



HART **COOLEY**[®]
install confidence.

Commercial
Grilles, Registers & Diffusers
Edition 12



Thousands of HVAC products ready to ship.



heatfab.



Residential Vent & Chimney

Vent:

Standard efficiency b-vent, high efficiency polypropylene, special gas vent for condensing, near-condensing, and non-condensing vent systems. Stock residential diameters and system components available in 3" – 14". Additional sizes available up to 30". Direct vent systems also available. Premium quality materials and designs backed by UL standards.

Chimney:

All fuel chimney systems for venting wood, coal, oil, or gas. Available in residential diameters 4" – 8". Additional sizes available up to 24". Pellet venting systems for gas, wood pellet, and bio-fuels. Stainless steel inner and outer materials. Variety of installer friendly components backed by UL standards.

Chimney Liner:

Aluminum and stainless steel. Lengths available up to 50'. Standard diameters available up to 8". Variety of installer friendly components backed by UL standards.



Grilles, Registers, & Diffusers

A full line for residential and commercial applications. Offered in steel, aluminum and plastic. Many sizes in stock for quick shipment.



Flexible Air Duct

Flexible air duct systems UL Greenguard Gold certified for residential and commercial applications. Complete line of R-4.2, R-6.0, and R-8.0 available in many outer jacket and core combinations from 3" - 24" diameters and 25' - 50' lengths. Flexible aluminum, duct, duct sleeves and uninsulated flex duct also available.

MILCOR.

Interior Access Doors

Access Doors – High quality and affordable interior access doors for all types of requirements. In stock or custom.



Roof Top Products

New construction and retrofit drain systems, flashings, expansion joint covers, equipment rails and curbs, duct supports and pipe mounting pedestals. In stock, or made to order.

WARD[®]
INDUSTRIES

Duct Components

Components and accessories for the residential and commercial HVAC and sheet metal industries including flange, rail, corners, hangers & strapping, and duct access doors.



Filters

A complete line of Multi-Pleat or Commercial & Industrial Disposable panel filters, available in fiberglass and polyester.



VAV Boxes

The SDV, single duct air terminal, features a primary inlet with an integral damper and a discharge plenum sized to fit standard Hart & Cooley hot water coils.

LIGHT COMMERCIAL

		Product Information	Engineering Data
REGISTERS & GRILLES—STEEL			
811-814	(800 Series) Curved Blade Steel, One-Way Through Four-Way	5	NA
821	Vertical Single Deflection, w/MS.....	6	77-78
831	Horizontal Single Deflection, w/MS	6	77-78
92HVO	Double Deflection Horizontal Face	7	79-85
92HVV	Double Deflection Horizontal Face, w/OB	7	79-85
92VHO	Double Deflection Vertical Face	8	79-85
92VHV	Double Deflection Vertical Face, w/OB	8	79-85
94HOV	Return Horizontal, w/OB	9	86-89
94A	Return Horizontal Deflected	9	86-89
94AHOV	Return Horizontal Deflected, w/OB	10	86-89
96AFB	Steel Fixed-Bar Filter Grille	10	86-89
92OOV	Opposed-Blade Damper	11	NA
PFG	Steel Perforated Face Grille.....	11	90
REGISTERS & GRILLES—ALUMINUM			
HX	Horizontal Single Deflection	12	91-92
HD	Horizontal Single Deflection, w/OB	12	91-92
HM	Horizontal Single Deflection, w/MS	13	91-92
HV	Double Deflection Horizontal Face	13	91-92
HVD	Double Deflection Horizontal Face, w/OB	14	91-92
VX	Vertical Single Deflection.....	14	91-92
VD	Vertical Single Deflection, w/OB.....	15	91-92
VM	Vertical Single Deflection, w/MS.....	15	91-92
VH	Double Deflection Vertical Face	16	91-92
VHD	Double Deflection Vertical Face, w/OB	16	91-92
CH1	Curved Blade One-Way Horizontal	17	93-94
CHD1	Curved Blade One-Way Horizontal, w/OB	17	93-94
CHM1	Curved Blade One-Way Horizontal, w/MS	17	93-94
CH2	Curved Blade Two-Way Horizontal	18	93-94
CHD2	Curved Blade Two-Way Horizontal, w/OB	18	93-94
CHM2	Curved Blade Two-Way Horizontal, w/MS	18	93-94
C3	Curved Blade Three-Way Horizontal	19	93-94
CD3	Curved Blade Three-Way Horizontal, w/OB	19	93-94
CM3	Curved Blade Three-Way Horizontal, w/MS	20	93-94
C4	Curved Blade Four-Way Horizontal.....	20	93-94
CD4	Curved Blade Four-Way Horizontal, w/OB.....	21	93-94
CM4	Curved Blade Four-Way Horizontal, w/MS.....	21	93-94
RCB/RCBD	Curved Blade Return , w/OB	22	95
RCBF	Curved Blade Filter Grille.....	22	95
RE5	1/2" Grid Core Return.....	23	97
RED5	1/2" Grid Core Return, w/OB.....	23	97
REF5	1/2" Grid Filter Grille	24	97
ER45	Extruded Aluminum Return Air Grille.....	24	95
RH45	Fixed Horizontal Deflected	25	95
RHD45	Fixed Horizontal Deflected, w/OB	25	95
RHF45	Fixed Horizontal Deflected Filter Grille	25	95
RH90	Fixed Horizontal Return Grille.....	26	96
RHD90	Fixed Horizontal Return Grille, w/OB.....	26	96
TG/TGF	Transfer Grille and Frame.....	27	99

LIGHT COMMERCIAL

		Product Information	Engineering Data
CEILING DIFFUSERS—STEEL			
19	Round OB Damper.....	28	NA
20	Round Adjustable.....	28	99
21	Steel Square Mounting Frame.....	29	NA
22	Steel Butterfly Damper with Mounting Frame.....	29	NA
23	Steel Opposed Blade Damper.....	29	NA
24	Steel Square (Ceiling) Diffuser.....	29	99
SRE	Directional, Flat Frame.....	30	103-105
SR7	OB Damper.....	30	NA
SR/AR	Air Patterns and Listed Sizes.....	33	100-105
CEILING DIFFUSERS—ALUMINUM			
ARE	Directional, Flat Frame.....	31	100-105
ARF	Directional, Flush Frame.....	31	100-105
ARS	Directional, Step Frame.....	32	100-105
AR6	Control Grid.....	32	NA
AR7	OB Damper.....	32	NA
SR/AR	Air Patterns and Listed Sizes.....	33	100-105
ASRE	Supply/Return, Flat Frame.....	34	106-107
ASRS	Supply/Return, Step Frame.....	34	106-107
MCD	Modular Diffuser, Flat Frame.....	35	108-109
MCDD	Modular Diffuser with OBD, Flat Frame.....	35	108-109
MCDS	Modular Diffuser, Step Frame.....	35	108-109
MCDS	Modular Diffuser with OBD, Step Frame.....	36	108-109
PANEL	Modular T-Bar Panel.....	36	108-109
SPIRAL DIFFUSERS			
SV	Single-Deflection Diffuser.....	37	113
SVH	Double-Deflection Diffuser.....	37	113
USV	Single-Deflection Universal Diffuser.....	37	113
USVH	Double-Deflection Universal Diffuser.....	38	113
SS	Linear Face Diffuser.....	38	111-112
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DL	Drum Louver.....	47	120-121
BV	Brick/Block Vents.....	48	NA
4ABC	Adjustable Louver.....	49	122
1530	Stationary Louvers.....	49	122
1545	Stationary Louvers.....	49	122
245	Stationary Louvers.....	50	122
445	Stationary Louvers.....	50	122
645	Stationary Louvers.....	50	122

T-BAR GRILLES & DIFFUSERS

		Product Information	Engineering Data
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659T	Steel—Lanced Face	52	126
659TI	Steel—Lanced Face with Fiberglass Back	52	126
673T	Steel—Filter Grille	52	126
673TI	Steel—Filter Grille with Fiberglass Back	52	126
673TPI R6	Steel—Filter Grille with Steel Plenum, R6 Insulation	53	126
R4/R6/R8	Molded Fiberglass Back Features	53	NA
96AFBT	Steel—Fixed-Bar Face	53	126
96AFBTI	Steel—Fixed-Bar Face with Fiberglass Back	54	126
RHF45T	Extruded Aluminum—Fixed Bar Face	54	126
RCBFT	Extruded Aluminum—Curved Blade Face	54	95
REF5T	Extruded Aluminum—1/2" Core Grid Face	55	126
REF5TI	Extruded Aluminum—1/2" Core Grid Face with Insulation	55	126
PFT	Steel—Perforated Face	55	126
PFTI	Steel—Perforated Face with Fiberglass Back	55	126
T-BAR RETURN AIR GRILLES			
94AT	Steel—Fixed-Bar Face	56	87-89
RH45T	Extruded Aluminum—Fixed-Bar Face	56	126
RCBT	Extruded Aluminum—Curved-Blade Face	56	95
RE5T	Extruded Aluminum—1/2" Core Grid Face	57	126
RE5TI	Extruded Aluminum—1/2" Core Grid Face with Fiberglass Back	57	126
T-BAR SURFAIRE/RENOVATOR DIFFUSER			
444	(441-445) Aluminum—One-Piece Stamped Face	58	126
REN4	Aluminum—One-Piece Stamped Face with Fiberglass Back	58	127
REZZIN™ DIFFUSERS			
4-Way T-Bar	Rezzin™ Plastic T-Bar Directional Diffuser	59	123-124
Mod Core	Rezzin™ Plastic T-Bar Modular Core Diffuser	59	123-124
Back Panel	Rezzin™ Plastic Back Panel	59	NA
Sq to Rd	Rezzin™ Plastic Square-to-Round Back Panel	59	125
RZ-Square	Rezzin™ Plastic Square Ceiling Diffuser	60	125
RZ-Round	Rezzin™ Plastic Round Ceiling Diffuser	60	125
Egg Crate	Rezzin™ Plastic T-Bar Egg Crate Filter Grille	57	126
Rough-In	Rezzin™ Rough-In Plates	60	NA
T-BAR FIXED-PATTERN DIFFUSER			
HVS	Steel—Square Three-Core Face with Insulation Options	61	127
FPD	Steel—Square Two-Core Face, Fixed Collar, R6 Insulation Option	61	127
AFPD	Aluminum—Square Two-Core Face, Fixed Collar, R6 Insulation Option	61	127
FPD12	Steel—Square Two-Core Face, Fixed Collar for 1 x 1 Tbar	62	130
FPD3	Steel—Square Three-Core Face, Fixed Collar, R6 Insulation Option	62	127
DPD	Steel—Detachable Plate Diffuser, Fixed Collar, R6 Insulation Option	63	127
ADPD	Aluminum—Detachable Plate Diffuser, Fixed Collar	63	127
DPD12	Steel—Detachable Plate Diffuser for 1' x 1'	63	130
T-BAR PERFORATED SUPPLY/RETURN			
RENPS	Steel—Perforated Face with Deflector, R6 Insulation Option	64	127
ARENPS	Aluminum—Perforated Face with Fiberglass Back	64	127
RENP	Steel—Perforated Face	64	128
CBPS	Steel—Perforated Face with Curved Blade Deflection	65	129
CBPR	Steel—Perforated Face	65	130

T-BAR GRILLES & DIFFUSERS

		Product Information		Engineering Data
SBP	Steel—Perforated Face Shallow Back	65	.....	128
PDS	Steel—Perforated Face with Fixed Deflector	66	.....	127
PDSD	Steel—Perforated Face with Adjustable Deflector	66	.....	127
PDR	Steel—Perforated Face	67	.....	128
PD	Perforated Face Only.....	67	.....	128

T-BAR DIRECTIONAL/MODULAR DIFFUSER

ART	Extruded Aluminum—Square Neck	68	100-105
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MCDSDT	Extruded Aluminum—Curved-Blade Face with Damper	69	108-109
A500	Steel—Panel Extruded Aluminum Face	70	110

T-BAR ACCESSORIES

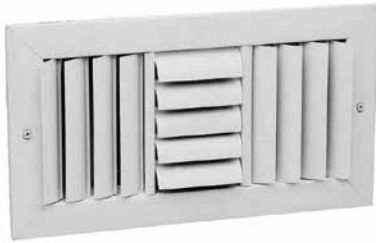
6400	Tab Collar	71	.....	NA
5400	Snap-In Collar Ring	71	.....	NA
5400PP	Push Pins	71	.....	NA
3800	Adjustable Butterfly Damper	71	.....	NA
T19	Steel—Multi-Blade Damper	72	.....	NA
RD	Radial Blade Damper	72	.....	NA
SMF	Extruded Aluminum—Surface Mount Frame	72	.....	NA
P Panel	Filler Panel	73	.....	NA

MISCELLANEOUS

AD	Damper	73	.....	NA
DT	Air Diverter	73	NA
FT	Flexiturn.....	74	NA
APF	Aluminum Plaster Frame	74	NA

ENGINEERING DATA

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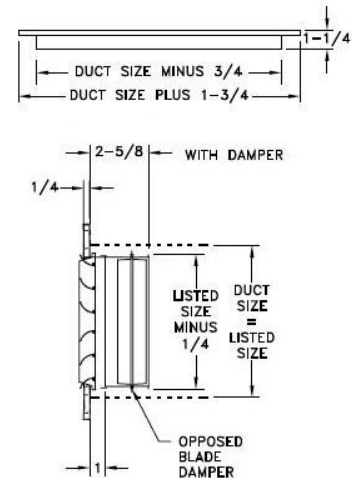
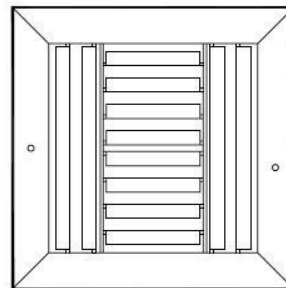


800 Series

- Steel construction
- Curved Blade design
- 1 - 4-way or 2-way corner air diffusion
- Available with or without damper
- Damper options: Multi-Shutter or Opposed Blade
- Individually adjustable bars for easy positive setting
- Opposed Blade damper is screwdriver operated
- Bright White finish

800 Series Available Sizes (in.)																
WIDTH																
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

x Available in



- 811 one-way no damper
- 811MS one-way with multi-shutter damper
- 811OB one-way with opposed blade damper
- 812 two-way no damper
- 812MS two-way with multi-shutter damper
- 812OB two-way with opposed blade damper
- 812C two-way corner no damper
- 812CMS two-way corner with multi-shutter damper
- 812COB two-way corner with opposed blade damper
- 813 three-way no damper
- 813MS three-way with multi-shutter damper
- 813OB three-way with opposed blade damper
- 814 four-way no damper
- 814MS four-way with multi-shutter damper
- 814OB four-way with opposed blade damper

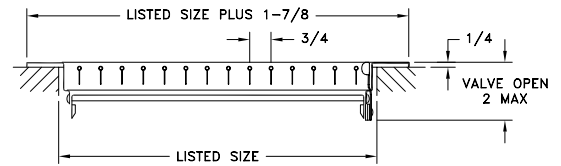
Registers & Grilles - Steel



821

- All-steel construction
- Vertical adjustable face bars
- Horizontal multi-shutter valve
- Bright White finish

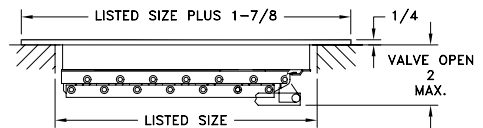
821 Available Sizes (in.)											
HT	WIDTH										
	6	8	10	12	14	16	18	20	24	30	36
4	X	X	X	X	X	X	X	X	X	X	
5			X	X	X						
6	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X
16						X	X	X	X	X	
18							X	X	X	X	
20								X			
24									X		



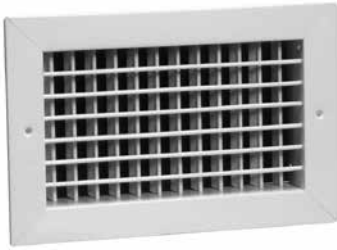
831

- All-steel construction
- Horizontal adjustable face bars
- Vertical valve
- Adjustable multi-shutter valve
- Bright White finish
- 3/4" fin spacing

831 Available Sizes (in.)										
HT	WIDTH									
	8	10	12	14	16	20	24	30	32	36
4	X	X	X	X						
6	X	X	X	X	X	X	X	X		
8		X	X	X	X	X	X	X		
10			X			X	X			
12							X			X
14						X			X	

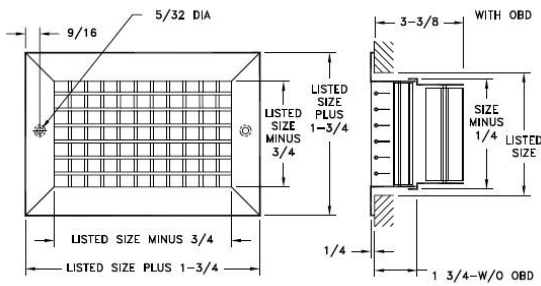


Note: Screw hole location details start on page 131
Engineering Data on Page 77-78



92HVO Register

- All-steel construction
- Adjustable face bars may be set to any desired deflection
- Horizontal front bars
- Vertical second bars
- Larger sizes available in multiple-piece construction
- Bright White finish

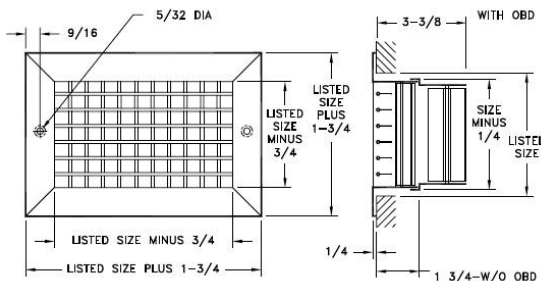


		92HVO Available Sizes (in.)															
		WIDTH															
HT	WIDTH																
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	



92HVV Register

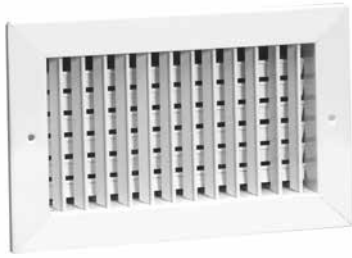
- All-steel construction
- Horizontal front bars
- Vertical second bars
- Opposed-blade damper
- Adjustable face bars may be set to any desired deflection
- Larger sizes available in multiple-piece construction
- Bright White finish



		92HVV Available Sizes (in.)															
		WIDTH															
HT	WIDTH																
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	

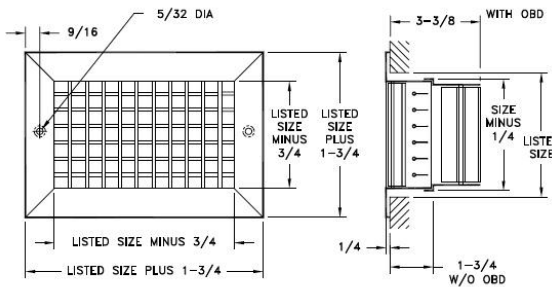
Note: Screw hole location details start on page 131
Engineering Data on Page 79-85

Registers & Grilles - Steel

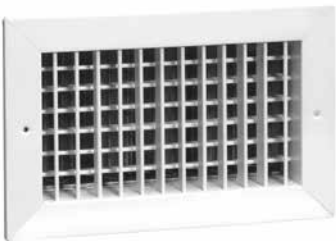


92VHO Register

- All-steel construction
- Vertical front bars
- Horizontal second bars
- Adjustable face bars may be set to any desired deflection
- Larger sizes available in multiple-piece construction
- Bright White finish

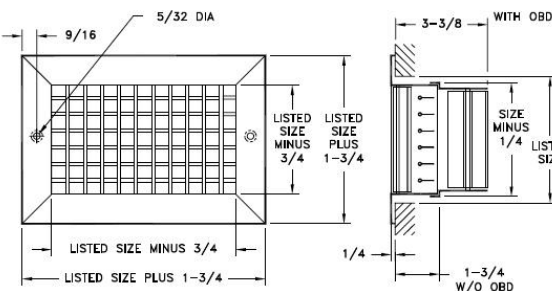


		92VHO Available Sizes (in.)															
HT	WIDTH																
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	



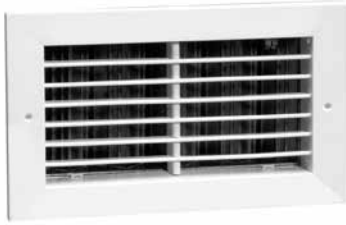
92VHV Register

- All-steel construction
- Vertical front bars
- Horizontal second bars
- Adjustable face bars may be set to any desired deflection
- Opposed-blade damper
- Larger sizes available in multiple-piece construction
- Bright White finish



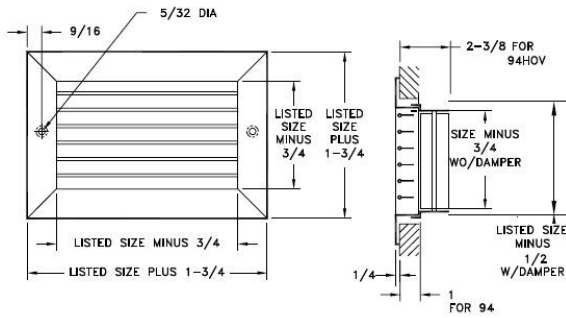
		92VHV Available Sizes (in.)															
HT	WIDTH																
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	

Note: Screw hole location details start on page 131
Engineering Data on Page 79-85



94HOV Register

- All-steel construction
- Horizontal face bars set straight
- Face bars permanently fixed into a heavy steel frame at 90-degree angle from face
- Opposed-blade damper
- Larger sizes available in multiple-piece construction
- Bright White finish

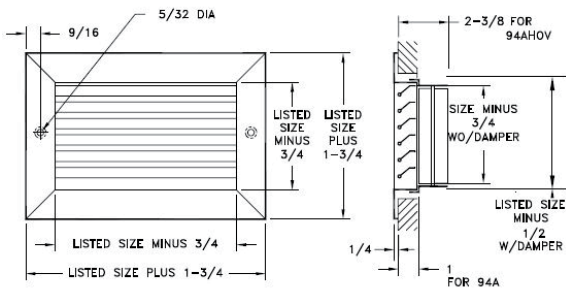


		94HOV Available Sizes (in.)															
		WIDTH															
HT	WIDTH																
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	



94A Grille (No Damper)

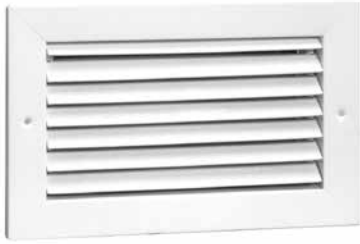
- All-steel construction
- 3/4" spaced fins set at 35°, horizontal face bars set at 35°
- Larger sizes available in multiple-piece construction
- Also available as 94AT T-Bar Return Grille (see page 57)
- Bright White finish



		94A Available Sizes (in.)															
		WIDTH															
HT	WIDTH																
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	

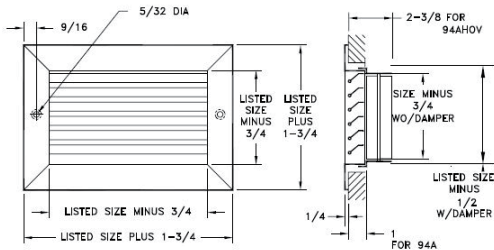
Note: Screw hole location details start on page 131
 Engineering Data on Page 86-89

Registers & Grilles - Steel



94AHOV Register

- All-steel construction
- 3/4" spaced fins set at 35°, horizontal face bars set at 35°
- Opposed-blade damper
- Larger sizes available in multiple-piece construction
- Bright White finish

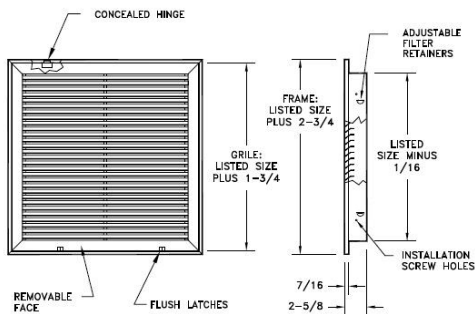


94AHOV Available Sizes (in.)																
HT	WIDTH															
	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X
26											X	X	X	X	X	X
28												X	X	X	X	X
30													X	X	X	X
32														X	X	X
34															X	X
36																X



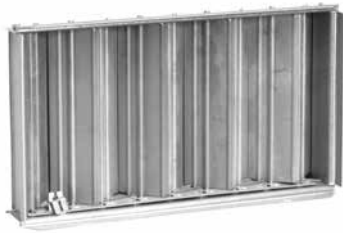
96AFB Fixed-Bar Filter Grille

- Steel construction
- Simplifies contractor installation
- Flush, removable face with concealed hinges
- Uses nominal 1" thick disposable filters (not included)
- 96AFB2 uses 2" thick disposable filters and is available by special order
- Equipped with adjustable filter retainers
- 3/4" spaced fins set at 35°
- Also available as 96AFBT T-Bar Fixed Bar Filter Grille (see page 54)
- Bright White finish



96AFB Standard Sizes (in.)										
HT	WIDTH									
	10	12	14	16	18	20	24	25	30	36
10						X	X		X	
12		X			X	X	X		X	
14			X			X	X	X	X	
16				X		X	X	X		
18					X	X	X		X	
20	X	X	X	X		X	X	X	X	
24		X	X		X		X		X	X
25			X	X		X		X		
30			X			X	X		X	X
36										X

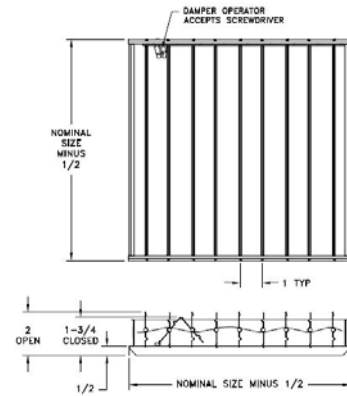
Note: Screw hole location details start on page 131
Engineering Data on Page 86-89



9200V Damper

- Steel construction
- Opposed-blade damper
- Controls the air volume from full flow to shut-off
- Mill finish
- For use with:
 - 92
 - 94
 - RE5
 - PFG

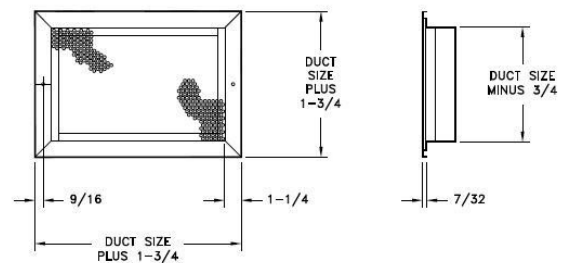
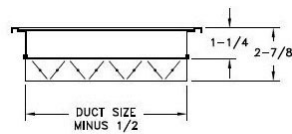
9200V Available Sizes (in.)
Minimum: 6" x 4"
Maximum: 24" x 24" One Piece



PFG Perforated Face Grille

- All steel construction
- Perforated face
- Optional opposed blade damper
- Optional T-Bar lay-in frames
- Bright white finish

PFG Available Sizes (in.)
Minimum: 6" x 4"
Maximum: 48" x 48" One Piece



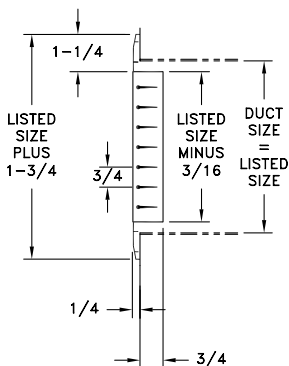
Note: Screw hole location details start on page 131
Engineering Data on Page 90 (PFG only)

Registers & Grilles - Aluminum



HX Grille

- Extruded aluminum construction
- Horizontal front bars
- Single row of individually adjustable horizontal face bars
- Pivoted bars for easy positive setting
- Bright White or Satin Anodized finish

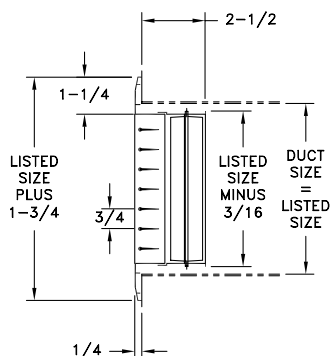


		HX Available Sizes (in.)																						
		WIDTH																						
HT	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24											X	X	X	X	X	X	X	X	X	X	X	X	X	X
26												X	X	X	X	X	X	X	X	X	X	X	X	X
28													X	X	X	X	X	X	X	X	X	X	X	X
30														X	X	X	X	X	X	X	X	X	X	X
32															X	X	X	X	X	X	X	X	X	X
34																X	X	X	X	X	X	X	X	X
36																	X	X	X	X	X	X	X	X
38																		X	X	X	X	X	X	X
40																			X	X	X	X	X	X
42																				X	X	X	X	X
44																					X	X	X	X
46																						X	X	X
48																							X	X



HD Register

- Extruded aluminum construction
- Single row of individually adjustable horizontal face bars
- Pivoted bars for easy positive setting
- Opposed-blade damper
- Bright White or Satin Anodized finish



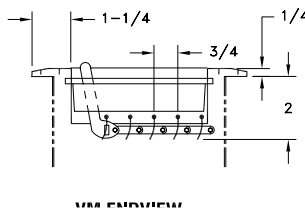
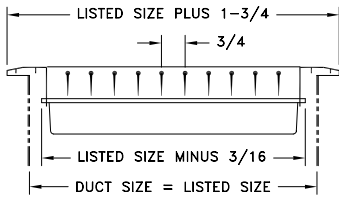
		HD Available Sizes (in.)																					
		WIDTH																					
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X	X
38																	X	X	X	X	X	X	X
40																		X	X	X	X	X	X
42																			X	X	X	X	X
44																				X	X	X	X
46																					X	X	X
48																						X	X

Note: Screw hole location details start on page 131
Engineering Data on Page 91-92

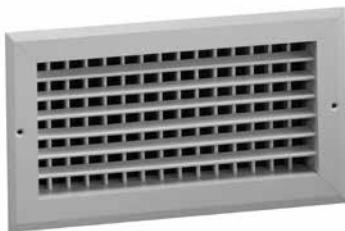


HM Register

- Extruded aluminum construction
- Single row of individually adjustable horizontal face bars
- Pivoted bars for easy positive setting
- Lever-operated, multi-shutter valve
- Bright White or Satin Anodized finish

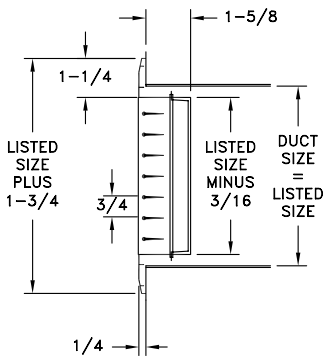


		HM Available Sizes (in.)															
		WIDTH															
HT		6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10				X	X	X	X	X	X	X	X	X	X	X	X	X	X
12					X	X	X	X	X	X	X	X	X	X	X	X	X
14						X	X	X	X	X	X	X	X	X	X	X	X
16							X	X	X	X	X	X	X	X	X	X	X
18								X	X	X	X	X	X	X	X	X	X
20									X	X	X	X	X	X	X	X	X
22										X	X	X	X	X	X	X	X
24											X	X	X	X	X	X	X
26												X	X	X	X	X	X
28													X	X	X	X	X
30														X	X	X	X
32															X	X	X
34																X	X
36																	X



HV Register

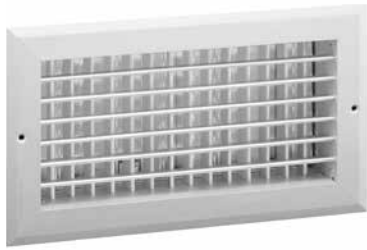
- Extruded aluminum construction
- Horizontal front bars
- Vertical second bars
- Two rows of individually adjustable face bars for horizontal and vertical deflection
- Pivoted bars for easy positive setting
- Bright White or Satin Anodized finish



		HV Available Sizes (in.)																					
		WIDTH																					
HT		6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22										X	X	X	X	X	X	X	X	X	X	X	X	X	X
24											X	X	X	X	X	X	X	X	X	X	X	X	X
26												X	X	X	X	X	X	X	X	X	X	X	X
28													X	X	X	X	X	X	X	X	X	X	X
30														X	X	X	X	X	X	X	X	X	X
32															X	X	X	X	X	X	X	X	X
34																X	X	X	X	X	X	X	X
36																	X	X	X	X	X	X	X
38																		X	X	X	X	X	X
40																			X	X	X	X	X
42																				X	X	X	X
44																					X	X	X
46																						X	X
48																							X

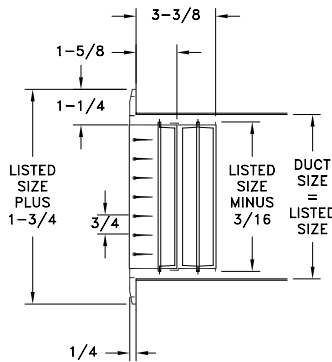
Note: Screw hole location details start on page 131
Engineering Data on Page 91-92

Registers & Grilles - Aluminum



HVD Register

- Extruded aluminum construction
- Two rows of individually adjustable face bars for horizontal and vertical deflection
- Pivoted bars for easy positive setting
- Opposed-blade damper
- Bright White or Satin Anodized finish

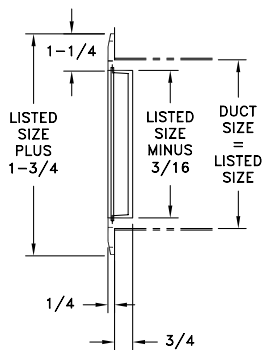


		HVD Available Sizes (in.)																					
		WIDTH																					
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X	X
38																	X	X	X	X	X	X	X
40																		X	X	X	X	X	X
42																			X	X	X	X	X
44																				X	X	X	X
46																					X	X	X
48																						X	X



VX Grille

- Extruded aluminum construction
- Vertical front bars
- Single row of individually adjustable face bars
- Pivoted bars for easy positive setting
- Bright White or Satin Anodized finish



