

Ultima Compact FreeCool

Free Cooling Chiller
75 kW - 450 kW

R407C



INSTALLATION & MAINTENANCE



ISO 14001
EMS52086



ISO 9001
FM00542

About Airedale Products & Customer Services

WARRANTY

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

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

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

Warranty is only valid in the event that

In the period between delivery and commissioning the equipment: is properly protected & serviced as per the AIAC installation & maintenance manual provided where applicable the glycol content is maintained to the correct level.

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

Any spare part supplied by Airedale under warranty shall be warranted for the unexpired period of the warranty or 3 months from delivery, whichever period is the longer.

To be read in conjunction with the Airedale Conditions of Sale - Warranty and Warranty Procedure, available upon request.

CAUTION



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

SPARES

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

TRAINING

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

CUSTOMER SERVICES

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

UK Sales Enquiries	+ 44 (0) 113 238 7789	enquiries@airedale.com
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

AIAC Ltd endeavours to ensure that the information in this document is correct and fairly stated, but none of the statements are to be relied upon as a statement or representation of fact. AIAC Ltd does not accept liability for any error or omission, or for any reliance placed on the information contained in this document.

The development of Airedale products and services is continuous and the information in this document may not be up to date. It is important to check the current position with AIAC Ltd at the address stated. This document is not part of a contract or licence unless expressly agreed.

No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or information storage and retrieval systems, for any purpose other than the purchaser's personal use, without the express written permission of AIAC Ltd.

© 2013 Airedale International Air Conditioning Limited. All rights reserved. Printed in the UK.

Contents

General Statement.....	4
Warranty.....	5
General Description	6
Unit Identification	6
Standard Features	7
Optional Extras – General.....	8
Installation Data.....	9
Dimensions	9
Weights, Point Loadings & Centre of Gravity (C of G)	11
Unit Lifting	13
Anti vibration mounting (optional).....	14
Positioning	15
Water System	16
Standard Recommended Installation	16
Water System – General Specification.....	19
Glycol Data	20
Electrical	21
Interconnecting Wiring	22
Electrical Data	23
Controls.....	29
Temperature control.....	29
General Description	30
Operation	30
Setting up.....	31
Viewing Unit Operating Status	32
Alarms.....	33
Commissioning Data.....	34
Operating Limits	34
Oil & Refrigerant Charges	34
Waterside Pressure Drops	35
Pump Packages.....	38
Operational Sequence	40
Commissioning Procedure.....	41
Pre Commissioning Checklist	41
Commissioning Checklist.....	43
Maintenance.....	44
General Maintenance.....	44
Compressor Maintenance	45
Shut Down Periods	45
Parts Identification	46

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

Installation, 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.

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.

SERIAL PLATE

The serial plate can be located to the inside of the control panel door, refer to **Parts Identification**, on page 46.

AIREDALE

UK Office

+ 44 113 2391000

+ 44 113 2507219

Unit/Gerät/Unite

Serial/Serie/Serie

Manufactured/Hergestellt/Fabrique

Supply/Spannung/Alimentation

Fuse/Hauptsicherung/Fusibles

Test Pressure

Prüfdruck

Pression d'essai

Refrigerant & Charge

Kältemittel und Füllung

Refrigerant & Charge

Max. operating pressure

Betriebsdruck (Maximal)

Pression de marche (Maximum)

N.B. No: 0086

www.airedale.com

UCFC75D-2/1

81543668-001 (63091072)

24/01/2007

400 V 3 PH 50 Hz

SAMPLE

CE

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 footprint to an absolute minimum.

CE DIRECTIVE



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

Electromagnetic Compatibility Directive (EMC)	2004/108/EC
Low Voltage Directive (LVD)	2006/95/EC
Machinery Directive (MD)	89/392/EEC in the version
	2006/42/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.

CONSTRUCTION

The base is fabricated from galvanised steel to ensure a rigid, durable, weatherproof construction.

Unit panels are manufactured from galvanised sheet steel coated with epoxy baked powder paint to provide a durable and weatherproof finish.

Standard unit colour is Light Grey (RAL 7035).

Compressors and evaporator are mounted on a rigid galvanised heavy-duty sub frame. Fully weatherproofed electrical panels are situated at one end of the unit. Access to the compressors is via end panels adjacent to the electrical control panel.

A set of 4 collared eye bolts to BS4278 are supplied.

Discharge Air Plenum - Condenser Fan

Constructed from galvanised sheet steel coated with epoxy baked powder paint, this plenum directs discharge air vertically, thus limiting a degree of air re-circulation and provides a degree of acoustic reduction in the horizontal plane; factory fitted. For details please contact Airedale.

Standard unit colour is Light Grey (RAL 7035).

General Description

STANDARD FEATURES

Standard Chiller - D

The Standard Ultima Compact FreeCool chiller comes complete with:

- **AIRE**Tronix Microprocessor Control with BMS capability
- 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
- 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

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

Controls

As standard, the **AIRE**Tronix 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 specify at order**.

For further details, refer to **Controls**, on page 29.

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 door locking electrical isolation for each mains compartment
- **Electrical terminals for external evaporator pipework trace heating (230V/500W) are provided.**

CAUTION



A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.

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**, on page 22.

General Description

OPTIONAL EXTRAS – GENERAL

- Loose Item
- Anti Vibration Mounts
 - Chiller Sequence Manager
- } Instructions supplied with item

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

- Factory Fitted
- Extended Discharge Air Plenum - Condenser Fan
 - Corrosion Resistant Coated Coils
 - Coil Guards
 - Power Factor Correction
 - BMS Interface Card
 - Single Pressure Relief Valve (UCFC75 - 450)
 - Dual Pressure Relief Valve (UCFC180 - 450)
 - R407C Leak Detection System
 - Electronic Soft Start
 - Flushing Bypass Kit
 - In Line Pump Packages including Flushing Bypass Kit
 - Evaporator Differential Pressure Sensor
 - Remote Setpoint Adjust
 - Control Panel Low Ambient Protection
 - Alternative Refrigerant (Outside EU)

- Optional Unit Cover
- Commissioning
Chillerguard® Maintenance⁽¹⁾

}

For details and a competitive quotation,
contact Airedale Service.
- (1)

UK Mainland Sites

Installation Data

DIMENSIONS

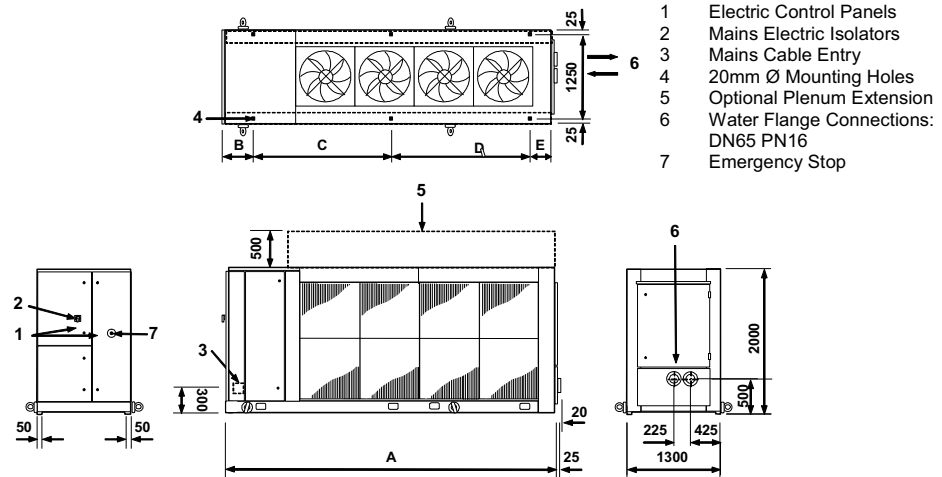
IMPORTANT



The following information is for general guidance; refer to the certified drawings provided for installation.

Single Row Fans - /1

UCFC75 - UCFC150



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

(1) Have only 4 fixing and 4 point loadings.

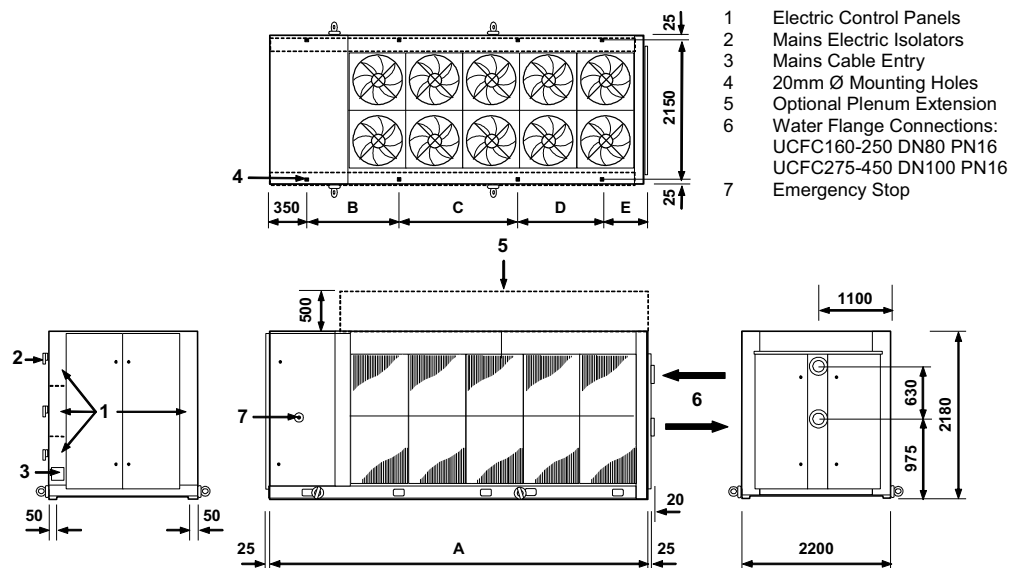
Installation Data

DIMENSIONS

IMPORTANT  The following information is for general guidance; refer to the certified drawings provided for installation.

