

# SERIES GSR

## Fixed and Adjustable Swirl Diffusers

PATENTED

PUBLICATION

DIFFUSERS 13

APRIL 2009



### Features

- Omni directional, swirl effect discharge.
- Horizontal or vertical projection.
- High induction effect.
- Slotted face design.
- Standard or clip-in ceiling border options.
- Suitable for high room air change rates.



# GILBERTS



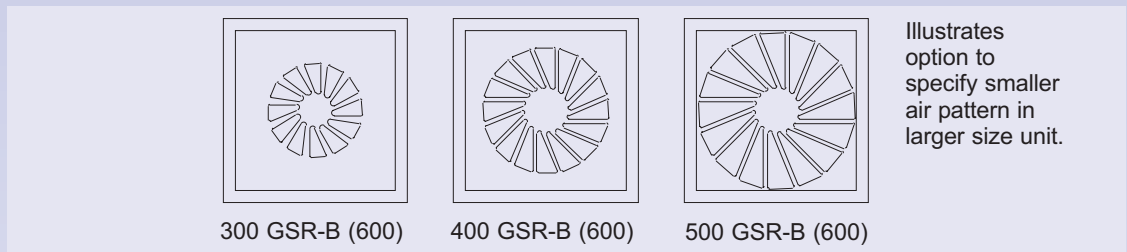
# SERIES GSR

## Introduction

Gilberts GSR Series presents a further new design concept on the popular and effective swirl type diffuser theme. Using a modern and stylish slotted rotary face design the GSR provides either a fixed pattern swirl diffuser with horizontal projection or an adjustable pattern swirl diffuser that offers both horizontal or vertical projection whilst retaining a low depth profile that is useful in restricted ceiling voids. The circular pattern of radial vanes concealed behind the fascia provide the swirl air distribution, allowing the unit to deliver high volumes of air into the conditioned space taking advantage of its rapid entrainment and intermixing capabilities.

As a result the unit can deliver significantly higher air change rate as compared to conventional diffusers. Both the GSR adjustable and GSRF fixed model share an identical visual appearance so for standard

horizontal throw applications the fixed GSRF model, with its lower manufacturing cost, is the recommended solution. Where vertical air projection is required, the GSR model should be selected. GSR units are set, as standard, for horizontal distribution and adjustment to the vertical position (adjustable units only) is achieved manually by pushing each vane individually inwards towards the centre, which unlocks the blade and allows it to rotate up into its vertical set position. In keeping with modern ceiling design the unit is also available in 4 different frame format options, allowing it to integrate cleanly with most available lay-in and clip-in ceiling arrangements. As illustrated below, this design of diffuser also allows the selection of smaller swirl patterns within larger outer frames for either performance or aesthetic reasons.



## Range

**THE GSR SWIRL** range comprises of a fixed (GSRF) or adjustable (GSR) swirl diffuser with the following border types:

- TYPE GSRF-A & GSR-A:** Standard fixed or adjustable swirl diffuser with 32mm flange border suitable for both lay-in and, with rear access, plaster ceiling installations.
- TYPE GSRF-B & GSR-B:** Fixed or Adjustable swirl diffuser with clip-in ceiling edge.
- TYPE GSRF-C & GSR-C:** Fixed or Adjustable swirl diffuser with concealed border frame ideally suited to lay-in ceiling grid application.
- TYPE GSRF-D & GSR-D:** Fixed or Adjustable swirl diffuser with step edge border frame suitable for Tegular ceiling grid applications

All units are fabricated from a combination of aluminium and steel components 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. Swirl diffuser sizes include a 300, 400 and 500 dia list size

with numerous overall size configurations. Standard diffuser finish is Polyester Powder White with matt black internals though internals can be finished to match the face upon request. Other colours and finish types available on request.

## Performance Data

The performance tables that are illustrated in this brochure give tabulated performance data for each listed size of diffuser, together with their design. The figures given relate to Cooling, Ventilation and heating applications and are given for both horizontal and vertical distribution of conditioned air.

