



INSTALLATION & MAINTENANCE MANUAL

Concept & Concept^{Plus}



ISO 14001
EMS52086



ISO 9001
FM00542

About Airedale Products & Customer Services

WARRANTY, COMMISSIONING & MAINTENANCE

As standard, Airedale guarantees all non consumable **parts only** for a period of **24 months**, variations tailored to suit product and application are also available, please contact Airedale for full terms and details.

To further protect your investment in Airedale products, we have introduced Airedale Service, who can provide full commissioning services, comprehensive maintenance packages and service cover 24 hours a day, 365 days a year (UK mainland). For a free quotation contact our Airedale Service or your local Sales Engineer.

All Airedale products are designed in accordance with EU Directives regarding prevention of build up of water, associated with the risk of contaminants such as Legionella.

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

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

CAUTION



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

SPARES

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

TRAINING

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

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Training Enquiries	+ 44 (0) 113 239 1000	marketing@airedale.com

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

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General Statement

IMPORTANT

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

SAFETY

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

CAUTION

1 **Service and maintenance of Airedale equipment should only be carried out by Technically trained competent personnel.**

CAUTION

2 **When working with any air conditioning units ensure that the electrical isolator is switched off prior to servicing or repair work and that there is no power to any part of the equipment.**

3 Also ensure that there are no other power feeds to the unit such as fire alarm circuits, BMS circuits etc

4 Electrical installation commissioning and maintenance work on this equipment should be undertaken by competent and trained personnel in accordance with local relevant standards and codes of practice.

5 Refrigerant used in this range of products is classified under the COSHH regulations as an irritant, with set Occupational Exposure Levels (OEL) for consideration if this plant is installed in confined or poorly ventilated areas.


6 A full hazard data sheet in accordance with COSHH regulations is available should this be required.

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

 Airedale International Air Conditioning Ltd.		UK OFFICE			
		Tel: 0113 2391000 Fax: 0113 2507219			
Model	Serial No	Voltage		Date of Mfg	
CSS12	U60000-01-01	240/1/50		30/06/99	
Fan Motor:	78 W	80	FLA	1.00 LRA	
Heating:	5.00 kW	20.80	FLA		
Humidity:	KG	FLA			
Fuse Rating:	25 A				
Net Weight:	57.5 KG	Refrigerant:	R407c		

CE DIRECTIVE



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

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

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

Warranty

GENERAL

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

The equipment carries Airedale's standard warranty for a period of 24 months from the date of despatch or of invoice which ever is the sooner in respect of non-consumable parts only and does not include for the cost of labour incurred during the investigation or replacement of a defective item.

WARRANTY IS ONLY VALID IN THE EVENT THAT:

- 1 The equipment is serviced & maintained by Airedale or an approved Airedale company in accordance with the Installation & Maintenance manual provided, during the Warranty Period.
- 2 Commissioning is carried out by Airedale or an approved Airedale company.
- 3 Commissioning documents have been completed and returned to Airedale within 28 days of the date of commissioning.
- 4 Replaced faulty parts have been returned to Airedale within 21 days of replacement for evaluation.

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

When a component part fails, a replacement part should be obtained through our Spares department. If the part is considered to be under warranty, the following details are required to process this requirement.

- Full description of part required, including Airedale's part number, if known.
- The original equipment serial (U) or (BP) number.
- An appropriate purchase order number.

A spares order will be raised under our "G" number system and the replacement part will be despatched, usually within 24 hours should they be in stock.

When replaced, the faulty part must be returned to Airedale with a suitably completed and securely attached "Faulty Component Return" (FCR) tag. FCR tags are available from Airedale and supplied with each "G" order.

On receipt of the faulty part, suitably tagged, Airedale will pass to its Warranty department, where it will be fully inspected and tested in order to identify the reason for failure, identifying at the same time whether warranty is justified or not.

On completion of the investigation of the returned part, a full "Report on Goods Returned" will be issued. On occasion the release of this complete report may be delayed as component manufacturer becomes involved in the investigation.

When warranty is allowed, a credit against the "G" number invoice will be raised. Should warranty be refused the "G" number invoice becomes payable on normal terms.

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

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.

Loose Items List

GENERAL

Control unit:
Infra-red transmitter (Part No 009-311) &
Wall bracket (Part No. 009-287)

Or
Wall Mounted Pendant controller (Part No 009-347) and
Cable (Part No 009-348)

2 off AAA Batteries (Part No 009-229)

Fresh Air Option Fixing (Self Adhesive Velcro strip (Part No 516-023))

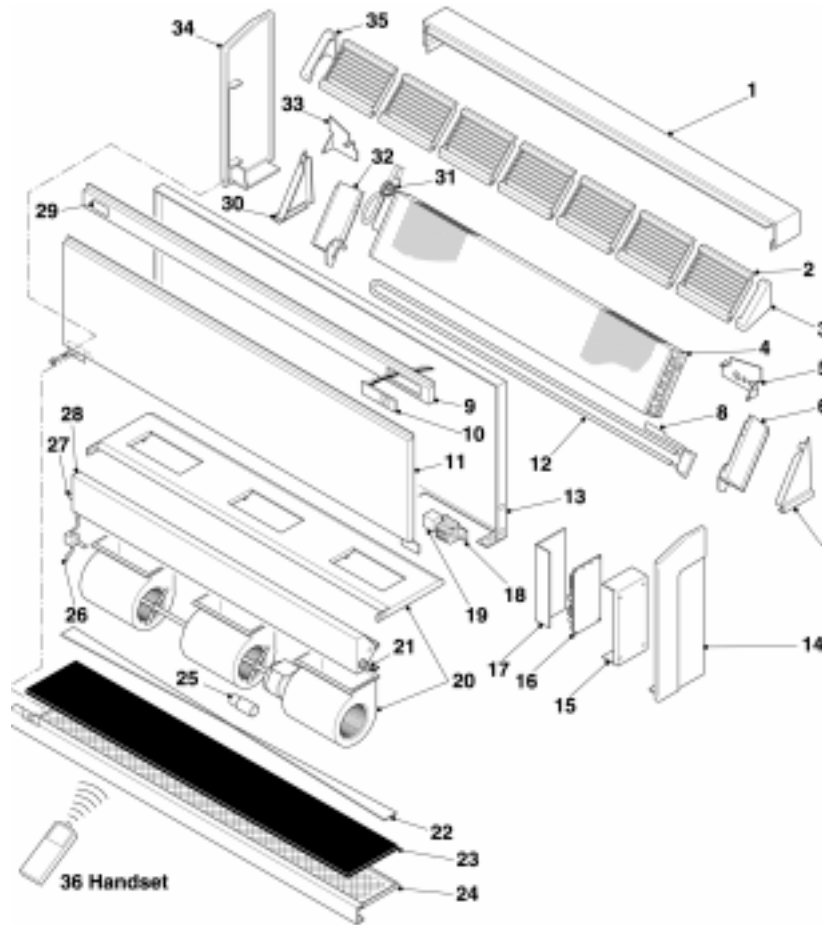
OPTIONAL EXTRAS

Low Pressure Hot Water 2 off 15mm couplings (Part No 512-519)

LPHW or Chilled Water Control Valve 1 3 way 4 Port valve including actuator (Part No 511-589).

Alternative Refrigerant For applications outside the EU, units can be supplied for use with R22.