Double Row Fans - /2

UCFC160 - UCFC450



Model D		A	B	C	D	E
UCFC160D - UCFC225D	mm	3800	1350	1475	(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	1350	1475	(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

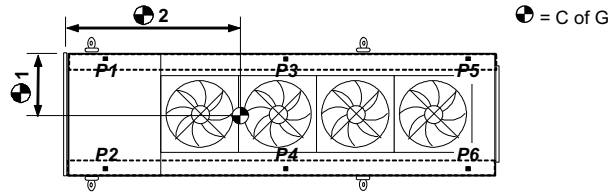
(1) Have only 6 fixing and 6 point loadings.

Installation Data

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

Single Row Fans - /1

UCFC75 - UCFC150



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

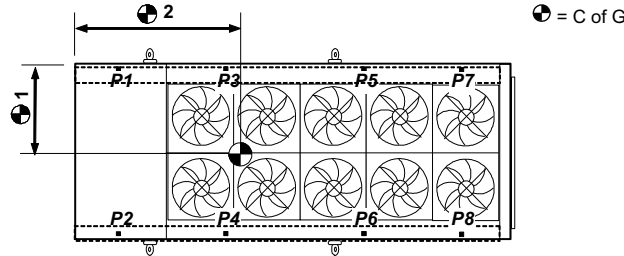
- (1) Have only 4 fixing and 4 point loadings.
- (2) Based on standard unit, for units fitted with pump options, please contact Airedale.
- (3) Operating weight includes refrigerant charge and system water volume.

Installation Data

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

Double Row Fans - /2

UCFC160 - UCFC450



Model D		P1	P2	P3	P4	P5	P6	P7	P8	Operating Weight	● C of G1 (mm)	● C of G2 (mm)
UCFC160D-6/2	kg	605	605	350	350	(1)	(1)	255	255	2420	1100	1335
UCFC180D-6/2	kg	645	645	360	360	(1)	(1)	260	260	2530	1100	1310
UCFC200D-6/2	kg	645	645	365	365	(1)	(1)	260	260	2540	1100	1315
UCFC225D-6/2	kg	695	695	375	375	(1)	(1)	265	265	2670	1100	1285
UCFC250D-8/2	kg	715	715	455	455	(1)	(1)	380	380	3100	1100	1760
UCFC275D-8/2	kg	735	735	475	475	(1)	(1)	390	390	3200	1100	1765
UCFC300D-8/2	kg	750	750	480	480	(1)	(1)	395	395	3250	1100	1760
UCFC330D-10/2	kg	695	695	465	465	435	435	370	370	3930	1100	2135
UCFC360D-10/2	kg	695	695	465	465	435	435	370	370	3930	1100	2135
UCFC400D-12/2	kg	720	720	535	535	510	510	445	445	4420	1100	2715
UCFC450D-12/2	kg	740	740	545	545	520	520	450	450	4510	1100	2700

Model DQ		P1	P2	P3	P4	P5	P6	P7	P8	Operating Weight	● C of G1 (mm)	● C of G2 (mm)
UCFC160DQ-6/2	kg	665	665	385	385	(1)	(1)	260	260	2620	1100	1305
UCFC180DQ-6/2	kg	700	700	405	405	(1)	(1)	265	265	2740	1100	1295
UCFC200DQ-6/2	kg	700	700	405	405	(1)	(1)	265	265	2740	1100	1295
UCFC225DQ-8/2	kg	745	745	515	515	(1)	(1)	380	380	3280	1100	1750
UCFC250DQ-8/2	kg	755	755	520	520	(1)	(1)	380	380	3310	1100	1740
UCFC275DQ-10/2	kg	670	670	455	455	425	425	360	360	3820	1100	2140
UCFC300DQ-10/2	kg	690	690	460	460	425	425	360	360	3870	1100	2120
UCFC330DQ-12/2	kg	810	810	545	545	485	485	435	435	4550	1100	2590
UCFC360DQ-12/2	kg	810	810	545	545	485	485	435	435	4550	1100	2590
UCFC400DQ-14/2	kg	850	850	605	605	565	565	505	505	5050	1100	3020
UCFC450DQ-14/2	kg	885	885	610	610	565	565	505	505	5130	1100	2980

Model DSQ		P1	P2	P3	P4	P5	P6	P7	P8	Operating Weight	● C of G1 (mm)	● C of G2 (mm)
UCFC160DSQ-8/2	kg	690	690	430	430	(1)	(1)	400	400	3040	1100	1810
UCFC180DSQ-8/2	kg	710	710	450	450	(1)	(1)	415	415	3150	1100	1815
UCFC200DSQ-8/2	kg	715	715	455	455	(1)	(1)	415	415	3170	1100	1810
UCFC225DSQ-10/2	kg	655	655	435	435	415	415	350	350	3710	1100	2140
UCFC250DSQ-10/2	kg	655	655	435	435	420	420	355	355	3730	1100	2150
UCFC275DSQ-12/2	kg	705	705	500	500	485	485	440	440	4260	1100	2720
UCFC300DSQ-12/2	kg	720	720	505	505	485	485	440	440	4300	1100	2700
UCFC330DSQ-16/2	kg	840	840	660	660	625	625	575	575	5400	1100	3345
UCFC360DSQ-16/2	kg	840	840	660	660	625	625	575	575	5400	1100	3345
UCFC400DSQ-16/2	kg	850	850	670	670	635	635	580	580	5470	1100	3340
UCFC450DSQ-16/2	kg	870	870	680	680	645	645	585	585	5560	1100	3330

- (1) Have only 6 fixing and 6 point loadings.
- (2) Based on standard unit, for units fitted with pump options, please contact Airedale.
- (3) Operating weight includes refrigerant charge and system water volume.

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 appropriate spreader bars/lifting slings (provided by others) with the holes/lugs provided
- Attach individual lifting chains to each of the lifting eye bolts/lifting lugs provided; each individual chain must be capable of lifting the whole unit

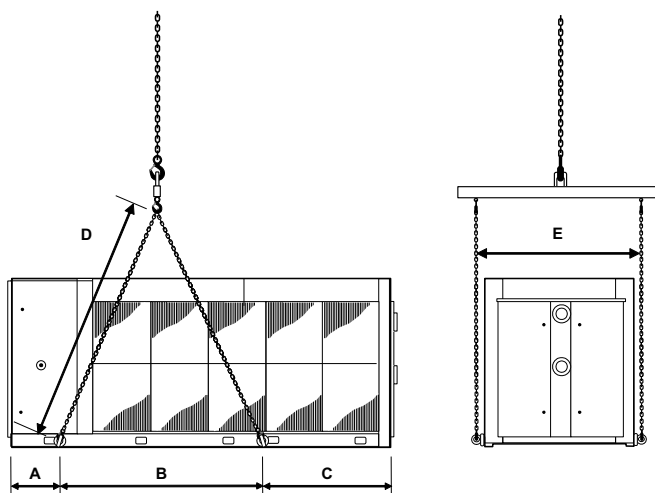
IMPORTANT  **Do not use 1 chain between 2 lifting points to avoid load shift.**

Only use lifting points provided.

- Chains/slides MUST NOT interfere with the casing or fan assembly to avoid damage
- Lift the unit slowly and evenly

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

LIFTING DIMENSIONS



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

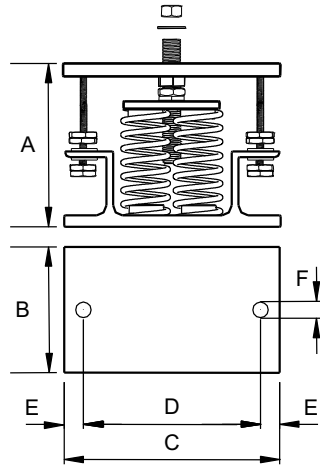
Installation Data

ANTI VIBRATION MOUNTING (OPTIONAL)

Spring Type

Each mount is coloured to indicate the different loads, refer to AV selection sheet supplied separately for correct allocation.

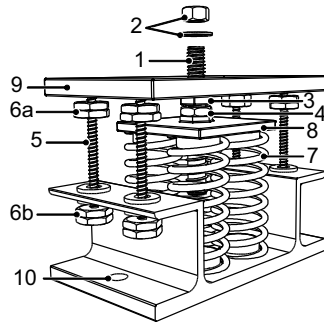
Dimensions



			A ⁽¹⁾	B	C	D	E	FØ
UCFC 75 – 150	(2)	mm	136	110	180	148	16	11
UCFC 160 - 450	(3)	mm	180	130	225	186	20	16

- (1) Unloaded dimension
- (2) 2 spring type
- (3) 4 spring type

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

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).

