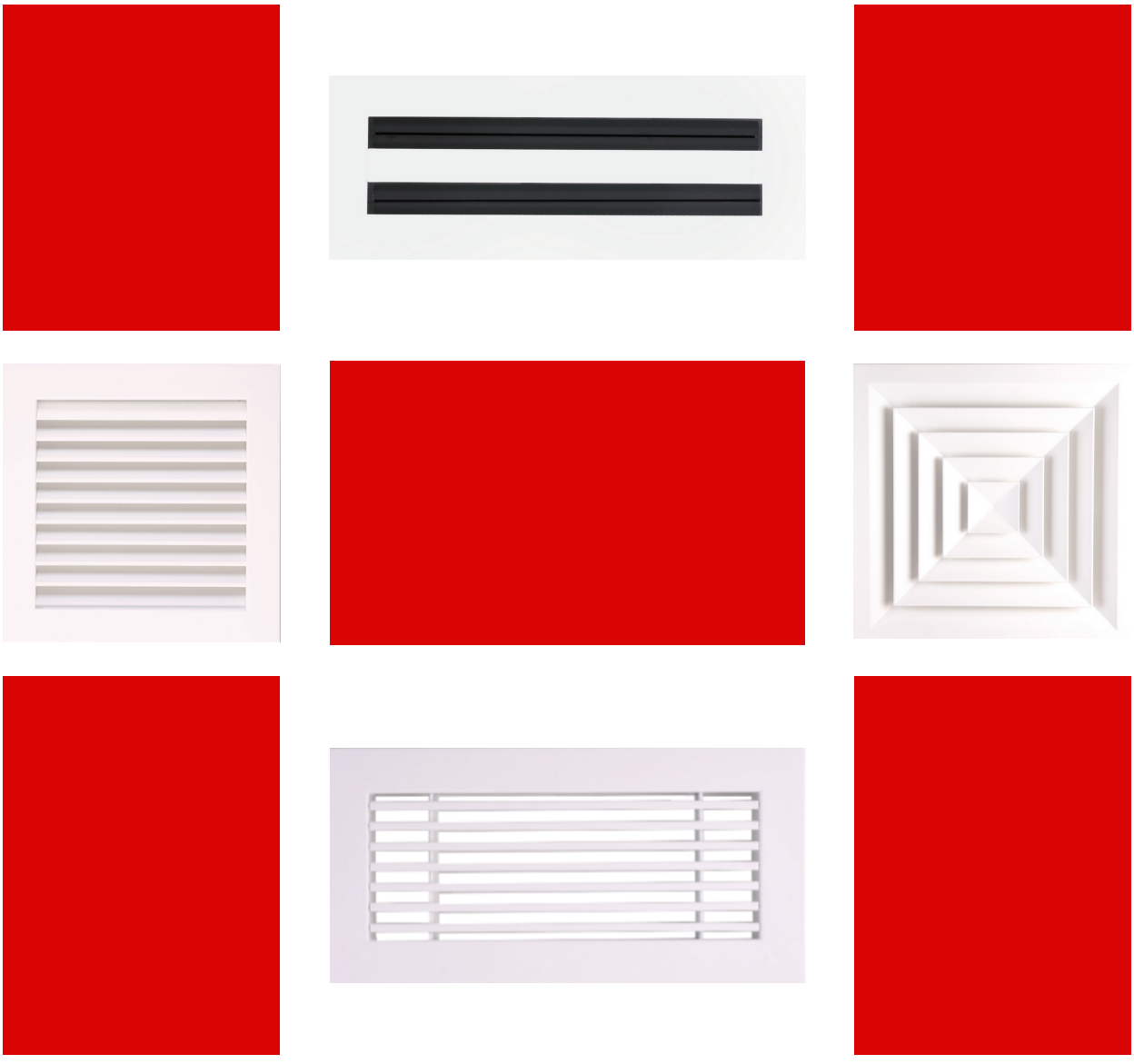
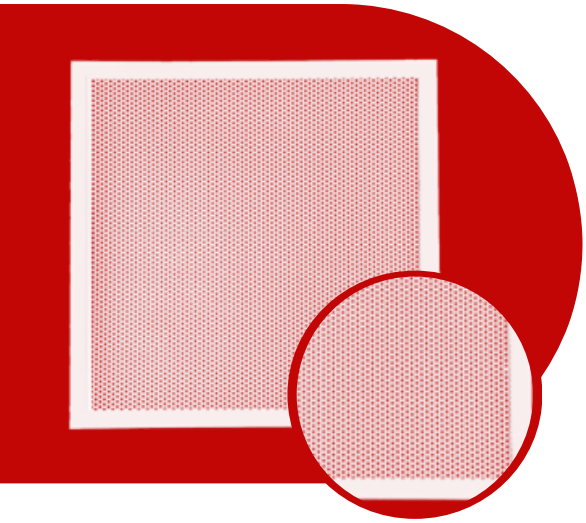
HART

AIR GRILLES & DIFFUSER





PERFORATED GRILLE

APPLICATION

The Perforated Grille (APG) is designed to handle large volumes of air with low airflow resistant for supply and return air application. It can be fixed or removable center blade. There are a variety of sizes available upon request.

ACCESSORIES

- Adjustable opposed blades volume control damper

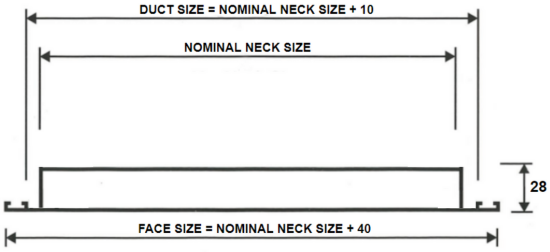
MATERIAL

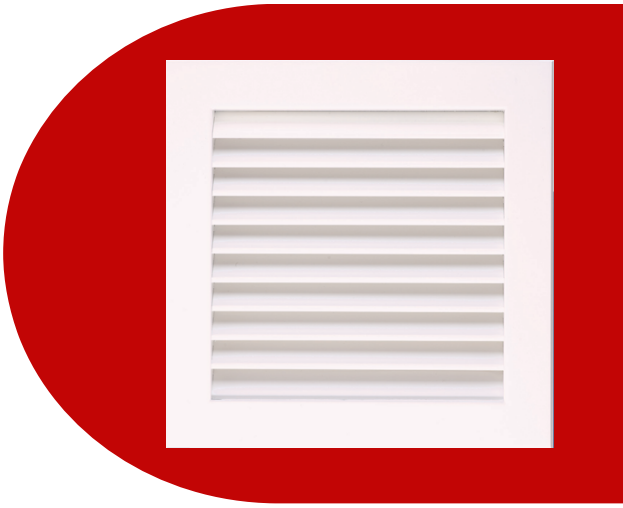
- Aluminum frame
- 5mm diameter G.I.

SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

APG Construction Illustration





FIXED LOUVRE GRILLE

APPLICATION

Model AFL Fixed Louvre Grille is constructed from highly corrosion resistant extruded aluminum. It is designed with welded butt joints and corner inserts and is able to withstand rough handling during installation. The grille is a very popular choice for many return or exhaust application, and it is designed to handle large volumes of air with low airflow resistant and low noise characteristics.

ACCESSORIES

The blades are held in position with spring wires on both sides of the grille. They are fixed at a 45° angle and at a 18mm blade spacing. The optional opposed blade volume control damper is screwdriver operated from the face of the grille. The free area is approximately 70%.

SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance. Grilles are designed to withstand rough handling without distortion. Units of grilles have been tested at an independent N.A.T.A. accredited test laboratory in Australia.

MATERIAL

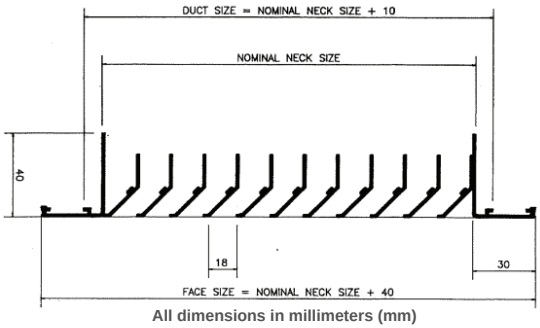
All corners of grilles are reinforced with a high temperature nylon corner inserts and argon welded to maintain hairline miter-joints to ensure rigid handling.

Accoustic and Airflow Performance Data of Fixed Louvre Grille (AFL)

Size in (mm)	Area (m2)	Qs (ℓ/s)	20	25	30	40	50	60	70	80	90	100	150	200	250	300	400	500	600	700	800	900	1000	1500	1600	1700	1800	1900
150 x 150	0.0225	SP	4	7	11	20	31	46	62	82	104	128	278	480														
		NR	-	-	-	11	14	18	21	24	26	29	34	40														
200 x 200	0.04	SP	1	1	2	4	8	13	20	27	35	43	94	162	175	336												
		NR	-	-	-	-	-	9	11	14	17	19	26	31	37	39												
250 x 250	0.0625	SP			1	2	3	4	8	11	14	18	41	70	106	150	252	390										
		NR			-	-	-	-	8	9	10	11	32	39	40	50	57	64										
300 x 300	0.09	SP					5	6	7	8	9	10	20	36	54	77	123	153	183	213	243	273	306					
		NR					-	-	-	-	8	9	22	31	36	42	50	62	74	86	98	110	120					
400 x 250	0.1	SP					1	1	2	3	4	7	12	20	33	47	80	123	180	240	313	391	479					
		NR					-	-	-	-	-	8	12	21	25	30	38	41	47	50	53	55	56					
400 x 400	0.16	SP						1	1	2	2	4	5	10	12	17	25	45	63	86	112	138	173	380	429	485		
		NR						-	-	-	-	-	9	11	13	17	22	27	31	34	38	42	43	53	55	57		
600 x 300	0.18	SP							1	1	1	1	2	5	10	14	23	35	50	68	86	110	132	289	326	368	416	470
		NR							-	-	-	8	15	22	23	26	32	38	41	47	49	53	57	66	68	70	72	74
1200 x 250	0.3	SP									1	1	1	2	4	8	11	18	24	31	42	48	60	132	148	169	188	224
		NR									-	-	10	13	16	20	21	25	29	32	36	37	41	52	54	56	59	61
600 x 600	0.36	SP											1	2	3	4	7	11	15	20	23	26	29	43	46	49	52	55
		NR											14	19	24	36	43	51	57	62	71	80	88	132	141	150	159	168
750 x 750	0.5625	SP												1	1	2	2	4	5	7	9	12	15	35	38	45	51	56
		NR												11	14	16	20	21	22	23	24	25	26	36	38	42	44	45
1200 x 600	0.72	SP													1	2	3	5	8	9	11	13	14	21	22	23	24	25
		NR													12	14	27	35	41	44	47	53	59	88	94	100	106	112

*SP - Static Pressure (Pa)
*NR - Noise rating number based upon room absorption 10dB
*- - Insufficient margin above background noise to allow any determination
*Qs - Primary Air Flow Rate (l/s)
Result of performance is tested under NATA (Australia)

