

METALAIRE®

GRILLES & REGISTERS

PRODUCT CATALOG

The METALAIRE InfoSource Catalog suite is the leading product catalog in the industry. Included in these catalogs are the complete product listings, drawings, product features and benefits, product performance data, specifications, and model specifications. These catalogs are organized to make it quick and easy to find the information you are looking for.

Revised: July 27, 2006



At METALAIRE®, we continually work to improve our products. Product descriptions, dimensions, and performance are subject to change without notice. For the most current available literature visit our web page at www.metalaire.com. Contact your local METALAIRE® representative to verify product or performance details.

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LBG • LINEAR BAR GRILLES

LBG

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- ★ Series 200010

GAR • GRILLES AND REGISTERS

GAR

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- ★ Series V32

Sidewall Supply Grilles

- ★ Series 400036

Sidewall Supply Grilles • Adjustable Air Foil Blades • Extruded Aluminum Blade

- ★ Series 4000-AF42

Sidewall Supply Grilles • Adjustable Air Foil Blades • Extruded Aluminum Blade

- ★ Series 4004P48

Supply Curved Blade Grilles

- ★ Series L52

Sidewall Return Grilles • Aluminum

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Sidewall/Ceiling Return Grilles & Registers • Extruded Aluminum / Aluminum

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- ★ Series RP86

Removable Core Grilles & Registers • Extruded Aluminum • Revers-A-Core

- ★ Series RC90

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LEB
G

LINEAR BAR GRILLES

LINEAR BAR GRILLES

LEADING THE INDUSTRY IN PRODUCT LITERATURE

With the choice of our Pre-Flite Catalog, Quick Select Catalog, InfoSource Catalog, InfoSource CD and our web site, www.metalaire.com, you pick the format for product information that best suits your air distribution design needs.

Pre-Flite - Product Overview Catalog

The METALAIRE Pre-Flite catalog is a condensed reference guide containing concise listings of our entire product line including grilles, registers, diffusers, and air terminal units. This catalog can be used to help select the type of device, along with available border styles. The catalog includes photos of each model along with the features and model guide, a great tool when you are trying to select a device for your project.



Quick Select Catalog - Air Distribution Selection Made Easy

The METALAIRE Quick Select Catalog is designed to save you time selecting air distribution equipment. This catalog is a compact version of our InfoSource Catalogs and includes drawings and performance for our most popular products. The Quick Select Catalog is broken into product types with each section beginning with a model summary that includes features and benefits of our products. To obtain product information not included in the Quick Select Catalog, simply go to our web site at www.metalaire.com.



InfoSource Catalog Suite - Complete guide to Air Distribution Selection

The METALAIRE InfoSource Catalog suite is the leading product catalog in the industry. Included in these catalogs are the complete product listings, drawings, product features and benefits, product performance data, specifications, and model specifications. These catalogs are organized to make it quick and easy to find the information you are looking for.

InfoSource Catalog Suite

- Ceiling Diffusers Catalog
- Grilles & Registers Catalog
- Air Terminal Unit Catalog
- Formations Catalog



InfoSource CD

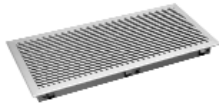
Our InfoSource CD has set the standard in the industry for air distribution product selection. This CD contains a complete library of all our catalogs and submittals along with our air terminal unit selection program.



Web Site: www.metalaire.com

METALAIRE leads the industry with a web site that contains all the product literature and performance data needed to design your air distribution system. Our web site includes all our submittals, catalogs, installation manuals, as well as as other valuable information to aid you in air distribution design.




Series 2000

Pg. 10

Linear Bar Grilles & Registers - Series 2000

- ✱ Series 2000 linear bar grilles and registers are engineered for supply and return air distribution in heating, cooling, and ventilating applications, and are designed for sidewall, floor, sill, and ceiling installation
- ✱ Constructed of high-grade aluminum extrusions
- ✱ Bar grille frames are available in three border widths: 3/16", 1/2", 1"
- ✱ A complete line of accessories is available for series 2000 bar grilles and registers; including mitered corners, opposed blade dampers, adjustable extractors and grids, access doors, and debris screens

Series 2000 1" Borders - 7/32" Bars - 1/2" Center	Grilles - 1" Border		
	0° Deflection	15° Deflection	30° Deflection
Wall Mounting	2000 1" Border	2015 1" Border	2030 1" Border
Core Only	2000CO 1" Border	2015CO 1" Border	2030CO 1" Border
Floor Mounting	2000F 1" Border	2015F 1" Border	2030F 1" Border
Floor or Sill Mounting	2000FP 1" Border	2015FP 1" Border	2030FP 1" Border
Concealed Mounting Hanger	2000H 1" Border	2015H 1" Border	2030H 1" Border
For Plaster Wall & Ceilings	2000HP 1" Border	2015HP 1" Border	2030HP 1" Border

Series 2100 1/2" Borders - 7/32" Bars - 1/2" Center	Grilles - 1/2" Border		
	0° Deflection	15° Deflection	30° Deflection
Wall Mounting	2100 1/2" Border	2115 1/2" Border	2130 1/2" Border
Concealed Mounting Hanger	2100H 1/2" Border	2115H 1/2" Border	2130H 1/2" Border
Concealed Spline Subframe	2100HP 1/2" Border	2115HP 1/2" Border	2130HP 1/2" Border
Narrow Subframe	2100HW 1/2" Border	2115HW 1/2" Border	2130HW 1/2" Border
Combination Subframe	2100HC 1/2" Border	2115HC 1/2" Border	2130HC 1/2" Border

Series 2200 3/16" Border - 7/32" Bars - 1/2" Center	Grilles - 3/16" Border		
	0° Deflection	15° Deflection	30° Deflection
Non-Flanged Floor Mounting	2200F Floor Frame	2215F Floor Frame	2230F Floor Frame
Non-Flanged Floor Mounting - Pencil Proof	2200FP Floor Frame	2215FP Floor Frame	2230FP Floor Frame

Series 2300 1" Border - 1/8" Bars - 1/4" Center	Grilles - 1" Border		
	0° Deflection	15° Deflection	30° Deflection
Wall Mounting	2300 1" Border	2315 1" Border	2330 1" Border
Core Only - 1/8" Bars - 1/4" Centers	2300CO 1" Border - Core Only	2315CO 1" Border - Core Only	2330CO 1" Border - Core Only
Concealed Mounting Hangers	2300H 1" Border	2315H 1" Border	2330H 1" Border
Concealed Spline Mounting Frame	2300HP 1" Border	2315HP 1" Border	2330HP 1" Border

Series 2400 1/2" Border - 1/8" Bars - 1/4" Center	Grilles - 1/2" Border		
	0° Deflection	15° Deflection	30° Deflection
Wall Mounting	2400 1/2" Border	2415 1/2" Border	2430 1/2" Border
Concealed Mounting Hangers	2400H 1/2" Border	2415H 1/2" Border	2430H 1/2" Border
Concealed Spline Mounting Frame	2400HP 1/2" Border	2415HP 1/2" Border	2430HP 1/2" Border
Narrow Mounting Frame	2400HW 1/2" Border	2415HW 1/2" Border	2430HW 1/2" Border
Combination Narrow Mounting Frame	2400HC 1/2" Border	2415HC 1/2" Border	2430HC 1/2" Border

	Border	Bars	Centers
2000	1"	7/32"	1/2"
2100	1/2"	7/32"	1/2"
2200	3/16"	7/32"	1/2"
2300	1"	1/8"	1/4"
2400	1/2"	1/8"	1/4"

➔ Linear Bar Grilles & Registers ➔ Series 2000 ➔ Extruded Aluminum

Product Details

- ★ Series 2000 linear bar grilles and registers are engineered for supply and return air distribution in heating, cooling, and ventilating applications, and are designed for sidewall, floor, sill, and ceiling installation
- ★ Constructed of high-grade aluminum extrusions
- ★ Bar grille frames are available in three border widths: 3/16", 1/2", 1"
- ★ A complete line of accessories are available for series 2000 bar grilles and registers; including mitered corners, opposed blade dampers, adjustable extractors and grids, access doors, and debris screens



Model 2000 Shown

Standard Finish: 01 White

Series 2000 - 1" Borders • 7/32" Bars • 1/2" Centers

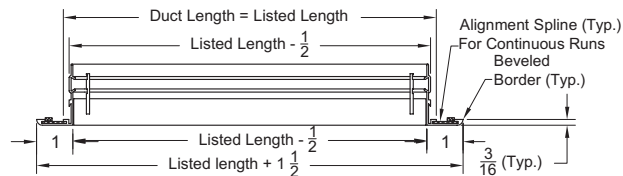
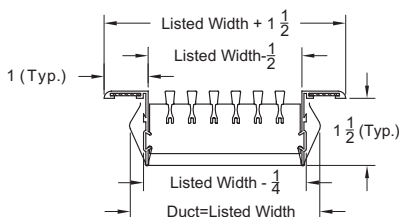
Sideview, dimensions are in inches

Wall Mounted - 1" Border/7/32" Bars/1/2" Centers - Extruded Aluminum - Series 2000

Model 2000 - 0° Deflection

Model 2015 - 15° Deflection

Model 2030 - 30° Deflection

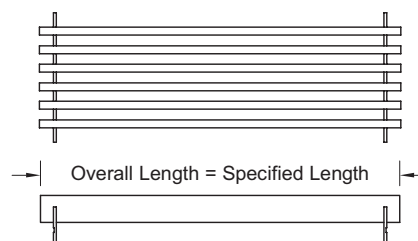
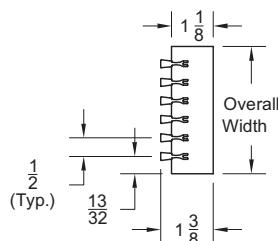


Core Only - 1" Border/7/32" Bars/1/2" Centers - Extruded Aluminum - Series 2000

Model 2000CO - 0° Deflection

Model 2015CO - 15° Deflection

Model 2030CO - 30° Deflection



Model 2000FP - 0° Deflection
Model 2015FP - 15° Deflection
Model 2030FP - 30° Deflection

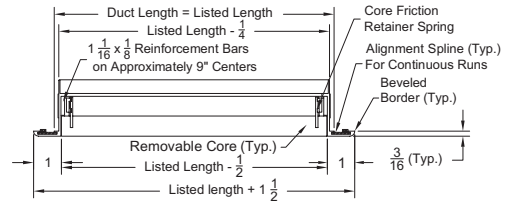
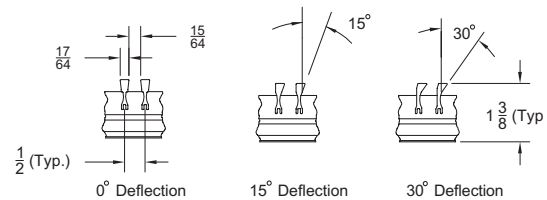


Diagram illustrating the alignment of a duct with a spline. The duct length is listed. The spline is positioned such that its center aligns with the center of the duct. The distance from the duct center to the spline center is labeled as "Listed Length - $\frac{1}{4}$ ". The distance from the duct center to the spline end is labeled as "Listed Length - $\frac{1}{2}$ ". The distance from the duct end to the spline end is labeled as "Listed Length + $1\frac{1}{2}$ ". The spline is labeled "Alignment Spline (Typ.)" and "For Continuous Runs Beveled Border (Typ.)". The distance from the duct end to the spline end is also labeled as "1" and " $\frac{3}{16}$ ".

Diagram illustrating the relationship between duct length, listed length, and beveled border for a 1/2 inch thick duct. The diagram shows a cross-section of the duct with the following dimensions:

- Duct Length = Listed Length + $\frac{9}{16}$
- Listed Length - $\frac{1}{4}$
- Listed Length - $\frac{1}{2}$
- Listed length + $1 \frac{1}{2}$
- Beveled Border (Typ.)
- $\frac{9}{16}$ (Typ.)

2000FP Pencil Proof



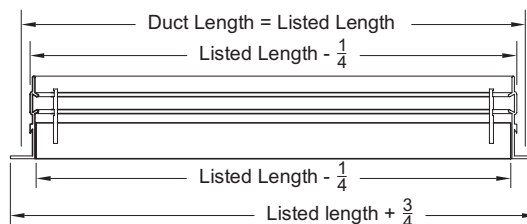
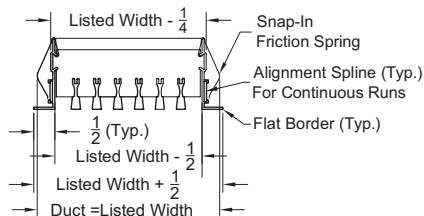
Series 2100 - 1/2" Borders • 7/32" Bars • 1/2" Centers

Wall Mounted - 1/2" Border/7/32" Bars/1/2" Centers - Extruded Aluminum - Series 2100

Model 2100 - 0° Deflection

Model 2115 - 15° Deflection

Model 2130 - 30° Deflection

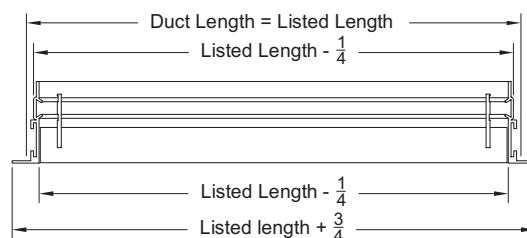
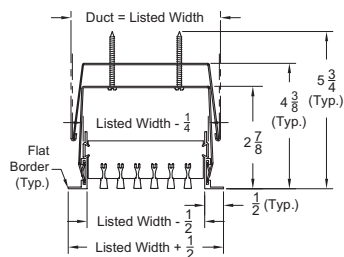


Concealed Mounting Hanger - 1/2" Border/7/32" Bars/1/2" Centers - Extruded Aluminum - Series 2100

Model 2100H - 0° Deflection

Model 2115H - 15° Deflection

Model 2130H - 30° Deflection

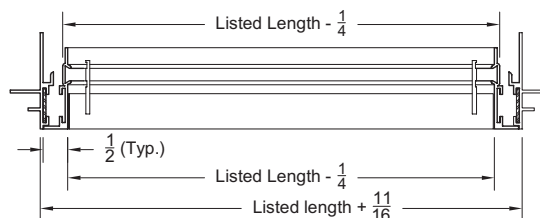
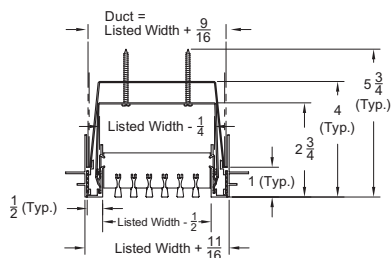


Concealed Spline Subframe - 1/2" Border/7/32" Bars/1/2" Centers - Extruded Aluminum - Series 2100

Model 2100HP - 0° Deflection

Model 2115HP - 15° Deflection

Model 2130HP - 30° Deflection

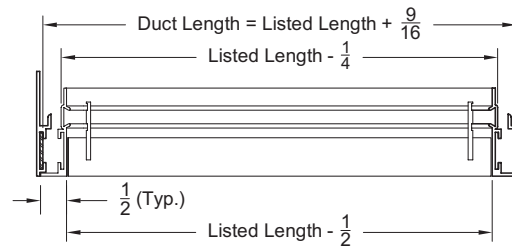
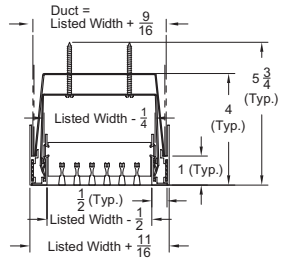


Narrow Subframe - 1/2" Border/7/32" Bars/1/2" Centers - Extruded Aluminum - Series 2100

Model 2100HW - 0° Deflection

Model 2115HW - 15° Deflection

Model 2130HW - 30° Deflection

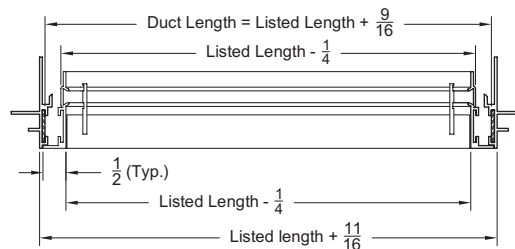
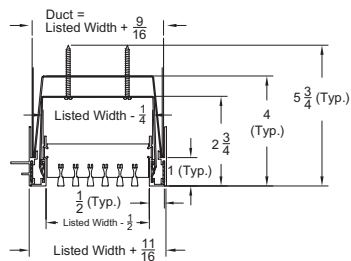


Combination Subframe - 1/2" Border/7/32" Bars/1/2" Centers - Extruded Aluminum - Series 2100

Model 2100HC - 0° Deflection

Model 2115HC - 15° Deflection

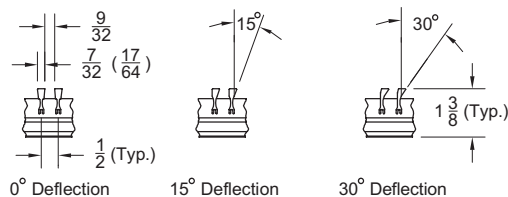
Model 2130HC - 30° Deflection



Deflection Angles

Models

2100/2100H/2100HP/2100HW/2100HC



Series 2200 - 3/16" Borders • 7/32" Bars • 1/2" Centers

3/16" Border/7/32" Bars/1/2" Centers - Extruded Aluminum - Series 2200

Non-Flanged Floor Mounting

Model 2200F - 0° Deflection

Model 2215F - 15° Deflection

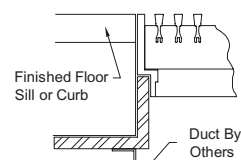
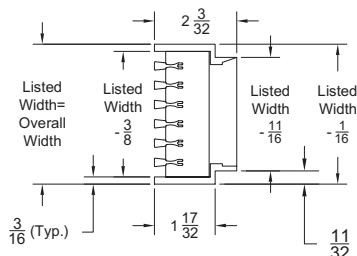
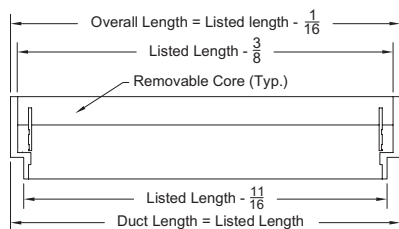
Model 2230F - 30° Deflection

Non-Flanged Floor Mounting/Pencil Proof

Model 2200FP - 0° Deflection

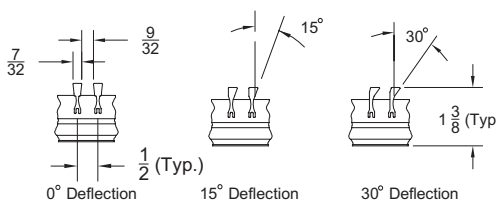
Model 2215FP - 15° Deflection

Model 2230FP - 30° Deflection

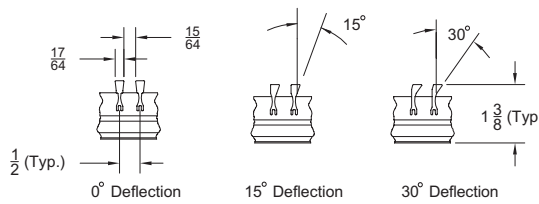


Deflection Angles

Models
2200F



Models
2200FP Pencil Proof



Linear Bar Grilles

LBG

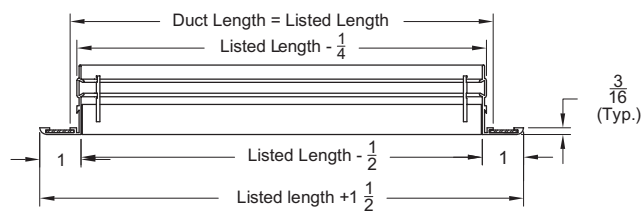
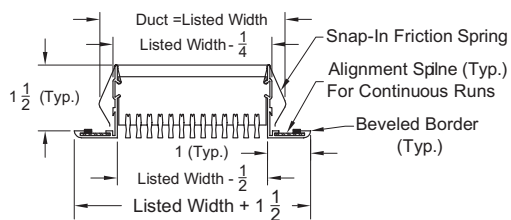
Series 2300 - 1" Borders • 1/8" Bars • 1/4" Centers

Wall Mounted - 1" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2300

Model 2300 - 0° Deflection

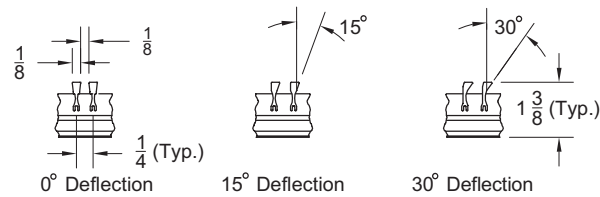
Model 2315 - 15° Deflection

Model 2330 - 30° Deflection



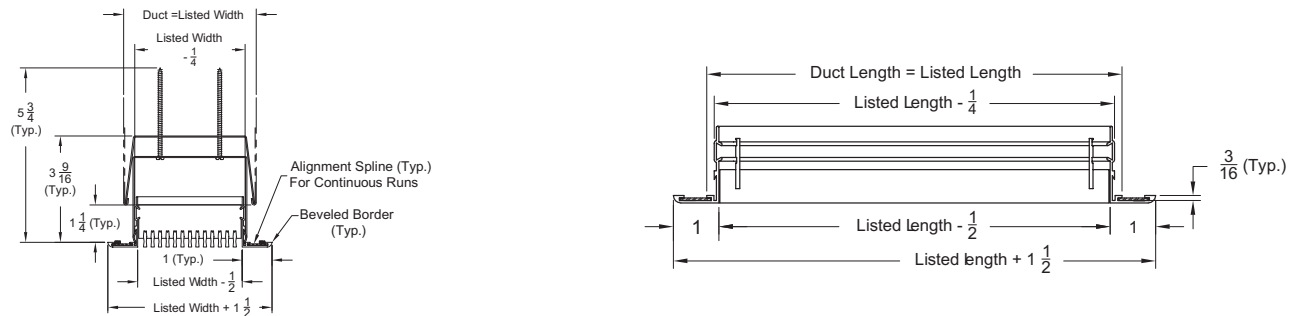
Core Only - 1" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2300

Model 2300CO - 0° Deflection
 Model 2315CO - 15° Deflection
 Model 2330CO - 30° Deflection



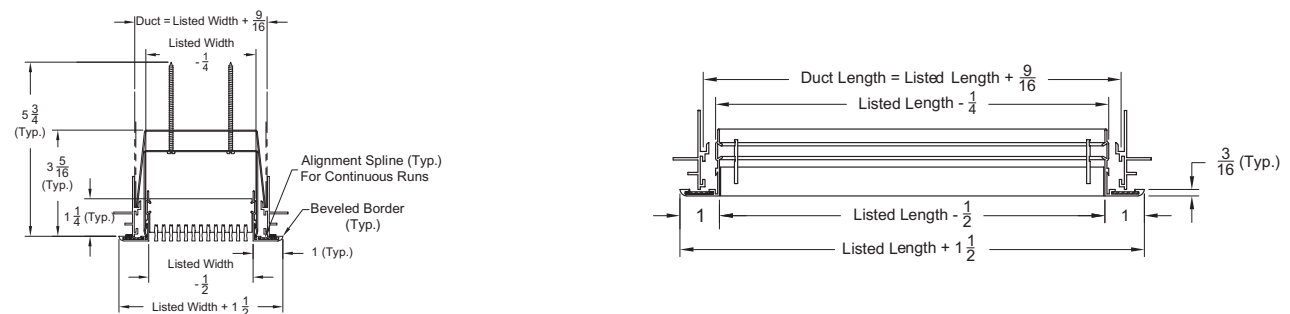
Concealed Mounting Hangers - 1" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2300

Model 2300H - 0° Deflection
 Model 2315H - 15° Deflection
 Model 2330H - 30° Deflection



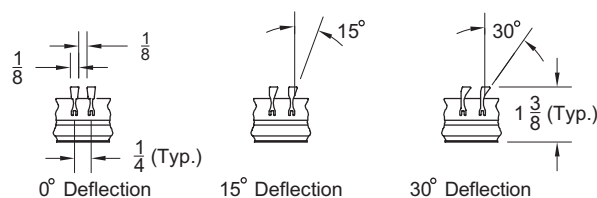
Spline Subframe - 1" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2300

Model 2300HP - 0° Deflection
 Model 2315HP - 15° Deflection
 Model 2330HP - 30° Deflection



Deflection Angles

Models
 2300/2300CO/2300H/2300HP



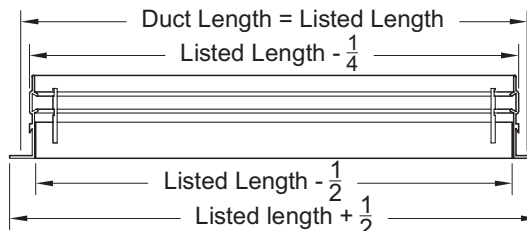
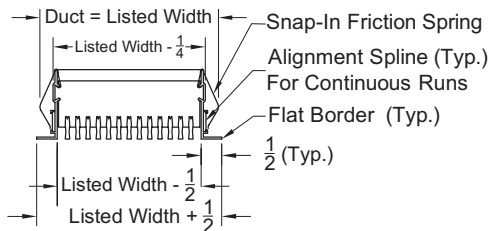
Series 2400 - 1/2" Borders • 1/8" Bars • 1/4" Centers

Wall Mounted - 1/2" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2400

Model 2400 - 0° Deflection

Model 2415 - 15° Deflection

Model 2430 - 30° Deflection

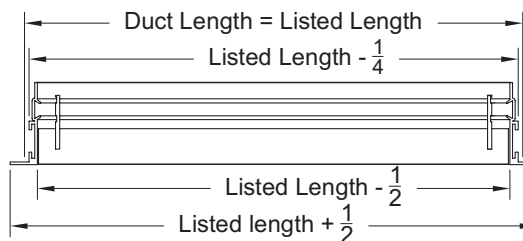
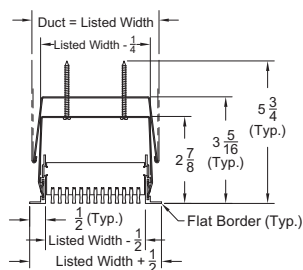


Concealed Mounting Hangers - 1/2" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2400

Model 2400H - 0° Deflection

Model 2415H - 15° Deflection

Model 2430H - 30° Deflection

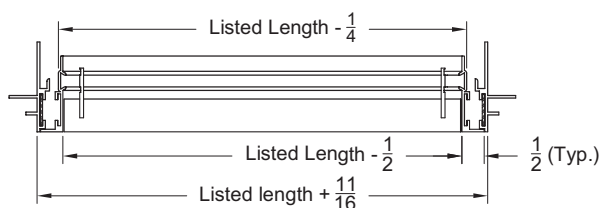
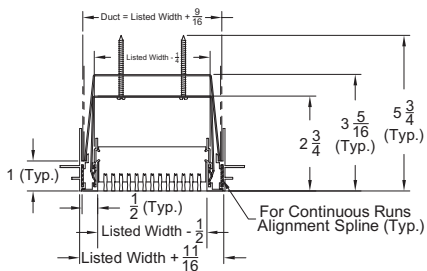


Concealed Spline Subframe - 1/2" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2400

Model 2400HP - 0° Deflection

Model 2415HP - 15° Deflection

Model 2430HP - 30° Deflection

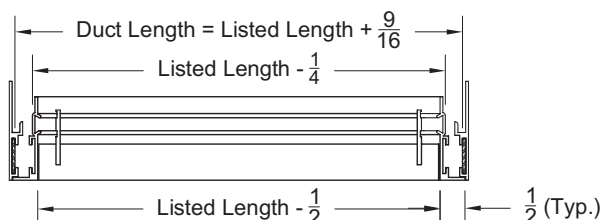
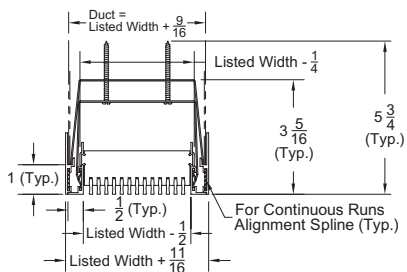


Narrow Subframe - 1/2" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2400

Model 2400HW - 0° Deflection

Model 2415HW - 15° Deflection

Model 2430HW - 30° Deflection

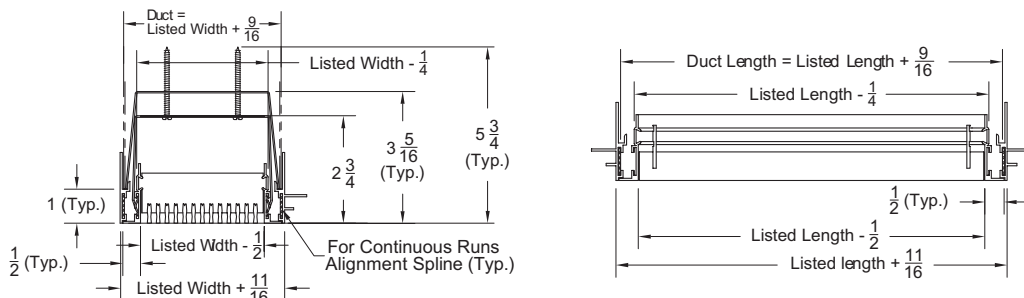


Spline Subframe - 1/2" Border/1/8" Bars/1/4" Centers - Extruded Aluminum - Series 2400

Model 2400HC - 0° Deflection

Model 2415HC - 15° Deflection

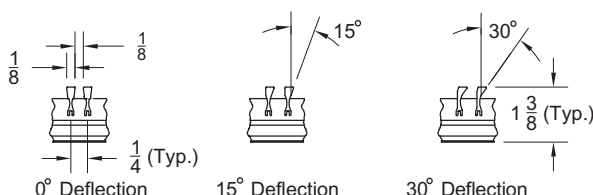
Model 2430HC - 30° Deflection



Deflection Angles

Models

2400/2400H/2400HP/2400HC



Notes for Models 2000, 2015, 2030, 2000F, 2015F, 2030F, 2000FP, 2015FP, 2030FP, 2000H, 2015H, 2030H, 2000HP, 2015HP, 2030HP, 2100, 2115, 2130, 2100H, 2115H, 2130H, 2100HP, 2115HP, 2130HP, 2100HW, 2115HW, 2130HW, 2100HC, 2115HC, 2130HC

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish 04 Clear Anodized 28 Custom color	L9 - Equalizing grid208 Mitered corner209 Damper (for grilles)	Dampers - Widths 3 1/2" and smaller use a single flap style damper Widths 4" and larger use model OBD - Steel OBDA - Aluminum damper Core Only (longer sections are not available for core only sections)	<ul style="list-style-type: none"> Widths available in 1/2" increments from 1 1/2" to 24" Lengths available in single pieces up to 72" Longer sections are made by joining sections in the field with factory supplied alignment strap For lengths less than 72", round up to next listed size. No odd size charges apply Standard mounting in concealed friction spring clips Available reverse sizes (face bars parallel to short side)

Notes for Models 2300, 2315, 2330, 2300H, 2315H, 2330H, 2300HP, 2315HP, 2330HP, 2400, 2415, 2430, 2400H, 2415H, 2430H, 2400HP, 2415HP, 2430HP, 2400HW, 2415HW, 2430HW

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish 04 Clear Anodized 28 Custom color	L9 - Equalizing grid208 Mitered corner209 Damper (for grilles)	Dampers - Widths 3 1/2" and smaller use a single flap style damper Widths 4" and larger use model OBD - Steel OBDA - Aluminum damper Core Only	<ul style="list-style-type: none"> Widths available in 1/2" increments from 1 1/2" to 24" Lengths available in single pieces up to 72" Longer sections are made by joining sections in the field with factory supplied alignment strap Standard mounting in concealed friction spring clips Available reverse sizes (face bars parallel to short side)

Notes for Models 2200F, 2215F, 2230F, 2200FP, 2215FP, 2230FP, 2300 CO, 2315 CO, 2330 CO

1. Available Finishes	2. Construction Details
Standard Finish: 01 White Optional Finish 04 Clear Anodized 28 Custom color	<ul style="list-style-type: none"> Widths available in 1/2" increments from 1 1/2" to 8" for series 2200F Lengths available in single pieces up to 48" Longer sections are available only as separate non-connected sections. For lengths less than 48", round up to the next size

LBG - Linear Bar Grilles

7/2006

Series 2000, 2100, 2200 (0° and 15° Deflection)

Listed Width (in inches) and Ak Area per foot	Outlet Velocity (V _k)						
	Total Pressure (Pt)						
	Static Pressure (Ps)						
	NC						
1 1/2	500	700	900	1000	1100	1200	1300
0.062	0.016	0.031	0.051	0.062	0.062	0.09	0.105
	0.012	0.024	0.04	0.05	0.05	0.072	0.084
	NC	15	20	23	23	29	31
Flow CFM/Ft.	31	44	56	63	69	75	81
Throw, Sill or Floor	6 9	9 13	10 14	11 16	13 18	13 19	14 20
Ft. Side Wall	8 11	11 16	13 18	14 20	15 22	17 24	17 25
2	43	60	77	85	94	102	111
0.086	5 8	8 12	10 14	11 16	13 18	13 19	14 20
	7 10	10 15	13 18	14 20	15 22	17 24	17 25
2 1/2	55	77	99	110	121	132	143
0.11	6 9	9 13	11 16	13 18	13 19	15 21	15 22
	8 11	11 16	14 20	16 23	17 24	18 26	20 28
3	65	91	117	130	143	156	169
0.13	7 10	10 15	13 18	15 21	15 22	17 24	18 26
	8 12	13 18	15 22	17 25	18 26	20 28	21 30
3 1/2	76	107	137	153	168	183	198
0.152	7 10	10 15	13 18	15 21	15 22	17 24	18 26
	9 13	13 19	16 23	18 26	20 28	21 30	22 23
4	110	154	198	220	242	264	286
0.176	8 11	13 18	14 20	16 23	18 26	19 27	20 29
	10 14	15 22	17 25	20 29	22 32	24 34	25 26
5	110	154	198	220	242	264	286
0.22	8 12	13 18	15 21	17 24	18 26	19 27	21 30
	10 15	15 22	19 27	22 31	23 33	24 35	27 38
6	133	186	239	265	292	318	345
0.265	8 12	13 18	15 22	17 25	18 26	20 28	21 30
	10 15	15 22	19 27	22 31	23 33	24 35	27 38
8	178	249	320	355	391		
0.062	10 14	13 19	15 22	18 26	19 27		
	12 17	17 24	20 28	23 33	24 34		
10	223	312	401	445			
0.446	10 15	15 22	18 26	21 30			
	13 19	20 28	23 33	26 37			
12	268	375	482				
0.536	12 17	22 31	21 30				
	15 21	24 35	27 38				

Performance Notes for Series 2000:

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic feet per minute (air)
- fpm - Velocity of air stream in feet per minute
- Pv - Velocity pressure (inches of water column)
- Pt - Total pressure (inches of water column)
- Ps - Static pressure = Pt - Pv (inches of water column)
- Throw - Cataloged throw is horizontal distances in feet to the terminal velocities of 150 and 50 fpm with supply air temperature 20° F below room air temperature.
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Series 2000, 2100, 2200 (30° Deflection)

Listed Width (in inches) and Ak Area per foot	Outlet Velocity (V _k)						
	Total Pressure (Pt)						
	Static Pressure (Ps)						
	NC						
1 1/2	570	805	1035	1140	1265	1380	1495
0.062	0.02	0.04	0.067	0.081	0.1	0.119	0.139
	0.017	0.034	0.056	0.07	0.084	0.1	0.118
	NC	20	25	28	31	34	36
Flow CFM/Ft.	36	50	65	71	79	86	94
Throw, Sill or Floor	6 9	9 13	10 14	11 16	13 18	13 19	14 20
Ft. Side Wall	8 11	11 16	13 18	14 20	15 22	17 24	17 25
2	48	68	88	97	108	117	127
0.086	5 8	8 12	10 14	11 16	13 18	13 19	14 20
	7 10	10 15	13 18	14 20	15 22	17 24	17 25
2 1/2	63	89	114	125	139	152	164
0.11	6 9	9 13	11 16	13 18	13 19	15 21	15 22
	8 11	11 16	14 20	16 23	17 24	18 26	20 28
3	74	105	135	148	164	179	194
0.13	7 10	10 14	13 18	15 21	15 22	17 24	18 26
	8 12	13 18	15 22	17 25	18 26	20 28	21 30
3 1/2	87	123	156	174	193	211	228
0.152	7 10	10 15	13 18	14 20	15 21	15 22	17 24
	9 13	13 19	16 23	18 26	20 28	21 30	22 32
4	100	141	181	200	221	242	262
0.176	8 11	13 18	15 21	17 24	18 26	19 27	21 30
	10 14	15 22	17 25	20 29	22 32	24 34	25 36
5	125	177	228	251	278	304	329
0.22	8 12	13 18	15 22	17 25	18 26	20 28	21 30
	10 15	15 22	19 27	22 31	23 33	24 35	27 38
6	157	213	274	302	335	366	396
0.265	8 12	13 18	15 22	17 25	18 26	20 28	21 30
	10 15	15 22	19 27	22 31	23 33	24 35	27 38
8	202	286	367	405	449		
0.062	10 14	13 19	15 22	18 26	19 27		
	12 17	17 24	20 28	23 33	24 34		
10	254	358	461	507			
0.446	10 15	15 22	18 26	21 30			
	13 19	20 28	23 33	26 37			
12	305	431	554				
0.536	12 17	22 31	21 30				
	15 21	24 35	27 38				

Linear Bar Grilles

LBG

Series 2300, 2400 (0° and 15° Deflection)

Listed Width (in inches) and Ak Area per foot	Outlet Velocity (V _k) Total Pressure (Pt) Static Pressure (Ps) NC	500	700	900	1000	1100	1200	1300
		0.020	0.038	0.062	0.076	0.091	0.110	0.128
		0.015	0.029	0.049	0.61	0.073	0.088	0.102
		15	18	24	28	31	35	37
1 1/2 0.062	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	31 7 11 10 13	44 11 16 13 19	56 12 17 16 22	63 13 19 17 24	69 16 22 18 26	75 16 23 20 29	81 17 24 20 30
2 0.086	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	43 6 10 8 12	60 10 14 12 18	77 12 17 16 22	85 13 19 17 24	94 16 22 18 26	102 16 23 20 29	111 17 24 20 30
2 1/2 0.11	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	55 7 11 10 13	77 11 16 13 19	99 12 17 17 24	110 13 19 19 28	121 16 22 20 29	132 18 25 22 31	143 18 26 24 34
3 0.13	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	65 8 12 10 14	91 12 17 16 22	117 16 22 18 26	130 17 24 20 30	143 18 25 22 31	156 18 26 24 34	169 20 29 25 36
3 1/2 0.152	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	76 8 12 10 14	107 12 18 16 22	137 16 22 18 26	153 18 25 20 30	168 18 26 22 31	183 20 29 24 34	198 22 31 25 36
4 0.176	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	88 10 13 12 17	123 16 22 18 26	158 17 24 20 30	175 19 28 24 35	193 22 31 26 38	210 23 32 29 41	228 24 35 30 31
5 0.22	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	110 10 14 12 18	154 16 22 18 26	198 18 25 22 31	220 20 29 25 36	242 22 0 26 0	264 23 32 29 41	286 25 36 31 44
6 0.265	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	133 10 14 12 18	186 16 22 18 26	239 18 26 23 32	265 20 30 26 37	292 22 0 28 0	318 24 34 29 42	345 25 36 32 46
8 0.062	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	178 12 17 14 20	249 16 23 20 29	320 18 26 24 34	355 22 31 28 40	391 23 29		
10 0.446	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	223 12 18 16 23	312 18 26 24 34	401 22 31 28 40	445 25 36 31 44			
12 0.536	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	268 14 20 18 25	375 26 37 29 42	482 25 36 32 46				

Series 2300, 2400 (30° Deflection)

Listed Width (in inches) and Ak Area per foot	Outlet Velocity (V _k) Total Pressure (Pt) Static Pressure (Ps) NC	500	700	900	1000	1100	1200	1300
		0.016	0.031	0.051	0.062	0.062	0.09	0.105
		0.012	0.024	0.04	0.05	0.05	0.072	0.084
		15	20	23	23	29	31	
1 1/2 0.062	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	36 7 11 10 13	50 11 16 13 19	65 12 17 16 22	71 13 19 17 24	79 16 22 18 26	86 16 23 20 29	94 17 24 20 30
2 0.086	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	48 6 10 8 12	68 10 14 12 18	88 12 17 16 22	97 13 19 17 24	108 16 22 18 26	117 16 23 20 29	127 17 24 20 30
2 1/2 0.11	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	63 7 11 10 13	89 11 16 13 19	114 12 17 17 24	125 16 22 19 28	139 16 23 20 29	152 18 25 22 31	164 18 26 24 34
3 0.13	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	74 8 12 10 14	105 12 17 16 22	135 16 22 18 26	148 17 24 20 30	164 18 25 22 31	179 18 26 24 34	194 20 29 25 36
3 1/2 0.152	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	87 8 12 11 16	123 12 18 16 23	156 16 22 19 28	174 18 25 22 31	193 18 26 24 34	211 20 29 25 36	228 22 31 26 38
4 0.176	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	100 10 13 12 17	141 16 22 18 26	181 17 24 20 30	200 19 28 24 35	221 22 31 26 38	242 23 32 29 41	262 24 35 30 43
5 0.22	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	125 10 14 12 18	177 16 22 18 26	228 18 25 22 31	251 20 29 25 36	278 22 31 26 38	304 23 32 29 41	329 25 36 31 44
6 0.265	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	157 10 14 10 14	213 16 22 16 22	274 18 26 18 26	302 20 30 20 30	335 22 31 22 31	366 24 34 24 34	396 25 36 25 36
8 0.062	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	202 12 17 14 20	286 16 23 20 29	367 18 26 24 34	405 22 31 28 40	449 23 29		
10 0.446	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	254 12 18 16 23	358 18 26 24 34	461 22 31 28 40	507 25 36 31 44			
12 0.536	Flow CFM/Ft. Throw, Sill or Floor Ft. Side Wall	305 14 20 18 25	431 26 37 29 42	554 25 36 32 46				

Performance Notes for Series 2000:

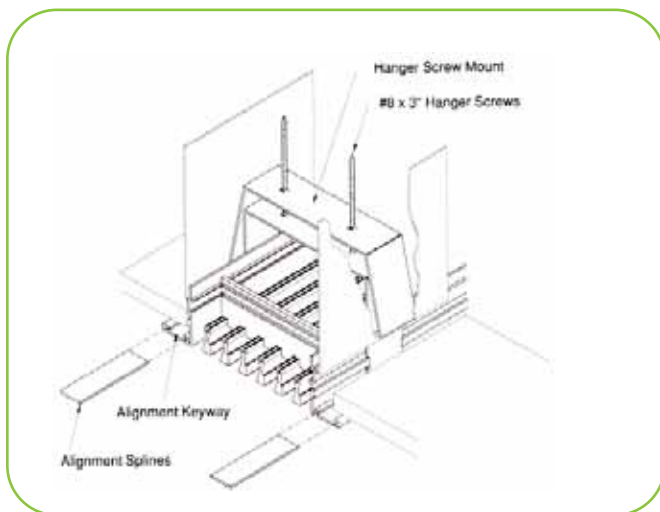
All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic feet per minute (air)
- fpm - Velocity of air stream in feet per minute
- Pv - Velocity pressure (inches of water column)
- Pt - Total pressure (inches of water column)
- Ps - Static pressure = Pt - Pv (inches of water column)
- Throw - Cataloged throw is horizontal distances in feet to the terminal velocities of 150 and 50 fpm with supply air temperature 20° F below room air temperature.
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Installation Information

Hanger Bracket Installation into Hemmed Ducts



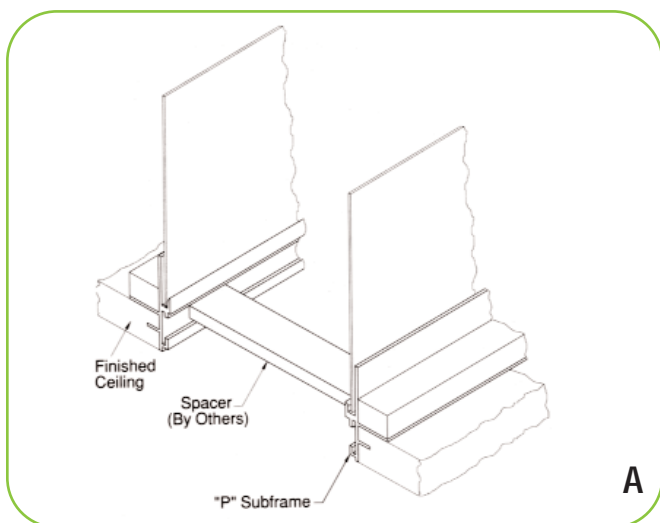
The hanger bracket mounting system is also designed to work well with factory supplied subframe material – both “P” and “W” styles. In order to ensure a satisfactory subframe installation, the following procedures should be followed:

- 1) The factory supplied subframe material should be cut to the proper length (i.e., the nominal size of the Grille).
- 2) The neck of the subframe should be attached to the outside of the ductwork with the ends of the duct nestled in the channel of the subframe extrusion.
- 3) Care should be taken that the face of the subframe material is parallel to the finished surface, and, if being used as a plaster ground, the “P” subframe is recessed the proper distance from the designed finish wall.
- 4) The long sides of the subframe must be braced with appropriately sized spacer bars to prevent distortion of the subframe dimensionally, especially during plastering. Note: this bracing must be done prior to plastering.
- 5) The spacer bars should remain in place until the Grille is installed, and, in a long run, should be removed only when each Grille section is ready for installation. Subframe material used on long runs should be aligned section to section by use of the factory supplied alignment splines. In addition to serving as a plaster ground, the “P” style auxiliary subframe is designed to accommodate standard concealed spline ceiling tiles. The “W” style auxiliary subframe is installed in much the same manner as the “P” style subframe, except that it is usually placed in a ceiling directly against a sidewall. Note that Model 2000 Bar Grilles cannot be used with a “W” style subframe next to a wall because the 1” border of the Grille would overlap the subframe.

Linear Bar Grilles

LBG

Auxiliary Subframe Preparation “P” and “W” Styles

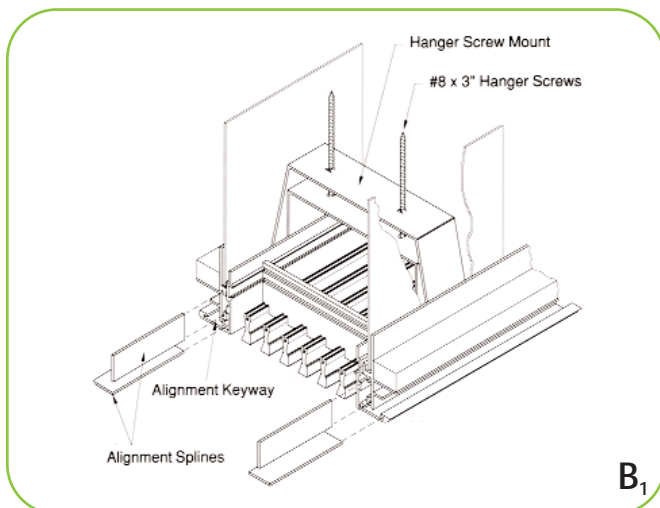


The hanger bracket mounting system is also designed to work well with factory supplied subframe material – both “P” and “W” styles. In order to ensure a satisfactory subframe installation, the following procedures should be followed:

- 1) The factory supplied subframe material should be cut to the proper length (i.e., the nominal size of the Grille).
- 2) The neck of the subframe should be attached to the outside of the ductwork with the ends of the duct nestled in the channel of the subframe extrusion.
- 3) Care should be taken that the face of the subframe material is parallel to the finished surface, and, if being used as a plaster ground, the “P” subframe is recessed the proper distance from the designed finish wall.
- 4) The long sides of the subframe must be braced with appropriately sized spacer bars to prevent distortion of the subframe dimensionally, especially during plastering. Note: this bracing must be done prior to plastering.
- 5) The spacer bars should remain in place until the Grille is installed, and, in a long run, should be removed only when each Grille section is ready for installation. Subframe material used on long runs should be aligned section to section by use of the factory supplied alignment splines. In addition to serving as a plaster ground, the “P” style auxiliary subframe is designed to accommodate standard concealed spline ceiling tiles. The “W” style auxiliary subframe is installed in much the same manner as the “P” style subframe, except that it is usually placed in a ceiling directly against a sidewall. Note that Model 2000 Bar Grilles cannot be used with a “W” style subframe next to a wall because the 1” border of the Grille would overlap the subframe.

Installation Information

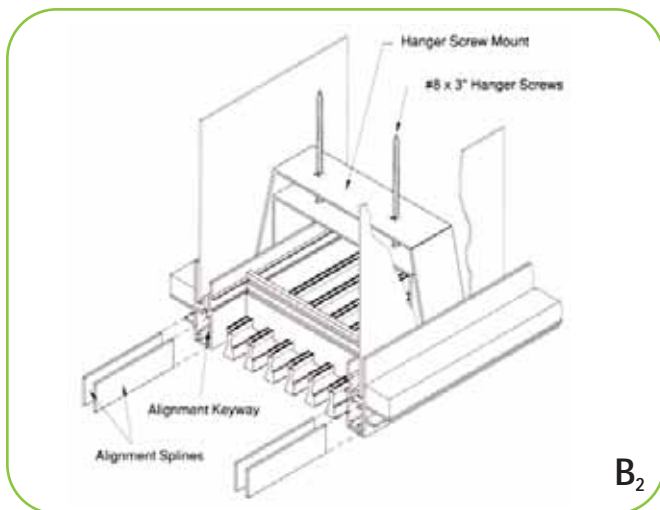
Hangar Bracket Installation into Auxiliary Subframe



Series 2000 and 2300 Linear Bar Grilles and Registers are easily installed into auxiliary subframe material using factory supplied hanger brackets and leveling screws according to the following instructions:

- 1) Arrange the appropriate number of hanger brackets and hanger screw mounts (shipped unattached) on the neck of the Grille, positioning the brackets over the hanger screw mounts.
- 2) Insert the supplied #8 X 3" screws through their mounts and into the proper hole in the hanger brackets, locking the Grille and hangers together.
- 3) Position the Grille carefully in the duct opening and press into position, pushing the legs of the hanger brackets past the extruded channel of the auxiliary subframe, allowing them to snap into position (if necessary, press the hanger brackets upward with the screws to seat the brackets properly).
- 4) Tighten the screws to draw the Grille firmly against the ceiling or sidewall, adjusting the tension to accommodate any variation in the mounting surface. In installations where long runs are composed of many separate units, the same procedure should be followed on each Grille section, taking care to use the factory supplied alignment splines to ensure a smooth and unbroken appearance.

Hangar Bracket Installation into Auxiliary Subframe

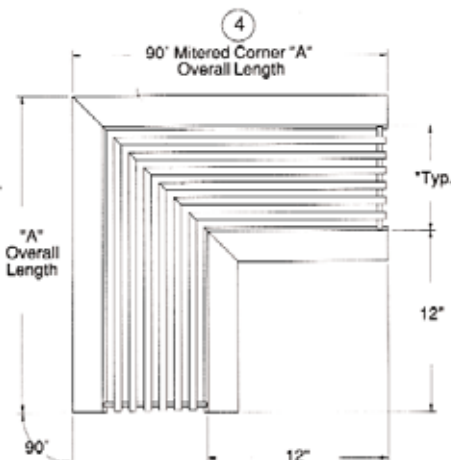
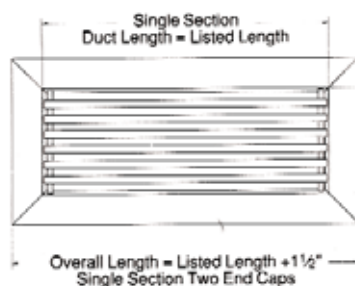
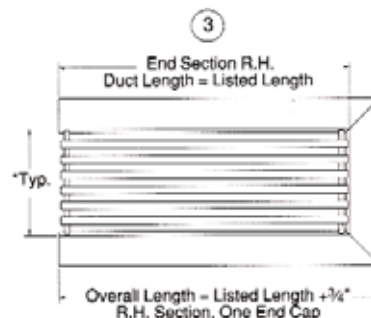
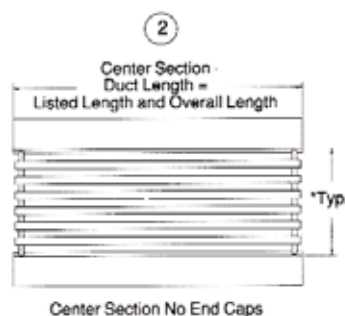
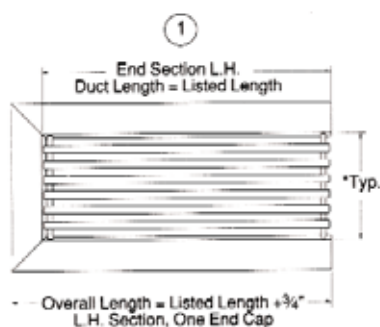
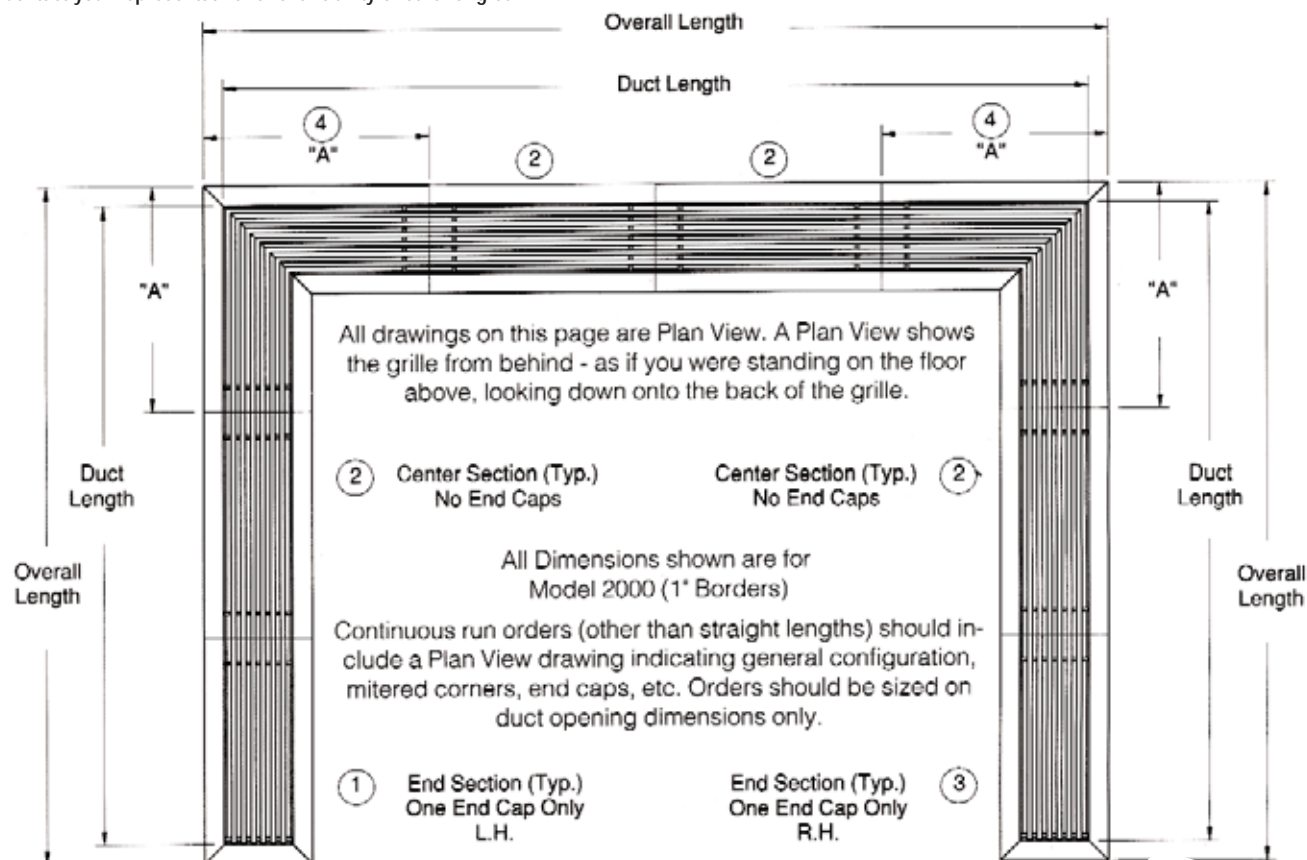


Model 2100 Units – 1/2 inch Borders Model 2100 Bar Grilles and Registers are installed into auxiliary subframes following basically the procedures outlined above. Special care must be taken, however, in the installation of the 2100 unit due to the extremely narrow frame borders of these units. Installation should proceed as follows:

- 1) Arrange the appropriate number of hanger brackets and hanger screw mounts (shipped unattached) on the neck of the Grille, positioning the brackets over the hanger screw mounts.
- 2) Insert the supplied #8 X 3" screws through their mounts and into the proper hole in the hanger brackets, locking the Grille and hangers together.
- 3) Position the Grille carefully in the duct opening and press into position, pushing the legs of the hanger brackets past the extruded channel of the auxiliary subframe, allowing them to snap into position (if necessary, press the hanger brackets upward with the screws to seat the brackets properly).
- 4) Tighten the screws to draw the Grille firmly against the ceiling or sidewall, adjusting the tension to accommodate any variation in the mounting surface. In installations where long runs are composed of many separate units, the same procedure should be followed on each Grille section, taking care to use the factory supplied alignment splines to ensure a smooth and unbroken appearance.

Dimensions and Continuous Runs

Contact your representative for availability of other angles



90° Mitered Corner Dimensions			
Listed Width	"A"	Listed Width	"A"
1 1/2"	14 1/4"	5"	17 3/4"
2"	14 3/4"	6"	18 3/4"
2 1/2"	15 1/4"	8"	20 3/4"
3"	15 3/4"	10"	22 3/4"
3 1/2"	16 1/4"	12"	24 3/4"
4"	16 3/4"		

* Duct Width Equals Listed Width

Series 2000 - Specifications

- 1" Border, 7/32" Bars, 1/2" Centers** - Model 2000
1/2" Border, 7/32" Bars, 1/2" Centers - Model 2100
1" Border, 1/8" Bars, 1/4" Centers - Model 2300
1/2" Border, 1/8" Bars, 1/4" Centers - Model 2400

Air outlets shall be Series 2000 extruded aluminum linear bar grilles manufactured by METALAIR®. Units shall be designed specifically for sidewall or ceiling applications and be constructed from heavy gauge extruded aluminum. The units shall be the size and quantity as outline in the plans and specifications.

Deflection bars shall be 0', 15' or 30' as detailed. Face bars shall be (1/8" or 7/32") wide on (1/4" or 1/2") centers and shall be permanently fixed in position. Borders shall be (1" or 1/2") wide. Auxiliary sub frames shall be furnished as required to fit the wall or ceiling system.

Bar Grilles and Registers shall be furnished with positive holding concealed mounting systems as required. Units shall be furnished in one piece up to 6 feet in length. Continuous sections shall butt together with hairline joints and be provided with interlocking alignment splines. Borders shall be mechanically fastened to provide a neat hairline corner.

Floor Applications

- 1" Border, 7/32" Bars, 1/2" Centers** - Model 2000F
3/16" Border, 7/32" Bars, 1/2" Centers (*Not available for continuous runs) - Model 2200F

Air outlets shall be Series 2000 extruded aluminum linear bar grilles manufactured by METALAIR®. Units shall be designed specifically for floor applications and be constructed from heavy gauge extruded aluminum. The units shall be the size and quantity as outline in the plans and specifications.

Deflection bars shall be 0', 15', or 30' as detailed.

Cores shall be removable and shall be held in place by coated steel retaining clips. Face bars shall be a minimum of 7/32" thick. Grille Borders shall be (3/16" or 1") inch wide with 3/16" wide bars. Units shall be specially reinforced for floor installation with 1/8" by 11/16" inch support brackets. Units shall be furnished in one piece up to 6 feet in length. Continuous sections* shall butt together with hairline joints and be provided with interlocking alignment splines. Bar Grille borders shall be mitered and mechanically fastened to provide a neat hairline corner.

Pencil Proof Floor

- 1" Border, 7/32" Bars, 1/2" Centers** - Model 2000FP
3/16" Border, 7/32" Bars, 1/2" Centers (*Not available for continuous runs) - Model 2200FP

Air outlets shall be Series 2000 extruded aluminum linear bar grilles manufactured by METALAIR®. Units shall be designed specifically for pencil proof applications and be constructed from heavy gauge extruded aluminum. The units shall be the size and quantity as outline in the plans and specifications.

Deflection bars shall be 0', 15' or 30' as detailed. Face bars shall be 3/16" wide on 1/2" centers and shall be permanently fixed in position. Borders shall be (1" or 3/16") wide as specified.

Bar Grilles and Registers shall be furnished with positive holding concealed mounting systems as required. Grille and Register sections shall be furnished in one piece up to 6 feet in length. Continuous Grille sections shall butt together with hairline joints and shall be provided with interlocking alignment splines. Bar Grille borders shall be mechanically fastened to provide a neat hairline corner.

Cores shall be removable and shall be held in place by coated steel retaining clips. Grilles and Registers shall be specially reinforced for floor or sill installation with 1/8 inch by 11/16 inch support brackets. Units shall be furnished in one piece up to 6 feet in length. Continuous sections* shall butt together with hairline joints and be provided with interlocking alignment splines. Borders shall be mitered and mechanically fastened to provide a neat hairline corner.

Optional Accessories

Opposed blade volume control dampers, extractors, and equalizing grids shall be furnished behind active supply sections.
 Opposed blade volume control dampers shall be furnished behind return sections as required.
 Debris screens shall be furnished behind active and return sections as required.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.



Paint Specification

Process shall be anodic electrode position using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaline cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series 2000 - Model Specification Guide

		Model			Available Widths	Available one piece length	Available Finishes	Available Options
		0"	15"	30"	1 1/2"	6"	Standard	AD1 - One Access Door
2000 Series 1" Border - 7/32" Bars - 1/2" Centers	Wall Mounting	2000	2015	2030	thru	thru	01 - White	AD2 - Two Access Doors
	Core Only	2000CO	2015CO	2030CO	24"	72"	Optional	L9 - Equalizing Grid
	Floor Mounting	2000F	2015F	2030F			02 - Aluminum	OBDA - Opposed Blade Damper - Steel
	Floor or Sill Mounting	2000FP	2015FP	2030FP			04 - Clear Anodized	OBDA - Opposed Blade Damper - Aluminum
	Concealed Mounting Hangers	2000H	2015H	2030H			03 - Black	
	Plaster Wall & Ceiling	2000HP	2015HP	2030HP			04 - Clear Anodized	
2100 Series 1/2" Border - 7/32" Bars - 1/2" Centers	Wall Mounting	2100	2115	2130			28 - Custom Color	
	Concealed Mounting Hangers	2100H	2115H	2130H				
	Concealed Spline Subframe	2100HP	2115HP	2130HP				
	Narrow Subframe	2100HW	2115HW	2130HW				
	Combination Subframe	2100HC	2115HC	2130HC				
2200 Series 3/16" Border - 7/32" Bars - 1/2" Centers	Non-Flanged Floor Mounting	2200F	2215F	2230F				
	Non-Flanged Floor Mounting Pencil Proof	2200FP	2215FP	2230FP				
2300 Series 1" Border - 1/8" Bars - 1/4" Centers	Wall Mounting	2300	2315	2330				
	Core Only	2300CO	2315CO	2330CO				
	Concealed Mounting Hangers	2300H	2315H	2330H				
	Plaster Wall & Ceiling	2300HP	2315HP	2330HP				
2400 Series 1/2" Border - 1/8" Bars - 1/4" Centers	Wall Mounting	2400	2415	2430				
	Concealed Mounting Hangers	2400H	2415H	2430H				
	Concealed Spline Subframe	2400HP	2415HP	2430HP				
	Narrow Subframe	2400HW	2415HW	2430HW				
	Combination Subframe	2400HC	2415HC	2430HC				



GAER

GRILLES & REGISTERS
GRILLES & REGISTERS

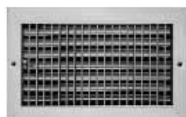


Series V
Pg. 32

Sidewall Supply Grilles - Economical Aluminum - Vertical Blades - Series V

- Series V grilles combine the advantages of corrosion resistant construction and durability with attractive design, solid performance, and competitive pricing
- This economical series of supply grilles and registers is available with the V-1 single deflection, VH-1 double deflection and with the VM-1 single deflection with a built in multi-shutter damper
- The series V are provided with vertical front blades. Units are constructed with an aluminum one piece formed border and blades

Single Deflection Grille	V-1
Double Deflection Grille	VH-1
Single Deflection — Multi-Shutter	VM-1



Series 4000
Pg. 36

Sidewall Supply Grilles - Aluminum/Steel - Series 4000

- The series 4000 sets the standards for performance and appearance in the industry. The series 4000 is all aluminum; the series 4000S has a steel border and steel blades
- The series 4000 is available with single or double deflection, and with a number of options and accessories to meet a variety of applications
- Series 4000 grilles and registers can be selected with either vertical or horizontal front blades

	Single Deflection	
	Steel	Aluminum
Vertical Blades	V4002S-1	V4002-1
Horizontal Blades	H4002S-1	H4002-1

	Double Deflection	
	Steel	Aluminum
Vertical Front Blades	V4004S-1	V4004-1
Horizontal Front Blades	H4004S-1	H4004-1

	Single Deflection - Multi-Shutter Damper	
	Steel	Aluminum
Vertical Blades	V4002SM-1	V4002M-1
Horizontal Blades	H4002SM-1	H4002M-1



Model 4000-AF
Pg. 42

Sidewall Supply Grille - Adjustable Air Foil Blades - Extruded Aluminum Blade Series 4000-AF - Air Foil

- The series 4000-AF is our premier product, offering superior construction and high performance with aerodynamically shaped extruded deflection blades. The 4000-AF series is constructed with an extruded aluminum border and air foil deflection blades; the 4000S-AF series has a steel border and extruded aluminum air foil deflection blades
- The series 4000-AF is an excellent choice for projects requiring superior performance and aesthetics
- The series 4000-AF is available with single or double deflection, and with a number of options and accessories to meet a variety of applications
- Series 4000-AF grilles and registers can be selected with either vertical or horizontal front blades

	Single Deflection	
	Steel Border - Aluminum Blades	Aluminum
Vertical Blades	V4002S-AF-1	V4002-AF-1
Horizontal Blades	H4002S-AF-1	H4002-AF-1

	Double Deflection	
	Steel Border - Aluminum Blades	Aluminum
Vertical Front Blades	V4004S-AF-1	V4004-AF-1
Horizontal Front Blades	H4004S-AF-1	H4004-AF-1



Series 4004P
Pg. 48

Supply Grilles - Spiral Pipe Grille - Aluminum/Steel - Series 4004P

- The model 4004P (aluminum) and 4004SP (galvanized steel) offers superior performance in exposed duct applications offering a clean, low profile appearance
- Units can be easily installed in round duct diameters 6"-48"
- Integral gasket seals grille tightly to duct
- Units includes built in extractor to allow accurate balancing and uniform air flow
- Model 4004P is all aluminum construction. Model 4004SP includes is provided with galvanized steel border and blades

	Aluminum	Steel
Surface Mount	4004P-1	4004SP-1



Series L
Model LS3 Shown
Pg. 52

Supply Curved Blade Ceiling Grilles - Aluminum - Series L

- ✱ The series L curved blade grilles and registers are an economic solution for use in applications requiring ceiling or sidewall installations with directional air patterns. The series L is available with 1-way, 2-way corner, 2-way opposite, 3-way, and 4-way directional air patterns
- ✱ The series L is constructed from aluminum with adjustable curved blade allowing adjustment from full horizontal to full vertical air directions
- ✱ Units are available with a wide range of options and accessories

	Single Deflection				
	No Damper		Multi-Shutter Damper Operated Through Curved Blades		Horizontal Multi-Shutter Damper Operated Through slot on border
	Long Blades	Short Blades	Long Blades	Short Blades	Long Blades
1 Way	L-1	S-1	LM-1	SM-1	LMH-1
2 Way Opposite	LT-1	ST-1	LTM-1	STM-1	LTMH-1
2 Way Corner	LTC-1		LTCM-1		
3 Way Corner	LTC3-1		LTC3M-1		
3 Way Equal Throw	LS3-1		LS3M-1		
4 Way	LS4-1		LS4M-1		

	Double Deflection - No Damper	
	Long Blades	Short Blades
1 Way	LV-1	SH-1
2 Way Opposite	LTV-1	STH-1



Series RH
Pg. 60

Sidewall Return Grilles - Aluminum - Series RH

- ✱ The series RH return grilles combine the advantages of corrosion resistant construction and durability with attractive design, solid performance, and competitive pricing
- ✱ This economical series of roll form aluminum return grilles and registers is available with a number of borders to integrate into a wide range of ceiling systems
- ✱ Series RH is an excellent choice for exhaust and return applications

Roll Formed Aluminum/RH - Grilles	
Surface Mount	RH-1
	RH-H-1 - Hinged Core
T-bar Lay-in Modules	RH-6
Concealed T-bar Lay-in	RH-7
Tegular Lay-in	RH-8
Donn Finline Lay-in	RH-9



Series RHE
Pg. 61

Sidewall Return Grilles - Extruded Aluminum - Series RHE

- ✱ The series RHE is our premier product, offering superior construction and high performance with extruded aluminum construction. This unit has both superior appearance and performance and is built for durability
- ✱ The series RHE is available with an optional hinge to allow access behind the grille face
- ✱ Series RHE is an excellent choice for projects requiring exhaust or return applications

Extruded Aluminum/RHE - Grilles	
Surface Mount	RHE-1
	RHE-H-1 - Hinged Core



Series SRH
Pg. 62

Sidewall Return Grilles - Steel - Series SRH

- ✱ The series SRH is designed for applications requiring a steel border. The blades of the SRH are constructed from steel
- ✱ This economical series of return grilles and registers is available a number of borders to integrate into a wide range of ceiling systems
- ✱ Series SRH is an excellent choice for exhaust and return applications

Steel/SRH - Grilles	
Surface Mount	SRH-1
	SRH-H-1 - Hinged Core
T-bar Lay-in Modules	SRH-6



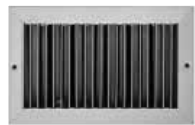
Model HDRH

Pg. 66

Heavy Duty Grilles - Sidewall Return - Extruded Aluminum - 1 1/3" Blade Spacing - Model HDRH

- ✦ The series HDRH is an excellent choice for projects that require a grille or register to withstand moderate physical abuse. Applications for the series HDRH include common areas in schools, hospitals, and other high traffic areas
- ✦ The series HDRH is made from aluminum material equal or greater than 14-gauge steel. Outer borders are thicker than those of standard commercial grilles and registers. Deflector blades are assembled in the outer border using heavy alloy metal screws for rigidity
- ✦ Series HDRH is an excellent choice for exhaust or return applications in heavy traffic public areas

Louver Grille Surface Mount	
Surface Mount	HDRH-1



Series 4002R

Pg. 68

Return Grilles & Registers - Extruded Aluminum - Fixed Blades 0° or 45° - Series 4002R

- ✦ The series 4002R return grilles and registers are designed to match the 4000 series supply models. These units are constructed of heavy aluminum. The 4002RS is constructed with a heavy steel border and steel deflector blades
- ✦ The deflector blades for both the series 4002R and 4002RS are fixed and available in 0° or 45° settings
- ✦ Series 4000R and 4000RS offer the advantage of a uniform appearance when selected with the series 4000 supply grilles and registers

	Steel	Aluminum
Vertical Blades	V4002RS-1	V4002R-1
Horizontal Blades	H4002RS-1	H4002R-1

Series DG



Model DGCO



Model DGDF

Pg. 72

Door Grilles - Exhaust & Return - Extruded Aluminum - Series DG

- ✦ Series DG door grilles are designed to transfer air through doors or walls. The DG Series include "V" shaped louvers providing a sight-proof return or exhaust grille regardless of the viewing angle
- ✦ The series DG is available with a number of options include a light-proof option (model DGLP), surface mounting applications, and door mounting (model DGDF)
- ✦ Series DG offers a number of solutions for your door and air transfer applications

Series DG	
Core Only	DGCO
Single Frame Flange	DGSF
Double Flange Frame - Telescoping	DGDF
Double Flange Frame - Light Resistant	DGLP

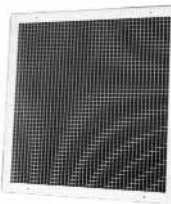


Series 4500
Pg. 76

Sidewall Grille - Steel Gym Grille - Series 4500

- ✱ The series 4500 is a heavy duty return gym grille. This unit is designed for applications such as gymnasiums and public areas. The border and deflection blades are heavy gauge steel and built to withstand moderate physical abuse
- ✱ The series 4500 is available with 0° deflection or for more sight-proof application, 38° deflection (model 4538-1)
- ✱ Series 4500 is an excellent choice for return or exhaust applications in high traffic applications where extra protection for the grille is required

Grilles	
Surface Mount	4500-1 0° Deflection - Horizontal Fixed Blades
	4538-1 38° Deflection - Horizontal Fixed Blades

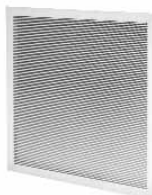


Series CC5
Pg. 80

Sidewall/Ceiling Return Grilles & Registers - Extruded Aluminum/Aluminum - Series CC5/CC15/CC1

- ✱ The series CC5 cubed core return and exhaust grilles are designed to provide low pressure drops and low sound levels
- ✱ The series CC5 is available with a number of options and accessories such as a 1" thick core (model CC1) to reduce sight into the grille
- ✱ Series CC5 is an excellent choice for applications requiring minimum pressure drop and noise in return and exhaust applications

	Grilles		
	CC5 - Cubed Core 1/2" x 1/2" x 1/2" Core	CC15 - Cubed Core 1/2" x 1/2" x 1" Core	CC1 - Cubed Core 1" x 1" x 1" Core
Surface Mount	CC5-1	CC15-1	CC1-1
T-bar Lay-in	CC5-6	CC15-6	CC1-6
Concealed Spline	CC5-7	CC15-7	CC1-7
Tegular Ceiling T-bar Lay-in	CC5-8	CC15-8	CC1-8
Donn Finline Lay-in	CC5-9	CC15-9	CC1-9
T-bar Lay-in Channel Frame	CC5 TBC-6		
Removable Core	CC5R-6		



Model RP
Pg. 86

Sidewall Ceiling Return Grille - Perforated Face - Aluminum - Model RP

- ✱ The series RP perforated face return or exhaust grilles are designed to blend into the ceiling system and provide a clean, uncluttered architectural appearance
- ✱ The series RP grilles and registers are available with a wide range of options and accessories
- ✱ Series RP is of aluminum construction and ideal for return and exhaust applications requiring low pressure drops and low sound

Sidewall Ceiling Return Grille - Perforated Face
RP-1



Series RC
Pg. 90

Removable Core Grilles & Registers - Extruded Aluminum - Series RC - Revers-A-Core®

- ✱ The series RC Revers-A-Core® supply grilles and registers combine rugged aluminum construction, a clean architectural design, and an extremely flexible air pattern versatility
- ✱ The fixed louvered core is removable from the face and can be rotated or reversed to achieve any of four different air deflection patterns
- ✱ Series RC grilles and registers is an excellent selection for applications calling for a distinctive appearance and high performance

Single Deflection		Double Deflection	
Curved Border	41C-1	Curved Border	42C-1
Flat Border	41F-1	Flat Border	42F-1
Curved Border - Removable Inner Frame	RC41C-1	Curved Border - Removable Inner Frame	RC42C-1

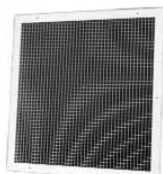


Series RHF
Pg. 96

Filter Return Grilles - Aluminum - Series RHF

- ✱ The series RHF return filter grilles combine the advantages of corrosion resistant construction and durability with attractive design, solid performance, and competitive pricing
- ✱ The series RHF is designed for 1" or 2" thick filters (by others) and includes a hinged face with 1/4" turn fasteners for quick filter changes
- ✱ Series RHF is an excellent choice for exhaust and return applications requiring a filter

	Roll Formed Aluminum	Extruded Aluminum	Steel
Surface Mount	RHF-1 G/S (Grille Size)	RHEF-1 G/S (Grille Size)	SRHF-1 G/S (Grille Size)
	RHF-1 F/S (Filter Size)	RHEF-1 F/S (Filter Size)	SRHF-1 F/S (Filter Size)
T-bar Lay-in	RHF-6 G/S (Grille Size)		SRHF-6 G/S (Grille Size)
	RHF-6 F/S (Filter Size)		SRHF-6 F/S (Filter Size)

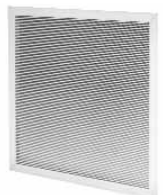


Series CC5F
Pg. 102

Filter Return Grilles - Cubed Core - Aluminum - Series CC5F

- ✱ The series CC5F cubed core return and exhaust filter grilles are designed to provide low pressure drops and low sound levels
- ✱ The series CC5F is designed for 1" thick filters (by others) and includes a hinged face with 1/4" turn fasteners for quick filter changes
- ✱ Series CC5F is an excellent choice for applications requiring minimum pressure drop and noise in return and exhaust applications

Return Grilles	
Surface Mount	CC5F-1 G/S Grille Size
	CC5F-1 F/S Filter Size
T-bar Lay-in	CC5F-6 G/S Grille Size
	CC5F-6 F/S Filter Size



Series RPF
Pg. 106

Filter Return Grilles - Aluminum - Series RPF

- ✱ The series RPF perforated face return or exhaust filter grilles are designed to blend into the ceiling system and provide a clean, uncluttered architectural appearance
- ✱ The series RPF is designed for 1" thick filters (by others) and includes a hinged face with 1/4" turn fasteners for quick filter changes
- ✱ Series RPF is of aluminum construction and ideal for return and exhaust filter applications requiring low pressure drops and low sound

Perforated Face Return Filter	
Surface Mount	RPF-1 G/S (Grill Size)
	RPF-1 F/S (Filter Size)
T-bar Lay-in	RPF-6 G/S (Grill Size)

LEADING THE INDUSTRY IN PRODUCT LITERATURE

With the choice of our Pre-Flite Catalog, Quick Select Catalog, InfoSource Catalog, InfoSource CD and our web site, www.metalaire.com, you pick the format for product information that best suits your air distribution design needs.

