MARSTAIR
REFRIGERATION AND SPECIALIST AIR CONDITIONING

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CO2 Evaporators

A WIDE RANGE OF CO2 EVAPORATORS SPECIFICALLY DESIGNED FOR COMFORT COOLING AND LOW TEMPERATURE AIR CONDITIONINGAPPLICATIONS SUCH AS FOOD PREPARATION AREAS.

These evaporators are available in cassette and concealed ducted models.

These simple to install and quiet evaporators offer the ability to deliver cooling at the higher CO2 pressures required for typical comfort cooling evaporating temperatures. There is also the option of an LPHW (Low pressure hot water) coil for recycling the waste heat produced from the CO2 pack. This allows all your refrigeration and air conditioning needs to be supplied through the one CO2 pack, creating a more efficient system and eradicating the need for separate split systems for space cooling and heating.

For further information please contact our Technical Department on 01484 405666 or email us at sales@marstair.com

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CO2 Cassette Evaporator + LPHW

THESE SIMPLE-TO-INSTALL AND QUIET CASSETTE CO2 EVAPORATORS OFFERS THE ABILITY TO DELIVER COOLING TO A WIDE VARIETY OF AREAS.

Units are available with a range of cooling duties from 2.9 to 8.2kW for comfort cooling and a range of heating duties. The lightweight, one-piece, removable chassis allows total access to all mechanical and electrical connections. The units deliver long air throws and low sound levels

Specification

- Coils tested to 120 barg
- Maximum operating pressure = 90 barg
- Units supplied with coil thermostat for passive defrosting
- Electric heating of up to 4kW available
- Units fitted with 0.5m lift condensate pump
- 4 way discharge cassette
- Low sound levels
- Long Air throws
- Removable 1 piece lightweight chassis
- Integral easy to clean chassis
- Easy access filters
- All services accessible from 1 corner
- Provision for fresh air inlet or branch duct outlet
- AC and EC fan options available

Applications

- CO2 only for low temperature food preparation areas
- CO2 only for cooling only comfort cooling
- LPHW only for heating using recovered heat from the CO2 pack
- Combined CO2 and LPHW for comfort cooling and heating

Technical Information

CO2 Low Temperature Air Conditioning - Cooling Performance

CC 875 - 140 CO2	PERFORMANCE IN kW											
AMBIENT	5°C			10°C			12.7°C			15°C		
Evaporating Temperature	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
-2.5°C	2.5	3.0	3.3	4.5	5.2	5.9	6.3	7.3	8.3	8.0	9.2	10.1
0°C	1.6	2.0	2.2	3.6	3.8	4.7	5.2	5.9	6.5	6.7	7.7	8.8
2.5°C	-	-	-	2.5	2.9	3.3	3.5	4.2	4.7	5.2	6.0	6.6
5°C	-	-	-	1.4	1.6	2.1	2.7	3.2	3.6	3.6	4.2	4.8

All ambients at 75% humidity

CO2 Cassette Comfort Cooling Performance

MODEL			HEATING DUTY AT AIR 20°C (kW) WATER TEMPERATURES °C				COOLING DUTY AT AIR 23°C (kW) EVAPORATING TEMPERATURE °C	
CWC	CO2	LPHW	60 - 30	60-40	65 - 40	50 - 30	7.00	5.00
600 - 20	Y	-	-	-	-	-	2.40	2.90
600-20	Y	Y	1.36	2.20	2.40	1.18	2.40	2.90
875 - 80	Y	-	-	-	-	-	5.50	7.00
875 - 140	Y	-	-	-	-	-	6.80	8.20
875 - 80	Y	Y	7.50	12.00	13.00	6.00	5.50	7.00

LPHW Only Cassette

MODEL		HEATING DUTY AT AIR 20°C (kW) WATER TEMPERATURES °C			
CWC	LPHW	60 - 30	60-40	65 - 40	50 - 30
25	Y	1.20	3.00	3.50	1.00
45	Y	2.30	5.00	5.50	2.00
65	Y	3.00	6.50	7.00	2.80
75	Y	4.00	8.00	8.50	3.50
95	Y	7.50	11.00	13.00	6.50
135	Y	10.50	14.00	17.00	9.00
155	Y	13.00	17.00	20.00	11.00

