

SERIES MBD

Multi-Blade Linear Diffuser

PUBLICATION

DIFFUSERS 2

MAY 2026



Features

- Singular or continuous designs
- One or two way blow
- Removable core with safety cord
- Options available to match current ceiling designs
- Extruded aluminium construction
- Comprehensive series of matching plenum boxes



GILBERTS

SERIES MBD

Multi-Blade Linear Diffuser

Introduction

Gilberts MBD Series complements existing rectangular and linear diffuser models to provide a continuous Louvre Face option. Combining up to date styling and design technology to blend with modern architecture the MBD maintains excellent air distribution characteristics providing smooth, even horizontal air discharge making the diffuser ideal for fan coil units as well as conventional ceiling diffuser applications.

Suitable for ceiling mounting the MBD is available in standard 100 to 400mm slot widths with both 1 and 2 way discharge patterns.

Manufactured throughout in extruded aluminium single units can be supplied up to 1.2m in one assembly with longer runs supplied in sections and joined, almost invisibly, with a simple alignment feature.

Standard and plank ceiling border details are available to match most popular ceiling designs.

In addition, the MBD is complemented by a comprehensive range of purpose built plenum boxes. Manufactured from galvanised or zinc coated Mild Steel the boxes can be supplied to suit all diffusers in sectional box lengths up to 1200mm. Connection between the boxes and diffusers is accomplished via concealed bracket fixings accessible through the diffuser face.

For installations without plenums, support brackets for drop rod fixings are provided. For volume control standard screwdriver operated opposed blade dampers can be fitted to the back of the diffuser.

Alternatively the plenum inlet can be fitted with Quadrant or Iris type dampers and, where adjustment via the face is preferred, both cord and teleflex operated spigot dampers can be installed.

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- Removable core with safety cord
- Options available to match current ceiling designs
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Performance Data

The performance data gives information for cooling, ventilation and heating applications. The selection charts are based on a 1m length of diffuser complete with a standard plenum box, and mounted flush with a ceiling. The correction notes following and factor tables opposite should be used for other sizes and applications.

- Pressure: All pressures are in Pa (N/m²)
- Throws: All horizontal throws are for a distance measured in metres, and correspond to terminal velocities of 0.25m/s and 0.5m/s.
- Sound: The NC values are based on limited room absorption and for one length of diffuser with damper fully open. Please note that noise level data is only available down to NR20.

HORIZONTAL PROJECTION

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

PLENUM BOXES

Standard Plenum box details are shown on page 7 and are 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 proves possible, then all boxes must be complete with a perforated baffle section.

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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 area volume (m³/s) by the effective length of diffuser and establish a volume per metre run.
4. Establish the throw based on notes in the performance specification. One or two way direction.
5. Refer to selection charts and establish the width of units required to meet your requirements.

EXAMPLE

A 4 metre length of diffuser is to be installed parallel with the external wall of a conditioned space. It is intended to distribute the air in one direction across the ceiling with a throw of 9 m to the opposite wall. The total volume of air supply has been calculated at 0.6m³/s. As the conditioned space is a office at NR level of 30 - 35 has been selected from table 1.

$$\text{Volume per metre required} = \frac{0.6}{4} = 0.15\text{m}^3/\text{s/m}$$

Now with a reference to the selection table for a MBD-1 200mm wide unit with this volume it would throw a distance of approximately 7m to a terminal velocity of 0.25m/s. As the diffuser is over 3 metres in length then the correction of 1.4 must be used which would give a final throw of 7 x 1.4 = 9.8 metres.

As this is close to the required throw and at a lower terminal velocity it can be accepted as if the correction for cooling is applied this would reduce this figure to 9.8 x 0.9 = 8.82m.