### References used

**Pressure:** All pressures are in Pa (N/m<sup>2</sup>)

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

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

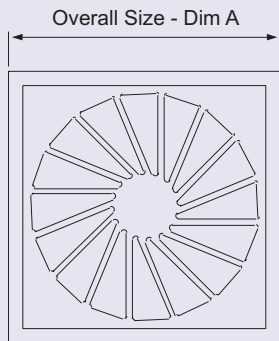
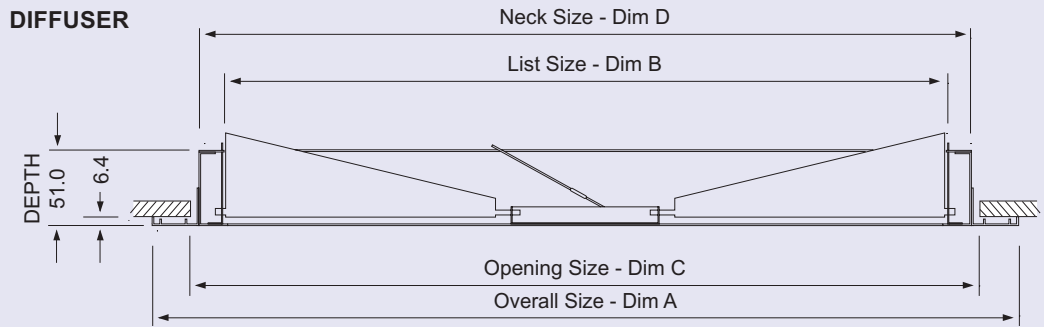
## Selection Procedure

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 distribution is even in all directions.
2. The total volume of air is then divided by the number of outlets and a volume per diffuser is established.
3. The performance charts should then be used to select the size and type of diffuser based upon volume and throw requirements. For high ceiling applications an overblow situation can be acceptable.
4. Check pressure loss and NC levels from design chart to confirm acceptability.



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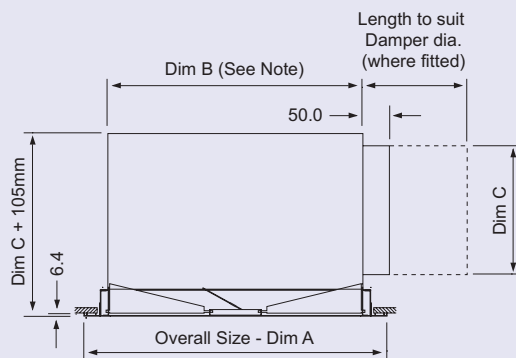
## Dimensional Details GSRF-A (Fixed) GSR-A (Adj)



SIZE	A	B	C	D
300	394	300	342	331
	494		442	431
	594		542	531
400	494	400	442	431
	594		542	531
500	594	500	542	531

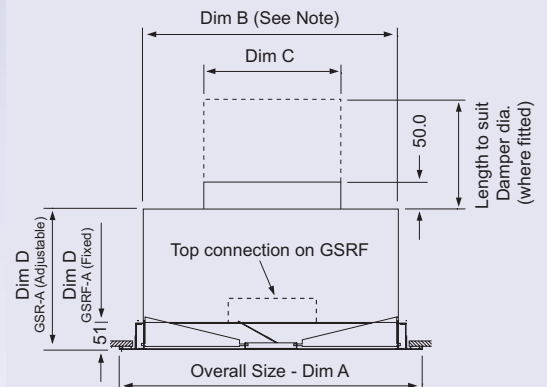
Size 400 suits 500 Sq ceiling grid  
Size 500 suits 600 Sq ceiling grid

### DIFFUSER WITH SIDE ENTRY



SIZE	A	B	C
300	394	302	250
	494	402	
	594	502	
400	494	402	300
	594	502	
500	594	502	350

### DIFFUSER WITH TOP CONNECTION



SIZE	A	B	C	D	
				(GSR/A)	(GSRF/A)
300	394	302	250	150	51
				200	51
				250	51
400	494	402	300	200	51
				250	51
500	594	502	350	250	51

