SERIES GD

Square and Circular Fixed Swirl Diffusers

PUBLICATION
DIFFUSERS 18
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Features

- Distinctive architecturally appealing designs
- Two swirl pattern options
- Border styles compatible with modern ceiling designs
- Circular or square face formats
- Cost effective design & construction

GILBERTS

SERIES GD

Square and Circular Fixed Swirl Diffusers

Introduction

Series GD provides a new extra dimension on the popular and effective swirl diffuser theme. Complimenting Gilberts existing swirl diffuser range the new GD series has been introduced to provide a wider range of architectural and design style swirl options which combine appealing aesthetics with cost effective design. Primarily the diffuser offers the choice of either a square or circular face plate design but there is then a choice of two different radial blade pattern configurations. Each configuration provides a high performance swirl air distribution effect which allows them to deliver high volumes of air into the conditioned space taking advantage of its rapid entrainment and mixing capabilities.

Series Options

Square Face

Series GDS A Swirl diffuser with 32mm flange border suitable for plaster ceiling applications with a choice of two different swirl face style

Series GDS-B Swirl diffuser with clip in border edge detail with a choice of two different swirl face style

Series GDS-C Swirl diffuser with borderless frame suitable for lay- in ceiling grid application with a choice of two different swirl face style

Series GDS-D Swirl diffuser with step flange border frame suitable for tegular ceiling grids with a choice of two different swirl face style

Circular Face

Series GDC-A Circular swirl diffuser with flange border suitable for plaster ceiling or exposed ductwork with a choice of two different swirl face style

Pattern Options

Pattern 1

Pattern 2

All units are fabricated from mild steel and are available with a matching range of top and side entry plenum boxes. Volume control can be achieved using Quadrant flap type or Iris Dampers on the plenum inlet spigots.
There are four Swirl diffuser List Sizes including 250, 315, 500 and 600mm diameters. All four swirl sizes are available in both square and circular faceplate configurations with square designs also including additional border styles to suit popular ceiling grid designs. Standard fixing uses a central screw into a secondary bracket within the plenum box. Special 'CB' fixing for installations without plenum are also available. Standard diffuser finish is Polyester Powder White. Other colours available on request.

Selection Procedure

The following selection procedure is to be used within areas of ceiling heights from 2.5 to 4 m and is based on an evenly distributed layout of diffusers.

1. Try if possible to construct in plan an imaginary square ceiling grid. This will enable the Designer to position each diffuser at each square centre so that the distribution is even in all directions.
2. The total volume of air should then be divided by the number of outlets and the volume per diffuser established.
3. The performance chart should then be used to select the size and type of diffuser based upon the volume and throw requirements. For high ceiling applications an over-blow situation can be acceptable.
4. Check pressure loss, NC levels from design chart to conform acceptability.

EXAMPLE:

Take an 8 x 12 m open plan office area with a total required volume to be supplied of 1.2 m3/s. Divide this area up into 6 equal spaced segments, each measuring 4 x 4 m, and position a diffuser in the centre of these imaginary grids. If we divide the total volume by 6, then this will equate to 200 l/s per diffuser. From the chart for a size 600 in a horizontal distribution, we can select a unit handling 200 l/s which gives a noise level of NC30, and a static pressure drop of 12 Pa. Throw in isothermal conditions of between 1.4 and 2 m, which is very similar whether in a heating or cooling mode. This should be an acceptable selection for this area.

Performance Data

The performance tables that are illustrated in the brochure give tabulated performance for each listed size of diffuser, together with their design. The figures given relate to cooling, ventilation and heating applications and are given for a horizontal distribution.

The performance data for all Gilberts products is derived using a Gilberts plenum design and specification. Performance cannot be guaranteed where alternative plenum designs are used

References Used

Pressure: All pressures are given in Pa (Newton per m2).

Throw: The horizontal distances are given for both 0.5 and 0.25 m/s terminal velocities and are based upon ceiling effect for horizontal distribution.

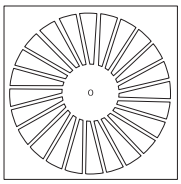
Sound: The NC values are peak values on the NC curves.

