

SQUARE AIR DIFFUSERS

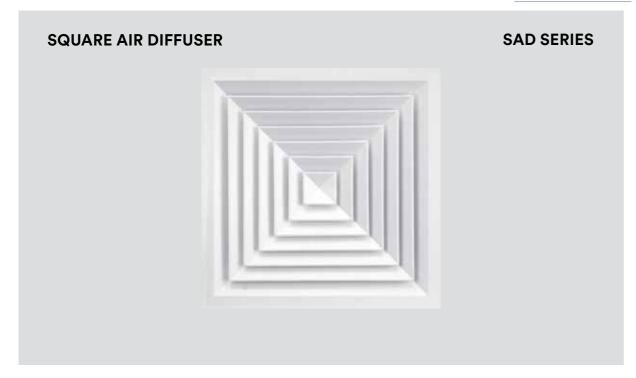
Airflow AC Middle East FZE-LLC

Email:-airflowacme@gmail.com.Tel:0509293811

www.airflowacme.com

SQUARE AIR DIFFUSER





Description

SCD type ceiling diffusers has been designed to handle a wide range of airflows and maintain a high quality of air diffusion in occupied spaces. The SCD series can be used for supply, return and exhaust air applications. Because this type of air outlet discharge horizontally near the ceiling, the warmest air in the room will mixed immediately with the cool primary air far above the occupied zone. Therefore, this type of air outlet is capable of handling large quantity of air at high temperature differentials. It has a pleasing appearance that suit to any type of ceiling to match the architectural design.

Standard Construction

Materials:

The frame and blades of ceiling diffusers are made of extruded aluminum alloy profiles.

The inner core of SCD type diffuser is fully removable for easy installation to plenum box. One side is with aluminum short pin held on the hole at the frame and the other side is with aluminum long pin with spring to allow adjustment for the removal of the inner core.

Option:

The inner core of the diffuser can be fixed if

Damper:

The frame and blades are made of extruded aluminum alloy profiles. If a volume control damper is required, it can be easily attached on the top side of diffuser by means of a locking clips. The air volume can be controlled by adjusting the damper blades from the face of the diffuser by means of scew driver.

Finish:

The standard coating finish is polyester powder coating, white color RAL 9010 (Code: Z0).

The coating finish of volume control damper is polyester powder coating, black color.

Optional Finish:

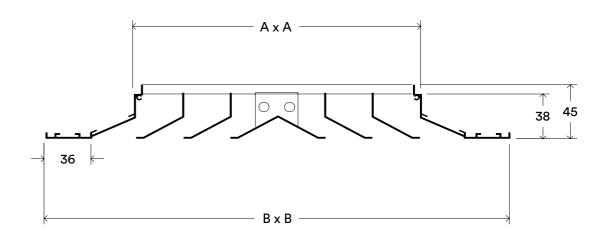
- 1. Natural anodized aluminium finish, Code: Z1
- 2. The powder coating can be of any color if requested as specified, Code: Z2



SQUARE AIR DIFFUSER

SAD SERIES [SAD - 1, SAD - 2, SAD - 3, SAD - 4, SADF

Dimensions



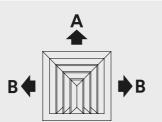
Standard Sizes

Dimensions

N	leck Size	Α	В	RANGE
(in)	(mm)	(mm)	(mm)	(CFM)
6 x 6	150 x 150	147	2 95	50 - 225
9 x 9	225 x 225	222	370	112 - 506
12 x 12	2 300 x 300	297	4 45	200 - 900
15 x 15	5 375 x 375	372	520	312 - 1406
18 x 18	3 450 x 450	447	595	450 - 2025

