



AIRFLOW AC

# LINEAR BAR GRILLES

Airflow AC Middle East FZE-LLC

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**Description**

The LBG Series supply linear bar grilles has been designed for residential, commercial and industrial buildings application. This type of outlets can be installed directly in sidewalls or in plenum box. If exposed air duct is required it can be fixed directly to duct collars. It is suitable for cooling, heating and ventilation applications. It can handle a wide range of airflows at high temperature differentials and maintain a high quality of air diffusion in occupied spaces.

**Standard Construction**

**Materials:**

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

The extruded aluminum blades are mounted in the frame fixed in different degree of air deflection; 0° and 15°.

**Damper:**

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

**Finish:**

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

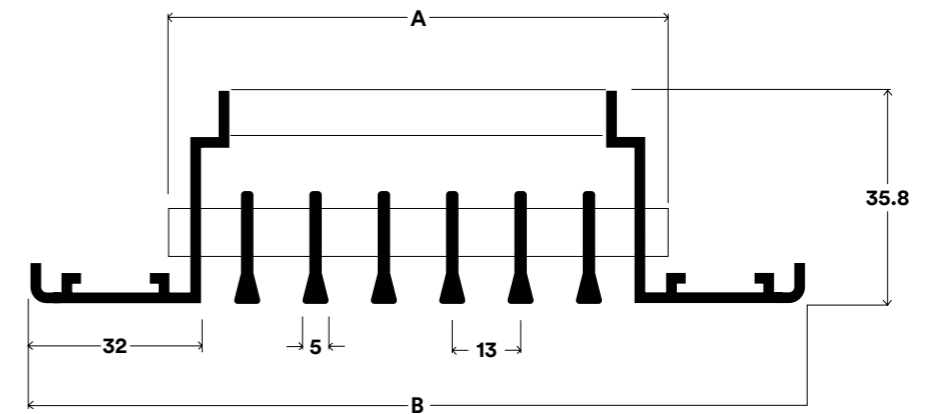
The coating finish of volume control damper is polyester powder coating, black color.

**Optional Finish:**

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

LBG 1300: BLADES WITH 0° DEFLECTION AT 1/2" (13MM) SPACING

**Dimensions**



**Standard Sizes**

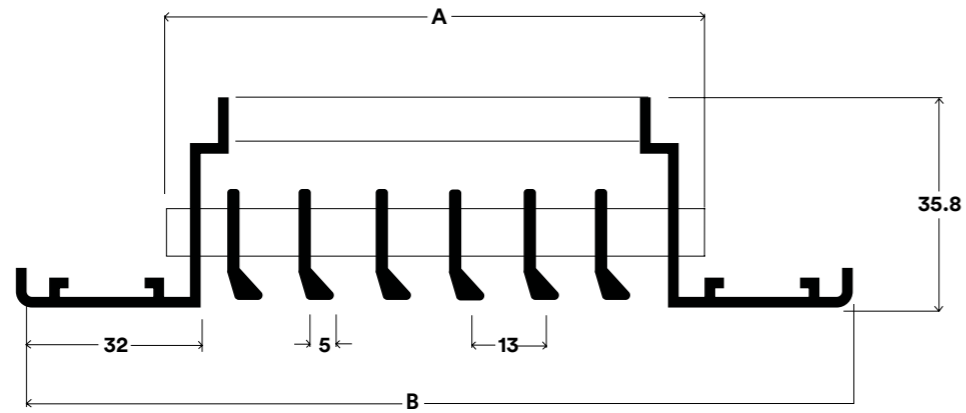
Neck Size (in)	Neck Size (mm)	A (mm)	B (mm)	Range (CFM / FT)
3	75	73	122	43 - 173
4	100	98	147	62 - 246
6	150	148	197	100 - 398
8	200	198	247	142 - 566
10	250	248	297	177 - 707
12	300	298	347	216 - 866

SUPPLY LINEAR BAR GRILLES



LBG 1315: BLADES WITH 15° DEFLECTION AT 1/2" (13MM) SPACING

Dimensions



Standard Sizes

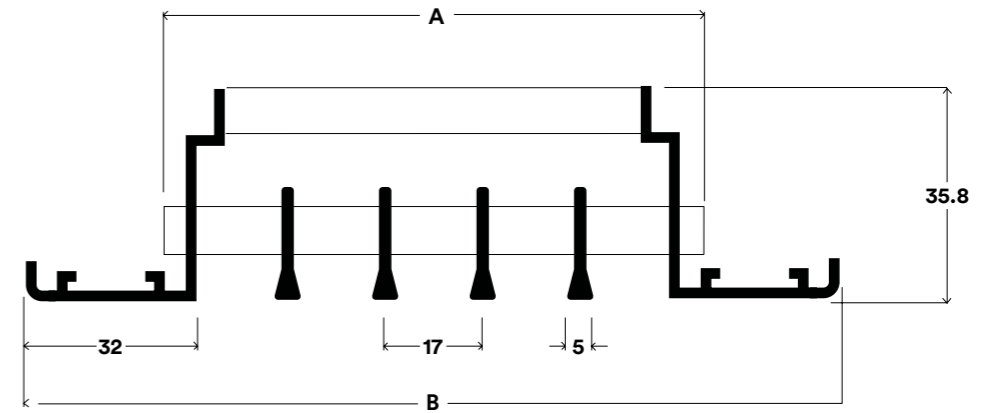
Neck Size (in)	Neck Size (mm)	A (mm)	B (mm)	Range (CFM / FT)
3	75	73	122	38 - 152
4	100	98	147	58 - 230
6	150	148	197	96 - 382
8	200	198	247	140 - 562
10	250	248	297	172 - 686
12	300	298	347	210 - 838