Pre-Flite - Product Overview Catalog

The METALAIRES Pre-Flite catalog is a condensed reference guide containing concise listings of our entire product line including grilles, registers, diffusers, and air terminal units. This catalog can be used to help select the type of device, along with available border styles. The catalog includes photos of each model along with the features and model guide, a great tool when you are trying to select a device for your project.



Quick Select Catalog - Air Distribution Selection Made Easy

The METALAIRES Quick Select Catalog is designed to save you time selecting air distribution equipment. This catalog is a compact version of our InfoSource Catalogs and includes drawings and performance for our most popular products. The Quick Select Catalog is broken into product types with each section beginning with a model summary that includes features and benefits of our products. To obtain product information not included in the Quick Select Catalog, simply go to our web site at www.metalaire.com.



InfoSource Catalog Suite - Complete guide to Air Distribution Selection

The METALAIRES InfoSource Catalog suite is the leading product catalog in the industry. Included in these catalogs are the complete product listings, drawings, product features and benefits, product performance data, specifications, and model specifications. These catalogs are organized to make it quick and easy to find the information you are looking for.

InfoSource Catalog Suite

- Ceiling Diffusers Catalog
- Grilles & Registers Catalog
- Air Terminal Unit Catalog
- Formations Catalog



InfoSource CD

Our InfoSource CD has set the standard in the industry for air distribution product selection. This CD contains a complete library of all our catalogs and submittals along with our air terminal unit selection program.



Web Site: www.metalaire.com

METALAIRES leads the industry with a web site that contains all the product literature and performance data needed to design your air distribution system. Our web site includes all our submittals, catalogs, installation manuals, as well as as other valuable information to aid you in air distribution design.

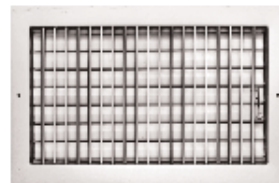


METALAIRES
EXPERIENCE AIRE SUPERIORITY

➔ Supply Grilles ➔ Series V ➔ Stamped Border ➔ Aluminum

Product Details

- ★ The V series of grilles combine the advantages of corrosion resistant construction and durability with attractive design, solid performance, and competitive pricing
- ★ This economical series of supply grilles and registers are available with the V-1 single deflection, VH-1 double deflection and with the VM-1 single deflection with a built in multi-shutter damper
- ★ The V series are provided with vertical front blades. Units are constructed with an aluminum one piece formed border



Model VM-1 Shown

Standard Finish: 01 White

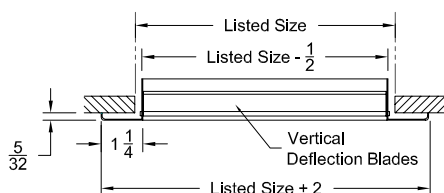
	6	8	10	12	14
4	✓	✓	✓	✓	✓
6	✓	✓	✓	✓	✓
8		✓	✓	✓	✓
10			✓		
12				✓	

Available neck sizes
(V-1, VH-1, VM-1)

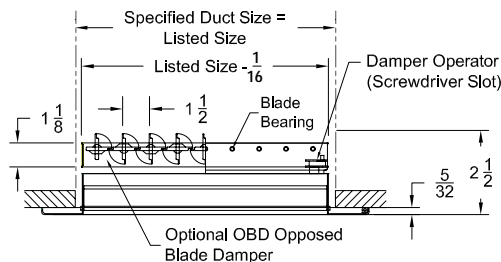
Single Deflection

Sideview, dimensions are in inches

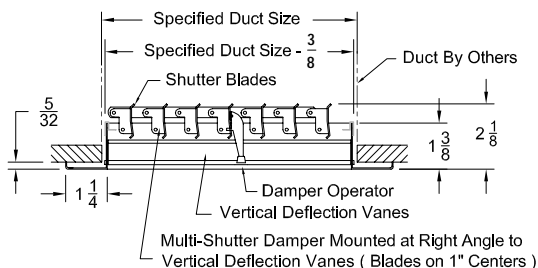
Supply - Single Deflection Grille - Surface Mount - Vertical Blades Model V-1



Supply - Single Deflection Register - Surface Mount - Vertical Blades With Opposed Blade Damper Model VD-1



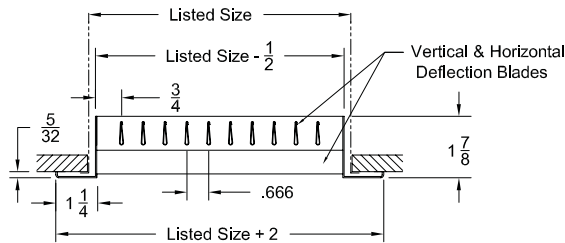
Supply - Single Deflection Register - Surface Mount - Vertical Blades With Multi Shutter Damper Model VM-1



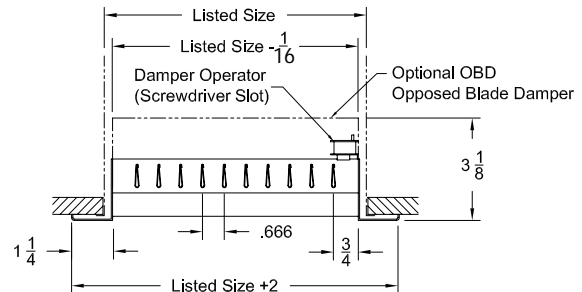
GAR - Grilles and Registers

Double Deflection

Supply - Double Deflection Grille - Surface Mount - Vertical Front Blades
Model VH-1



Supply - Double Deflection Register - Vertical Front Blades
With Opposed Blade Damper
Model VHD-1



1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper (for grilles only)208 OBDA - Aluminum - Opposed Blade Damper (for grilles only) .208 L9 - Equalizing Grid208 PF - Plaster Frame209	<ul style="list-style-type: none"> Sizes available only as listed For larger sizes, oversize or horizontal front blades, use series H (V) 4002 Border is one-piece construction

Series V - Performance

Models V, VH, VM/ Series V available sizes shown on GAR-32

CFM		OUTLET SIZE								NC
		6" x 4"	8" x 4"	10" x 4"	8" x 6"	10" x 6"	12" x 6"	10" x 8"	12" x 8"	
50	Velocity	300	225							
	Ps Throw	.011 12-9-7	.006 11-8-6							
100	Velocity	600	450	360	300	240	200			
	Ps Throw	.044 20-14-11	.025 18-13-10	.016 16-12-9	.011 15-11-9	.007 14-10-8	.005 13-10-7			
150	Velocity	900	675	540	450	360	300	270	225	20
	Ps Throw	.099 26-18-14	.056 23-17-13	.036 22-15-12	.025 20-14-11	.016 19-13-10	.011 18-13-10	.009 17-12-9	.006 16-11-9	
200	Velocity		900	720	600	480	400	360	300	
	Ps Throw		.099 28-20-16	.064 26-19-14	.044 25-18-14	.028 23-16-13	.020 22-15-12	.016 21-15-11	.011 20-14-11	
250	Velocity				750	600	500	450	375	
	Ps Throw				.069 29-20-16	.044 27-19-15	.031 25-18-14	.025 24-17-13	.017 23-16-13	
300	Velocity				900	720	600	540	450	
	Ps Throw				.099 33-23-18	.064 30-21-17	.044 28-20-16	.036 27-19-15	.025 26-18-14	
350	Velocity					840	700	630	525	
	Ps Throw					.087 34-24-18	.060 32-22-17	.049 30-22-17	.034 29-20-16	
400	Velocity						800	720	600	20
	Ps Throw						.079 35-25-19	.064 33-24-18	.044 31-22-17	
450	Velocity						900	810	675	25
	Ps Throw						.099 38-27-21	.080 36-26-20	.056 34-24-19	
500	Velocity								750	
	Ps Throw								.069 37-26-20	
550	Velocity								825	
	Ps Throw								.083 39-28-21	
600	Velocity								900	
	Ps Throw								.099 41-29-23	
	NC	30 - 35								

For Series V performance notes, see page GAR-34



Performance Notes for Series V

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

CFM - Cubic Feet per Minute (air)

fpm - Velocity of air stream in Feet Per Minute

Ps - Static pressure = $P_t - P_v$ (inches of water column)

Throw - Non-isothermal horizontal throw (supply air temperature 20°F colder than average room air temperature) values are for 50 fpm - 100 fpm - 150 fpm velocities

NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands

Series V - Specifications

Supply - Single Deflection Supply Grilles and Registers – Aluminum/Model V-1

Air Outlets shall be model V manufactured by METALAIR®. Units shall be single deflection supply grilles of aluminum construction and with a one piece formed border and a single set of vertical deflection blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be designed for surface mounting applications and be provided with screw holes on the face of the device.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Supply - Double Deflection Supply Grilles and Registers – Aluminum/Model VH-1

Air Outlets shall be model VH-1 manufactured by METALAIR®. Units shall be double deflection supply grilles of aluminum construction and with a one piece formed border and front vertical deflection blades on the front and rear mounted horizontal blades. Optional opposed blade damper shall be constructed of aluminum. Damper must be operable from the face of the diffuser. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with screw holes on the face for surface mounting.

The units shall be the size and quantity as outlined in the plans and specifications.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Supply - Single Deflection with Multi Shutter Damper - Supply Grilles and Registers – Aluminum/Model VM-1

Air Outlets shall be model VM-1 manufactured by METALAIR®. Units shall be single deflection supply grilles with a face operated multi-shutter damper. Units shall be of aluminum construction and with a one piece formed border and front vertical deflection. Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with screw holes on the face for surface mounting.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

The units shall be the size and quantity as outlined in the plans and specifications.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaline cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:



Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series V - Model Specification Guide

Supply - Sidewall

Series V - Aluminum - Economical

Model	Available Neck		Available Finishes	Available Options	
V-1 - Single Deflection Grille VH-1 - Single Deflection Grille	Neck 1	Neck 2	Standard	OBD	Opposed Blade Damper - Steel
	6" thru 14"	4" thru 12"	01 - White	OBDA	Opposed Blade Damper - Aluminum
			Optional	L9	Equalizing Grid
			02 - Aluminum	PF	Plaster Frame
			03 - Black		
			24 - Mill		
		28 - Custom Color			

Supply - Sidewall

Series V - Aluminum - Economical

Model VM-1 Single Deflection Register with Multi-Shutter Damper

Model	Available Neck		Available Finishes	Available Options	
VM-1 - Single Deflection Register with Multi-shutter Damper	Neck 1	Neck 2	Standard	L9	Equalizing Grid
	6" thru 14"	4" thru 12"	01 - White	PF	Plaster Frame
			Optional		
			02 - Aluminum		
			03 - Black		
			24 - Mill		
		28 - Custom Color			



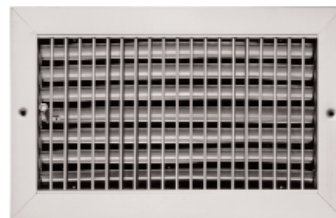
GAR - Grilles and Registers

7/2006

➔ Supply Grilles ➔ Series 4000 ➔ Aluminum
➔ Series 4000S ➔ Steel

Product Details

- ★ Series 4000 sets the standards for performance and appearance in the industry. Series 4000 is all aluminum; series 4000S has a steel border and steel deflection blades
- ★ The series 4000 are available with single or double deflection, with a number of options and accessories to meet a variety of applications
- ★ Series 4000 grilles and registers can be selected with either vertical or horizontal front blades



Model V4004 -1 Shown

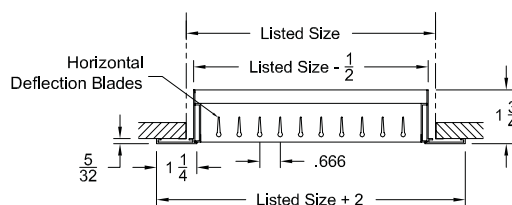
Standard Finish: 01 White

Series 4000 available in 6" x 4" to 48" x 48"
in one piece construction (2" increments)

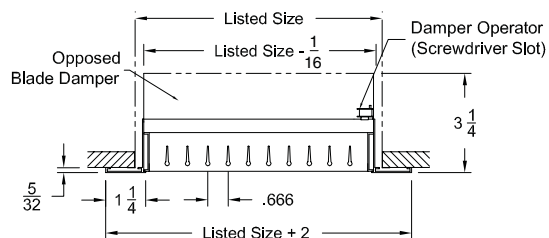
Single Deflection ➔ Aluminum

Sideview, dimensions are in inches

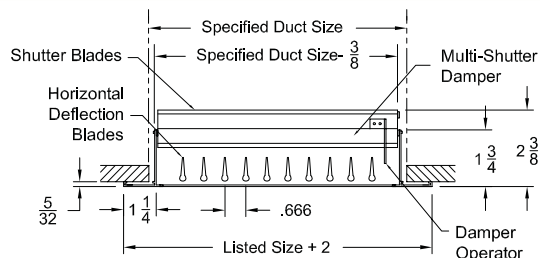
Supply - Single Deflection Grille - Surface Mount - Aluminum
Model H4002-1 - Horizontal Blades
Model V4002-1 - Vertical Blades



Supply - Single Deflection Register - Surface Mount - Aluminum
With Opposed Blade Damper
Model H4002D-1 - Horizontal Blades
Model V4002D-1 - Vertical Blades

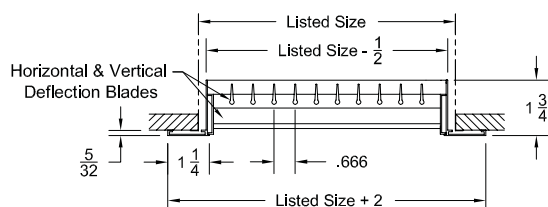


Supply - Single Deflection Register - Surface Mount - Aluminum
With Multi Shutter Damper
Model H4002M-1 - Horizontal Blades
Model V4002M-1 - Vertical Blades

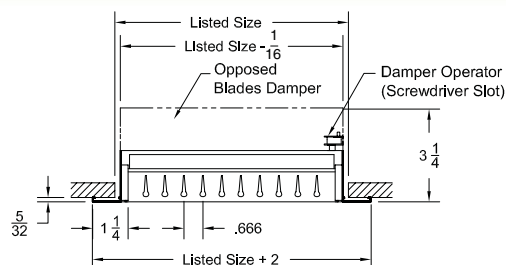


Double Deflection ➔ Aluminum

Supply - Double Deflection Grille - Surface Mount - Aluminum
Model H4004-1 - Horizontal Blades
Model V4004-1 - Vertical Blades



Supply - Double Deflection Register - Surface Mount - Aluminum
With Opposed Blade Damper
Model H4004D-1 - Horizontal Blades
Model V4004D-1 - Vertical Blades



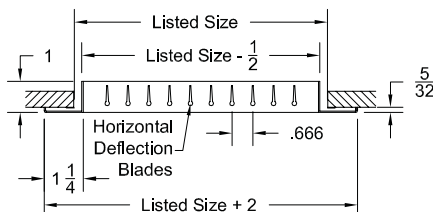
GAR - Grilles and Registers

Single Deflection - Steel

Supply - Single Deflection - Surface Mount - Steel

Model H4002S-1 - Horizontal Blades

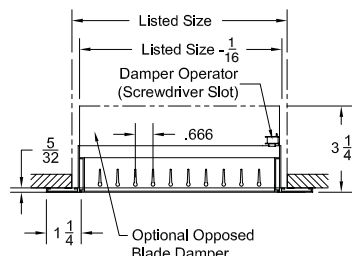
Model V4002S-1 - Vertical Blades



Supply - Single Deflection - Surface Mount - Steel With Opposed Blade Damper

Model H4002SD-1 - Horizontal Blades

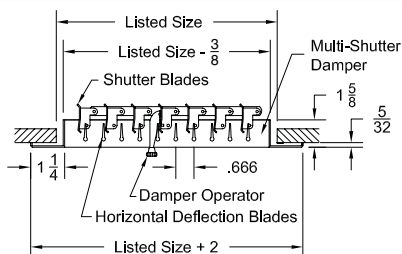
Model V4002SD-1 - Vertical Blades



Supply - Single Deflection - Surface Mount - Steel With Multi Shutter Damper

Model H4002SM-1 - Horizontal Blades

Model V4002SM-1 - Vertical Blades

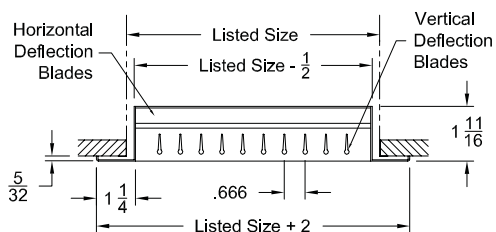


Double Deflection - Steel

Supply - Double Deflection - Surface Mount - Steel

Model H4004S-1 - Horizontal Blades

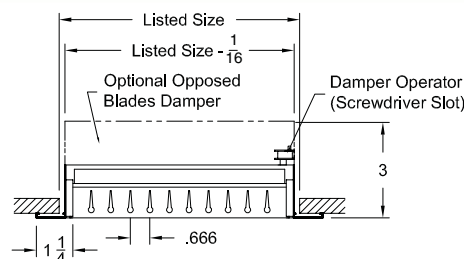
Model V4004S-1 - Vertical Blades



Supply - Double Deflection - Surface Mount - Steel With Opposed Blade Damper

Model H4004SD-1 - Horizontal Blades

Model V4004SD-1 - Vertical Blades



Notes for Models H4002-1, V4002-1, H4004-1, V4004-1, H4002M-1, V4002M-1

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper (for grilles only)208 OBDA - Aluminum - Opposed Blade Damper (for grilles only) .208 L9 - Equalizing Grid208 PF - Plaster Frame209	<ul style="list-style-type: none"> All sizes have steel borders and blades Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in field Can be ordered to fit standard T-bar grid sizes

Notes for Models H4002S-1, V4002S-1, H4004S-1, V4004S-1, H4002SM-1, V4002SM-1

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper (for grilles only)208 OBDA - Aluminum - Opposed Blade Damper (for grilles only) .208 L9 - Equalizing Grid208 PF - Plaster Frame209	<ul style="list-style-type: none"> All sizes have steel borders and blades Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in field Can be ordered to fit standard T-bar grid sizes



GAR - Grilles and Registers

7/2006

Series 4000 - Performance

Models H4002-1, V4002-1, H4004-1, V4004-1, H4002M-1, V4002M-1,
H4002S-1, V4002S-1, H4004S-1, V4004S-1, H4002SM-1, V4002SM-1

CFM		OUTLET SIZE														NC
		6" x 4"	8" x 4"	10" x 4"	8" x 6"	10" x 6"	12" x 6"	10" x 8"	12" x 8"	18" x 6"	16" x 8"	24" x 6"	20" x 8"	28" x 6"	30" x 6"	
50	Velocity Ps Throw	300 .011 12-9-7	225 .006 11-8-6													20
100	Velocity Ps Throw	600 .044 20-14-11	450 .025 18-13-10	360 .016 16-12-9	300 .011 15-11-9	240 .007 14-10-8	200 .005 13-10-7									
150	Velocity Ps Throw	900 .099 26-18-14	675 .056 23-17-13	540 .036 22-15-12	450 .025 20-14-11	360 .016 19-13-10	300 .011 18-13-10	270 .009 17-12-9	225 .006 16-11-9	200 .005 15-11-9						
200	Velocity Ps Throw		900 .099 28-20-16	720 .064 26-19-14	600 .044 25-18-14	480 .028 23-16-13	400 .020 22-15-12	360 .016 21-15-11	300 .011 20-14-11	267 .009 19-13-10	225 .006 18-13-10	200 .005 17-12-9				
250	Velocity Ps Throw				750 .069 29-20-16	600 .044 27-19-15	500 .031 25-18-14	450 .025 24-17-13	375 .017 23-16-13	333 .014 22-16-12	281 .010 21-15-11	250 .008 20-14-11	225 .006 19-14-11	214 .006 19-13-10	200 .005 18-13-10	
300	Velocity Ps Throw				900 .099 33-23-18	720 .064 30-21-17	600 .044 28-20-16	540 .036 27-19-15	450 .025 26-18-14	400 .020 25-18-14	338 .014 23-17-13	300 .011 22-16-12	270 .009 22-15-12	257 .008 22-15-12	240 .007 21-15-11	
400	Velocity Ps Throw						800 .079 35-25-19	720 .064 33-24-18	600 .044 31-22-17	533 .035 33-23-18	450 .025 28-20-16	400 .020 27-19-15	360 .016 26-19-14	343 .014 26-18-14	320 .013 25-18-14	
500	Velocity Ps Throw							750 .069 37-26-20	667 .055 35-25-19	563 .039 33-23-18	500 .031 32-23-17	450 .025 31-22-17	429 .023 30-21-17	400 .020 29-21-16		
600	Velocity Ps Throw							900 .099 41-29-23	800 .079 40-28-22	675 .056 38-27-21	600 .044 36-26-20	540 .036 35-25-19	514 .032 34-24-19	480 .028 33-24-18		
700	Velocity Ps Throw									787 .076 42-30-23	700 .060 40-28-22	630 .049 39-27-21	600 .044 38-27-21	560 .038 36-26-20		
	NC	30 - 35									20 - 25					

CFM		OUTLET SIZE													
		30" x 8"	16" x 16"	24" x 12"	30" x 10"	18" x 18"	28" x 12"	20" x 18"	24" x 16"	40" x 10"	30" x 14"	36" x 12"	24" x 20"	42" x 12"	48" x 12"
350	Velocity Ps Throw	210 .005 21-15-12													
400	Velocity Ps Throw	240 .007 23-16-13	225 .006 22-16-12	200 .005 22-15-12											
450	Velocity Ps Throw	270 .009 25-18-14	253 .008 24-17-13	225 .006 23-17-13	216 .006 23-16-13	200 .005 22-16-12									
500	Velocity Ps Throw	300 .011 27-19-15	281 .010 26-19-14	250 .008 25-18-14	240 .007 25-18-14	222 .006 24-17-13	214 .006 24-17-13	200 .005 23-17-13							
600	Velocity Ps Throw	360 .016 30-21-17	338 .014 30-21-16	300 .011 28-20-16	288 .010 28-20-15	267 .009 27-19-15	257 .008 27-19-15	240 .007 26-19-14	225 .006 26-18-14	216 .006 25-18-14	206 .005 25-18-14	200 .005 25-18-14			
650	Velocity Ps Throw	390 .019 32-23-18	366 .016 31-22-17	325 .013 30-21-16	312 .012 30-21-16	289 .010 29-20-16	279 .010 28-20-16	260 .008 28-20-15	244 .007 27-19-15	234 .007 27-19-15	223 .006 26-19-14	217 .006 26-19-14			
800	Velocity Ps Throw	480 .028 37-26-20	450 .025 36-26-20	400 .020 35-25-19	384 .018 34-24-19	356 .016 33-24-18	343 .014 33-23-18	320 .013 32-23-18	300 .011 31-22-17	288 .010 31-22-17	274 .009 30-22-17	267 .009 30-21-17	240 .007 29-21-16	229 .006 29-20-16	200 .005 27-19-15
1000	Velocity Ps Throw	600 .044 43-31-24	563 .039 42-30-23	500 .031 40-29-22	480 .028 40-28-22	444 .024 39-28-21	429 .023 38-27-21	400 .020 37-27-21	375 .017 37-26-20	360 .016 36-26-20	343 .014 35-25-19	333 .014 35-25-19	300 .011 34-24-19	286 .010 33-24-18	250 .008 32-23-17
1200	Velocity Ps Throw	720 .064 49-35-27	675 .056 48-34-26	600 .044 46-33-25	576 .041 45-32-25	533 .035 44-31-24	514 .032 43-31-24	480 .028 42-30-23	450 .025 41-29-23	432 .023 41-29-22	411 .021 40-29-22	400 .020 40-28-22	360 .016 38-27-21	343 .014 38-27-21	300 .011 36-26-20
1400	Velocity Ps Throw	840 .087 54-39-30	787 .076 53-38-29	700 .060 51-36-28	672 .055 50-36-28	662 .047 49-35-27	600 .044 48-34-27	560 .038 47-34-26	525 .038 46-32-25	504 .031 45-32-25	480 .028 44-31-24	467 .027 44-31-24	420 .022 43-30-24	400 .020 42-30-23	350 .015 38-27-21
	NC	30 - 35											20		

For Series 4000 performance notes, see page GAR-39

GAR - Grilles and Registers

Series 4000 - Performance

Models H4002-1, V4002-1, H4004-1, V4004-1, H4002M-1, V4002M-1,
H4002S-1, V4002S-1, H4004S-1, V4004S-1, H4002SM-1, V4002SM-1

CFM	OUTLET SIZE														
		42" x 16"	30" x 24"	48" x 16"	36" x 24"	30" x 30"	48" x 20"	44" x 24"	36" x 30"	48" x 24"	36" x 30"	48" x 26"	40" x 32"	36" x 36"	48" x 30"
1000	Velocity Ps Throw	214 .006 30-21-17	200 .005 29-21-16												
1200	Velocity Ps Throw	257 .008 34-24-19	240 .007 33-24-18	225 .006 33-23-18	200 .005 31-22-17										
1400	Velocity Ps Throw	300 .011 38-27-21	280 .010 37-26-20	263 .008 36-26-20	233 .007 35-25-19	224 .006 34-24-19	210 .005 34-24-18								
1600	Velocity Ps Throw	343 .014 42-30-23	320 .013 41-29-22	300 .011 40-28-22	267 .009 38-27-21	256 .008 38-27-21	240 .007 37-26-20	218 .006 36-25-20	213 .006 35-25-19	200 .005 35-25-19	213 .006 35-25-19				
1800	Velocity Ps Throw	386 .018 45-32-26	360 .016 44-31-24	338 .014 43-31-24	300 .011 41-29-23	288 .010 41-29-22	270 .009 40-28-22	245 .007 39-27-21	240 .007 38-27-21	225 .006 38-27-21	240 .007 38-27-21	208 .005 37-26-20	203 .005 26-26-20	200 .005 36-26-20	
2000	Velocity Ps Throw	429 .023 49-35-27	400 .020 48-34-26	375 .017 46-33-26	333 .014 45-32-25	320 .013 44-31-24	300 .011 43-31-24	273 .009 42-30-23	267 .009 41-29-23	250 .008 40-29-22	267 .009 41-29-23	231 .007 39-28-22	225 .006 39-28-21	222 .006 39-28-21	200 .005 37-27-21
2200	Velocity Ps Throw	471 .027 52-37-29	440 .024 51-36-28	413 .021 50-35-27	367 .016 48-34-26	352 .015 47-33-26	330 .013 46-33-25	300 .011 44-32-24	293 .011 44-31-24	275 .009 43-31-24	293 .011 44-31-24	254 .008 42-30-23	248 .008 42-30-23	244 .007 41-29-23	220 .006 40-28-22
2400	Velocity Ps Throw	514 .032 55-39-30	480 .028 54-38-30	450 .025 53-37-29	400 .020 51-36-28	384 .018 50-35-27	360 .016 49-35-27	327 .013 47-34-26	320 .013 47-33-26	300 .011 46-33-25	320 .013 47-33-26	277 .009 45-32-25	270 .009 44-31-24	267 .009 44-31-24	240 .007 42-30-23
2600	Velocity Ps Throw	557 .038 58-41-32	520 .033 57-40-31	488 .029 56-40-31	433 .023 53-38-29	416 .021 53-37-29	390 .019 52-37-28	355 .015 50-35-27	347 .015 50-35-27	325 .013 48-34-27	347 .015 50-35-27	300 .011 47-33-26	292 .010 49-33-26	289 .010 47-33-26	260 .008 45-32-25
2800	Velocity Ps Throw	600 .044 61-44-34	560 .038 60-43-33	525 .034 59-42-32	467 .027 56-40-31	448 .025 55-39-31	420 .022 54-39-30	382 .018 53-37-29	373 .017 52-37-29	350 .015 51-36-28	373 .017 52-37-29	323 .013 50-35-27	315 .012 49-35-27	311 .012 49-35-27	280 .010 47-34-26
3000	Velocity Ps Throw	643 .051 64-46-35	600 .044 63-45-35	563 .039 61-44-34	500 .031 59-42-32	480 .028 58-41-32	450 .025 57-40-31	409 .021 55-39-30	400 .020 55-39-30	375 .017 53-38-29	400 .020 55-39-30	346 .015 52-37-29	338 .014 52-37-28	333 .014 51-36-28	300 .011 50-35-27
3400	Velocity Ps Throw	729 .065 70-50-38	680 .057 68-48-38	637 .050 67-47-37	567 .039 64-46-35	544 .036 63-45-35	510 .032 62-44-34	464 .026 60-43-33	453 .025 60-42-33	425 .022 58-41-32	453 .025 60-42-33	392 .019 57-40-31	383 .018 56-40-31	378 .018 56-40-31	340 .014 54-38-30
3800	Velocity Ps Throw	814 .081 75-53-41	760 .071 74-52-40	712 .062 72-51-40	633 .049 69-49-38	608 .045 68-48-38	570 .040 67-47-37	518 .033 65-46-36	507 .031 64-46-35	475 .028 63-45-35	507 .031 64-46-35	438 .024 61-43-34	428 .022 61-43-33	422 .022 60-43-33	380 .018 58-41-32
4200	Velocity Ps Throw	900 .099 80-57-44	840 .087 79-56-43	787 .076 77-55-42	700 .060 77-55-42	672 .055 73-52-40	630 .049 71-51-39	573 .040 69-49-38	560 .038 69-49-38	525 .034 67-48-37	560 .038 69-49-38	485 .029 65-46-36	472 .027 65-46-36	467 .027 65-46-36	420 .022 60-43-33
	NC	25 - 30			20 - 25										

Performance Notes for Series 4000

All data are tested are accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic feet per minute (air)
- fpm - Velocity of air stream in feet per minute
- Ps - Static pressure = Pt - Pv (inches of water column)
- Throw - Non-isothermal horizontal throw (supply air temperature 20°F colder than average room air temperature) values are for 50 fpm - 100 fpm - 150 fpm velocities
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands



Series 4000 - Specifications

Supply - Single Deflection Supply Grilles and Registers – Aluminum/Model 4002

Air Outlets shall be model V4002 (vertical front blades) or H4002 (horizontal front blades) manufactured by METALAIR®. Units shall be single deflection supply grilles of aluminum construction and with an extruded aluminum border and a single set of deflection blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be designed for surface mounting applications and be provided with screw holes on the face of the device.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.

Supply - Double Deflection Supply Grilles and Registers – Aluminum/Model 4004

Air Outlets shall be model V4004S (vertical front blades) or H4004S (horizontal front blades) manufactured by METALAIR®. Units shall be double deflection supply grilles of aluminum construction and with an extruded border with a front and rear sets of deflection blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with screw holes on the face for surface mounting. The units shall be the size and quantity as outlined in the plans and specifications.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.

Supply - Single Deflection with Multi Shutter Damper - Supply Grilles and Registers – Aluminum/Model 4002M

Air Outlets shall be model V4002M (vertical front blades) or H4002M (horizontal front blades) manufactured by METALAIR®. Units shall be single deflection supply grilles with a face operated multi-shutter damper. Units shall be of aluminum construction and with an extruded aluminum border and a single set of deflection blades.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with screw holes on the face for surface mounting.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

The units shall be the size and quantity as outlined in the plans and specifications.

Supply - Single Deflection Supply Grilles and Registers – Steel/Model 4002S

Air Outlets shall be model V4002S (vertical front blades) or H4002S (horizontal front blades) manufactured by METALAIR®. Units shall be single deflection supply grilles of steel construction and with a steel border and a single set of deflection blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be designed for surface mounting applications and be provided with screw holes on the face of the device.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.

Supply - Double Deflection Supply Grilles and Registers – Steel/Model 4004S

Air Outlets shall be model V4004 (vertical front blades) or H4004 (horizontal front blades) manufactured by METALAIR®. Units shall be double deflection supply grilles of steel construction and with a steel border with a front and rear sets of deflection blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with screw holes on the face for surface mounting.

The units shall be the size and quantity as outlined in the plans and specifications.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.



GAR - Grilles and Registers

Supply - Single Deflection with Multi Shutter Damper - Supply Grilles and Registers –Steel/Model 4002SM

Air Outlets shall be model V4002M (vertical front blades) or H4002M (horizontal front blades) manufactured by METALAIR®. Units shall be single deflection supply grilles with a face operated multi-shutter damper. Units shall be of steel construction and with an steel border and a single set of deflection blades.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with screw holes on the face for surface mounting.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

The units shall be the size and quantity as outlined in the plans and specifications.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaline cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series 4000 - Model Specification Guide

Supply - Sidewall

Series 4000 - Aluminum

Series 4000S - Steel

Model	Available Neck	Available Finishes	Available Options	
Aluminum	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
V4002-1 - Single Deflection - Vertical Blades		01 - White	OBDA	Opposed Blade Damper - Aluminum
H4002-1 - Single Deflection - Horizontal Blades		Optional	L9	Equalizing Grid
V4004-1 - Double Deflection - Vertical Front Blades		02 - Aluminum	PF	Plaster Frame
H4004-1 - Double Deflection - Horizontal Front Blades		03 - Black		
		24 - Mill		
		28 - Custom Color		
Steel				
V4002S-1 - Single Deflection - Vertical Blades				
H4002S-1 - Single Deflection - Horizontal Blades				
V4004S-1 - Double Deflection - Vertical Front Blades				
H4004S-1 - Double Deflection - Horizontal Front Blades				

Supply - Sidewall

Series 4000 - Single Deflection Register with Multi-Shutter Damper

Model	Available Neck	Available Finishes	Available Options	
Aluminum	6" thru 48"	Standard	L9	Equalizing Grid
V4002M-1 - Single Deflection - Vertical Blades (With multi-shutter Damper)		01 - White	PF	Plaster Frame
H4002M-1 - Single Deflection - Horizontal Blades (With multi-shutter Damper)		Optional		
		02 - Aluminum		
		03 - Black		
		24 - Mill		
		28 - Custom Color		
Steel				
V4002SM-1 - Single Deflection - Vertical Blades (With multi-shutter Damper)				
H4002SM-1 - Single Deflection - Horizontal Blades (With multi-shutter Damper)				



GAR - Grilles and Registers

7/2006

- Supply Grilles ➤ Series 4000-AF ➤ Aluminum Border/Extruded Aluminum Blades
- Series 4000S-AF ➤ Steel Border/Extruded Aluminum Blades

Product Details

- ★ The series 4000-AF is our premier product, offering superior construction and high performance with aerodynamically shaped extruded deflection blades. The 4000-AF series is constructed with an extruded aluminum border and air foil deflection blades; the 4000S-AF series has a steel border and extruded aluminum air foil deflection blades
- ★ The series 4000-AF is an excellent choice for projects requiring superior performance and aesthetics
- ★ The series 4000-AF is available with single or double deflection, and with a number of options and accessories to meet a variety of applications
- ★ Series 4000-AF grilles and registers can be selected with either vertical or horizontal front blades



Model 4000-AF-1 Shown

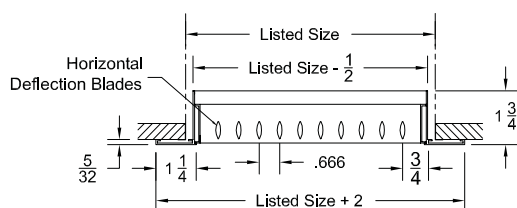
Standard Finish: 01 White

Single Deflection ➤ Aluminum Blades & Border

Sideview, dimensions are in inches

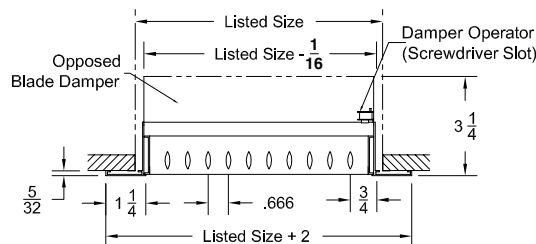
Supply - Single Deflection Grille - Surface Mount
Aluminum Border/Extruded Aluminum Blades

Model H4002-AF-1 - Horizontal Blades
Model V4002-AF-1 - Vertical Blades



Supply - Single Deflection Register - Surface Mount
Aluminum Border/Extruded Aluminum Blades - w/ Opposed Blade Damper

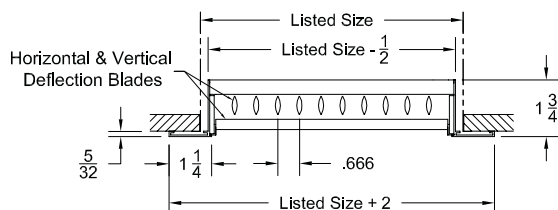
Model H4002D-AF-1 - Horizontal Blades
Model V4002D-AF-1 - Vertical Blades



Double Deflection ➤ Aluminum Blades & Border

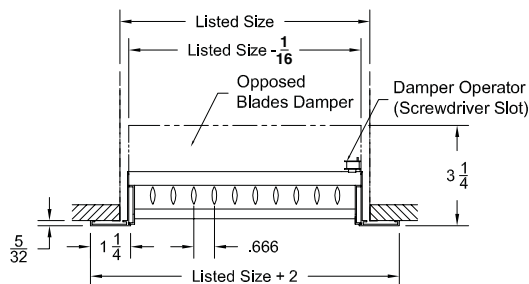
Supply - Double Deflection Grille - Surface Mount
Aluminum Border/Extruded Aluminum Blades

Model H4004-AF-1 - Horizontal Blades
Model V4004-AF-1 - Vertical Blades



Supply - Double Deflection Register - Surface Mount
Aluminum Border/Extruded Aluminum Blades - w/ Opposed Blade Damper

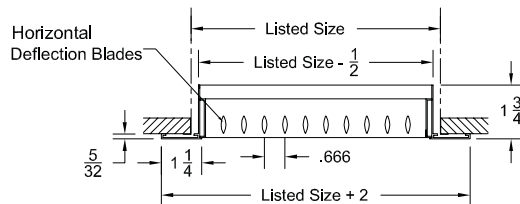
Model H4004D-AF-1 - Horizontal Blades
Model V4004D-AF-1 - Vertical Blades



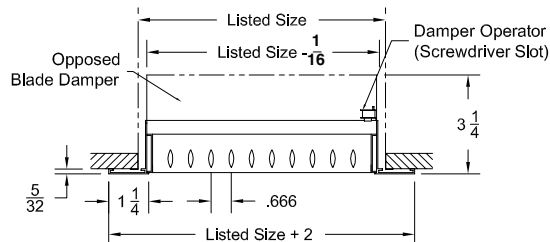
GAR - Grilles and Registers

Single Deflection ➤ Steel Border/Extruded Aluminum Blades

Supply - Single Deflection Grille - Surface Mount
Steel Border/Extruded Aluminum Blades
Model H4002S-AF-1 - *Horizontal Blades*
Model V4002S-AF-1 - *Vertical Blades*

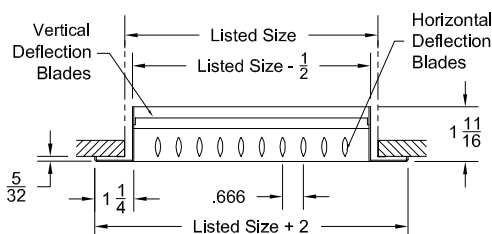


Supply - Single Deflection Register - Surface Mount
Steel Border/Extruded Aluminum Blades - With Opposed Blade Damper
Model H4002SD-AF-1 - *Horizontal Blades*
Model V4002SD-AF-1 - *Vertical Blades*

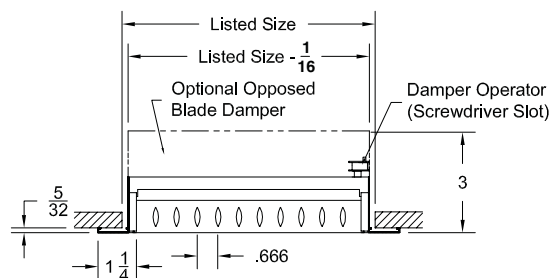


Double Deflection ➤ Steel Border/Extruded Aluminum Blades

Supply - Double Deflection Grille - Surface Mount
Steel Border/Extruded Aluminum Blades
Model H4004S-AF-1 - *Horizontal Blades*
Model V4004S-AF-1 - *Vertical Blades*



Supply - Double Deflection Register - Surface Mount - Aluminum
Steel Border/Extruded Aluminum Blades - With Opposed Blade Damper
Model H4004SD-AF-1 - *Horizontal Blades*
Model V4004SD-AF-1 - *Vertical Blades*



Notes for Models H4002-AF-1, V4002-AF, H4002D-AF-1, V4002D-AF-1, H4004-AF-1, V4004-AF, H4004D-AF-1, V4004D-AF-1

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish: 02 Aluminum paint 03 Black 04 Clear Anodized 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper :208 OBDA - Aluminum - Opposed Blade Damper :208 L9 - Equalizing Grid :208 PF - Plaster Frame :209	<ul style="list-style-type: none"> Extruded aluminum border and blades Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in field

Notes for Models H4002S-AF-1, V4002S-AF, H4002SD-AF-1, V4002SD-AF-1, H4004S-AF-1, V4004S-AF, H4004SD-AF-1, V4004SD-AF-1

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish: 02 Aluminum paint 28 Custom color	OBD - Steel - Opposed Blade Damper :208 OBDA - Aluminum - Opposed Blade Damper :208 L9 - Equalizing Grid :208 PF - Plaster Frame :209	<ul style="list-style-type: none"> Extruded aluminum air foil blades and steel border Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in field

GAR - Grilles and Registers

7/2006

Series 4000-AF - Performance

Models H4002-AF-1, V4002-AF-1, H4002D-AF-1, V4002D-AF-1, H4004-AF-1, V4004-AF, H4004D-AF-1, V4004D-AF-1, H4002S-AF-1, V4002S-AF-1, H4002SD-AF-1, V4002SD-AF-1, H4004S-AF-1, V4004S-AF, H4004SD-AF-1, V4004SD-AF-1

CFM		OUTLET SIZE														NC
		6" x 4"	8" x 4"	10" x 4"	8" x 6"	10" x 6"	12" x 6"	10" x 8"	12" x 8"	18" x 6"	16" x 8"	24" x 6"	20" x 8"	28" x 6"	30" x 6"	
50	Velocity Ps Throw	300 .011 12-9-7	225 .006 11-8-6													20
100	Velocity Ps Throw	600 .044 20-14-11	450 .025 18-13-10	360 .016 16-12-9	300 .011 15-11-9	240 .007 14-10-8	200 .005 13-10-7									
150	Velocity Ps Throw	900 .099 26-18-14	675 .056 23-17-13	540 .036 22-15-12	450 .025 20-14-11	360 .016 19-13-10	300 .011 18-13-10	270 .009 17-12-9	225 .006 16-11-9	200 .005 15-11-9						
200	Velocity Ps Throw		900 .099 28-20-16	720 .064 26-19-14	600 .044 25-18-14	480 .028 23-16-13	400 .020 22-15-12	360 .016 21-15-11	300 .011 20-14-11	267 .009 19-13-10	225 .006 18-13-10	200 .005 17-12-9				
250	Velocity Ps Throw				750 .069 29-20-16	600 .044 27-19-15	500 .031 25-18-14	450 .025 24-17-13	375 .017 23-16-13	333 .014 22-16-12	281 .010 21-15-11	250 .008 20-14-11	225 .006 19-14-11	214 .006 19-13-10	200 .005 18-13-10	
300	Velocity Ps Throw				900 .099 33-23-18	720 .064 30-21-17	600 .044 28-20-16	540 .036 27-19-15	450 .025 26-18-14	400 .020 25-18-14	338 .014 23-17-13	300 .011 22-16-12	270 .009 22-15-12	257 .008 22-15-12	240 .007 21-15-11	
400	Velocity Ps Throw						800 .079 35-25-19	720 .064 33-24-18	600 .044 31-22-17	533 .035 33-23-18	450 .025 28-20-16	400 .020 27-19-15	360 .016 26-19-14	343 .014 26-18-14	320 .013 25-18-14	
500	Velocity Ps Throw								750 .069 37-26-20	667 .055 35-25-19	563 .039 33-23-18	500 .031 32-23-17	450 .025 31-22-17	429 .023 30-21-17	400 .020 29-21-16	
600	Velocity Ps Throw								900 .099 41-29-23	800 .079 40-28-22	675 .056 38-27-21	600 .044 36-26-20	540 .036 35-25-19	514 .032 34-24-19	480 .028 33-24-18	
700	Velocity Ps Throw										787 .076 42-30-23	700 .060 40-28-22	630 .049 39-27-21	600 .044 38-27-21	560 .038 36-26-20	
	NC	30 - 35									20 - 25					

CFM	OUTLET SIZE														
		30" x 8"	16" x 16"	24" x 12"	30" x 10"	18" x 18"	28" x 12"	20" x 18"	24" x 16"	40" x 10"	30" x 14"	36" x 12"	24" x 20"	42" x 12"	48" x 12"
350	Velocity Ps Throw	210 .005 21-15-12													
400	Velocity Ps Throw	240 .007 23-16-13	225 .006 22-16-12	200 .005 22-15-12											
450	Velocity Ps Throw	270 .009 25-18-14	253 .008 24-17-13	225 .006 23-17-13	216 .006 23-16-13	200 .005 22-16-12									
500	Velocity Ps Throw	300 .011 27-19-15	281 .010 26-19-14	250 .008 25-18-14	240 .007 25-18-14	222 .006 24-17-13	214 .006 24-17-13	200 .005 23-17-13							
600	Velocity Ps Throw	360 .016 30-21-17	338 .014 30-21-16	300 .011 28-20-16	288 .010 28-20-15	267 .009 27-19-15	257 .008 27-19-15	240 .007 26-19-14	225 .006 26-18-14	216 .006 25-18-14	206 .005 25-18-14	200 .005 25-18-14			
650	Velocity Ps Throw	390 .019 32-23-18	366 .016 31-22-17	325 .013 30-21-16	312 .012 30-21-16	289 .010 29-20-16	279 .010 28-20-16	260 .008 28-20-15	244 .007 27-19-15	234 .007 27-19-15	223 .006 26-19-14	217 .006 26-19-14			
800	Velocity Ps Throw	480 .028 37-26-20	450 .025 36-26-20	400 .020 35-25-19	384 .018 34-24-19	356 .016 33-24-18	343 .014 33-23-18	320 .013 32-23-18	300 .011 31-22-17	288 .010 31-22-17	274 .009 30-22-17	267 .009 30-21-17	240 .007 29-21-16	229 .006 29-20-16	200 .005 27-19-15
1000	Velocity Ps Throw	600 .044 43-31-24	563 .039 42-30-23	500 .031 40-29-22	480 .028 40-28-22	444 .024 39-28-21	429 .023 38-27-21	400 .020 37-27-21	375 .017 37-26-20	360 .016 36-26-20	343 .014 35-25-19	333 .014 35-25-29	300 .011 34-24-19	286 .010 33-24-18	250 .008 32-23-17
1200	Velocity Ps Throw	720 .064 49-35-27	675 .056 48-34-26	600 .044 46-33-25	576 .041 45-32-25	533 .035 44-31-24	514 .032 43-31-24	480 .028 42-30-23	450 .025 41-29-23	432 .023 41-29-22	411 .021 40-29-22	400 .020 40-28-22	360 .016 38-27-21	343 .014 38-27-21	300 .011 36-26-20
1400	Velocity Ps Throw	840 .087 54-39-30	787 .076 53-38-29	700 .060 51-36-28	672 .055 50-36-28	662 .047 49-35-27	600 .044 48-34-27	560 .038 47-34-26	525 .038 47-34-26	504 .031 46-32-25	480 .028 45-32-25	467 .027 44-31-24	420 .022 43-30-24	400 .020 42-30-23	350 .015 38-27-21
	NC	30 - 35	20 - 25									20			

For Series 4000-AF performance notes, see page GAR-45

GAR - Grilles and Registers

Models H4002-AF-1, V4002-AF-1, H4002D-AF-1, V4002D-AF-1, H4004-AF-1, V4004-AF, H4004D-AF-1, V4004D-AF-1, H4002S-AF-1, V4002S-AF-1, H4002SD-AF-1, V4002SD-AF-1, H4004S-AF-1, V4004S-AF, H4004SD-AF-1, V4004SD-AF-1

CFM	OUTLET SIZE														
		42" x 16"	30" x 24"	48" x 16"	36" x 24"	30" x 30"	48" x 20"	44" x 24"	36" x 30"	48" x 24"	36" x 30"	48" x 26"	40" x 32"	36" x 36"	48" x 30"
1000	Velocity Ps Throw	214 .006 30-21-17	200 .005 29-21-16												
1200	Velocity Ps Throw	257 .008 34-24-19	240 .007 33-24-18	225 .006 33-23-18	200 .005 31-22-17										
1400	Velocity Ps Throw	300 .011 38-27-21	280 .010 37-26-20	263 .008 36-26-20	233 .007 35-25-19	224 .006 34-24-19	210 .005 34-24-18								
1600	Velocity Ps Throw	343 .014 42-30-23	320 .013 41-29-22	300 .011 40-28-22	267 .009 38-27-21	256 .008 37-26-20	240 .007 36-25-20	218 .006 35-25-19	213 .006 35-25-19	200 .005 35-25-19	213 .006 35-25-19				
1800	Velocity Ps Throw	386 .018 45-32-26	360 .016 44-31-24	338 .014 43-31-24	300 .011 41-29-23	288 .010 41-29-22	270 .009 40-28-22	245 .007 39-27-21	240 .007 38-27-21	225 .006 38-27-21	240 .007 38-27-21	208 .005 37-26-20	203 .005 26-26-20	200 .005 36-26-20	
2000	Velocity Ps Throw	429 .023 49-35-27	400 .020 48-34-26	375 .017 46-33-26	333 .014 45-32-25	320 .013 44-31-24	300 .011 43-31-24	273 .009 42-30-23	267 .009 41-29-23	250 .008 40-29-22	267 .009 41-29-23	231 .007 39-28-22	225 .006 39-28-21	222 .006 39-28-21	200 .005 37-27-21
2200	Velocity Ps Throw	471 .027 52-37-29	440 .024 51-36-28	413 .021 50-35-27	367 .016 48-34-26	352 .015 47-33-26	330 .013 46-33-25	300 .011 44-32-24	293 .011 43-31-24	275 .009 43-31-24	293 .011 44-31-24	254 .008 42-30-23	248 .008 42-30-23	244 .007 41-29-23	220 .006 40-28-22
2400	Velocity Ps Throw	514 .032 55-39-30	480 .028 54-38-30	450 .025 53-37-29	400 .020 51-36-28	384 .018 50-35-27	360 .016 49-35-27	327 .013 47-34-26	320 .013 47-33-26	300 .011 46-33-25	320 .013 47-33-26	277 .009 45-32-25	270 .009 44-31-24	267 .009 44-31-24	240 .007 42-30-23
2600	Velocity Ps Throw	557 .038 58-41-32	520 .033 57-40-31	488 .029 56-40-31	433 .023 53-38-29	416 .021 53-37-29	390 .019 52-37-28	355 .015 50-35-27	347 .015 50-35-27	325 .013 48-34-27	347 .015 50-35-27	300 .011 47-33-26	292 .010 49-33-26	289 .010 47-33-26	260 .008 45-32-25
2800	Velocity Ps Throw	600 .044 61-44-34	560 .038 60-43-33	525 .034 59-42-32	467 .027 56-40-31	448 .025 55-39-31	420 .022 54-39-30	382 .018 53-37-29	373 .017 52-37-29	350 .015 51-36-28	373 .017 52-37-29	323 .013 50-35-27	315 .012 49-35-27	311 .012 49-35-27	280 .010 47-34-26
3000	Velocity Ps Throw	643 .051 64-46-35	600 .044 63-45-35	563 .039 61-44-34	500 .031 59-42-32	480 .028 58-41-32	450 .025 57-40-31	409 .021 55-39-30	400 .020 55-39-30	375 .017 53-38-29	400 .020 55-39-30	346 .015 52-37-29	338 .014 52-37-28	333 .014 51-36-28	300 .011 50-35-27
3400	Velocity Ps Throw	729 .065 70-50-38	680 .057 68-48-38	637 .050 67-47-37	567 .039 64-46-35	544 .036 63-45-35	510 .032 62-44-34	464 .026 60-43-33	453 .025 60-42-33	425 .022 58-41-32	453 .025 60-42-33	392 .019 57-40-31	383 .018 56-40-31	378 .018 56-40-31	340 .014 54-38-30
3800	Velocity Ps Throw	814 .081 75-53-41	760 .071 74-52-40	712 .062 72-51-40	633 .049 69-49-38	608 .045 68-48-38	570 .040 67-47-37	518 .033 65-46-36	507 .031 64-46-35	475 .028 63-45-35	507 .031 64-46-35	438 .024 61-43-34	428 .022 61-43-33	422 .022 60-43-33	380 .018 58-41-32
4200	Velocity Ps Throw	900 .099 80-57-44	840 .087 79-56-43	787 .076 77-55-42	700 .060 77-55-42	672 .055 73-52-40	630 .049 71-51-39	573 .040 69-49-38	560 .038 69-49-38	525 .034 67-48-37	560 .038 69-49-38	485 .029 65-46-36	472 .027 65-46-36	467 .027 65-46-36	420 .022 60-43-33
NC		25 - 30		20 - 25											<20

Performance Notes for Series 4000-AF

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- fpm - Velocity of air stream in Feet Per Minute
- Ps - Static pressure = Pt - Pv (inches of water column)
- Throw - Non-isothermal horizontal throw (supply air temperature 20°F colder than average room air temperature) values are for 50 fpm - 100 fpm - 150 fpm velocities
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands



Series 4000-AF - Specifications

Supply - Single Deflection Supply Grilles and Registers – Extruded Aluminum - Airfoil Blades/Model 4002-AF

Air Outlets shall be model V4002-AF (vertical front blades) or H4002-AF (horizontal front blades) manufactured by METALAIR®. Units shall be single deflection supply grilles of all extruded aluminum construction with an extruded aluminum border and deflection blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with airfoil shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be designed for surface mounting applications and be provided with screw holes on the face of the device.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.

Supply - Double Deflection Supply Grilles and Registers – Extruded Aluminum - Airfoil Blades/Model 4004-AF

Air Outlets shall be model V4004-AF (vertical front blades) or H4004-AF (horizontal front blades) manufactured by METALAIR®. Units shall be double deflection supply grilles of all extruded aluminum construction and with an extruded border with front and rear sets of deflection blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with screw holes on the face for surface mounting. The units shall be the size and quantity as outlined in the plans and specifications.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.

Supply - Single Deflection Supply Grilles and Registers – Steel Border - Extruded Aluminum Airfoil Blades/Model 4002S-AF

Air Outlets shall be model V4002S-AF (vertical front blades) or H4002S-AF (horizontal front blades) manufactured by METALAIR®. Units shall be single deflection supply grilles of all steel construction. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with airfoil shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.

Supply - Double Deflection Supply Grilles and Registers – Steel Border - Extruded Aluminum Airfoil Blades/Model 4004S-AF

Air Outlets shall be model V4004S-AF (vertical front blades) or H4004S-AF (horizontal front blades) manufactured by METALAIR®. Units shall be double deflection supply grilles of all steel construction. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with screw holes on the face for surface mounting.

The units shall be the size and quantity as outlined in the plans and specifications.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.



GAR - Grilles and Registers

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaline cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series 4000-AF - Model Specification Guide

Supply - Sidewall

Series 4000-AF - Air Foil Blades - Extruded Aluminum

Series 4000S-AF - Air Foil Blades - Steel Border

Model	Available Neck	Available Finishes	Available Options		
Aluminum	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel	
V4002-AF-1 - Single Deflection - Vertical Blades H4002-AF-1 - Single Deflection - Horizontal Blades		01 - White	OBDA	Opposed Blade Damper - Aluminum	
V4004-AF-1 - Double Deflection - Vertical Front Blades H4004-AF-1 - Double Deflection - Horizontal Front Blades		Optional	L9	Equalizing Grid	
		02 - Aluminum	PF	Plaster Frame	
		03 - Black			
		24 - Mill			
		28 - Custom Color			
Steel					
V4002S-AF-1 - Single Deflection - Vertical Blades H4002S-AF-1 - Single Deflection - Horizontal Blades V4004S-AF-1 - Double Deflection - Vertical Front Blades H4004S-AF-1 - Double Deflection - Horizontal Front Blades					



GAR - Grilles and Registers

7/2006

- ➔ Supply Grilles ➔ Series 4004P-1 ➔ Aluminum
- ➔ Series 4004SP-1 ➔ Steel

Product Details

- ★ The model 4004P (aluminum) and 4004SP (galvanized steel) offers superior performance in exposed duct applications offering a clean, low profile appearance
- ★ Front blades are vertical
- ★ Units can be easily installed in round duct diameters 10" to 48"
- ★ Integral gasket seals grille tightly to duct
- ★ Units includes built in extractor to allow accurate balancing and uniform air flow
- ★ Model 4004P is all aluminum construction
Model 4004SP is galvanized steel construction



Model 4004SP-1 Shown

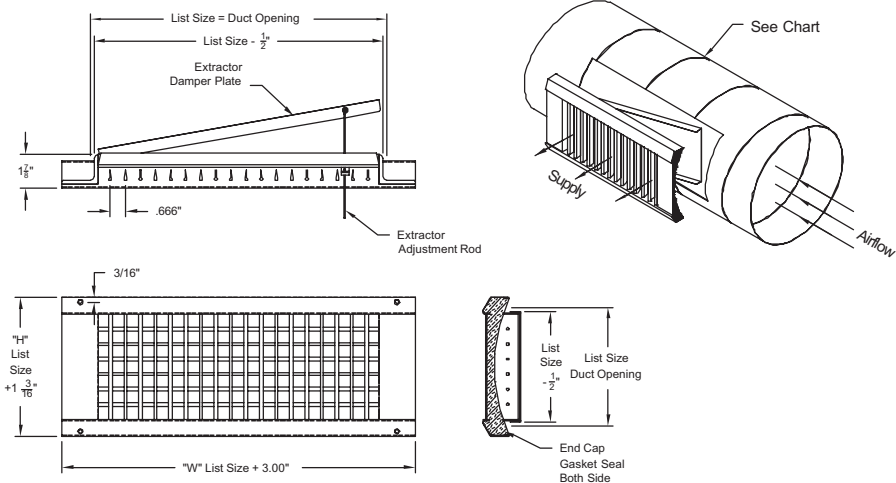
Standard Finish: 24 Mill (galvanized)

Sideview, dimensions are in inches

Supply - Spiral Pipe Grille - Surface Mount

Model 4004P-1 - Aluminum

Model 4004SP-1 - Galvanized Steel



Available in listed sizes only

HEIGHT	WIDTH															
	10"	12"	14"	16"	18"	20"	24"	30"	36"	38"	40"	42"	44"	46"	48"	
	MINIMUM / MAXIMUM DUCT DIAMETER															
3"	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24	6/24
4"	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24	8/24
6"	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24	12/24
8"	-	-	20/36	20/36	20/36	20/36	20/36	20/36	20/36	20/36	20/36	20/36	20/36	20/36	20/36	20/36
10"	-	-	-	-	30/48	30/48	30/48	30/48	30/48	30/48	30/48	30/48	30/48	30/48	30/48	30/48
12"	-	-	-	-	42/48	42/48	42/48	42/48	42/48	42/48	42/48	42/48	42/48	42/48	42/48	42/48

1. Available Finishes

Standard Finish for 4004SP - Steel:
24 Mill finish

Standard Finish for 4004P - Aluminum:
01 White

2. Construction Details

- Units include extractor with wire handle
- Ends are supplied with foam gasket to seal around duct
- Units are surface mount and provided with screws to mount into duct

GAR - Grilles and Registers

Series 4004P - Performance

CFM		10x3	12x3	10x4 14x3	16x3 12x4	18x3 14x4	10x6 20x3	16x4	24x3 12x6 18x4	14x6 20x4	16x6 24x4 30x3	14x8 18x6 36x3	16x8 20x6 30x4	24x6 18x8 36x4
50	Velocity Ps Throw	225 0.006 11-8-6												
100	Velocity Ps Throw	450 0.025 18-13-10	400 0.02 17-13-10	360 0.016 16-12-9	300 0.011 15-11-9	260 0.008 14-10-9	240 0.007 14-10-8	225 0.006 14-10-8	200 0.005 13-10-7					
150	Velocity Ps Throw	675 0.056 23-17-13	600 0.048 22-16-12	540 0.036 22-15-12	450 0.025 20-14-11	400 0.02 19-14-10	360 0.016 19-13-10	340 0.014 19-13-10	300 0.011 18-13-10	270 0.009 17-12-9	225 0.006 16-11-9			
200	Velocity Ps Throw	900 0.099 28-20-16	800 0.082 27-19-15	720 0.064 26-19-14	600 0.044 25-18-14	530 0.035 24-16-13	480 0.028 23-16-13	450 0.025 23-16-12	400 0.02 22-15-12	360 0.016 21-15-11	300 0.011 20-14-11	260 0.008 19-13-10	225 0.006 18-13-10	200 0.005 17-12-9
250	Velocity Ps Throw				750 0.069 29-20-16	660 0.054 28-19-15	600 0.044 27-19-15	565 0.039 27-19-15	500 0.031 25-18-14	450 0.025 24-17-13	375 0.017 23-16-13	330 0.013 22-15-12	281 0.01 21-15-11	250 0.008 20-14-11
300	Velocity Ps Throw				900 0.099 33-23-18	800 0.08 31-21-17	720 0.064 30-21-17	675 0.055 29-21-17	600 0.044 28-20-16	540 0.036 27-19-15	450 0.025 26-18-14	400 0.021 25-18-13	338 0.014 23-17-13	300 0.011 22-16-12
400	Velocity Ps Throw							900 0.091 37-30-22	800 0.079 35-25-19	720 0.064 33-24-18	600 0.044 31-22-17	535 0.036 30-22-18	450 0.025 28-20-16	400 0.02 27-19-15
500	Velocity Ps Throw										750 0.069 37-26-20	665 0.052 36-25-20	563 0.039 33-23-18	500 0.031 32-23-17
600	Velocity Ps Throw											770 0.07 41-29-23	675 0.056 38-27-21	600 0.044 36-26-20
700	Velocity Ps Throw												787 0.076 42-30-23	700 0.06 40-28-22

CFM		16x10 20x8	30x6 18x10	48x4 20x10 24x8	36x6 18x12	20x12 30x8 24x10	48x6 36x8 24x12	30x10	46x8 36x10 30x12	38x10 48x8	36x12	40x12 48x10	48x12
250	Velocity Ps Throw	225 0.006 19-14-11	200 0.005 18-13-10										
300	Velocity Ps Throw	270 0.009 22-15-12	240 0.007 21-15-11	215 0.006 20-15-11	200 0.005 19-14-10								
400	Velocity Ps Throw	360 0.016 26-19-14	320 0.013 25-18-14	288 0.01 24-17-14	265 0.008 23-17-13	240 0.007 23-16-13	200 0.005 22-15-12						
500	Velocity Ps Throw	450 0.025 31-22-17	400 0.02 29-21-16	360 0.017 29-20-16	330 0.014 28-20-15	300 0.011 27-19-15	250 0.008 25-18-14	240 0.007 23-17-13					
600	Velocity Ps Throw	540 0.036 35-25-19	480 0.028 33-24-18	435 0.024 32-23-18	400 0.019 31-22-17	360 0.016 30-21-17	300 0.011 28-20-16	288 0.01 28-20-15	240 0.007 26-19-14	225 0.006 25-17-14	200 0.005 25-18-14		
700	Velocity Ps Throw	630 0.049 39-27-21	560 0.038 36-26-20	500 0.032 36-25-20	460 0.027 35-24-19	420 0.022 34-23-18	350 0.016 33-23-17	335 0.016 33-22-17	280 0.01 29-21-16	265 0.009 26-19-15	235 0.007 27-19-15	210 0.005 27-20-16	
800	Velocity Ps Throw			575 0.037 39-27-22	535 0.034 38-26-21	480 0.028 37-26-20	400 0.02 35-25-19	384 0.018 34-24-19	320 0.013 32-23-18	300 0.011 29-21-16	267 0.009 30-21-17	240 0.008 28-20-17	200 0.005 27-19-15
1000	Velocity Ps Throw				660 0.05 45-34-27	600 0.044 43-31-24	500 0.031 40-29-22	480 0.028 40-28-22	400 0.02 37-27-21	375 0.017 34-23-18	333 0.014 35-25-19	300 0.012 33-24-18	250 0.008 32-23-17
1200	Velocity Ps Throw					720 0.064 49-35-27	600 0.044 46-33-25	576 0.041 45-32-25	480 0.028 42-30-23	450 0.026 39-28-21	411 0.021 40-29-22	360 0.016 38-28-21	300 0.011 36-26-20
1400	Velocity Ps Throw					840 0.087 54-39-30	700 0.06 51-36-28	672 0.055 50-36-28	560 0.038 47-34-26	530 0.032 45-33-26	480 0.028 45-32-25	420 0.022 41-29-23	350 0.015 38-27-21
1600	Velocity Ps Throw									600 0.04 48-34-26	530 0.031 47-34-27	480 0.027 44-31-26	400 0.019 40-29-23
1800	Velocity Ps Throw										600 0.043 49-35-27	540 0.034 44-33-26	450 0.026 42-30-25
2000	Velocity Ps Throw												500 0.032 44-32-27

Performance Notes for Series 4004P

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

CFM - Cubic Feet per Minute (air)

Velocity - Velocity of air stream in Feet Per Minute

Ps - Static pressure = $P_t - P_v$ (inches of water column)

Throw - Non-isothermal horizontal throw (supply air temperature 20°F colder than average room air temperature) values are for 50 fpm - 100 fpm - 150 fpm velocities



Series 4000P - Specifications

Supply - Double Deflection Spiral Pipe Registers

Air Outlets shall be model 4004P (aluminum construction) or 4004SP (galvanized steel construction) direct spiral duct-mounted supply grilles manufactured by METALAIRE. Units shall be double deflection supply grilles with a front and rear sets of deflection blades. The units shall be the size and quantity as outline in the plans and specifications

Units shall include an air extractor mounted on the back of the register. Extractor shall be face operated using an extractor adjustment rod. Grilles shall conform tightly to the duct radius and include a foam gasket around sides and end caps of the unit.

