

SERIES GSF

Circular Fixed Swirl Diffusers

PUBLICATION

DIFFUSERS 23

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Features

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



GILBERTS

SERIES GSF

Circular Fixed Swirl Diffusers

Introduction

With the GSF Series Gilberts introduce a contemporary and attractively designed range of Fixed Swirl Type Diffusers for ceiling supply and extract applications. The circular pattern of radial vanes featured on this unit provide the swirl, air distribution effect typically associated with this type of diffuser allowing the unit to introduce high volumes of air into the conditioned space, taking advantage of rapid entrainment and intermixing. On a Fixed Swirl Unit the distribution pattern

is horizontal across the ceiling. As a result the unit can deliver high air change rates as compared to conventional diffusers. Notwithstanding the performance potential, aesthetic aspects have also been considered. The circular profile of the GSF unit lends itself well to exposed ductwork and other contemporary applications.

The circular fixed swirl range comprises of 4 type options:

- **TYPE GSFR:** Standard Swirl Diffuser comprising of fixed blades mounted in a Circular Flanged Frame.
- **TYPE GSFE:** Circular Swirl Diffuser with fixed blades fitted into a Circular Perforated Fascia with removable core.
- **TYPE GSFA:** Premium Swirl Diffuser comprising fixed blades in a circular housing frame. Unit contains more swirl blades providing alternative visual appearance.
- **TYPE GSFP:** Standard Swirl Diffuser comprising fixed blades in a Circular Flanged Frame with round centre boss

For extract applications complementary exhaust swirl units are available to match supply diffuser type options.

Features

- Omni directional, swirl effect discharge.
- Horizontal projection.
- High induction effect.
- Perforated circular or open face circular design.
- Suitable for high room air change rates.



Type GSFR

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 range from 160 to 630mm dia as indicated in the dimensional data. Standard finish is white for type GSFR and white perforated fascia, with unexposed internals finished matt black on the GSFE.

Performance Data

The performance tables 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 always for horizontal distribution of conditioned air.

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

References Used

- Pressure:** All pressures are in Pa (N/m²)
- Throw:** The horizontal distances for air streams are given for both 0.5 and 0.25 m/s terminal velocities and are based upon a ceiling effect.
- Sound:** The NC values are peak levels 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 the 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.

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.

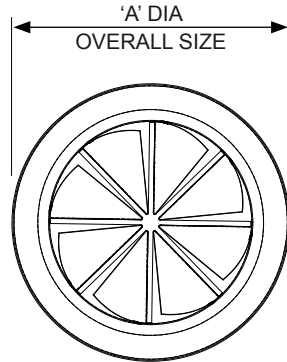
SERIES GSF

Circular Fixed Swirl Diffusers

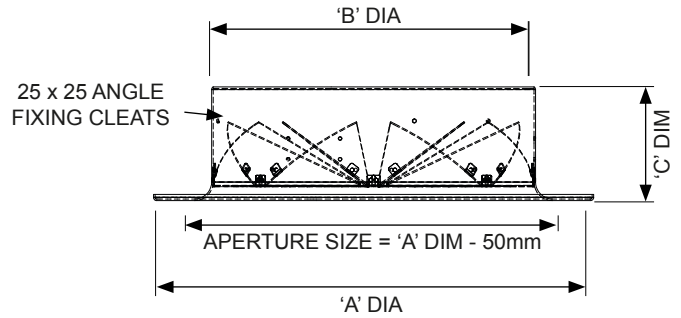
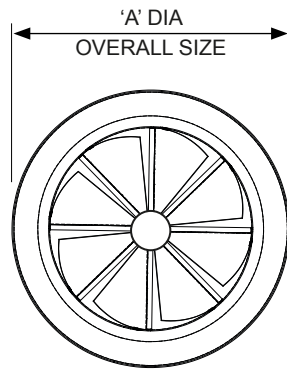
Type GSFR
& GSPF

