Ecotel™ Outdoor Upflow Telecom Unit

TCU5 - TCU19D

5KW - 19KW

TECHNICAL MANUAL

ISO 14001
EMS52086

ISO 9001
FM00542

About Airedale Products & Customer Services

WARRANTY

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

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

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

Warranty is only valid in the event that

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

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

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

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

CAUTION

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

SPARES

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

TRAINING

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

CUSTOMER SERVICES

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

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Contents

General Description

UNIT IDENTIFICATION

UPFLOW - ECOTEL OUTDOOR UNIT	
TCU	Upflow Telecom Communication Unit
5 - 19	Model Sizes (Nominal kW)
D	Dual Circuit
XQ	Extra Quiet Unit
Example	**Model TCU15D**

INTRODUCTION

This self-contained packaged air conditioning unit is purpose built for Outdoor Telecom applications, including cabins, shelters and base stations and is available in 6 model capacity sizes and suitable for single or 3 phase electrical supplies.

The unit is externally mounted and utilises single or dual circuit refrigeration systems to provide 1, 2 or 3 stages of cooling. Single circuit units comprise of 5kW, 8kW, 11kW and 15kW. Double circuit units include 15kW and 19kW. All models have 1 free cooling stage. Units are configured for upflow applications. As standard the unit controller offers an additional energy saving feature by shutting off the evaporator fans at low room temperatures.

Each unit is pre charged with R407C, factory piped, wired to current EU standards, performance, leak and function tested prior to despatch.

The unit is despatched having been pre-commissioned ready for offering up to the appropriate services.

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 in the version 2006/42/EC**
Pressure Equipment Directive (PED)	**97/23/EC**

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

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

Operating Temperature (TS),	TS =	Min -5°C to Max 120°C *
Maximum Operating Pressure (PS)	PS =	High Side 26 Barg

*Based upon the maximum machine running temperatures.

STANDARD FEATURES

Construction

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

Cabinets are lined internally with fire resistant foam (UL94 VO) for thermal and acoustic insulation.

Standard unit colour is Grey (RAL 7038).

Vandal proof fixings are employed to all externally removable service panels and the unit has a pitched roof to prevent water and snow collecting.

Evaporator

Large surface area coil(s) ideally positioned to optimise airflow and heat transfer, manufactured from refrigeration quality copper tubes with mechanically bonded aluminium fins.

Condenser

Large surface area coil(s) ideally positioned to optimise airflow and heat transfer, manufactured from refrigeration quality copper tubes with mechanically bonded aluminium fins.

General Description

Fan & Motor Assembly

Evaporator

Backward curved centrifugal fans, statically and dynamically balanced for efficient and quiet operation.

Each fan motor has in-built thermal overload protection.

Fan speed is microprocessor controlled.

Condenser

The unit utilises sickle bladed axial flow fan(s) for the benefit of low noise characteristics. The unique external rotor motor design allows the use of a low power output single phase speed controllable motor to power the fan. The motor has in-built thermal overload protection, and the assembly is supplied complete with a finger guard for protection.

Compressor

Hermetic scroll compressors fitted as standard with:

- Compressor(s) are mounted to the base via the use of vibration isolators.
- Internal thermal motor protection.

Refrigeration

Each refrigeration circuit features as standard:

- Externally equalised thermostatic expansion valve
- High pressure switch - automatic
- Low pressure switch - automatic
- Operating R407C Refrigerant charge
- Filter drier
- Sight glass

Filtration

Synthetic disposable panel filters in a rigid frame to BS EN 779 - G4.

Wire framed synthetic cleanable pre filters to BS EN 779 - G2.

An adjustable diaphragm pressure switch is fitted across the filter assembly to monitor pressure drop which will initiate a filter dirty alarm.

Electrical

The control panel is situated on the front of the unit behind the access panel. The access panel is hinged and supported by lockable door stays to provide a weather hood during servicing.

Controls

AIRETronix microprocessor controlled:

- TCU 5,8,11 & 15 operating 1 stage of DX cooling and 0-100% Free Cooling
- TCU 15D & TCU19D operating 3 stages of DX cooling and 0-100% free cooling
- Monitoring and Alarm Indication via optional Display.

For full details, please refer to the ***Controls*** section.

Outside Air Damper

The unit is fitted with an electrically controlled, modulating damper capable of supplying 100% fresh air into the room as “free cooling”. The damper may be automatically modulated to any position to allow mixing of the return air and outside air before being supplied to the conditioned space.

The damper has a manual operation facility.

The minimum set point for the fresh air damper is fully adjustable via the optional remote display keypad.

Indoor Air Pressure Relief	This is achieved when the unit is in free cooling mode by exhausting air over the condenser coil and through the condenser section.
Non Vision Grilles	Anodised aluminium construction, supplied loose for on site fitting.
Fixing Tool	As standard each unit is supplied with a tamperproof fixing tool, additional tools are available.

