Lynx

- Energy efficient fan coil unit
- Chilled water cooling & hot water heating
- Waterside control with variable air volume
- Commercially quiet with excellent acoustics
- Programmable communication control systems

‘Lynx’, designed and manufactured to ISO9001 : 2008 by Dunham-Bush Ltd, is a cost effective fan coil unit designed for quiet, powerful and resilient performance.

‘Lynx’ fan coil units are built to ‘best value’ engineering standards, with the latest design and manufacturing technology, ‘Lynx’ is the ideal solution to meet thermal and noise criteria within a limited budget.

Careful consideration has been given to safe site handling and ease of access to all serviceable items. Designed to offer maximum site flexibility, the ‘Lynx’ is a versatile and user-friendly product.

Efficient Cooling and Heating

Lynx provides a quiet solution to cooling and heating, with low noise air movement provided by efficient centrifugal fans and rapid response to cooling or heating demand provided by a compact heat exchanger coil block. Supply air can be ducted via circular spigots or by a single rectangular spigot; the circular spigots are removable and can be repositioned to suit system design.

Flexibility Is The Key

‘Lynx’ uses a non-handed, dual-purpose coil block within a galvanized steel ‘V’ formed condensate pan, terminating with a central drain connection at it’s lowest point. A single design is used on both RH and LH configurations allowing the complete coil and condensate pan assembly to be reversible on site. The discharge plenum is supplied with spigots fitted at customer specified positions and single blanking plates, screw-fixed to allow spigot interchange on site. The additional facility to re-locate the control box from one side of the unit to the other enables site layout changes and client fit-outs.

Access For Maintenance

Filters are simple to remove, they withdraw from either the rear or side of the unit without the use of tools or the need to remove panels. Sizes 4 to 7 are supplied with split filters for easier removal and handling.

The main access panel is secured using four setscrews, which are retained during the removal of the panel due to the use of ‘keyhole’ slots, and provides access to the condensate pan and fan/motor assemblies.
Electrical work can be easily performed via two hinged covers giving access to all components in the control box.

Fan Assemblies

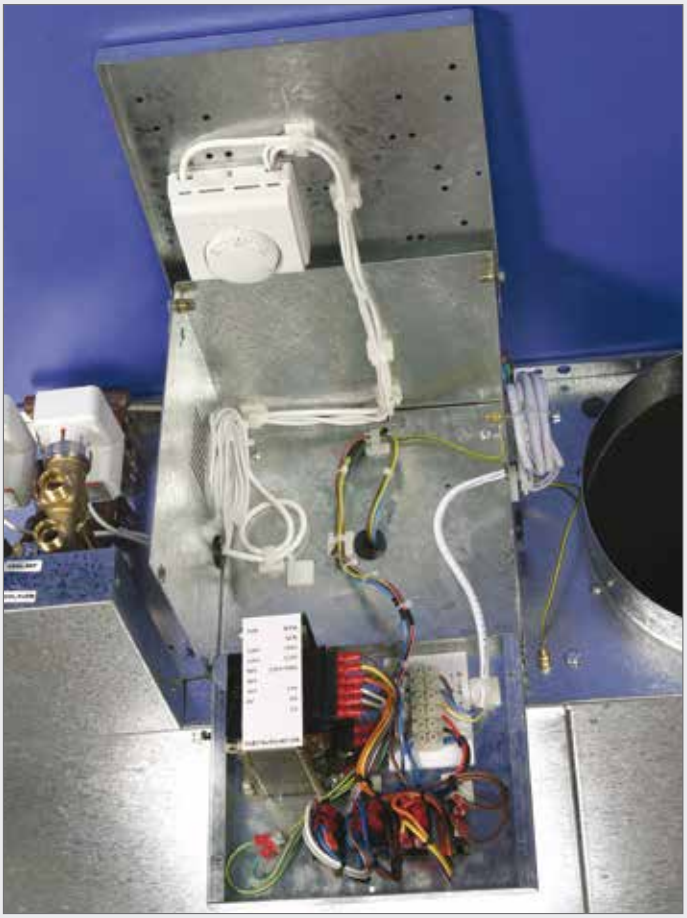
Lynx includes high efficiency electronically commutated (EC) motors with low specific fan powers (SFP).

