


DUNHAM-BUSH®

**INHERENTLY
QUIET AND
POWERFUL**



leopard
FAN COIL UNITS

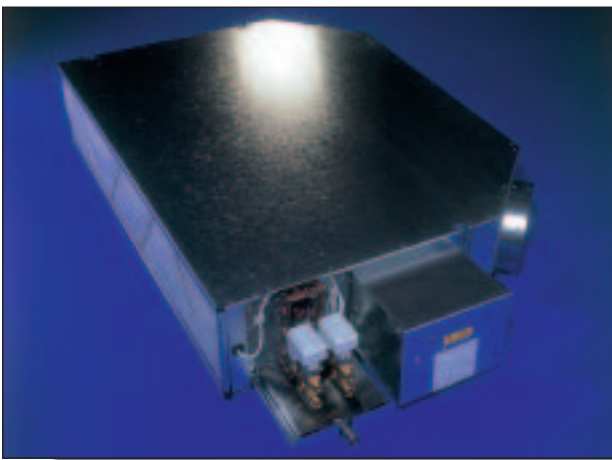
230 MM DEEP
HORIZONTAL WATERSIDE
CONTROL - IN CEILING



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.



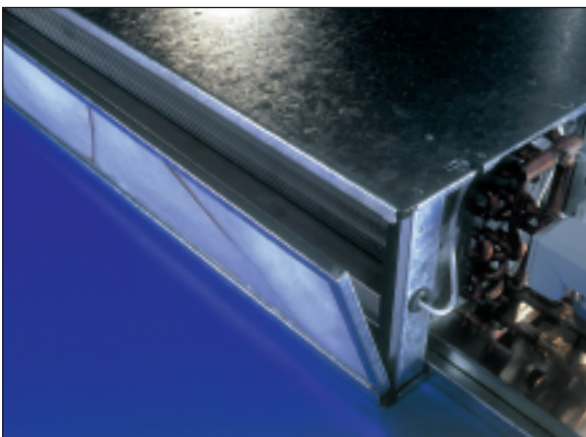
Flexibility Is The Key

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 performance, external rotor motor fans as standard. This design concept ensures that lower noise levels and higher air volumes are achieved than by using contemporary fan decks. The fan / motor assemblies are individually mounted on to a 'floating' bulkhead plate, isolating them from the rest of the unit chassis, reducing resonance and casing breakout noise. Controlling the fans via the auto-transformer ensures greater performance flexibility. Fifteen fan speeds are available via five main transformer tappings each linked to three 'fine adjustment' settings for accurate commissioning. Use of the highest quality components available is never more important than in the case of the fans / motors to ensure that quiet and powerful operation is consistently achieved year after year.

Long Life Stainless Steel Condensate Pans

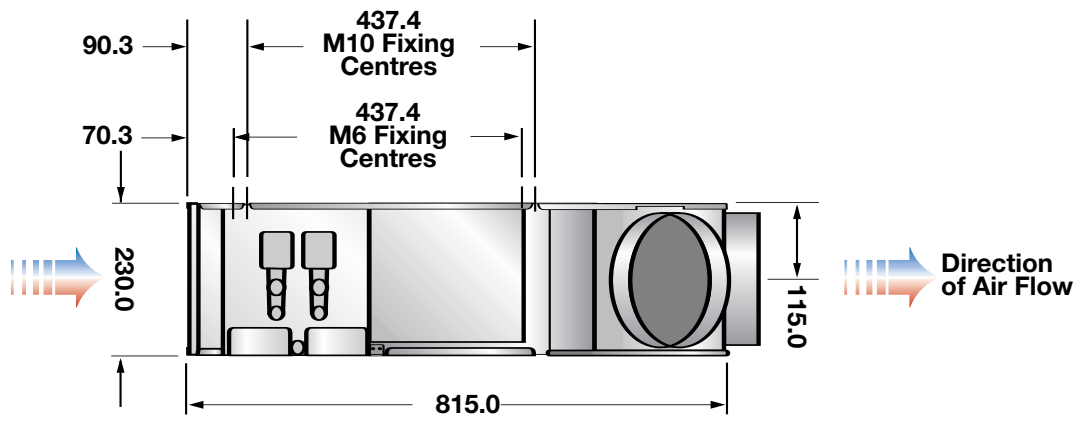
'Leopard' fan coil units incorporate stainless steel condensate pans as standard. By using stainless steel, cleaning is made easier whilst the resistance to corrosion is increased, vastly improving the longevity of the pan. The fully welded 'V' formed pan creates a positive seal against the coil preventing 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.