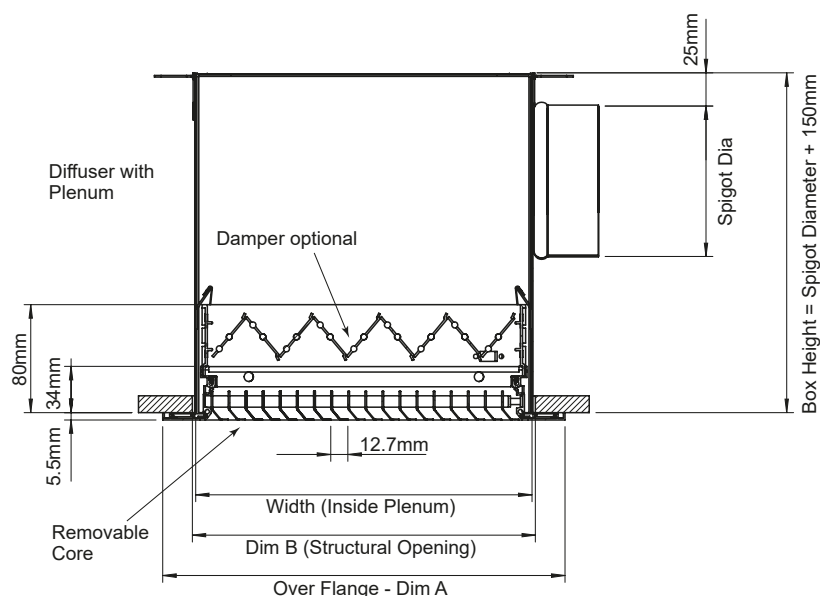
Noise levels have been given as NR30 which is within the required level selected.

Area to be served	Recommended Maximum NC Levels
Sound Broadcasting	15 - 20
Recording Studios, TV (Audience Studios)	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

SERIES MBD

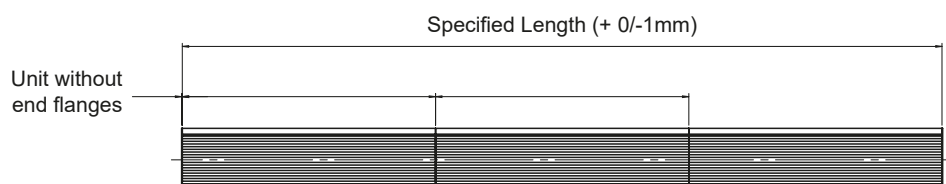
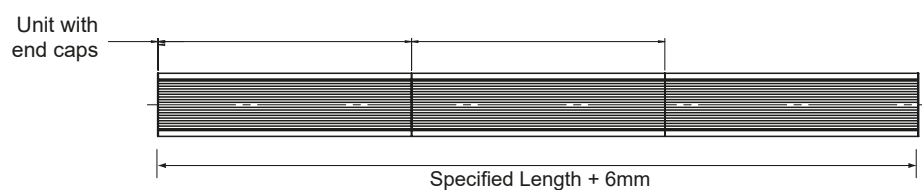
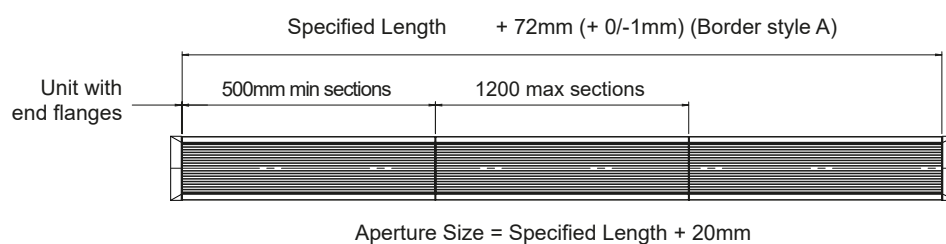
Multi-Blade Linear Diffuser

Type MBD/1
One Way
Discharge



Dimensional Data			
Width	Dim 'A'	Dim 'B'	Total Blades
100	149	105	6
150	199	155	10
200	249	205	14
250	299	255	18
245	294	250	18
300	349	305	22
350	399	355	26
400	449	405	30

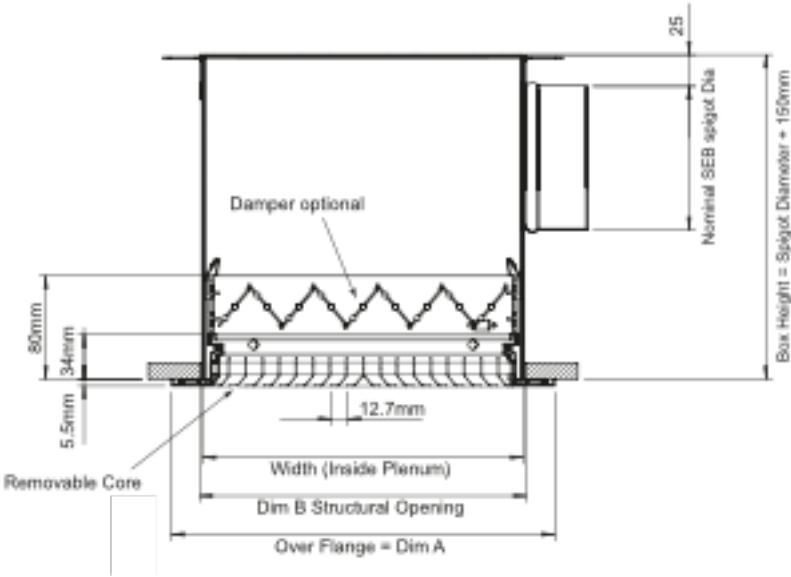
For ceiling tile sizes (module sizes) please refer to the Order Specification page at the back of the catalogue.