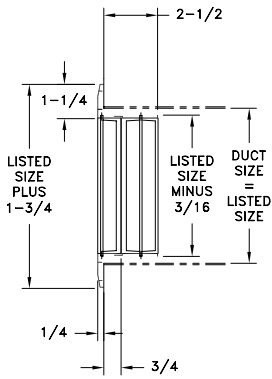
		VX Available Sizes (in.)																					
		WIDTH																					
HT	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X	X
38																	X	X	X	X	X	X	X
40																		X	X	X	X	X	X
42																			X	X	X	X	X
44																				X	X	X	X
46																					X	X	X
48																						X	X

Note: Screw hole location details start on page 131
Engineering Data on Page 91-92



VD Register

- Extruded aluminum construction
- Vertical front bars
- Single row of individually adjustable face bars
- Pivoted bars for easy positive setting
- Opposed-blade damper
- Bright White or Satin Anodized finish

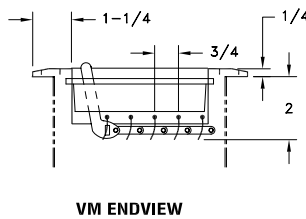
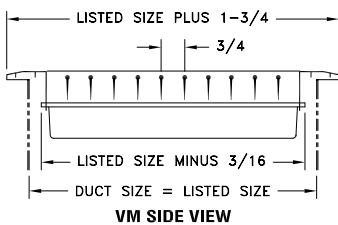


		VD Available Sizes (in.)																				
		WIDTH																				
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X
38																	X	X	X	X	X	X
40																		X	X	X	X	X
42																			X	X	X	X
44																				X	X	X
46																					X	X
48																						X



VM Register

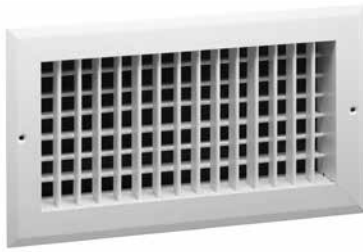
- Extruded aluminum construction
- Vertical front bars
- Pivoted bars for easy positive setting
- Lever-operated, multi-shutter valve
- Single row of individually adjustable face bars
- Horizontal valve blades
- Bright White or Satin Anodized finish



		VM Available Sizes (in.)															
		WIDTH															
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	

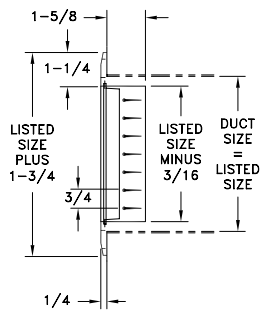
Note: Screw hole location details start on page 131
Engineering Data on Page 91-92

Registers & Grilles - Aluminum



VH Register

- Extruded aluminum construction
- Vertical front bars
- Horizontal second bars
- Two rows of individually adjustable face bars for horizontal and vertical deflection
- Pivoted bars for easy positive setting
- Bright White or Satin Anodized finish

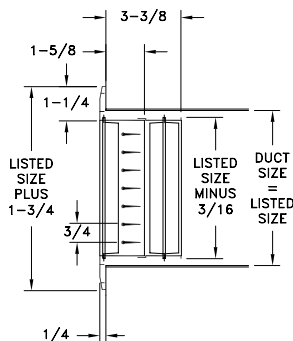


HT		VH Available Sizes (in.)																							
		WIDTH																							
4	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
											X	X	X	X	X	X	X	X	X	X	X	X	X	X	
												X	X	X	X	X	X	X	X	X	X	X	X	X	
													X	X	X	X	X	X	X	X	X	X	X	X	
														X	X	X	X	X	X	X	X	X	X	X	
															X	X	X	X	X	X	X	X	X	X	
																X	X	X	X	X	X	X	X	X	
																	X	X	X	X	X	X	X	X	
																		X	X	X	X	X	X	X	
																			X	X	X	X	X	X	
																				X	X	X	X	X	
																					X	X	X	X	
																						X	X	X	
																							X	X	
																								X	
																									X



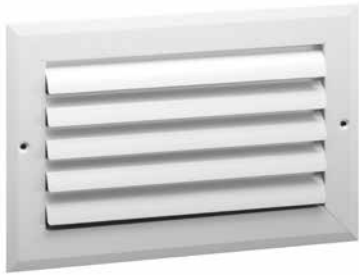
VHD Register

- Extruded aluminum construction
- Vertical front bars
- Horizontal second bars
- Two rows of individually adjustable face bars for horizontal and vertical deflection
- Pivoted bars for easy positive setting
- Opposed-blade damper
- Bright White or Satin Anodized finish



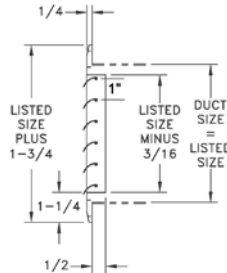
HT		VHD Available Sizes (in.)																							
		WIDTH																							
4	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
											X	X	X	X	X	X	X	X	X	X	X	X	X	X	
												X	X	X	X	X	X	X	X	X	X	X	X	X	
													X	X	X	X	X	X	X	X	X	X	X	X	
														X	X	X	X	X	X	X	X	X	X	X	
															X	X	X	X	X	X	X	X	X	X	
																X	X	X	X	X	X	X	X	X	
																	X	X	X	X	X	X	X	X	
																		X	X	X	X	X	X	X	
																			X	X	X	X	X	X	
																				X	X	X	X	X	
																					X	X	X	X	
																						X	X	X	
																							X	X	
																								X	
																									X

Note: Screw hole location details start on page 131
Engineering Data on Page 91-92

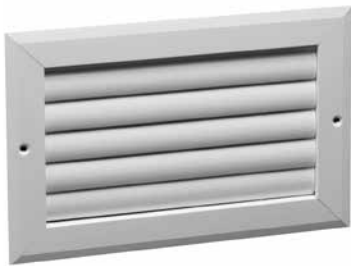


CH1 Grille

- Extruded aluminum construction
- One-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Bright White or Satin Anodized finish

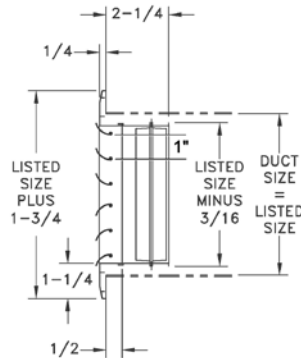


HT		CH1 Available Sizes (in.)															
		WIDTH															
6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
				X	X	X	X	X	X	X	X	X	X	X	X	X	
					X	X	X	X	X	X	X	X	X	X	X	X	
						X	X	X	X	X	X	X	X	X	X	X	
							X	X	X	X	X	X	X	X	X	X	
								X	X	X	X	X	X	X	X	X	
									X	X	X	X	X	X	X	X	
										X	X	X	X	X	X	X	
											X	X	X	X	X	X	
												X	X	X	X	X	
													X	X	X	X	
														X	X	X	
															X	X	
																X	



CHD1 Register

- Extruded aluminum construction
- One-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Opposed-blade damper
- Bright White or Satin Anodized finish

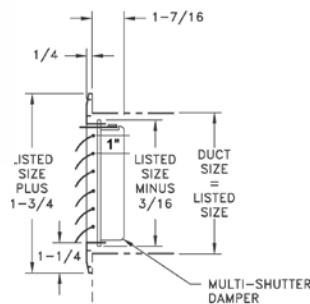


HT		CHD1 Available Sizes (in.)															
		WIDTH															
6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
				X	X	X	X	X	X	X	X	X	X	X	X	X	
					X	X	X	X	X	X	X	X	X	X	X	X	
						X	X	X	X	X	X	X	X	X	X	X	
							X	X	X	X	X	X	X	X	X	X	
								X	X	X	X	X	X	X	X	X	
									X	X	X	X	X	X	X	X	
										X	X	X	X	X	X	X	
											X	X	X	X	X	X	
												X	X	X	X	X	
													X	X	X	X	
														X	X	X	
															X	X	
																X	



CHM1 Register

- Extruded aluminum construction
- One-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Multi-shutter valve
- Bright White or Satin Anodized finish



HT		CHM1 Available Sizes (in.)															
		WIDTH															
6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
				X	X	X	X	X	X	X	X	X	X	X	X	X	
					X	X	X	X	X	X	X	X	X	X	X	X	
						X	X	X	X	X	X	X	X	X	X	X	
							X	X	X	X	X	X	X	X	X	X	
								X	X	X	X	X	X	X	X	X	
									X	X	X	X	X	X	X	X	
										X	X	X	X	X	X	X	
											X	X	X	X	X	X	
												X	X	X	X	X	
													X	X	X	X	
														X	X	X	
															X	X	
																X	

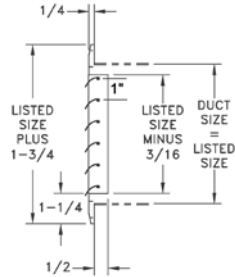
Note: Screw hole location details start on page 131
Engineering Data on Page 93-94

Registers & Grilles - Aluminum



CH2 Grille

- Extruded aluminum construction
- Two-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Bright White or Satin Anodized finish

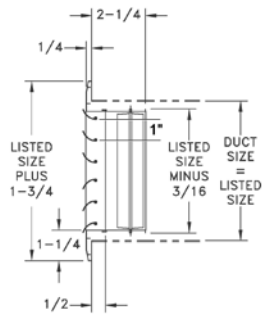


HT		CH2 Available Sizes (in.)															
		WIDTH															
6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
			X	X	X	X	X	X	X	X	X	X	X	X	X		
				X	X	X	X	X	X	X	X	X	X	X	X		
					X	X	X	X	X	X	X	X	X	X	X		
						X	X	X	X	X	X	X	X	X	X		
							X	X	X	X	X	X	X	X	X		
								X	X	X	X	X	X	X	X		
									X	X	X	X	X	X	X		
										X	X	X	X	X	X		
											X	X	X	X	X		
												X	X	X	X		
													X	X	X		
														X	X		
															X		



CHD2 Register

- Extruded aluminum construction
- Two-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Opposed-blade damper
- Bright White or Satin Anodized finish

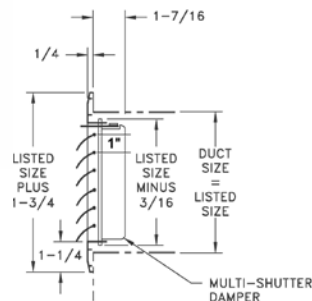


HT		CHD2 Available Sizes (in.)															
		WIDTH															
6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
			X	X	X	X	X	X	X	X	X	X	X	X	X		
				X	X	X	X	X	X	X	X	X	X	X	X		
					X	X	X	X	X	X	X	X	X	X	X		
						X	X	X	X	X	X	X	X	X	X		
							X	X	X	X	X	X	X	X	X		
								X	X	X	X	X	X	X	X		
									X	X	X	X	X	X	X		
										X	X	X	X	X	X		
											X	X	X	X	X		
												X	X	X	X		
													X	X	X		
														X	X		
															X		



CHM2 Register

- Extruded aluminum construction
- Two-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Multi-shutter valve
- Bright White or Satin Anodized finish



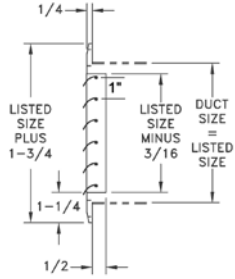
HT		CHM2 Available Sizes (in.)															
		WIDTH															
6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
		X	X	X	X	X	X	X	X	X	X	X	X	X	X		
			X	X	X	X	X	X	X	X	X	X	X	X	X		
				X	X	X	X	X	X	X	X	X	X	X	X		
					X	X	X	X	X	X	X	X	X	X	X		
						X	X	X	X	X	X	X	X	X	X		
							X	X	X	X	X	X	X	X	X		
								X	X	X	X	X	X	X	X		
									X	X	X	X	X	X	X		
										X	X	X	X	X	X		
											X	X	X	X	X		
												X	X	X	X		
													X	X	X		
														X	X		
															X		

Note: Screw hole location details start on page 131
Engineering Data on Page 93-94



C3 Grille

- Extruded aluminum construction
- Three-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Bright White or Satin Anodized finish

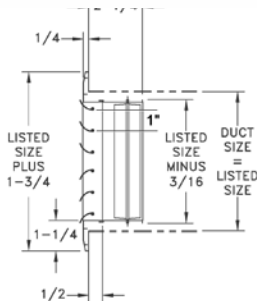


		C3 Available Sizes (in.)															
		WIDTH															
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	



CD3 Register

- Extruded aluminum construction
- Three-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Opposed-blade damper
- Bright White or Satin Anodized finish



		CD3 Available Sizes (in.)															
		WIDTH															
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	

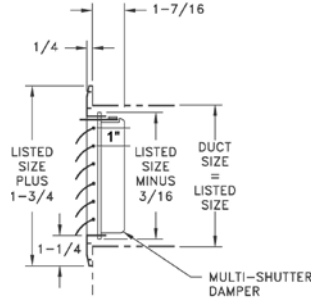
Note: Screw hole location details start on page 131
Engineering Data on Page 93-94

Registers & Grilles - Aluminum

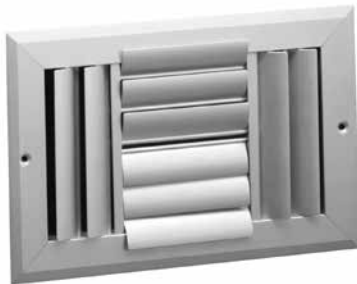


CM3 Register

- Extruded aluminum construction
- Three-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Multi-shutter valve
- Bright White or Satin Anodized finish

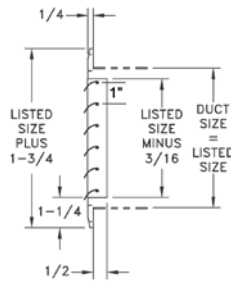


		CM3 Available Sizes (in.)															
		WIDTH															
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	



C4 Grille

- Extruded aluminum construction
- Four-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Bright White or Satin Anodized finish



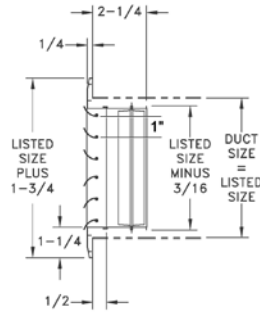
		CH2 Available Sizes (in.)															
		WIDTH															
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12				X	X	X	X	X	X	X	X	X	X	X	X	X	
14					X	X	X	X	X	X	X	X	X	X	X	X	
16						X	X	X	X	X	X	X	X	X	X	X	
18							X	X	X	X	X	X	X	X	X	X	
20								X	X	X	X	X	X	X	X	X	
22									X	X	X	X	X	X	X	X	
24										X	X	X	X	X	X	X	
26											X	X	X	X	X	X	
28												X	X	X	X	X	
30													X	X	X	X	
32														X	X	X	
34															X	X	
36																X	

Note: Screw hole location details start on page 131
Engineering Data on Page 93-94



CD4 Register

- Extruded aluminum construction
- Four-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Opposed-blade damper
- Bright White or Satin Anodized finish

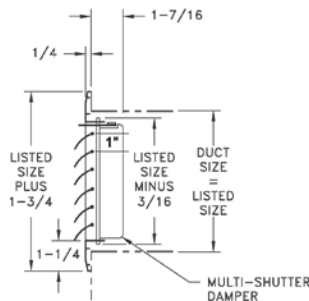


		CHD2 Available Sizes (in.)															
		WIDTH															
HT		6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X
28												X	X	X	X	X	X
30													X	X	X	X	X
32														X	X	X	X
34															X	X	X
36																X	X



CM4 Register

- Extruded aluminum construction
- Four-way deflection
- Individually adjustable curved-face bars
- Pivoted bars for easy positive setting
- Multi-shutter valve
- Bright White or Satin Anodized finish



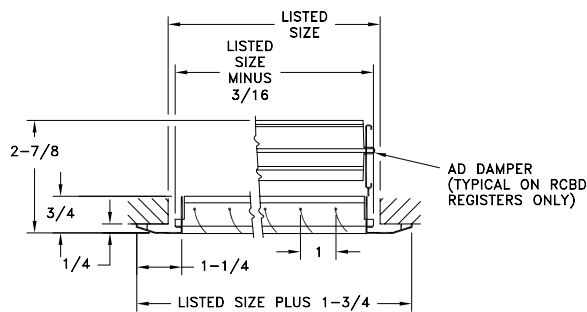
		CHM2 Available Sizes (in.)															
		WIDTH															
HT		6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X
28												X	X	X	X	X	X
30													X	X	X	X	X
32														X	X	X	X
34															X	X	X
36																X	X

Note: Screw hole location details start on page 131
Engineering Data on Page 93-94

Registers & Grilles - Aluminum



Blades at 40° angle



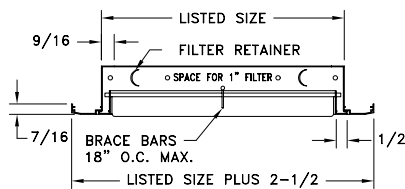
RCB Grille RCBD Register

- Extruded aluminum construction
- Curved blades fixed on one-inch spacing
- Opposed-blade damper
- Bright White or Satin Anodized finish

		RCB, RCBD Available Sizes (in.)																					
		WIDTH																					
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X	X
38																	X	X	X	X	X	X	X
40																		X	X	X	X	X	X
42																			X	X	X	X	X
44																				X	X	X	X
46																					X	X	X
48																						X	X



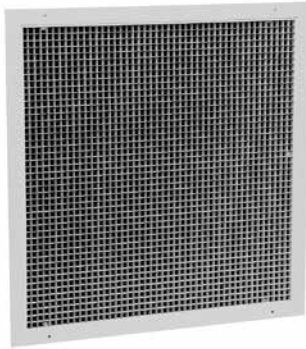
Blades at 40° angle



RCBF Filter Grille

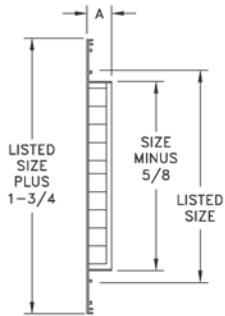
- Extruded aluminum construction
- Horizontal curved blades
- Hinged on bottom edge, removable face
- Accommodates standard 1" thick disposable filter (not included)
- Filter grilles equipped with plastic slide latch
- Bright White or Satin Anodized finish

		RCBF Available Sizes (in.)																					
		WIDTH																					
HT	6	8	10	12	14	16	18	20	22	24	25	26	28	30	32	34	36	38	40	42	44	46	48
	6	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
10		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
12			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
14				X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
16					X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
18						X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
20							X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
22								X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
24									X	X		X	X	X	X	X	X	X	X	X	X	X	X
25								X			X												
26											X	X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X	X
38																	X	X	X	X	X	X	X
40																		X	X	X	X	X	X
42																			X	X	X	X	X
44																				X	X	X	X
46																					X	X	X
48																						X	X



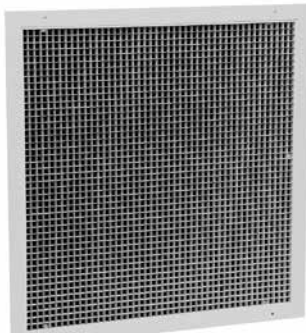
RE5 Grille

- All-aluminum construction
- Grid core $1/2" \times 1/2" \times 1/2"$
- Square core design with extruded aluminum frame
- Bright White or Mill finish



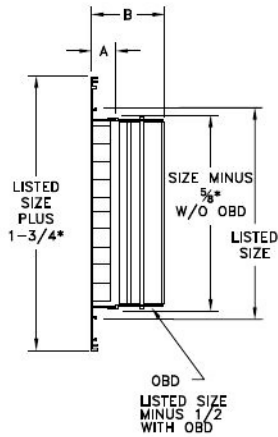
MODEL	GRID CORE DIMENSIONS	A
RE5	$1/2 \times 1/2 \times 1/2$	1-1/16
RE510	$1/2 \times 1/2 \times 1$	1-9/16
RE1	1x1x1	1-9/16

		RE5 Available Sizes (in.)																				
		WIDTH																				
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X
38																	X	X	X	X	X	X
40																		X	X	X	X	X
42																			X	X	X	X
44																				X	X	X
46																					X	X
48																						X



RED5 Register

- Aluminum construction
- Opposed-blade, galvanized damper
- Square core design with extruded aluminum construction
- Bright White or Mill finish

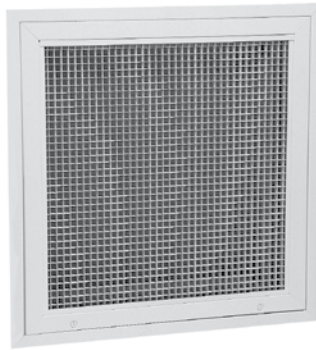


RED5 REGISTER

		RED5 Available Sizes (in.)																				
		WIDTH																				
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24									X	X	X	X	X	X	X	X	X	X	X	X	X	X
26										X	X	X	X	X	X	X	X	X	X	X	X	X
28											X	X	X	X	X	X	X	X	X	X	X	X
30												X	X	X	X	X	X	X	X	X	X	X
32													X	X	X	X	X	X	X	X	X	X
34														X	X	X	X	X	X	X	X	X
36															X	X	X	X	X	X	X	X
38																X	X	X	X	X	X	X
40																	X	X	X	X	X	X
42																		X	X	X	X	X
44																			X	X	X	X
46																				X	X	X
48																					X	X

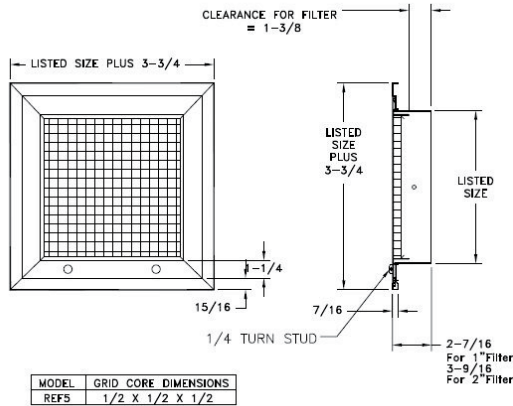
MODEL	GRID CORE DIMENSIONS	A	B
RE5	$1/2 \times 1/2 \times 1/2$	1-1/4	2-1/2
RE510	$1/2 \times 1/2 \times 1$	1-1/4	2-15/16
RE1	1x1x1	1-1/4	2-15/16

Registers & Grilles - Aluminum



REF5 Filter Grille, Grid Core

- All-aluminum construction
- 1/2" x 1/2" x 1/2" square core design
- Accommodates standard 1" thick disposable filter (not included)
- Filter grilles equipped with quarter turn fasteners
- Bright White or Mill finish
- Specify REF52 for 2" filter



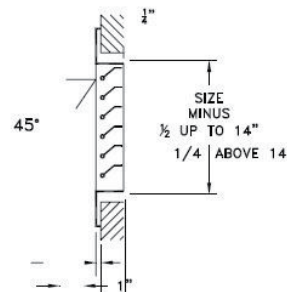
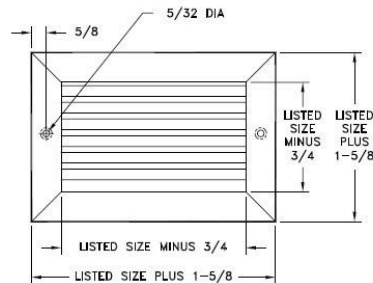
REF5 Available Sizes (in.)		WIDTH																
		6	8	10	12	14	16	18	20	22	24	25	26	28	30	32	34	36
HT	4	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
	5	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
	6	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
	8		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
	10			X	X	X	X	X	X	X	X		X	X	X	X	X	X
	12				X	X	X	X	X	X	X		X	X	X	X	X	X
	14					X	X	X	X	X	X		X	X	X	X	X	X
	16						X	X	X	X	X		X	X	X	X	X	X
	18							X	X	X	X		X	X	X	X	X	X
	20								X	X	X	X		X	X	X	X	X
	22									X	X	X		X	X	X	X	X
	24										X	X		X	X	X	X	X
	25									X		X						
	26												X	X	X	X	X	X
	28													X	X	X	X	X
	30														X	X	X	X
32															X	X	X	
34																X	X	
36																	X	



ER45 Return Air Grille

- Extruded aluminum construction
- Horizontal louvers fixed at 45 degree deflection
- Available in aluminum or white paint
- Minimum size - 4x4, Maximum size - 48x60
- One piece construction
- An economical choice for your light commercial needs

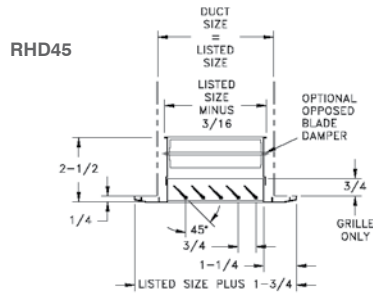
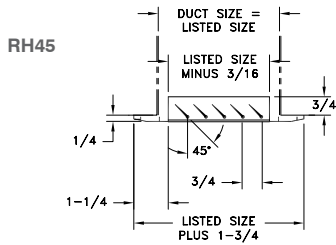
ER45 Available Sizes (in.)
Min Size 4x4, Max Size 48x60





RH45 Grille RHD45 Register

- Extruded aluminum construction
- Horizontal bars at 45 degrees
- Face bars permanently fixed into heavy aluminum frames at a 45-degree angle
- Opposed-blade damper on RHD45
- Bright White or Satin Anodized finish



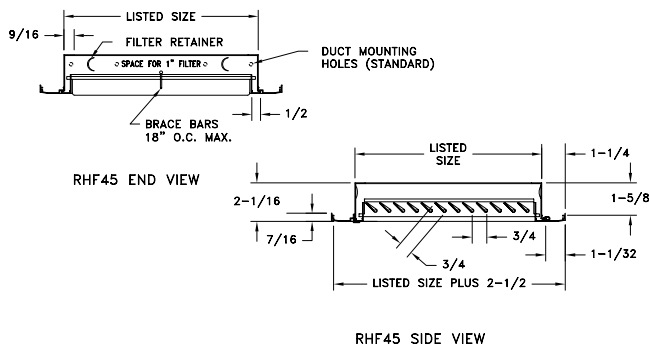
		RH45 Available Sizes (in.)																					
		WIDTH																					
HT	WIDTH																						
	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22										X	X	X	X	X	X	X	X	X	X	X	X	X	X
24											X	X	X	X	X	X	X	X	X	X	X	X	X
26												X	X	X	X	X	X	X	X	X	X	X	X
28													X	X	X	X	X	X	X	X	X	X	X
30														X	X	X	X	X	X	X	X	X	X
32															X	X	X	X	X	X	X	X	X
34																X	X	X	X	X	X	X	X
36																	X	X	X	X	X	X	X
38																		X	X	X	X	X	X
40																			X	X	X	X	X
42																				X	X	X	X
44																					X	X	X
46																						X	X
48																							X



RHF45 Filter Grille

- Extruded aluminum construction
- Horizontal bars at 45 degrees
- Hinged on the bottom edge, face is removable
- Accommodates standard 1" thick disposable filter (not included)
- Filter grilles equipped with plastic slide latch
- Bright White or Satin Anodized finish
- RHF452 - Accepts 2" filter
- RHF454 - Accepts 4" filter

Note: CFM capacity is equal to the filter capacity rating of two CFM per square inch of gross filter area.



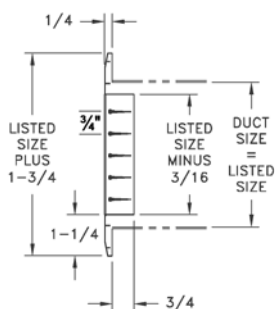
		RHF45 Available Sizes (in.)																					
		WIDTH																					
HT	WIDTH																						
	6	8	10	12	14	16	18	20	22	24	25	26	28	30	32	34	36	38	40	42	44	46	48
6	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
20								X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
22									X	X		X	X	X	X	X	X	X	X	X	X	X	X
24										X		X	X	X	X	X	X	X	X	X	X	X	X
25										X		X											
26											X	X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X	X
38																	X	X	X	X	X	X	X
40																		X	X	X	X	X	X
42																			X	X	X	X	X
44																				X	X	X	X
46																					X	X	X
48																						X	X

Registers & Grilles - Aluminum

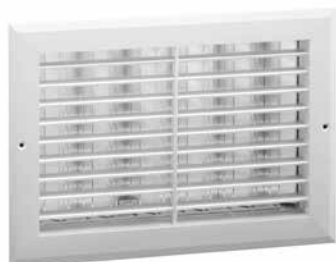


RH90 Grille

- Extruded aluminum construction
- Face bars permanently fixed into heavy aluminum frames at a 90-degree angle from face
- Bright White or Satin Anodized finish

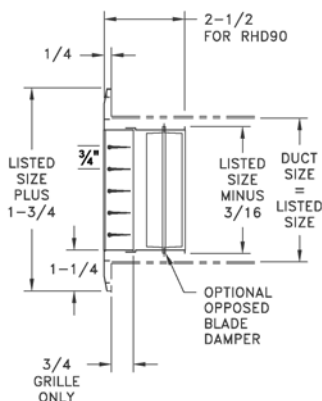


		RH90 Available Sizes (in.)																					
		WIDTH																					
HT	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22										X	X	X	X	X	X	X	X	X	X	X	X	X	X
24											X	X	X	X	X	X	X	X	X	X	X	X	X
26												X	X	X	X	X	X	X	X	X	X	X	X
28													X	X	X	X	X	X	X	X	X	X	X
30														X	X	X	X	X	X	X	X	X	X
32															X	X	X	X	X	X	X	X	X
34																X	X	X	X	X	X	X	X
36																	X	X	X	X	X	X	X
38																		X	X	X	X	X	X
40																			X	X	X	X	X
42																				X	X	X	X
44																					X	X	X
46																						X	X
48																							X



RHD90 Register

- Extruded aluminum construction
- Face bars permanently fixed into heavy aluminum frames at a 90-degree angle from face
- Opposed-blade damper
- Bright White or Satin Anodized finish



		RHD90 Available Sizes (in.)																				
		WIDTH																				
HT	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22									X	X	X	X	X	X	X	X	X	X	X	X	X	X
24										X	X	X	X	X	X	X	X	X	X	X	X	X
26											X	X	X	X	X	X	X	X	X	X	X	X
28												X	X	X	X	X	X	X	X	X	X	X
30													X	X	X	X	X	X	X	X	X	X
32														X	X	X	X	X	X	X	X	X
34															X	X	X	X	X	X	X	X
36																X	X	X	X	X	X	X
38																	X	X	X	X	X	X
40																		X	X	X	X	X
42																			X	X	X	X
44																				X	X	X
46																					X	X
48																						X



TG Transfer Grille

- Extruded aluminum construction
- Vision proof
- Inverted "Y" type grille bar for best vision proof quality and airflow
- Excellent for installation in doors or partitions
- Bright White or Satin Anodized finish

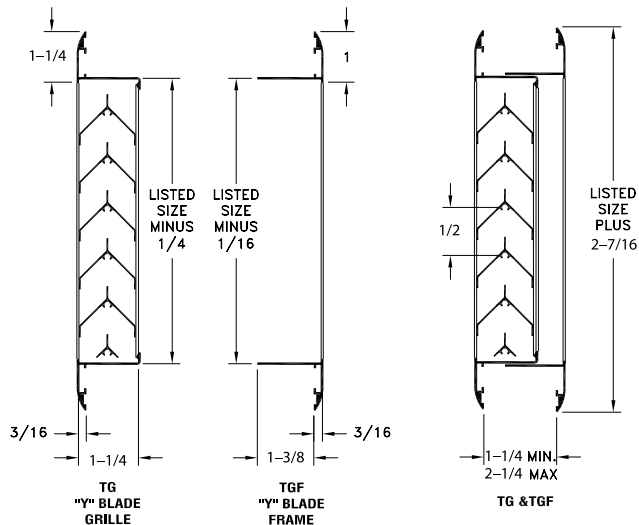


TGF Transfer Grille Frame

- Extruded aluminum construction

Note: When framing both sides of the door or partition opening, use the TGF frame with the TG Grille. Adjustable from 1 1/4" to 2 1/4" door thickness.

TG/TGF Transfer Grille with Transfer Grille Frame



TG/TGF Available Sizes (in.)													
HT	WIDTH												
	6	8	10	12	14	16	18	20	22	24	26	28	30
6	X	X	X	X	X	X	X	X	X	X	X	X	X
8		X	X	X	X	X	X	X	X	X	X	X	X
10			X	X	X	X	X	X	X	X	X	X	X
12				X	X	X	X	X	X	X	X	X	X
14					X	X	X	X	X	X	X	X	X
16						X	X	X	X	X	X	X	X
18							X	X	X	X	X	X	X
20								X	X	X	X	X	X
22									X	X	X	X	X
24										X	X	X	X
26											X	X	X
28												X	X
30													X

Ceiling Diffusers - Steel

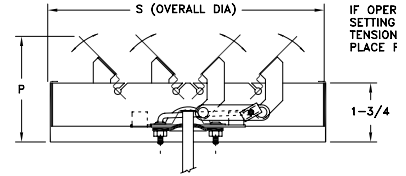


19 Damper

- Steel construction
- Opposed-blade damper
- Bright White finish
- Duct-mount only

19 Damper Listed Sizes (in.)								
Damper	6	8	10	12	14	15	16	18
S	5 ¹⁵ / ₁₆	7 ¹⁵ / ₁₆	9 ¹⁵ / ₁₆	11 ¹⁵ / ₁₆	13 ¹⁵ / ₁₆	14 ¹⁵ / ₁₆	15 ¹⁵ / ₁₆	17 ¹⁵ / ₁₆
P	3	3 ¹ / ₂	4 ⁹ / ₁₆	4 ⁹ / ₁₆	4 ⁹ / ₁₆	4 ⁹ / ₁₆	4 ⁹ / ₁₆	4 ⁹ / ₁₆

Note: 3/16" Hex Damper handle (by others) will lock into position if inserted too far into damper



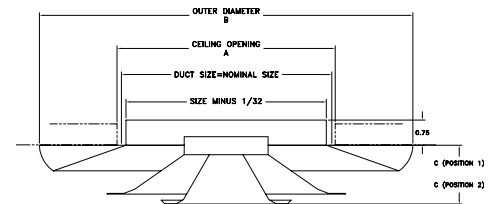
CROSS SECTION WITH VALVES PARTLY OPEN SHOWING OPPOSED-BLADE OPERATION



20 Round Diffuser

- Steel construction
- For ceiling or exposed duct installation
- Five-step positioning of air pattern adjustment
- 360-degree pattern, horizontal to vertical pattern change
- Removable center core
- Diffuser outer shell fastens directly to duct; margins fit tight to ceiling for optimum ceiling appearance
- Optional #19 damper; duct-mount only
- Bright White finish

Listed Size	A	B	C Pos. 1	C Pos. 2
6	6-1/2	11-1/8	1-1/8	1-3/4
8	8-1/2	14-3/4	1-1/2	2-1/8
10	10-1/2	18-1/4	2-1/8	2-7/8
12	12-1/2	22	2-3/8	3-1/8
14	14-1/2	26	2-5/8	3-3/8
16	16-1/2	29	3-1/4	4
18	18-1/2	33-1/2	3-7/8	4-3/4





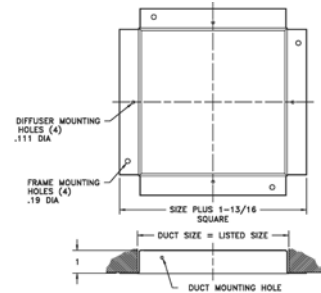
21 Installation Frame

- All-steel construction
- Golden Sand enamel finish
- Used but not furnished with #24 ceiling diffusers.

