Airedale
APPLIED THERMAL INNOVATION

Ultima Water Cooled

Water Cooled Chiller
75kW - 450kW

TECHNICAL MANUAL

bsi. ISO 9001 Quality Management FM00542
ISO 14001 Environmental Management EMS52086

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.

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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***

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Front Cover: Model UWC250DQ/DSQ Shown

Health and Safety

IMPORTANT The information contained in this manual is critical to the correct operation and maintenance of the unit and should be read by all persons responsible for the installation, commissioning and maintenance of this Airedale unit.

Safety

The equipment has been designed and manufactured to meet international safety standards but, like any mechanical/electrical equipment, care must be taken if you are to obtain the best results.

CAUTION **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 The refrigerant used in this range of products is classified under the COSHH regulations as an irritant, with set Workplace Exposure Levels (WEL) 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.

Protective Personal Equipment

Airedale recommends that personal protective equipment is used whilst installing, maintaining and commissioning equipment.

Refrigerant Warning

The Airedale Ultima water cooled chiller uses R407C refrigerant which is a medium pressure refrigerant. It requires careful attention to proper storage and handling procedures.

Use on manifold gauge sets designed for use with R407C refrigerant. Use only refrigerant recovery units and cylinders designed for high pressure refrigerants.

R407C must only be charged in the liquid state to ensure correct blend makeup.

The refrigerant must be stored in a clean, dry area away from sunlight. The refrigerant must never be stored above 50°C.

Manual Handling

Some operations when servicing or maintaining the unit may require additional assistance with regard to manual handling. This requirement is down to the discretion of the engineer. Remember do not perform a lift that exceeds your ability.

Environmental Policy

It is our policy to:

- Take a proactive approach to resolve environmental issues and ensure compliance with regulatory requirements.
- Train personnel in sound environmental practices.
- Pursue opportunities to conserve resources, prevent pollution and eliminate waste.
- Manufacture products in a responsible manner with minimum impact on the environment.
- Reduce our use of chemicals and minimise their release to the environment.
- Measure, control and verify environmental performance through internal and external audits.
- Continually improve our environmental performance.

Environmental Considerations

FREEZE PROTECTION

Airedale recommends the following actions to help protect the unit during low temperature operation. This also includes the units subject to low ambient temperatures.

Units with supply water temperatures below +5°C

- Glycol is recommended when a supply water temperature of +5°C or below is required or when static water can be exposed to freezing temperatures.

Units subject to ambient temperatures lower than 0°C

- Glycol of an appropriate concentration (1) is used within the system to ensure adequate protection. Please ensure that the concentration is capable of protection at least 3°C lower than ambient.
- Water/glycol solution is constantly circulated through all waterside pipework and coils to avoid static water from freezing.
- Ensure that pumps are started and running even during shut down periods, when the ambient is within 3°C of the solution freeze point (1) (i.e. if the solution freezes at 0°C, the pump must be operating at 3°C ambient).
- Additional trace heating is provided for interconnecting pipework.

(1) Referrer to your glycol supplier for details

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CE Directive

CE 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 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.

Maximum and Minimum Operation Temperature (TS) and Pressure (PS)

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

*Based upon the maximum machine running temperatures.

General Description

UNIT IDENTIFICATION

WATER COOLED LIQUID CHILLER	
UWC	**Ultima Water Cooled Chiller**
75 – 450	Model Size (Expressed as Nominal Cooling in kW)
D	**D**ouble Circuit - Standard Chiller
DQ	**D**ouble Circuit - **Q**uiet Chiller
DSQ	**D**ouble Circuit - **S**uper **Q**uiet Chiller
Example	**UWC250DQ**

INTRODUCTION

The Airedale range of Ultima Water Cooled liquid chillers covers the nominal 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 performance while keeping the sound and vibration levels and footprint to an absolute minimum.

The range has been specifically designed for plant room installations.

A matching range of Dry Cooler units is available to complement the Water Cooled Liquid Chiller, please refer to the ***Dry Cooler Specification***.

REFRIGERANTS

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

STANDARD FEATURES

Standard Chiller - D

The Standard Ultima Water Cooled Chiller comes complete with:

- AIRETronix Microprocessor Control
- Evaporator Pad Heater
- Multiple Scroll Compressors
- Plate Evaporator
- Plate Condenser(s)
- Dual Independent Refrigeration Circuits
- Electronic Expansion Valve(s)
- Connections for External Trace Heating (240V/500W available)
- A set of 4 M24 collared eye bolts to BS4278

Quiet Chiller - DQ

With the benefits of the Standard range, the Quiet chiller is supplied with an acoustic package, which incorporates:

- Compressor enclosure lined with Acoustic material

Super Quiet Chiller - DSQ

With the benefits of the Standard range, the Super Quiet chiller is supplied with a Quiet acoustic package, which incorporates the following to become one of the quietest chillers available:

- Compressor enclosure lined with 40mm Acoustic material

General Description

STANDARD FEATURES

Construction

The base and superstructure are fabricated from galvanised steel to ensure a tough, 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).

Components are mounted on a rigid galvanised heavy-duty sub frame. Fully locked 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 M24 collared eye bolts to BS4278 are supplied.

Evaporator

Stainless steel high efficiency brazed plate heat exchanger(s) will allow optimum heat transfer between media. Each heat exchanger is insulated with closed cell polyurethane foam to Class 0 fire rating.

Water inlet and outlet connections suit “Victaulic” type pipe and coupling assembly (counter-pipes and clamps supplied as an optional extra).

A pad heater is fitted to the single evaporator and will protect against freeze up in ambient temperatures as low as -20°C.

Condenser

Stainless steel high efficiency brazed plate heat exchanger(s) will allow optimum heat transfer between media.

Water inlet and outlet connections are “Victaulic” type pipe and coupling assembly (counter-pipes and clamps supplied as an optional extra).

Compressor

Tandem/Trio scroll compressors comprising 2/3 scroll compressors linked to provide 1 refrigeration circuit.

Each compressor includes internal motor protection, internal pressure relief, non return valve, discharge temperature protection and sight glass. Each compressor is equipped with oil heater to guard against oil foaming on start up.

Each Tandem/Trio has an oil equalisation line.

The compressors are mounted to the rigid galvanised heavy duty sub-frame with the use of vibration reducing isolation.

General Description

STANDARD FEATURES

Refrigeration

Each refrigeration circuit is supplied with the following:

- Full operating charge of R407C
- Electronic expansion valve
- 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

Controls

AIRETronix microprocessor controller can provide 4-6 stages of capacity control, dependent upon model type, as standard. The controller incorporates full Building Management System capabilities, full details can be found in the ***Controls*** section.

Electrical

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

- 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
- Separate door locking electrical isolation for each mains compartment

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.

General Description

OPTIONAL EXTRAS – GENERAL

Anti Vibration Mounts (Spring Type)	Spring vibration isolators can be supplied loose for on site fitting to the base frame of each chiller unit. The isolators are suitable for fitting to a concrete slab or structural steelwork providing the surface is level and of sufficient strength where a high level of vibration elimination is required.
Anti Vibration Mounts (Pad Type)	Pad vibration isolators can be supplied loose for on site fitting to the base frame of each chiller unit. The isolators are suitable for fitting to a structural steelwork only, providing the surface is level and of sufficient strength where a moderate degree of vibration elimination is required.
Sequence Control	For the efficient temperature and capacity operation of multiple units on a single site, the sequence controller will permit interlinked operation of the complete system thereby providing optimum temperature control and minimum power consumption. Included within this package is a site visit by Airedale Control Specialists to set up multiple unit sequence control.
BMS Interface Card	Enables AIRETronix Controlled chillers to be interfaced with most BMS, factory fitted, please contact Airedale.
Dual Pressure Relief Valve	A 3-way dual shut-off valve that incorporates 2 relief valve and rupture disc assemblies per circuit. The valve allows the maintenance of individual pressure relief valves and rupture discs without the need for refrigerant evacuation.
Electronic Soft Start	The electronic soft start enables the chiller compressor motor to be ramped to speed with the minimum full load current. Further benefits include removal of nuisance tripping, supply voltage dips and motor overheating.
Leak Detection Kit (DQ & DSQ Models Only)	A factory calibrated and fitted leak detection kit, will raise an alarm when refrigerant gas is detected.
Flow Switch – Evaporator & Condenser	The flow switch will protect the chiller against low water flow, supplied loose.
Water Filter – Evaporator & Condenser	20 mesh water filter(s) can be fitted on the inlet water pipework to protect the evaporator from clogging by sediment, (supplied loose).
“Victaulic” Counterpipe Kit	A pair of grooved counterpipes and clamps for each heat exchanger can be supplied for waterside connections.
Alternative Refrigerant	For applications outside the EU, units can be supplied for use with R22, please specify at time of order.
Commissioning	Airedale Service provides a full commissioning service carried out by professionally trained, industry experienced engineers. For a competitive quotation, please contact Airedale Customer Services.
Chillerguard®	In addition to commissioning, a 24 hour, 7 days a week on-call service is on available throughout the year. This service will enable customers to contact a duty engineer outside normal working hours and receive assistance over the telephone. The duty engineer can, if necessary, attend site, usually within 24 hours or less. Full details will be forwarded on acceptance of the maintenance agreement.

Design Features & Information

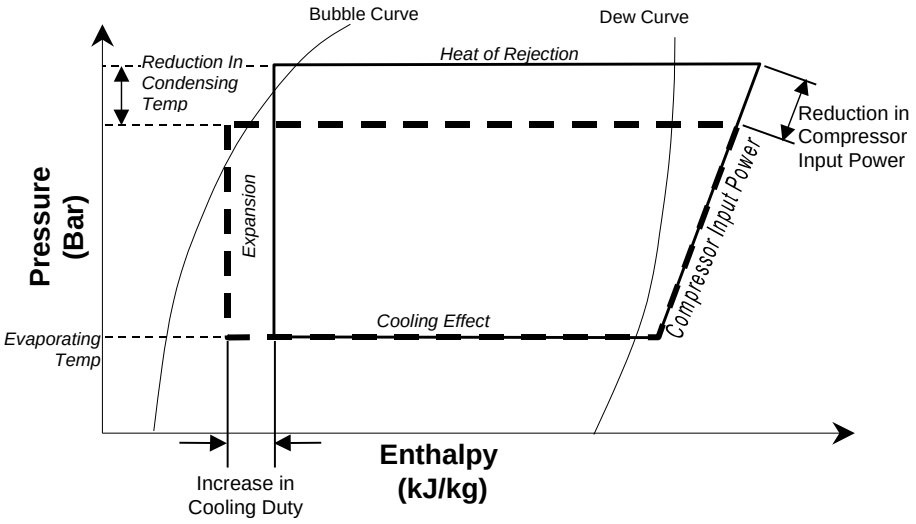
ENERGY EFFICIENCY

Electronic Expansion Valves (EEV)

Whilst offering versatile control at the full design duty of the chiller, Thermostatic Expansion Valves (TEV) do not automatically optimise themselves to all operating conditions. Therefore, if the chiller is operating at 40% or 50% of full load, especially at a lower ambient temperature than that for which the valve was sized, the conventional TEV must have the design head pressure available to ensure good refrigerant control. Maintaining an artificially high condensing pressure is normal in conventional systems, however, this leads to higher operating costs.

Using an EEV allows for good refrigeration control with the chiller operating at part load and lower load conditions with a reduced condensing pressure. By fitting an EEV and adjusting the head pressure control setting, **reduction in energy running values of up to 27% can be achieved**. The Mollier diagram shown below helps to illustrate how this increase in efficiency is achieved.

EEV's differ to normal thermostatic expansion valves in their ability to maintain control of refrigerant flow and the suction superheat at reduced head pressures. The turn-down rate of a typical EEV is superior to that of it's thermostatic equivalent, such that a reduced optimum condensing pressure can be maintained at low compressor load. However low the load is on the compressor, from zero to 100%, there will not be a problem with turn down, even below 30% rated capacity.



Key

Cooling Cycle @ 22°C ambient with a conventional TEV fitted.

Cooling cycle @ 22°C ambient, demonstrating a typical EEV condensing temperature taking full advantage of lower ambient air temperatures (below 30°C).