SERIES MBD

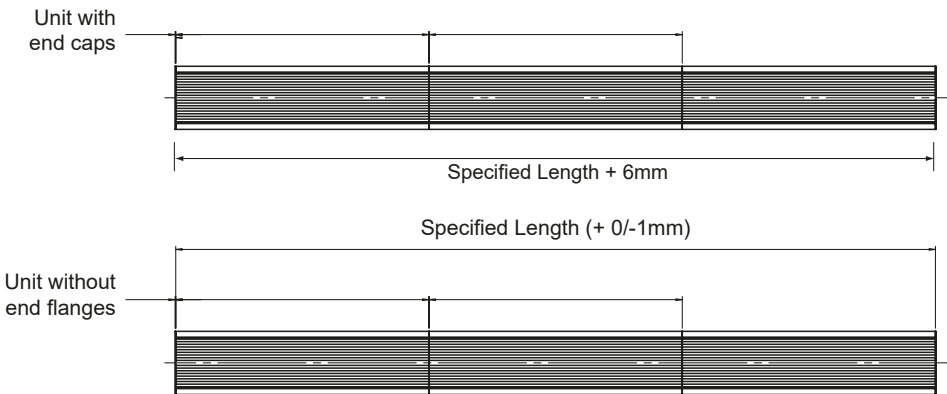
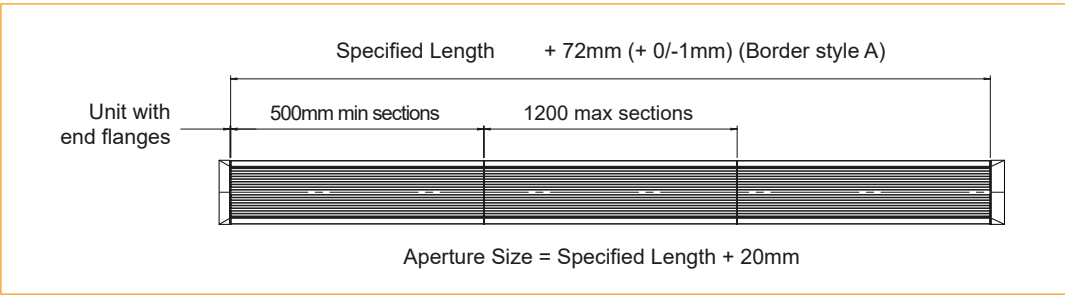
Multi-Blade Linear Diffuser

Type MBD/2
Two Way
Discharge



Dimensional Data			
Width	Dim 'A'	Dim 'B'	Total Blades
100	149	105	6
150	199	155	10
200	249	205	14
250	299	255	18
245	294	250	18
300	349	305	22
350	399	355	26
400	449	405	30

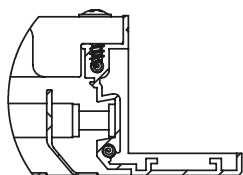
For ceiling tile sizes (module sizes) please refer to the Order Specification page at the back of the catalogue.



