Esc** to **exit** and **return** to the **Standard Operating** page.

Standard Operating Page


The **Operating Page** will appear and remain present following start up of the controller as illustrated:



AIRETronix Controls

OPERATION

Standard Operating Page cont.

The following **Menus** can be accessed from the **Operating Page**, it is recommended that the display is always returned to the **Operating Page** by using the  key

Password Protection

To guard against unauthorised adjustments, a password is required to gain access to certain menus as defined below.

FACTORY SET PASSWORD PIN NUMBER: 4648 (or Customer chosen number).



When a password is requested use the   keys to enter the number and  to access the page.

Menus (Listed in Sequence)

Menu	Description	Password
Switch On/Off	Enable or Disable the unit	Open Access
Service	Allows selection of setpoint limits, enables unit on/off from display, remote on/off and remote pump on/off.	Default 4648
Setpoint	Allows setpoint adjustment, includes supply temperature setpoint and unit temperature differential.	Default 4648
Status	Displays current status on digital and analogue inputs and outputs.	Open Access
Maintenance	Displays hours run for compressors and pumps (if fitted). Also includes Electronic Expansion Valves (if fitted).	Default 4648
Clock	Allows adjustment of real time clock, time zones	Default 4648
Alarm Log	Display last 100 alarms in chronological order.	Open Access
Manufacturer	Factory use only.	Airedale Only

SETTING UP

Unit ON/OFF

By pressing the  and  simultaneously for approximately 5 seconds, the unit operation will stop or start. The unit can also be enabled through the Switch On/Off menu.

Real Time Clock

The units leave the factory set, however follow the **Navigation** instructions if necessary.

Time Zones

The programme provides 3 On/Off periods per day, 7 days per week. The unit is factory set for continuous operation.

Technical Support

For further details, please contact Airedale.

AIRETronix Controls

VIEWING UNIT OPERATING STATUS

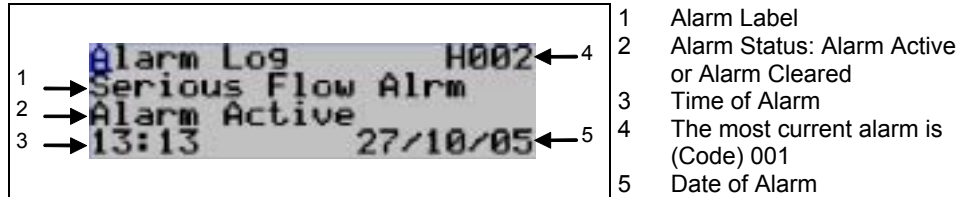
Status Menu Allows access to view operating status of Digital and Analogue Inputs and Outputs.
Using the **Navigation** instructions, the following **Sub-Menus** shown in sequence can be accessed:

Tandem Compressor Units		Trio Compressor Units	
Digital Inputs			
ID1	Phase Rotation or MCCB Status	Phase Rotation or MCCB Status	
ID2	Emergency Stop	Emergency Stop	
ID3	Evaporator Flow Switch	Evaporator Flow Switch	
ID4	Remote On/Off	Remote On/Off	
ID5	Compressor 1 Contactor Status	Compressor 1 Contactor Status	
ID6	Compressor 2 Contactor Status	Compressor 2 Contactor Status	
ID7	Compressor 3 Contactor Status	Compressor 3 Contactor Status	
ID8	Compressor 4 Contactor Status	Compressor 4 Contactor Status	
ID9	Circuit 1 Low Pressure Switch	Circuit 1 Low Pressure Switch	
ID10	Circuit 2 Low Pressure Switch	Circuit 2 Low Pressure Switch	
ID11	Pump 1 Contactor Status or Remote Pump Interlock (Optional)	Pump 1 Contactor Status or Remote Pump Interlock	
ID12	Pump 2 Contactor Status (Optional)	Pump 2 Contactor Status	
ID13	Remote Pump On/Off	Remote Pump On/Off	
ID14	Remote Summer/Winter Or Night Setback	Remote Summer/Winter Or Night Setback	
ID15	Not Used	Not Used	
ID16	Not Used	Not Used	
ID17	Not Used	Compressor 5 Contactor Status	
ID18	Not Used	Compressor 6 Contactor Status	
Digital Outputs			
NO1	Compressor 1 Contactor	Compressor 1 Contactor	
NO2	Compressor 2 Contactor	Compressor 2 Contactor	
NO3	Pump 1 Contactor (Optional)	Compressor 3 Contactor	
NO4	Compressor 3 Contactor	Compressor 4 Contactor	
NO5	Compressor 4 Contactor	Compressor 5 Contactor	
NO6	Pump 2 Contactor (Optional)	Compressor 6 Contactor	
NO7	Circuit 1 Condenser Coil Valve 1	Circuit 1 Condenser Coil Valve 1	
NO8	Circuit 1 Condenser Coil Valve 2	Circuit 1 Condenser Coil Valve 2	
NO9	Circuit 2 Condenser Coil Valve 1	Circuit 2 Condenser Coil Valve 1	
NO10	Circuit 2 Condenser Coil Valve 2	Circuit 2 Condenser Coil Valve 2	
NO11	Not Used	Not Used	
NO12	Alarm Circuit 1	Alarm Circuit 1	
NO13	Alarm Circuit 2	Alarm Circuit 2	
NO14	Evaporator Heater Pad	Evaporator Heater Pad	
NO15		Circuit 1 Condenser Coil Valve 3	
NO16		Circuit 2 Condenser Coil Valve 3	
NO17		Pump 1 Contactor	
NO18		Pump 2 Contactor	
Analogue Inputs			
B1	Circuit 1 Liquid Pressure	Circuit 1 Liquid Pressure	
B2	Circuit 2 Liquid Pressure	Circuit 2 Liquid Pressure	
B3	Circuit 1 Suction Pressure without EEV or Leak Detector (Optional)	Circuit 1 Suction Pressure without EEV or Leak Detector	
B4	Return Water Temperature	Return Water Temperature	
B5	Supply Water Temperature	Supply Water Temperature	
B6	Circuit 1 Suction Pressure without EEV	Circuit 1 Suction Pressure without EEV	
B7	Chilled Water Differential Pressure	Chilled Water Differential Pressure	
B8	Remote Setpoint Adjustment	Remote Setpoint Adjustment	
B9	Evaporator Inlet Water temperature	Evaporator Inlet Water temperature	
B10	Ambient Temperature	Ambient Temperature	
Analogue Outputs			
Y1	Free Cooling Valve	Free Cooling Valve	
Y2	Circuit 1 & 2 Condenser Controller (Modulated Head Pressure Control)	Circuit 1 & 2 Condenser Controller (Modulated Head Pressure Control)	
Y3-Y6	Not Used	Not Used	
EVD Driver # Inputs			
B1	Circuit # Suction Temperature	Circuit # Suction Temperature	
B2	Circuit # Suction Pressure	Circuit # Suction Pressure	








