

SERIES HSL

High Capacity Linear
Slot Diffuser

PUBLICATION

DIFFUSERS 20

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Features

- High Capacity One and Two Slot Widths.
- Adjustable for Horizontal & Vertical Distribution.
- Removable Air Deflection Vanes.
- Comprehensive Series of Matching Plenums.
- Alternative Border Options to Suit Popular Ceiling Designs.
- Curved Patterns Available.
- Extruded Aluminium Construction.



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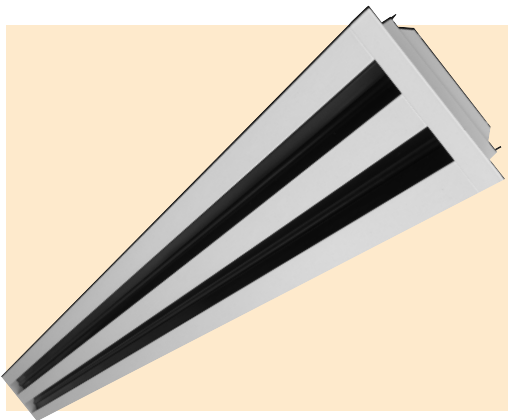
High Capacity Linear Slot Diffuser

Introduction

Gilberts HSL Series of Linear Slot Diffuser has been designed to meet the exacting performance requirements and standards of modern slot diffuser applications. Combining up to date styling and design technology to blend with modern architecture the HSL complements our standard slot diffuser design by offering a high capacity slot design. The HSL features a wider than normal slot gap (36mm) which contrasts with the 23mm slot width of our standard slot diffuser (Type GSL). This larger slot width allows a higher air flow rate per metre of slot length allowing a 2 slot HSL model to deliver as much as 150l/s/m. The HSL maintains excellent air distribution characteristics providing smooth, accurate and flexible airflow control making the unit suitable for both fan coil, VAV and conventional Linear Slot applications.

Available in standard one and two slot widths the unit is suitable for sidewall or ceiling mounting applications and is manufactured from extruded aluminium with a plastic air deflection vane. Single units can be supplied up to 2.0m in length with longer runs supplied in sections and joined almost invisibly, by a simple, accurate and effective alignment feature.

The diffuser incorporates a discreet directional control vane in each slot to direct the airflow across the ceiling, left or right, or discharge vertically downwards. Arranged in standard 2000mm lengths, the deflection vane offers a clean unbroken appearance and is easily clipped and unclipped from the diffuser to allow for fixing.

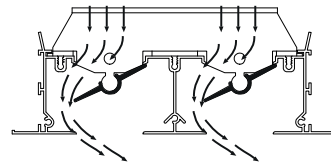


Features

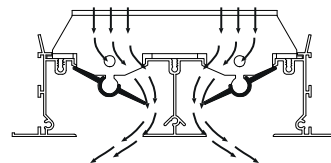
- High Capacity One and Two Slot Widths.
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The standard border detail comprises a 35mm flange border with end flanges or end caps optionally available to compliment contemporary ceiling design however, the HSL series is also available with alternative border styles to match different popular ceiling types and mitred corners can also be included. In addition, the HSL is complemented by a comprehensive range of purpose built Plenum boxes. Manufactured from Galvanised or Zintec coated Mild Steel the boxes can be supplied to suit all diffusers in sectional box lengths up to 2000mm. Connection between the boxes and the diffusers can be accomplished either by drill and rivet through the diffuser

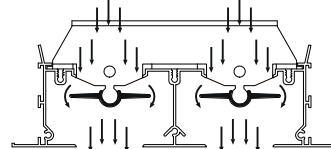
HORIZONTAL DISTRIBUTION - 1 way Airflow



HORIZONTAL DISTRIBUTION - 2 way Airflow



VERTICAL DISTRIBUTION



neck or where access is limited, via concealed bracket fixings accessible through the diffuser face (standard fixing is concealed bracket). The diffuser includes fixing holes for drop rod support as standard.

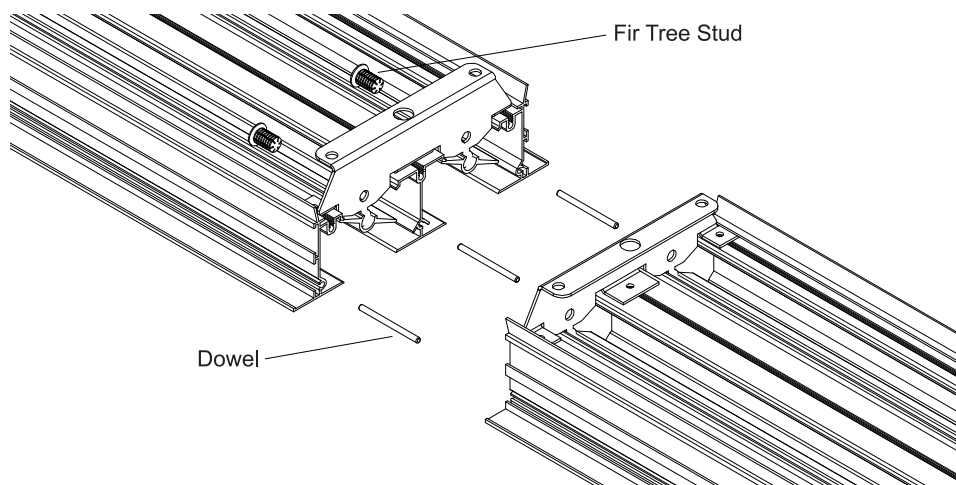
For volume control the standard Plenum inlet can be fitted with Quadrant or Iris type dampers and where adjustment via the slot face is preferred, both cord and Teleflex operated spigot dampers can be installed. Standard finish on all HSL Slot Diffuser is a White polyester powder coated face with all control vanes matt black. Other colours and finishes are available on request.