OPTIONAL EXTRAS - GENERAL

Extra Quiet	Extra quite unit for low noise applications, incorporates staged condenser and evaporator fan speeds with head pressure control and compressor acoustic jackets to minimise noise.
Epoxy Coated Coils	In atmospheres where high corrosion is anticipated epoxy coated aluminium finned coils can be supplied for the evaporator and condenser sections.
Heating Options	Finned electric heating element(s) complete with overheat cut out protection. Also incorporated is a factory fitted panel interlock device which de-activates the unit upon the control panel door being opened.
High Efficiency Filters	Synthetic disposable panel filters in a rigid frame to BS EN 779 - F5.
Shut off Damper	Additional damper assembly to close off return and supply air openings to the conditioned space in the event of smoke or fire being detected. (Not fire/smoke rated)
Double Deflection Discharge Air Grille	Anodised aluminium construction, to manually adjust direction of airflow, supplied loose for on site fitting.
External Mounting Rails	As standard units are supplied with internal fixings, optional external mountings can be factory fitted if required.
Roof Flashing Strip	Supplied loose for on site fitment to provide further weatherproofing.
48V dc Emergency Power Operating System	This option utilises a 48Vdc control circuit. If power should fail to the mains circuits the clients own UPS or battery system will maintain the 48Vdc control Circuit, enabling the 48Vdc evaporator fans and damper to provide 'Free Cooling'.
Electronic Soft Start	An electronic soft starter can be fitted to each compressor. Soft starting a compressor motor reduces the effects of high starting torque surges. Available in single and 3 phase.
Single Phase Unit (Except Model TCU15)	If required, units can be supplied as 230V/1PH+N/50Hz.
Maintenance 13A Socket	Single 13A socket for unit maintenance only.
Head Pressure Control	Head pressure is maintained by a factory fitted, pressure actuated, head pressure controller which varies the speed of the condenser fan(s) to provide optimum control under varying ambient conditions.
Panel Interlock	Factory fitted, the unit will de-activate upon the control panel door being opened.
Phase Sequence Relay	A phase failure relay can be fitted to shut down the system, upon sensing abnormality in the 3 phase sequence.

OPTIONAL EXTRAS - CONTROLS

User Display	Remote display can be installed inside the conditioned space or loose for hand held use, which can monitor temperatures, alarms, hours run and adjust setpoints.
Remote On/Off	An electrical contact is provided for connection to a remote unit ON/OFF device (supplied by others).
Real Time Clock	A real time clock plug-in card is available for energy savings and will time / date stamp any alarms.
BMS Communication	With use of communication plug-in cards, the AIRETronix microprocessor can also communicate with the following control protocols, Carel, ModBus / Jbus Echelon LONWorks, Johnson Metasys and Trend. The BMS can monitor remotely, Temperatures, Alarms, Hours run and adjust Setpoints; can be viewed using a PC via a PSTN / GSM modem connection.
Run/Standby	Up-to 6 units can be networked to provide run / standby, changing over on hours run and critical alarms.
Master/Slave	Up-to 6 units can be networked to provide master/slave, with an optional standby unit changing over on hours run, critical alarms.
Attend/Occupancy Mode	To allow reduction of evaporator fan speed during 'Attend Mode' and to allow reduction of airflow during low temperature conditions (< 10°C conditioned space temperature).

General Specification

MECHANICAL DATA

TCU			5	8	11	15	15D	19D
Capacity - Nom Cooling								
Total	(1)	kW	5.4	8.2	11.0	16.0	15.3	22.5
Sensible	(1)	kW	4.4	7.1	10.6	15.2	14.4	19.3
EER			3.4	2.8	3.2	3.2	3.4	2.6
Capacity Steps		%	0 & 100	0 & 100	0 & 100	0 & 100	0, 30, 70 & 100	0, 40, 60 & 100
Dimensions								
H x W x D		mm	1588 x 1005 x 565		2038 x 1365 x 565			
Weights								
Machine		kg	210	215	276	281	292	398
Operating		kg	212	217	280	285	296	400
Construction								
Material / Colour			Galvanised Sheet Steel, Epoxy Baked Powder Paint- Light Grey (RAL 7038)					
Evaporator			Copper Tubes / Aluminium Fins - Air Cooled					
Quantity			1	1	1	1	1	1
Face Area		m²	0.30	0.30	0.73	0.73	0.73	0.75
Nominal Airflow		m³/s	0.45	0.75	0.95	1.20	1.20	1.15
Discharge			Horizontal					
Condenser			Copper Tubes / Aluminium Fins – Air Cooled					
Quantity			1	1	1	1	1	1
Face Area		m²	0.35	0.35	0.60	0.60	0.60	0.71
Nominal Airflow		m³/s	1.10	1.10	1.80	2.00	2.00	2.00
Discharge			Horizontal					
Fan - Evaporator			Backward Curved Centrifugal					
Quantity			2	2	2	2	2	2
Diameter		mm	310	310	355	355	355	400
Maximum Speed		rpm	1430	1430	1430	1430	1430	1360
Fan - Condenser			Axial					
Quantity			1	1	2	2	2	2
Diameter		mm	450	450	400	450	450	450
Maximum Speed		rpm	1400	1400	1430	1400	1400	1320
Compressor			Hermetic – Scroll					
Quantity			1	1	1	1	2	2
Oil Charge Volume (Total)		l	1.0	1.1	1.8	1.85	1.00 & 1.10	1.1 & 1.95
Oil Type			Polyol Ester					
Refrigeration			Single Circuit				Dual Circuit	
Refrigeration Control			Thermostatic Expansion Device					
Refrigerant Type			R407C					
Charge (Total)		kg	2.0	2.0	2.3	3.98	2.0 & 3.0	2.0 & 3.7
Filtration			Disposable - BS EN 779 – G2 & BS EN 779 - G4					
Quantity			1+1	1+1	2 + 2	2 + 2	2 + 2	1 + 1
Size H x W x D		mm	624 x 395 x 5 & 624 x 395 x 47		448 x 448 x 5 & 448 x 448 x 47			1100x395x5 & 1100x395x47
Optional Extras								
Heating		kW	2.5	2.5	5.0	5.0	5.0	5.0
High Efficiency Filters			BS EN 779 – F5					