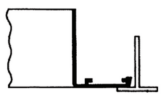
Model AFL Dimensions



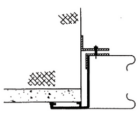
All dimensions in millimeters (mm)

Mounting Details

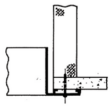
Lay-in frame exposed T-Bar ceilings



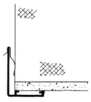
Concealed bracket fastening

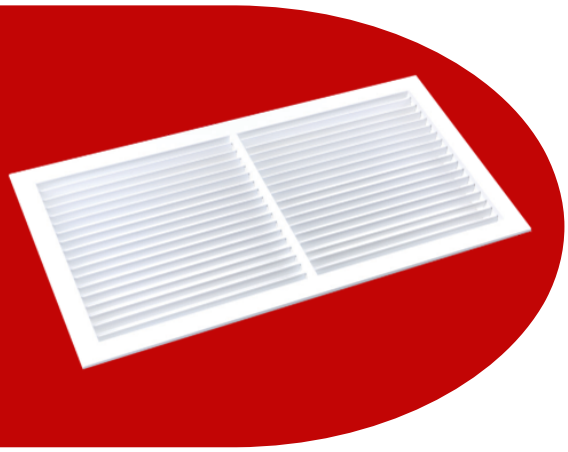


Countersunk screw fastening



Concealed spring clip fastening





SINGLE DEFLECTION GRILLE

APPLICATION

ASG Single Deflection Grille is constructed from highly corrosion resistant extruded aluminum. Designed with welded butt joints and corner inserts, it will be able to withstand rough handling during installation. The grille is a very popular choice for many cooling, heating and ventilating application, and it is designed to handle large volumes of air with good throw patterns, acceptable pressure drop and sound levels.

ACCESSORIES

Single Deflection Grilles have deflector blades that are individually adjustable for any degree of deflection. It is designed with aero-foil blades to achieve optimum air diffusion. The free area is approximately 85%.

SURFACE FINISH

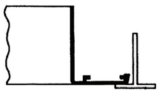
Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

MATERIAL

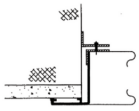
The frame and blades are separated by a very special high temperature nylon bush to eliminate vibration and corrosion. Corners of frame are reinforced with corner inserts and argon welded to maintain hairline miter-joints to ensure rigid handling.

Mounting Details

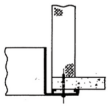
Lay-in frame exposed T-Bar ceilings



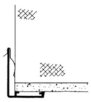
Concealed bracket fastening



Countersunk screw fastening

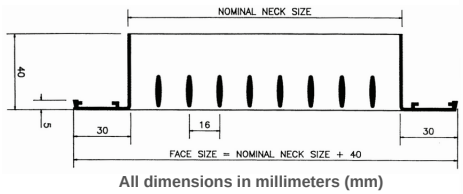


Concealed spring clip fastening



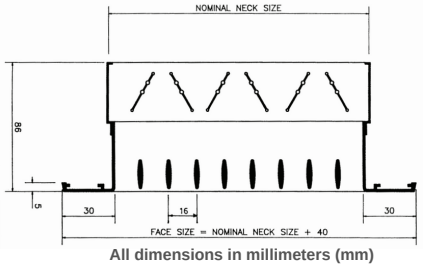
Model ASG Dimensions

Without volume control damper



All dimensions in millimeters (mm)

Complete with volume control damper



All dimensions in millimeters (mm)

WEATHERPROOF LOUVRE

APPLICATION

AWL Weatherproof Louvre is a very popular choice for many ventilating and weather-keeping application, and it is designed to handle large volumes of air with acceptable pressure drop and sound levels. It integrates the functional job of efficient air handling and weather-keeping with the necessary aesthetic appeal consistent with modern building practice. The Weatherproof Louvre is also designed with rain lips to minimize ingress of rainwater in normal climatic conditions.

ACCESSORIES

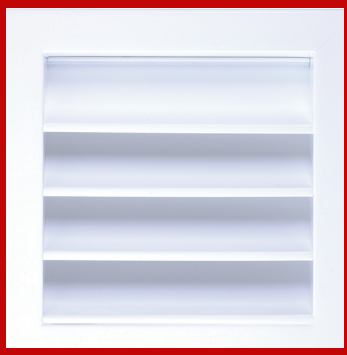
The Air Grilles Weatherproof Louvre has 45° angled blades and rain lips louvred weatherproof louvre provides maximum weather protection. It has a standard air gap of 39mm. Insect screen is available upon request.

MATERIAL

All corners of grille are reinforced with corner insets and argon welded to maintain hairline miter-joints to ensure rigid handling.

SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

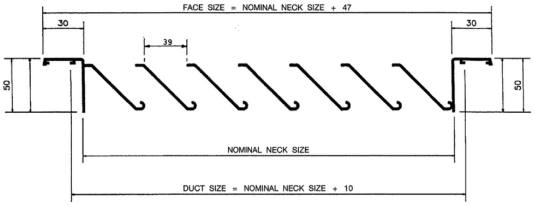


Accoustic and Airflow Performance Data of Weatherproof Louvre (AWL)

SIZE in (mm)	Area (m2)	Qs (ℓ/s)	100	150	200	300	400	500	600	1000	1500	2000	2500	3000	4000	5000	6000	7000
300 x 300	0.09	SP	13	28	50	115	200											
		m/s	1.25	1.75	2.5	4	5											
450 x 300	0.135	SP		12	20	48	80	130	200									
		m/s		1.25	1.5	2.5	3	4	5									
600 x 300	0.18	SP			12	25	45	70	100	280								
		m/s			1.25	2	2.5	3	4	6								
450 x 450	0.203	SP			10	20	35	60	75	220								
		m/s			1	1.5	2	2.5	3.25	5								
900 x 300	0.27	SP				12	20	30	45	125	280							
		m/s				1.25	1.5	2	2.5	4	6							
600 x 600	3.6	SP					11	18	25	70	150	260						
		m/s					1.25	1.5	1.75	3	4.5	6						
900 x 450	0.405	SP					8	14	20	55	125	220						
		m/s					1	1.25	1.5	2.5	3	5						
900 x 600	0.54	SP						7	11	30	65	125	200					
		m/s						1	1.25	2	2.75	4	5					
1200 x 600	0.72	SP							5	15	38	67	100	150	210			
		m/s							0.8	1.5	2.25	3	3.6	4.2	5.2			
1200 x 900	1.08	SP								7	11	28	45	62	120	180		
		m/s								1	1.5	2	2.5	3	4	5		
1200 x 1200	1.44	SP									9	16	25	35	60	100	150	200
		m/s									0.75	1.5	1.75	2.25	3	3.5	4	5

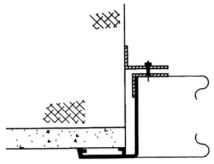
*SP - Static Pressure (Pa)
*m/s - Neck Velocity (meters/second)
*Qs - Primary Air Flow Rate (l/s)

Model AWL Dimensions

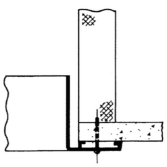


All dimensions in millimeters (mm)

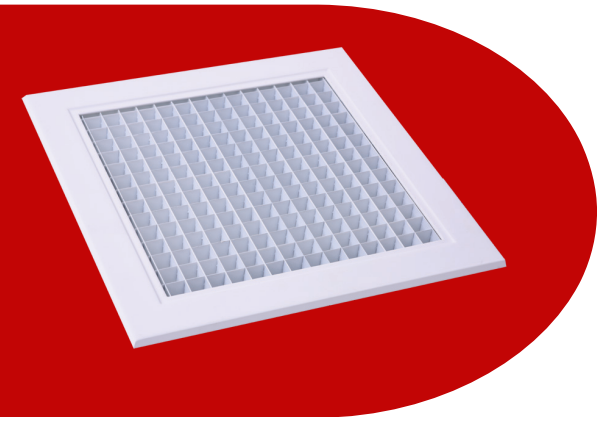
Mounting Details



Concealed bracket fastening



Countersunk screw fastening



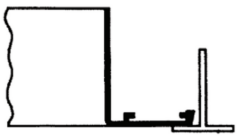
EGG-CRATE GRILLE

APPLICATION

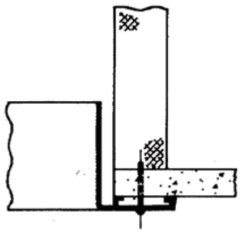
ARE Egg-Crate Grille is constructed from highly corrosion resistant extruded aluminum. Designed with welded butt joints and corner inserts, it will be able to withstand rough handling during installation. The grille is a very popular choice for many relief, return or exhaust application, and it is designed to handle large volumes of air with low airflow resistant and low noise characteristics. It is the most popular and economical ceiling return air inlet. Egg-Crate Grille is suitable for mounting on virtually all types of ceiling.

Mounting Details

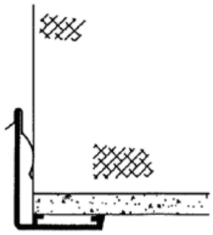
Lay-in frame for exposed T-bar ceilings



Countersunk, screw fastening



Concealed spring clip fastening



ACCESSORIES

It is available in "life-up" core (aluminum or white PVC), with or without frame work. Optional opposed blade volume control damper can be easily adjusted from the face of grille with the use of a screwdriver. The grille can be provided together with frame for wall to wall or perimeter run. The grille has a standard square grid of 12mm x 12mm x 12mm.

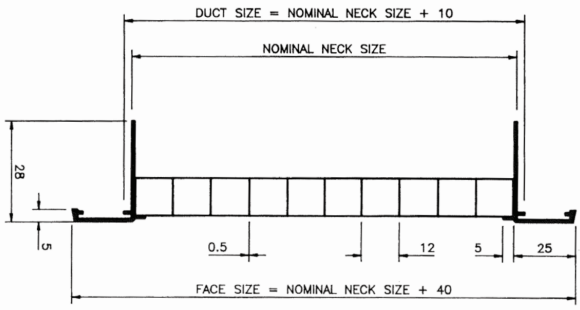
SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

MATERIAL

Corners of frame are reinforced with corner inserts and argon welded to maintain hairline mitre-joints to ensure rigid handling.