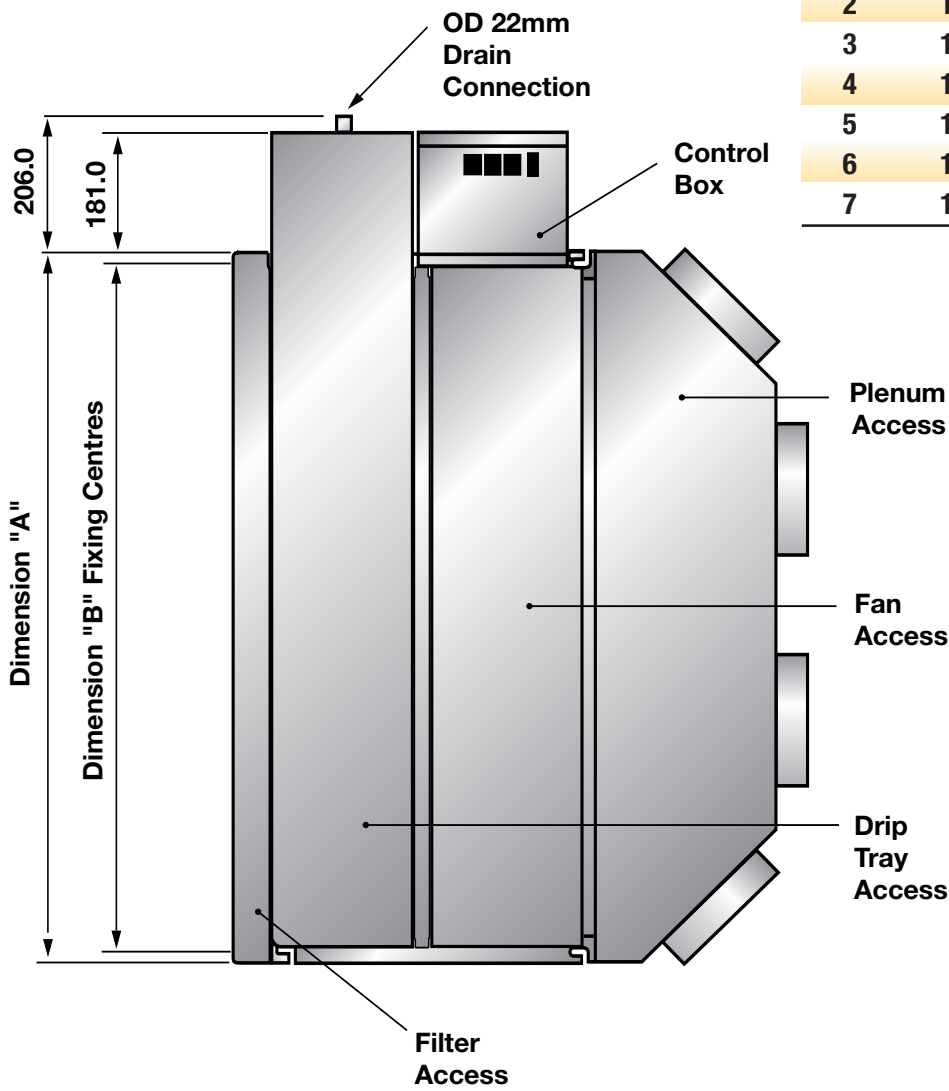
Adaptable Controls Box

'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



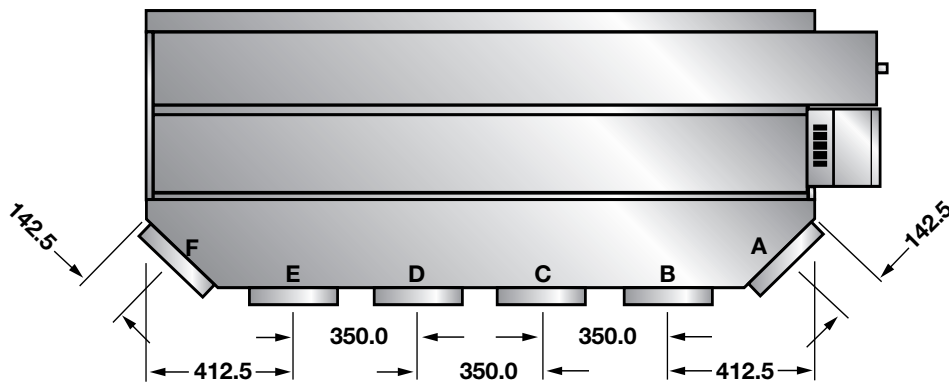
| Model | Dimension 'A' | Dimension 'B' | Dry Mass (kg) |
|-------|---------------|---------------|---------------|
| 1 | 675 | 641.2 | 42 |
| 2 | 1075 | 1041.2 | 54 |
| 3 | 1075 | 1041.2 | 60 |
| 4 | 1475 | 1441.2 | 75 |
| 5 | 1475 | 1441.2 | 81 |
| 6 | 1875 | 1841.2 | 93 |
| 7 | 1875 | 1841.2 | 99 |



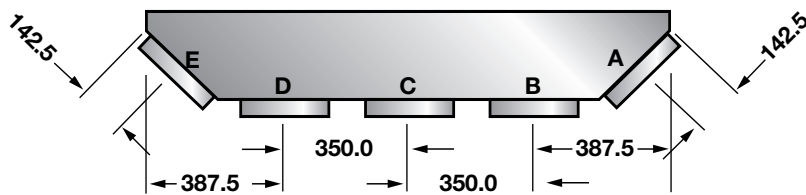
LH Unit shown, RH opposite.
 Note: unit handings are viewed looking against the direction of air flow.