SQUARE CEILING DIFFUSERS

MODEL: SCD - 4

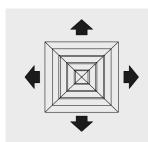


3-WAY AIR PATTERN

Table 2										
NECK SIZE in	Ak (ft²)	Neck Velocity	200	300	400	500	600	700	800	900
(mm)	(11)	Pressure Drop	0.012	0.036	0.06	0.086	0.122	0.17	0.22	0.27
	CFM	50	75	100	125	150	175	200	225	
		CFM1-Side A	12	19	26	31	38	43	50	57
6 x 6	0.129	CFM2-Side B	19	28	37	47	56	66	75	84
(150 x 150)	·	Throw-Side A	2 - 4	3-7	4 - 9	6 - 11	8 - 13	10 - 14	12 - 15	14 - 17
		Throw-Side B	3 - 5	4 - 8	5 - 10	7 - 12	9 - 14	11 - 15	13 - 16	15 - 18
		NC	<20	<20	<20	25	28	32	36	39
		CFM	112	168	225	281	337	393	450	506
		CFM1-Side A	28	42	57	71	85	99	112	126
9 x 9	0.246	CFM2-Side B	42	63	84	105	126	147	169	190
(225 x 225)	0.240	Throw-Side A	4-7	5 - 9	7 - 11	9 - 13	11 - 15	13 - 17	15 - 19	17 - 2 ⁻
		Throw-Side B	5 - 8	6 - 10	8 - 12	10 - 14	12 - 16	14 - 18	16 - 20	18 - 22
		NC	<20	<20	<20	27	30	35	39	42
		CFM	200	300	400	500	600	700	800	900
	CFM1-Side A	50	76	100	126	150	176	200	226	
12 x 12	0.405	CFM1-Side B	75	112	150	187	225	262	300	337
(300 x 300)	0.403	Throw-Side A	4-7	7 - 10	9 - 13	11 - 15	13 - 17	15 - 19	17 - 21	19 - 23
		Throw-Side B	5 - 8	8 - 11	10 - 14	12 - 16	14 - 18	16 - 20	18 - 22	20 - 2
		NC	<20	<20	22	31	34	38	42	45
		CFM	312	468	625	781	937	1093	1250	1406
		CFM1-Side A	78	118	157	195	235	273	312	352
15 x 15	0.647	CFM2-Side B	117	175	234	293	351	410	469	527
(375 x 375)	0.613	Throw-Side A	5-9	8 - 12	11 - 16	13 - 18	15 - 20	17 - 21	18 - 23	19 - 24
		Throw-Side B	6 - 10	9 - 13	12 - 17	14 - 19	16 - 21	18 - 22	19 - 24	20 - 2
		NC	<20	<20	26	34	38	41	45	48
		CFM	450	675	900	1125	1350	1575	1800	2025
		CFM1-Side A	112	169	226	281	338	393	450	507
18 x 18	0.864	CFM2-Side B	169	253	337	422	506	591	675	759
(450 x 450)		Throw-Side A	6 - 9	9 - 13	12 - 17	15 - 19	17 - 21	18 - 23	20 - 24	21 - 2
		Throw-Side B	7 - 10	10 - 14	13 - 18	16 - 20	18 - 22	19 - 24	21 - 25	22 - 20
	_	NC	<20	20	30	36	41	44	48	51

NOTE

- 1. CFM is the total air capacity of each size.
- 2. Throw datas (in feet) are based on isothermal air
- conditions at 100 and 50 FPM terminal velocity. 3. NC levels are based on 10 dB room absorption.
- 4. Pressure drop in inches W.G. is total pressure = S.P. + V.P. 5. Neck velocity in FPM and Ak is the area factor. 6. For Return SCD add +1 dB to above NC and multiply pressure drop by 1.1



4-WAY AIR PATTERN

Table 1

NECK SIZE in	Ak (ft²)	Neck Velocity	200	300	400	500	600	700	800	900
(mm)	(11-)	Pressure Drop	0.012	0.036	0.06	0.086	0.122	0.17	0.22	0.27
		CFM	50	75	100	125	150	175	200	225
6 x 6 (150 x 150)	0.129	Throw	2-5	3-6	4-8	6 - 10	8 - 11	10 - 14	12 - 15	14 - 19
		NC	<20	<20	<20	25	28	32	36	39
		CFM	112	168	225	281	337	393	450	506
9 x 9 (225 x 225)	0.246	Throw	4-9	6 - 10	8 - 11	10 - 13	12 - 16	14 - 18	16 - 20	18 - 23
		NC	<20	<20	<20	27	30	35	39	42
		CFM	200	300	400	500	600	700	800	900
12 x 12 (300 x 300)	0.405	Throw	6 - 11	9 - 14	12 - 16	14 - 19	17 - 22	19 - 24	21-26	23-29
		NC	<20	<20	22	31	34	38	42	45
		CFM	312	468	625	781	937	1093	1250	1406
15 x 15 (375 x 375)	0.613	Throw	7 - 13	12 - 18	16 - 21	18 - 24	20 - 27	22 - 29	24 - 31	26 - 33
		NC	<20	<20	26	34	38	41	45	48
		CFM	450	675	900	1125	1350	1575	1800	2025
18 x 18 (450 x 450)	0.864	Throw	9 - 15	15 - 23	20 - 26	22 - 30	24 - 32	26 - 34	28 - 36	30 - 3
		NC	<20	20	30	36	41	44	48	51