ALIGNMENT FEATURE

For long diffuser runs a concealed alignment feature is provided for positive and accurate joining of diffuser lengths whilst maintaining a clean unbroken appearance. Simply

align the units on site using the dowels and then push the 'fir tree' studs through the adjoining backstraps. A simple, straightforward and fast procedure.

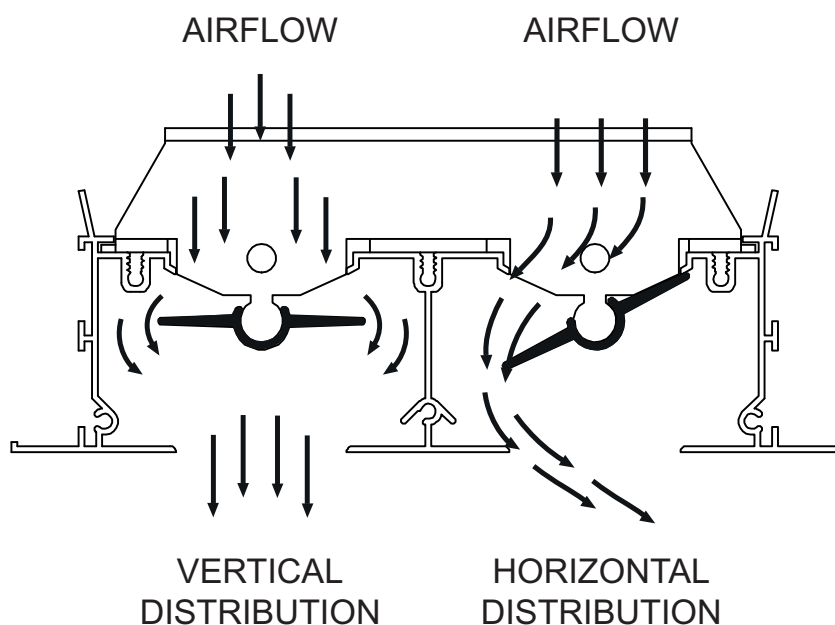


DIRECTIONAL CONTROL

Directional Control is achieved by adjustment of the control vane housed in each slot, moved left or right for opposite horizontal distribution and horizontal for vertical distribution. As standard airflow direction can be altered every 2000mm

although smaller intervals can be easily achieved on site by simply cutting the blade and inserting spacer brackets (see installation leaflet for details).

DIRECTIONAL CONTROL



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Selection Procedure

- 1 Establish a position within the conditioned space to achieve the best air distribution.
- 2 Knowing the type of space, refer to (table 1) and establish the recommended maximum noise level for that type of area.
- 3 Divide the total air volume (m^3/s) by the effective active length of diffuser and establish a volume per metre run.
- 4 Establish the throw based on notes in the performance specification.
- 5 Refer to selection NOMOGRAM and establish the number of slots required to meet your requirements

Gilberts Supply Diffusers have been tested within the range of $\pm 10^\circ\text{C}$ (as recommended in the HEVAC Guide to Air Distribution Technology). For any other temperature differential requirements please contact our Technical Department.

EXAMPLE

A 4 metre long active diffuser is to be installed within an office area and is required to handle $0.4\text{m}^3/\text{s}$ Total. The throw is approximately 10 metres (to $0.25\text{m}/\text{s}$).

From (table 1) the maximum recommended NC level for this type of area is 30 - 40 NC.

Volume per metre run = $0.1\text{m}^3/\text{s}/\text{m}$.

Now referring to selection NOMOGRAM it can be seen that a 2 slot diffuser will handle the required volume with a 7 metre horizontal throw. Since the unit selected is 4m long this figure must then be multiplied by a correction of 1.4, thus giving a final throw of 10 metres. From the NOMOGRAM, noise level is approximately 30 and with the addition of the correction factor of 4 this gives a total noise level of < 35 NC. With a 15 Pa pressure drop the diffuser selected is suitable for this area.

Performance Data

The performance data tables are information for cooling, ventilation and heating applications.

The selection NOMOGRAM is based on a 1m length of diffuser complete with a standard Plenum box, and mounted flush with a ceiling.

Isothermal conditions also apply, and the correction notes following and factor tables should be used for other sizes and applications.

- PRESSURE: All pressures are in Pa (N/m^2)
- THROWS: All horizontal and vertical throws are for a distance measured in metres and correspond to a terminal velocity of $0.25\text{ m}/\text{s}$ and $0.75\text{ m}/\text{s}$.
- SOUND: The NC values are based on a room absorption of $8\text{ db re } 10^{-12}\text{ watts}$, and for a 1m length of diffuser with damper fully open.

Table 1

Area to be served	Recommended Maximum NC Levels
Sound Broadcasting Recording Studios, TV (Audience Studios)	15 - 20 20 - 25
Lecture Theatres, Cinemas, Concert Halls, Boardroom/Ex Offices Lounge, Conference Room, Court Room, Churches, Private Bedrooms	25 - 30
Operating Theatres, Hospital Wards, Staff Room, Class Rooms, Ballroom, Banquet Room, Library, Bank, Museum, Offices	30 - 40
Restaurants, Department Stores, Computer Suite, Washroom Toilet	35 - 40
Laundries, Kitchens, Swimming Pools, Sports Arena	40 - 45
Garage, Light Engineering Workshop	45 - 50
Heavy Engineering Workshop	50 - 65

PLENUM BOXES

Standard Plenum box details are shown in the Plenum Box section with inlet sizing data. This provides the recommended minimum to obtain even distribution along the diffuser using a centre fed constant cross section Plenum Box.

