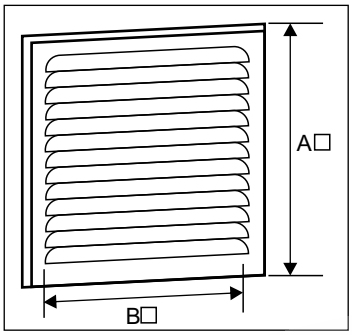
GRA

Aluminium externally mounted discharge/supply air grilles.



Model	Ext dim A□	Grille area B□	Recommended Airflow Δp = 30 pa m³/h
70	140 x 140	100 x 100	120
100	165 x 165	125 x 125	195
150	190 x 190	150 x 150	280
200	210 x 210	165 x 165	340
300	240 x 240	200 x 200	590

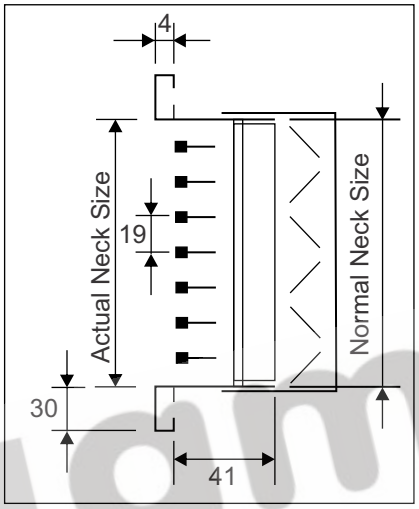
DD

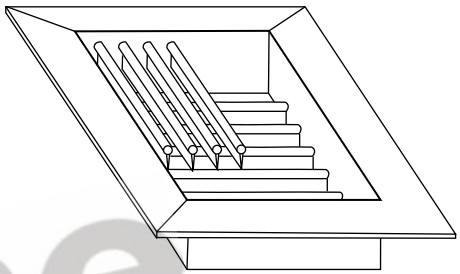
- The two sets of individually adjustable louvres - vertical and horizontal - with or without a damper attached, allow these grilles to provide maximum flexibility of adjustments for spread and throw requirements.
- The multi directional flexibility allows for multi-directional air supply.
- They are recommended for high sidewall, bulkhead or duct mounting and can be used for heating, cooling, or ventilating applications.

GENERAL SPECIFICATIONS

- All models feature two sets of individually adjustable blades - vertical and horizontal - spaced at 19mm apart, and fitted into a 20, 30 or 50mm frame.
- The optional opposed blade damper is constructed using extruded aluminium blades and frame.
- The individual blades are secured by corrosion resistant star lock washers with added adjusting tension supplied by corrosion resistant spring wire.
- All models can be furnished with powder coated white finish preceded by five stage preparation process of cleaning, phosphatising and drying.
- Grilles can be supplied in natural anodised and white powder coated finishes.
- Other colours are available on request.

DD





TYPE DD: Double deflection supply air grilles manufactured of extruded type 50S anodising grade aluminium with individually adjustable front vertical and rear horizontal louvres held in place by starlock washers and spring wire.

Optical Accessories

OBD	=	Opposed Blade Damper
PC	=	Punched counter sunk holes
CF	=	Concealed Fixing

Frame Options

30mm Standard
20mm
50mm

Finish Options

NA	=	Natural Anodised
EPC	=	Epoxy Powder Coating

Ordering Procedure: Example

Ref	Qty	Size (L x H)	Type	Access	Frame	Finish	Special Instructions
1	7	500 x 200	DD	OBD	30	NA	CF

Note:
(1) Dimensions given are for opening size into which grille will fit (i.e Normal Duct Size)
(2) If code "OS" is entered under SPECIAL INSTRUCTIONS, then dimensions given are over flange.