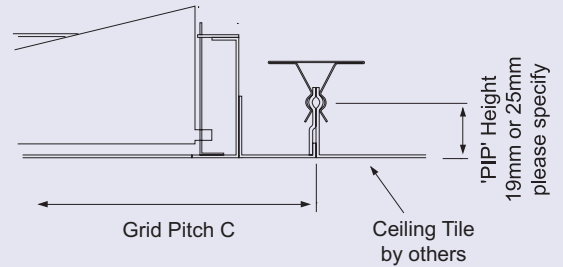
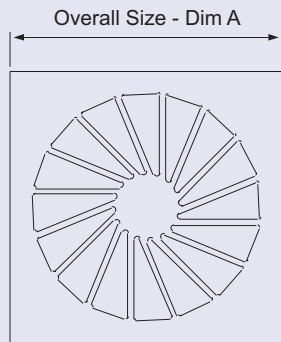
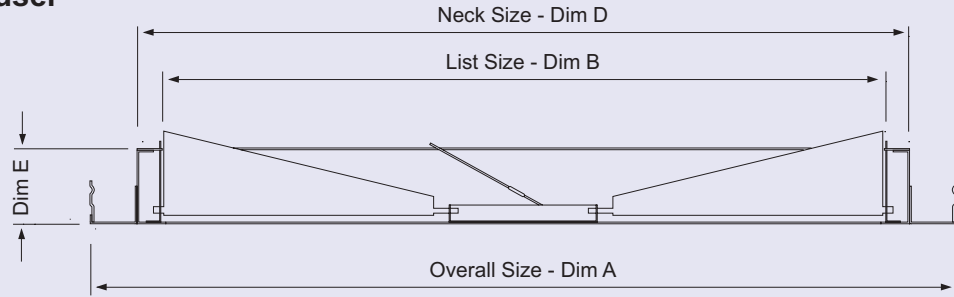
Dim B = Inside box size. Outside box size will be 50mm larger in one dimension due to its construction.



# SERIES GSR

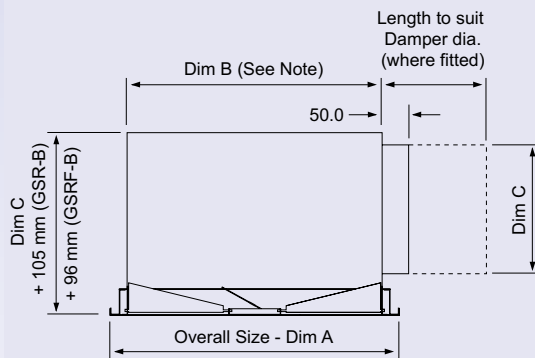
## Dimensional Details GSRF-B (Fixed) GSR-B (Adj)

### Diffuser



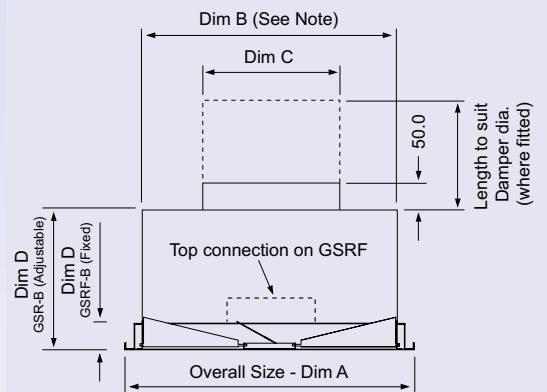
SIZE	A	B	C	D (GSR/B)	D (GSRF/B)	E (GSR/B)	E (GSRF/B)
300	499	300	500	445	468	51	42
	599		600	545	568		
400	499	400	500	445	468	51	42
	599		600	545	568		
500	599	500	600	545	568	51	54

### Diffuser with Side Entry



SIZE	A	B	C
300	499	402	250
	599	502	
400	499	402	300
	599	502	
500	599	502	350

### Diffuser With Top Connection



SIZE	A	B	C	D (GSR/B)	D (GSRF/B)
300	499	402	250	150	42
	599	502			
400	499	402	300	200	42
	599	502			
500	599	502	350	250	54