Each fan/motor assembly is independently mounted onto the floating bulkhead, isolating them from the unit chassis, reducing resonance and casing breakout noise. On standard EC motor units fan speed control is via a fan speed potentiometer or 2-10V DC control signal by others.

Condensate Pans

'Lynx' fan coil units feature a condensate pan formed from hot dipped galvanised steel. The 'V' formed pan creates a positive seal against the coil preventing any air bypass and is fabricated to provide a positive fall in two directions to the central outlet at its lowest end. (The rigidity of the folded component offers extra protection against accidental site damage).

The 22mm OD drain connection is located in a sump to ensure the condensate drains completely.



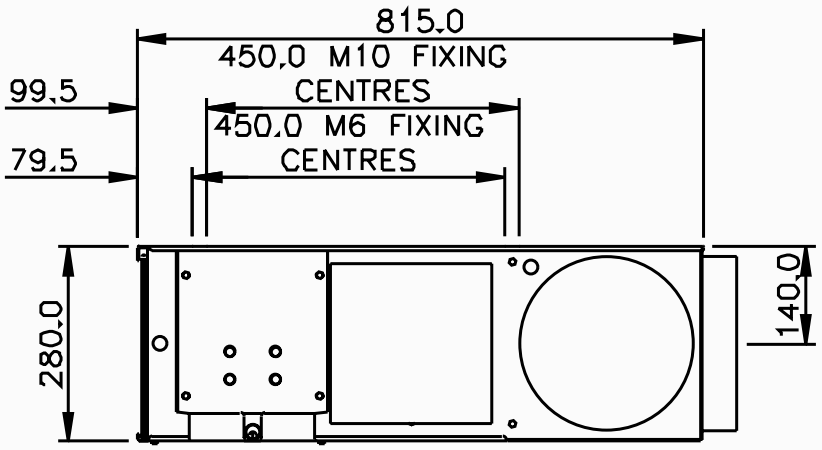
Adaptable Controls Box

'Lynx' units are supplied with a well ventilated IP20 control box fitted with a one metre flying lead for connection to an adjacent fused spur.

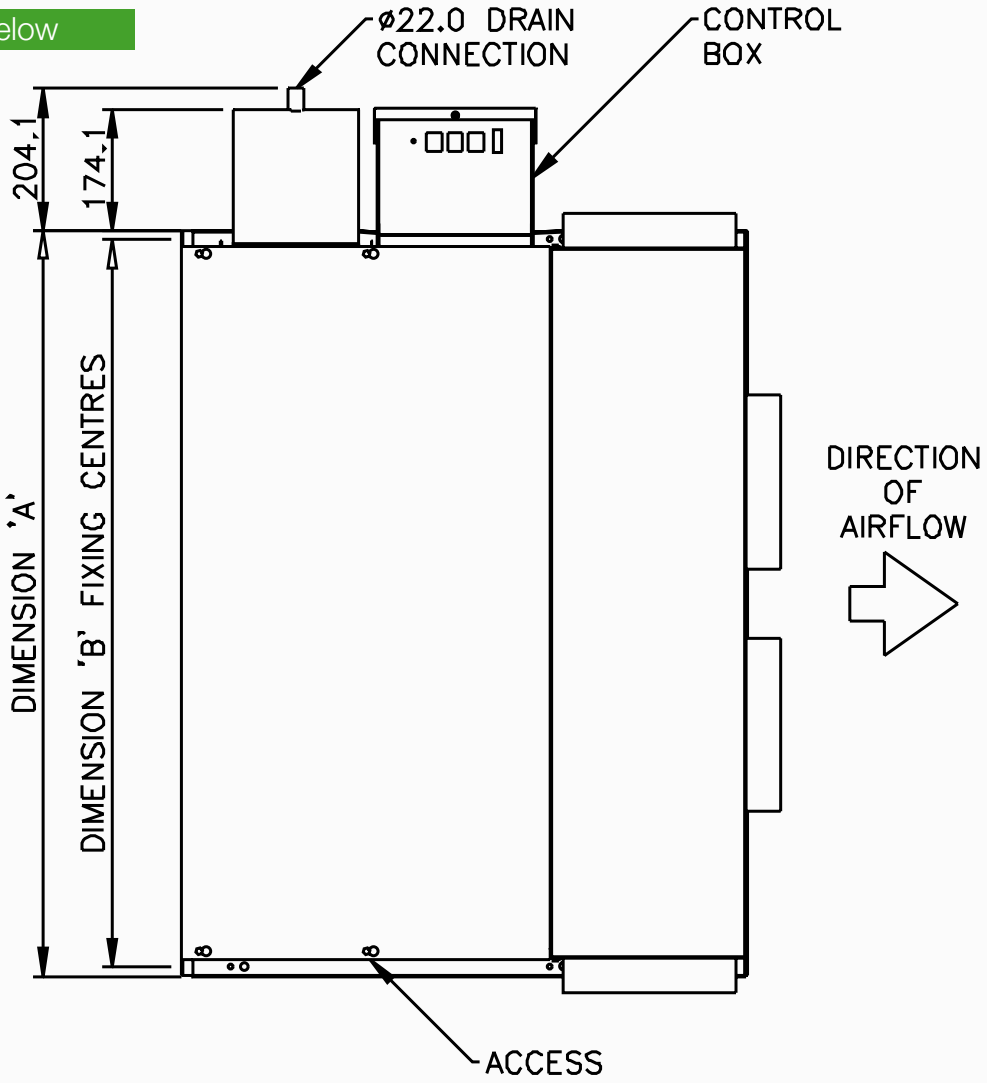
Also housed in the box are the mains fuse holder complete with a spare fuse and transformer, The control box features two hinged lids to provide improved access to either stand-alone or DDC controls. It is electrically connected to the fan/motor(s) via a quick release connector, a feature that enables it to be disconnected from the unit for refurbishment or to be retrofitted subsequent to the installation of the unit.