AIRETronix Controls

ALARMS

The controller logs and allows viewing of the last 100 conditions recorded in descending chronological order.



Alarm Handling

- 1 A **Red LED** behind the **Alarm**  key will light in the event of an alarm. To view the alarms, simply press the  key and the   keys to scroll through.
- 2 Auto reset alarms will clear following this first depression of the **Alarm**  key. If however the **Red LED** behind the **Alarm**  key remains illuminated, the unit requires some form of manual reset.
- 3 For manual reset alarms, isolate the affected circuits before further investigation.
- 4 To reset or delete the alarms displayed in the alarm screen, simply press  again.

COMMON ALARMS

Outlined below is a selection of Common Alarms, a full list is available, please contact Airedale.

Phase Rotation or MCCB

A normally closed contact. When Phase Rotation is incorrect all controller outputs are de-activated.

Emergency Stop

A normally open contact. On closing, all controller outputs are de-activated.

Evaporator Flow Failure

A normally closed contact. On opening, all controller outputs are de-activated.

Low Supply Temperature

Supply Water Temperature Low Limit alarm is generated when the supply water temperature falls below the low limit value set. All controller outputs are de-activated.

INDIVIDUAL CIRCUIT ALARMS

Outlined below is a selection of Individual Circuit Alarms, a full list is, please contact Airedale.

Electronic Expansion Valve Failure

This indicates that the electronic expansion valve controller has detected an operating problem.

Low Suction Pressure

When the suction pressure sensor value falls below the value set by the low suction level for a period exceeding 1 minute (or 3 minutes on compressor start-up), a visual alarm will be generated at the in-built display and the relevant compressor will be de-activated. On units with tandem compressors, both compressors from the same circuit will be switched off.

High Liquid Pressure

When the liquid pressure reaches 25 Barg, the relevant circuit will be switched off and an alarm activated, this can only be rectified by manual reset via the microprocessor.

Compressor Status

A normally closed contact when the compressor is operating. If this contact remains open for a period of 3 seconds during operation of the compressor, a visual alarm is generated and the relevant compressor will be de-activated. This alarm comprises of compressor motor protection module, discharge gas thermostat and safety high pressure switch.

Commissioning Data

GENERAL DATA

Operating Limits

Unit With Electronic Fan Speed HP Control (-20°C)	
Minimum ambient air db °C	-20°C
Maximum ambient air db °C	Refer to Technical Manual - Performance Data - Capacity Data
Minimum leaving water temperature °C	+6C
Maximum return water temperature °C	+20°C

- 1 Temperatures lower than those stated can be obtained with additional glycol.
- 2 For conditions outside those quoted, please refer to Airedale.

MECHANICAL DATA

Oil & Refrigerant Charges	UCFC75D-2/1	UCFC100D-2/1	UCFC125D-3/1	UCFC150D-3/1	UCFC160D-6/2
Compressor	Tandem Scroll				
Quantity	4	4	4	4	4
Oil Charge Volume (Total) l	3.25 + 3.25	3.80 + 3.80	6.20 + 3.80	6.20 + 6.20	4 x 6.2
Oil Type	Polyol Ester				
Refrigeration	Dual Circuit				
Refrigerant Control	Electronic Expansion Valve				
Refrigerant Precharged Charge (Total) kg	22 + 22	22 + 22	30 + 30	30 + 30	29 + 29
QUIET DQ	UCFC75DQ-2/1	UCFC100DQ-3/1	UCFC125DQ-3/1	UCFC150DQ-4/1	UCFC160DQ-6/2
Refrigerant Charge (Total) kg	22 + 22	30 + 30	30 + 30	40 + 40	29 + 29
SUPER QUIET DSQ	UCFC75DSQ-2/1	UCFC100DSQ-3/1	UCFC125DSQ-4/1	UCFC150DSQ-4/1	UCFC160DSQ-8/2
Refrigerant Charge (Total) kg	22 + 22	30 + 30	40 + 40	40 + 40	37 + 37

	UCFC180D-6/2	UCFC200D-6/2	UCFC225D-6/2	UCFC250D-8/2	UCFC275D-8/2
Compressor	Tandem Scroll				
Quantity	4	4	4	4	4
Oil Charge Volume (Total) l	2 x 8.0 / 2 x 6.2	2 x 8.0 / 2 x 6.2	4 x 8.0	4 x 8.0	4 x 8.0
Oil Type	Polyol Ester				
Refrigeration	Dual Circuit				
Refrigerant Control	Electronic Expansion Valve				
Refrigerant Precharged Charge (Total) kg	29 + 29	29 + 29	29 + 29	38 + 38	39 + 39
QUIET DQ	UCFC180DQ-6/2	UCFC200DQ-6/2	UCFC225DQ-8/2	UCFC250DQ-8/2	UCFC275DQ-10/2
Refrigerant Charge (Total) kg	29 + 29	29 + 29	37 + 37	38 + 38	46 + 46
SUPER QUIET DSQ	UCFC180DSQ-8/2	UCFC200DSQ-8/2	UCFC225DSQ-10/2	UCFC250DSQ-10/2	UCFC275DSQ-12/2
Refrigerant Charge (Total) kg	37 + 37	37 + 37	45 + 45	45 + 45	54 + 54