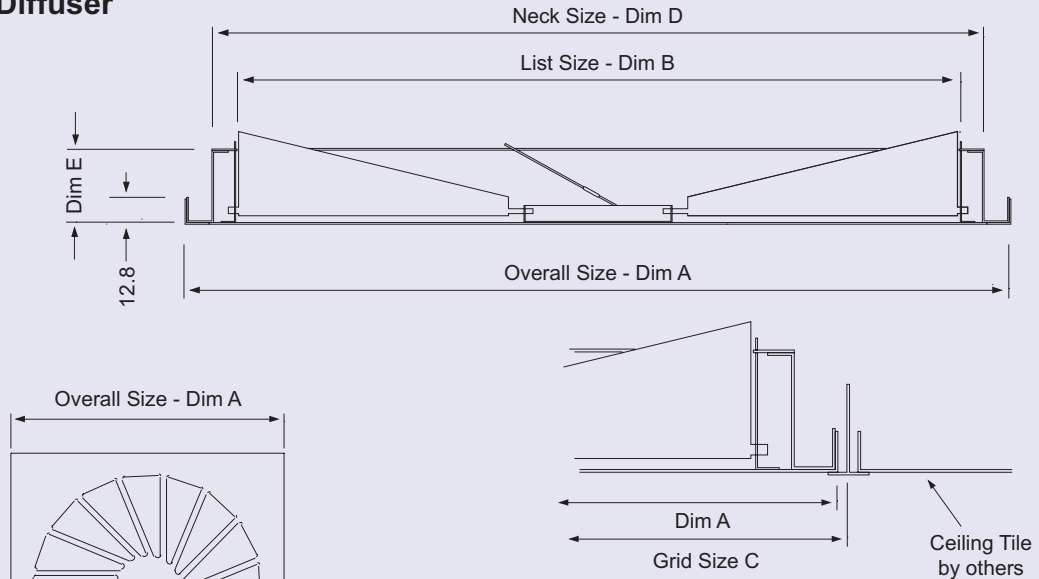
Dim B = Inside box size. Outside box size will be 50mm larger in one dimension due to its construction.



# SERIES GSR

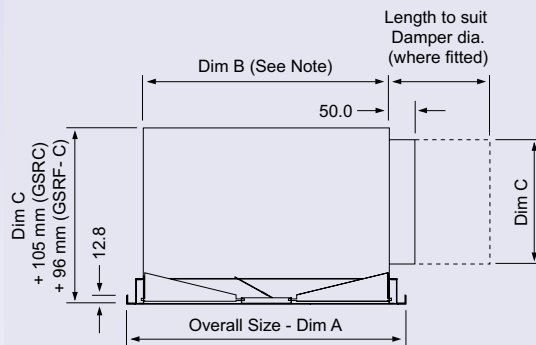
## Dimensional Details GSRF-C (Fixed) GSR-C (Adj)

### Diffuser



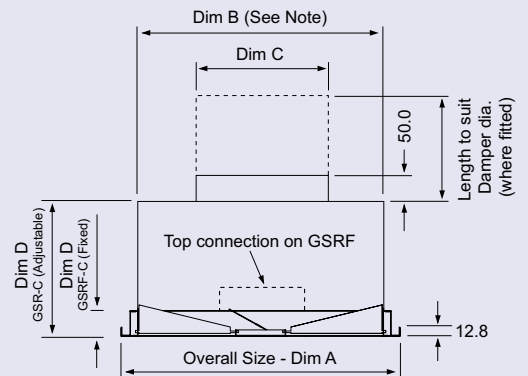
SIZE	A	B	C	D (GSR/C)	D (GSRF/C)	E (GSR/C)	E (GSRF/C)
300	494	300	500	445	488	51	42
	594		600	545	588		
400	494	400	500	445	488	51	42
	594		600	545	588		
500	594	500	600	545	588	51	52

### Diffuser with Side Entry



SIZE	A	B	C
300	494	402	250
	594	502	
400	494	402	300
	594	502	
500	594	502	350

### Diffuser With Top Connection



SIZE	A	B	C	D (GSR/C)	D (GSRF/C)
300	494	402	250	150	42
	594	502			
400	494	402	300	200	42
	594	502			
500	594	502	350	250	52