Do not scale. Contact our technical office for certified drawings

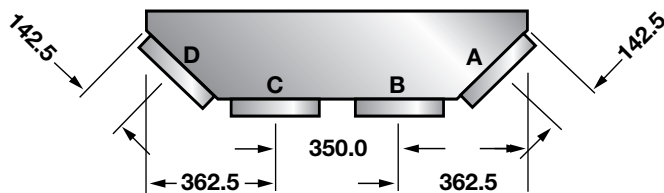
Useful Information



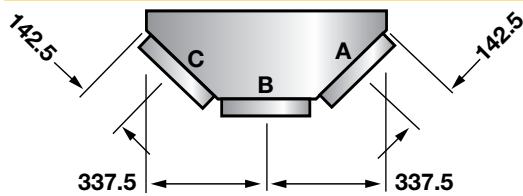
**Models
Lpd 6 & 7
View from below**



**Models
Lpd 4 & 5
View from below**



**Models
Lpd 2 & 3
View from below**



**Model
Lpd 1
View from below**

Standard Spigot Sizes

Ø200mm

Ø180mm

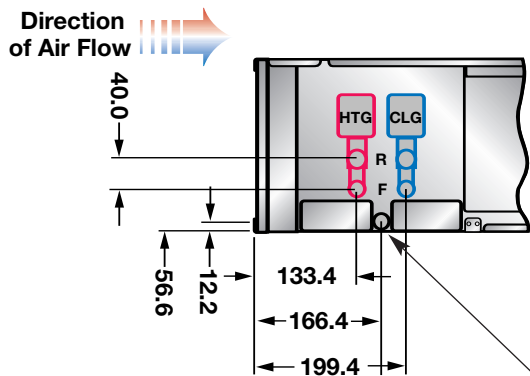
Ø160mm

Ø150mm

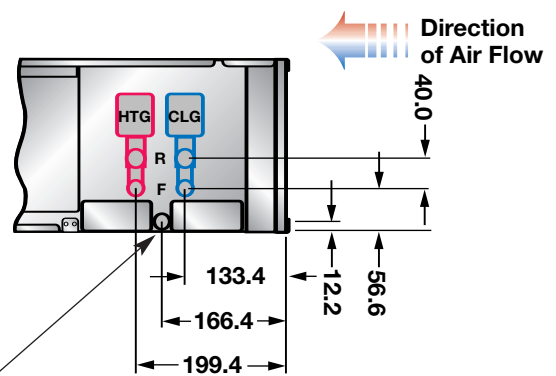
Rectangular Spigots are available on all models

