KLIMAK srl

Air Handling at its best

Our references speak for us and our certifications endorse

Construction and Components

1. CASING

a. Model KCD :

Double skinned panels are fixed to an anodised aluminium alloy framework with stainless steel screws, forming a rigid casing enclosing various air treatment sections such as mixing, filtration, heating, cooling, humidification, supply fan, extract fan. If required, other sections such as heat recovery, multizone, sound attenuators can be incorporated. Air tight sealing is ensured through a neoprene gasket between the panel and the frame depending on the application and the operating environment.

Overall panel thickness: 45mm

Outer and Inner sheets (solid): Polyester coated galv. steel sheet/ peraluman/ stainless steel.

Insulation: Pressure Injected Foam (50kg/m³) / Fibre Glass (80kg/m³)

Sound Transmission Loss (tested in accordance with ASTM 90-9 and E 413-04)

Hz	63*	125	250	500	1K	2K	4K	8K*
dB	20	23	26	30	21	42	52	54

**Although the measurements for 63 Hz and 8K Hz were made, they do not qualify as a part of the above stated ASTM standard.*

Mechanical Characteristics (tested @ TÜV Lab in accordance with EN 1886)

1. Thermal Transmittance: T2
2. Thermal Bridging Factor: TB2
3. Casing Mechanical Strength: D1(M)
4. Casing Air Leakage: L1 (M)
5. Filter By-Pass Leakage: G1 – F9

b. Model KCA :

Construction is the same as Model KCD, except that the 45mm thick KCD casing is acoustically insulated internally with 55mm thick fibre glass, making the overall panel thickness as 100mm with polyester coated galvanized steel inner sheet:

Overall panel thickness: 100mm

Outer sheet (solid): Polyester coated galvanised steel sheet/ peraluman/ stainless steel.

Inner sheet (perforated): Polyester coated galvanised steel sheet.

Insulation: Pressure Injected Foam (50kg/m³) + Fibre Glass (96kg/m³)

Sound Transmission Loss (tested in accordance with ASTM 90-9 and E 413-04)

Hz	63*	125	250	500	1K	2K	4K	8K*
dB	24	22	26	33	37	41	51	54

Sound Absorption Coefficient (tested in accordance with ASTM C423-09a and E795-05)

Hz	63*	125	250	500	1K	2K	4K	8K*
dB	0.02	0.35	0.84	1.24	1.13	1.11	1.13	1.36

NRC: 1,10

**Although the measurements for 63 Hz and 8K Hz were made, they do not qualify as a part of the above stated ASTM standard*

2. CONSTRUCTION

a. Base Frames: Units are supplied with 3.5mm thick galvanised base frame, powder coated after manufacture. The base frame extends under the perimeter of the complete monoblock unit or under the perimeter of each section, when supplied in multiple sections.

b. Access Doors: For inspection or maintenance of the components in various sections such as filters, fans, motors, coils, etc., double skinned access doors are provided either fully removable or with hinges made of nylon.

c. Return Inlet Plenum: Return / Inlet plenums with same construction as unit casing are supplied with or without opposed blade, volume control dampers.
Optional: Intake Louver

d. Mixing Box & Dampers: Mixing Boxes are of same construction as the unit casing and are available with two or three dampers arrangement with configuration to suit the plant room ductwork. Dampers are sized for 6.0 m/sec velocity.
Dampers are with opposed airfoil blades, made of aluminium alloy extrusions and are assembled in aluminium alloy framework.
Optional: Low leakage dampers for Hospital / Pharmaceutical applications.

e. Filter Section: Filter banks are designed for easy withdrawal and replacement of filter. Fully sealed filter frame are designed to accommodate various types of filters such as

- Panel filters
- Automatic roll filters
- Bag filters
- Absolute filters
- Activated carbon filters
- Inertial sand filters
- Oil bath filters
- Electrostatic filters

Optional

- Filter manometers.
- Filter pressure switches.

f. Heat Recovery Section: Heat Wheel, Plate Exchanger, Run Around Coils, are supplied where specified as integral part of the AHUs, complete with SS drain pan under.

g. Coil Section: Klimak coils are AHRI (ARI) 410 certified. Cooling / Heating coils are computer selected to obtain specified heat exchange capacities.
Cooling coils are of chilled water or direct expansion type while heating coils are of hot water or steam type. Coils are made of cupper tubes, mechanically bonded to aluminium fins, assembled in heavy gauge aluminium or SS frame work. Coils are complete with cooper headers. All coils are leak tested under water at 30 bar.
Drain pan made of stainless steel sheets is provided under the cooling coil section with threaded drain outlet. Coils are mounted within the coil section to facilitate easy withdrawal.
Optional