DIMENSIONS

View On Coil Connections



View From Below



Size	Dim' A (mm)	Dim' B (mm)	Dry Weight (kg)
Lynx 1	675	648	31
Lynx 2 & 3	1075	1048	47
Lynx 4 & 5	1475	1448	70
Lynx 6 & 7	1875	1848	85

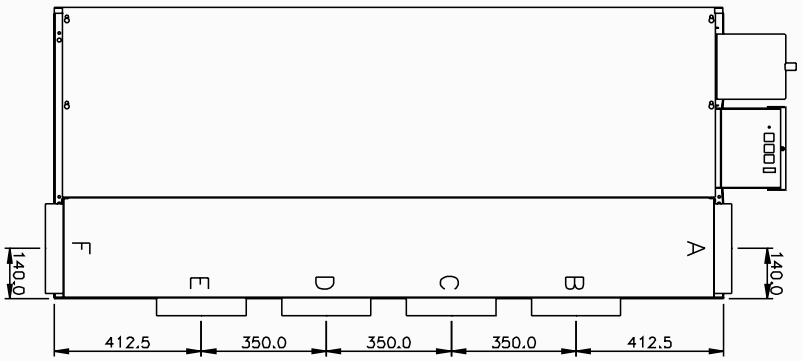
LH Unit shown, RH opposite.

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

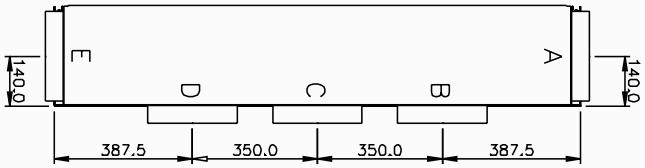
DIMENSIONS

Circular Spigot Connections

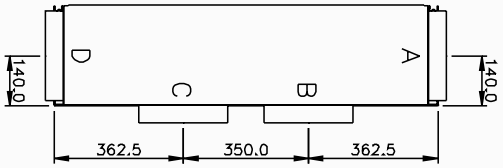
Standard Spigot Sizes
Ø250
Ø225
Ø200
Ø180
Ø150