Aerodynamically shaped deflector blades shall be on .666" centers. Deflector blades shall be individually adjustable. Units shall be provided with counter sunk screw holes on the face for surface mounting. Blades shall pivot in polymer friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



GAR - Grilles and Registers

Series 4000P - Model Specification Guide

Spiral Pipe Grille

Series 4004P-1 - Double Deflection - Vertical Front Blades

Model	Available Neck		Available Finishes
Aluminum	10" thru 48"	3" thru 12"	Standard
4004P-1 - Double Deflection - Vertical Front Blades			01 - White
			Optional
			02 - Aluminum
			03 - Black
		24 - Mill	
		28 - Custom Color	

Spiral Pipe Grille

Series 4004SP-1 - Double Deflection - Vertical Front Blades

Model	Available Neck		Available Finishes
Galvanized Steel	10" thru 48"	3" thru 12"	Standard
4004SP-1 - Double Deflection - Vertical Front Blades			01 - Galvanized Steel



Supply Curved Blade Grilles Series L Aluminum

Product Details

- ★ The L series of curved blade grilles and registers is an economic solution to application requiring ceiling or sidewall installations with direction air patterns. The L series is available with 1, 2-way, 2 way opposite, 3 and 4 way directional air patterns
- ★ The L series is constructed from aluminum with adjustable curved blade allowing adjustment from full horizontal to full vertical air directions
- ★ Units are available with a wide range of options and accessories



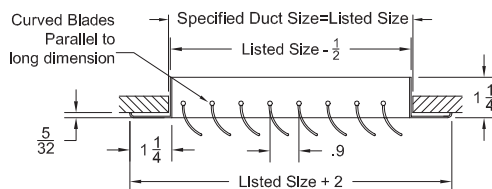
Model LS3-1 Shown

Standard Finish: 01 White

Single Deflection

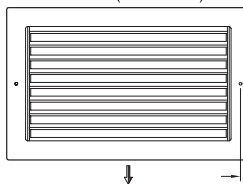
Sideview, dimensions are in inches

Supply - Single Deflection - Surface Mount
One Way - Long Blades
Model L-1

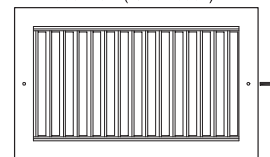


Supply - Single Deflection - Surface Mount
One Way - Short Blades
Model S-1

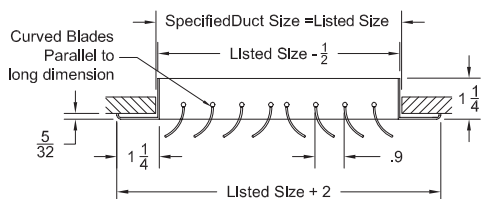
One Way - Long Blades
Face View (L-1 Model)



One Way - Short Blades
Face View (S-1 Model)

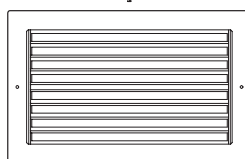


Supply - Single Deflection - Surface Mount
Two Way Opposite - Long Blades
Model LT-1

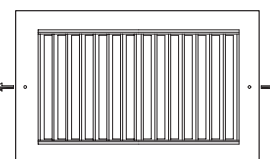


Supply - Single Deflection - Surface Mount
Two Way Opposite - Short Blades
Model ST-1

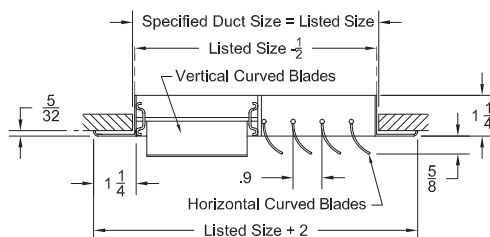
Two Way Opposite - Long Blades
Face View (LT-1 Model)



Two Way Opposite - Short Blades
Face View (ST-1 Model)

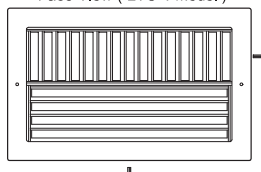


Supply - Single Deflection - Surface Mount
Two Way Corner Blow Pattern - Long Blades
Model LTC-1

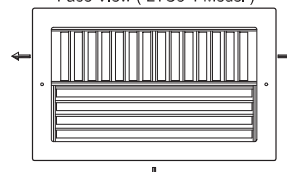


Supply - Single Deflection - Surface Mount
Three Way Corner Blow Pattern - Long Blades
Model LTC3-1

Two Way Corner - Long Blades
Face View (LTC-1 Model)

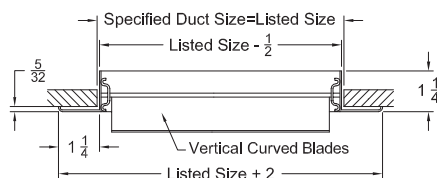


Three Way Corner - Long Blades
Face View (LTC3-1 Model)

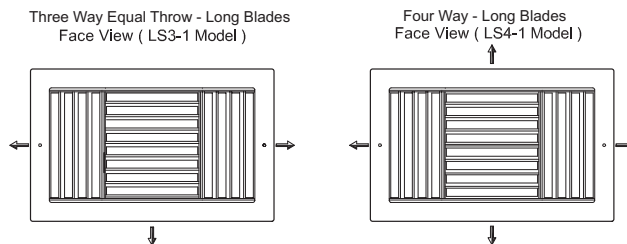


GAR - Grilles and Registers

Supply - Single Deflection - Surface Mount
Three Way Equal Throw Blow Pattern - Long Blades
Model LS3-1

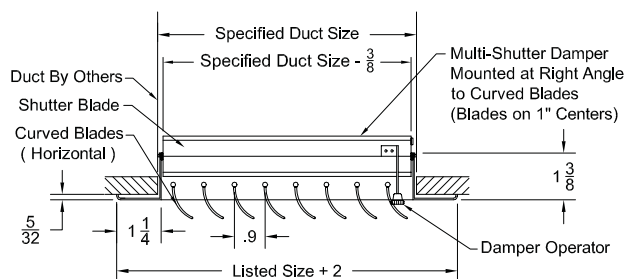


Supply - Single Deflection - Surface Mount
Four Way Blow Pattern - Long Blades
Model LS4-1

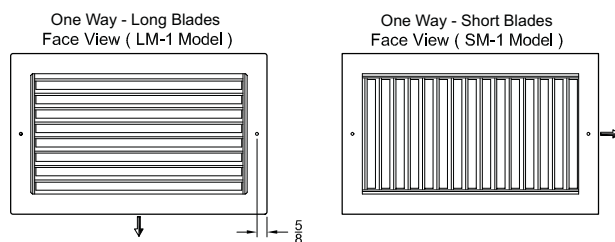


Single Deflection - Multi-Shutter Damper Operated Through Curved

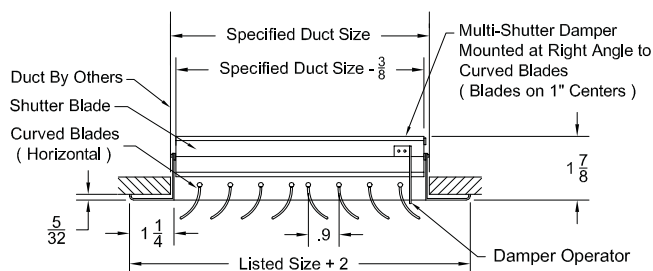
Supply - Single Deflection - Surface Mount
One Way - Long Blades - With Multi Shutter Damper
Model LM-1



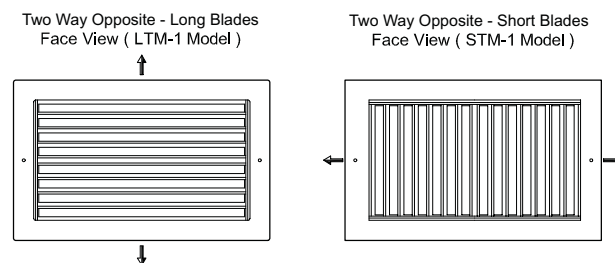
Supply - Single Deflection - Surface Mount
One Way - Short Blades - With Multi Shutter Damper
Model SM-1



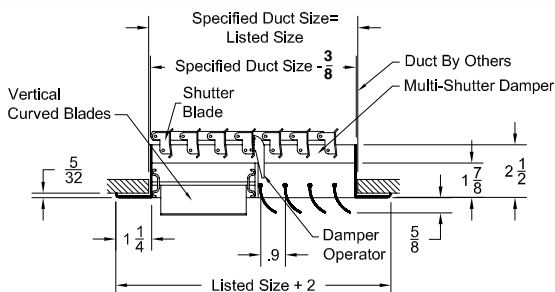
Supply - Single Deflection - Surface Mount
Two Way Opposite - Long Blades - With Multi Shutter Damper
Model LTM-1



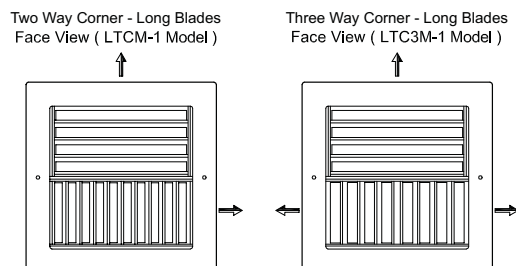
Supply - Single Deflection - Surface Mount
Two Way Opposite - Short Blades - With Multi Shutter Damper
Model STM-1



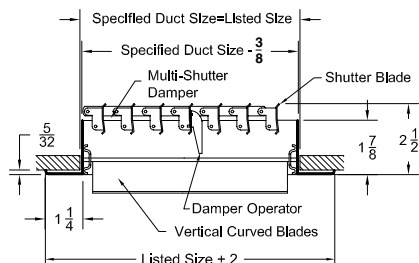
Supply - Single Deflection - Surface Mount
Two Way Corner Blow Pattern - Long Blades - With Multi Shutter Damper
Model LTCM-1



Supply - Single Deflection - Surface Mount
Three Way Corner Blow Pattern - Long Blades - With Multi Shutter Damper
Model LTC3M-1



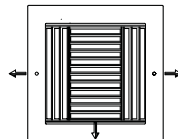
Supply - Single Deflection - Surface Mount
Three Way Equal Throw - Long Blades - With Multi Shutter Damper
Model LS3M-1



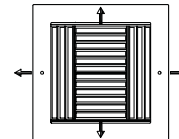
Note: Available In sizes 6 x 6, 8 x 8, 10 x 10, 12 x 12, 14 x 14 Only.

Supply - Single Deflection - Surface Mount
Four Way - Long Blades - With Multi Shutter Damper
Model LS4M-1

Three Way - Long Blades
Face View (LS3M-1 Model)

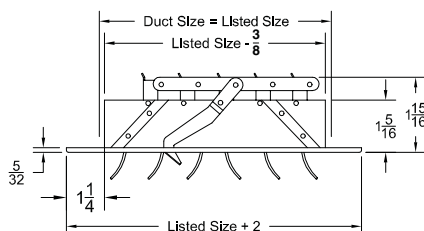


Four Way - Long Blades
Face View (LS4M-1 Model)



Single Deflection - Horizontal Multi-Shutter Damper Operated Through Slot On Border

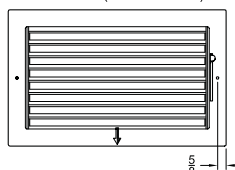
Supply - Single Deflection - Surface Mount - One Way - Long Blades
With Horizontal Multi Shutter Damper - with handles through border
Model LMH-1



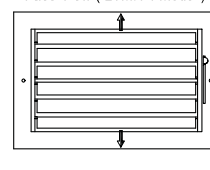
Only Available in Sizes: 6 x 4, 8 x 4, 10 x 4, 12 x 4, 14 x 4, 6 x 6, 8 x 6, 10 x 6, 12 x 6, 14 x 6, 8 x 8, 10 x 8, 12 x 8, 14 x 8, 10 x 10 and 12 x 12

Supply - Single Deflection - Surface Mount
Two Way Opposite - Long Blades - With Horizontal Multi Shutter Damper
Model LTMH-1

One Way - Long Blades
Face View (LMH-1 Model)

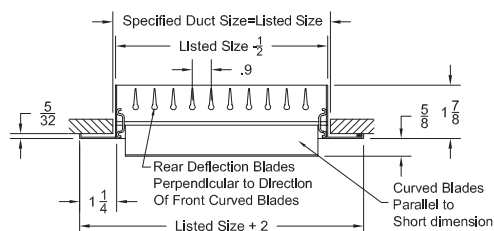


Two Way Opposite - Long Blades
Face View (LTMH-1 Model)



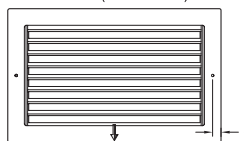
Double Deflection

Supply - Double Deflection - Surface Mount
One Way - Long Blades
Model LV-1

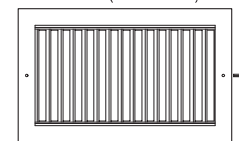


Supply - Double Deflection - Surface Mount
One Way - Short Blades
Model SH-1

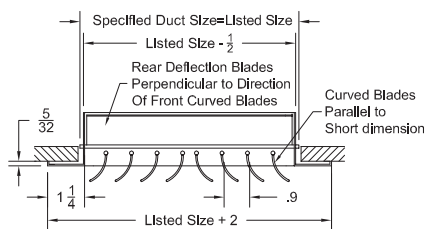
One Way - Long Blades
Face View (LV-1 Model)



One Way - Short Blades
Face View (SH-1 Model)

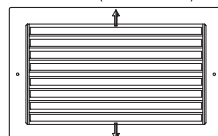


Supply - Double Deflection - Surface Mount
Two Way Opposite - Long Blades
Model LTV-1

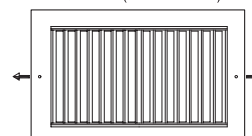


Supply - Double Deflection - Surface Mount
Two Way Opposite - Short Blades
Model STH-1

Two Way Opposite - Long Blades
Face View (LTV-1 Model)



Two Way Opposite - Short Blades
Face View (STH-1 Model)



GAR - Grilles and Registers

Notes for Models L-1, S-1, LT-1, ST-1, LTC-1, LTC3-1, LS3-1, LS4-1, LV-1, SH-1, LTV-1, STH-1

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper208 OBDA - Aluminum - Opposed Blade Damper208 L9 - Equalizing Grid208 PF - Plaster Frame209	<ul style="list-style-type: none"> • Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in field • Can be ordered to fit standard T-bar Lay-in grid sizes • Can be ordered with smaller neck sizes in T-bar panels

Notes for Models LM-1, SM-1, LTM-1, STM-1, LTCM-1, LTC3M-1, LMH-1, LTMH-1, LS3M-1, LS4M-1

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	L9 - Equalizing Grid208 PF - Plaster Frame209	<ul style="list-style-type: none"> • No odd/fractional sizes available • Sizes only as listed

Series L - Performance

Models L-1, S-1, LT-1, ST-1, LTC-1, LTC3-1, LS3-1, LS4-1, LV-1, SH-1, LTV-1, STH-1,
LM-1, SM-1, LTM-1, STM-1, LTCM-1, LTC3M-1, LMH-1, LTMH-1, LS3M-1, LS4M-1

CFM	Ak	OUTLET SIZE												NC
		6" x 6"	8" x 6"	8" x 8"	12" x 6"	10" x 8"	10" x 10"	12" x 10"	12" x 12"	14" x 12"	14" x 14"	18" x 12"	16" x 16"	
		.08	.10	.14	.15	.17	.22	.26	.31	.36	.42	.46	.55	
50	Velocity Ps Throw	645 .055 12-8-7-6	484 .012 11-7-6-5	363 .007 10-7-6-5	323 .005 9-6-5-4	290 .004 9-6-5-4	232 .003 8-6-5-4							20
100	Velocity Ps Throw		968 .049 17-12-10-8	726 .028 15-11-9-7	645 .022 15-10-9-7	581 .018 14-10-8-7	465 .011 13-9-8-6	387 .008 13-9-7-6	323 .005 12-8-7-6	276 .004 11-8-6-5	237 .003 11-7-6-5	215 .002 10-7-6-5		
150	Velocity Ps Throw			1089 .063 20-14-12-10	968 .049 20-14-11-9	871 .040 19-13-11-9	697 .026 17-12-10-8	581 .018 16-12-10-8	484 .012 15-11-9-7	415 .009 15-10-9-7	355 .007 14-10-8-7	323 .005 13-9-8-6	272 .004 13-9-7-6	
200	Velocity Ps Throw					1161 .071 23-16-13-11	929 .046 21-15-12-10	774 .032 20-14-12-9	645 .022 19-13-11-9	553 .016 18-13-10-8	474 .012 17-12-10-8	430 .010 16-11-10-8	363 .007 15-11-9-7	
250	Velocity Ps Throw						1161 .071 25-17-14-12	968 .049 23-16-14-11	806 .034 22-15-13-10	691 .025 21-15-12-10	592 .019 20-14-11-9	538 .015 19-13-11-9	454 .011 18-13-10-8	20 - 25
300	Velocity Ps Throw							1161 .071 26-19-15-12	968 .049 25-17-14-12	829 .036 23-16-14-11	711 .027 22-16-13-11	645 .022 22-15-13-10	544 .016 20-14-12-10	
350	Velocity Ps Throw								1129 .067 28-19-16-13	968 .049 26-18-15-12	829 .036 25-17-14-12	753 .030 24-17-14-11	635 .021 23-16-13-11	
400	Velocity Ps Throw									1106 .065 29-20-17-14	948 .047 27-19-16-13	860 .039 26-18-15-12	726 .028 25-17-14-12	
450	Velocity Ps Throw										1066 .060 29-21-17-14	968 .049 28-20-17-13	817 .035 27-19-16-13	30 - 35
500	Velocity Ps Throw										1185 .074 32-22-18-15	1075 .061 31-22-18-14	907 .043 29-20-17-14	
550	Velocity Ps Throw											1183 .074 33-23-19-15	998 .053 31-22-18-15	
600	Velocity Ps Throw												1089 .063 33-23-19-16	
650	Velocity Ps Throw												1179 .073 35-24-20-16	

For performance notes, see page GAR-57

Grilles and Registers

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GAR - Grilles and Registers

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Series L - Performance

Models L-1, S-1, LT-1, ST-1, LTC-1, LTC3-1, LS3-1, LS4-1, LV-1, SH-1, LTV-1, STH-1, LM-1, SM-1, LTM-1, STM-1, LTCM-1, LTC3M-1, LMH-1, LTMH-1, LS3M-1, LS4M-1

CFM	Ak	OUTLET SIZE											
		24" x 14"	18" x 18"	20" x 20"	22" x 22"	24" x 24"	36" x 24"	30" x 30"	32" x 32"	44" x 24"	48" x 24"	44" x 28"	46" x 30"
		.72	.70	.86	1.04	1.24	1.86	1.94	2.20	2.27	2.48	2.65	2.97
150	Velocity Ps Throw	207 .002 12-8-7-5	215 .002 12-8-7-6										
200	Velocity Ps Throw	276 .004 14-10-8-7	287 .004 14-10-8-7	232 .003 13-9-8-6									
250	Velocity Ps Throw	346 .006 16-12-10-8	358 .007 17-12-10-8	290 .004 15-11-9-7	240 .003 14-10-8-7								
300	Velocity Ps Throw	415 .009 19-13-11-9	430 .010 19-13-11-9	348 .006 17-12-10-8	288 .004 16-12-10-8	242 .003 15-11-9-7							
350	Velocity Ps Throw	484 .012 21-15-12-10	502 .013 21-15-12-10	406 .009 19-14-11-9	336 .006 18-13-11-9	282 .004 17-12-10-8							
400	Velocity Ps Throw	553 .016 23-16-13-11	573 .017 23-16-13-11	465 .011 21-15-12-10	384 .008 20-14-12-9	323 .005 19-13-11-9	215 .002 16-11-10-8	206 .003 16-11-9-8					
500	Velocity Ps Throw	691 .025 26-18-15-12	717 .027 27-19-15-13	581 .018 25-17-14-12	480 .012 23-16-13-11	403 .009 22-15-13-10	269 .004 19-13-11-9	258 .004 19-13-11-9	227 .003 18-13-10-8	220 .003 18-12-10-8	202 .002 17-12-10-8		
600	Velocity Ps Throw	829 .036 30-21-17-14	860 .039 30-21-18-14	697 .026 28-20-16-13	576 .017 26-18-15-12	484 .012 25-17-14-12	323 .005 22-15-13-10	264 .004 20-14-12-10	272 .004 20-14-12-10	264 .004 20-14-12-10	242 .003 20-14-11-9	226 .003 19-13-11-9	202 .002 18-13-11-9
700	Velocity Ps Throw	968 .049 33-23-19-16	1004 .053 34-24-20-16	813 .035 31-22-18-15	672 .024 29-21-17-14	565 .017 28-19-16-13	376 .007 24-17-14-11	308 .005 22-16-13-11	318 .005 23-16-13-11	308 .005 22-16-13-11	282 .004 22-15-13-10	264 .004 21-15-12-10	236 .003 20-14-12-10
800	Velocity Ps Throw	1106 .065 36-26-21-17	1147 .069 37-26-21-17	929 .046 34-24-20-16	768 .031 32-23-19-15	645 .022 30-21-18-14	430 .010 26-18-15-12	413 .009 26-18-15-12	363 .007 25-17-14-12	352 .007 24-17-14-12	323 .005 24-17-14-12	302 .005 23-16-13-11	269 .004 22-16-13-11
900	Velocity Ps Throw			1045 .058 37-26-22-18	864 .039 35-24-20-16	726 .028 33-23-19-16	484 .012 28-20-17-13	396 .008 28-20-16-13	408 .009 27-19-16-13	396 .008 27-19-15-13	363 .007 26-18-15-12	339 .006 25-18-15-12	303 .005 24-17-14-11
	NC	35			30			20 - 25			<20		

Grilles and Registers



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CFM	Ak	OUTLET SIZE												NC
		46" x 30"	46" x 32"	46" x 34"	46" x 36"	46" x 38"	46" x 40"	46" x 42"	46" x 44"	46" x 46"	48" x 44"	48" x 46"	48" x 48"	
		2.97	3.17	3.37	3.56	3.76	3.96	4.16	4.36	4.56	4.55	4.75	4.96	
700	Velocity Ps Throw	236 .003 20-14-12-10	221 .003 20-14-12-9	208 .002 20-14-11-9										
800	Velocity Ps Throw	269 .004 22-16-13-11	252 .003 22-15-13-10	238 .003 21-15-12-10	224 .003 21-15-12-10	213 .002 21-14-12-10	202 .002 20-14-12-10							
1000	Velocity Ps Throw	337 .006 26-18-15-12	316 .005 25-18-15-12	297 .005 25-18-15-12	281 .004 24-17-14-12	266 .004 24-17-14-11	252 .003 24-17-14-11	240 .003 23-16-13-11	230 .003 23-16-13-11	220 .003 22-16-13-11	220 .003 23-16-13-11	210 .002 22-16-13-10	202 .002 22-15-13-10	20
1200	Velocity Ps Throw	404 .009 29-21-17-15	379 .008 29-20-17-14	356 .007 28-20-16-13	337 .006 28-20-16-13	319 .005 27-19-16-13	303 .005 27-19-16-13	289 .004 26-18-15-12	275 .004 26-18-15-12	263 .004 26-18-15-12	264 .004 26-18-15-12	252 .003 25-18-15-12	242 .003 25-17-14-12	
1400	Velocity Ps Throw	471 .012 33-23-19-16	442 .010 32-23-19-15	416 .009 32-22-18-15	393 .008 31-22-18-15	372 .007 30-21-18-14	353 .007 30-21-17-14	337 .006 29-21-17-14	321 .005 29-20-17-14	307 .005 28-20-16-13	308 .005 28-20-16-13	295 .005 28-20-16-13	282 .004 28-19-16-13	
1600	Velocity Ps Throw	539 .015 36-25-21-17	505 .013 35-25-21-17	475 .012 35-24-20-16	449 .011 34-24-20-16	425 .010 33-23-19-16	404 .009 33-23-19-15	385 .008 32-23-19-15	367 .007 32-22-18-15	351 .007 31-22-18-15	352 .007 31-22-18-15	337 .006 31-22-18-15	323 .005 30-21-18-14	
1800	Velocity Ps Throw	606 .019 39-28-23-19	568 .017 38-27-22-18	535 .015 37-26-22-18	505 .013 37-26-21-17	478 .012 36-25-21-17	454 .011 35-25-21-17	433 .010 35-24-20-16	413 .009 34-24-20-16	395 .008 34-24-20-16	396 .008 34-24-20-16	379 .008 33-23-19-16	363 .007 33-23-19-16	
2000	Velocity Ps Throw	673 .024 42-30-24-20	631 .021 41-29-24-19	594 .019 40-28-23-19	561 .017 40-28-23-19	531 .015 39-27-23-18	505 .013 38-27-22-18	481 .012 37-26-22-18	459 .011 37-26-21-17	439 .010 36-26-21-17	440 .010 36-26-21-17	421 .009 36-25-21-17	403 .009 35-25-20-17	20 - 25
2400	Velocity Ps Throw	808 .034 48-33-28-23	757 .030 47-33-27-22	713 .027 46-32-27-22	673 .024 45-31-26-21	638 .021 44-31-26-21	606 .019 43-30-25-20	577 .018 42-30-25-20	551 .016 42-29-24-20	527 .015 41-29-24-19	528 .015 41-29-24-19	505 .013 41-29-24-19	484 .012 40-28-23-19	
2800	Velocity Ps Throw	942 .047 53-37-31-25	884 .041 52-36-30-24	832 .036 51-36-29-24	785 .033 50-35-29-23	744 .029 49-34-28-23	707 .026 48-34-28-23	673 .024 47-33-27-22	643 .022 46-33-27-22	615 .020 46-32-27-22	616 .020 46-32-27-22	589 .018 45-32-26-21	565 .017 44-31-26-21	
3000	Velocity Ps Throw	1010 .054 55-39-32-26	947 .047 54-38-31-26	891 .042 53-37-31-25	842 .037 52-37-30-25	797 .034 51-36-30-24	757 .030 50-35-29-24	721 .027 49-35-29-23	689 .025 48-34-28-23	659 .023 48-34-28-23	660 .023 48-34-28-23	631 .021 47-33-27-22	605 .019 47-33-27-22	
	NC	35 - 40			30 - 35									

GAR - Grilles and Registers

Series L - Performance

Models L-1, S-1, LT-1, ST-1, LTC-1, LTC3-1, LS3-1, LS4-1, LV-1, SH-1, LTV-1, STH-1,
LM-1, SM-1, LTM-1, STM-1, LTCM-1, LTC3M-1, LMH-1, LTMH-1, LS3M-1, LS4M-1

CFM	Ak	OUTLET SIZE												NC
		46" x 30"	46" x 32"	46" x 34"	46" x 36"	46" x 38"	46" x 40"	46" x 42"	46" x 44"	46" x 46"	48" x 44"	48" x 46"	48" x 48"	
		2.97	3.17	3.37	3.56	3.76	3.96	4.16	4.36	4.56	4.55	4.75	4.96	
2000	Velocity Ps Throw	673 .024 42-30-24-20	631 .021 41-29-24-19	594 .019 40-28-23-19	561 .017 40-28-23-19	531 .015 39-27-23-18	505 .013 38-27-22-18	481 .012 37-26-22-18	459 .011 37-26-21-17	439 .010 36-26-21-17	440 .010 36-26-21-17	421 .009 36-25-21-17	403 .009 35-25-20-17	25 - 30
2200	Velocity Ps Throw	741 .029 45-32-26-21	694 .025 44-31-26-21	653 .023 43-30-25-20	617 .020 42-30-25-20	585 .018 41-29-24-20	555 .016 41-29-24-19	529 .015 40-28-23-19	505 .013 39-28-23-19	483 .012 39-27-23-18	484 .012 39-27-23-18	463 .011 38-27-22-18	444 .010 38-26-22-18	
2400	Velocity Ps Throw	808 .034 48-33-28-23	757 .030 47-33-27-22	713 .027 46-32-27-22	673 .024 45-31-26-21	638 .021 44-31-26-21	606 .019 43-30-25-20	577 .018 42-30-25-20	551 .016 42-29-24-20	527 .015 41-29-24-19	528 .015 41-29-24-19	505 .013 41-29-24-19	484 .012 40-28-23-19	
2600	Velocity Ps Throw	875 .040 50-35-29-24	820 .036 49-35-29-23	772 .031 48-34-28-23	729 .028 47-33-27-22	691 .025 46-33-27-22	656 .023 46-32-26-22	625 .021 45-32-26-21	597 .019 44-31-26-21	571 .017 43-31-25-21	572 .017 44-31-25-21	547 .016 43-30-25-20	524 .014 42-30-25-20	
2800	Velocity Ps Throw	942 .047 53-37-31-25	884 .041 52-36-30-24	832 .036 51-36-29-24	785 .033 50-35-29-23	744 .029 49-34-28-23	707 .026 48-34-28-23	673 .024 47-33-27-22	643 .022 46-33-27-22	615 .020 46-32-27-22	616 .020 46-32-27-22	589 .018 45-32-26-21	565 .017 44-31-26-21	
3000	Velocity Ps Throw	1010 .054 55-39-32-26	947 .047 54-38-31-26	891 .042 53-37-31-25	842 .037 52-37-30-25	797 .034 51-36-30-24	757 .030 50-35-29-24	721 .027 49-34-28-23	689 .025 49-34-28-23	659 .023 48-34-28-23	660 .023 48-34-28-23	631 .021 47-33-27-22	605 .019 47-33-27-22	30 - 35
3200	Velocity Ps Throw	1077 .061 58-41-34-27	1010 .054 56-40-33-27	950 .048 55-39-32-26	898 .043 54-38-32-26	850 .038 53-37-31-25	808 .034 52-37-30-25	769 .031 52-36-30-24	734 .028 51-36-30-24	702 .026 50-35-29-24	704 .026 50-35-29-24	673 .024 49-35-29-23	645 .022 49-34-28-23	
3400	Velocity Ps Throw	1144 .069 60-42-35-28	1073 .061 59-41-34-28	1010 .054 58-40-33-27	954 .048 57-40-33-27	904 .043 56-39-32-26	858 .039 55-38-32-26	817 .035 54-38-31-25	780 .032 53-37-31-25	746 .029 52-37-30-25	748 .029 52-37-30-25	715 .027 51-36-30-24	685 .025 51-36-29-24	
3600	Velocity Ps Throw		1136 .068 61-43-35-29	1069 .060 60-42-35-28	1010 .054 59-41-34-28	957 .048 58-41-34-27	909 .044 57-40-33-27	866 .040 56-39-32-26	826 .036 55-39-32-26	790 .033 54-38-31-26	792 .033 54-38-31-26	757 .030 53-38-31-25	726 .028 53-37-31-25	
3800	Velocity Ps Throw		1199 .076 63-44-37-30	1129 .067 62-44-36-29	1066 .060 61-43-35-29	1010 .054 60-42-35-28	959 .049 59-41-34-28	922 .045 58-41-34-27	872 .040 57-40-33-27	834 .037 56-39-33-27	836 .037 56-39-33-27	799 .034 55-39-32-26	766 .031 55-38-32-26	
4000	Velocity Ps Throw			1188 .074 64-45-37-30	1122 .066 63-44-37-30	1063 .060 62-43-36-29	1010 .054 61-43-35-29	962 .049 60-42-35-28	918 .044 59-41-34-28	878 .041 58-41-34-27	880 .041 58-41-34-27	842 .037 57-40-33-27	806 .034 56-40-33-27	35 - 40
4200	Velocity Ps Throw				1178 .073 65-46-38-31	1116 .066 64-45-37-30	1060 .059 63-44-36-30	922 .045 60-42-35-28	964 .049 61-43-35-29	922 .045 60-42-35-28	924 .045 60-42-35-28	884 .041 59-42-34-28	847 .038 58-41-34-28	
4400	Velocity Ps Throw					1169 .072 66-46-38-31	1111 .065 65-45-38-31	1058 .059 64-45-37-30	1010 .054 63-44-36-30	966 .049 62-43-36-29	968 .049 62-43-36-29	926 .045 61-43-35-29	887 .042 60-42-35-28	
4600	Velocity Ps Throw						1161 .071 67-47-39-31	1010 .054 65-46-38-31	1056 .059 64-45-37-31	1010 .054 64-45-37-30	1012 .054 64-45-37-30	968 .049 63-44-36-30	927 .045 62-43-36-29	

Performance Notes for Series L

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic feet per minute (air)
- fpm - Velocity of air stream in feet per minute
- Ps - Static pressure = Pt - Pv (inches of water column)
- Throw - Non-isothermal horizontal throw (supply air temperature 20°F colder than average room air temperature) values are for 50 fpm velocities for 1, 2, 3, and 4-way air patterns
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Grilles and Registers



GAR

Series L - Specifications

Supply - Curved Blade Grilles – Aluminum/Model L – Long Blades/Model S – Short Blades

Air Outlets shall be model L (long blades) or S (short blades) manufactured by METALAIRE®. Units shall be curved blade supply grilles of aluminum construction and with an extruded aluminum border and curved deflection blades.

Rear Deflection Blades (Optional)

Outlets shall include rear deflection blades adjustable from the face (1-way model LV-1 or SV-1 or 2-way model LTV-1 or STH-1).

Units shall be available in 1, 2, 3, or 4 way directional patterns. Pattern shall be adjustable from full horizontal to vertical. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .9" center. Deflector blades shall be individually adjustable. Units shall be designed for surface mounting applications and be provided with screw holes on the face of the device.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Damper Accessories (Optional)

1. Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA). Damper must be operable from the face of the diffuser.
2. An integral multi-shutter damper shall be provided. Damper shall be operated from the face of the diffuser.
3. An integral multi-shutter damper shall be provided (1-way model LMH-1 or 2-way opposite model LTMH-1). Damper handle shall protrude through the border of the grille.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



GAR - Grilles and Registers

Series L - Model Specification Guide

Supply - Curved Blade Grille

Series L - Aluminum

Model	Available Neck	Available Finishes	Available Options	
Single Deflection	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
L-1 - One Way Long Blades		01 - White	OBDA	Opposed Blade Damper - Aluminum
S-1 - One Way Short Blades		Optional	L9	Equalizing Grid
LT-1 - Two Way Long Blades		02 - Aluminum	PF	Plaster Frame
ST-1 - Two Way Short Blades		03 - Black		
LTC-1 - Two Way Corner Blow Pattern		24 - Mill		
LTC3-1 - Three Way Corner Blow Pattern		28 - Custom Color		
LS3-1 - Three Way Blow Pattern				
LS4-1 - Four Way Blow Pattern				
Double Deflection				
LV-1 - One Way Long Blades with Rear Vertical Blades				
SH-1 - One Way Short Blades with Rear Horizontal Blades				
LTV-1 - Two Way Long Blades with Rear Vertical Blades				
STH-1 - Two Way Short Blades with Rear Horizontal Blades				

Supply - Curved Blade Grille- Multi Shutter Damper

Series L - Aluminum

Model	Available Neck	Available Finishes	Available Options	
Single Deflection	6" thru 24"	Standard	L9	Equalizing Grid
LM-1 - One Way Long Blades with Multi-Shutter Damper SM-1 - One Way Short Blades with Multi-Shutter Damper		01 - White	PF	Plaster Frame
LTM-1 - Two Way Long Blades with Multi-Shutter Damper STM-1 - Two Way Short Blades with Multi-Shutter Damper		Optional		
LMH-1 - One Way Long Blades with Horizontal Multi-Shutter Damper LTMH-1 - Two Way Long Blades with Horizontal Multi-Shutter Damper		02 - Aluminum		
LTCM-1 - One Way Corner Blow with Multi-Shutter Damper LTC3M-1 - Three Way Corner Blow with Multi-Shutter Damper		03 - Black		
LS3M-1 - Three Way Blow Pattern with Multi-Shutter Damper LS4M-1 - Four Way Blow Pattern with Multi-Shutter Damper		24 - Mill		
Double Deflection		28 - Custom Color		
LTV-1 - Two Way Long Blades with Rear Vertical Blades STH-1 - Two Way Short Blades with Rear Horizontal Blades				

Supply - Curved Blade Grille- Horizontal Multi-Shutter Damper with Handle Through Border

Series L - Aluminum

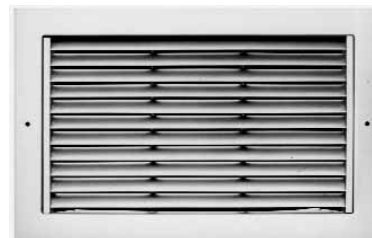
Model	Available Neck	Available Finishes	Available Options	
LMH-1 - One Way Long Blades with Multi-Shutter Damper LTMH-1 - Two Way Opposite Long Blades with Multi-Shutter Damper	6" thru 24"	Standard	L9	Equalizing Grid
		01 - White	PF	Plaster Frame
Optional				
		02 - Aluminum		
		03 - Black		
		24 - Mill		
		28 - Custom Color		



Return and Exhaust Grilles Series RH Aluminum

Product Details

- ★ The RH series of return grilles combine the advantages of corrosion resistant construction and durability with attractive design, solid performance, and competitive pricing
- ★ This economical series of rollformed aluminum return grilles and registers are available in a number of borders to integrate into a wide range of ceiling systems
- ★ The RH is an excellent choice for exhaust and return applications
- ★ See page GAR-63 for performance

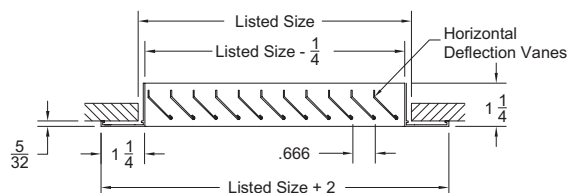


Model RH-1 Shown

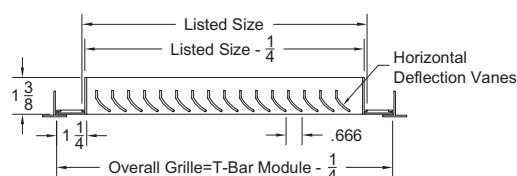
Standard Finish: 01 White

Sideview, dimensions are in inches

Return and Exhaust Grille - Surface Mount Model RH-1



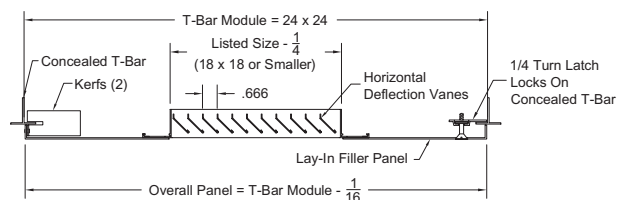
Return and Exhaust Grille - T-bar Lay-in Model RH-6



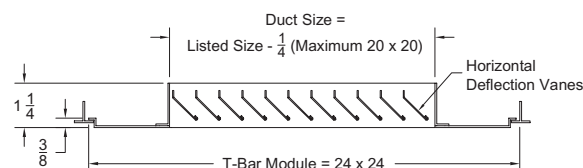
Modules 12 x 12 thru 48 x 48

T-bar Module	12 x 12	24 x 12	24 x 24	48 x 24	36 x 36	48 x 48
Nominal Neck Size	10 x 10	22 x 10	22 x 22	46 x 22	34 x 34	46 x 46

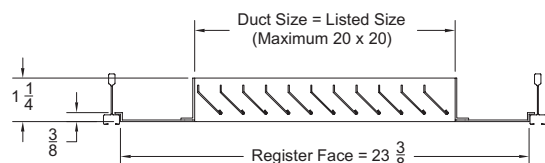
Return and Exhaust Grille - Concealed Spline Model RH-7



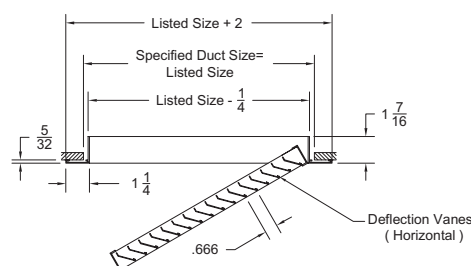
Return and Exhaust Grille - Tegular T-bar Model RH-8



Return and Exhaust Grille - Donn Finline Model RH-9



Return and Exhaust Grille - Surface Mount Hinged Face Model RH-H-1



GAR - Grilles and Registers

➡ Return Grilles ➡ Series RHE ➡ Extruded Aluminum

Product Details

- ★ The series RHE is our premier extruded aluminum product, offering superior construction and high performance. This unit is built for durability
- ★ The series RHE is available with an optional hinge to allow access behind the grille face
- ★ Series RHE is an excellent choice for projects requiring exhaust or return applications
- ★ See page GAR-63 for performance

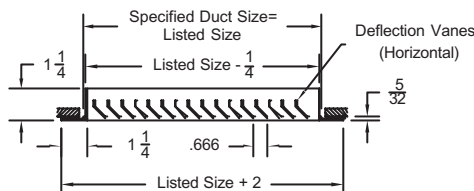


Model RHE-1 Shown

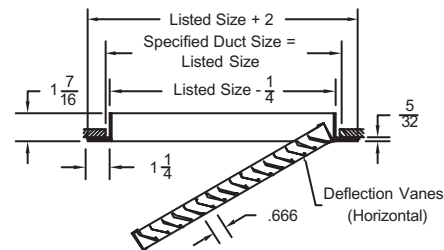
Standard Finish: 01 White

Sideview, dimensions are in inches

Return Grille - Surface Mount Model RHE-1



Return Grille - Surface Mount - Hinged Face Model RHE-H-1



Notes for Models RH (-1, -6, -7, -8, -9), RH-H-1

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper.....208 OBDA - Aluminum - Opposed Blade Damper...208 L9 - Equalizing Grid208 PF - Plaster Frame209	Reverse Sizes (blades parallel to short side) Hinged Core Insect Screen	<ul style="list-style-type: none"> • Odd/fractional sizes are available • Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in field

Notes for Models RHE-1, RHE-H-1

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 04 Clear Anodized 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper.....208 OBDA - Aluminum - Opposed Blade Damper...208 L9 - Equalizing Grid208 PF - Plaster Frame209	Reverse Sizes (blades parallel to short side) Hinged Core Insect Screen	<ul style="list-style-type: none"> • All sizes have extruded aluminum frames and blades • Odd/fractional sizes are available • Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in the field

Return Grilles → Series SRH → Steel

Product Details

- ✱ The series SRH is designed for applications requiring steel construction
- ✱ This economical series of return grilles and registers is available a number of borders to integrate into a wide range of ceiling system
- ✱ Series SRH is an excellent choice for exhaust and return applications

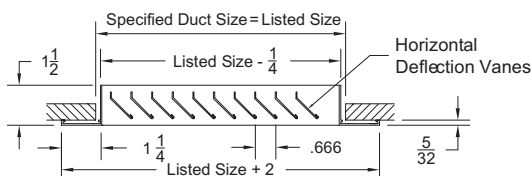


Model SRH-1 Shown

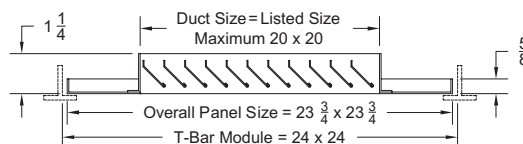
Standard Finish: 01 White

Sideview, dimensions are in inches

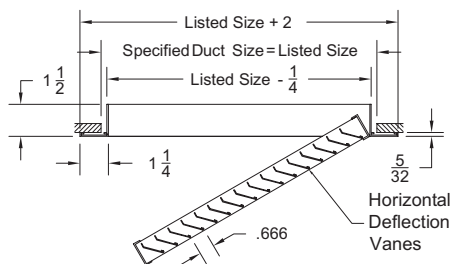
Return Grille - Surface Mount
Model SRH-1



Return Grille - T-bar Lay-in
Model SRH-6



Return Grille - Surface Mount - Hinged Face
Model SRH-H-1



1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 28 Custom color	OBD - Steel - Opposed Blade Damper208 OBDA - Aluminum - Opposed Blade Damper .208 L9 - Equalizing Grid208 PF - Plaster Frame209	Reverse Sizes (blades parallel to short side) Hinged Core Insect Screen	<ul style="list-style-type: none"> • Frame and blades are steel • Odd/fractional sizes are available • Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in the field

GAR - Grilles and Registers

Series RH, SRH & RHE - Performance

Models RH (-1, -6, -7, -8, -9), RH-H-1, RHE-1, RHE-H-1, SRH (-1, -6), SRH-H-1

CFM	Ak	NECK SIZE													
		10" x 6"	12" x 6"	10" x 8"	12" x 8"	18" x 6"	12" x 12"	16" x 12"	18" x 12"	20" x 12"	24" x 12"	18" x 18"	20" x 18"	20" x 20"	24" x 18"
		.40	.47	.53	.63	.71	.95	1.27	1.42	1.58	1.90	2.14	2.37	2.63	2.85
100	Nk Vel Ps	240 .007	200 .005												
150	Nk Vel Ps	360 .016	300 .011	270 .009	225 .006	200 .005									
200	Nk Vel Ps	480 .029	400 .020	360 .016	300 .011	267 .009	200 .005								
250	Nk Vel Ps	600 .046	500 .032	450 .026	375 .018	333 .014	250 .008								
300	Nk Vel Ps	720 .066	600 .046	540 .037	450 .026	400 .020	300 .011	225 .006	200 .005						
350	Nk Vel Ps	840 .089	700 .062	630 .050	525 .035	467 .028	350 .016	263 .009	233 .007	210 .006					
400	Nk Vel Ps		800 .081	720 .066	600 .046	533 .036	400 .020	300 .011	267 .009	240 .007	200 .005				
450	Nk Vel Ps		900 .103	810 .083	675 .058	600 .046	450 .026	338 .014	300 .011	270 .009	225 .006	200 .005			
500	Nk Vel Ps				750 .071	667 .056	500 .032	375 .018	333 .014	300 .011	250 .008	222 .006	200 .005		
550	Nk Vel Ps				825 .086	733 .068	550 .038	413 .022	367 .017	330 .014	275 .010	244 .008	220 .006		
600	Nk Vel Ps				900 .103	800 .081	600 .046	450 .026	400 .020	360 .016	300 .011	267 .009	240 .007	216 .006	200 .005
650	Nk Vel Ps					867 .095	650 .054	488 .030	433 .024	390 .019	325 .013	289 .011	260 .009	234 .007	217 .006
700	Nk Vel Ps						700 .062	525 .035	467 .028	420 .022	350 .016	311 .012	280 .010	252 .008	233 .007
750	Nk Vel Ps						750 .071	563 .040	500 .032	450 .026	375 .018	333 .014	300 .011	270 .009	250 .008
NC		40					35	30				25			

CFM	Ak	NECK SIZE													
		22" x 22"	30" x 18"	24" x 24"	36" x 18"	30" x 24"	36" x 24"	30" x 30"	36" x 30"	48" x 24"	42" x 30"	42" x 36"	48" x 36"	48" x 42"	48" x 48"
		3.19	3.56	3.80	4.27	4.75	5.70	5.94	7.12	7.60	8.31	9.67	11.40	13.30	15.20
700	Nk Vel Ps	208 .005													
800	Nk Vel Ps	238 .007	213 .006	200 .005											
1000	Nk Vel Ps	298 .011	267 .009	250 .008	222 .006	200 .005									
1200	Nk Vel Ps	357 .016	320 .013	300 .011	267 .009	240 .007	200 .005								
1400	Nk Vel Ps	417 .022	373 .017	350 .015	311 .012	280 .010	233 .007	224 .006							
1600	Nk Vel Ps	476 .028	427 .023	400 .020	356 .016	320 .013	267 .009	256 .008	213 .006	200 .005					
2000	Nk Vel Ps	595 .044	533 .036	500 .031	444 .025	400 .020	333 .014	320 .013	267 .009	250 .008	229 .007				
2500	Nk Vel Ps	744 .069	667 .056	625 .049	556 .039	500 .031	417 .022	400 .020	333 .014	313 .012	286 .010	238 .007	208 .005		
3000	Nk Vel Ps	893 .100	800 .080	750 .070	667 .056	600 .045	500 .031	480 .029	400 .020	375 .018	343 .015	286 .010	250 .008	214 .006	
3500	Nk Vel Ps			875 .096	778 .076	700 .061	583 .043	560 .039	467 .027	438 .024	400 .020	333 .014	292 .011	250 .008	219 .006
4000	Nk Vel Ps				889 .099	800 .080	667 .056	640 .051	533 .036	500 .031	457 .026	381 .018	333 .014	286 .010	250 .008
4500	Nk Vel Ps					900 .101	750 .070	720 .065	600 .045	563 .040	514 .033	429 .023	375 .018	321 .013	281 .010
5000	Nk Vel Ps						833 .087	800 .080	667 .056	625 .049	571 .041	476 .028	417 .022	357 .016	313 .012
6000	Nk Vel Ps								800 .080	750 .070	686 .059	571 .041	500 .031	429 .023	375 .018
NC		40					35	30				25			

For performance notes, see page GAR-64



Performance Notes for Series RH, SRH & RHE

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Nk Vel - Neck Velocity of air stream in Feet Per Minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Series RH, SRH & RHE - Specifications

Return Grilles – Aluminum/*Series RH*

- RH-1 - *Surface Mounted*
- RH-6 - *T-bar Lay-in*
- RH-7 - *Concealed Spline*
- RH-8 - *Tegular T-bar*
- RH-9 - *Donn Finline Lay-in*

Air Inlets shall be model RH manufactured by METALAIR®. Units shall be return or exhaust grilles of aluminum construction and with an extruded aluminum border and a single set of fixed deflection blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers set at 45°. Units shall be designed to integrate into the specified ceiling system.

Return Grilles – Extruded Aluminum/*Series RHE*

- RHE-1 - *Surface Mounted*
- RHE-H-1 - *Surface Mounted with hinged face*

Air Inlets shall be model RHE-H manufactured by METALAIR®. Units shall be return or exhaust grilles constructed of heavy extruded aluminum. The units shall be the size and quantity as outlined in the plans and specifications.

Hinged Face (Optional)

Units (model RHE-H) shall include a hinged face allowing access to concealed equipment. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped fixed deflector blades on .666" centers set at 45°. Units shall be designed for surface mounting applications and be provided with screw holes on the face of the device.

Return Grilles – Steel/*Series SRH*

- SRH-1 - *Surface Mounted*
- SRH-6 - *T-bar Lay-in*
- SRH-H-1 - *Surface Mounted – Hinged Face*

Air Inlets shall be model SRH manufactured by METALAIR®. Units shall be return or exhaust grilles constructed of steel with a single set of fixed deflector blades. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers set at 45°. Units shall be designed to integrate into the specified ceiling system.

Hinged Face (Optional)

Units (model SRH-H) shall include a hinged face allowing access to concealed equipment. The units shall be the size and quantity as outlined in the plans and specifications.

The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers set at 45°. Deflector blades shall be fixed. Units shall be designed to integrate into the specified ceiling system.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA). Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.



GAR - Grilles and Registers

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series RH, SRH & RHE - Model Specification Guide

Sidewall Return Grille - Horizontal Blades

Series RH - Aluminum

Series RHE - Extruded Aluminum

Series SRH - Steel

	Model	Available Neck	Available Finishes	Available Options	
Aluminum	RH-1 - Surface Mount RH-H-1 - Surface Mount - Hinged Core	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
			01 - White	OBDA	Opposed Blade Damper - Aluminum
Extruded Aluminum	RHE-1 - Surface Mount RHE-H-1 - Surface Mount - Hinged Core		Optional	L9	Equalizing Grid
			02 - Aluminum	PF	Plaster Frame
Steel	SRH-1 - Surface Mount SRH-H-1 - Surface Mount Hinged Core		03 - Black	IS	Insect Screen
			24 - Mill		
			28 - Custom Color		

Sidewall Return Grille - Horizontal Blades

Series RH - Aluminum

Series SRH - Steel

For T-bar Lay-in Ceiling Grid Applications

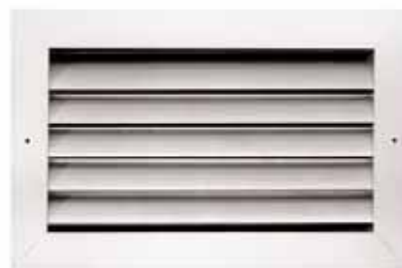
	Model	Available Neck	Module	Available Finishes	Available Options	
Aluminum	RH-6 - T-bar Lay-in Ceilings	6" thru 48"	12" x 12"	Standard	OBD	Opposed Blade Damper - Steel
	RH-7 - Concealed Spline Ceilings		24" x 12"	01 - White	OBDA	Opposed Blade Damper - Aluminum
	RH-8 - Tegular Ceilings		24" x 24"	Optional	L9	Equalizing Grid
	RH-9 - Donn Finline Ceilings		36" x 24"	02 - Aluminum	IS	Insect Screen
Steel	SRH-6 - T-bar Lay-in Ceilings		36" x 36"	03 - Black		
			48" x 24"	24 - Mill		
			48" x 48"	28 - Custom Color		



➔ Heavy Duty Return Grille ➔ Model HDRH ➔ Extruded Aluminum

Product Details

- ✪ The HDRH is an excellent choice for projects that require a grille or register to withstand moderate physical abuse. Applications for the series HDRH include common areas in schools, hospitals, and other high traffic areas
- ✪ The HDRH is made from aluminum material equal or greater than 14 gauge steel. Outer borders are thicker than those of standard commercial grilles and registers. Deflector blades are assembled in the outer border using heavy alloy metal screws for rigidity
- ✪ Model HDRH is an excellent choice for exhaust or return applications in heavy traffic public areas

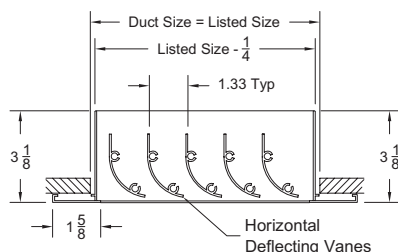


Model HDRH-1 Shown

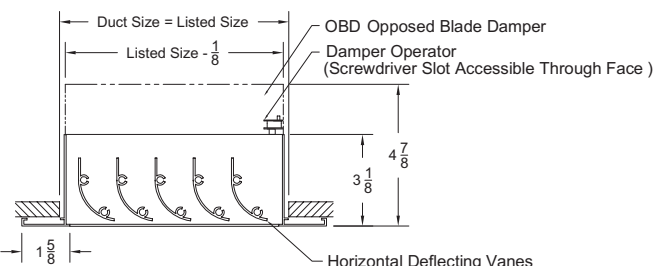
Standard Finish: 01 White

Sideview, dimensions are in inches

Heavy Duty Return Grille - Surface Mount
Model HDRH-1



Heavy Duty Return Grille - Surface Mount
With Opposed Blade Damper
Model HDRHD-1



1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish: 03 Black 04 Clear Anodized	OBD - Steel - Opposed Blade Damper208 OBDA - Aluminum - Opposed Blade Damper ...208 L9 - Equalizing Grid208	Reverse Sizes (blades parallel to short side) Insect Screen	<ul style="list-style-type: none"> Frame and blades are aluminum Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in the field

Model HDRH - Performance

Models HDRH-1, HDRHD-1

CFM	Ak	NECK SIZE													
		12" x 12"	16" x 16"	18" x 18"	20" x 20"	24" x 24"	24" x 30"	32" x 24"	36" x 32"	36" x 36"	36" x 42"	36" x 48"	42" x 42"	42" x 48"	48" x 48"
		.82	1.78	1.85	2.85	3.29	5.76	4.94	6.58	7.40	8.64	9.87	10.08	11.84	13.16
500	Nk Vel Ps	500 .014	281 .004	222 .003											
900	Nk Vel Ps	900 .045	506 .014	400 .009	324 .006	225 .003									
1500	Nk Vel Ps		844 .040	667 .025	540 .016	375 .008	300 .005	281 .004							
2000	Nk Vel Ps			889 .044	720 .029	500 .014	400 .009	375 .008	250 .003	222 .003					
3000	Nk Vel Ps					750 .031	600 .020	563 .018	375 .008	333 .006	286 .005	250 .003	245 .003	214 .003	
4000	Nk Vel Ps						800 .036	750 .031	500 .014	444 .011	381 .008	333 .006	327 .006	286 .005	250 .003
5000	Nk Vel Ps								625 .022	556 .017	476 .013	417 .010	408 .009	357 .007	313 .005
	NC	35								30					25

For performance notes, see page GAR-67

Performance Notes for Model HDRH

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM** - Cubic Feet per Minute (air)
- Nk Vel** - Neck Velocity of air stream in Feet Per Minute
- Ps** - Negative Static pressure (inches of water column)
- NC** - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak** - Area Factors

Model HDRH - Specifications

Return Grilles – Heavy Duty - Extruded Aluminum

Air Inlets shall be model HDRH manufactured by METALAIRES®. Units shall be heavy duty return or exhaust grilles of extruded aluminum construction. Extrusion thickness shall be equal or greater than the equivalent of 14 gauge steel. Units shall be designed to withstand moderate physical abuse. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 5/8" wide with aerodynamically shaped curved blades on 1 1/3" centers. Deflector blades shall be fixed in place heavy alloy metal screws. Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA). Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaline cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Model HDRH - Model Specification Guide

Return - Heavy Duty - Horizontal Blades

Series HDRH - Extruded Aluminum

Model HDRH-1 - 45 Degree Louver Grille Hinged Core

Model	Available Neck	Available Finishes	Available Options	
HDRH-1 - Surface Mount	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 - White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum	PF	Plaster Frame
		03 - Black	IS	Insect Screen
		24 - Mill		
		28 - Custom Color		



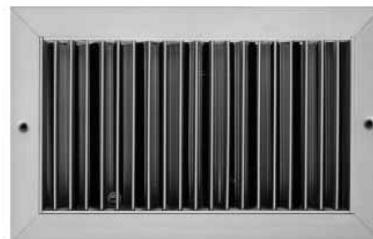
GAR - Grilles and Registers

7/2006

➔ Return Grilles ➔ Series 4002R ➔ Extruded Aluminum ➔ Series 4002RS ➔ Steel

Product Details

- ✱ The series 4002R return grilles and registers are designed to match the 4000 series supply models. These units are constructed of heavy aluminum. The 4002RS is constructed with a heavy steel border and steel deflector blades
- ✱ The deflector blades for series 4002R are fixed and available in 0° or 45°. The deflector blades for series 4002RS are fixed and available in 0° or 40° settings



Model 4002R-1 Shown

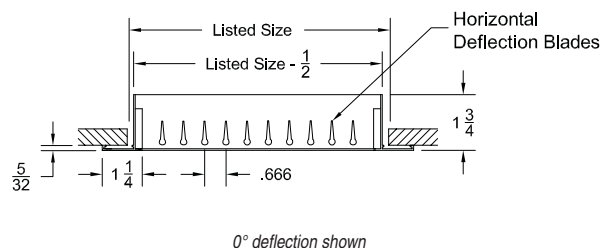
Standard Finish: 01 White

Extruded Aluminum

Sideview, dimensions are in inches

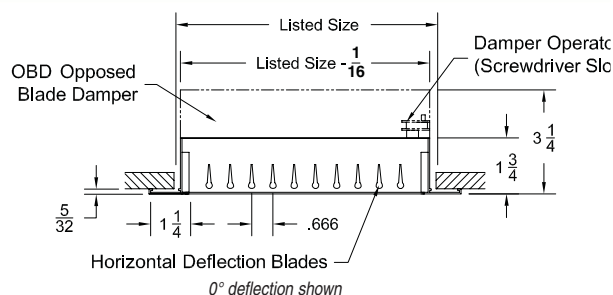
Single Deflection Sidewall Return Grille - Surface Mount Extruded Aluminum

Model V4002R-1
Model H4002R-1



Single Deflection Sidewall Return Register - Surface Mount With Opposed Blade Damper - Extruded Aluminum

Model V4002RD-1
Model H4002RD-1



Grilles and Registers

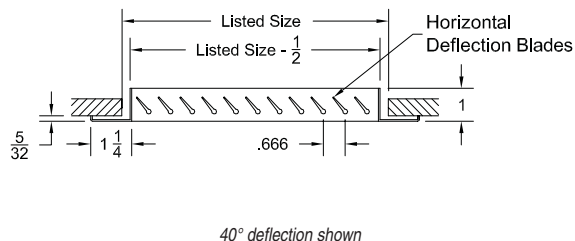


GAR

Steel

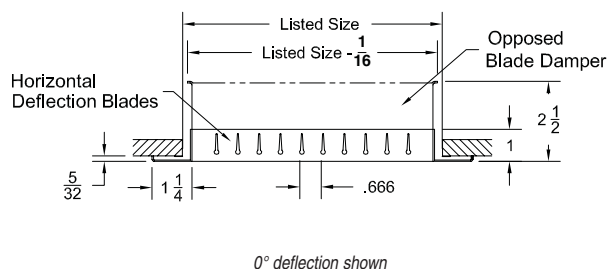
Single Deflection Sidewall Return Grille - Surface Mount - Steel

Model V4002RS-1
Model H4002RS-1



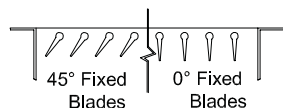
Single Deflection Sidewall Return Register - Surface Mount With Opposed Blade Damper - Extruded Aluminum

Model V4002RSD-1
Model H4002RSD-1



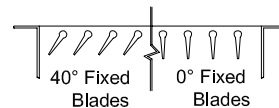
Series 4002R - Aluminum

Deflector Blades Are Available With 0° or 45° Fixed Settings



Series 4002RS - Steel

Deflector Blades Are Available With 0° or 40° Fixed Settings



GAR - Grilles and Registers

Notes for Models H4002R-1, V4002R-1, H4002RD-1, V4002RD-1

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 04 Anodized 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper208 OBDA - Aluminum - Opposed Blade Damper .208 L9 - Equalizing Grid208 PF - Plaster Frame209	Insect Screen	<ul style="list-style-type: none"> • Frame and blades are aluminum • Blades are at either 0° or 45° • Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in the field • Can be ordered to fit standard T-bar grid sizes • Can be ordered with smaller neck sizes in T-bar panels

Notes for Models H4002RS-1, V4002RS-1, H4002RSD-1, V4002RSD-1

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish 03 Black 04 Anodized 28 Custom color	OBD - Steel - Opposed Blade Damper208 OBDA - Aluminum - Opposed Blade Damper .208 L9 - Equalizing Grid208 PF - Plaster Frame209	Insect Screen	<ul style="list-style-type: none"> • Frame and blades are steel • Blades are at either 0° or 40° • Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in the field • Can be ordered to fit standard T-bar grid sizes

Series 4002R - Performance

Models H4002R-1, V4002R-1, H4002RD-1, V4002RD-1, H4002RS-1, V4002RS-1, H4002RSD-1, V4002RSD-1

CFM	Ak	NECK SIZE														NC
		6" x 4"	8" x 4"	10" x 4"	14" x 4"	12" x 6"	14" x 6"	16" x 6"	14" x 8"	18" x 8"	20" x 8"	24" x 8"	26" x 8"	24" x 10"	24" x 12"	
		.16	.22	.27	.38	.49	.58	.66	.77	.99	1.10	1.32	1.43	1.65		
50	Nk Vel Ps	300 .014	225 .008													20
100	Nk Vel Ps	600 .056	450 .031	360 .020	257 .010	200 .006										
150	Nk Vel Ps	900 .126	675 .071	540 .045	386 .023	300 .014	257 .010	225 .008								
200	Nk Vel Ps		900 .126	720 .081	514 .041	400 .025	343 .018	300 .014	257 .010	200 .006						
250	Nk Vel Ps				643 .064	500 .039	429 .029	375 .022	321 .016	250 .010	225 .008					
300	Nk Vel Ps				771 .093	600 .056	514 .041	450 .031	386 .023	300 .014	270 .011	225 .008	208 .007			
350	Nk Vel Ps				900 .126	700 .076	600 .056	525 .043	450 .031	350 .019	315 .015	263 .011	242 .009	210 .007		
400	Nk Vel Ps					800 .100	686 .073	600 .056	514 .041	400 .025	360 .020	300 .014	277 .012	240 .009	200 .006	
450	Nk Vel Ps					900 .126	771 .093	675 .071	579 .052	450 .031	405 .026	338 .018	312 .015	270 .011	225 .008	
500	Nk Vel Ps						857 .114	750 .087	643 .064	500 .039	450 .031	375 .022	346 .019	300 .014	250 .009	25
550	Nk Vel Ps							825 .106	707 .078	550 .047	495 .038	413 .026	381 .023	330 .017	275 .011	
600	Nk Vel Ps							900 .126	771 .093	600 .056	540 .045	450 .031	415 .027	360 .020	300 .013	
650	Nk Vel Ps								836 .109	650 .066	585 .053	488 .037	450 .031	390 .024	325 .016	
700	Nk Vel Ps								900 .126	700 .076	630 .062	525 .043	485 .037	420 .027	350 .018	
	NC	30 - 35										25 - 30				

For performance notes, see page GAR-70



Series 4002R - Performance

Models H4002R-1, V4002R-1, H4002RD-1, V4002RD-1, H4002RS-1, V4002RS-1, H4002RSD-1, V4002RSD-1

CFM	Ak	NECK SIZE														NC
		30" x 10"	28" x 12"	30" x 12"	30" x 14"	34" x 16"	48" x 14"	40" x 18"	48" x 18"	40" x 24"	42" x 24"	48" x 24"	48" x 30"	48" x 36"	48" x 48"	
		2.06	2.31	2.47	2.89	3.74	4.62	4.95	5.94	6.60	6.93	7.92	9.90	11.88	15.84	
500	Nk Vel Ps	240 .009	214 .007	200 .006												20
600	Nk Vel Ps	288 .013	257 .010	240 .009	206 .007											
700	Nk Vel Ps	336 .018	300 .014	280 .012	240 .009											
800	Nk Vel Ps	384 .023	343 .018	320 .016	274 .012	212 .007										
1000	Nk Vel Ps	480 .036	429 .029	400 .025	343 .018	265 .011	214 .007	200 .006								
1200	Nk Vel Ps	576 .052	514 .041	480 .036	411 .026	318 .016	257 .010	240 .009	200 .006							
1400	Nk Vel Ps	672 .070	600 .056	560 .049	480 .036	371 .021	300 .014	280 .012	233 .008	210 .007	200 .006					
1600	Nk Vel Ps	768 .092	686 .073	640 .064	549 .047	424 .028	343 .018	320 .016	267 .011	240 .009	229 .008	200 .006				
2000	Nk Vel Ps		857 .114	800 .100	686 .073	529 .044	429 .029	400 .025	333 .017	300 .014	286 .013	250 .010	200 .006			
2500	Nk Vel Ps				857 .114	662 .068	536 .045	500 .039	417 .027	375 .022	357 .020	313 .015	250 .010	208 .007		
3000	Nk Vel Ps					794 .098	643 .064	600 .056	500 .039	450 .031	429 .029	375 .022	300 .014	250 .010		
3500	Nk Vel Ps						750 .087	700 .076	583 .053	525 .043	500 .039	438 .030	350 .019	292 .013	219 .007	
4000	Nk Vel Ps						857 .114	800 .100	667 .069	600 .056	571 .051	500 .039	400 .025	333 .017	250 .010	
4500	Nk Vel Ps							900 .129	750 .089	675 .072	643 .066	563 .050	450 .032	375 .022	281 .013	
	NC	30 - 35										25 - 30				

Performance Notes for Series 4002R

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic feet per minute (air)
- Nk Vel - Neck Velocity of air stream in feet per minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Series 4002R - Specifications

Return Grilles – Aluminum/Model 4002R

Air Inlets shall be model V40002R (vertical blades) or H4002R (horizontal blades) manufactured by METALAIR®. Units shall be return or exhaust grilles of aluminum construction and with an extruded aluminum border and a single set of deflection blades. Air inlets to be specifically design to match the appearance of the supply units, METALAIR® Series 4000. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers set at 0° (or 45°). Deflector blades shall be fixed. Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Return Grilles – Steel/Model 4002RS

Air Inlets shall be model V40002RS (vertical blades) or H4002RS (horizontal blades) manufactured by METALAIR®. Units shall be return or exhaust grilles of steel construction and with a single set of deflection blades. Air inlets to be specifically design to match the appearance of the supply units, METALAIR® Series 4000. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers set at 0° (or 40°). Deflector blades shall be fixed. Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

GAR - Grilles and Registers

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaline cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series 4002R - Model Specification Guide

Aluminum Sidewall Return - Fixed Blades

Series 4002R - Matches 4000 Supply

Model	Available Neck	Blade Angles	Available Finishes	Available Options	
V4002R-1 - Single Deflection - Vertical Blades H4002R-1 - Single Deflection - Horizontal Blades	6" thru 48"	0° (degrees)	Standard	OBD	Opposed Blade Damper - Steel
		45° (degrees)	01 - White	OBDA	Opposed Blade Damper - Aluminum
			Optional	L9	Equalizing Grid
			02 - Aluminum	PF	Plaster Frame
			03 - Black	IS	Insect Screen
			04 - Anodized		
			24 - Mill		
			28 - Custom Color		

Model	Available Neck	Blade Angles	Available Finishes	Available Options	
V4002RS-1 - Single Deflection - Vertical Blades H4002RS-1 - Single Deflection - Horizontal Blades	6" thru 48"	0° (degrees)	Standard	OBD	Opposed Blade Damper - Steel
		45° (degrees)	01 - White	OBDA	Opposed Blade Damper - Aluminum
			Optional	L9	Equalizing Grid
			02 - Aluminum	PF	Plaster Frame
			03 - Black	IS	Insect Screen
			04 - Anodized		
			28 - Custom Color		



➔ Door Grilles ➔ Series DG ➔ Extruded Aluminum

Product Details

- ★ Series DG door grilles are designed to transfer air through doors or walls. The DG series include "V" shaped louvers providing a sight-proof return or exhaust grille regardless of the viewing angle
- ★ The series DG is available with a number of options include a light-proof option (model DGLP), surface mounting applications, and door mounting (model DGDF)
- ★ Series DG offers a number of solutions for your door and air transfer applications



Model DGCO Shown

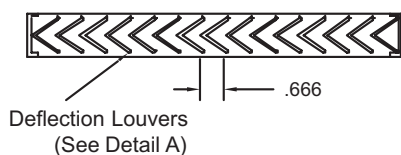


Model DGDF Shown

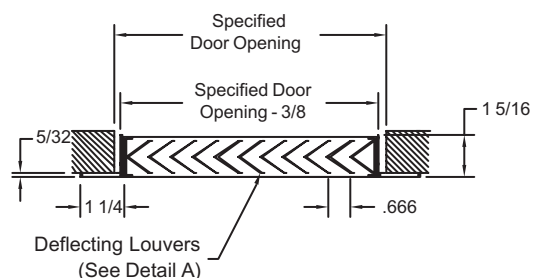
Standard Finish: 01 White

Sideview, dimensions are in inches

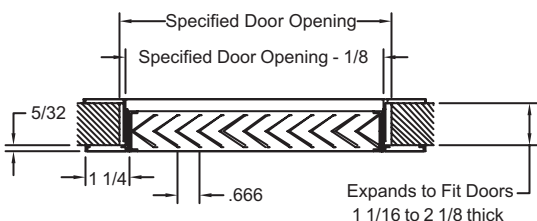
Door Grille - Core Only Model DGCO



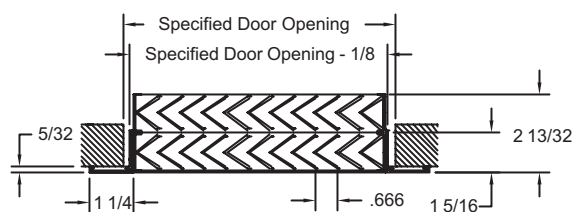
Door Grille - Surface Mount - Single Frame Flange Model DGSF



Door Grille - Surface Mount - Double Flange Frame - Telescoping Model DGDF



Door Grille - Surface Mount - Double Flange Frame - Light Resistant Model DGLP



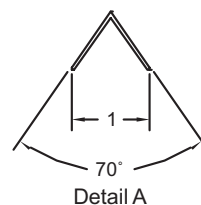
1. Available Finishes

Standard Finish:
01 White
Optional Finish:
02 Aluminum paint
03 Black
04 Clear anodized
24 Mill finish
28 Custom color

2. Construction Details

- Frame and blades are extruded aluminum

Detail A



Series DG - Performance

Models DGCO, DGSF, DGDG, DGLP

CFM	Ak	NECK SIZE													
		12" x 6"	12" x 8"	18" x 6"	12" x 10"	12" x 12"	18" x 10"	20" x 10"	18" x 12"	24" x 10"	24" x 12"	30" x 12"	24" x 16"	36" x 12"	30" x 16"
		.49	.66	.74	.82	.99	1.24	1.37	1.48	1.65	1.98	2.47	2.64	2.97	3.30
100	Nk Vel Ps	200 .024													
150	Nk Vel Ps	300 .055	225 .031	200 .024											
200	Nk Vel Ps	400 .097	300 .055	267 .043	240 .035	200 .024									
250	Nk Vel Ps	500 .152	375 .085	333 .067	300 .055	250 .038	200 .024								
300	Nk Vel Ps	600 .219	450 .123	400 .097	360 .079	300 .055	240 .035	216 .028	200 .024						
350	Nk Vel Ps	700 .298	525 .167	467 .132	420 .107	350 .074	280 .048	252 .039	233 .033	210 .027					
400	Nk Vel Ps	800 .389	600 .219	533 .173	480 .140	400 .097	320 .062	288 .050	267 .043	240 .035	200 .024				
450	Nk Vel Ps	900 .492	675 .277	600 .219	540 .177	450 .123	360 .079	324 .064	300 .055	270 .044	225 .031				
500	Nk Vel Ps		750 .342	667 .270	600 .219	500 .152	400 .097	360 .079	333 .067	300 .055	250 .038	200 .024			
550	Nk Vel Ps		825 .413	733 .327	660 .264	550 .184	440 .118	396 .095	367 .082	330 .066	275 .046	220 .029	206 .026		
600	Nk Vel Ps		900 .492	800 .389	720 .315	600 .219	480 .140	432 .113	400 .097	360 .079	300 .055	240 .035	225 .031	200 .024	
650	Nk Vel Ps			867 .456	780 .369	650 .257	520 .164	468 .133	433 .114	390 .092	325 .064	260 .041	244 .036	217 .029	
700	Nk Vel Ps				840 .428	700 .298	560 .190	504 .154	467 .132	420 .107	350 .074	280 .048	263 .042	233 .033	225 .031
750	Nk Vel Ps				900 .492	750 .342	600 .219	540 .177	500 .152	450 .123	375 .085	300 .055	281 .048	250 .038	210 .027
	NC	45				40	35				30	25			

Performance Notes for Series DG

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Nk Vel - Neck Velocity of air stream in Feet Per Minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors



Series DG - Specifications

Door Grille - Core Only - Extruded Aluminum/Model DGCO

Air Inlets shall be series DGCO manufactured by METALAIR®. Units shall be return or exhaust grilles designed to transfer air through doors or walls. Units shall be of extruded aluminum construction and with an extruded aluminum border and a single set of 1" inverted "V" louvers. The units shall be the size and quantity as outlined in the plans and specifications.