- Vinyl coated aluminium fins
- Copper fins
- Heresite / Electrofin coated coils
- Electro tinning of Cu/Cu coil after manufacture
- Hygienic cooling section suitable for washing completely

h. **Humidifying Section:** Following types of humidifiers are available;
- Wet deck complete with recirculation pump.
- Spray coil.
- Self generated steam package
- Alternatively, blank sections can be supplied to incorporate steam distributor / injector with steam from an external source.

i. **Moisture Eliminator:** It is recommended to install moisture eliminators after the cooling coil (with face velocity above 2.6 m/sec) / humidifier section to avoid moisture carryover. Eliminator blades are made of polypropylene and are assembled within a heavy gauge polyester coated galvanised steel frame.
Optional: Eliminator blades made of polyester coated steel

j. **Heater Batteries:** Electric heater batteries are supplied with sheathed electric resistance heating elements made of finned steel tubes assembled within a galvanised steel frame. Entire assembly is located within the casing of the heating section.
Optional:
- Heating element made of stainless steel / cooper tubes
- Overheat thermostat or other controls.
- Terminal block with internal prewiring

k. **Fan Section:** DIDW centrifugal fans with forward curved or backward curved impellers are available with various outlet configurations. Fans and casings are made of galvanised steel with epoxy coating. All fan wheels and pulleys are statically and dynamically balanced and keyed to the shaft. Fan shafts are made of high quality solid steel and are supported on pre-greased sealed for life ball bearings. Fans are driven by TEFC motor located within the unit casing. Fan and motor are mounted on a common base frame with facility to allow easy belt tensioning. Fan & motor assembly is isolated from the unit casing by anti vibration mounts and a flame retardant flexible connector on the fan discharge.
Protection screen at access door, bulkhead lights and inspection window are provided as standard for all fan sections. Floor plates made of 3.5mm thick aluminium alloy tread plates are provided as standard in the fan section.
Optional:
- Terminal block with internal prewiring
- Fan with anti spark features
- Fan casing with drain plugs and inspection doors
- Belt guards
- Two speed, variable speed or any other special motor

3. ADDITIONAL SECTIONS:
Units can be supplied incorporating the following sections:
- Face and Bypass
- Multizone
- Dual duct
- Sound attenuator

4. ROOF CANOPY:
Units are supplied with weather proof roof canopy for outdoor application.

5. SPECIAL APPLICATION:
AHUs for special applications can be designed to meet client's constraints and to operate at severe climatic environments.

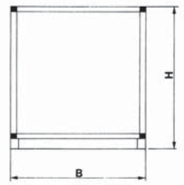
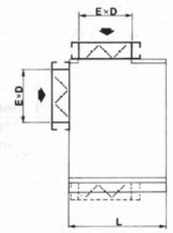
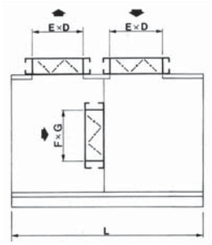
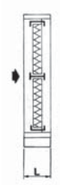
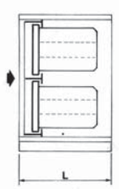
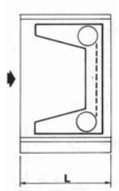
AHU Quick Selection Table:

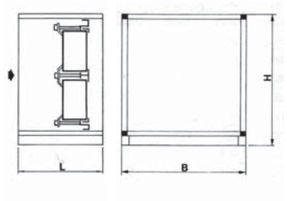
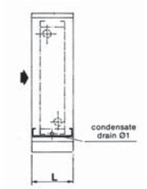
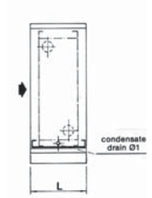
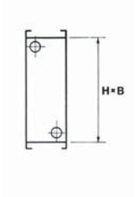
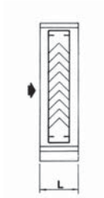
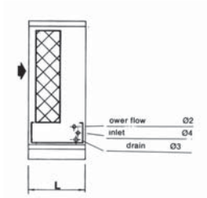
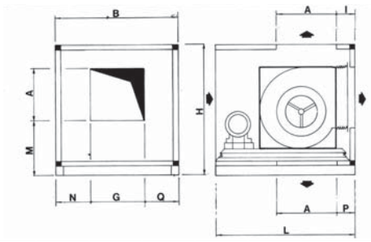
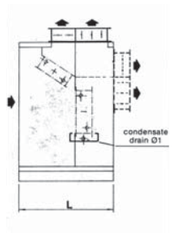
AHU MODEL	Length x Width x Height	COIL Width x Height	FAN Dia	AIR VOL Lit/sec	FILTERS Full+Half
KCD 020	2800 x 900 x 900	550 x 480	180	600	1 + 0
KCD 030	2900 x 1150 x 950	800 x 520	250	1000	1 + 1
KCD 045	3000 x 1450 x 1000	1100 x 560	280	1500	2 + 0
KCD 065	3100 x 1700 x 1100	1300 x 640	315	2000	2 + 1
KCD 080	3100 x 1950 x 1100	1600 x 640	355	2500	3 + 0
KCD 105	3300 x 2200 x 1220	1750 x 760	400	3200	3 + 1
KCD 130	3500 x 2200 x 1420	1750 x 960	450	4000	3 + 3
KCD 160	3800 x 2200 x 1700	1750 x 1200	500	5000	6 + 0
KCD 200	4000 x 2200 x 2020	1750 x 1520	560	6300	6 + 3
KCD 230	4100 x 2250 x 2220	1750 x 1720	630	7250	9 + 0
KCD 280	4300 x 2450 x 2300	1950 x 1800	710	8400	9 + 3
KCD 400	4500 x 2900 x 2550	2400 x 2080	800	12000	12 + 4
KCD 500	4600 x 3300 x 2550	2800 x 2080	900	14000	15 + 5
KCD 600	4600 x 4000 x 2550	3500 x 2120	1000	18000	18 + 6
KCD 700	4600 x 4600 x 2550	4100 x 2120	1000	21000	21 + 7
KCD 800	4600 x 5200 x 2550	4700 x 2120	1000	24000	24 + 8

1) All dimensions are in mm
2) AHU height includes 100mm high base frame around the perimeter
3) AHUs up to Model : KCD 230 are supplied in Monoblock
4) AHU Model: KCD 280 and above are supplied in 2 sections.
5) AHU length includes
   - Mixing Box with dampers + side Access Door
   - Panel + Bag combination Filter section
   - Cooling Coil with drain pan
   - Supply Fan with Motor and transmission + side access door