SUPPLY LINEAR BAR GRILLES



LBG 1700: BLADES WITH 0° DEFLECTION AT 6/9" (17MM) SPACING

Dimensions

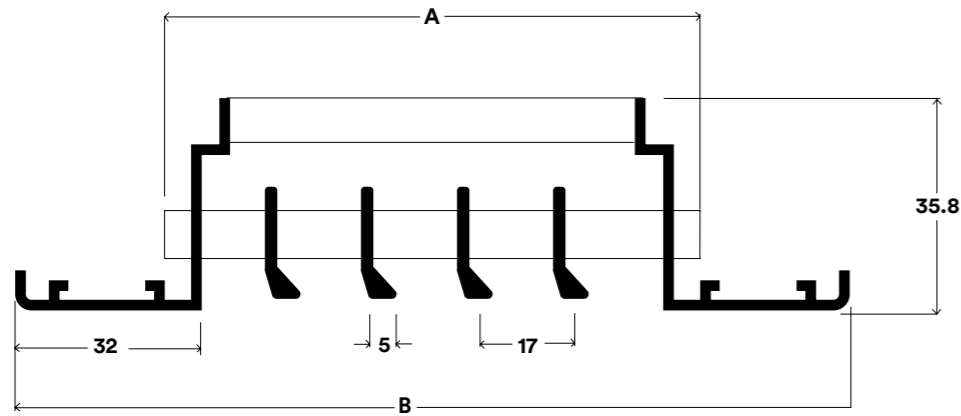


Standard Sizes

Neck Size (in)	Neck Size (mm)	A (mm)	B (mm)	Range (CFM / FT)
3	75	73	122	47 - 189
4	100	98	147	72 - 288
6	150	148	197	115 - 461
8	200	198	247	158 - 634
10	250	248	297	203 - 813
12	300	298	347	246 - 986

LBG 1715: BLADES WITH 15° DEFLECTION AT 6/9" (17MM) SPACING

Dimensions



Standard Sizes

Neck Size (in)	Neck Size (mm)	A (mm)	B (mm)	Range (CFM / FT)
3	75	73	122	42 - 166
4	100	98	147	68 - 272
6	150	148	197	111 - 445
8	200	198	247	154 - 618
10	250	248	297	199 - 797
12	300	298	347	242 - 970

LBG 1300: BLADES WITH 0° DEFLECTION AT 1/2" (13MM) SPACING

Table 1

Neck Size (in)	Ak (ft <sup>2</sup> /ft)	Discharge Velocity	400	600	800	1000	1200	1400	1600
			Total Press.	0.014	0.028	0.068	0.109	0.14	0.172
3	0.108	CFM	43	65	86	108	130	151	173
		Throw	9 - 19	14 - 27	20 - 32	24 - 42	34 - 52	35 - 58	39 - 60
		NC	10	12	14	17	23	29	34
4	0.154	CFM	62	92	123	154	185	216	246
		Throw	11 - 21	16 - 29	22 - 36	26 - 44	35 - 55	37 - 60	42 - 63
		NC	10	13	15	18	24	30	35
6	0.249	CFM	100	149	199	249	299	349	398
		Throw	13 - 24	19 - 32	25 - 40	30 - 48	36 - 56	41 - 64	47 - 68
		NC	10	14	18	21	27	33	38
8	0.354	CFM	142	212	283	354	425	496	566
		Throw	16 - 27	22 - 35	28 - 44	34 - 52	40 - 61	45 - 68	52 - 73
		NC	10	17	23	27	33	38	43
10	0.442	CFM	177	265	354	442	530	619	707
		Throw	19 - 30	25 - 39	32 - 48	37 - 56	44 - 65	50 - 72	57 - 78
		NC	10	20	28	33	39	43	48
12	0.541	CFM	216	325	433	541	649	757	866
		Throw	21 - 32	28 - 42	35 - 52	41 - 60	48 - 70	54 - 76	61 - 82
		NC	11	23	33	40	44	49	53

NOTE

1. CFM is the total air capacity of each size per linear foot.
2. Throw data ( in feet ) are based on isothermal air conditions and 3 feet bar grille length at 100 and 50 FPM terminal velocity.
3. NC levels are based on 10 dB room absorption with lowest NC not less than 10.
4. Total Pressure drop in inches W.G.
5. Discharge Velocity in FPM.
6. Ak is the free area factor.
7. If bar grilles is to be used for return or exhaust air add 4dB to the above NC levels and multiply by 0.8 the total pressure drop.