- 1. CFM is the total air capacity of each size.
- 2. Throw datas (in feet) are based on isothermal air conditions at 100 and 50 FPM terminal velocity.
- 3. NC levels are based on 10 dB room absorption.
- 4. Pressure drop in inches W.G. is total pressure = S.P. + V.P.
- 5. Neck velocity in FPM and Ak is the area factor.
- 6. For Return SCD add +1 dB to above NC and multiply pressure drop by 1.1

SQUARE CEILING DIFFUSERS

MODEL: SCD - 1

2-WAY AIR PATTERN

Table 3

NECK SIZE	Ak	Neck Velocity	200	300	400	500	600	700	800	900
(mm)	(ft²)	Pressure Drop	0.012	0.036	0.06	0.086	0.122	0.17	0.22	0.27
		CFM	50	75	100	125	150	175	200	225
6 x 6 (150 x 150)	0.129	Throw	4 - 8	5 - 10	7 - 12	6 - 10	11 - 15	12 - 18	14 - 20	16 - 22
		NC	<20	<20	<20	25	28	32	36	39
		CFM	112	168	225	281	337	393	450	506
9 x 9 (225 x 225)	0.246	Throw	6 - 10	8 - 13	10 - 15	13 - 18	15 - 20	17 - 22	18 - 25	20 - 27
		NC	<20	<20	<20	27	30	35	39	42
		CFM	200	300	400	500	600	700	800	900
12 x 12 (300 x 300)	0.405	Throw	8 - 13	11 - 17	14 - 20	14 - 19	19 - 25	21 - 27	23 - 30	26 - 34
		NC	<20	<20	22	31	34	38	42	45
		CFM	312	468	625	781	937	1093	1250	1406
15 x 15 (375 x 375)	0.613	Throw	9 - 15	14 - 21	18 - 24	21 - 28	23 - 30	25 - 33	27 - 35	29 - 38
		NC	<20	<20	26	34	38	41	45	48
		CFM	450	675	900	1125	1350	1575	1800	2025
18 x 18 (450 x 450)	0.864	Throw	10 - 17	17 - 26	22 - 30	25 - 34	26 - 35	28 - 38	30 - 41	33 - 45
		NC	<20	20	30	36	41	44	48	51

- 1. CFM is the total air capacity of each size.
- 2. Throw datas (in feet) are based on isothermal air conditions at 100 and 50 FPM terminal velocity.
- 3. NC levels are based on 10 dB room absorption.
- 4. Pressure drop in inches W.G. is total pressure = S.P. + V.P.
- 5. Neck velocity in FPM and Ak is the area factor.
- 6. For Return SCD add +1 dB to above NC and multiply pressure drop by 1.1