LH Pipework detail

RH Pipework detail



OD 22mm Drain Connection



Do not scale. Contact our technical office for certified drawings

leopard
FAN COIL UNITS

Maximum Cooling Data

| Model | Fan Speed | Voltage (V) | Air Volume (l/s) | Chilled Water | | | | | | | |
|-------|-------------|-------------|------------------|---------------|------------|-----------|------------|-----------|------------|-----------|------------|
| | | | | 5.5/11 °C | | 6/12 °C | | 8/13 °C | | 10/14 °C | |
| | | | | Sens (kW) | Total (kW) | Sens (kW) | Total (kW) | Sens (kW) | Total (kW) | Sens (kW) | Total (kW) |
| Lpd 1 | 1 Ultra Low | 110 | 74 | 1.13 | 1.45 | 1.07 | 1.34 | 0.98 | 1.14 | 0.87 | 0.95 |
| | 2 Ex Low | 120 | 89 | 1.28 | 1.61 | 1.21 | 1.47 | 1.10 | 1.26 | 0.99 | 1.07 |
| | 3 Low | 140 | 114 | 1.53 | 1.86 | 1.42 | 1.68 | 1.30 | 1.46 | 1.18 | 1.27 |
| | 4 Med | 150 | 124 | 1.62 | 1.96 | 1.50 | 1.76 | 1.38 | 1.54 | 1.26 | 1.36 |
| Lpd 2 | 1 Ultra Low | 130 | 104 | 1.65 | 2.23 | 1.53 | 1.99 | 1.40 | 1.70 | 1.27 | 1.42 |
| | 2 Ex Low | 150 | 127 | 2.02 | 2.69 | 1.87 | 2.39 | 1.71 | 2.04 | 1.55 | 1.72 |
| | 3 Low | 160 | 139 | 2.21 | 2.92 | 2.04 | 2.59 | 1.87 | 2.22 | 1.70 | 1.88 |
| | 4 Med | 170 | 151 | 2.40 | 3.16 | 2.22 | 2.80 | 2.03 | 2.40 | 1.85 | 2.03 |
| Lpd 3 | 1 Ultra Low | 100 | 130 | 2.07 | 2.75 | 1.91 | 2.44 | 1.75 | 2.09 | 1.59 | 1.76 |
| | 2 Ex Low | 120 | 177 | 2.77 | 3.60 | 2.56 | 3.19 | 2.34 | 2.75 | 2.13 | 2.34 |
| | 3 Low | 130 | 201 | 3.08 | 3.98 | 2.86 | 3.54 | 2.63 | 3.06 | 2.39 | 2.61 |
| | 4 Med | 140 | 224 | 3.39 | 4.35 | 3.14 | 3.88 | 2.89 | 3.35 | 2.62 | 2.86 |
| Lpd 4 | 1 Ultra Low | 110 | 157 | 2.50 | 3.36 | 2.31 | 2.98 | 2.11 | 2.55 | 1.92 | 2.14 |
| | 2 Ex Low | 130 | 210 | 3.34 | 4.41 | 3.08 | 3.91 | 2.83 | 3.36 | 2.57 | 2.83 |
| | 3 Low | 150 | 258 | 4.06 | 5.29 | 3.75 | 4.70 | 3.45 | 4.06 | 3.12 | 3.43 |
| | 4 Med | 170 | 305 | 4.69 | 6.05 | 4.35 | 5.41 | 3.99 | 4.66 | 3.62 | 3.96 |
| Lpd 5 | 1 Ultra Low | 100 | 190 | 3.02 | 4.02 | 2.79 | 3.56 | 2.56 | 3.05 | 2.33 | 2.57 |
| | 2 Ex Low | 110 | 222 | 3.53 | 4.65 | 3.26 | 4.12 | 2.99 | 3.54 | 2.72 | 2.99 |
| | 3 Low | 130 | 294 | 4.54 | 5.87 | 4.21 | 5.24 | 3.87 | 4.52 | 3.51 | 3.84 |
| | 4 Med | 140 | 325 | 4.95 | 6.37 | 4.61 | 5.71 | 4.23 | 4.92 | 3.83 | 4.18 |
| Lpd 6 | 1 Ultra Low | 110 | 249 | 3.96 | 5.27 | 3.66 | 4.67 | 3.35 | 4.01 | 3.05 | 3.38 |
| | 2 Ex Low | 120 | 283 | 4.50 | 5.95 | 4.16 | 5.27 | 3.81 | 4.53 | 3.46 | 3.82 |
| | 3 Low | 150 | 386 | 5.98 | 7.75 | 5.56 | 6.94 | 5.11 | 5.98 | 4.62 | 5.06 |
| | 4 Med | 160 | 422 | 6.45 | 8.31 | 6.03 | 7.49 | 5.52 | 6.44 | 4.98 | 5.44 |
| Lpd 7 | 1 Ultra Low | 100 | 268 | 4.26 | 5.65 | 3.94 | 5.00 | 3.61 | 4.30 | 3.28 | 3.63 |
| | 2 Ex Low | 110 | 314 | 5.00 | 6.55 | 4.61 | 5.81 | 4.23 | 5.00 | 3.84 | 4.23 |
| | 3 Low | 130 | 403 | 6.20 | 8.02 | 5.78 | 7.20 | 5.30 | 6.20 | 4.80 | 5.25 |
| | 4 Med | 140 | 446 | 6.74 | 8.63 | 6.33 | 7.85 | 5.80 | 6.75 | 5.20 | 5.67 |

Maximum Cooling Performance data is based on an entering air condition of 23°C dry bulb and 16°C wet bulb and a system pressure of 30Pa.

Maximum Heating Data

| Model | Fan Speed | Voltage (V) | Air Volume (l/s) | Hot Water | | | Electrical Data | | |
|-------|-------------|-------------|------------------|-----------|---------|---------|-------------------------|---------|--------|
| | | | | 82/71°C | 60/50°C | 50/40°C | Nominal Motor Power (W) | FLC (A) | SC (A) |
| Lpd 1 | 1 Ultra Low | 110 | 74 | 2.08 | 1.20 | 0.58 | 52 | 0.40 | 1.20 |
| | 2 Ex Low | 120 | 89 | 2.34 | 1.34 | 0.67 | 62 | 0.43 | 1.28 |
| | 3 Low | 140 | 114 | 2.75 | 1.57 | 0.86 | 82 | 0.50 | 1.50 |
| | 4 Med | 150 | 124 | 2.92 | 1.66 | 0.95 | 92 | 0.55 | 1.65 |
| Lpd 2 | 1 Ultra Low | 130 | 104 | 3.23 | 1.92 | 1.29 | 72 | 0.45 | 1.35 |
| | 2 Ex Low | 150 | 127 | 3.66 | 2.16 | 1.45 | 92 | 0.55 | 1.65 |
| | 3 Low | 160 | 139 | 3.88 | 2.29 | 1.54 | 103 | 0.58 | 1.73 |
| | 4 Med | 170 | 151 | 4.09 | 2.41 | 1.62 | 118 | 0.60 | 1.80 |
| Lpd 3 | 1 Ultra Low | 100 | 130 | 3.71 | 2.20 | 1.48 | 86 | 0.75 | 2.25 |
| | 2 Ex Low | 120 | 177 | 4.54 | 2.68 | 1.79 | 118 | 0.93 | 2.78 |
| | 3 Low | 130 | 201 | 4.96 | 2.92 | 1.95 | 136 | 1.00 | 3.00 |
| | 4 Med | 140 | 224 | 5.34 | 3.14 | 2.09 | 160 | 1.08 | 3.24 |
| Lpd 4 | 1 Ultra Low | 110 | 157 | 4.64 | 2.70 | 1.35 | 100 | 0.85 | 2.55 |
| | 2 Ex Low | 130 | 210 | 5.57 | 3.23 | 1.89 | 136 | 1.05 | 3.15 |
| | 3 Low | 150 | 258 | 6.39 | 3.69 | 2.37 | 188 | 1.20 | 3.60 |
| | 4 Med | 170 | 305 | 7.16 | 4.13 | 2.69 | 232 | 1.33 | 3.98 |
| Lpd 5 | 1 Ultra Low | 100 | 190 | 5.23 | 3.03 | 1.68 | 125 | 1.21 | 3.64 |
| | 2 Ex Low | 110 | 222 | 5.78 | 3.35 | 2.01 | 152 | 1.35 | 4.05 |
| | 3 Low | 130 | 294 | 6.99 | 4.03 | 2.63 | 208 | 1.55 | 4.65 |
| | 4 Med | 140 | 325 | 7.48 | 4.31 | 2.80 | 240 | 1.68 | 5.03 |
| Lpd 6 | 1 Ultra Low | 110 | 249 | 6.92 | 4.07 | 2.72 | 148 | 1.35 | 4.05 |
| | 2 Ex Low | 120 | 283 | 7.52 | 4.42 | 2.94 | 186 | 1.45 | 4.35 |
| | 3 Low | 150 | 386 | 9.28 | 5.43 | 3.60 | 272 | 1.80 | 5.40 |
| | 4 Med | 160 | 422 | 9.87 | 5.77 | 3.82 | 308 | 1.90 | 5.70 |
| Lpd 7 | 1 Ultra Low | 100 | 268 | 7.25 | 4.27 | 2.84 | 240 | 1.95 | 5.85 |
| | 2 Ex Low | 110 | 314 | 8.06 | 4.73 | 3.14 | 318 | 2.25 | 6.75 |
| | 3 Low | 130 | 403 | 9.56 | 5.59 | 3.71 | 360 | 2.40 | 7.20 |
| | 4 Med | 140 | 446 | 10.26 | 5.99 | 3.97 | 410 | 2.53 | 7.58 |

