DDRA Range
Glycol Drycoolers

Axlo24110

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DDRA - 75

EXTERNAL CONDENSERS

denco
air conditioning

General Information

The Company

For over 40 years, Denco has been the market leader in design, manufacture and installation of air conditioning equipment for close control environments. The DDRA range of glycol drycoolers or blast coolers incorporates the very latest in environmental and energy saving technology. These drycoolers may be applied to any cooling water system, but will usually incorporate a percentage of ethylene glycol if there is a risk of winter freezing.

Denco engineers, and overseas distributors, have the skill and experience to arrive at the most suitable and cost effective solutions to your needs and will willingly assist with the selection of equipment for any project. Comprehensive installation, commissioning and maintenance facilities are also available, our specialised Field Service Organisation being one of the largest and most reliable in the UK.

Denco Limited is a Lloyds Register Quality Assured Firm in accordance with BS EN ISO 9001.

The Product

The DDRA range of glycol drycoolers is compact with the higher performance and quality demanded by today's close control air conditioning market.

These units are designed and built within a Quality Assurance System conforming to BS EN ISO 9001, using our unrivalled experience in close control air conditioning, with extensive testing of components and complete systems. Every aspect is engineered to ensure maximum reliability, economy of operation and long working life, together with ease of installation and maintenance.

The Range

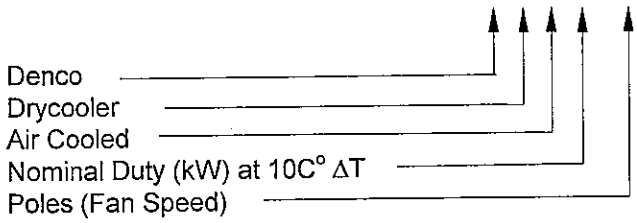
The Denco DDRA range of Glycol Drycoolers is now available in two versions, in total six models as detailed below. The range is fully modular such that individual fan modules can be assembled either at the factory or on site. By incorporating multiple shut off valves, a number of autonomous circuits can be provided to increase reliability.

Nominal duties range from 20 kW through to 75 kW total heat of rejection at 10K approach ΔT (Leaving Glycol Temperature minus Ambient Temperature).

- Quiet / Residential Version: DDRA 25-8, 40-8 and 60-8.
- Standard Version: DDRA 32-6, 50-6 and 75-6.

