searle

MDE Air-Cooled Condensers 10-135kW

SPECIFICATION

Certificate 95-10-015 (R22 capacity with aluminium fins)

General

The Searle MDE range of fully weather-proofed air-cooled condensers comprises 9 model sizes, each with a choice of four, two-speed motors, giving a total range of 72 models, covering a duty range from 10kW to 135kW.
The range is constructed with 1 to 3 fans arranged in a single line. Units may be bolted together on-site with the optional linking kit to form double banks.
The strong, lightweight construction of the MDE minimises the costs involved in providing specially strengthened mounting bases, which is particularly advantageous where units are roof mounted.
Capacities of units have been independently tested to prEN327.
Full range approval has been authorised by the Eurovent/Cecomaf company on certificate number 95-10-015.
The MDE range is suited for use in most refrigeration and air conditioning condenser applications and a range of corresponding dry-cooler units, DKE, is available.
The MDE/DKE range is offered with a two year guarantee.

Vertical Mounting

Single bank units may be operated vertically utilising the optional vertical mounting kit. As prevailing wind conditions can have a significant effect on performance, Searle does not recommend the use of 12 pole (Star/Delta) or 8 pole (Star) motors in vertical mode.

Casework

The casework is fabricated from pre-galvanised sheet steel with grey polyester powder painted external surfaces, oven cured at 180°C. This ensures an even, flexible and durable gloss finish, providing excellent corrosion protection, and tolerant to UV exposure. All fastenings are non-ferrous with the majority being stainless steel. The casework is extended at both ends of the unit to provide protection for the return bends, headers and controls (where fitted).

Coils

Standard condenser coils are manufactured from 3/8" OD seamless copper tube employing the latest extended inner surface technology. The DKE dry-cooler option features plain tubes. The tubes are mechanically expanded into the well-proven Searle 'E' fin. The fully-collared holes in the fin ensure an efficient and permanent bond between the expanded tube and the fin, giving the most effective heat transfer characteristics. The coil block has 2.1mm fin spacing (12 fins per inch).
Specially collared and reflared holes in the coil end-plate provide an ideal mounting for the coil tubes, minimising the risk of damage as a result of thermal movement in the coil.
Alternative fin materials are available to give added protection in saline or polluted atmospheres, as follows:-

Cu/Al	Copper tube/aluminium fins
Cu/Av	Copper tube/vinyl coated aluminium fins
Cu/Cu	Copper tube/copper fins
Cu/Et	Copper tube/electro-tinned copper fins

All models are suitable for multi-sectioning, allowing more than one system to operate with a single condenser.

Sub-Cooling

Sub-cooling is achieved by the use of an integrated sub-cooling section which utilises approximately 10% of the coil surface. This provides 7°C of sub-cooling at the standard rating condition of 15°C. Operating at a TD1 below 15°C, the amount of sub-cooling is reduced.
The total heat of rejection capacity, inclusive of sub-cooling, will be reduced by 5%.
The system should be designed so that refrigerant passes from the condensing section into a liquid receiver or liquid trap to prevent gas entering the sub-cooling section.

Motors and Fans

Three phase (400V/3ph/50Hz) motors are available in 4, 6, 8 and 12 pole speeds, each capable of running at two speeds selected by connecting either in Delta (high speed) or Star (low speed).
Single phase (230V/1ph/50Hz) motors are available in 6, 8 and 12 pole speeds. Capacity and noise levels vary (see correction factors).
All motors are internally protected and suitable for speed control (see Electrical Options). Motors are environmentally protected to IP54.
Fans are 630mm diameter, operating in a deep, bell-mouthed fan orifice designed to maximise efficiency and air-flow and minimise noise levels and air recirculation.

Electrical Options

On standard units, individual terminal boxes are located on top of the motor in the case of 6, 8 and 12 pole, or located within the wiring channel on the 4 pole.
There are a number of wiring and control options available. Cable routing is simplified through the use of pre-formed casework with knock-outs and mounting holes, and a wiring channel with removable cover along each side of the unit. Control boxes (rated IP55) are mounted at the header end of the condenser, underneath a removable cover, to provide maximum environmental and physical protection.
The range of options is as follows:-

- Motors wired back to a common junction box
- Individual Motor Isolators
- Contactor Box with Isolator
- Contactor Box with Isolator and Pressure Switches
- Contactor Box with Isolator and Triac

For further details of these electrical and control options, please contact the Searle Applications Department.
Customers fitting their own speed controls to 4 pole units should specify the lower pitch fan (35°) at the time of ordering.