	UCFC300D-8/2	UCFC330D-10/2	UCFC360D-10/2	UCFC400D-12/2	UCFC450D-12/2
Compressor	Tandem Scroll				
Quantity	4	6	6	6	6
Oil Charge Volume (Total) l	4 x 8.0	6 x 8.0	6 x 8.0	6 x 8.0	6 x 8.0
Oil Type	Polyol Ester				
Refrigeration	Dual Circuit				
Refrigerant Control	Electronic Expansion Valve				
Refrigerant Precharged Charge (Total) kg	39 + 39	49 + 45	47 + 47	57 + 53	56 + 56
QUIET DQ	UCFC300DQ-10/2	UCFC330DQ-12/2	UCFC360DQ-12/2	UCFC400DQ-14/2	UCFC450DQ-14/2
Refrigerant Charge (Total) kg	47 + 47	57 + 53	55 + 55	66 + 60	64 + 64
SUPER QUIET DSQ	UCFC300DSQ-12/2	UCFC330DSQ-16/2	UCFC360DSQ-16/2	UCFC400DSQ-16/2	UCFC450DSQ-16/2
Refrigerant Charge (Total) kg	54 + 54	74 + 68	71 + 71	74 + 68	72 + 72

Commissioning Data

WATERSIDE PRESSURE DROPS (20% Ethylene Glycol Concentration)

CAUTION  **Constant water flow MUST be maintained. Variable water volume is NOT recommended and may invalidate warranty.**

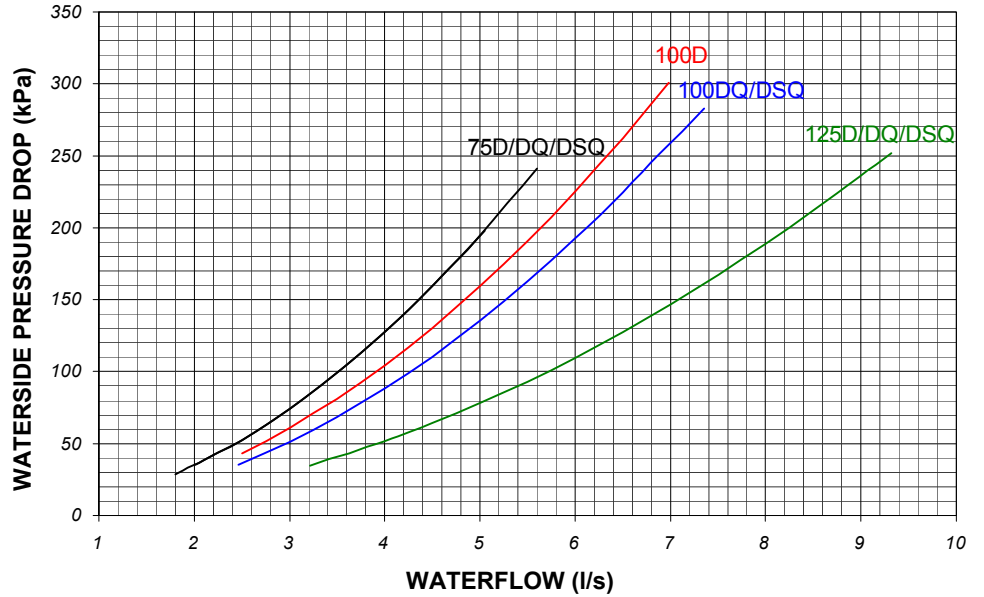
Use the formula below to calculate the External Head Available:

$$\boxed{\text{Total Pump Head Available}} - \boxed{\text{Chiller Pressure Drop}} = \boxed{\text{External Head Available}}$$

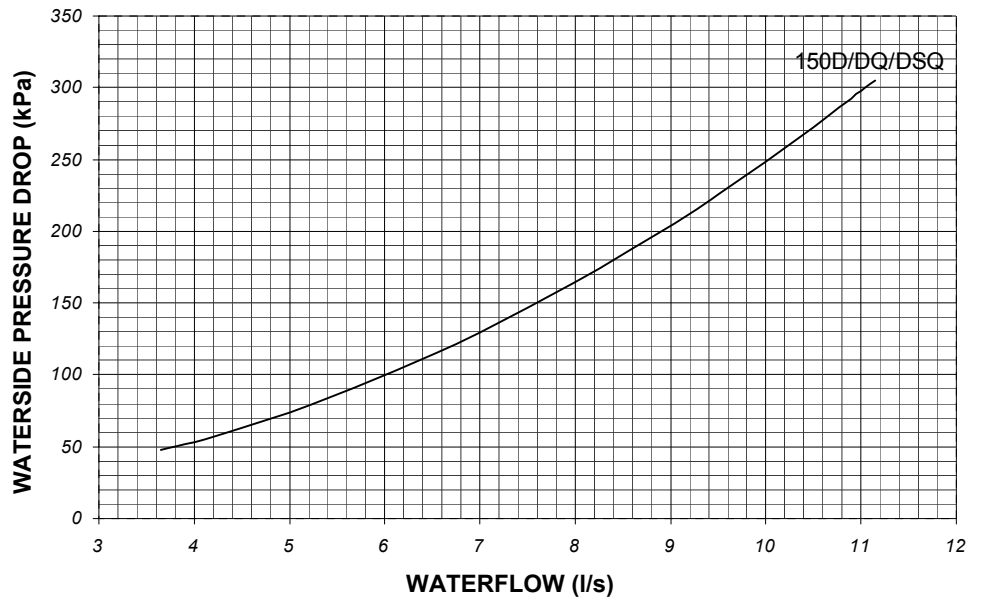
Example: UCFC125D-3/1 6.12 l/s, standard single pump:

$$\boxed{265 \text{ kPa}} - \boxed{112 \text{ kPa}} = \boxed{153 \text{ kPa}}$$

UCFC75 - UCFC125




UCFC150



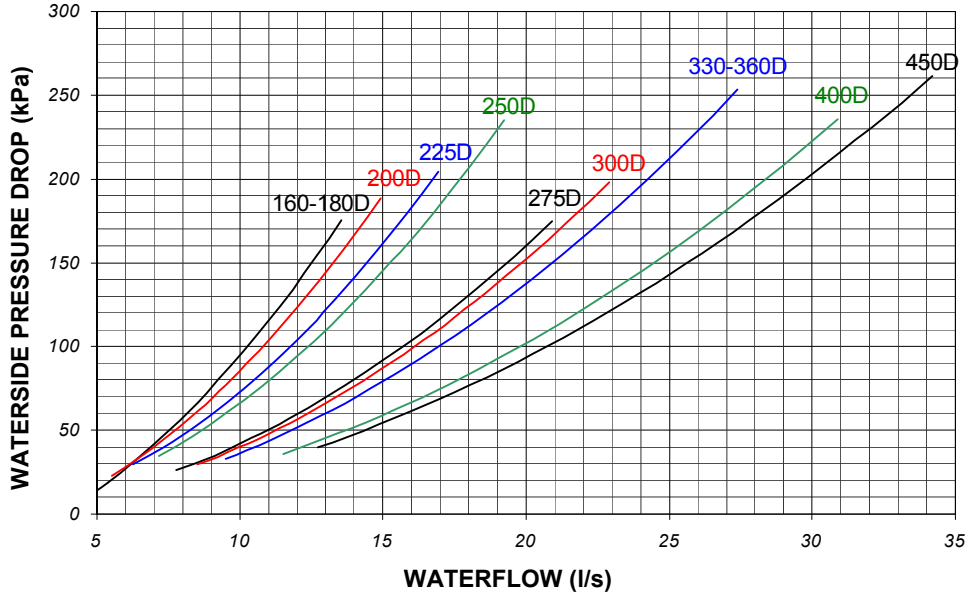
- 1 For glycol solutions, please refer to **Glycol Data**.
- 2 Chiller pressure drop refers to standard unit without optional pumps and/or pipework.

Commissioning Data

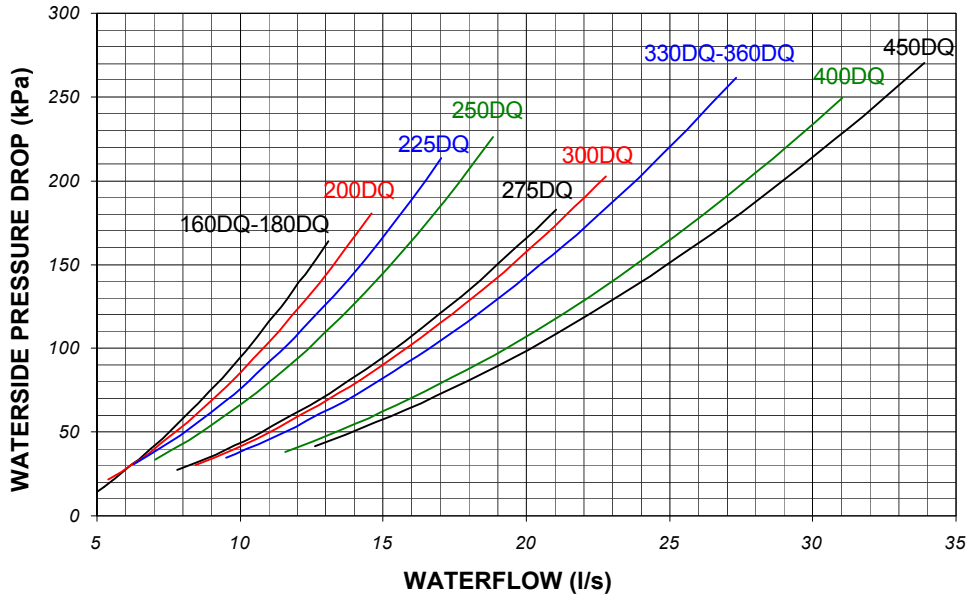
WATERSIDE PRESSURE DROPS
(20% Ethylene Glycol Concentration)

CAUTION  **Constant water flow MUST be maintained. Variable water volume is NOT recommended and may invalidate warranty.**

UCFC160D - UCFC450D



UCFC160DQ - UCFC450DQ

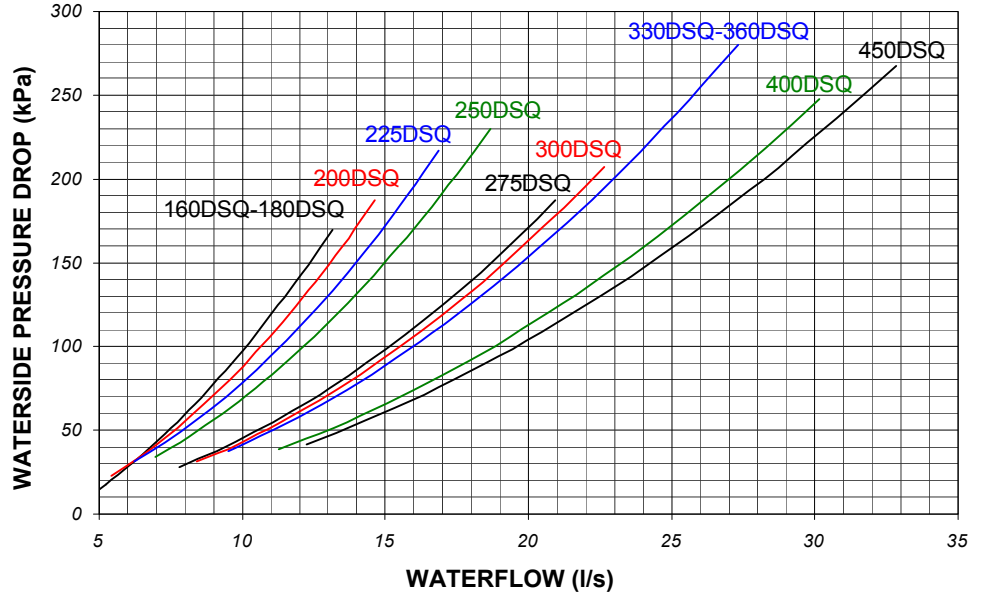


Commissioning Data

WATERSIDE PRESSURE DROPS
(20% Ethylene Glycol Concentration)

CAUTION  Constant water flow **MUST** be maintained. Variable water volume is **NOT** recommended and may invalidate warranty.

