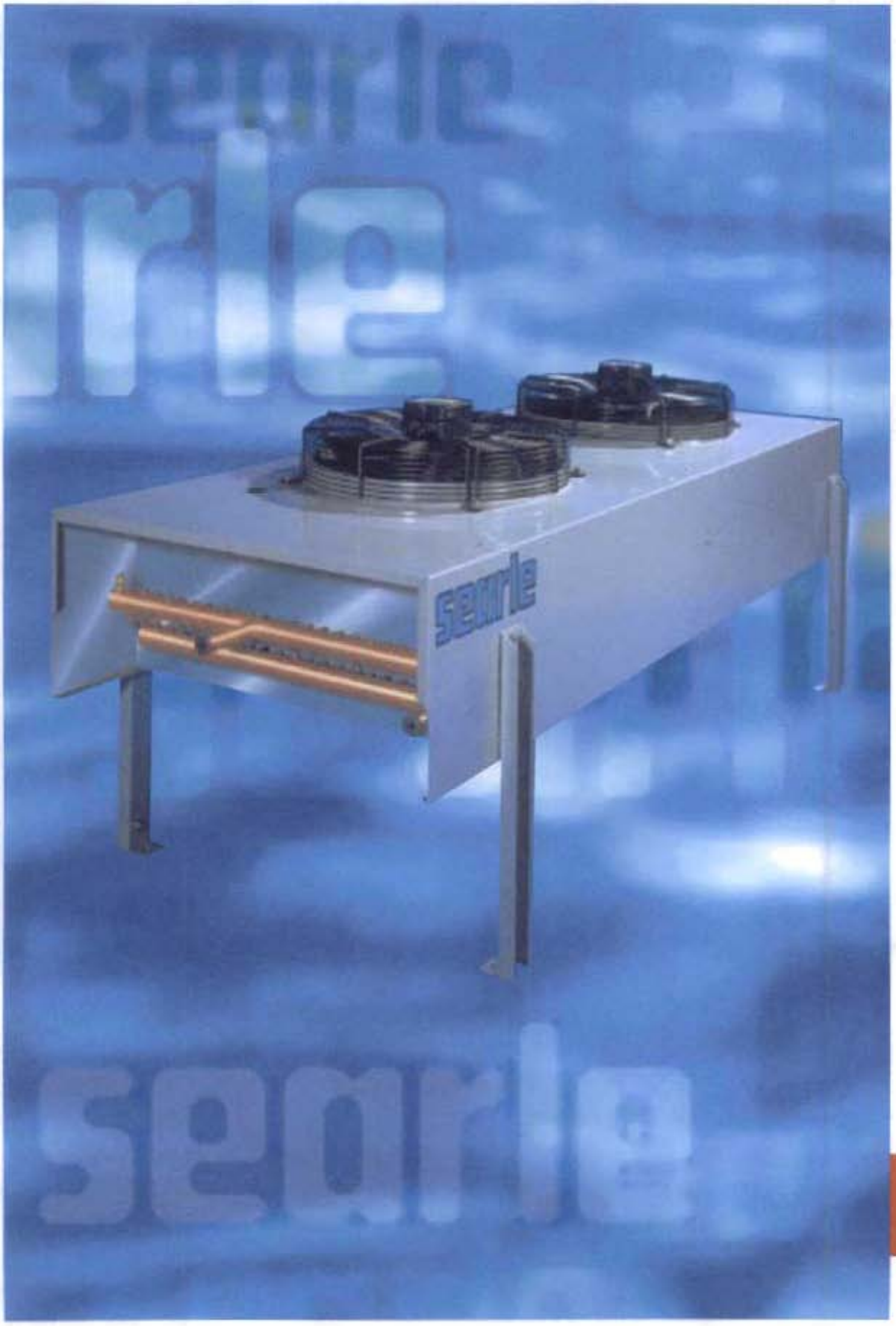
searle

# MDA Air-Cooled Condensers 7.5-36.3kW



# SPECIFICATION

### General

The Searle MDA range of fully weatherproof air-cooled condensers comprises 9 model sizes, each with a choice of two fan speed options, giving a range of 18 models, covering a duty range from 7.5kW to 36.3kW.
Units have 1 to 3 fans arranged in a single line.
Full range approval has been certified by the Eurovent/Cecomaf company on certificate number 95-10-015.
The MDA range is suited for use in most refrigeration and air conditioning condenser applications and a range of corresponding dry-cooler units is available (DKA). Most fluids can be cooled, including water/glycol solutions, many types of oil and gases. Please contact your supplier for assistance in selecting a suitable unit.
The MDA range is offered with a two-year guarantee.

