DUNHAM-BUSH

BROCHURE

LEOPARD FAN COIL UNIT

TECHNICAL

Welcome to the Comfort Zone

230mm Deep · Horizontal Waterside Control in ceiling

INTRODUCTION

The ‘Leopard’, manufactured by Dunham-Bush, is a compact, adaptable, high quality range of fan coil units, that will perform quietly and powerfully for many years to come.

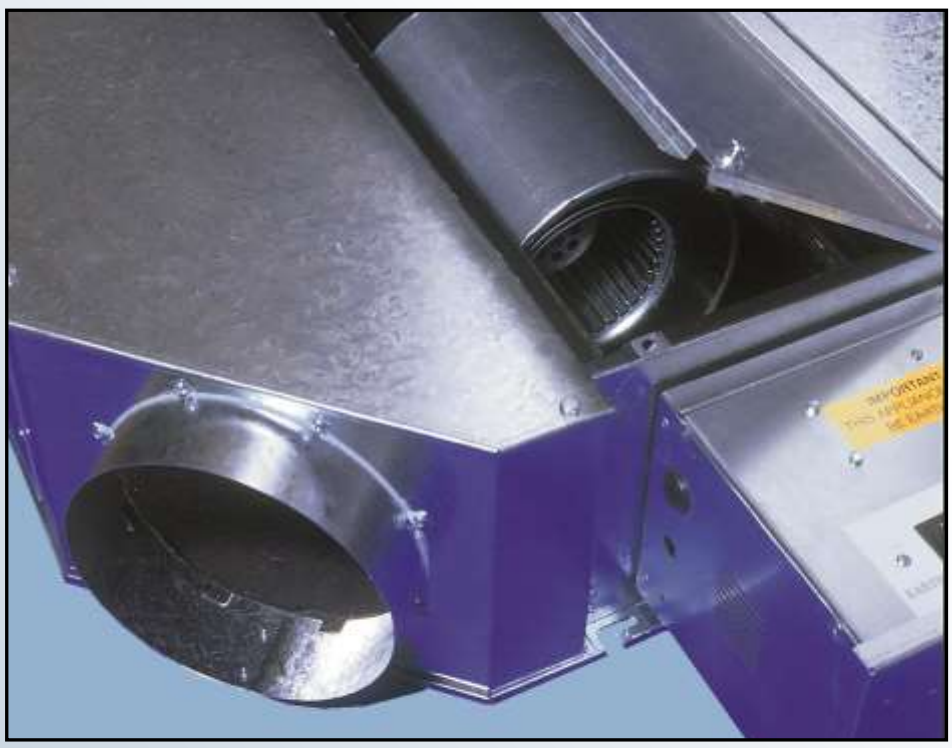
‘Leopard’ fan coil units are built to no-compromise engineering standards using only the most modern and reliable components available. Combined with the very latest design and manufacturing technology, the ‘Leopard’ provides the ideal solution to achieve even the most exacting thermal and noise criteria. Careful consideration has been given to safe site handling, fast / simple installation and ease of access for maintenance. Designed to offer maximum site flexibility, the ‘Leopard’ is one of the most versatile and user-friendly products available in today’s market.

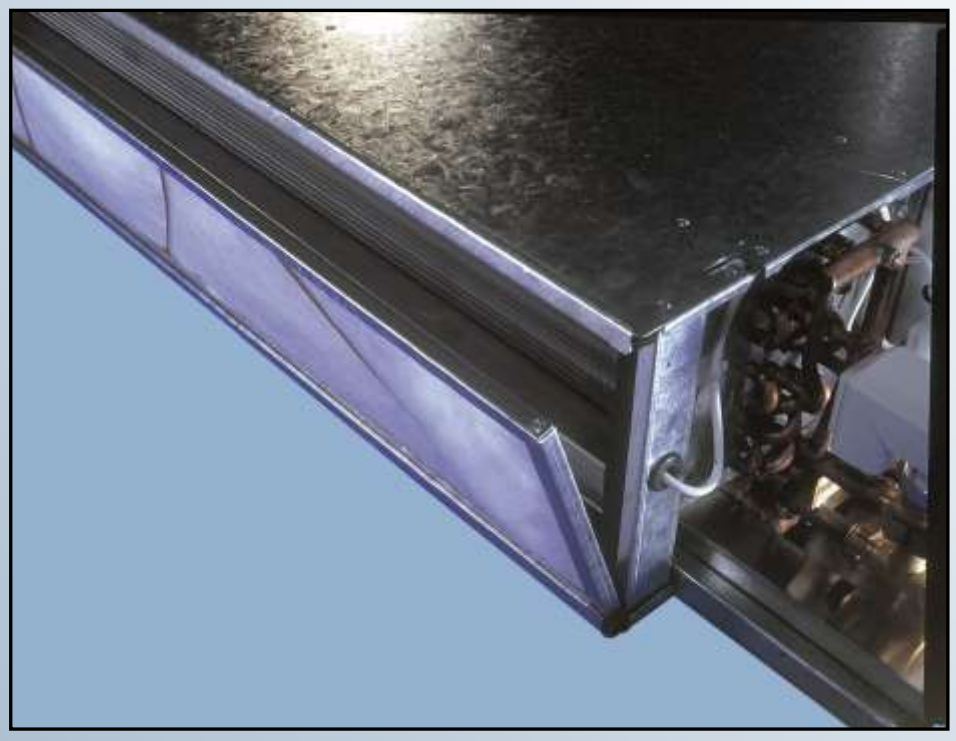
Flexibility Is The Key

The ‘Leopard’ uses a non-handed, dual-purpose coil block covered by a stainless steel ‘V’ formed condensate pan, terminating with a central drain point at the lowest end of the tray. This universal design is used on both RH and LH configurations and allows the complete coil and condensate pan assembly to be site reversible without the need for any additional parts or metalwork. The discharge plenum is supplied with a combination of spigots and blanking plates that are screw fixed to the plenum for ease of site interchange. The added facility to re-locate the controls box from one side of the unit to the other gives the ‘Leopard’ the flexibility to accommodate site layout changes and client fit-outs.

Simple Access For Maintenance

Removing large panels secured by 10-20 screws and then getting them through a 600mm x 600mm ceiling grid, all whilst stood on a stepladder, has made life difficult for the maintenance engineer in the past. Special consideration has been given to overcoming these problems and the resultant ‘Leopard’ now brings a ‘breath of fresh air’ to maintenance tasks. Filters are simple to remove for cleaning; they withdraw from either the rear or side of the unit without the use of tools or need to remove panels. The main unit access panel is secured by quarter turn ‘quick release’ fasteners and gives access for inspecting the fan/motor assemblies. Each fan/motor is mounted separately onto the main bulkhead plate with an in-line plug and socket to facilitate easy removal. On model sizes 4-7 both the filters and fan access panels are split into two smaller sections for easier removal and handling. Electrical and controls work can be easily carried out via two hinged covers giving access to all components. The stainless steel condensate pan can also be easily removed for cleaning via its own separate access panel.