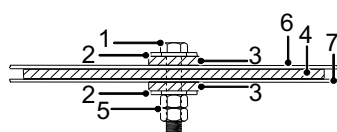
CAUTION  Mountings must be adjusted incrementally in turn. Do not fully adjust 1 mount at a time as this may overload and damage springs.

- 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.

Pad Type

Components/Installation



- 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:

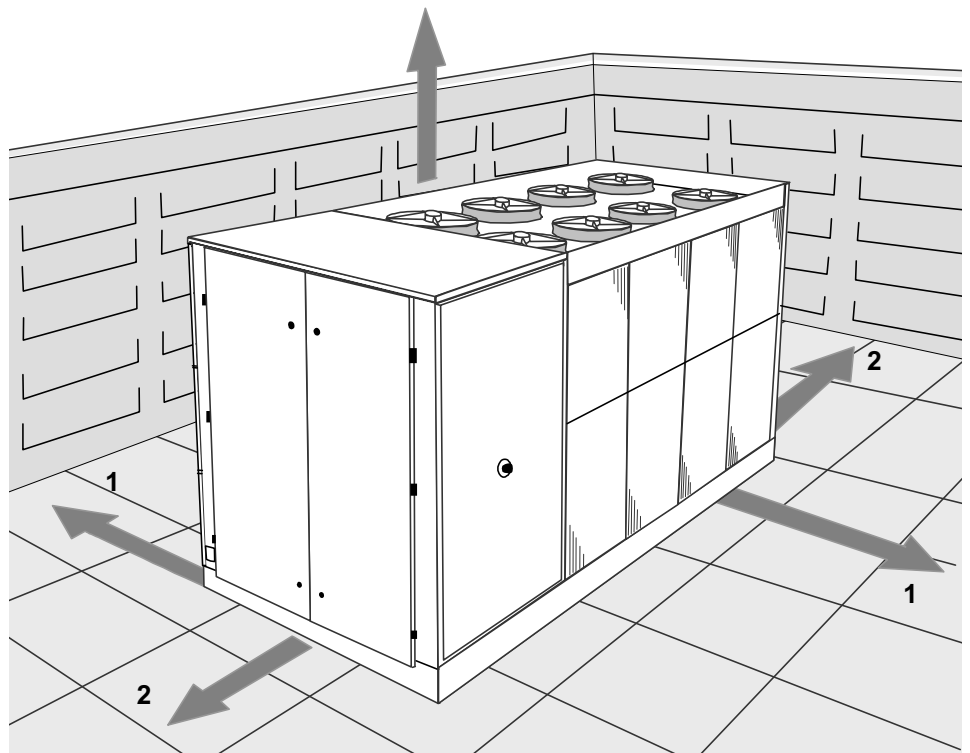
- Position on a stable and even base, levelled to ensure that the compressor operates correctly
- Levelling should be to +/- 5mm
- Where vibration transmission to the building structure is possible, fit spring anti-vibration mounts and flexible water connections
- Observe airflow and maintenance clearances
- 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 Prior to connecting services, ensure that the equipment is installed and completely level.

Airflow & Maintenance Clearances:

- 1 = 1.0m (2.0m)
2 = 1.0m (1.8m)




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 water 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 separately.**

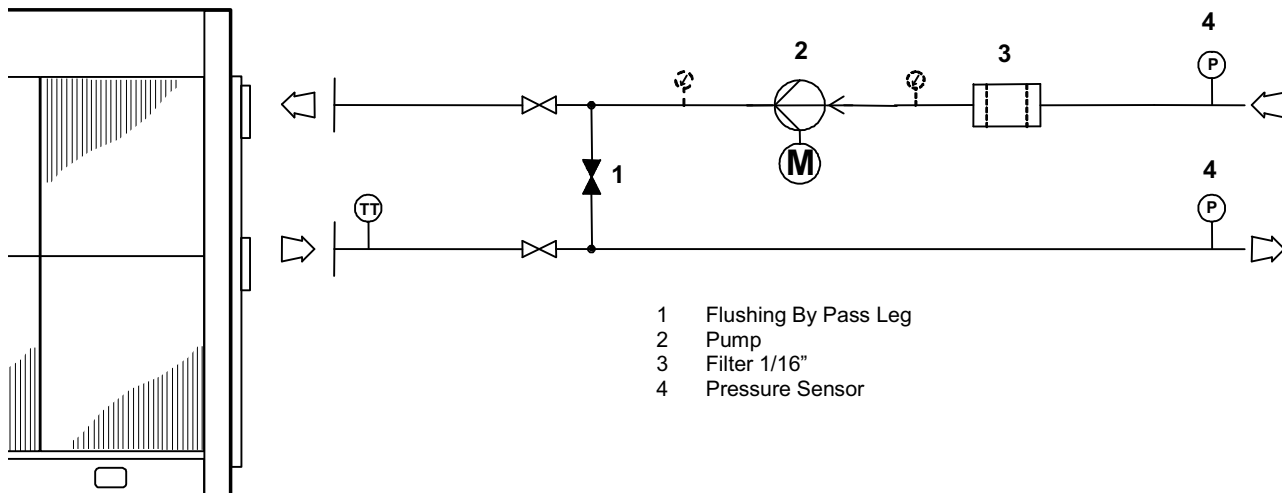
The water flow commissioning valve set is not shown in the diagram, as the valve can be fitted elsewhere within the chilled water circuit.


STANDARD RECOMMENDED INSTALLATION

General


The following diagram illustrates the minimum component installation requirements. A wide range of optional extras are available to suit various applications, please refer to **Optional Extras – General**, on page 8 for details.

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



CAUTION  **Full design water flow MUST be maintained at all times. Variable water volume is NOT recommended and will invalidate warranty.**

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

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

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

Installation Data

WATER SYSTEM

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
- 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

Pump Statement

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

- Ensure the system is filled with water 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

CAUTION

Where pumps are installed by others, a timer MUST be installed to ensure that the pumps run for at least 3 minutes after a remote off signal is received by the chiller.

Interlocks & Protection

Always electrically interlock the operation of the chiller with the pump controls for safety reasons.

CAUTION

Failure to will invalidate the chiller warranty.

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*, on page 22.

Installation Data


WATER SYSTEM

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.

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

RECORD  Record on commissioning sheet provided once completed.

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.

All free cooling units should use a **MINIMUM 20%** glycol concentration.

With auto-pressurisation system, regularly monitor the glycol concentration to ensure it does not fall below the minimum 20%.

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.

Installation Data

WATER SYSTEM – GENERAL SPECIFICATION

		UCFC75D-2/1	UCFC100D-2/1	UCFC125D-3/1	UCFC150D-3/1	UCFC160D-6/2
Connections						
Water Inlet / Outlet		PN16 DN65	PN16 DN65	PN16 DN65	PN16 DN65	PN16 DN80
Water Drain / Bleed	in	1/2	1/2	1/2	1/2	1/2
Water System						
Min. System Water Volume	(1) l	377	469	419	727	717
Max. System Press	Bar	10	10	10	10	10
OPTIONAL EXTRAS - ALL MODELS						
Water Pump (2) & (3)		In Line Pump				
Single Head or Run/Standby						
Nom External Head - Standard	kPa	143	109	145	122	187
Nom External Head - Larger	kPa	184	150	190	185	254
Twin Head						
Nom External Head - Standard	kPa	100	82	88	89	184
Nom External Head - Larger	kPa	146	125	133	152	254

		UCFC180D-6/2	UCFC200D-6/2	UCFC225D-6/2	UCFC250D-8/2	UCFC275D-8/2
Connections						
Water Inlet / Outlet		PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN80	PN16 DN100
Water Drain / Bleed	in	1/2	1/2	1/2	1/2	1/2
Water System						
Min. System Water Volume	(1) l	645	715	811	1156	1004
Max. System Press	Bar	10	10	10	10	10
OPTIONAL EXTRAS - ALL MODELS						
Water Pump (2) & (3)		In Line Pump				
Single Head or Run/Standby						
Nom External Head - Standard	kPa	169	160	151	136	163
Nom External Head - Larger	kPa	236	226	217	201	228
Twin Head						
Nom External Head - Standard	kPa	166	156	147	130	157
Nom External Head - Larger	kPa	235	225	215	199	225

		UCFC300D-8/2	UCFC330D-10/2	UCFC360D-10/2	UCFC400D-12/2	UCFC450D-12/2
Connections						
Water Inlet / Outlet		PN16 DN100	PN16 DN100	PN16 DN100	PN16 DN100	PN16 DN100
Water Drain / Bleed	in	1/2	1/2	1/2	1/2	1/2
Water System						
Min. System Water Volume	(1) l	1374	1168	1122	1337	1395
Max. System Press	Bar	10	10	10	10	10
OPTIONAL EXTRAS - ALL MODELS						
Water Pump (2) & (3)		In Line Pump				
Single Head or Run/Standby						
Nom External Head - Standard	kPa	151	138	121	125	108
Nom External Head - Larger	kPa	218	206	190	196	182
Twin Head						
Nom External Head - Standard	kPa	144	129	110	109	87
Nom External Head - Larger	kPa	213	198	180	181	161

(1) For minimum system volume calculation method, refer to **Technical Manual**.