Design Features & Information

MINIMUM SYSTEM WATER VOLUME CALCULATIONS

METHOD 1 Where the system permanent heat load is known:

Vm = Water Flow Rate (litres/minute) x Minimum Compressor Run Time (mins) x Chiller Loading Factor

Where Vm is the minimum water volume in litres
Minimum Compressor Run Time is 2 minutes

Chiller Loading Factor = $\frac{\text{Minimum Turndown (kW) x 1.2}}{\text{Permanent Heat Load}}$

The Chiller Loading Factor limits:
Max 1.00
Min 0.25

Example 250 kW Chiller, 7/12°C Water, Model UWC250DQ with a permanent load of 95 kW

$$Vm = \frac{250 \times 60}{4.19 \times 5} \times 2 \times \frac{60 \times 1.2}{95} = 1085 \text{ litres}$$

METHOD 2 Where the system permanent heat load is unknown:

Vm = $\frac{\text{Water Flow Rate (litres/hour) x Minimum Turndown Ratio x 1.2}}{\text{Maximum Compressor Starts Per Hour}}$

Where Minimum Turndown Ratio = $\frac{\text{Minimum Stage Capacity (kW)}}{\text{Chiller Full Capacity (kW)}}$

Example 250 kW Chiller, 7/12°C Water, Model UWC250DQ permanent load unknown.

$$Vm = \frac{250 \text{ x } 3600}{4.19 \text{ x } 5} \text{ x} \left(\frac{60}{250} \text{ x} 1.2 \right) \text{ x} \frac{1}{12} = 1031 \text{ litres}$$

Method 1 is always preferred.

Design Features & Information

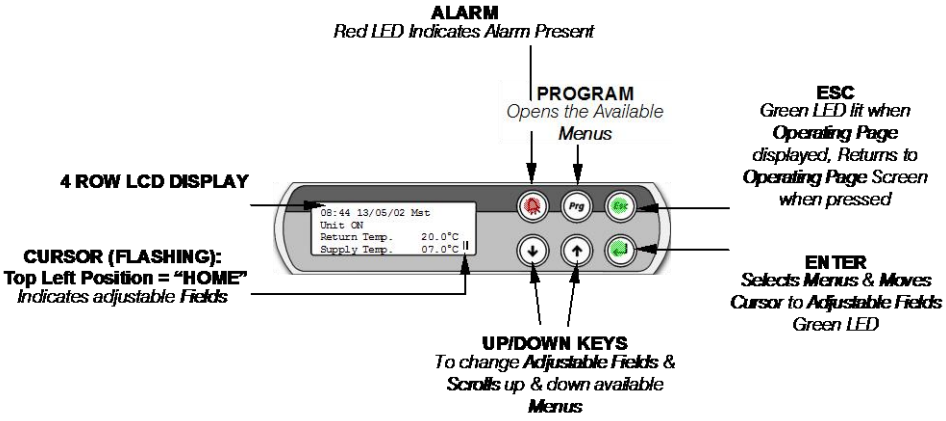
AIRETronix - Controls

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.



FEATURES

Unit Remote ON/OFF

Disables/Enables the chiller remotely.

Compressor Anti Cycle Control

Automatic via the Microprocessor.

Compressor Load Limit

Limits the condensing pressure by unloading above 24Barg.

Limits the evaporating pressure by unloading at the minimum pressure setpoint, which is, adjustable depending on system glycol content.

Remote Setback Temperature Setpoint Switch

A setback setpoint for supply water temperature can be selected to suit summer/winter conditions or night setback.

Compressor Hours Run

Displays hours run of each compressor.

Password Protection

The control system integrity can be maintained by restricting access with a password PIN number.

CAUTION **IMPORTANT: To change the PIN number, please contact Airedale at time of order with the preferred 4 digit number.**

Design Features & Information

FEATURES

Temperature

The microprocessor maintains the set supply Chilled Water temperature by sensing the return and supply water temperatures and manages the compressor loading.

The microprocessor also monitors and displays the following measured parameters:

- Supply Chilled Water Temperature
- Return Chilled Water Temperature
- Return Condenser Water Temperature
- Suction Pressure of each circuit
- Liquid Pressure of each circuit
- Suction Temperature at each circuit
- Superheat for each circuit

Alarms

The following conditions will be detected, triggering a visual display:
Common for both circuits:

- Low Supply Temperature
- Emergency Stop
- Water Flow

Individual for each circuit:
Individual alarms will isolate the affected circuit only.

- Compressor Trip
- Low Suction Pressure for each circuit
- High Liquid Pressure for each circuit
- Volt Free Contact Alarm Indication
- Low Pressure Switch
- Compressor Overload
- High Compressor Discharge Temperature

Networking

A Local Area Network (AIRELan) can be used to connect a number of chiller controllers to offer intercommunication and sequence control. This also allows the connection of computers, printers and modems on the same communications ring. For further details and quotation, please contact Airedale Controls.

Design Features & Information

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.

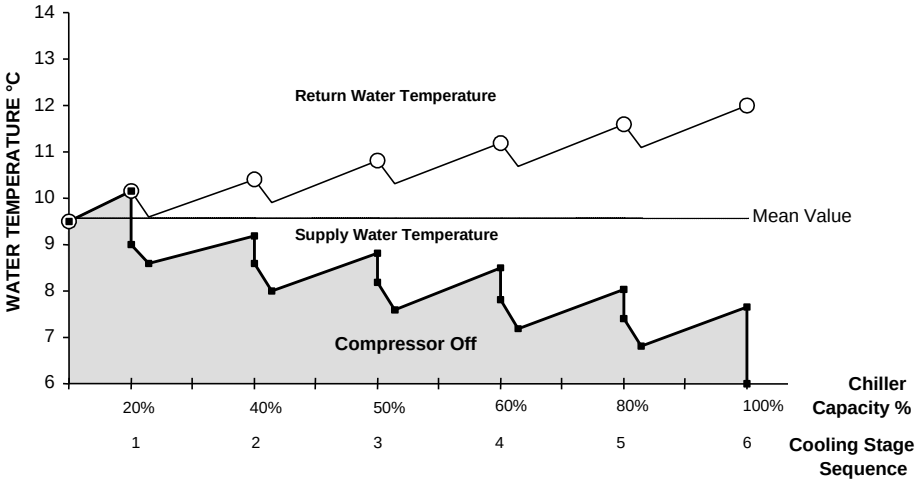
The onboard microprocessor has the capability of satisfying either control requirement as illustrated below. Using the Airedale Variable Supply Temperature control scheme, energy savings are available when compared with previous schemes and that of the Constant Supply Temperature application.

Variable Supply Temperature control schemes offer energy savings where the supply water temperature is not critical to its operation.

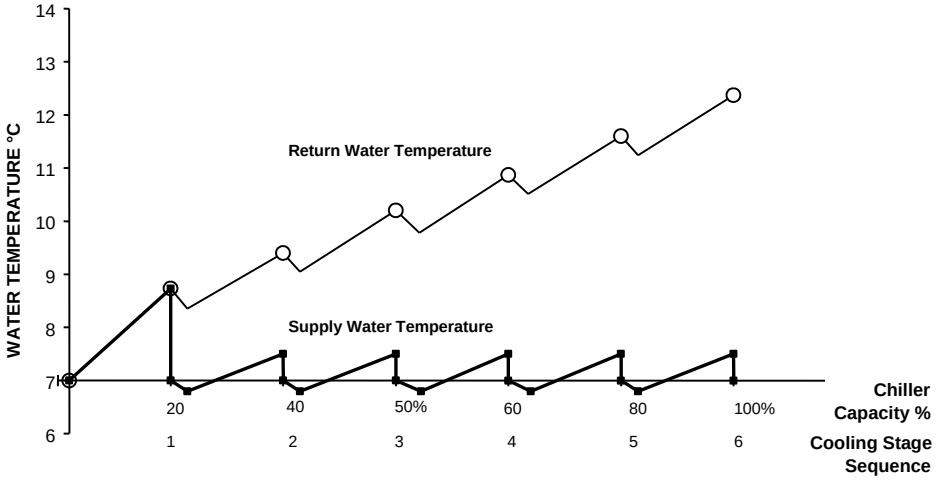
Selection of the best application control scheme can be made via a soft switch in the microprocessor during initial commissioning.

Examples based on Models UWC200D 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.

Performance Data All performance data is supplied in accordance with BS EN 14511-1:2013

CAPACITY DATA

		Condenser Leaving/Entering Water Temperature – based on ΔT of 5°C							
	Leaving Water	25/30°C		30/35°C		35/40°C		40/45°C	
	Temperature °C	Output kW	Input kW	Output kW	Input kW	Output kW	Input kW	Output kW	Input kW
UWC75	5	85.6	19.2	81.6	21.6	77.5	24.1	73.3	26.7
	6	88.7	19.3	84.6	21.7	80.3	24.2	76.0	26.7
	7	91.7	19.6	87.5	22.0	83.1	24.5	78.7	27.0
	10	101.7	20.1	97.0	22.4	92.3	24.8	87.5	27.2
UWC100	5	116.4	25.5	111.3	28.9	105.9	32.3	100.6	35.9
	6	120.6	25.6	115.2	29.0	109.7	32.5	104.2	36.0
	7	124.5	25.9	118.9	29.3	113.3	32.8	107.6	36.3
	10	137.1	26.3	131.1	29.8	125.0	33.2	118.9	36.7
UWC125	5	148.5	32.8	141.8	36.8	134.9	41.0	127.9	45.3
	6	153.8	33.0	146.9	37.0	139.7	41.2	132.5	45.5
	7	159.2	33.4	152.0	37.4	144.6	41.6	137.2	45.8
	10	176.2	34.0	168.4	37.9	160.2	42.1	152.0	46.3
UWC150	5	180.3	39.3	172.3	44.2	164.1	49.2	155.7	54.4
	6	186.5	39.7	178.2	44.5	169.8	49.5	161.1	54.7
	7	192.7	40.2	184.2	45.0	175.5	49.9	166.6	55.0
	10	212.6	41.4	203.3	46.0	194.0	50.7	184.3	55.6
UWC175	5	208.6	44.4	199.2	50.0	189.7	55.8	179.7	62.0
	6	215.9	44.7	206.2	50.2	196.4	56.0	186.1	62.2
	7	223.1	45.1	213.1	50.7	202.9	56.5	192.5	62.6
	10	246.2	45.9	235.4	51.5	224.5	57.2	213.2	63.3
UWC200	5	237.8	49.9	227.1	56.2	216.0	62.8	204.4	69.8
	6	246.3	49.9	235.2	56.2	223.7	62.9	211.8	69.9
	7	254.4	50.4	242.9	56.9	231.1	63.6	219.0	70.6
	10	281.0	50.6	268.7	57.1	256.1	63.9	243.1	71.1
UWC225	5	268.8	56.7	255.7	63.6	242.3	70.9	228.4	78.5
	6	278.4	56.9	264.8	63.9	250.9	71.1	236.6	78.7
	7	287.7	57.4	273.7	64.5	259.5	71.7	244.9	79.2
	10	317.7	58.3	302.6	65.4	287.3	72.6	271.7	80.1
UWC240	5	257.0	54.8	244.9	62.2	232.4	69.9	219.8	77.8
	6	266.1	55.2	253.5	62.5	240.7	70.1	227.7	77.9
	7	275.2	55.6	262.2	62.9	249.0	70.4	235.6	78.2
	10	303.4	57.0	289.3	64.1	275.1	71.4	260.7	78.8
UWC250	5	300.5	62.0	286.8	69.1	272.2	77.0	256.8	85.6
	6	312.3	63.6	296.4	71.1	280.2	78.9	263.5	87.2
	7	322.7	64.4	306.3	72.0	289.7	79.8	272.6	87.9
	10	356.6	65.7	338.8	73.3	320.8	81.0	302.6	88.9
UWC270	5	300.1	63.1	285.6	71.6	270.8	80.3	255.8	89.3
	6	310.6	63.4	295.7	71.9	280.5	80.6	265.0	89.6
	7	321.3	63.8	305.9	72.2	290.3	80.9	274.4	89.9
	10	354.3	64.8	337.7	73.3	320.9	81.9	303.9	90.8
UWC300	5	345.1	71.3	328.1	81.0	310.8	90.9	293.2	101.0
	6	357.2	71.6	339.7	81.2	321.9	91.1	303.8	101.3
	7	369.4	71.8	351.4	81.5	333.1	91.5	314.6	101.7
	10	407.4	72.4	388.0	82.4	368.5	92.6	348.8	102.9
UWC330	5	389.8	81.0	369.5	91.5	348.9	102.4	327.9	113.6
	6	403.6	81.4	382.8	91.9	361.6	102.8	340.0	114.0
	7	417.6	81.8	396.1	92.4	374.4	103.2	352.3	114.4
	10	461.1	83.0	437.9	93.7	414.6	104.6	391.0	115.7
UWC360	5	435.4	90.8	411.6	102.2	387.6	114.0	363.1	126.2
	6	451.0	91.4	426.5	102.7	401.8	114.5	376.6	126.6
	7	466.7	92.0	441.6	103.3	416.3	115.0	390.4	127.1
	10	515.7	93.8	488.6	105.2	461.4	116.7	433.8	128.6
UWC400	5	477.8	102.1	453.3	115.0	428.7	128.1	403.6	141.7
	6	494.8	102.7	469.6	115.5	444.3	128.6	418.4	142.2
	7	512.0	103.2	486.0	116.1	460.0	129.2	433.4	142.7
	10	565.5	104.8	537.3	117.8	509.3	130.9	480.7	144.4
UWC450	5	518.2	113.3	493.3	127.7	468.4	142.1	442.8	157.1
	6	536.6	113.8	510.9	128.1	485.2	142.6	458.8	157.6
	7	555.1	114.3	528.6	128.7	502.1	143.2	475.0	158.2
	10	612.8	115.6	583.9	130.3	555.3	145.0	526.1	160.0

1 Output kW refers to the chilled water duty.
2 Input kW refers to the compressor input power.
3 Duties applicable for chilled water ΔT between 4 and 8°C.
4 Interpolate for water temperatures between those quoted, do not extrapolate
5 Evaporator Water flow rate (l/s) = Output ÷ (4.19 x ΔT) Except Glycol use, refer to ***Glycol Data.***
6 Condenser Water flow rate (l/s) = (Output + Input) ÷ (4.19 x ΔT) Except Glycol use, refer to ***Glycol Data.***
7 For conditions outside those quoted, please refer to Airedale.