(1) Nominal Cooling Duties based on 27°C db/19°C wb and 35°C ambient.
All performance data is supplied in accordance with BS EN 14511-1:2013

General Specification

ELECTRICAL DATA

TCU			5	8	11	15	15D	19D
Electrical Supply Data								
Nominal Run Amps	(1)	A	4.6	6.8	8.5	11.4	10.9	18.7
Maximum Start Amps	(1)	A	27.8	49.8	56.0	81.1	56.1	87.8
Recommended Mains Fuse	(1)	A	10	16	16	20	16	25
Max Mains Incoming Cable Size	(1)	mm²	1.50	1.50	1.50	2.50	1.50	4.0
Mains Supply					400V / 3PH + N / 50Hz			
Controls Circuit		Vac	24	24	24	24	24	24
Evaporator Fan - per Fan	(2)							
Quantity			2	2	2	2	2	2
Motor Rating		W	120	120	210	210	210	415
Full Load Amps		A	0.54	0.54	0.97	0.97	0.97	2.00
Locked Rotor Amps		A	1.62	1.62	2.91	2.91	2.91	6.00
Condenser Fan - per Fan	(2)							
Quantity			1	1	2	2	2	2
Motor Rating		W	292	292	204	245	245	550
Full Load Amps		A	1.1	1.1	0.91	1.1	1.1	2.5
Locked Rotor Amps		A	3.3	3.3	2.73	3.3	3.3	8.4
Compressor 1 - per Compressor								
Motor Rating		kW	1.6	2.9	3.4	4.9	1.6	2.4
Nominal Run Amps		A	2.9	5.2	6.2	8.7	2.9	4.54
Locked Rotor Amps		A	24.0	46.0	50.0	74.0	24.0	40.0
Type of Start					Direct on Line			
Compressor 2 - per Compressor								
Motor Rating		kW	N/A	N/A	N/A	N/A	2.9	4.2
Nominal Run Amps		A	N/A	N/A	N/A	N/A	5.2	8.0
Locked Rotor Amps		A	N/A	N/A	N/A	N/A	46.0	66.0
Type of Start					Direct on Line			
OPTIONAL EXTRAS								
Heating								
Unit Run Amps with Elec Htg		A	10.87	10.87	21.74	21.74	21.74	21.74
Electric Heater Rating		kW	2.5	2.5	5.0	5.0	5.0	5.0
Number of Stages			1	1	1	1	1	1
Number of Elements			1	1	2	2	2	2
Electronic Compressor Soft Start								
Reduced Start 3Ph Compressor 1	(3)	A	14.2	28.3	30.6	45.8	14.2	24.0
Reduced Start 3Ph Compressor 2	(3)	A	N/A	N/A	N/A	N/A	28.3	39.6
Reduced Start 1Ph Compressor 1	(3)	A	25.9	55.0	62.2	N/A	25.9	N/A
Reduced Start 1Ph Compressor 2	(3)	A	N/A	N/A	N/A	N/A	55.0	N/A
Client's 48Vdc Emergency Power								
Nominal Run Amps		A	5.90	5.90	5.90	16.30	16.30	17
Single Phase Unit								
Nominal Run Amps	(1)	A	10.3	16.3	21.3	N/A	25.9	N/A
Maximum Start Amps	(1)	A	51.9	104.9	120.9	N/A	112.3	N/A
Recommended Mains Fuse	(1)	A	16	32	35	N/A	40.0	N/A
Max Mains Incoming Cable Size	(1)	mm²	1.5	4.0	6.0	N/A	6.0	N/A
Mains Supply					230V/1PH+N/50Hz			
Controls Voltage		Vac	24	24	24	N/A	24	N/A
Compressor 1 - per Compressor								
Motor Rating		kW	1.6	2.9	3.5	N/A	1.6	N/A
Nominal Run Amps		A	7.6	13.6	17.1	N/A	7.6	N/A
Locked Rotor Amps		A	47.0	100.0	113.0	N/A	47.0	N/A
Type of Start					Direct on Line			
Compressor 2 - per Compressor								
Motor Rating		kW	N/A	N/A	N/A	N/A	2.9	N/A
Nominal Run Amps		A	N/A	N/A	N/A	N/A	13.6	N/A
Locked Rotor Amps		A	N/A	N/A	N/A	N/A	100.0	N/A
Type of Start					Direct on Line			

(1) Cooling only unit (based at 35°C ambient and 50°C condensing temperature).
(2) Includes pressure drops.
(3) 3Ph Electronic Soft Start based on 40% Reduction In Compressor Starting Current.
1Ph Electronic Soft Start based on 45% Reduction In Compressor Starting Current.