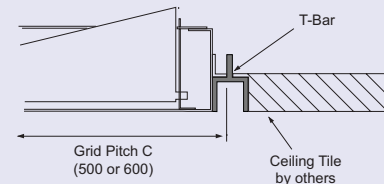
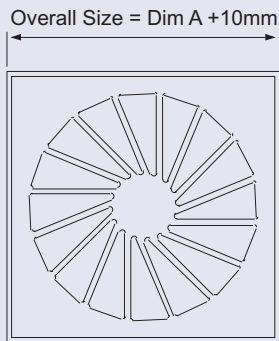
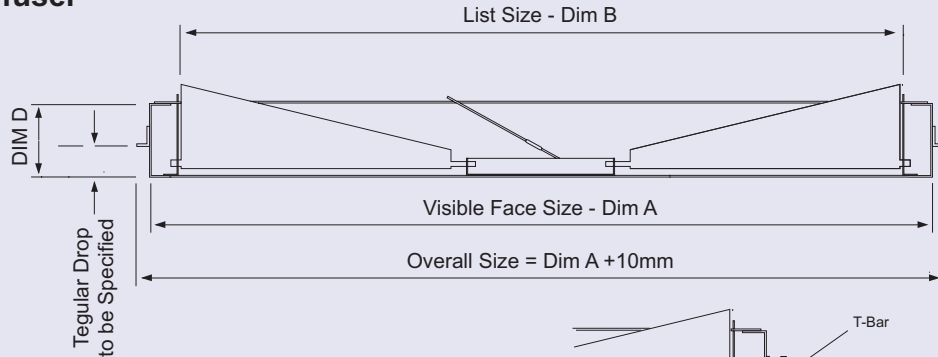
Dim B = Inside box size. Outside box size will be 50mm larger in one dimension due to its construction.



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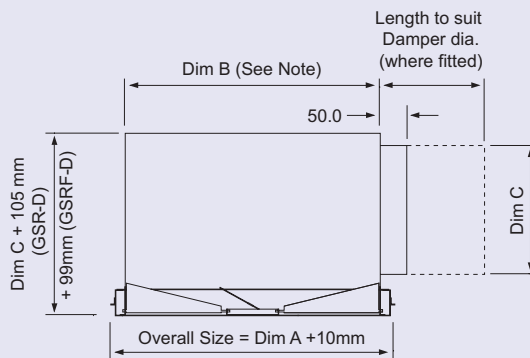
## Dimensional Details GSRF-D (Fixed) GSR-D (Adj)

### Diffuser



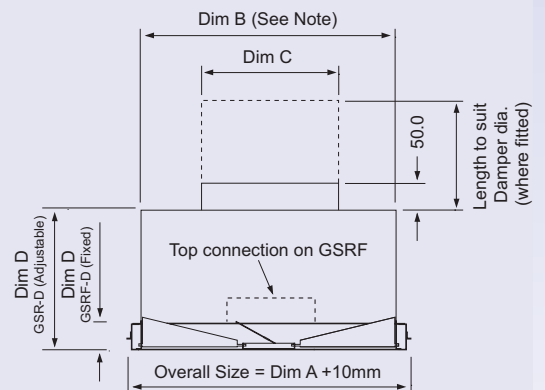
SIZE	A	B	C	D (GSR/D)	D (GSRF/D)
300	474	300	500	51	45
	484				
	574		600		
	584				
400	474	400	500	51	45
	484				
	574		600		
	584				
500	574	500	600	51	55
	584				

### Diffuser with Side Entry



SIZE	A	B	C
300	474	402	250
	484		
	574	502	
	584		
400	474	402	300
	484		
	574	502	
	584		
500	574	502	350
	584		

### Diffuser with Top Connection



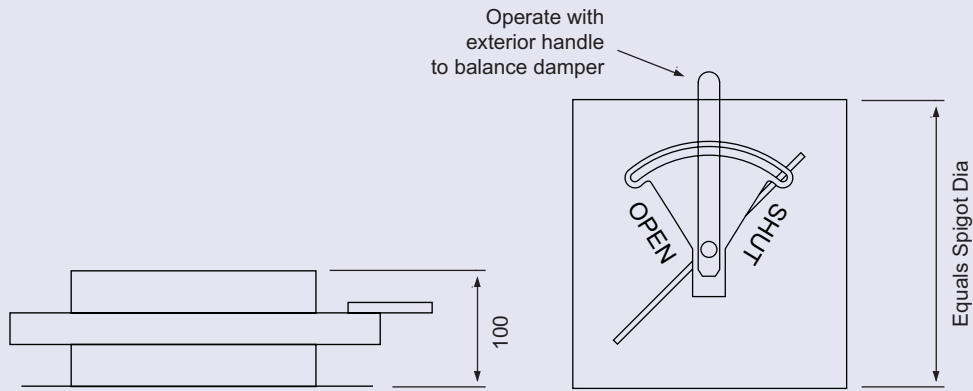
SIZE	A	B	C	D (GSR/D)	D (GSRF/D)
300	474	402	250	150	45
	484				
	574				
	584				
400	474	402	300	200	45
	484				
	574	502			
	584				
500	574	502	350	250	55
	584				

Dim B = Inside box size. Outside box size will be 50mm larger in one dimension due to its construction.