(2) Based on 12/7°C water temperature and 35°C ambient with a 20% Ethylene Glycol Water Concentration.

(3) Based on D Model, for DQ & DSQ details, please contact Airedale.

Installation Data

GLYCOL DATA

For a given percentage of glycol in the system there are correction factors that need to be applied, the following tables can be used as a guide.

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 <i>Technical Manual</i>)	146.1	x 0.98	143.2 kW
Input kW (refer to <i>Technical Manual</i>)	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 <i>Waterside Pressure Drops</i> , on page 35)	146	x 1.29	188 kPa

30% Ethylene Glycol =

CAUTION  Waste glycol needs to be handled responsibly, recycled or turned over to professional personnel for correct disposal. Most anti-freeze manufacturers recommend that used anti-freeze be collected and disposed according to Local Legislation. Waste glycol should NOT be drained onto the ground, rainwater drainage system or natural waters.

If the glycol contains heavy metals or other contaminants from gas or oil, the level of hazard posed by the glycol is increased and could be characterised as hazardous waste.

STEPS IF GLYCOL IS RELEASED/SPILLED

Small spill - soak up with absorbent material.

Large spill - contain spill and pump to suitable container for disposal.

Installation Data

ELECTRICAL

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
- The control voltage to the interlocks is 24V, always size the low voltage interlock and protection cabling for a maximum voltage drop of 2V
- Avoid large voltage drops on cable runs, particularly low voltage wiring

CAUTION

A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.

Wires should be capable of carrying the maximum load current under non-fault conditions at the stipulated voltage.

A separately fused, locally isolated, permanent single phase and neutral supply MUST BE FITTED for the compressor oil heater, evaporator trace heating and control circuits, FAILURE to do so will INVALIDATE WARRANTY.

To reduce down time, if possible support the above supply with a UPS.

ALL work MUST be carried out by technically trained competent personnel.

Ensure correct phase rotation.

The Emergency Stop MUST NOT be used to stop the chiller other than in the event of an emergency.

Refer also to *Interlocks & Protection*, on page 17.

Installation Data

IMPORTANT  The following information is for general guidance; refer to the certified drawings provided for installation.

INTERCONNECTING WIRING

No Pumps

UCFC 75 - 450	L1	○	←	Mains incoming supply 400V / 3PH / 50Hz
	L2	○	←	
	L3	○	←	
	E	○	←	
	L4	○	←	Separate Permanent Supply 230V / 1PH +N / 50Hz
	N1	○	←	
	E	○	←	
	2	○	→	External Trace Heater Connections 230V/500W max.
	N	○	←	
	502	○	→	(1)Evaporator Remote Pump Interlock 24VAC
	522	○	←	
	502	○	→	Unit Remote On/Off 24VAC
	505	○	←	
	502	○	→	Setback Setpoint Temperature switch
	507	○	←	
	573	○	←	Circuit 1Volt Free Common Alarm 1Volt Free Alarm N/O Volt Free Alarm N/C
	574	○	→	
	575	○	→	
	576	○	←	Circuit 2Volt Free Common Alarm 2Volt Free Alarm N/O Volt Free Alarm N/C
	577	○	→	
	578	○	→	
	RX-/TX-	○	↔	AIRELan Network Connections
	RX+/TX+	○	↔	
	GND	○	↔	

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

With Pumps

UCFC 75 - 450	L1	○	←	Mains incoming supply 400V / 3PH / 50Hz
	L2	○	←	
	L3	○	←	
	E	○	←	
	L4	○	←	Separate Permanent Supply 230V / 1PH +N / 50Hz
	N1	○	←	
	E	○	←	
	2	○	→	External Trace Heating Connections 230V/500W max
	N	○	←	
	502	○	→	Pump/s Remote On/Off 24VAC
	526	○	←	
	502	○	→	Unit Remote On/Off 24VAC
	505	○	←	
	502	○	→	Setback Setpoint Temperature switch
	507	○	←	
	573	○	←	Circuit 1Volt Free Common Alarm 1Volt Free Alarm N/O Volt Free Alarm N/C
	574	○	→	
	575	○	→	
	576	○	←	Circuit 2Volt Free Common Alarm 2Volt Free Alarm N/O Volt Free Alarm N/C
	577	○	→	
	578	○	→	
	RX-/TX-	○	↔	AIRELan Network Connections
	RX+/TX+	○	↔	
	GND	○	↔	

Installation Data

IMPORTANT  The following information is for general guidance; refer to the certified drawings provided for installation.

ELECTRICAL DATA

		UCFC75D-2/1	UCFC100D-2/1	UCFC125D-3/1	UCFC150D-3/1	UCFC160D-6/2
Unit Data (1)						
Nominal Run Amps	A	50	62	79	93	99
Maximum Start Amps	A	140	167	217	246	252
Rec Mains Fuse Size	A	63	80	125	125	125
Mains Supply	VAC	400V / 3PH / 50 Hz				
Max Mains Incoming Cable Size	mm ²	70 (direct to MCCB)	70 (direct to MCCB)	70 (direct to MCCB)	70 (direct to MCCB)	Direct to Bus Bar
Permanent Supply	VAC	230V / 1PH + N / 50 Hz				
Rec Permanent Fuse Size	A	16	16	16	16	16
Max Permanent Incoming Cable Size	mm ²	4 mm ² terminals				
Control Circuit	VAC	24V/230VAC				
Evaporator						
Immersion Heater Rating	W	40	40	80	80	100
External Trace Heating						
Available (fitted by others)	W	500	500	500	500	500
Fan & Motor - Per Fan						
Quantity		2	2	3	3	6
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 Size	kW	0.98	0.98	0.98	0.98	0.98
Compressor - Per Compressor (1)						
Quantity		4	4	2 + 2	4	4
Motor Size	kW	6.2	8.1	8.1 / 11.7	11.7	11.7
Nominal Run Amps	A	11.7	14.6	14.6 / 22.0	22.0	22.0
Oil Heater Rating	W	65.0	65.0	65.0 / 75.0	75.0	75.0
Start Amps	(2) A	98.0	120.0	120.0 / 175.0	175.0	175.0
Type Of Start		Direct on line				
OPTIONAL EXTRAS						
Power Factor Correction (1)						
Nominal Run Amps	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 (1)						
Nominal Run Amps	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
Water Pump (1)						
Single Head or Run/Standby - Standard						
Unit Nominal Run Amps	A	55	67	86	110	113
Recommended Mains Fuse	A	80	100	125	125	160
Motor Size	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
Single Head or Run/Standby - Larger						
Unit Nominal Run Amps	A	57	69	85	108	120
Recommended Mains Fuse	A	80	100	125	125	160
Motor Size	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 - Standard						
Unit Nominal Run Amps	A	56	68	85	99	113
Recommended Mains Fuse	A	80	100	125	125	160
Motor Size	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
Twin Head - Larger						
Unit Nominal Run Amps	A	56	70	87	102	120
Recommended Mains Fuse	A	80	100	125	125	160
Motor Size	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 with standard ac type fans.
 (2) Starting amps refers to the Star connection only with standard ac type fans.

Installation Data

IMPORTANT  The following information is for general guidance; refer to the certified drawings provided for installation.

ELECTRICAL DATA

		UCFC75DQ-2/1	UCFC100DQ-3/1	UCFC125DQ-3/1	UCFC150DQ-4/1	UCFC160DQ-6/2
ALL DATA AS D MODEL EXCEPT:						
Fan & Motor - Per Fan						
Quantity		2	3	3	4	6
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 Size	kW	0.68	0.68	0.68	0.68	0.70

		UCFC75DSQ-2/1	UCFC100DSQ-3/1	UCFC125DSQ-4/1	UCFC150DSQ-4/1	UCFC160DSQ-8/2
ALL DATA AS D MODEL EXCEPT:						
Fan & Motor - Per Fan						
Quantity		2	3	4	4	8
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 Size	kW	0.32	0.32	0.32	0.32	0.32

Installation Data

IMPORTANT  The following information is for general guidance; refer to the certified drawings provided for installation.