Performance Data

CAPACITY DATA

DX Cooling Capacity		Ambient							
	Air On ºC	25°C		30°C		35°C		40°C	
	db/50% RH	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)	TC (kW)	SC (kW)
	22	5.2	4.4	5.0	4.3	4.8	4.2	4.5	4.1
TCU5	24	5.5	4.5	5.3	4.4	5.0	4.3	4.7	4.2
	27	5.9	4.6	5.7	4.5	5.4	4.4	5.1	4.3
	22	8.1	7.2	7.7	6.9	7.2	6.7	6.4	6.4
TCU8	24	8.6	7.3	8.1	7.1	7.6	6.9	6.6	6.5
	27	9.2	7.4	8.6	7.2	8.2	7.1	7.2	6.7
	22	11.4	10.6	10.8	10.3	10.2	10.1	9.7	9.5
TCU11	24	11.9	10.8	11.3	10.6	10.7	10.3	10.1	9.9
	27	12.8	11.1	12.2	10.9	11.0	10.6	10.8	10.4
	22	16.0	15.1	15.2	14.8	14.4	14.0	13.7	13.3
TCU15	24	16.7	15.4	15.9	15.1	15.0	14.9	14.2	14.1
	27	17.8	15.9	16.9	15.6	16.0	15.2	15.0	14.9
	22	14.6	14.4	14.0	13.8	13.8	13.4	12.7	12.4
TCU15D	24	15.4	14.7	14.7	14.4	14.2	13.9	13.3	13.3
	27	16.6	15.8	15.8	15.6	15.3	14.4	14.4	14.4
	22	21.9	18.7	20.9	18.4	20.0	18.3	19.4	17.0
TCU19D	24	23.0	18.9	22.0	18.5	20.9	18.8	20.3	18.3
	27	24.8	20.2	23.7	19.8	22.5	19.3	21.2	19.0

Free Cooling Capacity (Gross)		Ambient			
	Air On ºC db/50% RH	13.5°C TC (kW)	15.0°C TC (kW)	19.0°C TC (kW)	20.0°C TC (kW)
TCU5	**24**	4.8	4.1	2.3	0.9
TCU8	**24**	8.0	6.9	3.8	1.5
TCU11	**24**	10.2	8.7	4.8	1.9
TCU15	**24**	12.9	11.0	6.1	2.4
TCU15D	**24**	12.9	11.0	6.1	2.4
TCU19D	**24**	12.9	11.0	6.1	2.4

TC = Total Cooling SC = Sensible Cooling

Performance Data

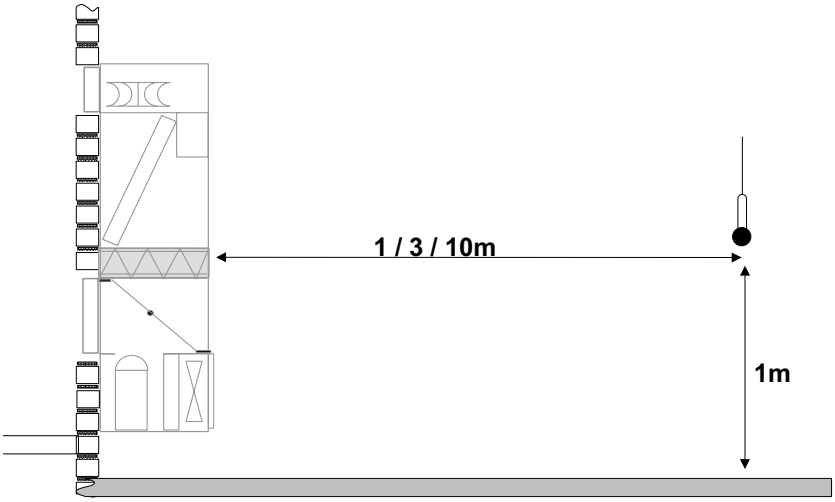
SOUND MEASUREMENT All sound data quoted has been measured in the third-octave band, limited values using a Real Time Analyser calibrated sound intensity meter in accordance with BS ISO9614 (Part 1) : 1995.

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

2 dB(A) is the overall sound level, measured on the A scale.

3 Sound Pressure Levels calculated from sound power using the semi-hemispherical method according to BS EN ISO11203 : 1996. If the equipment is placed adjacent to a reflective wall, values may vary to those stated in our Performance Data section, typically you can add 3dB(A) for each side added.

4 The above data is based on unit typical running conditions.



SOUND DATA

	Sound Measurement	Nominal Operation (dBA)		XQ Unit (dBA) (1)
		Free Cooling	DX	DX
TCU5	Power	47	78	71
	Pressure @ 1m	45	73	66
	Pressure @ 3m	35	63	56
	Pressure @ 10m	25	53	46
TCU8	Power	47	78	72
	Pressure @ 1m	45	73	67
	Pressure @ 3m	35	64	57
	Pressure @ 10m	25	53	47
TCU11	Power	70	79	72
	Pressure @ 1m	65	74	67
	Pressure @ 3m	55	64	57
	Pressure @ 10m	45	54	47
TCU15	Power	70	81	73
	Pressure @ 1m	65	75	69
	Pressure @ 3m	55	66	59
	Pressure @ 10m	45	55	49
TCU15D	Power	70	81	73
	Pressure @ 1m	65	75	69
	Pressure @ 3m	55	66	59
	Pressure @ 10m	45	55	49
TCU19D	Power	74	90	80
	Pressure @ 1m	69	84	72
	Pressure @ 3m	59	74	62
	Pressure @ 10m	49	64	52