LBG 1315: BLADES WITH 15° DEFLECTION AT 1/2" (13MM) SPACING

Table 2

Neck Size (in)	Ak (ft <sup>2</sup> /ft)	Discharge Velocity	400 600 800 1000 1200 1400 1600						
			Total Press.	0.014	0.028	0.068	0.109	0.14	0.172
3	0.095	CFM	38	57	76	95	114	133	152
		Throw	8 - 18	13 - 26	19 - 31	23 - 41	33 - 51	34 - 57	38 - 59
		NC	10	12	14	17	23	29	34
4	0.144	CFM	58	86	115	144	173	202	230
		Throw	10 - 20	15 - 28	21 - 35	25 - 43	34 - 54	36 - 59	41 - 62
		NC	10	13	15	18	24	30	35
6	0.239	CFM	96	143	191	239	287	335	382
		Throw	12 - 23	18 - 31	24 - 39	29 - 47	35 - 55	40 - 63	46 - 67
		NC	10	14	18	21	27	33	38
8	0.351	CFM	140	211	281	351	421	491	562
		Throw	15 - 26	21 - 34	27 - 43	33 - 51	39 - 60	44 - 67	51 - 72
		NC	10	17	23	27	33	38	43
10	0.429	CFM	172	257	343	429	515	601	686
		Throw	18 - 29	24 - 38	31 - 47	36 - 55	43 - 64	49 - 71	56 - 77
		NC	10	20	28	33	39	43	48
12	0.524	CFM	210	314	419	524	629	734	838
		Throw	20 - 31	27 - 41	34 - 51	40 - 59	47 - 69	53 - 75	60 - 81
		NC	11	23	33	40	44	49	53

NOTE

1. CFM is the total air capacity of each size per linear foot.
2. Throw data ( in feet ) are based on isothermal air conditions and 3 feet bar grille length at 100 and 50 FPM terminal velocity.
3. NC levels are based on 10 dB room absorption with lowest NC not less than 10.
4. Total Pressure drop in inches W.G.
5. Discharge Velocity in FPM.
6. Ak is the free area factor.
7. If bar grilles is to be used for return or exhaust air add 4dB to the above NC levels and multiply by 0.8 the total pressure drop.



LBG 1700: BLADES WITH 0° DEFLECTION AT 6/9" (17MM) SPACING

Table 3

Neck Size (in)	Ak (ft <sup>2</sup> /ft)	Discharge Velocity	400 600 800 1000 1200 1400 1600						
			Total Press.	0.012	0.025	0.06	0.096	0.123	0.151
3	0.118	CFM	47	71	94	118	142	165	189
		Throw	10 - 20	15 - 28	21 - 34	25 - 43	35 - 53	36 - 59	40 - 61
		NC	10	12	14	17	23	29	34
4	0.180	CFM	72	108	144	180	216	252	288
		Throw	12 - 22	17 - 30	23 - 37	28 - 46	36 - 56	39 - 62	44 - 65
		NC	10	14	16	19	25	31	36
6	0.288	CFM	115	173	230	288	346	403	461
		Throw	14 - 25	20 - 34	26 - 42	32 - 50	38 - 58	43 - 66	49 - 70
		NC	10	15	20	24	30	35	40
8	0.396	CFM	158	238	317	396	475	554	634
		Throw	17 - 28	23 - 36	30 - 46	35 - 54	42 - 63	47 - 70	54 - 75
		NC	10	19	26	30	36	41	46
10	0.508	CFM	203	305	406	508	610	711	813
		Throw	20 - 31	26 - 40	33 - 50	39 - 58	46 - 67	52 - 74	59 - 80
		NC	11	22	32	38	43	47	51
12	0.616	CFM	246	370	493	616	739	862	986
		Throw	22 - 34	30 - 44	38 - 55	44 - 63	51 - 73	58 - 80	65 - 86
		NC	12	26	37	46	48	54	57

NOTE

1. CFM is the total air capacity of each size per linear foot.
2. Throw data ( in feet ) are based on isothermal air conditions and 3 feet bar grille length at 100 and 50 FPM terminal velocity.
3. NC levels are based on 10 dB room absorption with lowest NC not less than 10.
4. Total Pressure drop in inches W.G.
5. Discharge Velocity in FPM.
6. Ak is the free area factor.
7. If bar grilles is to be used for return or exhaust air add 4dB to the above NC levels and multiply by 0.8 the total pressure drop.