Parts Identification

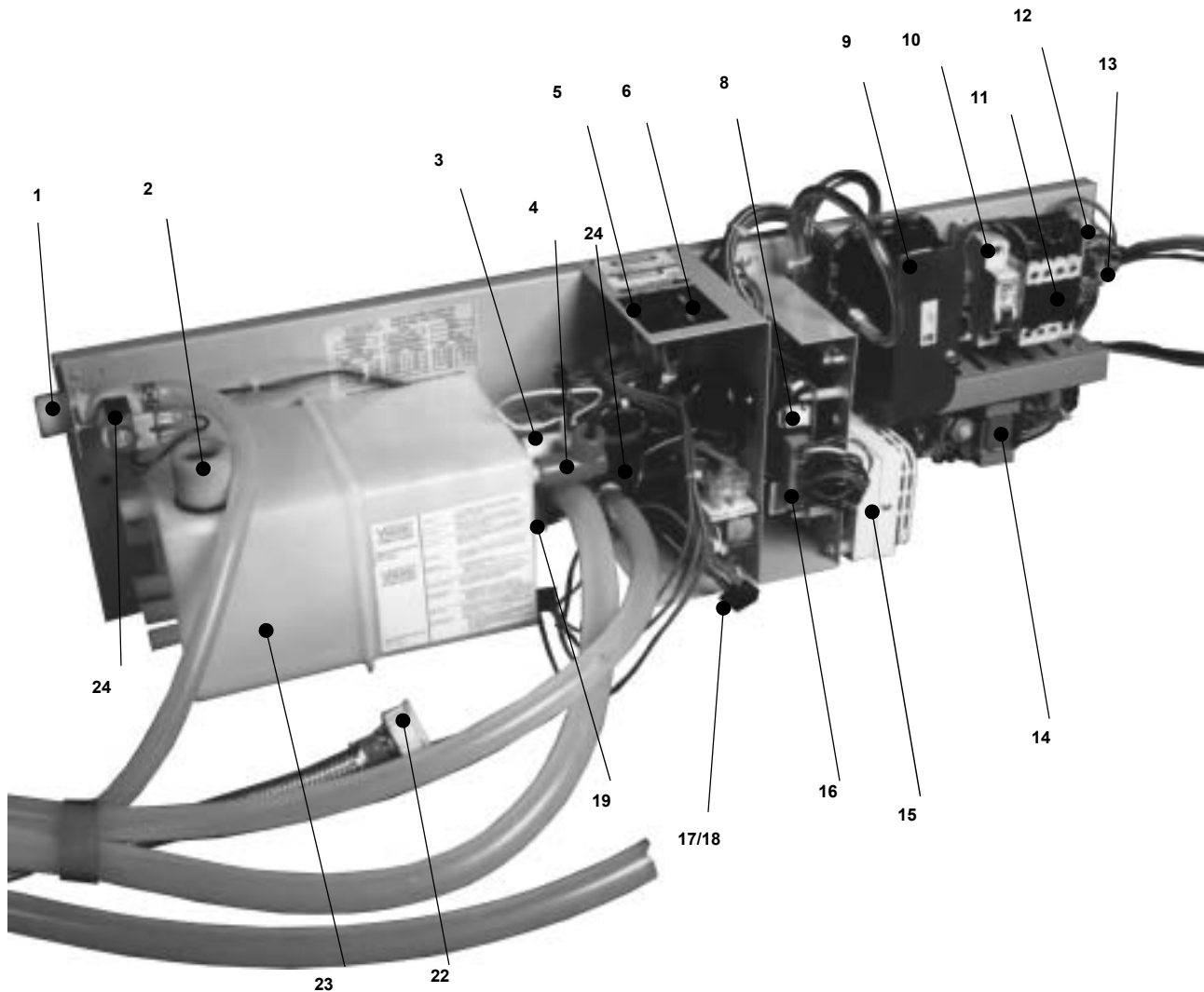


1	Top Panel	13	Unit Chassis	25	Motor Capacitor
2	Grille Module	14	End Board - R Hand	26	Condensate Pump Assembly
3	Grille End Cap - R Hand	15	PCB Control Box	27	Condensate Float Switch (Pump)
4	Evaporator Assembly	16	Control Board (PCB)	28	Condensate Tray
5	Sliding Bulkhead - R Hand	17	PCB Control Box Lid	29	Temperature Indicator
6	Fixed Bulkhead - R Hand	18	Terminal Rail & Relays	30	Coil Support - L Hand
7	Coil Support - R Hand	19	Timeclock (option)	31	Expansion Valve Assembly
8	Manual plus Auto Reset Cutouts	20	Fan Deck, Fan & Motor Assembly	32	Fixed Bulkhead - L Hand
9	Front Top Panel	21	Condensate Float Switch (High Level)	33	Sliding Bulkhead - L Hand
10	Infra-Red Receiver Assembly	22	Filter Retaining Band	34	End Board - L Hand
11	Front Panel	23	Filter	35	Grille End Cap - L Hand
12	Electric Heater Assembly	24	Filter Tray	36	Remote Handset

FEATURES & OPTIONAL EXTRAS

FEATURE	CONCEPT 2000	CONCEPT PLUS
Condensate Pump	Optional Extra	Optional Extra
Combination Condensate Pump	Not Available	Optional Extra
Electric Heating	Optional Extra	Standard Feature
LPHW Heating	Optional Extra	Not Available
Chilled Water Valve	Optional Extra	Not Available
LPHW Valve	Optional Extra	Not Available
Front Return Air Kit	Optional Extra	Standard Feature

Component Location - Humidifier Section (Concept Plus)



- | | | | |
|----|----------------------------------|----|---------------------------------------|
| 1 | Water Feed Valve | 13 | Mains Incoming Terminal Block |
| 2 | Steam Pipe Outlet | 14 | Humidity Control Board |
| 3 | High Level Electrode Cap (white) | 15 | Humidity Sensor |
| 4 | Electrode Caps (red) | 16 | Humidifier Electronics Board |
| 5 | Manual Water Drain Switch | 17 | Humidifier On/Running Neon (Green) |
| 6 | Fuse 1A | 18 | Humidifier Cylinder Change Neon (Red) |
| 8 | Steam Adjustment Set Plug | 19 | Water Drain Outlet |
| 9 | Differential Pressure Switch | 22 | Water Supply Pipe (15mm) |
| 10 | MCB | 23 | Humidifier Cylinder |
| 11 | Humidifier Contactor | 24 | Water Drain Pump |
| 12 | De-Humidifier Relay | | |

NOTE: It is important to check that the “O” ring at the cylinder base (Item 23) is seated correctly to eliminate the risk of unit flooding,

Site Installation

UNPACKING

NOTE: Keep all pipes capped during installation to prevent pipework contamination.

POSITIONING

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

- 1 To achieve a proper and unobstructed throw of air from the discharge grille to the area to be conditioned.
- 2 There are no walls or major obstructions within 1.5 m of the discharge air outlet.
- 3 Condensate pipework is fitted with the recommended fall and that the pump is capable of providing the lift required.
- 4 The unit mountings are of sufficient strength (check weights).
- 5 Pipework sizes and routes should be set in accordance with good refrigeration practice.
- 6 Pipework and electrical connections are readily accessible.

PENDANT CONTROLLER (OPTIONAL)

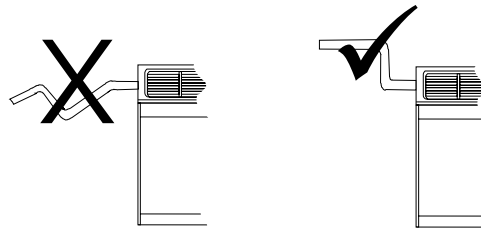
In addition to positioning the unit correctly, it is very important to locate the wall mounted controller in the optimum position to ensure the controller functions correctly. Therefore the installation should be selected with the following points in mind:

- 1 Position the controller approximately 1.5m above floor level.
- 2 Avoid external walls and draughts from windows and doors.
- 3 Avoid positioning near shelves, curtains and other fitting as these restrict air movement.
- 4 Avoid heat sources e.g. direct sunlight, heaters, dimmer switches and other electrical devices.

CONDENSATE PIPEWORK

When installing the unit, the following points should be remembered:

- 1 Maximum pump lift is 9m.
- 2 The highest point in the condensate pipework should be as close to the unit as possible. This prevents a large volume of water draining back into the unit when it is switched off.



- 3 Condensate pipework should slope downwards in the direction of water flow with a minimum gradient of 1 in 100.
- 4 When multiple units are connected to a common condensate drain, ensure the drain is large enough to cope with the volume of condensate from several units. It is also recommended to have an air vent in the condensate pipework to prevent any air locks.

ASSEMBLY

The pipework from the unit can be run from either the base or the rear of the unit. It is despatched with the pipework terminated within the unit case.

Site Installation

FRESH AIR DUCTING

If fresh air is to be ducted to the unit, the following should be completed:

- 1 Remove the fresh air knockout from the rear of the chassis, (*refer to **Dimensions & Weights***).
- 2 Ensure the area around the knockout is clean and free of grease on the inside of the unit. Attach the Velcro strip around the knockout circumference.
- 3 Attach filter pad to the Velcro strip.

SERVICES

Refer to the "Mechanical, Electrical and Refrigeration Information".

Mechanical Information

TECHNICAL DATA: CONCEPT - AIR COOLED

CSS		12	18	24	32
Nominal Capacity (1)	kW	3.70	5.00	6.5	8.8
Nominal Capacity (2)	kW	4.11	5.59	7.76	8.91
Capacity Steps	%	0-100	0-100	0-100	0-100
Construction					
Material		Galvanised Steel			
Colour		Light Grey (RAL 7035)			
Evaporator					
Type		Air Cooled			
Quantity		1	1	1	1
Face Area	m ²	0.12	0.20	0.25	0.29
Nominal Airflow	High	m ³ /s	0.16	0.23	0.30
	Med	m ³ /s	0.12	0.19	0.22
	Low	m ³ /s	0.10	0.14	0.17
Max. External Static Discharge	Pa	30	30	30	30
Fan					
Type		Direct Drive Centrifugal			
Quantity		1	2	3	3
Motor Size	W	20	47	40	63
Refrigeration					
Number of Circuits		1	1	1	1
Refrigeration Control		Capillary In CU		Thermostatic Expansion Valve	
Refrigerant Type		R407c			
Dimensions/Weights					
Height	mm	605	605	605	605
Width	mm	762	1118	1296	1474
Depth	mm	230	230	230	230
Machine Weight (nom)	kg	22.0	33.6	35.2	36.3
Operating Weight (nom)	kg	23.0	34.6	37.2	38.3
Connections					
Suction (3)	in	1/2	1/2	3/4	3/4
Liquid (3)	in	1/4	1/4	3/8	3/8
Condensate	mm	15	15	15	15
Condensate Drain (if Pump fitted)	in	3/8" poly or copper tubing			
Filtration					
Type		Wire Framed Periframe			
Quantity		1	1	1	1
Arrestance		BS EN 779 - G2			
Size	mm	634 x 208	990 x 208	1168 x 208	1346 x 208
Standard Unit Match		CU1	CU1.5	CUS2.5	CUS3
Options					
Elec. Heating Capacity	kW	2.00	3.00	4.00	4.00
LPHW* Heat. Capacity(4)	kW	4.52	8.21	8.47	9.30
LPHW* Coil Connection	mm	15	15	15	15
Condensate Pump					
Maximum Head	mm	9000	9000	9000	9000
Nominal Flow Rate	l/m	1.0	1.0	1.0	1.0

*Low Pressure Hot Water

- (1) Nominal cooling capacity based on 27°C Dry Bulb/19°C Wet Bulb and a 35°C ambient.
- (2) Nominal reverse cycle heat pump capacity based on 20°C Dry Bulb and a 7°C Dry Bulb/6°C Wet Bulb ambient.
- (3) Connections are capped copper tube.
- (4) LPHW heating capacity based on 20°C air on and 82/71°C water temperatures.