Performance Data All performance data is supplied in accordance with BS EN 14511-1:2013

OPERATING LIMITS
(For 100% Water)

Condenser Minimum Leaving Water Temperature °C	+25°C
Condenser Maximum Return Water Temperature °C	+45°C
Evaporator Minimum Leaving Water Temperature °C	+5°C
Evaporator Maximum Return Water Temperature °C	+20°C

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

GLYCOL DATA

Glycol is recommended when a supply water temperature of +5°C or below is required or when static water can be exposed to freezing temperatures.

Ethylene Glycol Nominal Correction Factors

Glycol in System / Freezing Point ºC		**10% / -4°C**	**20% / -9°C**	**30% / -15°C**	**40% / -23°C**
Cooling Duty	x by	0.98	0.97	0.95	0.93
Input Power		0.99	0.98	0.96	0.95
Water Flow		0.99	1.02	1.04	1.07
Pressure Drop		1.05	1.20	1.38	1.57

Propylene Glycol Nominal Correction Factors

Glycol in System / Freezing Point ºC		**10% / -2°C**	**20% / -6°C**	**30% / -12°C**	**40% / -20°C**
Cooling Duty	x by	0.97	0.95	0.91	0.88
Input Power		0.99	0.98	0.96	0.95
Water Flow		0.98	0.97	0.95	0.95
Pressure Drop		1.08	1.17	1.31	1.45

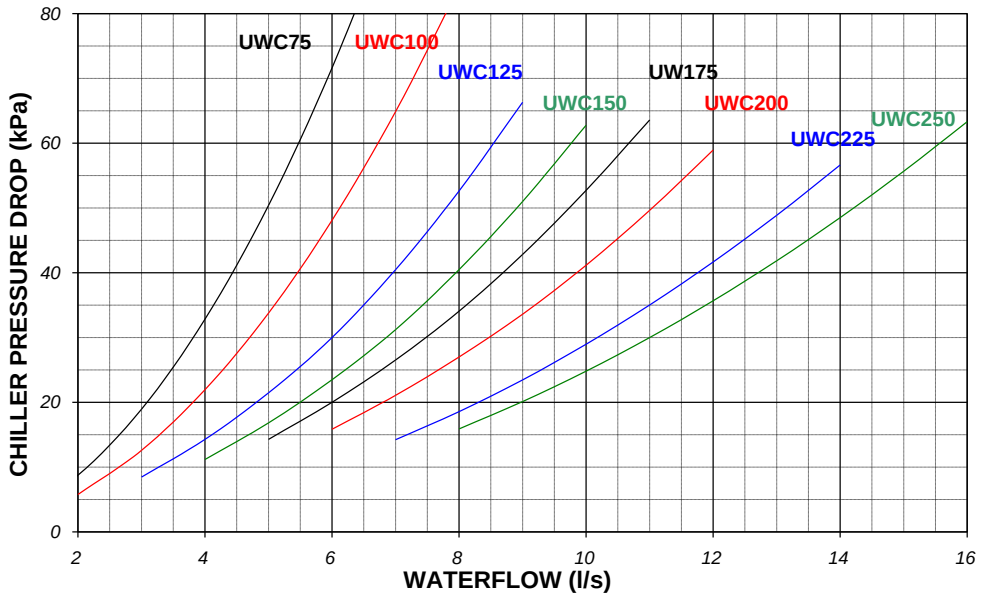
Performance Data

All performance data is supplied in accordance with BS EN 14511-1:2013

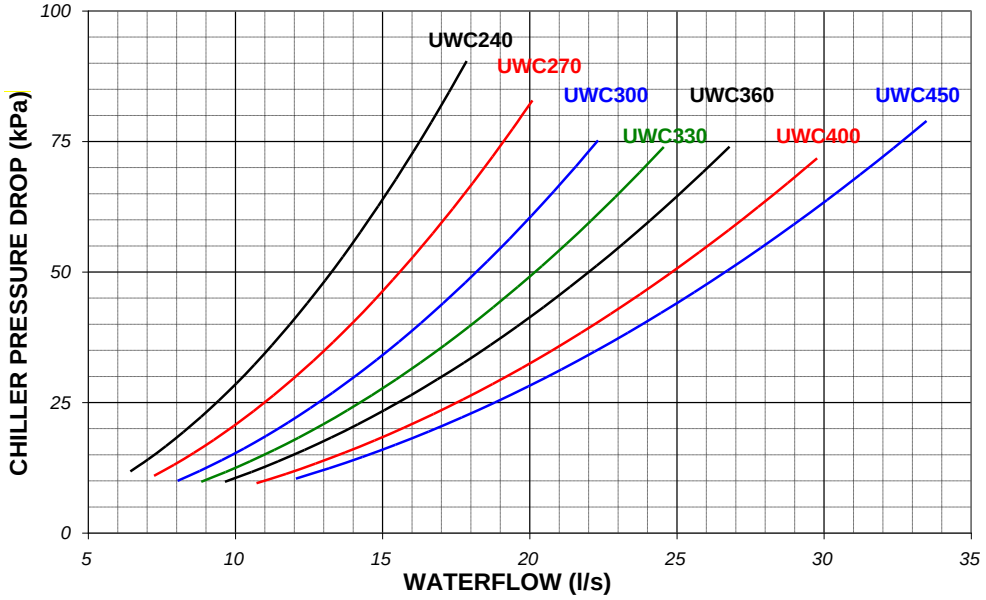
WATERSIDE PRESSURE DROPS

Evaporator

UWC75 – UWC250 (Except UWC240)



UWC240 – UWC450 (Except UWC250)

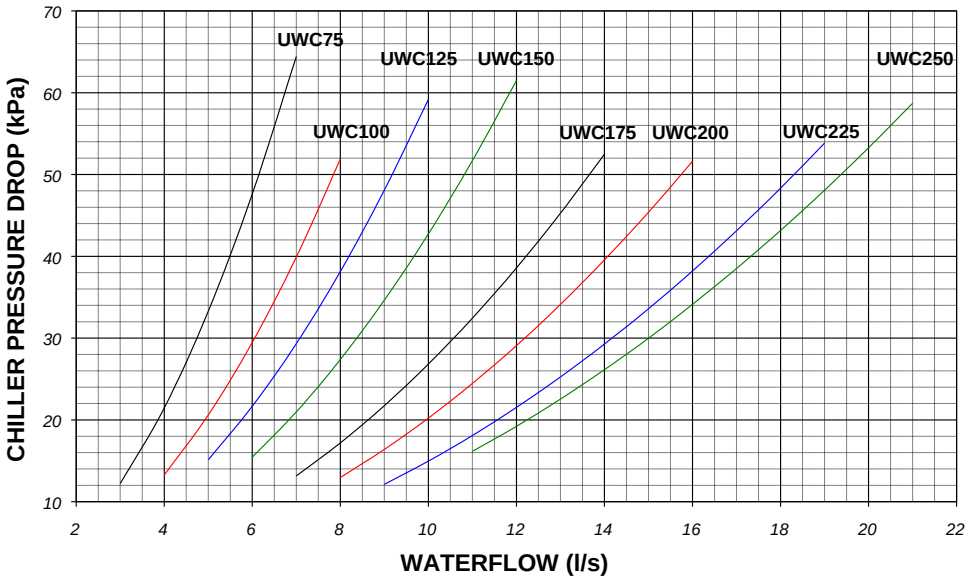


Performance Data

WATERSIDE PRESSURE DROPS

Condenser

UWC75 – UWC250 (Except UWC240)



(1) For glycol solutions, please refer to ***Glycol Data***.
All performance data is supplied in accordance with BS EN 14511-1:2013

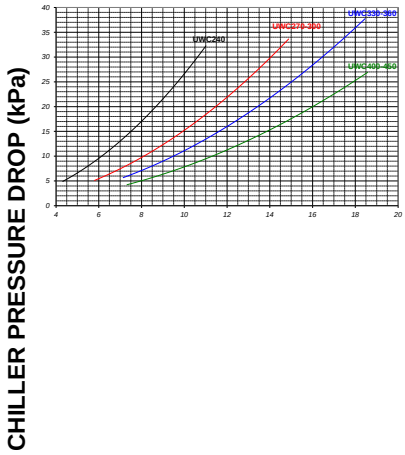
Performance Data

WATERSIDE PRESSURE DROPS

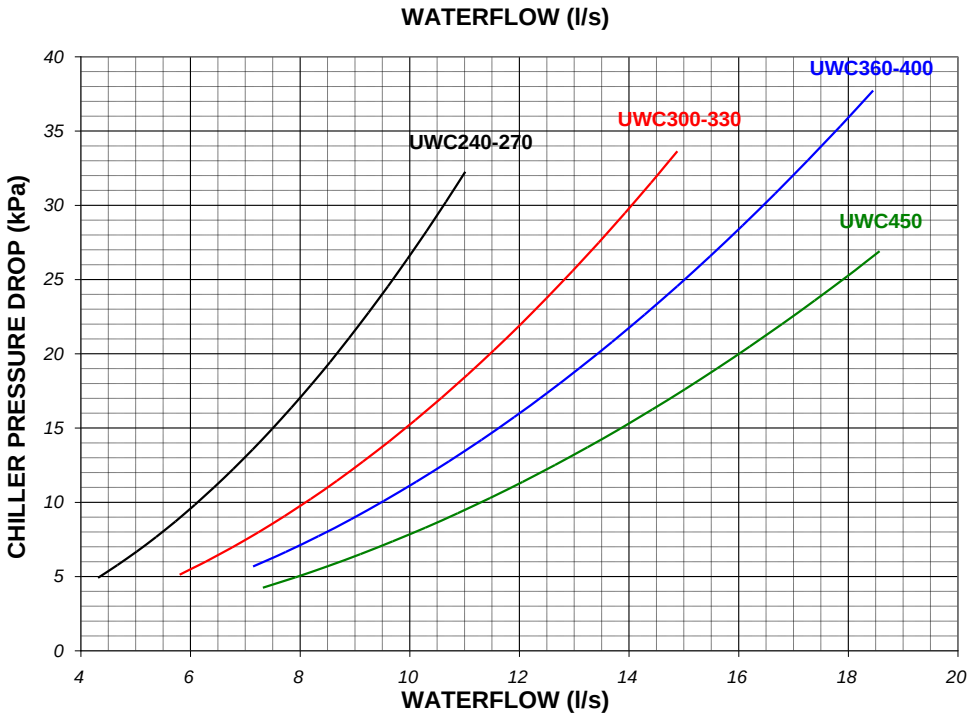
Condenser

UWC240 – UWC450
(Except UWC250)

CIRCUIT 1



Circuit 2



(1) For glycol solutions, please refer to ***Glycol Data***.
All performance data is supplied in accordance with BS EN 14511-1:2013

Performance Data

SOUND DATA

Measurement of Sound Data

All sound data quoted has been measured in the third-octave band limited values, using a Real Time Analyser calibrated sound intensity meter in accordance with BS EN ISO9614 Part 1: 1995. **The Global sound data quoted is valid for sound emitted in the horizontal plane in all directions**

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

Sound Pressure Levels are calculated from sound power using the expanded parallelepiped method according to BS EN ISO11203: 1996.