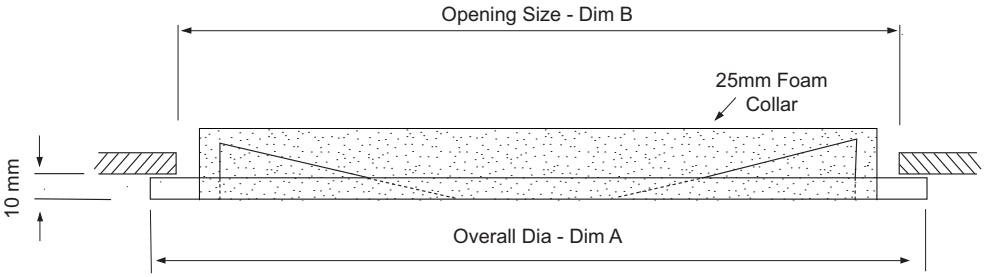
Type GDS-A

SQUARE FRAME ONLY

Diffuser

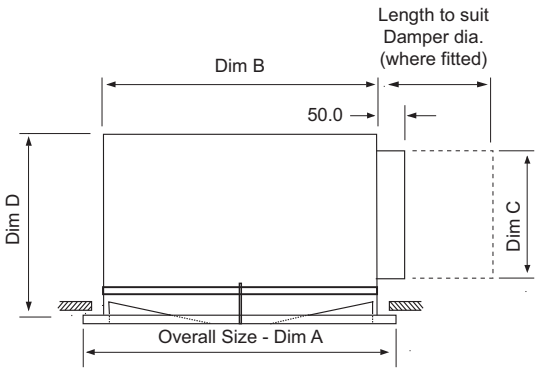
Type GDS-A (square)



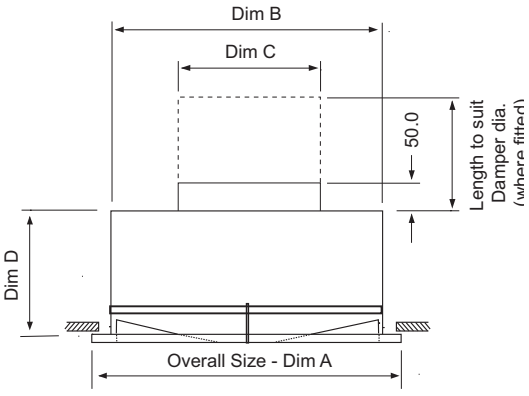


LIST SIZE (swirl diameter)	OVERALL SIZE A	B
250, 315 or 500	523	500
250, 315, 500 or 600	623	600

Diffuser with Side Entry



Diffuser with Top Entry



Side Entry

LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C	D
250, 315 or 500	523	452	250	350
250, 315, 500 or 600	623	552	315	415

Top Entry

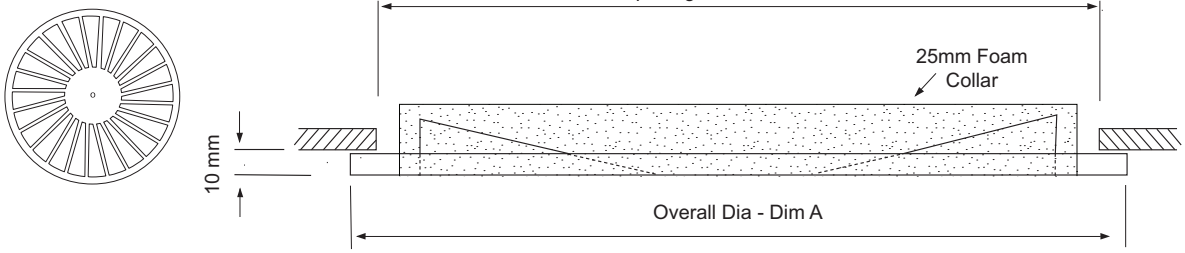
LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C	D
250, 315 or 500	523	452	250	250
250, 315, 500 or 600	623	552	315	250

Type GDC-A

CIRCULAR FRAME ONLY

Diffuser

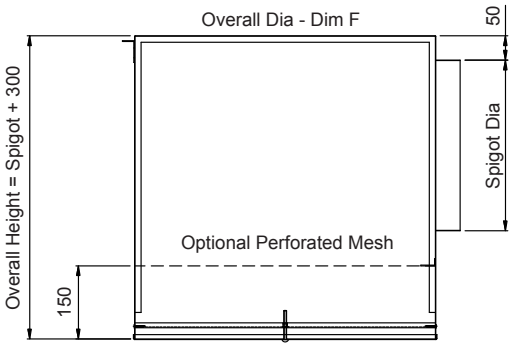
Type GDC-A (circular)