DD-SD Performance Data

Normal Size			200 x 100			250 x 100			300 x 100 200 x 150			400 x 100 250 x 150			500 x 100 300 x 150			350 x 150 250 x 200		
Core Area Ca(m)			0.015			0.02			0.024			0.032			0.038			0.044		
	Deflection		0°	22½°	45°	0°	22½°	45°	0°	22½°	45°	0°	22½°	45°	0°	22½°	45°	0°	22½°	45°
m^3/s	Aj	(m^2)	0.011	0.01	0.008	0.014	0.014	0.011	0.018	0.017	0.013	0.023	0.022	0.017	0.028	0.027	0.021	0.032	0.031	0.024
0.024	Tp THROW VEL NES	(Pa) (m) (m/s) dB	1.72 2.1-4.0 1.97 *	2.12 1.5-3.01 2.18 *	8.48 2-2.1 4.36 *	1.11 1.7-3.6 1.58 *	1.39 1.4-2.7 1.76 *	5.74 0.9-2.2 3.59 *												
0.036	Tp THROW VEL NES	(Pa) (m) (m/s) dB	3.87 3-4.8 2.95 *	4.77 2.4-3.61 3.27 *	19.09 8-2.7 6.65 *	2.5 2.7-4.9 2.37 *	3.11 2.1-3.7 2.64 *	12.92 1.5-2.7 5.39 *	1.74 2.4-4.9 1.98 *	2.18 1.8-3.7 2.21 *	9.33 1.3-2.6 4.58 *	1.14 2.1-4.3 1.6 *	1.45 1.6-3.2 1.8 *	6.78 1.3-2.3 3.9 *						
0.047	Tp THROW VEL NES	(Pa) (m) (m/s) dB	6.6 4-5.6 3.85 *	8.13 3-4.2 4.27 *	32.53 2.1-3 8.55 *	4.25 3.6-5.3 3.09 *	5.3 2.7-4.3 3.45 *	22.03 2.1-3.1 7.03 *	2.97 3.6-5 2.58 *	3.72 2.5-4.3 2.89 *	15.9 1.8-3 5.97 *	1.94 2.7-5.5 2.08 *	2.74 2.05-4.3 2.36 *	11.56 1.6-3.1 5.09 *	1.32 2.4-5.2 1.72 *	1.69 1.8-4.1 1.95 *	7.65 1.2-2.7 4.14 *			
0.060	Tp THROW VEL NES	(Pa) (m) (m/s) dB	10.76 4.3-6.5 4.91 17	13.25 3.4-4.9 5.45 18		6.93 4.3-6.4 3.94 *	8.63 3.5-5 4.4 *	35.9 2.5-3.7 8.98 *	4.84 4-6.1 3.29 *	6.06 3-4.6 3.69 *	25.9 2.2-3.5 7.63 *	3.16 3.4-6.5 2.66 *	4.03 2.4-4.9 3.01 *	18.85 1.8-3.7 6.5 *	2.15 3-6.1 2.2 *	2.76 2.4-4.6 2.49 *	12.46 1.8-3.4 5.29 *	1.74 3.1-6.2 1.97 *	2.13 2.4-4.6 2.19 *	8.58 1.8-3.4 4.39 *
0.070	Tp THROW VEL NES	(Pa) (m) (m/s) dB	14.64 4.9-6.5 5.73 23	18.04 3.7-5.5 6.36 24		9.44 4.9-7 4.6 18.4	11.75 3.7-5.5 5.14 19		6.58 4.8-7 3.84 *	8.25 3.7-7 4.3 *	35.26 2.7 8.9 *	4.3 4.2-6.7 3.11 *	5.48 3.4-5.2 3.51 *	26.65 2.3-3.7 7.59 *	2.93 4-6.7 2.56 *	3.76 3-5.2 2.9 *	16.96 2-3.8 6.17 *	2.36 3.7-6.8 2.3 *	2.9 2.7-5.2 2.55 *	11.68 2.1-3.7 5.12 *
0.083	Tp THROW VEL NES	(Pa) (m) (m/s) dB	20.58 5.2-7.6 6.8 28	25.36 4-5.8 7.55 29		13.27 5.2-7.3 5.46 19	16.52 4-5.3 6.09 21		9.25 5-7.2 4.56 *	11.6 4-5.4 5.1 *		6.04 4-7.2 3.68 *	7.71 3.6-5 4.16 *	36.06 2.7-4 9 *	4.12 4.2-7.2 3.04 *	5.28 3.4-5.4 3.44 *	23.85 2.4-4 7.32 *	3.32 4-7.3 2.73 *	4.07 3.1-5.4 3.02 *	16.41 2.1-4 6.07 *