Global Chiller Sound Level

Standard - D Models	Sound Measurement		Overall dB(A)	Frequency (Hz) dB						
				63	125	250	500	1000	2000	4000
UWC75D	Power		84	71	50	69	81	78	79	76
	Pressure	@ 10m	53	39	19	37	49	46	47	44
UWC100D	Power		83	75	48	63	79	76	77	74
	Pressure	@ 10m	51	43	16	32	47	45	46	42
UWC125D	Power		85	78	53	66	78	76	81	79
	Pressure	@ 10m	54	47	21	34	46	44	49	47
UWC150D	Power		85	84	55	71	80	77	81	75
	Pressure	@ 10m	53	53	23	39	48	46	49	44
UWC175D	Power		87	82	54	70	78	82	83	77
	Pressure	@ 10m	55	51	23	38	47	50	51	45
UWC200D	Power		88	78	53	69	75	84	84	78
	Pressure	@ 10m	57	46	21	38	44	52	53	46
UWC225D	Power		92	77	55	74	81	88	88	81
	Pressure	@ 10m	61	45	23	42	49	56	57	49
UWC240D	Power		90	96	90	89	90	80	82	77
	Pressure	@ 10m	62	68	62	61	62	52	54	49
UWC250D	Power		94	75	56	76	83	90	90	83
	Pressure	@ 10m	63	43	25	45	52	58	59	51
UWC270D	Power		91	94	89	89	89	85	84	79
	Pressure	@ 10m	63	66	61	61	61	57	56	51
UWC300D	Power		91	90	88	88	86	87	85	80
	Pressure	@ 10m	63	62	60	60	58	59	57	52
UWC330D	Power		95	88	90	93	91	91	90	83
	Pressure	@ 10m	67	60	62	65	63	63	62	55
UWC360D	Power		98	86	91	95	94	93	92	84
	Pressure	@ 10m	70	58	63	67	66	65	64	56
UWC400D	Power		98	87	92	96	95	93	92	85
	Pressure	@ 10m	70	59	64	68	67	65	64	57
UWC450D	Power		99	88	93	96	95	94	93	86
	Pressure	@ 10m	71	60	65	68	67	66	65	58

1 dB(A) is the overall sound level, measured on the A scale.
All performance data is supplied in accordance with BS EN 14511-1:2013

2 All sound data measured at nominal conditions: Based at 12/7°C evaporator water and 30/35°C condenser water.

The Sound Pressure data quoted is only valid in free field conditions, where the unit is installed on a reflective base. If the equipment is placed adjacent to a reflective wall, values may vary to those stated, typically increasing by 3dB for each side added.

Performance Data **All performance data is supplied in accordance with BS EN 14511-1:2013**

SOUND DATA

Global Chiller Sound Level

Quiet - DQ Models	Sound Measurement		Overall dB(A)	Frequency (Hz) dB						
				63	125	250	500	1000	2000	4000
UWC75DQ	Power		81	67	66	75	77	74	75	72
	Pressure	@ 10m	49	35	35	43	45	42	43	40
UWC100DQ	Power		79	71	64	69	75	72	73	70
	Pressure	@ 10m	47	39	32	38	43	41	42	38
UWC125DQ	Power		81	74	69	72	74	72	77	75
	Pressure	@ 10m	50	43	37	40	42	40	45	43
UWC150DQ	Power		81	80	71	77	76	73	77	71
	Pressure	@ 10m	49	49	39	45	44	42	45	40
UWC175DQ	Power		83	78	70	76	74	78	79	73
	Pressure	@ 10m	51	47	39	44	43	46	47	41
UWC200DQ	Power		84	74	69	75	71	80	80	74
	Pressure	@ 10m	53	42	37	44	40	48	49	42
UWC225DQ	Power		88	73	71	80	77	84	84	77
	Pressure	@ 10m	57	41	39	48	45	52	53	45
UWC240DQ	Power		89	95	89	89	90	77	77	71
	Pressure	@ 10m	61	67	61	61	62	49	49	43
UWC250DQ	Power		90	71	72	82	79	86	86	79
	Pressure	@ 10m	59	39	41	51	48	54	55	47
UWC270DQ	Power		89	93	88	88	88	81	79	72
	Pressure	@ 10m	61	65	60	60	60	53	51	44
UWC300DQ	Power		88	89	87	87	86	84	80	74
	Pressure	@ 10m	60	61	59	59	58	56	52	46
UWC330DQ	Power		93	88	89	92	91	87	84	77
	Pressure	@ 10m	65	60	61	64	63	59	56	49
UWC360DQ	Power		95	86	90	94	94	89	87	78
	Pressure	@ 10m	67	58	62	66	66	61	59	50
UWC400DQ	Power		96	86	91	95	95	90	87	79
	Pressure	@ 10m	68	58	63	67	67	62	59	51
UWC450DQ	Power		96	87	92	96	95	91	88	80
	Pressure	@ 10m	68	59	64	68	67	63	60	52

Super Quiet - DSQ Models	Sound Measurement		Overall dB(A)	Frequency (Hz) dB						
				63	125	250	500	1000	2000	4000
UWC75DSQ	Power		80	66	65	74	76	73	74	71
	Pressure	@ 10m	48	34	34	42	44	41	42	39
UWC100DSQ	Power		78	70	63	68	74	71	72	69
	Pressure	@ 10m	46	38	31	37	42	40	41	37
UWC125DSQ	Power		80	73	68	71	73	71	76	74
	Pressure	@ 10m	49	42	36	39	41	39	44	42
UWC150DSQ	Power		80	79	70	76	75	72	76	70
	Pressure	@ 10m	48	48	38	44	43	41	44	39
UWC175DSQ	Power		82	77	69	75	73	77	78	72
	Pressure	@ 10m	50	46	38	43	42	45	46	40
UWC200DSQ	Power		83	73	68	74	70	79	79	73
	Pressure	@ 10m	52	41	36	43	39	47	48	41
UWC225DSQ	Power		87	72	70	79	76	83	83	76
	Pressure	@ 10m	56	40	38	47	44	51	52	44
UWC240DSQ	Power		88	94	88	88	90	72	69	63
	Pressure	@ 10m	60	66	60	60	62	44	41	35
UWC250DSQ	Power		89	70	71	81	78	85	85	78
	Pressure	@ 10m	58	38	40	50	47	53	54	46
UWC270DSQ	Power		87	92	87	87	88	76	72	64
	Pressure	@ 10m	59	64	59	59	60	48	44	36
UWC300DSQ	Power		85	88	86	86	85	79	73	65
	Pressure	@ 10m	57	60	58	58	57	51	45	37
UWC330DSQ	Power		90	87	88	91	91	82	77	68
	Pressure	@ 10m	62	59	60	63	63	54	49	40
UWC360DSQ	Power		92	85	89	93	93	84	79	70
	Pressure	@ 10m	64	57	61	65	65	56	51	42
UWC400DSQ	Power		93	85	90	94	94	85	80	71
	Pressure	@ 10m	65	57	62	66	66	57	52	43
UWC450DSQ	Power		94	86	91	95	95	86	81	72
	Pressure	@ 10m	66	58	63	67	67	58	53	44

1 dB(A) is the overall sound level, measured on the A scale.
2 All sound data measured at nominal conditions: Based at 12/7°C evaporator water and 30/35°C condenser water.

The Sound Pressure data quoted is only valid in free field conditions, where the unit is installed on a reflective base. If the equipment is placed adjacent to a reflective wall, values may vary to those stated, typically increasing by 3dB for each side added.

General Specification

MECHANICAL DATA			UWC75	UWC100	UWC125	UWC150	UWC175
Duty – Cooling							
Cooling Only	(1)	kW	87.5	118.9	152.0	184.2	213.1
Nominal Input	(1)	kW	22.0	29.3	37.4	45.0	50.7
EER	(2)		4.0	4.1	4.1	4.1	4.2
Capacity Steps		%	0-25-50-75-100	0-25-50-75-100	0-25-50-75-100	0-25-50-75-100	0-20-30-50-70-80-100
Dimensions - H x L x W		mm	1850 x 1800 x 760			1850 x 2000 x 760	
Weight							
Machine - D		kg	810	865	890	1240	1345
- DQ		kg	840	885	920	1270	1385
- DSQ		kg	870	925	960	1310	1415
Operating - D		kg	820	880	910	1270	1380
- DQ		kg	850	900	940	1300	1420
- DSQ		kg	880	940	980	1340	1450
Construction - Material/Colour			Plain Galvanised Steel Base with Galvanised Sheet Steel, Epoxy Baked Powder Paint Superstructure– Light Grey (RAL 7035)				
Evaporator			Brazed Plate				
Insulation			Class 0				
Quantity			1	1	1	1	1
Water Volume		l	3.7	5.1	9.4	11.0	12.3
Total Max. Water Flow		l/s	6.1	8.2	10.5	12.7	14.7
Condenser			Brazed Plate				
Insulation			Class 0				
Quantity			1	1	1	1	1
Water Volume		l	7.2	9.4	11.4	18.5	23.0
Total Max. Water Flow		l/s	7.3	9.8	12.6	15.2	17.4
Compressor			Tandem Scroll - Hermetic				
Quantity			4	4	4	4	4
Oil Charge Volume (Total)		l	4 x 4.1	4 x 4.1	4 x 4.1	4 x 4.1	4.7 + 4.1 + 4.7 + 4.1
Oil Type			Polyol Ester				
Refrigeration			Dual Circuit				
Refrigerant Control			Electronic Expansion Valve				
Refrigerant Precharged			R407C				
Charge (Total)		kg	4.9 + 4.9	6.0 + 6.0	8.0 + 8.0	11.4 + 11.4	13.2 + 13.2
Connections - Evaporator			Suits “Victaulic” type Coupling & Pipe Assembly				
Water Inlet/Outlet		mm / (in)	50 (2”)	50 (2”)	65 (2 1/2”)	65 (2 1/2”)	65 (2 1/2”)
Connections - Condenser			Suits “Victaulic” type Coupling & Pipe Assembly				
Water Inlet/Outlet		mm / (in)	65 (2 1/2”)	65 (2 1/2”)	65 (2 1/2”)	80 (3”)	80 (3”)
Water System - Evaporator							
Min. System Water Volume	(3)	l	376	511	653	792	733
Max. System Press		Bar	10	10	10	10	10
Water System - Condenser							
Min. System Water Volume	(3)	l	471	637	814	985	907
Max. System Press		Bar	10	10	10	10	10

(1) Nominal Cooling Duties based on 12/7°C evaporator water and 30/35°C condensing water, where output is the chilled water duty and input is the compressor input power.
All performance data is supplied in accordance with BS EN 14511-1:2013

(2) EER is the Cooling Duty ÷ compressor input power.

(3) For minimum system volume refer to ***Minimum System Water Volume Calculations***.

General Specification

MECHANICAL DATA			UWC200	UWC225	UWC240	UWC250	UWC270
Duty – Cooling							
Cooling Only	(1)	kW	242.9	273.7	262.2	306.3	305.9
Nominal Input	(1)	kW	56.9	64.5	62.9	72.0	72.2
EER	(2)		4.3	4.2	4.17	4.3	4.2
Capacity Steps		%	0-25-50-75-100	0-20-30-50-70-80-100	0-17-33-50-67-83-100	0-25-50-75-100	0-19-33-52-67-86-100
Dimensions - H x L x W		mm	1850 x 2000 x 760		1900 x 3200 x 900	1850 x 2000 x 760	1900 x 3200 x 900
Weight							
Machine - D		kg	1450	1525	1420	1590	1750
- DQ		kg	1490	1565	1490	1630	1820
- DSQ		kg	1520	1595	1510	1670	1840
Operating - D		kg	1490	1580	1490	1650	1830
- DQ		kg	1530	1620	1560	1690	1900
- DSQ		kg	1560	1650	1580	1730	1920
Construction - Material/Colour			Plain Galvanised Steel Base with Galvanised Sheet Steel, Epoxy Baked Powder Paint Superstructure– Light Grey (RAL 7035)				
Evaporator			Brazed Plate				
Insulation			Class 0				
Quantity			1	1	1	1	1
Water Volume		l	14.6	22.1	22.5	24.8	27.0
Total Max. Water Flow		l/s	16.8	19.0	18.1	21.3	21.1
Condenser			Brazed Plate				
Insulation			Class 0				
Quantity			1	1	2	1	2
Water Volume Circuit 1		l	26.6	31.1	23.9	35.6	23.9
Water Volume Circuit 2		l	N/A	N/A	23.9	N/A	32.9
Total Max. Water Flow		l/s	19.8	22.5	18.1	25.2	21.1
Compressor			Tandem Scroll - Hermetic		Trio Scroll – Hermetic	Tandem Scroll - Hermetic	Trio Scroll – Hermetic
Quantity			4	4	6	4	6
Oil Charge Volume (Total)		l	4 x 4.7	6.3 + 4.7 + 6.3 + 4.7	6x3.4	4 x 6.3	4.7+4.7+4.7+3.4+3.4+3.4
Oil Type			Polyol Ester				
Refrigeration			Dual Circuit				
Refrigerant Control			Electronic Expansion Valve				
Refrigerant Precharged			R407C				
Charge (Total)		Kg	15.0 + 15.0	18.6 + 18.6	17.6 + 17.6	20.8 + 20.8	23.2 + 18.7
Connections - Evaporator			Suits “Victaulic” type Coupling & Pipe Assembly				
Water Inlet/Outlet		mm / (in)	65 (2 1/2”)	80 (3”)	80 (3”)	80 (3”)	80 (3”)
Connections - Condenser			Suits “Victaulic” type Coupling & Pipe Assembly				
Water Inlet/Outlet		mm / (in)	80 (3”)	80 (3”)	80 (3”)	80 (3”)	80 (3”)
Water System - Evaporator							
Min. System Water Volume	(3)	l	1044	941	763	1317	995
Max. System Press		Bar	10	10	10	10	10
Water System – Condenser 1							
Min. System Water Volume	(3)	l	1289	1163	927	1626	1213
Max. System Press		Bar	10	10	10	10	10
Water System – Condenser 2							
Min. System Water Volume	(3)	L	N/A	N/A	927	N/A	944
Max. System Press		Bar	N/A	N/A	10	N/A	10

(1) Nominal Cooling Duties based on 12/7°C evaporator water and 30/35°C condensing water, where output is the chilled water duty and input is the compressor input power.
All performance data is supplied in accordance with BS EN 14511-1:2013

(2) EER is the Cooling Duty ÷ compressor input power.