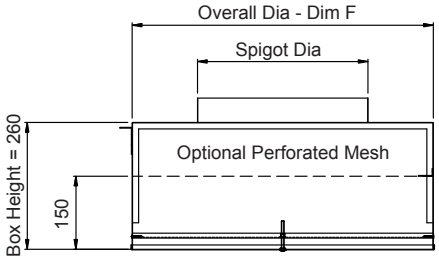
LIST SIZE (swirl diameter)	OVERALL SIZE A
250	323, 423, 623, 723
315	423, 623, 723

LIST SIZE (swirl diameter)	OVERALL SIZE A
500	623, 723
600	723

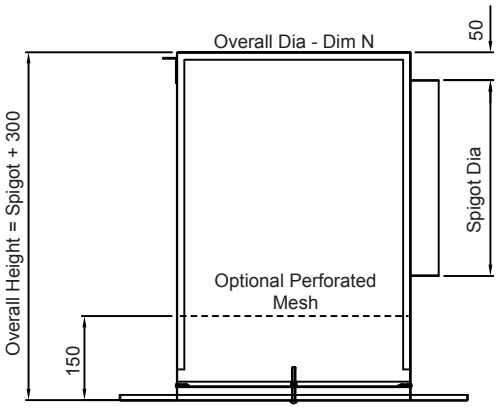
Diffuser with Side Entry

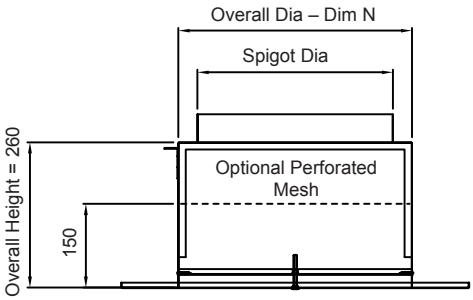


Diffuser with Top Entry



Box Fixed at Flange....Ref: FLN (exposed applications only)





Box Fixed at Neck... Ref: NEK

Diffuser Type	List Size (o/a size)	Dim 'F'	Dim 'N'
GDC-A	600 (723)	718	648
	500 (623)	618	548
	500 (723)	718	548

List Size (o/a size)	Dim 'F'	Dim 'N'
315 (423)	418	363
315 (623)	618	363
315 (723)	718	363
250 (323)	318	298
250 (423)	418	298
250 (623)	618	298
250 (723)	718	298

Plenums for GDC-A are circular not square

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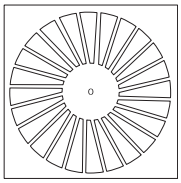
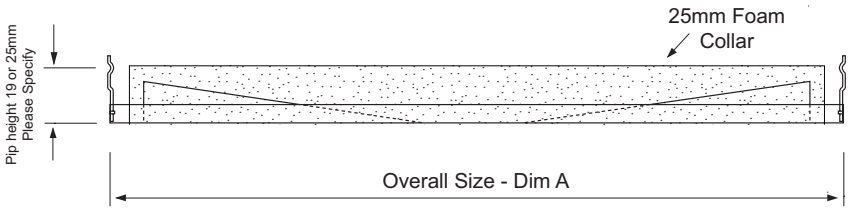
Square and Circular Fixed Swirl Diffusers

Type GDS-B

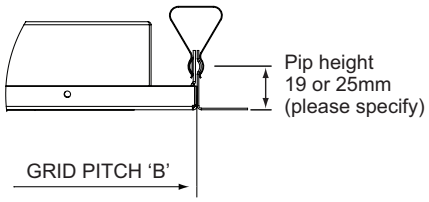
SQUARE FRAME ONLY

Diffuser

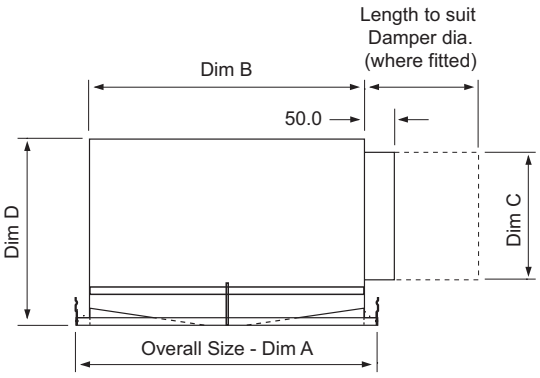




LIST SIZE (swirl diameter)	OVERALL SIZE A	B
250, 315 or 500	499	500
250, 315, 500 or 600	599	600