Model ARE Dimensions



All dimensions in millimeters (mm)

Accoustic and Airflow Performance Data of Egg-crate Grille (ARE)

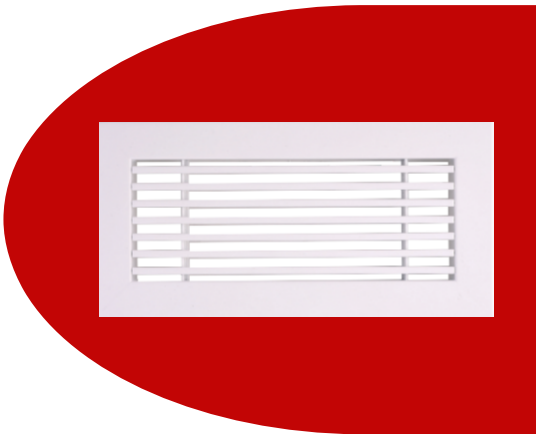
SIZE in (mm)	Area (m2)	Qs (ℓ/s)	100	150	200	250	300	400	500	600	700	800	900	1000	1500	2000	2500	3000	5000
300 x 300	0.09	SP NR	3 -	7.5 -	11 10	12.5 17	20 22	42.5 31											
450 x 300	0.135	SP NR		2.5 -	4 -	5 4	7.5 9	12 17	15 25	22.5 30	27.5 35	35 38	42.5 42	55 45					
600 x 300	0.18	SP NR				2.5 -	2.5 5	7.5 13	10 20	12.5 26	15 30	20 35	25 37	32.5 41	40 53				
900 x 300	0.27	SP NR						2.5 4	5 10	6 16	7.5 20	10 24	12 27	12.5 31	15 43	42.5 51			
600 x 600	0.36	SP NR							3 6	5 11	6 16	7.5 19	10 22	10 26	12.5 37	25 46	42.5 53		
900 x 600	0.54	SP NR							2.5 -	2.5 -	2.5 4	2.5 7	5 11	6 15	7.5 26	15 35	25 41	27.5 46	
1200 x 600	0.72	SP NR										2.5 -	3 4	4 7	4.5 20	12.5 27	20 35	22.5 40	
900 x 900	0.81	SP NR										2.5 -	2.5 -	2.5 5	5 17	10 25	15 32	17.5 37	47.5 46

*SP - Static Pressure (Pa)
*NR - Noise rating number based upon room absorption of 10dB
*- - Insufficient margin above background noise to allow any determination
*QS - Primary Air Flow Rate (l/s)

LINEAR BAR GRILLE

APPLICATION

ABL Linear Bar Grille is constructed from highly corrosion resistant extruded aluminum. It is designed to withstand rough handling without distortion. The Linear Bar Grille is a very popular choice for many cooling, heating and ventilating application, and is designed to handle large volumes of air with good throw patterns, acceptable pressure drop and sound levels. The Linear Bar Grille is specifically designed for architectures, designers and air conditioning engineers with skill and knowledge in the art of Air Distribution.



ACCESSORIES

The grille is available in 0° and 15° deflection bars and constructed with a standard spacing of 12mm from bar center to center. Optional opposed blade volume control damper can be easily adjusted from face of grille by a screwdriver.

SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

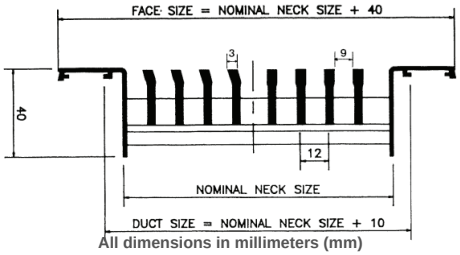
MATERIAL

Corners of frame are reinforced with corner inserts and argon welded to maintain hairline mitre-joints to ensure rigid handling.

Selection

Linear Bar Grille are designed for installation in sidewall or sill and can be used for supply or return air in heating, cooling or ventilating applications. With fixed bars parallel to the long dimension. Linear Bar Brilles are a popular choice for continuous line use on a variety of applications. Linear Bar Grilles installed in the sidewall near the ceiling can provide a horizontal air pattern above the occupied zone. Core deflections of 0° or 15° allow the air pattern to be directed up and across the ceiling. The air distribution then benefits from the ceiling coanda effect. For horizontal air patterns of cooling air in free space, 0° or 15° core deflections can direct the air path upward to compensate for the drop resulting from the cooling differential of the supply air. The core deflection also reduces the open appearance of the grille face. Linear Bar Grilles installed in the top of a sill or an enclosure provide a vertical air pattern. This is effective on counteracting cold down drafts and in offsetting the radiant effect of glass surfaces. A 15° core deflection, directed towards the glass, will increase the air pattern spread on the glass. The air flow will be directed up the glass and across the ceiling towards the interior. It is recommended that selections of ceiling mounted Linear Bar Grilles be confined to return or exhaust air application. When ceiling mounted for supply air, they will provide a vertical projection air pattern. Generally, vertical projection is required only for spot heating or spot cooling applications such as entrance vestibules. Mitered Corners are a standard feature with Linear Bar Grilles. When assembled and finished, the accurate mitered joints of the end cap blend perfectly into the total assembly.

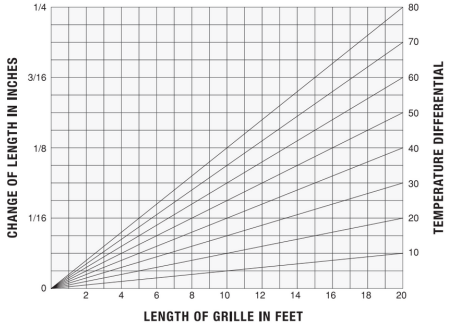
Model ALB Dimensions



All dimensions in millimeters (mm)

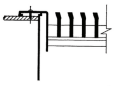
Expansion and Contraction of Aluminum

The expansion and contraction of the Extruded Aluminum Linear Bar Grille due to the difference in temperatures are shown in the graph. For all applications, the hairline joint which occurs when Linear Bar Grilles are butted together is sufficient to take care of the expansion and contraction of the aluminum. The alignment strips furnished with the grilles make it easy to allow this slight clearance during installation and still maintain alignment.

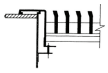


Mounting Details

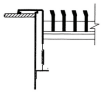
Countersunk screw fastening



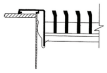
Concealed bracket fastening



Spring attachment fastening



Concealed fastening spring clip



Accessories

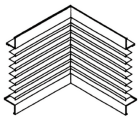
ALIGNMENT STRIPS

It is provided when Linear Bar Grilles are supplied with open ends for continuous installation.

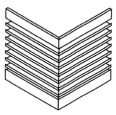
Mitered Corner Sections

Mitered corner sections for Model ABL Linear Bar Grilles are available in both simple or compound angles if required. They are factory assembled featuring precision miters plus welded construction at the joints to maintain hairline precision miter. Mitered corner sections are finished to match the associated straight sections of grille. Shown below are three mitered corner sections for Linear Bar Grilles with simple 90° angle joints

For ceiling, floor or sill



For sidewall inside mitred corner



For sidewall outside mitred corner

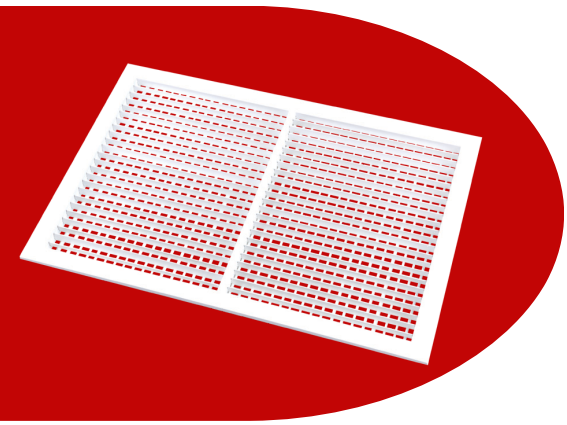
Accoustic and Airflow Performance Data of Linear Bar Grille (ABL)

SIZE (in mm)	Area(m2)	Qs(ℓ/s)	25	30	40	50	60	70	80	90	100	150	200	250	300	400	500	600	700	800	900	1000
300 x 150	0.045	SP NR T(m)	1 - 1	1 9 1.2	3 11 1.6	3 12 1.9	4 12 4	5 13 4.8	7 14 5.4	9 14 6.5	10 15 6.9	15 17 7.8	19 22 10.8	22 26 11.6	27 28 12.6	38 36 >16	58 43 >16					
450x 150	0.0675	SP NR T(m)			1 8 1.1	1 9 1.5	2 10 3.8	3 11 4.5	4 12 5.1	5 13 5.3	6 14 6.1	12 15 7.3	16 17 8.4	17 20 9.5	20 26 11.1	36 34 >16	55 41 >16	80 47 >16	90 52 >16			
600 X 150	0.09	SP NR T(m)					1 7 2	2 9 2.3	3 10 2.6	4 11 2.9	5 13 3.2	7 14 4.8	10 16 6.4	13 17 8	19 24 9	33 33 13	50 39 15	71 44 >16	83 51 >16	95 58 >16		
750 X 150	0.1125	SP NR T(m)						1 6 2.4	1 8 3	2 10 3.6	5 11 4.4	7 13 5.5	9 15 6.8	11 16 7.4	17 23 8.4	24 32 12	33 37 14	53 41 16	62 46 >16	70 54 >16	89 58 >16	110 60 >16
900 X 150	0.135	SP NR T(m)							1 7 2	1 9 3	1 10 4	2 12 5	3 14 6.3	6 16 7.1	10 22 8	18 28 11	28 34 13	40 37 15	46 43 >16	53 45 >16	68 48 >16	83 50 >16
1050 X 150	0.1575	SP NR T(m)									1 9 2.3	1 11 2.7	3 13 4.1	5 16 4.4	7 21 4.9	12 26 6	19 32 6.8	30 36 8.5	38 40 9	41 43 10	55 46 11	62 49 11.5
1200 x 150	0.18	SP NR T(m)										3 10 2	4 12 2.6	5 15 3.3	6 19 3.9	8 25 5.2	13 31 6.5	18 35 7.6	24 39 8.2	27 42 9.4	32 45 11	40 48 12.2

*SP - Static Pressure (Pa)
*NR - Noise rating number based upon room absorption of 10dB
*- - Insufficient margin above background noise to allow any determination
*T - Throw in meters to a Terminal Velocity of 0.25m/sec (as per ADC 1062-R3)
*Qs - Primary Air Flow Rate (ℓ/s)
Result of performance is tested under NATA (Australia)

Recommended Sound Levels

LOCATION	SPACE	NC CRITERIA	SUGGESTED FACE VELOCITY (m/s)
Auditoriums	Concert Halls, Studios, Movie Theatres, Lecture Halls, TV Audience Studios.	20 - 25 25 - 30	2.5 2.5 - 3.75
Churches and Schools	Sanctuaries Libraries, Classrooms	20 - 30 30 - 40	2.5 - 3.75 2.5 - 5.0
Offices	Boardrooms Conference Rooms Executive Rooms General Open Offices	20 - 30 25 - 35 30 - 40 35 - 50	2.5 - 3.75 2.5 - 3.75 2.5 - 5.0 2.5 - 6.5
Hospital	Intensive Care Wards Private Room Operating Room Wards	 25 - 35 30 - 40 30 - 40	 2.5 - 3.75 2.5 - 5.0 2.5 - 5.0
Hotel	Individual Rooms, Suites, Halls, Corridors, Lobbies, Ballrooms	30 - 40 35 - 40	2.5 - 5.0 2.5 - 5.0



DOUBLE DEFLECTION GRILLE

APPLICATION

ASR Double Deflection Grille is constructed from highly corrosion resistant extruded aluminum. Designed with welded butt joints and corner inserts, it will be able to withstand handling during installation. The grille is a very popular choice for many cooling, heating and ventilating application and is designed to handle large volumes of air with good throw patterns, acceptable pressure drop and sound levels.