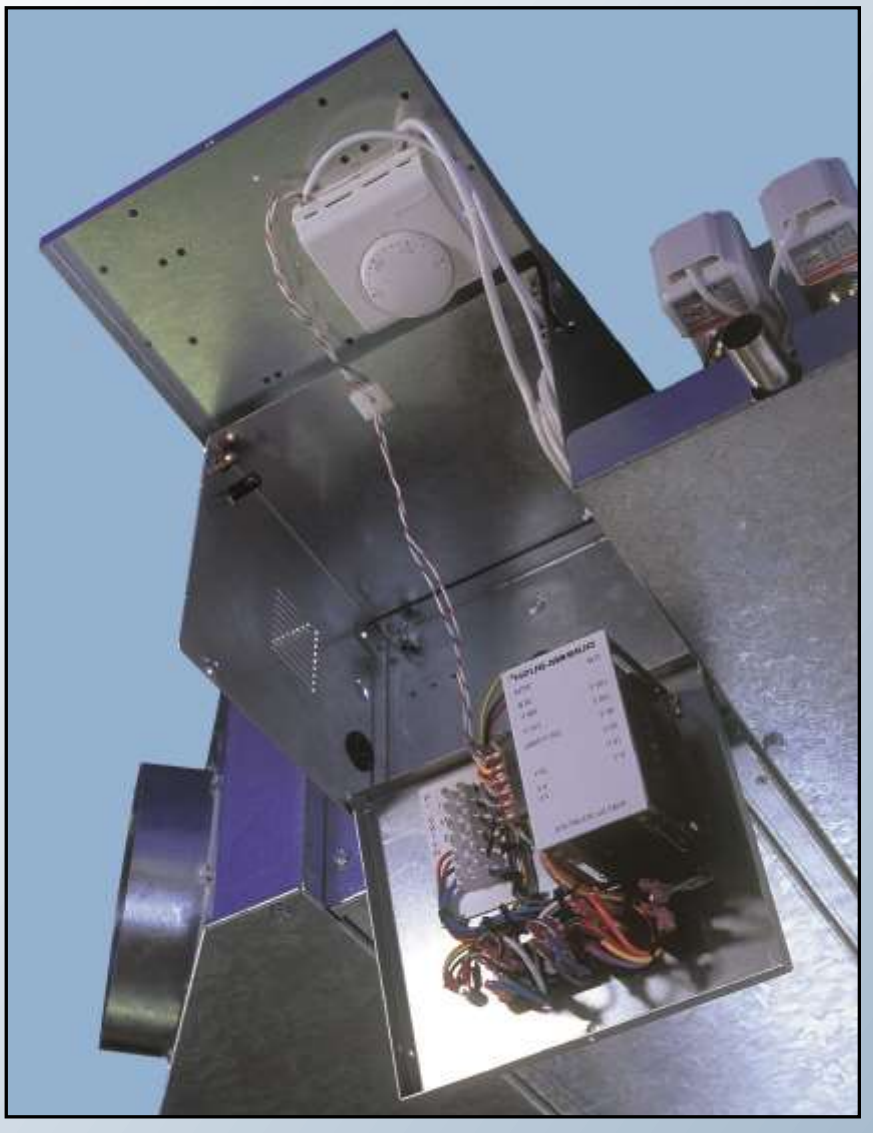


Quiet, Powerful Operation

The ‘Leopard’ incorporates high efficiency EC external rotor motor fans as standard. This design concept improves longevity by reducing the mechanical and thermal stress on the ‘sealed for life’ bearings and provides constant speed at different loads due to the high inertial mass of the motor. Furthermore, the unique integration of both rotating components, the motor and impeller, allows the precision balancing of the assembly. The fan/motor assemblies are individually mounted on a ‘floating’ bulkhead plate, isolating them from the rest of the unit chassis, reducing resonance and casing breakout noise. Controlling the fans using a 2-10v variable signal ensures greater performance flexibility. Use of the highest quality components available is never more important than in the case of the fan(s)/motor(s) to ensure that quiet and powerful operation is consistently achieved year after year.

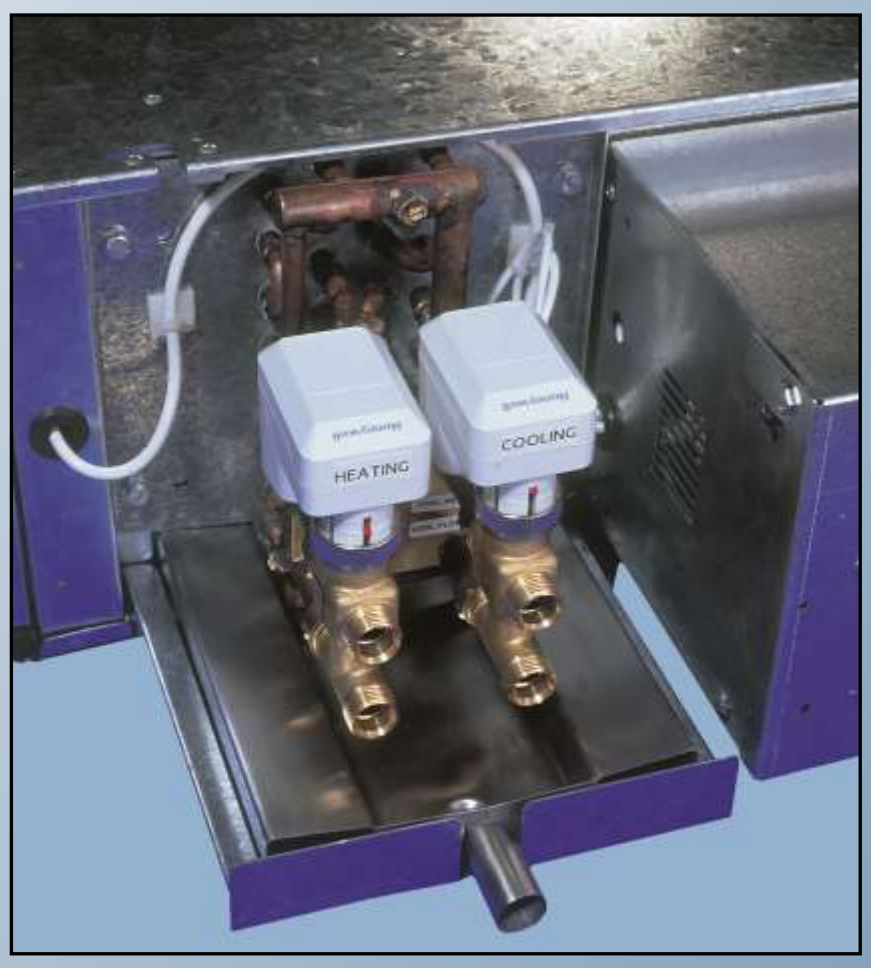
Long Life Stainless Steel Condensate Pans

‘Leopard’ fan coil units incorporate stainless steel condensate pans as standard. By using stainless steel, cleaning is made easier whilst the resistance to corrosion is increased, vastly improving the longevity of the pan. The fully welded ‘V’ formed pan creates a positive seal against the coil preventing any air bypass. The pan is mounted to provide a positive fall in two directions to the central outlet at the lowest end of the pan. The 22mm OD stainless steel outlet is finished flush with the bottom of the pan ensuring that condensate drains completely. The externally insulated pan is mounted in a separate galvanised steel carriage, removing the need for screw fixings in the actual pan. This carriage combined with the inherent strength of the stainless steel pan and outlet offers vital protection against accidental site damage.