DIFFUSER

The GSFR
Flat Centre

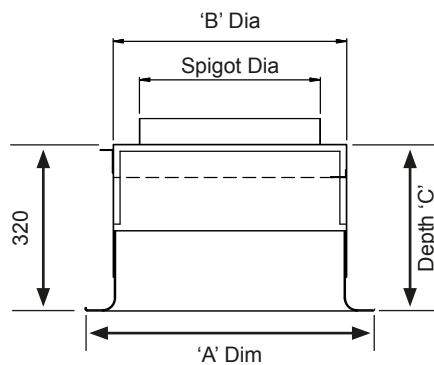


The GSPF
Domed Centre



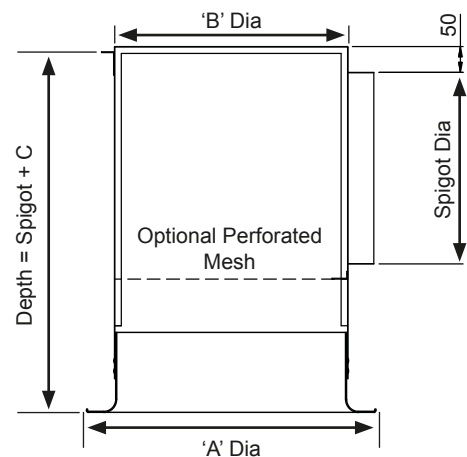
GSFR			
SIZE	A	B	C
160	240	158	90
250	330	248	100
315	425	313	110
450	560	448	155
630	740	628	220

DIFFUSER C/W TOP ENTRY BOX



GSFR - TCB		
SIZE	A	B
160	240	162
250	330	252
315	425	317
450	560	452
630	740	632

DIFFUSER C/W SIDE ENTRY BOX



GSFR - SEB			
SIZE	A	B	C*
160	240	162	273
250	330	252	273
315	425	317	273
450	560	452	313
630	740	632	313

* = Depth increases by 80mm if perf mesh fitted

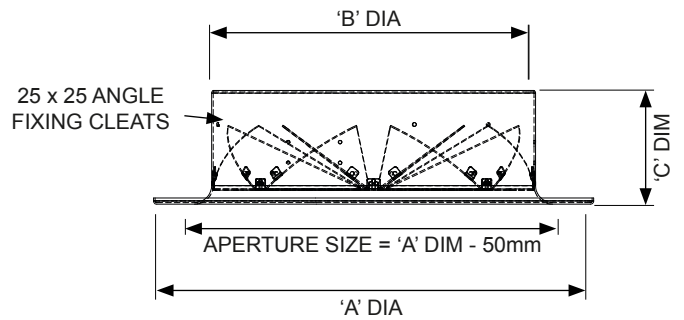
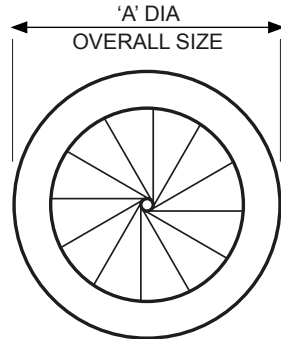
Standard Plenum Boxes are circular profile (not square). Plenums fitted to diffuser (Ref...NEK) are illustrated but plenums can be enlarged to fix at the diffuser flange (Ref...FLN). Please refer to brochure 'Diffusers 22 - Series TCB' for details

SERIES GSF

Circular Fixed Swirl Diffusers

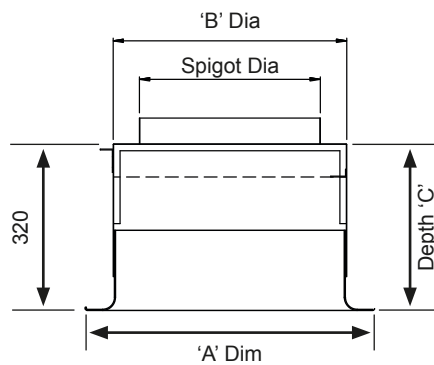
Type GSFA

DIFFUSER



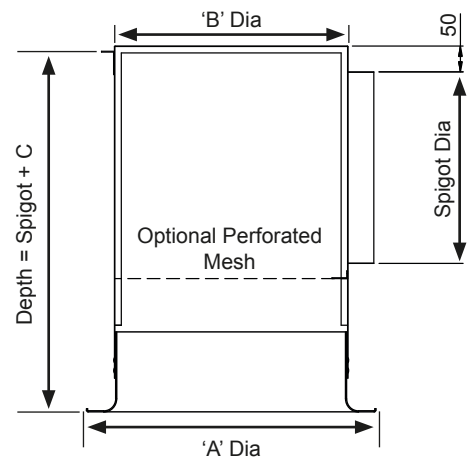
GSFA			
SIZE	A	B	C
160	240	158	90
250	330	248	100
315	425	313	110
450	560	448	155
630	740	628	220