ACCESSORIES

All aero-foil blades are individually adjustable for any angle of deflection. Double Deflection Grille is designed with the aero-foil blades to achieve optimum air diffusion. Optional opposed blade volume control damper is easily adjustable from face of grille by a screwdriver. The free area is approximately 80%.

MATERIAL

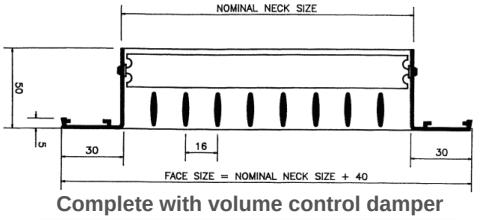
Corners of frame are reinforced with corner inserts and argon welded to maintain hairline miter-joints to ensure rigid handling. Units of grilles have been tested at an independent N.A.T.A. accredited test laboratory in Australia.

SURFACE FINISH

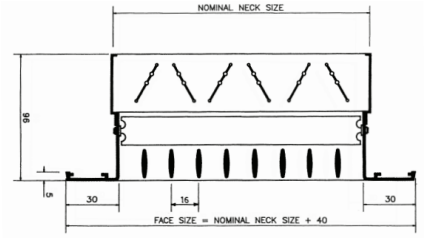
Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

Model ASR Dimensions

Without volume control damper



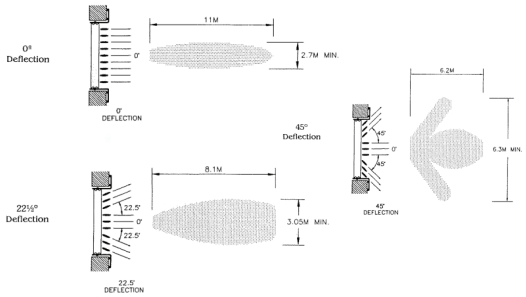
Complete with volume control damper



All dimensions in millimeters (mm)

Horizontal Deflection (Spread)

The diagrams shown below are based on the actual test results. They illustrate the spread and throw for a typical selection of a high sidewall supply outlet. The angle of spread also affects the angle of drop of the airstream.



SELECTION

When selecting a Double Deflection Grille to be used in specific location and a specific purpose, two important points have to be determined.

- What are the specific room-use characteristics?
- What are the performance characteristics?

1.Air Pattern Requirements - Drop

For any given constant air quantity, the air drop increases as the area of the neck of the specific grille increases. The increased drop is due to the inverse relationship of the face velocity of the air stream and the size of the neck area. Assuming that the spread angle of the aero-foil blades is maintained at a constant setting, the resulting length of the throw will increase as the quantity of air passing through the grille increases. Thus an increase in the air drop will follow. To alter the performance of the Double Deflection Grille, the easiest method is to adjust the spread angels of the aero-foil blades. There are three general rules to apply to the relationship between the spread of the air and the throw:

- At a 45° setting of the aero-foil blades, the spread of the air is approximately 1.5 times the throw.
- At a 22.5° setting of the aero-foil blades, the speed of the air is approximately 0.5 times the throw.
- At a 0° setting of the aero-foil blades, the speed of the air is approximately 0.35 times the throw.

2. The Throw Requirement

The throw of air from the grille being used should be limited to ensure the drop of the airstream does not fall below a reasonable working level within the specific room being conditioned if around 1500mm. The proper throw condition will be achieved if the two following extreme of conditions do not arise:

- Inadequate conditioning which fails to adequately cover the total area.
- Excessive quantities of air, relative to the neck area and spread angle of the grille, thus producing drafts.

3. The Air Quantity

The total volume of air to be delivered to each area is determined by the overall system design. Thus, the number of outlets per room, for example, will determine the volume of air to be transmitted through each grille.

4. The Desired Noise Levels

The noise level produced by a grille is directly related to the quantity of air being transmitted through the grille, as well as the neck size and louvre blade spread angle of the register. For a given constant air quantity, the noise level (N.R.) will increase as the core area of the register decreases. Similarly, for a constant quantity of air, the noise level (N.R.) increases as the angle of the aero-foil blades closes from 0 degree to 90 degrees.

Recommended Sound Levels

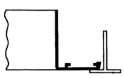
LOCATION	SPACE	NC CRITERIA	SUGGESTED FACE VELOCITY (m/s)
Auditoriums	Concert Halls, Studios, Movie Theatres, Lecture Halls, TV Audience Studios.	20 - 25 25 - 30	2.5 2.5 - 3.75
Churches and Schools	Sanctuaries Libraries, Classrooms	20 - 30 30 - 40	2.5 - 3.75 2.5 - 5.0
Offices	Boardrooms Conference Rooms Executive Rooms General Open Offices	20 - 30 25 - 35 30 - 40 35 - 50	2.5 - 3.75 2.5 - 3.75 2.5 - 5.0 2.5 - 6.5
Hospital	Intensive Care Wards Private Room Operating Room Wards	 25 - 35 30 - 40 30 - 40	 2.5 - 3.75 2.5 - 5.0 2.5 - 5.0
Hotel	Individual Rooms, Suites, Halls, Corridors, Lobbies, Ballrooms	30 - 40 35 - 40	2.5 - 5.0 2.5 - 5.0

Accounstic and AIrflow Performance Data of Double Deflection Grille (ASR)

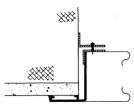
SIZE in (mm)	Area (m2)	Qs (ℓ/s)	20	25	30	40	50	60	70	80	90	100	150	200	250	300	400	500	600	700	800	900	1000	1500
150 x 150	0.0225	SP NR T(m)	5 - 2.2	6 - 2.8	7 - 3.3	8 - 4.4	10 - 5.5	11 - 6.5	12 6 7.6	13 9 8.7	14 12 9.8	17 20 10.9	19 24 16	21 27 >16	27 30 >16	30 35 >16								
200 x 200	0.04	SP NR T(m)				4 - 3.4	5 - 4.3	6 6 5.2	7 7 6	8 8 6.9	9 9 7.8	14 14 8.7	16 20 13	18 24 >16	20 26 >16	22 31 >16	33 39 >16	44 45 >16						
250 x 250	0.0625	SP NR T(m)					4 - 3.6	5 - 4.3	6 - 5	7 7 5.7	8 10 6.4	9 11 7.1	12 13 10.7	14 20 14.3	17 24 >16	20 29 >16	31 36 >16	42 43 >16	50 50 >16	56 56 >16	64 62 >16			
300 x 300	0.09	SP NR T(m)							3.5 - 4.2	4 - 4.8	4.5 - 5.4	5 8 6	8 12 9	11 16 12	13 20 15	18 26 15.2	30 33 >16	40 41 >16	47 46 >16	54 53 >16	62 60 >16	70 68 >16		
400 x 250	0.1	SP NR T(m)									3.5 - 3.8	4.5 - 4.2	7 11 6.3	10 15 8.4	13 19 10.5	17 26 12.6	27 33 >16	34 41 >16	41 46 >16	48 52 >16	55 59 >16	62 67 >16	70 74 >16	
400 x 400	0.16	SP NR T(m)								2.7 - 2.6	3 - 2.9	3.5 - 3.2	5.5 9 4.8	7 12 6.4	13 18 8	16 25 9.6	22 32 12.8	31 40 16	36 45 >16	40 51 >16	48 58 >16	55 66 >16	62 73 >16	
600 x 300	0.18	SP NR T(m)										4.5 - 3	7 9 4.8	10 13 6.4	13 17 8	15 24 9	18 31 13	24 39 15	30 44 >16	37 50 >16	41 57 >16	46 65 >16	56 72 >16	61 108 >16
600 x 600	0.36	SP NR T(m)											6 11 2.9	8 14 3.9	10 17 4.9	12 20 5.9	16 26 7.9	20 32 9.9	24 38 11.9	28 44 13.8	32 50 15.8	36 56 >16	40 62 >16	60 93 >16
1200 x 450	0.54	SP NR T(m)														6 19 4	8 25 5.2	13 31 6.4	18 35 7.6	24 39 8.2	27 44 9.4	30 49 11	33 54 12	49 81 >16
750 x 750	0.5625	SP NR T(m)													4 15 3.2	5.5 18 3.8	7.5 24 5	10 30 6.3	12 34 7.6	14 37 8	16 40 9.1	18 44 10.2	20 48 11.3	30 71 >16
1200 x 600	0.72	SP NR T(m)														4 13 3	5 17 4	6 21 5	7.5 25 6.1	9 29 7.1	11 33 8	12 37 9.2	14 41 10.3	21 61 15.5

*SP - Static Pressure (Pa)
*NR - Noise rating number based upon room absorption of 10dB
*- - Insufficient margin above background noise to allow any determination
*T - Throw in meters to a Terminal Velocity of 0.25m/sec (as per ADC 1062-R3)
*Qs - Primary Air Flow Rate (l/s)
Result of performance is tested under NATA (Australia)

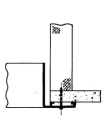
Mounting Details



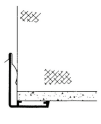
Lay-in frame for exposed T-Bar ceilings



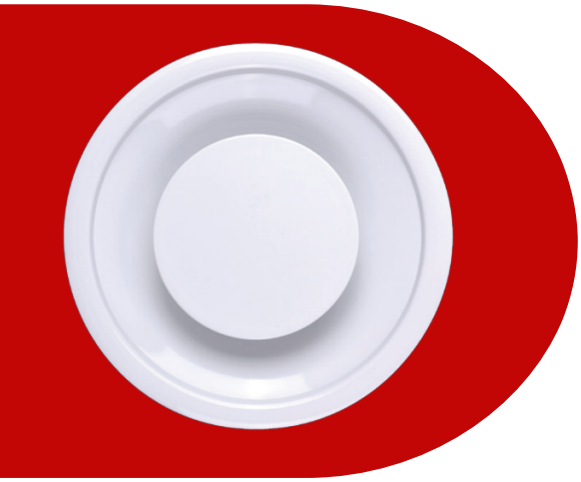
Concealed bracket fastening



Countersunk screw fastening



Concealed spring clip fastening



PAN DIFFUSER

APPLICATION

The Pan Diffuser (Model APD) is used for the supply and exhaust of cooled or heated air in facilities such as offices, shopping centers. The diffuser can be mounted in the ceiling where high aesthetic standards are required. It also has removable deflector plate and adjustable air pattern (horizontal - vertical). The Pan Diffuser has standard sizes which include 150 dia, 200 dia, 250 dia (mm).