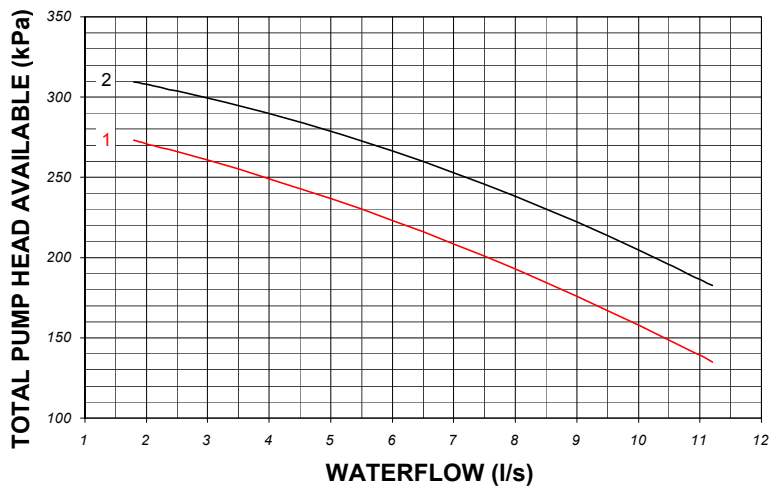
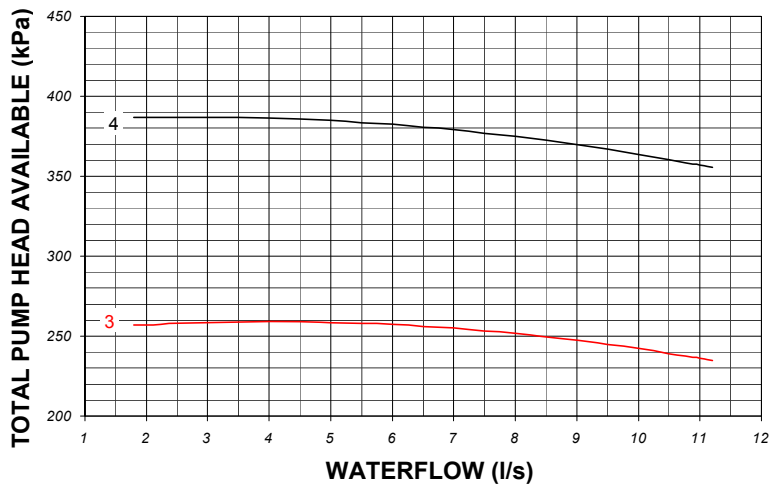
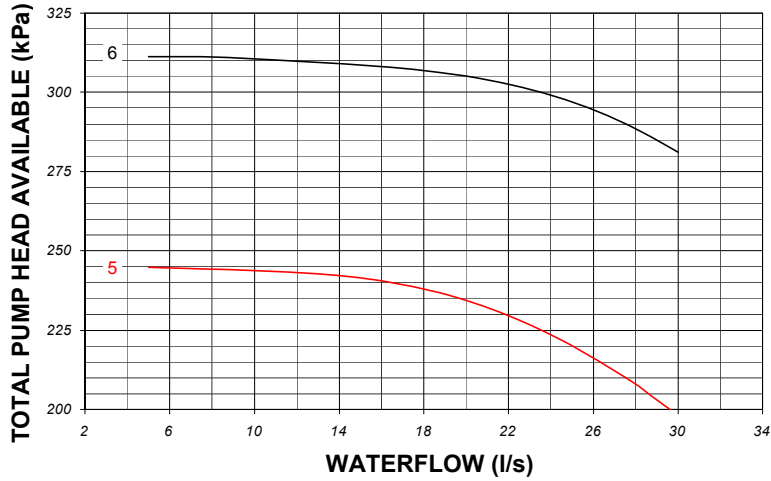
UCFC160DSQ -
UCFC450DSQ



Commissioning Data

PUMP PACKAGES

Single Head Pump or Run/Standby

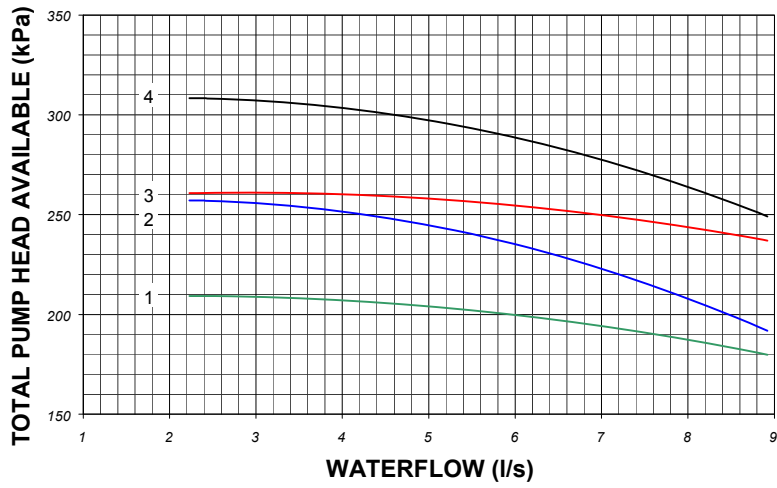
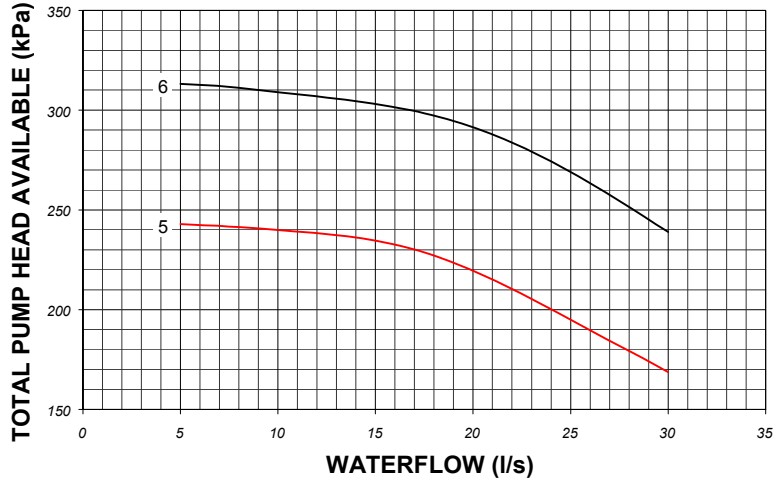