DIFFUSER C/W TOP ENTRY BOX



GSFA - TCB		
SIZE	A	B
160	240	162
250	330	252
315	425	317
450	560	452
630	740	632

DIFFUSER C/W SIDE ENTRY BOX



GSFA - SEB			
SIZE	A	B	C*
160	240	162	273
250	330	252	273
315	425	317	273
450	560	452	313
630	740	632	313

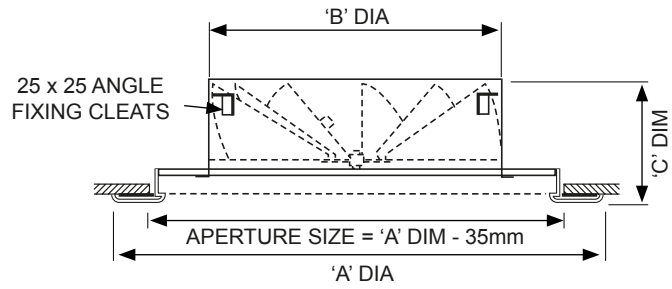
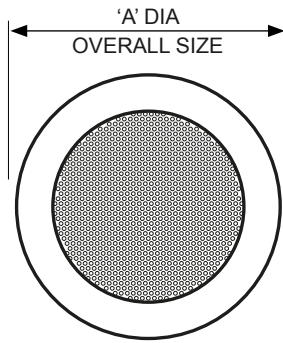
* = Depth increases by 80mm if perf mesh fitted

Standard Plenum Boxes are circular profile (not square). Plenums fitted to diffuser (Ref...NEK) are illustrated but plenums can be enlarged to fix at the diffuser flange (Ref...FLN). Please refer to brochure 'Diffusers 22 - Series TCB' for details

SERIES GSF

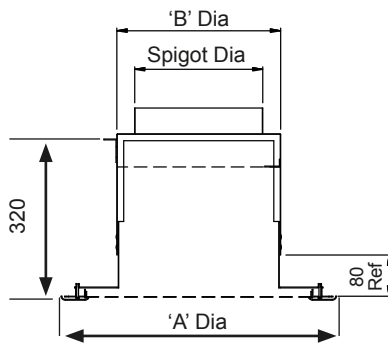
Circular Fixed Swirl Diffusers

Type GSFE



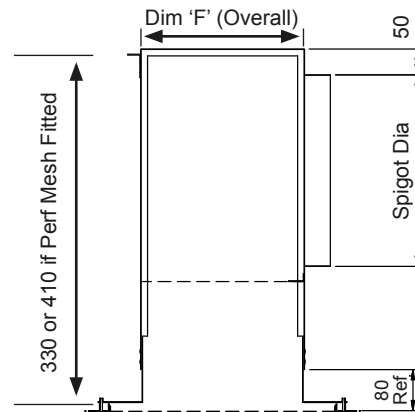
GSFE			
SIZE	A	B	C
160	378	158	108
250	468	248	118
315	533	313	128
450	667	448	173

DIFFUSER C/W TOP ENTRY BOX



GSFE - TCB		
SIZE	A	B
160	378	162
250	468	252
315	533	317
450	667	452

DIFFUSER C/W SIDE ENTRY BOX



GSFE - SEB	
LIST SIZE	Ø DIM F
160	162
250	252
315	317
450	450

TYPE GSXE: Extract unit available without swirl assembly. Dimensions as above.

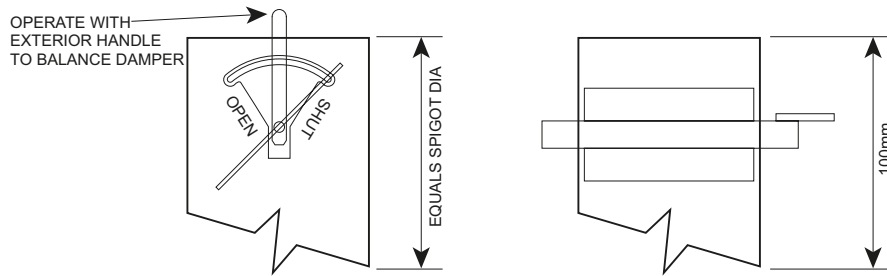
Standard Plenum Boxes are circular profile (not square). Plenums fitted to diffuser (Ref...NEK) are illustrated but plenums can be enlarged to fix at the diffuser flange (Ref...FLN). Please refer to brochure 'Diffusers 22 - Series TCB' for details

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Circular Fixed Swirl Diffusers