Airflows

RANGE 3			LOW SPEED	MEDIUM SPEED	HIGH SPEED
RANGE 2		LOW SPEED	MEDIUM SPEED	HIGH SPEED	
RANGE 1	LOW SPEED	MEDIUM SPEED	HIGH SPEED		

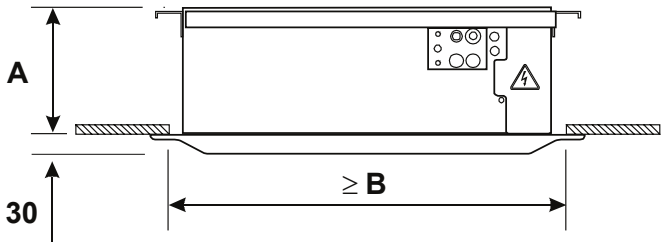
600 (ALL) M³/S					
20	0.12	0.146	0.173	0.209	0.256
40	0.12	0.146	0.173	0.209	0.256
60	0.12	0.146	0.173	0.209	0.256
875 (ALL) M³/S					
80	0.33	0.37	0.45	0.54	-
110	0.32	0.36	0.45	0.53	-
140	0.30	0.35	0.43	0.50	-

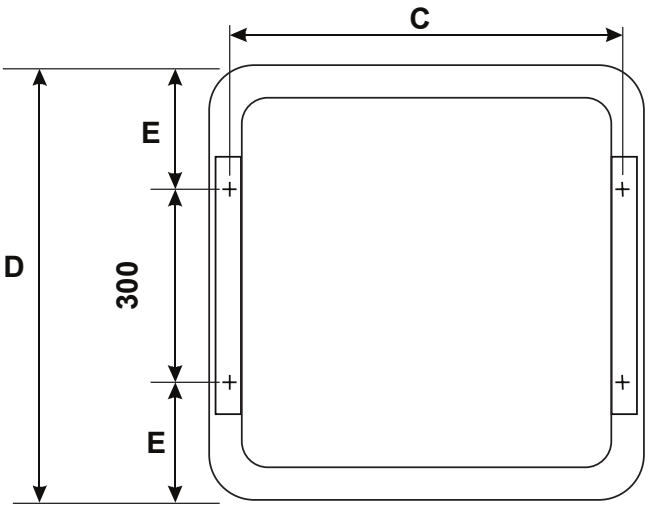
Sound Power & Sound Pressure (Speed 1 = Lowest, Speed 5 = Highest)