	Single Head Pump or Run / Standby Pump	
	Standard	Larger
UCFC75	1	2
UCFC100	1	2
UCFC125	2	4
UCFC150	3	4
UCFC160-450	5	6

Commissioning Data

PUMP PACKAGES



Twin Head Pump



	Twin Head Pump	
	Standard	Larger
UCFC75	1	2
UCFC100	1	3
UCFC125	1	3
UCFC150	2	4
UCFC160-450	5	6

Commissioning Data

OPERATIONAL SEQUENCE

- Refrigerant Charge** Check for the presence of a refrigerant charge in the condenser side.
- Sump Heater** The mains supply to the sump (oil) heater should be switched on at least 8 hours prior to compressor starting to avoid refrigerant migration.
- CAUTION**  **A separately fused, locally isolated, permanent single phase and neutral supply MUST BE FITTED for the compressor sump heater, evaporator trace heating and control circuits, FAILURE to do so could INVALIDATE WARRANTY.**
- Pre-Start-Up Check** Before compressor start-up, make sure that an oil level is showing in the compressor sight glass, and that all refrigerant ball valves are opened.
- CAUTION**  **Check phase rotation by connecting pressure gauges to the suction and discharge ports, if no differential pressure occurs, isolate immediately.**
- Adding Refrigerant** The unit is supplied with a full refrigerant charge, additional refrigerant should be added to the system via 1/4" schrader connection on the expansion line if required.
- Pump Down** Never pump down without the low pressure trip and high discharge temperature switches being operative.

UNLOADING PROTECTION

- Head Pressure** The microprocessor has inbuilt protection against nuisance trips. If the head pressure rises above 24Barg the system will unload 1 compressor and remain unloaded until the head pressure drops below 17Barg.
- Low Pressure** If low pressure drops below the microprocessor setting, the compressor will unload to 1 compressor, if low pressure persists for 1 minute, the circuit will be switched off and sound an alarm.

Commissioning Procedure

GENERAL

To be read in conjunction with the commissioning sheets provided, items highlighted should be recorded.

CAUTION  Please ensure all documents have been completed correctly and return to 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.


The door interlocking MCCB should be in the OFF position and the auxiliary alarm contact from the MCCB should be linked out.

Ensure all items listed in the Pre commissioning section are complete.

RECORD

 The unit should be visually inspected and any damage noted.






- Secure commissioning gauges to the high side of the system, check for a positive charge.
- Check tightness of electrical components and properly terminated.
- Check that the remote on/off switch (if fitted) is in the off position.
- With the MCBs in the off position measure the incoming voltage.
- Check Phase Rotation.
- Check voltage at permanent supply.
- Measure and record the primary (230V) and secondary (24V) voltages at each of the transformers, adjust tapping if necessary and record on the commissioning document.
- Check all timer settings are correct.
- Check Sump Heater (ensure this is switched on for a minimum of 8 hours prior to the unit operation).
- Check oil level of each compressor.
- Check water filter is fitted.
- Check design water flow is available.
- Check flow switch and pump interlocks are fitted to the water system and wired directly to the chiller.
- Switch on the controls and individual circuits, primary and secondary, MCBs to the ON position. At this stage the control display panel should be illuminated.
- Record Optional Extras.
- Record Controller Data.

CAUTION  Disable remote ON/OFF to ensure the unit does not start unintentionally.

The chiller will not start until microprocessor control SWITCH 1 is in the ON position. DO NOT SWITCH TO ON AT THIS STAGE

- Adjust the water temperature supply and return set points (if necessary) to call for 100% cooling (refer to the **Controls** section).
- Ensure all KNOBS and SWITCHES are adjusted to suit the design requirements (refer to the **Controls** section).

To switch the unit ON, use the microprocessor keypad as follows:

Press  , press  , press  , press  & finally .

CAUTION  There will always be a delay between the enabling of the unit and the energising of the compressor contactors, anything between 1 to 2 minutes. Be patient.

Commissioning Procedure

PRE COMMISSIONING CHECKLIST (CONT..)

- Check that each circuit trips on low pressure. The alarm should appear within 3 minutes.
- The alarm will be recognised at the display circuit trip, to clear the alarms refer to **Alarm Handling**.

CAUTION  Prior to the chiller compressors being allowed to start, the **Water Flow Fail and Pump Interlock features MUST both be proven to work correctly.**

- To check the water flow fail safety protection is working satisfactorily:

RECORD 

Reduce the flow rate to 75% of design and ensure that the evaporator pressure or flow protection switch trips at this flow rate, adjust as necessary.





With compressors off, ensure this alarm is recognised as **Water Flow Fail** at the display and disengages the circuits operation immediately. Restore flow rate to the design and check the alarm has self-cleared.

To check the pump interlock safety feature works satisfactorily:

RECORD 

Switch off the chiller water pump and check the interlock wiring connections at the chiller are open circuit.