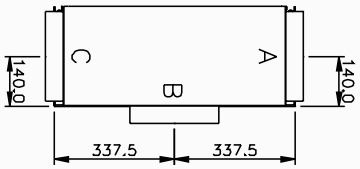
Size Lynx 6 & 7



Size Lynx 4 & 5

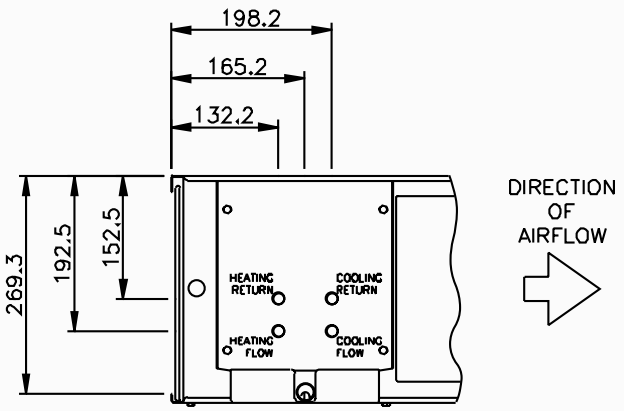


Size Lynx 2 & 3

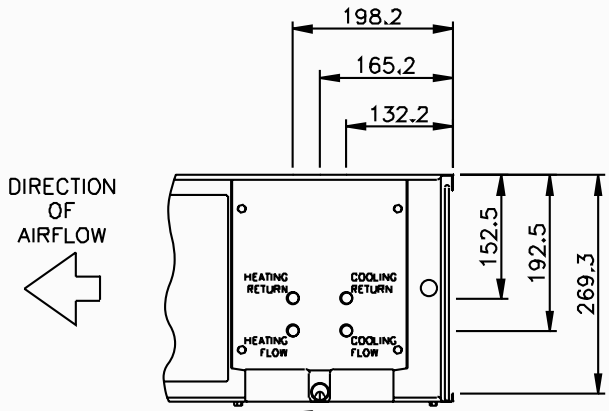


Size Lynx 1

LH Coil Connections



RH Coil Connections



Ø22mm Drain Connection

KEY FEATURES

Simple range of size options
- **7 unit sizes in range of 4 chassis sizes with multiple fan options**

Draw through airflow
- **Fan sound is attenuated by coil block, reducing inlet radiated noise levels**
- **Effective heat transfer with airflow by uniform air velocity across coil face**

Robust chassis
- **Precision fabrication with CNC punched and folded chassis components**
- **Rigid construction in stiffened 1.2mm thick galvanised steel**

Excellent acoustics
- **Plenums lined with 12mm open cell acoustic foam with optional attenuators**
- **Forward curved centrifugal fans isolated from the chassis on a floating bulkhead**

High performance cooling and heating
- **Integral heat exchanger coil block with dedicated cooling and heating sections**
- **Copper tube with 'AC' profile aluminium fins for better heat transfer**
- **Compatible with CHW and LPHW systems with or without glycol treatment**

Responsive waterside control
- **Rapid response to cooling and heating demand**
- **Optional pressure independent (PICV), 2 port, 3 port + bypass or 4 port control valves**

Effective condensate removal
- **Precision condensate pan to minimise air bypass**
- **Condensate pan is graded in two directions to provide rapid removal of condensate**

Energy efficient variable air supply
- **Electronically commutated (EC) motors with 0-10VDC signal speed control (on-board with fitted fan speed potentiometer or external BMS control)"**
- **Low specific fan powers (SFP) between 0.1W/l/s to 0.4W/l/s**

Bespoke control strategy
- **Flexible cooling and heating outputs**
- **Variable CHW and LPHW flowrates with variable air volume**

Easy commissioning and maintenance
- **Double hinged control box lids**
- **Removable washable inlet air filters (to either side or from underneath)**
- **Removable access panels**

OPTIONAL FLEXIBILITY

Fitted acoustic attenuators
- **Reduce noise levels with optional inlet attenuators**

Extended drip trays
- **Factory fitted commissioning sets with condensate pans extended by 200mm**

Filter upgrade
- **Improved supply air quality with inlet air filter upgrade to G3**

Stainless steel condensate pans
- **Additional corrosion resistant stainless steel condensate pans to standard or extended lengths**

Flexible supply air delivery
- **Multiple circular discharge spigots or single rectangular discharge spigots**

Stand-alone or communicating controls
- **Factory fitted 'free-issue' bespoke controls to suit any BMS network**

Pumped condensate removal
- **Fitted condensate pump with automatic operation and alarm signal**

Fan fault monitoring and alarm
- **Fitted fan monitoring board with fan speed output, relay alarm signal and fan status LEDs**