		SOUND POWER LEVELS							SOUND PRESSURE LEVELS	
		FREQUENCY Hz								
MODEL	SPEED	125	250	500	1K	2K	4K	dBA	dBA	NC
CC 600 20	1	56.3	48.3	45.5	39.0	36.6	35.8	47	26	18
	2	58.8	51.9	50.2	44.9	41.4	37.5	52	31	23
	3	61.6	57.8	55.6	53.8	48.5	44.4	58	37	31
	4	62.9	60.1	57.6	56.3	51.3	46.8	61	40	34
	5	67.0	65.6	62.9	61.3	57.6	53.0	66	45	39
CC 600 40	1	55.7	49.7	46.4	39.2	37.2	35.7	48	27	19
	2	57.5	53.6	50.9	45.1	42.3	39.8	52	31	24
	3	61.9	59.0	56.2	54.2	48.9	44.2	59	38	32
	4	63.1	62.0	58.3	56.6	51.6	46.7	61	40	34
	5	68.0	67.3	63.5	61.9	57.5	52.8	67	46	40
CC600 60	1	55.5	51.1	47.8	41.8	41.1	40.0	50	29	22
	2	58.8	54.8	52.0	47.5	46.2	42.3	54	33	26
	3	62.1	59.2	56.4	53.6	49.9	43.2	59	38	31
	4	64.1	61.2	58.5	55.6	51.7	45.4	60	39	33
	5	69.4	66.5	63.1	60.6	56.5	51.6	66	45	39
CC875 80	1	56.4	56.2	53.9	54.9	45.1	34.6	57	39	35
	2	59.1	58.7	56.0	57.0	49.5	39.2	60	42	38
	3	63.4	62.4	59.3	59.5	54.2	45.6	63	45	40
	4	66.1	65.5	62.9	62.5	57.8	50.8	66	48	43
CC 875 110	1	60.6	58.2	55.7	56.2	46.1	35.8	59	41	35
	2	63.1	60.5	57.8	58.4	50.6	40.3	61	43	38
	3	66.3	63.7	60.8	60.8	55.2	46.4	64	46	40
	4	68.8	67.1	64.5	63.9	59.1	52.6	68	50	43
CC875 140	1	64.7	60.2	57.5	57.4	47.1	36.9	60	42	38
	2	67.1	62.3	59.5	59.7	51.7	41.4	63	45	40
	3	69.2	64.9	62.2	62.0	56.2	47.1	65	47	43
	4	71.5	68.6	66.1	65.2	60.3	54.4	69	51	46

Sound Power Levels are obtained in conformance with BS4196:Part 5: 1981. Values are shown in dB with a standard reference of 1pW.
Sound Pressure Levels are dB relative to $2x10^{-5}$N/m and are calculated from results measured in anechoic conditions.
Values relate to a position of 3m away from the centre line of the unit, 1m down.

Unit Dimensions & Weight (Unpacked with fascia fitted)





DIMENSIONS AND WEIGHTS						
	CC 600			CC 875		
MODEL	20	40	60	80	100	140
DIM 'A' (mm)	306	306	306	314	314	314
DIM 'B' (mm)	580	580	580	900	900	900
DIM 'C' (mm)	610	610	610	913	913	913
DIM 'D' (mm)	675	675	675	966	966	966
DIM 'E' (mm)	187.5	187.5	187.5	333	333	333
WEIGHT (kg)	21	23	25	36	40	44

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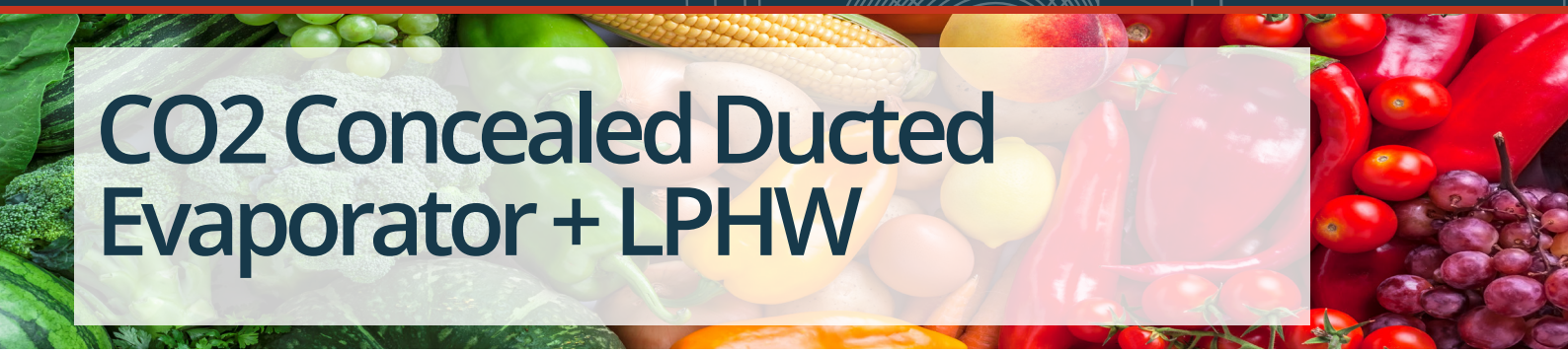
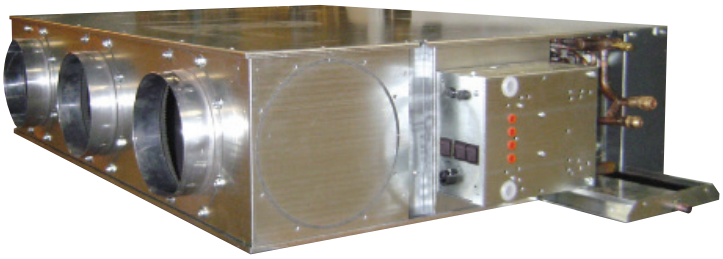