To switch the unit OFF, use the microprocessor keypad as follows:

Press , press , press , press  & finally .

Fully open all liquid line and discharge service ball valves on each circuit.





Commissioning Procedure

COMMISSIONING CHECKLIST

The following should be carried out with a load on the system, otherwise the unit is likely to short cycle. The following tests are to be carried out on 1 circuit at a time.

- Switch the door interlocking MCCB to the ON position but again only on the circuit which is to be tested.
- Adjust the water temperature supply and return set points to match the system requirements.

To switch the unit ON, use the microprocessor keypad as follows:

Press , press , press , press  & finally .

- Check pressures at suction and discharge ports for correct phase rotation.

CAUTION

If no differential pressure occurs, isolate immediately.

RECORD

- Measure and record the compressor amps once the compressors are fully loaded and then at each of the unloading stage.
- Measure and record full speed amps of each condenser.

CAUTION

The microprocessor LP setting is adjustable via the micro display. It is recommended that this setting be 0.4Bar below the equipment freezing point of the cooling medium ie:

with a 20% Ethylene Glycol water concentration LP micro settings is 1.9BarG.




- Ensure that the low water temperature safety cuts out at the correct setting +/- 0.5°C, to clear the alarms refer to **Alarm Handling** section.

RECORD

- Check the liquid line sight glass is clear and dry.
- Check the superheat setting adjust the expansion valve to maintain a superheat setting of 5 – 8°C at all operating loads.
- Check and record the following:
Suction and discharge pressures
Liquid, discharge and suction line temperature
Water inlet and outlet temperature

- Ensure the above are all within the design parameters.
- Repeat as follows for each circuit:

To switch the unit OFF, use the microprocessor keypad as follows:

Press , press , press , press  & finally .

- To switch the unit ON, repeat above.

The unit is now commissioned and will provide many years of trouble free operation providing the following maintenance schedule is followed.

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 operation.

3 MONTHS	ACTION	NOTES
REFRIGERATION	<p>Check the following and compare results with commissioning records.</p> <ul style="list-style-type: none"> • Suction and discharge readings. • Head pressure control is maintained. • Pressure relief indicator gauge. • Check each circuit sight glass for dryness and bubbles for indication of leaks. • Check compressor oil level and shell/sump temperature. • Visually inspect the unit for oil patches. 	<p>Investigate and rectify variations.</p> <p>Remember to re-cap the Schraeder connections!</p> <p>Investigate and repair possible leaks.</p>
SYSTEM	<p>Check the following against the commissioning records.</p> <ul style="list-style-type: none"> • Control settings. • Alarm log for unusual occurrences. • Chilled water control maintains design temperature. • Chilled water flow is within design limits of zero to plus 10%. • Concurrently ensure chilled water pump and flow switch operate efficiently, and that interlocks function correctly. • Operation of waterflow switch and pump interlock. 	<p>Investigate and adjust as necessary.</p>
Finally!	Record operating conditions.	
FABRIC	<p>Visually inspect the unit for general wear and tear, treat metalwork.</p> <p>Visually inspect pipe and pipework insulation.</p> <p>Clean evaporator water strainer.</p> <p>Clean condenser coils. Do not steam clean use detergent and stiff bristled brush. For heavy dirt, use either a high pressure water or chemical hose.</p> <p>Visually check the following:</p> <ul style="list-style-type: none"> • Pipework clamps are secure. • Tightness and condition of fan and compressor mounts. • Anti-Vibration mounts fixings (if fitted). 	<p>Rust should be inhibited, primed and touched up with matching paint (available from Airedale or your Distributor).</p> <p>Repair/rectify as necessary.</p> <p>At first maintenance visit and then as frequently as necessary (12 months).</p> <p>Do not damage fins and comb out if necessary.</p> <p>Secure/tighten as necessary.</p>
Finally!	Ensure control panel lids and access panels have been correctly replaced and securely fastened in position.	

Maintenance

GENERAL MAINTENANCE (CONT..)

6 MONTHS	ACTION	NOTES
	Repeat 3 month checks plus the following:	
SYSTEM	Check evaporator trace heating and low ambient thermostat are set to activate at 4.0°C.	Remember to re-cap the Schraeder connections!
12 MONTHS	ACTION	NOTES
	Repeat 6 month checks plus the following:	
SYSTEM	Check safety devices cut out the compressor at the correct settings.	
REFRIGERATION	Check glycol concentration if appropriate.	Adjust as necessary.
	Leak test all R407C joints and inspect all water connections.	Rectify as necessary.
	Check superheats with chiller running on full load (the height of summer is recommended). Recheck the charge following major adjustment of the superheats.	Adjust as necessary. A period of 30 minutes should be allowed between each resetting of the valve to allow pressures to stabilise. Thermostatic expansion valve only.
ELECTRICAL	Tighten all electrical terminals.	

COMPRESSOR MAINTENANCE Periodic maintenance and inspection of this equipment is necessary to prevent premature failure, the following periodic inspections should be carried out by period or hourly use whichever ever is sooner.

1 Year	Measure compressor motor insulation.
7,500 Hours or 4 Years	Inspect compressor oil.

SHUT DOWN PERIODS For periods of winter shut down the following precautions are recommended:

- Close the liquid and discharge ball valve
- Cap service ports
- Turn off electrical circuits
- Drain the water from the chiller evaporator via the evaporator drain plug