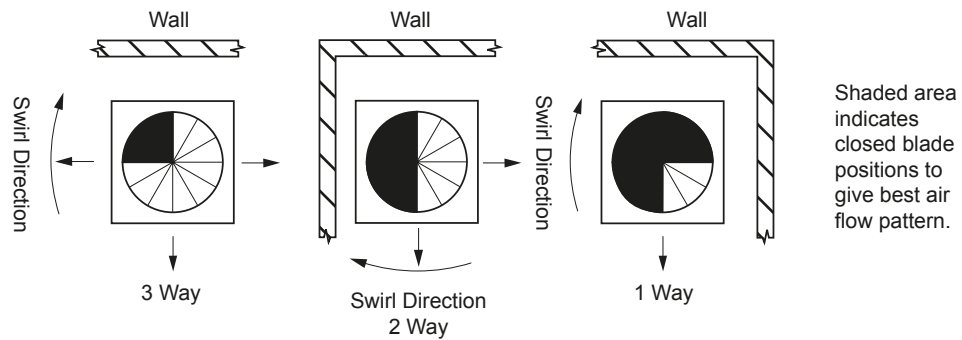
Volume Control

Series GSF offers 2 alternative methods of volume control. The principle means involves fitting of a manually operated flap type damper into the inlet spigot of the top or side entry plenum box. For a more sophisticated form of control however an iris damper can also be supplied. Full technical details on iris dampers are available in a separate data sheet.



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.

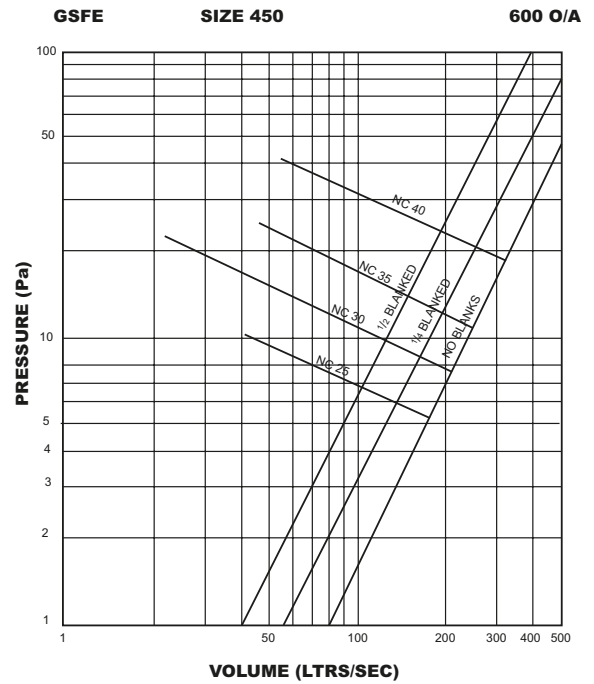
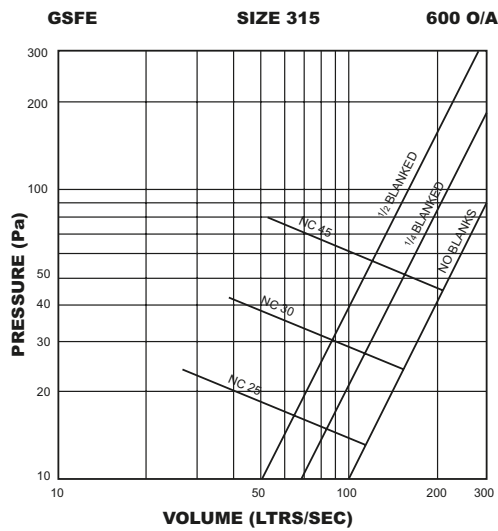
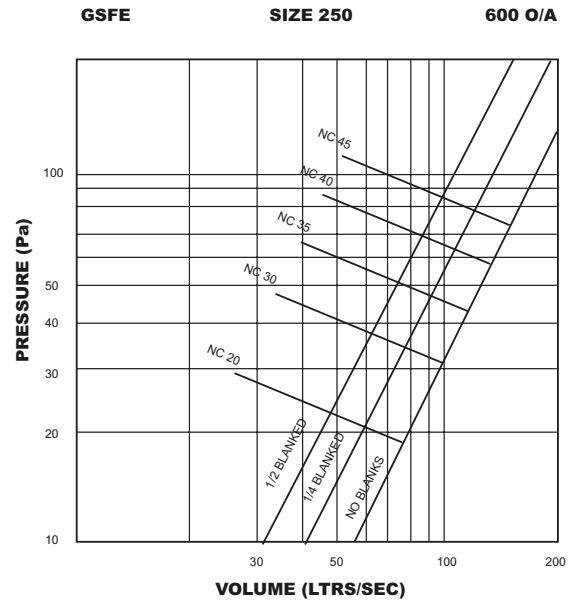
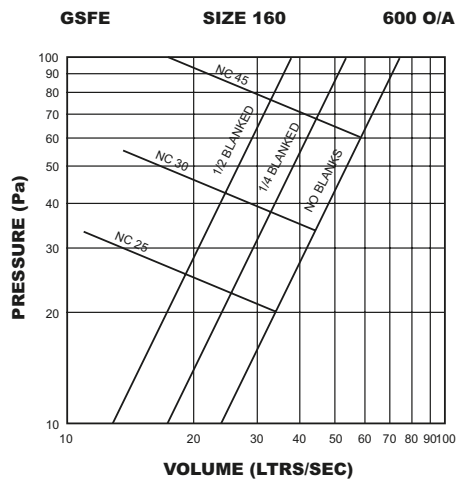