CO2 Concealed Ducted Evaporator + LPHW

THE DXD SERIES IS A CONCEALED, DUCTED CO2 EVAPORATOR DESIGNED FOR HORIZONTAL CEILING VOID APPLICATIONS AND SUPPLIED COMPLETE WITH A DISCHARGE PLENUM AND SPIGOTS.

Designed and manufactured in the UK using high quality components, the DXD is available with cooling duties from 5.5 to 16.1kW for comfort cooling.

The DXD exhibits all of the features expected from a modern, high quality evaporator whilst remaining highly competitive and exceptionally flexible.



Specification

- Low sound levels
- De-Ice thermostat
- Easy filter access
- Electronic remote controller (Hard Wired)
- 250mm Spigots
- Maximum working pressure 60barg
- Coils tested to 90barg

Applications

- CO2 only for low temperature food preparation areas
- CO2 only for cooling only comfort cooling
- LPHW only for heating using recovered heat from the CO2 pack
- Combined CO2 and LPHW for comfort cooling and heating

Options

- Condensate Pump
- Electric Heating
- Return Air Plenum
- 200mm Spigots
- Fresh Air Inlet
- Return Air Sensor
- Programmable Timer Cable (For wired control)
- EC fans

T: 01484 405 666
E: sales@marstair.com

Technical Information

CO2 Low Temperature Air Conditioning Cooling Performance

	MODEL	AIR ON °C	HUMIDITY % RH	EVAPORATING TEMPERATURE EC											
				-2.5		0		2.5		5		7		7.5	
				TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS	TOTAL	SENS
LOW FAN SPEED	150	5	75	4.15	3.23	-	-	-	-	-	-	-	-	-	-
		10	75	8.19	5.51	6.4	4.4	3.9	3.1	-	-	-	-	-	-
		15	75	12.8	7.7	11	6.7	8.7	5.4	6.7	4.3	-	-	-	-
		20	50	14.7	10.1	13	0.1	10.7	7.9	8.9	6.9	6.7	5.9	6	5.6
		23	50	17.5	11.3	15.8	10.4	13.5	9.1	11.5	8.1	9.5	7.2	6.9	9.9
MEDIUM FAN SPEED	150	5	75	4.6	3.6	-	-	-	-	-	-	-	-	-	-
		10	75	9	6	7	4.9	4.4	3.5	-	-	-	-	-	-
		15	75	14	8.5	12.2	7.4	9.6	6	7.6	5	-	-	-	-
		20	50	16.2	11.1	14.4	10.1	11.8	8.7	9.8	7.7	7.4	6.5	6.7	6.2
		23	50	19.2	12.4	17.4	11.4	14.9	10	12.2	8.9	10.5	7.9	7.7	11.4
HIGH FAN SPEED	150	5	75	5.28	4.12	-	-	-	-	-	-	-	-	-	-
		10	75	10.2	9.6	8	5.6	5.1	4	-	-	-	-	-	-
		15	75	15.9	9.6	13.8	8.4	11	6.9	8.7	5.7	-	-	-	-
		20	50	18.4	12.7	16.3	11.5	13.7	10.1	11.2	8.8	8.4	7.5	7.7	7.2
		23	50	21.8	14.1	19.7	13	16.9	11.5	14.8	10.4	12	9.2	8.8	9.2