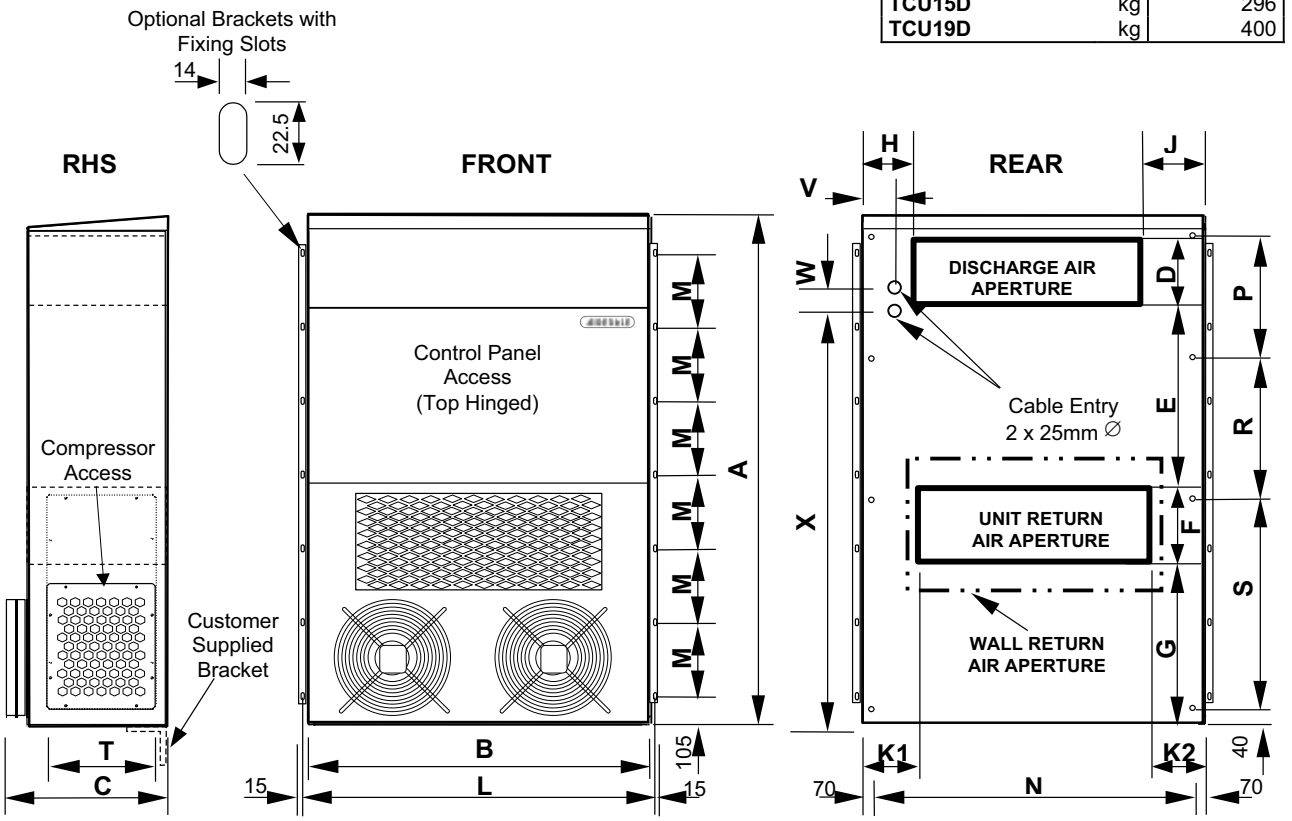
(1) This option utilises fan speed regulation to indoor and outdoor fans and a compressor acoustic jacket.

Installation Data

DIMENSIONS (mm)

WEIGHTS (kg)

		Operating
TCU5	kg	212
TCU8	kg	217
TCU11	kg	280
TCU15	kg	285
TCU15D	kg	296
TCU19D	kg	400



		A	B	C	D	E	F	G	H	J
TCU5	mm	1588	1005	650	200	552	250	535	177	228
TCU8	mm	1588	1005	650	200	552	250	535	177	228
TCU11	mm	2038	1365	600	263	768	325	633	296	269
TCU15 & TCU15D	mm	2038	1365	600	263	768	325	633	296	269
TCU19D	mm	2038	1365	661	263	768	325	633	296	269

		K1	K2	L	M	N	P	R	S	T
TCU5	mm	203	203	1030	675 x 2	866	500	462	500	320
TCU8	mm	203	203	1030	675 x 2	866	500	462	500	320
TCU11	mm	283	283	1395	300 x 6	1225	540	580	802	430
TCU15 & TCU15D	mm	283	283	1395	300 x 6	1225	540	580	802	430
TCU19D	mm	185	34	1395	300 x 6	1225	540	580	802	430

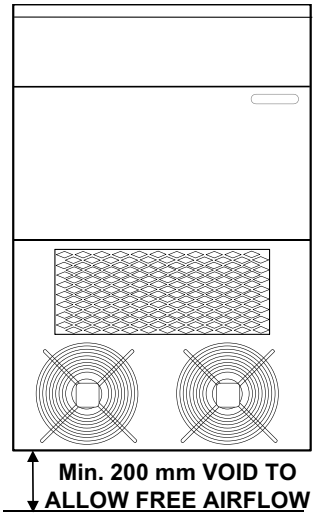
		Mains Incoming Hole Positions			Cabin/Wall Apertures*		Unit Apertures	
		V	W	X	Discharge	Return Air	Discharge	Return Air
TCU5	Mm	61	55	1354	600 x 200	600 x 410	600 x 200	600 x 250
TCU8	Mm	61	55	1354	600 x 200	600 x 410	600 x 200	600 x 250
TCU11	Mm	155	55	1883	800 x 263	800 x 480	800 x 263	800 x 325
TCU15 & TCU15D	Mm	155	55	1883	800 x 263	800 x 480	800 x 263	800 x 325
TCU19D	Mm	155	55	1883	800 x 263	1146 x 480	800 x 263	1146 x 325

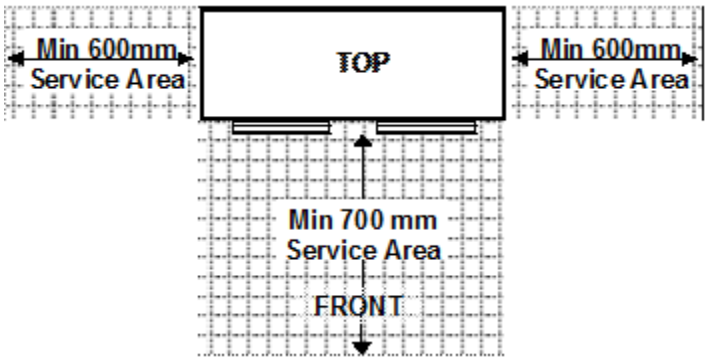
1 The cabin/wall apertures are to be cut central to the unit apertures.