Not required when using 22 Butterfly Damper or 23 Opposed Blade Damper.

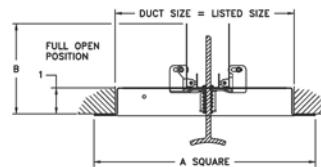
Cannot be used with SD or SDD.

21 Available Sizes (in.)	
6, 8, 10, 12, 14, 16, 18, 20, 22, 24	



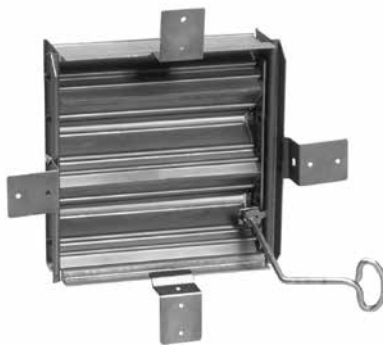
22 Butterfly Damper

- All-steel construction
- Used with #24 Ceiling Diffuser
- Knob control for quick adjustment (removable)
- Installation flange included
- Golden Sand enamel finish



22 Available Sizes (in.)		
Size	A	B
6	6 ³ / ₁₆	3 ¹¹ / ₁₆
8	8 ³ / ₁₆	4 ¹¹ / ₁₆
10	10 ³ / ₁₆	5 ¹¹ / ₁₆
12	12 ³ / ₁₆	6 ¹¹ / ₁₆
14	14 ³ / ₁₆	7 ¹¹ / ₁₆

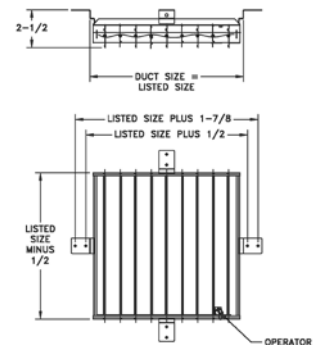
Only available in sizes shown.



23 Opposed-Blade Damper

- All-steel construction
- Used with #24 Ceiling Diffuser
- Controls air volume over entire diffuser
- Key operated
- Mill finish

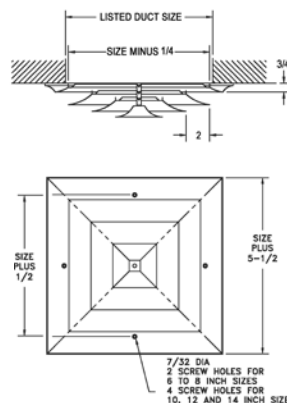
23 Available Sizes (in.)	
6, 8, 10, 12, 14, 16, 18, 20, 22, 24	



24 Square Ceiling Diffuser

- All-steel construction
- Step-down face deflects air stream 360 degrees
- Bright White finish

Only available in sizes shown.



24 Ceiling Diffuser (in.)		
Size	Free Area Sq. Inches	No. of Cones
6	41	3
8	65	3
10	84	3
12	123	4
14	152	4
16	199	5
18	236	5
20	293	6
22	338	6
24	404	7

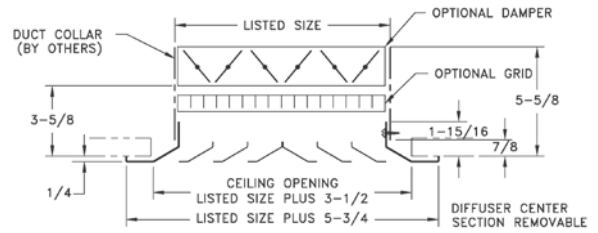
Ceiling Diffusers - Steel



SRE Diffuser

- Steel construction
- Removable core
- Flat margin style
- Optional opposed blade damper available for field installation (see SR7 damper)
- Bright White enamel finish

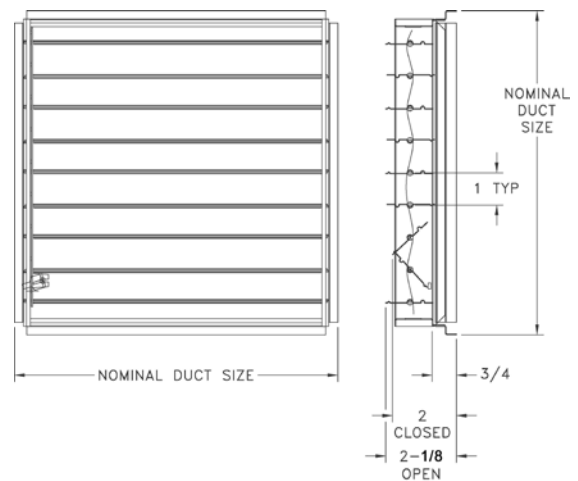
SRE Available Sizes (in.)							
HT	WIDTH						
	6	9	12	15	18	21	24
6	X	X	X	X	X	X	X
9		X	X	X	X	X	X
12			X	X	X	X	X
15				X	X	X	X
18					X	X	X
21						X	X
24							X



SR7 Volume Damper

- Steel construction
- Used to control airflow at the diffuser
- Mill finish
- Field installed for use with SRE, SRS or SRT diffusers

SR7 Available Sizes (in.)							
HT	WIDTH						
	6	9	12	15	18	21	24
6	X	X	X	X	X	X	X
9		X	X	X	X	X	X
12			X	X	X	X	X
15				X	X	X	X
18					X	X	X
21						X	X
24							X





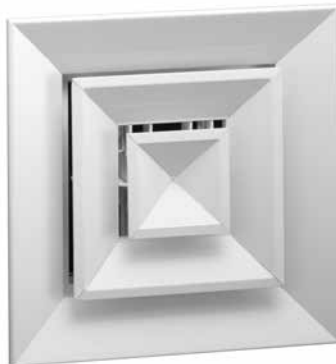
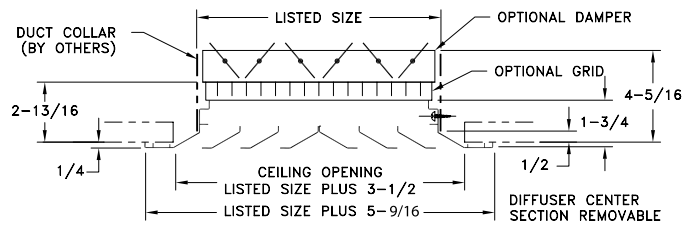
ARE Diffuser

- Extruded aluminum construction
- Removable core
- Flat margin style
- Optional factory-mounted aluminum opposed-blade damper available as ARED
- Bright White or Satin Anodized finish

See page 33 for available air patterns.

ARE Available Sizes (in.)											
HT	WIDTH										
	6	9	12	15	18	21	24	27	30	33	36
6	X	X	X	X	X	X	X	X	X	X	X
9		X	X	X	X	X	X	X	X	X	X
12			X	X	X	X	X	X	X	X	X
15				X	X	X	X	X	X	X	X
18					X	X	X	X	X	X	X
21						X	X	X	X	X	X
24							X	X	X	X	X
27								X	X	X	X
30									X	X	X
33										X	X
36											X

Note: Number of cones varies by size of diffuser



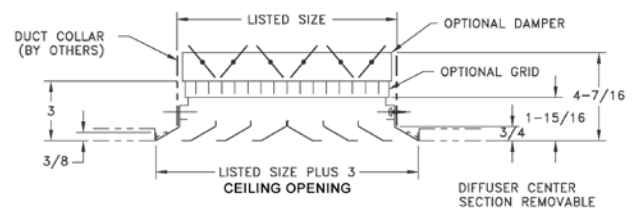
ARF Diffuser

- Extruded aluminum construction
- Removable core
- Flush margin style
- Optional factory-mounted, aluminum opposed-blade damper available as ARFD
- Bright White or Satin Anodized finish

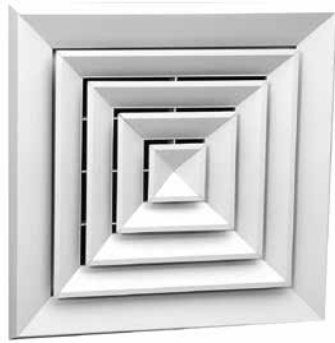
See page 33 for available air patterns.

ARF Available Sizes (in.)											
HT	WIDTH										
	6	9	12	15	18	21	24	27	30	33	36
6	X	X	X	X	X	X	X	X	X	X	X
9		X	X	X	X	X	X	X	X	X	X
12			X	X	X	X	X	X	X	X	X
15				X	X	X	X	X	X	X	X
18					X	X	X	X	X	X	X
21						X	X	X	X	X	X
24							X	X	X	X	X
27								X	X	X	X
30									X	X	X
33										X	X
36											X

Note: Number of cones varies by size of diffuser



Ceiling Diffusers - Aluminum



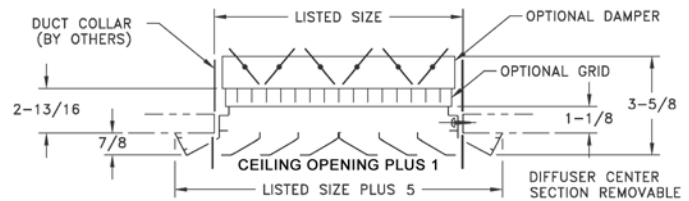
ARS Diffuser

- Extruded aluminum construction
- Removable core
- Beveled (step-down) margin style
- Optional factory-mounted, aluminum, opposed-blade damper available as ARSD
- Bright White or Satin Anodized finish

ARS Available Sizes (in.)											
HT	WIDTH										
	6	9	12	15	18	21	24	27	30	33	36
6	X	X	X	X	X	X	X	X	X	X	X
9		X	X	X	X	X	X	X	X	X	X
12			X	X	X	X	X	X	X	X	X
15				X	X	X	X	X	X	X	X
18					X	X	X	X	X	X	X
21						X	X	X	X	X	X
24							X	X	X	X	X
27								X	X	X	X
30									X	X	X
33										X	X
36											X

See page 33 for available air patterns.

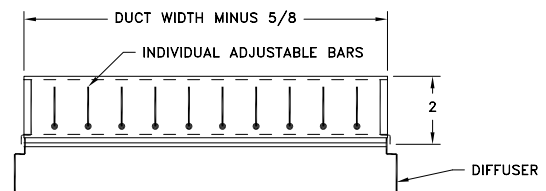
Note: Number of cones varies by size of diffuser



AR6 Control Grid

- Extruded aluminum construction
- Mounts on diffuser hanger bracket
- Provides uniform airflow in diffuser collar
- Mill finish

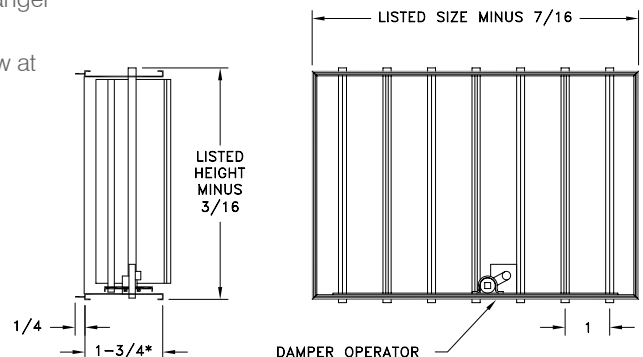
AR6 Available Sizes (in.)
Minimum: 6" x 6"
Maximum: 36" x 36" (in multiple sections)



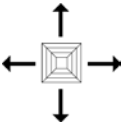
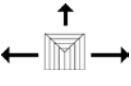
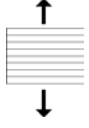
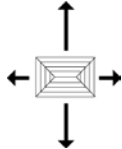
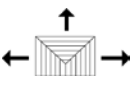

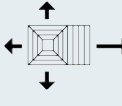
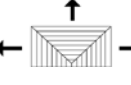
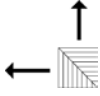
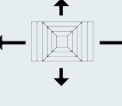
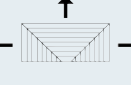
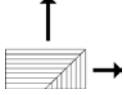
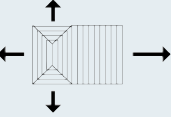
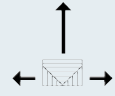
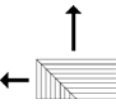
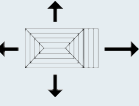
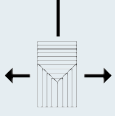

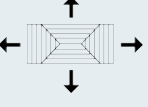
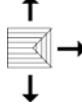



AR7 Damper

- Extruded aluminum construction
- Mounts on diffuser hanger bracket
- Used to control airflow at the diffuser
- Mill finish

AR7 Available Sizes (in.)
Minimum: 6" x 6"
Maximum: 36" x 36" (in multiple sections)



Neck View Type SR & AR Air Patterns

Style	Listed Sizes	Style	Listed Sizes	Style	Listed Sizes
 STYLE 4	6x6 24x24 9x9 27x27 12x12 30x30 15x15 33x33 18x18 36x36 21x21 24 x 24 Max. in Steel	 STYLE 3	6x6 24x24 9x9 27x27 12x12 30x30 15x15 33x33 18x18 36x36 21x21 24 x 24 Max. in Steel	 STYLE 2L	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33 24 x 21 Max. in Steel
 STYLE 4	9x6 to 45x6 24x21 to 45x21 12x9 to 45x9 27x24 to 45x24 15x12 to 45x12 30x27 to 45x27 18x15 to 45x15 33x30 to 45x30 21x18 to 45x18 36x33 to 45x33 24 x 21 Max. in Steel	 STYLE 3S	9x6 24x21 to 36x21 12x9 27x24 to 42x24 15x9 30x27 to 42x27 15x12 to 21x12 33x30 to 42x30 18x15 to 27x15 36x33 21x18 to 33x18 24 x 21 Max. in Steel	 STYLE 2S	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33 24 x 21 Max. in Steel
 STYLE 41	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33	 STYLE 3S	12x6 18x9 24x12 30x15 36x18	 STYLE 2C	6x6 24x24 9x9 27x27 12x12 30x30 15x15 33x33 18x18 36x36 21x21
 STYLE 42	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33	 STYLE 3S	15x6 to 36x6 21x9 to 36x9 27x12 to 36x12 33x15 36x15	 STYLE 2CR	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33 24 x 21 Max. in Steel
 STYLE 41L	9x9 to 36x9 24x24 to 36x24 12x12 to 36x12 27x27 to 36x27 15x15 to 36x15 30x30 to 36x30 18x18 to 36x18 33x33 to 36x33 21x21 to 36x21 36x36	 STYLE 31S	6x6 to 9x6 24x24 to 36x24 9x9 to 15x9 27x27 to 36x27 12x12 to 21x12 30x30 to 36x30 15x15 to 27x15 33x33 to 36x33 18x18 to 33x18 36x36 21x21 to 36x21	 STYLE 2CL	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33 24 x 21 Max. in Steel
 STYLE 41S	12x6 to 36x6 27x21 to 36x21 15x9 to 36x9 30x24 to 36x24 18x12 to 36x12 33x27 to 36x27 21x15 to 36x15 36x30 24x18 to 36x18	 STYLE 31L	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33	 STYLE 1	6x6 27x27 9x9 30x30 12x12 33x33 15x15 36x36 18x18 39x39 21x21 42x42 24x24 24 x 24 Max. in Steel
 STYLE 42S	12x6 to 36x6 27x21 to 36x21 15x9 to 36x9 30x24 to 36x24 18x12 to 36x12 33x27 to 36x27 21x15 to 36x15 36x30 24x18 to 36x18	 STYLE 3L	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33 24 x 21 Max. in Steel	 STYLE 1L	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33 24 x 21 Max. in Steel
		 STYLE 2	6x6 24x24 9x9 27x27 12x12 30x30 15x15 33x33 18x18 36x36 21x21 24 x 24 Max. in Steel	 STYLE 1S	9x6 to 36x6 24x21 to 36x21 12x9 to 36x9 27x24 to 36x24 15x12 to 36x12 30x27 to 36x27 18x15 to 36x15 33x30 to 36x30 21x18 to 36x18 36x33 24 x 21 Max. in Steel

 Aluminum Only

SR Sizes:

6x6 to 24x24 in 3" Increments (see page 30)

AR Sizes:

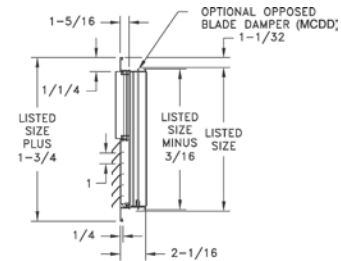
6x6 to 36x36 in 3" Increments (see page 32)



MCD Adjustable Modular Diffuser

- Extruded aluminum construction
- Four modular cores provide variable pattern adjustments of four-way, three-way, two-way, or one-way horizontal air patterns
- Flat margin
- Fixed fins
- Bright White finish

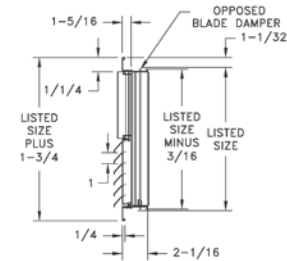
MCD Available Sizes (in.)
6" x 6", 8" x 8", 10" x 10", 12" x 12", 14" x 14",
16" x 16", 18" x 18", 20" x 20", 22" x 22"



MCDD Adjustable Modular Diffuser

- Extruded aluminum construction
- Opposed-blade damper
- Four modular cores provide variable pattern adjustments of four-way, three-way, two-way, or one-way horizontal air patterns
- Removable modules provide easy access to damper
- Flat margin
- Fixed fins
- Bright White finish

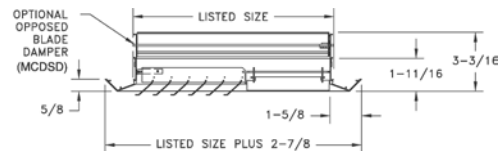
MCDD Available Sizes (in.)
6" x 6", 8" x 8", 10" x 10", 12" x 12", 14" x 14",
16" x 16", 18" x 18", 20" x 20", 22" x 22"



MCDS Adjustable Modular Diffuser

- Extruded aluminum construction
- Step-down (beveled) margin
- Four modular cores provide variable pattern adjustments of four-way, three-way, two-way, or one-way horizontal air patterns
- Fixed fins
- Bright White finish

MCDS Available Sizes (in.)
6" x 6", 8" x 8", 10" x 10", 12" x 12", 14" x 14",
16" x 16", 18" x 18", 20" x 20", 22" x 22"



For T-Bar application, see page 71

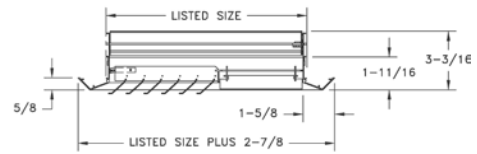
Ceiling Diffusers - Aluminum



MCDS D Adjustable Modular Diffuser

- Extruded aluminum construction
- Opposed-blade damper
- Step-down (beveled) margin
- Four modular cores provide variable pattern adjustments of four-way, three-way, two-way, or one-way horizontal air patterns
- Removable modules provide easy access to damper
- Fixed fins
- Bright White finish

MCDS D Available Sizes (in.)
6" x 6", 8" x 8", 10" x 10", 12" x 12", 14" x 14",
16" x 16", 18" x 18", 20" x 20", 22" x 22"



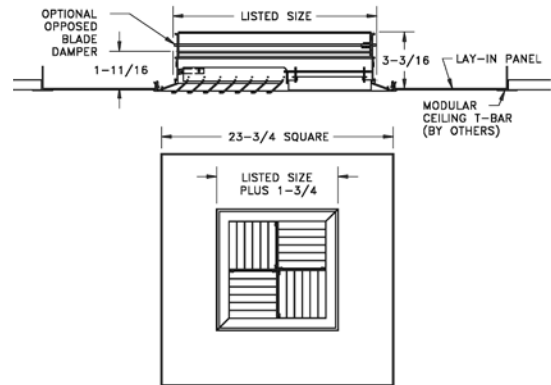
For T-Bar application, see page 71.



Modular T-Bar Panel

- Steel construction (aluminum optional)
- Adapts MCD and MCDD for T-Bar installation
- Bright White finish

Modular T-Bar Panel Available Sizes
Opening 6" - 20"
Overall 23-3/4" x 23-3/4"



Note: Aluminum panel for factory-mounted, step-down margin. Available as Models MCDST and MCSDST.

Spiral Diffusers

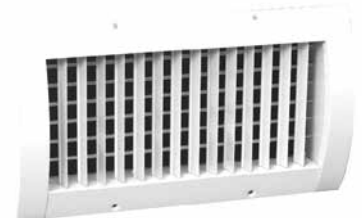
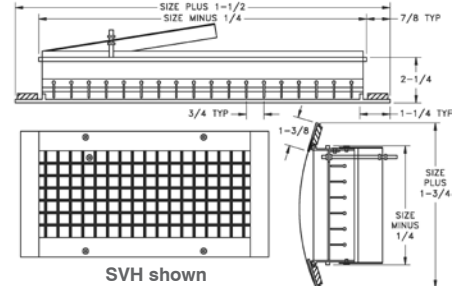


(Shown with scoop)
Size restrictions apply.
See price list for sizes and ordering information.

SV Single-Deflection Diffuser

- Extruded aluminum construction
- Single row of individually adjustable vertical blades for horizontal air-deflection control
- Available as diffuser only or diffuser with air scoop (SV3)
- Optional face adjustable scoop to direct airflow
- Counter-sunk screw holes
- Available sizes: 10x3 to 36x12 for 6" to 50" ducts
- Bright White and Satin Anodized finishes

SV Available Sizes (in.)
10" x 3" to 36" x 12"

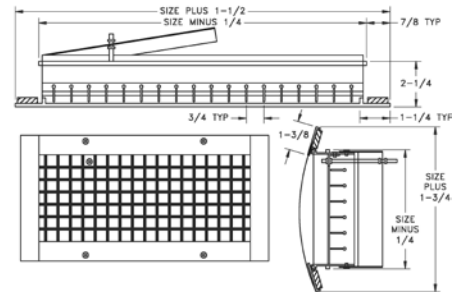


Size restrictions apply.
See price list for sizes and ordering information.

SVH Double-Deflection Diffuser

- Extruded aluminum construction
- Two rows of individually adjustable blades for horizontal and vertical deflection control
- Optional face adjustable scoop to direct airflow
- Counter-sunk screw holes
- Available sizes: 10x3 to 36x12 for 6" to 50" ducts
- Bright White and Satin Anodized finishes

SVH Available Sizes (in.)
10" x 3" to 36" x 12"

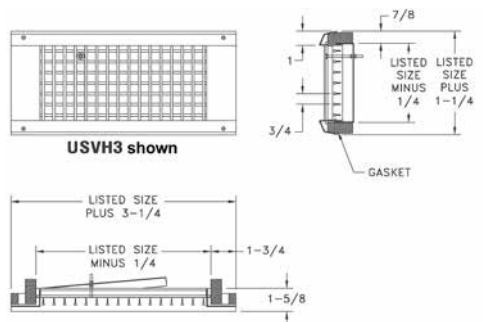


Size restrictions apply.
See price list for sizes and ordering information.

USV Single-Deflection Universal Diffuser

- Extruded aluminum construction
- Single row of individually adjustable vertical blades for horizontal air deflection control
- Optional face adjustable scoop to direct airflow
- Counter-sunk screw holes
- Available sizes: 10x3 to 36x12
- Fits duct sizes 6" on up, based on diffuser height
- Bright White and Satin Anodized finishes

USV Available Sizes (in.)
10" x 3" to 36" x 12"



Spiral Diffusers

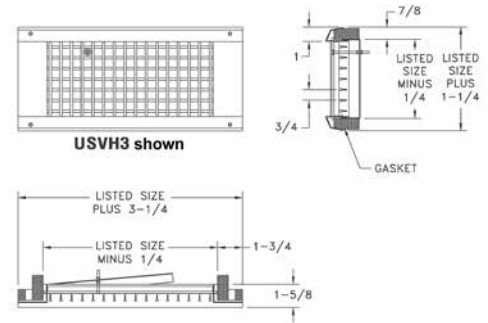


Size restrictions apply. See price list for sizes and ordering information.

USVH Double-Deflection Universal Diffuser

- Extruded aluminum construction
- Two rows of individually adjustable blades for horizontal and vertical deflection control
- Optional face adjustable scoop to direct airflow
- Counter-sunk screw holes
- Available sizes: 10x3 to 36x12
- Fits duct sizes 6" on up, based on diffuser height
- Bright White and Satin Anodized finishes

USVH Available Sizes (in.)
10" x 3" to 36" x 12"

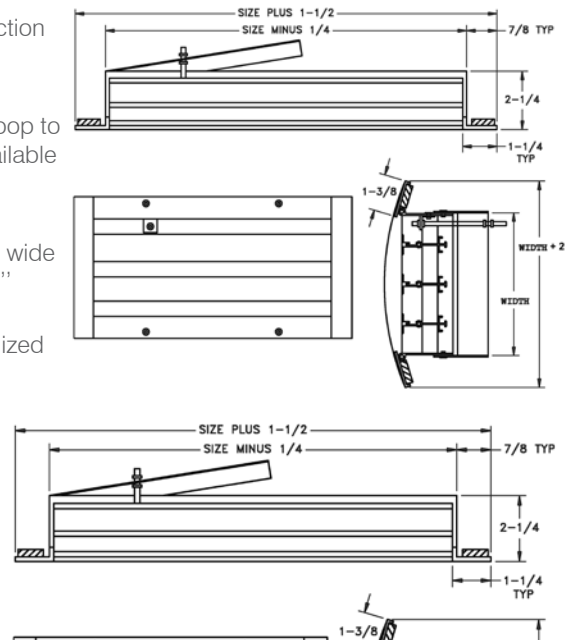


Size restrictions apply. See price list for sizes and ordering information.

SS Slot Face Diffuser

- Extruded aluminum construction
- Slot sizes available: 1/2", 3/4", 1"
- Optional face adjustable scoop to direct airflow. Scoop not available for 1/2" or 3/4" one slot
- Counter-sunk screw holes
- Available in one to four slots wide up to 48" length for 6" to 50" ducts
- Bright White and Satin Anodized finishes

SS Available Sizes (in.)
One to four slots wide up to 48" long



For Models SV and SVH
Minimum Duct Diameter per listed size

		Width								
		10	12	14	16	18	20	24	30	36
Height	3	5	5	5	5	5	5	5	5	5
	4	6	6	6	6	6	6	6	6	6
	6	8	8	8	8	8	8	8	8	8
	8	10	10	10	10	10	10	10	10	10
	10		12	12	12	12	12	12	12	12
12			14	14	14	14	14	14	14	

Maximum duct diameter for all sizes is 36".

For Models USV and USVH
Minimum Duct Diameter

		Width								
		10	12	14	16	18	20	24	30	36
Height	3	6	6	6	6	6	6	6	6	6
	4	10	10	10	10	10	10	10	10	10
	6	12	12	12	12	12	12	12	12	12
	8	20	20	20	20	20	20	20	20	20
	10			24	24	24	24	24	24	24
	12					30	30	30	30	30

Linear Bar Diffusers



Minimum width 1-1/2"
Sizes under 4" not available

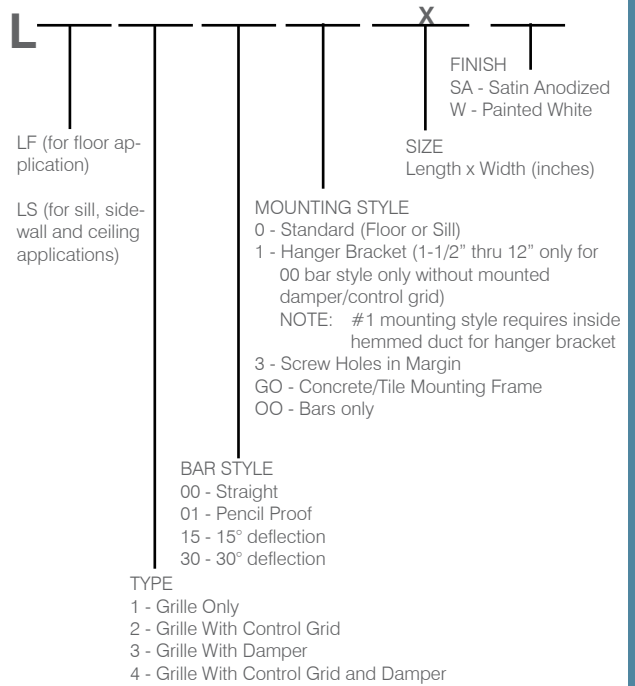
Note: Floor application must be ordered as "LF." Eight-inch maximum width for constant traffic; 12" maximum width for occasional traffic; maximum length 72".

* Control grids start at 4" and above

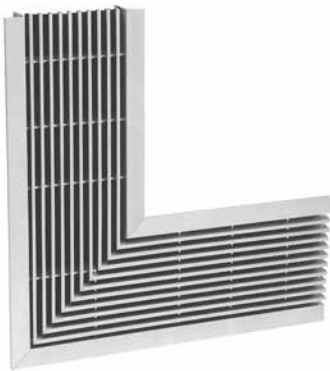
LS/LF Series Diffuser

- Extruded aluminum construction
- Ceiling, sidewall, sill or floor applications
- Available in 0, 15, or 30 degrees and pencil proof bar deflections
- Four mounting styles—standard, hanger bracket, and screw holes in margin
- Maximum one-piece length 72", width 24" (1/2" width increments)
- Lengths over 72" made in multiple units with keyway splices to form even continuous lengths
- Bright White or Satin Anodized finish

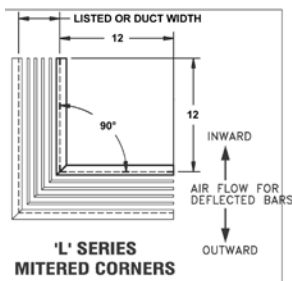
HOW TO ORDER



See following page for dimensional data.



Mitered Corner Sections furnished as shown.
Blank off baffles available upon request.

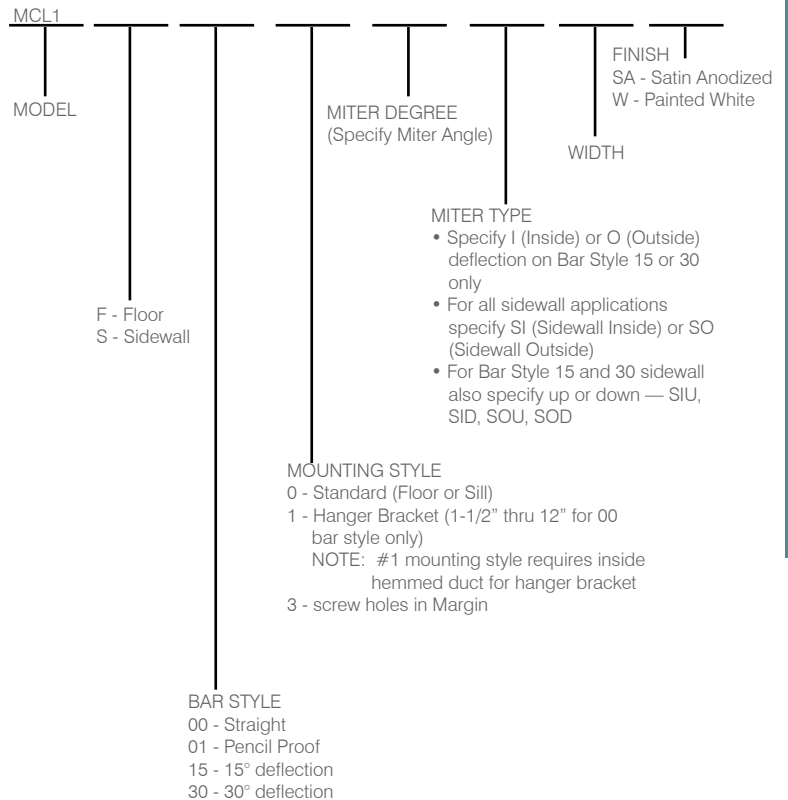


See page 47 for distribution plenums.

L Series Mitered Corners

Mitered corner sections furnished as shown.