CO2 Concealed Ducted Comfort Cooling Performance

MODEL			HEATING DUTY AT AIR 20°C (kW)				COOLING DUTY AT AIR 23°C (kW)	
			WATER TEMPERATURES °C				EVAPORATING TEMPERATURE °C	
DXD	CO2	LPHW	60 - 30	60-40	65 - 40	50 - 30	7.00	5.00
50	Y	-	-	-	-	-	4.60	5.50
60	Y	-	-	-	-	-	5.40	6.40
90	Y	-	-	-	-	-	9.20	10.80
130	Y	-	-	-	-	-	10.80	12.50
150	Y	-	-	-	-	-	12.00	14.80
165	Y	-	-	-	-	-	13.00	16.10
50	Y	Y	1.31	2.19	2.30	1.21	4.60	5.50
60	Y	Y	1.84	2.80	3.33	1.63	5.40	6.40
90	Y	Y	2.70	4.70	5.64	2.56	9.20	10.80
130	Y	Y	3.70	5.79	6.94	3.35	10.80	12.50
150	Y	Y	4.94	6.78	7.50	4.30	12.00	14.80
165	Y	Y	5.99	8.22	9.10	5.22	13.00	16.10

LPHW Concealed Ducted Heating Performance

MODEL SAPPHIRE			HEATING DUTY AT AIR 20°C (kW)				COOLING DUTY AT AIR 23°C (kW)	
			WATER TEMPERATURES °C				EVAPORATING TEMPERATURE °C	
	CO2	LPHW	60 - 30	60-40	65 - 40	50 - 30	7.00	5.00
1-1	-	Y	3.40	5.99	6.25	3.18	-	-
2-2	-	Y	4.29	7.35	7.69	4.07	-	-
3-3	-	Y	4.59	8.04	8.39	4.17	-	-
4-3	-	Y	7.28	12.75	13.34	7.00	-	-
5-4	-	Y	7.59	13.07	13.68	7.25	-	-
6-4	-	Y	9.49	15.84	16.59	8.96	-	-
7-5	-	Y	10.05	16.70	17.48	9.49	-	-
8-5	-	Y	11.95	19.49	20.40	11.14	-	-

Acoustic data and N.R. guide

All sound data ascertained at 30Pa. external resistance

Sound Power Level (SWL) dB ref. 10^{-12}W

MODEL	Spd	INLET / CASING RADIATED						DISCHARGE						N.R. GUIDE
		Hz						Hz						
		125	250	500	1k	2k	4k	125	250	500	1k	2k	4k	
DXD 50	1	57.3	52.6	48.6	37.8	32.3	25.7	48.8	45.8	34.6	27.2	15.0	8.5	35
	2	57.4	54.3	49.1	38.0	34.3	26.5	49.7	46.8	35.9	27.8	16.9	9.9	37
	3	58.3	55.5	49.4	39.2	34.9	28.1	50.9	47.4	37.2	28.3	18.7	11.3	40
DXD 60	1	57.3	52.6	48.6	38.1	32.5	26.1	48.8	45.8	35.2	27.7	15.8	8.9	35
	2	57.6	54.4	49.9	39.2	34.9	27.2	50.2	47.1	37.1	28.2	17.4	10.0	37
	3	58.8	56.1	50.8	41.0	36.2	29.9	52.1	48.3	38.8	30.0	20.0	12.1	40
DXD 90	1	57.4	52.8	48.8	38.8	33.0	27.0	48.9	45.9	36.0	28.2	17.0	9.2	35
	2	58.1	54.8	51.5	41.9	36.0	29.6	51.4	47.8	40.0	30.8	19.6	10.1	37
	3	59.2	58.1	54.6	44.4	38.7	33.4	54.5	52.0	43.6	34.4	23.7	14.0	40
DXD 130	1	57.7	53.5	49.6	40.2	34.2	28.2	49.0	46.0	36.4	29.1	17.9	9.7	35
	2	58.3	56.2	53.0	43.1	36.9	31.1	51.7	48.1	40.4	31.0	20.0	10.6	37
	3	59.8	58.4	55.1	45.1	39.0	34.2	54.7	52.2	43.9	34.7	23.9	14.6	40
DXD 150	1	58.2	55.3	51.7	42.5	35.3	30.5	49.1	46.2	36.5	29.5	18.5	10.0	35
	2	59.7	58.4	54.7	44.9	37.8	33.3	51.9	48.2	40.8	31.2	20.1	11.0	37
	3	60.0	58.5	55.2	45.6	39.2	35.4	55.0	52.4	44.1	34.9	24.0	14.8	40
DXD 165	1	59.7	59.4	55.7	46.9	39.8	35.3	51.9	48.2	41.8	31.2	20.1	11.0	37
	2	61.7	61.4	58.7	48.9	42.8	38.3	53.9	51.2	41.8	32.2	22.2	13.0	40
	3	64.2	63.9	61.2	51.4	45.3	40.8	56.4	53.7	44.3	34.7	24.7	15.5	43