Maximum Heating Performance data is based on an entering air condition of 20°C and a system pressure of 30Pa.

Acoustic Data

| Radiated Sound Power Levels (SWL) dB ref.10 ⁻¹² W | | | | | | | | | | | | | | |
|--|-------------|-----------|-------------------------|-----|-----|----|----|----|----------------------------|-----|-----|----|----|----|
| Model | Fan Speed | Voltage/V | Discharge Radiated (dB) | | | | | | Inlet / Case Radiated (dB) | | | | | |
| | | | Frequency/Hz | | | | | | Frequency/Hz | | | | | |
| | | | 125 | 250 | 500 | 1k | 2k | 4k | 125 | 250 | 500 | 1k | 2k | 4k |
| Lpd 1 | 1 Ultra Low | 110 | 45 | 44 | 37 | 26 | 6 | <5 | 45 | 44 | 42 | 35 | 28 | 22 |
| | 2 Ex Low | 120 | 47 | 47 | 39 | 28 | 8 | <5 | 47 | 46 | 44 | 38 | 31 | 26 |
| | 3 Low | 140 | 50 | 50 | 42 | 31 | 10 | 9 | 51 | 50 | 47 | 42 | 36 | 32 |
| | 4 Med | 150 | 52 | 52 | 44 | 33 | 12 | 12 | 53 | 52 | 49 | 44 | 38 | 35 |
| Lpd 2 | 1 Ultra Low | 130 | 45 | 44 | 37 | 26 | 6 | <5 | 48 | 45 | 45 | 38 | 33 | 26 |
| | 2 Ex Low | 150 | 49 | 48 | 40 | 30 | 9 | 8 | 51 | 48 | 48 | 42 | 38 | 32 |
| | 3 Low | 160 | 50 | 50 | 41 | 31 | 10 | 10 | 52 | 50 | 49 | 44 | 40 | 35 |
| | 4 Med | 170 | 51 | 51 | 43 | 33 | 13 | 12 | 54 | 51 | 50 | 46 | 41 | 37 |
| In-Duct Correction Values/dB ref. 10 ⁻¹² W | | | Frequency/Hz | | | | | | | | | | | |
| | | | 125 | 250 | 500 | 1k | 2k | 4k | | | | | | |
| | | | 7 | 3 | 1 | 0 | 0 | 0 | | | | | | |

Leopard models 1 and 2 were tested using 2 off 350 x 255 supply grilles, connected via Ø200mm flexible duct, with a system pressure of 30Pa applied to the Extra Low speed setting. To obtain in-duct discharge sound power levels, the correction values shown in the above table should be added to the discharge spectrum.