0.095	Tp THROW VEL NES	(Pa) (m) (m/s) dB				17.38 5.4-7.9 6.25 24	21.64 4.3-6.1 6.97 25		12.12 5.4-7.9 5.22 18	15.2 4.3-6.1 5.84 19		7.91 5.4-8 4.21 *	10.1 4.3-6.1 4.76 *		5.4 5.2-7.9 3.48 *	6.92 6.4 3.94 *	31.24 2.6-4.2 8.37 *	4.35 4.9-8 3.13 *	5.33 3.7-6 3.46 *	21.5 2.7-4.2 6.95 *
0.106	Tp THROW VEL NES	(Pa) (m) (m/s) dB				21.64 6.1-8.5 6.97 29	26.94 4.5-6.7 7.78 30		15.09 5.8-8.5 5.82 23	18.93 4.5-6.7 6.52 24		9.85 5.8-8.5 4.7 16	12.58 4.5-6.7 5.31 17		6.72 5.7-8.4 3.88 *	8.61 4.5-6.7 4.4 *	38.89 3-4.6 9.34 *	5.42 5.5-8.8 3.49 *	6.64 4.2-6.8 3.86 *	26.77 3-4.5 7.75 *
0.118	Tp THROW VEL NES	(Pa) (m) (m/s) dB				26.81 6.4-8.8 7.76 35	33.38 4.9-6.6 8.66 36		18.71 6-8.9 6.48 25	23.45 4.5-6.7 7.26 26		12.21 6-8.9 5.23 18	15.59 4.6-6.6 5.91 19		8.33 6-9.0 4.32 *	10.67 4.7-6.8 4.89 *		6.71 6-9.0 3.88 *	8.23 4.7-6.7 4.3 *	33.18 3.4-4.9 8.63 *
0.131	Tp THROW VEL NES	(Pa) (m) (m/s) dB							23.05 6.7-9.5 7.19 29	28.91 5.1-7.3 8.06 30		15.08 6-4.9 5.81 21	19.21 5-7.0 6.57 22		10.26 6.4-9.5 4.8 17	13.15 5-7.3 5.43 23		8.27 6.7-9 4.31 *	10.14 5.2-7 4.77 *	40-89 3.7-51 9.58 *
0.141	Tp THROW VEL NES	(Pa) (m) (m/s) dB							26.71 7-9.8 7.74 34	33.49 5.5-7.5 8.67 35		17.43 6.7-9.9 6.25 24	22.25 5.1-7.6 7.07 25		11.89 6.7-9.9 5.17 19	15.24 5-7.5 5.85 19		9.58 6.7-10 4.64 17	11.75 5.7-5 5.14 20	
0.165	Tp THROW VEL NES	(Pa) (m) (m/s) dB										23.87 7-10.3 7.32 29	30.47 5.6-8.2 8.27 30		16.28 7.3-10.4 6.05 24	20.86 5.4-8 6.84 25		13.12 7.3-10.4 5.43 20	16.09 5.4-8 6.01 21	
0.187	Tp THROW VEL NES	(Pa) (m) (m/s) dB										39.4 8-11.3 9.4 35	39.14 6-8.5 9.37 36		26.88 8-11.3 7.77 28	26.8 6.85 7.76 29		21.67 8-11.3 6.97 24	20.67 6-8.6 6.81 25	
0.212	Tp THROW VEL NES	(Pa) (m) (m/s) dB													33.31 8.5-12 8.65 33	34.44 6.7-9 8.79 34		26.85 8.5-12 7.76 28	26.57 6.7-9 7.72 29	
0.236	Tp THROW VEL NES	(Pa) (m) (m/s) dB													40.74 8.9-12.7 9.56 38	42.68 6.7-9.8 9.79 39		32.84 8.9-12.9 8.59 32	32.92 6.7-9.9 8.6 33	
0.261	Tp THROW VEL NES	(Pa) (m) (m/s) dB																38.88 9-13.5 9.34 37	40.27 7-10.5 9.51 38	