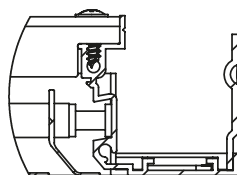
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Multi-Blade Linear Diffuser

Border Options



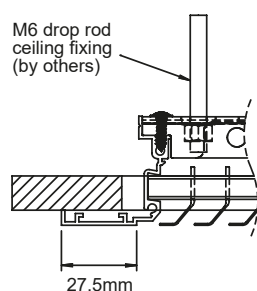
Standard.... Type A



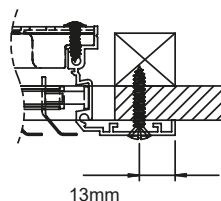
Plank Ceiling.... Type B

Fixing Arrangements

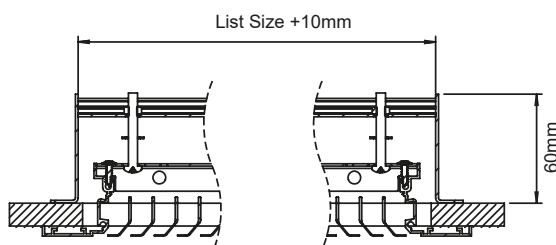
Drop Rod Fixing



Screw Flanged Fixing.... FF

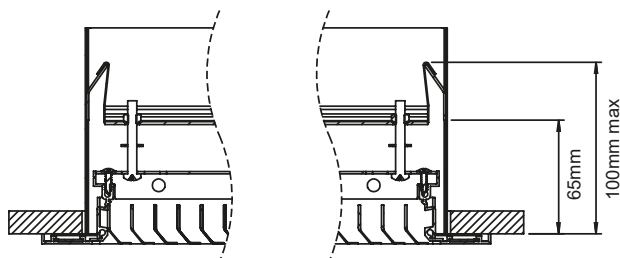


Concealed Leg Bracket Fixing



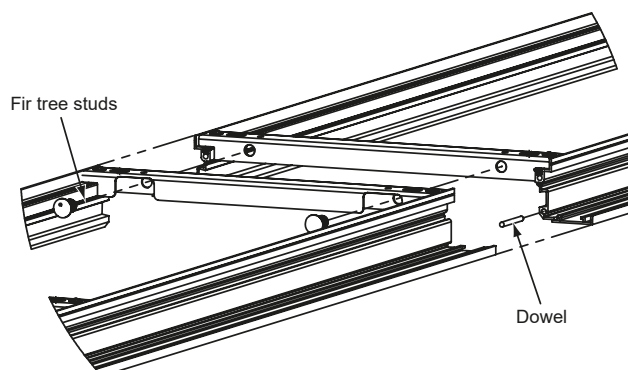
For independent support of slot diffuser
Ref.... LB

Concealed Bracket Fixing



For use in installations where plenum boxes are installed
Ref... CB

Alignment Feature



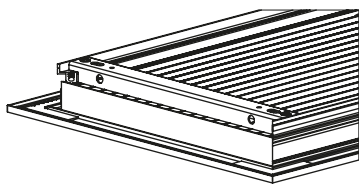
For long continuous runs a concealed alignment feature is provided for positive and accurate joining of diffuser lengths.

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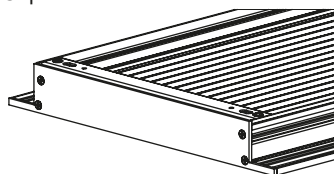
Multi-Blade Linear Diffuser

End Flanges & End Caps

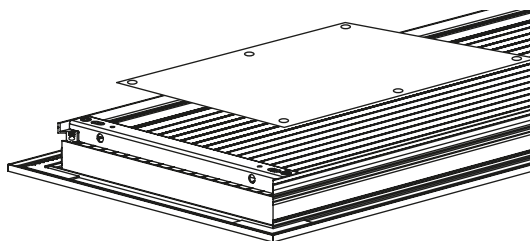
Mitred Ends



End Caps



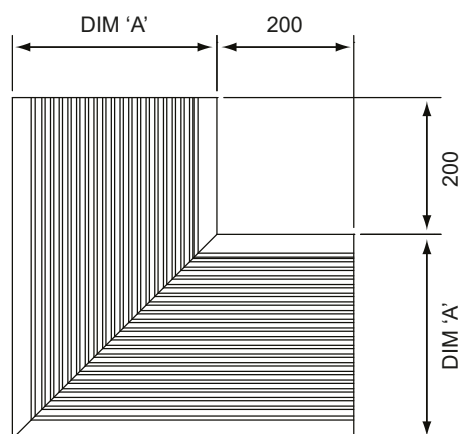
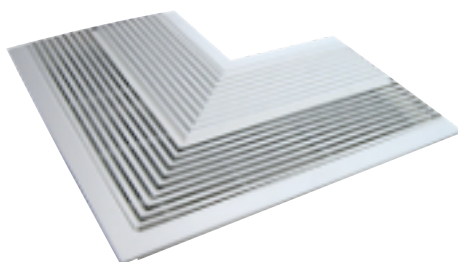
Blanking Plates



For inactive dummy sections, matt black blanking plates can be supplied. Blanking plates simply locate into the back of the diffuser where they can be secured with standard self-tapping screws.