| Radiated Sound Power Levels (SWL) dB ref. 10 ⁻¹² W | | | | | | | | | | | | | | |
|---|-------------|-----------|-------------------------|-----|-----|----|----|----|----------------------------|-----|-----|----|----|----|
| Model | Fan Speed | Voltage/V | Discharge Radiated (dB) | | | | | | Inlet / Case Radiated (dB) | | | | | |
| | | | Frequency/Hz | | | | | | Frequency/Hz | | | | | |
| | | | 125 | 250 | 500 | 1k | 2k | 4k | 125 | 250 | 500 | 1k | 2k | 4k |
| Lpd 3 | 1 Ultra Low | 100 | 45 | 45 | 38 | 28 | 6 | <5 | 45 | 45 | 43 | 37 | 28 | 21 |
| | 2 Ex Low | 120 | 50 | 49 | 43 | 34 | 13 | 9 | 49 | 49 | 47 | 42 | 35 | 29 |
| | 3 Low | 130 | 52 | 51 | 45 | 36 | 15 | 13 | 50 | 50 | 48 | 45 | 37 | 33 |
| | 4 Med | 140 | 54 | 53 | 46 | 38 | 18 | 16 | 52 | 52 | 50 | 47 | 39 | 36 |
| Lpd 4 | 1 Ultra Low | 110 | 46 | 45 | 39 | 28 | 8 | 7 | 46 | 45 | 43 | 37 | 30 | 24 |
| | 2 Ex Low | 130 | 50 | 48 | 42 | 33 | 13 | 13 | 50 | 49 | 46 | 42 | 35 | 32 |
| | 3 Low | 150 | 54 | 52 | 45 | 37 | 18 | 19 | 54 | 52 | 49 | 46 | 40 | 37 |
| | 4 Med | 170 | 57 | 56 | 48 | 40 | 22 | 24 | 56 | 55 | 52 | 50 | 44 | 42 |
| Lpd 5 | 1 Ultra Low | 100 | 46 | 46 | 41 | 30 | 8 | <5 | 46 | 47 | 45 | 40 | 31 | 25 |
| | 2 Ex Low | 110 | 48 | 49 | 43 | 33 | 11 | 9 | 49 | 49 | 47 | 42 | 34 | 29 |
| | 3 Low | 130 | 53 | 53 | 47 | 37 | 17 | 16 | 53 | 53 | 50 | 48 | 40 | 36 |
| | 4 Med | 140 | 55 | 55 | 49 | 39 | 20 | 19 | 55 | 55 | 52 | 50 | 42 | 39 |
| Lpd 6 | 1 Ultra Low | 110 | 46 | 45 | 41 | 30 | 10 | 10 | 48 | 47 | 45 | 37 | 32 | 26 |
| | 2 Ex Low | 120 | 47 | 47 | 43 | 33 | 12 | 10 | 50 | 49 | 47 | 37 | 36 | 30 |
| | 3 Low | 150 | 53 | 53 | 47 | 38 | 18 | 17 | 55 | 54 | 51 | 48 | 43 | 39 |
| | 4 Med | 160 | 55 | 55 | 49 | 39 | 21 | 20 | 57 | 56 | 53 | 50 | 45 | 42 |
| Lpd 7 | 1 Ultra Low | 100 | 45 | 45 | 40 | 29 | 8 | <5 | 47 | 47 | 46 | 40 | 31 | 25 |
| | 2 Ex Low | 110 | 47 | 47 | 42 | 32 | 12 | 7 | 49 | 49 | 48 | 42 | 34 | 29 |
| | 3 Low | 130 | 52 | 52 | 46 | 37 | 19 | 15 | 53 | 53 | 51 | 47 | 40 | 36 |
| | 4 Med | 140 | 54 | 54 | 48 | 39 | 23 | 19 | 55 | 55 | 53 | 49 | 43 | 40 |
| In-Duct Correction Values/dB ref. 10 ⁻¹² W | | | Frequency/Hz | | | | | | | | | | | |
| | | | 125 | 250 | 500 | 1k | 2k | 4k | | | | | | |
| | | | 2 | 1 | 0 | 0 | 0 | 0 | | | | | | |