Mechanical Information

TECHNICAL DATA: CONCEPT - CHILLED WATER

CCW		12	18	24	32
Nominal Capacity (1)	kW	3.6	4.6	6.6	8.8
Capacity Steps (1)	%	0-100	0-100	0-100	0-100
Construction					
Material		Galvanised Steel			
Colour		Light Grey (RAL 7035)			
Chilled Water Coil					
Type		Air Cooled			
Quantity		1	1	1	1
Face Area	m ²	0.12	0.20	0.25	0.29
Nominal Airflow	High	m ³ /s	0.16	0.23	0.30
	Med	m ³ /s	0.12	0.19	0.22
	Low	m ³ /s	0.10	0.14	0.17
Maximum External Static Discharge	Pa	30	30	30	30
Fan					
Type		Direct Driven Centrifugal			
Quantity		1	2	3	3
Motor Size	W	20	47	40	63
Dimensions/Weights					
Height	mm	605	605	605	605
Width	mm	762	1118	1296	1474
Depth	mm	230	230	230	230
Machine Weight (nom)	kg	22.0	33.6	35.2	36.3
Operating Weight (nom)	kg	23.0	34.6	37.2	38.3
Connections					
Chilled Water Inlet	in	1/2	1/2	1/2	1/2
Chilled Water Outlet	in	1/2	1/2	1/2	1/2
Condensate	mm	15	15	15	15
Condensate Drain (if Pump fitted)	in	3/8" poly or copper tubing			
Filtration					
Type		Wire Framed Periframe			
Quantity		1	1	1	1
Arrestance		BS EN 779 - G2			
Size	mm	634 x 208	990 x 208	1168 x 208	1346 x 208
Options					
Elec. Heating Capacity	kW	2.00	3.00	4.00	4.00
LPHW* Heat Capacity (2)	kW	4.52	8.21	8.47	9.30
LPHW* Coil Connection	mm	15	15	15	15
Condensate Pump					
Maximum Head	mm	9000	9000	9000	9000
Nominal Flow Rate	l/m	1.0	1.0	1.0	1.0

*Low Pressure Hot Water

- (1) Nominal cooling capacity based on 27°C Dry Bulb/19°C Wet Bulb and 7.0/12.0°C water temperatures.
 (2) LPHW heating capacity is based on 20°C air on and 82/71°C water temperatures.

Mechanical Information

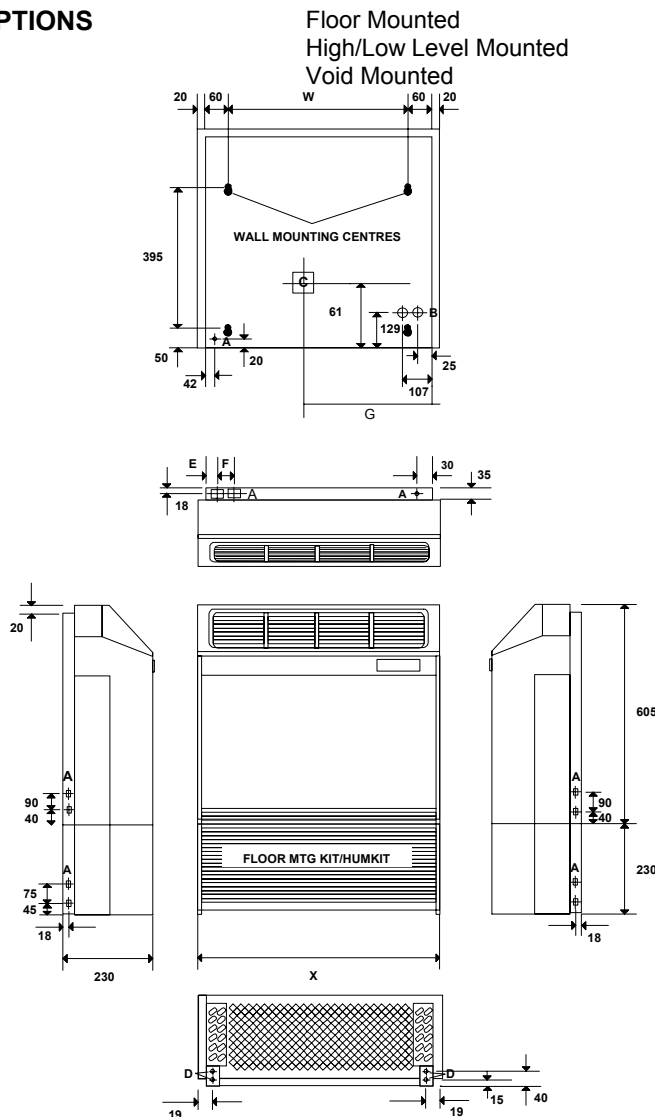
TECHNICAL DATA: CONCEPT PLUS – AIR COOLED

CSS Plus		18	24	32
Nominal Capacity (1)	kW	4.15	5.15	7.41
Capacity Steps	%	0-100	0-100	0-100
Construction				
Material		Galvanised Steel		
Colour		Light Grey (RAL 7035)		
Evaporator				
Type		Air Cooled		
Quantity		1	1	1
Face Area	m ²	0.20	0.25	0.29
Nominal Airflow	High	m ³ /s	0.23	0.30
	Med	m ³ /s	0.19	0.22
	Low	m ³ /s	0.14	0.17
Max. External Static Discharge	Pa	30	30	30
		Upflow		
Fan				
Type		Direct Drive Centrifugal		
Quantity		2	3	3
Motor Size	W	47	40	63
Refrigeration				
Number of Circuits		1	1	1
Refrigeration Control		Capillary In Outdoor Unit	Thermostatic Expansion Valve	
Refrigerant Type		R407c		
Humidifier				
Capacity	kg/hr	2	2	3
Electric Heat				
Capacity	kW	3.00	4.00	4.00
Dimensions/Weights				
Height	mm	835	835	835
Width	mm	1118	1296	1474
Depth	mm	230	230	230
Machine Weight (nom)	kg	36.0	37.8	39.0
Operating Weight (nom)	kg	37.5	39.8	41.0
Connections				
Suction (2)	in	5/8	3/4	3/4
Condensate	mm	15	15	15
Condensate Drain (if Pump fitted)	In	3/8" poly or copper tubing		
Liquid (2)	in	1/4	3/8	1/2
Humidifier Feed	mm	15	15	15
Humidifier Drain	mm	15	15	15
Filtration				
Type		Wire Framed Periframe		
Quantity		1	1	1
Arrestance		BS EN 779 - G2		
Size	mm	990 x 208	1168 x 208	1346 x 208
Options				
Condensate Pump				
Maximum Head	m	9.0	9.0	9.0
Nominal Flow Rate	l/m	1.0	1.0	1.0
Combination Condensate Pump				
Head	m	9.1	9.1	9.1
Flow Rate	l/m	0.67	0.67	0.67
Standard Unit Match		CU1.5	CUS2	CUS2.5

- (1) Nominal cooling capacity based on 24°C DB/50% RH high fan speed and a 35°C ambient.
 (2) Connections are capped copper tube.

Mechanical Information

DIMENSIONS & WEIGHTS INSTALLATION OPTIONS



WEIGHTS

		Machine	Operating
CSS/CCW 12	kg	22.0	23.0
CSS/CCW 18	kg	33.6	34.6
CSS/CCW 24	kg	35.2	37.2
CSS/CCW 32	kg	36.3	38.3
CSS 18 PLUS	kg	36.0	37.5
CSS 24 PLUS	kg	37.8	39.8
CSS 32 PLUS	kg	39.0	41.0

Model		A	B	C	D	E	F	G	W	X
CSS/CCW12	mm	20 Ø	25 Ø	80 x 80	20 Ø	25	25	478	602	762
CSS/CCW18	mm	Kn'out	Kn'out	Kn'out	Holes	29	31	528	958	1118
CSS/CCW24	mm			Fresh Air Intake		20	30	801	1136	1296
CSS/CCW32	mm					35	35	896	1314	1474

Notes:

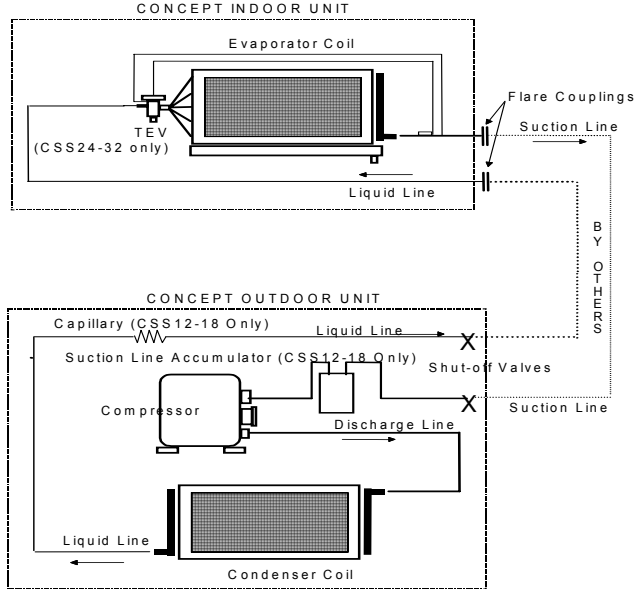
- 1 Refrigeration/Chilled Water and condensate connections terminate at the left hand bottom corner of unit. Should terminations be required in left hand top corner this must be advised to Airedale at the time of order.
- 2 Electrical connections terminate at the right hand bottom corner of the unit.
- 3 All maintenance of the unit can take place from the front of the unit.
- 4 Dimension B is for wall mounting.
- 5 Dimension D is for wall mount brackets when unit is floor mounted with plenum.