(3) For minimum system volume refer to ***Minimum System Water Volume Calculations***.

General Specification

MECHANICAL DATA			UWC300	UWC330	UWC360	UWC400	UWC450
Duty – Cooling							
Cooling Only	(1)	kW	351.4	396.1	441.6	486.0	528.6
Nominal Input	(1)	kW	81.5	92.4	103.3	116.1	128.7
EER	(2)		4.3	4.3	4.3	4.2	4.1
Capacity Steps		%	0-17-33-50-67-83-100	0-19-33-52-67-85-100	0-17-33-50-67-83-100	0-18-33-51-67-85-100	0-17-33-50-67-83-100
Dimensions - H x L x W		mm	1900 x 3200 x 900				
Weight							
Machine - D		kg	2080	2190	2300	2480	2660
- DQ		kg	2150	2260	2370	2550	2730
- DSQ		kg	2170	2280	2390	2570	2750
Operating - D		kg	2180	2300	2420	2620	2820
- DQ		kg	2240	2380	2500	2680	2900
- DSQ		kg	2280	2380	2500	2720	2900
Construction - Material/Colour			Plain Galvanised Steel Base with Galvanised Sheet Steel, Epoxy Baked Powder Paint Superstructure– Light Grey (RAL 7035)				
Evaporator			Brazed Plate				
Insulation			Class 0				
Quantity			1	1	1	1	1
Water Volume		l	32.4	36.9	41.4	49.5	55.8
Total Max. Water Flow		l/s	24.3	27.4	30.7	33.7	36.5
Condenser			Brazed Plate				
Insulation			Class 0				
Quantity			2	2	2	2	2
Water Volume Circuit 1		l	32.9	32.9	40.1	40.1	51.8
Water Volume Circuit 2		l	32.9	40.1	40.1	51.8	51.8
Total Max. Water Flow		l/s	24.3	27.4	30.7	33.7	36.5
Compressor			Trio Scroll - Hermetic				
Quantity			6	6	6	6	6
Oil Charge Volume (Total)		l	6 x 4.7	6.3+6.3+6.3+4.7 +4.7+4.7	6 x 6.3	5.9+5.9+5.9+6.3 +6.3+6.3	6 x 5.9
Oil Type			Polyol Ester				
Refrigeration			Dual Circuit				
Refrigerant Control			Electronic Expansion Valve				
Refrigerant Precharged			R407C				
Charge (Total)		Kg	24.5 + 24.5	29.3 + 25.7	30.4 + 30.4	38.3 + 32.4	39.8 + 39.8
Connections - Evaporator			Suits “Victaulic” type Coupling & Pipe Assembly				
Water Inlet/Outlet		mm / (in)	80 (3”)	80 (3”)	80 (3”)	80 (3”)	80 (3”)
Connections - Condenser			Suits “Victaulic” type Coupling & Pipe Assembly				
Water Inlet/Outlet		mm / (in)	80 (3”)	80 (3”)	80 (3”)	80 (3”)	80 (3”)
Water System - Evaporator							
Min. System Water Volume	(3)	l	1023	1289	1286	1498	1539
Max. System Press		Bar	10	10	10	10	10
Water System – Condenser 1							
Min. System Water Volume	(3)	l	1234	1539	1554	1863	1874
Max. System Press		Bar	10	10	10	10	10
Water System – Condenser 2							
Min. System Water Volume	(3)	l	1234	1247	1554	1571	1874
Max. System Press		Bar	10	10	10	10	10

(1) Nominal Cooling Duties based on 12/7°C evaporator water and 30/35°C condensing water, where output is the chilled water duty and input is the compressor input power.
All performance data is supplied in accordance with BS EN 14511-1:2013

(2) EER is the Cooling Duty ÷ compressor input power.

(3) For minimum system volume refer to ***Minimum System Water Volume Calculations***.

General Specification

ELECTRICAL DATA			UWC75	UWC100	UWC125	UWC150	UWC175
Unit Data							
Nominal Run Amps	(1)	A	47	58	74	90	103
Maximum Start Amps	(2)	A	1363	164	226	242	289
Permanent Supply		VAC			230V 1PH 50Hz		
Mains Supply		VAC			400V 3PH 50Hz		
Rec Permanent Fuse Size		A	16	16	16	16	16
Rec Mains Fuse Size		A	63	80	100	125	125
Max Permanent Incoming Cable Size		mm²			4 mm² terminals		
Max Mains Incoming Cable Size		mm²			70 (direct to MCCB)		
Control Circuit		VAC			24V/230VAC		
Evaporator							
Pad Heater Rating		W	40	40	40	80	100
External Trace Heating							
Available (fitted by others)		W	500	500	500	500	500
Compressor - Per Compressor							
Quantity			4	4	2+2	4	2+2
Motor Rating		kW	6.2	8.1	8.1/12.3	12.3	12.3/16.8
Nominal Run Amps	(1)	A	11.7	14.5	14.5/22.4	22.4	22.4//28.9
Crankcase Heater Rating		W	70.0	70.0	70.0/70	70.0	70.0/120.0
Start Amps	(2)		98	120	120/175	175	175/215
Type Of Start					Direct on line		
OPTIONAL EXTRAS							
Power Factor Correction							
Nominal Run Amps	(1)	A	40	52	66	72	92
Maximum Start Amps	(2)	A	128	159	221	235	281
Recommended Mains Fuse		A	63	80	100	100	125
Compressor Nominal Run Amps - Per Compressor		A	10	13	13.0/20.0	20	20/26
Electronic Soft-Start							
Nominal Run Amps	(1)	A	47	58	74	80	103
Maximum Start Amps	(2)	A	94	116	156	172	203
Recommended Mains Fuse		A	63	80	100	125	125

(1) Based at 12/7°C evaporator water and 30/35°C condenser water.
(2) Starting amps refers to the direct on line connections.

General Specification

ELECTRICAL DATA			UWC200	UWC225	UWC240	UWC270	UWC300
Unit Data							
Nominal Run Amps	(1)	A	116	129	149	155	151
Maximum Start Amps	(2)	A	350	355	299	380	376
Permanent Supply		VAC			230V 1PH 50Hz		
Mains Supply		VAC			400V 3PH 50Hz		
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		mm²			4 mm² terminals		
Max Mains Incoming Cable Size		mm²			70 (direct to MCCB)		
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
Compressor - Per Compressor							
Quantity			2+2	2+2	3+3	3+3	3+3
Motor Rating		kW	12.3/20.6	14.4/17.9	12.3/12.3	12.3/14.4	14.4/14.4
Nominal Run Amps	(1)	A	22.4/35.6	25.2/32.2	24.9/24.9	24.9/25.2	25.2/25.2
Crankcase Heater Rating		W	120/150	120/150	N/A	N/A	N/A
Start Amps	(2)		175/270	225/272	174/174	174/225	225/225
Type Of Start					Direct on line		
OPTIONAL EXTRAS							
Power Factor Correction							
Nominal Run Amps	(1)	A	104	116	134	134	135
Maximum Start Amps	(2)	A	342	354	286	337	338
Recommended Mains Fuse		A	125	160	200	200	160
Compressor Nominal Run Amps - Per Compressor		A	20/32	22.5/28.8	22.3/22.3	22.3/22.5	22.5/22.5
Electronic Soft-Start							
Nominal Run Amps	(1)	A	116	129	149	155	141
Maximum Start Amps	(2)	A	242	255	229	280	234
Recommended Mains Fuse		A	160	160	200	200	200

(1) Based at 12/7°C evaporator water and 30/35°C condenser water.
(2) Starting amps refers to the direct on line connections.

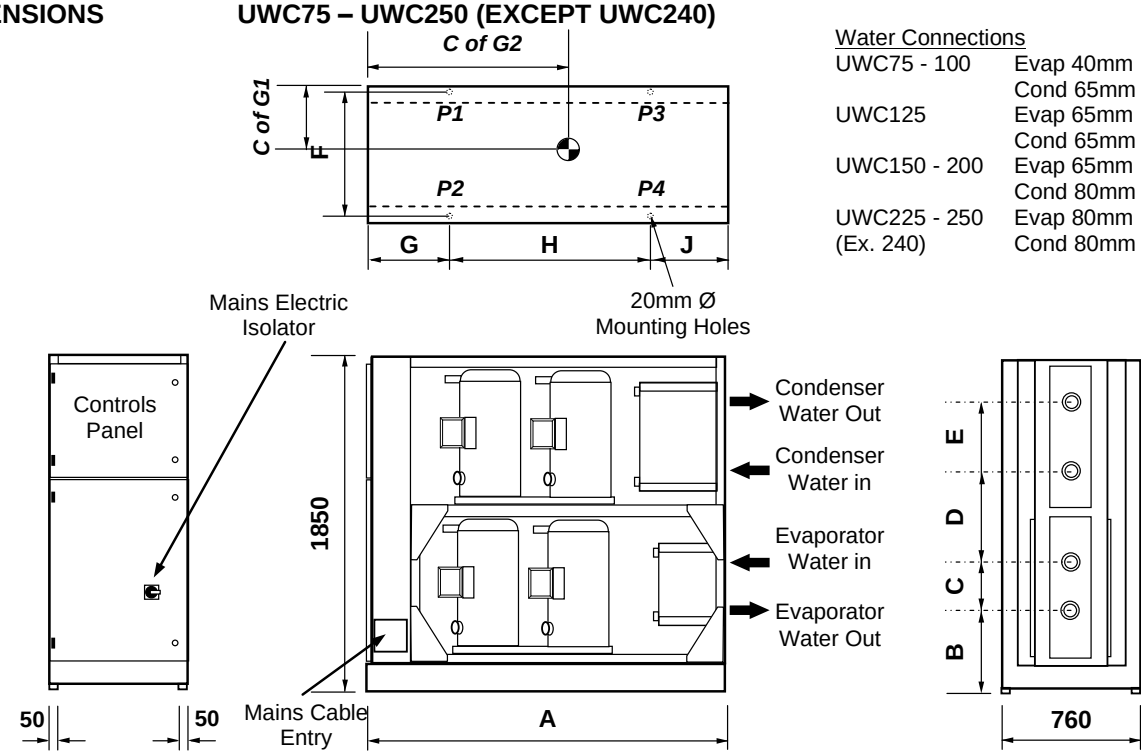
ELECTRICAL DATA			UWC330	UWC360	UWC400	UWC450
Unit Data						
Nominal Run Amps	(1)	A	172	193	218	242
Maximum Start Amps	(2)	A	412	433	497	522
Permanent Supply		VAC		230V 1PH 50Hz		
Mains Supply		VAC		400V 3PH 50Hz		
Rec Permanent Fuse Size		A	16	16	16	16
Rec Mains Fuse Size		A	250	250	315	315
Max Permanent Incoming Cable Size		mm²		4 mm² terminals		
Max Mains Incoming Cable Size		mm²		70 (direct to MCCB)		
Control Circuit		VAC		24V/230VAC		
Evaporator						
Pad Heater Rating		W	100	100	100	100
External Trace Heating						
Available (fitted by others)		W	500	500	500	500
Compressor - Per Compressor						
Quantity			3+3	3+3	3+3	3+3
Motor Rating		kW	17.9/14.4	17.9/17.9	22.5/17.9	22.5/22.5
Nominal Run Amps	(1)	A	32.2/25.2	32.2/32.2	40.3/32.2	40.3/40.3
Crankcase Heater Rating		W	N/A	N/A	N/A	N/A
Start Amps	(2)		272/225	272/272	320/272	320/320
Type Of Start				Direct on line		
OPTIONAL EXTRAS						
Power Factor Correction						
Nominal Run Amps	(1)	A	154	173	195	217
Maximum Start Amps	(2)	A	397	416	479	501
Recommended Mains Fuse		A	250	250	315	315
Compressor Nominal Run Amps - Per Compressor		A	28.8/22.5	28.8/28.8	36.1/28.8	36.1/36.1
Electronic Soft-Start						
Nominal Run Amps	(1)	A	180	201	228	252
Maximum Start Amps	(2)	A	303	324	369	394
Recommended Mains Fuse		A	250	250	315	315

(1) Based at 12/7°C evaporator water and 30/35°C condenser water.
(2) Starting amps refers to the direct on line connections.