If side entry cannot be accommodated and only top entry is possible then all boxes should be complete with a perforated mesh. Plenum Boxes are lengths up to 1800mm and are suitable for direct fixing through the neck of the diffuser, concealed bracket fixing, or where specified, toggle latch fixing. The Plenum to diffuser connection offers tight and secure fitting and provides an adequate air seal. However additional sealing may be applied on site at discretion. For low leakage ductwork applications in particular, secondary sealing is recommended.

VERTICAL PROJECTION

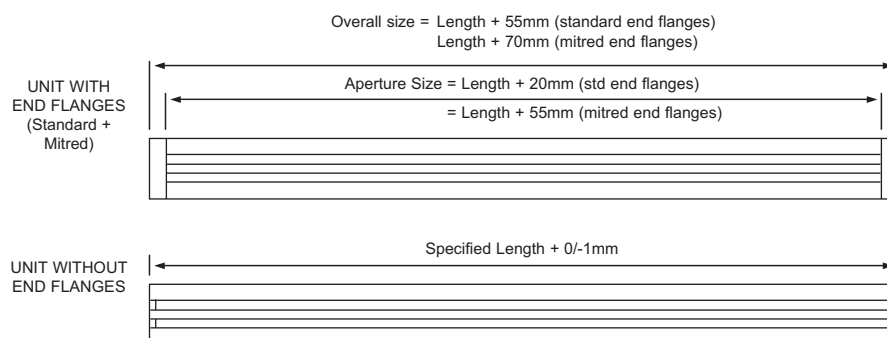
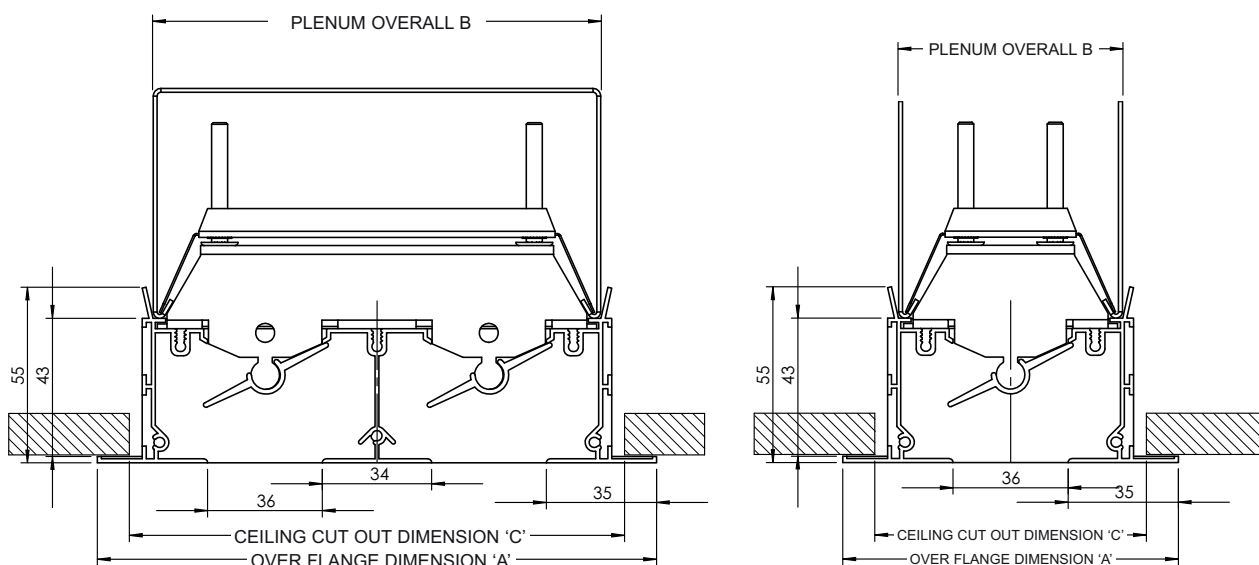
If the diffuser is next to a smooth vertical surface the throws given should be multiplied by a factor of 1.5. Also if a $10^\circ\text{C } \Delta t$ for heating or cooling applies the throws given should be multiplied by 0.75 or 1.3 respectively.

HORIZONTAL DIFFUSION

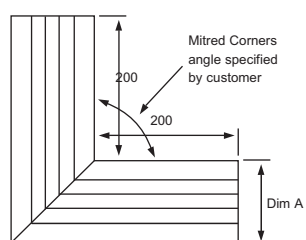
If the diffuser is mounted on exposed ductwork the throws given will be reduced by approximately 40%.