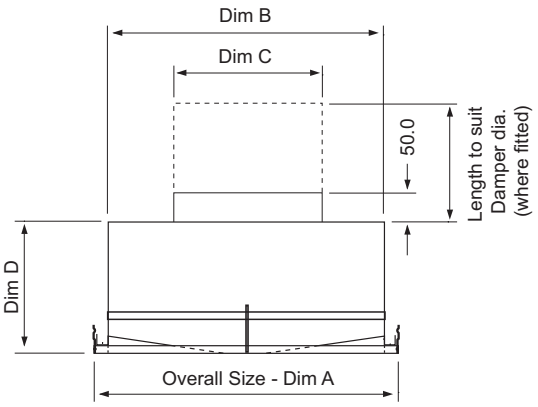


Diffuser with Side Entry



LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C	D
250, 315 or 500	499	452	250	350
250, 315, 500 or 600	599	552	315	415

Diffuser with Top Entry

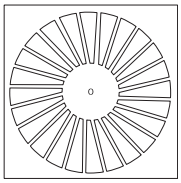


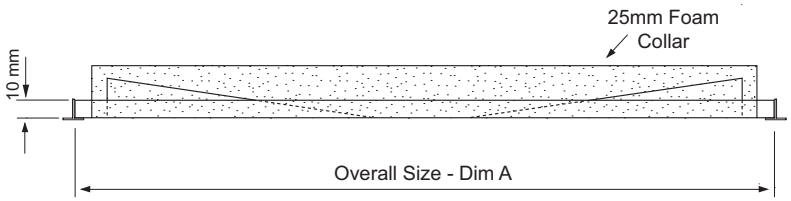
LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C	D
250, 315 or 500	499	452	250	250
250, 315, 500 or 600	599	552	315	250

Type GDS-C

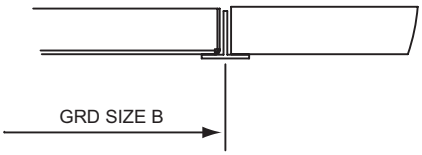
SQUARE FRAME ONLY

Diffuser

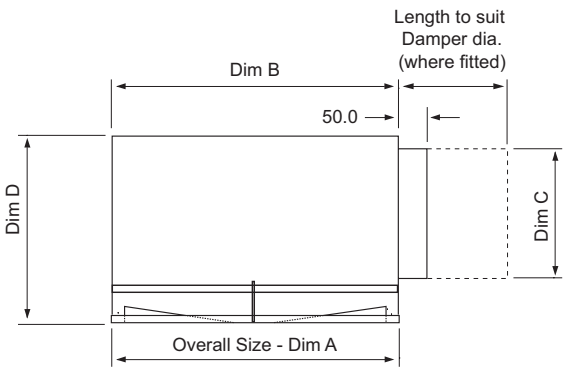




LIST SIZE (swirl diameter)	OVERALL SIZE A	B
250, 315 or 500	494	500
250, 315, 500 or 600	594	600

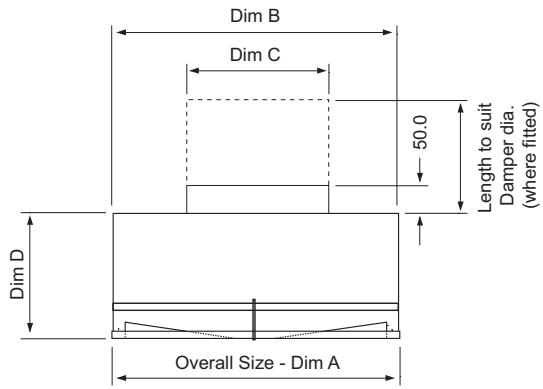


Diffuser with Side Entry



LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C	D
250, 315 or 500	494	452	250	350
250, 315, 500 or 600	594	552	315	415