### Vertical Mounting

Units may be operated with the coil vertical using the standard legs.

### 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 corrosion resistant with the majority being stainless steel.

### Coils

Standard condenser coils are manufactured from seamless copper tube employing the latest extended inner surface technology. The tubes are mechanically expanded into the 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 blocks have 2.1mm fin spacing (12 fins per inch).
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 |

Multi-sectioning is possible on all models, allowing more than one system to operate with a single condenser.

### Motors and Fans

Motors are either single phase (230V/1ph/50Hz) available in 4 and 6 pole speeds, or three phase (400V/3ph/50Hz) available in 4 pole.
Motors are internally protected and suitable for speed control (see Electrical Options). Motors are environmentally protected to IP54.
Fans are 400mm diameter, operating in a bell-mouthed fan orifice designed to maximise efficiency and air-flow and minimise noise levels and air re-circulation.
Motors are available for 60Hz operation - these will increase capacity by up to 15% and increase noise by up to 3 dB(A).

| Motor Details | RPM | Input per Fan kW | FLC A | SC A |
|---|---|---|---|---|
| 4 Pole 230V/1ph/50Hz | 1410 | 0.19 | 1.2 | 2.1 |
| 6 Pole 230V/1ph/50Hz | 910 | 0.13 | 0.7 | 1.4 |
| 4 Pole 400V/3ph/50Hz | 1410 | 0.19 | 0.6 | 1.2 |

### Electrical Options

On standard units, individual terminal boxes are located on top of each motor.
There are a number of wiring and control options available for single phase units as follows:-

- Motors wired back to a common terminal box.
- Speed control (pressure operated).
- A single multipole unit isolator which allows individual motors to be separately switched form an external source.

The common terminal box or isolator is mounted at the header end of the condenser, underneath a cover, to provide environmental and physical protection.
For further details of these electrical and control options, please contact your supplier.

### Noise Levels

Sound power levels have been determined from tests carried out in free field conditions. Sound power (dBA) figures have been verified and independently certified by Eurovent/Cecomaf. 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 flow add 3dB(A).

### Dew Point

The capacities shown in this document are rated at dew point. This is the pressure/temperature condition at which a refrigerant gas begins to condense on a surface. As some refrigerants now have significant glide (e.g. R407A/407C), the saturated gas and saturated liquid temperatures are not necessarily the same. Therefore it has become necessary to define the two conditions - saturated gas, now known as dew point and saturated liquid, now known as bubble point (the point at which liquid begins to boil). It is important to ensure that all the components of a system are selected using the same rating method. Whilst the use of mid-point does make selection easier, it is difficult to measure on-site. At the catalogue rating point of 15K DT1, mid point capacities would be approx. 17% higher for R407A and 9% higher for R407C than the equivalent dew point figures shown in the tables.

## 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 range is certified under the Eurovent CERTIFY-ALL Air Cooled Condensers program, with performances rated in accordance with EN327

# SELECTION DATA

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

## 4 Pole

| Model | No. of fans | Nom. Capacity @ 15 K DT1 (Dew Point) | | | | | Coil Details | | | | dB(A) @ 10m | Sound Pressure Levels, dB @10m Octave Band Frequency Hz | | | | | | | | Sound Power Level dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | R22,R404A, R507 | R134a | R407A | R407C | Air Flow Rate | Total Surface | No. of Circuits | Internal Vol. (*) | Refrig. Charge | | | | | | | | | | |
| | | kW | kW | kW | kW | m³/s | m² | | dm³ | kg | 10m | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| MDA 12-4 | 1 | 9.4 | 9.1 | 8.8 | 8.0 | 0.98 | 16 | 2 | 3.5 | 1.2 | 46 | 40 | 45 | 45 | 46 | 41 | 38 | 30 | 20 | 78 |
| MDA 13-4 | 1 | 11.3 | 11.0 | 10.4 | 9.6 | 0.91 | 24 | 3 | 4.8 | 1.6 | 46 | 40 | 45 | 45 | 46 | 41 | 38 | 30 | 20 | 78 |
| MDA 14-4 | 1 | 12.1 | 11.7 | 11.1 | 10.3 | 0.85 | 33 | 3 | 6.4 | 2.1 | 46 | 40 | 45 | 45 | 46 | 41 | 38 | 30 | 20 | 78 |
| MDA 22-4 | 2 | 18.8 | 18.3 | 17.3 | 16.0 | 1.96 | 33 | 4 | 6.0 | 2.0 | 49 | 43 | 48 | 48 | 49 | 44 | 41 | 33 | 23 | 81 |
| MDA 23-4 | 2 | 22.6 | 21.9 | 20.8 | 19.2 | 1.82 | 49 | 6 | 8.7 | 2.9 | 49 | 43 | 48 | 48 | 49 | 44 | 41 | 33 | 23 | 81 |
| MDA 24-4 | 2 | 24.2 | 23.5 | 22.3 | 20.6 | 1.70 | 65 | 6 | 11.2 | 3.7 | 49 | 43 | 48 | 48 | 49 | 44 | 41 | 33 | 23 | 81 |
| MDA 32-4 | 3 | 28.2 | 27.4 | 25.9 | 24.0 | 2.94 | 49 | 6 | 8.5 | 2.8 | 51 | 45 | 50 | 50 | 50 | 45 | 42 | 35 | 25 | 83 |
| MDA 33-4 | 3 | 33.9 | 32.9 | 31.2 | 28.8 | 2.73 | 73 | 9 | 12.5 | 4.1 | 51 | 45 | 50 | 50 | 50 | 45 | 42 | 35 | 25 | 83 |
| MDA 34-4 | 3 | 36.3 | 35.2 | 33.4 | 30.9 | 2.55 | 98 | 12 | 16.2 | 5.4 | 51 | 45 | 50 | 50 | 50 | 45 | 42 | 35 | 25 | 83 |