Refrigeration Information

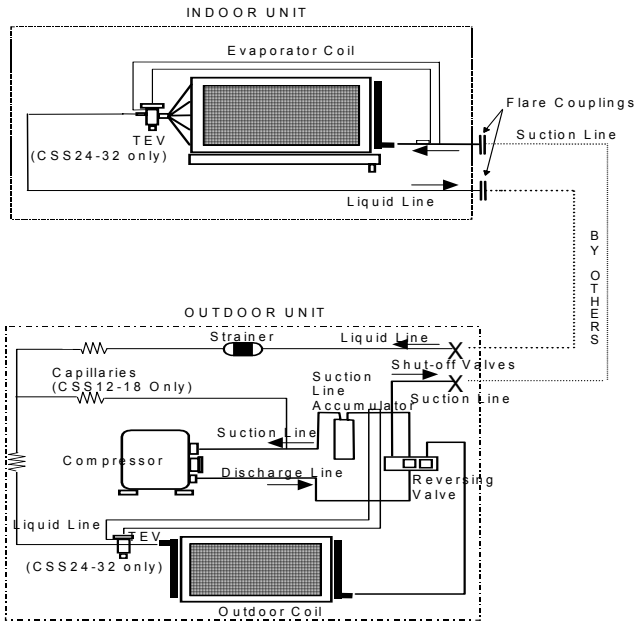
PIPEWORK SCHEMATICS

Air Cooled System

Cool Only Unit

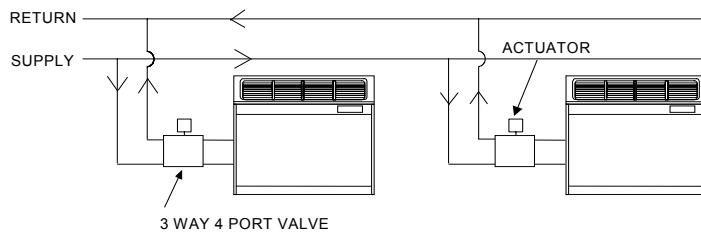


Heat Pump Unit



Chilled Water System

Chilled Water System & Low Pressure Hot Water Option



Refrigeration Information

HOLDING CHARGE

The units are shipped with a holding charge of inert gas to guard against contamination or moisture during shipping and storage.

The charge should be checked to indicate if leaks are present prior to evacuation.

If the charge appears to be either partially or totally lost, then the unit should be carefully checked for signs of physical damage.

PIPE SIZING GUIDE

It is important that the correct size refrigeration pipework is used to keep the system pressure drop to a minimum and promote correct oil return.

The following information is based on a complete Airedale matched system and should be used for guidance only.

R407C REFRIGERANT		TOTAL EQUIVALENT LENGTH OF PIPE METRES	MAXIMUM VERTICAL (METRES)	PIPE SIZE
CSS12/CU1	SUCTION	0 - 6 6 - 20	5 15	1/2" 1/2"
	LIQUID	0 - 20	15	1/4"
CSS18/CU1.5	SUCTION	0 - 6 6 - 20	5 15	1/2" 5/8"
	LIQUID	0 - 6 6 - 20	5 15	1/4" 3/8"
CSS24/CU(H)2.5	SUCTION	0 - 10 10 - 25 25 - 30	5 15 15	5/8" 3/4" 7/8" - 3/4" vertical
	LIQUID	0 - 25 25 - 30	15 15	3/8" 1/2"
CSS32/CU(H)3	SUCTION	0 - 15 15 - 30	10 15	3/4" 7/8"
	LIQUID	0 - 10 10 - 30	10 15	3/8" 1/2"

EQUIVALENT LENGTHS FOR BENDS (METRES)

	90° Short Rad	90° Long Rad	Site Formed	
			90°	180°
1/4"	0.35	0.28	0.07	0.12
3/8"	0.40	0.30	0.10	0.15
1/2"	0.50	0.33	0.12	0.17
5/8"	0.55	0.35	0.16	0.20
3/4"	0.60	0.42	0.23	0.30
7/8"	0.70	0.45	0.30	0.32

Refrigeration Information

PIPEWORK INSTALLATION

The suction line should be insulated.

Liquid lines should be insulated in areas of high temperature or when exposed to direct sunlight.

Special consideration should be given to vertical pipe runs and heat pump installation.

Unit performance will reduce if there are vertical rises of above 5m. Please consult Airedale Service for risers above 10m.

When insulating refrigerant lines, cut approximately 30-50cm longer than the distance between the units to ensure the insulation goes right upto the unit. Leave connections uncovered for leak testing.

Remove burrs to the ends of the copper tube, holding the tube downward to avoid allowing dirt to contaminate the tube.

Insert flare nuts removed from the pipework terminations and make a flare at the end of the copper tube to conform with the following:

- Inside surface is glossy and smooth
- Tapered sides are of uniform length
- Refrigeration lubrication is applied to matching surfaces

The installation of a sight glass close to the indoor unit is recommended.

PRESSURE TESTING

When installation is complete, the system should be pressure tested.

Fill the system with dry nitrogen to a pressure of between 17 bar/250psig and 34bar/500 psig.

NOTE: The LP switch if exposed to these pressures, MUST BE disconnected for pressures above 17bar/250 psig.

Record the pressure over a minimum of 60 minutes to detect major leaks (a 24 hour period should preferably be allowed).

If a reduction in pressure is detected, trace the leak and repair before conducting a further pressure test and charging.

EVACUATION

Evacuation for systems operating with R407C refrigerant to be carried out as follows (for alternative refrigerants please refer to Airedale).

Release the high pressure inert holding charge from the indoor unit and interconnecting pipework.

Use a high vacuum pump and connect to the high and low pressure sides of the system via a gauge manifold fitted with compound gauges. A high vacuum gauge should be fitted to the system at the furthest point from the vacuum pump.

Triple evacuation should be used to ensure that all contaminants are removed.

Operate the vacuum pump until a pressure of 1.5 torr (200 Pa) absolute pressure is reached, then stop the vacuum pump to break the vacuum using oxygen free Nitrogen until the pressure rises above zero.

The above operation should be repeated a second time.

The system should then be evacuated a third time but this time to 0.5 torr absolute pressure.

Break with the correct refrigerant, until pressures equalise between the charging bottle and the system.

ALTERNATIVE REFRIGERANTS

If an alternative refrigerant is to be used, this must be with the approval of Airedale International Air Conditioning Ltd in order for the warranty to be valid.

Care must be taken to ensure that the refrigerant and compressor oil are compatible.

Electrical Information

GENERAL

- A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.
- As standard the equipment is designed for 230V, 1 Phase, 50Hz or 400V, 3 Phase, 4 wire 50Hz to all relevant IEE regulations, British standards and IEC requirements.
- All mains and interconnecting wiring should be carried out to National and Local codes.
- 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.
- Once the refrigeration pipework is complete the electrical supply can be connected by routing the cable through the appropriate casing hole and connecting the cables as per the wiring diagram supplied with each unit.
- Power to the indoor unit is normally taken from the outdoor unit. Should there be a separate supply for each unit, a control neutral must be fitted between the indoor and outdoor units.

Electrical Information

ELECTRICAL DATA - CONCEPT

CSS/CCW		12	18	24	32
Unit Data					
Nominal Run Amps	A	0.85	1.05	1.10	1.40
Maximum Start Amps	A	1.90	2.70	2.90	4.10
Control Circuit	V	230	230	230	230
Mains Supply	V		230/1/50		
Rec Mains Fuse	A	6	6	6	6
Max Incoming Mains	mm ²	1	1	1	1
Evaporator Fan					
Motor Rating	W	20	47	40	63
Full Load Amps	A	0.35	0.55	0.60	0.90
Locked Rotor Amps	A	1.40	2.20	2.40	3.60
Electric Heat					
Heater Rating	kW	2.00	3.00	4.00	4.00
Current Per Phase	A	8.30	12.50	16.70	16.70
Nominal Running Current	A	9.2	13.6	17.8	17.8
With Elec. Heat					
Recommended Mains	A	16	25	32	32
Fuse with Elec. Heat					

ELECTRICAL DATA - CONCEPT PLUS

CSS		18	24	32
Unit Data				
Nominal Run Amps (1)	A	19.9	24.1	27.6
Maximum Start Amps	A	21.5	25.9	30.3
Control Circuit	V		230/1/50	
Mains Supply	V		230/1/50	
Rec. Mains Fuse	A	25	32	32
Maximum Incoming Mains	mm ²	2.5	4.0	4.0
Evaporator Fan				
Motor Rating	W	47	40	63
Full Load Amps	A	0.55	0.60	0.90
Locked Rotor Amps	A	2.20	2.40	3.60
Humidifier				
Mains Supply	V		230/1/50	
Full Load Amps	A	6.3	6.3	9.7
kW at OPR Voltage	kW	1.5	1.5	2.3
Rec. Mains Fuse	A	10	10	16
Electric Heat				
Heater Rating	kW	3.00	4.00	4.00
Current Per Phase	A	12.50	16.70	16.70

- (1) Nominal run amps, mains fuse and incoming mains are for full function units. An allowance of 0.5A has been included for control requirements.