LBG 1715: BLADES WITH 15° DEFLECTION AT 6/9" (17MM) SPACING

Table 4

Neck Size (in)	Ak (ft <sup>2</sup> /ft)	Discharge Velocity	Total Press.							
			400	600	800	1000	1200	1400	1600	
3	0.104	CFM	42	62	83	104	125	146	166	
		Throw	9 - 19	14 - 27	20 - 33	24 - 42	34 - 52	35 - 58	39 - 60	
		NC	10	12	14	17	23	29	34	
		Discharge Velocity	400	600	800	1000	1200	1400	1600	
4	0.170	CFM	68	102	136	170	204	238	272	
		Throw	11 - 21	16 - 29	22 - 36	27 - 45	35 - 55	38 - 61	43 - 64	
		NC	10	14	16	19	25	31	36	
		Discharge Velocity	400	600	800	1000	1200	1400	1600	
6	0.278	CFM	111	167	222	278	334	389	445	
		Throw	13 - 24	19 - 33	25 - 41	31 - 49	37 - 57	42 - 65	48 - 69	
		NC	10	15	20	24	30	35	40	
		Discharge Velocity	400	600	800	1000	1200	1400	1600	
8	0.386	CFM	154	232	309	386	463	540	618	
		Throw	16 - 27	22 - 35	29 - 45	34 - 53	41 - 62	46 - 69	53 - 74	
		NC	10	19	26	30	36	41	46	
		Discharge Velocity	400	600	800	1000	1200	1400	1600	
10	0.498	CFM	199	299	398	498	598	697	797	
		Throw	19 - 30	25 - 39	32 - 49	38 - 57	45 - 66	51 - 73	58 - 79	
		NC	11	22	32	38	43	47	51	
		Discharge Velocity	400	600	800	1000	1200	1400	1600	
12	0.606	CFM	242	364	485	606	727	848	970	
		Throw	21 - 33	29 - 43	37 - 54	43 - 62	50 - 72	57 - 79	64 - 85	
		NC	12	26	37	46	48	54	57	
		Discharge Velocity	400	600	800	1000	1200	1400	1600	

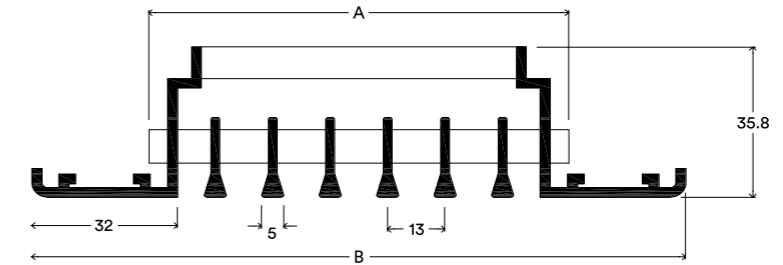
NOTE

1. CFM is the total air capacity of each size per linear foot.
2. Throw data ( in feet ) are based on isothermal air conditions and 3 feet bar grille length at 100 and 50 FPM terminal velocity.
3. NC levels are based on 10 dB room absorption with lowest NC not less than 10.
4. Total Pressure drop in inches W.G.
5. Discharge Velocity in FPM.
6. Ak is the free area factor.
7. If bar grilles is to be used for return or exhaust air add 4dB to the above NC levels and multiply by 0.8 the total pressure drop.

Supply Linear Bar Grilles

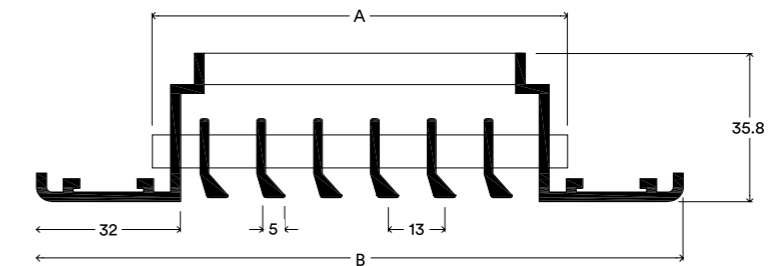
Model: LBG 1300

Blades with 0° deflection at 1/2" (13mm) spacing.



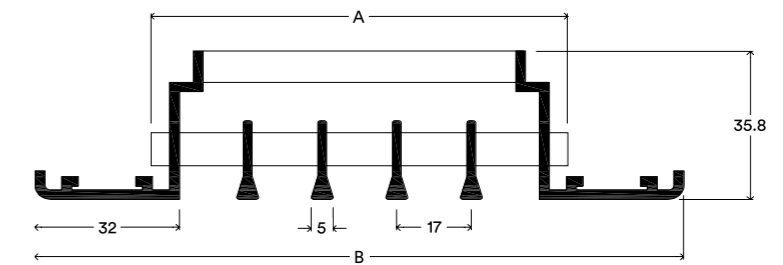
Model: LBG 1315

Blades with 15° deflection at 1/2" (13mm) spacing.



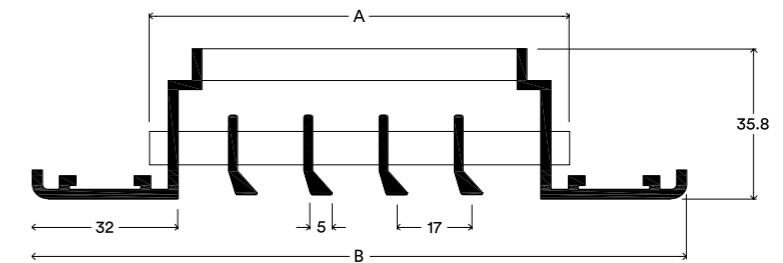
Model: LBG 1700

Blades with 0° deflection at 6/9" (17mm) spacing.