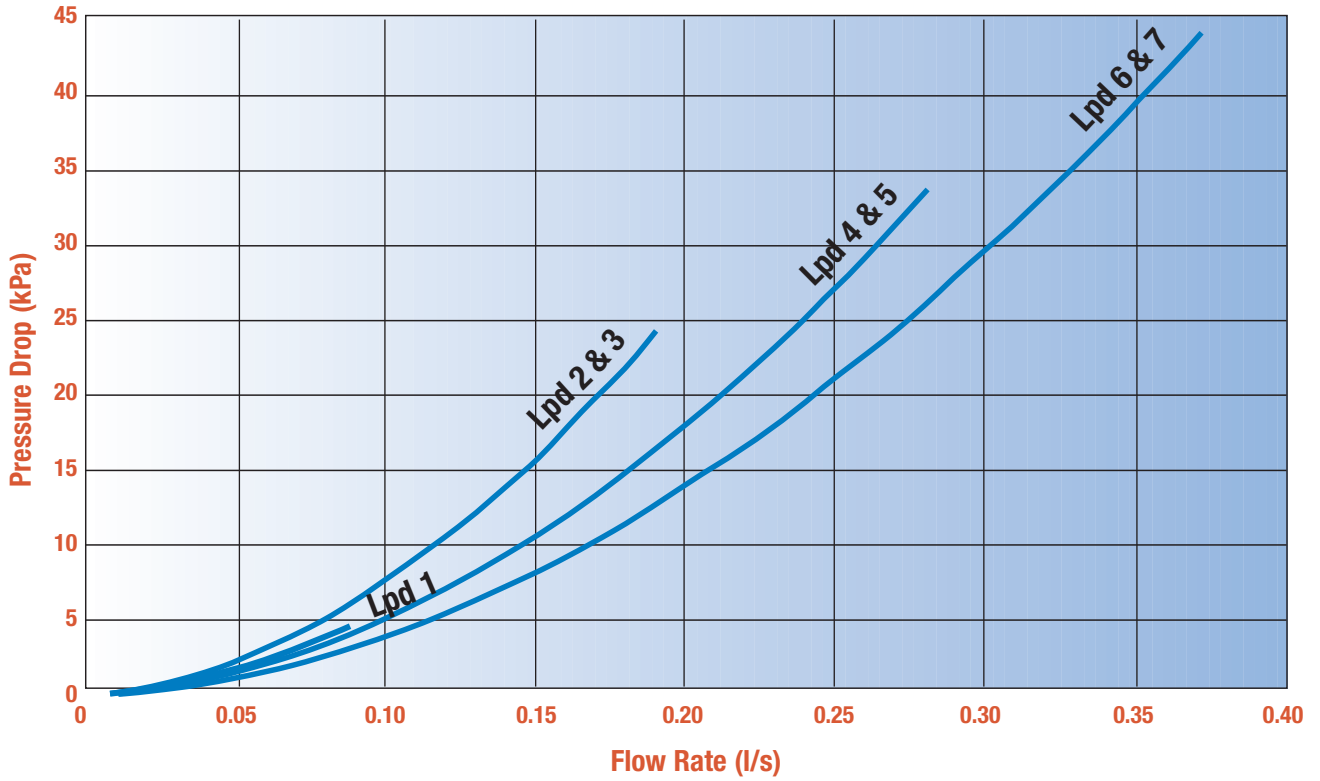
Leopard models 3, 4, 5, 6, and 7 were tested using 4 off 350 x 255 supply grilles, connected via Ø200mm flexible duct, with a system pressure of 30Pa applied to the Extra Low speed setting. To obtain in-duct discharge sound power levels, the correction values shown in the above table should be added to the discharge spectrum. The above sound power levels have been derived using the 'Real Room' test method.