ACCESSORIES

- Fan Blade Damper
- Adaptor Collar

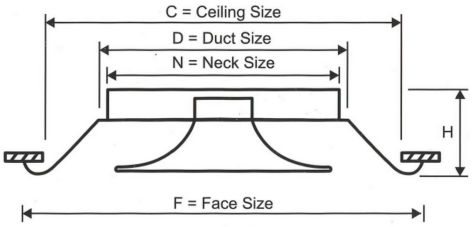
MATERIAL

- Extruded Aluminum Construction

SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

APD Construction Illustration



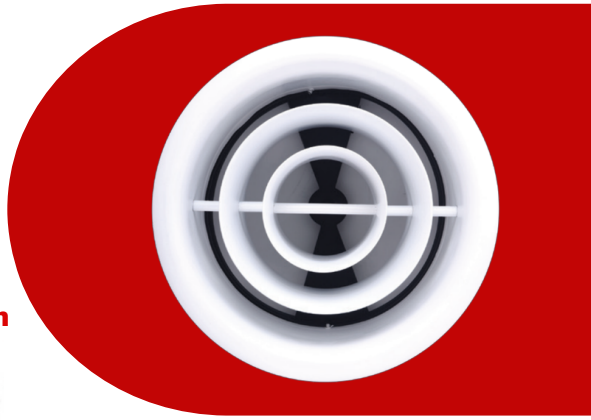
APD Physical Dimension (unit: mm)

MODEL	FACE SIZE (F)	NECK SIZE (N)	DUCT SIZE (D)	CEILING SIZE (C)	HEIGHT (H)
150	360	140	153	310	90
200	406	190	203	358	94
250	450	240	254	400	96

JET DIFFUSER

APPLICATION

The Jet Diffuser (Model AJD) is designed for spot cooling because its direction can be adjusted to suit one's requirement. Its adjustment is made easily by swinging to specific angles or desired directions which the center cones are pivoted. The smoothly finished and streamlined cones of jet stream diffuser provides the most even distribution of all around (360°). The Jet Diffuser has standard sizes which includes 125 dia, 150 dia, 200 dia, 250 dia, 300 dia, 350 dia, 400 dia (mm).



ACCESSORIES

- Fan Blade Damper
- Adaptor Collar

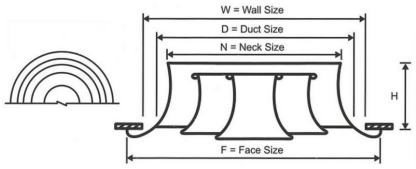
MATERIAL

- Extruded Aluminum Construction

SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

AJD Construction Illustration



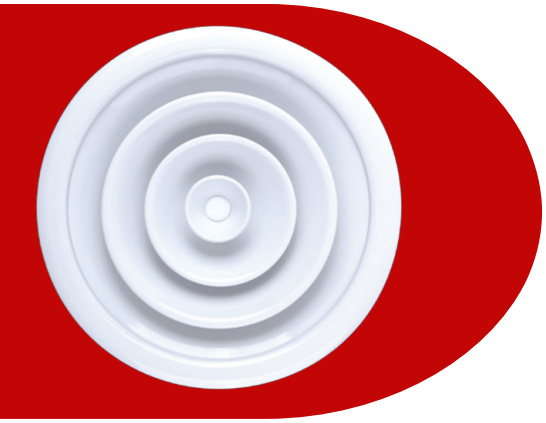
Accoustic and Airflow Performance Data of Jet Diffuser (AJD)

Diameter (inches)	Height (inches) inclusive of damper	Airflow (cfm)	Static pressure (in.w.g)	Throw (ft)	NC level
8	10	250	0.059	16	27
		350	0.096	20	28
10	12	450	0.085	28	30
		600	0.15	34	31
12	14	750	0.147	38	32
		900	0.196	42	31
14	16	1000	0.195	44	33
		1150	0.228	48	35

DATA NOTES
Throw values are provided for terminal velocity of 100fpm.
Throw values are provided for isothermal conditions.
NC values are based on octave band 2-7 sound power levels minus a room absorption of 10dB.
Each NC value represents the noise criteria curve which will not be exceeded by the sound pressure in any of the octave bands, second through seventh, with a room absorption of 10dB, re 10 (power-12) watts.
All pressures are provided in inches of water.

AJD Physical Dimension (unit: mm)

MODEL	FACE SIZE (F)	NECK SIZE (N)	WALL SIZE (W)	HEIGHT (H)
125	180	112	170	115
150	210	140	200	115
200	262	190	212	150
250	315	240	265	140
300	385	292	335	180
350	450	342	400	200
400	500	400	450	200



ROUND DIFFUSER

APPLICATION

The Round Diffuser (Model ARD) is used for the supply and exhaust of cooled or heated air in facilities such as offices, shopping centers. The diffuser can be used for ceiling or exposed duct mounting, especially in installations when an adjustable pattern is required (horizontally-vertically). The inner cores can be easily removed and adjusted up and down by turning clockwise and anti-clockwise. Its standard sizes include 150 dia, 200 dia, 250 dia, 300 dia, 350 dia, 400 dia (mm).

SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance.

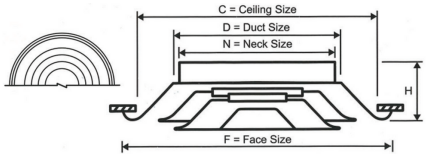
ACCESSORIES

- Fan Blade Damper
- Adaptor Collar

MATERIAL

- Extruded Aluminum Construction

ARD Construction Illustration



ARD Physical Dimension (unit: mm)

MODEL	FACE SIZE (F)	NECK SIZE (N)	DUCT SIZE (D)	CEILING SIZE (C)	HEIGHT (H)
150	360	140	153	310	90
200	406	190	203	358	94
250	450	240	254	400	96
300	508	292	304	458	112
350	650	342	355	600	140
400	650	393	406	600	145

Accoustic and Airflow Performance Data of Round Diffuser (ARD)

	Neck Velocity	500	650	800	950	1100
	Velocity pressure	0.015	0.025	0.042	0.057	0.088
	Total pressure	0.044	0.072	0.109	0.166	0.214
Neck Size						
6"	Airflow (cfm)	80	100	150	200	250
	NC (noise criteria)	20	23	24	26	27
	Throw (ft)	3	3	4	6	7
8"	Airflow (cfm)	200	240	280	320	380
	NC (noise criteria)	24	25	27	29	30
	Throw (ft)	6	7	8	9	11
10"	Airflow (cfm)	300	380	460	540	600
	NC (noise criteria)	25	27	29	29	31
	Throw (ft)	9	11	13	15	16
12"	Airflow (cfm)	450	530	620	720	840
	NC (noise criteria)	28	29	30	32	33
	Throw (ft)	13	15	16	17	19
14"	Airflow (cfm)	650	800	900	1000	1150
	NC (noise criteria)	29	31	34	35	36
	Throw (ft)	16	17	19	20	22
16"	Airflow (cfm)	850	1000	1200	1350	1500
	NC (noise criteria)	30	33	35	37	39
	Throw (ft)	18	20	22	24	26

DATA NOTES

Throw values are provided for terminal velocity of 100fpm.
Throw values are provided for isothermal conditions.
NC values are based on octave band 2-7 sound power levels minus a room absorption of 10dB.
Each NC value represents the noise criteria curve which will not be exceeded by the sound pressure in any of the octave bands, second through seventh, with a room absorption of 10dB, re 10 (power-12) watts.
All pressures are provided in inches of water.

BALL SPOUT JET DIFFUSER

DESCRIPTION

The frame and nozzle core of the Ball Spout Jet Diffuser (Model AJD-B) are high quality extruded aluminum sheet construction with advantages of corrosion resistance and rigidity. This type of jet air diffuser is specially designed to use in the application where the high airflow capacity and long throw supply system is required. Airflow can be easily adjusted from a jet to a diffused pattern and the orientation of the airflow can be adjusted by moving the inner core. The discharge nozzle with a spherical outlet is mounted to a housing. The mounted circular flange is removable for easy installation and maintenance.

ACCESSORIES

- OBD-R (Radial Damper)

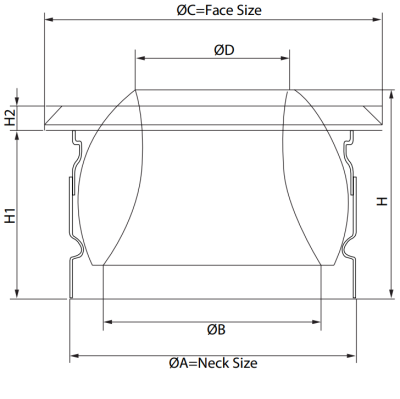
SURFACE FINISH

Powder coated color finish as per RAL color standard color: RAL9016

MATERIAL THICKNESS

- 1.3mm

Model AJD-B Technical Drawing



Standard Sizes

Item Code	Neck ø A (mm)	Face ø C (mm)	ø D	H1	H2
AJD-B-100	100	149	48	76	22
AJD-B-125	125	173	62	95	24
AJD-B-150	150	199	76	110	23
AJD-B-200	200	265	107	138	27
AJD-B-250	250	310	128	175	25
AJD-B-315	315	378	180	200	30
AJD-B-400	399	468	275	227	31
AJD-B-450	450	523	275	220	32
AJD-B-500	495	583	285	250	35
AJD-B-600	600	705	335	280	43

Accoustic and Airflow Performance Data of Ball Spout Jet Diffuser (AJD-B)