Diffuser with Top Entry

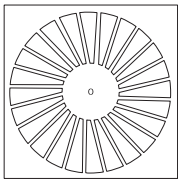


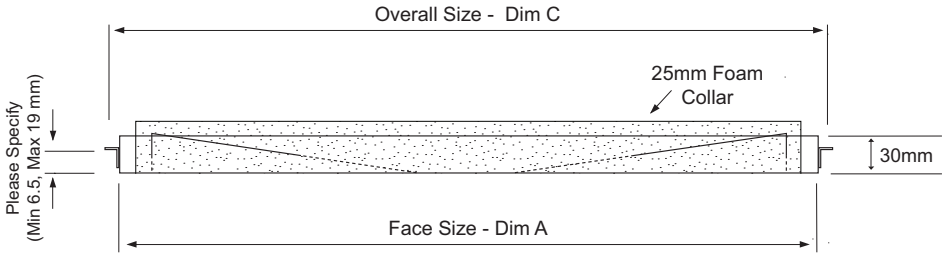
LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C	D
250, 315 or 500	494	452	250	250
250, 315, 500 or 600	594	552	315	250

Type GDS-D

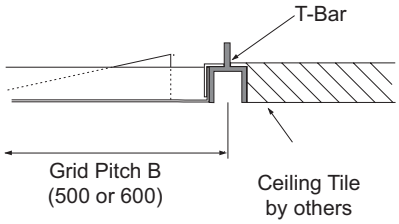
SQUARE FRAME ONLY

Diffuser

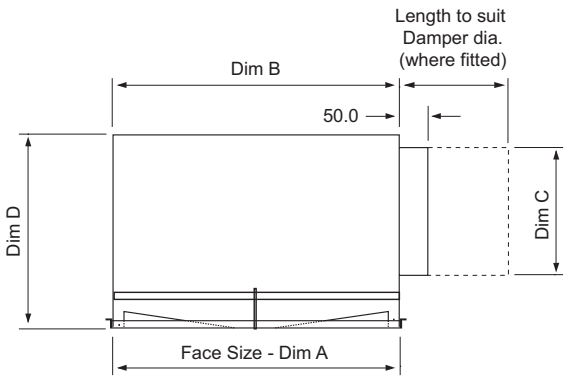




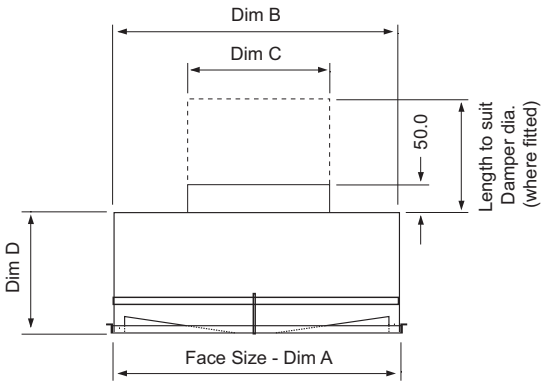
LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C
250, 315 or 500	474	500	484
	484		494
250, 315, 500 or 600	574	600	584
	584		594



Diffuser with Side Entry



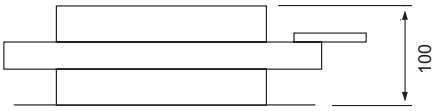
Diffuser with Top Entry



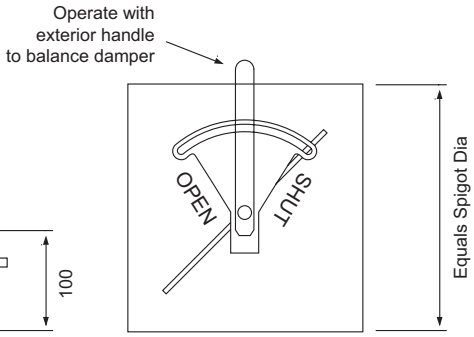
LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C	D
250, 315 or 500	474	452	250	350
	484			
250, 315, 500 or 600	574	552	315	415
	584			

LIST SIZE (swirl diameter)	OVERALL SIZE A	B	C	D
250, 315 or 500	474	452	250	250
	484			
250, 315, 500 or 600	574	552	315	250
	584			

Volume Control Options



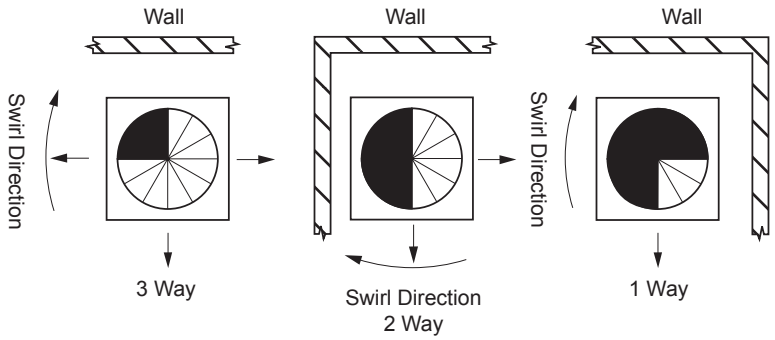
REF: DI
Iris Damper



REF: DQ
Quadrant Damper

Air Distribution Pattern

Although the discharge pattern for all swirl diffusers is omni directional, 2 way and 3 way distribution patterns can be achieved where necessary by factory fitted blanking plates in the positions illustrated.