Conventional 90° angle mitred corners available supplied pre-assembled in 200 x 200 section with fixed (not removable) core.

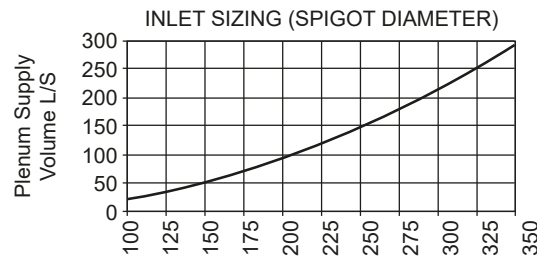
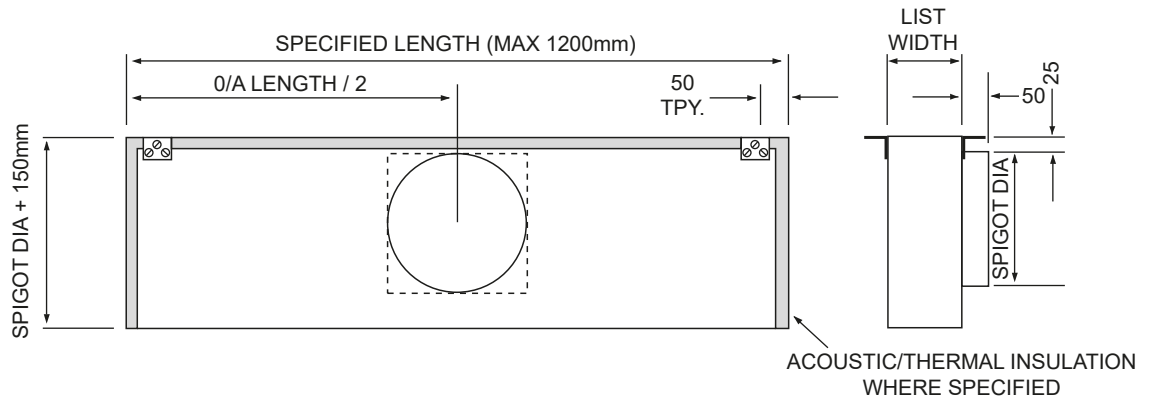
Mitred Corners



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Multi-Blade Linear Diffuser

Plenum Box Series PB



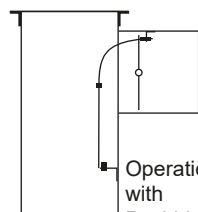
For low noise levels one size larger is recommended

Due to the demanding airflow characteristics of this type of diffuser the plenum internal arrangement will be configured by Gilberts to match each diffuser. Performance problems can occur where Gilberts' plenums are not installed.

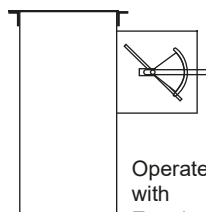
General Specification

- 0.7mm Galvanised or Zintec coated mild steel construction.
- Spigot Construction: Standard sizes use plastic clip-in spigot. Non-standard, a sealed screw-in spigot.
- Plenums include open ends (for continuous runs) closed ends need to be specified.
- Thermal Insulation: 12mm Pyrosorb foam approx. U-value 4.7 Wm⁻² k⁻¹
- Plenum dimensional data provides useful information for installation purposes only and is not suitable for manufacturing detail.

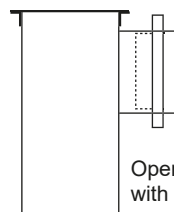
Teleflex Ref DT



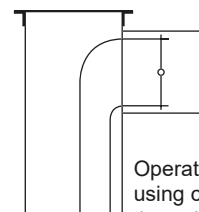
Operation with Pozidrive through Diffuser Face



Operate with Exterior Handle to balance Damper



Operate with exterior Adjustment Nut



Operate using cord through Diffuser Face

Spigot length = Spigot dia.