ELECTRICAL DATA

		UCFC180D-6/2	UCFC200D-6/2	UCFC225D-6/2	UCFC250D-8/2	UCFC275D-8/2
Unit Data (1)						
Nominal Run Amps	A	109	121	131	146	160
Maximum Start Amps	A	297	358	368	383	440
Rec Mains Fuse Size	A	160	160	200	200	200
Mains Supply	VAC	400V / 3PH / 50 Hz				
Max Mains Incoming Cable Size	mm ²	Direct to Bus Bar				
Permanent Supply	VAC	230V / 1PH + N / 50 Hz				
Rec Permanent Fuse Size	A	16	16	16	16	16
Max Permanent Incoming Cable Size	mm ²	4 mm ² terminals				
Control Circuit	VAC	24V/230VAC				
Evaporator						
Immersion Heater Rating	W	100	100	100	100	100
External Trace Heating						
Available (fitted by others)	W	500	500	500	500	500
Fan & Motor - Per Fan						
Quantity		6	6	6	8	8
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 Size	kW	0.98	0.98	0.98	0.98	0.98
Compressor - Per Compressor (1)						
Quantity		2 + 2	2 + 2	2 + 2	4	2 + 2
Motor Size	kW	15.0 / 11.7	18.2 / 11.7	18.2 / 15.0	18.2	22.8 / 18.2
Nominal Run Amps	A	27.0 / 22.0	33.0 / 22.0	33.0 / 27.0	33.0	40.0 / 33.0
Oil Heater Rating	W	130.0 / 75.0	130.0 / 75.0	130.0 / 130.0	130.0	130.0 / 130.0
Start Amps	A	215.0 / 175.0	270.0 / 175.0	270.0 / 215.0	270.0	320.0 / 270.0
Type Of Start	(2)	Direct on line				
OPTIONAL EXTRAS						
Power Factor Correction (1)						
Nominal Run Amps	A	99	111	119	134	146
Maximum Start Amps	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 (1)						
Nominal Run Amps	A	109	121	131	146	160
Maximum Start Amps	A	211	250	260	275	312
Recommended Mains Fuse	A	160	160	200	200	200
Water Pump (1)						
Single Head or Run/Standby - Standard						
Unit Nominal Run Amps	A	123	135	145	161	174
Recommended Mains Fuse	A	160	200	200	200	250
Motor Size	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
Single Head or Run/Standby - Larger						
Unit Nominal Run Amps	A	130	142	152	167	181
Recommended Mains Fuse	A	160	200	200	200	250
Motor Size	kW	11	11	11	11	11
Full Load Amps	A	21.4	21.4	21.4	21.4	21.4
Twin Head - Standard						
Unit Nominal Run Amps	A	123	135	145	161	174
Recommended Mains Fuse	A	160	200	200	200	250
Motor Size	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
Twin Head - Larger						
Unit Nominal Run Amps	A	130	142	152	167	181
Recommended Mains Fuse	A	160	200	200	200	250
Motor Size	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 with standard ac type fans.
 (2) Starting amps refers to the Star connection only with standard ac type fans.

Installation Data

IMPORTANT  The following information is for general guidance; refer to the certified drawings provided for installation.

ELECTRICAL DATA

		UCFC180DQ-6/2	UCFC200DQ-6/2	UCFC225DQ-8/2	UCFC250DQ-8/2	UCFC275DQ-10/2
ALL DATA AS D MODEL EXCEPT:						
Fan & Motor - Per Fan						
Quantity		6	6	8	8	10
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 Size	kW	0.70	0.70	0.70	0.70	0.70

		UCFC180DSQ-8/2	UCFC200DSQ-8/2	UCFC225DSQ-10/2	UCFC250DSQ-10/2	UCFC275DSQ-12/2
ALL DATA AS D MODEL EXCEPT:						
Fan & Motor - Per Fan						
Quantity		8	8	10	10	12
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 Size	kW	0.32	0.32	0.32	0.32	0.32

Installation Data

IMPORTANT  The following information is for general guidance; refer to the certified drawings provided for installation.

ELECTRICAL DATA

			UCFC300D-8/2	UCFC330D-10/2	UCFC360D-10/2	UCFC400D-12/2	UCFC450D-12/2
Unit Data (1)							
Nominal Run Amps	A		173	198	216	240	260
Maximum Start Amps	A		454	435	453	520	540
Rec Mains Fuse Size	A		250	250	315	315	355
Mains Supply	VAC		400V / 3PH / 50 Hz				
Max Mains Incoming Cable Size	mm ²		Direct to Bus Bar				
Permanent Supply	VAC		230V / 1PH + N / 50 Hz				
Rec Permanent Fuse Size	A		16	16	16	16	16
Max Permanent Incoming Cable Size	mm ²		4 mm ² terminals				
Control Circuit	VAC		24V/230VAC				
Evaporator							
Immersion Heater Rating	W		100	100	100	100	100
External Trace Heating							
Available (fitted by others)	W		500	500	500	500	500
Fan & Motor - Per Fan							
Quantity			8	10	10	12	12
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 Size	kW		0.98	0.98	0.98	0.98	0.98
Compressor - Per Compressor (1)							
Quantity			4	3 + 3	6	3 + 3	6
Motor Size	kW		22.8	18.2 / 15.0	18.2	22.8 / 18.2	22.8
Nominal Run Amps	A		40.0	33.0 / 27.0	33.0	40.0 / 33.0	40.0
Oil Heater Rating	W		130.0	130.0 / 130.0	130.0	130.0 / 130.0	130.0
Start Amps	A	(2)	320.0	270.0 / 215.0	270.0	320.0 / 270.0	320.0
Type Of Start			Direct on line				
OPTIONAL EXTRAS							
Power Factor Correction							
Nominal Run Amps	A	(1)	442	420	438	503	521
Maximum Start Amps	A	(2)	250	250	250	315	315
Recommended Mains Fuse	A		4 x 36	3 x 30 / 3 x 24	6 x 30	3 x 36 / 3 x 30	6 x 36
Compressor Nominal Run Amps - Per Compressor	A		158	180	198	219	237
Electronic Soft-Start (1)							
Nominal Run Amps	A		173	198	216	240	260
Maximum Start Amps	A	(2)	326	327	345	392	412
Recommended Mains Fuse	A		250	250	315	315	355
Water Pump (1)							
Single Head or Run/Standby - Standard							
Unit Nominal Run Amps	A		188	212	230	254	275
Recommended Mains Fuse	A		250	315	315	315	355
Motor Size	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
Single Head or Run/Standby - Larger							
Unit Nominal Run Amps	A		195	219	237	261	282
Recommended Mains Fuse	A		250	315	315	315	355
Motor Size	kW		11	11	11	11	11
Full Load Amps	A		21.4	21.4	21.4	21.4	21.4
Twin Head - Standard							
Unit Nominal Run Amps	A		188	212	230	254	275
Recommended Mains Fuse	A		250	315	315	315	355
Motor Size	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
Twin Head - Larger							
Unit Nominal Run Amps	A		195	219	237	261	282
Recommended Mains Fuse	A		250	315	315	315	355
Motor Size	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 with standard ac type fans.
 (2) Starting amps refers to the Star connection only with standard ac type fans.

Installation Data

IMPORTANT  The following information is for general guidance; refer to the certified drawings provided for installation.

ELECTRICAL DATA

		UCFC300DQ-10/2	UCFC330DQ-12/2	UCFC360DQ-12/2	UCFC400DQ-14/2	UCFC450DQ-14/2
ALL DATA AS D MODEL EXCEPT:						
Fan & Motor - Per Fan						
Quantity		10	12	12	14	14
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 Size	kW	0.70	0.70	0.70	0.70	0.70

		UCFC300DSQ-12/2	UCFC330DSQ-16/2	UCFC360DSQ-16/2	UCFC400DSQ-16/2	UCFC450DSQ-16/2
ALL DATA AS D MODEL EXCEPT:						
Fan & Motor - Per Fan						
Quantity		12	16	16	16	16
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 Size	kW	0.32	0.32	0.32	0.32	0.32

AIRETronix Controls

TEMPERATURE CONTROL

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.

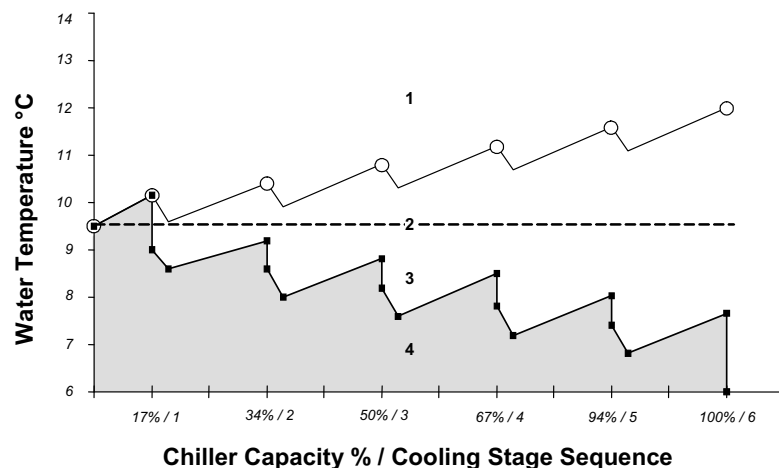
Selection of the best application control scheme can be made via a soft switch in the microprocessor during initial commissioning.

The microprocessor maintains the set supply Chilled Water temperature by sensing the return and supply water temperatures and ambient air temperature to adjust the compressor loading and water valve position as required.