Air Volume Data

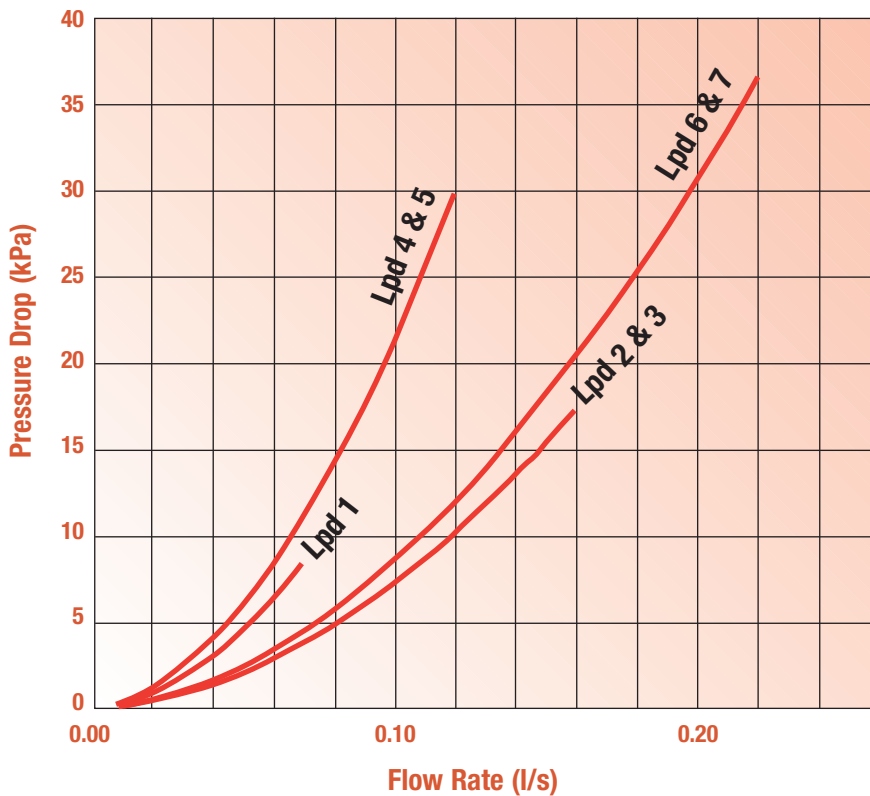
| Model | Fan Speed | Voltage/V | Air Volume (l/s) | | | | | | | | | |
|-------|-------------|-----------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | External Resistance (Pa) | | | | | | | | | |
| | | | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| Lpd 1 | 1 Ultra Low | 110 | 102 | 92 | 84 | 74 | 66 | 57 | 48 | 40 | 31 | 21 |
| | 2 Ex Low | 120 | 114 | 105 | 97 | 89 | 81 | 73 | 66 | 58 | 50 | 41 |
| | 3 Low | 140 | 133 | 126 | 120 | 114 | 107 | 101 | 96 | 90 | 83 | 77 |
| | 4 Med | 150 | 141 | 135 | 129 | 124 | 119 | 113 | 108 | 104 | 97 | 92 |
| Lpd 2 | 1 Ultra Low | 130 | 126 | 119 | 111 | 104 | 96 | 90 | 83 | 76 | 68 | 61 |
| | 2 Ex Low | 150 | 147 | 140 | 133 | 127 | 121 | 114 | 108 | 102 | 94 | 88 |
| | 3 Low | 160 | 158 | 152 | 146 | 139 | 134 | 127 | 122 | 116 | 109 | 103 |
| | 4 Med | 170 | 169 | 163 | 158 | 151 | 146 | 140 | 135 | 129 | 123 | 118 |
| Lpd 3 | 1 Ultra Low | 100 | 169 | 156 | 142 | 130 | 116 | 102 | 89 | 77 | 63 | 49 |
| | 2 Ex Low | 120 | 212 | 202 | 189 | 177 | 166 | 153 | 142 | 131 | 119 | 107 |
| | 3 Low | 130 | 233 | 225 | 212 | 201 | 191 | 178 | 169 | 159 | 148 | 138 |
| | 4 Med | 140 | 254 | 246 | 234 | 224 | 214 | 202 | 193 | 184 | 173 | 164 |
| Lpd 4 | 1 Ultra Low | 110 | 206 | 191 | 174 | 157 | 142 | 127 | 112 | 95 | 81 | 63 |
| | 2 Ex Low | 130 | 250 | 237 | 222 | 210 | 199 | 186 | 174 | 161 | 148 | 136 |
| | 3 Low | 150 | 292 | 280 | 269 | 258 | 248 | 237 | 227 | 216 | 206 | 195 |
| | 4 Med | 170 | 335 | 324 | 316 | 305 | 297 | 286 | 278 | 269 | 258 | 250 |
| Lpd 5 | 1 Ultra Low | 100 | 249 | 229 | 211 | 190 | 172 | 153 | 134 | 114 | 95 | 75 |
| | 2 Ex Low | 110 | 276 | 258 | 240 | 222 | 208 | 190 | 172 | 154 | 136 | 119 |
| | 3 Low | 130 | 338 | 323 | 308 | 294 | 279 | 264 | 249 | 234 | 219 | 205 |
| | 4 Med | 140 | 368 | 353 | 338 | 325 | 310 | 297 | 283 | 269 | 254 | 241 |
| Lpd 6 | 1 Ultra Low | 110 | 297 | 279 | 264 | 249 | 231 | 217 | 199 | 184 | 166 | 151 |
| | 2 Ex Low | 120 | 328 | 312 | 298 | 283 | 269 | 256 | 239 | 226 | 211 | 196 |
| | 3 Low | 150 | 418 | 409 | 397 | 386 | 377 | 368 | 356 | 344 | 332 | 323 |
| | 4 Med | 160 | 452 | 444 | 432 | 422 | 411 | 402 | 392 | 380 | 369 | 360 |
| Lpd 7 | 1 Ultra Low | 100 | 333 | 312 | 289 | 268 | 247 | 223 | 202 | 181 | 160 | 138 |
| | 2 Ex Low | 110 | 371 | 353 | 332 | 314 | 294 | 273 | 255 | 237 | 219 | 199 |
| | 3 Low | 130 | 451 | 436 | 421 | 403 | 389 | 374 | 356 | 341 | 326 | 308 |
| | 4 Med | 140 | 493 | 479 | 463 | 446 | 432 | 416 | 399 | 384 | 369 | 353 |

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.

Cooling Coil Pressure Drops



Heating Coil Pressure Drops



| | Water Content of Coil (Litres) | |
|-----------|--------------------------------|---------|
| | Cooling | Heating |
| Lpd 1 | 1.32 | 0.20 |
| Lpd 2 & 3 | 1.98 | 0.28 |
| Lpd 4 & 5 | 2.86 | 0.40 |
| Lpd 6 & 7 | 3.52 | 0.51 |

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 resonance 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 fully framed, washable, polyester G2 media to BS EN779. 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.

Condensate 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 - Fan/Motor assemblies shall be high quality low noise combined external rotor motor type, statically and dynamically balanced. Fans shall be double inlet, double width, direct drive, centrifugal type with low noise, forward curved, multi blade 'tab lock' galvanised steel impellers housed in galvanised steel scrolls. Motors shall be high efficiency, external rotor type with permanent split capacitors. Bearings shall be sealed for life, maintenance free ball race type with a minimum life expectancy of 50,000 hours under normal operating conditions. Overload protection shall be by way of auto re-setting thermal contactors incorporated into the windings. Insulation shall be to Class 'B' with enclosure to IP44 and electrical supply of 230/240V 1ph. 50Hz. Fan/Motor assemblies shall be mounted separately onto a 'floating' bulkhead to isolate noise resonance from the rest of the unit and facilitate easy removal of an individual fan/motor for replacement. Alternatively the complete 'floating' bulkhead can be removed from the unit for major work.

Fan Motor Speed Control - Speed control shall be effected by means of a multi-tapped auto-transformer with fifteen outputs, plus an isolated 24 V AC (30VA) output for operation of a controls package. Transformers shall be pre-wired to a selector switch providing three main speeds to suit the unit duty requirements, whilst a separate three position 'fine tuning' switch allows accurate commissioning on each of the main speeds. Speed control transformers shall be fitted within a ventilated controls box mounted on the side of the unit.

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.



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