NS = sound rating from sound power data assuming RA=8dB
CA = core area in m
Aj = effective area of throw in m/
Tp = static pressure + the duct velocity pressure in Pa.
Throw = distance to point of max. air stream velocity at 0.5/s and /to 0.25m/s

DD-SD Performance Data

Normal Size			300 x 400 800 x 150			300 x 250 375 x 200 500 x 150			300 x 100 200 x 150 450 x 200 600 x 150			350 x 300 420 x 250 525 x 200 700 x 150			400 x 300 400 x 250 600 x 200			450 x 350 525 x 300 750 x 200 750 x 200		
	Core Area Ca(m^2)		0.01			0.08			0.09			0.11			0.012			0.016		
	Deflection		0°	22½°	45°	0°	22½°	45°	0°	22½°	45°	0°	22½°	45°	0°	22½°	45°	0°	22½°	45°
m^3/s	Aj	(m^2)	0.07	0.064	0.03	0.045	0.04	0.019	0.054	0.048	0.022	0.062	0.056	0.026	0.071	0.064	0.03	0.093	0.083	0.038
0.07	Tp THROW VEL NES	(Pa) (m) (m/s) dB	0.43 3.4-6.4 0.98 *	0.54 2.4-4.9 1.1 *	2.5 1.8-3.8 3.27 *															
0.083	Tp THROW VEL NES	(Pa) (m) (m/s) dB	0.6 3.7-7.3 1.16 *	0.75 3-5.6 1.3 *	3.51 2.1-4 2.81 *	1.53 3.5-6.8 1.85 *	1.9 2.5-5.2 2.07 *	8.58 1.8-3.8 4.39 *												
0.095	Tp THROW VEL NES	(Pa) (m) (m/s) dB	0.79 4.3-8 1.33 *	0.99 3.5-6.2 1.49 *	4.6 2.5-4.3 3.21 *	2 4-7.6 2.12 *	2.49 3-5.8 2.36 *	11.25 2.1-4.3 5.02 *	1.4 3.7-7.3 1.77 *	1.74 2.7-5.5 1.98 *	7.97 2.1-4 4.23 *									
0.047	Tp THROW VEL NES	(Pa) (m) (m/s) dB	0.98 5-8.2 1.48 *	1.23 3.4-6.7 1.66 *	5.73 2.4-4.6 3.59 *	2.5 4.4-8.5 2.37 *	3.1 3.4-6.7 2.64 *	14 2.4-4.5 5.61 *	1.74 4.-7.9 1.97 *	2.17 3-6.0 2.2 *	9.92 2-4.3 4.72 *	1.28 3.8-7.4 1.69 *	1.6 2.8-5.5 1.89 *	7.4 2.1-4 4.07 *						
0.118	Tp THROW VEL NES	(Pa) (m) (m/s) dB	1.21 5-6.9 1.65 *	1.52 4.4-6.5 1.85 *	7.1 3-5.0 3.99 *	3.09 5-9.0 2.63 *	3.84 3.8-6.9 2.94 *	17.35 2.7-5 6.24 *	2.15 4.7-9 2.2 *	2.68 3.7-6.8 2.45 *	12.3 2.7-5 5.25 *	1.58 4.4-8.2 1.89 *	1.98 3.4-6.4 2.11 *	9.17 2.4-4.6 4.54 *						