Qualification of N.R. predictions:

The N.R. guide figures quoted on the output data page are intended to show the levels which may be expected in a typical office environment provided the following apply: Room sizes are based on a cooling load of 120W/m2. Units must be correctly mounted onto a solid structure, using drop rods attached to mounting points provided, in a false ceiling not less than 300mm deep, with standard 'T' bar grid and 10mm fibreboard tiles. Rooms should be carpeted, have not more than 20% glazing, or highly reflective surfaces. In open plan areas units should be mounted not less than 6m apart and return-air grilles should not be mounted directly below, or adjacent to unit inlets. 1m of non noise regenerative flexible duct should be fitted to each outlet spigot sized to maintain required N.R. level. i.e. 3m/s at NR35 and 4m/s at NR40.

The foregoing should ensure the 'guide' N.R. levels are met when measured at 1.5m from the nearest grille, provided the grille plenums are correctly sized and insulated.

For accurate assessment please consult our **Technical Sales Department on 01484 405606**.

Electrical Loads (230 Volts 50Hz 1Ph, in Amps)

DXD	50	60	90	130	150	165
FAN MOTOR	0.65	0.80	1.38	1.77	2.32	2.8
ELECTRIC HEATER (AIR COND.) OPTION	8.70	8.70	8.70	13.0	17.4	17.4

Air Volume (Based on 30Pa external resistance)

DXD(H)	SPIGOTS FRONT (QTY)	230V MINIMUM SPEED m^3/s	230V MEDIUM SPEED m^3/s	230V MAXIMUM SPEED m^3/s
50	2	0.160	0.170	0.180
60	2	0.180	0.194	0.209
90	3	0.310	0.350	0.372
130	3	0.335	0.382	0.462
150	4	0.425	0.477	0.560
165	4	0.560	0.680	0.800