Fluid Cooling (Dry Cooler)

The standard MDE range can be adapted to allow the units to operate as dry air fluid coolers (DKE). Most fluids can be cooled, including water/glycol solutions, many types of oil and gasses. Please contact the Searle Applications Department for assistance in selecting a suitable unit.

Noise Levels

Sound power levels have been determined from tests carried out in free field conditions. Sound power (dBA) data have been verified and independently certified by Eurovent/Cecomaf. Data for sound pressure levels have been derived using the same methods. Published figures are for distances measured horizontally from the longest side of a horizontal unit, when mounted on a reflective plane. For noise levels in the direction of air flows add 5dB for 4 pole, 4dB for 6 pole and 3dB for 8 and 12 pole.

Quality Assurance

Searle is a certified company to BS EN ISO 9001 which is the highest Quality Assurance qualification currently available, covering Performance Testing, Manufacturing Systems and Inspection Procedures.

Certification

The following items, shown in **bold type** in the Selection Data, are certified under identification number 95-10-015 according to the EUROVENT/ CECOMAF Certification Programme and rating standard prEN327:-

capacities (3ph, R22, Cu/Al)

air volume

power input

dB(A) sound power level

SPECIFICATION

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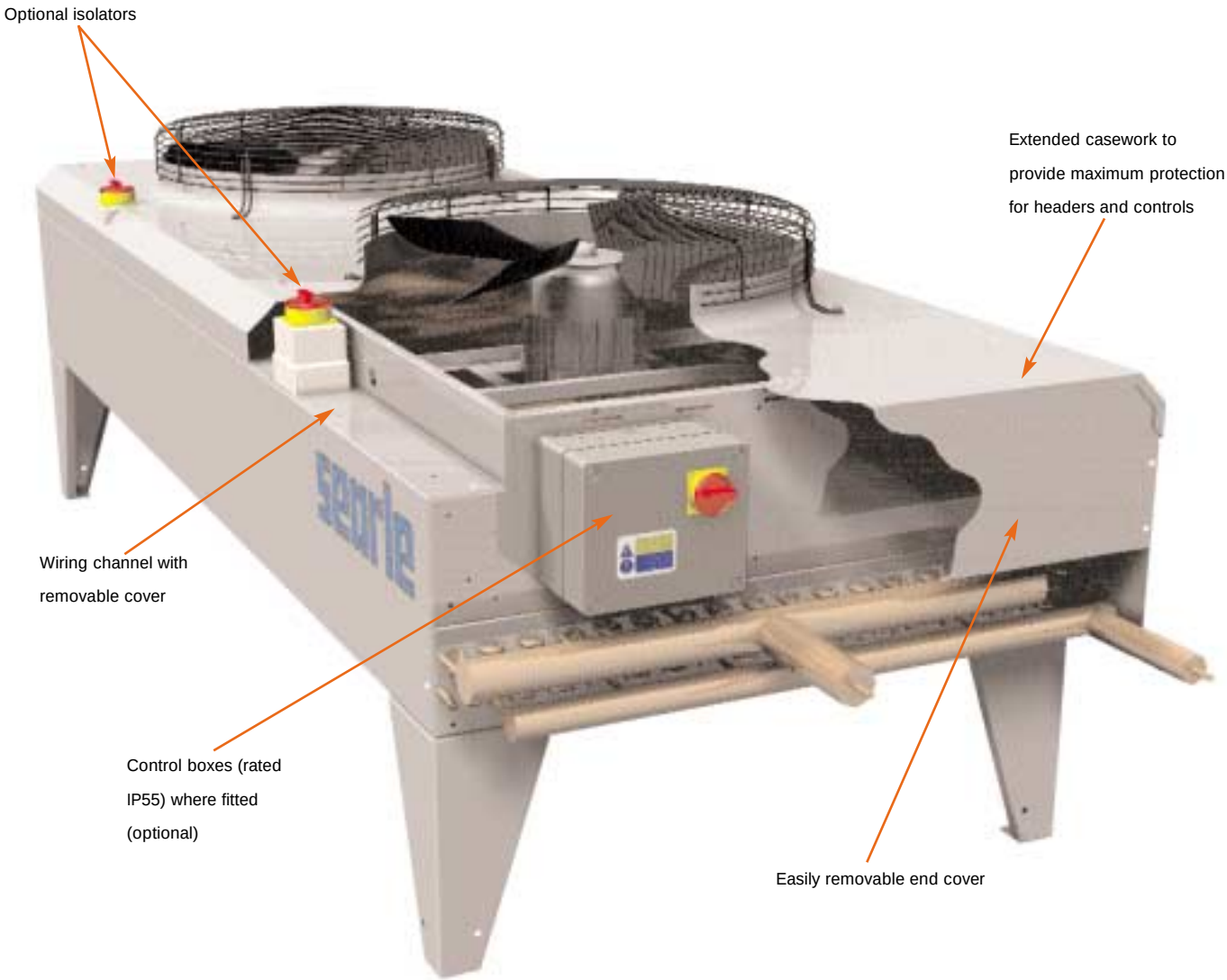