Optional extended drip tray and fitted condensate pump

Optional fan monitoring board

COOLING DATA

Size	Fan Speed (VDC)	NR Level	Airflow Rate (l/s)	Specific Fan Power (W/l/s)	CHW 6/12°C		CHW 7/13°C		CHW 9/15°C	
					Sens Cooling (kW)	Total Cooling (kW)	Sens Cooling (kW)	Total Cooling (kW)	Sens Cooling (kW)	Total Cooling (kW)
01	4.75	25	42	0.23	0.59	0.72	0.55	0.64	0.48	0.48
	6.00	30	96	0.25	1.24	1.45	1.16	1.30	1.01	1.01
	7.00	35	139	0.31	1.82	2.14	1.68	1.89	1.42	1.42
	8.50	40	212	0.43	2.64	3.04	2.43	2.68	2.01	2.01
02	5.25	25	51	0.24	0.73	0.89	0.68	0.80	0.60	0.60
	6.25	30	113	0.27	1.49	1.77	1.40	1.59	1.22	1.22
	7.50	35	174	0.35	2.36	2.82	2.19	2.49	1.76	1.76
	9.00	40	242	0.48	3.31	3.98	3.06	3.49	2.56	2.56
03	5.25	30	114	0.23	1.50	1.78	1.41	1.60	1.23	1.23
	6.25	35	212	0.24	2.88	3.45	2.67	3.04	2.24	2.24
	7.50	40	336	0.33	4.46	5.29	4.12	4.64	3.41	3.41
	10.00	45	419	0.42	5.47	6.45	5.05	5.66	4.17	4.17
04	5.50	30	144	0.23	1.87	2.20	1.76	1.98	1.52	1.52
	6.75	35	276	0.27	3.75	4.50	3.47	3.95	2.92	2.92
	8.00	40	401	0.39	5.46	6.57	5.05	5.76	4.20	4.20
	10.00	45	427	0.40	5.78	6.92	5.34	6.07	4.43	4.43
05	5.00	30	114	0.27	1.52	1.81	1.42	1.62	1.24	1.24
	6.00	35	259	0.23	3.51	4.25	3.25	3.70	2.74	2.74
	7.50	40	476	0.33	6.37	7.58	5.88	6.65	4.88	4.88
	9.00	45	624	0.44	8.06	9.46	7.52	8.44	6.26	6.26
06	5.25	30	166	0.26	2.19	2.60	2.06	2.33	1.79	1.79
	6.25	35	329	0.25	4.58	5.57	4.25	4.89	3.57	3.57
	7.50	40	526	0.34	7.39	9.01	6.83	7.89	5.70	5.70
	9.00	45	667	0.44	8.98	10.90	8.46	9.67	7.05	7.05
07	5.00	30	151	0.22	2.02	2.40	1.89	2.15	1.65	1.65
	6.25	35	373	0.24	5.24	6.39	4.84	5.59	4.07	4.07
	7.50	40	611	0.33	8.45	10.22	7.81	8.96	6.52	6.52
	9.00	45	853	0.47	11.13	13.12	10.40	11.70	8.86	8.86

1. Cooling data is based on chilled water with flow/return temperatures as shown; for chilled water with glycol, contact Dunham-Bush.
2. Entering air conditions are return air at 23°C 50%RH; for mixed return air and primary air, contact Dunham-Bush.
3. Air flow rate and specific fan power is based on external static pressure to fan coil unit of 30Pa. Lower external static pressures will reduce specific fan powers; contact Dunham-Bush for guidance.
4. NR levels are predicted guidance, based on typical conditions for commercial applications (see page 10) Sound power levels (inlet/case radiated and discharge radiated) are available; contact Dunham-Bush.