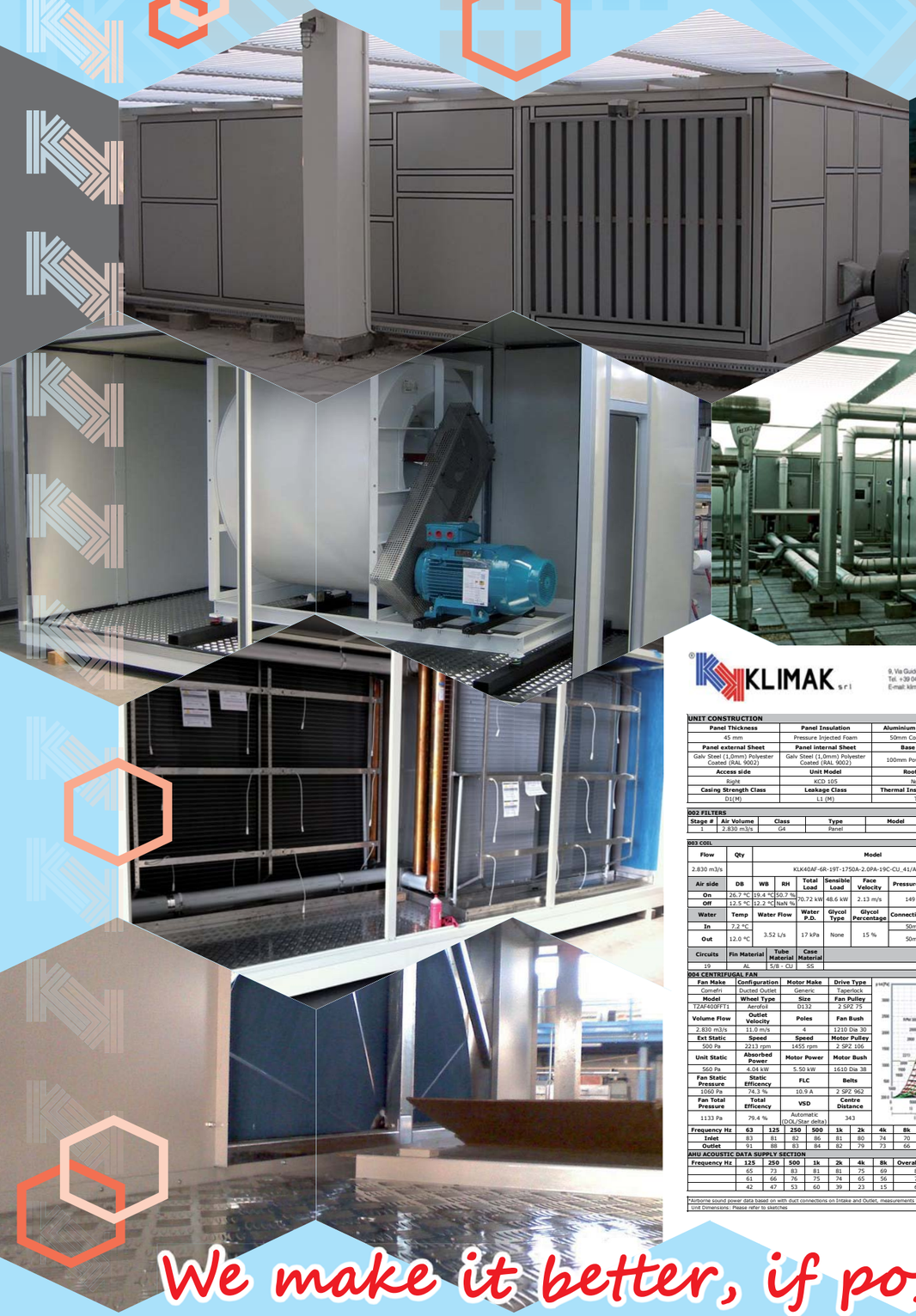
Note: All AHUs are custom designed at factory using selection software to meet the project specification and practical constraints.

Dimensional Guide

	CROSS SECTIONAL DIMENSION		END SECTION REF: S1	RETURN PLEUM WITH DAMPER REF: C1			MIXING BOX WITH 2 DAMPERS REF: C2			MIXING BOX WITH 3 DAMPERS REF: C3					PANEL FILTER SECTION REF: F1	BAG FILTER SECTION REF: F3	ROLL FILTER SECTION REF: F4
																	
Mod. KC	**B**	**H**	**L**	**E**	**D**	**L**	**E**	**D**	**L**	**E**	**D**	**L**	**F**	**G**	**L**	**L**	**L**
020	900	900	60	200	800	300	200	800	500	200	800	800	300	500	100	800	1100
030	1150	950	60	200	1050	300	200	1050	500	200	1050	800	300	800	100	800	1100
045	1450	1000	60	300	1350	400	300	1350	600	300	1350	1000	400	1100	100	800	1100
065	1700	1100	60	300	1600	400	300	1600	600	300	1600	1000	400	1300	100	800	1100
080	1950	1100	70	400	1850	500	400	1850	600	400	1850	1200	500	1500	100	800	1100
105	2200	1220	70	400	2100	500	400	2100	600	400	2100	1200	500	1700	100	800	1100
130	2200	1420	70	500	2100	600	500	2100	700	500	2100	1400	700	1700	100	800	1100
160	2200	1700	70	500	2100	600	500	2100	700	500	2100	1400	700	1700	100	800	1100
200	2200	2020	70	600	2100	700	600	2100	800	600	2100	1600	800	1700	100	800	1100
230	2250	2220	70	700	2150	800	700	2150	900	700	2150	1800	900	1700	100	800	1100
280	2450	2300	70	700	2350	800	700	2350	900	700	2350	1800	900	1900	100	800	1100
400	2900	2550	70	800	2800	900	800	2800	1000	800	2800	2000	1100	2300	100	800	1100
500	3300	2550	70	900	3200	1000	900	3200	1100	900	3200	2200	1200	2300	100	800	1100
600	4000	2550	90	900	3900	1000	900	3900	1100	900	3900	2200	1200	3200	100	800	1100
700	4600	2550	90	900	4500	1000	900	4500	1100	900	4500	2200	1200	4000	100	800	1100
800	5200	2550	90	900	5100	1000	900	5100	1100	900	5100	2200	1200	4500	100	800	1100