Inlets shall have a narrow border providing a recessed appearance when installed. Louvers shall be on .666" centers set at 70° and overlapped to provide a vision proof effect.

Deflector blades shall be fixed. Units shall be designed to integrate into a wall or door application.

Door Grille - Surface Mount - Single Frame Flange - Extruded Aluminum/Model DGSF

Air Inlets shall be series DGSF manufactured by METALAIR®. Units shall be return or exhaust grilles designed to transfer air through doors or walls. Units shall be of extruded aluminum construction and with an extruded aluminum border and a single set of 1" inverted "V" louvers. The units shall be the size and quantity as outlined in the plans and specifications.

Inlets shall have a single 1 1/4" border with screw holes for surface mounting. Units to provide a finished appearance on one side of the door. Louvers shall be on .666" centers set at 70° and overlapped to provide a vision proof effect.

Deflector blades shall be fixed. Units shall be designed to integrate into a wall or door application.

Door Grille - Surface Mount - Double Frame Flange - Telescoping - Extruded Aluminum/Model DGDF

Air Inlets shall be series DGDF manufactured by METALAIR®. Units shall be return or exhaust grilles designed to transfer air through doors or walls. Units shall be of extruded aluminum construction and with an extruded aluminum border and a single set of 1" inverted "V" louvers. The units shall be the size and quantity as outlined in the plans and specifications.

Inlets shall have a single 1 1/4" border and a telescoping rear frame to fit varying door thickness providing a finished appearance on both sides of the door or wall. Units shall include screw holes for surface mounting. Louvers shall be on .666" centers set at 70° and overlapped to provide a vision proof effect.

Deflector blades shall be fixed. Units shall be designed to integrate into a wall or door application.

Door Grille - Surface Mount - Double Frame Flange - Light Resistant - Extruded Aluminum/Model DGLP

Air Inlets shall be series DGLP manufactured by METALAIR®. Units shall be return or exhaust grilles designed to transfer air through doors or walls. Units shall be of extruded aluminum construction and with an extruded aluminum border and a two sets of 1" inverted "V" louvers. The units shall be the size and quantity as outlined in the plans and specifications.

Inlets shall have a single 1 1/4" border with screw holes for surface mounting. Units to provide a finished appearance on one side of the door. Louvers shall be on .666" centers set at 70° and overlapped to provide a minimum light transmission.

Deflector blades shall be fixed. Units shall be designed to integrate into a wall or door application.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss - 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



Series DG - Model Specification Guide

Door/Transfer - Door Grilles
Series DG - Extruded Aluminum

Model	Available Neck	Available Finishes
DGC0 - Core Only DGSF - Single Flange DGDF - Double Flange DGLP - Double Core - Double Flange	6" thru 48"	Standard
		01 - White
		Optional
		02 - Aluminum
		03 - Black
		04 - Clear Anodized
		24 - Mill
		28 - Custom Color



➔ Sidewall Grille ➔ Series 4500 ➔ Steel

Product Details

- ★ The series 4500 is a heavy duty return gym grille. This unit is designed for applications such as gymnasiums and public areas. The border and deflection blades are heavy gauge steel and built to withstand moderate physical abuse
- ★ The series 4500 is available with 0° deflection or for more sight-proof application, 38° deflection (model 4538-1)
- ★ Series 4500 is an excellent choice for return or exhaust applications in high traffic applications where extra protection for the grille is required



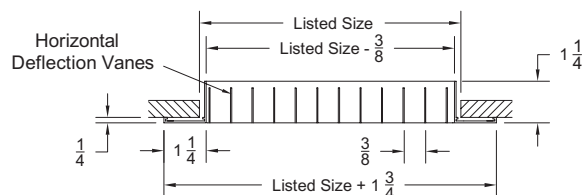
Model 4500-1 Shown

Standard Finish: 01 White

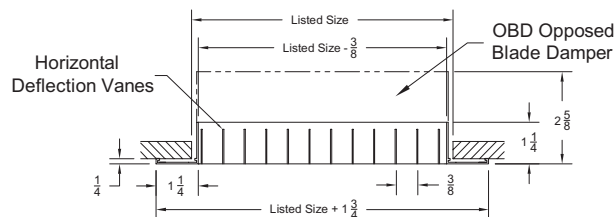
0° Deflection

Sideview, dimensions are in inches

Return - Heavy Duty Steel Gym Grille - Surface Mount
0° Deflection
Model 4500-1

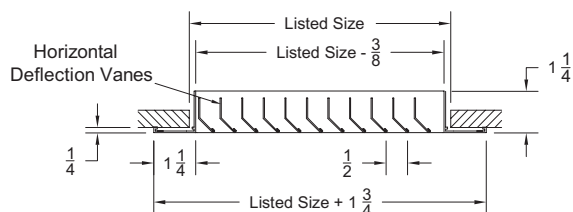


Return - Heavy Duty Steel Gym Register - Surface Mount
0° Deflection - With Opposed Blade Damper
Model 4500D-1

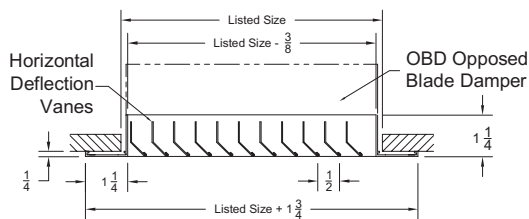


38° Deflection

Return - Heavy Duty Steel Gym Grille - Surface Mount
38° Deflection
Model 4538-1



Return - Heavy Duty Steel Gym Register - Surface Mount
38° Deflection - With Opposed Blade Damper
Model 4538D-1



1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish: 03 Black 24 Mill 28 Custom color	OBD - Steel - Opposed Blade Damper..... 204 OBDA - Aluminum - Opposed Blade Damper... 204 L9 - Equalizing Grid 204 PF - Plaster Frame 205	Reverse Sizes (blades parallel to short side) Insect Screen	<ul style="list-style-type: none"> • Frames and blades are steel • Blades are fixed at either 0° or 38° • Oversized units can be ordered in multiple sections, each with full flanges. Mullion strips provided for joining units in the field

GAR - Grilles and Registers

Series 4500 - 0° Performance

Models 4500-1, 4500D-1

Nominal Duct Size	L	W	Nominal Core Area	Core Velocity		200	300	400	500	600	700	800	900	1000	1200	1400	1600
				Negative Static Pressure		0.005	0.012	0.022	0.034	0.049	0.067	0.087	0.110	0.136	0.196	0.267	0.348
6"	6"	0.21		Volume (CFM)	42	63	84	105	126	147	168	189	210	252	294	336	
				NC	-	-	-	-	-	20	22	27	28	32	35	38	
8"	6"	0.29		Volume (CFM)	57	86	115	143	172	201	229	258	286	344	401	458	
				NC	-	-	-	-	-	21	23	28	29	33	36	39	
8"	8"	0.39		Volume (CFM)	78	117	156	195	234	273	313	352	391	469	547	625	
				NC	-	-	-	-	-	26	25	30	31	35	38	41	
12"	6"	0.44		Volume (CFM)	88	132	176	220	264	307	351	395	439	527	615	703	
				NC	-	-	-	-	-	23	25	30	31	35	38	73	
12"	8"	0.60		Volume (CFM)	120	180	240	299	359	419	479	539	599	719	839	958	
				NC	-	-	-	-	21	25	27	32	33	37	40	43	
12"	10"	0.76		Volume (CFM)	152	228	303	379	455	531	607	683	759	910	1062	1214	
				NC	-	-	-	-	22	26	28	33	34	38	41	44	
12"	12"	0.92		Volume (CFM)	184	276	367	459	551	643	735	827	918	1102	1286	1469	
				NC	-	-	-	-	22	26	28	33	34	38	41	44	
14"	12"	1.08		Volume (CFM)	216	323	431	539	647	755	863	970	1078	1294	1509	1725	
				NC	-	-	-	20	23	27	29	34	35	39	42	45	
14"	14"	1.27		Volume (CFM)	253	380	506	633	759	886	1013	1139	1139	252	294	336	
				NC	-	-	-	21	24	28	30	35	36	40	43	46	
18"	18"	2.13		Volume (CFM)	425	638	851	1063	1276	1489	1701	1914	2127	2552	2977	3403	
				NC	-	-	21	23	26	30	32	37	38	42	45	48	
24"	12"	1.88		Volume (CFM)	375	563	751	938	1126	1314	1501	1689	1877	2252	2627	3003	
				NC	-	-	20	22	25	29	31	36	37	41	44	47	
24"	18"	2.86		Volume (CFM)	571	857	1142	1428	1714	1999	2285	2570	2856	3427	3998	4569	
				NC	-	-	22	24	27	31	33	38	39	43	46	49	
24"	24"	3.84		Volume (CFM)	767	1151	1534	1918	2301	2685	3068	3452	3835	4602	5369	6136	
				NC	-	21	24	26	29	33	35	40	41	45	48	51	
30"	20"	3.99		Volume (CFM)	799	1198	1598	1997	2397	2797	3196	3595	3995	4794	5593	6392	
				NC	-	21	24	26	29	33	35	40	41	45	48	51	
30"	24"	4.81		Volume (CFM)	963	1444	1926	2407	2889	3370	3851	4333	4814	5777	6740	7703	
				NC	-	22	25	27	30	34	36	41	42	46	49	52	
36"	22"	5.30		Volume (CFM)	1060	1590	2120	2650	3180	3710	4240	4770	5300	6360	7420	8481	
				NC	-	22	25	27	30	34	36	41	42	46	49	52	
36"	24"	5.79		Volume (CFM)	1159	1738	2317	2897	3476	4055	4635	5214	5793	6952	8111	9269	
				NC	-	22	25	27	30	34	36	41	42	46	49	52	
42"	22"	6.20		Volume (CFM)	1239	1859	2478	3098	3718	4337	4957	5577	6196	7435	8675	9914	
				NC	20	23	26	28	31	35	37	42	43	47	50	53	
42"	26"	7.35		Volume (CFM)	1470	2205	2940	3674	4409	5144	5879	6614	7349	8819	10289	11758	
				NC	20	23	26	28	31	35	37	42	43	47	50	55	
48"	24"	7.75		Volume (CFM)	1550	2326	3101	3876	4651	5426	6201	6977	7752	9302	10852	12403	
				NC	21	24	27	29	32	36	38	43	44	48	51	54	
48"	30"	9.73		Volume (CFM)	1946	2919	3892	4865	5839	6812	7785	8758	9731	11677	13623	15569	
				NC	22	25	28	30	33	37	39	44	45	49	52	55	
48"	36"	11.71		Volume (CFM)	2342	3513	4684	5855	7026	8197	9368	10539	11710	14052	16394	18736	
				NC	22	25	28	30	33	37	39	44	45	49	52	55	
48"	40"	13.03		Volume (CFM)	2606	3909	5212	6515	7818	9121	10424	11727	13030	15635	18241	20847	
				NC	23	26	29	31	34	38	40	45	46	50	53	56	
48"	48"	15.67		Volume (CFM)	3134	4701	6267	7834	9401	10968	12535	14102	15668	18802	21936	25069	
				NC	24	27	30	32	35	39	41	46	47	51	54	57	



GAR - Grilles and Registers

7/2006

Series 4500 - 38° Performance

Models 4538-1, 4538D-1

Nominal Duct Size		Nominal Core Area	Core Velocity	200	300	400	500	600	700	800	900	1000	1200	1400	1600
L	W		Negative Static Pressure	0.005	0.012	0.022	0.034	0.049	0.067	0.087	0.110	0.136	0.196	0.267	0.348
6"	6"	0.21	Volume (CFM) NC	42 -	63 -	84 -	105 -	126 -	147 23	168 27	189 32	210 37	252 48	294 58	336 70
8"	6"	0.29	Volume (CFM) NC	57 -	86 -	115 -	143 -	172 -	201 24	229 28	258 33	286 38	344 49	401 59	458 71
8"	8"	0.39	Volume (CFM) NC	78 -	117 -	156 -	195 -	234 21	273 26	313 30	352 35	391 40	469 51	547 61	625 73
12"	6"	0.44	Volume (CFM) NC	88 -	132 -	176 -	220 -	264 21	307 26	351 30	395 35	439 40	527 51	615 61	703 73
12"	8"	0.60	Volume (CFM) NC	120 -	180 -	240 -	299 -	359 23	419 28	479 28	539 37	599 42	719 53	839 63	958 75
12"	10"	0.76	Volume (CFM) NC	152 -	228 -	303 -	379 20	455 24	531 29	607 33	683 38	759 43	910 54	1062 64	1214 76
12"	12"	0.92	Volume (CFM) NC	184 -	276 -	367 -	459 20	551 24	643 29	735 33	827 38	918 43	1102 54	1286 64	1469 76
14"	12"	1.08	Volume (CFM) NC	216 -	323 -	431 -	539 21	647 25	755 30	863 34	970 39	1078 44	1294 55	1509 65	1725 77
14"	14"	1.27	Volume (CFM) NC	253 -	380 -	506 -	633 22	759 26	886 31	1013 35	1139 40	1139 40	252 48	294 58	336 70
18"	18"	2.13	Volume (CFM) NC	425 -	638 -	851 20	1063 24	1276 28	1489 33	1701 37	1914 42	2127 47	2552 58	2977 68	3403 80
24"	12"	1.88	Volume (CFM) NC	375 -	563 -	751 19	938 23	1126 27	1314 32	1501 36	1689 41	1877 46	2252 57	2627 67	3003 79
24"	18"	2.86	Volume (CFM) NC	571 -	857 -	1142 21	1428 25	1714 29	1999 34	2285 38	2570 43	2856 48	3427 59	3998 69	4569 81
24"	24"	3.84	Volume (CFM) NC	767 -	1151 20	1534 23	1918 27	2301 31	2685 36	3068 40	3452 45	3835 50	4602 61	5369 71	6136 83
30"	20"	3.99	Volume (CFM) NC	799 -	1198 20	1598 23	1997 27	2397 31	2797 36	3196 41	3595 45	3995 50	4794 61	5593 71	6392 83
30"	24"	4.81	Volume (CFM) NC	963 -	1444 21	1926 24	2407 28	2889 32	3370 37	3851 41	4333 46	4814 51	5777 62	6740 72	7703 84
36"	22"	5.30	Volume (CFM) NC	1060 -	1590 21	2120 24	2650 28	3180 32	3710 37	4240 41	4770 46	5300 51	6360 62	7420 72	8481 84
36"	24"	5.79	Volume (CFM) NC	1159 -	1738 21	2317 24	2897 28	3476 32	4055 37	4635 41	5214 46	5793 51	6952 62	8111 72	9269 84
42"	22"	6.20	Volume (CFM) NC	1239 -	1859 22	2478 25	3098 29	3718 33	4337 38	4957 42	5577 47	6196 52	7435 63	8675 73	9914 85
42"	26"	7.35	Volume (CFM) NC	1470 -	2205 22	2940 25	3674 29	4409 33	5144 38	5879 42	6614 47	7349 52	8819 63	10289 73	11758 85
48"	24"	7.75	Volume (CFM) NC	1550 20	2326 23	3101 26	3876 30	4651 34	5426 39	6201 43	6977 48	7752 53	9302 64	10852 74	12403 86
48"	30"	9.73	Volume (CFM) NC	1946 21	2919 24	3892 27	4865 31	5839 35	6812 40	7785 44	8758 49	9731 54	11677 65	13623 75	15569 87
48"	36"	11.71	Volume (CFM) NC	2342 21	3513 24	4684 27	5855 31	7026 35	8197 40	9368 44	10539 49	11710 54	14052 65	16394 75	18736 87
48"	40"	13.03	Volume (CFM) NC	2606 22	3909 25	5212 28	6515 32	7818 36	9121 41	10424 45	11727 50	13030 55	15635 66	18241 76	20847 88
48"	48"	15.67	Volume (CFM) NC	3134 23	4701 26	6267 29	7834 33	9401 37	10968 42	12535 46	14102 51	15668 56	18802 67	21936 77	25069 89

For performance notes, see page GAR-78

Performance Notes for Series 4500

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Nk Vel - Neck velocity of air stream in Feet Per Minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw)
RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands

Series 4500 - Specifications

Model 4500 – 0° deflection

Model 4538 – 38° deflection

Air Inlets shall be model 4500 (0° deflection) or 4538 (38° deflection) manufactured by METALAIR®. Units shall be return or exhaust grilles constructed of 14 gauge deflector blades and 16 gauge borders. Outlets shall be designed to withstand moderate physical abuse. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers. Deflector blades shall be fixed. Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series 4500 - Model Specification Guide

Return - Gym Grille

Series 4500 - Steel

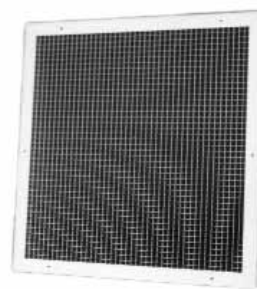
Model	Available Neck	Available Finishes	Available Options	
4500-1 - Horizontal Blades - 0 Degree Deflection 4538-1 - Horizontal Blades - 38 Degree Deflection	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 - White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum	PF	Plaster Frame
		03 - Black	IS	Insect Screen
		24 - Mill		
		28 - Custom Color		



Return and Exhaust Grilles Series CC5/CC15/CC1 Aluminum

Product Details

- ★ The series CC5 cubed core return and exhaust grilles are designed to provide low pressure drops and low sound levels
- ★ The series CC5 is available with a number of options and accessories such as a 1" thick core (model CC1) to reduce sight into the grille
- ★ Series CC5 is an excellent choice for applications requiring minimum pressure drop and noise in return and exhaust applications



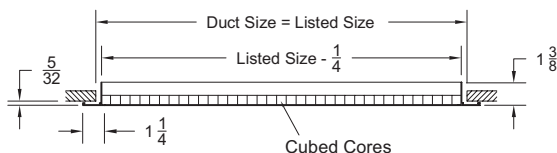
Model CC5-1 Shown

Standard Finish: 01 White

Sideview, dimensions are in inches

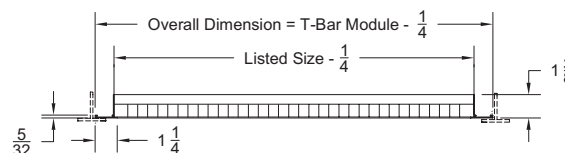
Return and Exhaust - Surface Mount

Model CC5-1 - 1/2" x 1/2" x 1/2" Core
Model CC15-1 - 1/2" x 1/2" x 1" Core
Model CC1-1 - 1" x 1" x 1" Core



Return and Exhaust - T-bar Lay-in

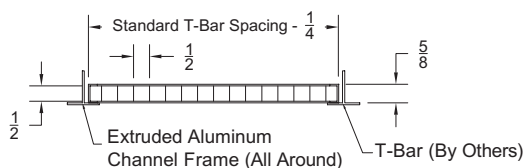
Model CC5-6 - 1/2" x 1/2" x 1/2" Core
Model CC15-6 - 1/2" x 1/2" x 1" Core
Model CC1-6 - 1" x 1" x 1" Core



T-bar Module	12 x 12	24 x 12	24 x 24	48 x 24	30 x 30	36 x 36	48 x 48
Nominal Neck Size	10 x 10	22 x 10	22 x 22	46 x 22	28 x 28	34 x 34	46 x 46

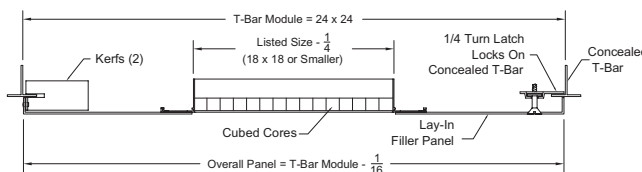
Return and Exhaust - Channel Frame - T-bar Lay-in

Model CC5-TBC-6 - 1/2" x 1/2" x 1/2" Core



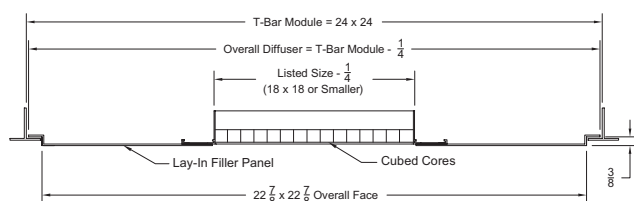
Return and Exhaust - Concealed Spline

Model CC5-7 - 1/2" x 1/2" x 1/2" Core
Model CC15-7 - 1/2" x 1/2" x 1" Core
Model CC1-7 - 1" x 1" x 1" Core



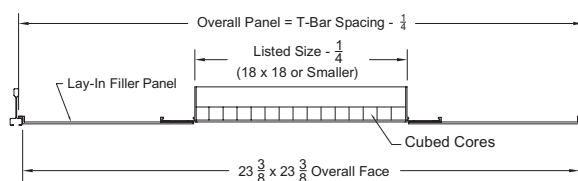
Return and Exhaust - Tegular T-bar

Model CC5-8 - 1/2" x 1/2" x 1/2" Core
Model CC15-8 - 1/2" x 1/2" x 1" Core
Model CC1-8 - 1" x 1" x 1" Core



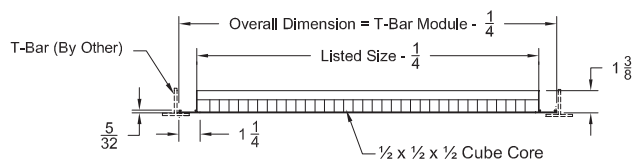
Return and Exhaust - Donn Finline

Model CC5-9 - 1/2" x 1/2" x 1/2" Core
Model CC15-9 - 1/2" x 1/2" x 1" Core
Model CC1-9 - 1" x 1" x 1" Core



GAR - Grilles and Registers

Return and Exhaust - Sidewall Ceiling Grille - 1/2" x 1/2" x 1/2" Core
T-bar Lay-in Removable Core
Model CC5R-6



Notes for Models CC5 (-1, -6, -7, -8, -9) CC5-TBC-6, CC5R-6, CC15 (-1, -6, -7, -8, -9), CC1 (-1, -6, -7, -8, -9)

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Opposed Blade Damper - Steel.....204 OBDA - Opposed Blade Damper - Aluminum...204 L9 - Equalizing Grid204 PF - Plaster Frame205	Insect Screen	<ul style="list-style-type: none"> Frame is extruded aluminum, core is aluminum eggcrate Oversized units made in multiple sections, each with full flanges. Mullion strips provided for joining units in the field



GAR - Grilles and Registers

7/2006

Series CC5/CC15/CC1 - Performance

Models CC5 (-1, -6, -7,-8, -9), CC5-TBC-6, CC5R-6, CC15 (-1, -6, -7,-8, -9), CC1 (-1, -6, -7,-8, -9)

CFM	Ak	NECK SIZE													
		6" x 6"	8" x 8"	10" x 10"	12" x 12"	14" x 14"	16" x 14"	16" x 16"	18" x 16"	18" x 18"	20" x 18"	20" x 20"	22" x 20"	22" x 22"	24" x 22"
		0.25	0.44	0.69	0.99	1.35	1.54	1.76	1.98	2.23	2.47	2.75	3.02	3.33	3.63
100	Velocity P _s	400 .014	225 .005												
150	Velocity P _s	600 .032	338 .010	216 .004											
200	Velocity P _s	800 .057	450 .018	288 .007	200 .004										
250	Velocity P _s		563 .028	360 .012	250 .006										
300	Velocity P _s		675 .041	432 .017	300 .008	220 .004									
350	Velocity P _s		787 .055	504 .023	350 .011	257 .006	225 .005								
400	Velocity P _s		900 .072	576 .030	400 .014	294 .008	257 .006	225 .005	200 .004						
450	Velocity P _s			648 .037	450 .018	331 .010	289 .007	253 .006	225 .005	200 .004					
500	Velocity P _s			720 .046	500 .022	367 .012	321 .009	281 .007	250 .006	222 .004	200 .004				
550	Velocity P _s			792 .056	550 .027	404 .015	354 .011	309 .009	275 .007	244 .005	220 .004				
600	Velocity P _s			864 .066	600 .032	441 .017	386 .013	338 .010	300 .008	267 .006	240 .005	216 .004			
650	Velocity P _s				650 .038	478 .020	418 .016	366 .012	325 .009	289 .007	260 .006	234 .005	213 .004		
700	Velocity P _s				700 .044	514 .024	450 .018	394 .014	350 .011	311 .009	280 .007	252 .006	229 .005	208 .004	
750	Velocity P _s				750 .050	551 .027	482 .021	422 .016	375 .013	333 .010	300 .008	270 .006	245 .005	223 .004	205 .004
NC		25-30			20-25		<20								

Grilles and Registers



GAR

GAR - Grilles and Registers

Series CC5/CC15/CC1 - Performance

Models CC5 (-1, -6, -7, -8, -9), CC5-TBC-6, CC5R-6, CC15 (-1, -6, -7, -8, -9), CC1 (-1, -6, -7, -8, -9)

CFM	Ak	NECK SIZE														NC
		24" x 24"	26" x 26"	28" x 28"	30" x 30"	32" x 32"	48" x 24"	34" x 34"	36" x 36"	38" x 38"	40" x 40"	42" x 42"	44" x 44"	46" x 46"	48" x 48"	
		3.96	4.65	5.39	6.19	7.04	7.92	7.95	8.91	9.93	11.00	12.13	13.31	14.55	15.84	
800	Velocity Ps	200 .003														
1000	Velocity Ps	250 .005	213 .004													
1200	Velocity Ps	300 .008	256 .006	220 .004												
1600	Velocity Ps	400 .014	341 .010	294 .007	256 .006	225 .004	200 .003									
2000	Velocity Ps	500 .021	426 .015	367 .011	320 .009	281 .007	250 .005	249 .005	222 .004							
2500	Velocity Ps	625 .033	533 .024	459 .018	400 .014	352 .010	313 .008	311 .008	278 .007	249 .005	225 .004	204 .004				
3000	Velocity Ps	750 .048	639 .035	551 .026	480 .020	422 .015	375 .012	374 .012	333 .009	299 .008	270 .006	245 .005	223 .004	204 .004		<20
3500	Velocity Ps	875 .065	746 .047	643 .035	560 .027	492 .021	438 .016	436 .016	389 .013	349 .010	315 .008	286 .007	260 .006	238 .005	219 .004	
4000	Velocity Ps		852 .062	735 .046	640 .035	563 .027	500 .021	498 .021	444 .017	399 .013	360 .011	327 .009	298 .008	272 .006	250 .005	
4500	Velocity Ps			827 .058	720 .044	633 .034	563 .027	561 .027	500 .021	449 .017	405 .014	367 .011	335 .010	306 .008	281 .007	
5000	Velocity Ps				800 .054	703 .042	625 .033	623 .033	556 .026	499 .021	450 .017	408 .014	372 .012	340 .010	313 .008	
6000	Velocity Ps					800 .104	750 .048	747 .047	667 .038	598 .030	540 .025	490 .020	446 .017	408 .014	375 .012	
7000	Velocity Ps						875 .065	872 .064	778 .051	698 .041	630 .034	571 .028	521 .023	476 .019	438 .016	
8000	Velocity Ps								889 .067	798 .054	720 .044	653 .036	595 .030	544 .025	500 .021	
NC		30-35											25-30		20-25	

Performance Notes for Series CC5/CC15/CC1

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic feet per minute (air)
- Nk Vel - Neck Velocity of air stream in feet per minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors



Series CC5/CC15/CC1 - Specifications

Return Grilles – Cubed Core – Aluminum

- CC5-1 – Surface Mount
- CC5-6 – T-bar Lay-in
- CC5 TBC-6 – T-bar Lay-in Channel Border
- CC5-7 – Concealed Spline
- CC5-8 – Tegular T-bar
- CC5-9 – Donn Fineline

Air Inlets shall be model:

1. CC5 with a 1/2" x 1/2" x 1/2" cubed core
2. CC15 with a 1/2" x 1/2" x 1" cubed core
3. CC1 with a 1" x 1" x 1" cubed core

Manufactured by METALAIR®. Border shall be 1 1/4" wide. Units shall be return or exhaust grilles of aluminum construction and with an extruded aluminum border and an aluminum cubed core. The units shall be the size and quantity as outlined in the plans and specifications.

Units shall be designed to integrate into the specified ceiling system.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA). Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



GAR - Grilles and Registers

Series CC5/CC15/CC1 - Model Specification Guide

Return/ Exhaust - Cubed Core - Sidewall/Ceiling
Series CC5 - Aluminum

	Model	Available Neck	Available Finishes	Available Options	
Surface Mount	CC5-1 - 1/2" X 1/2" X 1/2" Cube Core CC1-1 - 1" X 1" X 1" Cube Core CC15-1 - 1/2" X 1/2" X 1" Cube Core	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
	01 - White		OBDA	Opposed Blade Damper - Aluminum	
	Optional		L9	Equalizing Grid	
			02 - Aluminum	PF	Plaster Frame
			03 - Black	IS	Insect Screen
			24 - Mill		
			28 - Custom Color		

Return/ Exhaust - Cubed Core - Sidewall/Ceiling
For T-bar Lay-in Ceiling Grid Applications
Model CC5TBC-6 - Aluminum

	Model	Available Neck	Module	Available Finishes	Available Options	
1/2" x 1/2" x 1/2" Core Only	CC5TBC-6 - T-bar Lay-in	6" thru 48"	12" x 12"	Standard	OBD	Opposed Blade Damper - Steel
			24" x 12"	01 - White	OBDA	Opposed Blade Damper - Aluminum
			24" x 24"	Optional	L9	Equalizing Grid
			48" x 24"	02 - Aluminum	IS	Insect Screen
			48" x 48"	03 - Black		
				24 - Mill		
				28 - Custom color		

Return/ Exhaust - Cubed Core - Sidewall/Ceiling
Series CC5/CC15/CC1 - Aluminum

	Model	Available Neck	Module	Available Finishes	Available Options	
1/2" x 1/2" x 1/2" Cubed Core	CC5-6 - T-bar Lay-in	6" thru 48"	12" x 12"	Standard	OBD	Opposed Blade Damper - Steel
	CC5R-6 - Removable Core		24" x 12"	01 - White	OBDA	Opposed Blade Damper - Aluminum
	CC5-7 - Concealed Spline		24" x 24"	Optional	L9	Equalizing Grid
	CC5-8 - Tegular T-bar		48" x 24"	02 - Aluminum	IS	Insect Screen
	CC5-9 - Donn Finline		48" x 48"	03 - Black		
1" x 1" x 1" Cubed Core	CC1-6 - T-bar Lay-in			24 - Mill		
	CC1-7 - Concealed Spline			28 - Custom color		
	CC1-8 - Tegular T-bar					
1/2" x 1/2" x 1" Cubed Core	CC1-9 - Donn Finline					
	CC15-6 - T-bar Lay-in					
	CC15-7 - Concealed Spline					
	CC15-8 - Tegular T-bar					
	CC15-9 - Donn Finline					



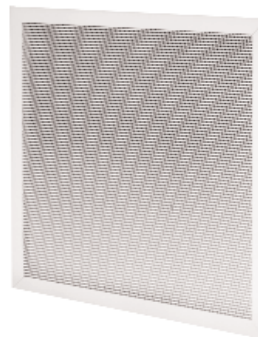
GAR - Grilles and Registers

7/2006

➔ Sidewall Return Grilles ➔ Series RP ➔ Aluminum

Product Details

- ★ The series RP perforated face return or exhaust grilles are designed to blend into the ceiling system and provide a clean, uncluttered architectural appearance
- ★ The series RP grilles and registers are available with a wide range of options and accessories
- ★ Series RP is of aluminum construction and ideal for return and exhaust applications requiring low pressure drops and low sound

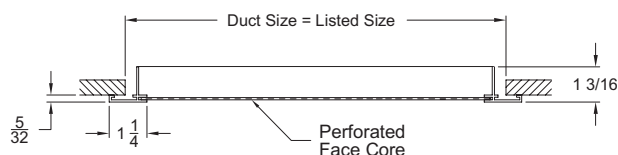


Model RP-1 Shown

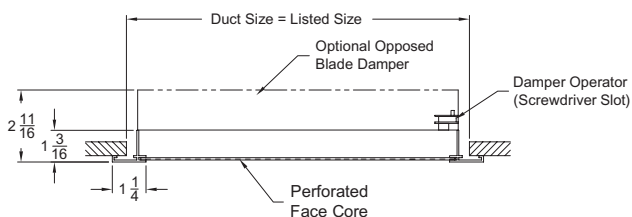
Standard Finish: 01 White

Sideview, dimensions are in inches

Return or Exhaust - Sidewall - Perforated Face - Surface Mount Model RP-1



Return or Exhaust - Sidewall - Perforated Face - Surface Mount With Opposed Blade Damper Model RPD-1



1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish: 02 Aluminum paint 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper.....204 OBDA - Aluminum - Opposed Blade Damper ...204 L9 - Equalizing Grid204 PF - Plaster Frame205	(Factory Mounted) Insect Screen	<ul style="list-style-type: none"> • Frame is extruded aluminum • 51% free area aluminum perforate face • Oversized made in multiple sections, each with full flanges. Mullion strips provide for joining units in field • Available to fit standard T-bar

GAR - Grilles and Registers

Series RP - Performance

Models RP-1, RPD-1

CFM	Ak	NECK SIZE															NC
		8" x 8"	10" x 10"	12" x 12"	14" x 14"	16" x 16"	18" x 18"	20" x 20"	22" x 22"	24" x 24"	30" x 24"	36" x 24"	40" x 24"	44" x 24"	48" x 24"		
		.36	.56	.80	1.09	1.42	1.80	2.22	2.69	3.20	4.00	4.80	5.33	5.87	6.40		
200	Nk Vel Ps	450 .003	288 .001	200 .001												25 -- 30	
400	Nk Vel Ps	900 .012	576 .005	400 .002	294 .001	225 .001											
600	Nk Vel Ps		864 .011	600 .005	441 .003	338 .002	267 .001	216 .001									
800	Nk Vel Ps			800 .010	588 .005	450 .003	356 .002	298 .001	238 .001	200 .001							
1000	Nk Vel Ps				735 .008	563 .005	444 .003	360 .002	298 .001	250 .001	200 .001						
1200	Nk Vel Ps				882 .012	675 .007	533 .004	432 .003	357 .002	300 .001	240 .001	200 .001					
1400	Nk Vel Ps					787 .009	622 .006	504 .004	417 .003	350 .002	280 .001	233 .001	210 .001				
1600	Nk Vel Ps					900 .012	711 .008	576 .005	476 .003	400 .002	320 .002	267 .001	240 .001	218 .001	200 .001		
1800	Nk Vel Ps						800 .010	648 .006	536 .004	450 .003	360 .002	300 .001	270 .001	245 .001	225 .001		
2000	Nk Vel Ps						889 .012	720 .008	595 .005	500 .004	400 .002	333 .002	300 .001	273 .001	250 .001		
2400	Nk Vel Ps							864 .011	714 .008	600 .005	480 .004	400 .002	360 .002	327 .002	300 .001		
2800	Nk Vel Ps								833 .011	700 .007	560 .005	467 .003	420 .003	382 .002	350 .002		
3200	Nk Vel Ps									800 .011	640 .006	533 .004	480 .004	436 .003	400 .002		
3600	Nk Vel Ps									900 .012	720 .008	600 .005	540 .004	491 .004	450 .003		
NC		35 - 40										30 - 35					

Performance Notes for Series RP

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Nk Vel - Neck velocity of air stream in Feet Per Minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw)
RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors



Series RP – Specifications

Air Inlets shall be model RP manufactured by METALAIR®. Units shall be perforated face, return or exhaust grilles constructed of aluminum. Perforate face shall have 3/16" diameter holes on 1/4" centers and shall have a 51% free area. The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4". Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



GAR - Grilles and Registers

Series RP - Model Specification Guide

Return/Exhaust Sidewall/Ceiling

Series RP - Aluminum

Model	Available Neck	Available Finishes	Available Options	
RP - Perforated Face	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 -White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum	IS	Insect Screen
		03 - Black		
		24 - Mill		
		28 - Custom Color		



GAR - Grilles and Registers

7/2006

➔ Reversible Core Grilles & Registers ➔ Series RC ➔ Extruded Aluminum

Product Details

- ★ The series RC, Revers-A-Core, supply grilles and registers combine rugged aluminum construction, a clean architectural design, and an extremely flexible air pattern versatility
- ★ The fixed louvered core is removable from the face and can be rotated or reversed to achieve any of four different air deflection patterns
- ★ Series RC grilles and registers is an excellent selection for applications calling for a distinctive appearance and high performance



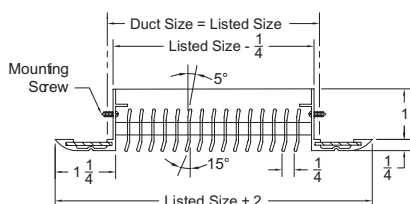
Model RC41C Shown

Standard Finish: 01 White

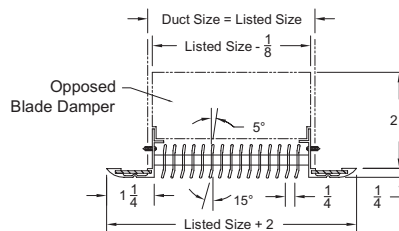
Single Deflection

Sideview, dimensions are in inches

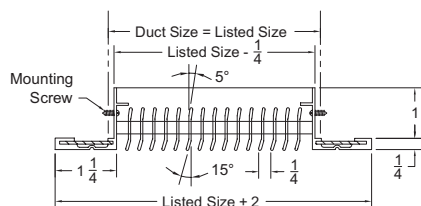
Supply - Single Deflection Grille - Curved Border - Surface Mount
Model 41C-1



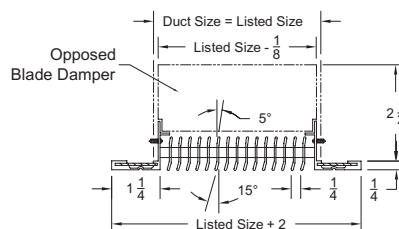
Supply - Single Deflection Grille - Curved Border - Surface Mount
With Opposed Blade Damper
Model 41CD-1



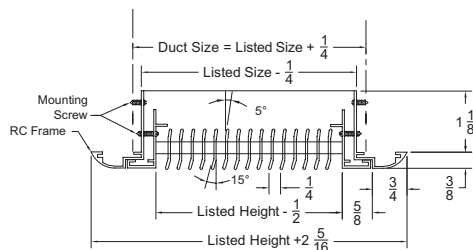
Supply - Single Deflection Grille - Flat Border - Surface Mount
Model 41F-1



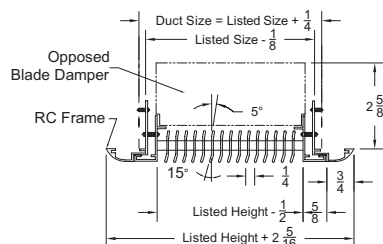
Supply - Single Deflection Grille - Flat Border - Surface Mount
With Opposed Blade Damper
Model 41FD-1



Supply - Single Deflection Grille - Curved Border
Removable Inner Frame - Surface Mount
Model RC41C-1



Supply - Single Deflection Grille - Curved Border
Removable Inner Frame - With Opposed Blade Damper - Surface Mount
Model RC41CD-1



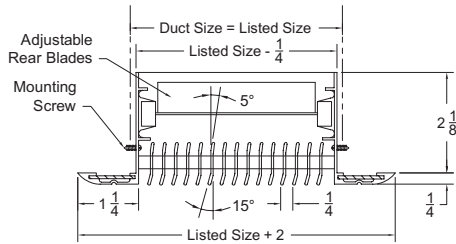
Grilles and Registers

GAR

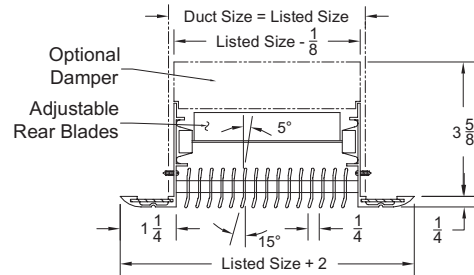
GAR - Grilles and Registers

Double Deflection

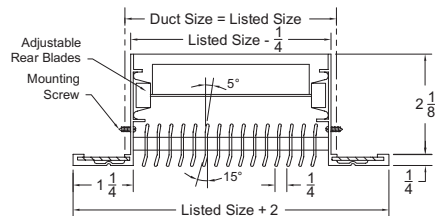
Supply - Double Deflection Grille - Curved Border - Surface Mount
Model 42C-1



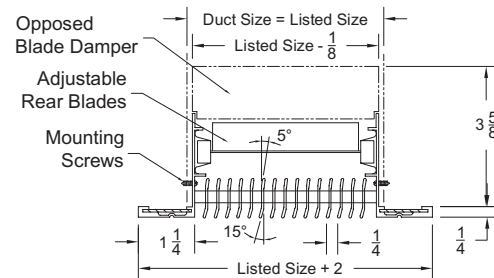
Supply - Double Deflection Grille - Curved Border - Surface Mount With Opposed Blade Damper
Model 42CD-1



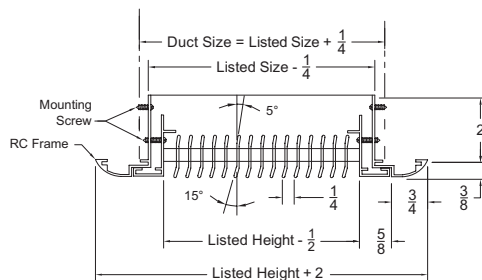
Supply - Double Deflection Grille - Flat Border - Surface Mount
Model 42F-1



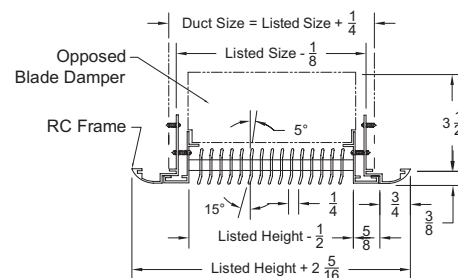
Supply - Double Deflection Grille - Flat Border - Surface Mount With Opposed Blade Damper
Model 42FD-1



Supply - Double Deflection Grille - Curved Border Removable Inner Frame - Surface Mount
Model RC42C-1



Supply - Double Deflection Grille - Curved Border Removable Inner Frame - With Opposed Blade Damper - Surface Mount
Model RC42C-1



1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Optional Finish: 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper.....204 OBDA - Aluminum - Opposed Blade Damper...204 L9 - Equalizing Grid204 PF - Plaster Frame205	(Factory Mounted) Insect Screen Reverse Sizes (blades parallel to short side)	<ul style="list-style-type: none"> • Frame and blades are aluminum • Blades are fixed at 5° on one side, 15° on the other • Oversized units up to 48" x 48" can be made with one-piece frames and multiple cores

GAR - Grilles and Registers

7/2006

Series RC - Performance

Models 41C-1, 42C-1, 41F-1, 42F-1, RC41C-1, RC42C-1, 41CD-1, 42CD-1, 41FD-1, 42FD-1, RC41CD-1, RC42CD-1

CFM	OUTLET SIZE															NC
	Ak	6" x 4"	8" x 4"	10" x 4"	8" x 6"	12" x 6"	10" x 8"	14" x 6"	12" x 8"	18" x 6"	14" x 8"	20" x 6"	16" x 8"	18" x 8"	20" x 8"	
		.06	.08	.11	.14	.21	.23	.245	.28	.315	.327	.35	.37	.42	.47	
50	Velocity Ps Throw	300 .032 12-9-7	225 .018 11-8-6													20
100	Velocity Ps Throw	600 .127 20-14-11	450 .072 18-13-10	360 .046 16-12-9	300 .032 15-11-9	200 .014 13-10-7										
150	Velocity Ps Throw	900 .286 26-18-14	675 .161 23-17-13	540 .103 22-15-12	450 .072 20-14-11	300 .032 18-13-10	270 .026 17-12-9	257 .023 17-12-9	225 .018 16-11-9	200 .014 15-11-9						
200	Velocity Ps Throw		900 .286 28-20-16	720 .183 26-19-14	600 .127 25-18-14	400 .057 22-15-12	360 .046 21-15-11	343 .042 20-15-11	300 .032 20-14-11	267 .025 19-13-10	257 .023 19-13-10	240 .020 18-13-10	225 .018 18-13-10	200 .014 17-12-9		
250	Velocity Ps Throw				750 .199 29-20-16	500 .088 25-18-14	450 .072 24-17-13	429 .065 24-17-13	375 .050 23-16-13	333 .039 22-16-12	321 .037 22-15-12	300 .032 21-15-12	281 .028 21-15-11	250 .022 20-14-11	225 .018 19-14-11	
300	Velocity Ps Throw				900 .286 33-23-18	600 .127 28-20-16	540 .103 27-19-15	514 .093 27-19-15	450 .072 26-18-14	400 .057 25-18-14	386 .053 24-17-13	360 .046 24-17-13	338 .040 23-17-13	300 .032 22-16-12	270 .026 22-15-12	
350	Velocity Ps Throw					700 .173 32-22-17	630 .140 30-22-17	600 .127 30-21-16	525 .097 29-20-16	467 .077 27-19-15	450 .072 27-19-15	420 .062 26-19-15	394 .055 26-18-14	350 .043 25-18-14	315 .035 24-17-13	
400	Velocity Ps Throw					800 .226 35-25-19	720 .183 33-24-18	686 .166 33-23-18	600 .127 31-22-17	533 .101 30-21-17	514 .093 30-21-16	480 .081 29-21-16	450 .072 28-20-16	400 .057 27-19-15	360 .046 26-19-14	
450	Velocity Ps Throw					900 .286 38-27-21	810 .232 36-26-20	771 .210 36-25-20	675 .161 34-24-19	600 .127 33-23-18	579 .118 32-23-18	540 .103 31-22-17	506 .091 31-22-17	450 .072 30-21-16	405 .058 29-20-16	
500	Velocity Ps Throw							857 .260 38-27-21	750 .199 37-26-20	667 .157 35-25-19	643 .146 35-25-19	600 .127 34-24-19	563 .112 33-23-18	500 .088 32-23-17	450 .072 31-22-17	30 - 35
550	Velocity Ps Throw								825 .241 39-28-21	733 .190 37-27-21	707 .177 37-26-20	660 .154 36-26-20	619 .135 35-25-19	550 .107 34-24-19	495 .087 33-23-18	
600	Velocity Ps Throw								900 .286 41-29-23	800 .226 40-28-22	771 .210 39-28-22	720 .183 38-27-21	675 .161 38-27-21	600 .127 36-26-20	540 .103 35-25-19	
650	Velocity Ps Throw									867 .265 42-30-23	836 .247 42-30-23	780 .215 41-29-22	731 .189 40-28-22	650 .149 38-27-21	585 .121 37-26-20	
700	Velocity Ps Throw										900 .286 44-31-24	840 .249 43-30-24	787 .219 42-30-23	700 .173 40-28-22	630 .140 38-27-21	
NC		30 - 40										30 - 35				

Grilles and Registers

GAR

GAR - Grilles and Registers

Series RC - Performance

Models 41C-1, 42C-1, 41F-1, 42F-1, RC41C-1, RC42C-1, 41CD-1, 42CD-1, 41FD-1, 42FD-1, RC41CD-1, RC42CD-1

CFM	Ak	OUTLET SIZE															NC
		18" x 12"	20" x 12"	20" x 16"	24" x 16"	24" x 20"	30" x 18"	24" x 24"	30" x 20"	36" x 18"	36" x 20"	36" x 24"	42" x 22"	48" x 22"	48" x 24"		
		.66	.78	.97	1.16	1.46	1.73	1.80	1.83	2.07	2.19	2.70	2.84	3.24	3.60		
400	Velocity Ps Throw	267 .025 24-17-13	240 .020 23-16-13													25	
500	Velocity Ps Throw	333 .040 28-20-15	300 .032 27-19-15	225 .018 24-14-13													
600	Velocity Ps Throw	400 .057 31-22-17	360 .046 30-21-17	270 .026 27-19-15	225 .018 26-18-14												
700	Velocity Ps Throw	467 .077 35-25-19	420 .062 34-24-18	315 .035 30-22-17	263 .025 29-20-16	210 .015 26-19-15											
800	Velocity Ps Throw	533 .101 38-27-21	480 .081 37-26-20	360 .046 33-24-18	300 .032 31-22-17	240 .020 29-21-16	213 .018 28-20-15	200 .014 27-20-15									
900	Velocity Ps Throw	600 .127 41-29-23	540 .103 40-28-22	405 .058 36-26-20	338 .040 34-24-19	270 .027 31-22-17	240 .020 30-21-17	225 .018 29-21-17	216 .016 29-21-16	200 .014 28-20-16							
1000	Velocity Ps Throw	667 .157 45-32-25	600 .127 43-31-24	450 .072 39-28-21	375 .050 37-26-20	300 .032 34-24-19	267 .026 32-23-18	256 .023 31-22-17	240 .020 31-22-17	222 .018 31-22-17	200 .014 29-21-16						
1200	Velocity Ps Throw	800 .226 51-36-28	720 .183 49-35-27	540 .102 44-31-24	450 .072 41-29-23	360 .046 38-27-21	320 .037 37-26-20	300 .032 36-25-20	288 .028 36-25-20	267 .026 35-25-19	240 .020 33-24-18	200 .014 31-22-17					
1400	Velocity Ps Throw		840 .245 54-39-30	630 .142 49-35-27	525 .100 46-33-25	420 .062 43-30-24	373 .050 41-29-23	350 .045 40-28-22	336 .040 40-28-22	311 .033 39-27-21	280 .027 37-26-20	233 .019 35-25-19	218 .015 34-24-19				
1600	Velocity Ps Throw			720 .183 54-38-30	600 .127 51-36-28	480 .081 47-33-26	427 .075 45-32-25	400 .058 44-31-25	384 .052 43-31-24	356 .044 42-30-23	320 .037 41-29-22	267 .024 38-27-21	249 .023 37-27-21	218 .015 36-25-20	200 .014 35-25-19		
2000	Velocity Ps Throw				750 .199 59-42-32	600 .127 55-39-30	533 .101 52-37-29	500 .082 51-36-28	480 .081 51-36-28	444 .070 49-35-27	400 .057 48-34-26	333 .039 45-32-25	312 .035 44-31-24	273 .027 42-30-23	250 .023 40-29-22		
2500	Velocity Ps Throw					750 .199 64-45-35	667 .160 61-43-34	625 .141 60-42-33	600 .127 59-42-32	556 .105 57-41-32	500 .088 55-39-30	417 .062 52-37-29	390 .060 51-36-28	341 .040 49-34-27	313 .035 47-33-26		
3000	Velocity Ps Throw					900 .286 72-51-40	800 .226 69-49-38	750 .199 68-48-37	720 .183 67-47-37	667 .164 65-46-36	600 .127 63-45-35	500 .088 59-42-32	468 .076 58-41-32	409 .058 55-39-30	375 .050 53-38-29		
3500	Velocity Ps Throw							875 .270 75-53-41	840 .245 74-53-41	778 .220 72-51-40	700 .173 70-49-38	583 .121 65-46-36	545 .100 64-45-35	477 .079 61-43-34	438 .070 56-40-31		
NC		35 - 40										25 - 30					

Performance Notes for Series RC Revers-a-Core

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Nk Vel - Neck velocity of air stream in Feet Per Minute
- Ps - Static pressure = $P_t - P_v$ (inches of water column)
- Throw - Non-isothermal horizontal throw (supply air temperature 20°F colder than average room air temperature) values are for 50 fpm velocities for 0°, 22°, and 45° spread on double deflection Models 42F, 42C, and RC 42C
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors



Series RC – Specifications

Supply - Single Deflection Supply Grilles and Registers – Aluminum

Model 41C-1 (curved border)

Air Outlets shall be model 41C-1 manufactured by METALAIR®. Units shall be single deflection supply grilles of with an extruded aluminum border and a removable core consisting of a single set of aluminum fixed deflection fins. Units shall have a 1 1/4" curved outer border. The units shall be the size and quantity as outlined in the plans and specifications.

The inlet shall have a removable core that includes fixed louver fins adjustable to provide 5° or 15°, upward or downward deflection air patterns. The removable core shall be held in place with spring clips. The inner core assembly shall have fins on 1/4" centers and include mullion support bars on 5" maximum spacing.

Units shall be designed for surface mounting applications and be designed to be fastened inside the duct opening with hidden screws.

Model 41F-1 (flat border)

Air Outlets shall be model 41F-1 manufactured by METALAIR®. Units shall be single deflection supply grilles of with an extruded aluminum border and a removable core consisting of a single set of aluminum fixed deflection fins. Units shall have a 1 1/4" flat outer border. The units shall be the size and quantity as outlined in the plans and specifications.

The inlet shall have a removable core with a 5/8" inner border that includes fixed louver fins adjustable to provide 5° or 15°, upward or downward deflection air patterns. The removable core shall be held in place with spring clips.

The inner core assembly shall have fins on 1/4" centers and include mullion support bars on 5" maximum spacing. Units shall be designed for surface mounting applications and be designed to be fastened inside the duct opening with hidden screws.

Model RC41C-1 (curved border with removable inner border)

Air Outlets shall be model RC41C-1 manufactured by METALAIR®. Units shall be single deflection supply grilles of with an extruded aluminum border and a single set of aluminum fixed deflection fins. Units shall have a 1 1/4" curved outer border with a 3/4" radius. The air outlet shall also include a removable inner core with a 5/8" border. The units shall be the size and quantity as outlined in the plans and specifications.

The inlet shall have a removable core with a 5/8" inner border that includes fixed louver fins adjustable to provide 5° or 15°, upward or downward deflection air patterns. The removable core shall be held in place with spring clips.

The inner core assembly shall have fins on 1/4" centers and include mullion support bars on 5" maximum spacing. Units shall be designed for surface mounting applications and be designed to be fastened inside the duct opening with hidden screws.

Supply - Double Deflection Supply Grilles and Registers – Aluminum

Model 42C-1 (curved border)

Air Outlets shall be model 42C-1 manufactured by METALAIR®. Units shall be double deflection supply grilles of with an extruded aluminum border and a removable core consisting of a single set of aluminum fixed deflection fins. Outlets shall also have a rear set of adjustable control blades that allow the spread of the discharge air pattern. Units shall have a 1 1/4" curved outer border. The units shall be the size and quantity as outlined in the plans and specifications.

The inlet shall have a removable core that includes fixed louver fins adjustable to provide 5° or 15°, upward or downward deflection air patterns. The removable core shall be held in place with spring clips.

The inner core assembly shall have fins on 1/4" centers and include mullion support bars on 5" maximum spacing.

Units shall be designed for surface mounting applications and be designed to be fastened inside the duct opening with hidden screws.

Model 42F-1 (flat border)

Air Outlets shall be model 42F-1 manufactured by METALAIR®. Units shall be double deflection supply grilles of with an extruded aluminum border and a removable core consisting of a single set of aluminum fixed deflection fins. Outlets shall also have a rear set of adjustable control blades that allow the spread of the discharge air pattern. Units shall have a 1 1/4" flat outer border. The units shall be the size and quantity as outlined in the plans and specifications.

The inlet shall have a removable core with a 5/8" inner border that includes fixed louver fins adjustable to provide 5° or 15°, upward or downward deflection air patterns. The removable core shall be held in place with spring clips.

The inner core assembly shall have fins on 1/4" centers and include mullion support bars on 5" maximum spacing. Units shall be designed for surface mounting applications and be designed to be fastened inside the duct opening with hidden screws.

Model RC42C-1 (curved border with removable inner border)

Air Outlets shall be model 41C-1 manufactured by METALAIR®. Units shall be double deflection supply grilles of with an extruded aluminum border and a single set of aluminum fixed deflection fins. Outlets shall also have a rear set of adjustable control blades that allow the spread of the discharge air pattern. Units shall have a 1 1/4" curved outer border with a 3/4" radius. The air outlet shall also include a removable inner core with a 5/8" border. The units shall be the size and quantity as outlined in the plans and specifications.

The inlet shall have a removable core with a 5/8" inner border that includes fixed louver fins adjustable to provide 5° or 15°, upward or downward deflection air patterns. The removable core shall be held in place with spring clips.

The inner core assembly shall have fins on 1/4" centers and include mullion support bars on 5" maximum spacing. Units shall be designed for surface mounting applications and be designed to be fastened inside the duct opening with hidden screws.



GAR - Grilles and Registers

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series RC - Model Specification Guide

Removable Core Grilles and Registers

Extruded Aluminum - Reverse A Core

Model	Available Neck	Available Finishes	Available Options	
41C-1 - Curved Frame - Single Deflection 41F-1 - Flat Frame - Single Deflection RC41C-1 - Curved Mounting Frame - Single Deflection 42C-1 - Curved Frame - Double Deflection 42F-1 - Flat Frame - Double Deflection RC42C-1 - Curved Mounting Frame - Double Deflection	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 - White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum	PF	Plaster Frame
		03 - Black		
		24 - Mill		
		28 - Custom Color		



- ➔ Filter Grilles ➔ Series RHF ➔ Aluminum
 - ➔ Series RHEF ➔ Extruded Aluminum
 - ➔ Series SRHF ➔ Steel

Product Details

- ★ The RHF series of return aluminum filter grilles combine the advantages of corrosion resistant construction and durability with attractive design, solid performance, and competitive pricing
- ★ The RHEF is our premiere extruded aluminum filter grille offering superior appearance and performance. The SRHF is designed for applications requiring steel construction
- ★ The RHEF and SRHF are excellent choices for exhaust and return applications requiring a filter
- ★ The SRHF is designed for applications requiring steel construction



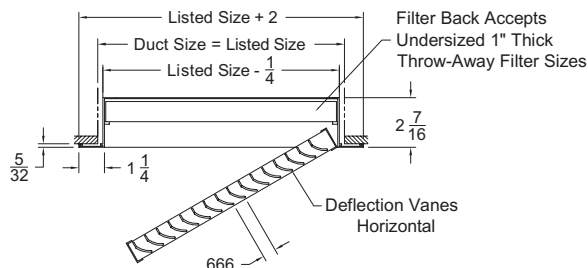
Model RHF-1 Shown

Standard Finish: 01 White

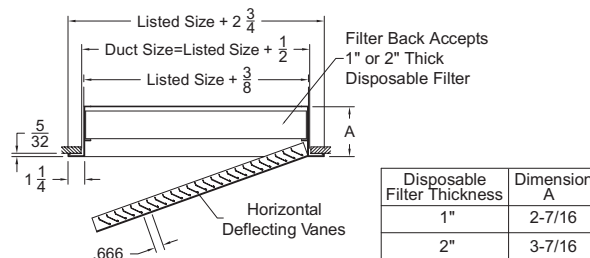
Aluminum

Sideview, dimensions are in inches

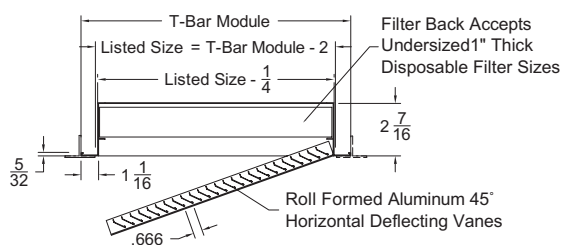
Filter Back Return Grilles and Registers
45° Louvered Face - Grille Size - Surface Mount - Aluminum
Model RHF-1 GS



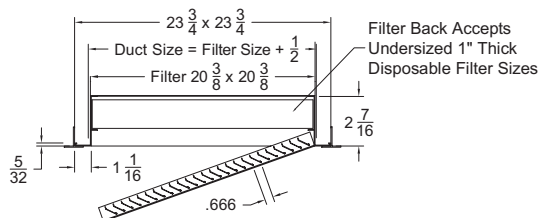
Filter Back Return Grilles and Registers
45° Louvered Face - Filter Size - Surface Mount - Aluminum
Model RHF-1 FS



Filter Back Return Grilles and Registers
45° Louvered Face - Grille Size - T-bar Lay-in - Aluminum
Model RHF-6 GS



Filter Back Return Grilles and Registers
45° Louvered Face - Filter Size - T-bar Lay-in - Aluminum
Model RHF-6 FS

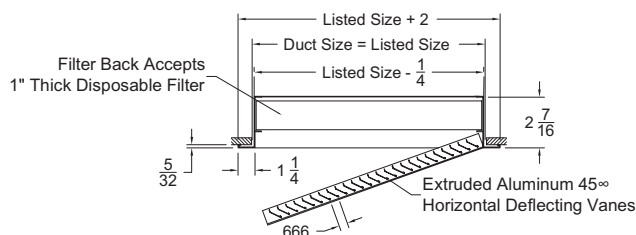


Lay-In T-Bar Modules for RHF-6 GS and RHF-6 FS	
24 x 24	48 x 24
Listed Sizes	
22 x 22	46 x 22
Overall Dimensions W x H	
23 3/4 x 23 3/4	47 3/4 x 23 3/4

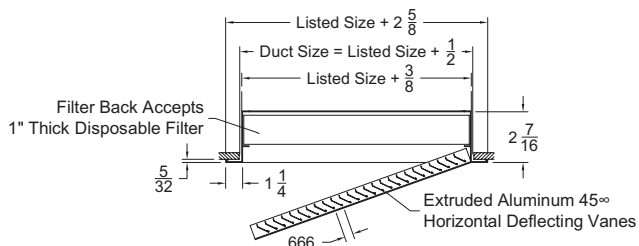
GAR - Grilles and Registers

Extruded Aluminum

Filter Back Return Grilles and Registers - 45° Louvered Face
Grille Size - Surface Mount - Extruded Aluminum
Model RHEF-1 GS

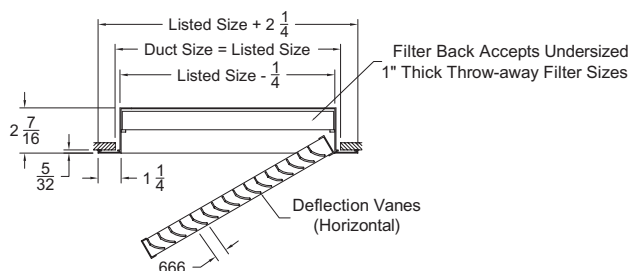


Filter Back Return Grilles and Registers - 45° Louvered Face
Filter Size - Surface Mount - Extruded Aluminum
Model RHEF-1 FS

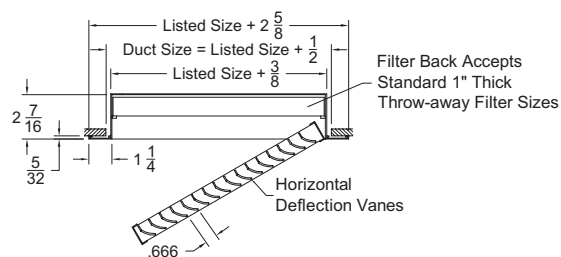


Steel

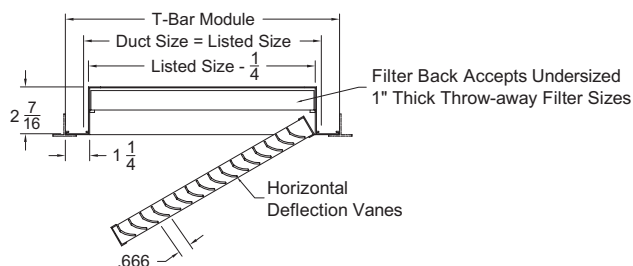
Filter Back Return Grilles and Registers - 45° Louvered Face - Steel
Grille Size - Surface Mount
Model SRHF-1 GS



Filter Back Return Grilles and Registers - 45° Louvered Face - Steel
Filter Size - Surface Mount
Model SRHF-1 FS

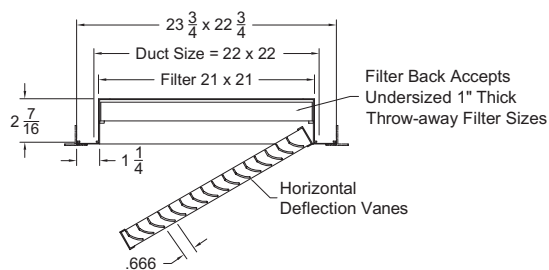


Filter Back Return Grilles and Registers - 45° Louvered Face - Steel
Grille Size- T-bar Lay-in
Model SRHF-6 GS



Lay-in T-Bar Modules for SRHF-6 GS and SRHFD-6 GS Models							
12 x 12	24 x 12	36 x 12	48 x 12	24 x 24	36 x 24	48 x 24	36 x 36
Listed Sizes							
10 x 10	22 x 10	34 x 10	46 x 10	22 x 22	34 x 22	46 x 22	34 x 34
							46 x 46

Filter Back Return Grilles and Registers - 45° Louvered Face - Steel
Filter Size - T-bar Lay-in
Model SRHF-6 FS



GAR - Grilles and Registers

7/2006

Notes for Series RHF

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish: 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper.....204 OBDA - Aluminum - Opposed Blade Damper ...204 L9 - Equalizing Grid.....204 PF - Plaster Frame205	• Frame and blades are aluminum

Notes for Series RHEF

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish (no additional charge): 02 Aluminum paint 03 Black 04 Clear Anodized 24 Mill Finish 28 Custom color	OBD - Steel - Opposed Blade Damper.....204 OBDA - Aluminum - Opposed Blade Damper ...204 L9 - Equalizing Grid.....204 PF - Plaster Frame205	• Frame and blades are aluminum. Can be ordered as either G/S (grille size) or F/S (filter size).