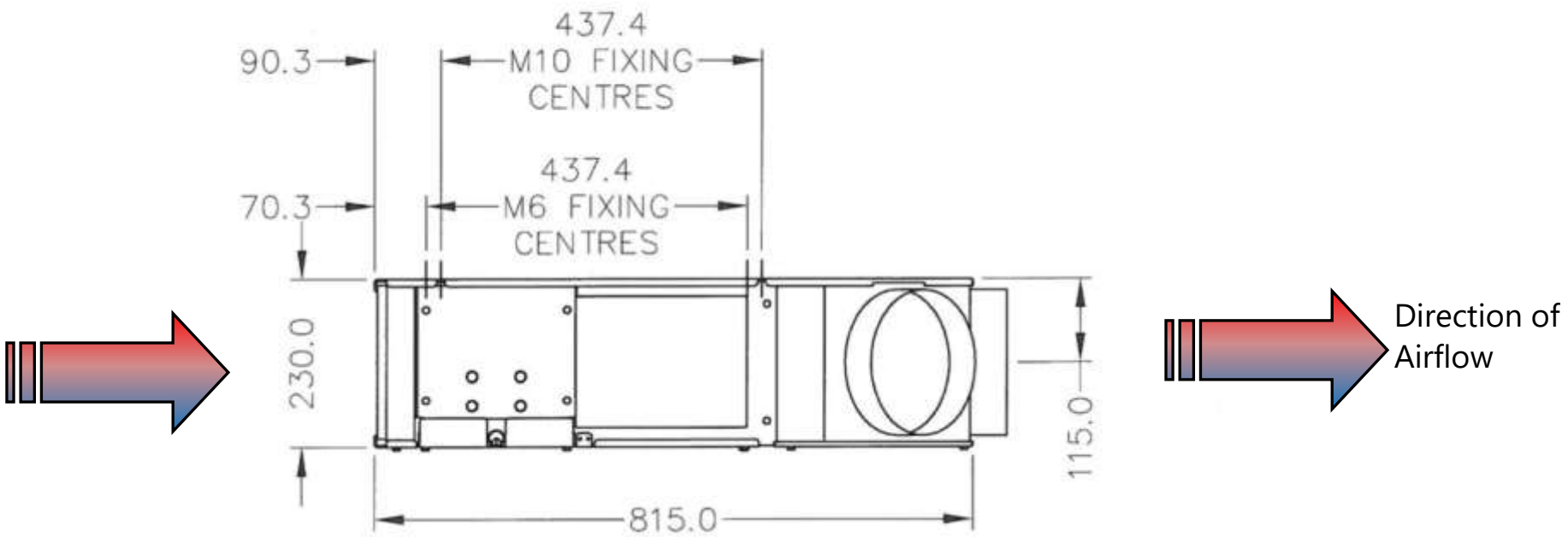


Adaptable Controls Box

‘Leopard’ units are supplied with a well-ventilated controls box supplied with a one metre flying lead for connection to an adjacent fused spur. The box is designed and wired to BS EN 60335-1:1995 and is intended to accommodate most available temperature controllers and associated electrical components. Also housed in the box are the auto-transformer, on/off, fan speed selector and ‘fine adjustment’ switches. The control box lids are hinged to give enhanced access to electrical or DDC controls. The lids can be removed should their opening arcs be obstructed. The complete control box has the added benefit of being connected to the fan/motor electrical loom via a plug in connector mounted in the side panel of the unit. This feature allows the complete control box to be disconnected from the unit for any major electrical/controls refurbishment, or enables the controls box to be retrofitted after the unit has been installed.