SERIES GSF

Circular Fixed Swirl Diffusers

Pressure Graphs

The following graphs indicate the revised pressure/volume relationship and associated noise levels attributable, when blanking swirl diffusers



DATA BASED ON GSFE WITH S.E.B.

SERIES GSF

Circular Fixed Swirl Diffusers

Technical Performance Data Series GSFR

Type GSFR, GSFP & GSFA

Size 160

NECK VELOCITY (M/S)		1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0
VOLUME FLOW RATE (M ³ /S)		0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.066
PRESSURE DROP (Pa)	TOP ENTRY	9.5	14	17	23	29	35	42	48
	SIDE ENTRY	11	15	19	24	31	38	46	55
	Static	6.4	9.0	12	16	20	25	30	36
THROW TO 0.25 M/S (M)	STRAIGHT CONNECTIONS	1.0	1.6	2.0	2.4	2.5	2.6	2.8	3.0
	AT + 10°C	1.2	1.4	1.6	1.8	2.0	2.4	2.6	2.8
	AT + 5°C	1.0	1.2	1.4	1.5	1.6	1.7	1.8	2.0
	ISOTHERMAL	0.4	0.6	0.8	1.0	1.2	1.4	1.6	2.0
	AT - 10°C	0.4	0.6	0.8	1.0	1.3	1.5	1.6	2.0
THROW TO 0.5 M/S (M)	AT + 10°C	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.0
	AT + 5°C	0.3	0.5	0.6	0.8	1.0	1.3	1.6	1.8
	ISOTHERMAL	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.8
	AT - 5°C	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.6
	AT - 10°C	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.8
NOISE LEVEL (NC)		20	20	20	20	25	25	30	35

Type GSFR, GSFP & GSFA

Size 250

NECK VELOCITY (M/S)		1.25	1.50	1.75	2.0	2.25	2.50	2.75	3.00
VOLUME FLOW RATE (M ³ /S)		0.061	0.073	0.085	0.098	0.11	0.122	0.134	0.147
PRESSURE DROP (Pa)	TOP ENTRY	10	15	18	23	28	34	39	48
	SIDE ENTRY	12	16	19	24	30	38	45	50
	Static	7	10	14	18	23	27	33	40
THROW TO 0.25 M/S (M)	STRAIGHT CONNECTIONS	1.3	2.0	2.5	3.0	3.3	3.6	3.8	4.2
	AT + 10°C	1.6	1.9	2.3	2.7	3.0	3.3	3.6	3.8
	AT + 5°C	1.4	1.6	1.8	2.0	2.2	2.5	2.7	3.0
	ISOTHERMAL	1.3	1.5	1.6	2.0	2.0	2.3	2.7	2.9
	AT - 10°C	1.4	1.8	2.1	2.4	2.6	2.7	3.0	3.1
THROW TO 0.5 M/S (M)	AT + 10°C	0.7	1.0	1.3	1.6	1.8	2.1	2.4	2.6
	AT + 5°C	0.7	0.9	1.2	1.4	1.7	2.0	2.2	2.4
	ISOTHERMAL	0.7	0.8	0.9	1.1	1.3	1.5	1.8	2.0
	AT - 5°C	0.7	0.9	1.1	1.4	1.6	1.8	2.1	2.2
	AT - 10°C	0.8	1.1	1.2	1.4	1.7	1.9	2.1	2.3
NOISE LEVEL (NC)		20	20	25	30	30	35	35	40