- Duty range from 10kW to 135kW
- Independently tested to prEN327
- Full Eurovent range approval
- 9 model sizes, each with a choice of four, two-speed motors
- 1 to 3 fans in-line
- Extended casework at both ends to provide protection for return bends, headers and controls
- Wiring channel with removable cover
- Control boxes (rated IP55) are mounted at the header end (where fitted)
- Removable end cover, to provide maximum environmental and physical protection
- Two year guarantee

SPECIFICATION

Certificate 95-10-015 (R22 capacity with aluminium fins)

8 Pole

Model MDE	Nominal Capacity 15 K DT1 (Dew Point) R404A R507 kW	R134a kW	**R22 kW**	R407A kW	R407C kW	**Air Vol. m³/s**	No. of Fans	Coil Details Total Surface m²	No. of Circuits	Internal Vol. dm³	R404A Charge kg	Sound Pressure Levels, dB @10m dB(A) @ 10m	Octave Band Frequency Hz 63	125	250	500	1k	2k	4k	8k	**Sound Power Level dB(A)**
112-8D	20.5	19.1	**19.7**	17.0	17.9	**1.94**	1	38	6	8.2	2.6	41	45	44	43	40	36	30	25	14	**72**
113-8D	25.2	23.4	**24.2**	20.9	21.9	**1.88**	1	57	9	11.3	3.6	41	45	44	43	40	36	30	25	14	**72**
114-8D	27.0	25.1	**25.9**	22.4	23.5	**1.75**	1	76	12	14.3	4.6	41	45	44	43	40	36	30	25	14	**72**
122-8D	41.0	38.2	**39.4**	34.0	35.8	**3.94**	2	78	12	15.6	5.0	44	48	47	46	43	39	33	28	17	**75**
123-8D	50.4	46.8	**48.4**	41.8	43.8	**3.80**	2	118	18	21.6	6.8	44	48	47	46	43	39	33	28	17	**75**
124-8D	54.0	50.2	**51.8**	44.8	47.0	**3.54**	2	157	24	27.6	8.6	44	48	47	46	43	39	33	28	17	**75**
132-8D	61.5	57.3	**59.1**	51.0	53.7	**5.91**	3	119	18	23.7	7.4	46	50	49	48	45	41	35	30	19	**77**
133-8D	75.6	70.2	**72.6**	62.7	65.7	**5.73**	3	178	27	32.7	10.2	46	50	49	48	45	41	35	30	19	**77**
134-8D	81.0	75.3	**77.7**	67.2	70.5	**5.34**	3	237	36	41.7	13.2	46	50	49	48	45	41	35	30	19	**77**
112-8S	14.9	13.9	**14.3**	12.4	13.0	**1.26**	1	38	6	8.2	2.6	33	38	38	35	32	27	22	18	<10	**63**
113-8S	17.9	16.7	**17.2**	14.9	15.6	**1.22**	1	57	9	11.3	3.6	33	38	38	35	32	27	22	18	<10	**63**
114-8S	18.9	17.5	**18.1**	15.6	16.4	**1.14**	1	76	12	14.3	4.6	33	38	38	35	32	27	22	18	<10	**63**
122-8S	29.8	27.8	**28.6**	24.8	26.0	**2.56**	2	78	12	15.6	5.0	36	41	41	38	35	30	25	21	<10	**66**
123-8S	35.8	33.4	**34.4**	29.8	31.2	**2.48**	2	118	18	21.6	6.8	36	41	41	38	35	30	25	21	<10	**66**
124-8S	37.8	35.0	**36.2**	31.2	32.8	**2.30**	2	157	24	27.6	8.6	36	41	41	38	35	30	25	21	<10	**66**
132-8S	44.7	41.7	**42.9**	37.2	39.0	**3.84**	3	119	18	23.7	7.4	38	43	43	40	37	32	27	23	11	**68**
133-8S	53.7	50.1	**51.6**	44.7	46.8	**3.72**	3	178	27	32.7	10.2	38	43	43	40	37	32	27	23	11	**68**
134-8S	56.7	52.5	**54.3**	46.8	49.2	**3.48**	3	237	36	41.7	13.2	38	43	43	40	37	32	27	23	11	**68**