Slot Diffuser Standard Border A



Mitred Corners

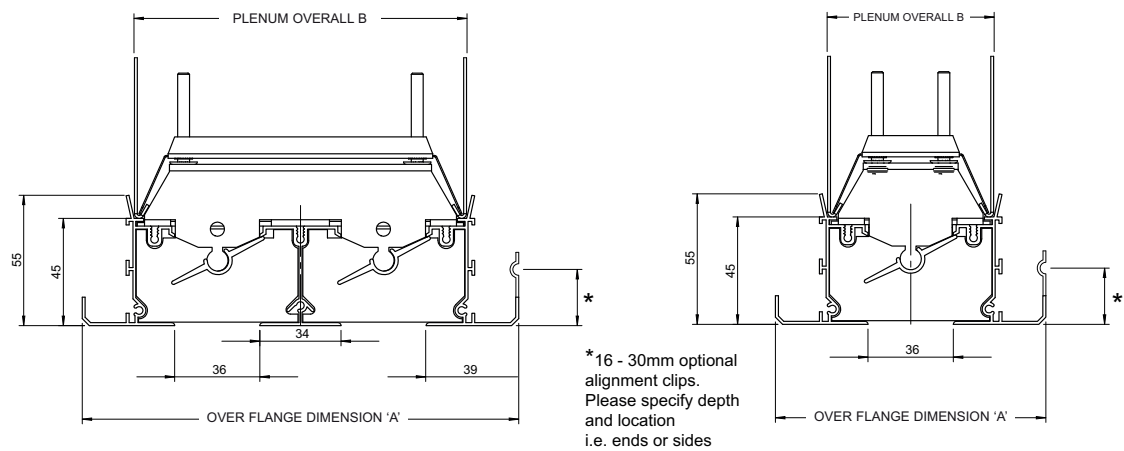


Series	No of Slots	Dim A	Dim B	Dim C
HSL	1	105	70	91
HSL	2	175	140	161

SERIES HSL

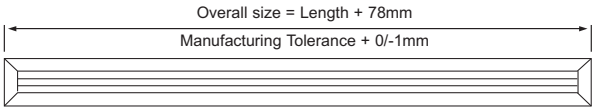
High Capacity Linear Slot Diffuser

Special
Border
Option B
(Plank
Ceiling)

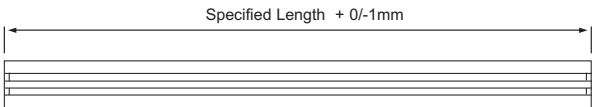


No of Slots	A	B
1	114	70
2	184	140

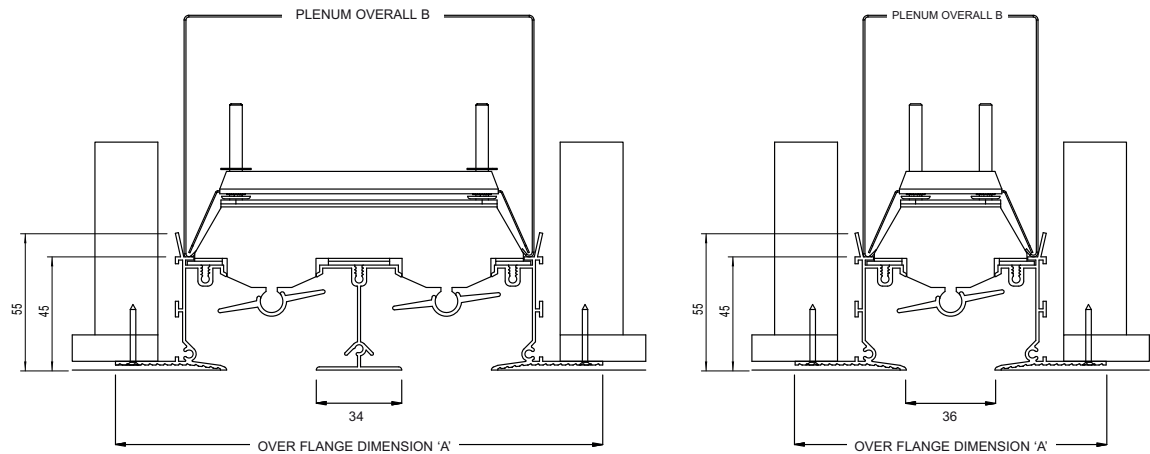
UNIT WITH
END FLANGES
(mitred)



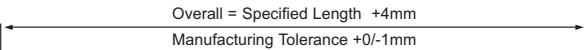
UNIT WITHOUT
END FLANGES



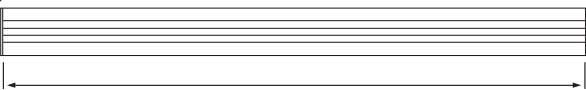
Plaster
Ceiling
(Option P)



No of Slots	Dim A	Dim B	Dim C
1	125	70	91
2	195	140	161



Unit with
end caps.



End caps compulsory
except for lengths in a
continuous run.



Curved Slot Diffuser (TYPE HSLC)

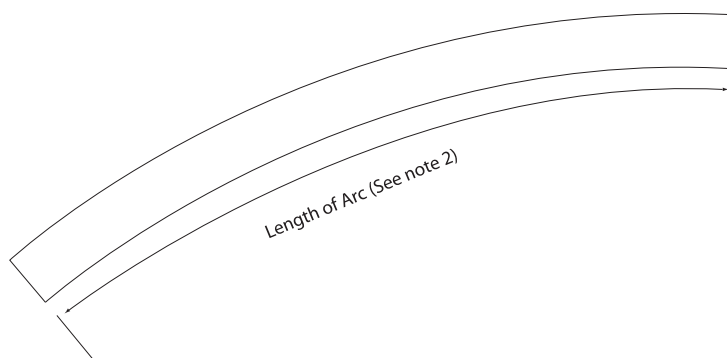
The unique design of the HSL frame and directional control vanes allows for shaping of the diffuser into a variety of curved patterns whether for architectural or aesthetic reasons. Instead of being blanked or having dummy sections however, the HSL curved diffuser can still provide full horizontal airflow adjustment with the directional control

vanes following the profile of the outer frame.