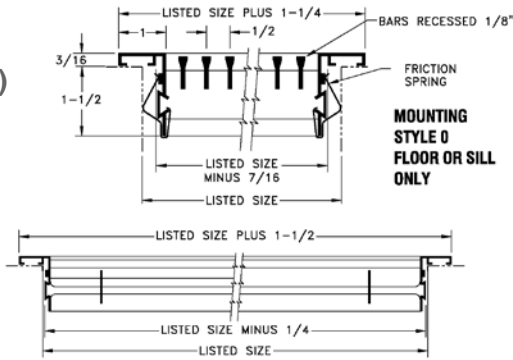
HOW TO ORDER



Linear Bar Diffusers

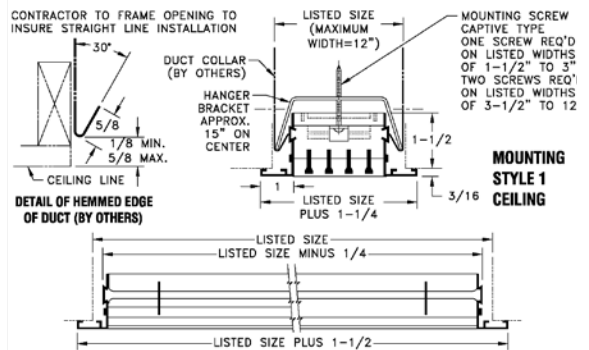
L Series - Dimensional Data

Mounting Style 0 (Floor/Sill) LF

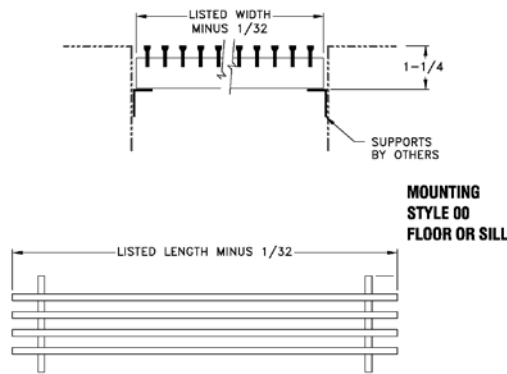


Mounting Style 1 (Ceiling) LS

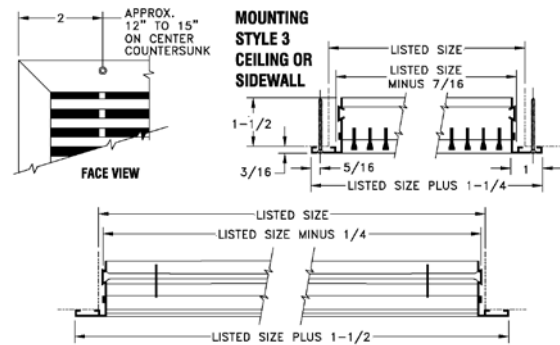
00 Bar Style Only w/o Mounted Damper or Control Grid



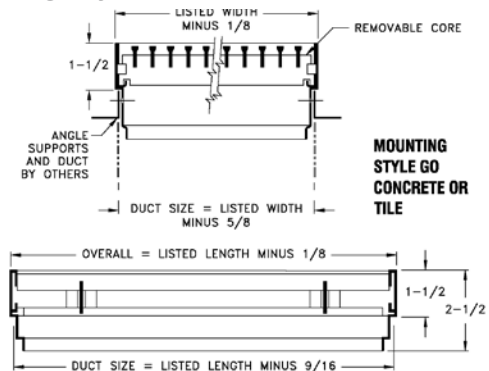
Mounting Style 00 (Bars Only)



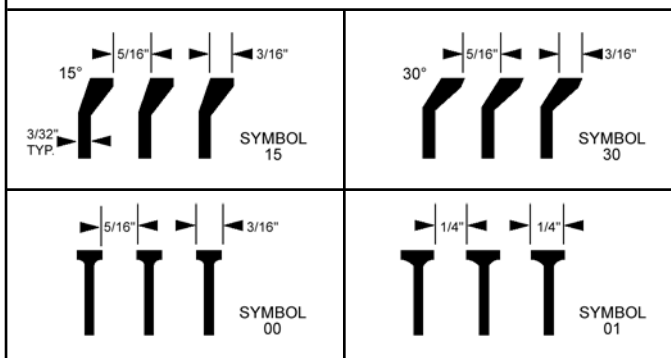
Mounting Style 3 (Ceiling/Sidewall) LS



Mounting Style GO (Concrete/Tile) LF



BAR STYLES



Bars on 1/2" Centers

Note: Quantity of bars = 2 x listed width minus 2.

Example: 4" listed width = 4" x 2 = 8 minus 2 = 6 bars.



L Series Single-Leaf Damper Option

- Aluminum construction
- Leaf type for sizes 1 1/2" to 3"

Note: Order with desired diffuser for attachment at factory.

Cannot be used with hanger brackets.



L Series G Grid Option

- Aluminum construction
- Individual adjustable blades
- Cannot be used with hanger brackets

Note: G Grid blades are assembled parallel to short dimension. Order with desired diffuser for factory fitting.

Control grids start at 4" and above.

Sizes under 4" not available



L Series D Damper Option

- Extruded aluminum construction
- Controls the air volume from full flow to shut-off
- Fits widths of 3 1/2" and wider

Note: Order with desired diffuser for attachment at factory.

Must be ordered separately and duct-mounted if mounting style #1 is used.

D Available Sizes (in.)
3 1/2" and wider

Linear Bar Diffusers



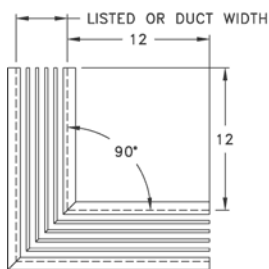
S Series MiterWed Corners

90-degree mitered corners are available as factory-fabricated section. Precise factory cutting and assembly reduces field fabrication time and assures proper fit. Corner sections are furnished and blanked off. Corner sections butt to adjacent straight sections, which are spliced together with aligning keys.

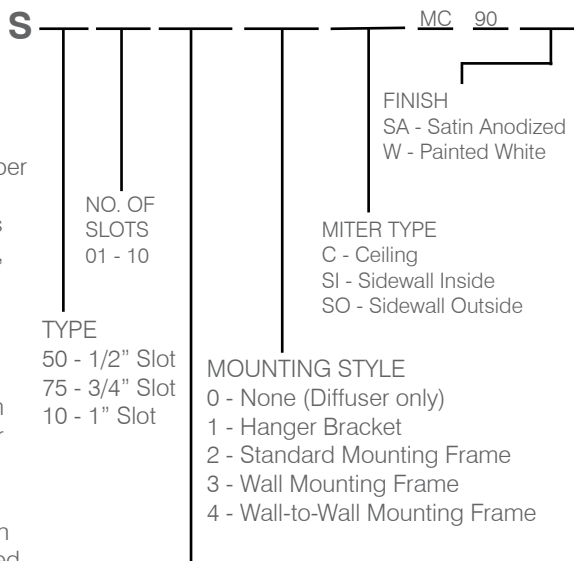
Mitered corners are furnished in style #4 (with pattern controller and damper). When viewed from the room side, the mitered corner section appears identical to the butting straight sections.

Plaster frame mitered corners can be specified with the outlet mitered corner.

S SERIES MITERED CORNERS



Mitered Corner Sections Order as:



MARGIN (see page 43)

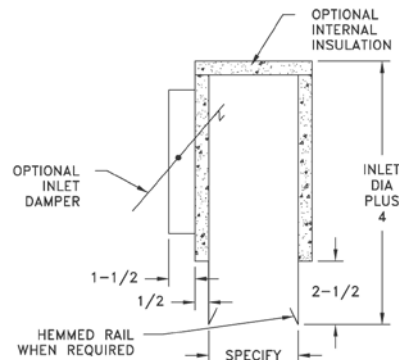
Note: Margins ordered without mounting frame may require hanger brackets and inside hemmed duct for installation.



DP Distribution Plenum

- Galvanneated steel construction
- For L and S Series Linear and Slots
- Available in insulated or noninsulated designs

DP Available Sizes
12", 24", 36", 48", 60", 72" lengths



DP

- I - Internally insulated
- N - Noninsulated

Number of slots for slot diffuser. Listed width in inches for linear bar grilles

- S - Slots for slot diffusers
- W - Listed width for linear bar grilles

Inlet size 5" to 12"

- N - No Inlet
- O - Oval Inlet
- R - Round Inlet

- D - Inlet Damper
- N - No Damper

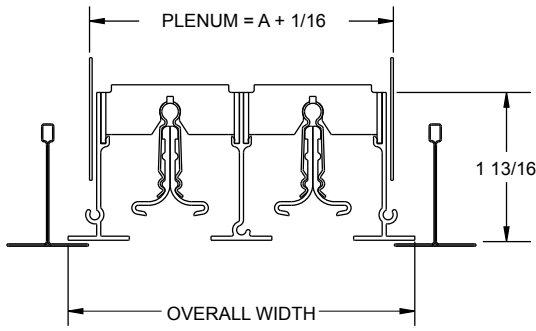
- H - Hemmed rail for concealed mfg. hanger brackets - Do not use with mounting frames
- S - Straight sides - Use with all mounting frames

Nominal Length - 12" to 72"

Linear Slot Diffusers

STYLE B0
Also for
T-Bar
applications

Order $22\frac{3}{4}$ " or
 $46\frac{3}{4}$ " lengths
with End Caps.



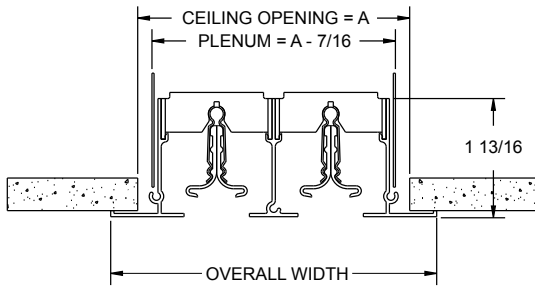
Style B0

Dimension	Type	Number of Slots								Duct Width	Overall Width
		1	2	3	4	5	6	7	8		
A	50	$1\frac{3}{8}$	$2\frac{5}{8}$	$3\frac{7}{8}$	$5\frac{1}{8}$	$6\frac{3}{8}$	$7\frac{5}{8}$	$8\frac{7}{8}$	$10\frac{1}{8}$	$A + 1/16$	$A + 5/8$
	75	$1\frac{5}{8}$	$3\frac{1}{8}$	$4\frac{5}{8}$	$6\frac{1}{8}$	$7\frac{5}{8}$	$9\frac{1}{8}$	$10\frac{5}{8}$	$12\frac{1}{8}$	$A + 1/16$	$A + 5/8$
	10	$1\frac{7}{8}$	$3\frac{5}{8}$	$5\frac{3}{8}$	$7\frac{1}{8}$	$8\frac{7}{8}$	$10\frac{5}{8}$	$12\frac{3}{8}$	$14\frac{1}{8}$	$A + 1/16$	$A + 5/8$

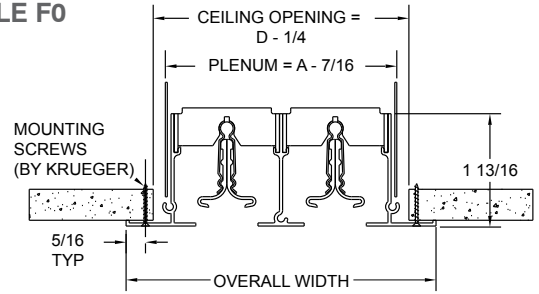
Linear Slot Diffusers

STYLE E0 Also for T-Bar applications

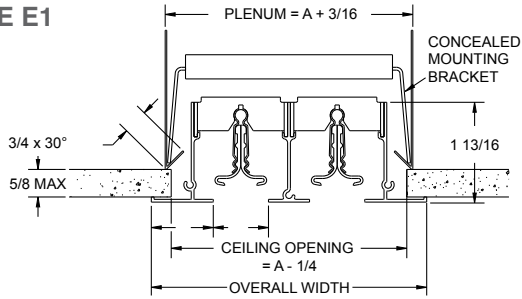
For E0, order 22" and 46" lengths with End Caps.



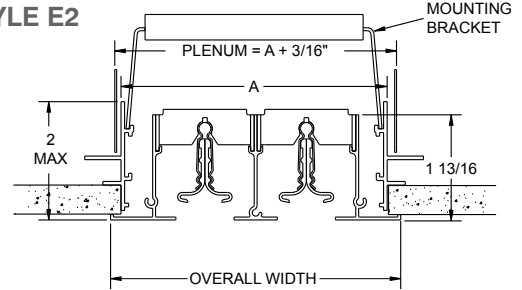
STYLE F0



STYLE E1



STYLE E2



Style E0/F0

Dimension	Type	Number of Slots								Duct Width	Overall Width
		1	2	3	4	5	6	7	8		
A	50	1 7/8	3 1/8	4 3/8	5 5/8	6 7/8	8 1/8	9 3/8	10 5/8	A - 7/16	A + 7/8
	75	2 1/8	3 5/8	5 1/8	6 5/8	8 1/8	9 5/8	11 1/8	12 5/8	A - 7/16	A + 7/8
	10	2 3/8	4 1/8	5 7/8	7 5/8	9 3/8	11 1/8	12 7/8	14 5/8	A - 7/16	A + 7/8

Style E1/E2

Dimension	Type	Number of Slots								Overall Width
		1	2	3	4	5	6	7	8	
A	50	2	3 1/4	4 1/2	5 3/4	7	8 1/8	9 1/2	10 3/4	A + 3/4
	75	2 1/4	3 3/4	5 1/4	6 3/4	8 1/4	9 3/4	11 1/4	12 3/4	A + 3/4
	10	2 1/2	4 1/4	6	7 3/4	9 1/2	11 1/4	13	14 3/4	A + 3/4

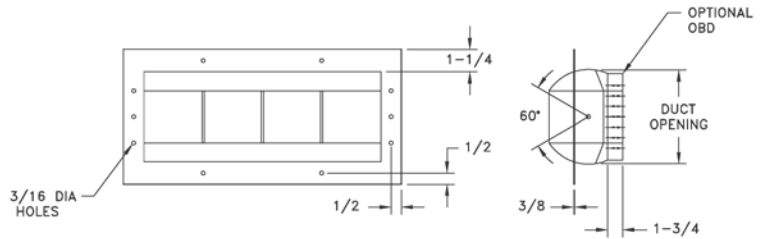


DL Drum Louver

- All-aluminum construction
- Horizontal and vertical air stream control
- Galvanized, opposed-blade damper (optional)
- Adjustable drum and vane design
- White or Mill finish

Drum Louver Available Sizes
6" x 12", 6" x 18", 6" x 24", 6" x 30", 6" x 36", 6" x 48", 6" x 60"
10" x 20", 10" x 25", 10" x 30", 10" x 35", 10" x 40", 10" x 50"
12" x 30", 12" x 40", 12" x 50", 12" x 70"
15" x 30", 15" x 50", 15" x 60", 15" x 70"

Order H x W



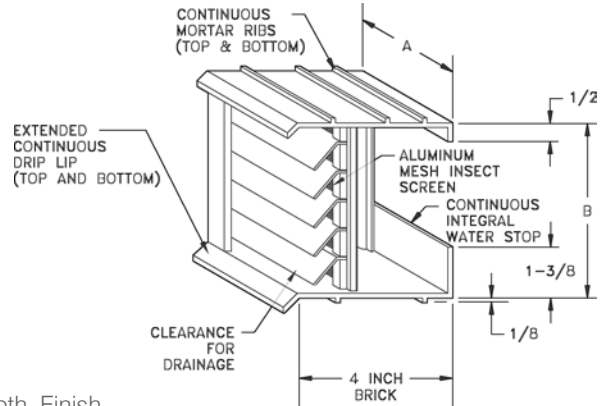
Duct Opening Sizing		
Listed Height Size	Duct Opening Height	Duct Opening Width
6	Listed Size Plus 5/8	Listed Size Plus 1 1/8
10	Listed Size Plus 3/8	Listed Size Plus 1 1/8
12	Listed Size Plus 3/8	Listed Size Plus 1 1/8
15	Listed Size Plus 3/8	Listed Size Plus 1 1/8

Other sizes not available.



BV Brick/Block Vent
















- Extruded aluminum construction
- Standard masonry size
- Maximum water protection
- 6063-T5 extruded aluminum alloy
- 18 x 16 mesh aluminum insect screen standard
- 4" standard depth
- Satin Anodized finish



Note: To order specify Model, Depth, Finish

Example: BV168 4 SA

DIMENSIONS/FREE AREA

	BV Model	Masonry Opening Size	A Width Inches	B Height Inches	Free Area Sq. Ft.
STANDARD BRICK	802	ONE BRICK 	8	2 1/2	.01
	805	TWO BRICK 	8	4 3/4	.06
	162	TWO BRICK 	16 3/8	2 1/2	.02
	808	THREE BRICK 	8	7 1/2	.13
	242	THREE BRICK 	24 3/4	2 1/2	.04
	165	FOUR BRICK 	16 3/8	4 3/4	.14
	168	SIX BRICK 	16 3/8	7 1/2	.30
	245	SIX BRICK 	24 3/4	4 3/4	.23
	248	NINE BRICK 	24 3/4	7 1/2	.50
JUMBO BRICK	122	ONE JUMBO 	11 5/8	2 1/2	.02
	125	TWO JUMBO 	11 5/8	4 3/4	.10
	128	THREE JUMBO 	11 5/8	7 1/2	.21
MODULAR BLOCK	158	STANDARD BLOCK 	15 1/2	7 1/2	.30
	318	TWO STANDARD BLOCK 	31 3/8	7 1/2	.66
	168	JUMBO BLOCK 	16 3/8	7 1/2	.30

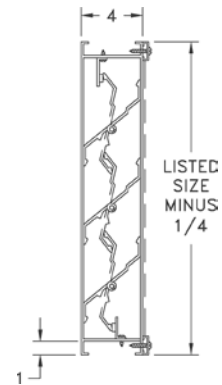
Notes:

1. Brick/Block vent depths are identical with or without the optional opposed-blade damper.
2. Contact factory regarding applications requiring custom size widths and/or heights.
3. Masonry opening sizes listed are representative of the blocks or bricks shown. Field dimensions must be verified to guarantee fit.



4ABC Adjustable Louver

- Extruded aluminum construction
- Adjustable baffle blades on 4" centers
- 4" louver depth
- Channel frame
- Max. one-piece size 60" W x 72" H
- Mill finish standard
- Lever activated, manually
- Blades open to 45°; closes fully



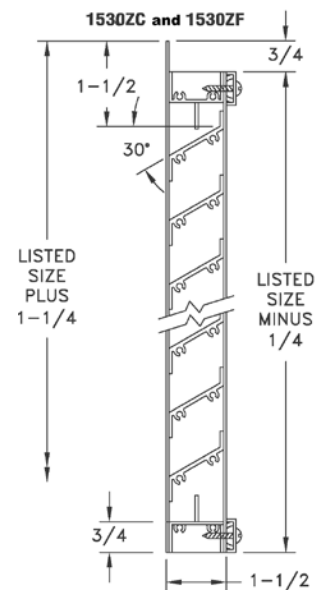
1530ZC Shown

1530ZC Stationary Louver

- Extruded aluminum construction
- Fixed Z blade louver
- Blades at 30-degree angle
- 1 1/2" louver depth
- Channel frame
- Available with bird screen or insect screen
- Mill finish standard

1530ZF Stationary Louver

- Extruded aluminum construction
- Fixed Z blade louver
- Blades at 30-degree angle
- 1 1/2" louver depth
- Flange frame
- Available with bird screen or insect screen
- Mill finish standard



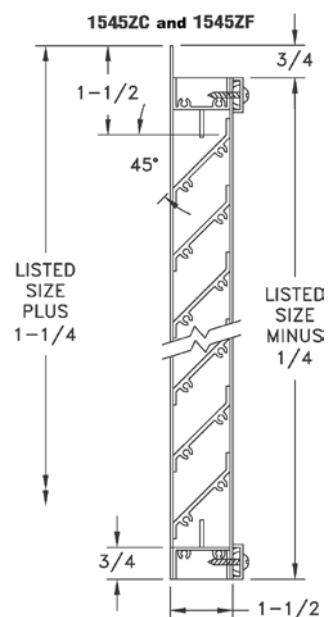
1545ZF Shown

1545ZC Stationary Louver

- Extruded aluminum construction
- Fixed Z blade louver
- Blades at 45-degree angle
- 1 1/2" louver depth
- Channel frame
- Available with bird screen or insect screen
- Mill finish standard

1545ZF Stationary Louver

- Extruded aluminum construction
- Fixed Z blade louver
- Blades at 45-degree angle
- 1 1/2" louver depth
- Flange frame
- Available with bird screen or insect screen
- Mill finish standard



Louvers



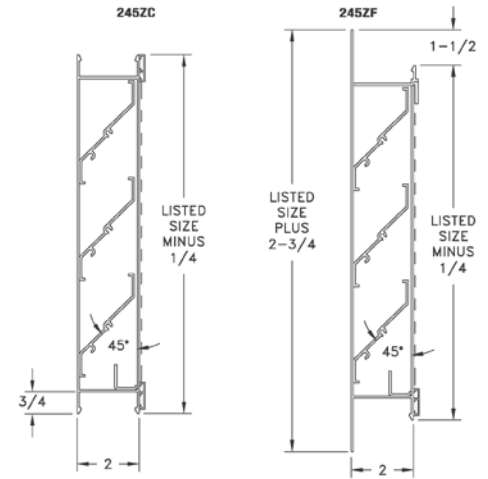
245ZF Shown

245ZC Stationary Louver

- Extruded aluminum construction
- Fixed-blade louver
- Blades at 45-degree angle
- 2" louver depth
- Channel frame
- Available with bird screen or insect screen
- Mill finish standard

245ZF Stationary Louver

- Extruded aluminum construction
- Fixed-blade louver
- Blades at 45-degree angle
- 2" louver depth
- Flange frame
- Available with bird screen or insect screen
- Mill finish standard



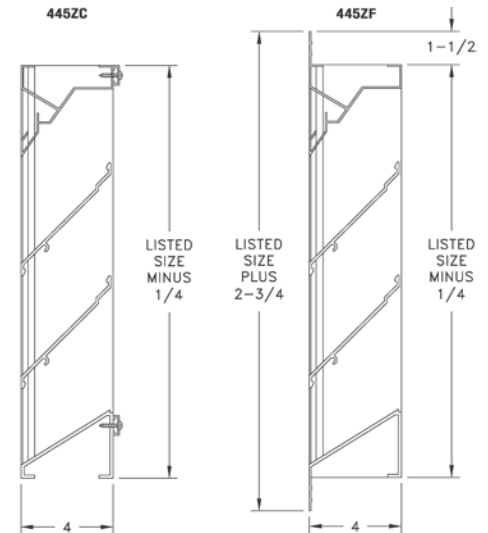
445ZF Shown

445ZC Stationary Louver

- Extruded aluminum construction
- Fixed-blade louver
- Blades at 45-degree angle
- 4" louver depth
- Channel frame
- Available with bird screen or insect screen
- Mill finish standard

445ZF Stationary Louver

- Extruded aluminum construction
- Fixed-blade louver
- Blades at 45-degree angle
- 4" louver depth
- Flange frame
- Available with bird screen or insect screen
- Mill finish standard



645ZC Shown

645ZC Fixed Louver

- Extruded aluminum construction
- Fixed-blade louver
- Blades at 45-degree angle
- 6" louver depth
- Channel frame
- Available with bird screen or insect screen
- Mill finish standard

645ZF Fixed Louver

- Extruded aluminum construction
- Fixed-blade louver
- Blades at 45-degree angle
- 6" louver depth
- Flange frame
- Available with bird screen or insect screen
- Mill finish standard

T-Bar Construction Features



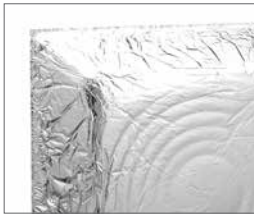
Our popular supply and return products for T-Bar ceilings are an innovative response to the challenge of creating a better indoor environment. T-Bar products combine clean appearance with installation ease, and include critical design details to ensure consistent performance. Glass fiber insulation minimizes condensation, and the aluminum foil vapor barrier protects the insulation from moisture, if condensation occurs.

Patented adjustable deflectors permit a variety of directional patterns and minimizes static pressure loss.

A unique modular collar system provides a standard collar and damper unit, which can be shared between a number of different T-Bar products. In addition, Hart & Cooley offers specialty T-Bar products to meet specific design demands. Surfaire® diffusers feature deflector apertures that enhance mixing of conditioned air.

T-Bar products are offered in lanced, perforated, louvered and fixed-bar face styles, with steel or molded fiberglass backs. They include a choice of easy mounting systems and adjustable damper designs.

T-Bar Return-Air Filter Grilles



See page 54 for fiberglass specifications.

659T Steel Lanced Filter Grille

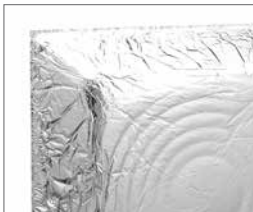
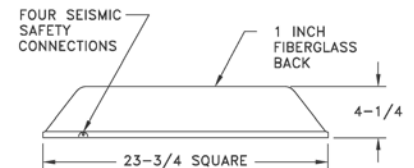
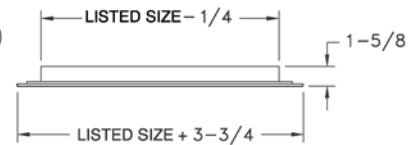
- Steel construction
- Lanced-face design with 1/3" blade spacing
- Flush, removable face with concealed latches and hinges can be installed in any direction
- Uses standard 1" disposable filters (not furnished)
- Bright White finish

659TI With Insulated Back

Includes these features

- Molded fiberglass back R4.2, R6 (see information on page 54)
- Accepts 6" to 14" unique tab collar (6400 series) or 6" to 16" unique snap-in collar (5400 and 5400PP series); also accepts standard spin-in collar
- Frame includes four seismic safety connections

659T / 659TI Available Sizes
20" x 20" with extended frame (overall 23 ³ / ₄ " x 23 ³ / ₄ "") for 24" x 24" openings
44" x 20" with extended frame (overall 47 ³ / ₄ " x 23 ³ / ₄ "") for 48"x24" opening (659T only)



673T Steel Filter Grille

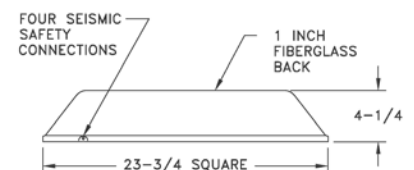
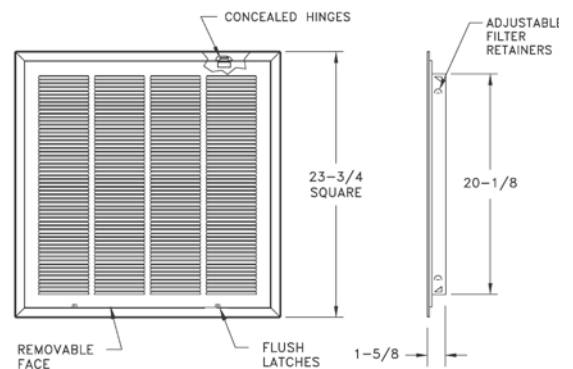
- Steel construction
- Lanced-face design with 1/2" blade spacing
- Flush, removable face with concealed latches and hinges can be installed in any direction
- Uses standard 1" disposable filters (not furnished)
- Bright White finish

673TI With Insulated Back

Includes these features

- Molded fiberglass back R4.2, R6 (see information on page 54)
- Accepts 6" to 14" unique tab collar (6400 series) or 6" to 16" unique snap-in collar (5400 and 5400PP series); also accepts standard spin-in collar
- Frame includes four seismic safety connections

673T/673TI Available Size
20" x 20", overall 23 ³ / ₄ " x 23 ³ / ₄ "



T-Bar Return-Air Filter Grilles

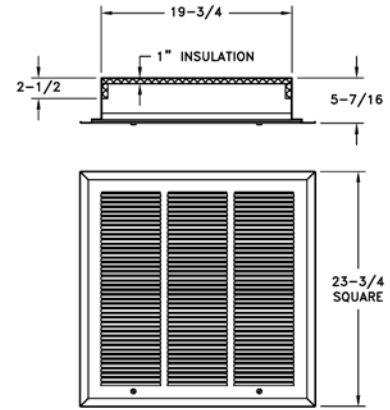


673TPI R6

Steel Filter Grille

- Steel construction
- Lanced-face design with 1/2" blade spacing
- Flush, face with screwdriver latches and piano hinges can be installed in any direction
- Plenum box with R6 insulated ductboard
- Uses standard 1" disposable filters (not furnished)
- Bright White finish

673TPI R6 Available Size
20" x 20", overall 23 ³ / ₄ " x 23 ³ / ₄ "



Molded Fiberglass Back R4.2, R6 & R8

- These fiberglass backs are sold separately for field installation. (Glue or double sided tape recommended)
- Available in 4.2, 6.0 and 8.0 "R" values
- Recommended for T-bar diffusers without steel back panel
- Accepts 6"-14" tab collars (6400 series) or 6"-18" snap in collar (5400 & 5400PP Series)
- Accepts standard spin-in collar

- Bonded foil vapor barrier minimizes condensation
- Fiberglass back meets or exceeds the following tests and ratings:
Meets 25/50 tested in accordance with A.S.T.M. E84 (UL723)
UL181 Erosion and Impact Test, and will not support microbial growth

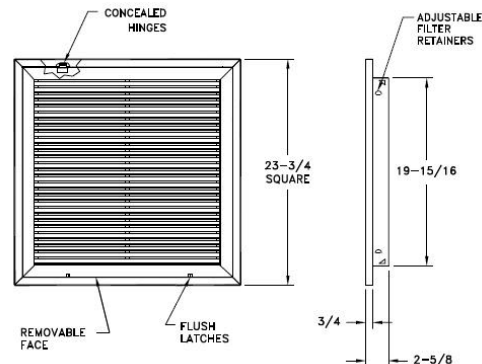
Note: Attachment of molded fiberglass back and 5400 collar requires 5400PP (push pins).



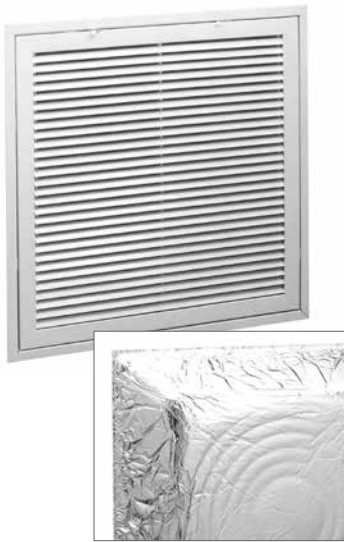
96AFBT Steel Fixed-Bar Filter Grille

- All-steel construction
- Bar-style face design
- Flush, removable face with concealed latches and hinges, can be installed in any direction
- Uses standard 1" disposable filters (not furnished)
- Bright White finish
- Specify 96AFBT2 for 2" filters

96AFBT Available Sizes
20" x 20", overall 23 ³ / ₄ " x 23 ³ / ₄ "
44" x 20", overall 47 ³ / ₄ " x 23 ³ / ₄ "



T-Bar Return-Air Filter Grilles

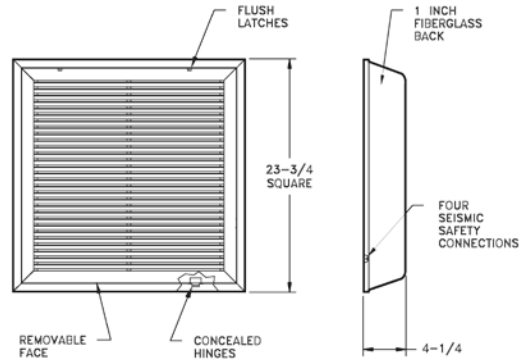


See page 54 for fiberglass specifications.

96AFBTI Steel Fixed-Bar Filter Grille with Fiberglass Back

- Steel construction
- Bar-style face design
- Flush, removable face with concealed latches and hinges, can be installed in any direction
- R4.2 molded fiberglass back
- Accepts 6" to 14" unique tab collar (6400 series) or 6" to 16" unique snap-in collar (5400 and 5400PP series); also accepts standard spin-in collar
- Frame includes four seismic safety connections
- Uses standard 1" disposable filters (not furnished)
- Bright White finish

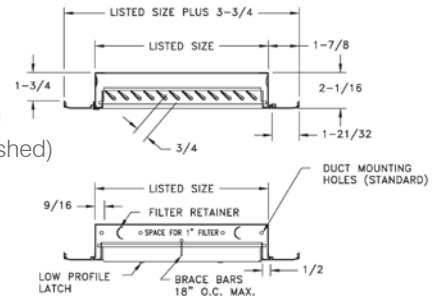
96AFBTI Available Size
20" x 20", overall 23 ³ / ₄ " x 23 ³ / ₄ "



RHF45T Aluminum Bar-Style Filter Grille

- Extruded aluminum construction
- Bar-style face
- Hinged to filter frame, removable face
- Mounts flush with T-Bar ceilings
- Filter grilles equipped with plastic slide latch
- Uses standard 1" disposable filter (not furnished)
- Bright White or Satin Anodized finish
- Specify RHF45T2 for 2" filters

RHF45T Available Sizes
20" x 20" with extended frame (overall 23 ³ / ₄ " x 23 ³ / ₄ ") for 24" x 24" openings
44" x 20" with extended frame (overall 47 ³ / ₄ " x 23 ³ / ₄ ") for 48" x 24" openings

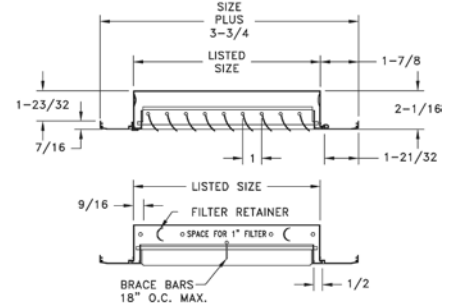


RCBFT Aluminum Curved-Blade Filter Grille

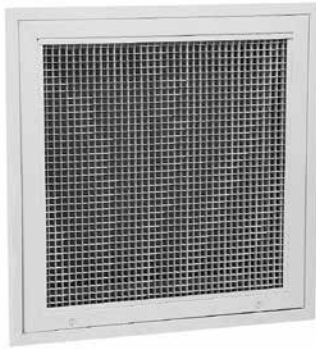
- Extruded aluminum construction
- Curved-blade style face
- Hinged to filter frame
- Mount flush with T-Bar ceilings
- Filter grilles equipped with plastic slide latch
- Uses standard 1" disposable filter (not furnished)
- Bright White or Satin Anodized finish

RCBFT Available Sizes
20" x 20" with extended frame (overall 23 ³ / ₄ " x 23 ³ / ₄ ") for 24" x 24" openings
44" x 20" with extended frame (overall 47 ³ / ₄ " x 23 ³ / ₄ ") for 48" x 24" openings

Engineering Data not available



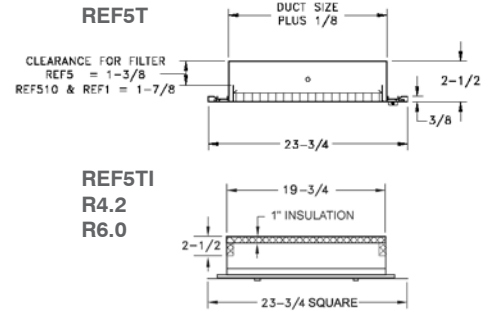
T-Bar Return-Air Filter Grilles



REF5T/REF5TI Aluminum Egg Crate Filter Grille

- Aluminum and steel construction
- Egg crate style face
- Non-removable face, hinged to filter frame
- Mount flush with T-Bar ceilings
- REF5T with thumb screw fasteners, REF5TI with cam lock
- Uses standard 1" disposable filter (not furnished)
- Bright White or Mill Aluminum finish
- Specify REF5T2 for 2" filters

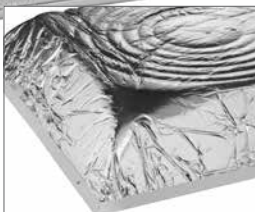
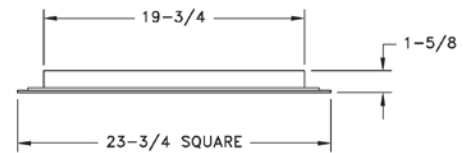
	Available Sizes
REF5T/ REF5TI	20" x 20" with extended frame (overall 23 ³ / ₄ " x 23 ³ / ₄ ") for 24" x 24" openings
REF5T only	44" x 20" with extended frame (overall 47 ³ / ₄ " x 23 ³ / ₄ ") for 48" x 24" openings



PFT Steel Perforated Filter Grille

- Steel construction
- Perforated face design
- Flush, removable face with concealed latches and hinges, can be installed in any direction
- Uses standard 1" disposable filter (not furnished)
- Bright White finish

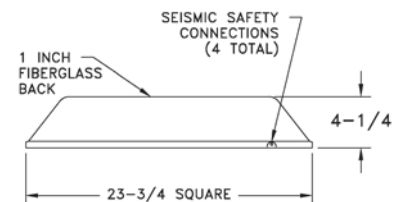
PFT Available Size
20" x 20", overall 23 ³ / ₄ " x 23 ³ / ₄ "



PFTI Steel Perforated Filter Grille with Insulated Back

- Steel construction
- Perforated face design
- Flush, removable face with concealed latches and hinges, can be installed in any direction
- Molded fiberglass back, available in R4.2 or R10
- Accepts 6" to 14" unique tab collar (6400 series) or 6" to 16" unique snap-in collar (5400 and 5400PP series); also accepts standard spin-in collar
- Frame includes four seismic safety connections
- Uses standard 1" disposable filters (not furnished)
- Bright White finish

PFTI Available Size
20" x 20", overall 23 ³ / ₄ " x 23 ³ / ₄ "



See page 54 for fiberglass specifications.