Motor Details	RPM	**Input per Fan kW**	400V/3ph/50Hz FLC A	SC A	230V/1ph/50Hz FLC A	SC A
8 Pole Delta	653	**0.335**	0.8	2.0	1.7	2.4
8 Pole Star	464	**0.220**	0.4	0.7	-	-

12 Pole

Model MDE	Nominal Capacity 15 K DT1 (Dew Point) R404A R507 kW	R134a kW	**R22 kW**	R407A kW	R407C kW	**Air Vol. m³/s**	No. of Fans	Coil Details Total Surface m²	No. of Circuits	Internal Vol. dm³	R404A Charge kg	Sound Pressure Levels, dB @10m dB(A) @ 10m	Octave Band Frequency Hz 63	125	250	500	1k	2k	4k	8k	**Sound Power Level dB(A)**
112-12D	13.5	12.6	**13.0**	11.2	11.8	**1.11**	1	38	6	8.2	2.6	30	36	34	32	28	24	19	15	<10	**61**
113-12D	15.8	14.7	**15.2**	13.1	13.8	**1.05**	1	57	9	11.3	3.6	30	36	34	32	28	24	19	15	<10	**61**
114-12D	16.1	15.0	**15.5**	13.4	14.0	**0.95**	1	76	12	14.3	4.6	30	36	34	32	28	24	19	15	<10	**61**
122-12D	27.0	25.2	**26.0**	22.4	23.6	**2.24**	2	78	12	15.6	5.0	33	39	37	35	31	27	22	18	<10	**64**
123-12D	31.6	29.4	**30.4**	26.2	27.6	**2.12**	2	118	18	21.6	6.8	33	39	37	35	31	27	22	18	<10	**64**
124-12D	32.2	30.0	**31.0**	26.8	28.0	**1.92**	2	157	24	27.6	8.6	33	39	37	35	31	27	22	18	<10	**64**
132-12D	40.5	37.8	**39.0**	33.6	35.4	**3.39**	3	119	18	23.7	7.4	35	41	39	37	33	29	24	20	<10	**66**
133-12D	47.4	44.1	**45.6**	39.3	41.4	**3.21**	3	178	27	32.7	10.2	35	41	39	37	33	29	24	20	<10	**66**
134-12D	48.3	45.0	**46.5**	40.2	42.0	**2.91**	3	237	36	41.7	13.2	35	41	39	37	33	29	24	20	<10	**66**
112-12S	10.9	10.2	**10.5**	9.1	9.5	**0.83**	1	38	6	8.2	2.6	24	30	29	26	23	18	14	<10	<10	**55**
113-12S	12.4	11.5	**11.9**	10.3	10.8	**0.78**	1	57	9	11.3	3.6	24	30	29	26	23	18	14	<10	<10	**55**
114-12S	12.5	11.6	**12.0**	10.4	10.9	**0.70**	1	76	12	14.3	4.6	24	30	29	26	23	18	14	<10	<10	**55**
122-12S	21.8	20.4	**21.0**	18.2	19.0	**1.68**	2	78	12	15.6	5.0	27	33	32	29	26	21	17	11	<10	**58**
123-12S	24.8	23.0	**23.8**	20.6	21.6	**1.58**	2	118	18	21.6	6.8	27	33	32	29	26	21	17	11	<10	**58**
124-12S	25.0	23.2	**24.0**	20.8	21.8	**1.42**	2	157	24	27.6	8.6	27	33	32	29	26	21	17	11	<10	**58**
132-12S	32.7	30.6	**31.5**	27.3	28.5	**2.52**	3	119	18	23.7	7.4	29	35	34	31	28	23	19	13	<10	**60**
133-12S	37.2	34.5	**35.7**	30.9	32.4	**2.37**	3	178	27	32.7	10.2	29	35	34	31	28	23	19	13	<10	**60**
134-12S	37.5	34.8	**36.0**	31.2	32.7	**2.13**	3	237	36	41.7	13.2	29	35	34	31	28	23	19	13	<10	**60**