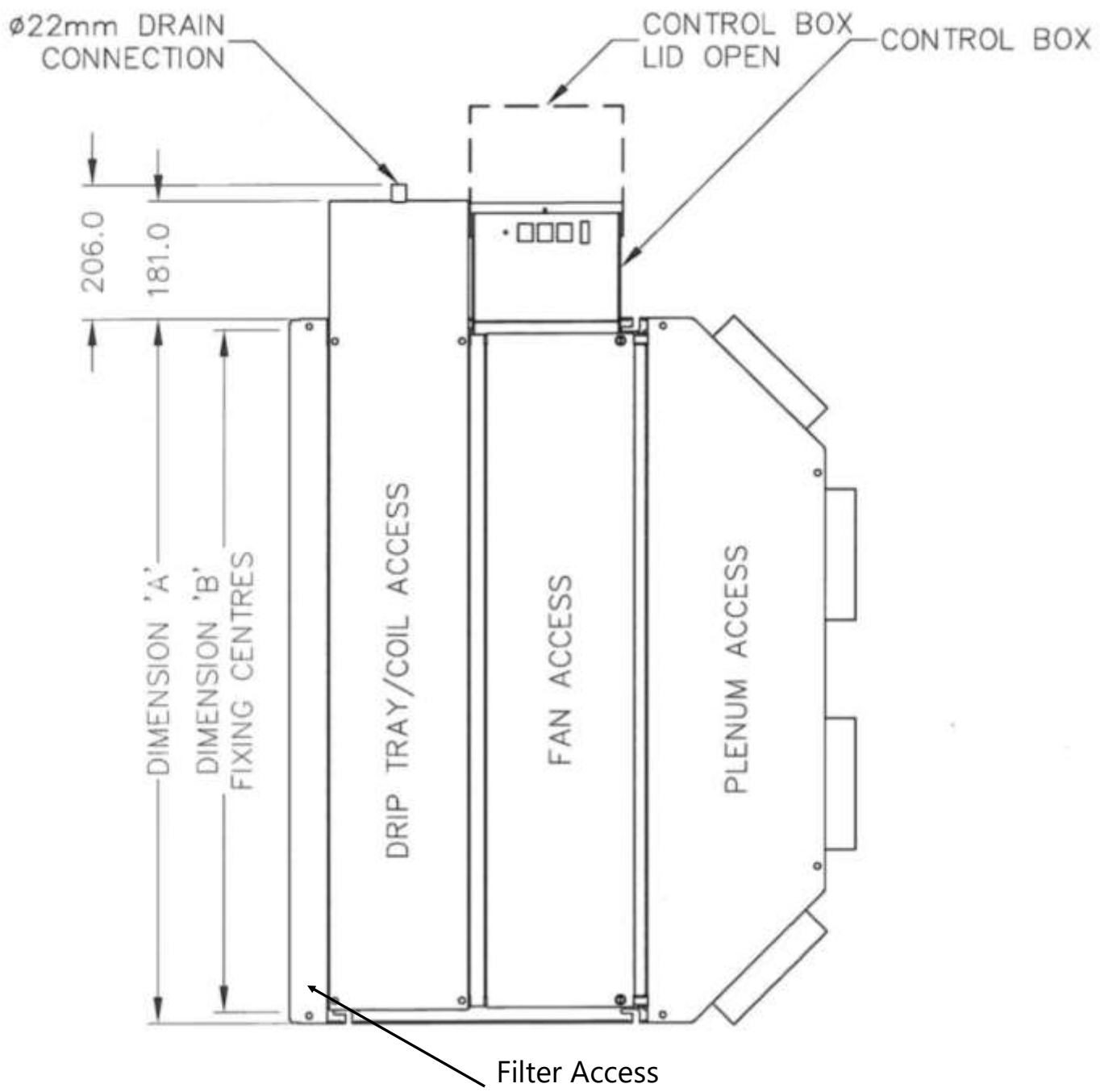
DIMENSIONS

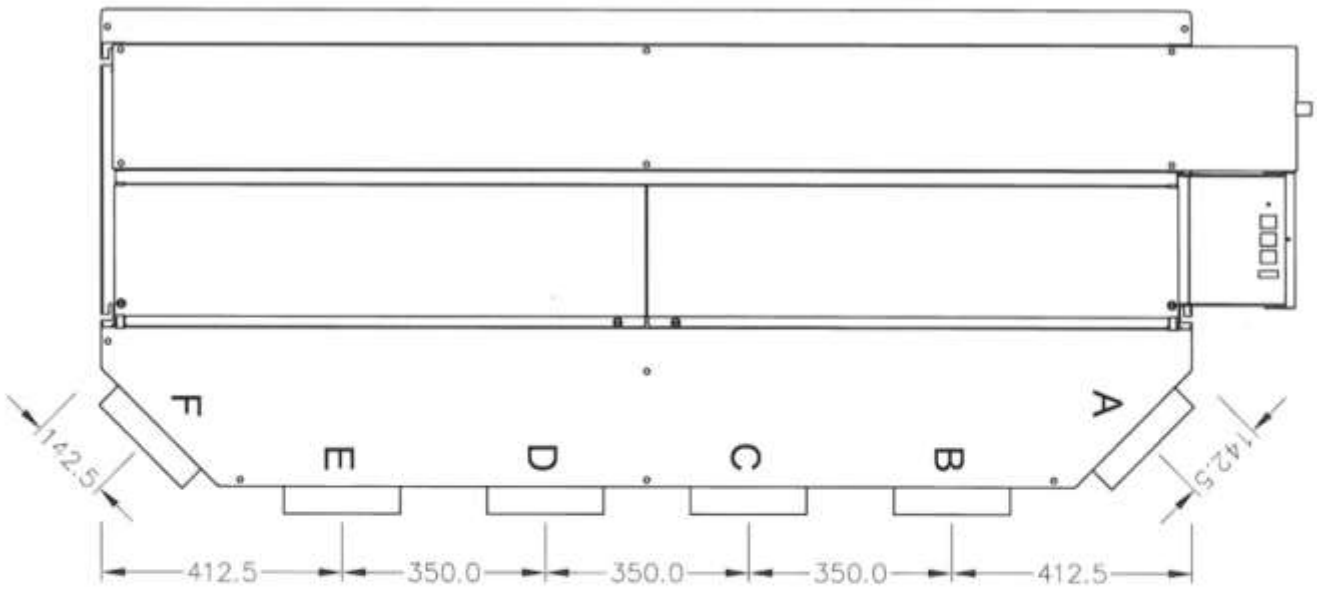


Model	Dimension 'A'	Dimension 'B'	Dry weights (kg)
1	675	641	42
2	1075	1041	54
3	1075	1041	60
4	1475	1441	75
5	1475	1441	81
6	1875	1841	93
7	1875	1841	99

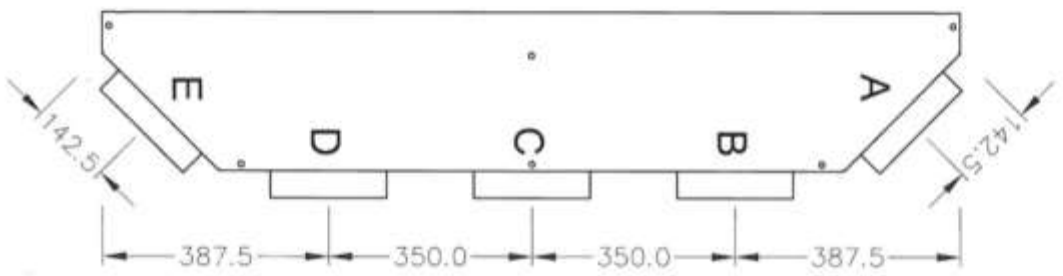
LH Unit shown, RH opposite.

Note: unit handings are viewed looking against the direction of air flow.