Size(mm)	风管风速 Wind velocity of tube(m/s)	1	2	3	4	5	6	7	8	9	10
100	风量Volume(m³/h)	25	51	77	102	128	153	180	205	-	-
	出风风速Outlet Wind velocity (m/s)	2.8	5	7.5	9.7	12	14.5	17	19.5	-	-
	全压损失Pressure loss(Pa)	6.2	21	59	94	164	210	372	483	-	-
	射程Flow distance(m)	2.1	2.9	3.7	5.1	6.5	6.9	8.1	9.5	-	-
	噪音Noise dB(A)	<20	<20	24	33	36	43	48	54	-	-
125	风量Volume(m³/h)	41	82	122	163	205	244	285	326	366	410
	出风风速Outlet Wind velocity (m/s)	2.8	5	7.5	9.7	12	14.5	17	19	21	24
	全压损失Pressure loss(Pa)	9	26	57	92	153	239	347	456	607	723
	射程Flow distance(m)	2.9	3.6	5.1	7	7.8	8.7	9.8	11.5	12.7	14.1
	噪音Noise dB(A)	<20	<20	23	30	36	46	51	>55	>55	>55
160	风量Volume(m³/h)	60	119	180	238	298	356	416	475	535	595
	出风风速Outlet Wind velocity (m/s)	2.5	4.5	6.5	8.5	11	12.5	15	17	19	21
	全压损失Pressure loss(Pa)	7	25	53	104	162	241	336	413	542	675
	射程Flow distance(m)	2.8	4.1	5.8	7.7	9.3	10.5	11.2	14.3	16.7	18.4
	噪音Noise dB(A)	<20	<20	27	35	42	47	53	>55	>55	>55
200	风量Volume(m³/h)	113	226	339	452	565	678	791	904	1017	1130
	出风风速Outlet Wind velocity (m/s)	2.5	4.5	7	9.5	12	14.5	17	19.2	21.5	24.5
	全压损失Pressure loss(Pa)	7.1	21	49	89	146	197	251	310	403	537
	射程Flow distance(m)	3.1	5.7	8.2	10.1	11.3	12.8	14.8	17.9	19.8	22
	噪音Noise dB(A)	<20	<20	28	37	45	48	52	>55	>55	>55
250	风量Volume(m³/h)	176	353	530	705	883	1060	1236	1410	1585	1765
	出风风速Outlet Wind velocity (m/s)	2.5	4.5	7	9.5	11.5	14	16.5	18.6	21	23
	全压损失Pressure loss(Pa)	8	27	52	95	151	212	284	363	552	692
	射程Flow distance(m)	4.7	8.1	10.2	13.1	14.7	16.3	18.9	20.6	24.8	27.6
	噪音Noise dB(A)	<20	<20	32	38	46	52	55	>55	>55	>55
315	风量Volume(m³/h)	254	508	763	1017	1272	1526	1780	2035	2289	2543
	出风风速Outlet Wind velocity (m/s)	2.4	4.7	7	9.5	12	14	16.5	18.8	19.5	23.5
	全压损失Pressure loss(Pa)	7	24	52	85	141	193	269	381	504	596
	射程Flow distance(m)	3.8	6.9	11.7	14.8	16.9	19.2	23.6	26.9	29.5	30.9
	噪音Noise dB(A)	<20	<20	33	38	43	51	55	>55	>55	>55
350	风量Volume(m³/h)	374	720	1100	1480	1800	2100	1650	3020	3060	3721
	出风风速Outlet Wind velocity (m/s)	2.4	4.7	7	9.3	11.8	14	16.3	18.6	21	23.4
	全压损失Pressure loss(Pa)	5	25	46	86	140	203	275	390	465	590
	射程Flow distance(m)	4.5	8.3	13	16	18.5	21	23.1	26	32.5	39
	噪音Noise dB(A)	<20	<20	32	42	43	51	55	>55	>55	>55
400	风量Volume(m³/h)	452	904	1356	1805	2260	2712	3165	3610	4060	4521
	出风风速Outlet Wind velocity (m/s)	2.3	4.7	7	9.3	11.7	14	16.3	18.6	21	23.3
	全压损失Pressure loss(Pa)	5	19	42	87	139	203	282	369	451	562
	射程Flow distance(m)	5.8	9.6	14.9	17.7	20.5	24.2	27.9	32.7	37.2	42.4
	噪音Noise dB(A)	<20	22	32	41	43	51	55	>55	>55	>55
500	风量Volume(m³/h)	705	1410	2110	2815	3520	4232	4926	5638	6341	7036
	出风风速Outlet Wind velocity (m/s)	2.3	4.6	7	9	11.5	14	16	18.5	20.5	23
	全压损失Pressure loss(Pa)	4.3	18	40	73	128	186	242	312	374	431
	射程Flow distance(m)	7.2	12.9	17.8	22.1	26.7	29.8	34.9	39.7	45.6	50.2
	噪音Noise dB(A)	<20	23	33	42	45	52	55	>55	>55	>55

CEILING DIFFUSER

APPLICATION

ACD Ceiling Diffuser is constructed from highly corrosion resistant extruded aluminum. Designed with welded butt joints and corner inserts, it will be able to withstand rough handling during installation. The grille is a very popular choice for many cooling, heating and ventilating application, and is designed to handle large volumes of air with good throw patterns, lower pressure drop and sound levels. The excellent performance is complimented by a pleasing appearance that harmonizes with various architectural details. It is suitable for mounting on virtually all types of ceilings and is available in various sizes and core patterns to suit every architectural requirement.

ACCESSORIES

The center core is easily removable from the diffuser face for maintenance and the opposed blade volume control damper can be adjusted from face of diffuser with a screwdriver. The square to round adaptor can be supplied to permit attachment of round duct to a square neck diffuser.

MATERIAL

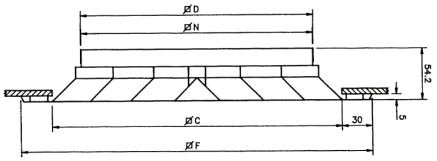
The corners of the frame are reinforced with corner inserts and argon welded to maintain hairline mitre-joints to ensure rigid handling.

SURFACE FINISH

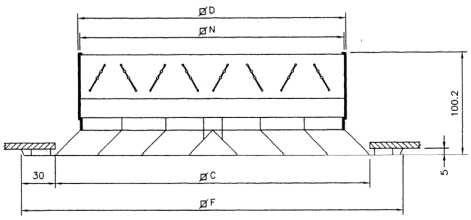
Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance. Units of the grilles have been tested at an independent N.A.T.A accredited test laboratory in Australia.

Model ACD Dimensions

Without volume control damper

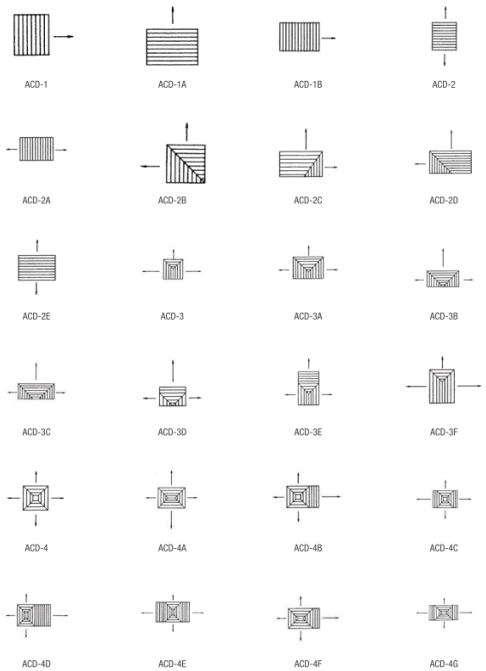


Complete with volume control damper

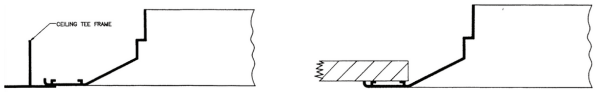


All dimensions in millimeters (mm)

Model ACD Core Styles



Mounting Details



Lay-in frame for exposed T-bar Ceilings.

Flush frame

ø N NECK SIZE		ø F ACTUAL FACE SIZE	ø C CEILING OPENING	ø D DUCT SIZE
ACTUAL (w/o VCD)	ACTUAL (c/w VCD)			
148 x 148	152 x 152	291 x 291	239 x 239	160 x 160
224 x 224	228 x 228	367 x 367	315 x 315	236 x 236
330 x 300	304 x 304	443 x 443	391 x 391	312 x 312
376 x 376	380 x 380	519 x 519	467 x 467	388 x 388
452 x 452	456 x 456	595 x 595	543 x 543	464 x 464
457 x 457	461 x 461	600 x 600	548 x 548	469 x 469
462 x 462	466 x 466	605 x 605	553 x 553	474 x 474
528 x 528	532 x 532	671 x 671	619 x 619	540 x 540
604 x 604	608 x 608	747 x 747	695 x 695	616 x 616

Recommended Sound Levels

LOCATION	SPACE	NC CRITERIA	SUGGESTED FACE VELOCITY (m/s)
Auditoriums	Concert Halls, Studios, Movie Theatres, Lecture Halls, TV Audience Studios.	20 - 25 25 - 30	2.5 2.5 - 3.75
Churches and Schools	Sanctuaries Libraries, Classrooms	20 - 30 30 - 40	2.5 - 3.75 2.5 - 5.0
Offices	Boardrooms Conference Rooms Executive Rooms General Open Offices	20 - 30 25 - 35 30 - 40 35 - 50	2.5 - 3.75 2.5 - 3.75 2.5 - 5.0 2.5 - 6.5
Hospital	Intensive Care Wards Private Room Operating Room Wards	 25 - 35 30 - 40 30 - 40	 2.5 - 3.75 2.5 - 5.0 2.5 - 5.0
Hotel	Individual Rooms, Suites, Halls, Corridors, Lobbies, Ballrooms	30 - 40 35 - 40	2.5 - 5.0 2.5 - 5.0

Accoustic and Airflow Performance Data for 600 x 600 Face Size Ceiling Diffusers (ACD)

SIZE (In mm)	Area(m2)	Qs(ℓ/s)	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400	450	500	600	700
150 x 150	0.0225	SP NR T(m)	12 20 1.7	13 22 1.9	15 26 2.2	21 29 2.5	26 31 2.8	30 32 3	36 35 3.3	42 41 3.5	48 45 3.5	54 47 4									
200x 200	0.04	SP NR T(m)			11 20 2.9	16 22 3.3	18 23 3.7	20 24 3.8	24 26 4.4	28 31 4.7	32 34 4.8	37 35 5.3	40 39 5.9								
250 X 250	0.0625	SP NR T(m)				11 18 3.6	12 19 3.8	13 20 3.9	16 21 4.6	19 24 4.9	22 27 5.1	25 28 5.6	27 31 6.2	30 39 7.6	36 46 8.8	42 54 10.3					
300 X 300	0.09	SP NR T(m)						5 8 4	6 10 4.8	7 11 5	11 12 5.3	12 14 5.9	13 16 6.5	19 22 7.7	24 27 8.9	34 33 10.5	46 38 12	58 41 >12	66 43 >12	86 48 >12	
350 X 350	0.1225	SP NR T(m)								6 9 5.8	9 11 6.2	10 13 6.9	11 14 7.6	16 20 8.5	21 26 9.3	29 32 10.7	39 37 12	50 40 >12	57 42 >12	74 47 >12	86 55 >12
400 X 400	0.16	SP NR T(m)									8 10 7.1	9 11 7.6	10 12 8.4	14 19 9	18 25 9.6	25 31 10.8	34 37 12	44 40 >12	27 42 >12	65 47 >12	76 54 >12
450 x 450	0.2025	SP NR T(m)										5 10 7.7	6 11 8.5	8 18 9.5	10 24 10	14 29 11	18 36 11.5	22 39 >12	28 42 >12	39 46 >12	50 52 >12

*SP - Static Pressure (Pa)
*NR - Noise rating number based upon room absorption of 10dB
*T - Throw in meters to a Terminal Velocity 0.25m/sec (as per ADC 1062-R3)
*Qs - Primary Air Flow Rate (l/s)
Result of performance is tested under NATA (Australia)

Selection of Ceiling Diffuser (ACD)

Air Quantity and Noise Requirements

The total volume of air (l/s) transmitted into a given area to be conditioned is a function of the overall system design (i.e. Total l/s = Number of outlets x l/s per outlet). The permissible Noise Level of the conditioned area is directly related to the intended use of conditioned area (Please refer to the table on Recommended Sound Levels).