	ABSOLUTE FILTER SECTION REF: F5			COIL SECTION REF: B1 (1 to 4 rows)	COIL SECTION REF: B2 (5 to 10 rows)	COOLING HEATING COIL		MOISTURE ELIMINATOR REF: US	WET DECK HUMIDIFIER (WITHOUT PUMP) TYPE "A" - REF: UA				FAN SECTION REF: V1 (FORWARD CURVED) V2 (BACKWARD CURVED)									MULTIZONE SECTION REF: MZ
																						
Mod. KC	**L**	**B**	**H**	**L**	**L**	**H**	**B**	**L**	**L**	**ø 2**	**ø 3**	**ø 4**	**A**	**G**	**M**	**N**	**Q**	**B**	**H**	**I**	**P**	**L**	**L**
020	800	900	900	150	450	480	550	250	500	1 1/4"	1 1/4"	3/4"	230	230	381	335	335	900	900	150	150	1050	1000
030	800	1150	950	150	450	520	800	250	500	1 1/4"	1 1/4"	3/4"	323	323	398	413,5	413,5	1150	950	150	150	1150	1000
045	800	1450	1000	150	450	560	1100	250	500	1 1/4"	1 1/4"	3/4"	362	362	422	544	544	1450	1000	150	150	1150	1100
065	800	1700	1100	150	450	640	1300	250	500	2"	1 1/4"	1"	405	405	440	597,5	597,5	1700	1100	150	150	1250	1200
080	800	1950	1100	150	450	640	1600	250	500	2"	1 1/4"	1"	454	454	457	748	748	1950	1100	150	150	1250	1300
105	800	2200	1220	150	450	780	1750	250	500	2"	1 1/4"	1"	508	508	533	845	845	2200	1220	150	150	1450	1650
130	800	2200	1420	150	450	960	1750	250	500	2"	1 1/4"	1"	570	570	471	815	815	2200	1420	150	150	1550	1750
160	800	2200	1700	150	450	1200	1750	250	500	2"	1 1/4"	1 1/2"	639	639	522	780,5	780,5	2200	1700	150	150	1850	1900
200	800	2200	2020	150	450	1520	1750	250	500	2"	1 1/4"	1 1/2"	716	716	665	742	742	2200	2020	150	150	1950	2200
230	800	2250	2220	150	450	1720	1750	250	500	2"	1 1/4"	1 1/2"	802	802	722	724	724	2250	2220	150	150	1950	2200
280	800	2450	2300	150	450	1800	1950	250	500	2 1/2"	1 1/4"	1 1/2"	899	899	785	775,5	775,5	2450	2300	150	150	2150	2600
400	800	2900	2550	150	450	2080	2400	250	500	2 1/2"	1 1/4"	1 1/2"	1008	1008	861	946	946	2900	2550	150	150	2250	2700
500	800	3300	2550	150	450	2080	2800	250	500	3"	1 1/4"	2"	1131	1131	918	1084,5	1084,5	3300	2550	150	150	2250	2700
600	800	4000	2550	150	450	2120	3500	250	500	3"	1 1/4"	2"	1268	1268	963	1366	1366	4000	2550	150	150	2250	2700
700	800	4600	2550	150	450	2120	4100	250	500	3"	1 1/4"	2"	1268	1268	963	1566	1566	4600	2550	150	150	2250	2700
800	800	5200	2550	150	450	2120	4700	250	500	3"	1 1/4"	2"	1268	1268	963	1955	1955	5200	2550	150	150	2250	2700

Engineered with passion and Manufactured for Excellence



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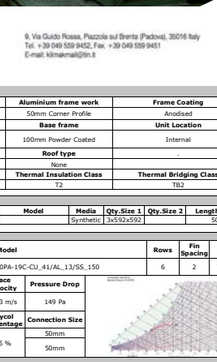
UNIT CONSTRUCTION			
Panel Thickness	**Panel Insulation**	**Aluminium frame work**	**Frame Coating**
45 mm	Pressure Injected Foam	50mm Corner Profile	Anodised
Panel external Sheet	**Panel internal Sheet**	**Base frame**	**Unit Location**
Galv Steel (1,0mm) Polyester Coated (RAL 9002)	Galv Steel (1,0mm) Polyester Coated (RAL 9002)	100mm Powder Coated	Internal
Access side	**Unit Model**	**Roof type**	-
Right	KCD 105	None	
Casing Strength Class	**Leakage Class**	**Thermal Insulation Class**	**Thermal Bridging Class**
D1(M)	L1 (M)	T2	TB2