Motor Details	RPM	**Input per Fan kW**	400V/3ph/50Hz FLC A	SC A	230V/1ph/50Hz FLC A	SC A
12 Pole Delta	421	**0.145**	0.5	0.7	1.3	2.0
12 Pole Star	319	**0.070**	0.2	0.3	-	-

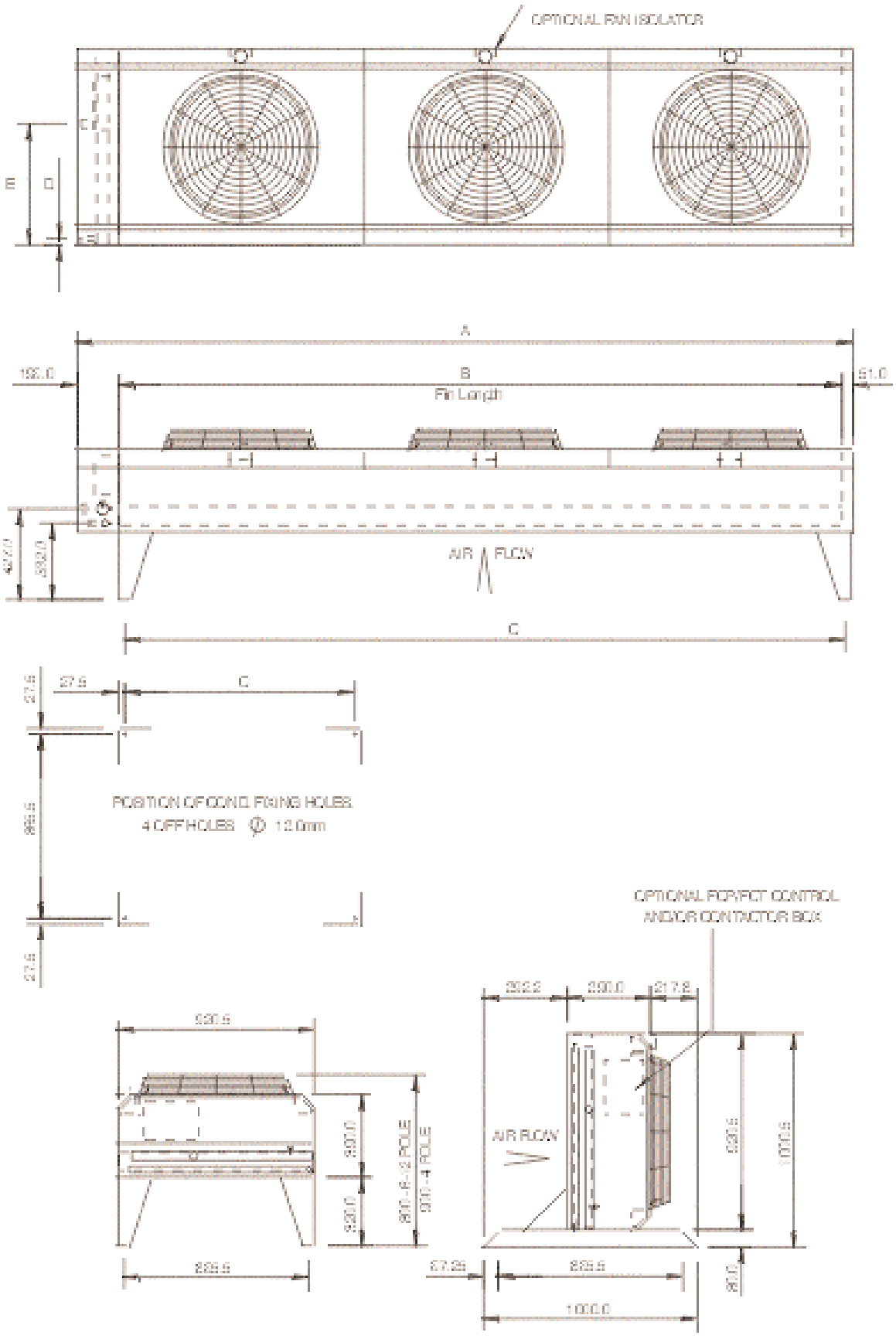
Correction Factors (Multiply the above capacities by the following factors)