Electrical Information

INTERCONNECTING WIRING - CONCEPT

INDOOR UNIT	L1	○	←	
	N	○	←	Mains Incoming 230/1/50
	E	○	←	
	S1A	○	→	Communication Connection ⁽³⁾
	S1B	○	←	To Outdoor Unit
	S2A	○	→	Communication Connection Between ⁽³⁾
	S2B	○	←	Master/Slave Control Units
	STOP	○	←	
	COM	○	←	Volt Free Optional Remote Stop / Start
	START	○	←	
	A3	○	→	Optional Auxiliary Alarm
	A3	○	→	Volt Free Input (Normally Closed = Healthy)
	CCA	○	→	Common
	CA1	○	→	Normally Closed Contact
	CA2	○	→	Normally Open Contact

} Common Alarm Changeover
Volt Free Contacts

SYSTEM FIELD Connections FOR AD05 CONTROLLED UNITS:

INDOOR UNIT	L1	○	→	○	L1	AD05 CONTROLLED OUTDOOR UNIT
	N	○	→	○	N	
	E	○	→	○	E	
	S1A	○	↔	○	S1A	
	S1B	○	↔	○	S1B	

Notes

- 1 Master/Slave control refers to a number of indoor units in one area being controlled at one designated indoor unit by one command. This does not refer to connection to a proprietary commercial BMS system.
- 2 The indoor and outdoor controls communication connection must be via a 2 core screened twisted pair cable (minimum size 0.75mm²), earthed at one end.

Electrical Information

INTERCONNECTING WIRING - CONCEPT PLUS

INDOOR UNIT	L1	○	←	Mains Incoming 230/1/50
	N	○	←	
	E	○	←	
	S1A	○	→	Communication Connection ⁽³⁾ To Outdoor Unit
	S1B	○	←	
	S2A	○	→	Communication Connection Between ⁽³⁾ Master/Slave Control Units
	S2B	○	←	
	STOP	○	←	Volt Free Optional Remote Stop / Start
	COM	○	←	
	START	○	←	
	A3	○	→	Optional Auxiliary Alarm Volt Free Input (Normally Closed = Healthy)
	A3	○	→	
	CCA	○	→	Common Normally Closed Contact Normally Open Contact } Common Alarm Changeover Volt Free Contacts
	CA1	○	→	
	CA2	○	→	
91	○	→	Compressor Signal from Dehumidifier	
92	○	→		

SYSTEM FIELD Connections FOR AD05 CONTROLLED UNITS:

INDOOR UNIT	L1	○	→	○	L1	AD05 CONTROLLED OUTDOOR UNIT
	N	○	→	○	N	
	E	○	→	○	E	
	S1A	○	↔	○	S1A	
	S1B	○	↔	○	S1B	
	91	○	→	○	COM	
92	○	→	○	COOL		

Notes

- 1 Master/Slave control refers to a number of indoor units in one area being controlled at one designated indoor unit by one command. This does not refer to connection to a proprietary commercial BMS system.
- 2 The indoor and outdoor controls communication connection must be via a 2 core screened twisted pair cable (minimum size 0.75mm²), earthed at one end.

Controls

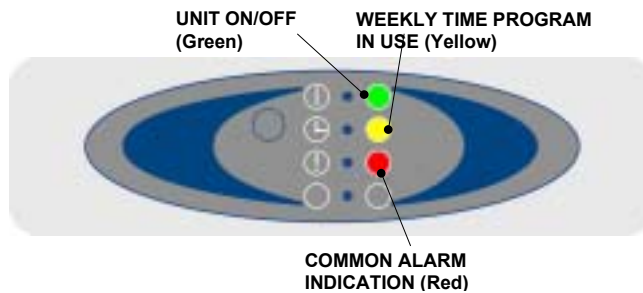
GENERAL

The microprocessor controller enables user defined room conditions to be maintained remotely and alarms to be monitored at the receiver display on the unit fascia. Communication to the controller is by either a hand held infra red transmitter or hardwired Pendant, both of which are supplied with a wall mounting bracket and batteries.

A Master/Slave scheme of up to 20 units can be configured, refer to **Master/Slave Option** for further details.

DISPLAY

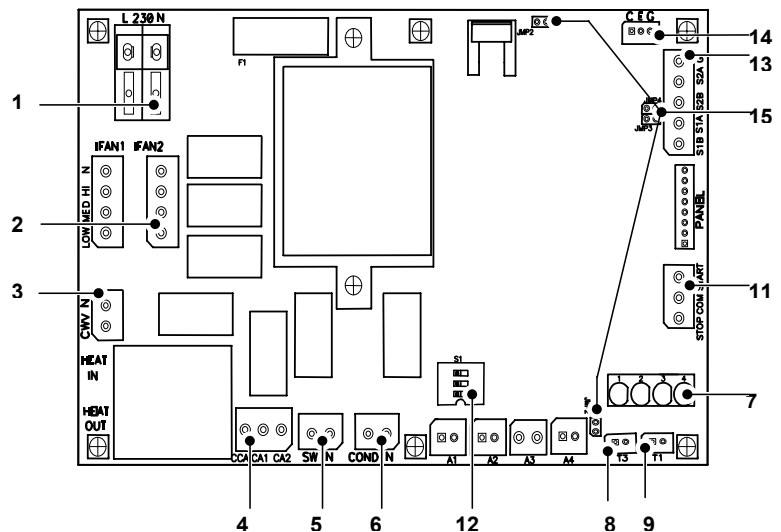
The fascia mounted display indicates unit status with a series of coloured indicators and an audible buzzer (refer to **Alarms** for diagnostics). Being an extension of the indoor unit controller the display is connected by means of a 7 pin plug and socket (Item 10).



MICROPROCESSOR CONTROLLER

The control board (PCB) mounted inside the indoor unit control panel, has installation connections to the fascia display, sensors and the output relays.

- 1 Power Connections
- 2 Indoor Fan
- 3 Chilled Water Valve
- 4 Common Alarm Changeover Contacts
- 5 Swing Motor
- 6 Condensate Pump
- 7 Diagnostic Indicators
- 8 Indoor Coil Sensor
- 9 Return Air Sensor
- 10 Display Panel Connections
- 11 Remote On/Off
- 12 Configuration DIP Switch
- 13 Indoor/Outdoor Communication Connection
- 14 Pendant Connector
- 15 Jumper Links



Controls

ALARMS

When an alarm is present, the common alarm indicator (Red) on the display will switch on for the duration of the alarm. The specific alarm can be identified by four red diagnostic indicators on the control board (refer to Item 7 on the illustration). These have been pre-programmed to show all possible alarm conditions as outlined in the following table. Note that LED 4 operates independently of the other alarm LEDs.

When the fault indicated has been rectified, the alarm will automatically clear and return to the previous mode of operation.

	LED 1	LED 2	LED 3	LED 4
A1/A2 Indoor Fan Fault	On			
A3 Auxiliary Alarm		On		
A4 Condensate Float Switch Fault			On	
T1 Return Sensor Fault	Flashing			
T3 Coil Sensor Fault			Flashing	
S1 Outdoor Communication Fault ⁽¹⁾				On
S2 Master/Slave Communication Fault ⁽²⁾				Flashing

Chilled Water units only – LED 4 will be on, indicating normal operation.

LED 4 will also flash intermittently when the controller is communicating with the outdoor unit.

JUMPER LINKS

The indoor unit has four jumper links (refer item 15 on the illustration). The setting of each jumper link is explained below:

	Jumper ON	Jumper OFF
JMP1 – Not Used		
JMP2 – PENDANT OPTION	Pendant Not Fitted	Pendant Fitted
JMP3 – Not Used		
JMP4 – S2 Indoor Network Terminator	Terminator On	Terminator Off

If a pendant controller is to be used then JMP2 should be OFF, if infra-red controls are used then JMP2 should be ON.

To ensure reliable communication between indoor units when networked together to form a Master/Slave network the first and last unit in the network should have JMP4 set to ON. All the units in-between should have JMP4 set to OFF.

JMP1 and JMP3 are not currently used and should be set to OFF.

MASTER/SLAVE OPTION

The network option allows for **1** “master” unit and up to **19** “slave” units to be interconnected using a twin twisted pair screened cable to create a network.

The master/slave operation has been programmed to operate the units in the following manner:

When the master unit receives a transmission from the transmitter, the transmitter settings are provided to all units on the network.

Slave units do NOT monitor the return air temperature but rely instead on the master unit to monitor return air temperature and make all control decisions. Slave units will mimic the operation of the master unit and will cool, heat, switch on, switch off etc, with the Master. When the units are configured as heat pumps the defrost programme is operated independently, to avoid unnecessary defrosting and loss of heating performance.