Supply Square Ceiling Diffuser

1-WAY AIR PATTERN

Table 4

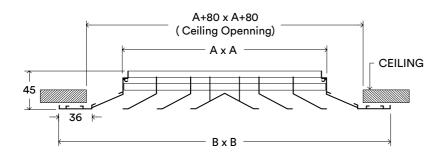
NECK SIZE	Ak	Neck Velocity	200	300	400	500	600	700	800	900
in (mm)	(ft²)	Pressure Drop	0.012	0.036	0.06	0.086	0.122	0.17	0.22	0.27
		CFM	50	75	100	125	150	175	200	225
6 x 6 (150 x 150)	0.129	Throw	5 - 10	7 - 12	10 - 15	12 - 18	14 - 20	15 - 21	17 - 23	19 - 2
		NC	<20	<20	<20	25	28	32	36	39
		CFM	112	168	225	281	337	393	450	506
9 x 9 (225 x 225)	0.246	Throw	8 - 13	11 - 17	14 - 19	16 - 22	18 - 24	20 - 26	21 - 28	24 - 3
		NC	<20	<20	<20	27	30	35	39	42
		CFM	200	300	400	500	600	700	800	900
12 x 12 (300 x 300)	0.405	Throw	10 - 15	14 - 19	17 - 23	20 - 26	22 - 29	24 - 32	26 - 35	30 - 3
		NC	<20	<20	22	31	34	38	42	45
		CFM	312	468	625	781	937	1093	1250	140
15 x 15 (375 x 375)	0.613	Throw	12 - 18	16 - 23	20 - 27	23 - 31	26 - 34	28 - 37	30 - 39	33 - 4
		NC	<20	<20	26	34	38	41	45	48
	0.864	CFM	450	675	900	1125	1350	1575	1800	202
18 x 18 (450 x 450)		Throw	13 - 20	20 - 29	25 - 34	27 - 38	30 - 39	32 - 41	34 - 45	37 - 4
(**************************************		NC	<20	20	30	36	41	44	48	51

- 1. CFM is the total air capacity of each size.
- 2. Throw datas (in feet) are based on isothermal air conditions at 100 and 50 FPM terminal velocity.
- 3. NC levels are based on 10 dB room absorption.
- 4. Pressure drop in inches W.G. is total pressure = S.P. + V.P.
- 5. Neck velocity in FPM and Ak is the area factor.
- 6. For Return SCD add +1 dB to above NC and multiply pressure drop by 1.1

Square Ceiling Diffuser Without Volume Control Damper

Model: SCD - 1, 2, 3, 4

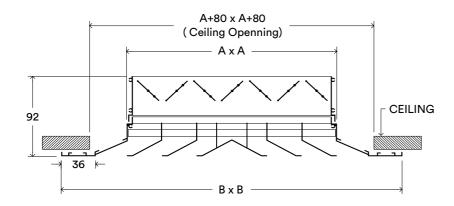
: SCDF - 1, 2, 3, 4



Square Ceiling Diffuser With Volume Control Damper

Model: SCD-1-V, 2-V, 3-V, 4-V

: SCDF-1-V, 2-V, 3-V, 4-V



Square Ceiling Diffuser Variants

SCD Series

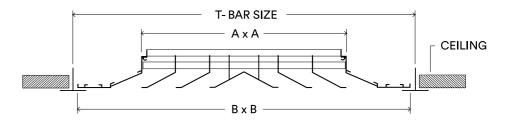
SQUARE CEILING DIFFUSERS

Lay in Ceiling T-Bar

Square Ceiling Diffuser Without Volume Control Damper.

Model: SCD-1-T, 2-T, 3-T, 4-T

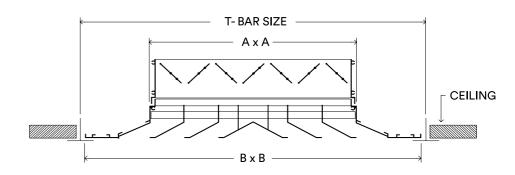
: SCDF-1-T, 2-T, 3-T, 4-T



Square Ceiling Diffuser With Volume Control Damper.

Model: SCD -1-T-V, 2-T-V, 3-T-V, 4-T-V

: SCDF-1-T-V, 2-T-V, 3-T-V, 4-T-V



Standard Sizes

Neck Size	Α	В
460 x 460	457	595
470 x 470	467	605
	460 x 460	460 x 460 457

Diffusers to fit other sizes of T-Bars are available on request.

For the performance data, use the neck size 450×450 from Table 1 to Table 4.