Notes for Series SRHF

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish: 03 Black 28 Custom color	OBD - Steel - Opposed Blade Damper.....204 OBDA - Aluminum - Opposed Blade Damper ...204 L9 - Equalizing Grid.....204 PF - Plaster Frame205	• Frame and blades are steel. Can be ordered as either G/S (grille size) or F/S (filter size).

Series RHF - Performance

Models RHF-1 GS, RHF-6 GS, RHF-1 FS, RHF-6 FS, RHEF-1 GS, RHEF-1 FS, SRHF-1 GS, SRHF-1FS, SRHF-6 GS, SRHF-6 FS

CFM	Ak	OUTLET SIZE													
		10" x 6"	12" x 6"	10" x 8"	12" x 8"	18" x 6"	12" x 12"	16" x 12"	18" x 12"	20" x 12"	24" x 12"	18" x 18"	20" x 18"	20" x 20"	24" x 18"
		.40	.47	.53	.63	.71	.95	1.27	1.42	1.58	1.90	2.14	2.37	2.63	2.85
100	Nk Vel Ps	240 .007	200 .005												
150	Nk Vel Ps	360 .016	300 .011	270 .009	225 .006	200 .005									
200	Nk Vel Ps	480 .029	400 .020	360 .016	300 .011	267 .009	200 .005								
250	Nk Vel Ps	600 .046	500 .032	450 .026	375 .018	333 .014	250 .008								
300	Nk Vel Ps	720 .066	600 .046	540 .037	450 .026	400 .020	300 .011	225 .006	200 .005						
350	Nk Vel Ps	840 .089	700 .062	630 .050	525 .035	467 .028	350 .016	263 .009	233 .007	210 .006					
400	Nk Vel Ps		800 .081	720 .066	600 .046	533 .036	400 .020	300 .011	267 .009	240 .007	200 .005				
450	Nk Vel Ps		900 .103	810 .083	675 .058	600 .046	450 .026	338 .014	300 .011	270 .009	225 .006	200 .005			
500	Nk Vel Ps				750 .071	667 .056	500 .032	375 .018	333 .014	300 .011	250 .008	222 .006	200 .005		
550	Nk Vel Ps				825 .086	733 .068	550 .038	413 .022	367 .017	330 .014	275 .010	244 .008	220 .006		
600	Nk Vel Ps				900 .103	800 .081	600 .046	450 .026	400 .020	360 .016	300 .011	267 .009	240 .007	216 .006	200 .005
650	Nk Vel Ps					867 .095	650 .054	488 .030	433 .024	390 .019	325 .013	289 .011	260 .009	234 .007	217 .006
700	Nk Vel Ps						700 .062	525 .035	467 .028	420 .022	350 .016	311 .012	280 .010	252 .008	233 .007
750	Nk Vel Ps						750 .071	563 .040	500 .032	450 .026	375 .018	333 .014	300 .011	270 .009	250 .008
	NC	40					35	30			25				

For performance notes, see page GAR-99

Performance Notes for Series RHF

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Nk Vel - Neck velocity of air stream in Feet Per Minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw)
RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Series RHF - Specifications

Model RHF - Return Grilles – Extruded Aluminum

- RHF-1 G/S Grille Size - Surface Mount
- RHF-1 F/S Filter Size - Surface Mount
- RHF-6 G/S Grille Size - T-bar Lay-in
- RHF-6 F/S Filter Size - T-bar Lay-in

Air Inlets shall be model RHF manufactured by METALAIR®. Units shall be filter return or exhaust grilles of aluminum construction and with an aluminum border and a single set of fixed deflection blades. Units shall include a hinged face and integral frame designed to accept a 1" thick (optional 2" thick) filter. Filter face shall be secured in place with 1/4" turn fasteners. The units shall be the size and quantity as outlined in the plans and specifications.

Option G/S or F/S

1. Inlets shall be size to fit the required filter dimensions (option F/S)
2. Inlets shall be sized to fit the listed duct dimension (option G/S)

Border shall be 1 1/4" wide with aerodynamically shaped deflector blades on .666" centers set at 45°. Deflector blades shall be fixed.

For T-Bar Lay-in

Units shall be designed to integrate into the specified ceiling system.

For Surface Mount

Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Model RHEF - Filter Return Grilles – Extruded Aluminum

- RHEF-1 G/S Grille Size - Surface Mount
- RHEF-1 F/S Filter Size - Surface Mount

Air Inlets shall be model RHEF-1 manufactured by METALAIR®. Units shall be filter return or exhaust grilles constructed of heavy extruded aluminum. Unit shall include a hinged face and integral frame designed to accept a 1" thick (optional 2" thick) filter. Filter face shall be secured in place with 1/4" turn fasteners. The units shall be the size and quantity as outlined in the plans and specifications.

Option G/S or F/S

1. Inlets shall be size to fit the required filter dimensions (option F/S)
2. Inlets shall be sized to fit the listed duct dimension (option G/S)

Border shall be 1 1/4" wide with aerodynamically shaped fixed deflector blades on .666" centers set at 45°. Deflector blades shall be fixed. Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Model SRHF - Return Grilles – Steel

- SRHF-1 G/S Grille Size - Surface Mount
- SRHF-1 F/S Filter Size - Surface Mount
- SRHF-6 G/S Grille Size - T-bar Lay-in
- SRHF-6 F/S Filter Size - T-bar Lay-in

Air Inlets shall be model SRHF manufactured by METALAIR®. Units shall be filter return or exhaust grilles constructed of steel. Unit shall include a hinged face and integral frame designed to accept a 1" thick (optional 2" thick) filter. Filter face shall be secured in place with 1/4 turn fasteners. The units shall be the size and quantity as outlined in the plans and specifications.

Option G/S or F/S

1. Inlets shall be size to fit the required filter dimensions (option F/S)
2. Inlets shall be sized to fit the listed duct dimension (option G/S)

Border shall be 1 1/4" wide with aerodynamically shaped fixed deflector blades on .666" centers set at 45°. Deflector blades shall be fixed. Units shall be designed to integrate into the specified ceiling system.

For T-Bar Lay-in

Units shall be designed to integrate into the specified ceiling system.

For Surface Mounting

Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.



Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series RHF - Model Specification Guide

Return and Exhaust - Filter Back Return Grilles
Aluminum - 45° Degree Louvered Face

Model	Available Neck	Available Finishes	Available Options	
RHF-1 F/S - Surface Mount Filter Grille (Filter Size) RHF-1 G/S - Surface Mount Filter Grille (Grille Size)	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 - White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum	D5	Opposed Blade Damper - Steel
		03 - Black	D5A	Opposed Blade Damper - Aluminum
		24 - Mill		
		28 - Custom Color		

Return and Exhaust - Filter Back Return Grilles
Aluminum - 45° Degree Louvered Face
For T-bar Lay-in Ceiling Grid Applications

Model	Available Neck	Module	Available Finishes	Available Options	
RHF-6 F/S - Surface Mount Filter Grille (Filter Size)	6" x 6" to 22" x 22"	24" to 24"	Standard	OBD	Opposed Blade Damper - Steel
RHF-6 G/S - Surface Mount Filter Grille (Grille Size)	6" x 6" to 22" x 22"	48" to 24"	01 - White	OBDA	Opposed Blade Damper - Aluminum
			Optional	L9	Equalizing Grid
			02 - Aluminum	D5	Opposed Blade Damper - Steel
			03 - Black	D5A	Opposed Blade Damper - Aluminum
			24 - Mill		
			28 - Custom Color		



GAR - Grilles and Registers

Series RHEF - Model Specification Guide

Return and Exhaust - Filter Back Return Grilles
Extruded Aluminum - 45° Degree Louvered Face

Model	Available Neck	Available Finishes	Available Options	
RHEF-1 F/S - Surface Mount Filter Grille (Filter Size)	6" thru 46"	Standard	OBD	Opposed Blade Damper - Steel
		01 - White	OBDA	Opposed Blade Damper - Aluminum
RHEF-1 G/S - Surface Mount Filter Grille (Grille Size)	6" thru 48"	Optional	L9	Equalizing Grid
		02 - Aluminum	D5	Opposed Blade Damper - Steel
		03 - Black	D5A	Opposed Blade Damper - Aluminum
		04 - Clear Anodized		
		24 - Mill		
		28 - Custom Color		

Series SRHF - Model Specification Guide

Return and Exhaust - Filter Back Return Grilles
Steel - 45° Degree Louvered Face

Model	Available Neck	Available Finishes	Available Options	
SRHF-1 F/S - Surface Mount Filter Grille (Filter Size) SRHF-1 G/S - Surface Mount Filter Grille (Grille Size)	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 - White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum	D5	Opposed Blade Damper - Steel
		03 - Black	D5A	Opposed Blade Damper - Aluminum
		24 - Mill		
		28 - Custom Color		

Return and Exhaust - Filter Back Return Grilles
Steel - 45° Degree Louvered Face
For T-bar Lay-in Ceiling Grid Applications

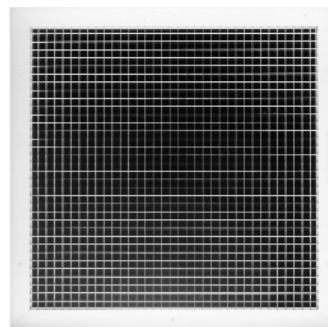
Model	Available Neck	Module	Available Finishes	Available Options	
SRHF-6 F/S - T-bar Lay-in Filter Grille (Filter Size) SRHF-6 G/S - T-bar Lay-in Filter Grille (Grille Size)	6" x 6" to 22" x 22"	24" to 24"	Standard	OBD	Opposed Blade Damper - Steel
			01 - White	OBDA	Opposed Blade Damper - Aluminum
			Optional	L9	Equalizing Grid
			02 - Aluminum	D5	Opposed Blade Damper - Steel
			03 - Black	D5A	Opposed Blade Damper - Aluminum
			24 - Mill		
			28 - Custom Color		



➔ Filter Return Grilles & Registers ➔ Cube Core ➔ Series CC5F ➔ Aluminum

Product Details

- ★ The series CC5F cubed core return and exhaust filter grilles are designed to provide low pressure drops and low sound levels
- ★ The series CC5F is designed for 1" thick filters (by others) and includes a hinged face with 1/4" turn fasteners for quick filter changes
- ★ Series CC5F is an excellent choice for applications requiring minimum pressure drop and noise in return and exhaust applications

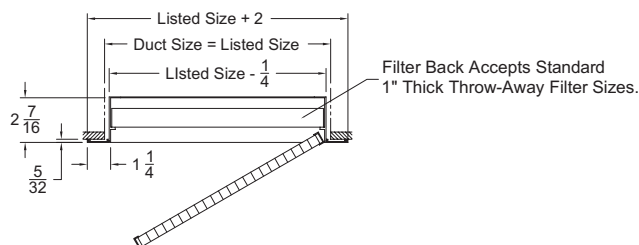


Model CC5F-1 Shown

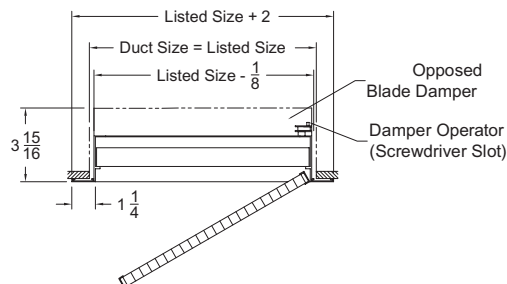
Standard Finish: 01 White

Sideview, dimensions are in inches

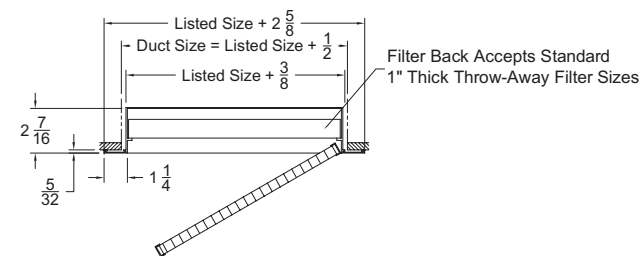
Filter Back Return Grilles and Registers - 1/2" x 1/2" x 1/2" Cube Core Grille Size - Surface Mount Model CC5F-1 GS



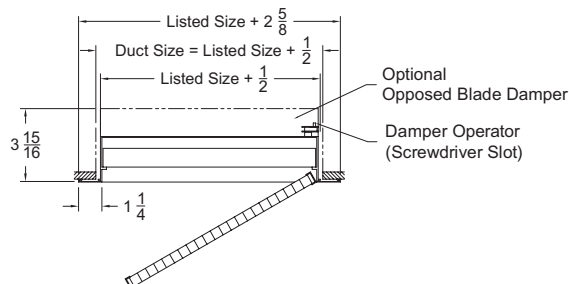
Filter Back Return Grilles and Registers - 1/2" x 1/2" x 1/2" Cube Core Grille Size - With Opposed Blade Damper - Surface Mount Model CC5FD-1 GS



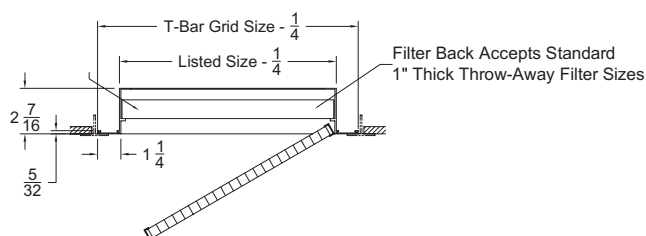
Filter Back Return Grilles and Registers - 1/2" x 1/2" x 1/2" Cube Core Filter Size - Surface Mount Model CC5F-1 FS



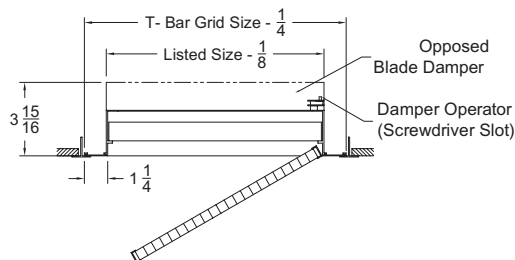
Filter Back Return Grilles and Registers - 1/2" x 1/2" x 1/2" Cube Core Filter Size - With Opposed Blade Damper - Surface Mount Model CC5FD-1 FS



Filter Back Return Grilles and Registers - 1/2" x 1/2" x 1/2" Cube Core Grille Size - T-bar Lay-in Model CC5F-6 GS

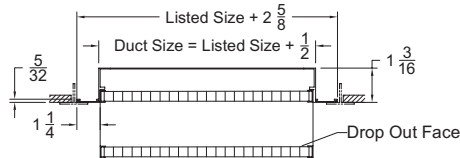


Filter Back Return Grilles and Registers - 1/2" x 1/2" x 1/2" Cube Core Grille Size - With Opposed Blade Damper - T-bar Lay-in Model CC5FD-6 GS



GAR - Grilles and Registers

Filter Back Return Grilles and Registers - 1/2" x 1/2" x 1/2" Cube Core
Filter Size - T-bar Lay-in with four thumb latches/removable core
Model CC5F-6 FS



1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finish: 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper.....204 OBDA - Aluminum - Opposed Blade Damper.....204 L9 - Equalizing Grid204 PF - Plaster Frame205	<ul style="list-style-type: none"> Frame and cube core are aluminum Can be ordered as either G/S (grille size) or F/S (filter size)

Series CC5F - Performance

Models CC5F-1 GS, CC5-1 FS, CC5F-6 GS, CC5F-6 FS, CC5FD-1 GS, CC5FD-1 FS, CC5FD-6 GS

CFM	Ak	NECK SIZE													
		6" x 6"	8" x 8"	10" x 10"	12" x 12"	14" x 14"	16" x 14"	16" x 16"	18" x 16"	18" x 18"	20" x 18"	20" x 20"	22" x 20"	22" x 22"	24" x 22"
		0.25	0.44	0.69	0.99	1.35	1.54	1.76	1.98	2.23	2.47	2.75	3.02	3.33	3.63
100	Velocity P _s	400 .064	225 .0055												
150	Velocity P _s	600 .082	338 .06	216 .054											
200	Velocity P _s	800 .107	450 .068	288 .057	200 .054										
250	Velocity P _s		563 .078	360 .062	250 .056										
300	Velocity P _s		675 .091	432 .067	300 .058	220 .054									
350	Velocity P _s		787 .105	504 .073	350 .061	257 .056	225 .055								
400	Velocity P _s		900 .122	576 .080	400 .064	294 .058	257 .056	225 .055	200 .054						
450	Velocity P _s			648 .087	450 .068	331 .060	289 .057	253 .056	225 .055	200 .054					
500	Velocity P _s			720 .096	500 .072	367 .062	321 .059	281 .057	250 .056	222 .054	200 .054				
550	Velocity P _s			792 .106	550 .077	404 .065	354 .061	309 .059	275 .057	244 .055	220 .054				
600	Velocity P _s			864 .116	600 .082	441 .067	386 .063	338 .060	300 .058	267 .056	240 .055	216 .054			
650	Velocity P _s				650 .088	478 .070	418 .066	366 .062	325 .059	289 .057	260 .056	234 .055	213 .054		
700	Velocity P _s				700 .094	514 .074	450 .068	394 .064	350 .061	311 .059	280 .057	252 .056	229 .055	208 .054	
750	Velocity P _s				750 .100	551 .077	482 .071	422 .066	375 .063	333 .060	300 .058	270 .056	245 .055	223 .054	205 .054
NC		25-30			20-25		<20								

For performance notes, see page GAR-104



Series CC5F - Performance

Models CC5F-1 GS, CC5-1 FS, CC5F-6 GS, CC5F-6 FS, CC5FD-1 GS, CC5FD-1 FS, CC5FD-6 GS

CFM	Ak	NECK SIZE														NC
		24" x 24"	26" x 26"	28" x 28"	30" x 30"	32" x 32"	48" x 24"	34" x 34"	36" x 36"	38" x 38"	40" x 40"	42" x 42"	44" x 44"	46" x 46"	48" x 48"	
		3.96	4.65	5.39	6.19	7.04	7.92	7.95	8.91	9.93	11.00	12.13	13.31	14.55	15.84	
800	Velocity Ps	200 .053														
1000	Velocity Ps	250 .055	213 .054													
1200	Velocity Ps	300 .058	256 .056	220 .054												
1600	Velocity Ps	400 .064	341 .060	294 .057	256 .056	225 .054	200 .053									
2000	Velocity Ps	500 .071	426 .065	367 .061	320 .059	281 .057	250 .055	249 .055	222 .054							
2500	Velocity Ps	625 .083	533 .074	459 .068	400 .064	352 .060	313 .058	311 .058	278 .057	249 .055	225 .054	204 .054				
3000	Velocity Ps	750 .098	639 .085	551 .076	480 .070	422 .065	375 .062	374 .062	333 .059	299 .058	270 .056	245 .055	223 .054	204 .054		<20
3500	Velocity Ps	875 .115	746 .097	643 .085	560 .077	492 .071	438 .066	436 .066	389 .063	349 .060	315 .058	286 .057	260 .056	238 .055	219 .054	
4000	Velocity Ps		852 .112	735 .096	640 .085	563 .077	500 .071	498 .071	444 .067	399 .063	360 .061	327 .059	298 .058	272 .056	250 .055	
4500	Velocity Ps			827 .108	720 .094	633 .084	563 .077	561 .077	500 .071	449 .067	405 .064	367 .061	335 .060	306 .058	281 .057	
5000	Velocity Ps				800 .104	703 .092	625 .083	623 .083	556 .076	499 .071	450 .067	408 .064	372 .062	340 .060	313 .058	
6000	Velocity Ps					800 .104	750 .098	747 .097	667 .088	598 .080	540 .075	490 .070	446 .067	408 .064	375 .062	
7000	Velocity Ps						875 .115	872 .114	778 .101	698 .091	630 .084	571 .078	521 .073	476 .069	438 .066	
8000	Velocity Ps								889 .117	798 .104	720 .094	653 .086	595 .080	544 .075	500 .071	
NC		30-35											25-30			

Performance Notes for Series CC5F

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Nk Vel - Neck velocity of air stream in Feet Per Minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw)
RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Series CC5F - Specifications

CC5F-1 G/S Grille Size - Surface Mount

CC5F-1 F/S Filter Size - Surface Mount

CC5F-6 G/S Grille Size - T-bar Lay-in

CC5F-6 F/S Filter Size - T-bar Lay-in

Air Inlets shall be Model: CC5 with a 1/2" x 1/2" x 1/2" cubed core manufactured by METALAIR®. Border shall be 1 1/4" wide. Units shall be filter return or exhaust grilles of aluminum construction and with an extruded aluminum border and an aluminum cubed core. Units shall include a hinged face and integral frame designed to accept a 1" thick filter. Filter face shall be secured in place with 1/4" turn fasteners. The units shall be the size and quantity as outlined in the plans and specifications.

Option G/S or F/S

- Inlets shall be size to fit the required filter dimensions (option F/S)
- Inlets shall be sized to fit the listed duct dimension (option G/S)

For T-Bar Lay-in

Units shall be designed to integrate into the specified ceiling system.

For Surface mounting

Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

GAR - Grilles and Registers

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaline cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series CC5F - Model Specification Guide

Return and Exhaust Filter Grille

Series CC5F - Aluminum - 1/2" x 1/2" x 1/2" Cube Core

Model	Available Neck	Available Finishes	Available Options	
CC5F-1 F/S - Surface Mount Filter Grille (Filter Size) CC5F-1 G/S - Surface Mount Filter Grille (Grille Size)	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 -White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum		
		03 - Black		
		24 - Mill		
		28 - Custom Color		

Return and Exhaust Filter Grille

Series CC5F - Aluminum - 1/2" x 1/2" x 1/2" Cube Core

For T-bar Lay-in Ceiling Grid Applications

Model	Available Neck	Available Finishes	Available Options	
CC5F-1 F/S - Surface Mount Filter Grille (Filter Size) CC5F-1 G/S - Surface Mount Filter Grille (Grille Size)	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 -White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum		
		03 - Black		
		24 - Mill		
		28 - Custom Color		



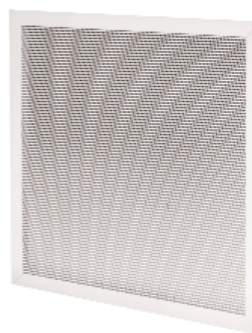
GAR - Grilles and Registers

7/2006

➔ Filter Return Grilles & Registers ➔ Perforated Face ➔ Series RPF ➔ Aluminum

Product Details

- ★ The series RPF perforated face return or exhaust filter grilles are designed to blend into the ceiling system and provide a clean, uncluttered architectural appearance
- ★ The series RPF is designed for 1" thick filters (by others) and includes a hinged face with 1/4" turn fasteners for quick filter changes
- ★ Series RPF is of aluminum construction and ideal for return and exhaust filter applications requiring low pressure drops and low sound

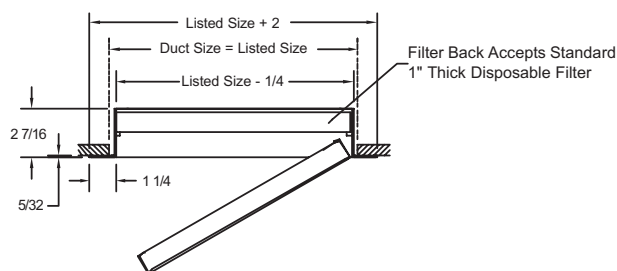


Model RPF-1 Shown

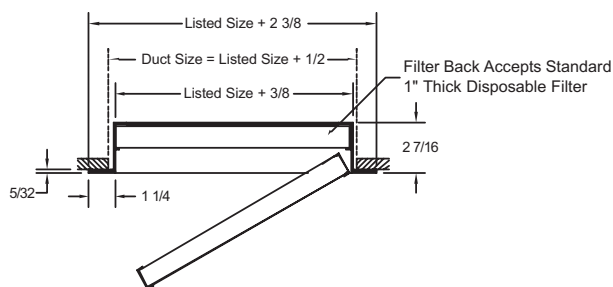
Standard Finish: 01 White

Sideview, dimensions are in inches

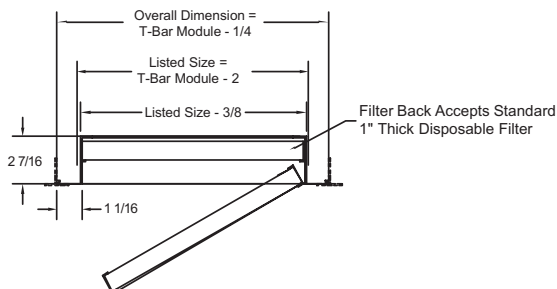
Filter Return Grille & Registers - Grille Size Filter - Surface Mount Model RPF-1 GS



Filter Return Grille & Registers - Filter Size Filter - Surface Mount Model RPF-1 FS



Filter Return Grille & Registers - Grille Size Filter - T-bar Lay-in Model RPF-6 GS



Grilles and Registers

GAR

1. Available Finishes	2. Available Accessories	3. Construction Details
<p>Standard Finish: 01 White</p> <p>Optional Finishes: 02 Aluminum paint 03 Black 24 Mill finish 28 Custom color</p>	<p>OBD - Steel - Opposed Blade Damper.....204 OBDA - Aluminum - Opposed Blade Damper204 L9 - Equalizing Grid204 PF - Plaster Frame205</p>	<ul style="list-style-type: none"> • Frame and perforated face are aluminum • Can be ordered as either G/S (grille size) or F/S (filter size) • Can be ordered to fit standard T-bar sizes

GAR - Grilles and Registers

Series RPF - Performance

Models RPF-1 GS, RPF-1 FS, RPF-6 GS

CFM	Ak	NECK SIZE														NC
		8" x 8"	10" x 10"	12" x 12"	14" x 14"	16" x 16"	18" x 18"	20" x 20"	22" x 22"	24" x 24"	30" x 24"	36" x 24"	40" x 24"	44" x 24"	48" x 24"	
		.36	.56	.80	1.09	1.42	1.80	2.22	2.69	3.20	4.00	4.80	5.33	5.87	6.40	
200	Nk Vel Ps	450 .003	288 .001	200 .001												
400	Nk Vel Ps	900 .012	576 .005	400 .002	294 .001	225 .001										
600	Nk Vel Ps		864 .011	600 .005	441 .003	338 .002	267 .001	216 .001								
800	Nk Vel Ps			800 .010	588 .005	450 .003	356 .002	298 .001	238 .001	200 .001						
1000	Nk Vel Ps				735 .008	563 .005	444 .003	360 .002	298 .001	250 .001	200 .001					
1200	Nk Vel Ps				882 .012	675 .007	533 .004	432 .003	357 .002	300 .001	240 .001	200 .001				
1400	Nk Vel Ps					787 .009	622 .006	504 .004	417 .003	350 .002	280 .001	233 .001	210 .001			
1600	Nk Vel Ps					900 .012	711 .008	576 .005	476 .003	400 .002	320 .002	267 .001	240 .001	218 .001	200 .001	
1800	Nk Vel Ps						800 .010	648 .006	536 .004	450 .003	360 .002	300 .001	270 .001	245 .001	225 .001	
2000	Nk Vel Ps						889 .012	720 .008	595 .005	500 .004	400 .002	333 .002	300 .001	273 .001	250 .001	
2400	Nk Vel Ps							864 .011	714 .008	600 .005	480 .004	400 .002	360 .002	327 .002	300 .001	
2800	Nk Vel Ps								833 .011	700 .007	560 .005	467 .003	420 .003	382 .002	350 .002	
3200	Nk Vel Ps									800 .011	640 .006	533 .004	480 .004	436 .003	400 .002	
3600	Nk Vel Ps									900 .012	720 .008	600 .005	540 .004	491 .004	450 .003	
NC		35 - 40										30 - 35				

Performance Notes for Series RPF

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Nk Vel - Neck velocity of air stream in Feet Per Minute
- Ps - Negative Static pressure (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw)
RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Series RPF - Specifications

Model RPF-1 G/S Grille Size - Surface Mount

Model RPF-1 F/S Filter Size - Surface Mount

Air Inlets shall be model RPF manufactured by METALAIR®. Units shall be perforated face, return or exhaust grilles constructed of aluminum. Perforate face shall have 3/16" diameter holes on 1/4" centers and shall have a 51% free area. Units shall include a hinged face and integral frame designed to accept a 1" thick filter. Filter face shall be secured in place with 1/4 turn fasteners. The units shall be the size and quantity as outlined in the plans and specifications.

Option G/S or F/S

- Inlets shall be size to fit the required filter dimensions (option F/S)
- Inlets shall be sized to fit the listed duct dimension (option G/S)

Border shall be 1 1/4". Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Damper Accessories (Optional)

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.



Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series RPF - Model Specification Guide

Return and Exhaust Filter Grille

Series RPF - Perforated Face - Aluminum


Model	Available Neck	Available Finishes	Available Options	
RPF-1 F/S - Surface Mount Filter Grille (Filter Size) RPF-1 G/S - Surface Mount Filter Grille (Grille Size)	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
		01 - White	OBDA	Opposed Blade Damper - Aluminum
		Optional	L9	Equalizing Grid
		02 - Aluminum		
		03 - Black		
		24 - Mill		
		28 - Custom Color		

Return and Exhaust Filter Grille

Series RPF - Perforated Face - Aluminum

For T-bar Lay-in Ceiling Grid Applications

Model	Available Neck	Module	Available Finishes	Available Options	
RPF-6 G/S - T-bar Lay-in Filter Grille (Grille Size)	6" x 6" to 10" x 10"	12" x 12"	Standard	OBD	Opposed Blade Damper - Steel
	6" x 6" to 22" x 22"	24" x 24"	01 - White	OBDA	Opposed Blade Damper - Aluminum
	6" x 6" to 46" x 22"	48" x 24"	Optional	L9	Equalizing Grid
			02 - Aluminum		
			03 - Black		
			24 - Mill		
			28 - Custom Color		



IND

**INDUSTRIAL /
HIGH CAPACITY DEVICES**

Series 4100 Series 4200 Series 4300

Pg. 112

Industrial/High Capacity Grilles & Registers - Modular Frame/Multi-Core - Aluminum Series 4100, 4200, 4300

- ★ Series 4100, 4200 and 4300 industrial grilles and registers are engineered specifically for high capacity industrial air distribution applications where performance is a priority
- ★ The series 4100, 4200 and 4300 models are designed for ceiling and high sidewall installation and are available with of choice of three collar depths
- ★ Series 4100, 4200 and 4300 are excellent selections for industrial applications requiring high capacity and performance

Series 4100	Vertical Blades	Horizontal Blades
Single Deflection	V4152	H4152
Double Deflection - Front Blades	V4154	H4154
Single Deflection - Inverted Frame	V4152 IF	H4152 IF
Double Deflection - Inverted Frame - Front Blades	V4154 IF	H4154 IF
Single Deflection - w/ Trunk Latch Frame	V4152-TLF	H4152-TLF
Double Deflection - Front Blades - w/ Trunk Latch Frame	V4154-TLF	H4154-TLF
Modular Frame - Single Deflection	V4152MF	H4152MF
Modular Frame - Double Deflection	V4154MF	H4154MF

Series 4200	Vertical Blades	Horizontal Blades
Single Deflection	V4252	H4252
Double Deflection - Front Blades	V4254	H4254
Single Deflection - Inverted Frame	V4252 IF	H4252 IF
Double Deflection - Inverted Frame - Front Blades	V4254 IF	H4254 IF
Single Deflection - w/ Trunk Latch Frame	V4252-TLF	H4252-TLF
Double Deflection - Front Blades - w/ Trunk Latch Frame	V4254-TLF	H4254-TLF
Modular Frame - Single Deflection	V4252MF	H4252MF
Modular Frame - Double Deflection	V4254MF	H4254MF

Series 4300	Vertical Blades	Horizontal Blades
Single Deflection	V4352	H4352
Double Deflection - Front Blades	V4354	H4354
Modular Frame - Single Deflection	V4352MF	H4352MF
Modular Frame - Double Deflection	V4354MF	H4354MF

Gang Operator for Series 4100, 4200, & 4300	Vertical Blades	Horizontal Blades
Gang Operator	GOV	GOH

Airfoil Blades for Series 4100 & 4200	
Optional Airfoil Blades (Mounted)	AB

Series	Collar	Blades	Center
4100	4 3/8"	1 1/2"	1 1/2"
4200	1 7/8"	1 1/2"	1 1/2"
4300	7"	3"	3"





Model RL
Pg. 124

Industrial/High Capacity Drum Louver - Supply - Extruded Aluminum - Series RL Roto-Louver

- ✧ The series RL Roto-Louver outlets are engineered for high capacity, long throw applications such as sports arenas, gymnasiums, conference centers, industrial plants and other large spaces.
- ✧ The series RL units have the flexibility to change throw direction and spread of the discharge jet with individually adjustable deflection blades and a rotating cylindrical drum assembly.
- ✧ Series RL Roto-Louver outlets are an excellent choice for high capacity, long throw applications. These units offer flexibility allowing installation in a variety of applications.

Roto-Louver
RL
RL-DF Dual Flow
RL-GO Gang Operator



Model JA-1
Pg. 134

High Capacity - Supply - Round Neck - Steel - Series JA - Jet*Aire

- ✧ Jet*Aire Diffusers offer an economical solution to high capacity air distribution applications requiring long throw distances. This diffuser can be effectively applied to large space applications such as civic centers, auditoriums, and arenas.
- ✧ Units are available as a single diffuser, or multiple diffusers mounted in a panel.
- ✧ Jet*Aire Diffusers are an excellent choice for high capacity, long throw applications. The modular design of the Jet*Aire diffusers allows selection for a wide range of air volumes

Jet*Aire
JA-1 Surface Mount - Single Unit
JA-1P Panel Mounted - 1 Unit
JA-2P Panel Mounted - 2 Units
JA-3P Panel Mounted - 3 Units
JA-4P Panel Mounted - 4 Units
JA-1EX Exposed Duct Mount - No Panel



Model OAL
Pg. 138

Outside Air Louvers - Extruded Aluminum - Series OAL

- ✧ Series OAL stationary outside air louvers are fixed multiple blade air distribution devices designed for installation in building exterior wall openings
- ✧ The series OAL inhibit the entrance of wind, rain, snow, sleet, sand, birds, insects, and airborne debris while serving to enhance the building's exterior appearance
- ✧ Each series OAL blade has a 45° face deflection and includes a water baffle with a 1/4" return bend
- ✧ Series OAL blades also overlap to improve the weather resistance of the louver

Type "C" Channel Frame	Type "F" Flange Frame
OAL2C 2" Depth	OAL2F 2" Depth
OAL4C 4" Depth	OAL4F 4" Depth



Model MPK
Pg. 146

Industrial/High Capacity Punkah Louver Global Adjustment - Aluminum - Model MPK

- ✧ Model MPK discharges a high-velocity jet that can be directed to condition a specific space or area
- ✧ The model MPK is constructed using a felt gasket that allows smooth movement of the inner core to direct air flow and provides a tight seal to prevent air leakage
- ✧ An optional aperture damper is available which includes an adjustment knob and stainless steel linkage and tension springs for maximum corrosion protection



Model MRDD
Pg. 150

Architectural - High Velocity - Round - Series MRD

- ✧ An excellent selection for architecturally pleasing applications requiring an adjustable outlet with high capacities and long throw.
- ✧ Heavy gauge aluminum construction
- ✧ Available in single and double deflection
- ✧ Unit is designed for surface mounting with concealed fastening

Single Deflection	Double Deflection
MRDS	MRDD



Supply/Modular Frame/Multi-Core Series 4100/4200/4300 Aluminum

Product Details

- Series 4100, 4200 and 4300 industrial grilles and registers are engineered specifically for high capacity industrial air distribution applications where performance is a priority
- The series 4100, 4200 and 4300 models are designed for ceiling and high sidewall installation and are available with of choice of three collar depths
- Series 4100, 4200 and 4300 are excellent selections for industrial applications requiring high capacity and performance



Model V4154 Shown

Standard Finish: 02 Aluminum

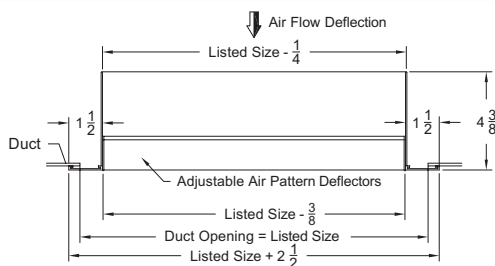
Series 4100 4 3/8" Deep Collar - 1 1/2" Blades - 1 1/2" Centers

Sideview, dimensions are in inches

Supply Grille/Multi-Core - Single Deflection - 4 3/8" Deep Collar 1 1/2" Blades - 1 1/2" Centers

Model H4152 - Horizontal Blades

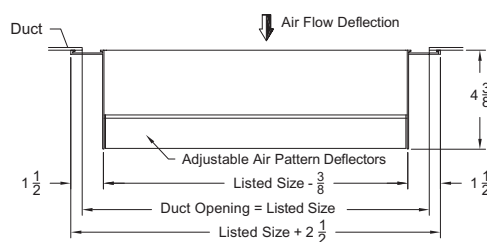
Model V4152 - Vertical Blades



Supply Grille/Multi-Core - Single Deflection - 4 3/8" Deep Collar 1 1/2" Blades - 1 1/2" Centers - Inverted Frame

Model H4152IF - Horizontal Blades

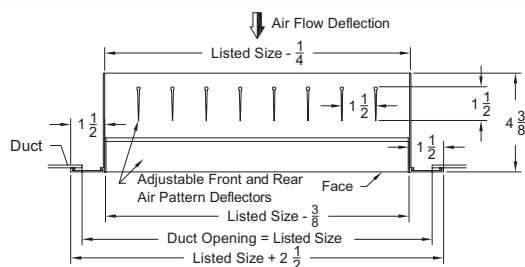
Model V4152IF - Vertical Blades



Supply Grille/Multi-Core - Double Deflection - 4 3/8" Deep Collar 1 1/2" Blades - 1 1/2" Centers

Model H4154 - Horizontal Blades

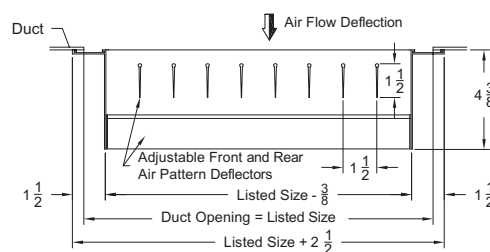
Model V4154 - Vertical Blades



Supply Grille/Multi-Core - Double Deflection - 4 3/8" Deep Collar 1 1/2" Blades - 1 1/2" Centers - Inverted Frame

Model H4154IF - Horizontal Blades

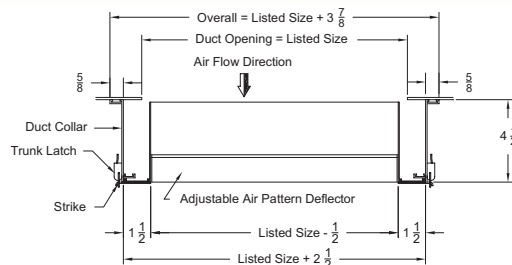
Model V4154IF - Vertical Blades



Supply Grille/Multi-Core - Single Deflection - 4 3/8" Deep Collar 1 1/2" Blades - 1 1/2" Centers - With Trunk Latch Frame

Model H4152 TLF - Horizontal Blades

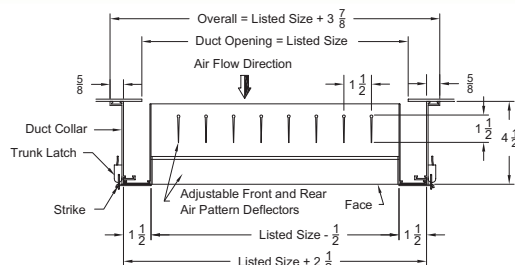
Model V4152 TLF - Vertical Blades



Supply Grille/Multi-Core - Double Deflection - 4 3/8" Deep Collar 1 1/2" Blades - 1 1/2" Centers - With Trunk Latch Frame

Model H4154 TLF - Horizontal Blades

Model V4154 TLF - Vertical Blades

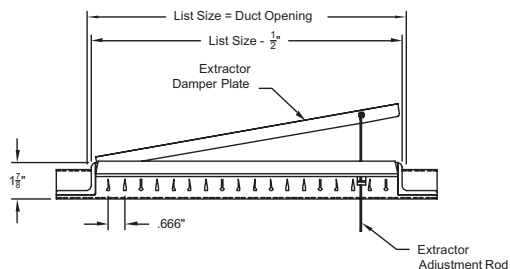


Series 4200 → 1 7/8" Deep Collar - 1 1/2" Blades - 1 1/2" Centers

Supply Grille/Multi-Core - Single Deflection - 1 7/8" Deep Collar
1 1/2" Blades - 1 1/2" Centers

Model H4252 - *Horizontal Blades*

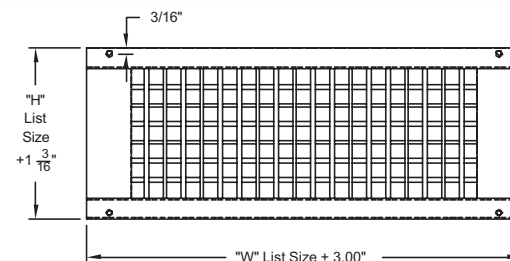
Model V4252 - *Vertical Blades*



Supply Grille/Multi-Core - Single Deflection - 1 7/8" Deep Collar
1 1/2" Blades - 1 1/2" Centers - Inverted Frame

Model H4252IF - *Horizontal Blades*

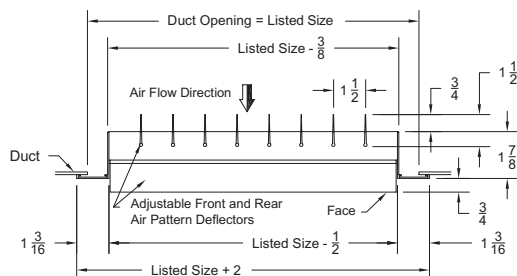
Model V4252IF - *Vertical Blades*



Supply Grille/Multi-Core - Double Deflection - 1 7/8" Deep Collar
1 1/2" Blades - 1 1/2" Centers

Model H4254 - *Horizontal Blades*

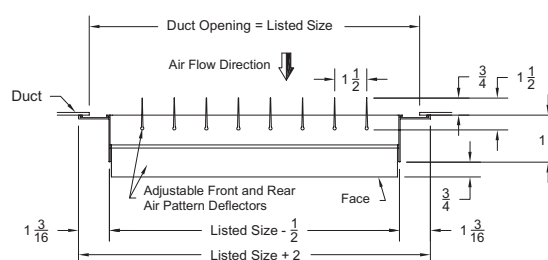
Model V4254 - *Vertical Blades*



Supply Grille/Multi-Core - Double Deflection - 1 7/8" Deep Collar
1 1/2" Blades - 1 1/2" Centers - Inverted Frame

Model H4254IF - *Horizontal Blades*

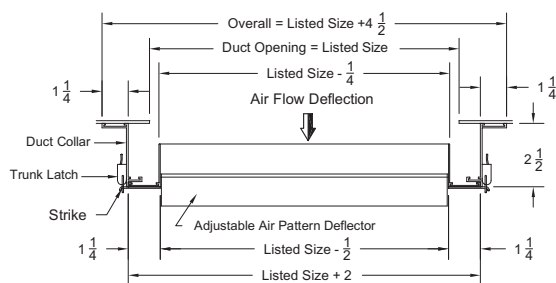
Model V4254IF - *Vertical Blades*



Supply Grille/Multi-Core - Single Deflection - 1 7/8" Deep Collar
1 1/2" Blades - 1 1/2" Centers - With Trunk Latch Frame

Model H4252 TLF - *Horizontal Blades*

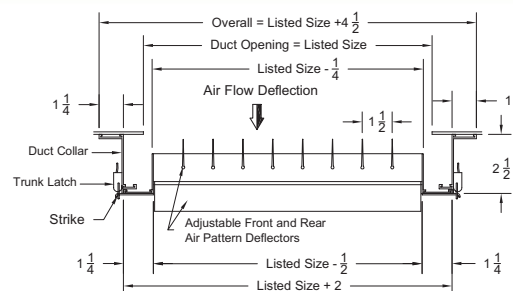
Model V4252 TLF - *Vertical Blades*



Supply Grille/Multi-Core - Double Deflection - 1 7/8" Deep Collar
1 1/2" Blades - 1 1/2" Centers - With Trunk Latch Frame

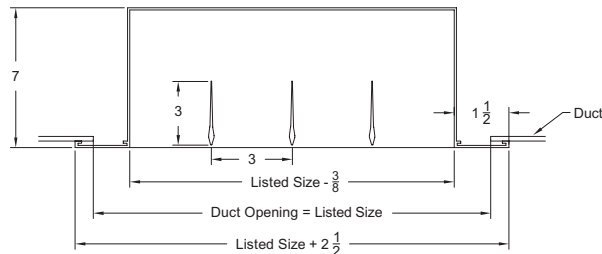
Model H4254 TLF - *Horizontal Blades*

Model V4254 TLF - *Vertical Blades*

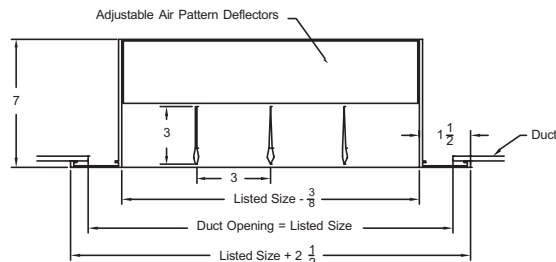


Series 4300 ➔ 7" Deep Collar - 3" Blades - 3" Centers

Supply Grille/Multi-Core - Single Deflection - 7" Deep Collar
3" Blades - 3" Centers
Model H4352 - Horizontal Blades
Model V4352 - Vertical Blades

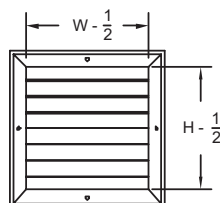


Supply Grille/Multi-Core - Double Deflection - 7" Deep Collar
3" Blades - 3" Centers
Model H4352 - Horizontal Blades
Model V4352 - Vertical Blades

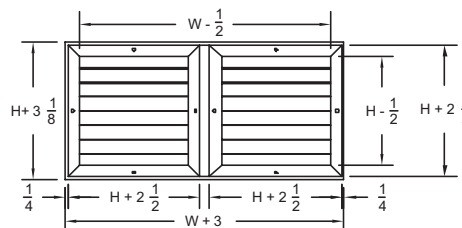


Series 4100/4200/4300 ➔ Modular Frame

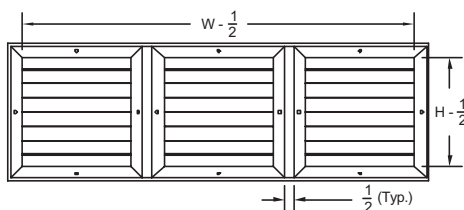
Modular Frame Industrial Grille - 1-1 Core
Series 4100 MF - 4 3/8" Deep Frame
Series 4200 MF - 1 7/8" Deep Narrow Frame
Series 4300 MF - 7" Deep Frame



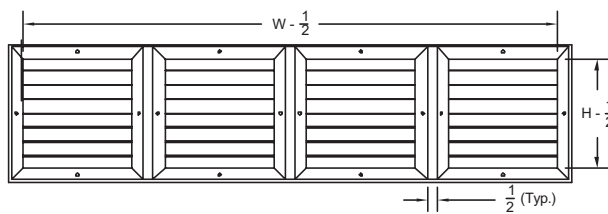
Modular Frame Industrial Grille - 2-2 Core
Series 4100 MF - 4 3/8" Deep Frame
Series 4200 MF - 1 7/8" Deep Narrow Frame
Series 4300 MF - 7" Deep Frame



Modular Frame Industrial Grille - 3-3 Core
Series 4100 MF - 4 3/8" Deep Frame
Series 4200 MF - 1 7/8" Deep Narrow Frame
Series 4300 MF - 7" Deep Frame



Modular Frame Industrial Grille - 4-4 Core
Series 4100 MF - 4 3/8" Deep Frame
Series 4200 MF - 1 7/8" Deep Narrow Frame
Series 4300 MF - 7" Deep Frame



Modular Frame	Duct Dimension W			
	1-1 Core	2-2 Core	3-3 Core	4-4 Core
8	8	19	30	41
10	10	23	36	49
12	12	27	42	57
15	15	33	51	69

Modular Frame		
Model	Vertical Blade	Horizontal Blade
Series 4100		
Single Deflection	V4152 MF	H4152 MF
Double Deflection	V4154 MF	H4154 MF
Series 4200		
Single Deflection	V4252 MF	H4252 MF
Double Deflection	V4254 MF	H4254 MF
Series 4300		
Single Deflection	V4352 MF	H4352 MF
Double Deflection	V4354 MF	H4354 MF

IND - Industrial / High Capacity Devices

Notes for Models 4100, 4200, 4300, 4100 IF, 4200 IF, 4300 IF

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 02 Aluminum Optional Finish: 01 White 03 Black 04 Clear Anodized 24 Mill finish 28 Custom color	OBD - Steel - Opposed Blade Damper204 (not for use with inverted frame) OBDA - Aluminum -Opposed Blade Damper .204 (not for use with inverted frame)	TLF -Trunk Latch Frame MF -Modular Frame GOH - Gang Operator for Horizontal Blades GOV - Gang Operator for Vertical Blades AB - Airfoil Blades	<ul style="list-style-type: none"> Maximum 1-piece dimension 48" x 48" Oversized units made in multiple sections, each with full flanges Mullion strips provided for joining units in the field

Notes for Models 4100 TLF, 4200 TLF, 4300 TLF

1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 02 Aluminum Optional Finish: 01 White 03 Black 04 Clear Anodized 24 Mill finish 28 Custom color	(Shipped Unattached) OBD - Steel - Opposed Blade Damper204 OBDA - Aluminum -Opposed Blade Damper ..204	(Factory Mounted) GOH - Gang Operator for Horizontal Blades GOV - Gang Operator for Vertical Blades AB - Airfoil Blades	<ul style="list-style-type: none"> Maximum 1-piece dimension 48" x 48" No oversized units available on TLF option

Notes for Models 4100MF, 4200MF, 4300MF

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 02 Aluminum Optional Finish: 01 White 03 Black 28 Custom color	TLF -Trunk Latch Frame MF -Modular Frame GOH - Gang Operator for Horizontal Blades.....205 GOV - Gang Operator for Vertical Blades205 AB - Airfoil Blades205	<ul style="list-style-type: none"> Sizes only as listed in tables Dampers can be mounted on each individual core Dampers not available on Models H4254, and V4254 Cores are extruded aluminum, panels are steel



IND - Industrial / High Capacity Devices

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Series 4100/4200/4300 - Performance

Series 4100, 4200, 4300

CFM	Listed Size (Inches)	12" x 6"			14" x 6"			12" x 10" 10" x 8"			12" x 10" 16" x 6"			16" x 8"		
	Average Ac Core Area Sq. Ft.	0.44			0.50			0.59			0.75			0.80		
	Deflection	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°
No Mullions																
100	Velocity Throw Pt NC	325 7 .006 -	340 5 .007 -	435 4 .012 -												
150	Velocity Throw Pt NC	490 10 .015 -	515 8 .016 -	655 5 .027 -	435 10 .012 -	453 8 .013 -	575 5 .020 -	365 9 .008 -	385 7 .009 -	490 5 .015 -						
200	Velocity Throw Pt NC	655 14 .027 -	685 10 .029 -	875 8 .048 -	580 13 .020 -	605 10 .023 -	770 7 .037 -	490 12 .015 -	510 9 .016 -	650 7 .026 -	385 11 .009 -	400 8 .010 -	510 4 .016 -	365 11 .008 -	380 8 .009 -	485 6 .015 -
250	Velocity Throw Pt NC	820 18 .042 -	855 14 .045 -	1090 10 .074 -	720 16 .032 -	755 12 .035 -	960 9 .057 -	610 15 .023 -	640 11 .025 -	815 8 .041 -	480 13 .014 -	500 10 .015 -	640 7 .025 -	455 13 .013 -	475 10 .014 -	605 7 .023 -
300	Velocity Throw Pt NC	985 21 .060 -	1025 16 .065 -	1310 11 .107 -	865 20 .047 -	905 15 .051 -	1155 11 .083 -	735 18 .034 -	765 14 .036 -	975 10 .059 -	575 16 .020 -	600 12 .022 -	765 9 .036 -	545 16 .018 -	570 12 .020 -	725 9 .033 -
350	Velocity Throw Pt NC	1145 25 .082 24	1195 19 .089 25	1525 14 .145 30	1010 23 .063 20	1055 18 .069 21	1345 13 .113 26	855 21 .045 -	895 16 .050 -	1140 11 .081 -	675 19 .028 -	700 15 .030 -	895 10 .050 -	635 18 .025 -	665 14 .027 -	845 10 .044 -
400	Velocity Throw Pt NC	1310 28 .107 28	1370 21 .117 29	1745 15 .190 34	1155 27 .083 24	1210 21 .091 25	1540 15 .148 30	980 24 .059 20	1025 18 .065 21	1300 13 .105 26	770 22 .037 -	805 17 .040 -	1025 12 .065 -	725 21 .033 -	760 16 .036 -	965 11 .058 -
450	Velocity Throw Pt NC	1475 31 .135 31	1540 24 .148 32	1965 17 .241 37	1300 30 .105 27	1360 23 .115 28	1730 16 .186 33	1100 27 .075 23	1150 21 .082 24	1465 15 .134 29	865 24 .047 -	905 18 .051 -	1150 13 .082 -	820 24 .042 -	855 18 .045 -	1085 13 .073 -
500	Velocity Throw Pt NC	1640 35 .167 35	1710 27 .182 36	2185 19 .297 41	1445 33 .130 31	1510 25 .142 32	1925 18 .231 37	1225 31 .093 27	1280 24 .102 28	1600 17 .166 33	960 27 .057 20	1005 21 .063 21	1280 15 .102 26	910 26 .052 -	950 20 .056 -	1205 14 .090 -
600	Velocity Throw Pt NC				1735 40 .187 36	1810 31 .204 37	2305 22 .331 42	1470 37 .135 32	1535 28 .147 33	1955 20 .238 38	1155 33 .083 26	1205 25 .090 27	1535 18 .147 32	1090 32 .074 23	1340 25 .112 24	1450 18 .131 29
700	Velocity Throw Pt NC							1715 43 .183 37	1790 33 .199 38	2280 24 .324 43	1345 38 .113 30	1405 29 .123 31	1790 21 .199 36	1270 37 .100 28	1330 28 .110 29	1690 20 .178 34
800	Velocity Throw Pt NC										1540 43 .148 34	1605 33 .160 35	2045 24 .260 40	1455 42 .132 32	1520 32 .144 33	1930 23 .232 38
900	Velocity Throw Pt NC										1730 49 .186 38	1805 38 .203 39	2300 27 .329 44	1635 48 .166 35	1705 37 .181 36	2175 26 .295 41
1000	Velocity Throw Pt NC													1820 53 .206 39	1895 41 .224 40	2415 29 .364 45

For performance notes, see page IND-120



IND - Industrial / High Capacity Devices

Series 4100/4200/4300 - Performance

Series 4100, 4200, 4300 - continued

CFM	Listed Size (Inches)	24" x 6"			30" x 6"			34" x 6" 20" x 10"			38" x 6" 28" x 8" 22" x 10"			38" x 6" 28" x 8" 22" x 10"			38" x 6" 28" x 8" 22" x 10"		
	Average Ac Core Area Sq. Ft.	0.89			1.13			1.29			1.42			1.55			1.83		
	Deflection	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°
		One Front Mullion																	
200	Velocity Throw Pt NC	355 11 .007 -	375 8 .008 -	475 6 .014 -															
250	Velocity Throw Pt NC	445 14 .012 -	465 11 .013 -	590 8 .021 -	350 12 .007 -	365 9 .008 -	465 7 .013 -												
300	Velocity Throw Pt NC	535 16 .017 -	560 12 .019 -	710 9 .031 -	420 14 .010 -	440 11 .012 -	560 8 .019 -	370 14 .008 -	385 11 .009 -	490 8 .014 -									
350	Velocity Throw Pt NC	625 19 .024 -	650 15 .026 -	830 10 .043 -	490 17 .014 -	515 13 .016 -	655 9 .026 -	430 16 .011 -	450 12 .012 -	575 9 .020 -	395 15 .009 -	410 11 .010 -	520 8 .017 -	360 14 .008 -	375 11 .009 -	480 8 .014 -	305 13 .005 -	315 10 .006 -	405 7 .010 -
400	Velocity Throw Pt NC	715 22 .031 -	745 17 .034 -	945 12 .055 -	565 20 .019 -	590 15 .021 -	745 11 .034 -	495 18 .015 -	515 14 .016 -	655 10 .026 -	450 17 .012 -	470 13 .013 -	595 9 .022 -	410 16 .010 -	430 12 .011 -	545 9 .018 -	345 15 .007 -	360 11 .008 -	460 8 .013 -
450	Velocity Throw Pt NC	805 25 .040 -	840 19 .044 -	1065 14 .070 -	635 22 .025 -	660 17 .027 -	840 12 .044 -	555 20 .019 -	580 15 .020 -	735 11 .033 -	505 20 .015 -	525 15 .017 -	670 11 .027 -	465 18 .013 -	485 14 .014 -	615 10 .023 -	390 17 .009 -	410 13 .010 -	520 9 .017 -
500	Velocity Throw Pt NC	890 27 .049 -	930 21 .053 -	1185 15 .087 -	705 24 .030 -	735 18 .033 -	935 13 .054 -	615 23 .023 -	645 18 .025 -	820 13 .042 -	560 22 .019 -	585 17 .021 -	745 12 .034 -	515 21 .016 -	540 16 .018 -	685 11 .029 -	435 19 .011 -	455 14 .012 -	575 10 .020 -
600	Velocity Throw Pt NC	1070 33 .071 23	1120 25 .078 24	1420 18 .125 30	845 29 .044 23	880 22 .048 24	1120 16 .078 29	740 27 .034 21	775 21 .037 15	985 15 .060 29	675 26 .028 20	705 20 .030 14	895 14 .049 20	620 25 .023 19	645 19 .025 14	820 12 .042 18	520 23 .017 18	545 18 .018 12	690 12 .029 12
700	Velocity Throw Pt NC	1250 38 .097 27	1305 29 .106 28	1660 21 .172 33	985 34 .060 23	1030 26 .066 24	1310 19 .107 29	865 32 .046 25	900 25 .050 22	1145 18 .082 31	785 30 .038 23	820 23 .042 16	1045 16 .068 29	720 29 .032 21	755 22 .035 16	960 16 .057 20	610 26 .023 19	635 20 .025 14	810 14 .040 10
800	Velocity Throw Pt NC	1430 44 .127 31	1490 34 .138 32	1895 24 .223 37	1125 39 .078 28	1175 30 .086 29	1495 21 .139 34	985 36 .060 22	1030 28 .066 23	1310 20 .107 28	900 35 .050 -	935 27 .054 -	1195 19 .089 -	825 33 .042 -	860 25 .046 -	1095 18 .074 -	695 31 .030 -	725 24 .032 -	925 17 .053 -
900	Velocity Throw Pt NC	1605 49 .161 35	1680 38 .176 36	2130 27 .282 42	1265 44 .099 31	1325 34 .109 32	1680 24 .176 37	1110 41 .076 25	1160 31 .083 26	1475 22 .136 31	1010 39 .063 23	1055 30 .069 24	1345 21 .113 29	925 37 .053 20	970 28 .058 21	1230 20 .094 26	780 40 .038 20	815 26 .041 19	1040 19 .067 -
1000	Velocity Throw Pt NC	1785 55 .199 38	1865 42 .216 39	2370 30 .350 44	1410 49 .124 34	1470 38 .135 35	1870 27 .218 41	1235 46 .095 29	1290 35 .103 30	1640 25 .167 35	1125 44 .078 26	1170 34 .085 27	1490 24 .138 32	1030 42 .066 24	1075 32 .072 25	1370 23 .117 30	870 36 .047 -	905 28 .051 -	1155 20 .083 -
1100	Velocity Throw Pt NC				1550 54 .150 37	1615 41 .163 38	2055 30 .263 44	1360 50 .115 32	1415 38 .124 33	1805 27 .203 38	1235 48 .095 29	1290 37 .103 30	1640 26 .167 35	1135 46 .080 27	1185 35 .087 28	1505 25 .141 34	955 42 .057 21	1000 32 .062 22	1270 23 .100 27
1200	Velocity Throw Pt NC				1690 59 .178 40	1765 45 .194 41	2240 32 .313 46	1480 55 .137 34	1545 42 .149 35	1965 30 .241 40	1350 52 .113 32	1405 40 .123 33	1790 29 .200 38	1235 50 .095 29	1290 38 .103 30	1645 27 .169 35	1045 46 .068 24	1090 35 .074 25	1385 25 .119 30
1300	Velocity Throw Pt NC							1605 59 .161 37	1675 45 .175 38	2130 32 .282 43	1460 57 .133 34	1525 44 .145 35	1940 31 .234 40	1340 54 .112 32	1400 41 .122 33	1780 30 .198 38	1130 49 .079 26	1180 38 .086 27	1500 27 .140 32
1400	Velocity Throw Pt NC							1730 64 .186 39	1805 49 .203 40	2295 35 .327 45	1575 61 .155 36	1640 47 .167 37	2090 33 .272 42	1445 59 .130 34	1505 45 .141 35	1915 32 .228 40	1215 53 .092 28	1270 41 .100 29	1615 29 .163 34
1200	Velocity Throw Pt NC										1685 65 .177 38	1760 50 .193 39	2240 36 .313 44	1545 63 .149 36	1615 48 .163 37	2055 34 .263 42	1305 57 .106 31	1360 44 .115 32	1730 31 .186 37
1300	Velocity Throw Pt NC										1795 70 .201 40	1875 54 .219 41	2390 38 .356 46	1650 67 .170 38	1720 51 .184 39	2190 37 .299 44	1390 61 .120 33	1450 47 .131 34	1845 33 .212 39
1400	Velocity Throw Pt NC										2020 78 .254 44	2110 60 .277 45	2685 43 .449 50	1855 75 .214 42	1935 58 .233 43	2465 41 .378 48	1565 69 .113 36	1635 53 .166 37	2080 38 .269 42

For more product information visit us at www.metalair.com

Series 4100/4200/4300 - Performance

Series 4100, 4200, 4300 - continued

CFM	Listed Size (Inches)	20" x 20"			24" x 24"			28" x 24"			36" x 24"			38" x 24"		
	Average Ac Core Area Sq. Ft.	2.64			3.38			4.49			5.79			6.12		
	Deflection	0° 22 1/2° 45°			0° 22 1/2° 45°			0° 22 1/2° 45°			0° 22 1/2° 45°			0° 22 1/2° 45°		
		One Front and One Rear Mullion														
600	Velocity Throw Pt NC	345 18 .007 -	365 14 .008 -	460 10 .013 -												
700	Velocity Throw Pt NC	405 21 .010 -	425 16 .011 -	540 11 .018 -												
800	Velocity Throw Pt NC	465 24 .013 -	485 18 .014 -	561 13 .023 -												
900	Velocity Throw Pt NC	520 27 .017 -	545 21 .018 -	690 15 .029 -	360 23 .008 -	375 18 .009 -	480 12 .014 -									
1000	Velocity Throw Pt NC	580 31 .020 -	605 24 .022 -	770 17 .036 -	400 25 .009 -	415 19 .010 -	530 14 .017 -	340 23 .007 -	355 18 .008 -	455 13 .012 -						
2000	Velocity Throw Pt NC	1160 61 .083 23	1210 47 .091 24	1540 33 .148 29	800 51 .039 20	830 39 .043 21	1060 28 .070 26	680 46 .028 -	710 36 .031 -	910 26 .052 -	530 41 .017 -	550 31 .019 -	700 22 .030 -	500 40 .015 -	520 31 .017 -	655 22 .027 -
3000	Velocity Throw Pt NC	1740 92 .189 35	1815 70 .205 36	2310 50 .332 41	1200 76 .089 32	1250 58 .097 33	1590 42 .158 38	1020 69 .064 28	1065 54 .070 29	1365 39 .116 34	795 62 .039 -	825 46 .042 -	1050 33 .068 -	750 60 .035 -	780 46 .038 -	995 33 .061 -
3500	Velocity Throw Pt NC	2030 108 .256 40	2120 83 .280 41	2695 59 .453 46	1400 89 .122 36	1460 68 .133 37	1855 49 .214 41	1190 80 .088 32	1245 63 .096 33	1590 45 .158 38	925 72 .053 24	965 54 .058 25	1225 38 .093 30	875 70 .047 20	915 54 .052 21	1165 38 .048 26
4000	Velocity Throw Pt NC				1600 102 .159 41	1670 78 .174 42	2120 58 .280 47	1360 92 .115 36	1420 72 .125 37	1820 52 .206 42	1060 82 .083 28	1100 62 .075 29	1400 44 .122 34	1000 80 .062 25	1045 62 .068 26	1330 44 .110 31
4500	Velocity Throw Pt NC				1800 115 .210 44	1880 88 .221 45	2390 63 .356 50	1530 106 .146 40	1600 82 .159 41	2045 58 .260 46	1195 92 .089 31	1240 70 .095 32	1575 50 .155 37	1125 90 .078 28	1175 69 .86 29	1495 49 .139 34
5000	Velocity Throw Pt NC				2000 127 .249 47	2085 97 .271 48	2655 69 .439 53	1700 115 .180 43	1780 90 .198 44	2265 65 .319 49	1320 102 .108 34	1375 78 .117 35	1755 56 .192 40	1250 100 .097 31	1305 77 .106 32	1660 55 .172 37
5500	Velocity Throw Pt NC							1875 126 .219 46	1960 100 .239 47	2495 72 .388 52	1455 112 .132 37	1520 86 .144 38	1930 61 .232 43	1375 110 .117 34	1435 84 .128 35	1830 60 .208 40
6000	Velocity Throw Pt NC							2045 138 .260 48	2135 108 .284 49	2720 78 .461 54	1585 124 .157 40	1655 92 .171 41	2110 66 .277 46	1500 120 .140 37	1565 92 .153 38	1995 66 .248 43
6500	Velocity Throw Pt NC										1720 135 .184 43	1795 103 .201 44	2285 74 .325 49	1625 130 .165 39	1700 100 .180 40	2160 71 .290 45
7000	Velocity Throw Pt NC										1850 145 .213 45	1935 111 .233 46	2460 79 .377 51	1750 140 .191 41	1830 108 .208 42	2325 76 .337 47
7500	Velocity Throw Pt NC													1875 150 .219 43	1960 116 .239 44	2495 82 .388 49
8000	Velocity Throw Pt NC													2000 160 .249 45	2090 124 .272 46	2660 88 .441 51

For performance notes, see page IND-120

Series 4100/4200/4300 - Performance

Series 4100, 4200, 4300 - continued

CFM	Listed Size (Inches)	48" x 20"			48" x 24"			72" x 20"			72" x 24"			44" x 44"			48" x 48"		
	Average Ac Core Area Sq. Ft.	6.43			7.75			9.68			11.70			13.14			15.67		
	Deflection	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°	0°	22 1/2°	45°
		One Front and One Rear Mullion						Three Front and One Rear Mullion						Two Front and Two Rear Mullion					
2000	Velocity	485	510	645	405	420	535	315	325	415									
	Throw	39	30	21	37	28	20	32	24	17									
	Pt	.014	.016	.025	.010	.011	.017	.006	.007	.010									
	NC	-	-	-	-	-	-	-	-	-									
3000	Velocity	730	760	970	605	630	805	470	490	625	390	405	515						
	Throw	58	45	32	55	42	30	48	36	25	43	33	23						
	Pt	.033	.036	.056	.022	.024	.040	.013	.014	.024	.009	.010	.016						
	NC	-	-	-	-	-	-	-	-	-	-	-	-						
3500	Velocity	850	890	1130	705	740	940	550	575	730	455	475	605	430	455	575	360	380	480
	Throw	68	52	36	64	49	35	56	42	29	50	38	27	50	38	27	46	35	25
	Pt	.045	.049	.079	.030	.034	.055	.019	.020	.033	.012	.014	.022	.011	.012	.020	.008	.009	.014
	NC	-	20	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4000	Velocity	970	1020	1290	810	840	1070	630	650	830	520	540	690	495	515	655	415	430	550
	Throw	78	60	42	74	56	40	64	48	34	58	44	32	58	44	32	53	41	29
	Pt	.058	.064	.103	.040	.044	.071	.024	.026	.043	.017	.018	.029	.015	.016	.026	.010	.011	.019
	NC	24	25	30	21	22	27	-	-	24	-	-	21	-	-	-	-	-	-
4500	Velocity	1095	1145	1450	910	950	1205	705	735	940	585	610	775	555	580	740	465	485	620
	Throw	87	67	48	83	63	45	72	54	38	65	50	35	65	50	35	60	46	33
	Pt	.074	.082	.131	.052	.056	.090	.030	.033	.055	.021	.023	.037	.019	.020	.034	.013	.014	.023
	NC	27	28	33	24	25	30	21	22	27	-	-	24	-	-	21	-	-	-
5000	Velocity	1215	1270	1615	1010	1055	1340	785	820	1040	650	675	860	615	645	820	520	540	690
	Throw	97	75	53	92	70	50	80	60	42	72	55	39	73	56	40	67	51	37
	Pt	.092	.100	.163	.063	.069	.112	.038	.042	.067	.026	.028	.046	.023	.025	.042	.017	.018	.029
	NC	30	31	36	27	28	33	24	25	30	21	22	27	-	-	24	-	-	21
5500	Velocity	1340	1395	1775	1110	1160	1475	865	900	1145	715	745	950	680	710	900	570	595	755
	Throw	106	82	58	100	77	55	88	66	46	79	60	42	79	61	43	73	56	40
	Pt	.112	.121	.197	.076	.083	.136	.046	.050	.082	.031	.034	.056	.028	.031	.050	.020	.022	.035
	NC	33	34	39	30	31	36	27	28	33	24	25	30	21	22	27	-	-	24
6000	Velocity	1460	1520	1940	1210	1260	1610	940	980	1250	780	810	1030	740	775	985	620	650	825
	Throw	116	90	64	111	84	60	96	72	51	86	66	46	86	66	47	80	61	44
	Pt	.133	.144	.234	.091	.098	.162	.055	.059	.097	.038	.040	.066	.034	.037	.060	.023	.026	.042
	NC	36	37	42	33	34	39	30	31	36	27	28	33	24	25	30	21	22	27
6500	Velocity	1580	1650	2100	1315	1370	1745	1020	1065	1355	845	880	1120	800	840	1065	670	700	895
	Throw	126	97	69	119	91	65	104	78	55	93	71	50	93	71	50	86	66	47
	Pt	.156	.170	.274	.107	.117	.190	.064	.070	.114	.044	.048	.078	.039	.044	.070	.027	.030	.049
	NC	38	39	44	35	36	41	32	33	38	29	30	35	26	27	33	23	24	29
7000	Velocity	1700	1780	2260	1410	1480	1880	1100	1150	1460	910	950	1210	860	900	1150	720	755	960
	Throw	136	104	75	128	98	70	112	84	60	100	76	54	100	76	54	92	70	50
	Pt	.180	.198	.318	.124	.137	.221	.075	.082	.133	.052	.056	.091	.046	.050	.082	.032	.035	.057
	NC	40	41	46	37	38	43	34	35	40	31	32	37	28	29	34	25	26	31
7500	Velocity	1825	1905	2420	1515	1580	2010	1175	1230	1565	975	1015	1295	925	970	1230	775	810	1030
	Throw	146	112	79	138	105	75	120	90	64	108	82	59	108	82	59	99	76	54
	Pt	.207	.226	.365	.143	.156	.251	.086	.094	.153	.059	.064	.104	.053	.058	.094	.037	.040	.066
	NC	42	43	48	39	40	45	36	37	42	33	34	39	30	31	36	27	28	33
8000	Velocity	1945	2030	2585	1620	1680	2140	1260	1310	1660	1040	1080	1380	990	1030	1310	830	860	1100
	Throw	156	120	84	148	112	80	128	96	68	116	88	64	116	88	64	106	82	58
	Pt	.236	.256	.416	.164	.176	.285	.098	.107	.172	.067	.072	.118	.061	.066	.107	.043	.046	.075
	NC	44	45	50	41	42	47	38	39	44	35	36	41	32	33	38	29	30	35
8500	Velocity							1335	1390	1770	1100	1150	1465	1050	1095	1395	885	915	1170
	Throw							136	102	71	122	93	67	123	94	67	113	87	62
	Pt							.111	.120	.195	.075	.082	.134	.068	.074	.121	.048	.052	.085
	NC							40	41	46	37	38	43	34	35	40	31	32	37
9000	Velocity							1410	1475	1880	1170	1220	1550	1110	1160	1480	930	970	1240
	Throw							144	108	75	129	99	70	130	100	70	120	92	66
	Pt							.124	.136	.221	.085	.092	.150	.076	.083	.137	.053	.058	.095
	NC							42	43	48	39	40	45	36	37	42	33	34	39
9500	Velocity							1490	1555	1980	1230	1285	1635	1170	1225	1560	985	1025	1310
	Throw							152	114	79	136	104	74	138	106	75	127	97	70
	Pt							.138	.151	.244	.094	.102	.166	.085	.093	.152	.060	.065	.107
	NC							44	45	50	41	42	47	38	39	44	35	36	41
10,000	Velocity							1570	1640	2080	1300	1350	1720	1230	1290	1640	1040	1080	1380
	Throw							160	120	84	144	110	78	146	112	80	134	102	74
	Pt							.154	.167	.269	.105	.113	.184	.094	.103	.167	.007	.072	.118
	NC							46	47	52	43	44	49	40	41	46	37	38	43

For performance notes, see page IND-120



Performance Notes for Series 4100/4200/4300

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- fpm - Velocity of air stream in Feet Per Minute
- Pt - Total pressure (inches of water column)
- Ps - Static pressure = Pt - Pv (inches of water column)
- Throw - Cataloged throw is horizontal distances in feet at the terminal velocity of 150 fpm with ambient supply air temperature
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Throw Calculations for 4100, 4200, and 4300

Vt (fpm) Terminal Velocity	50	75	80	100	125	150	200	250
Mult Factor	3.0	2.0	1.8	1.5	1.2	1.0	.75	.6

To calculate throw distances at terminal velocities other than 150 fpm, multiply the appropriate factor by throw values shown on IND-116 to IND-119

Throw Calculations for Multi-Core Units

2 Cores	3 Cores	4 Cores
1.25 x Single Core Unit	1.33 x Single Core Unit	1.42 x Single Core Unit
Above corrections assume neck velocity is constant through each core with uniform velocity		

Throw Calculations for Multi-Core Units

$$\text{To calculate Ps for Series 4100 and 4200} \quad \frac{\text{CFM}}{\text{Neck Area in Square Ft.}} = \text{Neck Velocity (fpm),} \quad \left(\frac{\{\text{Neck Velocity (fpm)}\}}{4005} \right)^2 = \text{Pv (Velocity Pressure in. w.c.)}$$

Series 4100/4200/4300 - Specifications

Supply - Single Deflection Supply Grilles and Registers – Aluminum/Series 4100/4200/4300

- Model 4152 - 4 3/8" deep collars with 1 1/2" blades on 1 1/2" centers
- Model 4252 - 1 7/8" deep collars with 1 1/2" blades on 1 1/2" centers
- Model 4352 - 7" deep collars with 3" blades on 3" centers

Air Outlets shall be model V4152, V4252, or V4352 with vertical front blades or H4152, H4252, or H4352 with horizontal front blades manufactured by METALAIRES. Units shall be single deflection supply grilles of extruded aluminum construction.