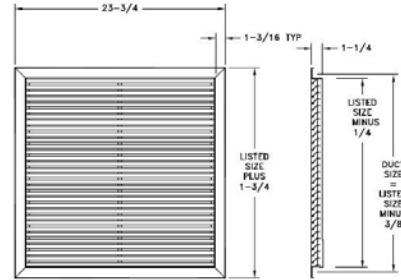
T-Bar Return-Air Grilles



94AT
Steel
Bar-Style
Return Grille

- Steel construction
- Mount flush with T-Bar ceilings
- Bright White finish

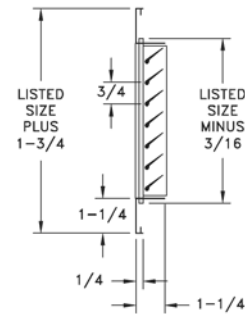
94AT Available Sizes
22" x 22" (overall 23 ³ / ₄ " x 23 ³ / ₄ ") for 24" x24" openings
46" x 22" (overall 47 ³ / ₄ " x 23 ³ / ₄ ") for 48" x 24" openings



RH45T
Aluminum
Bar-Style
Return Grille

- Extruded aluminum construction
- Horizontal bars at 45 degree
- Mount flush with T-Bar ceilings
- Bright White or Satin Anodized finish

RH45T Available Sizes
22" x 22" (overall 23 ³ / ₄ " x 23 ³ / ₄ ") for 24" x24" openings
46" x 22" (overall 47 ³ / ₄ " x 23 ³ / ₄ ") for 48" x 24" openings

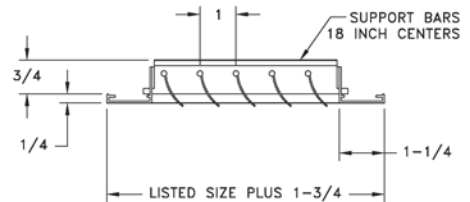


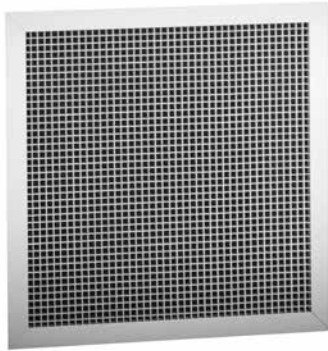
RCBT
Aluminum
Curved-Blade
Return Grille

- Extruded aluminum construction
- Horizontal curved blades
- Mount flush with T-Bar ceilings
- Bright White or Satin Anodized finish

RCBT Available Sizes
22" x 22" (overall 23 ³ / ₄ " x 23 ³ / ₄ ") for 24" x24" openings
46" x 22" (overall 47 ³ / ₄ " x 23 ³ / ₄ ") for 48" x 24" openings

Engineering Data not available

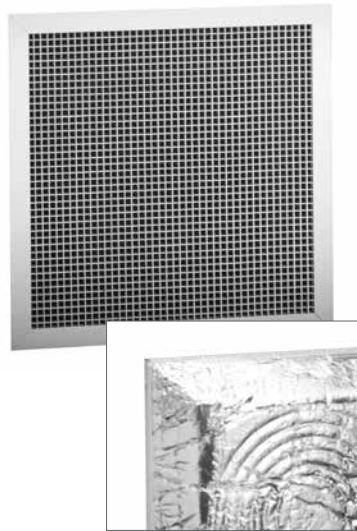
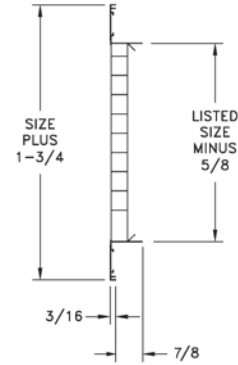




RE5T
Aluminum
Egg Crate
Return Grille

- All aluminum construction
- Egg crate style face
- Mount flush with T-Bar ceilings
- Bright White or Mill Aluminum finish

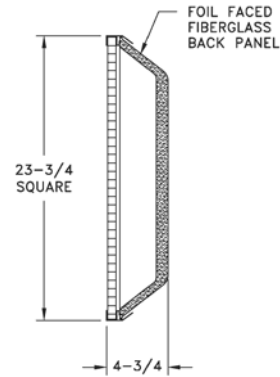
RE5T Available Sizes
22" x 22" (overall 23 ³ / ₄ " x 23 ³ / ₄ ") for 24" x24" openings
22" x 46" (overall 47 ³ / ₄ " x 23 ³ / ₄ ") for 48" x 24" openings



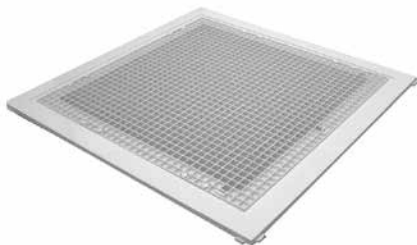
RE5TI
Aluminum
Egg Crate
**Return Grille with Insu-
 lated Back**

- All aluminum construction
- Egg crate style face
- R4.2 molded fiberglass back
- Accepts 6" to 14" unique tab collar (6400 series) or 6" to 16" unique snap-in collar (5400 and 5400PP series); also accepts standard spin-in collar
- Bright White finish
- No steel, great for MRI rooms

RE5TI Available Size
grid core face 1/2" x 1/2" x 1/2"



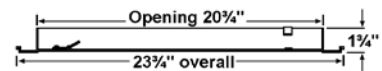
See page 54 for fiberglass specifications.



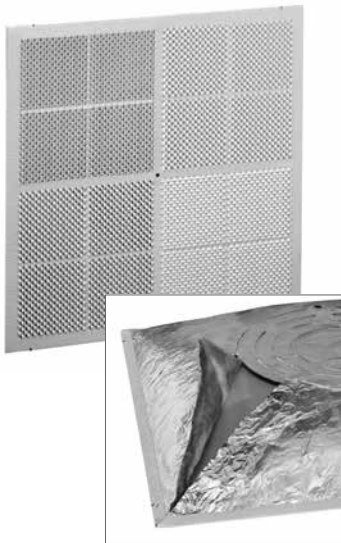
Rezzin Plastic T-Bar Egg-Crate Filter Grille

- Egg crate style face, 1/2" x 1/2" x 1/2" grid pattern
- Face is hinged to filter frame
- Mounts flush with T-bar ceilings
- Uses Rezzin back panel or standard fiberglass back
- Uses standard 1" disposable filters
- Bright white finish
- Contains metal screws

Available Size
20" x 20", overall 23 ³ / ₄ " x 23 ³ / ₄ "



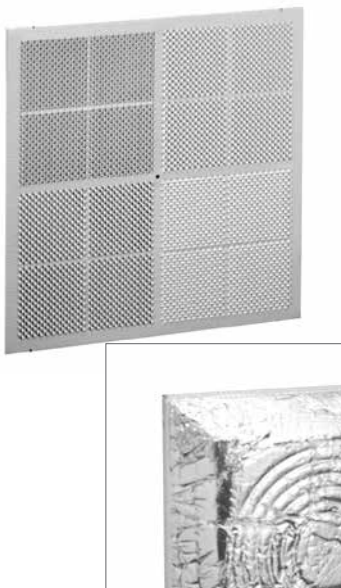
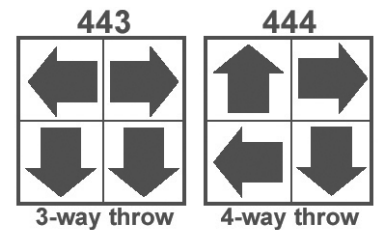
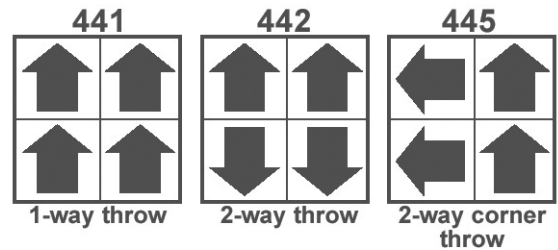
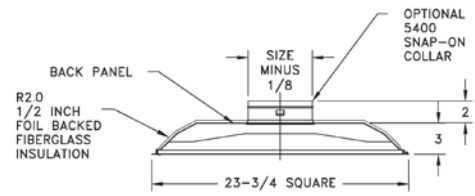
T-Bar Surfaire/Renovator Diffusers



444 SurfAire® Aluminum Face Renovator Series Diffuser

- Aluminum face
- Unique deflector apertures
- Air distributed in thin layers along ceiling surface allowing optimum mixing of conditioned air
- Formed galvanized steel back panel
- Frame includes four seismic safety connections
- Back plate covered with glass fiber insulation to reduce condensation
- Aluminum foil vapor barrier protects insulation from harmful effects of condensation
- Insulation prescored to accommodate collar size desired
- Accepts snap-in collar (5400 Series) (6" to 12")
- 444 - 14" collar is factory-installed
- Utilizes butterfly damper (3800 Series) inserted in collar
- Damper adjusted through diffuser face to allow proper air balancing
- Bright White finish

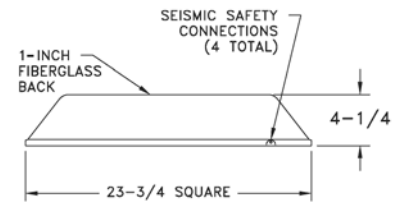
444 Available Size
overall size 23³/₄" x 23³/₄"



REN4 Aluminum Face Renovator Series Diffuser with Insulated Back

- Aluminum face
- Unique deflector apertures
- Molded fiberglass back panel, available in R4.2 or R6
- Accepts 6" to 14" unique tab collar (6400 series) or 6" to 16" unique snap-in collar (5400 and 5400PP series); also accepts standard spin-in collar
- Frame includes four seismic safety connections
- Bright White finish

REN4 Available Size
20" x 20", overall 23³/₄" x 23³/₄"



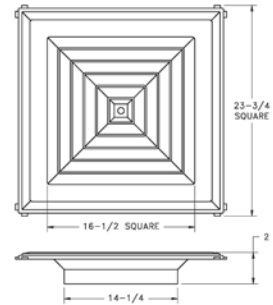
See page 54 for fiberglass specifications.



4-Way Rezzin T-Bar Diffuser

- Engineered polymer construction
- Four-way deflection
- Available with Rezzin square-to-round, ordered separately
- Bright White finish
- Contains metal screws

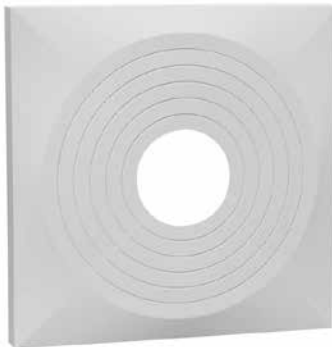
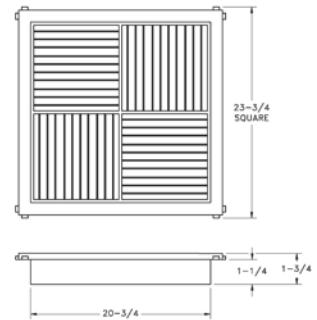
4-Way Diffuser Available Size (in.)
24 x 24



Rezzin T-Bar Modular Core Diffuser

- Engineered polymer construction
- Modular cores provide one, two, three, or four-way horizontal air patterns
- Removable modules provide easy access to accessories
- Available with Rezzin back panel, ordered separately
- Bright White finish

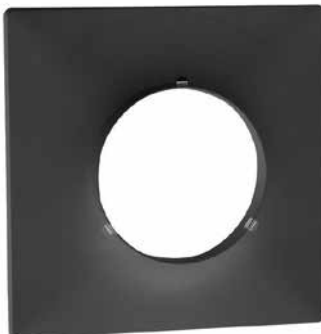
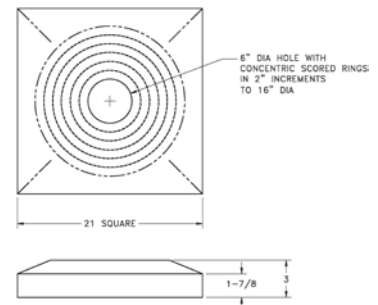
Modular Core Available Size (in.)
24 x 24



Rezzin Back Panel

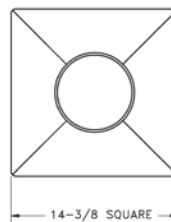
- Engineered polymer construction
- Use 6400 Series Tab Collar
- Bright White finish
- Use with Rezzin Modular Core and Rezzin Egg Crate diffuser

Back Panel Available Size (in.)
24 x 24

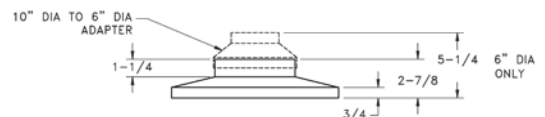


Rezzin Square-to-Round Transition

- Engineered polymer construction
- Allows flex duct installation for 4-Way Rezzin Diffuser
- Black finish
- Contains metal screws/clips
- Can use RD damper



Sq to Rd Available Sizes (in.)	
Square Size	Round Neck
14 x 14	6
14 x 14	8
14 x 14	10
14 x 14	12
14 x 14	14



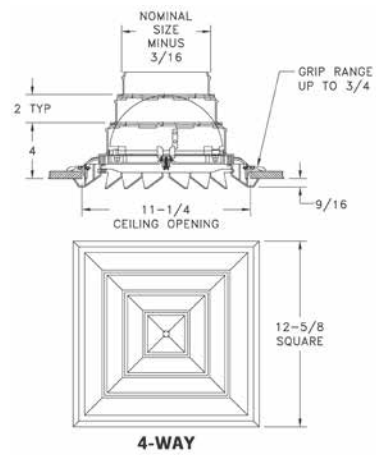
T-Bar Rezzin Diffusers



Rezzin Square Ceiling Diffuser

- Engineered polymer construction
- 12"x12" face
- 6", 7" and 8" collars included
- Ratcheting cam lock—install without screws
- Removable core and integral damper
- Available in 4-way, 3-way and 2-way corner
- Bright White finish
- Contains metal parts

Square Available Size (in.)
12 x 12



T-Bar Backer Plate or Rafter Rough-In Plate Available



3-Way



4-Way



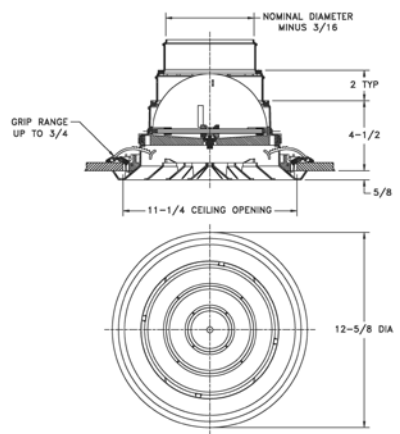
2-Way Corner



Rezzin Plastic Round Ceiling Diffuser

- Engineered polymer construction
- 12" round face
- 6", 7" and 8" collars included
- Ratcheting cam lock—install without screws
- Removable core and integral damper
- Bright White finish
- Contains metal parts

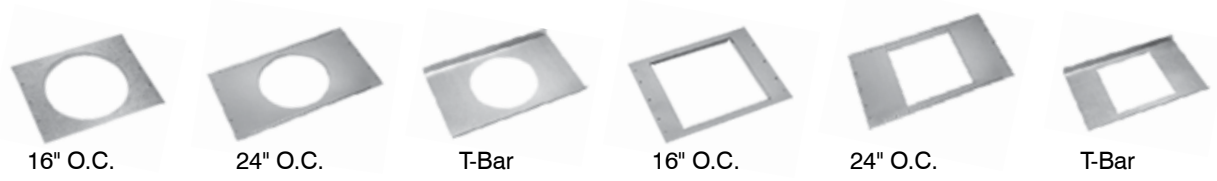
Round Available Size (in.)
12"



T-Bar Backer Plate or Rafter Rough-In Plate Available



Rezzin Rough-In Plates



16" O.C.

24" O.C.

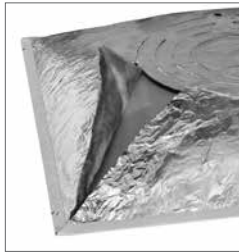
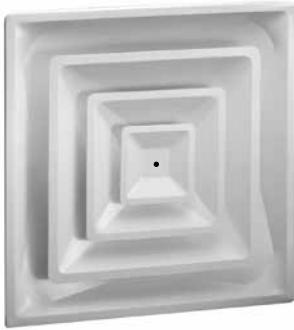
T-Bar

16" O.C.

24" O.C.

T-Bar

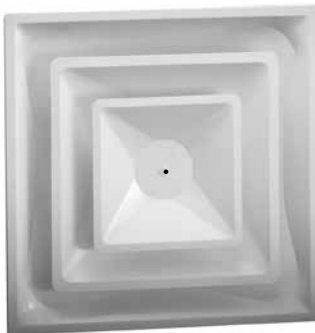
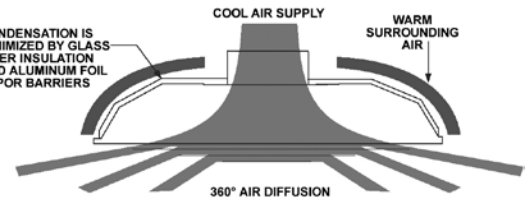
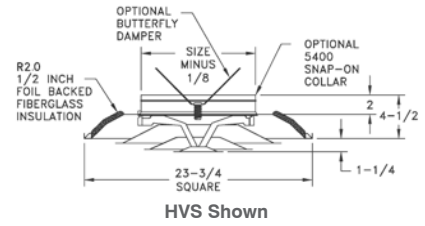
T-Bar Fixed-Pattern Diffusers



HVS/HVS R6 Steel High-Volume Supply

- Steel construction
- Provides high air volume delivery
- 360-degree air diffusion
- Formed back panel
- Fixed core
- Fiberglass insulation blanket with foil vapor barrier to minimize condensation on HVS
- Insulation prescored to accommodate collar size desired
- R6 molded fiberglass back on HVS R6; use 5400 with 5400PP
- Accepts unique 2" high snap-in collar (5400 series) (6" to 12")
- Utilizes butterfly damper (3800 Series) inserted in collar
- Bright White finish
- HVS14-14" collar factory-installed

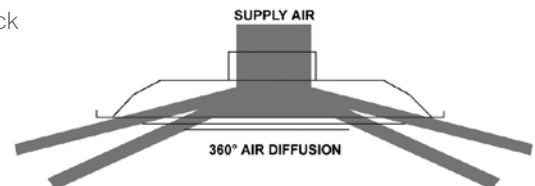
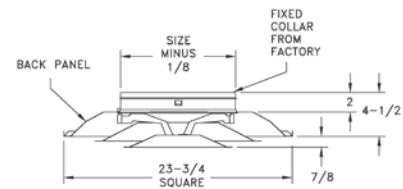
HVS Available Size
Overall Size 23³/₄" x 23³/₄"



FPD/FPD R6 AFPD Steel/Aluminum Fixed-Pattern Diffuser

- Steel construction - FPD
- Aluminum construction - AFPD
- Provides high air volume delivery
- 360-degree air diffusion
- Two-cone fixed core
- Fixed collar 6" to 14"
- Unique 2" high collar permits easy flex connections
- Utilizes butterfly damper (3800 Series) inserted in collar; order separately
- Damper adjustable through face
- Formed back panel
- Bright White finish
- FPD R6 features insulated back

FPD T-Bar Available Size
Overall Size 23³/₄" x 23³/₄"



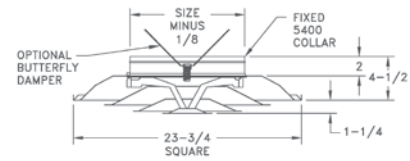
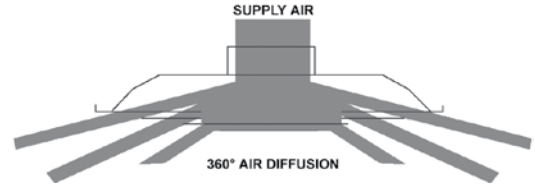
T-Bar Fixed-Pattern Diffusers



FPD3/FPD3 R6 Steel Fixed-Pattern Diffuser

- Steel construction
- Provides high air volume delivery
- 360-degree air diffusion
- Three cone fixed core
- Fixed collar 6" to 14"
- Unique 2" high collar permits easy flex connections
- Utilizes butterfly damper (3800 Series) inserted in collar—order separately
- Damper adjustable thru face
- Formed steel back panel
- Bright White finish
- FPD3 R6 features insulated back

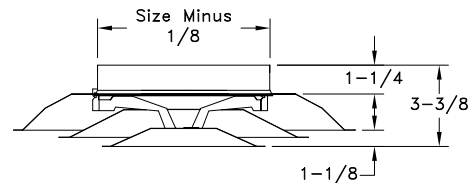
FPD3 T-Bar Available Size
Overall Size 23 ³ / ₄ " x 23 ³ / ₄ "



FPD12 Steel Fixed Pattern Diffuser

- Steel construction
- 360-degree air diffusion
- Two-cone fixed core
- Fixed collar
- Removable plug for damper
- Used with SMF (page 74) for surface-mount applications
- Bright White finish
- Accepts Model RD Radial Damper

FPD12 Available Size
Overall Size 11-3/4" x 11-3/4"



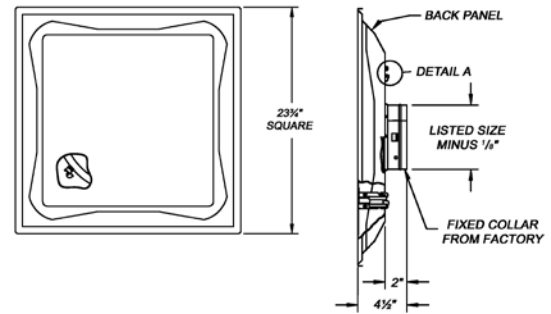


DPD/DPD R6 Steel

T-Bar Plate Diffuser

- Aesthetically appealing, single-face plate design
- 360° air diffusion pattern
- Detachable face plate
- 2" fixed collar
- Optional R6 insulated back (DPD R6)
- White finish

DPD/DPD R6 Available Sizes				
6"	8"	10"	12"	14"



Removing Face Plate

1. Remove black push pins from hook.
2. Push the face plate towards the back panel. This will disengage the hooks from the backside panel slots (*Detail A*).
3. Rotate the face plate counterclockwise, and pull plate away from back panel and hooks through the slots.

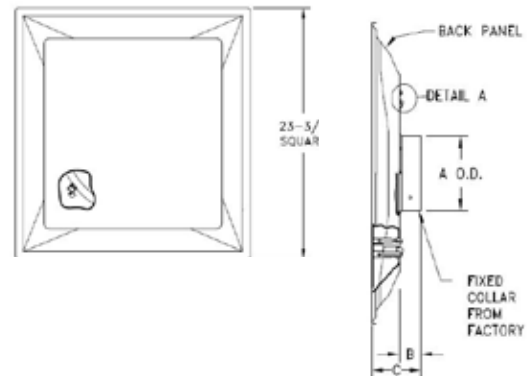


ADPD Aluminum

T-Bar Plate Diffuser

- Aesthetically appealing, single-face plate design
- 360° air diffusion pattern
- Detachable face plate
- 2" fixed collar
- Constructed of 100% aluminum allowing for MRI applications
- Can be used with SMF 24 x 24 W surface mount frames for drywall applications
- White finish

Tbar grid	round duct size	B	C
12 x 12	6, 7	1-1/8"	2-1/4"
	8	1-1/4"	2-3/8"
24 x 24	6,8	1-1/4"	3-3/4"
	10,12,14	1-3/8"	3-7/8"

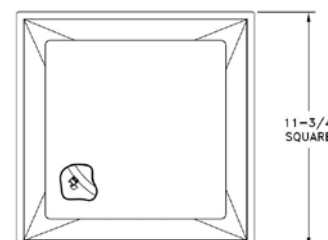


DPD12 Steel

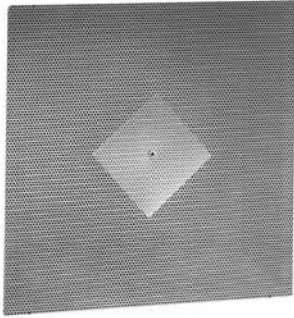
T-Bar Plate Diffuser

- Aesthetically appealing, single-face plate design
- 360° air diffusion pattern
- Detachable face plate
- Constructed of heavy gauge steel for 1' x 1' Tbar grids
- Can be used with SMF 12 x 12 W surface mount frames for drywall applications
- White finish

Tbar grid	round duct size	B	C
12 x 12	6, 7	1-1/8"	2-1/4"
	8	1-1/4"	2-3/8"
24 x 24	6,8	1-1/4"	3-3/4"
	10,12,14	1-3/8"	3-7/8"



T-Bar Fixed-Pattern Perforated Supply Diffusers

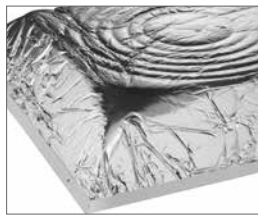


RENPS/ARENPS RENPS R6 Steel/Aluminum

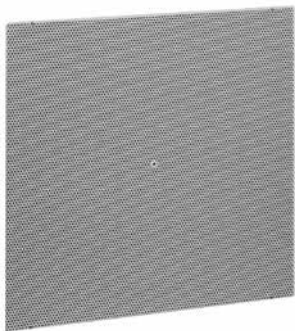
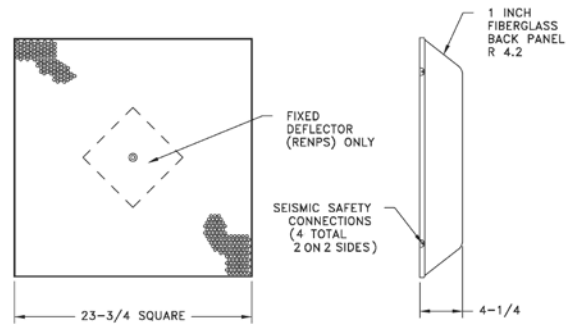
RENPS Available Size
Overall 23 ³ / ₄ " x 23 ³ / ₄ "

Perforated Supply Diffuser with Insulated Back

- Perforated steel face with deflector
- Molded fiberglass back panel, available in R4.2 or R6
- Accepts 6" to 14" unique tab collar (6400 series) or 6" to 16" unique snap-in collar (5400 and 5400PP series); also accepts standard spin-in collar
- ARENPS constructed with aluminum face
- Bright White finish



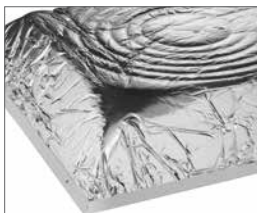
See page 54 for fiberglass specifications.



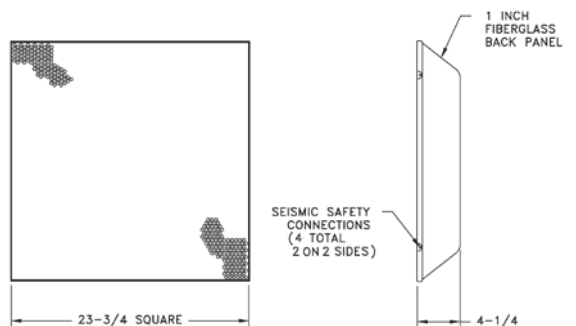
RENP Steel Perforated Return with Insulated Back

RENP Available Size
Overall 23 ³ / ₄ " x 23 ³ / ₄ "

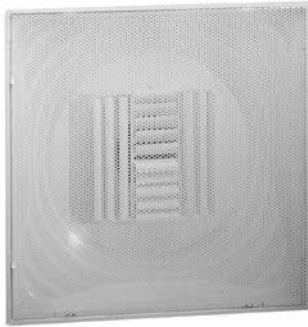
- Perforated steel face
- R4.2 molded fiberglass back panel
- Accepts 6" to 14" unique tab collar (6400 series) or 6"-16" unique snap-in collar (5400 and 5400PP series); also accepts standard spin-in collar
- Bright White finish



See page 54 for fiberglass specifications.