General Specification

DIMENSIONS

UWC75 – UWC250 (EXCEPT UWC240)



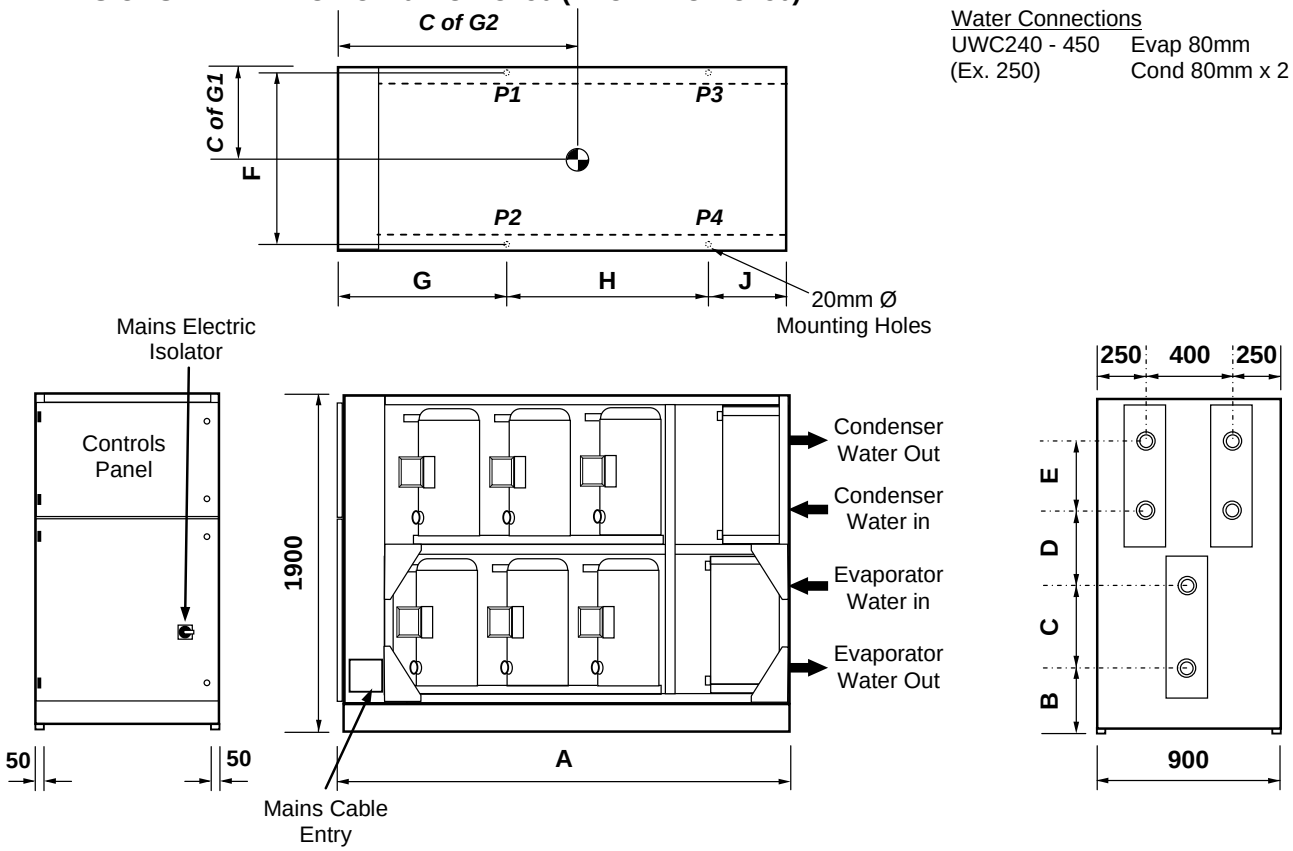
Water Connections

UWC75 - 100	Evap 40mm
	Cond 65mm
UWC125	Evap 65mm
	Cond 65mm
UWC150 - 200	Evap 65mm
	Cond 80mm
UWC225 - 250	Evap 80mm
(Ex. 240)	Cond 80mm

Model Size		A	B	C	D	E	F	G	H	J
UWC75	mm	1800	428	308	482	397	710	462	876	462
UWC100	mm	1800	428	308	482	397	710	462	876	462
UWC125	mm	1800	383	397	438	397	710	462	876	462
UWC150	mm	2000	380	397	325	628	710	462	1076	462
UWC175	mm	2000	380	397	325	628	710	462	1076	462
UWC200	mm	2000	380	397	325	628	710	462	1076	462
UWC225	mm	2000	268	628	207	628	710	462	1076	462
UWC250	mm	2000	268	628	207	628	710	462	1076	462

General Specification

DIMENSIONS **UWC240 – UWC450 (EXCEPT UWC250)**



Water Connections

UWC240 - 450	Evap 80mm
(Ex. 250)	Cond 80mm x 2

Model Size		A	B	C	D	E	F	G	H	J
UWC240	mm	3200	256	628	269	628	850	970	1730	500
UWC270	mm	3200	256	628	269	628	850	970	1730	500
UWC300	mm	3200	256	628	269	628	850	970	1730	500
UWC330	mm	3200	256	628	269	628	850	970	1730	500
UWC360	mm	3200	256	628	269	628	850	970	1730	500
UWC400	mm	3200	256	628	269	628	850	970	1730	500
UWC450	mm	3200	256	628	269	628	850	970	1730	500

General Specification

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

Model D		P1	P2	P3	P4	Operating Weight	C of G1 (m)	C of G2 (m)
UWC75D	kg	165	165	245	245	820	380	720
UWC100D	kg	175	175	265	265	880	380	720
UWC125D	kg	180	180	275	275	910	380	730
UWC150D	kg	255	255	380	380	1270	380	850
UWC175D	kg	275	275	415	415	1380	380	850
UWC200D	kg	300	300	445	445	1490	380	850
UWC225D	kg	315	315	475	475	1580	380	860
UWC240D	kg	560	560	340	340	1490	1624	450
UWC250D	kg	330	330	495	495	1650	380	860
UWC270D	kg	610	610	380	380	1830	1721	450
UWC300D	kg	670	670	420	420	2180	1723	450
UWC330D	kg	690	690	460	460	2300	1739	450
UWC360D	kg	720	720	490	490	2420	1744	450
UWC400D	kg	760	760	550	550	2620	1760	450
UWC450D	kg	810	810	600	600	2820	1765	450

Model DQ		P1	P2	P3	P4	Operating Weight	C of G1 (m)	C of G2 (m)
UWC75DQ	kg	170	170	255	255	850	380	720
UWC100DQ	kg	180	180	270	270	900	380	720
UWC125DQ	kg	190	190	280	280	940	380	720
UWC150DQ	kg	260	260	390	390	1300	380	850
UWC175DQ	kg	285	285	425	425	1420	380	850
UWC200DQ	kg	305	305	460	460	1530	380	850
UWC225DQ	kg	325	325	485	485	1620	380	860
UWC240DQ	kg	580	580	360	360	1560	1720	450
UWC250DQ	kg	340	340	505	505	1690	380	860
UWC270DQ	kg	630	630	400	400	1900	1726	450
UWC300DQ	kg	680	680	440	440	2240	1731	450
UWC330DQ	kg	710	710	480	480	2380	1742	450
UWC360DQ	kg	740	740	510	510	2500	1747	450
UWC400DQ	kg	780	780	560	560	2680	1758	450
UWC450DQ	kg	830	830	620	620	2900	1767	450

Model DSQ		P1	P2	P3	P4	Operating Weight	C of G1 (m)	C of G2 (m)
UWC75DSQ	kg	175	175	265	265	880	380	720
UWC100DSQ	kg	190	190	280	280	940	380	720
UWC125DSQ	kg	195	195	295	295	980	380	730
UWC150DSQ	kg	270	270	400	400	1340	380	850
UWC175DSQ	kg	290	290	435	435	1450	380	850
UWC200DSQ	kg	310	310	470	470	1560	380	850
UWC225DSQ	kg	330	330	495	495	1650	380	860
UWC240DSQ	kg	590	590	360	360	1580	1716	450
UWC250DSQ	kg	345	345	520	520	1730	380	860
UWC270DSQ	kg	640	640	400	400	1920	1722	450
UWC300DSQ	kg	690	690	450	450	2280	1733	450
UWC330DSQ	kg	710	710	480	480	2380	1742	450
UWC360DSQ	kg	740	740	510	510	2500	1747	450
UWC400DSQ	kg	790	790	570	570	2720	1759	450
UWC450DSQ	kg	830	830	620	620	2900	1767	450

1 For C of G diagram refer to ***Unit Lifting***.

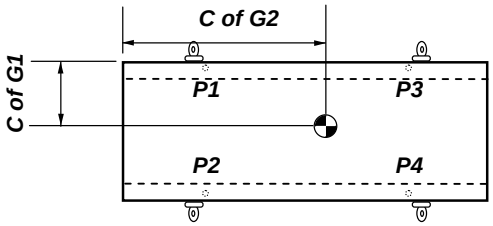
Installation Data

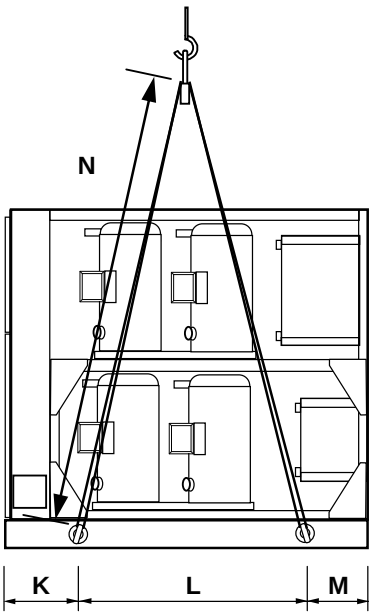
UNIT LIFTING

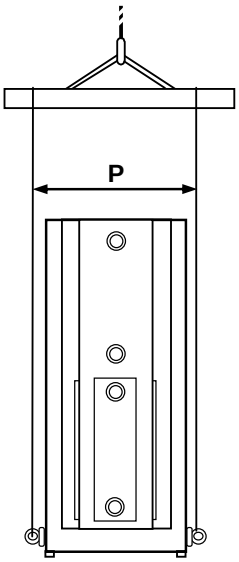
- Employ lifting specialists.
- Local codes and regulations relating to the lifting of this type of equipment should be observed.
- Use the lifting eye bolts provided.
- Use the appropriate spreader bars/lifting slings with the holes/lugs provided.
- Attach lifting chains to the 4 lifting eye bolts, 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

		K	L	M	N	P
UWC 75 - 125	mm	370	1060	370	2100	850
UWC 150 - 250 (Ex. 240)	mm	370	1260	370	2100	850
UWC 240 - 450 (Ex. 250)	mm	885	1900	415	2100	990

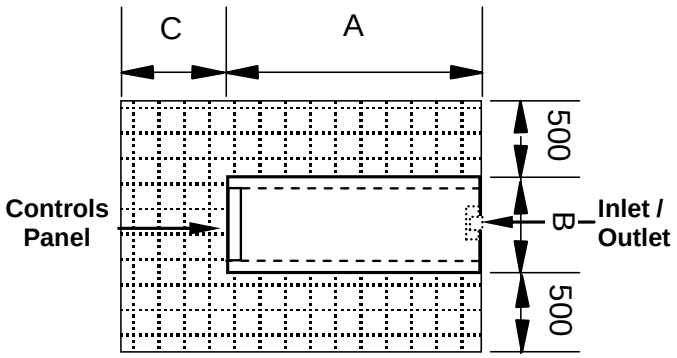
Installation Data

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.

CAUTION **Prior to connecting services, ensure that the equipment is installed and completely level.**



Model Size		A	B	C
UWC 75 – 125	mm	1800	760	760
UWC 150 – 250 (Ex. 240)	mm	2000	760	760
UWC 240 – 450 (Ex. 250)	mm	3200	900	900

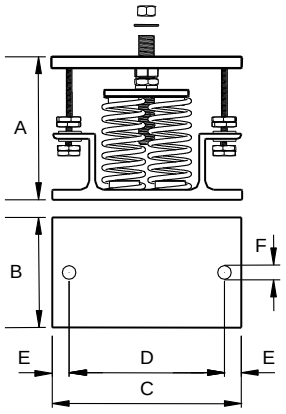
Installation Data

ANTI VIBRATION MOUNTING (OPTIONAL)

Spring Type

Each mount is coloured to indicate the different loads, refer to instructions supplied for correct allocation.