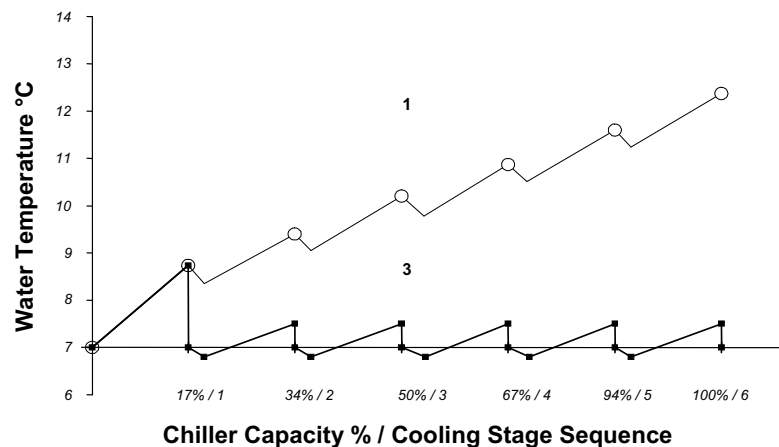
Examples based on Models UCFC125D-3/1 having 6 Stages of Cooling

- Key:**
- 1 Return Water Temperature
 - 2 Mean Value
 - 3 Supply Water Temperature
 - 4 Compressor Off

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.

AIRETronix Controls

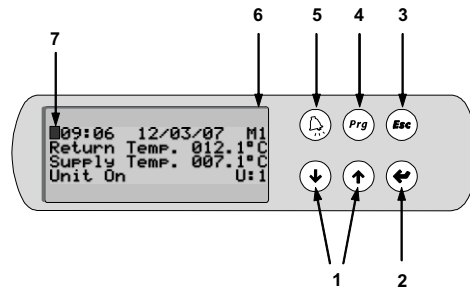
GENERAL DESCRIPTION

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

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.

DISPLAY/KEYPAD



- 1 UP/DOWN KEYS - To change Adjustable Fields & Scrolls up & down available Menus
- 2 ENTER -Selects Menus & Moves Cursor to Adjustable Fields Green LED
- 3 ESC - Green LED lit when Operating Page displayed, Returns to Operating Page Screen when pressed
- 4 PROGRAM - Opens the Available Menus
- 5 ALARM - Red LED Indicates Alarm Present
- 6 4 ROW LCD DISPLAY
- 7 CURSOR (FLASHING) Top Left Position = "HOME" Indicates adjustable Fields

OPERATION

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**, on page 31.

Initially, use the **Prg** 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.

AIRETronix Controls

OPERATION

Standard Operating Page

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

Free Cool	M1	13:12	27/10/05	M0
Inlet Temp.	06.0°C	Return Temp.	07.0°C	
Ambient Temp.	01.0°C	Supply Temp.	06.0°C	
FreeC Valve	000.0%	OFF by Keyboard Mst.		

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 **Esc** 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 (Optional Extra)

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.

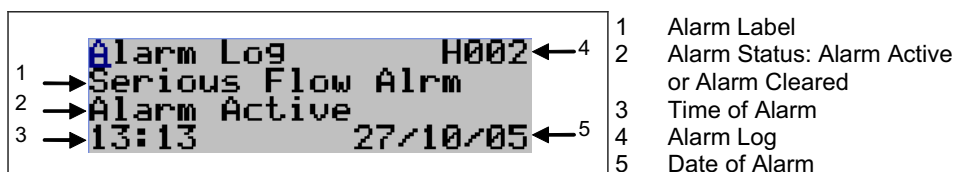
Using the **Navigation** instructions, the following **Sub-Menus** shown in sequence can be accessed:

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 (Optional)	
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

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	+6°C
Maximum return water temperature °C	+20°C

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

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 6.20
Oil Type	Polyol Ester				
Refrigeration	Dual Circuit				
Refrigerant Control	Electronic Expansion Valve (EEV)				
Refrigerant Pre Charged	R407C				
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 (EEV)				
Refrigerant Pre Charged	R407C				
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		Trio 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 (EEV)				
Refrigerant Pre Charged	R407C				
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  Full design water flow **MUST** be maintained at all times. Variable water volume is **NOT** recommended and will invalidate warranty.

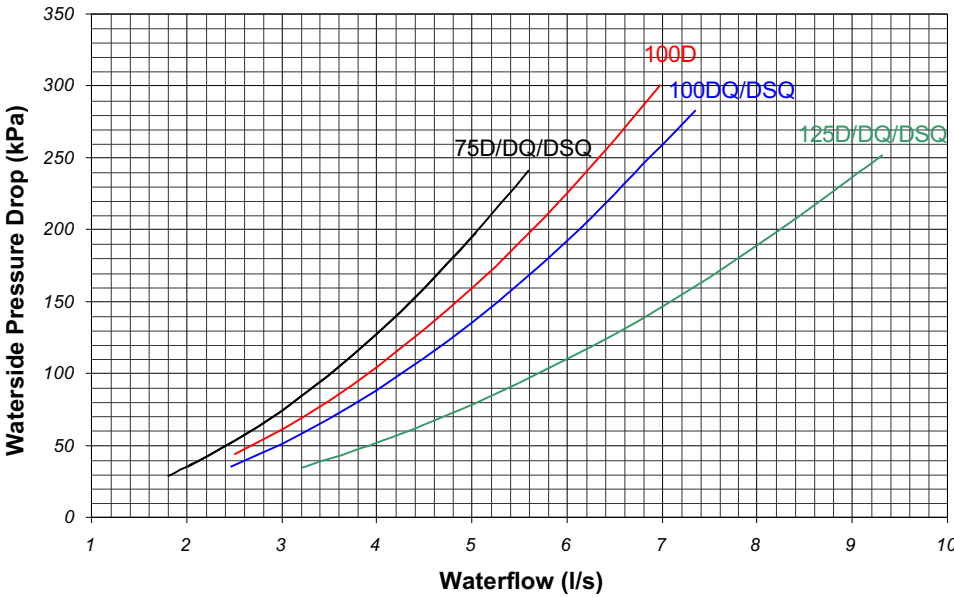
Use the formula below to calculate the External Head Available:

Total Pump Head Available - Chiller Pressure Drop = External Head Available

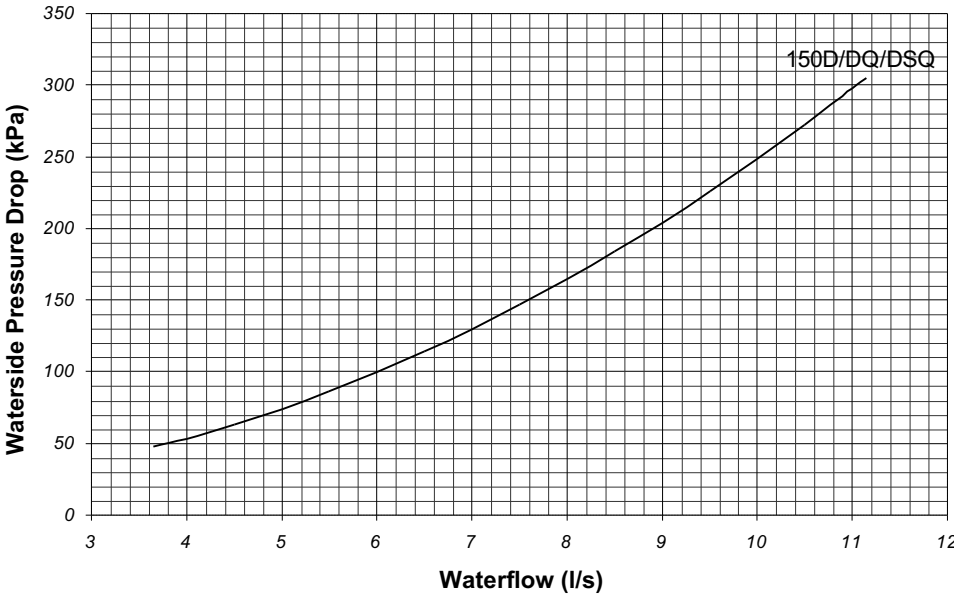
Example: UCFC125D-3/1 6.12 l/s, standard single pump:

265 kPa - 112 kPa = 153 kPa

UCFC75 - UCFC125




UCFC150



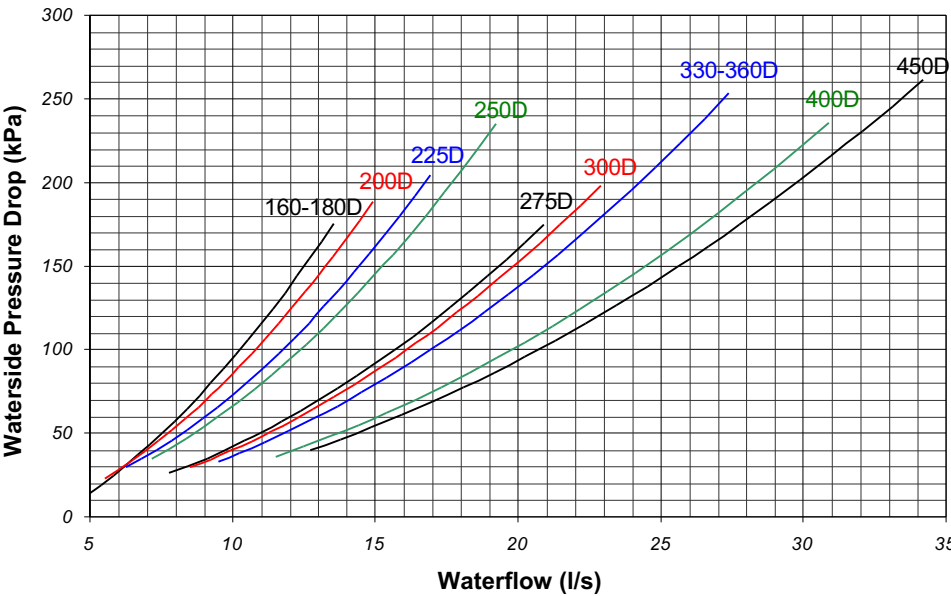
- 1 Chiller pressure drop refers to standard unit only. For pump options, please contact Airedale.
- 2 For glycol solutions, please refer to **Glycol Data**, on page 20.