Options

- Outlets shall have 4 3/8" deep collars with 1 1/2" blades on 1 1/2" centers
- Outlets shall have 1 7/8" deep collars with 1 1/2" blades on 1 1/2" centers
- Outlets shall have 7" deep collars with 3" blades on 3" centers

Options

- Units shall include a Inverted Frame
- Units shall include a Trunk Latch Frame
- Units shall included a Modular Frame

The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/2" wide with individually adjustable, aerodynamically shaped deflector blades. Units shall be designed for surface mounting applications and be provided with screw holes on the face of the device.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional Damper

- Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
- Damper must be operable from the face of the diffuser.

Supply - Double Deflection Supply Grilles and Registers – Aluminum/Series 4100/4200/4300

- Model 4154 - 4 3/8" deep collars with 1 1/2" blades on 1 1/2" centers
- Model 4254 - 1 7/8" deep collars with 1 1/2" blades on 1 1/2" centers
- Model 4354 - 7" deep collars with 3" blades on 3" centers

Air Outlets shall be model V4154, V4254, or V4354 with vertical front blades or H4154, H4254, or H4354 with horizontal front blades manufactured by METALAIRES. Units shall be single deflection supply grilles with front and rear sets of deflection extruded aluminum blades.

Options

- Outlets shall have 4 3/8" deep collars with 1 1/2" blades on 1 1/2" centers
- Outlets shall have 1 7/8" deep collars with 1 1/2" blades on 1 1/2" centers
- Outlets shall have 7" deep collars with 3" blades on 3" centers

Options

Units shall include a Inverted Frame (Model 4154 IF)

Units shall include a Trunk Latch Frame – (Model 4154 TLF)

Units shall included a Modular Frame – (Model 4154 MF)

The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/2" wide with individually adjustable, aerodynamically shaped deflector blades. Units shall be designed for surface mounting applications and be provided with screw holes on the face of the device.

Blades shall pivot in friction mounting retainers. Retainers shall hold the deflector blade position throughout the specified operating range of the device. Metal friction wires are not acceptable.

Optional Damper

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



Series 4100/4200/4300 - Model Specification Guide

Supply - High Capacity - Industrial Grilles and Registers

4 3/8" Collar - 1 1/2' Blades - 1/2" Centers

Series 4100 - Aluminum

Model		Available Neck	Available Finishes	Available Options	
Horizontal Front Blades	Vertical Front Blades	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
H4152 - Single Deflection	V4152 - Single Deflection		02 - Aluminum	OBDA	Opposed Blade Damper - Aluminum
H4154 - Double Deflection	V4154 - Double Deflection		Optional	GOV	Gang Operated Blades - Vertical
H4152 IF - Single Deflection Inverted Frame	V4152 IF - Single Deflection Inverted Frame		01 - White	GOH	Gang Operated Blades - Horizontal
H4154 IF - Double Deflection Inverted Frame	V4154 IF - Double Deflection Inverted Frame		03 - Black		
H4152 TLF - Single Deflection Trunk Latch Frame	V4152 TLF - Single Deflection Trunk Latch Frame		04 - Clear Anodized		
H4154 TLF - Double Deflection Trunk Latch Frame	V4154 TLF - Double Deflection Trunk Latch Frame		24 - Mill		
H4152 MF - Single Deflection Modular Frame	V4152 MF - Single Deflection Modular Frame		28 - Custom Color		
H4154 MF - Double Deflection Modular Frame	V4154 MF - Double Deflection Modular Frame				

Supply - High Capacity - Industrial Grilles and Registers

1 7/8" Collar - 1 1/2' Blades - 1/2" Centers

Series 4200 - Aluminum

Model		Available Neck	Available Finishes	Available Options	
Horizontal Front Blades	Vertical Front Blades	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
H4252 - Single Deflection	V4252 - Single Deflection		02 - Aluminum	OBDA	Opposed Blade Damper - Aluminum
H4254 - Double Deflection	V4254 - Double Deflection		Optional	GOV	Gang Operated Blades - Vertical
H4252 IF - Single Deflection Inverted Frame	V4252 IF - Single Deflection Inverted Frame		01 - White	GOH	Gang Operated Blades - Horizontal
H4254 IF - Double Deflection Inverted Frame	V4254 IF - Double Deflection Inverted Frame		03 - Black		
H4252 TLF - Single Deflection Trunk Latch Frame	V4252 TLF - Single Deflection Trunk Latch Frame		04 - Clear Anodized		
H4254 TLF - Double Deflection Trunk Latch Frame	V4254 TLF - Double Deflection Trunk Latch Frame		24 - Mill		
H4252 MF - Single Deflection Modular Frame	V4252 MF - Single Deflection Modular Frame		28 - Custom Color		
H4254 MF - Double Deflection Modular Frame	V4254 MF - Double Deflection Modular Frame				



IND - Industrial / High Capacity Devices

Series 4100/4200/4300 - Model Specification Guide

Supply - High Capacity -Industrial Grilles and Registers

7" Collar - 3' Blades - 3" Centers

Series 4300 - Aluminum

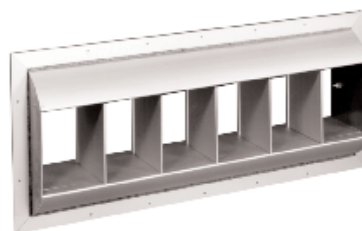
Model		Available Neck	Available Finishes	Available Options	
Horizontal Front Blades	Vertical Front Blades	6" thru 48"	Standard	OBD	Opposed Blade Damper - Steel
H4252 - Single Deflection	V4252 - Single Deflection		02 - Aluminum	OBDA	Opposed Blade Damper - Aluminum
H4254 - Double Deflection	V4254 - Double Deflection		Optional	GOV	Gang Operated Blades - Vertical
H4252 MF - Single Deflection Modular Frame	V4252 MF - Single Deflection Modular Frame		01 - White	GOH	Gang Operated Blades - Horizontal
H4254 MF - Double Deflection Modular Frame	V4254 MF - Double Deflection Modular Frame		03 - Black		
			04 - Clear Anodized		
			24 - Mill		
			28 - Custom Color		



➔ Industrial High Capacity ➔ Supply ➔ Series RL Roto Louver ➔ Aluminum

Product Details

- ★ The series RL Roto-Louver outlets are engineered for high capacity, long throw applications such as sports arenas, gymnasiums, conference centers, industrial plants and other large spaces
- ★ The series RL units have the flexibility to change throw direction and spread of the discharge jet with individually adjustable deflection blades and a rotating cylindrical drum assembly
- ★ Series RL Roto-Louver outlets are an excellent choice for high capacity, long throw applications. These units offer flexibility allowing installation in a variety of applications

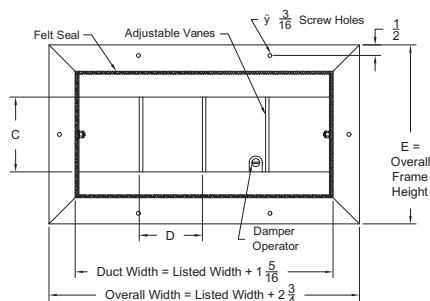
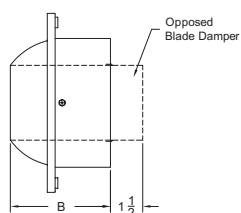


Model RL Shown

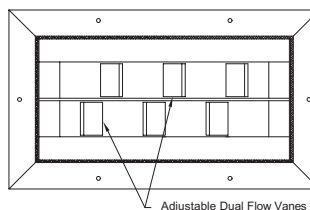
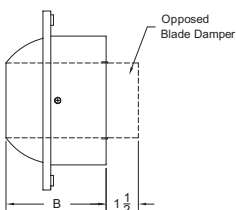
Standard Finish: 02 Aluminum

Sideview, dimensions are in inches

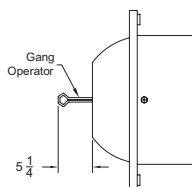
Supply - Cylindrical Drum - Roto Louver - Standard Blades Model RL - Standard Unit



Supply - Cylindrical Drum - Roto Louver - Standard Blades Model RL-DF - Dual Flow Blades



Supply - Cylindrical Drum - Roto Louver - Standard Blades Model RL-GO - With Gang Operator



Available Listed Height	6								10								12								15							
Available Listed Widths	9	12	18	24	30	36	48	60	20	25	30	35	40	50	60	70	20	25	30	35	40	50	60	70	15	20	25	30	40	50	60	70
Number of Louvers	2	3	5	7	9	11	15	19	3	4	5	6	7	9	11	13	3	4	5	6	7	9	11	12	2	3	4	5	7	9	11	13
A	1 3/4								2 5/8								3								3 1/2							
B	4 3/8								6 1/8								6 1/8								8							
C	3 1/2								5 7/8								6 1/4								9 1/2							
D	3								5								5								5							
E	8 1/2								12 1/4								13 7/8								16 7/8							
F	7								10 13/16								12 1/2								15 1/2							

Notes for Models RL, RL-DF, RL-GO

1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 04 Clear Anodized Optional Finish: 01 White 28 Custom Color	OBD - Steel - Opposed Blade Damper204 OBDA - Aluminum - Opposed Blade Damper204	• Sizes available only as listed

Series RL - Performance

Models RL, RL-DF, RL-GO

CFM	Listed Sizes (Inches)	9" x 6"			12" x 6"			18" x 6"			24" x 6"		
	Duct Opening Area (Sq. Ft.)	0.50			0.65			0.94			1.23		
	Deflection At Outlet Area (Sq. Ft.)	0° .17	15° .16	30° .13	0° .23	15° .21	30° .18	0° .35	15° .32	30° .26	0° .47	15° .41	30° .35
100	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	590 8 .021 <	625 7 .024 <	770 6 .036 <									
200	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1175 14 .086 <	1250 12 .097 <	1540 10 .148 <	870 12 .047 <	950 10 .056 <	1110 8 .076 <	570 10 .020 <	625 8 .024 <	770 7 .036 <			
300	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1765 21 .194 22	1875 18 .219 26	2305 15 .331 31	1305 19 .106 <	1430 16 .127 <	1665 13 .173 23	855 17 .045 <	935 14 .054 <	1150 12 .082 <	635 16 .025 <	730 14 .033 <	855 11 .045 <
400	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC				1740 24 .189 23	1905 20 .226 27	2200 17 .302 32	1140 23 .081 <	1250 19 .097 <	1535 16 .147 22	850 21 .045 <	975 18 .059 <	1140 15 .081 <
500	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC							1425 27 .126 20	1560 23 .152 24	1920 19 .229 29	1060 25 .070 <	1220 21 .092 <	1425 17 .026 22
600	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC							1715 30 .183 25	1875 25 .219 29	2305 21 .331 34	1275 28 .101 <	1460 24 .133 22	1715 20 .183 27
700	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC							2000 33 .249 30	2185 28 .298 34	2690 23 .451 39	1490 31 .138 23	1705 26 .181 27	2000 22 .249 32
800	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC										1700 34 .180 27	1950 29 .237 31	2285 24 .325 36
900	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC										1915 38 .228 30	2195 32 .300 34	2570 27 .412 39

For performance notes, see page IND-133



Series RL - Performance

Models RL, RL-DF, RL-GO

CFM	Listed Sizes (Inches)	30" x 6"			36" x 6"			48" x 6"			60" x 6"		
	Duct Opening Area (Sq. Ft.)	1.52			1.81			2.40			2.98		
	Deflection At Outlet Area (Sq. Ft.)	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°
		.59	.52	.44	.72	.62	.55	.94	.83	.70	1.17	1.05	.88
400	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	675 18 .028 <	770 15 .036 <	910 13 .052 <									
500	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	845 24 .044 <	960 20 .057 <	1135 17 .080 <	695 22 .030 <	805 19 .040 <	910 15 .052 <						
600	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1015 28 .064 <	1150 24 .082 <	1360 20 .115 22	850 26 .043 <	965 22 .058 <	1090 18 .074 <	635 25 .025 <	720 21 .032 <	855 17 .045 <			
700	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1185 32 .087 <	1345 27 .113 22	1590 19 .158 27	970 30 .058 <	1130 25 .079 <	1270 21 .100 <	745 29 .034 <	840 25 .044 <	1000 20 .062 <			
800	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1355 33 .114 22	1535 29 .147 26	1815 24 .205 31	1110 32 .076 <	1290 27 .103 22	1455 22 .132 27	850 31 .045 <	960 26 .057 <	1140 22 .001 <	680 30 .028 <	760 25 .036 <	910 21 .052 <
1000	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1695 40 .179 29	1920 34 .229 33	2270 28 .321 38	1385 38 .119 25	1610 32 .162 29	1820 27 .206 34	1060 37 .070 <	1205 31 .090 <	1425 26 .126 25	855 36 .045 <	950 31 .056 <	1135 25 .080 <
1200	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC				1665 43 .173 30	1935 36 .233 34	2180 30 .298 39	1275 42 .101 21	1445 36 .130 25	1715 29 .183 30	1025 41 .065 <	1140 35 .081 20	1360 29 .115 25
1400	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC				1945 48 .235 35	2255 41 .317 39	2545 34 .404 44	1490 47 .138 26	1685 40 .177 30	2000 33 .249 35	1195 46 .089 21	1330 39 .110 25	1590 32 .158 30
1600	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC							1700 50 .180 30	1925 42 .231 34	2285 35 .325 39	1365 49 .116 25	1520 42 .144 29	1815 34 .205 34
1800	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC							1915 53 .228 34	2165 45 .292 38	2570 37 .412 43	1535 52 .147 29	1715 44 .183 33	2045 36 .260 38
2000	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC										1710 56 .182 32	1905 48 .226 36	2270 39 .321 41
2250	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC										1920 60 .228 36	2140 51 .285 40	2555 42 .407 45

For performance notes, see page IND-133



Series RL - Performance

Models RL, RL-DF, RL-GO

CFM	Listed Sizes (Inches)	20 x 10			25 x 10			30 x 10			35 x 10		
	Duct Opening Area (Sq. Ft.)	1.60			1.97			2.35			2.73		
	Deflection	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°
	Ak Outlet Area (Sq. Ft.)	.59	.52	.44	.72	.62	.55	.94	.83	.70	1.17	1.05	.88
400	Outlet Velocity (fpm)	590	665	785									
	Throw in Feet @ Vt = 150 fpm	20	17	14									
	Pt Inches W.G.	.021	.027	.038									
	NC	<	<	<									
600	Outlet Velocity (fpm)	880	1000	1175	705	800	935	570	665	790			
	Throw in Feet @ Vt = 150 fpm	27	23	19	26	22	18	23	19	16			
	Pt Inches W.G.	.048	.062	.086	.030	.039	.054	.020	.027	.039			
	NC	<	<	<	<	<	<	<	<	<			
800	Outlet Velocity (fpm)	1175	1336	1570	940	1065	1250	760	890	1050	665	760	890
	Throw in Feet @ Vt = 150 fpm	33	28	23	32	27	22	29	25	20	27	23	19
	Pt Inches W.G.	.086	.111	.154	.055	.070	.097	.036	.049	.068	.027	.036	.049
	NC	<	23	28	<	<	21	<	<	<	<	<	<
1000	Outlet Velocity (fpm)	1470	1665	1960	1175	1335	1560	950	1110	1315	835	950	1110
	Throw in Feet @ Vt = 150 fpm	39	33	27	38	32	27	35	30	24	33	28	23
	Pt Inches W.G.	.135	.173	.239	.086	.111	.152	.056	.076	.107	.043	.056	.076
	NC	28	32	37	21	25	30	<	<	24	<	<	20
1200	Outlet Velocity (fpm)	1765	2000	2350	1410	1600	1875	1140	1335	1580	1000	1140	1335
	Throw in Feet @ Vt = 150 fpm	43	36	30	42	36	29	39	33	27	37	31	26
	Pt Inches W.G.	.194	.249	.344	.124	.159	.219	.081	.111	.156	.062	.081	.111
	NC	35	39	44	28	32	37	22	26	31	<	22	27
1400	Outlet Velocity (fpm)				1645	1865	2185	1335	1555	1840	1165	1335	1555
	Throw in Feet @ Vt = 150 fpm				47	40	33	44	37	31	42	36	29
	Pt Inches W.G.				.169	.216	.298	.111	.151	.211	.085	.111	.151
	NC				34	38	43	28	32	37	24	28	33
1600	Outlet Velocity (fpm)				1880	2135	2500	1525	1775	2105	1335	1525	1775
	Throw in Feet @ Vt = 150 fpm				50	42	35	47	37	33	45	38	31
	Pt Inches W.G.				.221	.284	.389	.145	.197	.276	.111	.145	.197
	NC				39	43	48	33	37	42	29	33	38
1800	Outlet Velocity (fpm)							1715	2000	2370	1500	1715	2000
	Throw in Feet @ Vt = 150 fpm							52	44	36	50	42	35
	Pt Inches W.G.							.183	.249	.350	.140	.183	.249
	NC							38	42	47	33	37	42
2000	Outlet Velocity (fpm)							1905	2220	2630	1665	1905	2220
	Throw in Feet @ Vt = 150 fpm							55	47	38	53	45	37
	Pt Inches W.G.							.226	.307	.431	.173	.226	.307
	NC							42	46	51	37	41	46
2250	Outlet Velocity (fpm)										1875	2140	2500
	Throw in Feet @ Vt = 150 fpm										59	50	41
	Pt Inches W.G.										.219	.285	.389
	NC										42	46	51

For performance notes, see page IND-133



Series RL - Performance

Models RL, RL-DF, RL-GO

CFM	Listed Sizes (Inches)	40 x 10			50 x 10			60 x 10			70 x 10		
	Duct Opening Area (Sq. Ft.)	3.10			3.80			4.60			5.30		
	Deflection	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°
	Ak Outlet Area (Sq. Ft.)	1.35	1.20	1.00	1.70	1.50	1.30	2.05	1.85	1.55	2.40	2.15	1.80
800	Outlet Velocity (fpm)	590	665	800									
	Throw in Feet @ Vt = 150 fpm	26	22	18									
	Pt Inches W.G.	.021	.027	.039									
	NC	<	<	<									
1000	Outlet Velocity (fpm)	740	835	1000	590	665	770						
	Throw in Feet @ Vt = 150 fpm	32	28	23	31	26	22						
	Pt Inches W.G.	.034	.043	.062	.021	.027	.036						
	NC	<	<	<	<	<	<						
1200	Outlet Velocity (fpm)	890	1000	1200	705	800	925	585	650	775			
	Throw in Feet @ Vt = 150 fpm	36	31	25	34	29	24	32	27	22			
	Pt Inches W.G.	.049	.062	.089	.030	.039	.053	.021	.026	.037			
	NC	<	<	22	<	<	<	<	<	<			
1400	Outlet Velocity (fpm)	1035	1165	1400	825	935	1075	680	755	905	585	650	775
	Throw in Feet @ Vt = 150 fpm	40	34	28	38	32	27	36	31	25	34	29	24
	Pt Inches W.G.	.067	.084	.122	.042	.054	.072	.028	.035	.051	.021	.026	.037
	NC	<	23	28	<	<	21	<	<	<	<	<	<
1600	Outlet Velocity (fpm)	1185	1335	1600	940	1065	1230	780	865	1030	665	745	890
	Throw in Feet @ Vt = 150 fpm	44	37	31	42	36	29	40	34	28	38	32	27
	Pt Inches W.G.	.087	.111	.159	.055	.070	.094	.038	.046	.066	.027	.034	.049
	NC	24	28	33	<	21	26	<	<	21	<	<	<
1800	Outlet Velocity (fpm)	1335	1500	1800	1060	1200	1385	880	970	1160	750	835	1000
	Throw in Feet @ Vt = 150 fpm	47	40	33	45	38	31	43	36	30	41	35	29
	Pt Inches W.G.	.111	.140	.201	.070	.089	.119	.048	.058	.083	.035	.043	.062
	NC	28	32	37	22	26	31	<	20	25	<	<	20
2000	Outlet Velocity (fpm)	1480	1665	2000	1175	1335	1540	975	1080	1290	835	930	1110
	Throw in Feet @ Vt = 150 fpm	51	43	36	49	42	34	47	40	33	45	38	31
	Pt Inches W.G.	.137	.173	.249	.086	.111	.148	.059	.072	.103	.043	.053	.076
	NC	32	36	41	26	30	35	20	24	29	<	<	24
2250	Outlet Velocity (fpm)	1665	1875	2250	1325	1500	1730	1095	1215	1450	935	1045	1250
	Throw in Feet @ Vt = 150 fpm	55	47	38	53	45	37	51	43	36	49	42	34
	Pt Inches W.G.	.173	.219	.315	.109	.140	.186	.074	.092	.131	.054	.068	.097
	NC	37	41	46	31	35	40	25	29	34	20	24	29
2500	Outlet Velocity (fpm)	1850	2085	2500	1470	1665	1925	1220	1350	1610	1040	1160	1390
	Throw in Feet @ Vt = 150 fpm	60	51	42	58	49	41	56	48	39	54	46	38
	Pt Inches W.G.	.213	.271	.389	.135	.173	.231	.092	.113	.162	.067	.083	.120
	NC	41	45	50	35	39	44	29	33	38	24	28	33
3000	Outlet Velocity (fpm)				1765	2000	2305	1465	1620	1935	1250	1395	1665
	Throw in Feet @ Vt = 150 fpm				65	55	45	63	53	44	61	52	43
	Pt Inches W.G.				.194	.249	.331	.134	.164	.233	.097	.121	.173
	NC				42	46	51	36	40	45	31	35	40
3500	Outlet Velocity (fpm)							1705	1890	2260	1460	1625	1945
	Throw in Feet @ Vt = 150 fpm							69	59	48	67	57	47
	Pt Inches W.G.							.181	.222	.318	.133	.165	.235
	NC							42	46	51	37	41	46
3750	Outlet Velocity (fpm)							1830	2025	2420	1560	1745	2085
	Throw in Feet @ Vt = 150 fpm							72	61	50	69	59	48
	Pt Inches W.G.							.208	.255	.365	.152	.190	.271
	NC							44	48	53	39	43	48
4000	Outlet Velocity (fpm)							1950	2160	2580	1665	1860	2220
	Throw in Feet @ Vt = 150 fpm							77	65	54	74	63	52
	Pt Inches W.G.							.237	.291	.415	.173	.215	.307
	NC							47	51	56	42	46	51

For performance notes, see page IND-133



Series RL - Performance

Models RL, RL-DF, RL-GO

CFM	Listed Sizes (Inches)	20 x 12			25 x 12			30 x 12			35 x 12		
	Duct Opening Area (Sq. Ft.)	1.85			2.29			2.83			3.37		
	Deflection	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°
	Ak Outlet Area (Sq. Ft.)	.69	.61	.52	.87	.77	.64	1.04	.89	.75	1.21	1.06	.90
400	Outlet Velocity (fpm)	580	655	770									
	Throw in Feet @ Vt = 150 fpm	12	10	8									
	Pt Inches W.G.	.020	.026	.036									
	NC	<	<	<									
600	Outlet Velocity (fpm)	870	985	1155	690	780	935	575	675	800	495	565	665
	Throw in Feet @ Vt = 150 fpm	17	14	12	16	14	11	15	13	10	14	12	10
	Pt Inches W.G.	.047	.060	.083	.029	.038	.054	.020	.028	.039	.015	.019	.027
	NC	<	<	<	<	<	<	<	<	<	<	<	<
800	Outlet Velocity (fpm)	1160	1310	1540	920	1040	1250	770	900	1065	660	755	890
	Throw in Feet @ Vt = 150 fpm	23	19	16	22	19	15	21	18	15	20	17	14
	Pt Inches W.G.	.083	.107	.148	.053	.067	.097	.036	.050	.070	.027	.035	.049
	NC	<	20	25	<	<	<	<	<	<	<	<	<
1000	Outlet Velocity (fpm)	1450	1640	1925	1150	1300	1560	960	1125	1335	825	945	1110
	Throw in Feet @ Vt = 150 fpm	29	25	20	28	24	20	27	23	19	26	22	18
	Pt Inches W.G.	.131	.167	.231	.082	.105	.152	.057	.078	.111	.042	.055	.076
	NC	23	27	32	<	21	26	<	<	<	<	<	<
1200	Outlet Velocity (fpm)	1740	1965	2305	1380	1560	1875	1155	1350	1600	990	1130	1335
	Throw in Feet @ Vt = 150 fpm	35	30	24	33	28	23	32	27	22	30	25	21
	Pt Inches W.G.	.189	.241	.331	.118	.152	.219	.083	.113	.159	.061	.079	.111
	NC	28	32	37	22	26	31	<	21	26	<	<	22
1400	Outlet Velocity (fpm)				1610	1820	2185	1345	1575	1865	1155	1320	1555
	Throw in Feet @ Vt = 150 fpm				37	31	26	35	41	24	33	28	23
	Pt Inches W.G.				.162	.206	.298	.113	.155	.216	.083	.108	.151
	NC				27	31	36	22	26	31	<	22	27
1600	Outlet Velocity (fpm)				1840	2075	2500	1540	1795	2135	1320	1510	1775
	Throw in Feet @ Vt = 150 fpm				43	36	30	40	34	28	37	31	26
	Pt Inches W.G.				.211	.268	.389	.148	.201	.284	.108	.142	.197
	NC				31	35	40	26	30	35	23	27	32
1800	Outlet Velocity (fpm)							1730	2020	2400	1485	1700	2000
	Throw in Feet @ Vt = 150 fpm							46	39	32	44	37	31
	Pt Inches W.G.							.186	.254	.359	.137	.180	.249
	NC							29	33	38	26	30	35
2000	Outlet Velocity (fpm)							1925	2245	2665	1650	1885	2220
	Throw in Feet @ Vt = 150 fpm							50	42	35	48	41	34
	Pt Inches W.G.							.231	.314	.443	.170	.221	.307
	NC							32	36	41	29	33	38
2250	Outlet Velocity (fpm)										1860	2120	2500
	Throw in Feet @ Vt = 150 fpm										54	46	38
	Pt Inches W.G.										.215	.280	.389
	NC										32	36	41

For performance notes, see page IND-133



Series RL - Performance

Models RL, RL-DF, RL-GO

CFM	Listed Sizes (Inches)	40 x 12			50 x 12			60 x 12			70 x 12		
	Duct Opening Area (Sq. Ft.)	3.59			4.45			5.32			6.19		
	Deflection	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°
	Ak Outlet Area (Sq. Ft.)	.80	.70	.60	1.08	.92	.78	1.37	1.22	1.01	1.65	1.44	1.24
800	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	580 19 .020 <	650 16 .026 <	785 13 .038 <									
1000	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	725 23 .032 <	815 19 .041 <	980 16 .059 <	580 21 .020 <	655 18 .026 <	805 15 .040 <						
1200	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	870 25 .047 <	975 21 .059 <	1175 17 .086 <	695 23 .030 <	785 19 .038 <	965 16 .058 <	575 21 .020 <	640 18 .025 <	765 15 .036 <			
1400	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1015 27 .064 <	1140 23 .081 <	1370 19 .117 24	810 25 .040 <	915 21 .052 <	1130 17 .079 22	675 23 .028 <	745 19 .034 <	890 16 .049 <	580 22 .020 <	645 19 .025 <	775 15 .037 <
1600	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1160 31 .083 <	1300 26 .105 23	1570 22 .154 28	925 30 .053 <	1045 25 .068 <	1290 21 .103 23	770 28 .036 <	850 24 .045 <	1020 20 .064 <	660 26 .027 <	735 22 .033 <	885 18 .048 <
1800	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1305 40 .106 22	1465 34 .134 26	1765 28 .194 31	1040 38 .067 <	1175 32 .086 21	1450 27 .131 26	885 37 .046 <	955 31 .057 <	1145 26 .082 <	745 35 .034 21	830 30 .043 <	995 24 .061 <
2000	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1450 45 .131 25	1625 38 .165 29	1960 31 .239 34	1155 41 .083 20	1305 35 .106 24	1610 29 .162 29	960 39 .057 <	1065 33 .070 <	1275 27 .101 24	825 37 .042 <	920 31 .053 <	1105 26 .076 20
2250	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1630 50 .166 29	1830 42 .208 33	2205 35 .303 38	1300 46 .105 24	1470 39 .135 28	1815 32 .205 33	1080 44 .072 <	1195 37 .089 23	1435 31 .128 28	930 42 .053 <	1035 36 .067 <	1245 29 .096 24
2500	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC	1810 54 .204 32	2030 46 .256 36	2450 38 .374 41	1445 50 .130 27	1635 42 .166 31	2015 35 .253 36	1200 48 .089 22	1330 41 .110 26	1590 34 .158 31	1035 46 .067 <	1150 39 .082 22	1380 32 .118 27
3000	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC				1735 60 .187 32	1960 51 .239 36	2420 42 .365 41	1440 56 .129 27	1595 48 .158 31	1910 39 .227 36	1240 54 .095 23	1380 46 .118 27	1655 38 .171 32
3500	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC							1680 64 .176 32	1860 54 .215 36	2230 45 .310 41	1445 62 .130 28	1610 53 .162 32	1935 43 .233 37
4000	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC							1925 72 .231 36	2125 61 .281 40	2545 50 .404 45	1650 70 .170 32	1845 59 .212 36	2210 49 .304 41
4500	Outlet Velocity (fpm) Throw in Feet @ Vt = 150 fpm Pt Inches W.G. NC										1860 76 .215 35	2075 65 .268 39	2485 53 .384 44

For performance notes, see page IND-133



Series RL - Performance

Models RL, RL-DF, RL-GO

CFM	Listed Sizes (Inches)	15 x 15			20 x 15			25 x 15			30 x 15		
	Duct Opening Area (Sq. Ft.)	1.75			2.29			2.83			3.37		
	Deflection	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°
	Ak Outlet Area (Sq. Ft.)	.80	.70	.60	1.08	.92	.78	1.37	1.22	1.01	1.65	1.44	1.24
500	Outlet Velocity (fpm)	625	715	835									
	Throw in Feet @ Vt = 150 fpm	11	9	8									
	Pt Inches W.G.	.024	.031	.043									
	NC	<	<	<									
1000	Outlet Velocity (fpm)	1250	1430	1665	925	1085	1280	730	820	990	605	695	805
	Throw in Feet @ Vt = 150 fpm	21	18	15	20	17	14	19	16	13	18	15	13
	Pt Inches W.G.	.097	.127	.173	.053	.073	.102	.033	.042	.061	.022	.030	.040
	NC	20	24	29	<	<	22	<	<	<	<	<	<
1250	Outlet Velocity (fpm)	1560	1785	2085	1155	1360	1600	910	1025	1235	755	870	1010
	Throw in Feet @ Vt = 150 fpm	27	23	19	26	22	18	24	20	17	22	19	15
	Pt Inches W.G.	.152	.199	.271	.083	.115	.159	.052	.065	.095	.035	.047	.063
	NC	27	31	36	20	24	29	<	<	24	<	<	<
1500	Outlet Velocity (fpm)	1875	2140	2500	1390	1630	1925	1095	1230	1485	910	1040	1210
	Throw in Feet @ Vt = 150 fpm	32	27	22	31	26	22	29	25	20	27	23	19
	Pt Inches W.G.	.219	.285	.389	.120	.166	.231	.074	.094	.137	.052	.067	.091
	NC	32	36	41	25	29	34	20	24	29	<	<	24
1750	Outlet Velocity (fpm)				1620	1900	2245	1275	1435	1730	1060	1215	1410
	Throw in Feet @ Vt = 150 fpm				36	31	25	34	29	24	31	26	22
	Pt Inches W.G.				.164	.225	.314	.101	.128	.186	.070	.092	.124
	NC				30	34	39	25	29	34	<	23	28
2000	Outlet Velocity (fpm)				1850	2175	2565	1460	1640	1980	1210	1390	1610
	Throw in Feet @ Vt = 150 fpm				42	36	29	39	33	27	36	31	25
	Pt Inches W.G.				.213	.295	.410	.133	.167	.244	.091	.120	.162
	NC				34	38	43	29	33	28	24	28	33
2250	Outlet Velocity (fpm)							1640	1845	2225	1365	1560	1815
	Throw in Feet @ Vt = 150 fpm							44	37	31	40	34	28
	Pt Inches W.G.							.167	.212	.308	.116	.152	.205
	NC							32	36	41	27	31	36
2500	Outlet Velocity (fpm)							1825	2050	2475	1515	1735	2015
	Throw in Feet @ Vt = 150 fpm							49	42	34	44	37	31
	Pt Inches W.G.							.207	.262	.382	.143	.187	.253
	NC							35	39	44	30	34	39
3000	Outlet Velocity (fpm)										1820	2085	2420
	Throw in Feet @ Vt = 150 fpm										53	45	37
	Pt Inches W.G.										.206	.271	.365
	NC										36	40	45
3250	Outlet Velocity (fpm)										1970	2255	2620
	Throw in Feet @ Vt = 150 fpm										58	49	41
	Pt Inches W.G.										.242	.317	.428
	NC										38	42	47

For performance notes, see page IND-133



Series RL - Performance

Models RL, RL-DF, RL-GO

CFM	Listed Sizes (Inches)	40 x 15			50 x 15			60 x 15			70 x 15		
	Duct Opening Area (Sq. Ft.)	4.45			5.52			6.60			7.67		
	Deflection	0°	15°	30°	0°	15°	30°	0°	15°	30°	0°	15°	30°
	Ak Outlet Area (Sq. Ft.)	2.17	1.93	1.60	2.69	2.40	2.03	3.21	2.83	2.36	3.68	3.30	2.78
1500	Outlet Velocity (fpm)	690	775	935									
	Throw in Feet @ Vt = 150 fpm	25	21	17									
	Pt Inches W.G.	.029	.037	.054									
	NC	<	<	<									
1750	Outlet Velocity (fpm)	805	905	1095	650	730	860						
	Throw in Feet @ Vt = 150 fpm	29	25	20	27	23	19						
	Pt Inches W.G.	.040	.051	.074	.026	.033	.046						
	NC	<	<	<	<	<	<						
2000	Outlet Velocity (fpm)	920	1035	1250	745	835	985	625	705	845			
	Throw in Feet @ Vt = 150 fpm	33	28	23	31	26	22	29	25	20			
	Pt Inches W.G.	.053	.067	.097	.034	.043	.060	.024	.030	.044			
	NC	<	20	25	<	<	20	<	<	<			
2250	Outlet Velocity (fpm)	1035	1165	1405	835	935	1110	700	795	955	610	680	810
	Throw in Feet @ Vt = 150 fpm	37	31	26	35	30	24	33	28	23	32	27	22
	Pt Inches W.G.	.067	.084	.123	.043	.054	.076	.030	.039	.057	.023	.028	.040
	NC	20	24	29	<	<	23	<	<	<	<	<	<
2500	Outlet Velocity (fpm)	1150	1295	1560	930	1040	1230	780	885	1060	680	755	900
	Throw in Feet @ Vt = 150 fpm	41	35	29	39	33	27	37	31	26	36	31	25
	Pt Inches W.G.	.082	.104	.152	.053	.067	.094	.038	.048	.070	.028	.035	.050
	NC	23	27	32	<	21	26	<	<	22	<	<	<
3000	Outlet Velocity (fpm)	1380	1555	1875	1115	1250	1475	935	1060	1270	815	910	1080
	Throw in Feet @ Vt = 150 fpm	49	42	34	46	39	32	44	37	31	43	36	30
	Pt Inches W.G.	.118	.151	.219	.077	.097	.136	.054	.070	.100	.041	.052	.072
	NC	29	33	38	23	27	32	<	22	27	<	<	24
3250	Outlet Velocity (fpm)	1495	1685	2030	1210	1355	1600	1010	1150	1375	885	985	1170
	Throw in Feet @ Vt = 150 fpm	53	45	37	50	42	35	48	41	34	46	39	32
	Pt Inches W.G.	.139	.177	.256	.091	.114	.159	.063	.082	.117	.048	.060	.085
	NC	31	35	40	25	29	34	21	25	30	<	21	26
3500	Outlet Velocity (fpm)	1610	1815	2185	1300	1460	1725	1090	1235	1485	950	1060	1260
	Throw in Feet @ Vt = 150 fpm	57	48	40	54	46	38	52	44	36	50	42	35
	Pt Inches W.G.	.162	.205	.298	.105	.133	.185	.074	.095	.137	.056	.070	.098
	NC	33	37	42	27	31	36	23	27	32	.056	23	28
4000	Outlet Velocity (fpm)	1845	2070	2500	1485	1665	1970	1245	1415	1695	1085	1210	1440
	Throw in Feet @ Vt = 150 fpm	66	56	46	62	53	43	59	50	41	57	48	40
	Pt Inches W.G.	.212	.267	.389	.137	.173	.242	.096	.124	.179	.073	.091	.129
	NC	37	41	46	31	35	40	27	31	36	23	27	32
6000	Outlet Velocity (fpm)							1870	2120	2540	1630	1820	2160
	Throw in Feet @ Vt = 150 fpm							89	76	62	85	72	59
	Pt Inches W.G.							.218	.280	.402	.166	.206	.291
	NC							39	43	48	35	39	44

For performance notes, see page IND-133

Performance Notes for Series RL

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- Out Vel - Velocity of air stream in Feet Per Minute
- Ps - Static Pressure = Pt - Pv (inches of water column)
- Pt - Total Pressure (inches of water column)
- Throw - Non-isothermal horizontal throw (supply air temperature 20°F colder than average room air temperature) values are for 150 fpm velocities for 0°, 15°, and 30° spread
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Outlet Velocity at 0° deflection should not exceed 2000 FPM. Units should not be selected above cataloged flow rates.

Throw Calculations for RL								
Vt (fpm) Terminal Velocity	50	75	80	100	125	150	200	250
Mult Factor	3.0	2.0	1.8	1.5	1.2	1.0	.75	.6

To calculate throw distances at terminal velocities other than 150 fpm, multiply the appropriate factor by throw values shown on IND-125 to IND-132

Calculating Velocity and Static Pressure	
$\frac{\text{CFM}}{\text{Neck Area in Square Ft.}} = \text{Neck Velocity (fpm), } \left(\frac{\{\text{Neck Velocity (fpm)}\}}{4005} \right)^2 = \text{Pv (Velocity Pressure) in. w.c.}$	

Series RL Roto Louver - Specifications

- Model RL - Standard Unit
- Model RL-DL - Dual Flow
- Model RL-GO - Gang Operator

Air Outlets shall be model RL Roto-Louvers METALAIR®. Units shall be constructed of a vertical deflection blades mounted in a cylindrical drum. The cylindrical drum shall rotate on nylon bushings and allow the discharge jet to be directed vertically within a 60° arc. Rotating drum shall be sealed with felt gasketing. Deflector blades shall be individually adjustable allowing the discharge jet to be adjusted horizontally from 0° to 60°.

Dual Flow (Optional)

Outlets shall have split deflector blades along the center of the horizontal plane. Top and bottom deflector blades shall be individually adjustable.

Gang Operator (Optional)

Outlets shall include a gang operator to permit uniform adjustment of all deflector blades. Gang operator shall be accessible from the face of the outlet.

The units shall be the size and quantity as outlined in the plans and specifications.

Border shall be 1 1/4" wide with individually adjustable, aerodynamically shaped deflector blades. Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Optional Damper

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Series RL - Model Specification Guide

Supply - High Capacity Cylindrical Drum

Series RL - Extruded Aluminum

Model	Available Neck		Available Finishes
RL - Roto Louver RL-DF - Roto Louver - Dual Flow RL-GO - Roto Louver - Gang Operator	Neck 1		Standard
	9"	35"	02 - Aluminum
	12"	36"	
	15"	40"	
	18"	48"	Optional
	20"	50"	01 - White
	24"	60"	24 - Mill
	25"	70"	28 - Custom Color
	30"		
		6"	
		10"	
		12"	
		15"	



IND - Industrial / High Capacity Devices

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➔ High Capacity ➔ Supply ➔ Round Neck ➔ Series JA - JET*AIRE ➔ Steel

Product Details

- ★ Jet*Aire diffusers offer an economical solution to high capacity air distribution applications requiring long throw distances. This diffuser can be effectively applied to large space applications such as civic centers, auditoriums, and arenas.
- ★ Units are available as a single diffuser, or multiple diffusers mounted in a panel.
- ★ Jet*Aire diffusers are an excellent choice for high capacity, long throw applications. The modular design of the Jet*Aire diffusers allows selection for a wide range of air volumes



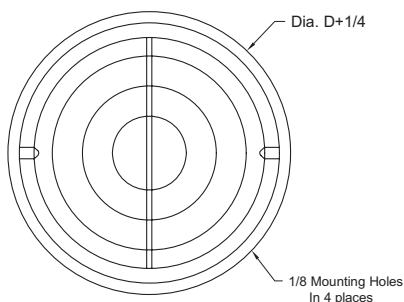
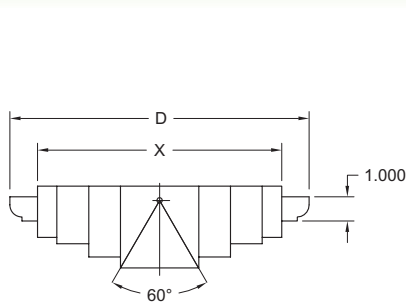
Model JA-1P Shown

Standard Finish: 01 White

Sideview, dimensions are in inches

Supply - Industrial/High Capacity - Round Neck - Series JA Jet*Aire - Steel

Model JA-1 - Single Unit

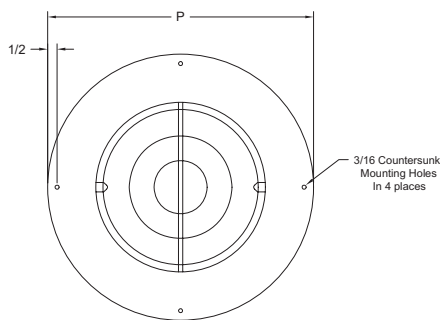
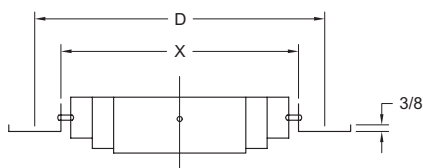


JA - 1EX for exposed duct installation

Model	X Element Diameter	Rings Per Element	Dia D Duct Size
6	4	3	6
8	6	3	8
10	8	3	10
12	10	3	12
14	12	3	14
16	14	4	16
18	16	4	18
20	18	4	20

Supply - Industrial/High Capacity - Round Neck - Series JA Jet*Aire - Steel

Model JA-1 EX - Panel Mount



JA - 1 for surface mount installation

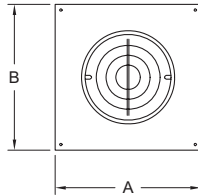
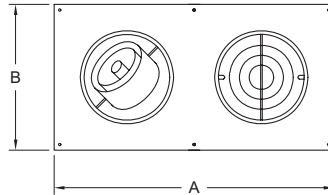
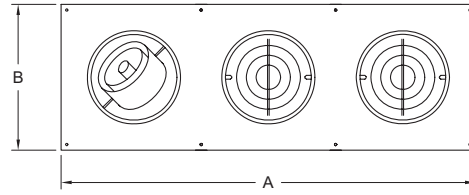
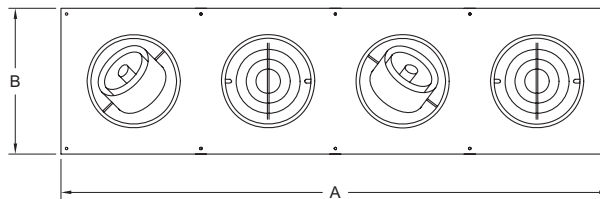
Model	X Element Diameter	Rings Per Element	Dia D Duct Size	P
6	4	3	6	8
8	6	3	8	10
10	8	3	10	12
12	10	3	12	14
14	12	3	14	16
16	14	4	16	18
18	16	4	18	20
20	18	4	20	2

Supply - Industrial/High Capacity - Round Neck - Series JA Jet*Aire - Steel

 Model JA-1P - *Panel Mounted* - 1 Unit

 Model JA-2P - *Panel Mounted* - 2 Unit

 Model JA-3P - *Panel Mounted* - 3 Unit

 Model JA-4P - *Panel Mounted* - 4 Unit

JA - 1P

JA - 2P

JA - 3P

JA - 4P

Available Size	Element Sizes	1 Jet (1 Panel)			2 Jets (2 Panel)			3 Jets (3 Panel)			4 Jets (4 Panel)		
		A	B	Duct	A	B	Duct	A	B	Duct	A	B	Duct
6	4	7 7/8	7 7/8	6 x 6	14 7/8	7 7/8	12 x 6	19 7/8	7 7/8	18 x 6	25 7/8	7 7/8	24 x 6
8	6	9 7/8	9 7/8	8 x 8	18 7/8	9 7/8	17 x 8	27 7/8	9 7/8	26 x 8	36 7/8	9 7/8	35 x 8
10	8	11 7/8	11 7/8	10 x 10	23 7/8	11 7/8	22 x 10	35 7/8	11 7/8	34 x 10	47 7/8	11 7/8	46 x 10
12	10	13 7/8	13 7/8	12 x 12	26 7/8	13 7/8	25 x 12	39 7/8	13 7/8	38 x 12	52 7/8	13 7/8	51 x 12
14	12	15 7/8	15 7/8	14 x 14	30 7/8	15 7/8	29 x 14	45 7/8	15 7/8	44 x 14	60 7/8	15 7/8	59 x 14
16	14	17 7/8	17 7/8	16 x 16	34 7/8	17 7/8	33 x 16	51 7/8	17 7/8	50 x 16	68 7/8	17 7/8	67 x 16
18	16	19 7/8	19 7/8	18 x 18	39 7/8	19 7/8	38 x 18	59 7/8	19 7/8	58 x 18	79 7/8	19 7/8	78 x 18
20	18	21 7/8	21 7/8	20 x 20	45 7/8	21 7/8	44 x 20	66 7/8	21 7/8	64 x 20	89 7/8	21 7/8	88 x 20

1. Available Finishes	2. Construction Details
Standard Finish: 01 White	<ul style="list-style-type: none"> Available only in listed sizes No dampers can be mounted on units



Series JA - Performance

Models JA, JA-1P, JA-2P, JA-3P, JA-4P

Size	Capacity in CFM	Neck Velocity in fpm	Throw in Feet	Static Pressure	NC
6 Ak = 0.182	75	398	5-10-14	0.030	<20
	125	664	8-15-20	0.070	<20
	127	930	11-18-25	0.131	<20
	225	1195	13-20-28	0.200	22
8 Ak = 0.325	200	591	9-17-27	0.058	<20
	300	887	14-24-33	0.115	<20
	400	1083	18-28-38	0.188	20
	500	1478	22-30-42	0.274	20
10 Ak = 0.511	400	752	12-21-30	0.125	<20
	600	1128	19-28-31	0.229	21
	800	1504	23-32-45	0.350	33
	1000	1880	27-36-49	0.489	45
12 Ak = 0.738	400	520	9-18-27	0.048	<20
	700	910	15-26-34	0.131	<20
	1000	1300	21-30-40	0.243	26
	1300	1690	24-33-46	0.376	39
14 Ak = 1.010	600	571	9-19-28	0.052	<20
	1000	952	15-24-35	0.154	<20
	1400	1333	21-29-41	0.279	22
	1800	1714	25-36-47	0.397	39
16 Ak = 1.319	900	655	16-19-29	0.073	<20
	1400	1019	18-27-37	0.156	<20
	1900	1382	22-32-43	0.265	29
	2400	1746	26-35-48	0.398	43

Performance Notes for Series JA-Jet*Aire

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- fpm - Velocity of air stream in Feet Per Minute
- Ps - Static pressure = Pt - Pv (inches of water column)
- Throw - Non-isothermal horizontal throw (supply air temperature 20°F colder than average room air temperature) values are for 50 fpm - 100 fpm - 150 fpm velocities
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands

Series JA - Performance

Supply – Industrial/High Capacity Round Neck – Panel Mounted

Model JA-1 Surface Mount – Single Unit

Model JA-1P Panel Mounted – 1 Unit

Model JA-2P Panel Mounted – 2 Units

Model JA-3P Panel Mounted – 3 Units

Model JA-4P Panel Mounted – 4 Units

Air Outlets shall be model JA Jet*Aire by METALAIRES. Units shall be constructed of steel. The outlets shall consist of a core assembly constructed with a series of circular rings. The core shall be capable of adjustment from the face of the outlet without the use of special tools. The core assembly shall pivot on two nylon sleeved steel bolts. The core assembly shall be adjustable to obtain a full 60° arc along the vertical plane.

Options:

Units shall have a single core mounted in a square panel (Model JA-1)

Units shall have two cores mounted in a rectangular panel (Model JA-2P)

Units shall have three cores mounted in a rectangular panel (Model JA-3P)

Units shall have four cores mounted in a rectangular panel (Model JA-4P)

The units shall be the size and quantity as outlined in the plans and specifications.

Units shall be designed for surface mounting applications and be provided with counter sunk screw holes on the face of the device.

Supply – Industrial/High Capacity - Exposed Round Duct Installation

Model JA- 1EX Exposed Duct Mounted – No Panel

Air Outlets shall be model JA Jet*Aire by METALAIRE®. Units shall be constructed of steel. The outlets shall consist of a core assembly constructed with a series of circular rings. The core shall be capable of adjustment from the face of the outlet without the use of special tools. The core assembly shall pivot on two nylon sleeved steel bolts. The core assembly shall be adjustable to obtain a full 60° arc along the vertical plane.

The units shall be the size and quantity as outlined in the plans and specifications.

Units shall be designed to integrate round exposed ductwork (Model JA- 1EX)

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series JA - Model Specification Guide

Supply - High Capacity - Industrial Grilles and Registers

Round - Jet Aire

Model	Available Neck	Available Finishes
JA - 1 Jet No Panel	6"	Standard
JA-1 EX - 1 Jet No Panel	8"	01 - White
JA-1P - 1 Jet Panel Mounted	10"	
JA-2P - Jet*Aire - 2 Jets Panel Mounted	12"	
JA-3P - Jet*Aire - 3 Jets Panel Mounted	14"	
JA-4P - Jet*Aire - 4 Jets Panel Mounted	16"	
	18"	
	20"	



➔ Outside Air Louvers ➔ Series OAL ➔ Extruded Aluminum

Product Details

- ★ Series OAL stationary outside air louvers are fixed multiple blade air distribution devices designed for installation in building exterior wall openings
- ★ The series OAL inhibit the entrance of wind, rain, snow, sleet, sand, birds, insects, and airborne debris while serving to enhance the building's exterior appearance
- ★ Each series OAL blade has a 45° face deflection and includes a water baffle with a 1/4" return bend
- ★ Series OAL blades also overlap to improve the weather resistance of the louver



Model OAL-2C Shown

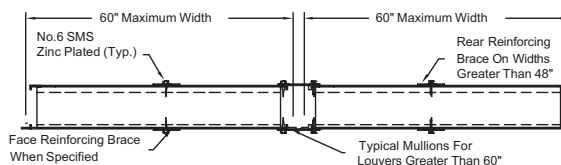
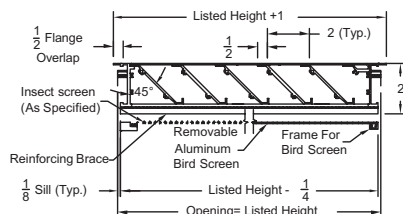
Standard Finish: 24 Mill finish

Sideview, dimensions are in inches

Outside Intake and Exhaust Air Louvers - Type C (Channel Frame) - 2" Depth

Series OAL - Extruded Aluminum

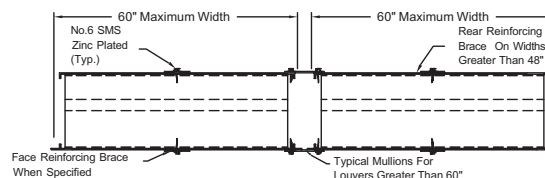
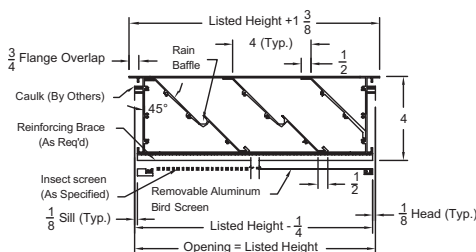
Model OAL-2C



Outside Intake and Exhaust Air Louvers - Type F (Flanged Frame) - 2" Depth

Series OAL - Extruded Aluminum

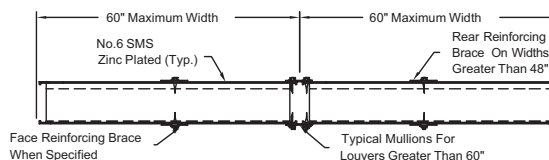
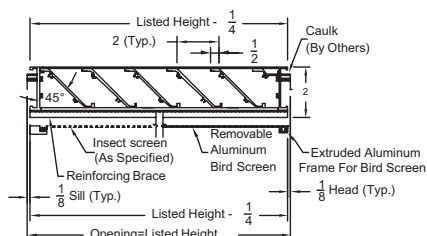
Model OAL-2F



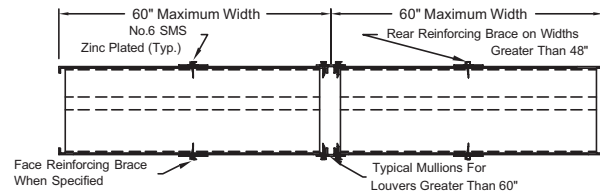
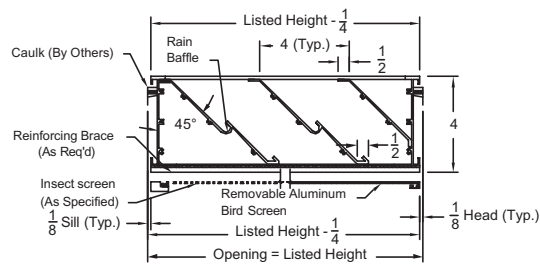
Outside Intake and Exhaust Air Louvers - Type 4 (Channel Frame) - 4" Depth

Series OAL - Extruded Aluminum

Model OAL-4C



Outside Intake and Exhaust Air Louvers - Type 4 (Flanged Frame) - 4" Depth Series OAL - Extruded Aluminum Model OAL-4F



1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 24 Mill finish Optional Finish: 01 White 02 Aluminum paint 04 Clear Anodized 28 Custom color	(Factory Mounted) I/S - Insect - #18 Aluminum Mesh B/S - Bird Screen - Expanded Aluminum	<ul style="list-style-type: none"> Maximum 1-piece dimension of 72" x 120" or 120" x 72" Even/odd inch sizes for widths Height available only as listed

Series OAL - Free Area (Sq. ft.)

Models OAL-4C, OAL-4F

Model																						
Height	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96
12	.2	.3	.4	.4	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0
16	.3	.5	.6	.7	.9	1.0	1.2	1.3	1.4	1.6	1.7	1.8	2.0	2.1	2.2	2.4	2.5	2.7	2.8	2.9	3.1	3.2
20	.5	.6	.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.2	4.4
24	.6	.8	1.1	1.3	1.5	1.8	2.0	2.5	2.8	3.0	3.2	3.2	3.5	3.7	3.9	4.2	4.4	4.7	4.9	5.2	5.4	5.6
28	.7	1.0	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.6	3.7	4.0	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3	6.6	6.9
32	.8	1.2	1.5	1.9	2.2	2.6	2.9	3.3	3.6	3.9	4.3	4.6	5.0	5.3	5.7	6.0	6.4	6.7	7.0	7.4	7.7	8.9
36	.9	1.4	1.8	2.2	2.6	2.9	3.3	3.7	4.1	4.5	5.0	5.3	5.7	6.1	6.5	6.9	7.3	7.7	8.1	8.5	8.9	9.3
40	1.1	1.5	1.9	2.4	2.9	3.3	3.8	4.2	4.7	5.1	5.6	6.1	6.5	6.9	7.4	7.8	8.3	8.7	9.2	9.6	10.1	10.5
44	1.2	1.6	2.2	2.7	3.2	3.7	4.2	4.8	5.6	5.7	6.2	6.9	7.2	7.7	8.2	8.7	9.3	9.7	10.2	10.7	11.2	11.7
48	1.3	1.9	2.5	3.0	3.6	4.1	4.7	5.6	5.8	6.3	6.9	7.5	8.0	8.5	9.1	9.6	10.2	10.8	11.3	11.8	12.4	12.9
52	1.5	2.1	2.7	3.3	3.9	4.5	5.1	5.7	6.3	6.9	7.5	8.1	8.7	9.3	10.0	10.6	11.2	11.8	12.4	13.0	13.6	14.2
56	1.6	2.3	2.9	3.6	4.2	4.9	5.6	6.2	6.9	7.5	8.5	8.8	9.5	10.2	10.8	11.5	12.1	12.8	13.4	14.1	14.8	15.4
60	1.7	2.4	3.2	3.9	4.6	5.3	6.0	6.7	7.4	8.1	8.8	9.5	10.3	10.9	11.7	12.4	13.1	13.8	14.5	15.2	15.9	16.6
64	1.8	2.6	3.4	4.1	4.9	5.7	6.4	7.2	8.0	8.7	9.5	10.2	11.0	11.8	12.6	13.3	14.1	14.8	15.6	16.3	17.1	17.9
68	1.9	2.8	3.6	4.4	5.2	6.1	6.9	7.7	8.5	9.3	10.1	10.9	11.8	12.6	13.4	14.2	15.0	15.8	16.6	17.4	18.3	19.1
72	2.1	3.0	3.8	4.7	5.6	6.4	7.3	8.2	9.0	10.0	10.8	11.6	12.6	13.4	14.2	15.1	16.0	16.9	17.7	18.6	19.4	20.3
76	2.2	3.2	4.1	5.0	5.9	6.8	7.7	8.7	9.6	10.5	11.4	12.3	13.3	14.2	15.1	16.0	16.9	17.8	18.8	19.7	20.6	21.5
80	2.4	3.3	4.3	5.3	6.2	7.2	8.2	9.2	10.1	11.1	12.1	12.0	14.0	15.0	16.0	16.9	17.8	18.9	19.9	20.8	21.8	22.7
84	2.5	3.5	4.5	5.5	6.6	7.6	8.6	9.6	10.7	11.7	12.7	13.7	14.8	15.8	16.8	17.8	18.9	19.9	20.9	21.9	22.9	24.0
88	2.6	3.7	4.8	5.8	6.9	8.0	9.1	10.1	11.2	12.3	13.4	14.4	15.5	16.6	17.7	18.7	19.8	20.9	21.9	23.0	24.1	24.2
92	2.7	3.9	5.0	6.1	7.3	8.4	9.5	10.6	11.8	12.9	14.0	15.1	16.3	17.4	18.5	19.6	20.8	21.9	23.0	24.2	25.3	26.4
96	2.9	4.1	5.2	6.4	7.6	8.8	10.0	11.1	12.3	13.5	14.6	15.8	17.0	18.2	19.4	20.5	21.7	22.9	24.1	25.3	26.4	27.6

For performance notes, see page IND-141 - IND-143



IND - Industrial / High Capacity Devices

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Series OAL - Free Area (Sq ft)

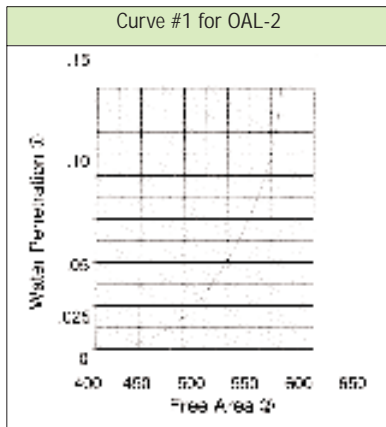
Models OAL-2C, OAL-2F - *continued*

Model																							
Height	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	
12	.4	.5	.6	.7	.8	1.0	1.1	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.2	2.3	2.4	2.6	2.7	2.8	2.9	3.1	
16	.5	.7	.9	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.6	3.8	4.0	4.2	4.4	
20	.6	.9	1.1	1.4	1.6	1.8	2.1	2.3	2.6	2.8	3.0	3.3	3.5	3.8	4.0	4.3	4.5	4.7	5.0	5.2	5.5	5.7	
24	.8	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.3	4.6	5.0	5.2	5.5	5.8	6.1	6.4	6.7	7.0	
28	.9	1.3	1.7	2.	2.3	2.7	3.0	3.4	3.8	4.1	4.5	4.8	5.2	5.5	5.9	6.2	6.6	6.9	7.3	7.6	8.0	8.3	
32	1.1	1.5	1.9	2.3	2.7	3.1	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0	8.4	8.9	9.3	9.7	
36	1.2	1.7	2.2	2.6	3.1	3.6	4.0	4.5	5.0	5.4	5.9	6.3	6.8	7.3	7.7	8.2	8.7	9.1	9.6	10.0	10.5	11.0	
40	1.4	1.8	2.4	2.9	3.5	4.0	4.5	5.0	5.5	6.1	6.6	7.1	7.6	8.1	8.6	9.2	9.7	10.2	10.7	11.2	11.8	12.3	
44	1.5	2.1	2.7	3.3	3.8	4.5	5.0	5.6	6.1	6.6	7.3	7.9	8.4	9.0	9.6	10.2	10.7	11.3	11.9	12.4	13.0	13.6	
48	1.7	2.3	2.9	3.6	4.2	4.8	5.5	6.1	6.7	7.4	8.0	8.6	9.3	9.9	10.5	11.1	11.8	12.4	13.0	13.7	14.3	15.0	
52	1.8	2.5	3.2	3.9	4.6	5.3	6.0	6.6	7.4	8.0	8.7	9.4	10.0	10.9	11.4	12.1	12.8	13.5	14.2	14.9	15.6	16.2	
56	1.9	2.7	3.5	4.2	4.9	5.7	6.4	7.2	7.9	8.7	9.4	10.0	10.9	11.6	12.4	13.1	13.8	14.6	15.3	16.1	16.8	17.6	
60	2.1	2.9	3.7	4.5	5.1	6.1	6.9	7.7	8.5	9.3	10.1	10.9	11.7	12.5	13.3	14.1	14.9	15.7	16.5	17.3	18.1	19.0	
64	2.3	3.1	4.0	4.8	5.7	6.5	7.4	8.2	9.1	10.0	10.9	11.7	12.5	13.4	14.2	15.1	15.9	16.8	17.6	18.5	19.3	20.2	
68	2.4	3.3	4.2	5.2	6.1	7.0	7.9	8.8	9.7	10.6	11.5	12.4	13.3	14.2	15.1	16.1	17.0	17.9	18.8	19.7	20.6	21.5	
72	2.6	3.6	4.5	5.5	6.4	7.4	8.4	9.3	10.3	11.3	12.4	13.1	14.1	15.1	16.4	17.0	18.0	18.9	19.9	21.0	21.9	22.8	
76	2.7	3.8	4.8	5.8	6.8	7.8	8.8	9.9	10.9	11.9	12.9	13.9	15.0	16.0	17.0	18.0	19.0	20.1	21.1	22.1	23.1	24.2	
80	2.9	4.0	5.0	6.1	7.2	8.3	9.3	10.4	11.5	12.5	13.6	14.7	15.8	16.8	18.0	19.0	20.1	21.1	22.2	23.3	24.4	25.5	
84	3.0	4.2	5.3	6.4	7.6	8.9	9.8	10.9	12.1	13.2	14.3	15.5	16.6	17.7	18.8	20.0	21.1	22.2	23.4	24.5	25.6	26.8	
88	3.2	4.4	5.6	6.5	7.9	9.1	10.3	11.5	12.7	13.8	15.0	16.2	17.4	18.6	19.8	21.0	22.1	23.3	24.5	25.7	27.0	28.1	
92	3.3	4.6	5.8	7.1	8.3	9.5	10.8	12.0	13.3	14.5	15.7	17.0	18.2	19.5	20.7	22.0	23.2	24.4	25.7	27.0	28.1	29.4	
96	3.5	4.8	6.1	7.4	8.7	10.0	11.3	12.5	13.8	15.2	16.4	17.7	19.0	20.3	21.6	23.0	24.2	25.5	26.8	28.1	29.4	30.7	

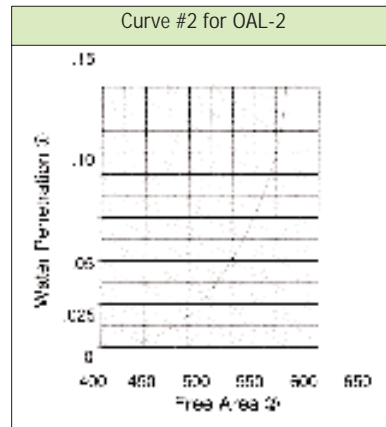
For performance notes, see page IND-141 - IND-143



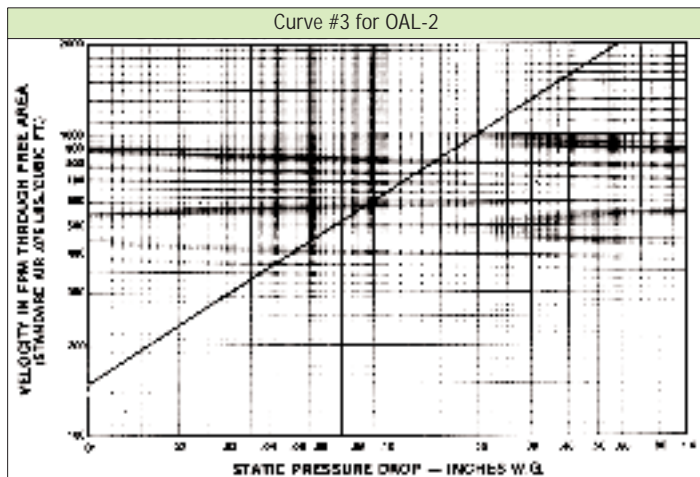
Curve #1 for OAL-2



Curve #2 for OAL-2



Curve #3 for OAL-2



Introduction

The performance data shown on pages 4 to 6 are designed to assist in the proper selection of Model OAL Outside Air Louvers. These performance values, developed through testing in the field and at Metal Industries Research Laboratory in Clearwater, Florida, have proven reliable in thousands of installations and may be relied upon with confidence. As with all performance ratings, however, the data shown must be applied according to the manufacturer's recommendations and with an understanding of the basic premises upon which the performance values are predicated.