Air Distribution Pattern

Given the shape of the space to be conditioned, the pattern requirement is determined by the number of outlets in it and the incidence of any exposed beams or light fittings below the ceiling line that may affect the dispersement of air. For example, for a two-way corner blow pattern. Models ACD-2B, ACD-2C or ACD-2D may be ideally situated in the corner of a room whilst in corridors, a two way opposite blow pattern, Models ACD-2, ACD-2A or ACD-2E may be used. For larger areas, the division of the total area being conditioned into a series of overlapping space modules, usually square or rectangular, into which Model ACD-4 or ACD-4A diffusers are installed is most common.

Throw Requirement

The required throw is usually the distance from the nearest enclosing wall or partition or to the point of intersection with the airstream of an adjacent outlet. For high ceiling areas, the throw requirement may be specified as the horizontal distance described above plus the vertical distance from the outlet to the occupied zone. This vertical distance is commonly measured to extend to the 1500mm level in the room. Generally, the specified throw should not exceed 1.5 times the diffuser mounting height.

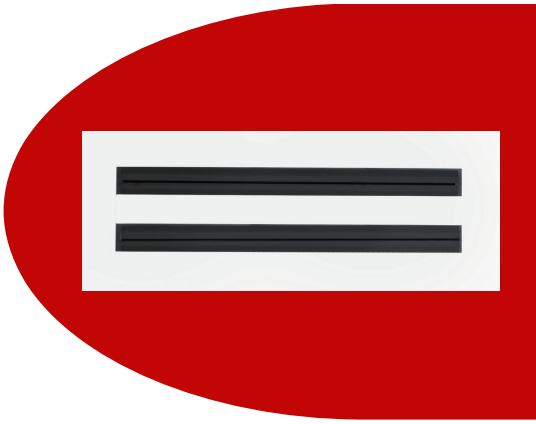
VAV Application

Model ACD Ceiling Diffuser is ideally suited for Variable Air Volume (VAV) applications. The 360° radial horizontal air flow pattern promotes rapid mixing, temperature equalization and velocity reduction. The diffuser provides a consistent and stable air pattern as the air volume is reduced. For ceiling applications, neck velocities as low as 75FPM on reduced air volume results in stable, horizontal air distribution without dumping. On exposed duct VAV applications, stable horizontal air distribution is maintained without dumping down to 20% of the maximum air volume.

Damper Balancing Noise

For convenience, an opposed blade damper can be fitted in the square to round adaptor to allow balancing through the face of the diffuser. But this is only recommended when minor adjustments are necessary. Extensive throttling always be carried out in the distribution ductwork.

ALUMINIUM LINEAR DIFFUSER



APPLICATION

ALD Linear Diffuser is constructed from highly corrosion resistant extruded aluminum. It is designed to withstand rough handling without distortion. The Linear Diffuser is a very popular choice for many cooling, heating and ventilating application, and is designed to handle large volume of air with good throw patterns, acceptable pressure drops and sound levels. With a superior horizontal air pattern, it produces the maximum entrainment of room air, generating the air motion required to provide the optimum comfort conditions throughout the occupied zone.

ACCESSORIES

The pattern vanes permits 180° adjustable air pattern, complete flow rate control, including blank-off. The flow patterns can also be easily adjusted even after diffusers are installed. The diffuser has standard slot width of 20mm and 25mm.

SURFACE FINISH

Standard color will be powder-coated with white finish. All other colors will be enamel-coated and oven-baked for scratch resistance. Units of the grilles have been tested at an independent N.A.T.A accredited test laboratory in Australia.

DESIGN

The Linear Diffuser are specially designed to suit modern architectural and interior decoration requirements. It is stylish, scratch resistant and non-yellowing. For continuous runs, it is made up of individual lengths, the extruded shapes are specially designed to include alignment pins and slugs.

SELECTION

Air Quantity and Noise Requirements

The total volume of air (l/s) transmitted into a given area to be conditioned is a function of the overall system design (i.e. Total l/s = Number of outlets x l/s per outlet). The permissible Noise Level of the conditioned area is directly related to the intended use of conditioned area (Please refer to the table on Recommended Sound Levels).

Air Distribution Pattern

given the shape of the space to be conditioned, the pattern requirement is determined by the number of outlets in it and the incidence of any exposed beams or light fittings below the ceiling line that may affect the disbursement of air.

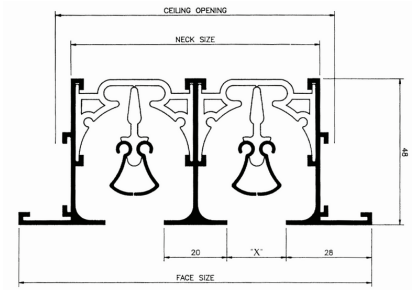
Throw Requirement

The required throw is usually the distance from the nearest enclosing wall or partition or to the point of intersection with the airstream of an adjacent outlet. For high ceiling areas, the throw requirement may be specified as the horizontal distance described above plus the vertical distance from the outlet to the occupied zone. This vertical distance is commonly measured to extend to the 1500mm level in the room. Generally, the specified throw should not exceed 1.5 times the diffuser mounting height.

General Selection

Model ALD Linear Diffusers are available in lengths of up to 3000mm. Any diffusers of longer lengths are joined together using alignment pins/plates. Plenum boxes are also available in lengths of up to 2000mm.

Model ALD Dimensions



No. Of SLOT	20mm SLOT WIDTH (X)			25mm SLOT WIDTH (X)		
	FACE SIZE	NECK SIZE	CEILING OPENING	FACE SIZE	NECK SIZE	CEILING OPENING
1	76	44	54	81	49	59
2	116	84	94	126	94	104
3	156	124	134	171	139	149
4	196	164	174	216	184	194
5	236	204	214	261	229	239
6	276	244	254	306	274	284
7	316	284	294	351	319	329
8	356	324	334	396	364	374

All dimensions in millimeters (mm)

Accoustic and Airflow Performance Data For 1200mm Length x 20mm Slot Width Linear Diffuser (ALD)

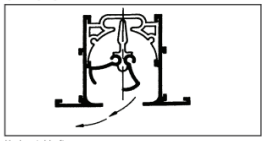
SIZE (In mm)	Qs(ℓ/s)	25	30	40	50	60	70	80	90	100	150	200	250	300	400	500	600	700	800	900	1000
1	SP NR T(m)	4 6 1.1	5 7 1.3	7 9.5 1.7	9 12 2.2	11 14 2.6	13 16 9	15 20 10	20 24 11	24 28 12	51 42 >14	90 56 >14									
2	SP NR T(m)			4.5 6 1.2	6 8 1.5	8.5 13 2	11.5 15 6	15 19 7	18.5 23 9	22.5 26 10	49.5 36 12	81 46 >14	101 58 >14	121 70 >14	161 93 >16						
3	SP NR T(m)				5 7 1.5	7.5 10 1.8	9 12 6	10 14 7	12.5 17 8	15 24 9.5	33.5 31 12	56 42 >14	76 52 >14	96.5 61 >14	140 77 >14	175 96 >14					
4	SP NR T(m)					4 7 1.7	4.5 8 4.8	5.5 9 7	6.5 11 7	8 21 9	17.5 26 12	31 38 >14	51.5 46 >14	72 51 >14	119 60 >14	149 75 >14	179 90 >14	209 105 >14			
5	SP NR T(m)							5 8 5.6	6 10 6.3	7 19 7	15 24 9	26 32 12	40 40 13	56 46 >14	95 54 >14	125 66 >14	151 79 14	176 92 >14	201 105 >14	226 118 >14	251 131 >14
6	SP NR T(m)									6 18 5	13 21 6.5	20 25 8	28 34 10	40.5 41 >14	70 48 >14	102 57 >14	122 68 >14	142 79 >14	163 90 >14	183 101 >14	203 112 >14

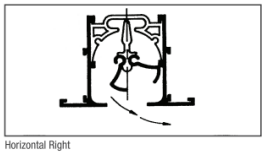
*SP - Static Pressure (Pa)
*NR - Noise rating number based upon room absorption of 10dB
*T - Throw in meters to a Terminal Velocity 0.25m/sec (as per ADC 1062-R3)
*Qs - Primary Air Flow Rate (l/s)
Result of performance is tested under NATA (Australia)

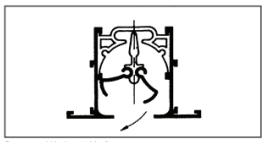
PATTERN ADJUSTMENT

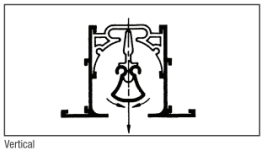
Contoured vanes permit full 180° adjustable air pattern, complete flow rate control, including blank-off.

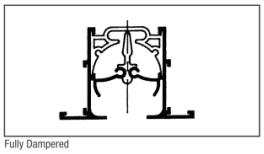
ONE SLOT


Horizontal Left

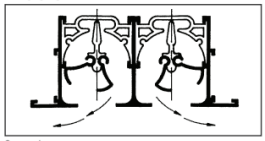

Horizontal Right

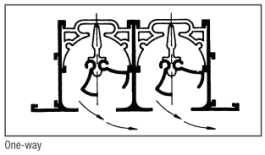

Dampered Horizontal Left

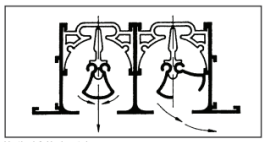

Vertical

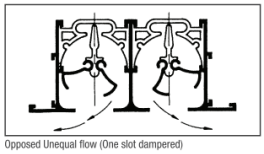

Fully Dampered

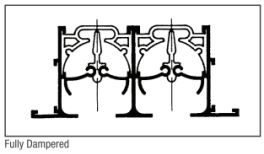
TWO SLOT


Opposed

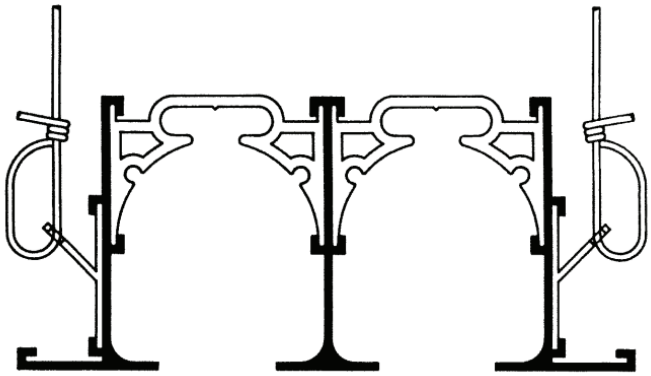

One-way


Vertical & Horizontal

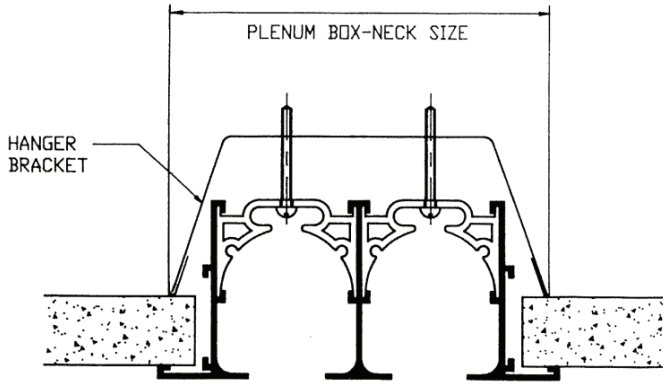

Opposed Unequal flow (One slot dampered)


Fully Dampered

MOUNTING DETAILS

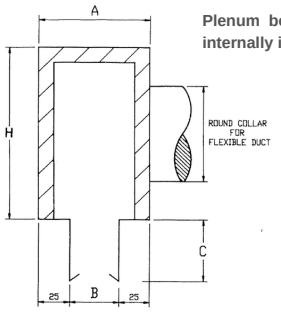


Mounting in exposed ceiling tee system



Mounting in concealed (Plaster) Ceiling

PLENUM BOX FOR ALD SERIES

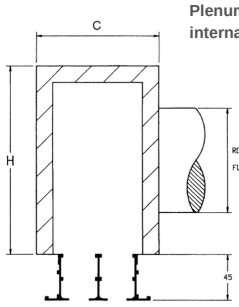


Plenum box shall be constructed of 24 gauge galvanized sheet, internally insulated with 12mm thick fiberglass of 48kg/m³ density.