Single Phase	**Factor**
Capacity	0.98
Noise	-3 dB(A)

Sound Pressure Levels - Correction for Distance					
Distance from Unit (m)	5	10	20	40	60
Change in dB	+6	0	-6	-12	-15

Capacity Correction Factors	**Dew Point DT1**					
	8K	**10K**	**12K**	**15K**	**17K**	**20K**
R22, R507, R134a, R404A	0.53	0.67	0.80	1.00	1.13	1.33
R407A, R407C	0.46	0.62	0.77	1.00	1.15	1.38

DIMENSIONS



Horizontal Unit **Vertical Unit**

DIMENSIONS/WEIGHTS

Model MDE	A	B	C	D	E	Approx. Weight		Hot Gas Conn.	Liquid Conn.
						Cu/Al	Cu/Cu		
	mm	mm	mm	mm	mm	kg	kg	ins OD	ins OD
112	1340	1093	1080	27.5	567.5	80	125	$1^{3}/_{8}$	$^{7}/_{8}$
113	1340	1093	1080	27.5	567.5	115	145	$1^{3}/_{8}$	$^{7}/_{8}$
114	1340	1093	1080	27.5	567.5	120	165	$1^{3}/_{8}$	$^{7}/_{8}$
122	2490	2243	2230	30.5	568.0	155	200	$1^{5}/_{8}$	$1^{1}/_{8}$
123	2490	2243	2230	30.5	568.0	175	245	$1^{5}/_{8}$	$1^{1}/_{8}$
124	2490	2243	2230	30.5	593.4	195	285	$1^{5}/_{8}$	$1^{1}/_{8}$
132	3640	3393	3380	33.5	593.4	210	280	$2^{1}/_{8}$	$1^{3}/_{8}$
133	3640	3393	3380	33.5	568.0	235	340	$2^{1}/_{8}$	$1^{3}/_{8}$
134	3640	3393	3380	33.5	555.3	265	400	$2^{1}/_{8}$	$1^{3}/_{8}$

HOW TO ORDER

MDE 1 1 2 - 4 S AL 3 H

TYPE

SINGLE BANK
1

NUMBER OF FANS
1, 2, 3

NUMBER OF ROWS IN COIL
2, 3, 4

MOTOR POLES
4, 6, 8, 12

WIRING
D = Delta
S = Star

COIL MATERIAL
Al = Copper tubes/aluminium fins
AV = Copper tubes/vinyl coated aluminium fins
Cu = Copper tubes/copper fins
ET = Copper tubes/electro-tinned copper fins

ELECTRICAL SUPPLY
3 Ph
1 Ph

ORIENTATION
H = Horizontal
V = Vertical