This ensures that full horizontal or vertical airflow distribution can be achieved.

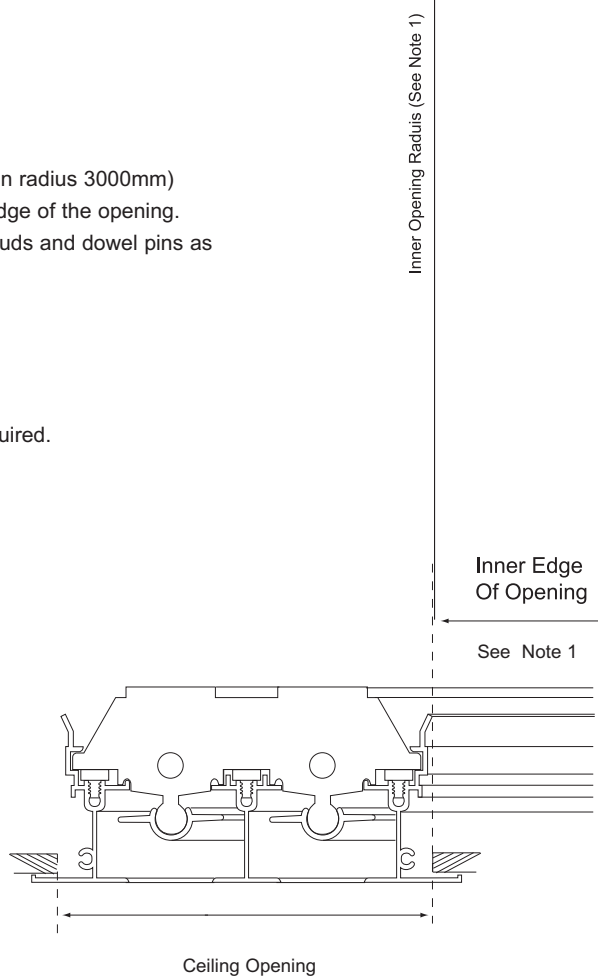
All other details in terms of dimensions fixings and plenum boxes are as standard.

Opening Detail



Notes

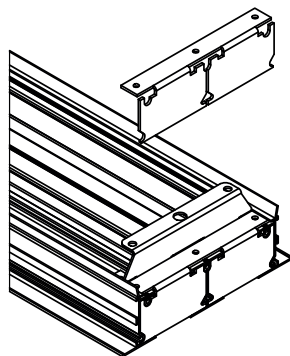
1. List radius is to inside edge of opening (min radius 3000mm)
2. List length is the arc length of the inside edge of the opening.
3. For joining sections together use fir tree studs and dowel pins as shown on Page 3
4. Maximum plenum box length as follows
 - over 15m radius: 1500
 - over 10m radius: 1000
 - over 7m radius: 600
5. Under 7m radius shaped boxes will be required.



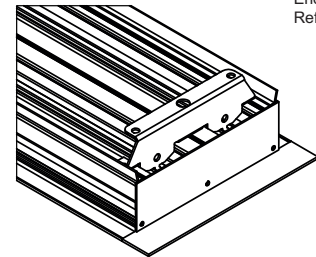
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End Flanges and End Caps



End caps-
Ref: EC



End Flanges-
Ref: EF

Fixing Options

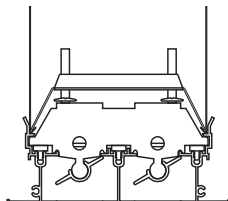
The standard fixing option for the HSL slot diffuser is the popular concealed bracket fixing. The concealed brackets are fixed to the rear of the diffuser and quickly push fit into the plenum. Unclipping the diffuser blade allows access to the captive nuts on the brackets to tighten and align the unit in place.

Where access is easily available to the ceiling void an alternative fixing option is to simply drill through the neck of

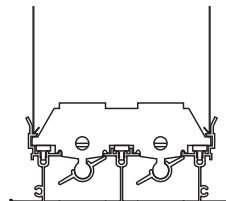
the diffuser and the plenum box and then rivet into place. This offers a unit cost saving over the standard concealed bracket fixing arrangement but may take a little more time to install.

For installations without a plenum the diffuser always automatically includes holes for standard drop rod support on the diffuser back straps. The back straps are spaced on approx. 300mm centres.

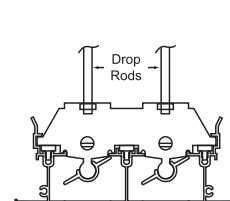
Standard
Concealed
Bracket Fixing



Optional
Drill and Rivet
Fixing

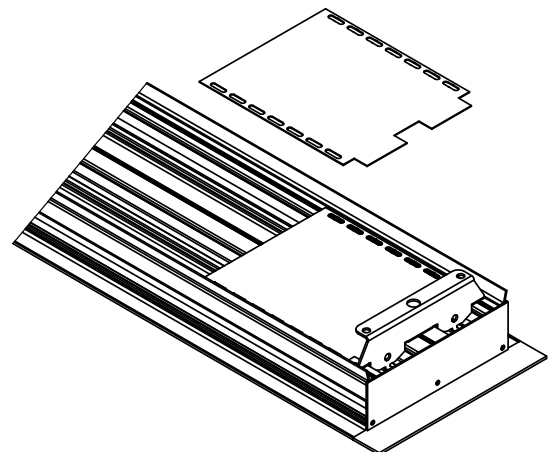


Optional
Support Brackets
(By others)