Parts Identification**SPARES**

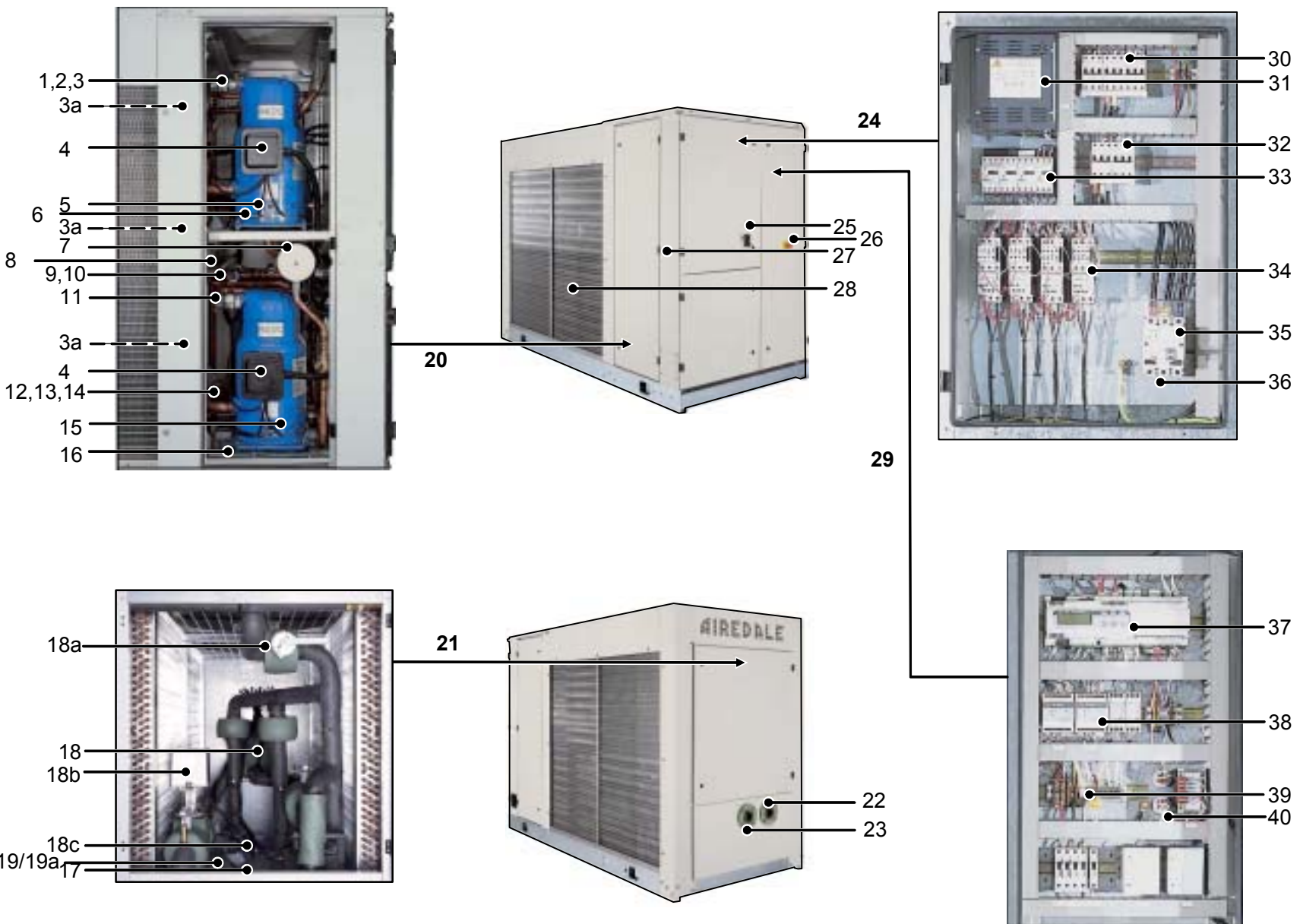
For ease of identification when ordering spares or contacting Airedale about your unit, please quote the unit type, unit serial number and the date of manufacture, which can be found on the unit serial plate.

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.

The serial plate can be located inside Item 24.

- | | | | |
|-----|---|----|---|
| 1 | Discharge Line Ball Valve | 20 | Compressor Compartment |
| 2 | Discharge Shraeder Connection | 21 | Evaporator, Waterside & Optional Pump Compartment |
| 3 | HP Switch | 22 | Water Inlet Flange Connection |
| 3a | Head Pressure Control Solenoid Valve Set (behind panel) | 23 | Water Outlet Flange Connection |
| 4 | Compressor Electrical Terminal Box | 24 | Mains Panel |
| 5 | Oil Level Sight Glass | 25 | Door Interlocking isolator |
| 6 | Sump Heater | 26 | Emergency Stop |
| 7 | Liquid Line Filter Drier | 27 | Incoming Customer Mains Access Points |
| 8 | Electronic Expansion Valve | 28 | Condenser Coils |
| 9 | Liquid Line Sight Glass | 29 | Unit Controller Panel |
| 10 | Liquid Line | 30 | Fan Contactor MPCB |
| 11 | Discharge Thermostat Switch | 31 | Modulating Head Pressure Controller |
| 12 | Low Pressure Switch | 32 | Compressors MCBs |
| 13 | Suction Pressure Transducer | 33 | Condenser Fan MPCB |
| 14 | Suction Port | 34 | Compressor Contactors |
| 15 | Oil Sump Drain Point | 35 | Isolator |
| 16 | Compressor Feet/Resilient Mounts | 36 | Incoming Customer Mains 3 Phase |
| 17 | Water Inlet Sensor | 37 | Microprocessor Controller |
| 18 | Evaporator | 38 | Electronic Expansion Valve Controller |
| 18a | Isolating valves for maintenance | 39 | Customer Permanent Supply/Controls Connections |
| 18b | Free Cooling Control Valve & Actuator | 40 | EMC Filter |
| 18c | Run/Standby Pump Set (Optional Extra) | | |
| 19 | Flow Switch | | |
| 19a | Water Filter | | |

Parts Identification



Notes:

Notes:

AIREDALE

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: enquiries@airedale.com

website: www.airedale.com

A **MODINE** Company

PART NO:
903-132 IM E

ISSUE
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DATE
01/06/05

Airedale Departmental Contact Details:

CUSTOMER SERVICES For further assistance, please e-mail: enquiries@airedale.com or telephone:

UK Sales Enquiries	+ 44 (0) 113 238 7789	uk.sales@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	marketing@airedale.com

For information, visit us at our Web Site: www.airedale.com