0.131	Tp THROW VEL NES	(Pa) (m) (m/s) dB	1.5 5-8.9 1.83 *	1.87 4.6-7 2.05 *	8.75 3-5.2 4.43 *	3.81 5.2-9 2.95 *	4.73 4-7.0 3.26 *	21.38 2.8-5.2 6.93 *	2.65 5-9.7 2.44 *	3.31 3.7-7.3 2.72 *	15.15 2.7-5.2 5.83 *	1.95 4-6.9 2.09 *	2.44 3.7-7 2.34 *	11.3 2.4-5.2 8.04 *	1.51 4.3-8.3 1.84 *	1.86 3-5.2 2.9 *	16.96 2-3.8 6.17 *			
0.165	Tp THROW VEL NES	(Pa) (m) (m/s) dB	2.37 7.3-10.3 2.31 17	2.97 5.5-8.2 2.58 18	13.88 3.7-51 5.58 23	6.05 6.7-10.4 3.68 *	7.51 5.2-7.8 4.11 *	33.93 3.7-5.8 8.73 *	4.21 6.1-10.4 3.07 *	5.25 4.6-7.9 3.43 *	24.04 3.4-5.8 7.35 *	3.1 5.9-10.4 2.64 *	3.87 4.6-7.8 2.95 *	17.92 3-5.9 6.34 *	2.4 5.2-10.4 2.32 *	2.95 4-8.0 2.57 *	13.52 2.4-4.6 4.37 *	1.4 4.6-9.6 1.77 *	1.74 3.7-7.3 1.97 *	8.21 2.4-5.2 4.29 *
0.187	Tp THROW VEL NES	(Pa) (m) (m/s) dB	3.05 8-11.3 2.62 20	3.82 6-8.6 2.93 21	17.82 4.3-6 6.32 26	7.77 8-11.3 4.18 16	9.65 6-8.6 4.65 17	43.58 4.3-6 9.89 22	5.41 7-11.0 3.48 *	6.74 5.6-8.5 3.89 *	30.88 4-6.1 8.33 *	3.98 6.7-11.3 2.99 *	4.97 5.2-8.5 3.34 *	23.02 3.7-6.1 7.19 *	3.08 6.1-11.3 2.63 *	3.79 4.6-8.5 2.92 *	17.37 3.4-6.1 6.24 *	1.8 5.1-10.3 2.01 *	2.23 4-8.0 2.24 *	10.54 2.7-5.8 4.86 *
0.206	Tp THROW VEL NES	(Pa) (m) (m/s) dB	3.92 8.1-12 2.97 23	4.91 6.5-9.1 3.32 24		9.98 8.5-11.9 4.73 19	12.4 6.7-9 5.28 20		6.95 8-12.0 3.95 *	8.66 6-9.0 4.41 *	39-69 4.3-6.4 9.44 *	5.11 7.6-12 3.39 *	6.39 5.8-9.1 3.79 *	29.59 4.3-6.4 8.15 *	3.95 6.7-12 2.98 *	4.87 5.2-9 3.31 *	22.33 3.7-6.4 7.08 *	2.31 6-12.0 2.28 *	2.86 4.6-9 2.54 *	13.55 3.4-6.4 5.51 *
0.236	Tp THROW VEL NES	(Pa) (m) (m/s) dB	4.86 8.8-12.5 3.33 27	6.08 6.6-10 3.7 28		12.37 8.8-12.6 5.27 22	15.37 6.7-10 5.87 23		8.61 8.9-12.6 4.4 17	10.73 6.7-9.7 4.91 18		6.34 8.3-12.6 3.77 *	7.92 6.5-10 4.22 *	36.67 4.6-7.1 9.07 *	4.9 7.3-12.6 3.32 *	6.04 5.6-10 3.68 *	27.67 4-7.0 7.88 *	2.87 6.7-12.6 2.54 *	3.55 5.2-10 2.82 *	16.79 3.7-7 6.14 *