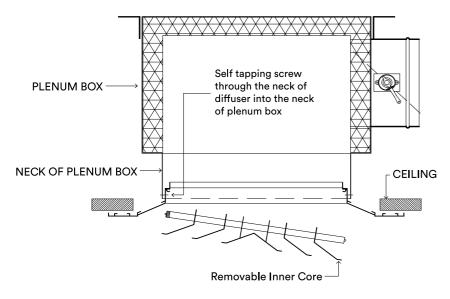


Fixing Details SCD Series

Flush Mounting in Ceiling

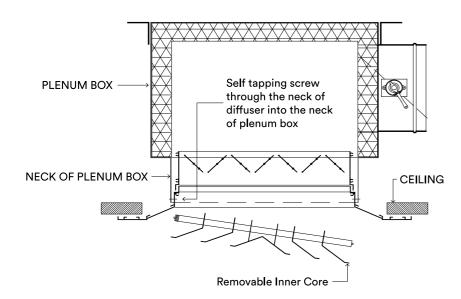
Fixing To Plenum Box:

Diffuser Model: SCD-1, 2, 3, 4



Fixing To Plenum Box:

Diffuser Model: SCD-1-V, 2-V, 3-V, 4-V

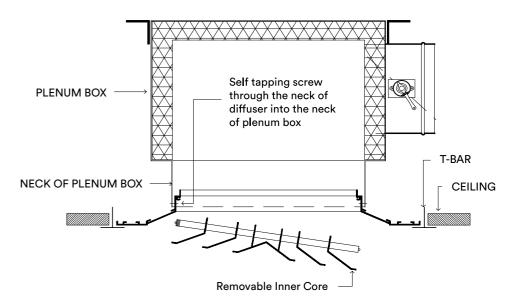


Fixing Details SCD Series

Lay in Ceiling T-Bar

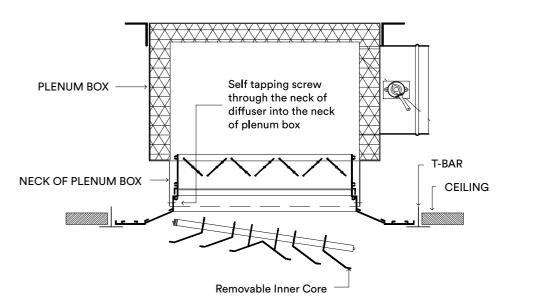
Fixing To Plenum Box:

Diffuser Model: SCD-1-T, 2-T, 3-T, 4-T



Fixing To Plenum Box:

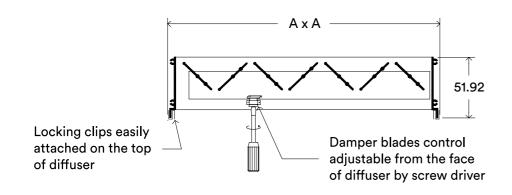
Diffuser Model: SCD 1-T-V, 2-T-V, 3-T-V, 4-T-V



SQUARE CEILING DIFFUSERS



Dimensions



Dimensions

Nec	k Size	AxA
(inches)	(mm)	(mm)
6 × 6	150 × 150	147 × 147
9 × 9	225 × 225	222 × 222
12 × 12	300 × 300	297 × 297
15 × 15	375 × 375	372 × 372
18 × 18	450 × 450	447 × 447



Definitions:

"Throw" of a jet is the distance an airstream travels from the air outlet to a point where the maximum velocity in the airstream cross section has been reduced to a selected terminal velocity.

"Throw Distance" of a jet is denoted by Tv, where subscript V indicates the terminal velocity for which the throw is given.

"Characteristic Room Length (L)" is the distance from the diffuser to the nearest boundary wall in the horizontal direction of airflow. However, if the airflow is directed to the opposite diffuser, the characteristic room length (Lt) is equal to one-half the horizontal distance between two diffusers (Lh) plus the vertical distance (Lv) the mixed air jet travels downward to reach the occupied zone (Lt=Lh+Lv).

"Terminal Velocity (Vt)" is the maximum sustained airstream velocity at the end of the throw (e.g. 150, 100, 50 fpm).

"Discharge or Intake Air Velocity (Vk)" of an outlet or inlet (fpm) is the velocity of airstream measured at certain locations of outlet's or inlet's air slots.

"Area Factor (Ak)" of an air outlet or inlet is a factor determined from discharge or intake air velocity (Vk) and the airflow rate (Q).

Ak = Q/Vk

The recommended maximum airflow (CFM) per one airflow direction of the diffuser in relation to the ceiling height and temperature difference (ΔT) between the supply air and room air temperature can be selected on the table below.