SERIES MBD

Multi-Blade Linear Diffuser

Performance Chart One Way

TYPE MBD/1							
Width	Terminal Velocity	Pressure	2 Pa	4 Pa	7Pa	9Pa	15Pa
		Neck Velocity	0.5	0.75	1	1.25	1.5
100	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.035 1.2/2.7 24	0.05 2.1/3.8 27	0.07 3.0/5.0 30	0.08 5.0/7.2 32	0.10 7.0/9.5 34
150	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.06 2.0/3.5 24	0.09 3.2/5.0 26	0.12 4.5/6.5 30	0.15 6.0/8.5 32	0.18 7.8/10.5 35
200	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.085 2.8/3.9 25	0.12 4.3/5.9 28	0.17 5.8/8.0 31	0.21 7.0/9.7 33	0.25 8.4/11.5 35
250	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.11 2.9/4.0 25	0.16 4.6/6.4 27	0.22 6.5/8.5 30	0.27 8.0/11.0 34	0.33 9.7/13.0 38
300	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.13 3.0/4.2 26	0.20 5.0/7.0 28	0.27 7.0/9.0 29	0.34 9.0/13.0 32	0.40 11.0/15.0 40
350	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.16 3.6/5.0 27	0.24 5.6/8.0 29	0.32 7.7/11.0 30	0.40 10.0/14.0 34	0.48 12.0/16.0 41
400	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.18 4.2/5.8 29	0.27 6.3/9.0 30	0.37 8.5/12.0 31	0.46 11.0/15.0 35	0.55 13.0/17.0 43

Performance Chart Two Way

TYPE MBD/2							
Width	Terminal Velocity	Pressure	2 Pa	4 Pa	7Pa	9Pa	15Pa
		Neck Velocity	0.5	0.75	1	1.25	1.5
100	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.03 0.8/1.2 24	0.05 1.3/1.8 27	0.07 1.8/2.5 30	0.08 2.3/3.1 32	0.10 2.9/3.8 34
150	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.06 1.1/1.6 24	0.09 1.7/2.2 26	0.12 2.2/3.2 30	0.15 2.9/4.0 32	0.18 3.7/5.0 35
200	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.08 1.4/2.0 25	0.12 2.0/3.0 28	0.17 2.7/4.0 31	0.21 3.6/5.0 33	0.25 4.5/6.0 35
250	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.11 1.6/2.2 25	0.16 2.3/3.3 27	0.22 3.1/4.4 30	0.27 3.9/5.5 34	0.33 4.9/6.8 38
300	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.135 1.8/2.5 26	0.204 2.6/3.6 28	0.27 3.5/4.8 29	0.34 4.3/6.1 32	0.40 5.3/7.4 40
350	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.16 1.9/2.7 27	0.24 2.8/4.0 29	0.32 3.7/5.4 30	0.40 4.9/6.8 34	0.48 6.1/8.2 41
400	0.5/0.25m/s	Volume m³/s/m Throw m Noise NR	0.18 2.1/3.0 29	0.27 3.0/4.5 30	0.37 4.0/6.0 31	0.46 5.5/7.5 35	0.55 7.0/9.0 43

The above tables are based on tests conducted on a 1000mm length of diffuser.
Correction factors should be applied to acoustic and throw data for continuous lengths.
Noise data is expressed in NR figures with a minimum room absorption factor of 8dB.
Throws are based on a terminal velocity of 0.5m/s and 0.25m/s isothermal conditions.

Correction factors for other supply temperatures
Cooling 10° Δt throws x 0.9
Heating 10° Δt throws x 1.15

Correction Factors for Length						
Length	0.9	1.0	1.2	1.5	2.0	3+
Multiple throw by	0.9	1.0	1.1	1.2	1.3	1.4
Add to NR level	-1	0	+1	+2	+3	+4

All data is based on 1 metre long diffuser, isothermal conditions, damper full open and diffuser flush with ceiling. Based on a room height of 2.8 metres.

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

should be used:

- Pressure figures for supply x2
- Noise figures as for supply

Gilberts Supply Diffusers have been tested within the range of +/- 10°C (as recommended in the HEVAC Guide to Air Distribution Technology). For any other temperature differential requirements please contact our Technical Department.