Key to Type Codes

The designations signify for example DDRA 32 - 6

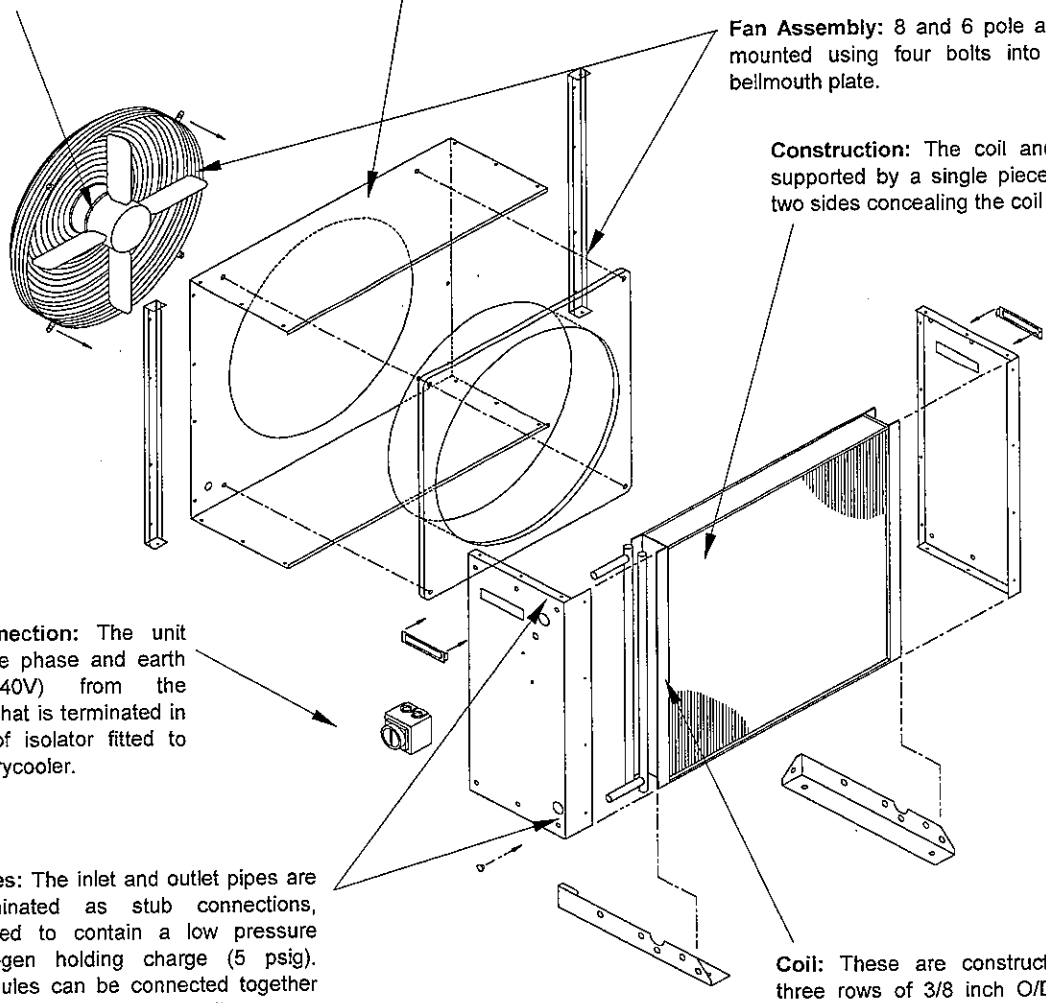


Due to our policy of continuous development and Improvement, the specifications and data hereln are subject to change without notice. We must therefore reserve the right to supply equipment that may differ from that described and illustrated herein.
All information, including illustrations, contained in this brochure, is believed to be accurate and reliable. Users, however, should independently evaluate the suitability of each product for their own application. Denco makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use.

DDRA Drycooler - Exploded View

Fans: These are axial flow type with profiled aluminium sheetmetal blades fitted to an external rotor motor, all supported in a wire guard.
A thermostat or fan speed controller located within the Air Handling Unit controls the fans.

Material: The components are housed in a casing using ribbed aluminium / zinc coated rolled steel sheet. This material gives the strength of steel, the corrosion resistance of aluminium and contains zinc that gives cathodic protection of cut edges and surface scratches.



Fan Assembly: 8 and 6 pole are externally mounted using four bolts into a standard bellmouth plate.

Construction: The coil and fan(s) are supported by a single piece casing and two sides concealing the coil pipework.

Electrical Connection: The unit requires a single phase and earth supply (220-240V) from the electrical panel that is terminated in the weatherproof isolator fitted to the side of the drycooler.

Pipes: The inlet and outlet pipes are terminated as stub connections, sealed to contain a low pressure nitrogen holding charge (5 psig). Modules can be connected together either at the factory or on site

Coil: These are constructed from three rows of 3/8 inch O/D copper tubes with corrugated aluminium fins.

This range of drycoolers can be installed into either a horizontal or vertical airflow configuration, using the mounting feet (supplied loose). The feet have holes for securing the unit in position when installed. This must be done in all cases.

Air is drawn through the coil and over the fan giving uniform distribution and optimum performance.

Performance

Approach Temperature is equivalent to Glcol Leaving Temperature minus Ambient Temperature.