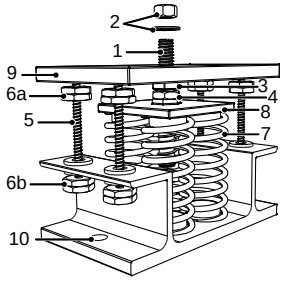
Dimensions



			A(1)	B	C	D	E	FØ
DCC22x Units	(3)	mm	180	130	225	186	20	16

(1) Unloaded dimension

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 Slacken levelling lock nut (4). (the levelling screw will not move if this is not slackened)
6 Remove retaining nut and washer (2), lower the unit onto the mounts and replace retaining nut and washer.
7 Beginning with the mount with the largest deflection adjust the height of each mount using the levelling screw (3).

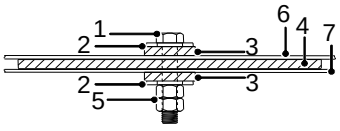
CAUTION **Mountings must be adjusted incrementally in turn. Do not fully adjust 1 mount at a time as this may overload and damage springs.**

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

WATER SYSTEM

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.
- In ambients of 0°C and below and when water supply temperatures of +5°C are required, the necessary concentration of Glycol or use of an electrical trace heater is added where static water can be expected.
- 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.**

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

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

- A 20 mesh strainer fitted prior to the evaporator and condenser inlet.
- Water-flow commissioning valve set fitted to the system.
- In multiple chiller installations, 2 commissioning valve sets are 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.

Interlocks & Protection

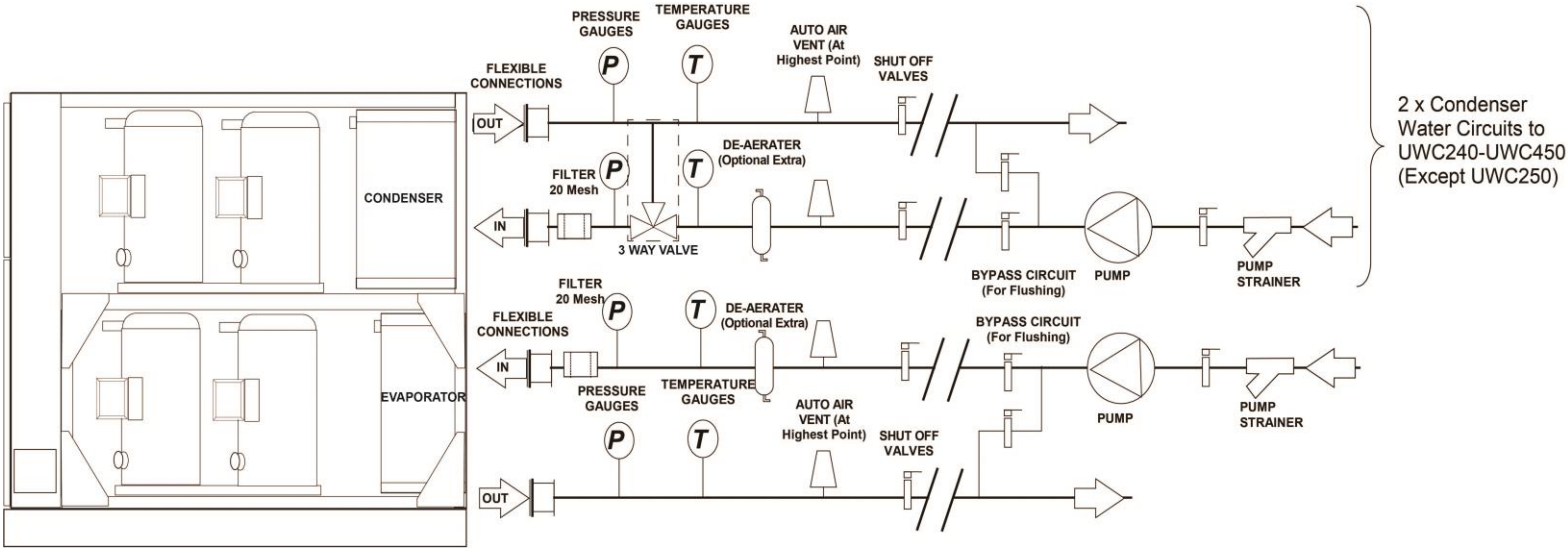
Always electrically interlock the operation of the chiller with the pump controls **and** water flow switch for safety reasons. **Failure to do this will invalidate the chiller warranty.**

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

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

Installation Data

Standard Recommended Installation (Parts Supplied By Others)



CONDENSER HEAD PRESSURE CONTROL

To ensure correct operation of the chiller a 3-way bypass valve must be installed on the condenser return water leg. The 3-way bypass valve should control the flow of water to the condenser by sensing the liquid line pressure. The aim is to maintain the design head pressure setpoint throughout the operation of the chiller at various loading stages and ambient conditions.

For example the 3-way bypass valve on a chiller running at minimum load in a low ambient condition would be expected to be bypassing a portion of the flow to increase head pressure on the refrigerant circuit.

The 3-way bypass valve should be commissioned with one compressor running initially to ensure correct operation.

Installation Data

ELECTRICAL

General

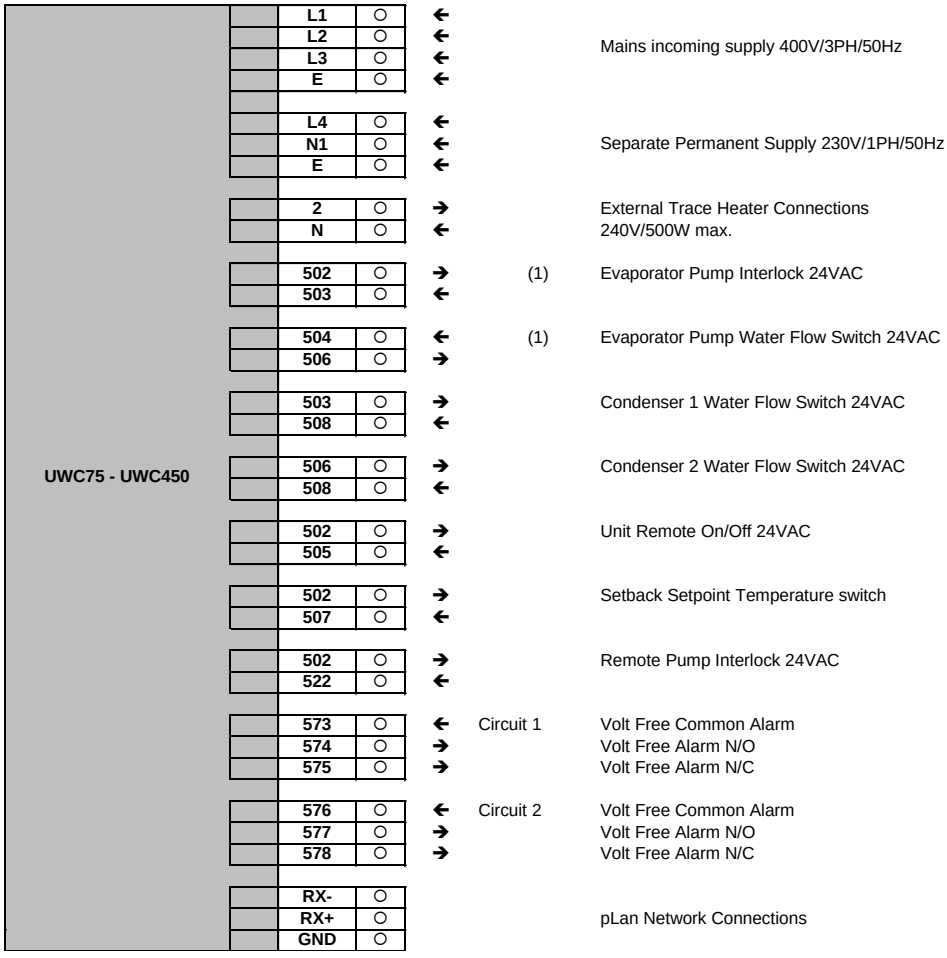
- As standard the equipment is designed for 400V, 3 phase, 3 wire 50Hz and a separate permanent 230V, 1 phase, 50Hz supply, to all relevant IEE regulations, British standards and IEC requirements.
- A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.
- 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 <u>MUST BE FITTED</u> for the compressor sump heater, evaporator trace heating and control circuits, <u>FAILURE to do so could INVALIDATE WARRANTY</u>.**

INTERCONNECTING WIRING



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

APPLIED THERMAL INNOVATION

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

CAUTION

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

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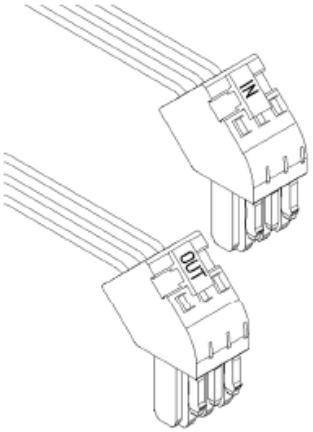
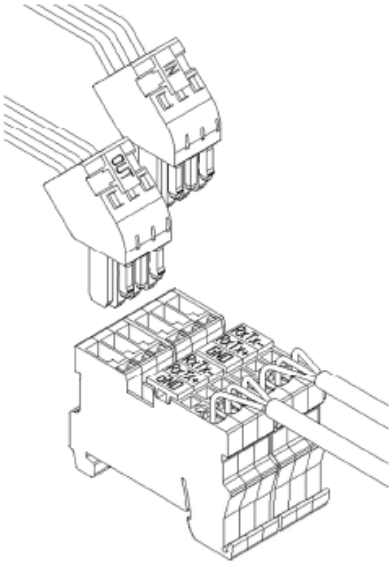
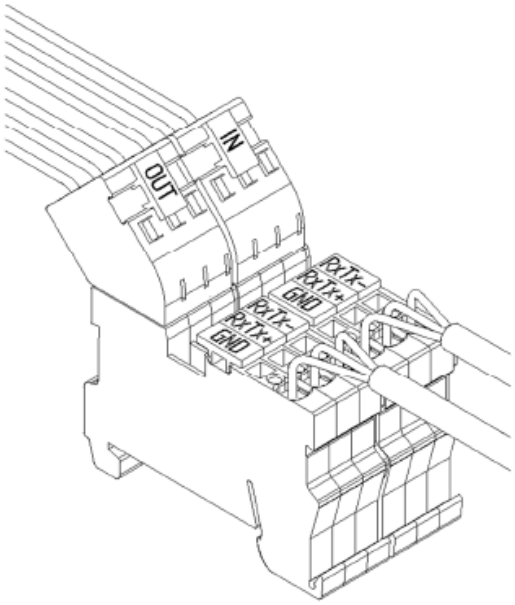
1. Disconnect power to the control circuit before wiring the pLAN connection.



2. Remove the plugs from the bag and wire the pLAN connections to them. Check the correct orientation of the connections against the terminal labels and wiring diagram. Ensure the other end of the pLAN cable is also correctly terminated.



3. Check wiring to ensure no shorts or incorrect connections before connecting to the unit. Failure to do so may cause serious damage to electrical components.



4. Plug the pLAN connectors into the terminals. The control circuit power can then be reconnected.

Dry Cooler Specification

GENERAL SPECIFICATION

Water Cooled Chiller		UWC75	UWC100	UWC125	UWC150	UWC175
Matched Dry Cooler – Per Unit		**DE75**	**DE100**	**DE125**	**DE150**	**DE175**
Sound Data						
Sound Pressure Level at 10m	dB(A)	52	56	56	50	56
Mechanical Data						
Dimensions						
Horizontal - H x L x W -	mm	1168 x 4625 x 630	1383 x 4753 x 795	1383 x 4753 x 795	1383 x 6228 x 795	2286 x 3658 x 760
Vertical - H x L x W	mm	1020 x 4625 x 1098	1335 x 4756 x 1272	1335 x 4756 x 1272	1335 x 6228 x 1272	1220 x 3658 x 2286
Weight - Machine	kg	337	388	470	646	519
Construction - Material/Colour		Painted Galvanised Steel – Light Grey (RAL 9002)				
Dry Cooler Coil						
Nominal Airflow	m³/s	9.3	16.8	16.3	16.4	19.9
Discharge		Vertical or Horizontal				
Fan & Motor						
Quantity		4	3	3	4	6
Diameter	mm	630	800	800	800	630
Maximum Speed	rpm	870	890	890	680	1140
Connections						
Water Inlet/Outlet	in	2 1/2	2 1/2	3	4	4
Electrical Data						
Mains Supply	VAC	400V 3PH 50Hz				
Nominal Run Amps	A	5.2	12.0	12.0	9.6	12.0

Water Cooled Chiller		UWC200	UWC225	UWC240	UWC250	UWC270
Matched Dry Cooler – Per Unit		**DE200**	**DE225**	**DE240 x 2**	**DE250**	**DE240 & DE300**
Sound Data						
Sound Pressure Level at 10m	dB(A)	60	59	58	59	58 & 57
Mechanical Data						
Dimensions						
Horizontal - H x L x W -	mm	2286 x 3658 x 760	2436 x 4783 x 878	1168 x 4625 x 630	2436 x 4783 x 878	1168 x 4625 x 630 & 1383 x 6228 x 795
Vertical – H x L x W	mm	1220 x 3658 x 2286	1335 x 4783 x 2436	1020 x 4625 x 1098	1335 x 4783 x 2436	1020 x 4625 x 1098 & 1335 x 6228 x 1272
Weight – Machine	Kg	601	860	391	910	391 & 611
Construction - Material/Colour		Painted Galvanised Steel – Light Grey (RAL 9002)				
Dry Cooler Coil						
Nominal Airflow	m³/s	21.4	32.0	14.3	30.5	14.3 & 21.7
Discharge		Vertical or Horizontal				
Fan & Motor						
Quantity		6	6	4	6	4 & 4
Diameter	mm	630	800	630	800	630 & 800
Maximum Speed	Rpm	1380	890	1380	890	1380 & 890
Connections						
Water Inlet/Outlet	in	4	4	2 1/2	2 x 4	2 1/2 & 3
Electrical Data						
Mains Supply	VAC	400V 3PH 50Hz				
Nominal Run Amps	A	18.6	24.0	12.4	24	24.0 & 16.0

(1) Standard unit match based on 12/7°C chilled water, 40/45°C condenser glycol solution (20% ethylene), 30° ambient. For alternative conditions, please contact Airedale.