Installation Data

LIFTING/POSITIONING

- Remove packing and check that the unit is exactly as ordered. Any discrepancy to order, or transit damage, should be reported to Airedale immediately.
- Airedale recommends that whenever possible, the packaging is left covering the unit, to protect it from damage and general site debris.
- This small footprint unit is relatively tall and heavy. Care should be taken during handling and lifting, that the unit is well supported and properly balanced.
- Care should be taken that there are no obstructions to free airflow, particularly in the vicinity of the condenser fan discharge (outdoor) and also the return / discharge air (indoor).
- Where a cavity wall exists between AHU and conditioned space, a wall sleeve will be required. (Supplied by others).





CAUTION **Airedale will accept no responsibility for mishandling during the positioning of the equipment.**

DRAINAGE

Each module has condensate drain(s) exiting from the base of the unit which should be clear of obstructions.

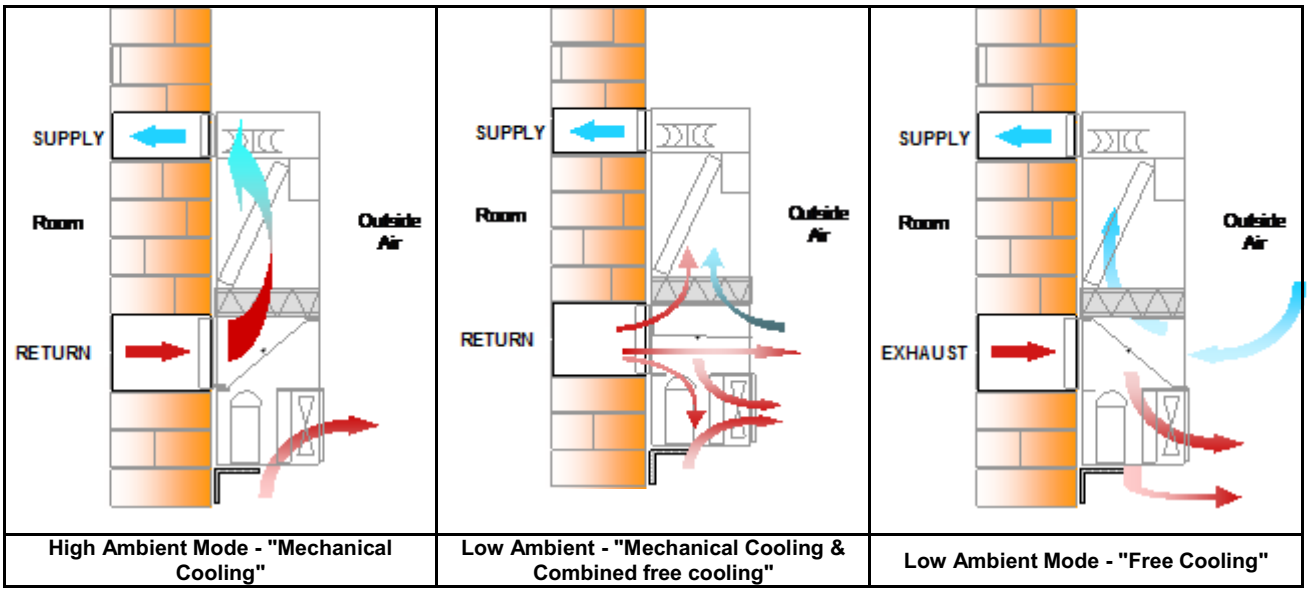
The unit condensate drain trap(s) accessible through the unit side panel(s), require filling to be fully effective. Water should be added to the drain until water discharges from the condensate outlet.

MOUNTING

CAUTION **Units MUST be supported by a 3"cabin mounted angle iron (not supplied).**