Commissioning Data

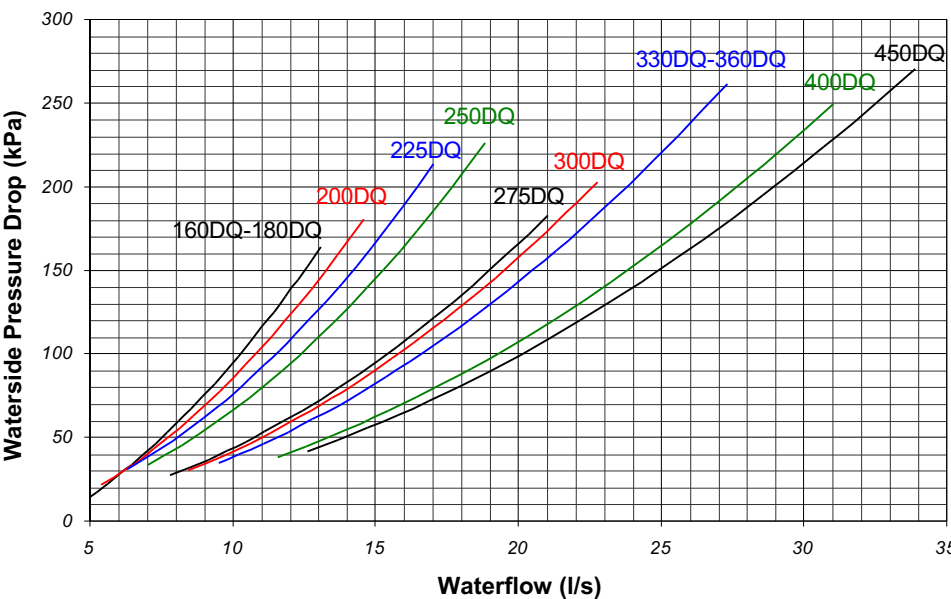
WATERSIDE PRESSURE DROPS
(20% Ethylene Glycol Concentration)

CAUTION  Full design water flow **MUST** be maintained at all times. Variable water volume is **NOT** recommended and will invalidate warranty.

UCFC160D - UCFC450D




UCFC160DQ - UCFC450DQ



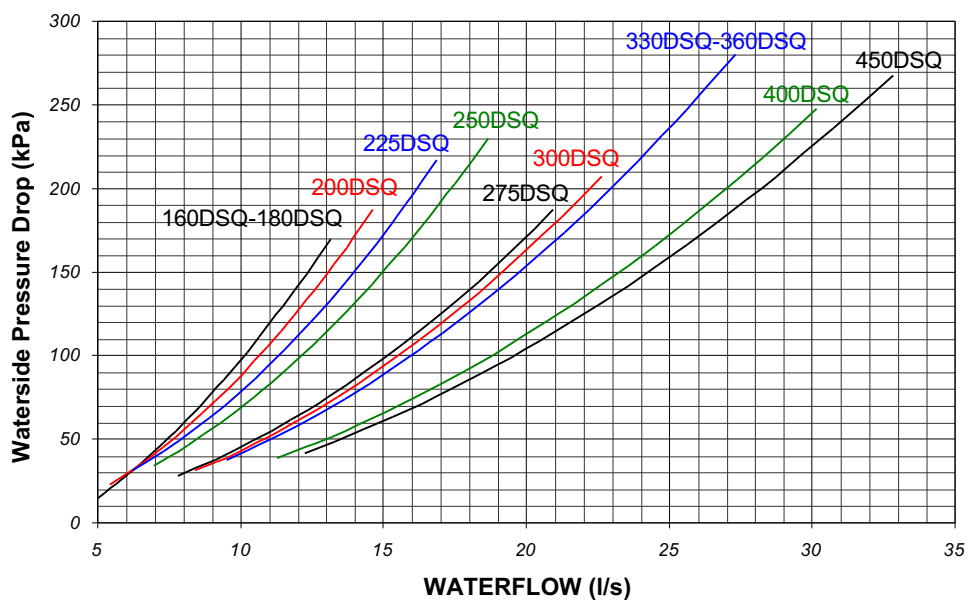
1 Chiller pressure drop refers to standard unit only. For pump options, please contact Airedale.
2 For glycol solutions, please refer to **Glycol Data**, on page 20.

Commissioning Data

WATERSIDE PRESSURE DROPS (20% Ethylene Glycol Concentration)

CAUTION  Full design water flow **MUST** be maintained at all times. Variable water volume is **NOT** recommended and will invalidate warranty.

UCFC160DSQ -
UCFC450DSQ

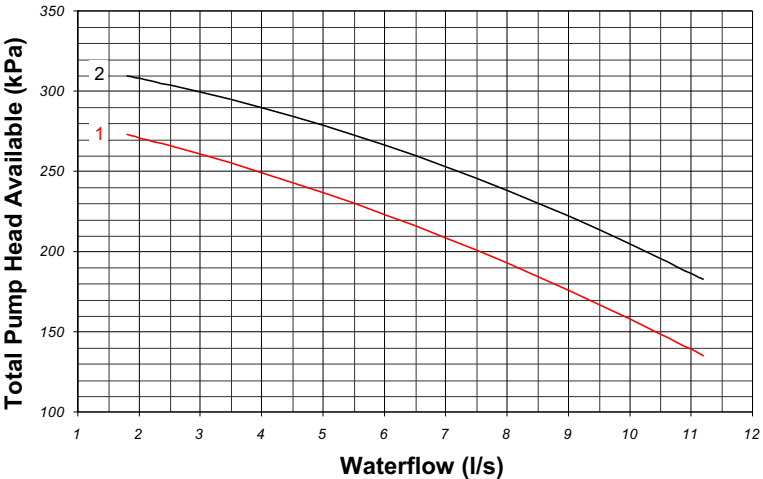
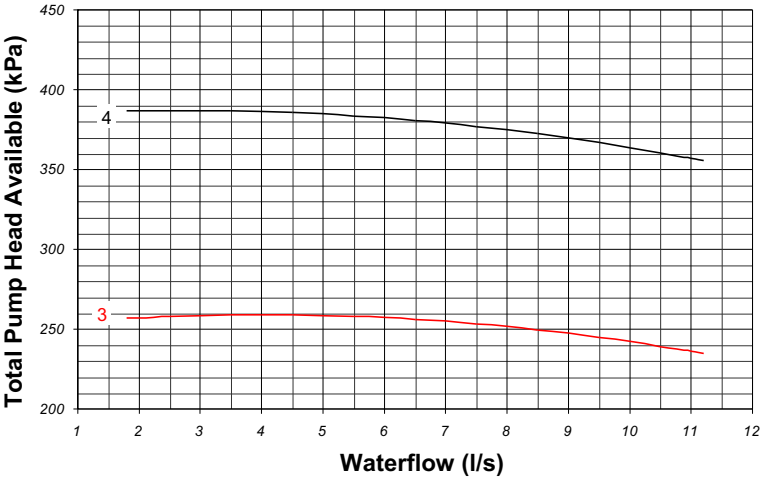
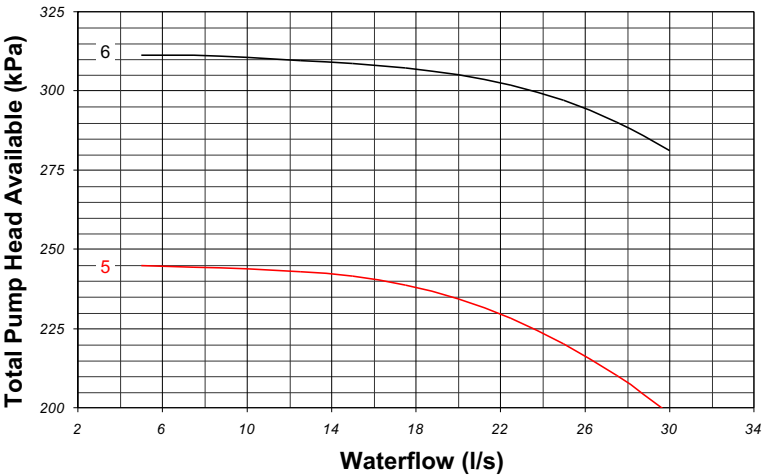


- 1 Chiller pressure drop refers to standard unit only. For pump options, please contact Airedale.
- 2 For glycol solutions, please refer to **Glycol Data**, on page 20.