Table 5

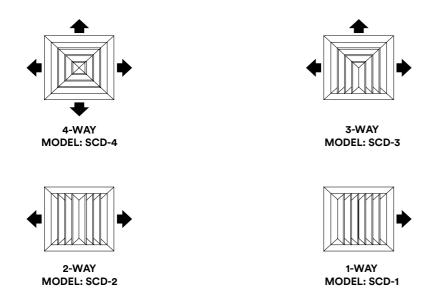
Celing Height (ft)	Max. Temperature Difference (ΔT) (°F)	Maximum Airflows per One Direction (CFM)
8	20	215
9	25	400
10	29	745
12	30	1000
14	30	1400
16	30	1800

NOTE

The total airflows per diffuser can be lower than the allowed maximum airflows at any given ceiling height and temperature difference to meet the required room NC level.

SELECTION PROCEDURE

Inner Core Arrangement:



Airflow Measurement:

- 1. Place the diffuser prove in a position as shown in Figure 1.
- 2. Measure the air velocity in various air slots and locations.
- 3. Determine the average air velocity readings and calculate the airflow rate by using the formula.

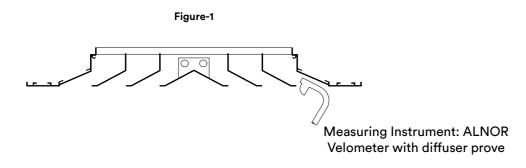
Q= Vk x Ak

Where:

Q= airflow rate in CFM

Vk = average air velocity in FPM

Ak = area factor in FT2



NOTE

SQUARE CEILING DIFFUSERS

The alternative instrument to directly measure the airflow rate of each diffusers is the Flow Measuring Hood.

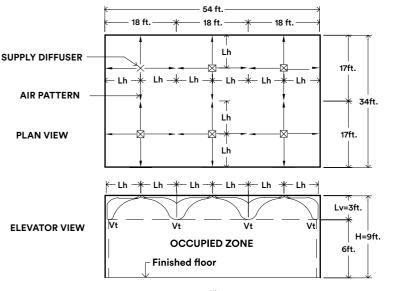


Figure 2

Example:

Specifications:

General office with room dimensions of 54 feet x 34 feet and the ceiling height is 9 feet. The total airflow to the room is 4200 CFM.

The required room Noise Critea is NC35.

The supply and room air temperature difference ($\triangle T$) is 25 °F.

Calculations:

Check first the required length of throw (Lt), Lt=Lh+Lv.

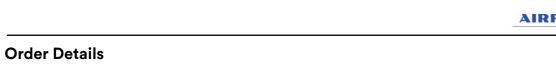
Where:

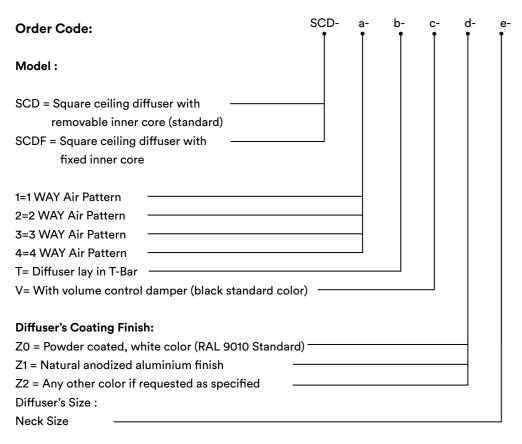
Lh = the length of horizontal distance between the opposite diffusers or the horizontal distance from diffuser to the wall.

Lv = the length of vertical distance from the ceiling down to the region of occupied zone, where the standard height of the occupied zone is 6ft above the finished floor.

Since the general office is a common area, divide the space into 6 parts with equal size of 18ft x 17ft. In this case, the airflow will be directed to the opposite diffuser. The lenght of horizontal throw will be one- half the distance between two diffusers (Lh=18/2=9ft, the longest side) and the length of vertical throw the mixed air jet travels downward (Lv=9—6=3ft) to reach the occupied zone. Therefore Lt=Lh+Lv=9ft+3ft.=12ft. See Figure 2.