## 6 Pole

| Model | No. of fans | Nom. Capacity @ 15 K DT1 (Dew Point) | | | | | Coil Details | | | | dB(A) @ 10m | Sound Pressure Levels, dB @10m Octave Band Frequency Hz | | | | | | | | Sound Power Level dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | R22,R404A, R507 | R134a | R407A | R407C | Air Flow Rate | Total Surface | No. of Circuits | Internal Vol. (*) | Refrig. Charge | | | | | | | | | | |
| | | kW | kW | kW | kW | m³/s | m² | | dm³ | kg | 10m | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| MDA 12-6 | 1 | 7.5 | 7.3 | 6.9 | 6.4 | 0.72 | 16 | 2 | 3.5 | 1.2 | 39 | 29 | 34 | 40 | 39 | 33 | 30 | 19 | 11 | 73 |
| MDA 13-6 | 1 | 8.9 | 8.6 | 8.2 | 7.6 | 0.67 | 24 | 3 | 4.8 | 1.6 | 39 | 29 | 34 | 40 | 39 | 33 | 30 | 19 | 11 | 73 |
| MDA 14-6 | 1 | 9.4 | 9.1 | 8.6 | 8.0 | 0.62 | 33 | 3 | 6.4 | 2.1 | 39 | 29 | 34 | 40 | 39 | 33 | 30 | 19 | 11 | 73 |
| MDA 22-6 | 2 | 15.0 | 14.5 | 13.8 | 12.7 | 1.44 | 33 | 4 | 6.0 | 2.0 | 42 | 32 | 37 | 43 | 42 | 36 | 33 | 22 | 14 | 76 |
| MDA 23-6 | 2 | 17.8 | 17.3 | 16.4 | 15.1 | 1.34 | 49 | 6 | 8.7 | 2.9 | 42 | 32 | 37 | 43 | 42 | 36 | 33 | 22 | 14 | 76 |
| MDA 24-6 | 2 | 18.8 | 18.3 | 17.3 | 16.0 | 1.24 | 65 | 6 | 11.2 | 3.7 | 42 | 32 | 37 | 43 | 42 | 36 | 33 | 22 | 14 | 76 |
| MDA 32-6 | 3 | 22.5 | 21.8 | 20.7 | 19.1 | 2.16 | 49 | 6 | 8.5 | 2.8 | 44 | 34 | 38 | 44 | 44 | 38 | 35 | 24 | 16 | 77 |
| MDA 33-6 | 3 | 26.7 | 25.9 | 24.6 | 22.7 | 2.01 | 73 | 9 | 12.5 | 4.1 | 44 | 34 | 38 | 44 | 44 | 38 | 35 | 24 | 16 | 77 |
| MDA 34-6 | 3 | 28.2 | 27.4 | 25.9 | 24.0 | 1.86 | 98 | 12 | 16.2 | 5.4 | 44 | 34 | 38 | 44 | 44 | 38 | 35 | 24 | 16 | 77 |

(*) Headers are included in internal volume figure. The refrigerant charge (R22) is based on the condenser being filled with 25% liquid and 75% gas at a condensing temperature of 45°C.