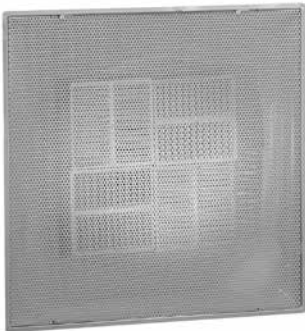
T-Bar Perforated Supply/Return



CBPS Curved-Blade Perforated Supply



CBPR Curved-Blade Perforated Return



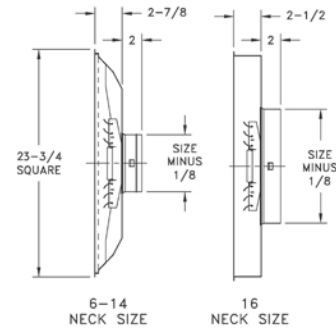
CBPS/CBPR

Steel

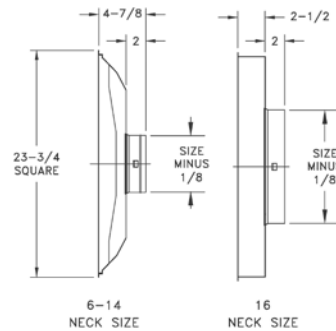
Curved-Blade Perforated Supply/Return

- Steel construction
- Removable, hinged face allows for easy access to air pattern control core
- Individually adjustable pattern deflectors factory-set at 4-way deflection; can be field-adjusted for 1, 2, 3-way air patterns
- Available in 6", 8", 10", 12", 14" and 16" diameter necks
- Unique 2" high collar permits easy flex connections
- Accepts 3800 Series butterfly damper (order separately)
- For 16", use T19
- Bright White finish

CBPS/CBPR Available Size
Overall Size 23 ³ / ₄ " x 23 ³ / ₄ "



CBPS



CBPR

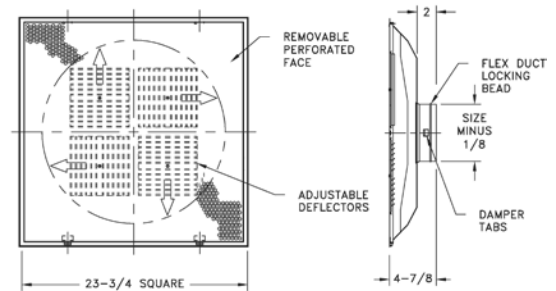
SBP

Steel

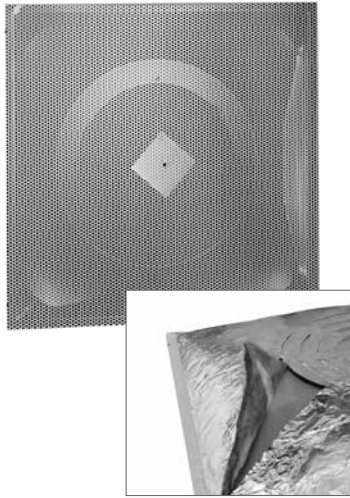
Shallow Back Perforated Supply

- Steel construction
- Available in 6" to 14" collar sizes
- Face-mounted, adjustable deflectors
- Removable perforated face
- Hinged/latched face for easy access to deflector and damper
- Bright White finish

SBP Available Size
Overall Size 23 ³ / ₄ " x 23 ³ / ₄ "



T-Bar Perforated Supply/Return

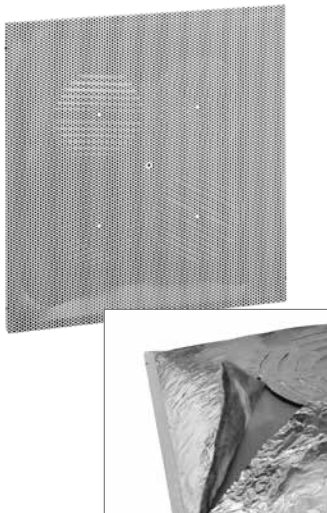
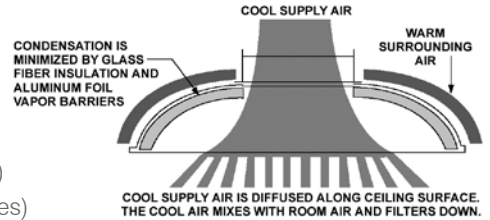
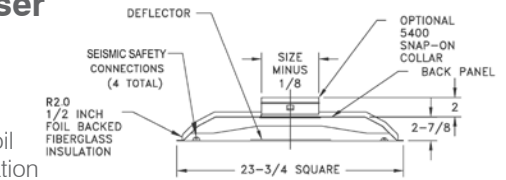


PDS Steel

Perforated Supply Diffuser (with fixed deflector)

- Perforated steel face
- Formed steel, black back panel
- Fiberglass insulation blanket with foil vapor barrier to minimize condensation
- Insulation prescored to accommodate collar size desired
- Accepts unique snap-in collar (5400 Series) 6" to 12" – order separately
- Available in 14" fixed collar (PDS14)
- Utilizes butterfly damper (3800 Series) inserted in collar
- Damper adjusted through diffuser face to allow proper air balancing
- Bright White finish

PDS Available Size
Overall Size 23³/₄" x 23³/₄"

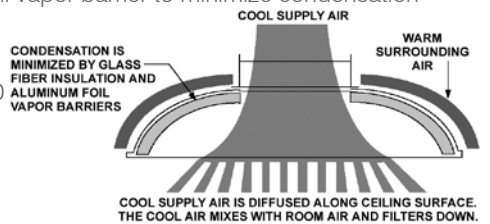
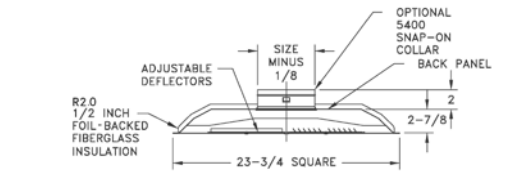


PDS D Steel

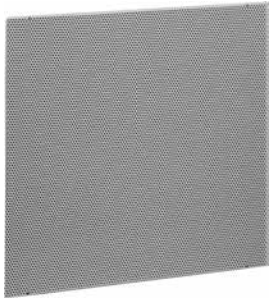
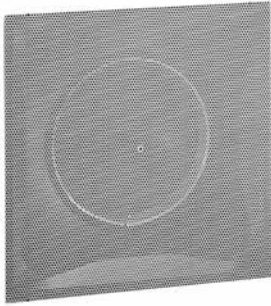
Perforated Diffuser Supply (with adjustable deflector)

- Perforated steel face
- Face adjustable deflectors
- Formed steel, black back panel
- Fiberglass insulation blanket with foil vapor barrier to minimize condensation
- Insulation prescored to accommodate collar size desired
- Accepts unique snap-in collar (5400 Series) 6" to 12" – order separately
- Available in 14" fixed collar (PDS D14)
- Utilizes butterfly damper (3800 Series) inserted in collar
- Damper adjusted through diffuser face to allow proper air balancing
- Bright White finish

PDS D Available Size
Overall Size 23³/₄" x 23³/₄"



T-Bar Perforated Supply/Return

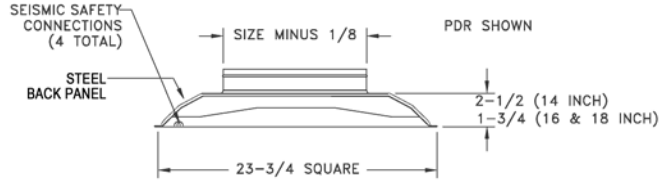


PDR

Steel

Perforated Return Grille

- 51% net free area
- Available with 14", 16", or 18" fixed collars
- Formed steel, black back panel
- White finish



PDR Available Size
Overall Size 23 ³ / ₄ " x 23 ³ / ₄ "

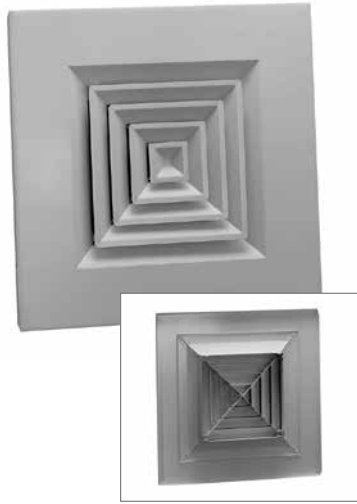
PD

Steel

Perforated Return Face Only—No Back

- Face only return for plenum ceilings
- Available in 24" x 12", 24" x 24" and 48" x 24" sizes
- White finish

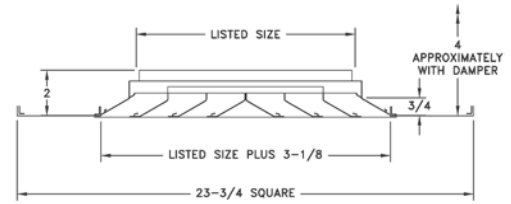
T-Bar Directional/Modular Diffuser



ART Aluminum Square and Rectangular T-Bar Diffusers

- Aluminum construction
- Available in one, two, three and four-way deflections
- Removable core
- Bright White or Satin Anodized finish

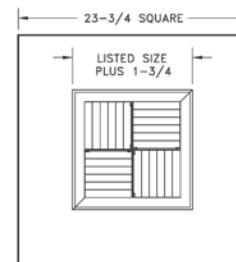
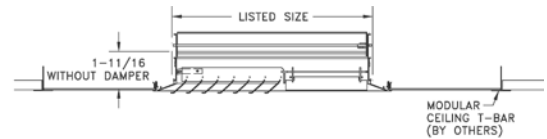
ART Available Sizes
6" x 6", 9" x 9", 12" x 12", 15" x 15", 21" x 21"
Note: For 18" x 18" neck, order ARE 18" x 18".



MCDST Aluminum Modular Core Diffuser

- Extruded aluminum diffuser in aluminum panel
- Modular cores provide one, two, three, and four-way air patterns
- Removable modules provide easy access to duct-mounted damper
- Available in 6" to 20"
- Available as MCDSTSR w/ square-to-round transition attached
- Bright White finish

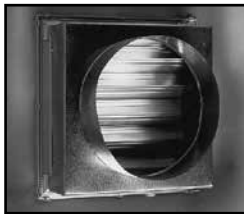
MCDST/MCDSTSR Available Sizes
6" x 6", 8" x 8", 10" x 10", 12" x 12", 14" x 14", 16" x 16", 18" x 18", 20" x 20"



MCDSTSR



MCDSDT

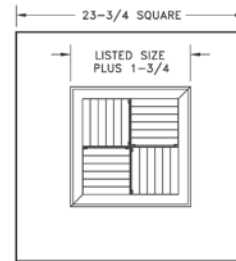
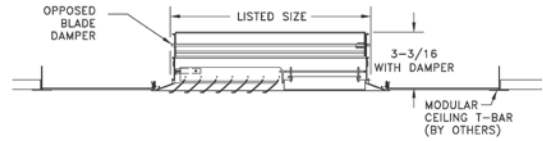


MCSDTSR

MCDSDT
Aluminum
Modular Core
Diffuser with Damper

- Extruded aluminum diffuser in aluminum panel
- Modular cores provide one two, three, and four-way air patterns
- Removable modules provide easy access to damper
- Aluminum opposed-blade damper
- Available in 6" to 20"
- Available as MCSDTSR with square-to-round transition attached
- Bright White finish

MCDSDT/MCSDTSR Available Sizes
6" x 6", 8" x 8", 10" x 10", 12" x 12", 14" x 14", 16" x 16", 18" x 18", 20" x 20"



T-Bar Directional/Modular Diffuser



A501MS/A501OB
One-way deflection

A500 Series Diffusers

- Extruded aluminum construction
- Cores flush with margin
- One-way air diffusion
- Face mount for easy installation
- For sidewall or ceiling application
- Multi-shutter or opposed-blade dampers - aluminum
- Inconspicuous fingertip lever for air volume control
- Bright white finish

A500 Series Available Sizes				
6" x 6"	8" x 8"	10" x 10"	12" x 12"	14" x 14"



A502MS/A502OB
Two-way deflection



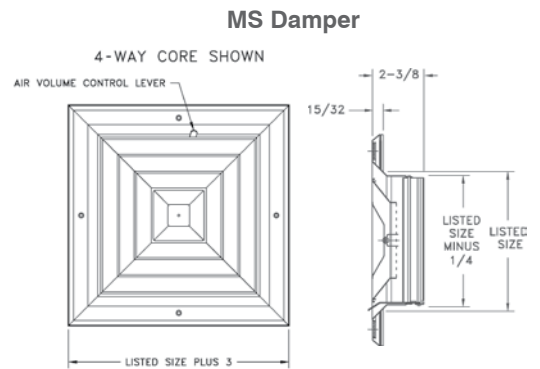
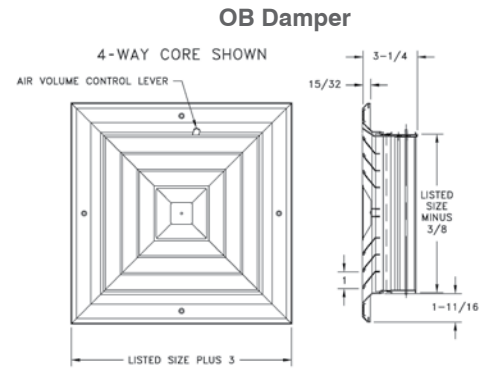
A503MS/A503OB
Three-way deflection



A504MS/A504OB
Four-way deflection



A505MS/A505OB
Two-way corner deflection

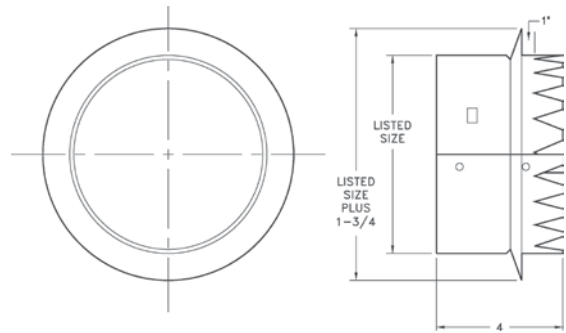




6400 Tab Collar

- Galvanized steel construction
- For use with fiberglass-backed ceiling diffusers
- Tabbed for easy installation
- Accepts 3800 Series damper

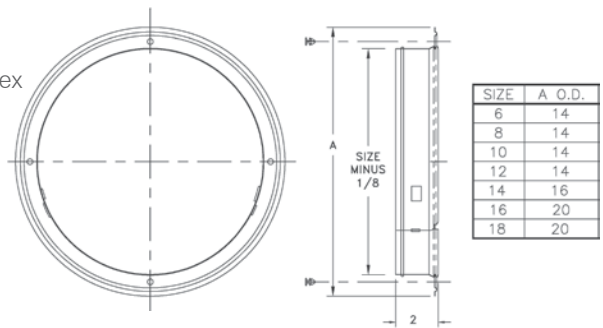
6400 Series Available Sizes				
6"	8"	10"	12"	14"



5400 Series Collar Ring*

- Unique snap-in design for easy installation
- 2" high collar permits easy flex connections
- Bead on collar improves the strength and provides retention for flexible duct connections

5400 Series Available Sizes									
6"	7"	8"	9"	10"	12"	14"*	16"	18"	



*14" collar is mounted to diffuser at factory for steel back panels only.

Note: Uses 5400PP (black push pins) with insulated back panels (non-steel).



5400PP Push Pins

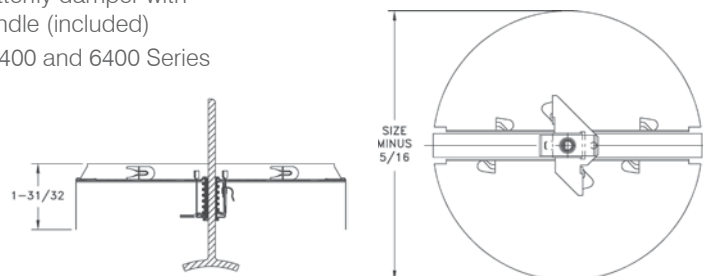
- Attaches 5400 collar to molded fiberglass back for the following products:

- 659TI 1 1/4" long
- PFTI 1 1/4" diameter head
- REN
- RENPS/RENPS R6
- RE5TI
- 96AFBTI
- REN4
- HVS R6
- SRET/SRET R6

3800 Series Damper

3800 Series Available Sizes						
6"	7"	8"	9"	10"	12"	14"

- Adjustable butterfly damper with removable handle (included)
- For use with 5400 and 6400 Series collars
- Golden Sand finish



No Engineering Data

T-Bar Accessories

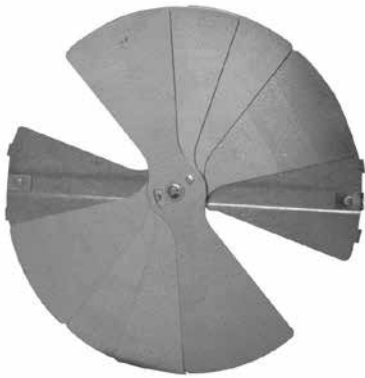
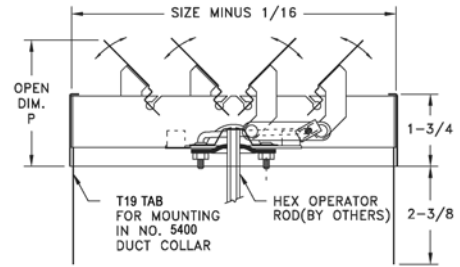


T19 Series Damper

- Multi-blade damper
- Tabs for easy installation
- For use with 5400 Series collar
- Bright White finish

Note: $\frac{3}{16}$ hex operator by others

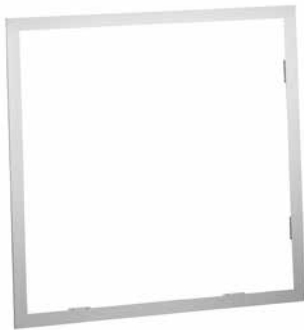
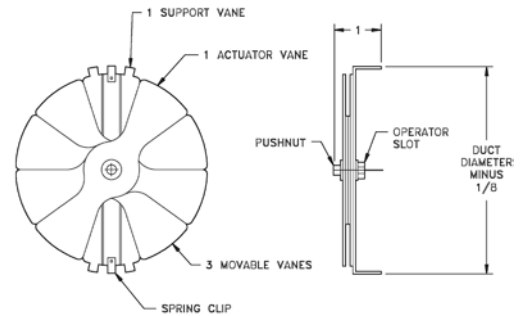
19 Series Available Sizes					
6"	8"	10"	12"	14"	16"



RD Radial Damper

- Galvanized steel construction
- Face-adjustable
- For use with round neck diffusers
- Mill finish

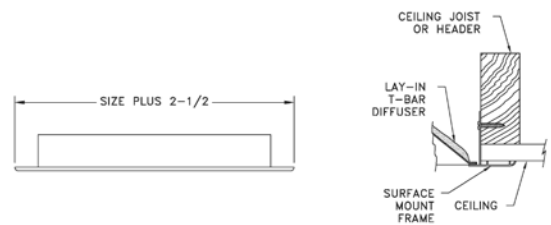
RD Available Sizes				
6"	8"	10"	12"	14"



SMF Aluminum Surface Mount Frame

- Aluminum construction
- Permits installation of standard T-Bar diffusers in a plaster ceiling
- Accepts standard T-Bar diffusers
- Bright White finish

SMF Available Sizes
12" x 12", 24" x 12", 24" x 24", 24" x 48"



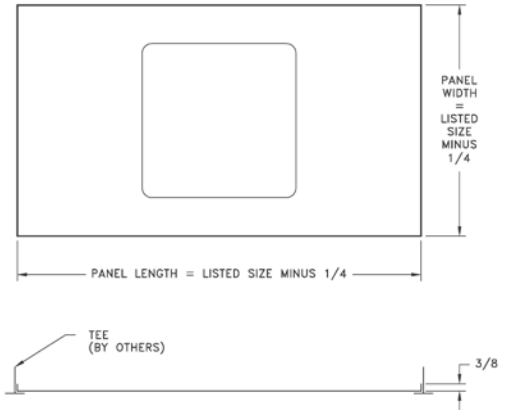


P Filler Panel

- Steel or aluminum construction
- Available in 9 sizes from 12" x 12" to 36" x 36" in 12" increments
- Bright White finish

P Filler Panel Available Sizes
12" x 12", 24" x 12", 36" x 12", 48" x 12", 24" x 24", 36" x 24", 48" x 24", 36" x 36"

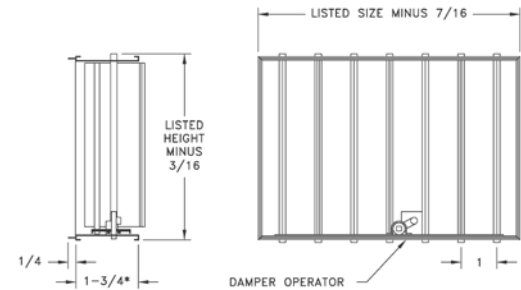
Diffusers are factory-installed (must order with diffuser).



AD Aluminum Opposed-Blade Damper

- Extruded aluminum construction
- Opposed-blade damper
- Controls the air volume from full flow to shut-off

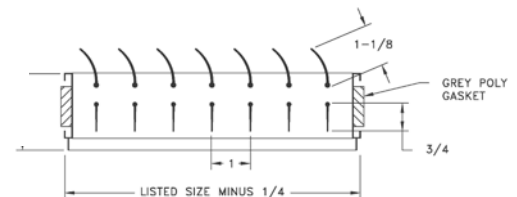
AD Available Sizes
Minimum: 6" x 4", 1 3/4" x 4"
Maximum: 24" x 24" One-Piece



DT Air Diverter

- Extruded aluminum construction
- Two sets of individually adjustable blades
- Equalizes flow and controls volume at collar take-offs to registers and grilles
- Equipped with gasket around outside of frame for positioning firmly in duct
- Mill finish

DT Available Sizes
Minimum: 6" x 4"
Maximum: 48" x 48"



Miscellaneous

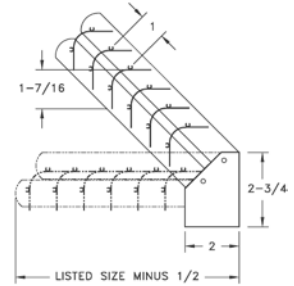


FT Flexiturn

- Extruded aluminum construction
- Designed to pick up air from the main trunk at branch take-offs and divert it toward the grille
- Mounts easily with sheet metal screws
- Gang-operated blades move from 45 degrees open to fully closed
- Positive setting
- Mill finish

FT Flexiturn Available Sizes

Minimum: 8" x 4"
Maximum: 36" x 18"

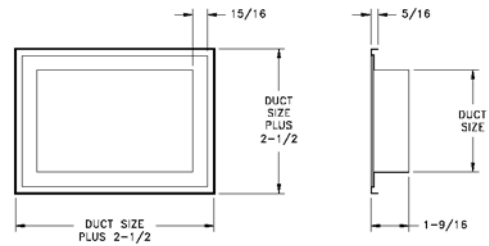


APF
Aluminum
Plaster Frame

- Aluminum construction
- Provides attractive appearance for registers and grilles around plaster
- Bright White finish

APF Available Sizes

Minimum: 6" x 4"
Maximum: 48" x 48"



Using the Engineering Data

For most of the models & sizes we've done the calculations for you.
CFM = volume of air flow in cubic feet per minute

421

Face Velocity		300	400	500	600	700	800
Pressure Loss		.006	.010	.016	.022	.031	.040
4x10 Ak .170	CFM	50	70	85	100	120	135
	Spread	4.5	5.0	6.5	7.5	9.0	10.0
	Throw	4.0	6.0	8.0	10.0	11.0	12.5

Terminal velocity of 50 fpm

821-defl A

Face Velocity		400	500	600	700	800
Pressure Loss		.010	.016	.022	.031	.040
24 x 8 Ak 1.045	CFM	420	525	625	730	835
	Throw	17.0	21.0	25.0	29.0	33.0

Terminal velocity is 75 fpm

Face Velocity = speed of air at the face of diffuser in feet per minute (FPM)

Ak = net area in square feet. This is the lab measured area across the face when air is mechanically forced through the opening.

Free Area (if given) = daylight area (in²) of blade openings. Free area is typically only required on natural / gravity movement of air, non-mechanically forced, as in free area needed for combustion air requirements on heating equipment. Use the Ak value (*144 to get to in²) if the free area has not been calculated, but is needed for a given size/model grille requiring free area for combustion.

Equation of Airflow: CFM = Ak (ft²) x Face Velocity (fpm)

Example from 421 table above: 100 = .17 x 600 _ numbers are often rounded

Sizing a Supply

Determine the amount of CFM (air volume) needed for each supply outlet. This should be done by room heating and cooling load requirements from various design manuals (ACCA Man J, ASHRAE Fundamentals Hndbk) and then followed by the duct design and layout.

Face Velocity - H&C recommends sizing a supply outlet in the range of 500 to 800 fpm face velocity (700 being a common target). The upper end of this range will create better mixing of room air and longer throws, which is what the typical forced air system is intended to do. However, the Pressure resistance and Noise must be taken into consideration depending upon the application. In some instances, greater face velocity is allowed because the pressure and noise can be accommodated.

Pressure Loss (inches of w.c.) – the selection of the face velocity must consider the associated pressure loss that deals with each relative model. An increase in face velocity creates more pressure resistance against the blower's delivery of air volume. The velocity ranges given previously will, in most cases, have minor effect on the blower's overall performance given the entire duct system losses that it will encounter.

Noise – an increase in face velocity will create more noise. The tables below show NC design guidelines and also face velocity ranges if NC values have not been tabulated.

Application	Recommended Face Velocities
Broadcasting Studios	<500 FPM
Residences	500 to 750 FPM
Apartments	500 to 750 FPM
Churches	500 to 750 FPM
Hotel Guestrooms	500 to 750 FPM
Legitimate Theaters	500 to 1000 FPM
Private Offices, acoustically treated	500 to 1000 FPM
Private Offices, not treated	1000 to 1250 FPM
Motion Picture Theaters	1000 to 1250 FPM
General Offices	1250 to 1500 FPM
Stores, upper floors	1500 FPM
Stores, main floors	1500 FPM
Industrial Buildings	1500 to 2000 FPM

	Communication Environment	Typical Occupancy
< NC 25	Extremely quiet environment; suppressed speech is quite audible; suitable for acute pickup of all sounds.	Broadcasting studios, concert halls, music rooms.
NC 30	Very quiet office; suitable for large conferences; telephone use satisfactory.	Residences, theaters, libraries, executive offices, directors rooms.
NC 35	Quiet office; satisfactory for conference at a 15-foot table; normal voice 10 to 30 feet; telephone use satisfactory.	Private offices, schools, hotel guestrooms, courtrooms, churches, hospital rooms.
NC 40	Satisfactory for conferences at a 6-to 8-foot table; normal voice 6 to 12 feet; telephone use satisfactory.	General office, labs, dining rooms.
NC 45	Satisfactory for conferences at a 4- to 5-foot table; normal voice 3 to 6 feet; raised voice 6 to 12 feet; telephone use occasionally difficult.	Retail stores, cafeterias, lobby areas, large drafting and engineering offices, reception areas.
> NC 50	Unsatisfactory for conference of more than two or three persons; normal voice 1 to 2 feet; raised voice 3 to 6 feet; telephone use slightly difficult.	Computer rooms, stenographic pools, print machine rooms, process areas.

Sizing a Return

Air volume going back to the air handler (fan) must equal what is supplied from the air handler. Therefore the total CFM capacity of the return grilles must equal or exceed the total CFM capacity of all the supply diffusers.

Engineering Data

Keeping face velocity low

- Returns should be at 400-600 fpm maximum
- Filter Returns should be at 450 fpm maximum
- *ACCA recommends 300 max for filter grilles and 500 max for non-filter grilles.
- The rule of thumb is 2 cfm per square inch of filter size. See table below.
- Low velocity reduces noise, especially on stamped face grilles (672/673); fixed-bar grilles can handle more velocity without noise (94A/96AFB/RH45/RHF45/RCB).
- A single point return cannot be oversized like a supply. The system will not be affected adversely, only improved. *This does not apply to multiple return locations where balancing is more critical to pull in relevant amounts from each room.
- Static pressure is also reduced. Pressure works against & reduces blower delivery volume (cfm)
- Noise is not expected from a return.

Location

Filter Size	Area (in ²)	Ton (cfm)	Filter Size	Area (in ²)	Ton (cfm)
12 12	144	n/a	20 20	400	2 (800)
12 20	240	1 (400)	20 25	500	2.5 (1000)
12 24	288	1.5 (600)	20 30	600	3 (1200)
12 30	360	1.5 (600)	20 36	720	3 (1200)
14 14	196	1 (400)	24 24	576	3 (1200)
14 20	280	1.5 (600)	24 30	720	3 (1200)
14 24	336	1.5 (600)	24 36	864	4 (1600)
14 30	420	2 (800)	25 25	625	3 (1200)
16 20	320	1.5 (600)	30 30	900	4 (1600)
16 24	384	2 (800)	30 36	1080	5 (2000)

- Returns should be put in stagnant air locations that need to be reconditioned.
 - High for cooling mode (hot air rises)
 - Low for heating mode (cold air falls)
 - Both modes, choose a primary season
- Returns should not be near a supply register's throw range. If at all possible place the return at an opposite corner of the room.

Room Air Movement

- Returns do NOT have much effect on a room's air movement, regardless of face velocity. They only grab air about a duct diameter away from the face. Most of the room air movement is done by the supplies.

Unlisted Sizes—Engineering Data

When a size is not listed there are a couple ways to do an engineered estimate. Airflow principles permit you to utilize existing sizes to determine sizes not shown.

Method 1: Use nearest nominal size table entry. If a 14x14 is not given, but a 20x10 is, since these two sizes have an approximate equal core area (196 and 200) the table entry for a 20x10 can be used to approximate what the 14x14 grille would perform to.

Method 2: A more exact method would be to do interpolation process between two listed sizes. If 14x14 is not given, but 18x10 and 20x10 are, then this equation will get more exact 14x14 data. $Y = Y1$

+ $[\{(X - X1) * (Y2 - Y1)\} / (X2 - X1)]$ where:

Y = unknown CFM or throw that is being computed for 14x14

Y1 = CFM or throw of listed 18x10 (for ex 600 cfm)

Y2 = CFM or throw of listed 20x10 (for ex 640 cfm)

X = 196 in² (nominal area of 14x14)

X1 = 180 in² (nominal area of 18x10)

X2 = 200 in² (nominal area of 20x10)

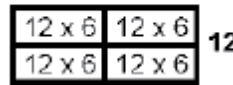
Using equation above computes $Y = 600 + [\{(196 - 180) * (640 - 600)\} / (200 - 180)] =$

$600 + [\{16 * 40\} / 20] = 600 + 32 = 632$ cfm for Y

Method 3: Sizes beyond the table (smaller or larger) can have their CFM or Throw determined by using listed sizes by the following:

CFM for larger sizes:

If **24** looking for 24x6 or 24x12 cfm that is not listed, using the listed 12x6 cfm and doubling it or quadrupling it will give the answer for the 24x6 and 24x12, respectively.



CFM for smaller sizes:

If looking for a 6x6 cfm that is not listed, using the listed 12x6 cfm and halving it will give the answer for a 6x6.

Throw:

Double the size and CFM, multiply the throw by 1.5

Quadruple the size and CFM, multiply the throw by 2

Half the size and CFM, multiply the throw by .67

One quarter the size and CFM, multiply the throw by .5

*Pressure loss, face velocity and noise criteria will all remain the same relative to the listed size used to determine the larger or smaller sizes not shown.

821, 831, (Page 6)

Deflection A

Face Velocity	400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000	
Pressure Loss	.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249	
8 x 4	CFM	65	80	100	110	130	145	160	175	190	210	225	255	290	320
Ak 160	Throw	6.5	8.0	10.0	11.0	13.0	15.0	16.0	18.0	19.0	21.0	23.0	26.0	29.0	32.0
10 x 4	CFM	80	100	120	140	160	180	200	220	240	265	285	325	365	405
Ak 202	Throw	7.0	9.0	11.0	13.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	29.0	33.0	36.0
12 x 4	CFM	100	120	145	170	195	220	245	270	295	315	340	390	440	490
Ak 244	Throw	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	32.0	36.0	40.0
14 x 4	CFM	115	145	170	200	230	255	285	315	345	370	400	460	515	570
Ak 286	Throw	8.5	11.0	13.0	15.0	17.0	19.0	22.0	24.0	26.0	28.0	30.0	35.0	39.0	43.0
12 x 5	CFM	125	155	190	220	250	280	310	345	375	405	435	500	560	625
Ak 312	Throw	9.0	11.0	14.0	16.0	18.0	20.0	22.0	25.0	27.0	29.0	31.0	36.0	41.0	45.0
10 x 6	CFM	125	155	190	220	250	285	315	345	375	410	440	500	565	630
Ak 314	Throw	9.0	11.0	14.0	16.0	18.0	21.0	23.0	25.0	27.0	30.0	32.0	36.0	41.0	45.0
14 x 5	CFM	145	185	220	255	295	330	365	405	440	475	510	585	660	730
Ak 366	Throw	10.0	12.0	15.0	17.0	20.0	22.0	24.0	27.0	29.0	32.0	34.0	39.0	44.0	49.0
12 x 6	CFM	150	190	225	265	305	340	380	415	455	495	530	605	680	760
Ak 379	Throw	10.0	12.0	15.0	17.0	20.0	22.0	25.0	27.0	30.0	33.0	35.0	40.0	45.0	50.0
16 x 5	CFM	170	210	250	295	335	380	420	460	505	545	585	670	755	840
Ak 419	Throw	11.0	13.0	16.0	18.0	21.0	24.0	26.0	29.0	32.0	34.0	37.0	42.0	47.0	53.0
14 x 6	CFM	180	220	265	310	355	400	445	490	535	575	620	710	800	890
Ak 444	Throw	11.0	13.0	16.0	19.0	22.0	24.0	27.0	30.0	32.0	35.0	38.0	43.0	49.0	54.0
16 x 6	CFM	205	255	305	355	410	460	510	560	610	665	715	815	920	1020
Ak 510	Throw	12.0	15.0	17.0	20.0	23.0	26.0	29.0	32.0	35.0	38.0	41.0	47.0	53.0	58.0
20 x 5	CFM	210	265	315	370	420	475	525	580	630	685	735	840	945	1050
Ak 526	Throw	12.0	15.0	18.0	21.0	23.0	27.0	29.0	32.0	35.0	38.0	41.0	47.0	53.0	59.0
24 x 5	CFM	255	315	380	445	505	570	635	695	760	825	890	1015	1140	1270
Ak 634	Throw	13.0	16.0	19.0	23.0	26.0	29.0	32.0	35.0	39.0	42.0	45.0	52.0	58.0	65.0
20 x 6	CFM	255	320	385	445	510	575	640	705	770	830	895	1015	1140	1270
Ak 640	Throw	13.0	16.0	19.0	23.0	26.0	29.0	32.0	36.0	39.0	42.0	45.0	52.0	58.0	65.0
24 x 6	CFM	310	385	465	540	615	695	770	850	925	1000	1080	1235	1390	1540
Ak 771	Throw	14.0	18.0	21.0	25.0	28.0	32.0	35.0	39.0	43.0	46.0	50.0	57.0	64.0	71.0
20 x 8	CFM	345	435	520	610	695	780	870	955	1040	1130	1215	1390	1560	1735
Ak 868	Throw	15.0	19.0	23.0	26.0	30.0	34.0	38.0	41.0	45.0	49.0	53.0	60.0	68.0	75.0
30 x 6	CFM	385	485	580	675	775	870	965	1065	1160	1255	1355	1545	1740	1935
Ak 967	Throw	16.0	20.0	24.0	28.0	32.0	36.0	40.0	44.0	48.0	51.0	56.0	63.0	71.0	79.0
24 x 8	CFM	420	525	625	730	835	940	1045	1150	1255	1360	1465	1670	1880	2090
Ak 1.045	Throw	17.0	21.0	25.0	29.0	33.0	37.0	41.0	46.0	50.0	54.0	58.0	66.0	74.0	83.0
30 x 8	CFM	525	655	785	915	1050	1180	1310	1440	1570	1705	1835	2095	2360	2620
Ak 1.310	Throw	19.0	23.0	28.0	32.0	37.0	42.0	46.0	51.0	56.0	60.0	65.0	74.0	84.0	93.0
24 x 10	CFM	530	660	790	925	1055	1185	1320	1450	1585	1715	1845	2110	2375	2640
Ak 1.319	Throw	19.0	23.0	28.0	33.0	37.0	42.0	46.0	51.0	56.0	60.0	65.0	74.0	84.0	93.0
36 x 8	CFM	630	790	945	1105	1260	1420	1575	1735	1890	2050	2205	2520	2835	3150
Ak 1.576	Throw	20.0	25.0	30.0	36.0	41.0	46.0	51.0	56.0	61.0	66.0	71.0	81.0	91.0	101.0
24 x 12	CFM	635	795	955	1115	1275	1435	1595	1755	1910	2070	2230	2550	2865	3185
Ak 1.401	Throw	20.0	25.0	31.0	36.0	41.0	47.0	51.0	56.0	61.0	66.0	71.0	82.0	92.0	102.0
30 x 10	CFM	660	825	990	1160	1325	1490	1655	1820	1985	2150	2315	2645	2975	3310
Ak 1.654	Throw	21.0	26.0	31.0	37.0	42.0	47.0	52.0	57.0	63.0	68.0	73.0	83.0	94.0	104.0
36 x 10	CFM	795	995	1195	1390	1590	1790	1990	2190	2385	2585	2785	3180	3580	3980
Ak 1.989	Throw	23.0	29.0	34.0	40.0	46.0	51.0	57.0	63.0	68.0	74.0	80.0	91.0	103.0	114.0
30 x 12	CFM	800	1000	1200	1400	1600	1800	2000	2200	2395	2595	2795	3195	3595	3995
Ak 1.997	Throw	23.0	29.0	34.0	40.0	45.0	51.0	57.0	63.0	68.0	74.0	80.0	91.0	103.0	114.0
36 x 12	CFM	960	1200	1440	1680	1920	2160	2400	2640	2880	3120	3365	3845	4325	4805
Ak 2.402	Throw	25.0	31.0	38.0	44.0	50.0	56.0	63.0	69.0	75.0	81.0	88.0	100.0	113.0	125.0

Terminal Velocity of 75 FPM

Deflection C

Face Velocity	400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000	
Pressure Loss	.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249	
8 x 4	CFM	55	70	85	100	110	125	140	155	170	180	195	225	250	280
Ak 140	Throw	5.0	6.0	7.5	8.5	9.5	11.0	12.0	14.0	15.0	16.0	17.0	20.0	22.0	24.0
10 x 4	CFM	70	90	105	125	140	160	180	195	215	230	250	285	320	355
Ak 178	Throw	5.0	7.0	8.0	9.5	11.0	12.0	14.0	15.0	17.0	18.0	19.0	22.0	25.0	28.0
12 x 4	CFM	85	110	130	150	170	195	215	235	260	280	300	345	385	430
Ak 215	Throw	6.0	8.0	9.0	11.0	12.0	14.0	15.0	17.0	18.0	20.0	21.0	24.0	27.0	30.0
14 x 4	CFM	100	125	150	175	200	225	250	275	300	330	355	405	455	505
Ak 252	Throw	6.5	8.0	10.0	11.0	13.0	15.0	16.0	18.0	20.0	22.0	23.0	26.0	29.0	32.0
12 x 5	CFM	110	135	165	190	220	245	275	300	330	355	385	440	495	550
Ak 274	Throw	7.0	8.5	10.0	12.0	14.0	15.0	17.0	19.0	21.0	22.0	24.0	28.0	31.0	34.0
10 x 6	CFM	110	140	165	195	220	245	275	305	330	360	385	440	495	550
Ak 276	Throw	7.0	8.5	10.0	12.0	14.0	15.0	17.0	19.0	21.0	22.0	24.0	27.0	31.0	34.0
14 x 5	CFM	130	160	195	225	255	290	320	355	385	415	450	515	580	645
Ak 321	Throw	7.5	9.0	11.0	13.0	15.0	17.0	18.0	21.0	22.0	24.0	26.0	30.0	34.0	37.0
12 x 6	CFM	135	165	200	235	265	300	335	365	400	435	465	535	600	665
Ak 333	Throw	7.5	9.5	11.0	13.0	15.0	17.0	19.0	21.0	23.0	25.0	26.0	30.0	34.0	38.0
16 x 5	CFM	150	185	220	260	295	330	370	405	445	480	515	590	665	740
Ak 369	Throw	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	32.0	36.0	40.0
14 x 6	CFM	155	195	235	275	315	350	390	430	470	510	545	625	705	780
Ak 391	Throw	8.0	10.0	12.0	14.0	17.0	18.0	20.0	23.0	25.0	27.0	29.0	33.0	37.0	41.0
16 x 6	CFM	180	225	270	315	360	405	450	495	540	580	625	715	805	895
Ak 448	Throw	9.0	11.0	13.0	15.0	18.0	20.0	22.0	24.0	26.0	28.0	31.0	35.0	39.0	44.0
20 x 5	CFM	185	230	280	325	370	415	465	510	555	600	650	740	835	925
Ak 463	Throw	9.0	11.0	13.0	16.0	18.0	20.0	22.0	25.0	27.0	29.0	31.0	36.0	40.0	44.0
24 x 5	CFM	225	280	335	390	445	500	555	615	670	725	780	890	1005	1115
Ak 557	Throw	10.0	12.0	15.0	17.0	19.0	22.0	24.0	27.0	29.0	32.0	34.0	40.0	44.0	49.0
20 x 6	CFM	225	280	340	395	450	505	565	620	675	730	790	900	1015	1125
Ak 563	Throw	10.0	12.0	15.0	17.0	20.0	22.0	25.0	27.0	29.0	32.0	34.0	39.0	44.0	49.0
24 x 6	CFM	270	340	405	475	540	610</								

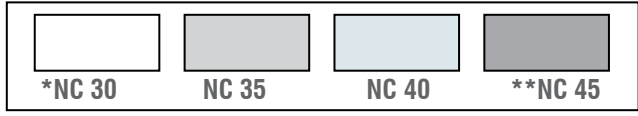
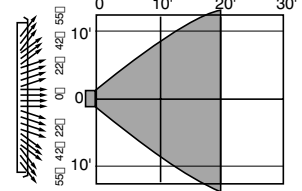
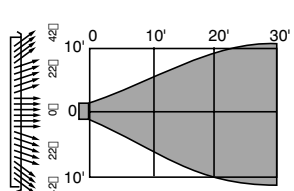
821, 831 (Page 6)

Deflection E

Table with columns: Face Velocity, Pressure Loss, and rows for various duct sizes (8x4 to 36x12) and configurations (CFM, Throw).