Divide the total airflow 4200CFM in to 6 resulting to 700CFM per diffuser which is still covered by the allowed maximum airflows as per Table 5. In the Performance Data Table 1, Model: SCD-4, select the neck size of diffuser 15"x15" (375×375); Noise Critea is NC 30; Throw is 17 - 22ft. and pressure drop is 0.073in W.G. See locations of diffusers in Figure 2.





Plenum Box: See Page 21 - 24 for details

Specifications:

- 1. Suppy square ceilling diffuser with removabe inner core, with 4 Way air pattern, with powder coating white color RAL 9010 and with opposed blades volume control damper. Neck size = 375×375
- 2. Same as Item No 1 but without volume control damper

Order Example

Make: Airflow ac

Type: SCD - 4 - V - Z0 - 375 x 375

Qty:1pc

NOTE

For plenum box ordering, see Page 24.

Ordering:

Item No. 1

Qty:1pc

Item No. 2

Type: SCD-4-Z0-375 x 375

AIRFLOW AC

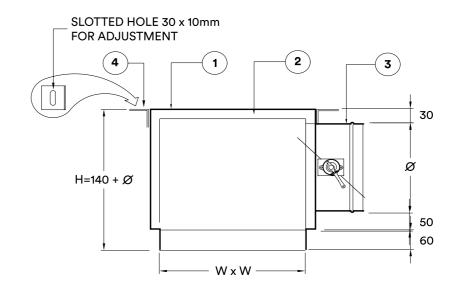
PLENUM BOXES FOR SQUARE CEILING DIFFUSERS

4 - Hanging Bracket

VK SERIES [VK - 200, VK - 210, VK - 220, VK - 230, VK - 240, VK - 250]

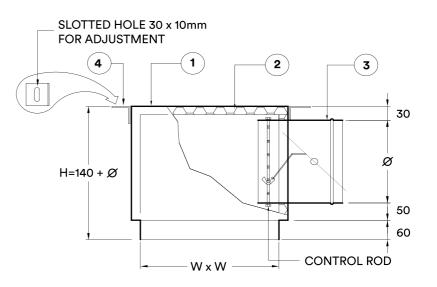
1 - Casing 2 -Acoustic Lining 3 - Spigot Inlet

Plenum Box VK - 200



Plenum Box VK - 210

VK - 210 plenum box designed for square ceiling diffusers is suitable for supply and ducted return and exhaust air systems. The standard construction is built of galvanized steel sheet Ga.24, conform to ASTM A653, lock forming quality with 25mm thick. acoustic lining, density 48kg/m3. The exposed surface of acoustic lining is with strong black Woven Glass Fiber Fabric (WGF) facing to avoid fiberglass erosion. The spigot inlet with built-in balancing damper can be adjusted from the face of diffuser.



SQUARE CEILING DIFFUSERS

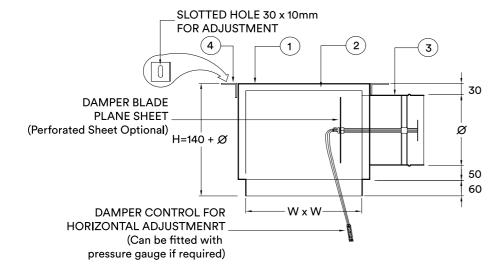
2 -Acoustic Lining

1 - Casing 2 -Acoustic Lining 3 - Spigot Inlet

4 - Hanging Bracket

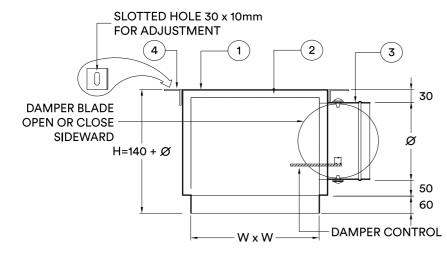
Plenum Box VK - 220

VK - 220 plenum box designed for square ceiling diffusers is suitable for supply and ducted return and exhaust air systems. The standard construction is built of galvanized steel sheet Ga.24, conform to ASTM A653, lock forming quality with 25mm thk. acoustic lining, density 48kg/m3. The exposed surface of acoustic lining is with strong black Woven Glass Fiber Fabric (WGF) facing to avoid fiberglass erosion. Spigot inlet with special damper adjustable horizontally with damper control on face of diffuser. A plastic tube is fitted to damper control for pressure test if required.