Design Considerations

METALAIR extruded aluminum stationary louvers are fixed multiple blade air distribution devices for installation in building exterior wall openings. They are designed to permit flow of fresh air into the building interior and exhaust air to the building exterior with a minimum pressure drop and sound level. They also inhibit the entrance of wind, rain, snow, sleet, sand, birds, insects and airborne debris, and enhance the exterior building appearance.

Model OAL Air Louvers for exterior wall installation are designed with 45° face deflection blades. Blades overlap and include a vertical water baffle with a 1/4 inch return bend at the upper blade edge concealed by the adjacent blade above which improves weather resistance. Models are available with overlapping wall opening flanges for flush mounting and with channel frames for recessed installation inside exterior wall openings. Since no louver is capable of retarding water penetration under all conditions of weather, it is suggested that louvers be recessed in wall openings to avoid rain water cascading down the building face onto a flush mounted louver. When this is not feasible it is suggested that drain pans, drained ductwork, with or without eliminator plates, or other positive means of water collection and drainage be considered when absolutely no moisture carryover can be tolerated.

Performance Variables

The resistance of a louver to water penetration is an important design consideration. A louver's water resistance performance is usually determined by a specific set of laboratory tests in which water is directed over the louver face without external wind, referencing only the velocity of the air entering the louver. This industry standard aids the design engineer in sizing intake louvers for NORMAL WEATHER conditions, but is not a guarantee that, for all variable conditions of wind and rain, a tested louver will prevent water penetration. Metal Industries, Inc. certainly does not offer such a claim. Designers of critical installations should consider their local weather records, and provide a reasonable safety factor by sizing louvers at some point less than the manufacturer's maximum recommended free area velocities.

Maximum Recommended Free Area Velocities for Minimum Water Penetration (Intake Louvers Only, No Maximum for Exhaust Louvers)

OAL2 F	575 fpm
OAL2 C	
OAL4 F	525 fpm
OAL4 C	

Curves 1 and 2 show the relationship between water penetration and free area velocity in Feet Per Minute (fpm).

AMCA (Air Moving and Conditioning Association) Standard 500 is the basis for the louver free area calculations ONLY as shown in Tables 1 and 2 on page 4. Louver static pressure drop data shown in Curves 3 and 4.



Louver free area, static pressure drop and water penetration should all be considered in the proper selection of Outside Air Louvers. Louvers should not be specified to meet a percent free area requirement since the percent free area varies with the louver size and model. Louvers should be specified to meet a maximum allowable pressure drop for a specific volume of design CFM with acceptable water penetration levels. The examples on this page show how these factors are interrelated.

OAL2 or OAL2 Louver Sizes

Example: Select a Model OAL2 F and OAL2 C for fresh air intake application to handle 5000 CFM at less than 0.084 inches W.G. for minimum water penetration.

Step 1: Refer to Louver Performance Curve No. 3 and determine the free area velocity at 0.94 inches W.G. A pressure drop of 0.084 inches W.G. limits the free area velocity to approximately 575 fpm.

Step 2: Use the formula for finding Free Area in square feet.

$$\text{Free Area (sq. ft.)} = \frac{\text{CFM}}{\text{Free Area Velocity (fpm)}}$$

$$\text{Free Area (sq. ft.)} = \frac{5000 \text{ CFM}}{575 \text{ (fpm)}} = 8.7 \text{ sq. ft.}$$

Step 3: Refer to Water Penetration Curve No. 1 at a Free Area Velocity of 575 fpm, water penetration is slight, approximately 0.075 ounces of water per square foot of free area in 5 minutes at 2≤ per hour rainfall rate. Water penetration for Models OAL2 F and OAL2 C starts to become of concern above 615 fpm free area velocity.

Step 4: Use the following formula to calculate the total water penetration of the louver required for the application:

$$\text{Total Louver Water Penetration} = \text{Louver Free Area in sq. ft.} \times \text{Ounces of Water per sq. ft. of Free Area}$$

$$\text{Total Louver Water Penetration} = 8.7 \text{ sq. ft.} \times .75 \times .6525 \text{ ozs. in 5 minutes}$$

Step 5: Refer to Table 2 and select a Louver with approximately 8.7 sq. ft. of free area. Several selections are available.

Width x Height	Free Area (Sq. Ft.)	Water Penetration in 5 Minutes
76 x 36	8.7	.652 ounces H ₂ O
52 x 52	8.7	.653 ounces H ₂ O
44 x 60	8.5	.637 ounces H ₂ O
36 x 76	8.8	.660 ounces H ₂ O

Example: Select a Model OAL4 F and OAL4 C for fresh air intake application to handle 5000 CFM at less than 0.04 inches W.G. for minimum water penetration.

Step 1: Refer to Louver Performance Curve No. 4 and determine the free area velocity at 0.04 inches W.G. A pressure drop of 0.04 inches W.G. limits the free area velocity to approximately 525 fpm.

Step 2: Use the formula for finding Free Area in square feet.

$$\text{Free Area (sq. ft.)} = \frac{\text{CFM}}{\text{Free Area Velocity (fpm)}}$$

$$\text{Free Area (sq. ft.)} = \frac{5000 \text{ CFM}}{575 \text{ (fpm)}} = 8.7 \text{ sq. ft.}$$

Step 3: Refer to Water Penetration Curve No. 2. At a Free Area Velocity of 525 fpm, water penetration is slight, approximately 0.030 ounces of water per square foot of free area in 5 minutes at 2≤ per hour rainfall rate. Water penetration for Models OAL4 F and OAL4 C starts to become of concern above 550 fpm free area velocity.

Step 4: Use the following formula to calculate the total water penetration of the louver required for the application:

Step 5: Refer to Table 1 and select a Louver with approximately 9.5 sq. ft. of free area. Several selections are available.

$$\text{Total Louver Water Penetration} = \text{Louver Free Area in sq. ft.} \times \text{Ounces of Water per sq. ft. of Free Area}$$

$$\text{Total Louver Water Penetration} = 8.7 \text{ sq. ft.} \times .75 \times .6525 \text{ ozs. in 5 minutes}$$

Width x Height	Free Area (Sq. Ft.)	Water Penetration in 5 Minutes
76 x 36	8.7	.652 ounces H ₂ O
52 x 52	8.7	.653 ounces H ₂ O
44 x 60	8.5	.637 ounces H ₂ O
36 x 76	8.8	.660 ounces H ₂ O

Selections at higher free area velocities are possible for installations with built-in positive protection of equipment against water penetration. In these situations, the recommended free area velocities for minimum water penetration may be exceeded.

Curve #4 for OAL-4

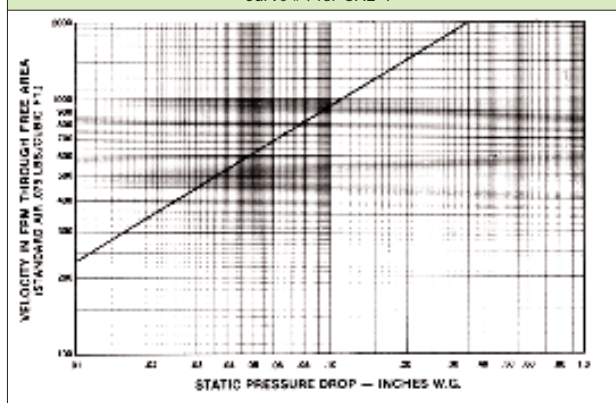


Figure 1

Braces and Mullions

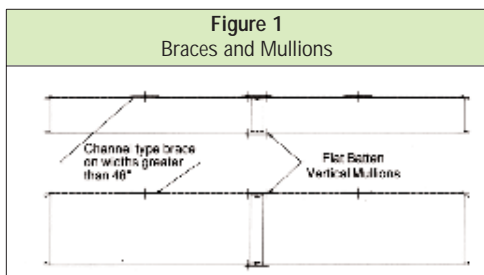


Figure 2

Braces and Mullions

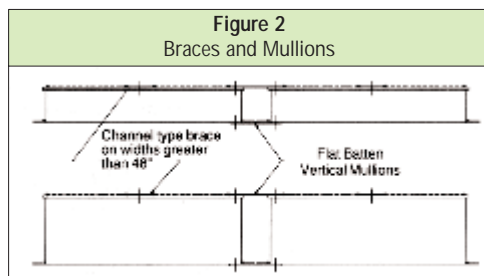


Figure 3

Face Flange with Expansion Anchor

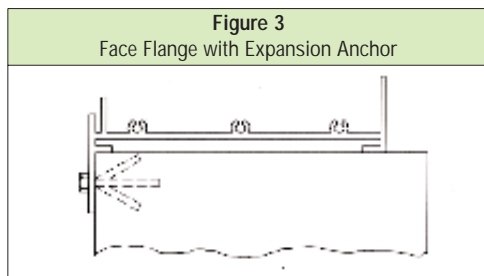


Figure 4

Expansion Anchor Through Jamb

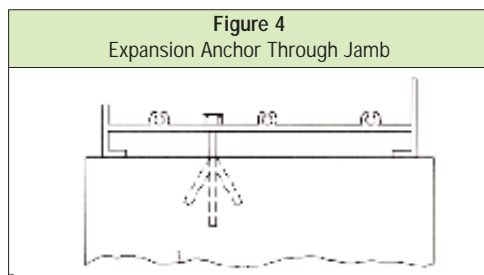
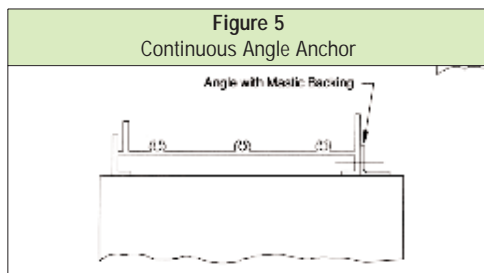


Figure 5

Continuous Angle Anchor



Louver Installation Details

Louvers can be installed in wall openings by a variety of methods. Louvers are available with flanges for overlapping wall openings and with channel periphery for recess in wall openings. Face flange Models OAL4 F and OAL2 F are provided with front flanges on head, sill and jambs. Model OAL4 F has $3/4 \leq$ wall opening overlap and Model OAL2 F has a $1/2$ inch wall opening overlap. Attachment is suggested through the face flange with lead expansion shields and stainless steel bolts or screws to suit the conditions of construction. (Please see Fig. 3).

Angle Anchors

Continuous angles or $6 \leq$ long sections of $1 \frac{1}{4} \leq x 1 \frac{1}{4} \leq$ aluminum angles for $4 \leq$ and $2 \leq$ deep face flanged louvers and $1 \leq x 5/8 \leq x 1 \frac{1}{4} \leq$ aluminum angles for $4 \leq$ and $2 \leq$ deep channel louvers can be used at jambs, sills, and heads for attachment from the rear. Bolt the angle leg to the wall opening. It is suggested that a coating of mastic sealant be used between the wall and angle leg surfaces. Fasten the remaining angle leg to the louver. On continuous angles, installation bolts should be spaced on $18 \leq$ centers. (Please see Fig. 5).

Lead Expansion Anchors

Stainless steel bolts with lead expansion shields can be used through holes drilled in louver jambs. Large flat washers of the same material as the bolts should be used with mastic sealant between the washers and louver jambs. (Please see Fig. 4).

Vertical Mullions

Flat batten vertical mullions are available for multiple louver sections and are field installed with stainless steel screws by others. The flat batten mullions are $0.081 \leq$ thick aluminum strips available undrilled in 5 ft. and 10 ft. lengths in $1 \frac{1}{4} \leq$ widths for Models OAL2 C and OAL4 C and $1 \frac{1}{2} \leq$ widths for Models OAL2 F and OAL4 F louvers. (Please see Figs. 1 & 2).

Installation, caulking around perimeter of louvers and wall openings, hardware and structural materials are furnished by others.

Any of the recommended methods, as well as other means of attachment and installation as detailed by the architect can be employed.



Series OAL - Specifications

Outside Intake and Exhaust Air Louvers – Extruded Aluminum - Series OAL

Model OAL2C - 2" deep – "C" channel frame

Model OAL4C - 4" deep – "C" channel frame

Model OAL2F - 2" deep – "F" flanged frame

Model OAL4F - 4" deep – "F" flanged frame

Supply Unit Specification

Outside air louvers shall be Model OAL manufactured by METALAIRE®. Units shall be constructed from heavy aluminum extrusions with fixed multiple blades. The louver blades shall be on 2" spacing and have a 45° deflection and include a water baffle with a 1/4" bend. Blades shall overlap to increase water resistance. Units to include vertical reinforcing channel type braces for louvers with blade width spans in excess of 48".

Options:

Units shall be 2" deep and include a channel frame (Model OAL2C)

Units shall be 4" deep and include a channel frame (Model OAL4C)

Units shall be 2" deep and include a flanged frame and a 1" wide face flange (Model OAL2F)

Units shall be 4" deep and include a flanged frame and a 1 1/4" wide face flange (Model OAL4F)

Units shall include caulking type sills, jambs, and head allowing a weather tight seal between the louver frame and the wall opening. All fastening shall be steel cadmium plated self-tapping screws threaded into stiffening bosses.

Options:

Units shall include an aluminum bird screen.

Units shall include and aluminum insect screen

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



Series OAL - Model Specification Guide

Outside Air Louvers - Extruded Aluminum

Series OAL

Model	Available Neck	Available Finishes	Available Options		
OAL 2F - 2" Depth - Flange Frame	12" thru 120"	Standard	IS	Insect Screen	
OAL 2C - 2" Depth - Channel Frame		24 - Mill	BS	Bird Screen	
OAL 4F - 4" Depth - Flange Frame		Optional			
OAL 4C - 4" Depth - Channel Frame		01 - White			
		02 - Aluminum			
		03 - Black			
		04 - Clear Anodized			
		28 - Custom Color			



➔ Punkah Louver ➔ Global Adjustment ➔ Model MPK ➔ Aluminum

Product Details

- ★ Model MPK discharges a high-velocity jet that can be directed to condition a specific space or area
- ★ The model MPK is constructed using a felt gasket that allows smooth movement of the inner core to direct air flow and provides a tight seal to prevent air leakage
- ★ An optional aperture damper is available which includes an adjustment knob and stainless steel linkage and tension springs for maximum corrosion protection

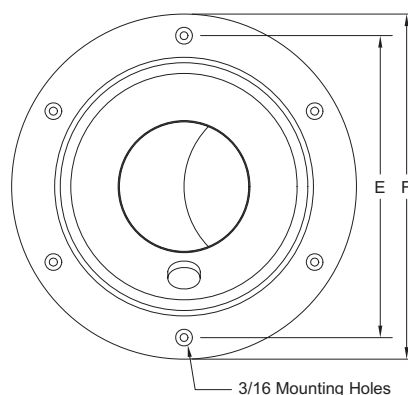
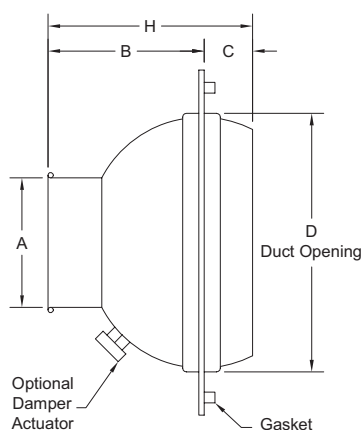


Model MPK Shown

Standard Finish: 24 Mill finish

Sideview, dimensions are in inches

Industrial High Capacity Punkah Louver - Aluminum - Global Adjustment Model MPK



Size	A	B	C	D	E	F	H	No. of Mtg. Holes
6	3	3 5/8	1 1/8	6	7	8	4 3/4	4
8	4 3/8	4 5/8	1 3/4	8	9	10	6 1/8	4
10	5 3/4	6 1/4	2 1/2	10	11	12	8 3/4	6
12	7 3/8	6 1/2	3	12	13	14	9 1/2	6
14	8 5/8	7 3/8	4 1/8	14	15	16	11 1/2	6
16	9 3/4	8 1/2	4 5/8	16	17	18	13 1/8	6
18	10 1/2	10	4 5/8	18	19	20	14 5/8	8
20	12 3/8	11	5	20	21	22	16	8

1. Available Finishes	2. Aluminum Construction
Standard Finish: 24 Mill finish Optional Finish: 01 White 02 Aluminum 04 Clear Anodized	• Available only in listed sizes



Series MPK - Performance

Model MPK

Model	Nozzle Velocity (fpm)	1000	1500	2000	2500	3000	3500	4000
6	CFM	49	74	96	123	147	172	196
	Ps	0.05	0.12	0.22	0.34	0.49	0.66	0.86
	NC	<15	<15	15	21	25	29	33
	RC	<10N	<10N	11N	22N	26N	30N	34N
	Projection @ Vt = 400 fpm	3	4	5	6	7	9	10
	Projection @ Vt = 200 fpm	5	7	10	12	14	15	16
	Projection @ Vt = 100 fpm	10	13	15	18	19	20	22
	Projection @ Vt = 50 fpm	15	20	22	26	28	30	32
8	CFM	104	157	209	261	313	365	418
	Ps	0.06	0.14	0.24	0.38	0.53	0.70	0.92
	NC	<15	<15	17	24	30	35	38
	RC	<10N	<10N	15N	22N	28N	33N	36N
	Projection @ Vt = 400 fpm	4	5	7	9	11	13	15
	Projection @ Vt = 200 fpm	7	11	15	17	19	21	23
	Projection @ Vt = 100 fpm	15	18	23	25	27	29	32
	Projection @ Vt = 50 fpm	23	28	32	39	41	44	45
10	CFM	180	270	361	451	541	631	721
	Ps	0.07	0.15	0.25	0.39	0.56	0.74	0.96
	NC	<15	<15	21	29	35	40	45
	RC	<10R	11R	17N	26N	33N	39N	43N
	Projection @ Vt = 400 fpm	5	7	9	12	15	17	19
	Projection @ Vt = 200 fpm	9	14	19	23	25	27	30
	Projection @ Vt = 100 fpm	18	24	30	32	36	38	43
	Projection @ Vt = 50 fpm	30	37	43	45	51	57	60
12	CFM	297	445	593	742	890	1038	1187
	Ps	0.07	0.15	0.26	0.40	0.58	0.78	1.01
	NC	<15	15	24	32	38	44	47
	RC	<10R	11R	18N	28N	35N	41N	43N
	Projection @ Vt = 400 fpm	7	9	12	15	19	22	25
	Projection @ Vt = 200 fpm	12	18	25	29	32	35	38
	Projection @ Vt = 100 fpm	25	31	38	41	46	49	57
	Projection @ Vt = 50 fpm	38	47	55	65	70	74	76
14	CFM	406	609	811	1014	1217	1420	1623
	Ps	0.07	0.15	0.26	0.41	0.58	0.79	1.02
	NC	<15	15	25	33	39	44	48
	RC	<10R	12R	22N	31N	37N	42N	45N
	Projection @ Vt = 400 fpm	8	11	14	17	22	25	29
	Projection @ Vt = 200 fpm	14	21	29	34	37	41	45
	Projection @ Vt = 100 fpm	29	36	45	48	54	57	64
	Projection @ Vt = 50 fpm	45	55	64	76	81	86	89
16	CFM	518	778	1036	1296	1555	1815	2074
	Ps	0.07	0.14	0.26	0.41	0.58	0.80	1.03
	NC	<15	<16	26	33	39	44	49
	RC	<10R	12R	22R	31N	37N	42N	46N
	Projection @ Vt = 400 fpm	8	11	13	16	20	25	30
	Projection @ Vt = 200 fpm	16	19	23	27	34	39	42
	Projection @ Vt = 100 fpm	30	35	43	46	52	56	62
	Projection @ Vt = 50 fpm	43	50	60	72	76	82	87
18	CFM	601	902	1202	1503	1804	2105	2406
	Ps	0.06	0.13	0.24	0.37	0.54	0.74	0.96
	NC	<15	16	26	33	39	44	49
	RC	<10R	12R	23R	31N	37N	42N	47N
	Projection @ Vt = 400 fpm	9	13	15	18	24	27	31
	Projection @ Vt = 200 fpm	18	24	26	32	26	40	45
	Projection @ Vt = 100 fpm	33	37	43	50	54	60	66
	Projection @ Vt = 50 fpm	47	53	66	73	80	85	93
20	CFM	835	1253	1670	2088	2506	2924	3341
	Ps	0.06	0.12	0.22	0.34	0.49	0.68	0.91
	NC	<15	17	27	34	40	46	48N
	RC	<10R	13R	24R	31N	37N	43N	33
	Projection @ Vt = 400 fpm	10	14	18	24	28	30	33
	Projection @ Vt = 200 fpm	20	26	32	39	45	50	56
	Projection @ Vt = 100 fpm	34	45	50	60	65	71	80
	Projection @ Vt = 50 fpm	50	66	74	85	91	96	108

For performance notes, see page IND-148



Performance Notes for Model MPK

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Cubic Feet per Minute (air)
- fpm - Velocity of air stream in Feet Per Minute
- Ps - Static pressure = Pt - Pv (inches of water column)
- NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands
- Ak - Area Factors

Model MPK - Specifications

Supply Unit Specification

Air Outlets shall be model MPK Punka Louver Diffusers manufactured by METALAIRE. Units shall be composed of an adjustable inner round nozzle section and a round outer frame. The units shall be the size and quantity as outline in the plans and specifications.

Unit shall be manually adjustable without the use of tools allowing the discharge jet to be directed a full 70 degrees. Outlet shall be constructed using a felt gasket seal providing smooth adjustment without leakage. Outer circular frame of unit shall include a closed cell neoprene gasket to prevent leakage between the outlet and mounting surface.

Optional Aperture Damper

Outlets shall include an integral aperture damper. Damper shall have an adjustment knob constructed from aluminum. Connecting linkage, tension springs, and damper hardware shall be constructed from stainless steel.

Outlets shall be constructed of heavy gauge aluminum and available in 6", 8", 10", 12", 14", 16", 18", and 20" diameters. Finish shall be white or aluminum paint, mill finish, or clear anodized finish.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



Model MPK - Model Specification Guide

Supply - High Capacity Punkah Louver - Global Adjustment
Model MPK - Aluminum

Model	Available Neck	Available Finishes	Available Options
MPK - Punkah Louver	6"	Standard	D - MPK Damper
	8"	24 - Mill	
	10"		
	12"	Optional	
	14"	01 - White	
	16"	02 - Aluminum	
	18"		
	20"	04 - Clear Anodized	



➔ Architectural ➔ High Velocity ➔ Round ➔ Series MRD

Product Details

- ★ An excellent selection for architecturally pleasing applications requiring an adjustable outlet with high capacities and long throw
- ★ Heavy gauge aluminum construction
- ★ Available in single and double deflection
- ★ Unit is designed for surface mounting with concealed fastening

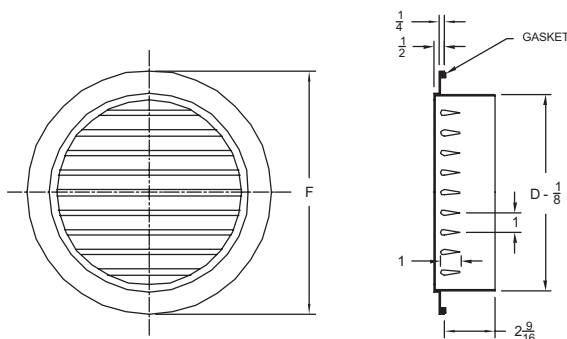


Model MRDD Shown

Standard Finish: 01 White

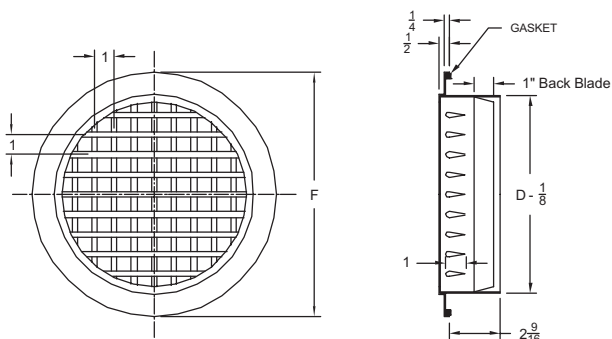
Sideview, dimensions are in inches

Single Deflection Grille - Wall/Ceiling Mount - Adjustable air pattern Model MRDS



Models: MRDS & MRDD		
Available Sizes	D	F
6	6	8-1/4
8	8	10-1/4
10	10	12-1/4
12	12	14-1/4
14	14	16-1/4
16	16	18-1/4
18	18	20-1/4
20	20	22-1/4
22	22	24-1/4
24	24	26-1/4

Double Deflection Grille - Wall/Ceiling Mount - Adjustable Horizontal/Vertical Blades Model MRDD



Models: MRDS & MRDD		
Available Sizes	D	F
6	6	8-1/4
8	8	10-1/4
10	10	12-1/4
12	12	14-1/4
14	14	16-1/4
16	16	18-1/4
18	18	20-1/4
20	20	22-1/4
22	22	24-1/4
24	24	26-1/4

1. Available Finishes

Standard Finish:
01 White
Optional Finish:
02 Aluminum paint
03 Black
24 Mill finish

2. Construction Details

- Concealed mounting system - Suitable for both hard and flexible ductwork
- Mounting screws included
- Border is one-piece construction



Series MRD - Performance

Models MRDS, MRDD

Model	Duct Velocity Velocity Press	400 0.01	600 0.022	800 0.04	1000 0.062	1200 0.09	1400 0.122	1600 0.16
MRD-06	CFM	79	118	157	196	236	275	314
	Ps	0.021	0.047	0.073	0.133	0.185	0.254	0.322
	NC	<15	<15	15	23	29	35	40
	Projection	4-8-15	6-12-21	8-14-24	10-16-28	13-21-30	15-22-32	17-24-34
MRD-08	CFM	140	209	279	349	419	489	559
	Ps	0.016	0.038	0.067	0.105	0.15	0.205	0.266
	NC	<15	<15	<15	21	27	33	38
	Projection	5-10-20	8-16-27	11-21-32	14-25-36	17-28-39	20-30-41	21-32-45
MRD-10	CFM	218	327	436	545	655	764	873
	Ps	0.014	0.033	0.059	0.092	0.131	0.18	0.234
	NC	<15	<15	<15	20	26	32	36
	Projection	6-12-24	9-17-32	14-26-37	17-31-45	21-34-47	25-37-52	29-40-56
MRD-12	CFM	314	471	628	786	943	1100	1257
	Ps	0.014	0.031	0.053	0.085	0.12	0.165	0.213
	NC	<15	<15	<15	19	25	31	35
	Projection	7-15-30	12-24-40	16-33-47	20-37-53	25-41-59	29-45-65	33-48-74
MRD-14	CFM	428	641	855	1069	1283	1497	1711
	Ps	0.013	0.029	0.05	0.077	0.114	0.154	0.201
	NC	<15	<15	<15	19	25	31	35
	Projection	8-18-37	14-28-47	18-38-55	23-44-61	30-48-70	34-52-74	38-56-83
MRD-16	CFM	559	838	1117	1396	1676	1955	2234
	Ps	0.013	0.027	0.048	0.076	0.108	0.147	0.191
	NC	<15	<15	<15	19	25	31	35
	Projection	10-20-40	15-30-53	22-44-65	28-50-72	34-54-80	40-60-85	45-64-90
MRD-18	CFM	707	1060	1414	1767	2121	2474	2828
	Ps	0.012	0.027	0.046	0.072	0.104	0.142	0.185
	NC	<15	<15	<15	20	26	32	36
	Projection	11-22-44	18-36-61	25-50-72	31-57-80	40-63-89	45-67-95	50-71-101
MRD-20	CFM	873	1309	1746	2182	2618	3055	3491
	Ps	0.012	0.026	0.045	0.07	0.101	0.137	0.177
	NC	<15	<15	<15	20	26	32	36
	Projection	12-24-49	20-40-68	27-53-80	35-63-89	44-68-99	51-74-105	56-78-112
MRD-22	CFM	1056	1584	2112	2640	3168	3696	4224
	Ps	0.011	0.025	0.043	0.068	0.097	0.133	0.173
	NC	<15	<15	<15	21	27	33	37
	Projection	13-27-54	22-44-74	30-57-85	37-68-98	47-76-110	57-85-120	60-87-123
MRD-24	CFM	1257	1885	2514	3142	3770	4399	5027
	Ps	0.011	0.024	0.042	0.068	0.096	0.13	0.17
	NC	<15	<15	15	22	29	34	38
	Projection	14-29-60	24-48-81	33-66-95	41-75-106	50-84-116	58-88-124	66-95-130

Performance Notes for Series MRD

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

Projection - Projection distance (THROW) in feet from the Nozzle discharge at which the maximum velocity has been reduced to specified terminal velocity (Vt)

Terminal Velocity - Maximum velocity (Vt) in feet per minute at the specified distance from the outlet face (THROW) 200 fpm, 100 fpm and 50 fpm respectively.

CFM - Standard air density and isothermal conditions

Ps - Inches of water gauge required

NC - Noise criterion, sound pressure level. NC ratings are based on sound power level (Lw) RE: 10E-12 watts minus a 10 dB room attenuation in all octave bands



Series MRD - Specifications

Supply – Single Deflection/Model MRDS

Air Outlets shall be model MRDS by METALAIRE. Units shall be a round, single deflection supply register with 1" extruded aluminum airfoil shaped blades on 1" spacing. Border shall be constructed of heavy gauge aluminum. Deflector blades shall be individually adjustable.

Units shall be designed for concealed mounting in either wall or ceiling applications and allow installation for both hard and flexible ductwork. Units shall also include a foam gasket to seal the border and mounting surface.

The units shall be the size and quantity as outlined in the plans and specifications.

Supply – Double Deflection/Model MRDD

Air Outlets shall be model MRDD by METALAIRE. Units shall be a round, double deflection supply register with a set of front and perpendicular rear deflection blades. Deflection blades shall be 1" extruded aluminum airfoil shaped blades on 1" spacing. Border shall be constructed of heavy gauge aluminum. Deflector blades shall be individually adjustable.

Units shall be designed for concealed mounting and allow installation for both hard and flexible ductwork. Units shall also include a foam gasket to seal the border and mounting surface.

The units shall be the size and quantity as outline in the plans and specifications.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series MRD - Model Specification Guide

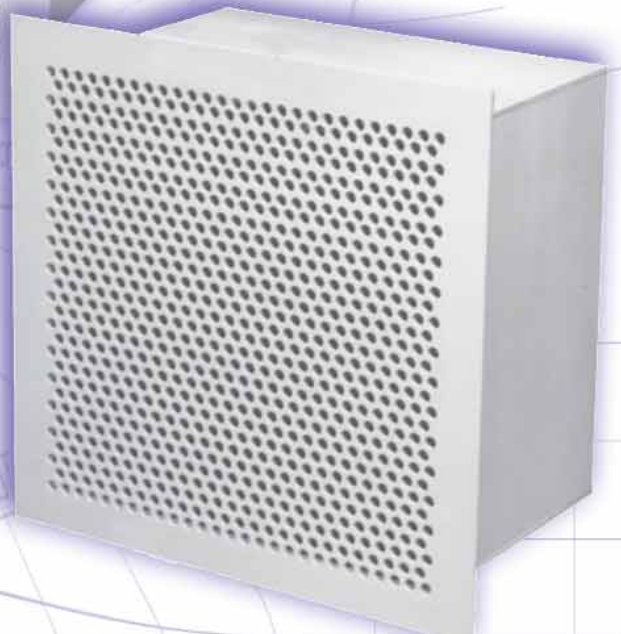
Supply - Architectural - Round

Series MRD - Aluminum

Model	Available Neck	Available Finishes
MRDS - Round - Single Deflection	6" 8" 10" 12" 14" 16" 18" 20" 22" 24"	Standard
MRDD - Round - Double Deflection		01 - White
		Optional
		02 - Aluminum
		03 - Black
		24 - Mill



GOING



SECURITY PRODUCTS

SECURITY PRODUCTS





Model SGSP
Pg. 156

Maximum Security Grilles - Square Holes/Mesh Face - Series SGSP

- ✦ The series SGSP is a supply maximum security steel grille and has a face plate perforated with 2" square holes separated by 1" wide fret bars. A woven steel mesh screen is inserted directly behind the face panel and is sandwiched by a steel backup plate
- ✦ The series SGSP is designed for sidewall applications. A rear operated opposed blade damper is available as an option
- ✦ Series SGSP is an excellent choice for maximum security applications such as federal correctional facilities, state and local prisons, psychiatric hospitals, and manufacturing plants where security is of paramount concern. This grille can be used for both supply and return applications



Model SGRP
Pg. 162

Maximum Security Grilles - Round Perforated Holes - Series SGRP

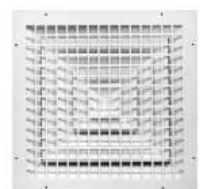
- ✦ The series SGRP is a supply maximum security steel grille and has round holes and a perforated face plate
- ✦ The series SGRP is designed for sidewall applications. A rear operated opposed blade damper is available as an option
- ✦ Series SGRP is an excellent choice for maximum security applications such as federal correctional facilities, state and local prisons, psychiatric hospitals, and manufacturing plants where security is of paramount concern. This grille can be used for both supply and return applications



Model SGRH
Pg. 168

Minimum Security Grilles - Fixed Louver Face - Series SGRH

- ✦ The series SGRH is a return, minimum security grille constructed with heavy gauge steel louvers that are reinforced and welded to a steel sleeve
- ✦ The series SGRH is designed for sidewall applications. A rear operated opposed blade damper is available as an option
- ✦ Series SGRH is an excellent choice for a return grille in minimum security, supervised areas. Applications for the series SGRH include minimum security areas in federal correctional facilities, state and local prisons, psychiatric hospitals, and manufacturing plants. The SGRH is also an excellent choice for public areas to resist vandalism



Model SG5500S
Pg. 172

Minimum Security Grilles - Steel Diffuser and Face Plate - Series SG5500S

- ✦ The series SG5500S is a supply, minimum security steel ceiling diffuser and features a steel lattice face panel attached to the high performing Series 5500S steel supply diffuser
- ✦ This surfaced mounted diffuser is available with 1, 2, 3, or 4 way air patterns
- ✦ Series SG5500S is an excellent choice for minimum security, supervised areas requiring a ceiling mounted diffuser. Applications for the SG5500S include minimum security areas in federal correctional facilities, state and local prisons, psychiatric hospitals, and manufacturing plants. The SG5500S is also an excellent choice for public areas to resist vandalism



Model SG2000
Pg. 176

Minimum Security Grilles - 1" Borders - 7/32" Bars - 1/2" Centers - Series SG2000

- ✦ The series SG2000 is a return, minimum security grille constructed with heavy gauge aluminum louvers that are reinforced and welded to a steel sleeve
- ✦ The series SG2000 is designed for sidewall applications. A rear operated opposed blade damper is available as an option
- ✦ Series SG2000 is an excellent choice for a return grille in minimum security, supervised areas. Applications for the series SG2000 include minimum security areas in federal correctional facilities, state and local prisons, psychiatric hospitals, and manufacturing plants. The SG2000 is also an excellent choice for public areas to resist vandalism

Extruded Aluminum		
Deflection	Single Face	Dual Face (Transfer Grille)
0°	SG2000-1	SG2000-2
15°	SG2015-1	SG2015-2
30°	SG2030-1	SG2030-2

Other Security Grilles	
Lattice Face (Min.)	SGLF 4" - 12" or 13" - 16" Sleeve
Wire Mesh Face (Min.)	SGWM 4" - 12" or 13" - 16" Sleeve
Duct Bar Assemblies - Welded in Sleeve	SGDB 4" - 12" or 13" - 16" Sleeve
Duct Bar Assemblies - Welded in Mounting Frame	SGDF

Accessories for Security Grilles	
BSA	Bolted Steel Angles
DS-AL	Debris Screen for SG 2000-1 1/4" x 1/4" Wire Mesh - Aluminum
DS-GS	Debris Screen for SG 2000-1 1/4" x 1/4" Wire Mesh - Galvanized Steel
DS-SS	Debris Screen for SG 2000-1 1/4" x 1/4" Wire Mesh - Stainless Steel
IS	Insect Screen
LSA	Loose Steel Angles
Optional screw holes	
Optional security screws	
SAB	Steel Anchor Bars
SBR	Duct Bars
SG5LFP	Steel Face Plate for SG5500S (Min.)
SGLFO	Steel Lattice Face Plate
SG-OBDA	Aluminum Dampers for Grilles
Steel Angles	
WAF	Companion Flanges (Welded Angle Frames)
WSA	Welded Steel Angles (Welded to Grille Sleeve)
WS	Wall Sleeve



➔ Maximum Security Grilles ➔ Square Holes/Mesh Face ➔ Model SGSP ➔ Steel

Product Details

- ★ The series SGSP is a supply maximum security steel grille and has a face plate perforated with 2' square holes separated by 1" wide fret bars. A woven steel mesh screen is inserted directly behind the face panel and is sandwiched by a steel backup plate
- ★ The series SGSP is designed for sidewall applications. A rear operated opposed blade damper is available as an option
- ★ Series SGSP is an excellent choice for maximum security applications such as federal correctional facilities, state and local prisons, psychiatric hospitals, as well as manufacturing plants. The SGSP is also an excellent choice for public areas to resist vandalism

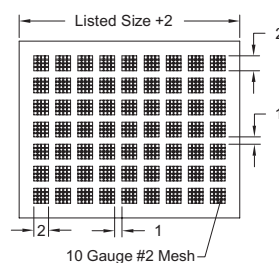
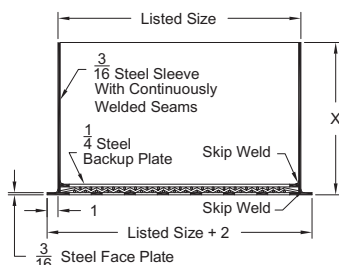


Model SGSP Shown

Standard Finish: 01 White

Sideview, dimensions are in inches

Security Grille - Square Holes - Mesh Screen Face Model SGSP



1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Note: Contact Factory for other finish	OBD - sleeve mounted steel damper206 OBDA - sleeve mounted aluminum damper . .206 SAB - Steel Anchors206 BSA - Bolted Steel Angles207 WSA - Welded Steel Angles207 SBR - Security Bars207 Screw Holes	LSA - Loose Steel Angles WAF - Welded Angle Frame	<ul style="list-style-type: none"> • Neck Sizes available in 2" increments as listed • Damper can be mounted for rear operation with standard flat tip screwdriver. Due to tight bar spacing, face operated dampers are not recommended • Face plate, sleeve and horizontal blades are 14 gauge steel • Wire mesh is 10 gauge by #2

Model SGSP - Performance

CFM		6" x 6"	9" x 6"	12" x 6"	15" x 6"	18" x 6"	21" x 6"	24" x 6"	NC
25	Nk Vel Ps Throw	100 0.008 4 2							20 - 25
50	Nk Vel Ps Throw	200 0.034 12 6	133 0.015 10 5	100 0.008 8 4					
75	Nk Vel Ps Throw	300 0.076 17 8	200 0.034 14 7	150 0.019 13 6	120 0.012 12 6	100 0.008 11 5			
100	Nk Vel Ps Throw	400 0.135 21 10	267 0.06 18 9	200 0.034 16 8	160 0.022 15 7	133 0.015 14 7	114 0.011 13 6	100 0.008 12 6	
150	Nk Vel Ps Throw		400 0.135 23 12	300 0.076 21 11	240 0.049 20 10	200 0.034 19 9	171 0.025 18 9	150 0.019 17 8	
200	Nk Vel Ps Throw			400 0.135 26 13	320 0.087 24 12	267 0.06 23 11	229 0.044 21 11	200 0.034 21 10	
250	Nk Vel Ps Throw			500 0.211 30 15	400 0.135 28 14	333 0.094 26 13	286 0.069 25 12	250 0.053 24 12	
300	Nk Vel Ps Throw				480 0.265 35 18	400 0.184 33 16	343 0.135 31 12	300 0.104 30 12	
350	Nk Vel Ps Throw					467 0.241 36 18	400 0.177 34 17	350 0.135 33 16	
400	Nk Vel Ps Throw						457 0.224 37 19	400 0.171 35 18	
450	Nk Vel Ps Throw							450 0.211 38 19	25 - 30
500	Nk Vel Ps Throw							500 0.256 41 20	

CFM		9" x 9"	12" x 9"	15" x 9"	18" x 9"	21" x 9"	24" x 9"	NC
100	Nk Vel Ps Throw	178 0.027 15 8	133 0.015 14 7	107 0.01 13 6				20 - 25
150	Nk Vel Ps Throw	267 0.06 21 10	200 0.034 19 9	160 0.022 17 9	133 0.015 16 8	114 0.011 15 8	100 0.008 14 7	
200	Nk Vel Ps Throw	356 0.107 25 12	267 0.06 23 11	213 0.038 21 10	178 0.027 20 10	152 0.02 19 9	133 0.015 18 9	
250	Nk Vel Ps Throw	444 0.167 27 14	333 0.094 26 13	267 0.06 24 12	222 0.042 23 11	190 0.031 22 11	167 0.023 21 10	
300	Nk Vel Ps Throw		400 0.135 30 15	320 0.087 28 14	267 0.06 26 13	229 0.044 25 12	200 0.034 23 12	
350	Nk Vel Ps Throw		467 0.184 33 16	373 0.118 31 15	311 0.082 29 14	267 0.06 27 14	233 0.046 26 13	
400	Nk Vel Ps Throw			427 0.195 36 18	356 0.135 34 17	305 0.099 32 16	267 0.076 31 13	
450	Nk Vel Ps Throw			480 0.241 39 19	400 0.167 37 18	343 0.123 35 17	300 0.094 33 17	
500	Nk Vel Ps Throw				444 0.202 39 20	381 0.148 37 19	333 0.114 35 18	
550	Nk Vel Ps Throw				489 0.241 42 21	419 0.177 39 20	367 0.135 38 19	
600	Nk Vel Ps Throw					457 0.207 42 21	400 0.159 40 20	25 - 30
650	Nk Vel Ps Throw					495 0.241 44 22	433 0.184 42 21	
700	Nk Vel Ps Throw						467 0.241 44 22	

For performance notes, see page SEC-160

For more product information visit us at www.metalair.com

Model SGSP - Performance

CFM		12" x 12"	15" x 12"	18" x 12"	21" x 12"	24" x 12"	NC
100	Nk Vel Ps Throw	100 .008 12 7					
150	Nk Vel Ps Throw	150 .019 17 9	120 .012 15 9	100 .008 14 8			
200	Nk Vel Ps Throw	200 .034 21 11	160 .022 19 10	133 .015 18 10	114 .011 17 9	100 .008 16 9	
250	Nk Vel Ps Throw	250 .053 24 13	200 .034 22 12	167 .023 21 11	143 .017 20 11	125 .013 19 10	
300	Nk Vel Ps Throw	300 .076 27 15	240 .049 25 14	200 .034 23 13	171 .025 22 12	150 .019 21 12	
350	Nk Vel Ps Throw	350 .104 30 16	280 .066 28 15	233 .046 26 14	200 .034 25 14	175 .026 24 13	
400	Nk Vel Ps Throw	400 .135 33 18	320 .087 30 17	267 .060 29 16	229 .044 27 15	200 .034 26 14	20 - 25
450	Nk Vel Ps Throw	450 .211 38 21	360 .135 35 19	300 .094 33 18	257 .069 31 17	225 .053 30 17	
500	Nk Vel Ps Throw	500 .256 41 22	400 .164 38 21	333 .114 35 19	286 .084 34 18	250 .064 32 18	
550	Nk Vel Ps Throw		440 .195 40 22	367 .135 38 21	314 .099 36 20	275 .076 34 19	
600	Nk Vel Ps Throw		480 .229 42 23	400 .159 40 22	343 .117 38 21	300 .089 36 20	
650	Nk Vel Ps Throw			433 .184 42 23	371 .135 40 22	325 .104 38 21	
700	Nk Vel Ps Throw			467 .211 44 24	400 .155 42 23	350 .119 40 22	
750	Nk Vel Ps Throw			500 .211 44 24	429 .155 42 23	375 .119 40 22	
NC		25 - 30					

CFM		15" x 15"	18" x 15"	21" x 15"	24" x 15"	NC
200	Nk Vel Ps Throw	128 .014 18 9	107 .010 16 8			
300	Nk Vel Ps Throw	160 .022 21 10	133 .015 19 10	114 .011 18 9	100 .008 17 9	
400	Nk Vel Ps Throw	192 .031 23 12	160 .022 22 11	137 .016 21 10	120 .012 20 10	
500	Nk Vel Ps Throw	256 .055 28 14	213 .038 26 13	183 .028 25 13	160 .022 24 12	
600	Nk Vel Ps Throw	320 .087 33 16	267 .060 31 15	229 .044 29 15	200 .034 28 14	20 - 25
700	Nk Vel Ps Throw	384 .125 37 19	320 .087 35 17	274 .064 33 17	240 .049 32 16	
800	Nk Vel Ps Throw	448 .222 45 23	373 .154 42 21	320 .113 40 20	280 .087 38 19	
900	Nk Vel Ps Throw		427 .195 46 23	366 .143 44 22	320 .110 42 21	
1000	Nk Vel Ps Throw		480 .241 50 25	411 .177 47 23	360 .135 45 22	
1100	Nk Vel Ps Throw			457 .254 53 27	400 .195 51 25	
1200	Nk Vel Ps Throw				480 .229 54 27	

For performance notes, see page SEC-160

Model SGSP - Performance

CFM		18" x 18"	21" x 18"	24" x 18"	21" x 21"	24" x 21"	24" x 24"	NC
300	Nk Vel Ps Throw	133 .015 21 10	114 .011 19 10	100 .008 19 9				
400	Nk Vel Ps Throw	178 .027 25 12	152 .020 24 12	133 .015 23 11	131 .014 22 11	114 .011 21 11	100 .008 21 10	
500	Nk Vel Ps Throw	222 .042 29 14	190 .031 27 14	167 .023 26 13	163 .023 26 13	143 .017 25 12	125 .013 24 12	
600	Nk Vel Ps Throw	267 .060 23 16	229 .044 31 16	200 .034 30 15	196 .032 29 15	171 .025 28 14	150 .019 27 13	
700	Nk Vel Ps Throw	311 .082 36 18	267 .060 34 17	233 .046 33 16	229 .044 33 16	200 .034 31 16	175 .026 30 15	
800	Nk Vel Ps Throw	356 .107 40 20	305 .079 38 19	267 .060 36 18	261 .058 36 18	229 .044 34 17	200 .034 33 16	20 -
900	Nk Vel Ps Throw	400 .167 47 23	343 .123 44 22	300 .094 42 21	294 .090 42 21	257 .069 40 20	225 .053 38 16	25
1000	Nk Vel Ps Throw	444 .241 53 26	381 .177 50 25	333 .135 48 24	327 .130 47 24	286 .099 45 23	250 .076 43 22	
1200	Nk Vel Ps Throw		457 .241 56 28	400 .184 53 27	392 .177 53 26	343 .135 50 25	300 .104 48 24	
1400	Nk Vel Ps Throw			467 .241 58 29	457 .231 58 29	400 .177 55 28	350 .135 53 26	
1600	Nk Vel Ps Throw					457 .224 60 30	400 .171 57 29	
1800	Nk Vel Ps Throw						450 .211 62 31	25 -
2000	Nk Vel Ps Throw						500 .211 62 31	30

For performance notes, see page SEC-160



Performance Notes for Series SGSP

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM** - Air volume is in cubic feet per minute
- Nk Vel** - Neck Velocity is the airstream velocity in the duct just before it reaches the supply outlet; measured in feet per minute.
- NC** - Noise Criteria based on a room absorption of 10 dB, re: 10E-12 watts.
- Throw** - Throw distances in feet are for terminal velocities of 50 and 100 fpm respectively
- Ps** - Static pressure is in inches of water

Model SGSP - Specifications

Air outlets shall be model SG-SP manufactured by METALAIRE. Units shall be maximum security supply grilles of steel construction. Units shall have a face plate constructed of 3/16" steel with 2" square holes and 1" fret bars. A 10 gauge, 3/8" woven steel mesh screen shall be inserted directly behind the face panel sandwiched by a 1/4" steel backup plate. This assembly shall be backed by a continuous seam welded 3/16" thick steel sleeve. Both face and back-up plate shall be skip welded to the sleeve. Units shall include a 1" border.

The units shall be the size and quantity as outline in the plans and specifications.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).

Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



Series SGSP - Model Specification Guide

Maximum Security Grilles - Square Holes/Mesh Face
Model SGSP - Steel

Model	Available Neck	Available Sleeve Length	Available Finishes	Available Options	
SGSP - Screw Holes	6" thru 24"	4" - 16"	01 - White	SAB	Steel Anchor Bars
				BSA 2S	2 Bolted Steel Angles - Short Side
				BSA 2L	2 Bolted Steel Angles - Long Side
				BSA 4	4 Bolted Steel Angles
				WSA 2S	2 Welded Steel Angles - Short Side
				WSA 2L	2 Welded Steel Angles - Long Side
				WSA 4	4 Welded Steel Angles
				LSA 2S	2 Loose Steel Angles - Short Side
				LSA 2L	2 Loose Steel Angles - Long Side
				LSA 4	4 Loose Steel Angles
				WAF	Welded Angle Frame
				SBR	Security Bars
				SH	Screw Holes
				OBD	Opposed Blade Damper - Steel
				OBDA	Opposed Blade Damper - Aluminum



➔ Maximum Security Grilles ➔ Round Perforated Holes ➔ Series SGRP ➔ Steel

Product Details

- ★ The series SGRP is a supply maximum security steel grille and has round holes and a perforated face plate
- ★ The series SGRP is designed for sidewall applications. A rear operated opposed blade damper is available as an option
- ★ Series SGRP is an excellent choice for maximum security applications such as federal correctional facilities, state and local prisons, psychiatric hospitals, as well as manufacturing plants where security is of paramount concern. This grille can be used for both supply and return applications

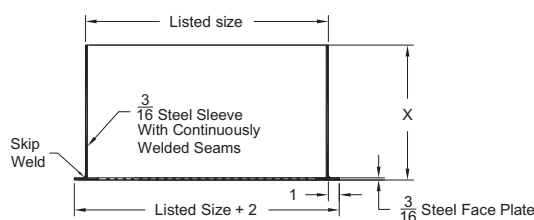


Model SGRP Shown

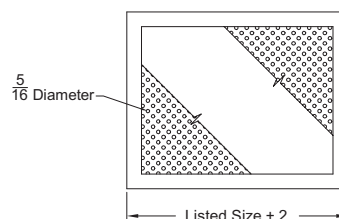
Standard Finish: 01 White

Sideview, dimensions are in inches

Security Grille - With Perforated Face Model SGRP



X = Sleeve Length (Has to be specified)



1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Note: Contact Factory for other finish	OBDA - sleeve mounted aluminum damper . . .206 OBD - sleeve mounted steel damper206 SAB - Steel Anchors206 BSA - Bolted Steel Angles207 WSA - Welded Steel Angles207 SBR - Security Bars207 Screw Holes	LSA - Loose Steel Angles WAF - Welded Angle Frame	<ul style="list-style-type: none"> • Neck Sizes available in 2" increments as listed • Damper can be mounted for rear operation with standard flat tip screwdriver. Due to tight bar spacing, face operated dampers are not recommended • Face plate, sleeve and horizontal blades are 14 gauge steel

Series SGRP - Performance

CFM		6" x 6"	9" x 6"	12" x 6"	15" x 6"	18" x 6"	21" x 6"	24" x 6"	NC
50	Nk Vel Ps Throw	200 .008 10 4	133 .003 8 3	100 .002 7 2					20 - 25
75	Nk Vel Ps Throw	300 .018 14 5	200 .008 12 4	150 .004 11 4	120 .003 10 3	100 .002 9 3			
100	Nk Vel Ps Throw	400 .031 17 6	267 .014 15 5	200 .008 13 5	160 .005 12 4	133 .003 11 4	114 .003 11 4		
125	Nk Vel Ps Throw	500 .049 20 7	333 .022 17 6	250 .012 16 5	200 .008 15 5	167 .005 14 5	143 .004 13 5	125 .003 12 4	
150	Nk Vel Ps Throw		400 .031 20 7	300 .018 18 6	240 .011 16 6	200 .008 15 5	171 .006 15 5	150 .004 14 5	
200	Nk Vel Ps Throw			400 .031 22 8	320 .020 20 7	267 .014 19 7	229 .010 18 6	200 .008 17 6	
250	Nk Vel Ps Throw			500 .049 25 9	400 .031 23 8	333 .022 22 8	286 .016 21 7	250 .012 20 7	
300	Nk Vel Ps Throw				480 .061 29 10	400 .042 27 10	343 .031 26 7	300 .018 22 8	
350	Nk Vel Ps Throw					467 .055 30 11	400 .041 29 10	350 .024 25 9	
400	Nk Vel Ps Throw						457 .051 31 11	400 .031 27 10	
450	Nk Vel Ps Throw							450 .049 32 10	25 - 30
500	Nk Vel Ps Throw							500 .059 34 12	

For performance notes, see page SEC-166



Series SGRP - Performance

CFM		9" x 9"	12" x 9"	15" x 9"	18" x 9"	21" x 9"	24" x 9"	NC
75	Nk Vel Ps Throw	133 .003 10 4	100 .002 9 3					20 - 25
100	Nk Vel Ps Throw	178 .006 13 4	133 .003 11 4	107 .002 10 4				
125	Nk Vel Ps Throw	222 .010 15 5	167 .005 14 5	133 .003 13 4	111 .002 12 4			
150	Nk Vel Ps Throw	267 .014 17 6	200 .008 15 5	160 .005 14 5	133 .003 13 5	114 .003 13 4	100 .002 12 4	
175	Nk Vel Ps Throw	311 .019 19 7	233 .011 17 6	187 .007 16 6	156 .005 15 5	133 .003 14 5	117 .003 14 5	
200	Nk Vel Ps Throw	356 .025 21 7	267 .014 17 7	213 .009 17 6	178 .006 16 6	152 .005 16 5	133 .003 15 5	
250	Nk Vel Ps Throw	444 .055 27 10	333 .031 25 9	267 .020 23 8	222 .014 22 8	190 .010 20 7	167 .008 20 5	
300	Nk Vel Ps Throw		400 .042 27 10	320 .027 25 9	267 .019 24 8	229 .014 23 8	200 .011 22 8	
350	Nk Vel Ps Throw		467 .055 30 11	373 .035 28 10	320 .027 25 9	267 .018 25 9	233 .014 24 8	
400	Nk Vel Ps Throw			427 .045 30 11	373 .035 28 10	305 .023 27 9	267 .018 26 9	
450	Nk Vel Ps Throw			480 .055 32 11	400 .038 31 11	343 .028 29 10	300 .022 28 10	25 - 30
500	Nk Vel Ps Throw				444 .047 33 11	381 .034 31 11	333 .026 30 10	
550	Nk Vel Ps Throw				489 .047 33 11	419 .034 31 11	367 .026 30 10	
600	Nk Vel Ps Throw					457 .048 35 12	400 .037 33 12	
650	Nk Vel Ps Throw					495 .05 37 13	433 .042 35 12	
700	Nk Vel Ps Throw						467 .049 37 13	
750	Nk Vel Ps Throw						500 .055 38 13	

For performance notes, see page SEC-166

CFM		12" x 12"	15" x 12"	18" x 12"	21" x 12"	24" x 12"	NC
100	Nk Vel Ps Throw	100 .002 10 4					20 - 25
125	Nk Vel Ps Throw	125 .003 12 4	100 .002 11 4				
150	Nk Vel Ps Throw	150 .004 14 5	120 .003 13 5	100 .002 12 4			
175	Nk Vel Ps Throw	175 .006 16 5	140 .004 14 5	117 .003 14 5	100 .002 13 4		
200	Nk Vel Ps Throw	200 .008 18 6	160 .005 16 6	133 .003 15 5	114 .003 14 5	100 .002 13 5	
250	Nk Vel Ps Throw	250 .012 20 7	200 .008 17 6	167 .005 17 6	143 .004 16 6	125 .003 16 5	
300	Nk Vel Ps Throw	300 .018 22 8	240 .011 21 7	200 .008 20 7	171 .006 19 7	150 .004 18 6	
350	Nk Vel Ps Throw	350 .031 27 10	280 .020 25 9	233 .014 24 8	200 .010 23 8	175 .008 22 8	
400	Nk Vel Ps Throw	400 .039 30 10	320 .025 27 10	267 .018 26 9	229 .013 24 9	200 .010 23 8	
450	Nk Vel Ps Throw	450 .049 32 11	360 .031 29 10	300 .022 28 10	257 .016 26 9	225 .012 25 9	
500	Nk Vel Ps Throw	500 .059 34 12	400 .038 31 11	333 .026 30 10	286 .019 28 10	250 .015 27 9	25 - 30
550	Nk Vel Ps Throw		440 .045 33 12	367 .031 31 11	314 .023 30 10	275 .018 28 10	
600	Nk Vel Ps Throw		480 .053 35 12	400 .037 33 12	343 .027 31 11	300 .021 30 10	
650	Nk Vel Ps Throw			433 .037 33 12	371 .027 31 11	325 .021 30 10	
700	Nk Vel Ps Throw			467 .042 35 12	400 .031 33 12	350 .024 32 11	
750	Nk Vel Ps Throw			500 .049 37 13	429 .036 35 12	375 .027 33 12	
800	Nk Vel Ps Throw				457 .041 36 13	400 .031 35 12	
850	Nk Vel Ps Throw				486 .046 38 13	425 .035 36 13	
900	Nk Vel Ps Throw					450 .044 39 14	
950	Nk Vel Ps Throw					475 .049 40 14	
1000	Nk Vel Ps Throw					500 .054 42 15	

Series SGRP - Performance

CFM		15" x 15"	18" x 15"	21" x 15"	24" x 15"	NC
200	Nk Vel Ps Throw	128 .003 15 5	107 .002 14 5			
300	Nk Vel Ps Throw	192 .007 19 7	160 .005 18 6	137 .004 17 6	120 .003 16 6	
400	Nk Vel Ps Throw	256 .013 23 8	213 .009 22 8	183 .007 21 7	160 .005 20 7	
500	Nk Vel Ps Throw	320 .020 28 10	267 .014 26 9	229 .010 24 9	200 .008 23 8	
600	Nk Vel Ps Throw	384 .029 31 11	320 .020 29 10	274 .015 28 10	240 .011 26 9	20 - 25
700	Nk Vel Ps Throw	448 .039 34 12	373 .027 32 11	320 .020 31 11	280 .015 29 10	
800	Nk Vel Ps Throw		427 .045 38 13	366 .033 36 13	320 .025 35 12	
900	Nk Vel Ps Throw		480 .055 41 14	411 .041 39 14	360 .031 37 13	
1000	Nk Vel Ps Throw			457 .049 42 15	400 .038 40 14	
1100	Nk Vel Ps Throw				440 .045 42 15	25 - 30
1200	Nk Vel Ps Throw				480 .053 45 16	

For performance notes, see page SEC-166

CFM		18" x 18"	21" x 18"	24" x 18"	21" x 21"	24" x 21"	24" x 24"	NC
300	Nk Vel Ps Throw	133 .003 17 6	114 .003 16 6	100 .002 15 5				
400	Nk Vel Ps Throw	178 .006 21 7	152 .005 20 7	133 .003 19 7	131 .003 19 7	114 .003 18 6	100 .002 17 6	
500	Nk Vel Ps Throw	222 .010 24 8	190 .007 23 8	167 .005 22 8	163 .005 22 8	143 .004 21 7	125 .003 20 7	
600	Nk Vel Ps Throw	267 .014 27 10	229 .010 26 9	200 .008 25 9	196 .007 25 9	171 .006 23 8	150 .004 22 8	
700	Nk Vel Ps Throw	311 .019 30 11	267 .014 29 10	233 .011 27 10	229 .010 27 10	200 .008 26 9	175 .006 25 9	
800	Nk Vel Ps Throw	356 .025 33 12	305 .018 32 11	267 .014 30 11	261 .013 30 10	229 .010 29 10	200 .008 27 10	20 - 25
900	Nk Vel Ps Throw	400 .038 39 14	343 .028 37 13	330 .022 35 12	294 .021 35 12	257 .016 33 12	225 .012 32 10	
1000	Nk Vel Ps Throw	444 .055 44 15	381 .041 42 15	333 .031 40 14	327 .030 40 14	286 .023 38 13	250 .018 36 13	
1200	Nk Vel Ps Throw		457 .055 46 16	400 .042 44 16	392 .041 44 15	343 .031 42 15	300 .024 40 14	
1400	Nk Vel Ps Throw			467 .055 49 17	457 .053 48 17	400 .041 46 16	350 .031 44 15	
1600	Nk Vel Ps Throw					457 .051 50 17	400 .039 48 17	
1800	Nk Vel Ps Throw						450 .049 51 18	25 - 30
2000	Nk Vel Ps Throw						500 .049 51 18	

Performance Notes for Series SGRP

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM** - Air volume is in cubic feet per minute
- Nk Vel** - Neck Velocity is the airstream velocity in the duct just before it reaches the supply outlet; measured in feet per minute.
- NC** - Noise Criteria based on a room absorption of 10 dB, re: 10E-12 watts.
- Throw** - Throw distances in feet are for terminal velocities of 50 and 100 fpm respectively
- Ps** - Static pressure is in inches of water

Model SGRP - Specifications

Air outlets shall be model SG-RP manufactured by METALAIRE. Units shall be maximum security supply grilles of steel construction. Units shall have a perforated face plate backed by a continuously seam welded steel sleeve. Face plate shall be constructed of 3/16" steel with 5/16" perforations on 7/16" staggered centers and shall be skip welded to the sleeve. The sleeve shall be 3/16" steel with continuously welded seams. Units shall include a 1" border.