Model: LBG 1715

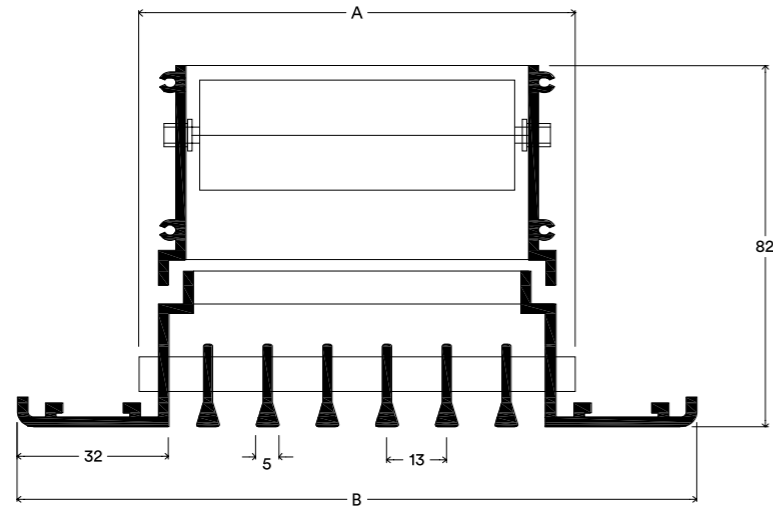
Blades with 15° deflection at 6/9" (17mm) spacing.



Supply Linear Bar Blades

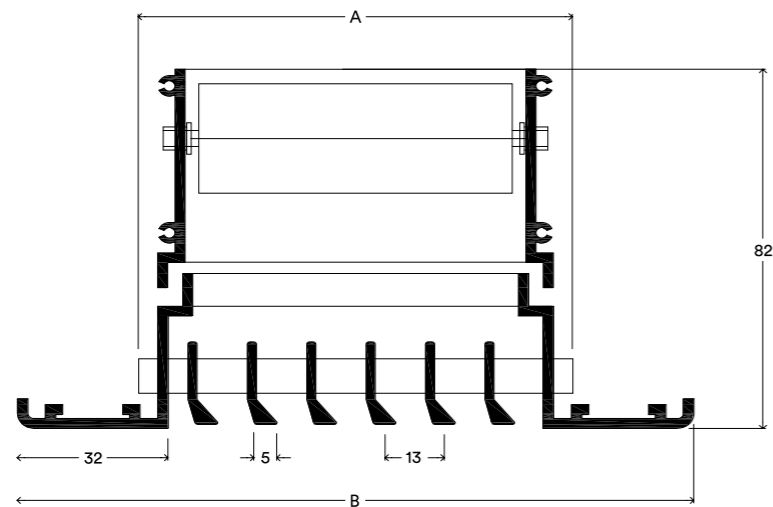
**Model: LBG 1300 - V**

Blades with 0° deflection at 1/2" (13mm) spacing with volume control damper.



**Model: LBG 1315 - V**

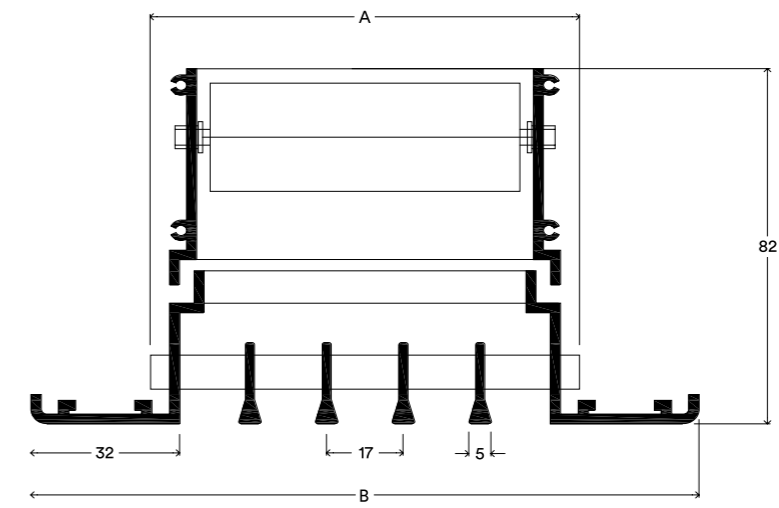
Blades with 15° deflection at 1/2" (13mm) spacing with volume control damper.



Supply Linear Bar Blades

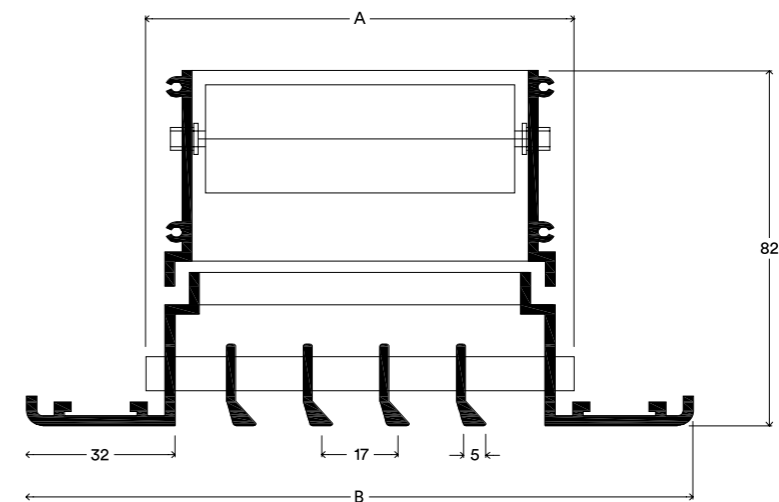
**Model: LBG 1700 - V**

Blades with 0° deflection at 6/9" (17mm) spacing with volume control damper.