Plenum Box VK - 230

VK - 230 plenum box designed for square ceiling diffusers is suitable for supply and ducted return and exhaust air systems. The standard construction is built of galvanized steel sheet Ga.24, conform to ASTM A653, lock forming quality with 25mm thk. acoustic lining, density 48kg/m3. The exposed surface of acoustic lining is with strong black Woven Glass Fiber Fabric (WGF) facing to avoid fiberglass erosion. The spigot inlet with damper blade open and close sideward can be adjusted from the face of diffuser.



VK SERIES [VK - 200, VK - 210, VK - 220, VK - 230, VK - 240, VK - 250]

1 - Casing

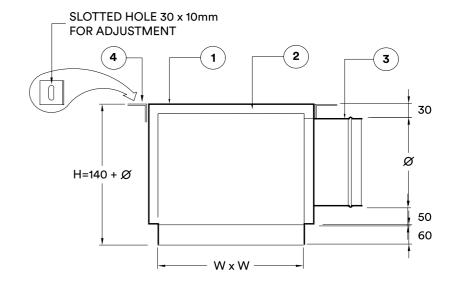
3 - Spigot Inlet

4 - Hanging Bracket

Plenum Box VK - 240

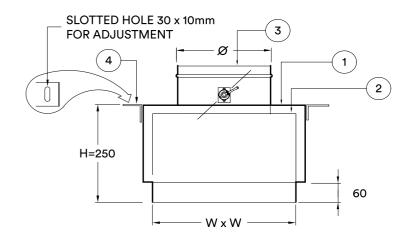
AIRFLOW AC

VK - 240 plenum box designed for square ceiling diffusers is suitable for supply and ducted return and exhaust air systems. The standard construction is built of galvanized steel sheet Ga.24, conform to ASTM A653, lock forming quality with 25mm thk. acoustic lining, density 48kg/m3. The exposed surface of acoustic lining is with strong black Woven Glass Fiber Fabric (WGF) facing to avoid fiberglass erosion. The spigot inlet is without balancing damper.



Plenum Box VK - 250

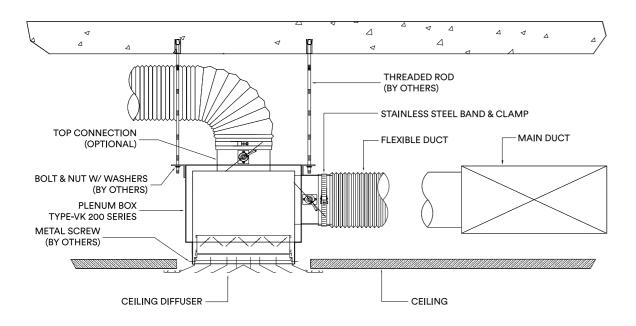
VK - 250 plenum box designed for square ceiling diffusers is suitable for supply and ducted return and exhaust air systems. The standard construction is built of galvanized steel sheet Ga.24, conform to ASTM A653, lock forming quality with 25mm thk. acoustic lining, density 48kg/m3. The exposed surface of acoustic lining is with strong black Woven Glass Fiber Fabric (WGF) facing to avoid fiberglass erosion. The spigot inlet with balancing damper fixed on top side of the plenum box is a good application for limited space where side connection is not possible.



PRODUCT DETAILS



Installation Details

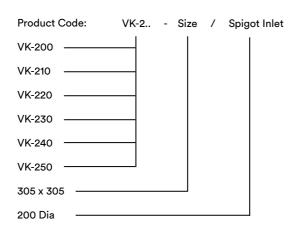


VK - 200...210...220...230...240...250

Sizes of Plenum Box

Item No.	Diffuser Neck Size (mm)	Plenum Size W x W (mm)	Spigot Inlet Dia (mm)
1	150 x 150	155 x 155	100
2	225 x 225	230 x 230	150
3	300 x 300	305 x 305	200
4	375 x 375	380 x 380	250
5	450 x 450	455 x 455	300
6	460 x 460	465 x 465	300

Order Reference Details



NOTE

Spigot inlet diameter can be of any size as per the requirements of the customer.

Make: Airflow AC

Type: VK-200 - 155 × 155 / 100

Qty.:1 pc