Commissioning Data

PUMP PACKAGES

Single Head Pump or
Run/Standby

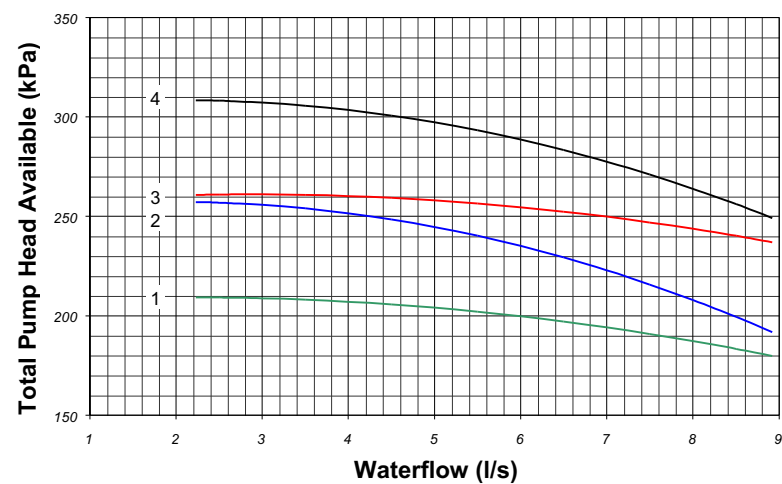
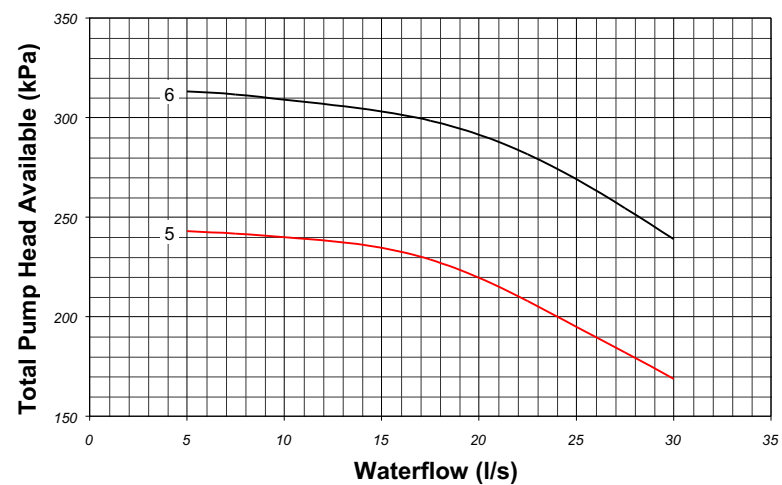


		Single Head Pump or Run / Standby Pump	
		Standard	Larger
UCFC75	Curve	1	2
UCFC100		1	2
UCFC125		2	4
UCFC150		3	4
UCFC160 - UCFC450		5	6

Commissioning Data

PUMP PACKAGES



Twin Head Pump



		Twin Head Pump	
		Standard	Larger
UCFC75	Curve	1	2
UCFC100		1	3
UCFC125		1	3
UCFC150		2	4
UCFC160 - UCFC450		5	6

Commissioning Data

OPERATIONAL SEQUENCE

- Refrigerant Charge** Check for the presence of a refrigerant charge in the condenser side.
- Compressor Oil Heater** The mains supply to the 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 oil heater, evaporator trace heating and control circuits, FAILURE to do so will INVALIDATE WARRANTY.**
- To reduce down time, if possible support the above supply with a UPS.
- 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 21Barg.
- 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 Airedale Technical Support immediately to validate warranty.

PRE COMMISSIONING CHECKLIST

CAUTION

ALL work **MUST** be carried out by technically trained competent personnel.



The equipment contains live electrical and moving parts, **ISOLATE** prior to maintenance or repair work.

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 compressor oil 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 and functioning correctly**
- 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 **Controls**, on page 29)
- Ensure all **KNOBS** and **SWITCHES** are adjusted to suit the design requirements (refer to **Controls**, on page 29)

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

- 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**, on page 33

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 fan(s)

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**, on page 33


RECORD


- Check the liquid line sight glass is clear and dry
- Check the superheat setting adjusts 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.

WARNING  The equipment contains live electrical and moving parts, **ISOLATE** prior to maintenance or repair work.

WARNING  **Power Factor Correction - Optional Extra**
Allow Discharge time and short circuit the capacitor before handling! This applies to any flying leads directly attached to the capacitor terminals.

IMPORTANT  **UK MAINLAND - The Chiller Maintenance Record and supporting maintenance documents **MUST** be complete and available on request to validate warranty.**

The Chiller Maintenance Record is located within the unit control panel.

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

GENERAL MAINTENANCE

The maintenance schedule indicates the time period between maintenance operations.

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 Schrader 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 flow providing device 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

6 MONTHS	ACTION	NOTES
	Repeat 3 month checks plus the following:	
SYSTEM	Check evaporator heater and low ambient thermostat are set to activate at 4.0°C.	Remember to re-cap the Schrader 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 refrigerant 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 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.

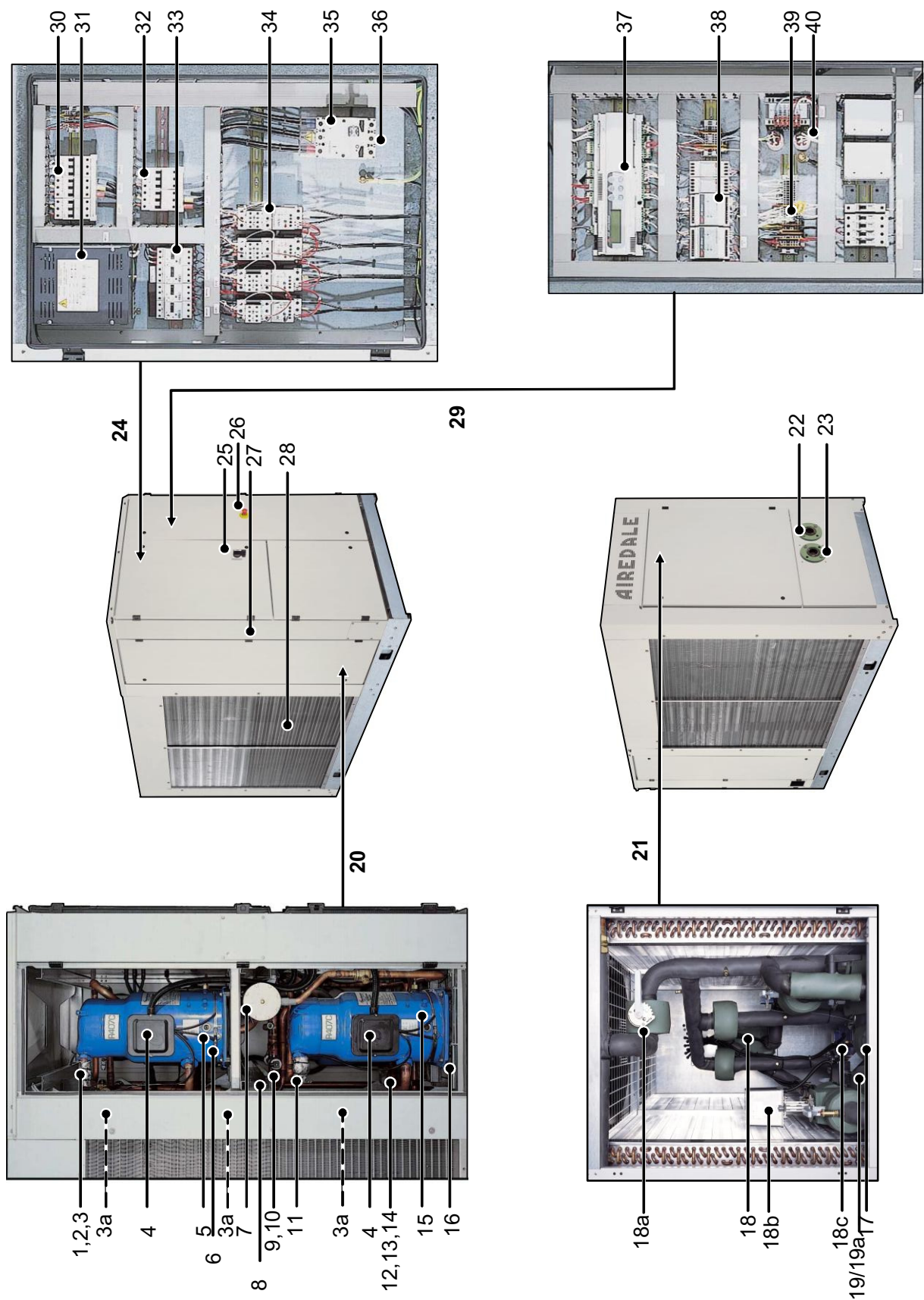
A spares list for 1, 3 and 5 years will be supplied with every unit and is also available from our Spares department on request.

The serial plate can be located inside Item 24.

UK MAINLAND - Chiller Maintenance Record can be located inside Item 24.

1	Discharge Line Ball Valve	20	Compressor Compartment
2	Discharge Schrader 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	Compressor Oil 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 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





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



SYSTEMY HVAC Sp. z o.o.
ul. Rydygiera 8, 01-793 Warszawa
tel.: +48 22 101 74 00
fax: +48 22 101 74 01
e-mail: biuro@systemy-hvac.pl
www.systemy-hvac.pl

PART NO:		DATE
6259584 (IM E)	A	09/2008
	B	01/2010
	V1.2.0	02/2013