At all times the slave units will follow the usual method of operation regarding alarms and will act accordingly. When a master unit experiences an alarm it will act in the usual manner whilst maintaining instruction to slave units to operate normally. The exception to this is when the Master unit experiences a return air sensor failure. Due to the fact that it cannot control correctly, the Master unit will instruct the slave units to revert to stand alone operation.

Controls

MASTER/SLAVE OPTION

In the event of the network cable being severed or communications between Master and Slaves being lost for any reason, the slave units will revert to stand alone control after six minutes without instruction from the Master. During this time the slaves will monitor the return air temperature themselves and will make their own control decisions based upon the last set of transmitter settings received from the Master.

On large Master/Slave installations it is recommended that slave units are allocated in groups to prevent excessive start-up currents. After a power failure the slave units in group 1 will randomly start-up between 0 and 60 seconds, slave units in group 2 will randomly start-up between 60 and 120 seconds and slave units in group 3 will randomly start-up between 120 and 180 seconds.

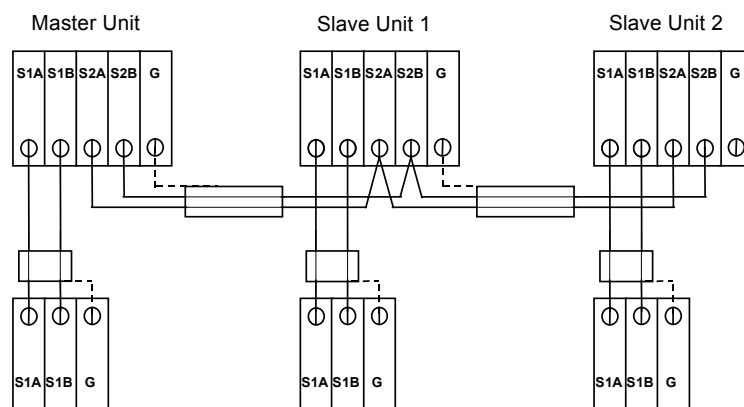
The indoor unit control board DIP switches (see Item 12 on the illustration) determine the Master/Slave operation and can be set as follows:

	DIP 1	DIP 2	DIP 3
Master	OFF	OFF	OFF
Slave Group 1	ON	OFF	OFF
Slave Group 2	OFF	ON	OFF
Slave Group 3	ON	ON	OFF

NOTE: Power off unit before making any changes!

NETWORK CONNECTION

The network cable is routed between controllers and terminated at each unit in the manner shown below. The diagram shows a master and two slave units with matching outdoor units. If the system is chilled water the outdoor units would not be present and hence the S1 wiring would not be present.



Note: The cable screen is provided to prevent signals being imposed on and corrupting the data carried by the 2 cable cores. The screen must be earthed at only one end for each unit on the network.

Controls

TRANSMITTER

Small, light and practically designed, the hand held transmitter comes in dark grey, while the Pendant transmitter is offered in light grey.



The batteries (2 x Size AAA) can be easily fitted by removing the sliding lid on the underside of the transmitter/Pendant.

Please pay attention to the polarity and correct orientation of the batteries during fitting.

The transmitters are supplied with wall brackets which should be affixed in a suitably accessible position. The Pendant wiring comprises a socket and plug assembly. Please refer to fitting instructions supplied with Pendant.

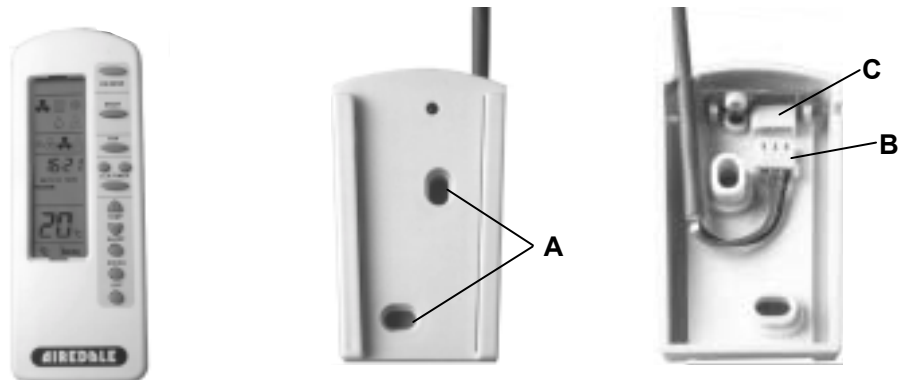
PENDANT (OPTIONAL)

The Pendant assembly consists of the following parts.

Pendant Controller

Pendant Wall Mounting Bracket

Reverse of Wall Mounting Bracket, showing cable connection.



Position the wall bracket and mark through the 2 fixing holes (Item A).

Connect the 3 way female cable connector (Item B) with the male bracket connector (Item C). The cable can be routed from either the top or the left hand side of the wall bracket and the bracket then affixed to the wall.

Offer the Pendant controller from the top of the wall bracket and slide down to complete the assembly.

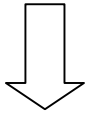
NOTE: The Pendant controller MUST be mounted in the wall bracket and operated from this position to communicate with the unit controller.

Finally, plug the other end of the cable into the indoor control board (Item 14).

Controls

TRANSMITTER

DISPLAY INDICATORS



TRANSMIT INDICATOR

Flashes when system settings are transmitted.

MODE INDICATOR

Highlights mode of operation.

FAN MODE INDICATOR

Highlights fan speed.

CLOCK/TIMER DISPLAY

Shows current day, time or weekly programme stop/start times.

SETPOINT DISPLAY

Indicates temperature setpoint.

SWING INDICATOR

Indicates operation of the air vanes (5-12kW Cassettes only).

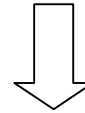
SLEEP INDICATOR

Indicates when sleep mode is selected.

ON/SEND

Press this button to switch the unit on and transmit the system settings. The unit will confirm receipt of the adjustment by producing a short audible tone.

SELECTOR BUTTONS



MODE (OF OPERATION)

Selects the mode options: COOL, AUTO, DRY, FAN & HEAT.

FAN

Selects fan speed options: LOW, MED, HIGH & AUTO.

CLK/TIMER + / -

Selects and adjust the clock or weekly programme stop/start times.

TEMP + / -

Adjusts temperature setpoint in intervals of 1°C between 18 - 30°C.

SLEEP

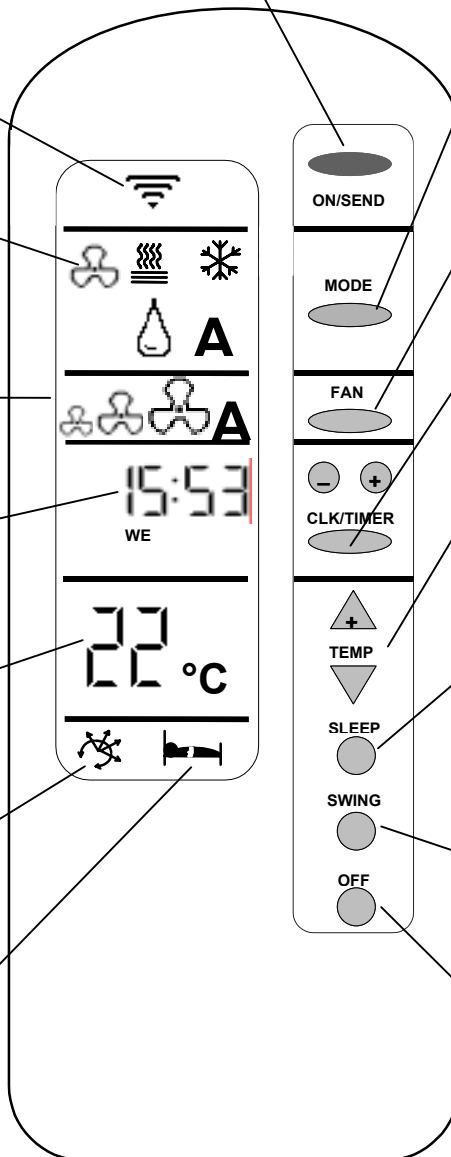
Selects/deselects sleep mode. Using the ON/SEND button, the temperature setpoint will setback 1°C after 1 hour, 2°C after 2 hours.

SWING (5-12kW Cassettes)

Causes the air vanes to oscillate when selected.

OFF

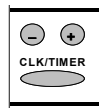
The indoor unit fan will run for 2 minutes after OFF being selected, to dissipate residual heating or cooling.



Controls

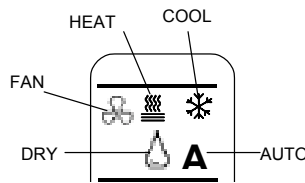
SET UP PROCEDURE

How To Set The Present Time



- 1 Press CLK/TIMER: "CLOCK SET" highlights. **NOTE display will stop flashing after 15 seconds.**
- 2 Select Hour with either (+) or (-) (figure will flash)
- 3 Press (+) or (-) to change hour.
- 4 Press CLK/TIMER to confirm and advance.
- 5 Repeat 3 & 4 for minutes and day of week.
- 6 Press CLK/TIMER to confirm.

How To Set Cool, Heat Or Auto Mode



- 1 Press **MODE** button until desired mode is highlighted.
- 2 Select temperature with **TEMP + / -** buttons (range 18°C to 30°C).
- 3 Select desired fan speed with **FAN** button.
- 4 Press the **ON/SEND** to switch unit on and transmit system settings.
- 5 Repeat for each mode.