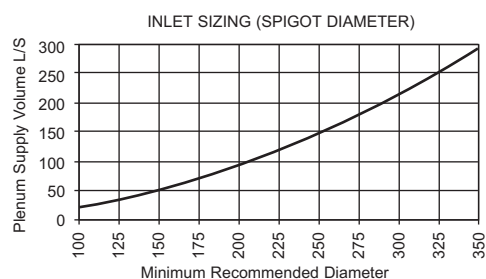
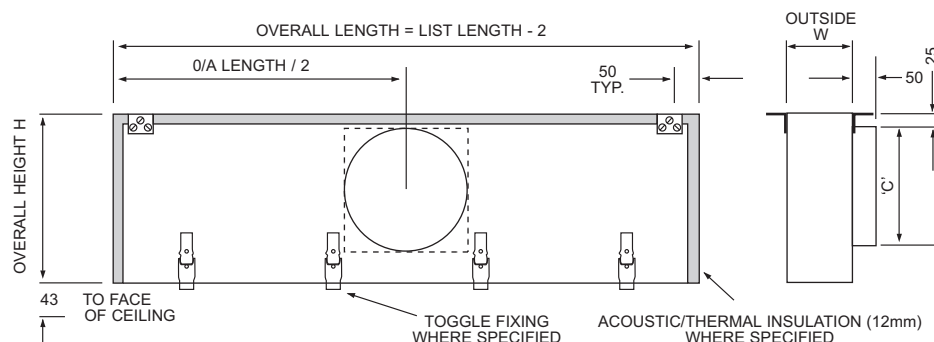
Blanking Plates

For inactive or dummy sections, matt black blanking plates can be supplied. Blanking plates are supplied in standard 150mm lengths and simply locate onto the back of the diffuser where they can be secured with standard self-tapping screws.





Plenum Box Series PB



No of Slots	Width W
1	70
2	140

Nominal Spigot Dia (or height) C	Standard Height H
100	220
125	220
150	262.5
160	262.5
200	305
250	347.5
300	390
350	432.5

For low noise levels one size larger is recommended

General Specification

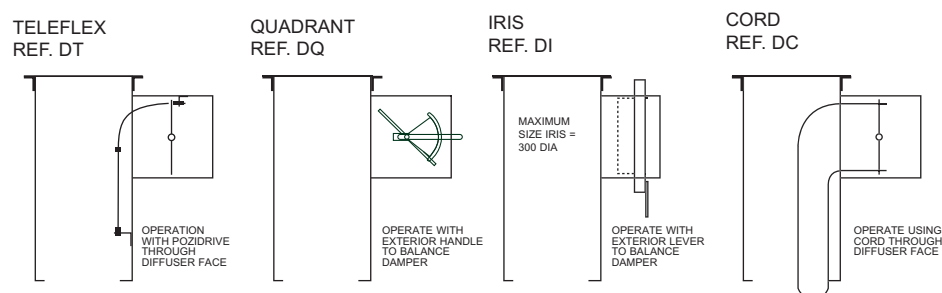
0.7mm Galvanised or Zintec coated mild steel construction.

Spigot Construction: Standard sizes use plastic clip-in spigot.

Nonstandard, a sealed screw-in spigot.

AT1 - Thermal Insulation: 12mm Pyrosorb foam approx. U-value $4.7 \text{ Wm}^{-2} \text{ K}^{-1}$