Type GSFR, GSFP & GSFA

Size 315

NECK VELOCITY (M/S)		1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0
VOLUME FLOW RATE (M ³ /S)		0.097	0.116	0.136	0.155	0.175	0.194	0.214	0.233
PRESSURE DROP (Pa)	TOP ENTRY	8	12	15	19	24	29	34	40
	SIDE ENTRY	9	13	16	21	26	31	36	42
	Static	6	9	12	15	22	25	32	39
THROW TO 0.25 M/S (M)	STRAIGHT CONNECTIONS	1.8	2.4	3.0	3.6	4.0	4.4	4.8	5.3
	AT + 10°C	2.0	2.4	3.0	3.6	4.0	4.2	4.5	4.8
	AT + 5°C	1.8	2.0	2.4	2.6	3.0	3.3	3.6	3.8
	ISOTHERMAL	2.1	2.5	2.8	3.0	3.2	3.4	3.6	3.8
	AT - 10°C	2.4	3.0	3.5	3.8	3.9	4.1	4.2	4.5
THROW TO 0.5 M/S (M)	AT + 10°C	1.0	1.5	1.8	2.2	2.4	2.8	3.0	3.2
	AT + 5°C	1.0	1.2	1.8	2.0	2.4	2.6	2.8	3.0
	ISOTHERMAL	0.8	1.0	1.2	1.4	1.8	2.0	2.4	2.6
	AT - 5°C	1.0	1.2	1.5	2.0	2.2	2.4	2.6	2.8
	AT - 10°C	1.2	1.6	1.8	2.0	2.4	2.5	2.6	2.8
NOISE LEVEL (NC)		20	20	20	25	30	35	35	40

Type GSFR, GSFP & GSFA

Size 450

NECK VELOCITY (M/S)		1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0
VOLUME FLOW RATE (M ³ /S)		0.198	0.238	0.278	0.318	0.357	0.397	0.437	0.477
PRESSURE DROP (Pa)	TOP ENTRY	4	6.5	7.8	9	12	17	20	24
	SIDE ENTRY	5	7	8	11	14	18	21	25
	Static	4	6	7.4	10	13	16	18	20
THROW TO 0.25 M/S (M)	STRAIGHT CONNECTIONS	2.8	3.0	4.0	4.8	5.5	6.2	7.0	7.8
	AT + 10°C	2.4	2.8	3.6	4.0	4.6	5.2	5.8	6.2
	AT + 5°C	2.0	2.2	2.5	3.0	3.5	3.8	4.3	4.8
	ISOTHERMAL	2.4	2.6	2.8	3.2	4.0	4.4	4.8	5.3
	AT - 10°C	2.6	2.8	3.0	3.9	4.3	4.8	5.3	5.7
THROW TO 0.5 M/S (M)	AT + 10°C	1.5	2.4	2.6	3.2	3.6	4.2	4.8	5.4
	AT + 5°C	1.5	1.8	2.2	2.4	2.8	3.2	3.6	4.0
	ISOTHERMAL	0.8	1.0	1.2	1.5	1.8	2.4	3.0	4.0
	AT - 5°C	1.2	1.5	1.8	2.0	2.4	2.6	3.0	3.5
	AT - 10°C	1.7	2.0	2.4	2.8	3.0	3.5	3.8	4.2
NOISE LEVEL (NC)		20	25	25	30	35	35	40	40

Type GSFR, GSFP & GSFA

Size 630

NECK VELOCITY (M/S)		1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0
VOLUME FLOW RATE (M ³ /S)		0.390	0.467	0.546	0.623	0.701	0.779	0.857	0.935
PRESSURE DROP (Pa)	TOP ENTRY	6.5	10	13	17	22	28	33	40
	SIDE ENTRY	7	11	15	19	23	29	36	45
	Static	6	8	12	15	20	24	29	36
THROW TO 0.25 M/S (M)	STRAIGHT CONNECTIONS	5.0	5.7	6.4	7.2	7.9	8.7	9.4	10.2
	AT + 10°C	4.6	5.2	6.0	6.8	7.5	8.3	9.0	9.9
	AT + 5°C	4.1	4.8	5.6	6.4	7.1	7.9	8.6	9.5
	ISOTHERMAL	4.2	5.0	5.8	6.6	7.3	8.1	8.8	9.7
	AT - 10°C	4.4	5.2	6.0	6.8	7.5	8.3	9.0	9.9
THROW TO 0.5 M/S (M)	AT + 10°C	3.0	3.7	4.5	5.2	5.6	6.2	7.1	7.8
	AT + 5°C	2.2	3.6	4.3	4.9	5.5	6.1	7.0	7.7
	ISOTHERMAL	2.4	3.6	4.0	4.7	5.4	6.1	7.0	7.7
	AT - 5°C	2.4	3.4	3.9	4.4	5.0	5.7	6.4	6.9
	AT - 10°C	2.5	3.0	3.4	3.9	4.5	5.1	5.8	6.4
NOISE LEVEL (NC)		20	20	25	30	40	40	45	50