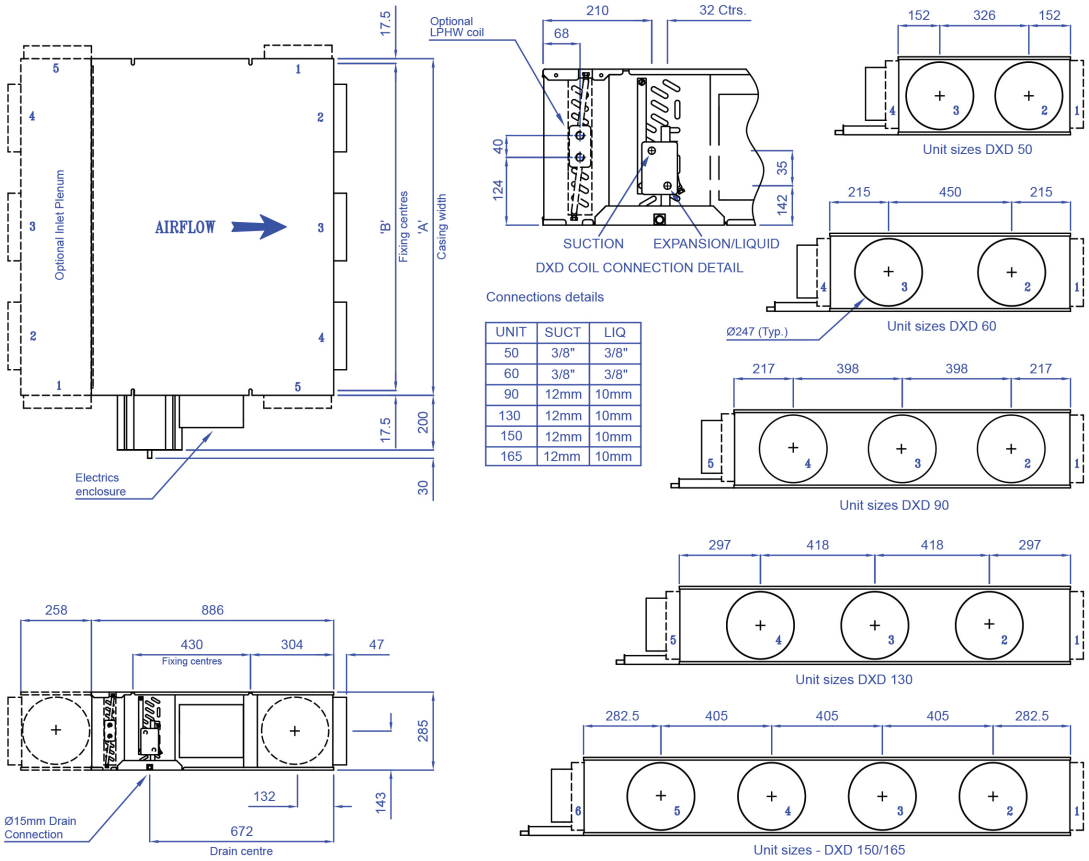
NOTE: DXD 165 requires 5-off spigots on discharge plenum and 5-off spigots on inlet plenum if fitted.

Optional Electric Heating (factory fit only)

	MODEL					
	50	60	90	130	150	165
ELECTRIC HEATER (kW AT 240V)	2.0	2.0	2.0	3.0	4.0	4.0
ELECTRIC HEATER kW AT 230V)	1.92	1.92	1.92	2.87	3.84	3.84

Unit Dimensions

Standard Units



All Handings viewed in direction of airflow
All units supplied as right hand as per illustration above

NB. Max. airflow per 250mm dia. spigot to maintain NR35 = 150 l/s
Max. airflow per 200mm dia. spigot to maintain NR35 = 100 l/s

1. If a front spigot is not to be used then it must be replaced by the corresponding side spigot to allow equal airflow over the coil
2. A maximum of 30pa resistance is allowed (total of inlet and discharge added together)
3. Unit supplied with ALL front spigots fitted
4. DXD 165 requires 5 spigots to be fitted

Dimensional Information

Unit Model	Dim 'A'	Dim 'B'	Spigot Options	Weight (approx Kg)	Minimum number of outlets and return air spigots to be used
DXD 50	630	595	2-3	42	2
DXD 60	880	845	2-3	52	2
DXD 90	1230	1195	2-3-4	69	3
DXD 130	1430	1395	2-3-4	86	3
DXD 150	1780	1745	2-3-4-5	103	4
DXD 165	1780	1745	2-3-4-5	108	4

T: 01484 405 666
E: sales@marstair.com

TEV has earned management system accreditations – BSI 14001: 2015 Environmental Management and BSI 9001: 2015 Quality Management.

bsi. ISO 9001 Quality Management ISO 14001 Environmental Management
Certificate No. FM 00671 EMS 91502

CE

In partnership with QUARTZ FAN COILS AND HVAC

DESIGNED & BUILT IN THE UK