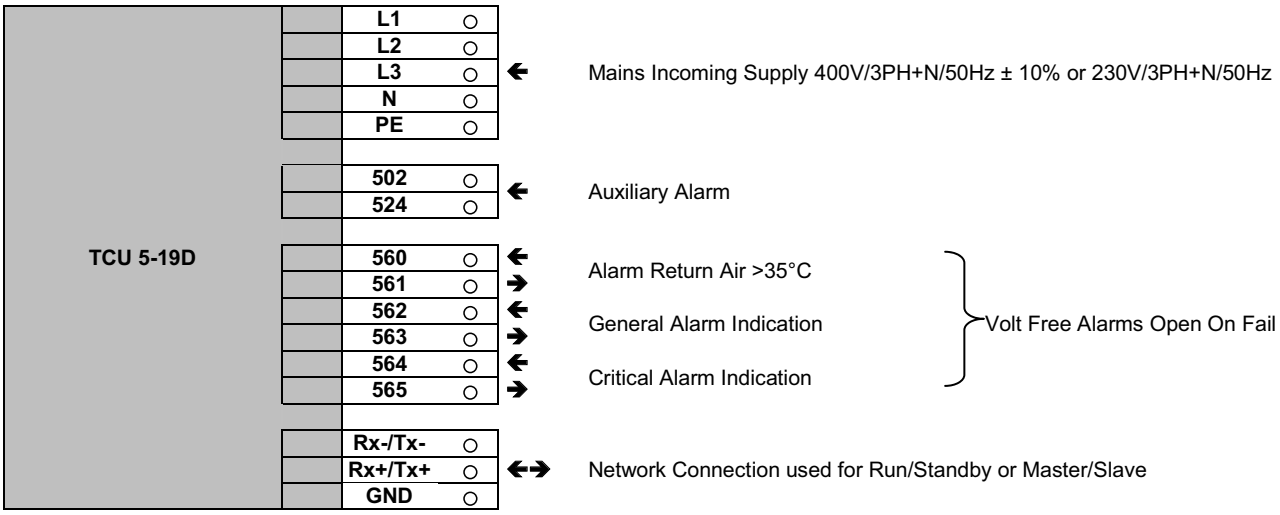
Design Data

UNIT OPERATION

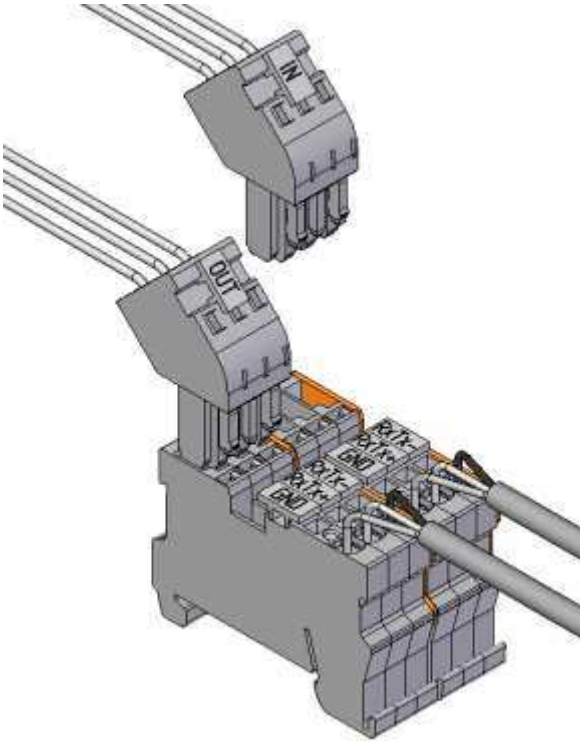


High Ambient Mode - "Mechanical Cooling"	Low Ambient - "Mechanical Cooling & Combined free cooling"	Low Ambient Mode - "Free Cooling"

INTERCONNECTING WIRING



pLan Termination



Controls

GENERAL

As standard the units are fitted with an AIRETronix microprocessor controller, with optional Real Time Clock (RTC), RS232 communication port, networking capability and BMS connection. An optional LCD remote display provides all the necessary functions for the wide range of features and options available. The LCD display provides audible and visual monitoring of the unit operation.

The LCD display is mounted remotely.

With use of optional communication plug-in cards, the AIRETronix microprocessor can also communicate with the following control protocols, Carel, ModBus / Jbus Echelon LONWorks, Johnson Metasys and Trend.

The AIRETronix microprocessor controller has been specifically designed to provide the control information necessary to operate the unit in an energy efficient manner.

The unit will operate in 1 of 4 modes:

1 Free Cooling - using outside air only
2 Free Cooling and DX Cooling - using outside air and DX cooling
3 DX Cooling - mechanical cooling with room return air
4 Electric Heating (Optional Extra)

TEMPERATURE CONTROL

The AIRETronix microprocessor senses the Return Air condition and maintains this by controlling cooling and heating (Optional) outputs accordingly.

The AIRETronix microprocessor monitors and displays the following measured parameters:

- Return Air Temperature
- Exterior Air Temperature
- Evaporator Coil Temperature
- Compressor 1 (2) Liquid Line Pressure (Head Pressure Control Option)
- Alarms Reset
- Attend Mode or Remote On/OFF (Optional)
- Overheat Cut-Out (Electric Heat Option)
- Airflow Switch
- Filter Switch
- Compressor 1 (Compressor 2) MCB
- Condenser Fan MCB
- Evaporator Fan MCB
- Compressor 1 (Compressor 2) Low Pressure Switch
- Compressor 1 (Compressor 2) High Pressure Switch
- Auxiliary Alarm (Smoke/Fire/Panel Interlock)

STANDARD FEATURES

Compressor Anti-Cycle Control Automatic compressor protection via the microprocessor.

Evaporator Fan Speeds Varying speeds can be configured for heating, 1, 2 or 3 DX stages, free cooling and speed at temperature setpoint.

Hours Run Calculates hours run of major components.

Maintenance Overrides Allows testing of major components.

OPTIONAL FEATURES

- User Display
- Real Time Clock
- Password Protection
- Remote On/Off
- Head Pressure Control
- Master/Slave Networking
- Run/Standby Networking
- Attend/occupancy Mode
- Duty Rotation Networking

AIRETronix - Controls

OPTIONAL GRAPHICAL DISPLAY

ALARMS

Outlined below is a selection of Common Alarms:

- Room Air Temperature out of limits or faulty probe
- Exterior Air Temperature out of limits or faulty probe
- Frost Protection or faulty probe
- Compressor 1(2) Liquid Line Pressure out of limits or faulty probe (Head Pressure Control option)
- Overheat Cut-out tripped (Electric Heat option)
- Air Flow Switch tripped
- Filter Dirty Switch tripped
- Compressor 1(2) MCB tripped
- Condenser Fan MCB tripped
- Evaporator Fan MCB tripped
- Compressor 1(2) Low Pressure Switch tripped
- Compressor 1(2) High Pressure Switch tripped
- Auxiliary Alarm tripped (Smoke/Fire/Panel Interlock)

An **Audio-Visual** alarm will be triggered at the optional display keypad.