0.261	Tp THROW VEL NES	(Pa) (m) (m/s) dB	5.94 9-13.0 3.65 30	7.44 7-10.0 4.09 31		15.13 9-13.0 5.83 24	18.79 7-10.1 6.5 25		10.53 9.1-13.1 4.86 20	13.13 7-10.1 5.43 21		7.75 9.1-13.1 4.17 16	9.69 7-10.1 4.66 17		5.99 8.3-13.2 3.6 *	7.38 5-10.2 4.07 *	33.84 4.7-7.4 8.72 *	3.5 7.4-13.2 2.8 *	4.34 5.6-10.2 3.12 *	20.53 4.1-7.4 6.79 *
0.284	Tp THROW VEL NES	(Pa) (m) (m/s) dB	7.03 9.9-13.8 3.97 32	8.81 7.7-10.8 4.45 33		17.91 9.6-13.8 6.34 27	22.25 7.3-10.7 7.07 28		12.47 9.9-13.8 5.29 22	15.53 7-10.7 5.91 23		9.18 9.9-14 4.54 19	11.47 7.6-10.7 5.07 20		7.1 8.9-13.7 3.99 *	8.74 6.8-10.8 4.43 *	40.07 5-7.7 9.48 *	4.15 7.4-13.2 3.05 *	5.14 6-10.6 3.4 *	24.31 4.4-7.7 7.39 *
0.331	Tp THROW VEL NES	(Pa) (m) (m/s) dB	9.55 10-14.9 4.63 38	11.97 8-11.6 5.18 39		24.33 10.4-15 7.39 32	30.23 8-11.7 8.24 33		16.94 10.4-15 6.17 26	21.12 8-11.7 6.88 27		12.46 10.4-15 5.29 23	15.58 8-1.7 5.91 24		9.64 10.7-15 4.65 18	11.88 8.3-11.6 5.16 19		5.64 9-15.0 3.56 *	6.98 7-11.7 3.96 *	33.02 5.3-8.3 8.61 *
0.380	Tp THROW VEL NES	(Pa) (m) (m/s) dB				32.07 11.2-16 8.48 37	39.84 8.6-12 9.46 38		22.32 11.4-16.8 7.08 31	27.83 8.6-12.3 7.9 32		16.43 11-16.0 6.07 27	20.53 8.6-12.3 6.79 28		12.7 11.4-16 5.34 22	15.65 8.6-12.4 5.93 23		7.43 10.7-16 4.08 17	9.2 8.3-12.3 4.55 18	43.52 5.8-8.9 9.88 23
0.424	Tp THROW VEL NES	(Pa) (m) (m/s) dB							27.79 12-16.0 7.9 35	34.65 9-2.8 8.82 36		20.45 12-16.0 6.78 31	25.56 9.1-12.8 7.57 31		15.82 11.7-17 5.96 25	19.49 8.9-12.8 6.61 26		9.25 11.7-17 4.56 17	11.46 9-12.9 5.07 21	
0.473	Tp THROW VEL NES	(Pa) (m) (m/s) dB							34.58 12.6-18 8.81 39	43.12 9.8-14 9.84 40		25.45 12.6-17.8 7.56 35	31.81 9.9-13.8 8.45 36		19.68 12.5-17 6.65 28	24.25 9.9-13.8 7.36 39		11.51 12.6-17.8 5.08 23	14.26 9.9-13.8 5.6 24	

	0°	22½°	45°
Aj Register with OBD	.73 CA	.70 CA	.55 CA
Aj Register without OBD	.79 CA	.74 CA	.58 CA
Throw	100 %	77 % of Straight	55 % of straight
C pressure Coeff.	1.341	1.315	1.305
Basic Formulae:	$m^3/s = V \times Aj$ $V = C$		