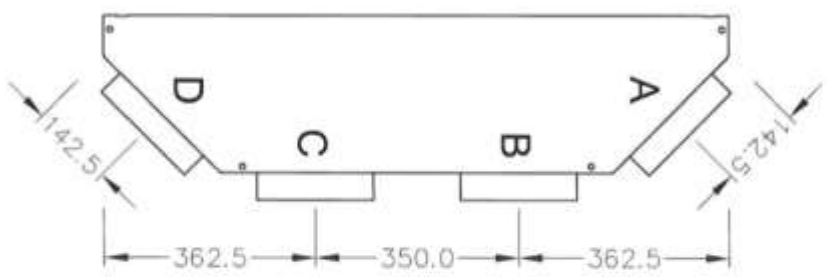




Sizes
Lpd 6 & 7
View from below

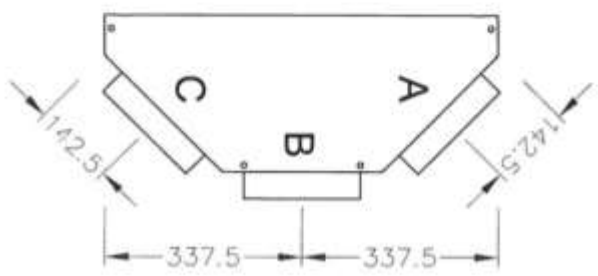


Sizes
Lpd 4 & 5
View from below

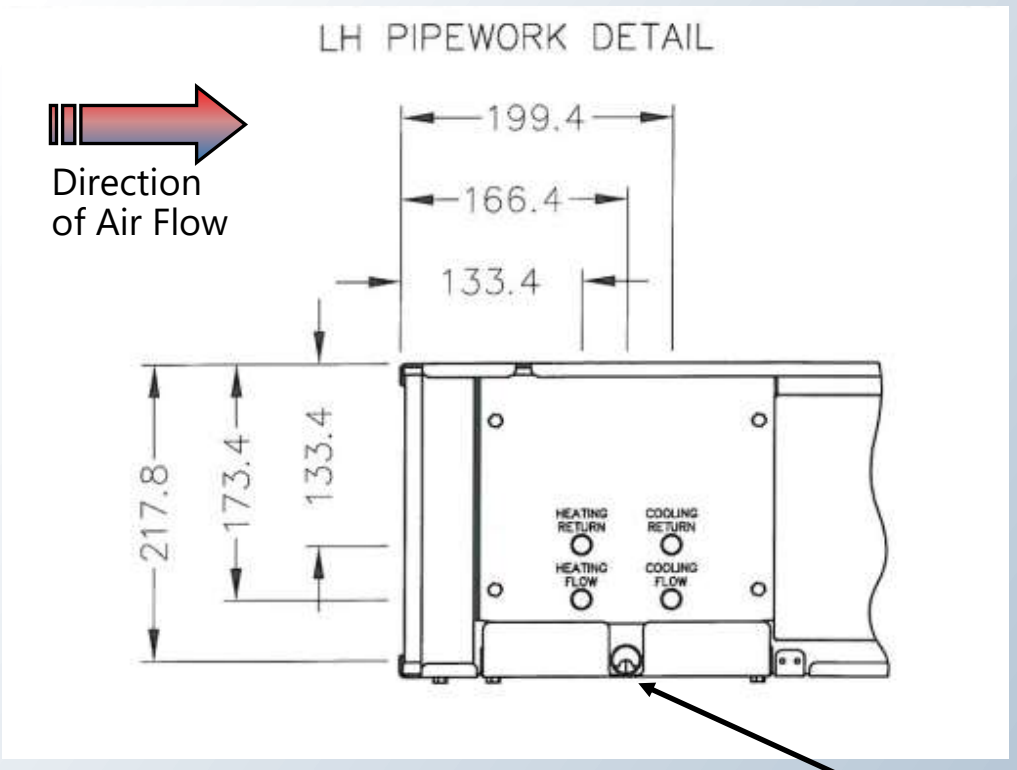


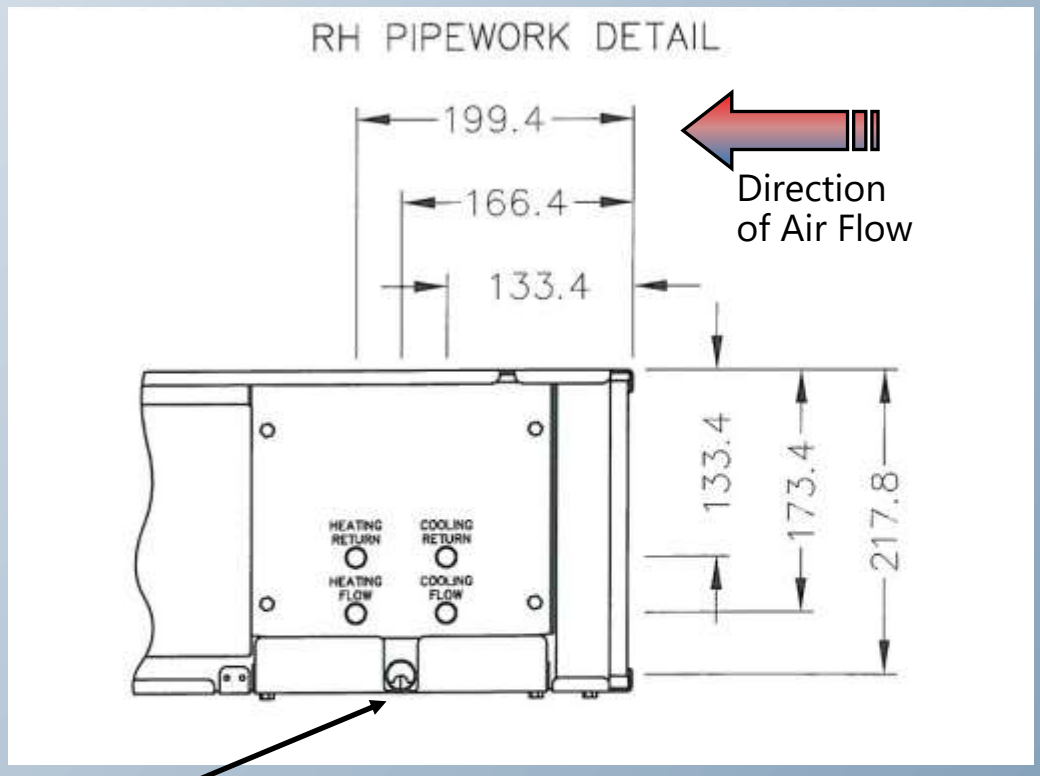
Sizes
Lpd 2 & 3
View from below

Standard Spigot Sizes
160 Ø
150 Ø
125 Ø
100 Ø
Rectangular are available on all models