Shaded area indicates closed blade positions to give best air flow pattern.

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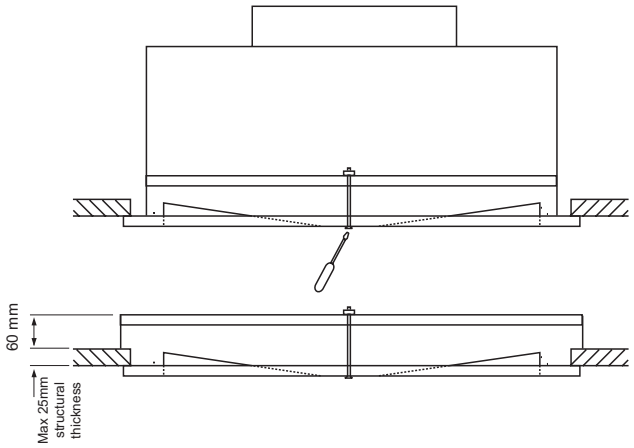
Square and Circular Fixed Swirl Diffusers

Fixing

STANDARD (WITH PLENUM)
All units are fixed to the plenum using a central screw that drives into a secondary bracket in the plenum box neck. The exposed screw head is finished to match the diffuser face to maintain aesthetics.

Sealing plenum to diffuser by others (if required)

SPECIAL (WITHOUT PLENUM)
For plasterboard ceiling applications without plenum box we can provide LB type fixing which again screws through face of diffuser into a secondary support bracket.
Please take care not to overtighen.



Sizing Data

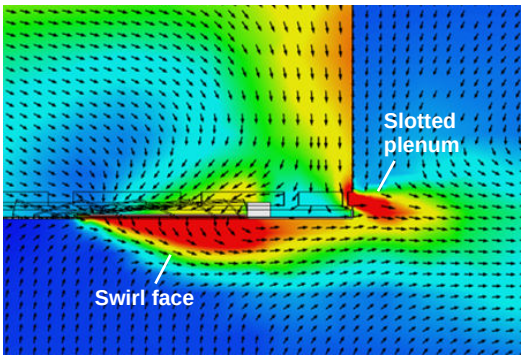
AIR VOLUME 250 SIZE (l/s)			20	30	40	50
AIR VOLUME 315 SIZE (l/s)			40	60	80	100
AIR VOLUME 500 SIZE (l/s)			70	100	140	170
AIR VOLUME 600 SIZE (l/s)			100	150	200	250
FACE STYLE 1		NOISE NC	20	25	30	35
		PRESSURE Pa	5	10	17	25
FACE STYLE 2		NC	20	25	35	40
		Pa	7	13	29	46
	THROW	At + 10K	0.9/1.5	1.2/1.9	1.6/2.3	1.9/2.6
		At + 5K	0.8/1.4	1.1/1.8	1.5/2.2	1.8/2.5
		ISOTHERMAL	0.7/1.2	1.0/1.6	1.4/2.0	1.7/2.3
		At - 5K	0.6/1.0	0.9/1.5	1.3/1.9	1.6/2.2
		At - 10K	0.5/0.9	0.8/1.4	1.2/1.8	1.5/2.1

For extract, multiply Pa by x2 or increase duct size and multiply by x1.3.

GDC-A High Capacity Plenum

GDC-A slotted plenum

The GDC-A flange fix (FLN) offers a performance enhancing high-capacity plenum. Incorporating 12mm x 100mm slots adjacent to the swirl face provides a significant increase in air volume coupled with improved Coanda effect. See CFD detail below:



CFD velocity section through

Sizing Data

AIR VOLUME 500 SIZE (l/s) FLANGE FIX (FLN)			100	140	185	230
AIR VOLUME 600 SIZE (l/s) FLANGE FIX (FLN)			150	200	260	320
FACE STYLE 1		NOISE NC	20	25	30	35
		PRESSURE Pa	3	7	14	25
FACE STYLE 2		NC	20	25	35	40
		Pa	7	13	24	37
	THROW	At + 10K	1.2/1.9	1.6/2.3	1.9/2.6	2.4/3.3
		At + 5K	1.1/1.8	1.5/2.2	1.8/2.5	2.3/3.1
		ISOTHERMAL	1.0/1.6	1.4/2.0	1.7/2.3	2.1/2.9
		At - 5K	0.9/1.5	1.3/1.9	1.6/2.2	1.9/2.7
		At - 10K	0.8/1.4	1.2/1.8	1.5/2.1	1.8/2.5

For extract, multiply Pa by x2 or increase duct size and multiply by x1.3.

Please note - when ordering, use code HCP to specify the slotted plenum option. This is only available with the flange fix (FLN) option. When directional blanking is used in conjunction with high-capacity plenums, some air discharge may still occur from the plenum slots in the direction of the blanking. In this configuration, performance data may be difficult to determine accurately.

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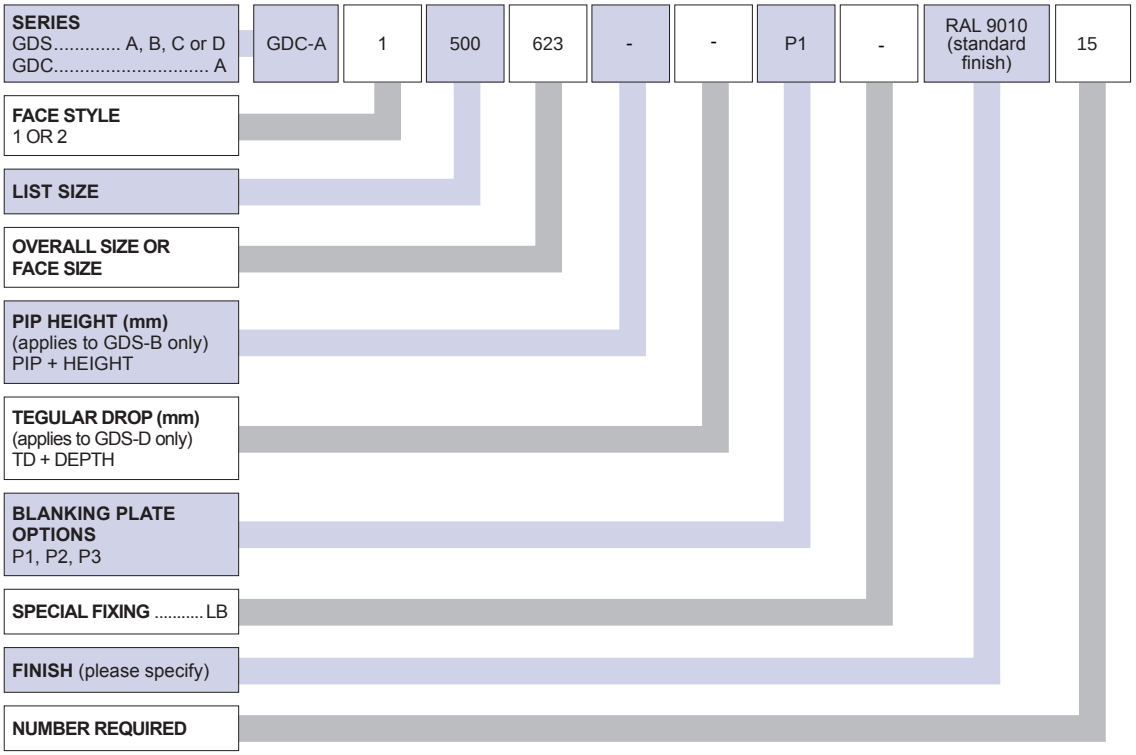
Square and Circular Fixed Swirl Diffusers

Ordering Specification (Diffuser)



Finish

Standard Finish:
Polyester Powder Coat White RAL 9010 20% Gloss.
Special Finishes:
PPC to Stock BS or RAL colour.

Suspended Ceilings

All items installed into suspended ceilings must be supported independently of the grid. Any feature offered to suit ceiling type, is for alignment purposes only.

Fixing

All units are fixed to the plenum using a central screw that drives into a secondary bracket in the plenum box neck. The exposed screw head is finished to match the diffuser face to maintain aesthetics.
For plasterboard ceilings without Plenum the 'LB' special fixing option can be specified.