HEATING DATA

Size	Fan Speed (VDC)	NR Level	Airflow Rate (l/s)	Specific Fan Power (W/l/s)	LPHW 80/70°C Heating (kW)	LPHW 70/50°C Heating (kW)	LPHW 50/40°C Heating (kW)
01	4.75	25	42	0.23	0.82	0.49	0.30
	6.00	30	96	0.25	1.86	1.13	0.68
	7.00	35	139	0.31	2.68	1.70	1.02
	8.50	40	212	0.43	3.62	2.32	1.40
02	5.25	25	51	0.24	1.02	0.65	0.40
	6.25	30	113	0.27	2.24	1.49	0.90
	7.50	35	174	0.35	3.44	2.32	1.41
	9.00	40	242	0.48	4.77	3.20	1.95
03	5.25	30	114	0.23	2.26	1.50	0.91
	6.25	35	212	0.24	4.18	2.81	1.71
	7.50	40	336	0.33	5.99	4.00	2.44
	10.00	45	419	0.42	7.02	4.66	2.85
04	5.50	30	144	0.23	2.82	1.75	1.02
	6.75	35	276	0.27	5.37	3.48	2.10
	8.00	40	401	0.39	7.46	4.06	2.96
	10.00	45	427	0.40	7.76	5.05	3.07
05	5.00	30	114	0.27	2.24	1.35	0.81
	6.00	35	259	0.23	5.04	3.24	1.95
	7.50	40	476	0.33	8.33	5.41	3.29
	9.00	45	624	0.44	10.06	6.50	3.95
06	5.25	30	166	0.26	3.28	2.09	1.26
	6.25	35	329	0.25	6.47	4.33	2.64
	7.50	40	526	0.34	9.83	6.53	3.98
	9.00	45	667	0.44	11.48	7.60	4.63
07	5.00	30	151	0.22	2.99	1.89	1.14
	6.25	35	373	0.24	7.33	4.90	2.99
	7.50	40	611	0.33	10.83	7.17	4.37
	9.00	45	853	0.47	13.64	8.98	5.48

ELECTRICAL DATA

Size	Fan Speed (VDC)	Current (A)
01	4.75	0.16
	6.00	0.19
	7.00	0.23
	8.50	0.42
02	5.25	0.17
	6.25	0.20
	7.50	0.30
	9.00	0.54
03	5.25	0.18
	6.25	0.25
	7.50	0.53
	10.00	0.79
04	5.50	0.21
	6.75	0.41
	8.00	0.71
	10.00	0.78
05	5.00	0.20
	6.00	0.33
	7.50	0.73
	9.00	1.24
06	5.25	0.22
	6.25	0.43
	7.50	0.82
	9.00	1.32
07	5.00	0.19
	6.25	0.40
	7.50	0.92
	9.00	1.63

1. Heating data is based on low pressure hot water with flow/return temperatures as shown.
2. Entering air conditions are return air at 21°C; for mixed return air and primary air, contact Dunham-Bush
3. Air flow rate and specific fan power is based on external static pressure to fan coil unit of 30Pa.
   Lower external static pressures will reduce specific fan powers; contact Dunham-Bush for guidance.
4. NR levels are predicted guidance, based on typical conditions for commercial applications (see page 10)
   Sound power levels (inlet/case radiated and discharge radiated) are available; contact Dunham-Bush.
5. Electrical current is drawn by fan coil unit at speed indicated with 230V/1ph/50Hz supply.

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:

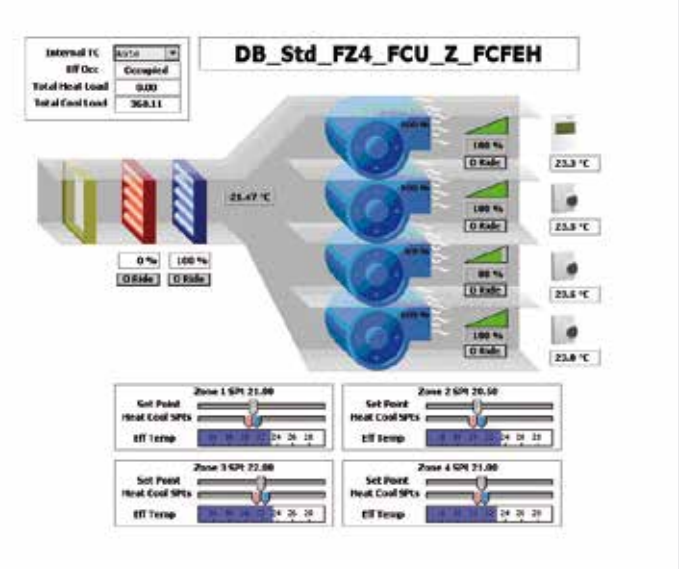
- Room acoustic characteristics are taken as medium or average, with a typical reverberation time of 1.0s. Room construction would typically be contract carpet, fibreboard lay-ceiling tiles in a ceiling grid, wall surface areas comprising glazing and conventional wall finishes, room furnished with office 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

'Zone Flow' Control System

The 'Zone Flow' system by Dunham-Bush includes a fully functional communicating controller, enabling FCUs to communicate with external networks. The system allows individual control of FCUs via a router or gateway, communicating to any network such as BACnet, Echelon, Modbus networks as well as BMS networks. Alterations to the control strategy can be made using a web-serving graphical user interface, allowing the user to edit control software and algorithms. The controller is fitted with an enhanced range of analogue, digital and universal inputs/outputs as well as sensors for monitoring FCU status.