002 FILTERS								
Stage #	**Air Volume**	**Class**	**Type**	**Model**	**Media**	**Qty.Size 1**	**Qty.Size 2**	**Length mm**
1	2.830 m3/s	G4	Panel		Synthetic	3x592x592		50

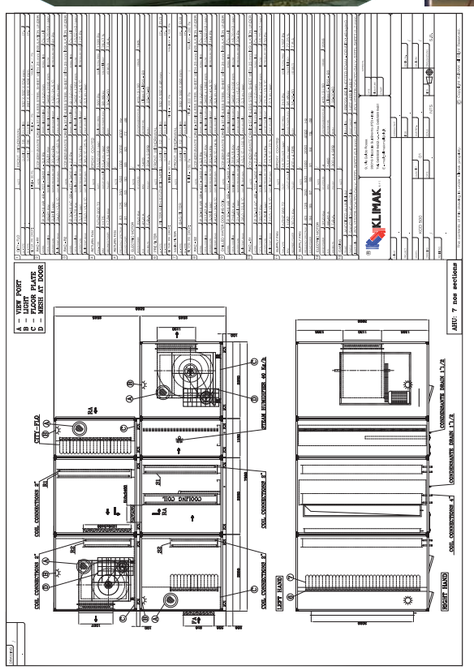
003 COIL										
Flow	**Qty**	**Model**							**Rows**	**Fin Spacing**	**Face Area**
2.830 m3/s		KLK40AF-6R-19T-1750A-2.0PA-19C-CU_41/AL_13/SS_.150							6	2	1750 x 760
Air side	**DB**	**WB**	**RH**	**Total Load**	**Sensible Load**	**Face Velocity**	**Pressure Drop**				
On	26.7 °C	19.4 °C	50.7 %	70.72 kW	48.6 kW	2.13 m/s	149 Pa				
Off	12.5 °C	12.2 °C	NaN %								
Water	**Temp**	**Water Flow**		**Water P.D.**	**Glycol Type**	**Glycol Percentage**	**Connection Size**				
In	7.2 °C	3.52 L/s		17 kPa	None	15 %	50mm				
Out	12.0 °C						50mm				
Circuits	**Fin Material**	**Tube Material**	**Case Material**	-							
19	AL	5/8 - CU	SS								



004 CENTRIFUGAL FAN										
Fan Make	**Configuration**	**Motor Make**	**Drive Type**							
Comefri	Ducted Outlet	Generic	Taperlock							
Model	**Wheel Type**	**Size**	**Fan Pulley**							
T2AF400FFT1	Aerofoil	D132	2 SPZ 75							
Volume Flow	**Outlet Velocity**	**Poles**	**Fan Bush**							
2.830 m3/s	11.0 m/s	4	1210 Dia 30							
Ext Static	**Speed**	**Speed**	**Motor Pulley**							
500 Pa	2213 rpm	1455 rpm	2 SPZ 106							
Unit Static	**Absorbed Power**	**Motor Power**	**Motor Bush**							
560 Pa	4.04 kW	5.50 kW	1610 Dia 38							
Fan Static Pressure	**Static Efficency**	**FLC**	**Belts**							
1060 Pa	74.3 %	10.9 A	2 SPZ 962							
Fan Total Pressure	**Total Efficency**	**VSD**	**Centre Distance**							
1133 Pa	79.4 %	Automatic (DOL/Star delta)	343							
Frequency Hz	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**Description**
Inlet	83	81	82	86	81	80	74	70	SWL Inside the Inlet Duct (dB)
Outlet	91	88	83	84	82	79	73	66	SWL Inside the Outlet Duct (dB)

AHU ACOUSTIC DATA SUPPLY SECTION										
Frequency Hz	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**Overall dB(A)**	**Description**
	65	73	83	81	81	75	69	86	Outlet Sound Power(dB)
	61	66	76	75	74	65	56	79	Inlet Sound Power(dB)
	42	47	53	60	39	23	15	60	Airborne Sound Power (dB)*

*Airborne sound power data based on with duct connections on Intake and Outlet, measurements taken in an acoustic laboratory as per ASTM E90-09 and E413-04
Unit Dimensions : Please refer to sketches



We make it better, if possible and it is always possible

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