Volume Control Options

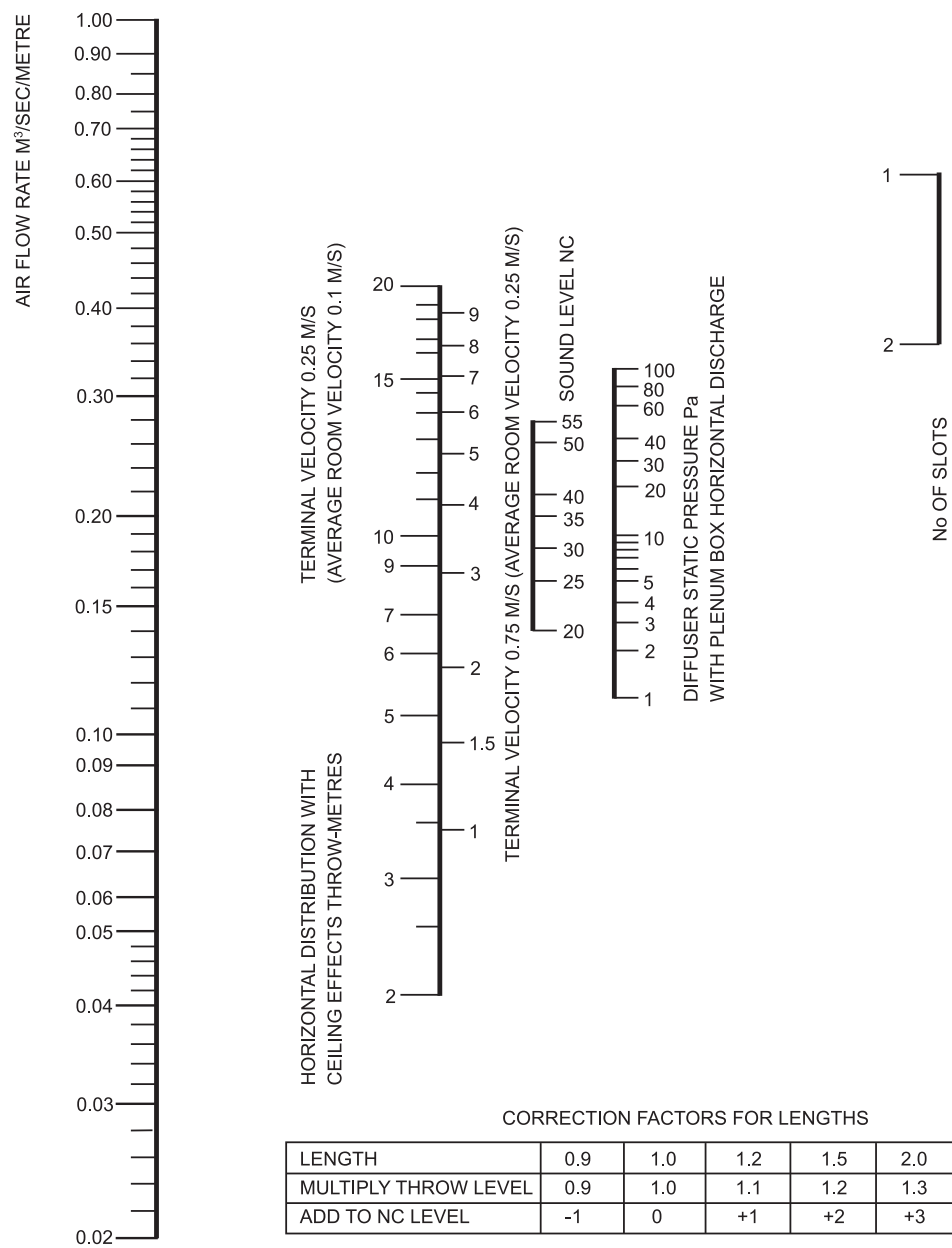


Spigot length = Spigot dia.

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Sizing
Nomogram:
Horizontal
Distribution



CORRECTION FACTORS FOR OTHER SUPPLY TEMPERATURES
COOLING 10° Δt THROWS x 0.9
HEATING 10° Δt THROWS x 1.15

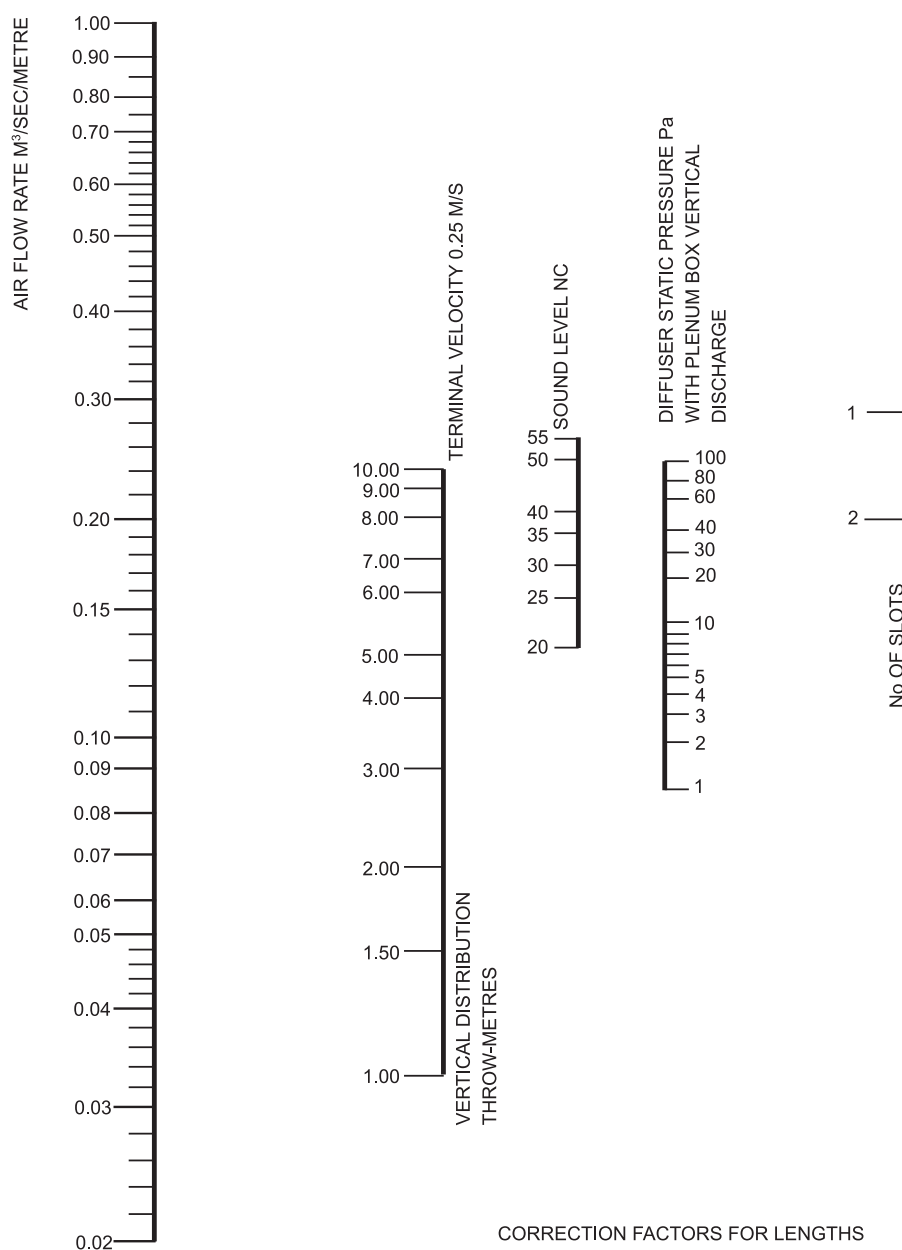
ALL DATA BASED ON 1 METRE LONG DIFFUSER ISOTHERMAL
CONDITIONS DAMPER FULL OPEN AND DIFFUSER FLUSH WITH CEILING
BASED ON ROOM HEIGHT OF 2.8 METRES