**Model: LBG 1715 - V**

Blades with 15° deflection at 6/9" (17mm) spacing with volume control damper.

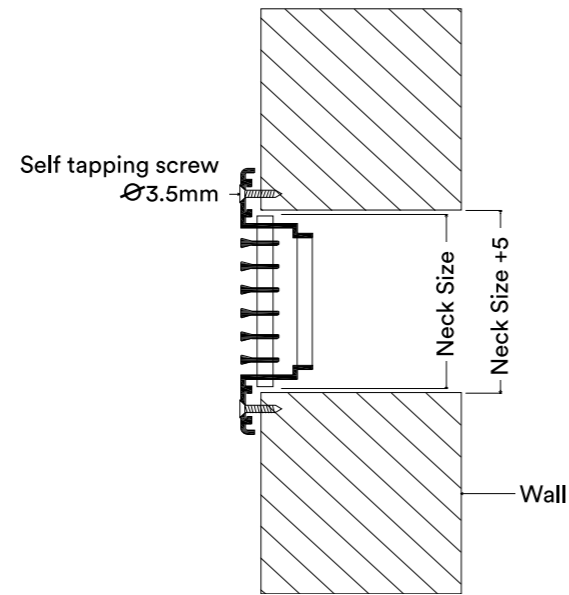


Fixing Details: Linear Bar Grille Without Volume Control Damper

**Fixing in Wall**

**Standard Fixing:**

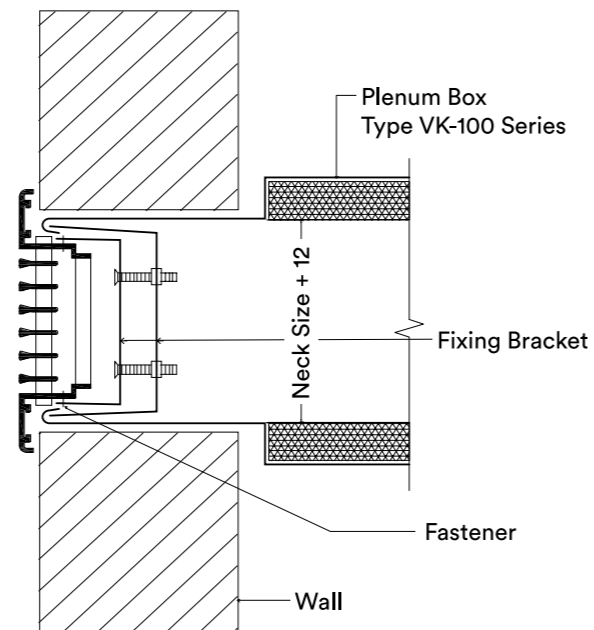
**Option 1:** Fixing type S  
With  $\varnothing 4$  mm holes on flange for self tapping screw. Self tapping screw by others.



**Wall Mounted  
Fixing in Plenum Box**

**Standard Fixing:**

**Option 2:** Fixing type F  
With fixing bracket and without holes on flange.

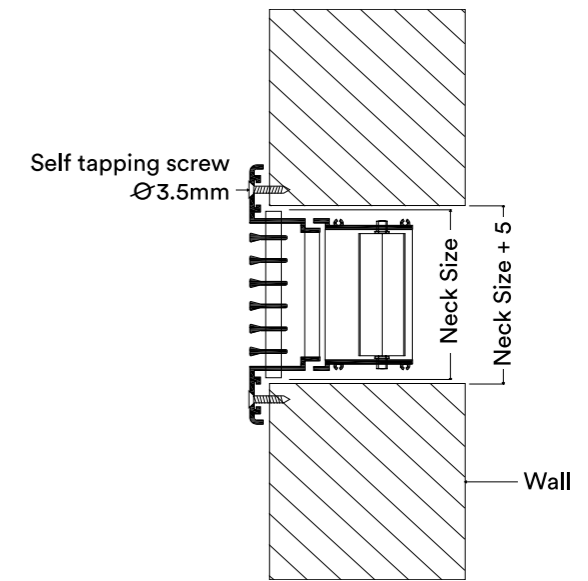


Fixing Details: Linear Bar Grille With Volume Control Damper

**Fixing in Wall**

**Standard Fixing:**

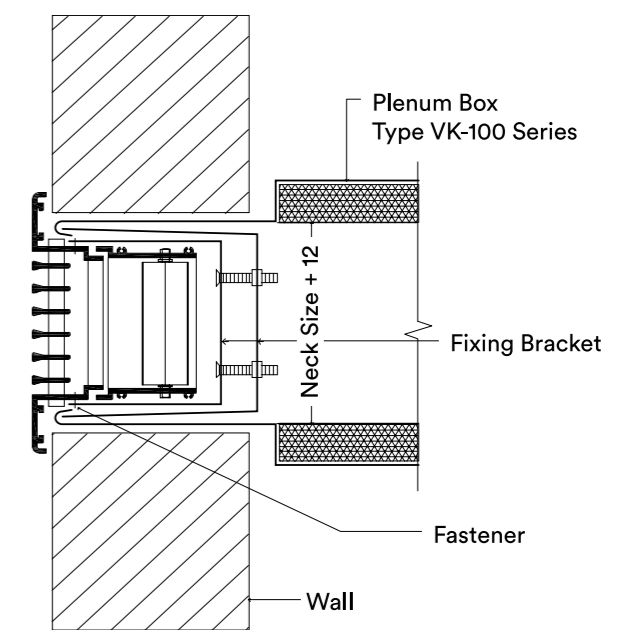
**Option 1:** Fixing type S  
With  $\varnothing 4$  mm holes on flange for self tapping screw. Self tapping screw by others.