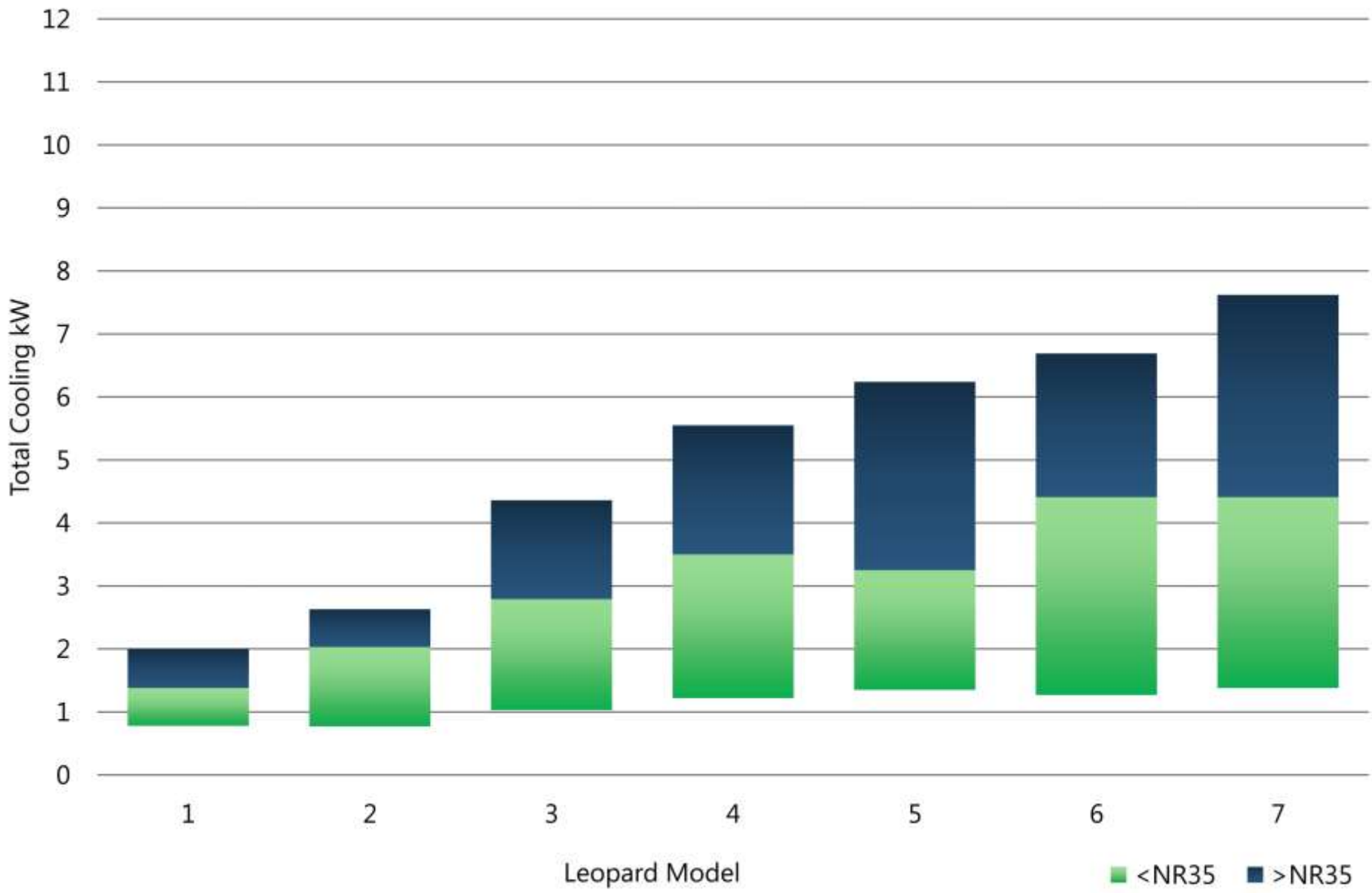
Size
Lpd 1
View from below





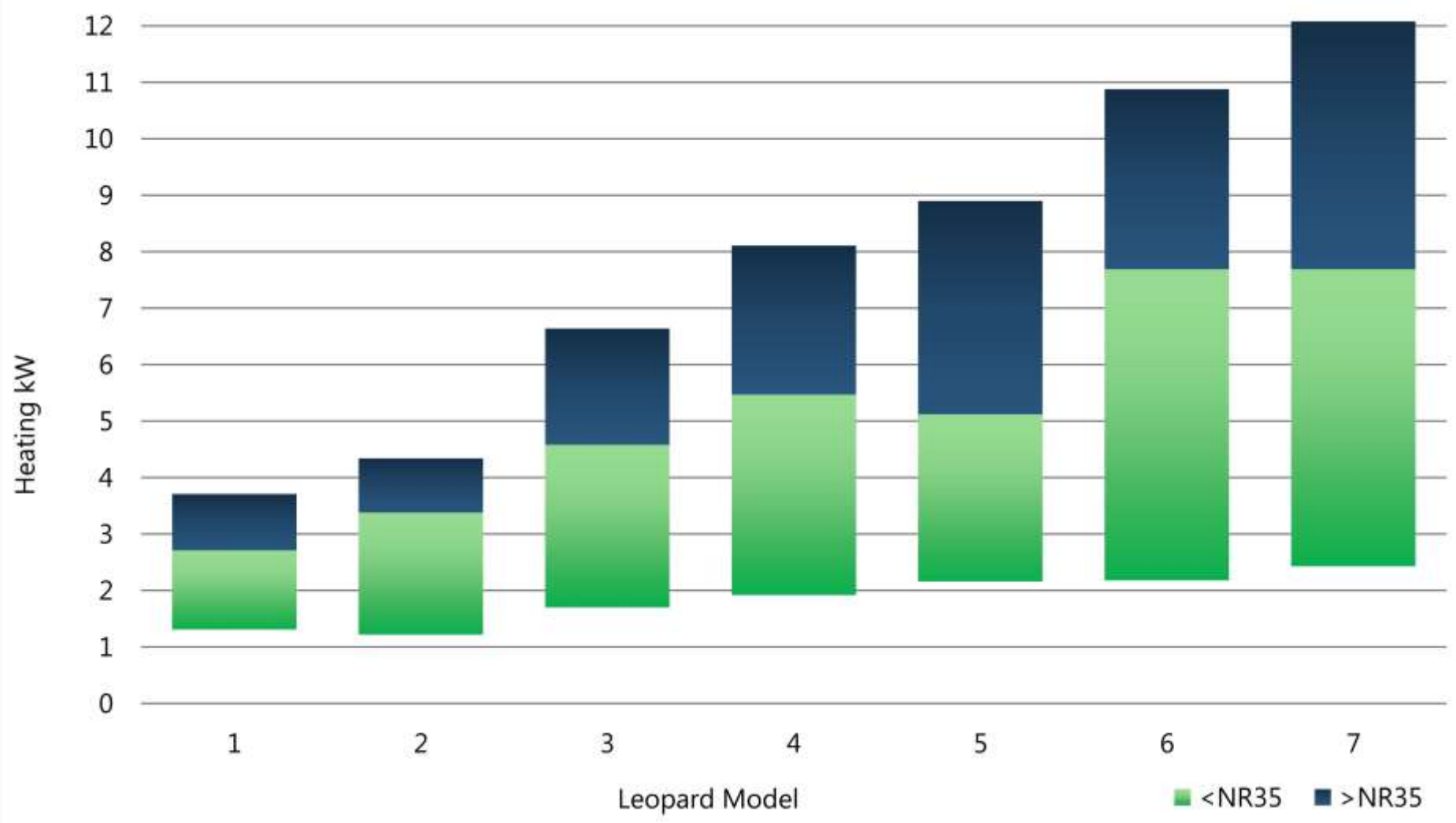
OD 22mm Drain Connection

COOLING DATA



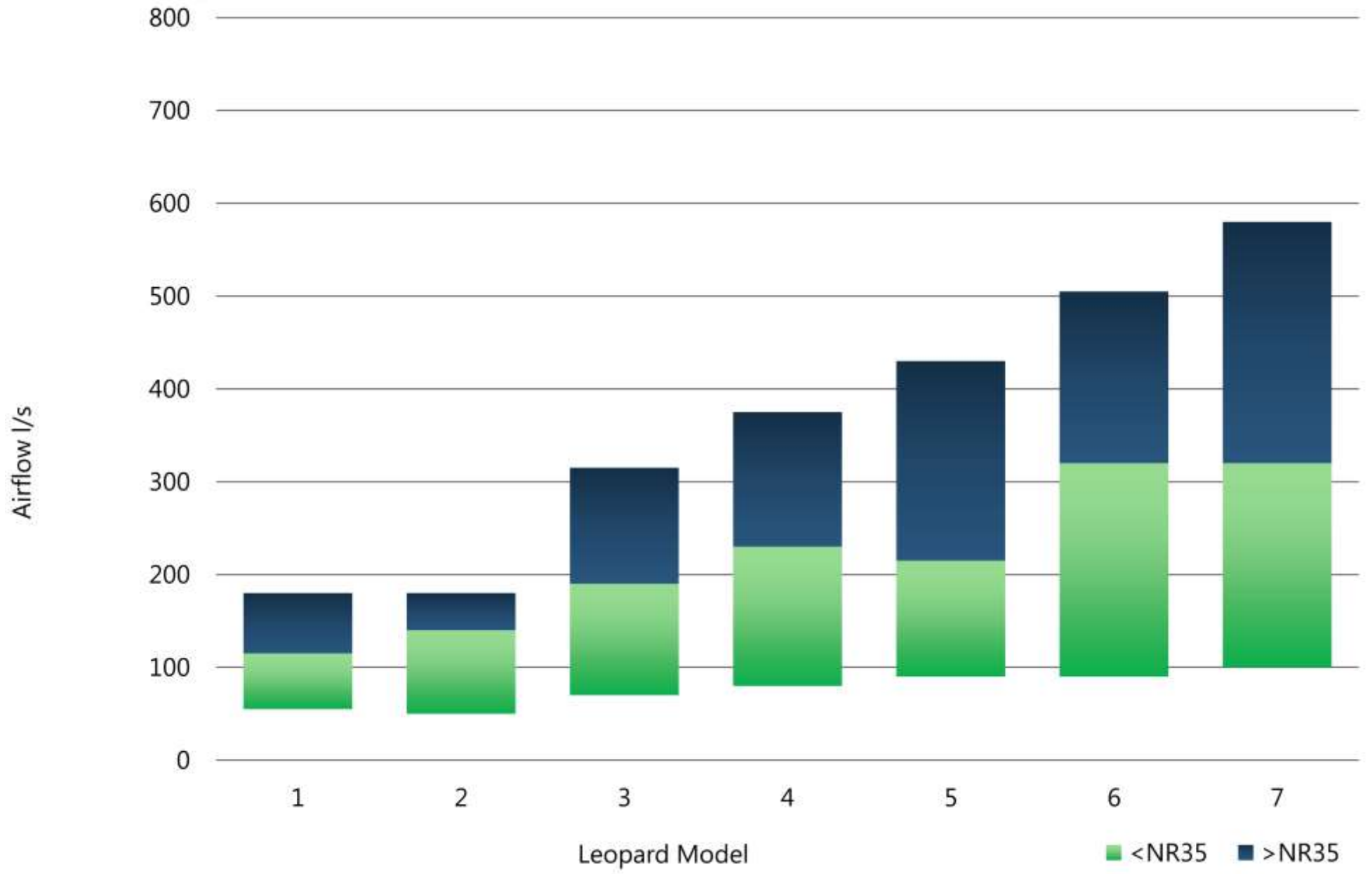
Maximum cooling performance data is based on an entering