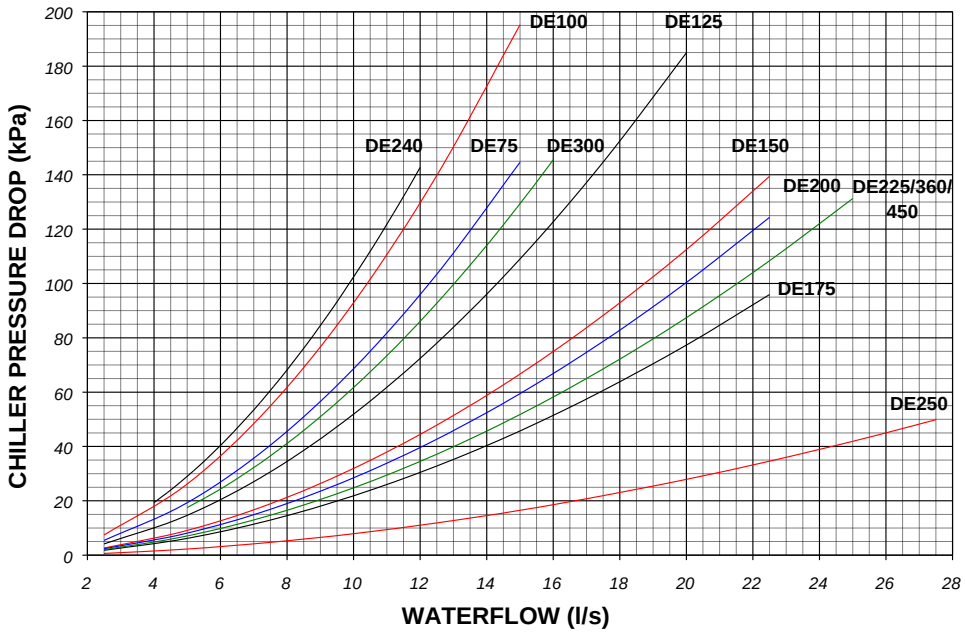
Dry Cooler Specification

GENERAL SPECIFICATION

Water Cooled Chiller		UWC300	UWC330	UWC360	UWC400	UWC450
Matched Dry Cooler – Per Unit		**DE300 x 2**	**DE300 & DE360**	**DE360 x 2**	**DE360 & DE450**	**DE450 x 2**
Sound Data						
Sound Pressure Level at 10m	dB(A)	57	57 & 59	59	59 & 59	59
Mechanical Data						
Dimensions						
Horizontal - H x L x W -	mm	1383 X 6228 X 795	1383 X 6228 X 795 & 2436 X 4783 X 878	2436 X 4783 X 878	2436 X 4783 X 878 & 2436 X 4783 X 878	2436 X 4783 X 878
Vertical – H x L x W	mm	1335 X 6228 X 1272	1335 X 6228 X 1272 & 1335 X 4783 X 2436	1335 X 4783 X 2436	1335 X 4783 X 2436 & 1335 X 4783 X 2436	1335 X 4783 X 2436
Weight - Machine	kg	611	611 & 860	860	860 & 860	860
Construction - Material / Colour		Painted Galvanised Steel – Light Grey (RAL 9002)				
Dry Cooler Coil						
Nominal Airflow	m³/s	21.7	21.7 & 21.7	32.0	32.0 & 32.0	32.0
Discharge		Vertical or Horizontal				
Fan & Motor						
Quantity		4	4 & 6	6	6 & 6	6
Diameter	mm	800	800 & 800	800	800 & 800	800
Maximum Speed	rpm	890	890 & 890	890	890 & 890	890
Connections						
Water Inlet / Outlet	in	3	3 & 4	4	4 & 4	4
Electrical Data						
Mains Supply	VAC	400V 3PH 50Hz				
Nominal Run Amps	A	16.0	16.0 & 24.0	24.0	24.0 & 24.0	24.0

(1) Standard unit match based on 12/7°C chilled water, 40/45°C condenser glycol solution (20% ethylene), 30° ambient. For alternative conditions, please contact Airedale.

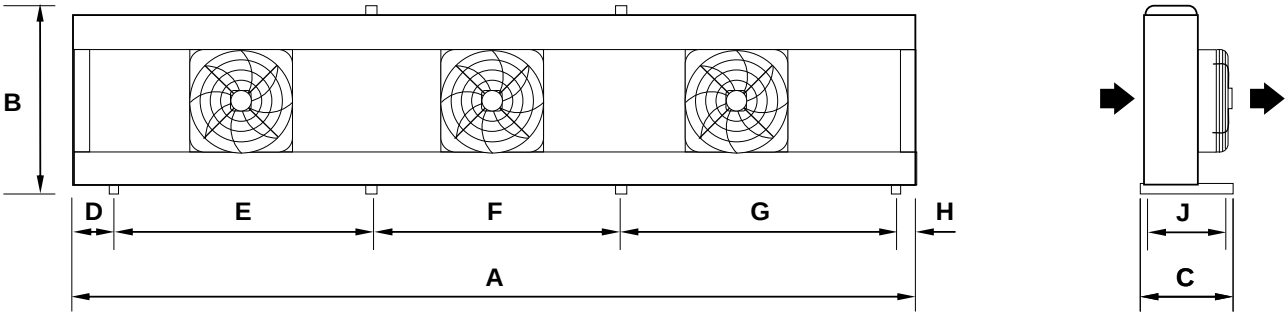
WATERSIDE PRESSURE DROPS



(1) For glycol solutions, please refer to ***Glycol Data***.

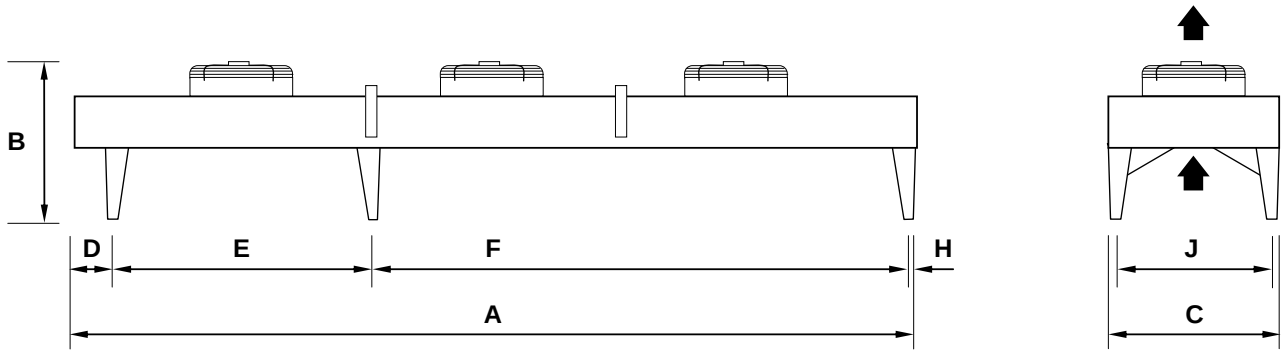
Dry Cooler Installation Data

DIMENSIONS



HORIZONTAL		A	B	C[1]	D	E	F	G	H	J
DE75-H	mm	4625	1168	530 (630)	183	2186	N/A	2187	69	492
DE100-H	mm	4753	1383	795	293	1450	1475	1450	85	745
DE125-H	mm	4753	1383	795	293	1450	1475	1450	85	745
DE150-H	mm	6228	1383	795	293	1450	2 x 1475	1450	85	745
DE175-H	mm	3658	2286	760	323	1075	1100	1075	85	492
DE200-H	mm	3658	2286	760	323	1075	1100	1075	85	492
DE225-H	mm	4783	2436	878	323	1450	1475	1450	85	745
DE240-H	mm	4625	1168	530 (630)	183	2186	N/A	2187	69	492
DE250-H	mm	4783	2436	878	323	1450	1475	1450	85	745
DE300-H	mm	6228	1383	795	293	1450	2 x 1475	1450	85	745
DE360-H	mm	4783	2436	878	323	1450	1475	1450	85	745
DE450-H	mm	4783	2436	878	323	1450	1475	1450	85	745

(1) Dimensions C represents unit footprint, figures in brackets represents overall unit width.



VERTICAL		A	B	C	D	E	F	G	H	J
DE75-V	mm	4625	1020	1098	170	2193	N/A	2206	55	1037
DE100-V	mm	4753	1335	1272	288	1385	N/A	3003	80	1171
DE125-V	mm	4753	1335	1272	288	1385	N/A	3003	80	1171
DE150-V	mm	6228	1335	1272	288	2860	N/A	3003	80	1171
DE175-V	mm	3658	1220	2286	317	1082	N/A	2181	80	2071
DE200-V	mm	3658	1220	2286	317	1082	N/A	2181	80	2071
DE225-V	mm	4783	1335	2436	317	1456	N/A	2930	80	2221
DE240-V	mm	4625	1020	1098	170	2193	N/A	2206	55	1037
DE250-V	mm	4783	1335	2436	317	1456	N/A	2930	80	2221
DE300-V	mm	6228	1335	1272	288	2860	N/A	2930	80	1171
DE360-V	mm	4783	1335	2436	317	1456	N/A	2930	80	2221
DE450-V	mm	4783	1335	2436	317	1456	N/A	2930	80	2221

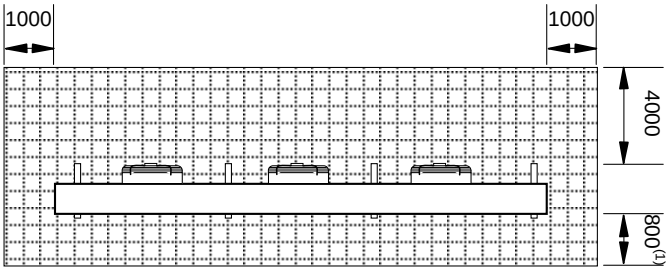
WEIGHTS Refer to ***General Specification***.

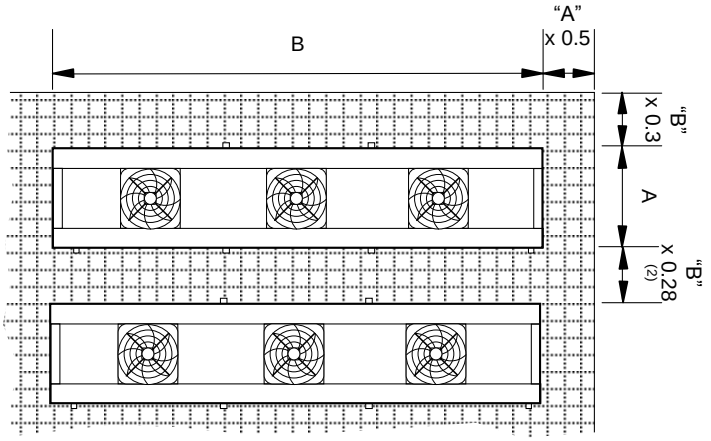
Dry Cooler Installation Data

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 with the holes/lugs provided.
- Lift the unit slowly and evenly.
- If the unit is dropped, it should immediately be checked for damage and reported to Airedale Service.

POSITIONING





(1) 1 Row of fans, when 2 rows, allow 1.5m between structure and unit.
(2) Free field, for enclosure allow "B" x 0.5.

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
- 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.
- Ensure there are no obstructions directly above the fans.
- Allow free space above the fans to prevent air recirculation.

Notes:

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PART NO:	ISSUE	DATE
903-119 TM E	~~A~~	~~01/07/04~~
	B	02/08/04
	C	02/2011
	V1.3.0	02_2013
	V1.4.0	07_2014
	V1.5.0	10/2014
	V1.6.0	08/2015