SERIES MBD

Multi-Blade Linear Diffuser

Ordering Specification (Diffusers)

Customer string selection example:

SERIES: MBDS 1 [1 way supply] MBDE 1 [1 way extract] MBDS 2 [2 way supply] MBDE 2 [2 way extract]	MBDS2	B	1127 X 250	PIP 19	2MF	CB	P500	DO	PPC RAL 9010 20% GLOSS (STANDARD FINISH)	15
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BORDER OPTIONS Standard..... A Clip-In Pip..... B	
SPECIFIED LENGTH x WIDTH mm	
PIP HEIGHT mm CLIP-IN UNITS ... PIP + HEIGHT	
END FLANGES (mitred) One End..... MF Both Ends..... 2MF End cap (x2)..... 2EC End cap (x1)..... 1EC	
FIXING Concealed Bracket ..CB Leg Bracket..... LB Flange Screw..... FF	
BLANKING PLATE P + length (mm)	
OPPOSED BLADE DAMPER DO	
FINISH (Please Specify)	
NUMBER REQUIRED	

Ceiling type	Border	Specified length	1200x300 module order specification example
Lay-in	A	Module (tile) size - 78	MBDS2/A/1122x245/9/2MF/CB
Clip-in	B	Module (tile) size - 73	MBDS2/B/1127x250/PIPxx/2MF/CB*
Tegular	Special		Specified by technical/sales team

*Confirm pip location (long or short sides)

Fixing

Support brackets for drop rods are built in as standard. Fixings can be mixed and matched on long runs to suit the installation. Optional fixings as below.

Support Brackets..... Built in. Used for units or lengths where no plenum box is fitted.

Concealed Brackets (CB) Standard for plenum box fixing.

Leg Bracket..... (LB) Alternative to standard CB typically for plasterboard fixing.

Flange Fixed..... (FF) Screw through flange.

Blanking Plates

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

Finish

Standard finish: Polyester powder coat white RAL 9010 20% gloss

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

SERIES MBD

Multi-Blade Linear Diffuser

Ordering Specification (Plenums)

Customer string selection example:

PB/MBD1	1200 X 300	AT1	BH500	PM	BB	DQ 250	TS	DQ 250	15
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SERIES: PB/MBDS 1 (1 way supply) PB/MBDE 1 (1 way extract) PB/MBDS 2 (2 way supply) PB/MBDE 2 (2 way extract)	
SPECIFIED LENGTH X WIDTH mm	
THERMAL / ACOUSTIC: INSULATION (SEB ONLY) 12mm PYRO (Standard)..... AT1 25mm PYRO AT2 12mm CLOSED CELL*..... AT3	
BOX HEIGHT (If Different From Standard)	
PERFORATED MESH PM	
MATT BLACK FINISH (internal & external) (If Thermal / Acoustic Insulation Not Required) BB	
SPIGOT & DAMPER OPTIONS: No Damper..... SS + Size Quadrant..... DQ + Size Cord Operated..... DC + Size Teleflex..... DT + Size Iris..... DI + Size	
TWIN SPIGOT OPTIONS: SAME SIDE TSS OPPOSITE..... TSO	
2nd SPIGOT & DAMPER OPTIONS: See Spigot & Damper Options	
NUMBER REQUIRED	

Plenum Ends

All plenums include cut outs at each end of the Box to allow units to be placed over diffusers in continuous runs. To reduce leakage on single units or at the ends of long runs, plenums are provided with end plates. These ends are push fit and so can be removed, or swapped to suit handing where necessary.

Perforated Mesh

Plenum fitted internally with 50% perforated Equalising mesh.

Exposed Plenums

Please advise where plenums are exposed. **Galvalike®** is the default finish for exposed plenum boxes. A unique powder coated finish formulated to best match British galvanised material, whilst protecting the products from finish variation and moisture damage etc. Plenums may also be powder coated to suit grille/diffuser finish. For alternative plenum finishes, please contact head office.

Spigot Options

Plenums can be supplied with either single or twin 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.

Plenum Design

Due to the demanding airflow characteristics of this type of diffuser the plenum internal arrangement will be configured by Gilberts to match each diffuser. Performance problems can occur where Gilberts plenums are not installed.

Plenums are normally required for all diffusers and are only unnecessary for bulkhead applications.

Thermal/Acoustic Insulation [AT1, AT2 and AT3]

Plenum box can be fully lined with 12mm [standard] or 25mm Pyrosorb thermal/acoustic insulation. Alternatively 12mm closed cell* can also be specified.

*Class '0' fire-rated, closed cell, elastomeric PVC nitrile foam.

GILBERTS

Head Office and Works

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