air condition of 23ºC dry bulb and 16ºC wet bulb, and a system pressure of 30Pa.

HEATING DATA



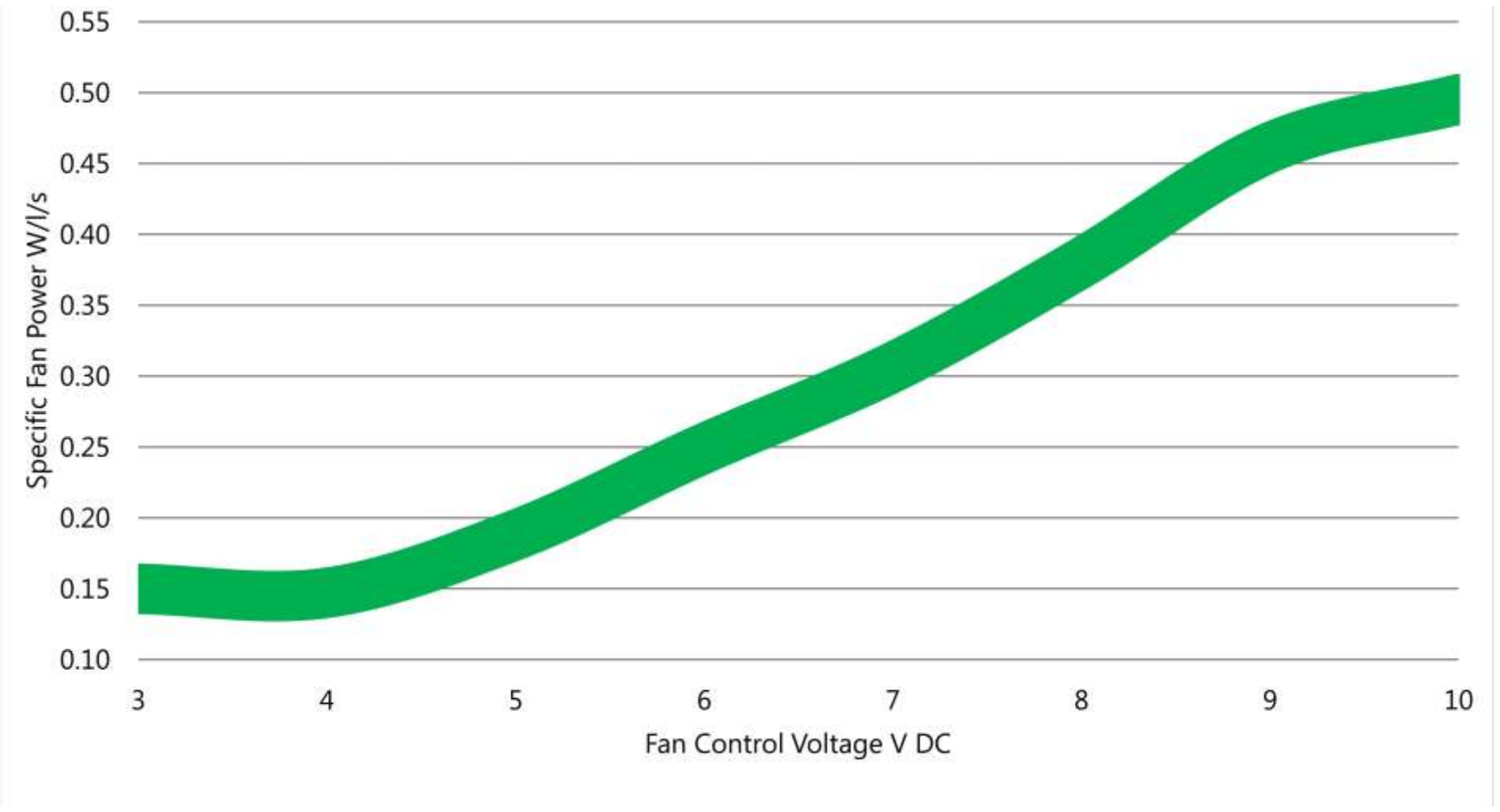
Maximum heating performance data is based on an entering air condition of 20ºC and a system pressure of 30Pa.