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## Volume Control



Iris Damper Ref. DI

Quadrant Damper Ref. DQ

## Sizing Data

Size 300 Horizontal Distribution

Total Volume (l/s)	50	60	70	80	90	100	
Noise Volume (NC)	25	25	30	30	35	35	
Static Press. (Pa)	9.0	11	15	20	26	33	
THROW	At +10K	0.3/1.6	0.5/2.2	0.8/2.8	1.0/3.2	1.4/3.6	1.7/4.0
	At +5K	0.2/1.2	0.4/2.0	0.7/2.6	0.9/2.8	1.2/3.1	1.4/3.4
	Isothermal	0.2/1.2	0.4/1.8	0.6/2.4	0.8/2.5	1.0/2.6	1.2/2.8
	At -5K	0.5/1.5	0.7/2.0	0.9/2.6	1.1/2.7	1.3/2.9	1.6/3.2
	At -10K	0.8/1.9	1.0/2.2	1.2/2.7	1.4/2.9	1.6/3.3	1.8/3.6

Size 300 Vertical Distribution

Total Volume (l/s)	50	60	70	80	90	100	
Noise Volume (NC)	15	15	15	15	20	20	
Static Press. (Pa)	1.5	2.2	3	4	5	6.4	
THROW	At +10K	0.9/1.0	1.0/1.2	1.2/1.5	1.4/1.8	2.0/2.3	2.2/2.8
	At +5K	1.1/1.5	1.2/1.3	2.1/1.5	1.7/2.5	2.1/2.9	2.5/3.3
	Isothermal	1.6/2.0	1.7/2.3	1.8/2.7	2.0/3.2	2.3/3.5	2.7/3.8
	At -5K	2.2/2.8	2.7/3.2	3.0/3.6	3.4/4.1	3.7/4.5	4.0/5.0
	At -10K	3.3/4.0	3.7/4.5	4.1/4.8	4.5/5.2	4.8/5.6	5.2/6.0

Size 400 Horizontal Distribution

Total Volume (l/s)	100	130	160	190	220	250	
Noise Volume (NC)	15	25	25	35	35	40	
Static Press. (Pa)	6.0	11	16	22	29	36	
THROW	At +10K	1.0/2.0	1.2/2.2	1.4/2.9	1.7/3.6	2.0/4.0	2.3/4.5
	At +5K	0.8/1.9	1.1/2.1	1.3/2.6	1.6/3.1	1.8/3.5	2.1/4.0
	Isothermal	0.7/1.7	1.0/2.0	1.2/2.5	1.5/2.7	1.8/3.0	2.0/3.5
	At -5K	0.6/1.5	0.9/1.8	1.2/2.1	1.4/2.4	1.7/2.7	1.8/3.0
	At -10K	0.4/1.2	0.7/1.5	1.0/1.8	1.3/2.1	1.6/2.4	1.7/2.8

Size 400 Vertical Distribution

Total Volume (l/s)	100	130	160	190	220	250	
Noise Volume (NC)	15	15	15	15	20	25	
Static Press. (Pa)	0.6	1.0	1.6	2.2	2.6	2.9	
THROW	At +10K	1.0/1.4	1.3/1.2	1.5/2.0	1.7/2.3	2.2/2.6	2.4/2.8
	At +5K	1.4/2.2	1.7/2.6	2.0/3.0	2.3/3.6	2.6/4.0	2.8/4.5
	Isothermal	2.2/3.0	2.6/3.6	3.1/4.2	3.6/4.9	4.1/5.5	4.5/6.0
	At -5K	2.7/4.0	3.3/5.0	3.8/5.8	4.3/6.5	5.0/	5.5/
	At -10K	3.0/5.0	4.0/6.0	4.5/7.5	5.0/	5.8/	6.5/