Quiet / Residential Version				
8 Pole Model	**Capacity kW**	**Flow l/s**	**No. of Fan(s)**	**Pressure Loss kPa**
DDRA 25 - 8	23	0.8	1	18
DDRA 40 - 8	38	1.25	2	20
DDRA 60 - 8	52	1.75	3	23

Standard Version				
6 Pole Model	**Capacity kW**	**Flow l/s**	**No. of Fan(s)**	**Pressure Loss kPa**
DDRA 32 - 6	29	1.0	1	25
DDRA 50 - 6	54	1.8	2	32
DDRA 75 - 6	75	2.5	3	36

All the above performances are based on a 25% glycol solution, flow at 40°C with return 47.5°C (i.e. 7.5K ΔT) and in an ambient of 30°C (i.e. 10K ΔT).

The fans provide the above air volumes with no restrictions on air inlet and outlet. Restrictions will reduce the airflow with corresponding reduction in performance, but special high-pressure fans can be supplied on request.

Performance Modifiers

Performance Factors with alternative Approaches (ΔT)

Ambient	**30 °C**	**32.5 °C**	**35 °C**
Approach	**10K**	**7.5K**	**5K**
Factor	1.00	0.78	0.55

Performance Factors with alternative % Glycol Concentrations

% Glycol	**10%**	**25%**	**30%**	**40%**
Factor	1.02	1.00	0.97	0.94

Noise Levels

Quiet / Residential Version			
8 Pole Model	Noise Level @ 3 m dB(A) / NR	Noise Level @ 5 m dB(A) / NR	Noise Level @ 10 m dB(A) / NR
DDRA 25 - 8	56 / 50	50 / 44	43 / 37
DDRA 40 - 8	58 / 52	52 / 46	45 / 39
DDRA 60 - 8	60 / 54	54 / 48	47 / 41

Standard Version			
6 Pole Model	Noise Level @ 3 m dB(A) / NR	Noise Level @ 5 m dB(A) / NR	Noise Level @ 10 m dB(A) / NR
DDRA 32 - 6	65 / 59	59 / 53	52 / 46
DDRA 50 - 6	66 / 60	60 / 54	53 / 47
DDRA 75 - 6	68 / 62	62 / 56	55 / 49

Noise figures are typical sound pressure levels in an external environment.

Ancillaries and Options

Electrical Supplies

The following options are available: 265V / 1ph / 60Hz or 220V / 2ph / 60Hz wired from a 3 phase 3 wire supply

Stacking Frame

For horizontal airflow versions, simple plates and alternative feet are available for stacking of two drycoolers.

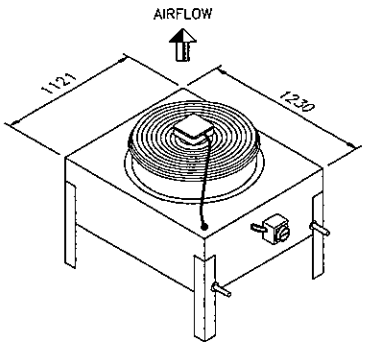
Pump Package

Drycoolers can be supplied complete with an on board pumping station. This consists of a single or optional dual pump arrangement with automatic changeover in the event of flow failure. The allowance on pump head pressure is generous with a typical allocation of 100 kPa for field installed piping and fittings. A sealed expansion vessel is also provided so that the correct system pressure is maintained at all times.