AIR VOLUME DATA



Note: When sizing the discharge (supply air) duct work, ensure that an adequate number and size of spigots are selected. In normal applications, duct velocity should not exceed the recommended maximum of 3.0m/s. For special low noise applications, lower duct velocities may be required. Contact our Technical Sales Office for assistance.

SPECIFIC FAN POWER



ACOUSTICS

Fan Coil Unit Acoustics

To predict Noise Rating (NR) levels of installed fan coil units, Dunham-Bush use the following assumptions for horizontal fan coil units installed above a false or suspended ceiling:

- Room acoustic characteristics are taken as medium or average, with a typical reverberation time of 1.0s.

- Room construction would typically be contract carpet, fibreboard lay-ceiling tiles in a ceiling grid, wall surface areas comprising glazing and conventional wall finishes, room furnished with office equipment and occupied.

- Room dimensions typically taken as 8m x 8m with a ceiling height of 2.7m and the listener is assumed to be 1.5m from all noise sources.

- Supply/return air paths are via typical ceiling grilles/diffusers, installed within the ceiling at least 1.0m from any wall surfaces

- Sound pressure levels are determined with fan coil units installed above the ceiling, with return air from the ceiling void; fan coil units are installed at least 6.0m apart in all directions.

The following corrections can be used to provide an approximate adjustment to predicted NR levels for different room conditions:

- Good quality suspended ceiling; medium dead room acoustics -2dB
- Medium live room acoustics +1dB
- Poor quality suspended ceiling; medium live room acoustics +4dB
- No suspended ceiling; live room acoustics +9dB

SPECIFICATION

The 'Leopard' Series Fan Coil Units shall be manufactured by Dunham-Bush Limited, Downley Road, Havant, Hampshire, PO9 2JD. Units shall be selected to achieve the required performance data whilst operating against the specified design parameters. 'Leopard' units shall be of a draw through design and comprise of a washable air filter, dual purpose coil with separate connections for cooling and heating, stainless steel condensate pan, low noise external rotor motors/fans, integral multi-outlet discharge plenum and an electrical/controls enclosure.

Unit Chassis - Chassis shall be of a rivetted construction manufactured from a minimum thickness of 1.2mm galvanised steel. Stiffeners and strengthening folds shall be used to form a solid robust structure. Recessed, reinforced mounting slots able to accept M6, M8 or M10 drop rods or mounting bolts are provided for installation whilst the panel design and use of 'dutch folds' produce a flush external finish with no sharp edges. Fan/Motor assemblies shall be mounted on a 1.6mm 'floating' bulkhead plate, isolated from the rest of the unit to reduce noise resonation through the unit casing. Panels shall be designed to allow separate unhindered access to the serviceable items, namely filters, condensate pan, coil, fans / motors and controls.

Discharge (Supply Air) Plenums - A mitred, integral acoustically lined discharge plenum shall form part of the unit chassis with multi-outlet spigots with various size options available to match most ductwork configurations. Use of interchangeable circular spigots and blanking plates, secured to the plenum by screws allow outlet positions to be easily moved or extra spigots to be added in the event of a site layout changes or client fit-out.

Access - Access for inspection and service to the fans/motors shall be via an insulated panel secured with 1/4 turn captive quick release fasteners. On model sizes 4 - 7 this panel is to be split into two sections to allow easy removal by a single engineer through a standard ceiling grid. Access to the condensate pan / coil, filters and discharge plenum are via separate insulated panels by M6 setscrews into nutserts. All access panels form a positive airtight seal against the main unit chassis.

Insulation - Unit chassis and panel work shall be both thermally and acoustically insulated with 95kg/m3, CFC & HFC free, Class 'O' open cell expanded foam insulation, having a maximum thermal conductivity of 0.047 W/mK, fully complying with London
Borough and CAA flammability and toxicity requirements. The adhesive is a modified acrylic, light and ageing resistant synthetic resin with high temperature tolerance.

Air Filters - Filters shall be Coarse 30% to ISO 16890. Filters shall be easily removable from either the rear or side of the unit without the need to remove any panel work.

Coils - Coils shall be single block, dual purpose, divided into two sections to provide both cooling and heating. To be constructed from 3/8" seamless copper tube mechanically expanded into aluminium fins and brazed into copper headers. Aluminium fins shall have die formed collars to maximise contact with the tubes and provide maximum heat transfer. Coils shall be circuited to provide low hydraulic pressure drops under normal operating conditions whilst being designed to prevent air locks, ensuring positive venting and draining via easily accessible slotted square vent and drain plugs. Coils to terminate with 15mm copper tails, spaced at 40mm centres to accept most standard 4-port valves. Tails are to terminate within a restraining plate providing adequate support to the control valves and adjoining pipework. Coils shall be tested by dry air under water to 30 bar.

Pan - The condensate pan shall be of a one-piece construction manufactured from 1.2mm 304L stainless steel with fully brazed corners. Pans to be 'V' formed and mounted to provide a positive fall in two directions ensuring the free flow of condensate to the OD 22mm stainless steel end connection. Pans shall be externally insulated with 3mm closed cell class 'O' thermal insulation. Pans to be enclosed within a galvanised steel carriage providing both protection against damage and easy removal for cleaning.

Fans/ Motors - The Leopard incorporates high efficiency EC (electronically commutated) motors. Speed adjustment is by an infinitely adjustable potentiometer fitted on the control box, or continuously variable fan speed is affected by a 2-10v DC control signal.

Controls Box - Each unit shall be provided with a well-ventilated electrical box complete with a removable/hinged lid for ease of access. The box shall contain a terminal block, auto transformer, on/off switch, three speed and 'fine tuning' fan selector switches, and mains fuse whilst also providing space to accommodate most available temperature controllers along with any associated relays (if required). The control box shall be designed and wired to BS EN 60335-1:1995, and be provided with a 1 metre flying lead for site connection to an adjacent fused spur outlet.

Temperature Controls - Temperature controls shall be provided in accordance with the project specification. Standard temperature controls will comprise of modulating 4 port valves and actuators acting in conjunction with an electronic stand alone controller wired to a return air or room sensor. A wide variety of controls packages are available, either supplied and fitted by Dunham-Bush, or 'Free Issued' to Dunham-Bush for factory fitting only.

Service Support

Dunham-Bush offers a range of services from installation and commissioning to aftercare and routine maintenance to suit all your needs. Our Service Team has a wide range of experience and knowledge of all refrigeration equipment, which includes split A/C VRV or VRF air and water cooled chillers and heat pumps. Continued support and regular maintenance will help prevent any down time of your equipment. All our engineers are fully trained and hold current Skill Cards and F-Gas qualifications.

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