Size 500 Horizontal Distribution

Total Volume (l/s)	170	200	240	270	310	350	
Noise Volume (NC)	20	25	25	30	30	35	
Static Press. (Pa)	5.0	6.8	9.5	12.2	15.5	20	
THROW	At +10K	1.0/2.8	1.4/3.3	1.9/3.9	2.5/4.4	3.1/5.0	3.7/5.6
	At +5K	0.8/2.3	1.1/2.9	1.5/3.5	2.1/4.0	2.8/4.6	3.4/5.2
	Isothermal	0.7/1.9	0.9/2.3	1.2/3.0	1.8/3.5	2.4/4.0	3.0/4.6
	At -5K	0.8/2.1	1.1/2.6	1.5/3.2	2.0/3.7	2.6/4.2	3.2/4.8
	At -10K	0.8/2.3	1.3/2.9	1.8/3.5	1.9/4.0	2.1/4.6	3.1/5.2

Size 500 Vertical Distribution

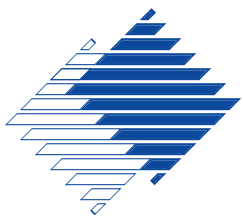
Total Volume (l/s)	170	200	240	270	310	350	
Noise Volume (NC)	15	15	15	15	15	15	
Static Press. (Pa)	0.5	0.6	0.7	0.8	0.9	1.0	
THROW	At +10K	1.0/1.5	1.6/2.2	2.3/2.9	2.9/3.4	3.5/4.5	4.1/4.5
	At +5K	2.1/3.3	2.4/3.6	2.8/3.9	3.4/4.4	4.1/5.0	4.5/5.5
	Isothermal	2.8/3.6	3.1/4.4	3.5/5.0	4.0/5.7	4.8/6.5	5.8/7.3
	At -5K	4.0/4.8	5.0/5.8	6.1/6.7	6.9/7.5		
	At -10K	4.8/6.0	6.0/7.5	7.3/8.6			

THROW:

NC LEVELS:

First throw figure Corresponds to 0.5m/s, second figure 0.25m/s (max figures)

No room correction figures have been deducted



# SERIES GSR

## Ordering Specification Diffuser

SERIES	GSR-A, B, C OR D GSRF-A, B, C or D	GSR-D	400	584	PIP 19	TD 8	FF	PPC RAL 9010 20% GLOSS (STANDARD FINISH)	15
LIST SIZE	300, 400 or 500 Dia								
OVERALL SIZE (mm)									
PIP HEIGHT (mm) (Applies to GSRF-B & GSRB ONLY)...	PIP + HEIGHT								
REGULAR DROP (mm) (Applies to GSRF-D & GSRD ONLY)...	TD + DEPTH								
INTERNALS: Finish as Face (Otherwise Black) .....	FF								
FINISH (Please Specify)									
NUMBER REQUIRED									

## Plenum

TYPE REQUIRED: TCB.....Top Connection SEB.....Side Connection + Type ie: TCB/GSRF-B	SEB/GSRF-B	AT1	400/594	150 DIA	DQ 150 DIA	TSO	DQ 150 DIA	15
THERMAL / ACOUSTIC INSULATION (SEB ONLY) 12mm PYRO (Standard) ..... AT1 25mm PYRO ..... AT2 12mm ARMAFLEX .....AT3								
SIZE OF SWIRL DIFFUSER CONNECTED TO								
BOX HEIGHT (Where different from standard)								
1st SPIGOT & DAMPER OPTIONS PLUS NOMINAL SPIGOT SIZE: No Damper .....SS + SIZE Quadrant .....DQ + SIZE Cord Operated.....DC + SIZE Iris .....DI + SIZE								
TWIN SPIGOT OPTIONS: Adjacent .....TSA Opposite .....TSO								
2nd SPIGOT & DAMPER OPTIONS (See first Damper options)								
NUMBER REQUIRED								

### FIXING

Standard fixing for all units is external via drop rods (by others) to elongated slots in the hanging brackets or top face of the plenum box.

For plaster ceilings rear access will be required or flange screw fixing should be specified.

### PLENUM SPECIFICATION

0.7 Galvanised or Zintec coated mild steel plenum.  
Spigot Construction: Standard size spigots use plastic clip-in spigots. Non standard, a sealed screw-in steel spigot

### FINISH

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

## Contact

### GILBERTS

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