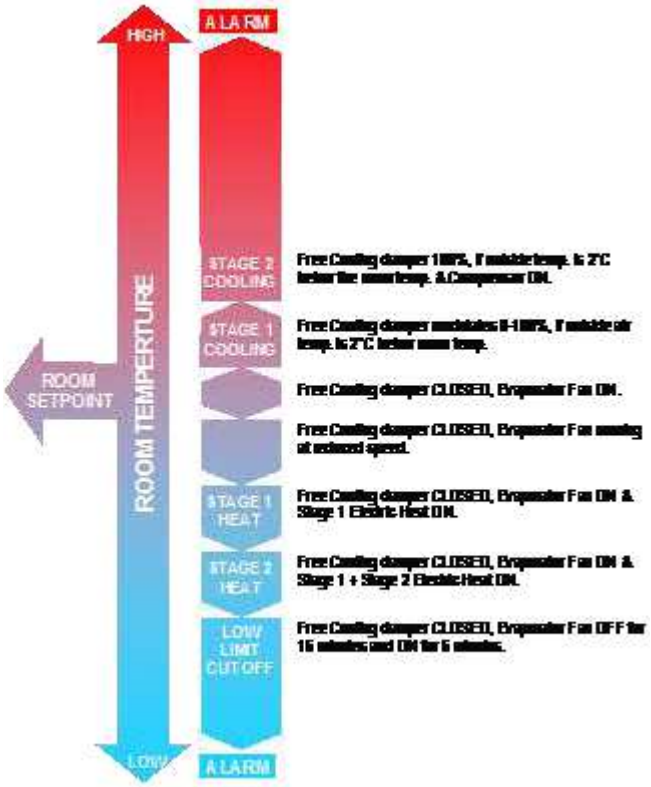
ALARMS LOG

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

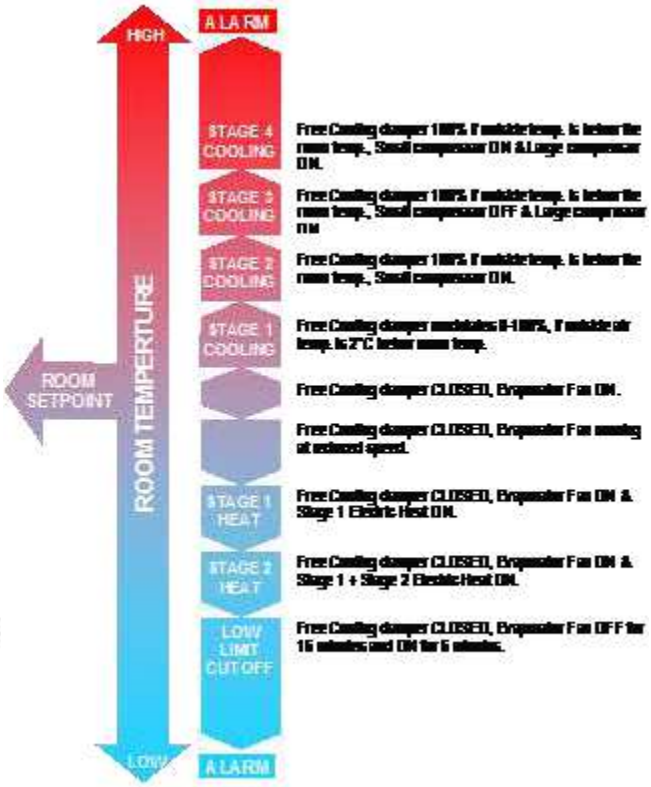
AIRETronix - Controls

OPERATION

Single Circuit Unit



Double Circuit Unit



OPERATING LIMITS	CONDITIONED SPACE TEMPERATURE	UNIT OPERATION
TCU5 - TCU15	Less than 18°C	Damper is closed
	Between 18°C and 21°C	Fresh air damper modulates
	23°C	Circuit 1 (5kW, 8kW, 11kW & 15kW cooling) is active
	35°C	Over temperature alarm is generated
TCU15D – TCU19D	Less than 18°C	Damper is closed
	Between 18°C and 21°C	Fresh air damper modulates
	21°C	Circuit 1 (1st stage compressor) is active
	23°C	Circuit 2 (2nd stage compressor) is active
	25°C	Circuits 1 & 2 (combined 1st & 2nd stage compressors) are active
	35°C	Over temperature alarm is generated

1 The damper also assists mechanical cooling when the outdoor air is less than 2°C below the return air temperature.
2 When the outdoor ambient is below 13.5°C the DX Cooling will not operate.
3 When conditioned area is below 14°C the evaporator fans will switch off to conserve energy.
4 All microprocessor settings are adjustable via the user display.

Notes:

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PART NO:	ISSUE	DATE
901-063 TM E	~~A~~	~~01/06/01~~
	~~B~~	~~11/07/01~~
	~~C~~	~~26/10/01~~
	~~D~~	~~23/11/01~~
	~~E~~	~~17/04/02~~
	~~F~~	~~18/06/03~~
	~~G~~	~~15/04/2010~~
	H	11/2011
	I	10/2012
	V1.9.0	02_2013