Deflection G

Table with columns: Face Velocity, Pressure Loss, and rows for various duct sizes (8x4 to 36x12) and configurations (CFM, Throw).



* less than or equal to ** greater than or equal to

92HVO, 92HVV, 92VHO, 92VHV (Page 7, 8)
 Performance based on nominal sizes shown in bold

Nom. Duct Size (in.)	Nom. Duct Area (ft ²)	Core Area (ft ²)	Core Vel. Vel. Press. 0° Total 22.5° Press. 45°	NC-20				NC-30			NC-40	
				300	400	500	600	700	800	1000	1200	1400
				0.006	0.010	0.016	0.022	0.031	0.040	0.062	0.090	0.122
6x6	0.25	0.19	cfm	57	76	95	114	133	152	190	228	266
			NC	-	-	-	15	20	24	31	36	41
			Throw 0°	5-7-14	7-10-16	8-12-18	10-14-20	12-15-21	13-16-23	15-18-25	16-20-28	17-21-30
			Throw 22.5° (ft)	4-6-11	5-8-12	6-10-14	8-11-15	9-12-16	10-12-18	11-14-20	12-15-22	13-16-23
8x6	0.33	0.26	cfm	78	104	130	156	182	208	260	312	364
			NC	-	-	11	17	21	25	32	38	42
			Throw 0°	5-9-16	8-12-19	10-15-21	12-16-23	14-18-25	15-19-27	17-21-30	19-23-32	20-25-35
			Throw 22.5° (ft)	4-7-13	6-9-15	8-11-16	9-13-18	11-14-19	12-15-21	13-16-23	15-18-25	16-19-27
10x6	0.42	0.34	cfm	102	136	170	204	238	272	340	408	476
			NC	-	-	12	18	23	27	33	39	43
			Throw 0°	6-10-19	9-13-21	11-17-24	13-19-26	16-20-28	18-21-30	20-24-34	21-26-37	23-28-40
			Throw 22.5° (ft)	5-8-14	7-10-17	9-13-19	10-14-20	12-16-22	14-17-23	15-19-26	17-20-29	18-22-31
8x8	0.44	0.37	cfm	111	148	185	222	259	296	370	444	518
			NC	-	-	13	18	23	27	34	39	44
			Throw 0°	6-10-19	9-14-22	12-17-25	14-19-27	16-21-30	18-22-32	20-25-35	22-27-39	24-30-42
			Throw 22.5° (ft)	5-8-15	7-11-17	9-13-19	11-15-21	13-16-23	14-17-25	16-19-27	17-21-30	19-23-32
12x6	0.50	0.41	cfm	123	164	205	246	287	328	410	492	574
			NC	-	-	13	19	23	27	34	39	44
			Throw 0°	7-11-20	10-15-24	12-18-26	15-20-29	17-22-31	19-24-33	21-26-37	24-29-41	25-31-44
			Throw 22.5° (ft)	5-8-16	8-11-18	9-14-20	11-16-22	13-17-24	15-18-26	17-20-29	18-22-32	20-24-34
14x6	0.58	0.48	cfm	144	192	240	288	336	384	480	576	672
			NC	-	-	14	19	24	28	35	40	45
			Throw 0°	7-12-22	11-16-25	13-20-28	16-22-31	18-24-34	21-25-36	23-28-40	25-31-44	28-34-48
			Throw 22.5° (ft)	6-9-17	8-12-20	10-15-22	12-17-24	14-18-26	16-20-28	18-22-31	20-24-34	21-26-37
16x6 12x8	0.67	0.57	cfm	171	228	285	342	399	456	570	684	798
			NC	-	-	15	20	25	29	35	41	45
			Throw 0°	8-13-24	11-17-28	14-22-31	17-24-34	20-26-37	23-28-39	25-31-44	28-34-48	30-37-52
			Throw 22.5° (ft)	6-10-19	9-13-22	11-17-24	13-19-26	16-20-28	18-22-30	20-24-34	22-26-37	23-28-40
10x10	0.69	0.59	cfm	177	236	295	354	413	472	590	708	826
			NC	-	-	15	20	25	29	35	41	46
			Throw 0°	8-13-24	12-18-28	15-22-32	18-24-35	20-26-37	23-28-40	26-32-45	28-35-49	31-37-53
			Throw 22.5° (ft)	6-10-19	9-14-22	11-17-24	14-19-27	16-20-29	18-22-31	20-24-35	22-27-38	24-29-41
18x6	0.75	0.63	cfm	189	252	315	378	441	504	630	756	882
			NC	-	-	15	20	25	29	36	41	46
			Throw 0°	8-14-25	12-18-29	15-23-33	18-25-36	21-27-39	24-29-41	27-33-46	29-36-51	32-39-55
			Throw 22.5° (ft)	7-11-20	9-14-23	12-18-25	14-20-28	16-21-30	18-23-32	21-25-36	23-28-39	24-30-42
20x6 12x10	0.83	0.72	cfm	216	288	360	432	504	576	720	864	1008
			NC	-	-	16	21	26	30	36	42	46
			Throw 0°	9-15-27	13-19-31	16-24-35	19-27-38	23-29-41	25-31-44	28-35-49	31-38-54	34-41-58
			Throw 22.5° (ft)	7-11-21	10-15-24	12-19-27	15-21-30	17-23-32	20-24-34	22-27-38	24-30-42	26-32-45
22x6	0.92	0.77	cfm	231	308	385	462	539	616	770	924	1078
			NC	-	-	16	21	26	30	37	42	47
			Throw 0°	9-15-28	13-20-32	17-25-36	20-28-40	23-30-43	26-32-46	29-36-51	32-40-56	35-43-60
			Throw 22.5° (ft)	7-12-22	10-16-25	13-19-28	16-22-31	18-23-33	20-25-35	23-28-40	25-31-43	27-33-47
24x6 18x8 12x12	1.00	0.88	cfm	264	352	440	528	616	704	880	1056	1232
			NC	-	-	16	22	26	30	37	43	47
			Throw 0°	10-16-30	14-21-34	18-27-39	21-30-42	25-32-46	28-34-49	31-39-55	34-42-60	37-46-65
			Throw 22.5° (ft)	8-12-23	11-17-27	14-21-30	17-23-33	19-25-35	22-27-38	24-30-42	27-33-46	29-35-50
30x6 18x10	1.25	1.11	cfm	333	444	555	666	777	888	1110	1332	1554
			NC	-	11	17	23	27	31	38	44	48
			Throw 0°	11-18-34	16-24-39	20-30-43	24-34-47	28-36-51	32-39-55	35-43-61	39-47-67	42-51-72
			Throw 22.5° (ft)	9-14-26	12-19-30	16-23-34	19-26-37	22-28-40	25-30-42	27-34-47	30-37-52	32-40-56
			cfm	333	444	555	666	777	888	1110	1332	1554
			NC	-	11	17	23	27	31	38	44	48
			Throw 22.5° (ft)	9-14-26	12-19-30	16-23-34	19-26-37	22-28-40	25-30-42	27-34-47	30-37-52	32-40-56
			Throw 45°	5-8-15	7-11-17	9-14-19	11-15-21	13-16-23	14-17-25	16-19-28	17-21-30	19-23-33

Performance notes appear at end of table

92HVO, 92HVV, 92VHO, 92VHV (Page 7, 8)

Performance based on nominal sizes shown in bold

Nom. Duct Size (in.)	Nom. Duct Area (ft ²)	Core Area (ft ²)	NC-20				NC-30			NC-40		NC-50
			Core Vel.	300	400	500	600	700	800	1000	1200	1400
			Vel. Press.	0.006	0.010	0.016	0.022	0.031	0.040	0.062	0.090	0.122
14x14	1.36	1.22	Total	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Press.	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			0°	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			22.5°	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
36x6 27x8 18x12	1.50	1.35	cfm	405	540	675	810	945	1080	1350	1620	1890
			NC	-	12	18	24	28	32	39	44	49
			0°	12-20-37	18-26-43	22-33-48	26-37-52	31-40-57	35-43-60	39-48-68	43-52-74	46-57-80
			Throw (ft)	22.5° 10-15-29	14-21-33	17-26-37	21-29-41	24-31-44	27-33-47	30-37-52	33-41-57	36-44-62
22x10	1.53	1.37	cfm	411	548	685	822	959	1096	1370	1644	1918
			NC	-	12	18	24	28	32	39	44	49
			0°	12-20-37	18-27-43	22-33-48	27-37-53	31-40-57	35-43-61	39-48-68	43-53-75	46-57-81
			Throw (ft)	22.5° 10-16-29	14-21-33	17-26-37	21-29-41	24-31-44	27-33-47	30-37-53	33-41-58	36-44-62
30x8 24x10	1.67	1.49	cfm	447	596	745	894	1043	1192	1490	1788	2086
			NC	-	12	19	24	29	33	39	45	49
			0°	13-21-39	19-28-45	23-35-50	28-39-55	32-42-59	37-45-63	41-50-71	45-55-78	48-59-84
			Throw (ft)	22.5° 10-16-30	14-22-35	18-27-39	22-30-43	25-33-46	28-35-49	32-39-55	35-43-60	38-46-65
42x6 18x14	1.75	1.59	cfm	477	636	795	954	1113	1272	1590	1908	2226
			NC	-	12	19	24	29	33	40	45	50
			0°	13-22-40	19-29-46	24-36-52	29-40-57	34-43-61	38-46-66	42-52-73	46-57-80	50-61-87
			Throw (ft)	22.5° 10-17-31	15-22-36	19-28-40	22-31-44	26-34-48	29-36-51	34-40-57	36-44-62	39-48-67
16x16	1.78	1.62	cfm	486	648	810	972	1134	1296	1620	1944	2268
			NC	-	12	19	24	29	33	40	45	50
			0°	14-22-41	19-29-47	24-36-52	29-41-57	34-44-62	38-47-66	43-52-74	47-57-81	51-62-88
			Throw (ft)	22.5° 11-17-31	15-22-36	19-28-41	22-31-44	26-34-48	30-36-51	34-41-57	36-44-63	39-48-68
48x6 36x8 24x12 18x16	2.00	1.82	cfm	546	728	910	1092	1274	1456	1820	2184	2548
			NC	-	13	19	25	30	34	40	46	50
			0°	14-23-43	20-31-50	26-38-55	31-43-61	36-46-66	41-50-70	45-55-78	50-61-86	54-66-93
			Throw (ft)	22.5° 11-18-33	16-24-38	20-30-43	24-33-47	28-36-51	31-38-54	35-43-61	38-47-67	42-51-72
18x18	2.25	2.07	cfm	621	828	1035	1242	1449	1656	2070	2484	2898
			NC	-	13	20	25	30	34	41	46	51
			0°	15-25-46	22-33-53	27-41-59	33-46-65	38-49-70	43-53-75	48-59-84	53-65-92	57-70-99
			Throw (ft)	22.5° 12-19-36	17-25-41	21-32-46	25-36-50	30-38-54	33-41-58	37-46-65	41-50-71	44-54-77
42x8 24x14	2.33	2.14	cfm	642	856	1070	1284	1498	1712	2140	2568	2996
			NC	-	13	20	26	30	34	41	46	51
			0°	16-25-47	22-33-54	28-42-60	33-47-66	39-50-71	44-54-76	49-60-85	54-66-93	58-71-101
			Throw (ft)	22.5° 12-19-36	17-26-42	22-32-47	26-36-51	30-39-55	34-42-59	38-47-66	42-51-72	45-55-78
36x10 30x12	2.50	2.29	cfm	687	916	1145	1374	1603	1832	2290	2748	3206
			NC	-	14	20	26	30	34	41	47	51
			0°	16-26-48	23-34-56	29-43-62	34-48-68	40-52-74	45-56-79	51-62-88	56-68-96	60-74-104
			Throw (ft)	22.5° 12-20-37	18-27-43	22-33-48	27-37-53	31-40-57	35-43-61	39-48-68	43-53-75	47-57-81
48x8 24x16	2.67	2.46	cfm	738	984	1230	1476	1722	1968	2460	2952	3444
			NC	-	14	21	26	31	35	41	47	51
			0°	17-27-50	24-36-58	30-45-64	36-50-71	42-54-76	47-58-82	53-64-91	58-71-100	62-76-108
			Throw (ft)	22.5° 13-21-39	18-28-45	23-35-50	28-39-55	32-42-59	36-45-63	41-50-71	45-55-77	48-59-84
20x20	2.78	2.57	cfm	771	1028	1285	1542	1799	2056	2570	3084	3598
			NC	-	14	21	26	31	35	42	47	52
			0°	17-27-51	24-37-59	30-46-66	37-51-72	43-55-78	48-59-83	54-66-93	59-72-102	64-78-110
			Throw (ft)	22.5° 13-21-40	19-28-46	24-35-51	28-40-56	33-43-60	37-46-65	42-51-72	46-56-79	49-60-85
36x12 24x18	3.00	2.75	cfm	825	1100	1375	1650	1925	2200	2750	3300	3850
			NC	-	15	21	27	31	35	42	47	52
			0°	18-28-53	25-38-61	31-47-68	38-53-75	44-57-81	50-61-86	56-68-96	61-75-106	66-81-114
			Throw (ft)	22.5° 14-22-41	20-29-47	24-37-53	29-41-58	34-44-63	39-47-67	43-53-75	47-58-82	51-63-88

Performance notes appear at end of table

92HVO, 92HVV, 92VHO, 92VHV (Page 7, 8)
Performance based on nominal sizes shown in bold

Nom. Duct Size (in.)	Nom. Duct Area (ft ²)	Core Area (ft ²)	NC-20		NC-30		NC-40		NC-50			
			Core Vel.	300	400	500	600	700	800	1000	1200	1400
			Vel. Press.	0.006	0.010	0.016	0.022	0.031	0.040	0.062	0.090	0.122
48x10 30x16 24x20	3.33	3.11	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
22x22	3.36	3.14	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
42x12 36x14	3.50	3.22	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
24x22	3.67	3.43	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
30x18	3.75	3.5	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
48x12 36x16 24x24	4.00	3.75	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
36x18	4.50	4.22	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
36x20 30x24	5.00	4.71	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
42x18	5.25	4.94	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
28x28	5.44	5.16	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
42x20 30x28	5.83	5.51	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
48x18 36x24	6.00	5.66	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354
30x30	6.25	5.94	0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
			cfm	933	1244	1555	1866	2177	2488	3110	3732	4354

Performance notes appear at end of table

92HVO, 92HVV, 92VHO, 92VHV (Page 7, 8)

Performance based on nominal sizes shown in bold

Nom. Duct Size (in.)	Nom. Duct Area (ft²)	Core Area (ft²)	Core Vel. Vel. Press.	NC-20		NC-30		NC-40			NC-50	
				300	400	500	600	700	800	1000	1200	1400
				0°	22.5°	45°	0°	22.5°	45°	0°	22.5°	45°
42x24 36x28	7.00	6.66	Total	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Press.	0.006	0.010	0.016	0.022	0.031	0.040	0.062	0.090	0.122
			0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			22.5°	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
46x22	7.03	6.68	Total	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press.	0.006	0.010	0.016	0.022	0.031	0.040	0.062	0.090	0.122
			0°	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			22.5°	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
32x32	7.11	6.78	cfm	1998	2664	3330	3996	4662	5328	6660	7992	9324
			NC	-	18	25	30	35	39	46	51	56
			0°	28-44-82	39-59-95	49-74-106	59-82-116	69-89-126	77-95-134	87-106-150	95-116-164	102-126-178
			22.5°	21-34-64	30-46-74	38-57-82	46-64-90	53-69-97	60-74-104	67-82-116	74-90-127	79-97-138
36x30	7.50	7.16	cfm	2004	2672	3340	4008	4676	5344	6680	8016	9352
			NC	-	18	25	30	35	39	46	51	56
			0°	28-44-82	39-59-95	49-74-106	59-82-116	69-89-126	78-95-134	87-106-150	95-116-165	103-126-178
			22.5°	21-34-64	30-46-74	38-57-82	46-64-90	53-69-97	60-74-104	67-82-116	74-90-128	80-97-138
48x24 36x32	8.00	7.63	cfm	2034	2712	3390	4068	4746	5424	6780	8136	9492
			NC	-	18	25	30	35	39	46	51	56
			0°	28-45-83	40-59-96	49-74-107	59-83-117	69-90-127	78-96-135	87-107-151	96-117-166	103-127-179
			22.5°	22-34-64	31-46-74	38-57-83	46-64-91	54-69-98	61-74-105	68-83-117	74-91-129	80-98-139
34x34	8.03	7.68	cfm	2148	2864	3580	4296	5012	5728	7160	8592	10024
			NC	-	19	25	31	35	39	46	51	56
			0°	29-46-85	41-61-98	51-76-110	61-85-121	71-92-130	80-98-139	90-110-156	98-121-170	106-130-184
			22.5°	22-35-66	32-47-76	39-59-85	47-66-93	55-71-101	62-76-108	70-85-121	76-93-132	82-101-143
42x30	8.75	8.38	cfm	2289	3052	3815	4578	5341	6104	7630	9156	10682
			NC	-	19	25	31	35	39	46	52	56
			0°	29-47-88	42-63-102	52-79-114	63-88-124	73-95-134	83-102-144	93-114-161	102-124-176	110-134-190
			22.5°	23-37-68	33-49-79	41-61-88	49-68-96	57-74-104	64-79-111	72-88-124	79-96-136	85-104-147
36x34	8.50	8.14	cfm	2304	3072	3840	4608	5376	6144	7680	9216	10752
			NC	-	19	25	31	36	40	46	52	56
			0°	30-47-88	42-63-102	53-79-114	63-88-125	74-95-135	83-102-144	93-114-161	102-125-176	110-135-191
			22.5°	23-37-68	33-49-79	41-61-88	49-68-97	57-74-104	64-79-112	72-88-125	79-97-137	85-104-148
42x34 48x30	10.00	9.6	cfm	2442	3256	4070	4884	5698	6512	8140	9768	11396
			NC	-	19	26	31	36	40	46	52	56
			0°	30-49-91	43-65-105	54-81-117	65-91-128	76-98-139	86-105-148	96-117-166	105-128-182	113-139-196
			22.5°	24-38-70	34-50-81	42-63-91	50-70-100	59-76-108	66-81-115	74-91-129	81-100-141	88-108-152
36x36	9.00	8.63	cfm	2514	3352	4190	5028	5866	6704	8380	10056	11732
			NC	11	19	26	31	36	40	47	52	57
			0°	31-49-92	44-66-106	55-82-119	66-92-130	77-100-141	87-106-151	97-119-168	106-130-184	115-141-199
			22.5°	24-38-71	34-51-82	43-64-92	51-71-101	60-77-109	67-82-117	75-92-130	82-101-143	89-109-154
38x38	10.03	9.64	cfm	2589	3452	4315	5178	6041	6904	8630	10356	12082
			NC	11	19	26	31	36	40	47	52	57
			0°	31-50-94	45-67-108	56-84-121	67-94-132	78-101-143	88-108-153	99-121-171	108-132-187	117-143-202
			22.5°	24-39-72	35-52-84	43-65-94	52-72-103	61-78-111	68-84-118	76-94-132	84-103-145	90-111-157
42x36	10.50	10.1	cfm	2892	3856	4820	5784	6748	7712	9640	11568	13496
			NC	11	20	26	32	36	40	47	53	57
			0°	33-53-99	47-71-114	59-88-127	71-99-140	82-107-151	93-114-161	104-127-180	114-140-197	123-151-213
			22.5°	26-41-77	37-55-88	46-69-99	55-76-108	64-83-117	72-88-125	81-99-140	88-108-153	95-117-165
46x34	10.86	10.45	cfm	3030	4040	5050	6060	7070	8080	10100	12120	14140
			NC	11	20	27	32	37	41	47	53	57
			0°	34-54-101	48-72-117	60-91-131	72-101-143	85-109-155	95-117-165	107-131-185	117-143-202	126-155-219
			22.5°	26-42-78	37-56-91	47-70-101	56-78-111	65-85-120	74-91-128	83-101-143	91-111-157	98-120-169
46x34	10.86	10.45	cfm	3135	4180	5225	6270	7315	8360	10450	12540	14630
			NC	11	20	27	32	37	41	47	53	58
			0°	34-55-103	49-74-119	61-92-133	74-103-146	86-111-157	97-119-168	109-133-188	119-146-206	128-157-222
			22.5°	27-43-80	38-57-92	48-71-103	57-80-113	67-86-122	75-92-130	84-103-146	92-113-160	99-122-172
46x34	10.86	10.45	cfm	3135	4180	5225	6270	7315	8360	10450	12540	14630
			NC	11	20	27	32	37	41	47	53	58
			0°	34-55-103	49-74-119	61-92-133	74-103-146	86-111-157	97-119-168	109-133-188	119-146-206	128-157-222
			22.5°	27-43-80	38-57-92	48-71-103	57-80-113	67-86-122	75-92-130	84-103-146	92-113-160	99-122-172
46x34	10.86	10.45	cfm	3135	4180	5225	6270	7315	8360	10450	12540	14630
			NC	11	20	27	32	37	41	47	53	58
			0°	34-55-103	49-74-119	61-92-133	74-103-146	86-111-157	97-119-168	109-133-188	119-146-206	128-157-222
			22.5°	27-43-80	38-57-92	48-71-103	57-80-113	67-86-122	75-92-130	84-103-146	92-113-160	99-122-172
46x34	10.86	10.45	cfm	3135	4180	5225	6270	7315	8360	10450	12540	14630
			NC	11	20	27	32	37	41	47	53	58
			0°	34-55-103	49-74-119	61-92-133	74-103-146	86-111-157	97-119-168	109-133-188	119-146-206	128-157-222
			22.5°	27-43-80	38-57-92	48-71-103	57-80-113	67-86-122	75-92-130	84-103-146	92-113-160	99-122-172

Performance notes appear at end of table

92HVO, 92HVV, 92VHO, 92VHV (Page 7, 8)
 Performance based on nominal sizes shown in bold

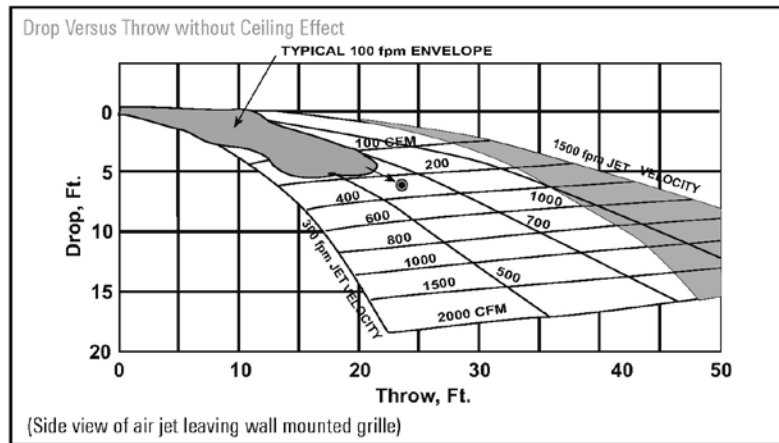
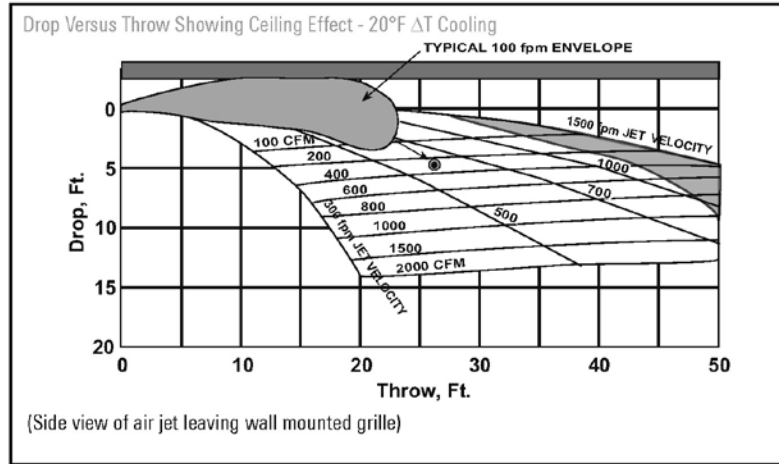
Nom. Duct Size (in.)	Nom. Duct Area (ft ²)	Core Area (ft ²)	NC-20		NC-30			NC-40			NC-50	
			Core Vel.	300	400	500	600	700	800	1000	1200	1400
			Vel. Press.	0.006	0.010	0.016	0.022	0.031	0.040	0.062	0.090	0.122
			0°	0.016	0.029	0.046	0.066	0.090	0.117	0.183	0.263	0.358
			Throw 22.5°	0.018	0.033	0.051	0.074	0.100	0.131	0.204	0.294	0.401
			Press. 45°	0.028	0.049	0.077	0.111	0.152	0.198	0.309	0.445	0.606
42x38	11.08	10.67	cfm	3201	4268	5335	6402	7469	8536	10670	12804	14938
			NC	12	20	27	32	37	41	48	53	58
			0°	35-56-104	50-74-120	62-93-134	74-104-147	87-112-159	98-120-170	110-134-190	120-147-208	130-159-225
			Throw (ft) 45°	16-25-47	22-34-54	28-42-60	34-47-66	39-51-71	44-54-76	49-60-85	54-66-94	58-71-101
40x40	11.11	10.7	cfm	3210	4280	5350	6420	7490	8560	10700	12840	14980
			NC	12	20	27	32	37	41	48	53	58
			0°	35-56-104	50-75-120	62-93-134	75-104-147	87-113-159	98-120-170	110-134-190	120-147-208	130-159-225
			Throw (ft) 45°	16-25-47	22-34-54	28-42-61	34-47-66	39-51-72	44-54-77	49-61-86	54-66-94	58-72-101
48x36	12.00	11.57	cfm	3471	4628	5785	6942	8099	9256	11570	13884	16198
			NC	12	21	27	33	37	41	48	53	58
			0°	36-58-108	52-78-125	65-97-140	78-108-153	90-117-165	102-125-177	114-140-198	125-153-217	135-165-234
			Throw (ft) 45°	16-25-49	23-35-56	29-44-63	35-49-69	41-53-74	46-56-80	51-63-89	56-69-97	61-74-105
42x42	12.25	11.82	cfm	3546	4728	5910	7092	8274	9456	11820	14184	16548
			NC	12	21	27	33	37	41	48	53	58
			0°	37-59-109	52-78-126	65-98-141	78-109-155	91-118-167	103-126-179	115-141-200	126-155-219	137-167-236
			Throw (ft) 45°	16-26-49	24-35-57	29-44-64	35-49-70	41-53-75	46-57-80	52-64-90	57-70-99	61-75-106
44x44	13.44	12.99	cfm	3897	5196	6495	7794	9093	10392	12990	15588	18186
			NC	12	21	28	33	38	42	48	54	58
			0°	38-62-115	55-82-133	68-103-148	82-115-162	96-124-175	108-133-187	121-148-210	133-162-230	143-175-248
			Throw (ft) 45°	17-28-52	25-37-60	31-46-67	37-52-73	43-56-79	49-60-84	54-67-94	60-73-103	64-79-112
48x42	14.00	13.54	cfm	4062	5416	6770	8124	9478	10832	13540	16248	18956
			NC	13	21	28	33	38	42	49	54	59
			0°	39-63-117	56-84-135	70-105-151	84-117-166	98-127-179	110-135-191	124-151-214	135-166-234	146-179-253
			Throw (ft) 45°	18-28-53	25-38-61	31-47-68	38-53-75	44-57-81	50-61-86	56-68-96	61-75-105	66-81-114
46x46	14.69	14.22	cfm	4266	5688	7110	8532	9954	11376	14220	17064	19908
			NC	13	21	28	33	38	42	49	54	59
			0°	40-64-120	57-86-139	72-107-155	86-120-170	100-130-183	113-139-196	127-155-219	139-170-240	150-183-259
			Throw (ft) 45°	18-29-54	26-39-62	32-48-70	39-54-76	45-58-83	51-62-88	57-70-99	62-76-108	67-83-117
48x46	15.33	14.85	cfm	4455	5940	7425	8910	10395	11880	14850	17820	20790
			NC	13	22	28	34	38	42	49	54	59
			0°	41-66-123	59-88-142	73-110-158	88-123-174	102-133-187	116-142-200	129-158-224	142-174-245	153-187-265
			Throw (ft) 45°	18-30-55	26-40-64	33-49-71	40-55-78	46-60-84	52-64-90	58-71-101	64-78-110	69-84-119
48x48	16.00	15.50	cfm	4650	6200	7750	9300	10850	12400	15500	18600	21700
			NC	13	22	28	34	38	42	49	55	59
			0°	42-67-125	60-90-145	75-112-162	90-125-177	105-135-192	118-145-205	132-162-229	145-177-251	156-192-271
			Throw (ft) 45°	19-30-56	27-40-65	34-50-73	40-56-80	47-61-86	53-65-92	59-73-103	65-80-113	70-86-122

- 0°, 22.5° & 45° represent blade deflection angles
- Performance data is based on duct sizes in bold, the performance varies slightly for duct sizes not shown in bold
- See the section, Engineering Guidelines, for drop information when selecting larger supply grilles for cooling purposes
- See the "Performance Notes" portion in this section for notes and correction factors
- See the section, Engineering Guidelines, for catalog throw information
- Each NC value represents the noise criteria curve that will not be exceeded by the sound pressure in any of the octave bands, 2 through 7, with a room absorption of 10 dB, re 10⁻¹² watts

92HVO, 92HVV, 92VHO, 92VHV (Page 7, 8)

PERFORMANCE NOTES

- Performance data includes damper
- Data obtained from tests conducted in accordance with ANSI/ASHRAE Standard 70-2006
- All pressures are in inches of water
- Core velocities are in feet per minute
- Throw values given are for isothermal terminal velocities of 150, 100 and 50 fpm
- Each NC value represents the noise criterion curve that will not be exceeded by the sound pressure in any of the octave bands, 2 through 7. Each NC value is based on a room absorption of 10 dB, re 10⁻¹² watts. Each NC value is further based on grille operating at a 0° deflection. Settings of 22½° or 45°, increase the stated sound levels by 1 or 7 NC, respectively.
- Bold dividing lines on H12-H16 denote ranges of NC values
- The stated deflection settings refer to the horizontal setting of the blade's deflection angle. For a 20° upward deflection, use the throw rating for the 0° setting and the total pressure for the 22½° horizontal setting.
- Dash (—) in space indicates NC value less than 10
- For additional information concerning drop and throw, see the Engineering Guidelines section of this catalog



VARIABLE AIR VOLUME

APPLICATIONS

All supply grilles can be applied to variable air volume systems with excellent results. For detailed selection methods, consult your Titus representative or the Engineering Guidelines section of this catalog.