**Wall Mounted  
Fixing in Plenum Box**

**Standard Fixing:**

**Option 2:** Fixing type F  
With fixing bracket and without holes on flange.





# TECHNICAL DATA



## 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  $T_v$ , where subscript V indicates the terminal velocity for which the throw is given.

“**Characteristic Room Length (L)**” is the distance from the air outlet device to the nearest boundary wall in the horizontal direction of airflow. This is based on the 9 feet standard ceiling height. If the ceiling height is more than 9 feet, the characteristic room length ( $L_t=L+L_v$ ) will be equal to the room length (L) plus the difference ( $L_v$ ) between the ceiling height and the 9 feet standard ceiling height. However, if the airflow is directed to the opposite diffuser, the characteristic room length ( $L_t$ ) is equal to one-half the horizontal distance between two diffusers ( $L_h$ ) plus the vertical distance ( $L_v$ ) the mixed air jet travels downward to reach the occupied zone ( $L_t=L_h+L_v$ ).

“**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).  $Ak = Q / V_k$

## Throw Data:

All throws shown in the performance data from **Table 1 to Table 4** are based on isothermal air and 3 feet linear bar grille length. For other lengths, the throws can be determined from **Table 5**.

**Table 5 - Throw Correction Factors**

Length (Feet)	1	2	3	4	6	8	10	13	16
Correction Factors	0.7	0.8	1	1.03	1.1	1.1	1.1	1.1	1.1

## Noise Criterion Data:

All NC levels shown in the performance data from **Table 1 to Table 4** are based on 8dB room absorption and 3 feet linear bar grille length. For other lengths, the NC levels can be determined from **Table 6**.

**Table 6 - NC Correction Factors**

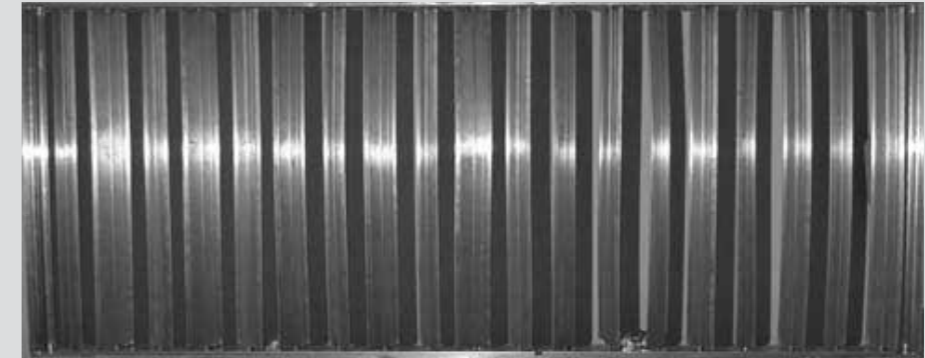
Length (Feet)	1	2	3	4	6	8	10	13	16
Correction Factors	-6	-3	0	+1	+3	+4	+5	+6	+7