How To Set Dry Mode

Repeat Steps 1, 2 & 4

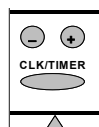
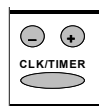
NOTE: During the dry mode the system operates in cooling only mode and the indoor fan is fixed at low speed.

How To Set Fan Only Mode

Repeat Steps 1, 2 & 4

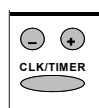
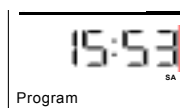
NOTE: During the fan only mode only the indoor fan will operate, cooling and heating will be disabled.

How To Set The Weekly Programme Monday - Friday



- 1 Press CLK/TIMER: twice "PROGRAM" highlights. **NOTE display will stop flashing after 15 seconds.**
- 2 Select Program 1 by pressing (+) or (-) "PROGRAM 1" and "START TIME" will flash.
- 3 Press (+) or (-) to select and change hours.
- 4 Press CLK/TIMER to move to minutes.
- 5 Repeat 3 & 4, "STOP TIME" will flash.
- 6 Repeat 3 to 5, "PROGRAM 2" and "START TIME" will flash.
- 7 Repeat 3 to 5, "SEND" will flash.
- 8 Press ON/SEND to switch unit on and transmit system settings. **NOTE: A small clock will appear in the transmitter display and the yellow weekly time program indicator on the unit will switch on - after a short delay indicating the weekly programme is in operation.**

How To Set The Weekly Programme Saturday



- 1 Press CLK/TIMER three times "PROGRAM" and "SA" highlight. **NOTE display will stop flashing after 15 seconds.**
- 2 Repeat as per Monday – Friday above.

How To Set The Weekly Programme Sunday

- 1 Press CLK/TIMER four times "PROGRAM" and "SU" highlight. **NOTE display will stop flashing after 15 seconds.**
- 2 Repeat as per Monday – Friday above.

Commissioning

GENERAL

The following commissioning information is based on a complete matched Airedale system using R407C.

PRE-START CHECKS

Once the whole system has been installed it is most important that the following pre-start checks are made:-

- 1 The unit condition is satisfactory.
- 2 All pipework is complete and insulated where necessary.
- 3 All fans are able to rotate freely.
- 4 All condensate drains are installed correctly.
- 5 The system has been evacuated correctly.
- 6 All electrical connections (both mains and control) are properly terminated.
- 7 The power supply is of the correct voltage and frequency.
- 8 The units are properly earthed in accordance with current regulations.
- 9 All pipework is earth bonded as required.

COMMISSIONING PROCEDURE

Once the above pre-start checks have been carried out satisfactorily and recorded on the commissioning sheet, the main commissioning operation can commence.

CONTROL CIRCUIT CHECKS

Air Cooled Units

- 1 The compressor should be isolated by disconnecting the compressor power wiring from the compressor contactor/relay at the outdoor unit. The indoor and outdoor units can now be switched on. A system electrical check can now be carried out.
- 2 Switch on the indoor unit by the transmitter/Pendant and check On/off works - Note, there is a random start delay when multiple units are networked to prevent multiple units switching instantaneously and a 2 minute fan run on when then unit is switched off.
- 3 High, medium and low fan speeds are available.
- 4 Timer functions work.
- 5 If units are configured for master/slave operation, check the operation by switching the master unit on/off with the transmitter/Pendant and noting the action of the slave units.
- 6 Isolate the outdoor unit and re-connect the compressor power wiring.

Chilled Water Units

A thorough pipework check and pressure test should be performed before the Unit controls are commissioned.

- 1 Isolate the Unit from the chilled water supply. A system electrical check can now be carried out.
- 2 Carry out operations 2-6 as given above.
- 3 Select cooling mode and set temperature to 18°C and note the actuator opening the chilled water valve (room ambient must be above 19°C). Select heating and watch the valve shut.
- 4 Allow chilled water to enter the Unit and vent air from the unit by opening the 1/4" bleed. Re-tighten the bleed screw once all air has been removed.
- 5 The unit is now ready for the system balance to be performed.

Commissioning

REFRIGERANT CHARGING

The following information is based on a complete Airedale matched system and indicates the approximate amount of refrigerant charge required. It is also assumed that the system has been designed within operating parameters and to good refrigeration practice.

NOTE: It is important that the system is charged with the correct amount of refrigerant. Remember, a seriously over or undercharged system may lead to major component failure.

The final refrigerant charge level should be set by the design evaporating and condensing pressures, together with a full or nearly full sight glass.

NOTE: The sight glass level must be checked in the COOLING MODE ONLY.

The initial system charge is sufficient for 7m equivalent pipe lengths. The approximate, additional charges are as follows:

ADDING REFRIGERANT

The following approximate amounts should be added to the system for every additional metre of pipe run above the standard charge:

SYSTEM	ADDITIONAL GRAMS PER METRE PIPE RUN
CSS 12/CU1	24g
CSS 18/CU1.5	24g
CSS 24/CUS 2.5	67g
CSS 32/CUS 3	67g

ADDING OIL

For systems matched with CU1 – CU1.5, the initial oil charge in the compressor is suitable for pipe runs of up to 20m and for units matched with CUS2-4 a charge of 30m is available, provided good refrigeration practice is followed.

For longer pipe runs add 26g of oil for every ADDITIONAL 0.45 kg of refrigerant added up to the maximum permissible pipe runs stated. Please consult Airedale for further details.

SYSTEM READINGS

NOTE: The sight glass should only be used as an assistance to charging as the charge level showing in the glass will vary according to different operating conditions. This is especially noticeable with the heat pump units where the system may appear to be undercharged in the heating mode.

Evaporating temperature (suction gauge) should read approximately 2°C. to 3°C. with a room (return air temperature) of approximately 22 °C.

Condensing temperature (as read on the discharge gauge) should be in the region of 45 to 46 °C. with an external ambient temperature of 30°C (Condensing is normally 15 °C. above ambient).

HEAD PRESSURE CONTROL

The head pressure controller is factory set, in the unlikely event that this requires adjustment, please contact Airedale Service.

RUNNING CHECKS

Once the system has been charged as above the following running checks should be carried out:-

Check the operation of the fan speed controller by observing an increase in fan speed if

If the system is a heat pump option, check that the reversing valve switches over from cooling to heating and vice-versa.

NOTE: Head pressure control also operates in heating mode by slowing down the outdoor unit fan as the system pressure rises. This can be checked by partially blocking the inlet grilles of the indoor unit and observing the outdoor unit fan slowing down.

IMPORTANT


FINALLY AND MOST IMPORTANT - Fill in the commissioning sheet and return a copy to the factory to ensure that the warranty on the unit will be valid.

Commissioning

ELECTRODE BOILER HUMIDIFIER - CONCEPT PLUS

- INITIAL STARTUP**
- 1 The initial start-up must be carefully monitored. Initially the humidifier cylinder will be empty, the drain pump de-energised, and the feed valve open.
 - 2 The cylinder will fill with water until it reaches the level sensing electrode in the boiler (white connection cap) at which point the feed solenoid will close.
 - 3 When the water reaches the electrodes (red connection caps), current will pass and start to heat the water. The initial current will usually remain low and the addition of table salt may be required in soft water areas to improve conductivity.
 - 4 The water will then boil and the water level in the cylinder will then drop steadily until the level sensing element opens the feed solenoid valve, thus allowing further water into the cylinder.
 - 5 As the water boils away and is replaced with new water, any salts or solids in the water will gradually build up bringing the conductivity of the water within the cylinder higher until the desired operating current is reached.
 - 6 The process will take a few minutes, or several hours, depending upon the hardness of the water.
 - 7 In soft water areas this process may well take several hours, whilst in hard water areas it may be only a matter of minutes.
 - 8 This initial start-up sequence will only occur with a new steam cylinder.
- NORMAL OPERATION**
- 1 Once the initial start-up sequence has taken place, the cylinder will automatically operate at the same output.
 - 2 Once the current value is exceeded with a cylinder in normal operation, the feed pump and drain valve open simultaneously for a short time allowing some of the high solid content water to drain away - at the same time replacing this with fresh water.
 - 3 After this pre-set time the drain pump will stop, but the feed valve will remain open until the normal operating level of water is again reached.
 - 4 The water, now being below boiling point, will once again be brought to the boil and continue to boil at the previous output.
 - 5 The humidifier will now operate under the control of the humidistat providing steam when called for.
- BUILD-UP OF SCALE**
- 1 As the electrodes become scaled, the sensing device allows the conductivity of the water in the cylinder to gradually rise whilst keeping the current reasonably static at the desired value by altering the water level to suit.
 - 2 As this process progresses, the drain down periods taking the solids to waste become less frequent.
 - 3 Eventually they cease altogether, at which time the electrodes will be heavily coated with scale and the electrode current will fall away rapidly.
 - 4 An alarm (Bottle Change) will then be initiated, indicating that a bottle change is required.
 - 5 After a bottle change the initial start-up sequence is repeated and then normal running resumed.