SPECIFICATION

The 'Lynx' 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 whilst operating against the specified design parameters.
'Lynx' Fan Coil 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, galvanised steel condensate pan, EC motors/fans, integral multi-outlet discharge plenum and an electrical/controls enclosure.

Unit Chassis – Chassis shall be of a riveted construction manufactured from 1.2mm galvanised steel. Stiffeners and strengthening folds shall be used to form a solid robust structure. Mounting holes able to accept either M6 or M10 drop rods or mounting bolts are provided for installation whilst a combination of panel design and use of fillet radii minimises sharp edges. Fan/motor assemblies shall be mounted on a 1 .6mm thick galvanised steel 'floating' bulkhead, isolated from the case of the unit to prevent radiated noise.

Discharge (Supply Air) Plenum – An integral acoustically lined multi-outlet discharge plenum shall form part of the unit chassis complete with spigots, with various diameter options to satisfy most ductwork configurations. Rectangular and oval spigots are also available upon request.

Access - Access to all serviceable items, namely condensate pan, coil, and fans/motors, shall be via a single insulated panel retained using M6 setscrews into captive 'nutserts'. The use of keyhole slots shall enable the removal of the panel whilst the setscrews remain in position.

Coils – A single dual-purpose coil block divided into two sections shall provide both cooling and heating. The coil shall be constructed from 3/8" seamless copper tube mechanically expanded into aluminium fins and brazed into copper headers. Fins shall have die formed collars to provide maximum contact and optimum heat transfer. Coils shall be circuited to provide low hydraulic resistance under normal operating conditions whilst being designed to prevent air locks, ensuring positive venting and draining via easily accessible slotted hexagonal vent and drain plugs. Coils shall terminate with 15mm copper tails, spaced at 40mm centres to accept most standard 4-port & 2-port valves. Tails to be contained within a plate providing sufficient support for both valves and adjoining pipe work. Coils shall be tested by dry air under water to 30bar.

Condensate Pan – The condensate pan shall be formed from hot dipped galvanised steel and fabricated to provide a positive fall in two directions ensuring the free flow of condensate to the 22mm OD end connection. Condensate pans shall be externally insulated with 3mm closed cell class 'O' thermal insulation. Stainless Steel pans are extra price options.

Insulation – Unit chassis and panel work shall be insulated both acoustically and thermally using 95kg/m3, CFC and HFC free, class 'O' open cell expanded foam, having a maximum thermal conductivity of 0.047W/m/K, 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 Filter – The filter mat shall be formed from bonded synthetic polyester fibres, to EN779 class G2 (EU2), and fire rated to class F1 to DN 53 438. The washable media shall be secured over a copper coated mild steel wire frame. Filters shall be easily removable from either the side or the rear of the unit without the need to remove any panel work. G2/3 Filters or Mesh screens are options.
The control box shall be provided with a one metre flying lead for connection to a adjacent fused spur.

Energy Efficient EC Fan Motors - The Lynx 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.

Fan Motor Assemblies – Fan/Motor assemblies shall be mounted on a 'floating bulkhead' to isolate noise resonation from the rest of the unit and to facilitate easy fan replacement.

Controls Box – Each unit shall be provided with a well-ventilated IP20 electrical box complete with a removable/hinged lid. The box shall contain a terminal block, 'on/off' switch, fan speed potentiometer (if required), harmonic filter and a mains fuse. Space is provided to accommodate most available temperature controllers, along with associated relays (if required). If controls are being fitted, a 24v controls transformer is fitted.

Temperature Controls – Temperature controls shall be provided in accordance with the project specification and will comprise of modulating 2 or 4 port valves and actuators acting in conjunction with an electronic stand alone or DDC temperature controller wired to a return air or room sensor. A wide variety of controls packages are available, either supplied and fitted by Dunham-Bush, for factory fitting only.

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