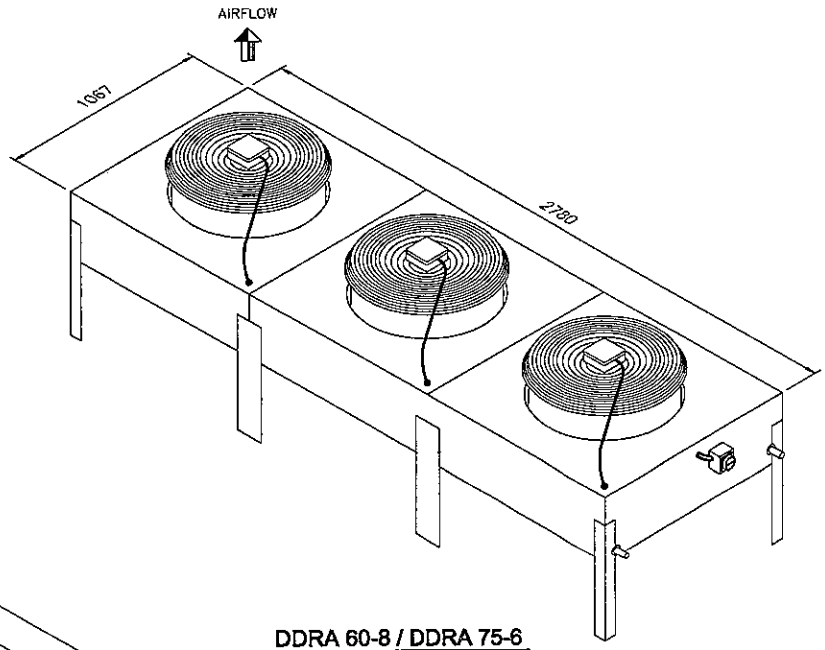
Drycooler Fan Control

If used with Denco Ambicool air conditioning units, the Millennium controller card can be used to switch the drycooler fans and pumps from the indoor Air Handling Unit. Alternatively a panel can be provided at the drycooler with a simple multi stage thermostat to cycle the fans, achieving a coarse but satisfactory control of glycol temperature.

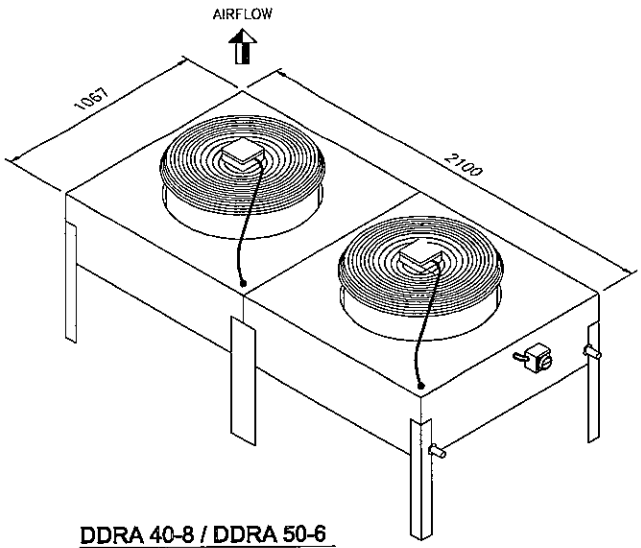
Dimensions and Weights - DDRA Vertical Airflow



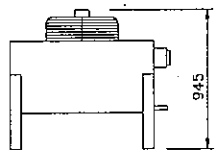
DDRA 25-8 / DDRA 32-6



DDRA 60-8 / DDRA 75-6



DDRA 40-8 / DDRA 50-6



Applicable to ALL Models

Weight and Connection Details:

Models	Weight (kgs)	Connections (OD Cu mm)
DDRA 25 - 8 / 32 - 6	90	35
DDRA 40 - 8 / 50 - 6	180	42
DDRA 60 - 8 / 75 - 6	270	54

Drycooler Location on Site

Ensure that the site is level and that it can support the weight of the equipment.

Drycoolers must be located in an unobstructed position to ensure adequate air circulation through the cooling coils. Care must be taken to avoid "short circuit" air paths and re-circulation of air from one unit to another.

Whenever possible position Drycoolers such that they are reasonably sheltered from strong winds and avoid prevailing winds blowing directly onto the fan(s). Units should be bolted down in case of high winds.

Drycoolers should not be sited more than 15m (50ft) above or 4m (13ft) below the base of the air conditioning unit.

Access space should be provided as detailed on the drawings below but allowing at least one metre free access.