ROUND COLLAR SIZE	1 SLOT				2 SLOT				3 SLOT				4 SLOT			
	H	A	B	C	H	A	B	C	H	A	B	C	H	A	B	C
ø 100 mm	125	109	59	57	125	149	99	57								
ø 150 mm	175	109	59	57	175	149	99	57	175	189	139	57	175	229	179	57
ø 200 mm					225	149	99	57	225	189	139	57	225	229	179	57
ø 250 mm					275	149	99	57	275	189	139	57	275	229	179	57
ø 300 mm									325	189	139	57	325	229	179	57

Concealed (plaster) ceiling type

All dimensions in millimeters (mm)



Plenum box shall be constructed of 24 gauge galvanized sheet, internally insulated with 12mm thick fiberglass of 48kg/m³ density.

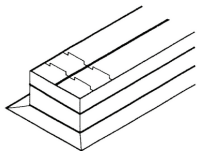
ROUND COLLAR SIZE	1 SLOT			2 SLOT			3 SLOT			4 SLOT		
	H	H+45	C	H	H+45	C	H	H+45	C	H	H+45	C
ø 100 mm	125	170	94	125	170	134						
ø 150 mm	175	220	94	175	220	134	175	220	174	175	220	214
ø 200 mm				225	270	134	225	270	174	225	270	214
ø 250 mm				275	320	134	275	320	174	275	320	214
ø 300 mm							325	370	174	325	370	214

T-bar ceiling type

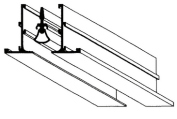
All dimensions in millimeters (mm)

ALD DIFFUSERS END DETAILS

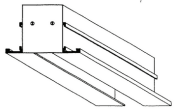
TYPE "M" is for use where end of Linear Diffuser terminates away from wall.



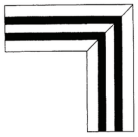
TYPE "0" is for use where Linear Diffuser is to be butted with another Linear Diffuser.



TYPE "E" is for use where Linear Diffuser terminates at a wall or partition.



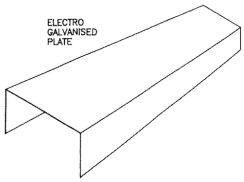
TYPE "MC" Mitered corners



ACCESSORIES

Blank Off

Used to cover inactive sections of Linear Diffuser. Shipped loose for field cutting and installation.

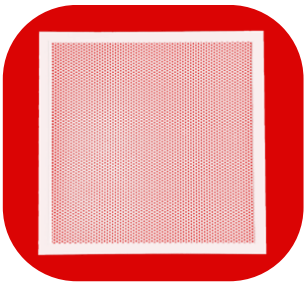
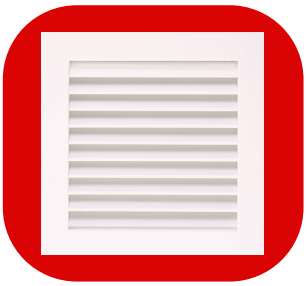
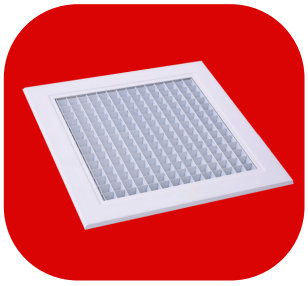
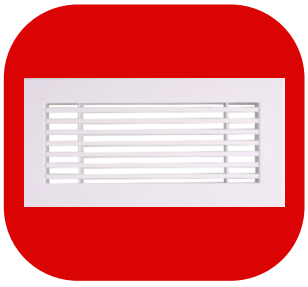


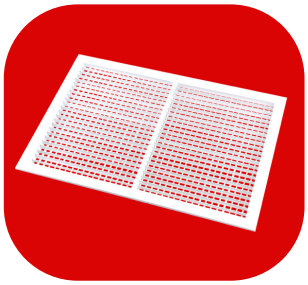
RECOMMENDED SOUND LEVELS

LOCATION	SPACE	NC CRITERIA	SUGGESTED FACE VELOCITY (m/s)
Auditoriums	Concert Halls, Studios, Movie Theatres, Lecture Halls, TV Audience Studios.	20 - 25 25 - 30	2.5 2.5 - 3.75
Churches and Schools	Sanctuaries Libraries, Classrooms	20 - 30 30 - 40	2.5 - 3.75 2.5 - 5.0
Offices	Boardrooms Conference Rooms Executive Rooms General Open Offices	20 - 30 25 - 35 30 - 40 35 - 50	2.5 - 3.75 2.5 - 3.75 2.5 - 5.0 2.5 - 6.5
Hospital	Intensive Care Wards Private Room Operating Room Wards	25 - 35 30 - 40 30 - 40	2.5 - 3.75 2.5 - 5.0 2.5 - 5.0
Hotel	Individual Rooms, Suites, Halls, Corridors, Lobbies, Ballrooms	30 - 40 35 - 40	2.5 - 5.0 2.5 - 5.0

THIS PAGE IS
INTENTIONALLY LEFT BLANK

SUMMARY

PRODUCTS	DESCRIPTION	MODEL
	**Perforated Grille** • The Perforated Grille is designed to handle large volumes of air with low airflow resistant for supply and return air applications. • It has fixed or removable center blade. • Variety of sizes are available upon request.	**APG**
	**Fixed Louvre Grille** • Half chevron return/exhaust air grilles • 45° fixed horizontal louvres • Extruded Aluminum Construction	**AFL**
	**Single Deflection Grille** • Horizontal or Vertical Aero-foil blades • Extruded Aluminum Construction	**ASG**
	**Weatherproof Louvre** • For intake and exhaust ventilation application • Extruded Aluminum Construction	**AWL**
	**Egg-crate Grille** • Utilizing a 12mm x 12mm x 12mm square grid core • Extruded Aluminum Construction	**ARE**
	**Linear Bar Grille** • Available with 0° or 15° • Fixed deflection bars • Extruded Aluminum Construction	**ABL - 0** **ABL - 15**



Double Deflection Grille

- Horizontal and Vertical Aero-foil blades
- Extruded Aluminum Construction

ASR

Pan Diffuser

- The Pan Diffuser is used for the supply and exhaust of cooled or heated air in facilities such as offices, shopping centers.
- The diffuser can be mounted in the ceiling where high aesthetic standards are required.
- Removable deflector plate
- Adjustable air pattern (horizontal - vertical)

APD

Jet Diffuser

- The Jet Diffuser is designed for spot cooling because its direction can be adjusted to suit one's requirement.
- Easy adjustment by swinging to specific angles or desire direction which the center cones are pivoted.
- It is recommended in halls.
- Smoothly finished and streamlined cones of jet stream diffuser, which provides the most even distribution of all around (360°).

AJD

Round Diffuser

- The Round Diffuser is used for the supply and exhaust of cooled or heated air in facilities such as offices, shopping centers.
- The diffuser can be used for ceiling or exposed duct mounting, especially in installations when an adjustable pattern is required (horizontally - vertically).
- The inner cores can be easily removed and adjusted up and down by turning clockwise and anti-clockwise

ARD

Ball Spout Jet Diffuser

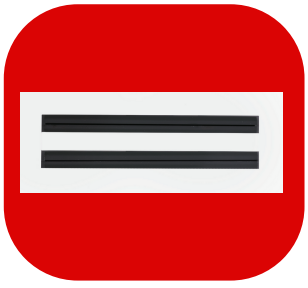
- The frame & nozzel core are high quality extruded aluminum sheet construction with advantages of corrosion resistance and rigidity.

AJD - B

Ceiling Diffuser

- Flush frame surface mounted
- Easy removal Center Core
- Extruded Aluminum Construction

ACD



Linear Diffuser

- Featuring 0° to 180° pattern control
- Available from 1 to 8 slot
- Extruded Aluminum Construction

ALD

GENERAL SELECTION CHARTS

1.Selection of Neck Sizes for Diffusers, Grilles and Louvres

(Applicable for supply air, exhaust air and return air)

AIR QUANTITY		NECK SIZES	
CMH	L/S	mm x mm	AREA (m^2)
0-100	0 - 27	100 x 100	0.01
101 -250	28 - 69	150 x 150	0.0225
251 - 400	70 - 110	200 x 200	0.04
401 - 650	111 - 180	250 x 250	0.0625
651 - 950	181 - 263	300 x 300	0.09
951 - 1200	264 - 333	350 x 350	0.1225
1201 - 1500	334 - 416	400 x 400	0.16
1501 - 2000	417 - 555	450 x 450	0.2025
2001 - 2500	556 - 694	500 x 500	0.25
2501 - 3000	695 - 833	550 x 550	0.3025
3001 - 3500	834 - 972	600 x 600	0.36

1.Selection of Linear Diffusers

(Applicable for supply air, exhaust air and return air)

AIR QUANTITY		No. of Slots
CMH	L/S	
0 - 255	0 - 71	1
256 - 510	72 - 141	2
551 - 765	142 - 212	3
766 - 1020	213 - 283	4
1021 - 1275	284 - 354	5
1276 - 1530	355 - 425	6
1531 - 1785	426 - 495	7
1786 - 2040	496 - 567	8

HART ENGINEERING (PRIVATE) LIMITED
11 Tuas Avenue 2 Singapore 639450
Tel: (65) 6291 2611
Fax: (65) 6296 4514
Email: info@hart.sg
Web: www.hart.com.sg