Troubleshooting

FAULT	POSSIBLE CAUSE	REMEDY/ACTION
Critical Alarms:		
Indoor Fan Fault (LED 1 ON)	Fan Trip.	Check/replace fan.
Auxiliary Alarm (LED 2 ON)	Auxiliary Trip.	Check customer added alarm function.
Condensate High Level (LED 3 ON)	Faulty float switch.	Check operation of float switch (normally closed).
	Condensate drain blocked.	Clear drain.
	Condensate pump failed.	Replace condensate pump.
Return Air Sensor Failure (LED 1 flashing)		Replace sensor.
Coil Sensor Failure (LED 3 flashing)	Dirty or blocked air filter.	Clean/Replace air filter.
	Loss of refrigerant.	Trace leak and repair before re-charging.
NOTE: Once fault is cleared - the unit will automatically reset.		
Unit Will Not Start	No power.	Check power supply to the controller.
	Transmitter failure.	Try new batteries first, if receiver bleeps on transmitting signal, transmitter is OK.
	Microprocessor failure.	If fans can be operated by bypassing the microprocessor, then the microprocessor is faulty and requires replacing/investigation.
	Infra-red receiver.	If audible bleep is heard on signal transmission and the LED is working, receiver is OK.
	Wired incorrectly.	Check wire connections in accordance with wiring diagram on control box lid.
	Loose wires.	Check all wires, connections, terminals etc.
<p>CAUTION  The close control air conditioners are designed for use in telecoms situations with a constant room heat load. In the case of standards rooms, where no load or variable loads exist, the air conditioner will very quickly meet the cooling requirement and stop. The compressor is limited to 6 starts per hour, having stopped operation, the unit will wait for 10 minutes before re-starting. If the temperature in the conditioned space rises during this time the air conditioner will not respond in order to protect the compressor, consequently the temperature/humidity may go outside of any pre-set limits.</p>		
Fans Will Not Run	Loose wire.	Check all fan wire connections, terminations etc.
	Faulty capacitor.	Check fan capacitors, replace if necessary.
	Faulty motor.	Check fan motor protector for open circuit, replace if faulty.
	Microprocessor.	If fans can be operated by bypassing the microprocessor, then the microprocessor is faulty and requires replacing/investigation.
Excessive Noise	Obstacle caught in fans.	Remove any obstacle from fan.
	Worn fan motor.	Replace fan motor.

Troubleshooting

FAULT	POSSIBLE CAUSE	REMEDY/ACTION
No Cooling	Incorrect MODE setting.	Check that the transmitter MODE is set to Cooling or Auto Mode.
	Setpoint too high.	Check the setpoint on the controller and adjust if necessary.
	Compressor protection delay.	Wait for a maximum of ten minutes then re-check if cooling is operational.
	Blocked or dirty filter.	Remove filter and clean or replace.
	High condensate level trip.	Drain the condensate tray and investigate the cause of the trip using the section "Water leaking from unit".
	Indoor coil temperature too low.	Check refrigerant charge by measuring operating pressures. Check filter condition.
	Sensor failure.	If any of the sensors are faulty the microprocessor will prevent operation of the compressor (refer to Critical Alarms:).
	Outdoor unit tripped.	Check outdoor unit – refer to outdoor unit troubleshooting section.
	Reversing valve stuck in heating position. (Heat pump only).	Check reversing valve signal is present at outdoor unit. Check the reversing valve and replace if necessary.
Faulty valve actuator.(CW only)	Check cooling signal present at actuator. Check actuator by manually opening the valve. Replace actuator if necessary.	
No Heating (Heat Pump)	Incorrect MODE setting.	Check that the transmitter MODE is set to Cooling or Auto Mode.
	Setpoint too low.	Check the setpoint on the controller and adjust if necessary.
	Defrost Mode.	Unit is defrosting the outdoor coil. This condition will automatically reset itself.
	Compressor protection delay.	Check that the green On/Off LED is not flashing. If it is flashing wait for a maximum of ten minutes then re-check if heating is operational.
	Outdoor unit tripped.	Refer to outdoor unit troubleshooting section.
	Reversing valve stuck in cooling position.	Check the reversing valve and replace if necessary. Check that there is no output on the outdoor microprocessor.
	Indoor coil temperature too high.	Check refrigerant charge by measuring operating pressures. Check filter condition.

Troubleshooting

FAULT	POSSIBLE CAUSE	REMEDY/ACTION
No Heating (Electric Heat)	Incorrect mode setting.	Check transmitter setting is set to Heat or Auto mode.
	Incorrect temperature set point.	Temperature set point must be above return air temperature. Adjust as necessary.
	Blocked or dirty filters.	Remove and clean or replace.
	Overheat cut out tripped.	Reset manual overheat cut out by rubbing. NOTE: DO NOT PRESS!
	Heater element failed.	Replace faulty heater element.
	Faulty heater relay.	Replace PCB.
No Heating (LPHW)	Incorrect Mode setting.	Check transmitter setting is set to Heat or Auto mode.
	Blocked or dirty filters.	Remove and clean or replace.
	No hot water.	Check hot water source.
	Faulty valve/actuator.	Check actuator by manually opening valve, replace if faulty.
	Heater relay failed.	Replace PCB.
Water Leaking From Unit	Unit installed unevenly.	Check alignment of Unit chassis.
	Blocked/kinked condensate pipe.	Check condensate pipework for blocks/kinks, clear as necessary.
	Condensate pump failure.	Replace condensate pump.
	Insulation worked loose.	Replace any loose insulation.
Concept Plus Only	Humidifier Cylinder leaking.	Ensure "O" ring at the cylinder base is seated correctly.
ELECTRIC OVERHEAT:	1	Auto Cut-out - if the auto cut-out trips the electric heat is temporarily disabled until the unit temperature falls and the overheat cut-out resets. The unit otherwise continues to operate normally.
	2	Manual Cut-out - if the manual cut-out trips, the heating will be disabled and the fan(s) will continue to operate. Once the unit has cooled down (typically five minutes) the manual cut-out can be reset.

Troubleshooting - Electrode Boiler Humidifier (Concept Plus)

FAULT	POSSIBLE CAUSE	REMEDY/ACTION
Mains fuse blows when initially switched "on"	Cylinder Electrode Damage - Electrodes shorted out or low resistance path (salts).	Test with Megger - if faulty - replace cylinder.
Water in Cylinder - Contactor in and no steam available	Control fuse failed.	Check wiring - replace fuse (rated 1 amp).
Humidifier called for but not filling	Water not available at cylinder.	Check all stop valves in water supply pipework. Solenoid valve not operating - check electrical supply - replace solenoid / control board as necessary.
	Water available - cylinder not filling.	Drain pump operating - check override switch is in "run" position and not "drain" position.
Cylinder operating - low current or output	Low conductivity.	Conductivity has not risen enough due to new bottle - allow to operate to bring up conductivity. Assist current draw by adding small amount of common salt.
	Cylinder nearing end of useful life.	Replace cylinder.

Maintenance

IMPORTANT	<p>The equipment contains live electrical and moving parts, isolate all electrical equipment before any work is carried out.</p> <p>The maintenance schedule indicates the recommended time period between maintenance operations.</p>
MAINTENANCE SCHEDULE	
3 MONTHS	<ul style="list-style-type: none"> • Check the air filter condition, clean if necessary. • Check sight glass for signs of refrigerant loss. • Concept 2000 Plus with Humidifier – Check operational sequence and flushing. If cylinder is near end of life – replace.
Condensate Pumps (Optional)	<p>CPKIT (Vertical Units) - Check drain pipes are free from blockage and that the float switch moves freely.</p> <p>HCPKIT (Horizontal Units) - Check drain pipes for blockages and ensure water level detectors are clean.</p>
6 MONTHS	<ul style="list-style-type: none"> • As per 3 months plus: • Clean condensate tray with suitable biocide. • Clean the cabinets. • Particular attention should be paid to the inside of the cabinet where moisture is present and any signs of corrosion should be dried, cleaned, inhibited and suitably repainted with water resistant paint.
Electric Heaters	<p>Due to expansion and contraction of the elements, the terminals may eventually loosen. Tighten as necessary.</p>
12 MONTHS	<ul style="list-style-type: none"> • As per 6 months plus: • Check all electrical connections for security. • Check there are no signs of arcing or overheating of cables or components.
Fan Deck	<p>Ensure fans run freely without touching fan inlet assembly.</p> <p>Concept 2000 Plus with Humidifier – Check operational sequence and flushing. If cylinder is near end of life – replace. Also clean the following:-</p> <ol style="list-style-type: none"> 1 Strainer in inlet of solenoid valve. 2 Drain Pump. 3 Manifold at base of bottle.
DISASSEMBLY PROCEDURE	
Filter Removal	<ol style="list-style-type: none"> 1 Remove the screw from underneath the unit that retains the filter tray and pull the tray forwards out of the unit. The filter will now be accessible. 2 Pull the tray out far enough for the filter retaining band to be removed. 3 Standard Filter - Remove filter, vacuum clean and replace, or High Efficiency Filter - Replace with Airedale approved spare.
Humidifier	<ol style="list-style-type: none"> 1 Feed Water Solenoid Valve - This is fitted with a strainer in the inlet connection which should be periodically removed and cleaned. 2 Manifold - This should be checked to ensure that the “O” ring is in place correctly and that there are no deposits lodged. <p>NOTE: It is important to check that the “O” ring at the cylinder base is seated correctly to eliminate the risk of unit flooding, refer to <i>Parts Identification</i>.</p> <ol style="list-style-type: none"> 3 Drain Pump - This should be checked for correct operation. 4 Control Board - This should maintain a reasonably steady operating current on the main electrodes.



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