Size Range

Available in four standard List Sizes (Swirl Dia) of 250, 315, 500, or 600 Dia.

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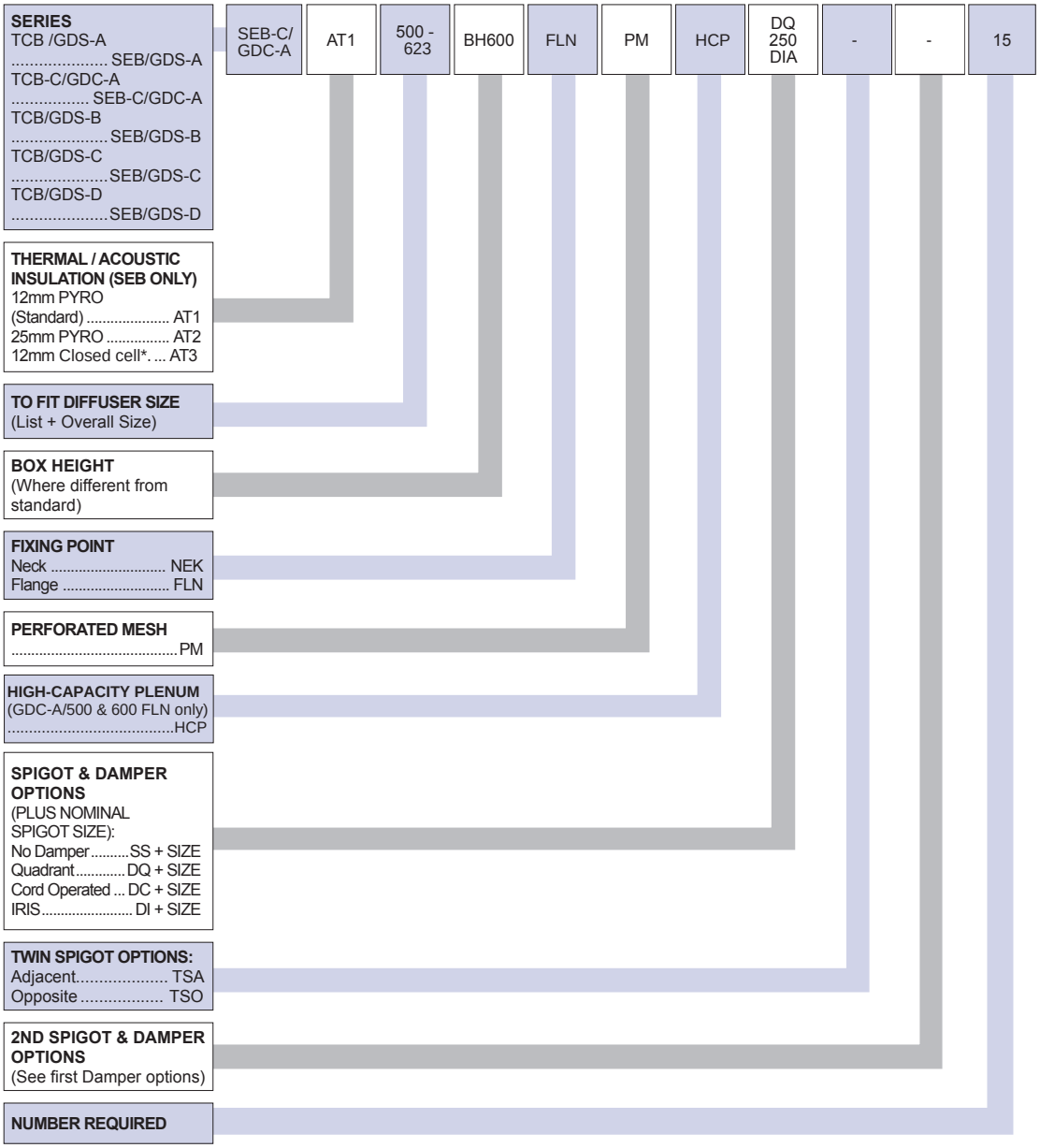
Square and Circular Fixed Swirl Diffusers

Ordering Specification (Plenum)



Fixing Point (circular plenums)

NEK - narrow plenum for ceiling mounted applications.
FLN - wider plenum for exposed applications.

Exposed Plenums

Please advise where plenums are exposed. **Galvalike®** is the defaultfinish 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.

Thermal/Acoustic Insulation [AT1, AT2,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
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