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

| Refrigerant | DT1 (Dew Point Temperature Difference) | | | | | |
|---|---|---|---|---|---|---|
| | 8K | 10K | 12K | 15K | 17K | 20K |
| R22, R134a, R404A, R507 | 0.53 | 0.67 | 0.80 | 1.00 | 1.13 | 1.33 |
| R407A, R407C | 0.44 | 0.60 | 0.76 | 1.00 | 1.16 | 1.40 |

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

# HOW TO ORDER

MDA 1 2 - 4 AL 1PH

TYPE

NUMBER OF FANS
1, 2, 3

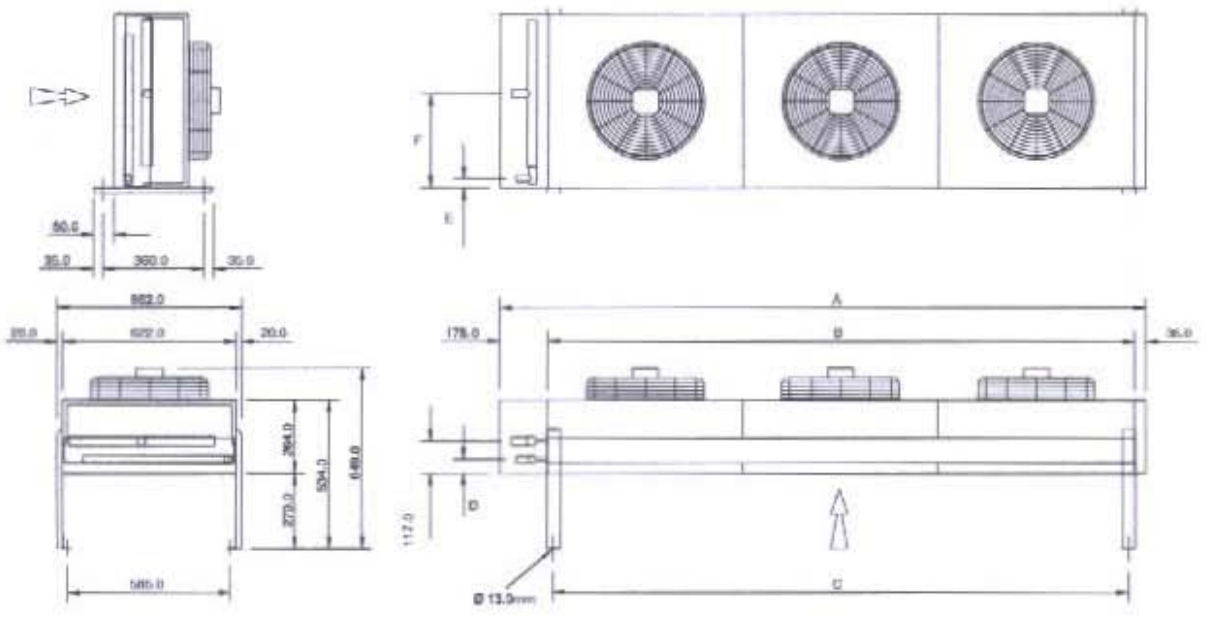
NUMBER OF ROWS IN COIL
2, 3, 4

MOTOR POLES
4, 6

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
1PH, 3PH

# DIMENSIONS




| Model MDA | No. Rows | A | B | C | D | E | F | Approx. Weight | | Inlet Size | Outlet Size |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Cu/Al | Cu/Cu | | |
| | | mm | mm | mm | mm | mm | mm | kg | kg | ins OD | ins OD |
| 12 | 2 | 915 | 700 | 660 | 51 | 29 | 266 | 40 | 62 | 5/8 | 5/8 |
| 13 | 3 | 915 | 700 | 660 | 73 | 31 | 393 | 52 | 70 | 5/8 | 5/8 |
| 14 | 4 | 915 | 700 | 660 | 51 | 29 | 266 | 60 | 80 | 7/8 | 5/8 |
| 22 | 2 | 1615 | 1400 | 1360 | 51 | 28 | 267 | 75 | 97 | 7/8 | 5/8 |
| 23 | 3 | 1615 | 1400 | 1360 | 73 | 30 | 342 | 85 | 112 | 7/8 | 7/8 |
| 24 | 4 | 1615 | 1400 | 1360 | 51 | 28 | 267 | 95 | 132 | 7/8 | 7/8 |
| 32 | 2 | 2315 | 2100 | 2060 | 51 | 28 | 267 | 100 | 138 | 7/8 | 7/8 |
| 33 | 3 | 2315 | 2100 | 2060 | 73 | 33 | 329 | 110 | 170 | 1 1/8 | 7/8 |
| 34 | 4 | 2315 | 2100 | 2060 | 51 | 29 | 294 | 130 | 190 | 1 1/8 | 7/8 |

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