SERIES GSF

Circular Fixed Swirl Diffusers

Technical Performance Data Series GSFE

Type GSFE

Size 160

NECK VELOCITY (M/S)	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0	
VOLUME FLOW RATE (M ³ /S)	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060	
PRESSURE DROP (Pa) Static	TOP ENTRY	11	16	19	25	31	37	44	50
	SIDE ENTRY	13	17	21	26	33	40	48	57
	STRAIGHT CONNECTIONS	7	10	14	18	22	27	32	38
THROW TO 0.25 M/S (M)	AT + 10°C	0.7	0.8	0.9	1.0	1.2	1.5	1.8	2.0
	AT + 5°C	0.7	0.8	0.9	1.0	1.2	1.5	1.8	2.0
	ISOTHERMAL	0.5	0.6	0.7	0.8	1.0	1.1	1.1	1.2
	AT - 5°C	0.7	0.8	0.9	1.0	1.1	1.4	1.5	1.6
THROW TO 0.5 M/S (M)	AT - 10°C	0.7	0.8	0.9	1.0	1.1	1.4	1.5	1.6
	AT + 10°C	-	-	-	0.3	0.5	0.6	0.8	1.0
	AT + 5°C	-	-	-	0.3	0.5	0.6	0.8	1.0
	ISOTHERMAL	-	-	-	0.3	0.5	0.6	0.8	1.0
NOISE LEVEL (NC)	AT - 5°C	-	-	-	0.4	0.6	0.7	0.9	1.1
	AT - 10°C	-	-	-	0.4	0.6	0.7	0.9	1.1
		20	25	25	30	30	35	40	45

Type GSFE

Size 250

NECK VELOCITY (M/S)	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	
VOLUME FLOW RATE (M ³ /S)	0.061	0.073	0.085	0.098	0.11	0.122	0.134	0.147	
PRESSURE DROP (Pa) Static	TOP ENTRY	9	13	19	25	32	39	48	52
	SIDE ENTRY	11	16	22	30	38	47	54	68
	STRAIGHT CONNECTIONS	8	11	16	20	26	32	41	48
THROW TO 0.25 M/S (M)	AT + 10°C	1.1	1.3	1.4	1.7	2.0	2.3	2.7	3.0
	AT + 5°C	1.0	1.2	1.4	1.5	1.7	2.0	2.3	2.6
	ISOTHERMAL	0.7	0.9	1.0	1.2	1.4	1.6	1.7	1.8
	AT - 5°C	1.0	1.2	1.4	1.5	1.7	1.9	2.0	2.1
THROW TO 0.5 M/S (M)	AT - 10°C	1.1	1.3	1.5	1.7	1.8	2.0	2.2	2.3
	AT + 10°C	0.3	0.5	0.7	0.9	1.1	1.2	1.5	1.7
	AT + 5°C	0.3	0.5	0.6	0.7	0.8	1.0	1.2	1.4
	ISOTHERMAL	-	-	0.3	0.5	0.7	0.8	1.0	1.2
NOISE LEVEL (NC)	AT - 5°C	-	-	0.3	0.6	0.9	1.0	1.2	1.4
	AT - 10°C	-	-	0.5	0.7	1.0	1.1	1.3	1.5
		20	20	30	30	35	35	40	45