# ACCESSORIES

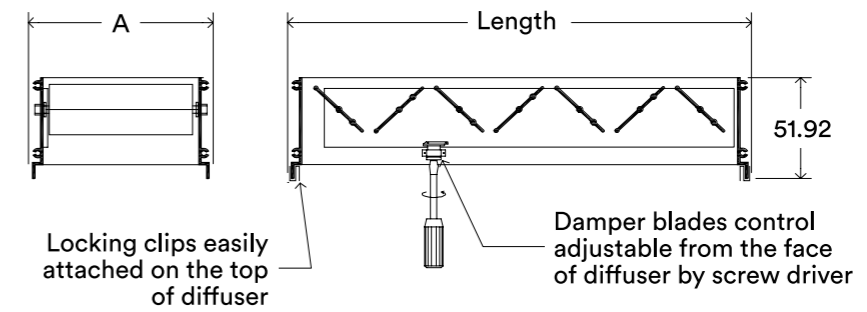


## VOLUME CONTROL DAMPER

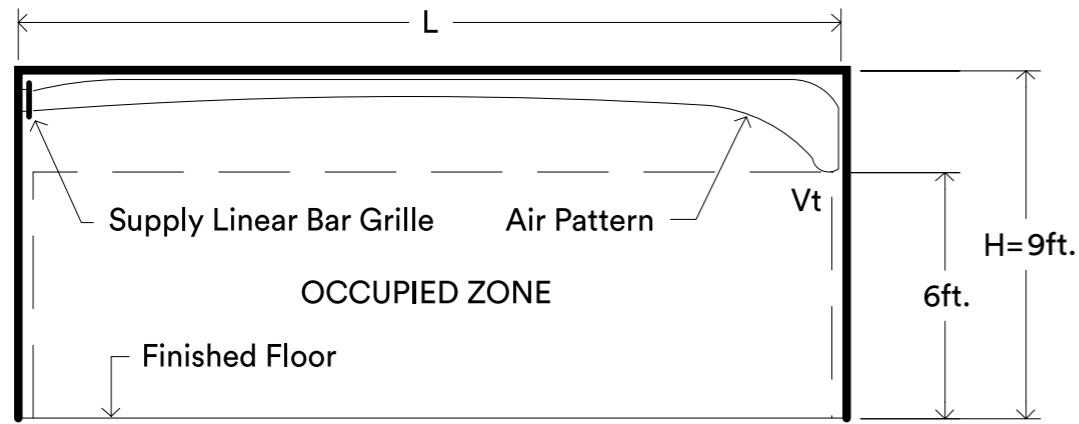
## LBG SERIES



## Standard Sizes



Neck Size		A
(in)	(mm)	(mm)
3	75	73
4	100	98
6	150	148
8	200	198
10	250	248
12	300	298



ELEVATION VIEW

**Example:**

**Specifications:**

Room dimensions of 25 feet x 15 feet and the ceiling height is 9 feet.  
 The total airflow to the room is 750CFM.  
 Noise Criteria is NC30.  
 Terminal velocity at the end of throw is 50 FPM.  
 The supply linear bar grille is to be installed on the wall 8" below the ceiling level.

**Required:**

Size of supply bar grilles with 0° blades deflection.

**Solution:**

During cooling due to supply air and room air temperature difference, the throw distance of isothermal air will be reduced. In general the acceptable isothermal throw ratios (Tv/L) can vary from 1.5 to 1.8 times the characteristic room length (L).

**Calculations:**

The characteristic room length (L) is 25 feet.  
 Throw ratio (Tv/L)=1.5.  
 Throw at 50 FPM=1.5 x 25=37.5 feet [throw ratio (Tv/L) times the characteristic room length (L)].

In Table 1 with 6" neck size, select 199CFM/FT air capacity. Divide the 750CFM total airflow by 199CFM/FT=4 feet (length of linear bar grille). Length of throw is 40 feet, total pressure is 0.068" W.G. and space noise level is NC21. Since 5 feet length of linear bar grille is over then 3 feet, corrections for throw and NC level should not be applied. The selected size of the linear bar grille will be 6" neck size by 4 feet long. If volume control damper is required, space noise level will be NC21 + 2 = NC23 and total pressure drop will be 0.068" x 1.5 = 0.102" of water (please see the notes below Table 1 - 4).

Order Details

**Order Code:**

**Model:**

- LBG 1300 = Linear bar grille with blades at 0° deflection at 1/2" (13mm) spacing.
- LBG 1315 = Linear bar grille with blades at 15° deflection at 1/2" (13mm) spacing.
- LBG 1700 = Linear bar grille with blades at 0° deflection at 6/9" (17mm) spacing.
- LBG 1715 = Linear bar grille with blades at 15° deflection at 6/9" (17mm) spacing.

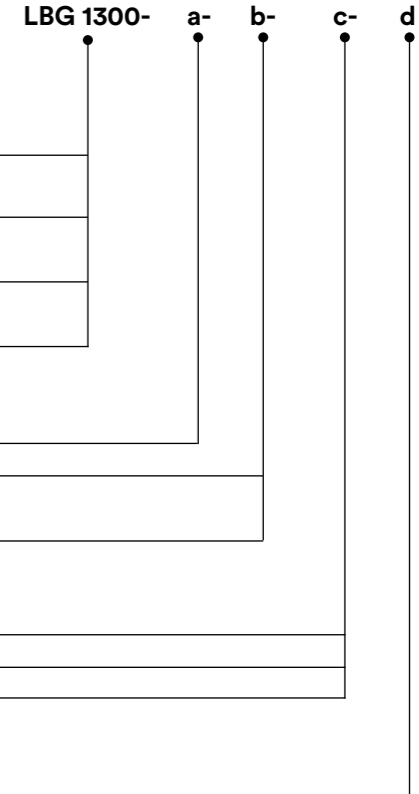
- V = With volume control damper ( black standard color ).
- S = With ø4mm holes on flange for ø3.5mm self tapping screw. (self tapping screws by others)
- F = With fixing bracket and without holes on flange.

**Coating Finish:**

- Z0 = Powder coated, white color RAL 9010 (standard)
- Z1 = Natural anodized aluminium finish
- Z2 = Any other color if requested as specified.

**Size:**

**Neck Size**



**Order Example**

**Specifications:**

1. Supply linear bar grille with 0° blades deflection at 1/2" (13mm) spacing with powder coating white color RAL 9010 with standard fixing Type S.  
 Neck size = 6" x 5 feet long ( 150mm x 1524mm long )
2. Supply linear bar grille with 0° blades deflection at 1/2" (13mm) spacing with volume control damper, coated white color RAL 9010 with standard fixing Type F.  
 Neck size - 6" x 5 feet long ( 150mm x 1524mm long ).

**Ordering:**

Make: Airflow AC  
**Item No. 1**  
 Type: LBG 1300 - S - Z0 -150 x 1524  
 Qty: 1 pc  
**Item No. 2**  
 Type: LBG 1300 - V - F - Z0 -150 x 1524  
 Qty: 1 pc