The units shall be the size and quantity as outline in the plans and specifications.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



Series SGRP - Model Specification Guide

Maximum Security Grilles - Round Perforated Holes
Model SGRP - Steel

Model	Available Neck	Available Sleeve Length	Available Finishes	Available Options	
SGRP - Screw Holes	6" thru 24"	4" - 16"	01 - White	SAB	Steel Anchor Bars
				BSA 2S	2 Bolted Steel Angles - Short Side
				BSA 2L	2 Bolted Steel Angles - Long Side
				BSA 4	4 Bolted Steel Angles
				WSA 2S	2 Welded Steel Angles - Short Side
				WSA 2L	2 Welded Steel Angles - Long Side
				WSA 4	4 Welded Steel Angles
				LSA 2S	2 Loose Steel Angles - Short Side
				LSA 2L	2 Loose Steel Angles - Long Side
				LSA 4	4 Loose Steel Angles
				WAF	Welded Angle Frame
				SBR	Security Bars
				SH	Screw Holes
				OBD	Opposed Blade Damper - Steel
				OBDA	Opposed Blade Damper - Aluminum



➔ Minimum Security Grilles ➔ Fixed Louver Face ➔ Series SGRH

Product Details

- ★ The series SGRH is a return, minimum security grille constructed with heavy gauge steel louvers that are reinforced and welded to a steel sleeve
- ★ The series SGRH is designed for sidewall applications. A rear operated opposed blade damper is available as an option
- ★ Series SGRH is an excellent choice for a return grille in minimum security, supervised areas. Applications for the series SGRH include minimum security areas in federal correctional facilities, state and local prisons, psychiatric hospitals, as well as manufacturing plants. The SGRH is also an excellent choice for public areas to resist vandalism

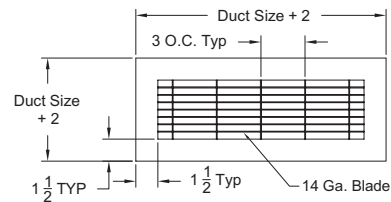
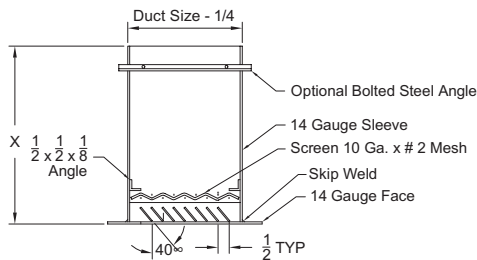


Model SGRH Shown

Standard Finish: 01 White

Sideview, dimensions are in inches

Security Grille - Fixed Louver Face Model SGRH



1. Available Finishes	2. Available Accessories	3. Available Options	4. Construction Details
Standard Finish: 01 White Note: Contact Factory for other finish	OBDA - sleeve mounted aluminum damper . . .206 OBD - sleeve mounted steel damper206 SAB - Steel Anchors206 BSA - Bolted Steel Angles207 WSA - Welded Steel Angles207 SBR - Security Bars207 Screw Holes	LSA - Loose Steel Angles WAF - Welded Angle Frame	<ul style="list-style-type: none"> • Neck Sizes available in 2" increments as listed • Damper can be mounted for rear operation with standard flat tip screwdriver. Due to tight bar spacing, face operated dampers are not recommended • Face plate, sleeve and horizontal blades are 14 gauge steel • Wire mesh is 10 gauge by #2

Series SGRH - Performance

CFM		6" x 6"	9" x 6"	12" x 6"	15" x 6"	18" x 6"	21" x 6"	24" x 6"
50	Nk Vel Ps	200 .022						
100	Nk Vel Ps	400 .089	267 .040	200 .022				
150	Nk Vel Ps		400 .089	300 .050	240 .032	200 .022		
200	Nk Vel Ps			400 .089	320 .057	267 .040	229 .029	200 .022
250	Nk Vel Ps			500 .139	400 .089	333 .062	286 .046	250 .035
300	Nk Vel Ps				480 .129	400 .089	343 .066	300 .050
400	Nk Vel Ps						457 .117	400 .089
500	Nk Vel Ps							500 .201

CFM		9" x 9"	12" x 9"	15" x 9"	18" x 9"	21" x 9"	24" x 9"
150	Nk Vel Ps	267 .040	200 .022				
200	Nk Vel Ps	356 .071	267 .040	213 .025			
250	Nk Vel Ps	444 .110	333 .062	267 .040	222 .028		
300	Nk Vel Ps		400 .089	320 .057	267 .040	229 .029	200 .022
400	Nk Vel Ps			427 .102	356 .071	305 .052	267 .040
500	Nk Vel Ps				444 .159	381 .117	333 .089
600	Nk Vel Ps					457 .159	400 .122
700	Nk Vel Ps						467 .159

CFM		12" x 12"	15" x 12"	18" x 12"	21" x 12"	24" x 12"
200	Nk Vel Ps	200 .022				
250	Nk Vel Ps	250 .035	200 .022			
300	Nk Vel Ps	300 .050	240 .032	200 .022		
350	Nk Vel Ps	350 .068	280 .044	233 .030	200 .022	
400	Nk Vel Ps	400 .089	320 .057	267 .040	229 .029	200 .022
500	Nk Vel Ps	500 .139	400 .089	333 .062	286 .046	250 .035
600	Nk Vel Ps		480 .129	400 .089	343 .066	300 .050
700	Nk Vel Ps			467 .159	400 .117	350 .089
800	Nk Vel Ps				457 .148	400 .113
900	Nk Vel Ps					450 .110
1000	Nk Vel Ps					500 .159

CFM		15" x 15"	18" x 15"	21" x 15"	24" x 15"
350	Nk Vel Ps	224 .028			
400	Nk Vel Ps	256 .037	213 .025		
500	Nk Vel Ps	320 .057	267 .040	229 .029	200 .022
600	Nk Vel Ps	384 .082	320 .057	274 .042	240 .032
700	Nk Vel Ps	448 .112	373 .078	320 .057	280 .044
800	Nk Vel Ps		427 .102	366 .075	320 .057
900	Nk Vel Ps		480 .159	411 .117	360 .089
1000	Nk Vel Ps			457 .168	400 .129
1200	Nk Vel Ps				480 .175

For performance notes, see page SEC-170



Series SGRH - Performance

CFM		18" x 18"	21" x 18"	24" x 18"	21" x 21"	24" x 21"
500	Nk Vel Ps	222 .028				
600	Nk Vel Ps	267 .040	229 .029	200 .022		
700	Nk Vel Ps	311 .054	267 .040	233 .030	229 .029	200 .022
800	Nk Vel Ps	356 .071	305 .052	267 .040	261 .038	229 .029
900	Nk Vel Ps	400 .089	343 .066	300 .050	294 .048	257 .037
1000	Nk Vel Ps	444 .110	381 .081	333 .062	327 .059	286 .046
1200	Nk Vel Ps		457 .159	400 .122	392 .117	343 .089
1400	Nk Vel Ps			467 .159	457 .152	400 .117
1600	Nk Vel Ps					457 .148

Performance Notes for Series SGRH

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Air volume is in cubic feet per minute
- Nk Vel - Neck Velocity is the airstream velocity in the duct just before it reaches the supply outlet; measured in feet per minute.
- Ps - Static pressure is in inches of water



Series SGRH - Specifications

Air outlets shall be model SG-RH manufactured by METALAIRE. Units shall be minimum security supply grilles of steel construction. Units shall have 14 gauge horizontal fixed louvers set at 0° (or 40°) on 1/2" centers. Louvers shall be reinforced and welded to a steel sleeve. Units shall include a 14 gauge steel face plate and a 10 gauge by #2 wire mesh screen located behind the louvers and secured by 1/8" welded angle. Units shall include a 1 1/2" border.

The units shall be the size and quantity as outline in the plans and specifications.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA).
Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours

Series SGRH - Model Specification Guide

Maximum Security Grilles - Fixed Louver Face Model SGRH - Steel

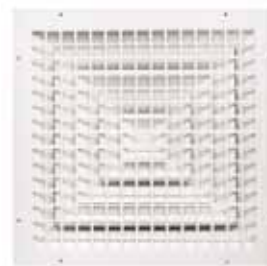
Model	Available Neck	Available Sleeve Length	Available Finishes	Available Options	
SGRH - Fixed Louver Face	6" thru 30"	4" - 16"	01 - White	SAB	Steel Anchor Bars
				BSA 2S	2 Bolted Steel Angles - Short Side
				BSA 2L	2 Bolted Steel Angles - Long Side
				BSA 4	4 Bolted Steel Angles
				WSA 2S	2 Welded Steel Angles - Short Side
				WSA 2L	2 Welded Steel Angles - Long Side
				WSA 4	4 Welded Steel Angles
				LSA 2S	2 Loose Steel Angles - Short Side
				LSA 2L	2 Loose Steel Angles - Long Side
				LSA 4	4 Loose Steel Angles
				WAF	Welded Angle Frame
				SBR	Security Bars
				SH	Screw Holes
				OBD	Opposed Blade Damper - Steel
				OBDA	Opposed Blade Damper - Aluminum



➔ Minimum Security Diffuser ➔ Steel Diffuser and Face Plate ➔ Series SG5500S

Product Details

- ✦ The series SG5500S is a supply, minimum security steel ceiling diffuser and features a steel lattice face panel attached to the high performing Series 5500S steel supply diffuser
- ✦ This surfaced mounted diffuser is available with 1, 2, 3, or 4 way air patterns
- ✦ Series SG5500S is an excellent choice for minimum security, supervised areas requiring a ceiling mounted diffuser. Applications for the SG5500S include minimum security areas in federal correctional facilities, state and local prisons, psychiatric hospitals, as well as manufacturing plants. The SG5500S is also an excellent choice for public areas to resist vandalism

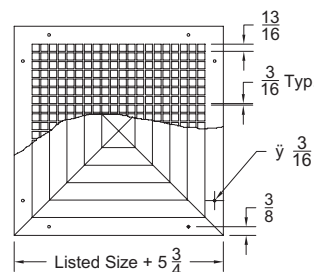
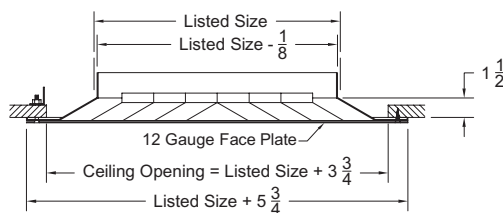


Model SG5500S Shown

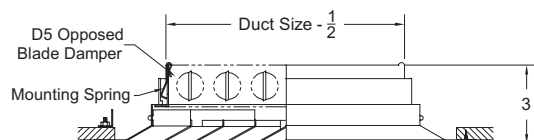
Standard Finish: 01 White

Sideview, dimensions are in inches

Minimum Security Diffuser and Face Plate - Surface Mount Model SG5500S-1



Minimum Security Diffuser and Face Plate With D5/D5A Damper Surface Mount Model SG5500S-1



1. Available Finishes	2. Available Accessories	3. Construction Details
<p>Standard Finish: 01 White</p> <p>Note: Contact Factory for other finish</p>	<p>Model D5/D5A - Neck Mounted Damper</p>	<ul style="list-style-type: none"> • Neck Sizes available in 3" increments as listed • Face plate is 12 gauge steel. Overall face plate dimension is Listed Size + 5 9/16 • Pre-drilled holes are included in both the lattice face and louvered diffuser. The two pieces are shipped unattached and must be field assembled with tamper proof fasteners, provided by others

Series SG5500S - Performance

CFM		6" x 6"	9" x 9"	12" x 12"	15" x 15"	18" x 18"	21" x 21"	21" x 21"	NC
50	Nk Vel Ps Throw	200 .023 4 1							20 - 25
100	Nk Vel Ps Throw	400 .091 7 3	178 .018 5 2	100 .006 3 1					
150	Nk Vel Ps Throw	600 .204 11 1	267 .040 7 3	150 .013 5 2					
200	Nk Vel Ps Throw		356 .072 9 4	200 .023 7 3	128 .009 6 2				
250	Nk Vel Ps Throw		444 .112 11 5	250 .035 8 4	160 .015 7 3	111 .007 6 2			
300	Nk Vel Ps Throw		533 .161 14 6	300 .051 10 4	192 .021 8 3	133 .010 7 3			
350	Nk Vel Ps Throw		622 .219 16 7	350 .069 12 5	224 .028 10 4	156 .014 8 3	114 .007 7 3		
400	Nk Vel Ps Throw			400 .115 13 6	256 .047 11 5	178 .023 9 4	131 .012 8 3	100 .006 7 3	
450	Nk Vel Ps Throw			450 .142 15 6	288 .058 12 5	200 .028 10 4	147 .015 9 3	133 .007 8 3	
500	Nk Vel Ps Throw			500 .171 16 7	320 .070 14 6	222 .034 11 5	163 .018 10 4	125 .009 8 4	
550	Nk Vel Ps Throw			550 .204 18 8	352 .084 15 6	244 .040 13 5	180 .022 11 4	138 .011 7 4	
600	Nk Vel Ps Throw			600 .239 20 8	384 .098 16 7	267 .047 14 6	196 .026 12 4	150 .013 10 4	
650	Nk Vel Ps Throw			650 .278 21 9	416 .114 18 7	289 .055 15 6	212 .030 13 5	163 .015 11 5	
700	Nk Vel Ps Throw			700 .278 23 10	448 .114 19 8	311 .055 16 7	229 .030 14 5	175 .017 12 5	
900	Nk Vel Ps Throw				596 .334 25 10	400 .161 21 9	294 .087 18 7	225 .051 15 7	
1200	Nk Vel Ps Throw					533 .252 27 11	392 .136 24 9	300 .080 20 9	25 - 30
1500	Nk Vel Ps Throw					667 .252 34 14	490 .196 29 11	375 .115 25 11	
1800	Nk Vel Ps Throw						588 .242 35 13	450 .142 30 13	
2000	Nk Vel Ps Throw						653 .348 39 15	500 .204 34 15	
2400	Nk Vel Ps Throw							600 .278 40 18	
2800	Nk Vel Ps Throw							700 .278 47 21	

For performance notes, see page SEC-174



Performance Notes for Series SG5500S

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM** - Air volume is in cubic feet per minute
- Nk Vel** - Neck Velocity is the airstream velocity in the duct just before it reaches the supply outlet; measured in feet per minute.
- NC** - Noise Criteria based on a room absorption of 10 dB, re: 10E-12 watts.
- Throw** - Throw distances in feet are for terminal velocities of 50 and 100 fpm respectively
- Ps** - Static pressure is in inches of water

Series SG5500S - Specifications

Air outlets shall be model SG-5500S manufactured by METALAIR. Units shall be minimum security supply ceiling diffusers construction of steel. Units shall consist of a 12 gauge steel lattice face panel with 13/16" square holes and 3/16" fret bars mounted in front of a fixed pattern louvered core fastened into a border with spring loaded latches. Units shall be furnished with screw holes for tamper proof screws (provided by others). With the face lattice face removed, the core shall be removable without the use of tools.

Outlets shall be engineered to perform in variable volume systems and include deflector blades with a horizontal lip to provide longer throw distances. The units shall be the size and quantity as outline in the plans and specifications.

Outlets shall be available in 1, 2 way opposite, 2 way corner, 3, and 4 way directional air patterns.

The units shall be the size and quantity as outline in the plans and specifications.

Optional opposed blade damper shall be constructed of steel (Model OBD) or aluminum (Model OBDA). Damper must be operable from the face of the diffuser.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Paint Specification

Process shall be anodic electrodeposition using an anodic acrylic paint. Units shall undergo pre-treatment including a pressurized spray stage using an alkaine cleaner and a de-ionized water rinse.

Film Properties shall meet or exceed the following standards:

Property	Test Method	Performance
Film thickness		.8-1.0 mils
Film Cure		320 F @ 20 min
Gloss – 60 deg.	ASTM D523-89	70-80%
Pencil Hardness	ASTM D3363-92A	HB-H
Crosshatch Adhesion	ASTM D3359-95	4B-5B
Direct Impact	ASTM D2794-93	100 in.lbs. Min
Reverse Impact	ASTM D2794-93	60 in.lbs. Min.
Salt Spray	ASTM B117-95	48-96 Hours
Humidity	ASTM D1735-92	500 Hours
Water Soak	ASTM D870-92	250 Hours



Series SG5500S - Model Specification Guide

Maximum Security Grilles - Steel Diffuser & Face Plate
Model SG5500S - Steel

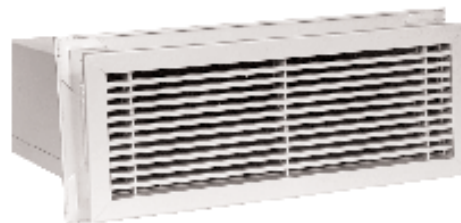
Model	Available Neck	Available Finishes	Available Options	
SG5500S-1 - Surface Mount	6" thru 24"	01 - White	D5	Opposed Blade Damper - Steel
			D5A	Opposed Blade Damper - Aluminum



➔ Minimum Security Grille ➔ 1" Borders - 7/32" Bars - 1/2" Centers ➔ Series SG2000

Product Details

- ★ The series SG2000 is a return, minimum security grille constructed with heavy gauge aluminum louvers that are reinforced and welded to a steel sleeve
- ★ The series SG2000 is designed for sidewall applications. A rear operated opposed blade damper is available as an option
- ★ Series SG2000 is an excellent choice for a return grille in minimum security, supervised areas. Applications for the series SG2000 include minimum security areas in federal correctional facilities, state and local prisons, psychiatric hospitals, as well as manufacturing plants. The SG2000 is also an excellent choice for public areas to resist vandalism

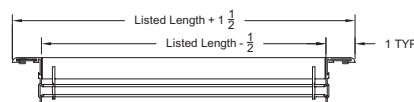
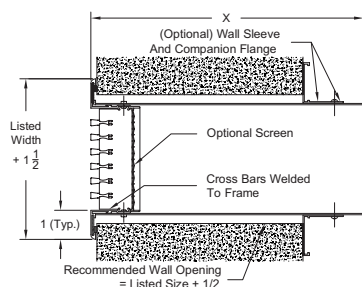


Model SG2000 Shown

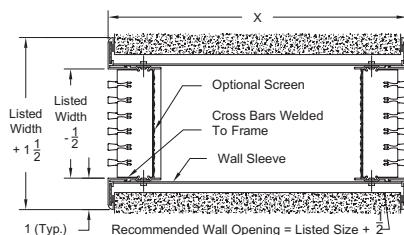
Standard Finish: 01 White

Sideview, dimensions are in inches

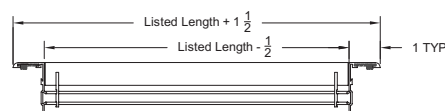
Security Grille - 0°, 15°, or 30° Deflection - No Sleeve - Surface Mount
Model SG2000-1



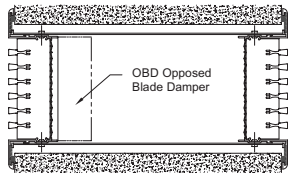
Security Grille - 0°, 15°, or 30° Deflection - With Sleeve - V-Beveled
Model SG2000-2



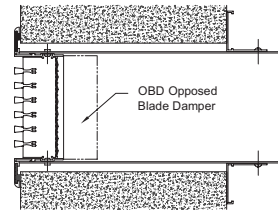
X Has to be specify (when ordering)



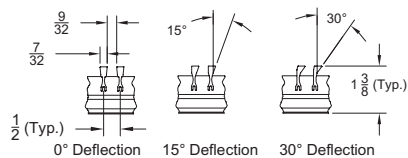
Security Register - 0°, 15°, or 30° Deflection - With OBDA Damper
No Sleeve
Options SG2000-1D/SG2015-1D/SG2030-1D



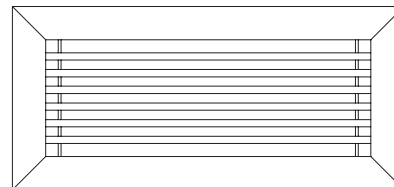
Security Register - 0°, 15°, or 30° Deflection - With OBDA Damper
With Steel Sleeve
Options SG2000-2D/SG2015-2D/SG2030-2D



Air Pattern Deflectors



Face View Models SG2000-1/SG2000-2



1. Available Finishes	2. Available Accessories	3. Construction Details
Standard Finish: 01 White Optional Finishes: 04 Clear anodized	Factory Mounted Accessories Model OBDA aluminum damper Moedl OBD steel damper Wall Sleeves Aluminum debris screen 1/4 x 1/4 Galvanized steel debris screen 1/4 x 1/4 Stainless steel debris screen 1/4 x 1/4 Insect screen	<ul style="list-style-type: none"> • Neck Sizes available in widths and lengths as listed (No larger unit available) • Widths in 1/2" increments



Series SG2000 - Performance

CFM		6" x 4"	6" x 6"	12" x 4"	12" x 6"	12" x 8"	12" x 10"	12" x 12"	NC
25	Nk Vel Ps Throw	150 .004 5 4	100 .002 3 2						
50	Nk Vel Ps Throw	300 .017 12 9	200 .007 10 8	150 .004 9 7	100 .002 7 5				
75	Nk Vel Ps Throw	450 .038 16 12	300 .017 14 11	225 .009 13 9	150 .004 12 9	133 .002 9 7			
100	Nk Vel Ps Throw		400 .030 17 13	300 .017 15 12	200 .007 13 10	150 .004 12 9	120 .004 11 8	100 .002 10 8	
125	Nk Vel Ps Throw		500 .047 20 15	375 .026 18 14	250 .012 16 12	188 .007 14 11	150 .004 13 10	125 .003 12 10	
150	Nk Vel Ps Throw			450 .038 20 15	300 .017 18 13	225 .009 16 12	180 .008 15 11	150 .004 14 11	
175	Nk Vel Ps Throw				350 .023 20 15	263 .013 18 13	210 .008 17 12	175 .006 15 12	
200	Nk Vel Ps Throw				400 .038 23 18	300 .021 21 16	240 .014 20 12	200 .007 17 13	
225	Nk Vel Ps Throw				450 .047 25 19	338 .026 23 17	270 .017 21 16	225 .010 18 14	
250	Nk Vel Ps Throw				500 .057 27 20	375 .032 24 18	300 .020 22 17	250 .012 20 15	
275	Nk Vel Ps Throw					413 .038 26 19	330 .024 24 18	275 .014 21 16	
300	Nk Vel Ps Throw					450 .044 27 20	360 .028 25 19	300 .017 22 17	
325	Nk Vel Ps Throw					488 .052 29 21	390 .033 26 20	325 .020 23 18	
350	Nk Vel Ps Throw						420 .033 26 20	350 .023 25 19	
NC		25 - 30							

CFM		18" x 4"	18" x 6"	18" x 8"	18" x 10"	18" x 12"	NC
75	Nk Vel Ps Throw	150 .004 11 8	100 .002 9 7				
100	Nk Vel Ps Throw	200 .007 13 7	133 .003 11 9	100 .002 10 8			
150	Nk Vel Ps Throw	300 .017 18 13	200 .007 15 12	150 .004 14 11	120 .003 13 10	100 .002 12 9	
200	Nk Vel Ps Throw	400 .030 22 16	267 .013 19 14	200 .007 17 13	160 .005 16 12	133 .003 15 11	
250	Nk Vel Ps Throw	500 .047 25 19	333 .021 22 16	250 .012 20 15	200 .007 18 14	167 .005 17 13	
300	Nk Vel Ps Throw		400 .030 25 19	300 .017 22 17	240 .011 21 16	200 .007 20 15	20 - 25
350	Nk Vel Ps Throw		467 .041 27 21	350 .023 25 19	280 .015 23 17	233 .010 22 16	
400	Nk Vel Ps Throw			400 .038 30 20	320 .024 27 21	267 .017 26 19	
450	Nk Vel Ps Throw			450 .047 32 24	360 .030 29 22	300 .021 28 21	
500	Nk Vel Ps Throw			500 .057 34 25	400 .036 31 24	333 .025 30 22	
550	Nk Vel Ps Throw				440 .043 33 25	367 .030 31 24	
600	Nk Vel Ps Throw				480 .051 35 26	400 .035 33 25	
650	Nk Vel Ps Throw					433 .041 35 26	25 - 30
700	Nk Vel Ps Throw					467 .041 35 26	

For performance notes, see page SEC-180

Series SG2000 - Performance

CFM		24" x 4"	24" x 6"	24" x 8"	24" x 10"	24" x 12"	NC
75	Nk Vel Ps Throw	133 .002 9 7					20 - 25
100	Nk Vel Ps Throw	150 .004 12 9	100 .002 10 8				
150	Nk Vel Ps Throw	225 .009 16 12	150 .004 14 11	113 .002 13 9			
200	Nk Vel Ps Throw	300 .017 20 15	200 .007 17 13	150 .004 15 12	120 .003 14 11	100 .002 13 10	
250	Nk Vel Ps Throw	375 .026 23 17	250 .012 20 15	188 .007 18 14	150 .004 17 13	125 .003 16 12	
300	Nk Vel Ps Throw	450 .038 26 19	300 .017 22 17	225 .009 20 15	180 .006 19 14	150 .004 18 13	
350	Nk Vel Ps Throw		350 .023 25 19	263 .013 23 17	210 .008 21 16	175 .006 20 15	
400	Nk Vel Ps Throw		400 .047 32 24	300 .026 29 22	240 .017 27 20	200 .012 25 19	
500	Nk Vel Ps Throw		500 .067 36 27	375 .038 33 24	300 .024 30 23	250 .017 28 21	
600	Nk Vel Ps Throw			450 .052 26 27	360 .033 34 25	300 .023 32 24	
700	Nk Vel Ps Throw				420 .043 37 28	350 .038 35 26	25 - 30
800	Nk Vel Ps Throw				480 .055 40 30	400 .038 38 28	
900	Nk Vel Ps Throw					450 .047 40 30	
1000	Nk Vel Ps Throw					500 .047 40 30	

For performance notes, see page SEC-180

CFM		30" x 4"	30" x 6"	30" x 8"	30" x 10"	30" x 12"	NC
100	Nk Vel Ps Throw	120 .003 11 8					20 - 25
150	Nk Vel Ps Throw	180 .006 15 11	120 .003 13 10				
200	Nk Vel Ps Throw	240 .011 18 14	160 .005 16 12	120 .003 14 11			
250	Nk Vel Ps Throw	300 .017 21 16	200 .007 18 14	150 .004 17 13	120 .003 15 12	100 .002 15 11	
300	Nk Vel Ps Throw	360 .024 25 19	240 .011 21 16	180 .006 19 14	144 .004 18 13	120 .003 16 12	
400	Nk Vel Ps Throw	480 .043 29 22	320 .019 25 19	240 .011 23 17	192 .007 21 16	160 .005 20 15	
500	Nk Vel Ps Throw		400 .030 29 22	300 .017 27 20	240 .011 25 19	200 .007 23 17	
600	Nk Vel Ps Throw		480 .059 37 28	360 .033 34 25	288 .021 31 23	240 .015 29 22	
700	Nk Vel Ps Throw			420 .043 37 28	336 .028 34 26	280 .019 32 24	
800	Nk Vel Ps Throw			480 .055 40 30	384 .035 37 28	320 .024 35 26	
900	Nk Vel Ps Throw				432 .043 40 30	360 .030 37 28	25 - 30
1000	Nk Vel Ps Throw				480 .052 43 32	400 .036 40 30	
1100	Nk Vel Ps Throw					440 .043 42 32	
1200	Nk Vel Ps Throw					480 .043 42 32	



Series SG2000 - Performance

CFM		36" x 4"	36" x 6"	36" x 8"	36" x 10"	36" x 12"	NC
200	Nk Vel Ps Throw	200 .007 17 13	133 .003 15 11	100 .002 13 10			
300	Nk Vel Ps Throw	300 .017 22 17	200 .007 20 15	150 .004 18 13	120 .003 16 12	100 .002 15 12	
400	Nk Vel Ps Throw	400 .030 27 20	267 .013 24 18	200 .007 22 16	160 .005 20 15	133 .003 19 14	
500	Nk Vel Ps Throw	500 .047 32 24	333 .021 28 21	250 .012 25 19	200 .007 23 17	167 .005 22 16	
600	Nk Vel Ps Throw		400 .030 31 24	300 .017 28 21	240 .011 26 20	200 .007 25 19	
700	Nk Vel Ps Throw		467 .041 35 26	350 .023 32 24	280 .015 29 22	233 .010 27 21	20 -
800	Nk Vel Ps Throw			400 .030 35 26	320 .019 32 24	267 .013 30 23	25
900	Nk Vel Ps Throw			450 .047 40 30	360 .030 37 28	300 .021 35 26	
1000	Nk Vel Ps Throw			500 .057 43 32	400 .036 40 30	333 .025 37 28	
1100	Nk Vel Ps Throw				440 .043 42 32	367 .030 40 30	
1200	Nk Vel Ps Throw				480 .051 45 34	400 .035 42 32	
1300	Nk Vel Ps Throw					433 .041 44 33	
1400	Nk Vel Ps Throw					467 .047 46 35	25 -
1500	Nk Vel Ps Throw					500 .047 46 35	30

Performance Notes for Series SG2000

All data are tested in accordance with ANSI/ASHRAE 70-1991

Definition of Units:

- CFM - Air volume is in cubic feet per minute
- Nk Vel - Neck Velocity is the airstream velocity in the duct just before it reaches the supply outlet; measured in feet per minute.
- NC - Noise Criteria based on a room absorption of 10 dB, re: 10E-12 watts.
- Throw - Throw distances in feet are for terminal velocities of 50 and 100 fpm respectively
- Ps - Static pressure is in inches of water

Series SG2000 - Specifications

Minimum Security Grilles - Supply/Return/Exhaust Linear Bar Grille - Single Face/Series SG-2000-1

SG 2000-1 - 0° deflection

SG 2015-1 - 15° deflection

SG 2030-1 - 30° deflection

Air outlets (or inlets) shall be model SG-2000-1 manufactured by METALAIRE. Units shall be minimum security supply grilles of aluminum construction. Units shall have linear bars 3/4" deep by 7/32" wide spaced on 1/2" centers. Heavy extruded aluminum face and cross bars shall be heliarc welded to an aluminum frame. Border shall be 1" wide.

Optional: Unit shall include an 18 gauge, galvanized steel wall sleeve fitted with an aluminum companion flange.

Accessories

Optional opposed blade damper shall be constructed of aluminum shall be provide on units 4" and wider. Units under 4" wide shall be provide with an aluminum "flap" type damper. Damper must be operable from the rear of the grille.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Finish Specification

Units shall be clear anodized.

Minimum Security Linear Bar Grilles - Dual Face Transfer Grille/Series SG-2000-2

SG 2000-2 - 0° deflection

SG 2015-2 - 15° deflection

SG 2030-2 - 30° deflection

Air transfer grilles shall be model SG-2000-2 manufactured by METALAIRE. Units shall be minimum security supply grilles of aluminum construction. Units shall be designed for air transfer applications and include two linear bar grilles connected with a sleeve. Linear bars shall be 3/4" deep by 7/32" wide spaced on 1/2" centers. Heavy extruded aluminum face and cross bars shall be heliarc welded to an aluminum frame. Borders shall be 1" wide.

The units shall be the size and quantity as outline in the plans and specifications.

Optional opposed blade damper shall be constructed of aluminum shall be provide on units 4" and wider. Units under 4" wide shall be provide with an aluminum "flap" type damper. Damper must be operable through the face of the bar grille.

Performance Specification

The manufacturer shall provide published performance data. Data shall be tested in accordance to ANSI/ASHRAE Standard 70-1991.

Finish Specification

Units shall be clear anodized.

Series SG2000 - Model Specification Guide

Maximum Security Grilles - Supply/Return/Exhaust Linear Bar Grille

Model SG2000-1 - Steel - Single Face Transfer Grilles

Model	Available Neck		Available Finishes	Sleeve Length	Available Options	
SG2000-1 - 0° Deflection - 1" Border SG2015-1 - 15° Deflection - 1" Border SG2030-1 - 30° Deflection - 1" Border SG2000-1D - 0° Deflection - 1" Border - With OBDA Damper SG2015-1D - 15° Deflection - 1" Border - With OBDA Damper SG2030-1D - 30° Deflection - 1" Border - With OBDA Damper	Neck 1	Neck 2	Standard	4" - 10"	DS-AL	Aluminum Debris Screen
	6" thru 36"	4" thru 12"	01 - White		DS-GS	Galvanized Steel Debris Screen
			Optional		DS-SS	Stainless Steel Debris Screen
			03 - Black		IS	Insect Screen
			04 - Clear Anodized		Screws	Security Screws
					OBD	Opposed Blade Damper - Steel
					OBDA	Opposed Blade Damper - Aluminum

Maximum Security Grilles - Supply/Return/Exhaust Linear Bar Grille

Model SG2000-2 - Steel - Dual Face Transfer Grilles - 7/32" Bars - 1/2" Centers - Steel Sleeve 4"-10"

Model	Available Neck		Available Finishes	Sleeve Length	Available Options		
	Neck 1	Neck 2	Standard	4" - 10"	DS-AL	Aluminum Debris Screen	
SG2000-1 - 0° Deflection - 1" Border	6" thru 36"	4" thru 12"	01 - White		DS-GS	Galvanized Steel Debris Screen	
SG2015-1 - 15° Deflection - 1" Border					DS-SS	Stainless Steel Debris Screen	
SG2030-1 - 30° Deflection - 1" Border					Optional		
SG2000-1D - 0° Deflection - 1" Border - With OBDA Damper					03 - Black	IS	Insect Screen
SG2015-1D - 15° Deflection - 1" Border - With OBDA Damper					04 - Clear Anodized	Screws	Security Screws
SG2030-1D - 30° Deflection - 1" Border - With OBDA Damper					OBD	Opposed Blade Damper - Steel	
					OBDA	Opposed Blade Damper - Aluminum	

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The METALAIR Pre-Flite catalog is a condensed reference guide containing concise listings of our entire product line including grilles, registers, diffusers, and air terminal units. This catalog can be used to help select the type of device, along with available border styles. The catalog includes photos of each model along with the features and model guide, a great tool when you are trying to select a device for your project.



Quick Select Catalog - Air Distribution Selection Made Easy

The METALAIR Quick Select Catalog is designed to save you time selecting air distribution equipment. This catalog is a compact version of our InfoSource Catalogs and includes drawings and performance for our most popular products. The Quick Select Catalog is broken into product types with each section beginning with a model summary that includes features and benefits of our products. To obtain product information not included in the Quick Select Catalog, simply go to our web site at www.metalaire.com.



InfoSource Catalog Suite - Complete guide to Air Distribution Selection

The METALAIR InfoSource Catalog suite is the leading product catalog in the industry. Included in these catalogs are the complete product listings, drawings, product features and benefits, product performance data, specifications, and model specifications. These catalogs are organized to make it quick and easy to find the information you are looking for.

InfoSource Catalog Suite

- Ceiling Diffusers Catalog
- Grilles & Registers Catalog
- Air Terminal Unit Catalog
- Formations Catalog



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Our InfoSource CD has set the standard in the industry for air distribution product selection. This CD contains a complete library of all our catalogs and submittals along with our air terminal unit selection program.



Web Site: www.metalaire.com

METALAIR leads the industry with a web site that contains all the product literature and performance data needed to design your air distribution system. Our web site includes all our submittals, catalogs, installation manuals, as well as as other valuable information to aid you in air distribution design.



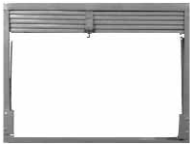
METALAIR
EXPERIENCE AIRE SUPERIORITY.

FF
ER
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FIRE RATED PRODUCTS

T-Bar Module = 24 x 24



Model FD11 AH
Pg. 188

Thinline 2" Frames - Blades in Airstream - Series FD11 A

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour fire partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 2" deep frame
- ★ Optional 12" deep sleeve

Horizontal Application	Vertical Application
FD11 AH	FD11 AV



Model FD12 AH
Pg. 189

Standard 4 1/4" Frames - Blades in Airstream - Series FD12 A

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 4 1/4" deep frame
- ★ Optional 12" deep sleeve

Horizontal Application	Vertical Application
FD12 AH	FD12 AV

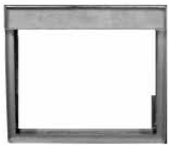


Model FD11 BH
Pg. 190

Thinline 2" Frames - Blades out of Airstream - Series FD11 B

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour fire partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 2" deep frame
- ★ Optional 12" deep sleeve

Horizontal Application	Vertical Application
FD11 BH	FD11 BV



Model FD12 BH
Pg. 191

Standard 4 1/4" Frames - Blades out of Airstream - Series FD12 B

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 4 1/4" deep frame
- ★ Optional 12" deep sleeve

Horizontal Application	Vertical Application
FD12 BH	FD12 BV



Model FD11 C
Pg. 192

Thinline 2" Frames - Round Inlet/Outlet - Series FD11 C

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour fire partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 2" deep frame
- ★ Optional 12" deep sleeve

Horizontal Application	Vertical Application
FD11 CH	FD11 CV



Model FD12 C
Pg. 193

Standard 4 1/4" Frames - Round Inlet/Outlet - Series FD12 C

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 4 1/4" deep frame
- ★ Optional 12" deep sleeve

Horizontal Application	Vertical Application
FD12 CH	FD12 CV



Model 5500S-6 FRS
Pg. 194

Square/Rectangular Louver Face Ceiling Diffusers with Radiation Damper for T-bar Lay-in - Series 5500S FRS

- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled — Ready to install



Model 5700-6 FRS
Pg. 195

Square Face Diffusers - Round Neck 2-Cone with Radiation Damper for T-bar Lay-in - Series 5700 FRS

- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled — Ready to install



Model 5800-6 FRS
Pg. 196

Square Face Diffusers - Round Neck 3-Cone with Radiation Damper for T-bar Lay-in - Series 5800 FRS

- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled — Ready to install
- ★ Optional volume damper on select models

Supply	
Fixed Volume	Adjustable Volume
5800-6 FRS	5800-6 FRSA



Model 7500-6 FRS
Pg. 197

Perforated Ceiling Diffuser - Face Mounted Adjustable Pattern Controller with Radiation Damper for T-bar Lay-in - Series 7500 FRS

- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled — Ready to install
- ★ Optional volume damper on select models

Flush Face	Supply		Return
	Fixed Volume	Adjustable Volume	Fixed Volume
Round Neck	7500-6 FRS	7500-6 FRSA	7500R-6 FRS
Square Neck	7550-6 FRS	7550-6 FRSA	7550R-6 FRS

Drop Face	Supply		Return
	Fixed Volume	Adjustable Volume	Fixed Volume
Round Neck	7500-6 DF FRS	7500-6 DF FRSA	7500R-6 DF FRS
Square Neck	7550-6 DF FRS	7550-6 DF FRSA	7550R-6 DF FRS

For more product information visit us at www.metalair.com



Model
7600-6 FRS
Pg. 198

Perforated Ceiling Diffuser - Curved Blade - Neck Mounted Pattern Controller with Radiation Damper for T-bar Lay-in - Series 7600 FRS

- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled — Ready to install

	Flush Face			Drop Face	
	Supply	Return		Supply	Return
Round Neck	7600-6 FRS	7600R-6 FRS	Round Neck	7600-6 DF FRS	7600R-6 DF FRS
Square Neck	7650-6 FRS	7650R-6 FRS	Square Neck	7650-6 DF FRS	7650R-6 DF FRS



Model
CC5 FRS
Pg. 199

Sidewall/Ceiling Return Grilles & Registers with Radiation Damper for T-bar Lay-in - Series CC5 FRS

- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled - Ready to install



Series
PRTB FRS
Pg. 200

Perforated Screen - Non-Ducted - Return with Radiation Damper for T-bar Lay-in - Series PRTB FRS

- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled - Ready to install

Aluminum	Steel
PRTB FRS	SPRTB FRS



Model RD-10
Pg. 201

Round Radiation Dampers - Series RD-10

- ★ Three hour UL fire resistant classification
- ★ Approved for use with flexible duct, steel duct, and non-ducted supply/return applications
- ★ Heavy duty rollformed steel construction
- ★ Optional adjustable volume control

Fixed Volume	Adjustable Volume
RD-10	RD-10A



Model RD-20
Pg. 202

Square Radiation Dampers - Series RD-20

- ★ Three hour UL fire resistant classification
- ★ Approved for use with flexible duct, steel duct, and non-ducted supply/return applications
- ★ Heavy duty rollformed steel construction
- ★ Optional adjustable volume control

Fixed Volume	Adjustable Volume
RD-20	RD-20A

LEADING THE INDUSTRY IN PRODUCT LITERATURE

With the choice of our Pre-Flite Catalog, Quick Select Catalog, InfoSource Catalog, InfoSource CD and our web site, www.metalaire.com, you pick the format for product information that best suits your air distribution design needs.

Pre-Flite - Product Overview Catalog

The METALAIRES Pre-Flite catalog is a condensed reference guide containing concise listings of our entire product line including grilles, registers, diffusers, and air terminal units. This catalog can be used to help select the type of device, along with available border styles. The catalog includes photos of each model along with the features and model guide, a great tool when you are trying to select a device for your project.



Quick Select Catalog - Air Distribution Selection Made Easy

The METALAIRES Quick Select Catalog is designed to save you time selecting air distribution equipment. This catalog is a compact version of our InfoSource Catalogs and includes drawings and performance for our most popular products. The Quick Select Catalog is broken into product types with each section beginning with a model summary that includes features and benefits of our products. To obtain product information not included in the Quick Select Catalog, simply go to our web site at www.metalaire.com.



InfoSource Catalog Suite - Complete guide to Air Distribution Selection

The METALAIRES InfoSource Catalog suite is the leading product catalog in the industry. Included in these catalogs are the complete product listings, drawings, product features and benefits, product performance data, specifications, and model specifications. These catalogs are organized to make it quick and easy to find the information you are looking for.

InfoSource Catalog Suite

- Ceiling Diffusers Catalog
- Grilles & Registers Catalog
- Air Terminal Unit Catalog
- Formations Catalog



InfoSource CD

Our InfoSource CD has set the standard in the industry for air distribution product selection. This CD contains a complete library of all our catalogs and submittals along with our air terminal unit selection program.



Web Site: www.metalaire.com

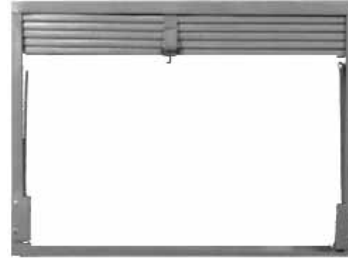
METALAIRES leads the industry with a web site that contains all the product literature and performance data needed to design your air distribution system. Our web site includes all our submittals, catalogs, installation manuals, as well as as other valuable information to aid you in air distribution design.



➡ Thinline 2" Frames ➡ Blades in Airstream ➡ Series FD11A

Product Details

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour fire partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 2" deep frame
- ★ Optional 12" deep sleeve

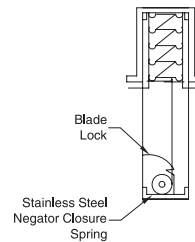
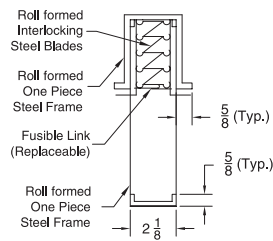


Model FD11 AH
Standard Finish: 01 White

Sideview, dimensions are in inches

Thin Line 2" Frame - Blades in Air Stream

Model FD-11-AV (Vertical Application)
Model FD-11-AG (Horizontal Application)



➡ Standard 4 1/4" Frames ➡ Blades in Airstream ➡ Series FD12A

Product Details

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 4 1/4" deep frame
- ★ Optional 12" deep sleeve

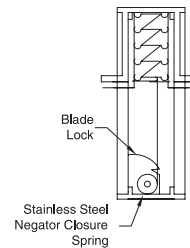
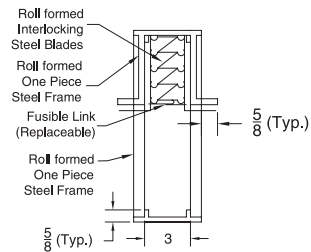


Model FD12 AH
Standard Finish: 01 White

Sideview, dimensions are in inches

Standard 4 1/4" Frame - Blades in Air Stream

Model FD-11-AV (Vertical Application)
Model FD-11-AH (Horizontal Application)



➡ Thinline 2" Frames ➡ Blades in Airstream ➡ Series FD11B

Product Details

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 4 1/4" deep frame
- ★ Optional 12" deep sleeve

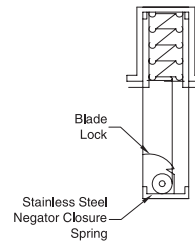
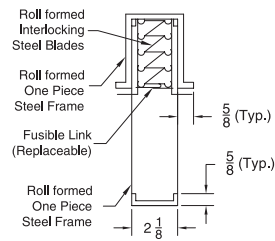


Model FD11 B
Standard Finish: 01 White

Sideview, dimensions are in inches

Thin Size 2" Frame - Blades out of Air Stream

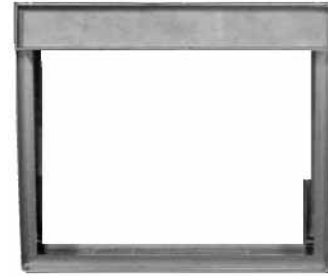
Model FD-11 BV (Vertical Application)
Model FD-11 BH (Horizontal Application)



➡ Standard 4 1/4" Frames ➡ Blades out at Airstream ➡ Series FD12 B

Product Details

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 4 1/4" deep frame
- ★ Optional 12" deep sleeve

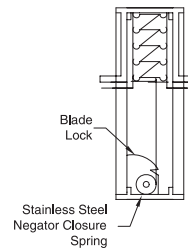
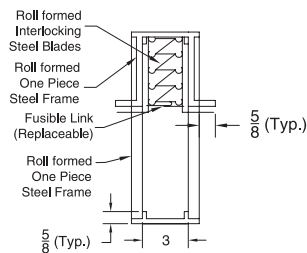


Model FD12 BH
Standard Finish: 01 White

Sideview, dimensions are in inches

Standard 4 1/4" Frame - Blades out of Air Stream

Model FD-12 BV (Vertical Application)
Model FD-12 BH (Horizontal Application)



➔ Thinline 2" Frames - Round Inlet/Outlet ➔ Series FD11C

Product Details

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour fire partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 2" deep frame
- ★ Optional 12" deep sleeve

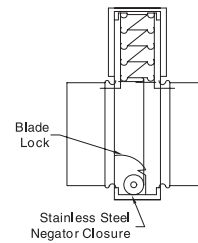
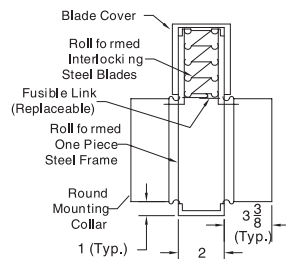


Model FD11 C
Standard Finish: 01 White

Sideview, dimensions are in inches

Thin Line 2" Frame - Round Inlet / Outlet

Model FD-11-CV (Vertical Application)
Model FD-11-CH (Horizontal Application)



➡ Standard 4 1/4" Frames ➡ Round Inlet/Outlet ➡ Series FD12 C

Product Details

- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 4 1/4" deep frame
- ★ Optional 12" deep sleeve

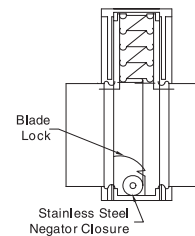
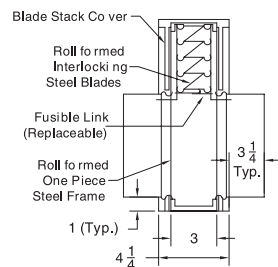


Model FD12 C
Standard Finish: 01 White

Sideview, dimensions are in inches

Standard 4 1/4" Frame - Round Inlet / Outlet

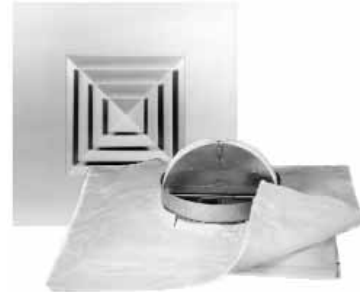
Model FD-12-CV (Vertical Application)
Model FD-12-CH (Horizontal Application)



➡ Square/Rectangular Louver Face Ceiling Diffusers w/Radiation Damper for T-bar Lay-in ➡ Series 5500S FRS

Product Details

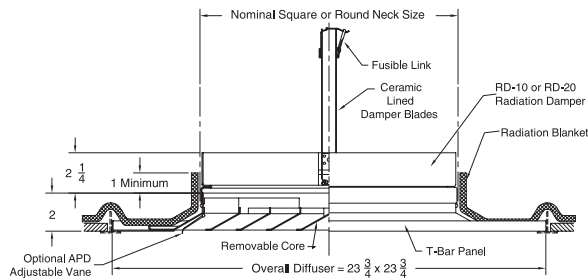
- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled — Ready to install



Model 5500S-6 FRS
Standard Finish: 01 White

Sideview, dimensions are in inches

Louver Face Diffuser - Square or Round Neck Model 5500-6 FRS



Round Neck Diameters	Square Neck Size
6	6 x 6
8	9 x 9
10	12 x 12
12	15 x 15
14	18 x 18
16	21 x 21

➡ Square Face Diffusers ➡ Round Neck 2-Cone w/Radiation Damper for T-bar Lay-in ➡ Series 5700 FRS

Product Details

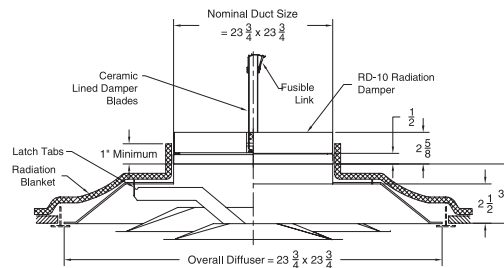
- ★ 1 1/2 hour UL fire resistance
- ★ Rated for use in 2 hour fire partitions
- ★ Heavy duty rollformed steel construction
- ★ Meets NFPA 90a requirements for vertical or horizontal mounts
- ★ 2" deep frame
- ★ Optional 12" deep sleeve



Model 5700-6 FRS
Standard Finish: 01 White

Sideview, dimensions are in inches

Square Diffuser - Two Cones
Model 5700-6 FRS



➡ Square Face Diffusers ➡ Round Neck 3-Cone w/Radiation Damper for T-bar Lay-in ➡ Series 5800 FRS

Product Details

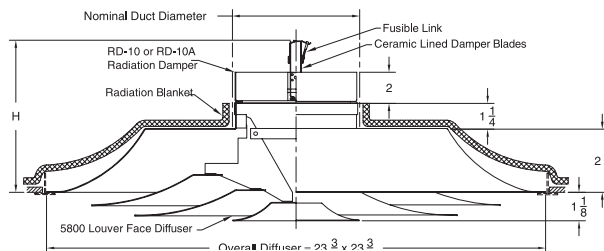
- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled — Ready to install
- ★ Optional volume damper on select models



Model 5800-6 FRS
Standard Finish: 01 White

Sideview, dimensions are in inches

Square Diffuser - Three Cones Model 5800-6 FRS

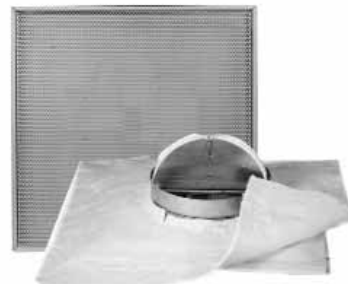


Listed Size	Duct Size	H
6/24	6	8
8/24	8	8 3/8
10/24	10	9 3/8
12/24	12	10 3/8
14/24	14	11 3/8
15/24	15	11 7/8

➡ Perforated Ceiling Diffuser ➡ Face Mounted Adjustable Pattern Controller w/Radiation Damper for T-bar Lay-in ➡ Series 7500 FRS

Product Details

- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled — Ready to install
- ★ Optional volume damper on select models



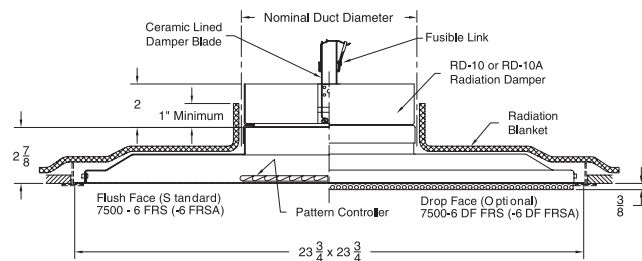
Model 7500-6 FRS

Standard Finish: 01 White

Sideview, dimensions are in inches

Round Neck - Face Mounted Controller

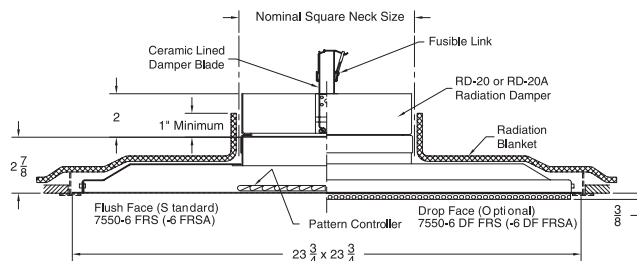
Model 7500-6-FRS
 Model 7500-6-FRSA Adjustable Damper
 Model 7500-6-DR-FRS Drop Face
 Model 7500-6-DF-FRSA Drop Face - Adjustable Damper



Available Neck Size
6
8
10
12
14
16

Round Neck - Face Mounted Controller

Model 7500-6-FRS
 Model 7500-6-FRSA Adjustable Damper
 Model 7500-6-DR-FRS Drop Face
 Model 7500-6-DF-FRSA Drop Face - Adjustable Damper

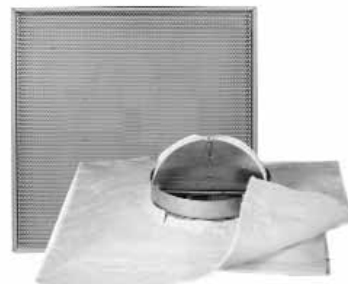


Available Neck Size
6 x 6
8 x 8
10 x 10
12 x 12
14 x 14
16 x 16

➔ Perforated Ceiling Diffuser ➔ Curved Blade ➔ Neck Mounted Pattern Controller w/Radiation Damper for T-bar Lay-In ➔ Series 7600 FRS

Product Details

- ✱ Three hour UL classified ceiling diffuser system
- ✱ Complete factory package - diffuser, damper, & blanket
- ✱ Factory assembled — Ready to install



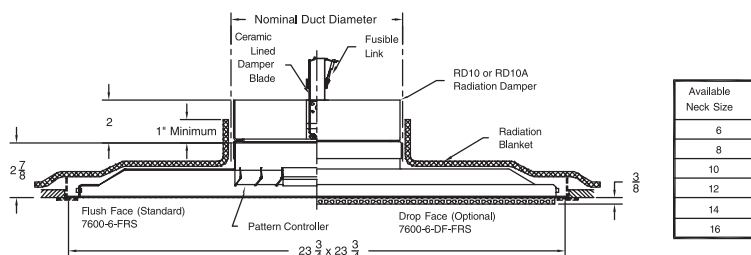
Model 7600-6 FRS
Standard Finish: 01 White

Sideview, dimensions are in inches

Round Neck - Curved Blade Controller

Model 7600-6-FRS (Round Neck-Curved Blade Deflector)

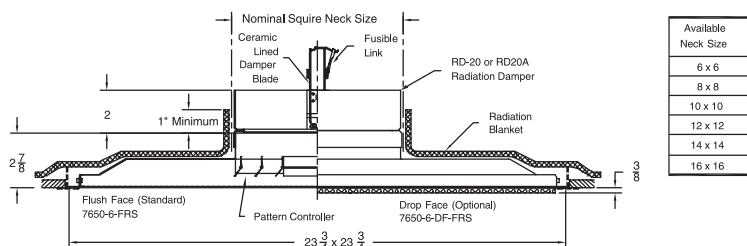
Model 7600-6-DF-FRS (Round Neck-Curved Blade Deflector-Drop Face)



Square Neck - Curved Blade Controller

Model 7650-6-FRS (Square Neck-Curved Blade Deflector)

Model 7650-6-DF-FRS (Square Neck-Curved Blade Deflector-Drop Face)



➡ Sidewall/Ceiling Return Grilles & Registers w/Radiation Damper for T-bar Lay-in ➡ Series CC5 FRS

Product Details

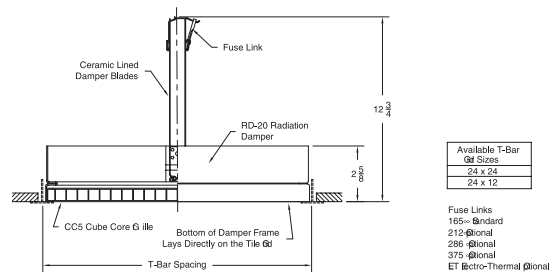
- ✱ Three hour UL classified ceiling diffuser system
- ✱ Complete factory package - diffuser, damper, & blanket
- ✱ Factory assembled - Ready to install



Model CC5 FRS
Standard Finish: 01 White

Sideview, dimensions are in inches

Aluminum Square Return - Cube Core 1/2" x 1/2" x 1/2"
Model CC5-FRS (Aluminum Square Return - Cube Core 1/2" x 1/2" x 1/2")



➡ Perforated Screen ➡ Non-Ducted ➡ Return w/Radiation Damper for T-bar Lay-in ➡ Series PRTB FRS

Product Details

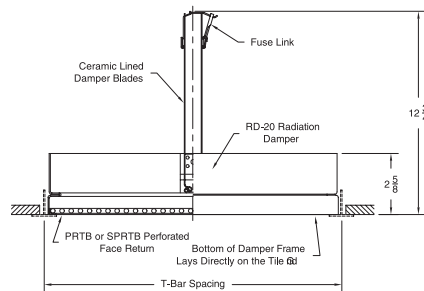
- ★ Three hour UL classified ceiling diffuser system
- ★ Complete factory package - diffuser, damper, & blanket
- ★ Factory assembled - Ready to install



Model PRTB FRS
Standard Finish: 01 White

Sideview, dimensions are in inches

Perforated Screen - Square / Rectangular Neck
Model SPR-TB-FRS (Steel Square Return Diffuser)
Model PR-TB-FRS (Aluminum Square Returns Diffuser)



➡ Round Radiation Dampers ➡ Series RD-10

Product Details

- ★ Three hour UL fire resistant classification
- ★ Approved for use with flexible duct, steel duct, and non-ducted supply/return applications
- ★ Heavy duty rollformed steel construction
- ★ Optional adjustable volume control

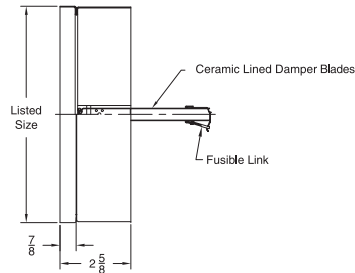


Model RD-10
Standard Finish: 01 White

Sideview, dimensions are in inches

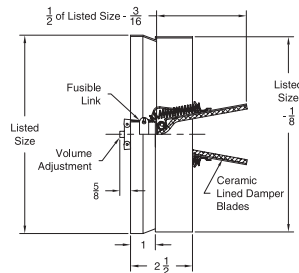
Round Radiation Damper

Model RD-10 (Round Radiation Damper - Non Adjustable)



Round Radiation Damper

Model RD-10A (Round Radiation Damper - Adjustable Volume Control)



➡ Square Radiation Dampers ➡ Series RD-20

Product Details

- ★ Three hour UL fire resistant classification
- ★ Approved for use with flexible duct, steel duct, and non-ducted supply/return applications
- ★ Heavy duty rollformed steel construction
- ★ Optional adjustable volume control

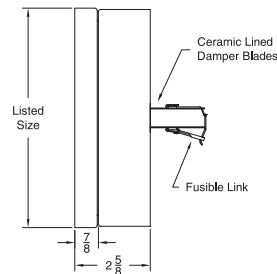


Model RD-20
Standard Finish: 01 White

Sideview, dimensions are in inches

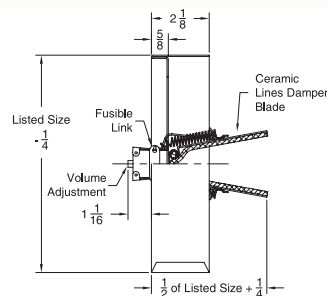
Round Radiation Damper

Model RD-20 (Round Radiation Damper - Non Adjustable)



Round Radiation Damper

Model RD-20A (Round Radiation Damper - Adjustable Volume Control)



A
C
C



ACCESSORIES

Grilles & Registers - Accessories

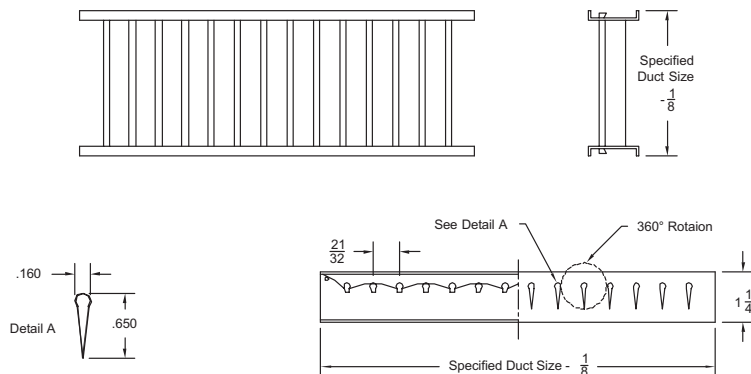
7/2006

Square/Rectangular Equalizing Grid ➡ Aluminum ➡ Model L9

- ★ Designed to provide uniform airflow in branch ducts
- ★ Pre-tensioned blades adjust individually and may be set at an angle at the branch take-off to provide a rake-off effect



Sideview, dimensions are in inches



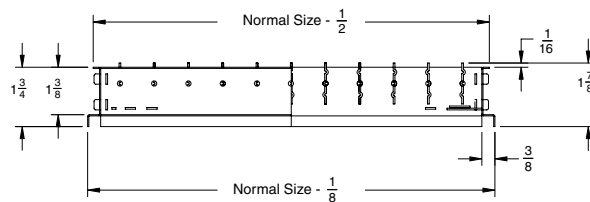
Opposed Blade Damper for Grilles ➡ Aluminum ➡ Model OBDA

➡ Aluminum ➡ Model OBD

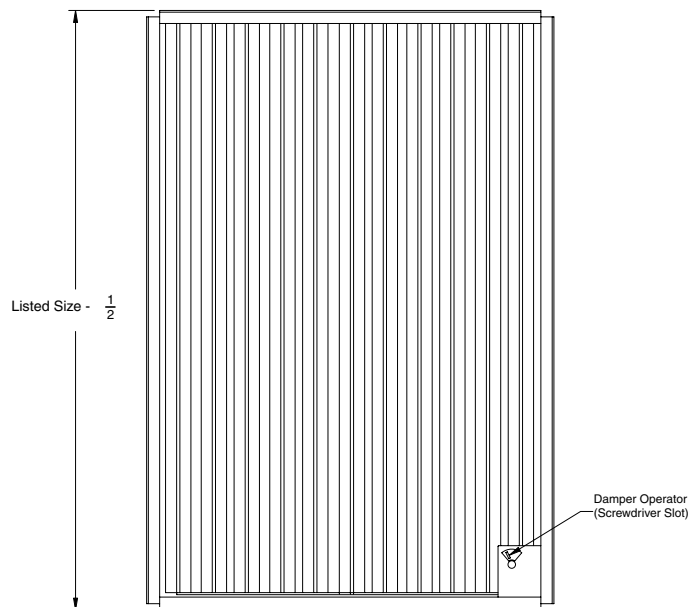
- ★ Tapered blades set in a U-channel frame
- ★ Opposed blades on 1" centers
- ★ Screwdriver slot operator



Sideview, dimensions are in inches



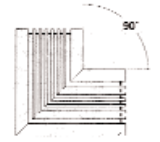
Face View (Models OBD / OBDA)



Grilles & Registers - Accessories

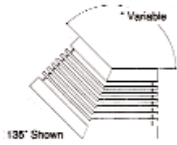
Optional Mitered Corners

- Available for installation in ceiling, floor, sill or sidewall applications, the standard horizontal (flat) mitered corner section includes an angle of 90° and is available in 0°, 15°, and 30° deflection. The corner section contains two (2) feet of straight grille, one foot on either side of the miter line. When specifying a corner section with 15° or 30° deflection, it is imperative to specify the direction of the air throw - either toward the inside or the outside of the corner. Normally inactive, corner sections are of one piece welded construction and are not supplied with dampers equalizing grids, or other accessories.



Standard Finish: 01 White

Special Horizontal



Vertical Outside



Vertical Inside



Access Door

- Used in a variety of applications that require hands-on access through the grille face - for example, to provide access to the operating controls of a fan coil cabinet - the Series 2000 access door consists of a 2000 core section, approximately 7 1/2 inches long, with concealed hinges that allow it to pivot upward 90°. Access doors are available on either or both ends of a Series 2000 grille section, and can be specified in 0°, 15°, or 30° deflection. When 15° or 30° deflection is specified, it is imperative to orient the access door location to the direction of the air flow. Access doors are not available in floor units.

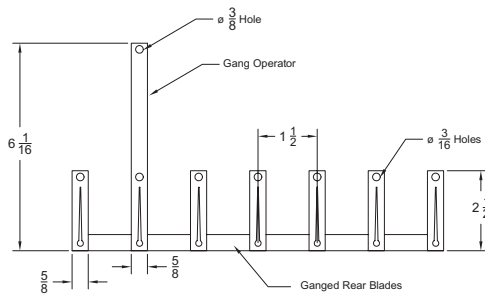


Standard Finish: 01 White

Gang Operator - For Series 4100, 4200 & 4300

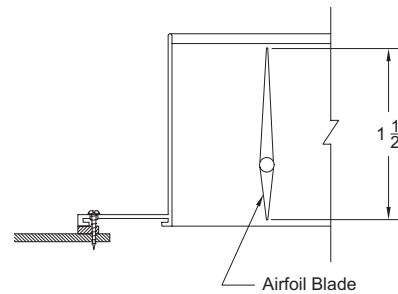
Model GOH - Horizontal Blades

Model GOV - Vertical Blades



Airfoil Blades - Mounted - For Series 4100 & 4200

Model AB

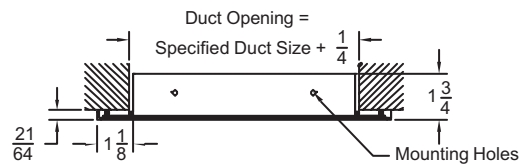


Sidewall Mounted Plaster Frame ➡ Model PF

- Provides a uniform opening in plaster ceilings or sidewall to accommodate grilles and registers
- Are available for all ceiling and sidewall grilles and registers



Sideview, dimensions are in inches



Grilles & Registers - Accessories

7/2006

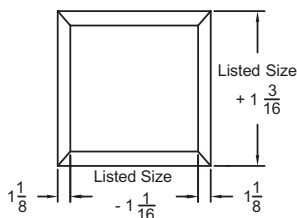
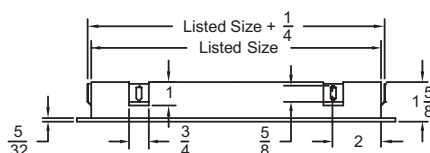
T-bar Plaster Frame ➡ Aluminum/Steel ➡ Series TBPF

- ✱ Permits installation of a T-bar frame style ceiling diffuser into plaster or gypsum type ceiling

Aluminum	Steel
TBPF	STBPF



Sideview, dimensions are in inches

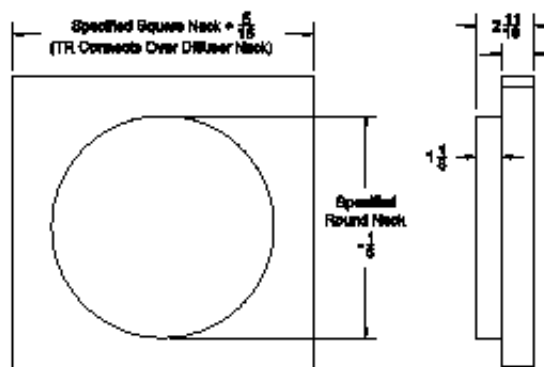


Available Size (TBPF models)	
Nominal	Overall
12" x 12"	13 3/16" x 13 3/16"
24" x 12"	25 3/16" x 13 3/16"
24" x 24"	25 3/16" x 25 3/16"
36" x 24"	37 3/16" x 25 3/16"
36" x 36"	37 3/16" x 37 3/16"
48" x 24"	49 3/16" x 25 3/16"
48" x 48"	49 3/16" x 49 3/16"

Square to Round Transitions ➡ Model TR

- ✱ Square to round transitions slip fit over the square neck or register to permit installation to round or flex-duct
- ✱ 2 11/16" overall depth

□ Model: TR (Square to Round Transition)



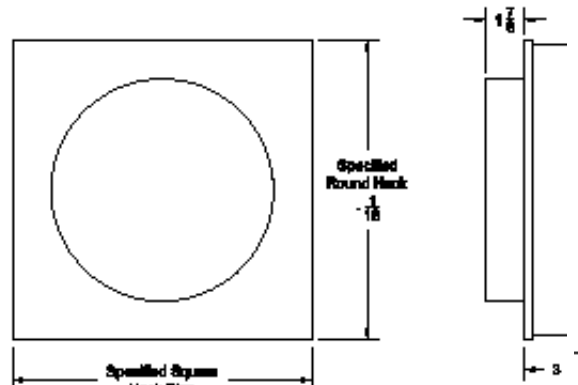
Available Sizes	
Square Neck Size	Round Neck Size
6 x 6	4, 5, 6, 8
8 x 8	5, 6, 7, 8, 9
9 x 9	6, 7, 8, 9, 10
10 x 10	6, 7, 8, 9, 10, 11, 12
12 x 12	6, 7, 8, 9, 10, 11, 12, 14
14 x 14	6, 7, 8, 9, 10, 11, 12, 14, 16
16 x 16	6, 7, 8, 9, 10, 11, 12, 14, 16, 18
18 x 18	6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20
22 x 22	6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22



Square to Round Deep Transitions ➡ Model TR DEEP

- ✱ Square to round transitions slip fit over the square neck or register to permit installation to round or flex-duct
- ✱ 4 7/8" overall depth

□ Model: TR-DEEP (Square to Round Deep Transition)

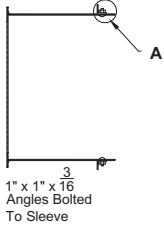
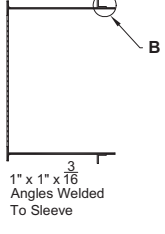
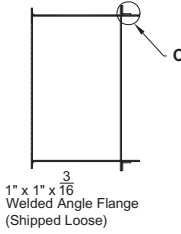
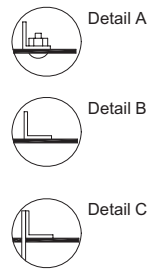


Available Sizes	
Square Neck Size	Round Neck Size
6 x 6	4, 5, 6, 8
8 x 8	5, 6, 7, 8, 9
9 x 9	6, 7, 8, 9, 10
10 x 10	6, 7, 8, 9, 10, 11, 12
12 x 12	6, 7, 8, 9, 10, 11, 12, 14
14 x 14	6, 7, 8, 9, 10, 11, 12, 14, 16
16 x 16	6, 7, 8, 9, 10, 11, 12, 14, 16, 18
18 x 18	6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20

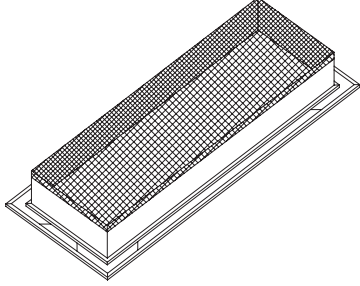
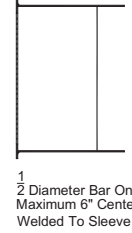

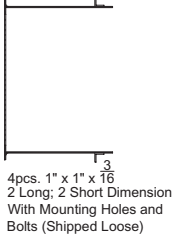


Grilles & Registers - Accessories

SEC - Security Products - Accessories

<p>Security Grilles and Registers - Accessories Model BSA - Bolted steel angles - Shipped loose</p>  <p>1" x 1" x 16' ³/₈" Angles Bolted To Sleeve</p>	<p>Security Grilles and Registers - Accessories Model WSA - Welded steel angles - Welded to grille sleeve</p>  <p>1" x 1" x 16' ³/₈" Angles Welded To Sleeve</p>
<p>Security Grilles and Registers - Accessories Model WAF - Companion flanges - Welded angle frames</p>  <p>1" x 1" x 16' ³/₈" Welded Angle Flange (Shipped Loose)</p>	<p>Security Grilles and Registers - Accessories Details</p>  <p>Detail A Detail B Detail C</p>

SEC - Security Products - Accessories

<p>Security Grilles and Registers - Accessories Model DS - Debris screen</p> 	<p>Security Grilles and Registers - Accessories Model SBR - Duct bars - Installed in security grilles</p>  <p>1/2" Diameter Bar On Maximum 6" Centers Welded To Sleeve</p>
<p>Security Grilles and Registers - Accessories Model SAB - Steel Anchor Bars - Welded on sleeve</p>  <p>1/2" Diameter 3" Long For Concrete Block Or Brick Wall.</p>	<p>Security Grilles and Registers - Accessories Model LSA - Loose Steel Angles</p>  <p>4pcs. 1" x 1" x 16' ³/₈" 2 Long; 2 Short Dimension With Mounting Holes and Bolts (Shipped Loose)</p>

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