Horizontal Blow

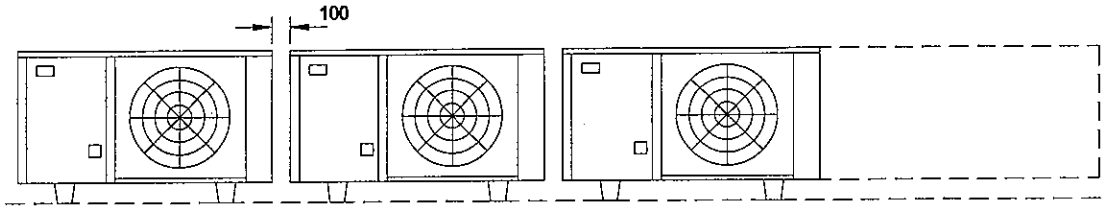


Fig 1: End to end in a continuous line

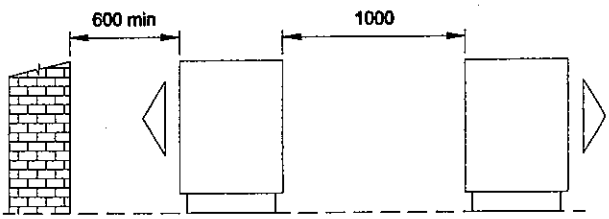


Fig 2: With coils facing but a minimum of 1 metre clearance between units

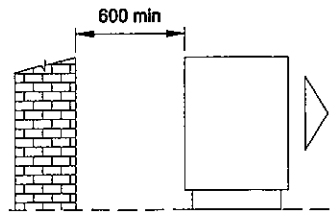


Fig 3: With single coil

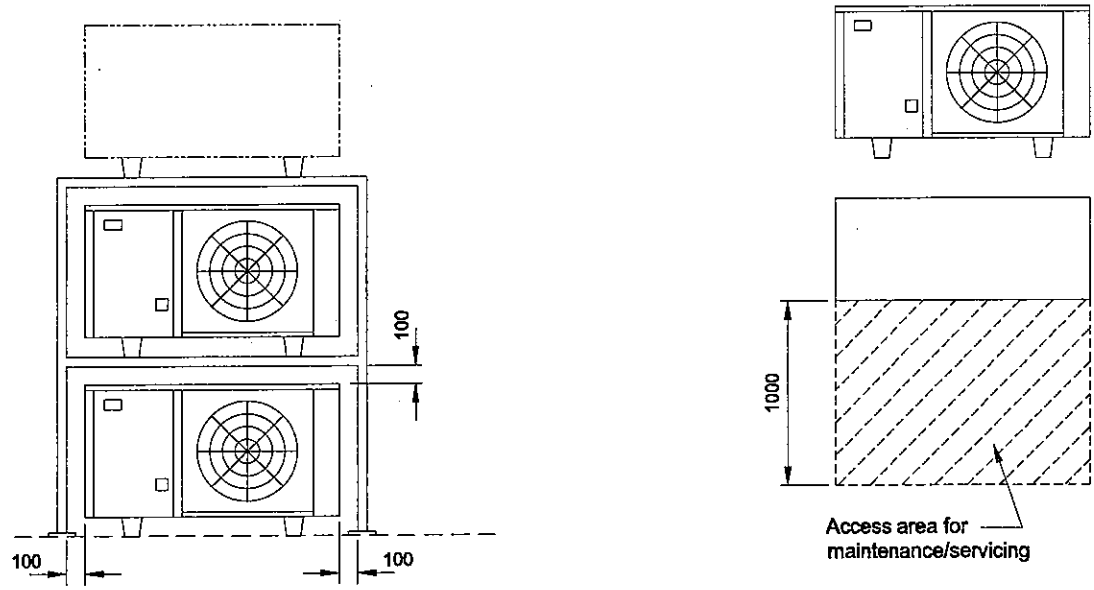


Fig 4: Stacked on a purpose built frame

Vertical Blow

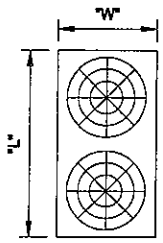


Fig 1:
Single unit with no restriction within the unit's length has no limitations in use.