Extract : If units are used for extract purposes the following correction factors should be used:

- Pressure value as for supply x 2
- Noise values as for supply + 10 NC



Sizing Nomogram: Vertical Distribution



CORRECTION FACTORS FOR LENGTHS

LENGTH	0.9	1.0	1.2	1.5	2.0	3+
ADD TO NC LEVEL	-1	0	+1	+2	+3	+4

ALL DATA BASED ON 1 METRE LONG DIFFUSER ISOTHERMAL CONDITIONS DAMPER FULL OPEN
8DB RE 10⁻¹² WATTS ROOM ABSORPTION ALLOWED

SERIES HSL

High Capacity Linear Slot Diffuser

Ordering Specification (Diffuser)

SERIES: Supply/Extract.....HSL Curved.....HSLC	HSL	2	A	5200	2EF	CB	CP	DR	P3	FF	PPC RAL 9010 20% Gloss (Standard Finish)	15
NUMBER OF SLOTS (1 - 2)												
BORDER OPTIONS: Standard.....A Special.....B & P												
SPECIFIED LENGTH (mm) (Length of Arc on type HSLC)												
END FLANGES: 'A' Border Type Only: Standard (x2).....2EF Standard (x1).....1EF 'A' & 'B' Border Types: Mitred Flange (x2).....2MF Mitred Flange (x1).....1MF End Cap (x2).....2EC End Cap (x1).....1EC												
Concealed Bracket Fixing.....CB												
Plasterboard Ceiling Brackets.....CP												
Drill & Rivet Fixing (Not Available with CB or CP Fixings).....DR												
Blanking Plate (P + Number of metres)												
Finish on Blades as Face (Otherwise Matt Black as Standard).....FF												
Finish (Please Specify)												
Number Required												

Fixing

Standard fixing options as listed. Fixings can be mixed and matched on long runs to suit the installation.

Support Brackets.....(SB): Always fitted. Used for units or lengths where no plenum box is fitted.

Concealed Brackets.....(CB): Standard for plenum box fixing

Plaster Ceiling Brackets...(CP): Std fixing for plaster ceiling installations.

Drill & Rivet.....(DR): Alternative to std CB option for plenum fixing.

Blanking Plates

Screw fix matt black blanking plates available for dummy/inactive sections and are fitted to the back of the diffuser. Supplied in modular 150mm lengths.

Finish

Standard finish: Polyester powder coat White RAL 9010 20% gloss with internal vanes matt black.

Special Finishes: Polyester powder finish to stock BS/RAL colour.

Internals: Matt black plastic vanes for all finishes unless face finish option (FF) is specified.



Ordering Specification (Plenum Boxes)

SERIES.....PB/HSL	PB/HSL	2	AT	1500	BH500	BB	PM	ST	DQ 250 Dia	TSO	DQ 250 Dia	15
NUMBER OF SLOTS (1 -2)												
Thermal/Acoustic Insulation: 12mm Pyro (Std).....AT1 25mm Pyro.....AT2 12mm Armaflex.....AT3												
SPECIFIED LENGTH (mm)												
Box Height (Where Different From Standard)												
Matt Black Internals Option: (if Thermal/Acoustic Insulation Not Required).....BB												
Perforated Mesh.....PM												
Fixing Arrangement: Standard.....ST Plaster Ceiling.....PC												
Single Spigot & Damper Options Plus Nominal Spigot Size*: No Damper.....SS+Size Quadrant.....DQ+Size Cord Operated.....DC+Size Teleflex.....DT+Size Iris.....DI+Size												
Twin Spigot Options: Adjacent.....TSA Opposite.....TSO												
Second Spigot & Damper Options Plus Nominal Spigot Size*: No Damper.....SS+Size Quadrant.....DQ+Size Cord Operated.....DC+Size Teleflex.....DT+Size Iris.....DI+Size												
Number Required												

Thermal/Acoustic Insulation (AT1, AT2, and AT3)

Plenum box can be fully lined with 12mm (standard) or 25mm Pyrosorb thermal/acoustic insulation as well as 12mm Armaflex. No insulation lining is available on 1 slot plenums and 25mm thick insulation is not available on 2 slot plenums unless box is stepped out to accept the insulation lining thickness.

Please check with office for dimensional information in these applications.

Perforated Mesh (PM)

Plenum fitted internally with 50% perforated Equalising mesh.

Spigot Options

Plenums can be supplied with either single or twin spigot inlets and mounted on the same, or opposite sides of the box. Each spigot can also be fitted with quadrant, cord, teleflex or iris dampers. Standard sizes use plastic clip in spigot. Non standard, a sealed screw in spigot.

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Ordering Specification (Mitred Corner)

SERIES: Supply / Extract MC/ HSL	MC/ HSL	2	A	80	PPC RAL 9010 20% Gloss (Standard Finish)	15
NUMBER OF SLOTS (1 - 2)						
BORDER OPTIONS: Standard.....A Special.....B & P						
Internal Angle of Mitred Corner (90 Degrees as Standard)						
Finish (Please Specify)						
Number Required						

Note: All mitred corners supplied size 200x200 Internal length
(see illustration on page 5).

Diffuser ordering specification: See Page 12.
Plenum Box ordering Specification: See Page 13

GILBERTS

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