Type GSFE

Size 315

NECK VELOCITY (M/S)	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0	
VOLUME FLOW RATE (M ³ /S)	0.097	0.116	0.136	0.155	0.175	0.194	0.214	0.233	
PRESSURE DROP (Pa) Static	TOP ENTRY	10	14	17	21	26	31	36	42
	SIDE ENTRY	11	15	18	23	28	33	38	44
	STRAIGHT CONNECTIONS	8	11	14	17	24	27	34	41
THROW TO 0.25 M/S (M)	AT + 10°C	1.5	1.8	2.0	2.4	2.8	3.2	3.6	4.0
	AT + 5°C	1.4	1.7	1.9	2.0	2.2	2.6	2.9	3.3
	ISOTHERMAL	1.0	1.2	1.4	1.6	1.9	2.1	2.3	2.5
	AT - 5°C	1.4	1.7	1.9	2.1	2.3	2.4	2.5	2.6
THROW TO 0.5 M/S (M)	AT - 10°C	1.6	1.9	2.1	2.5	2.6	2.7	2.9	3.0
	AT + 10°C	0.6	1.0	1.2	1.5	1.7	1.9	2.2	2.4
	AT + 5°C	0.6	0.7	0.9	1.1	1.2	1.4	1.6	1.7
	ISOTHERMAL	0.4	0.6	0.7	0.8	1.0	1.1	1.3	1.5
NOISE LEVEL (NC)	AT - 5°C	0.4	0.6	0.7	0.9	1.1	1.2	1.4	1.6
	AT - 10°C	0.5	0.7	0.9	1.0	1.3	1.5	1.7	2.0
		20	25	30	30	40	45	45	50

Type GSFE

Size 450

NECK VELOCITY (M/S)	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0	
VOLUME FLOW RATE (M ³ /S)	0.198	0.238	0.278	0.318	0.357	0.397	0.437	0.477	
PRESSURE DROP (Pa) Static	TOP ENTRY	5	7	9	12	16	20	24	28
	SIDE ENTRY	6	8	11	14	19	24	29	34
	STRAIGHT CONNECTIONS	6	9	12	15	20	25	29	35
THROW TO 0.25 M/S (M)	AT + 10°C	2.4	2.7	3.1	3.6	3.8	4.2	4.5	4.8
	AT + 5°C	2.1	2.4	2.7	3.0	3.2	3.5	3.8	4.0
	ISOTHERMAL	1.8	1.9	2.1	2.4	2.5	2.7	2.9	3.0
	AT - 5°C	1.7	1.8	2.0	2.3	2.4	2.6	2.7	3.0
THROW TO 0.5 M/S (M)	AT - 10°C	1.7	1.8	2.0	2.3	2.4	2.6	2.7	3.0
	AT + 10°C	0.9	1.2	1.4	1.7	2.0	2.2	2.4	2.5
	AT + 5°C	0.8	1.1	1.3	1.5	1.7	2.0	2.2	2.5
	ISOTHERMAL	0.8	1.0	1.3	1.5	1.6	1.8	2.0	2.1
NOISE LEVEL (NC)	AT - 5°C	0.7	1.0	1.2	1.3	1.5	1.6	1.8	2.0
	AT - 10°C	0.7	1.0	1.2	1.3	1.5	1.6	1.8	2.0
		20	25	35	40	40	45	50	55

SERIES GSF

Circular Fixed Swirl Diffusers

Ordering Specification (Diffuser)

SERIES GSFR, P, A OR E	GSFR	160	P1	SB	PPC RAL 9010 20% GLOSS (STANDARD FINISH)	15
LIST SIZE (DIA MM)						
BLANKING PLATE OPTIONS P1, P2, P3						
SUPPORT BRACKETS (required without plenum)..... SB						
FINISH (please specify)						
NUMBER REQUIRED						

Ordering Specification (Plenum)

SERIES TCB-C / GSFR, P, A or E SEB-C / GSFR, P, A or E	SEB-C GSFR	AT1	315	NEK	BH500	BB	DQ 150 DIA	TSO	DQ 150 DIA	15
THERMAL / ACOUSTIC INSULATION (SEB ONLY) 12mm Pyro (standard) .. AT1 25mm Pyro AT2 12mm Amaflex AT3										
TO FIT DIFFUSER SIZE (List Size + Overall Size)										
FIXING POINT Neck NEK Flange..... FLN										
BOX HEIGHT (Where Different From Standard)										
MATT BLACK INTERNALS OPTION: BB										
SPIGOT & DAMPER OPTIONS (Plus NOMINAL Spigot Size): No Damper SS + SIZE Quadrant DQ + SIZE Cord Operated. DC + SIZE Iris DI + SIZE										
TWIN SPIGOT OPTIONS: Opposite TSO										
2nd SPIGOT & DAMPER OPTION (see above)										
NUMBER REQUIRED										

Fixing

Standard fixing for all units is via drop rods (by others) to 20 x 9mm elongated slots in 25 x 25mm angle cleats at the rear. Alternatively an internal fixing where the drop rods locate inside the plenum can be specified where required.

Finish

Standard finish: PPC White RAL 9010 20% gloss
Special Finishes: PPC to Stock BS or RAL colour
Plenum: Natural Galvanised Steel (unpainted)

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