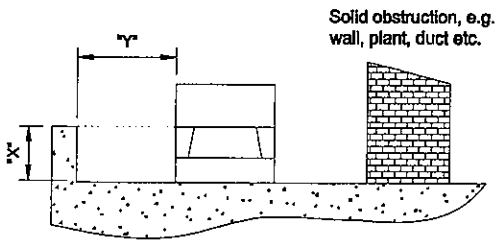


Fig 2:
Side wall will not be restrictive provided that "Y" is greater than "2X".

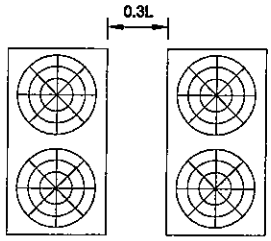


Fig 3:
Multiple units with no restrictions with a distance "L" have no limitations. Distance between ajoining units should be as indicated.

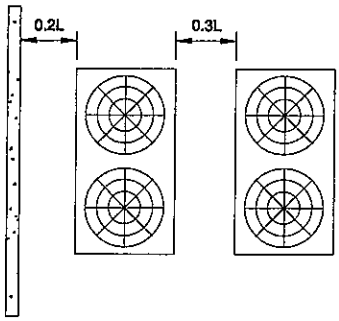


Fig 4:
The dimension "0.2L" is critical if more than one unit is installed by a solid wall.

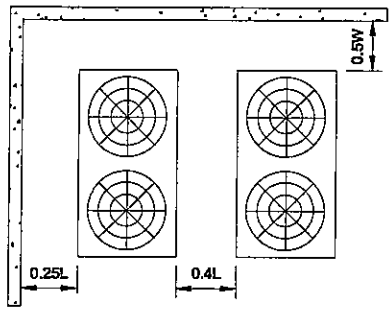


Fig 5:
Solid obstructions along any two walls.

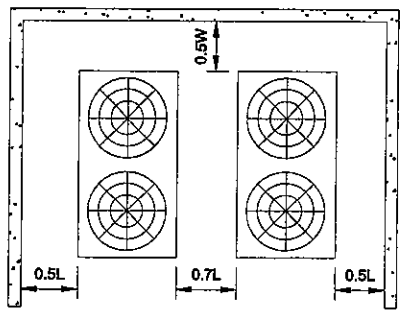


Fig 6:
Where multiple units are located where there are solid obstructions along any three sides, the open side must give free air to each of the units.

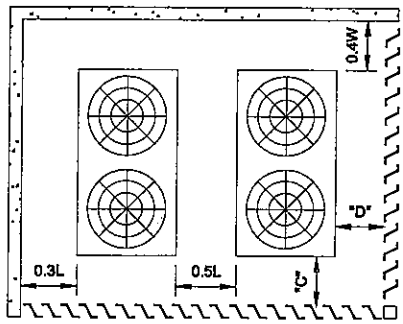


Fig 7:
Where multiple units are located within two solid obstructions and two louvred sections, "C"+"D" must be greater than "L". The total free area of the louvres should not be less than 70%. Fan discharge should be level with the top of the louvres.

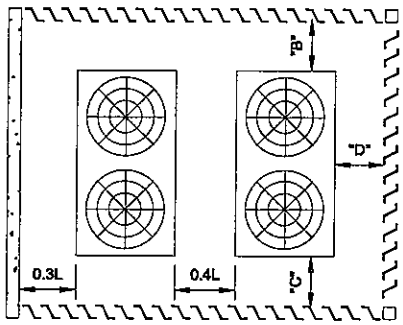


Fig 8:
Where multiple units are located within one solid obstruction and three louvred sections, "B"+"C"+"D" must be greater than "L". The total free area of the louvres should not be less than 70%. Fan discharge should be level with the top of the louvres.