Correction Factors for Supply Grilles

Damper	A_x/A_c	Throw	Total Pressure	NC
With	0.77	1.00	1.00	0
Without	0.82	0.98	0.88	-2

Note: Throw and total pressure corrections are multipliers. The NC correction is an addition. A_x is the flow factor. A_c is the core area from the main table.

92HVO, 92HVV, 92VHO, 92VHV (Page 7, 8)

HORIZONTAL DEFLECTION (SPREAD)

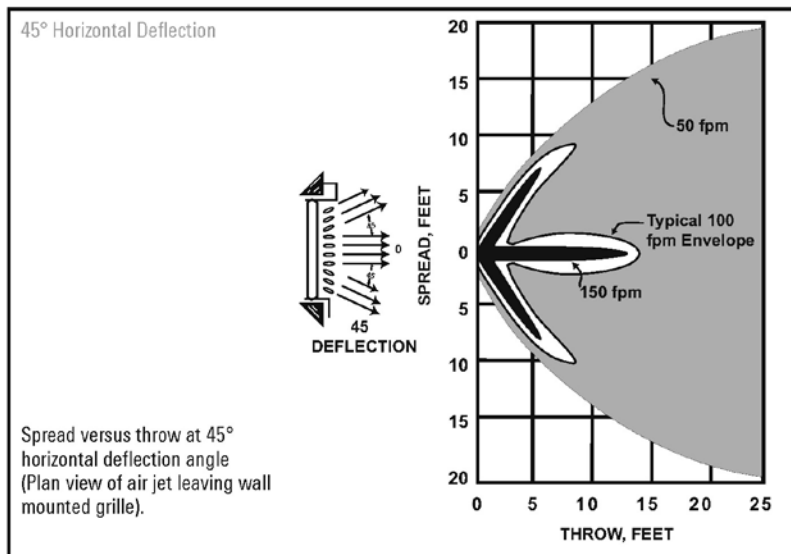
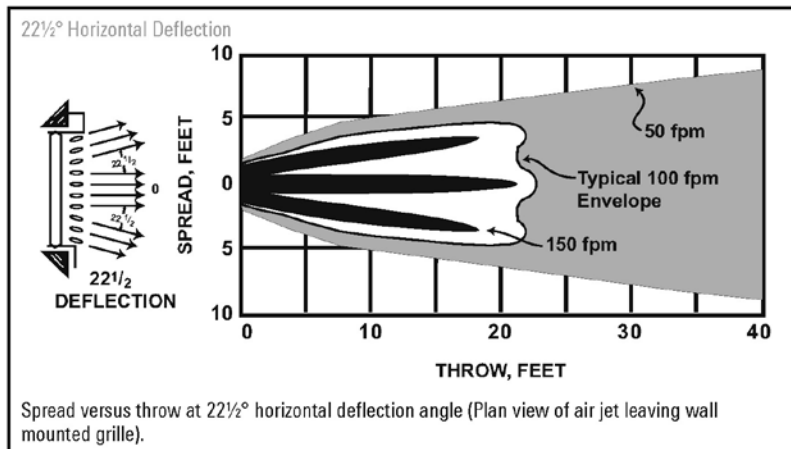
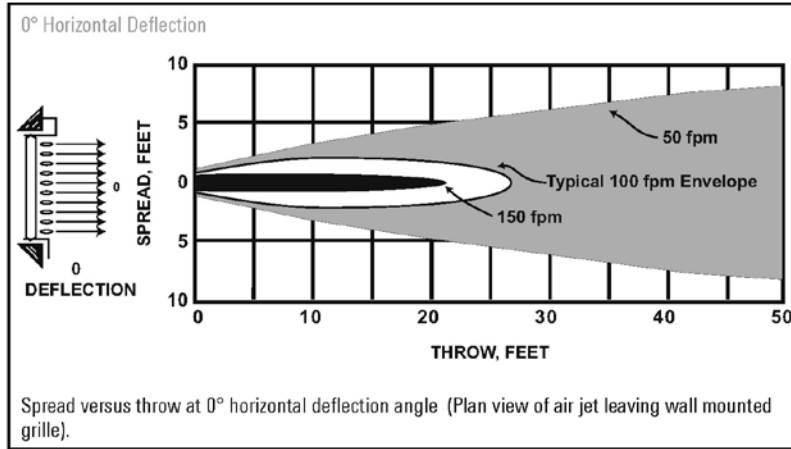
SUPPLY GRILLES

The figures depicting deflection, throw and drop are based on actual tests conducted by Titus. They show the relationship of spread to throw for a typical high side-wall supply outlet selection.

Notice the outer shaded area represents the 50 fpm isovel, the white area, the 100 fpm isovel, and the inner area, the 150 fpm isovel.

The spread angle also affects the airstream drop amount. Always consider for any given temperature, volume and core velocity; the wider spread results in a smaller drop. See section, Engineering Guidelines, for more drop, throw and spread relationship information.

Grilles can be selected with a single set of blades for adjusting either horizontal or vertical deflection, or with two sets of blades for adjusting both horizontal and vertical deflections.



94A Series: 94A, 94AHOV, 94AT, 94HOV Return Air Grilles & Registers (Page 9-10, 56)
 96AFB Steel Fixed-Bar Filter Grille (Page 10)
 Performance based on nominal sizes shown in bold

NC-20

Nominal Duct Size (in.)	Nominal Duct Area (ft ²)	Core Area (ft ²)	Core Velocity Velocity Pressure Neg. Static Pressure	100	200	300	400	500	600	700	800	900
				0.001 0.002	0.002 0.008	0.006 0.018	0.010 0.032	0.016 0.051	0.022 0.073	0.031 0.099	0.040 0.130	0.050 0.164
6x6	0.25	0.19	Airflow, cfm NC	19 -	38 -	57 -	76 -	95 -	114 13	133 19	152 25	171 29
8x6	0.33	0.26	Airflow, cfm NC	26 -	52 -	78 -	104 -	130 -	156 15	182 20	208 26	234 30
10x6	0.42	0.34	Airflow, cfm NC	34 -	68 -	102 -	136 -	170 -	204 16	238 21	272 28	306 32
8x8	0.44	0.37	Airflow, cfm NC	37 -	74 -	111 -	148 -	185 -	222 16	259 22	296 28	333 32
12x6	0.5	0.41	Airflow, cfm NC	41 -	82 -	123 -	164 -	205 -	246 17	287 22	328 30	369 34
14x6	0.58	0.48	Airflow, cfm NC	48 -	96 -	144 -	192 -	240 -	288 18	336 24	384 30	432 34
16x6 12x8	0.67 0.57	0.57 0.57	Airflow, cfm NC	57 -	114 -	171 -	228 -	285 10	342 19	399 25	456 30	513 35
10x10	0.69	0.59	Airflow, cfm NC	59 -	118 -	177 -	236 -	295 10	354 19	413 25	472 31	531 35
18x6	0.75	0.63	Airflow, cfm NC	63 -	126 -	189 -	252 -	315 10	378 19	441 25	504 32	567 35
20x6 12x10	0.83 0.72	0.72 0.72	Airflow, cfm NC	72 -	144 -	216 -	288 -	360 11	432 19	504 25	576 30	648 35
22x6	0.92	0.77	Airflow, cfm NC	77 -	154 -	231 -	308 -	385 11	462 19	539 25	616 30	693 35
24x6 12x12	1 0.88	0.88 0.88	Airflow, cfm NC	88 -	176 -	264 -	352 -	440 11	528 19	616 25	704 30	792 35
30x6 18x10	1.25 1.11	1.11 1.11	Airflow, cfm NC	111 -	222 -	333 -	444 -	555 12	666 20	777 26	888 32	999 35
14x14	1.36	1.22	Airflow, cfm NC	122 -	244 -	366 -	488 -	610 12	732 20	854 27	976 32	1098 35
36x6 18x12	1.5 1.35	1.35 1.35	Airflow, cfm NC	135 -	270 -	405 -	540 -	675 13	810 20	945 27	1080 32	1215 35
22x10	1.53	1.37	Airflow, cfm NC	137 -	274 -	411 -	548 -	685 13	822 20	959 27	1096 32	1233 36
30x8 24x10	1.67 1.49	1.49 1.49	Airflow, cfm NC	149 -	298 -	447 -	596 -	745 14	894 21	1043 27	1192 33	1341 37
42x6 18x14	1.75 1.59	1.59 1.59	Airflow, cfm NC	159 -	318 -	477 -	636 -	795 14	954 21	1113 27	1272 33	1431 37
16x16	1.78	1.62	Airflow, cfm NC	162 -	324 -	486 -	648 -	810 14	972 21	1134 27	1296 33	1458 37
24x12 18x16	2 1.82	1.82 1.82	Airflow, cfm NC	182 -	364 -	546 -	728 -	910 14	1092 21	1274 28	1456 33	1638 38
18x18	2.25	2.07	Airflow, cfm NC	207 -	414 -	621 -	828 -	1035 14	1242 21	1449 28	1656 33	1863 38
24x14	2.33	2.14	Airflow, cfm NC	214 -	428 -	642 -	856 -	1070 14	1284 22	1498 28	1712 33	1926 38
30x12	2.5	2.29	Airflow, cfm NC	229 -	458 -	687 -	916 -	1145 15	1374 22	1603 28	1832 33	2061 38
24x16	2.67	2.46	Airflow, cfm NC	246 -	492 -	738 -	984 -	1230 15	1476 22	1722 29	1968 34	2214 39
20x20	2.78	2.57	Airflow, cfm NC	257 -	514 -	771 -	1028 -	1285 16	1542 23	1799 29	2056 34	2313 39
36x12 30x16 24x20	3 3.33 3.11	2.75 3.11 3.11	Airflow, cfm NC	275 -	550 -	825 -	1100 -	1375 16	1650 23	1925 29	2200 34	2475 39
22x22	3.36	3.14	Airflow, cfm NC	311 -	622 -	933 -	1244 -	1555 17	1866 24	2177 30	2488 35	2799 40
42x12 36x14	3.5 3.22	3.14 3.22	Airflow, cfm NC	314 -	628 -	942 -	1256 -	1570 17	1884 24	2198 30	2512 35	2826 40
24x22	3.67	3.43	Airflow, cfm NC	322 -	644 -	966 -	1288 -	1610 17	1932 24	2254 30	2576 36	2898 40
30x18	3.75	3.5	Airflow, cfm NC	343 -	686 -	1029 -	1372 -	1715 17	2058 24	2401 30	2744 36	3087 40
			Airflow, cfm NC	350 -	700 -	1050 -	1400 -	1750 17	2100 24	2450 30	2800 36	3150 40

NC-30

NC-40

• Static pressures are negative, in inches of water, measured per ANSI/ASHRAE Standard 70-2006

• NC based on room absorption of 10 dB, re 10⁻¹² watts, measured per ANSI/ASHRAE Standard 70-2006

94A Series: 94A, 94AHOV, 94AT, 94HOV Return Air Grilles & Registers (Page 9-10, 56)
 96AFB Steel Fixed-Bar Filter Grille (Page 10)
 Performance based on nominal sizes shown in bold

Nominal Duct Size (in.)	Nominal Duct Area (ft ²)	Core Area (ft ²)	Core Velocity Velocity Pressure Neg. Static Pressure	100		200		300		400		500		600		700		800		900	
				0.001 0.002	0.002 0.008	0.006 0.018	0.010 0.032	0.016 0.051	0.022 0.073	0.031 0.099	0.040 0.130	0.050 0.164									
48x12 24x24	4	3.75	Airflow, cfm NC	375 -	750 -	1125 -	1500 -	1875 18	2250 25	2625 37	3000 38	3375 41									
36x18	4.5	4.22	Airflow, cfm NC	422 -	844 -	1266 -	1688 -	2110 18	2532 25	2954 31	3376 38	3798 41									
36x20 30x24	5	4.71	Airflow, cfm NC	471 -	942 -	1413 -	1884 -	2355 18	2826 25	3297 31	3768 38	4239 41									
42x18	5.25	4.94	Airflow, cfm NC	494 -	988 -	1482 -	1976 -	2470 18	2964 25	3458 31	3952 38	4446 41									
28x28	5.44	5.16	Airflow, cfm NC	516 -	1032 -	1548 -	2064 -	2580 18	3096 25	3612 32	4128 38	4644 41									
42x20 30x28	5.83	5.51	Airflow, cfm NC	551 -	1102 -	1653 -	2204 10	2755 18	3306 26	3857 32	4408 38	4959 41									
48x18 36x24	6	5.66	Airflow, cfm NC	566 -	1132 -	1698 -	2264 10	2830 18	3396 26	3962 32	4528 38	5094 41									
30x30	6.25	5.94	Airflow, cfm NC	594 -	1188 -	1782 -	2376 10	2970 18	3564 26	4158 32	4752 38	5346 41									
42x24 36x28	7	6.66	Airflow, cfm NC	666 -	1332 -	1998 -	2664 10	3330 19	3996 26	4662 32	5328 38	5994 41									
46x22	7.03	6.68	Airflow, cfm NC	668 -	1336 -	2004 -	2672 10	3340 19	4008 27	4676 32	5344 38	6012 42									
32x32	7.11	6.78	Airflow, cfm NC	678 -	1356 -	2034 -	2712 10	3390 19	4068 27	4746 32	5424 38	6102 42									
36x30	7.5	7.16	Airflow, cfm NC	716 -	1432 -	2148 -	2864 10	3580 19	4296 27	5012 32	5728 38	6444 42									
48x24 36x32	8	7.63	Airflow, cfm NC	763 -	1526 -	2289 -	3052 10	3815 19	4578 27	5341 32	6104 38	6867 42									
34x34	8.03	7.68	Airflow, cfm NC	768 -	1536 -	2304 -	3072 10	3840 19	4608 27	5376 32	6144 38	6912 42									
36x34	8.5	8.14	Airflow, cfm NC	814 -	1628 -	2442 -	3256 11	4070 19	4884 27	5698 32	6512 38	7326 42									
42x30	8.75	8.38	Airflow, cfm NC	838 -	1676 -	2514 -	3352 11	4190 20	5028 27	5866 32	6704 38	7542 42									
36x36	9	8.63	Airflow, cfm NC	863 -	1726 -	2589 -	3452 11	4315 20	5178 27	6041 33	6904 38	7767 43									
42x34 48x30	10	9.6	Airflow, cfm NC	960 -	1920 -	2880 -	3840 11	4800 20	5760 27	6720 33	7680 38	8640 43									
38x38	10.03	9.64	Airflow, cfm NC	964 -	1928 -	2892 -	3856 11	4820 20	5784 27	6748 33	7712 38	8676 43									
42x36	10.5	10.1	Airflow, cfm NC	1010 -	2020 -	3030 -	4040 11	5050 20	6060 27	7070 33	8080 38	9090 43									
46x34	10.86	10.45	Airflow, cfm NC	1045 -	2090 -	3135 -	4180 11	5225 20	6270 27	7315 33	8360 38	9405 43									
42x38	11.08	10.67	Airflow, cfm NC	1067 -	2134 -	3201 -	4268 11	5335 20	6402 27	7469 33	8536 38	9603 43									
40x40	11.11	10.7	Airflow, cfm NC	1070 -	2140 -	3210 -	4280 11	5350 20	6420 27	7490 33	8560 38	9630 43									
48x36	12	11.57	Airflow, cfm NC	1157 -	2314 -	3471 -	4628 11	5785 20	6942 27	8099 33	9256 39	10413 44									
42x42	12.25	11.82	Airflow, cfm NC	1182 -	2364 -	3546 -	4728 11	5910 20	7092 27	8274 33	9456 39	10638 44									
44x44	13.44	12.99	Airflow, cfm NC	1299 -	2598 -	3897 -	5196 12	6495 21	7794 28	9093 34	10392 39	11691 44									
48x42	14	13.54	Airflow, cfm NC	1354 -	2708 -	4062 -	5416 12	6770 21	8124 28	9478 34	10832 40	12186 45									
46x46	14.69	14.22	Airflow, cfm NC	1422 -	2844 -	4266 -	5688 12	7110 21	8532 28	9954 35	11376 40	12798 45									
48x46	15.33	14.85	Airflow, cfm NC	1485 -	2970 -	4455 -	5940 12	7425 22	8910 28	10395 35	11880 40	13365 45									
48x48	16	15.5	Airflow, cfm NC	1550 -	3100 -	4650 -	6200 13	7750 22	9300 29	10850 35	12400 40	13950 45									

- Static pressures are negative, in inches of water, measured per ANSI/ASHRAE Standard 70-2006
- NC based on room absorption of 10 dB, re 10⁻¹² watts, measured per ANSI/ASHRAE Standard 70-2006

94A Series: 94A, 94AHOV, 94AT, 94HOV Return Air Grilles & Registers (Page 9-10, 56)
96AFB Steel Fixed-Bar Filter Grille (Page 10)
 Performance based on nominal sizes shown in bold

Nominal Duct Size (in.)	Nominal Duct Area (ft ²)	Core Area (ft ²)	Core Velocity Velocity Pressure Neg. Static Pressure	300		400		500		600		700		900		1100		1300		1500	
				0.006 0.012	0.010 0.022	0.016 0.034	0.022 0.049	0.031 0.067	0.050 0.111	0.075 0.165	0.105 0.231	0.140 0.307	NC-10	NC-20	NC-30	NC-40					
6x6	0.25	0.19	Airflow, cfm NC	57 -	76 -	95 -	114 -	133 13	171 20	209 26	247 31	285 35									
8x6	0.33	0.26	Airflow, cfm NC	78 -	104 -	130 -	156 -	182 14	234 22	286 27	338 32	390 36									
10x6	0.42	0.34	Airflow, cfm NC	102 -	136 -	170 -	204 11	238 16	306 23	374 28	442 33	510 37									
8x8	0.44	0.37	Airflow, cfm NC	111 -	148 -	185 -	222 12	259 16	333 23	407 29	481 34	555 38									
12x6	0.5	0.41	Airflow, cfm NC	123 -	164 -	205 -	246 12	287 16	369 24	451 29	533 34	615 38									
14x6	0.58	0.48	Airflow, cfm NC	144 -	192 -	240 -	288 13	336 17	432 24	528 30	624 35	720 39									
16x6	0.67	0.57	Airflow, cfm NC	171 -	228 -	285 -	342 13	399 18	513 25	627 31	741 36	855 40									
10x10	0.69	0.59	Airflow, cfm NC	177 -	236 -	295 -	354 14	413 18	531 25	649 31	767 36	885 40									
18x6	0.75	0.63	Airflow, cfm NC	189 -	252 -	315 -	378 14	441 18	567 25	693 31	819 36	945 40									
20x6	0.83	0.72	Airflow, cfm NC	216 -	288 -	360 -	432 14	504 19	648 26	792 32	936 37	1080 41									
22x6	0.92	0.77	Airflow, cfm NC	231 -	308 -	385 -	462 15	539 19	693 26	847 32	1001 37	1155 41									
24x6	1	0.88	Airflow, cfm NC	264 -	352 -	440 -	528 15	616 20	792 27	968 33	1144 37	1320 42									
30x6	1.25	1.11	Airflow, cfm NC	333 -	444 -	555 11	666 16	777 21	999 28	1221 34	1443 38	1665 43									
14x14	1.36	1.22	Airflow, cfm NC	366 -	488 -	610 11	732 17	854 21	1098 28	1342 34	1586 39	1830 43									
36x6	1.5	1.35	Airflow, cfm NC	405 -	540 -	675 12	810 17	945 22	1215 29	1485 35	1755 39	2025 43									
22x10	1.53	1.37	Airflow, cfm NC	411 -	548 -	685 12	822 17	959 22	1233 29	1507 35	1781 39	2055 43									
30x8	1.67	1.49	Airflow, cfm NC	447 -	596 -	745 12	894 18	1043 22	1341 29	1639 35	1937 40	2235 44									
42x6	1.75	1.59	Airflow, cfm NC	477 -	636 -	795 13	954 18	1113 22	1431 29	1749 35	2067 40	2385 44									
16x16	1.78	1.62	Airflow, cfm NC	486 -	648 -	810 13	972 18	1134 22	1458 30	1782 35	2106 40	2430 44									
24x12	2	1.82	Airflow, cfm NC	546 -	728 -	910 13	1092 18	1274 23	1638 30	2002 36	2366 41	2730 45									
18x18	2.25	2.07	Airflow, cfm NC	621 -	828 -	1035 14	1242 19	1449 23	1863 31	2277 36	2691 41	3105 45									
24x14	2.33	2.14	Airflow, cfm NC	642 -	856 -	1070 14	1284 19	1498 24	1926 31	2354 37	2782 41	3210 45									
30x12	2.5	2.29	Airflow, cfm NC	687 -	916 -	1145 14	1374 19	1603 24	2061 31	2519 37	2977 42	3435 46									
24x16	2.67	2.46	Airflow, cfm NC	738 -	984 -	1230 15	1476 20	1722 24	2214 31	2706 37	3198 42	3690 46									
20x20	2.78	2.57	Airflow, cfm NC	771 -	1028 -	1285 15	1542 20	1799 24	2313 32	2827 37	3341 42	3855 46									
36x12	3	2.75	Airflow, cfm NC	825 -	1100 -	1375 15	1650 20	1925 25	2475 32	3025 38	3575 42	4125 47									
30x16	3.33	3.11	Airflow, cfm NC	933 -	1244 -	1555 16	1866 21	2177 25	2799 32	3421 38	4043 43	4665 47									
22x22	3.36	3.14	Airflow, cfm NC	942 -	1256 -	1570 16	1884 21	2198 25	2826 32	3454 38	4082 43	4710 47									
42x12	3.5	3.22	Airflow, cfm NC	966 -	1288 -	1610 16	1932 21	2254 25	2898 33	3542 38	4186 43	4830 47									
24x22	3.67	3.43	Airflow, cfm NC	1029 -	1372 -	1715 16	2058 21	2401 26	3087 33	3773 39	4459 43	5145 47									
30x18	3.75	3.5	Airflow, cfm NC	1050 -	1400 -	1750 16	2100 21	2450 26	3150 33	3850 39	4550 43	5250 48									

- Static pressures are negative, in inches of water, measured per ANSI/ASHRAE Standard 70-2006
- NC based on room absorption of 10 dB, re 10⁻¹² watts, measured per ANSI/ASHRAE Standard 70-2006

94A Series: 94A, 94AHOV, 94AT, 94HOV Return Air Grilles & Registers (Page 9-10, 56)
 96AFB Steel Fixed-Bar Filter Grille (Page 10)
 Performance based on nominal sizes shown in bold

Nominal Duct Size (in.)	Nominal Duct Area (ft ²)	Core Area (ft ²)	Core Velocity Velocity Pressure Neg. Static Pressure	NC-10		NC-20		NC-30	NC-40			
				300 0.006 0.012	400 0.010 0.022	500 0.016 0.034	600 0.022 0.049	700 0.031 0.067	900 0.050 0.111	1100 0.075 0.165	1300 0.105 0.231	1500 0.140 0.307
48x12 24x24	4	3.75	Airflow, cfm NC	1125 -	1500 -	1875 16	2250 22	2625 26	3375 33	4125 39	4875 44	5625 48
36x18	4.5	4.22	Airflow, cfm NC	1266 -	1688 -	2110 17	2532 22	2954 27	3798 34	4642 39	5486 44	6330 48
36x20 30x24	5	4.71	Airflow, cfm NC	1413 -	1884 11	2355 17	2826 23	3297 27	4239 34	5181 40	6123 45	7065 49
42x18	5.25	4.94	Airflow, cfm NC	1482 -	1976 11	2470 18	2964 23	3458 27	4446 34	5434 40	6422 45	7410 49
28x28	5.44	5.16	Airflow, cfm NC	1548 -	2064 11	2580 18	3096 23	3612 27	4644 35	5676 40	6708 45	7740 49
42x20 30x28	5.83	5.51	Airflow, cfm NC	1653 -	2204 12	2755 18	3306 23	3857 28	4959 35	6061 41	7163 45	8265 50
48x18 36x24	6	5.66	Airflow, cfm NC	1698 -	2264 12	2830 18	3396 23	3962 28	5094 35	6226 41	7358 46	8490 50
30x30	6.25	5.94	Airflow, cfm NC	1782 -	2376 12	2970 18	3564 24	4158 28	5346 35	6534 41	7722 46	8910 50
42x24 36x28	7	6.66	Airflow, cfm NC	1998 -	2664 12	3330 19	3996 24	4662 28	5994 36	7326 41	8658 46	9990 50
46x22	7.03	6.68	Airflow, cfm NC	2004 -	2672 12	3340 19	4008 24	4676 29	6012 36	7348 41	8684 46	10020 50
32x32	7.11	6.78	Airflow, cfm NC	2034 -	2712 13	3390 19	4068 24	4746 29	6102 36	7458 42	8814 46	10170 50
36x30	7.5	7.16	Airflow, cfm NC	2148 -	2864 13	3580 19	4296 24	5012 29	6444 36	7876 42	9308 47	10740 51
48x24 36x32	8	7.63	Airflow, cfm NC	2289 -	3052 13	3815 19	4578 25	5341 29	6867 36	8393 42	9919 47	11445 51
34x34	8.03	7.68	Airflow, cfm NC	2304 -	3072 13	3840 19	4608 25	5376 29	6912 36	8448 42	9984 47	11520 51
36x34	8.5	8.14	Airflow, cfm NC	2442 -	3256 13	4070 20	4884 25	5698 29	7326 37	8954 42	10582 47	12210 51
42x30	8.75	8.38	Airflow, cfm NC	2514 -	3352 13	4190 20	5028 25	5866 29	7542 37	9218 42	10894 47	12570 51
36x36	9	8.63	Airflow, cfm NC	2589 -	3452 14	4315 20	5178 25	6041 30	7767 37	9493 43	11219 47	12945 51
42x34 48x30	10	9.6	Airflow, cfm NC	2880 -	3840 14	4800 20	5760 26	6720 30	8640 37	10560 43	12480 48	14400 52
38x38	10.03	9.64	Airflow, cfm NC	2892 -	3856 14	4820 20	5784 26	6748 30	8676 37	10604 43	12532 48	14460 52
42x36	10.5	10.1	Airflow, cfm NC	3030 -	4040 14	5050 21	6060 26	7070 30	9090 38	11110 43	13130 48	15150 52
46x34	10.86	10.45	Airflow, cfm NC	3135 -	4180 14	5225 21	6270 26	7315 30	9405 38	11495 43	13585 48	15675 52
42x38	11.08	10.67	Airflow, cfm NC	3201 -	4268 14	5335 21	6402 26	7469 31	9603 38	11737 44	13871 48	16005 52
40x40	11.11	10.7	Airflow, cfm NC	3210 -	4280 15	5350 21	6420 26	7490 31	9630 38	11770 44	13910 48	16050 52
48x36	12	11.57	Airflow, cfm NC	3471 -	4628 15	5785 21	6942 26	8099 31	10413 38	12727 44	15041 49	17355 53
42x42	12.25	11.82	Airflow, cfm NC	3546 -	4728 15	5910 21	7092 27	8274 31	10638 38	13002 44	15366 49	17730 53
44x44	13.44	12.99	Airflow, cfm NC	3897 -	5196 15	6495 22	7794 27	9093 31	11691 39	14289 44	16887 49	19485 53
48x42	14	13.54	Airflow, cfm NC	4062 -	5416 16	6770 22	8124 27	9478 32	12186 39	14894 45	17602 49	20310 53
46x46	14.69	14.22	Airflow, cfm NC	4266 -	5688 16	7110 22	8532 27	9954 32	12798 39	15642 45	18486 50	21330 54
48x46	15.33	14.85	Airflow, cfm NC	4455 -	5940 16	7425 22	8910 28	10395 32	13365 39	16335 45	19305 50	22275 54
48x48	16	15.5	Airflow, cfm NC	4650 -	6200 16	7750 23	9300 28	10850 32	13950 39	17050 45	20150 50	23250 54

• Static pressures are negative, in inches of water, measured per ANSI/ASHRAE Standard 70-2006

• NC based on room absorption of 10 dB, re 10⁻¹² watts, measured per ANSI/ASHRAE Standard 70-2006

NC-50

PFG Perforated Face Grille (Page 11)

PFG Perforated Face Grille
Return Air Grille Balancing Data
To Determine CFM:

1. Use an ALNOR Velometer with No. 2220 or 2220A Tip or a 4" rotating vane anemometer. If a 4" rotating vane anemometer is used, place dial face against perforated plate, and sample in a random manner for at least 1 minute.
2. Select proper Ak from Table by unit size and instrument used for measuring velocity.
3. Determine CFM by the following equation: CFM = Ak x Average Velocity.

Sample Problem

Determine Return Airflow Rate (CFM) through a 10 x 10, using an ALNOR Velometer with Tip No. 2220 or 2220A.

Solution

1. Assume the average of 6 velocity readings taken with an ALNOR Velometer is 2000 FPM.
2. From Table, the Area Factor for a 10 x 10 using an ALNOR Velometer is Ak = .39 sq. ft.
3. CFM = Ak x Average Velocity = .39 sq. ft. x 2000 FPM = 780 CFM

Neck Velocity			200	300	400	500	600	650	700	750	800	900
S.P. Drop w/OBD			.012	.027	.049	.078	.110	.130	.150	.170	.190	.240
Size	Ak	Ak	Air Capacities - CFM									
	ALNOR	4" ROT. Vane										
10 x 10	.39	.55	140	210	285	350	415	450	485	520	555	625
12 x 12	.46	.79	200	300	400	500	600	650	700	750	800	900
14 x 14	.62	1.07	270	410	545	680	815	885	955	1020	1090	1225
10 x 22	.71	1.21	305	460	610	765	915	995	1070	1150	1220	1375
16 x 16	.82	1.40	355	530	710	890	1065	1155	1245	1335	1425	1600
18 x 18	1.05	1.77	450	675	900	1125	1350	1460	1575	1690	1800	2030
20 x 20	1.28	2.25	555	835	1110	1390	1665	1805	1945	2080	2220	2500
22 x 22	1.55	2.70	670	1010	1345	1680	2020	2180	2350	2520	2690	3020

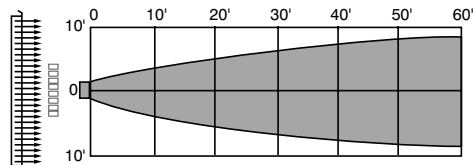
H and V Series (Page 12-16)

Deflection A

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8 x 4	CFM	60	80	95	110	125	140	155	170	185	205	220	250	280	310
Ak. 156	Throw	6.5	8.0	10.0	12.0	13.0	15.0	16.0	18.0	19.0	22.0	23.0	26.0	29.0	33.0
10 x 4	CFM	80	100	120	140	160	180	200	220	240	260	275	315	355	395
Ak. 198	Throw	7.5	9.5	12.0	13.0	15.0	17.0	19.0	20.0	22.0	24.0	26.0	29.0	33.0	37.0
12 x 4	CFM	95	120	145	170	190	215	240	265	290	310	335	385	430	480
Ak. 240	Throw	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	25.0	26.0	28.0	33.0	36.0	41.0
14 x 4	CFM	115	140	170	195	225	255	280	310	340	365	395	450	510	565
Ak. 282	Throw	9.0	11.0	13.0	15.0	18.0	20.0	22.0	24.0	27.0	29.0	31.0	35.0	40.0	44.0
12 x 5	CFM	125	155	185	215	250	280	310	340	370	405	435	495	560	620
Ak. 310	Throw	9.0	12.0	14.0	16.0	19.0	21.0	23.0	25.0	28.0	30.0	32.0	37.0	42.0	46.0
10 x 6	CFM	125	155	190	220	250	280	315	345	375	405	440	500	565	625
Ak. 313	Throw	9.0	12.0	14.0	16.0	19.0	21.0	23.0	26.0	28.0	30.0	33.0	37.0	42.0	46.0
14 x 5	CFM	145	180	220	255	290	330	365	400	435	475	510	580	655	730
Ak. 364	Throw	10.0	12.0	15.0	18.0	20.0	23.0	25.0	28.0	30.0	33.0	35.0	40.0	45.0	50.0
12 x 6	CFM	150	190	225	265	305	340	380	415	455	495	530	605	680	760
Ak. 379	Throw	10.0	13.0	15.0	18.0	21.0	23.0	26.0	28.0	31.0	33.0	36.0	41.0	46.0	51.0
16 x 5	CFM	165	210	250	295	335	375	420	460	500	545	585	670	750	835
Ak. 418	Throw	11.0	13.0	16.0	19.0	22.0	24.0	27.0	30.0	32.0	35.0	38.0	43.0	48.0	54.0
14 x 6	CFM	180	225	270	310	355	400	445	490	535	580	625	715	805	890
Ak. 446	Throw	11.0	14.0	17.0	19.0	22.0	25.0	28.0	30.0	33.0	36.0	39.0	44.0	50.0	55.0
16 x 6	CFM	205	255	305	360	410	460	510	565	615	665	715	820	920	1025
Ak. 512	Throw	11.0	14.0	17.0	20.0	22.0	25.0	28.0	31.0	34.0	36.0	39.0	45.0	50.0	56.0
20 x 5	CFM	210	265	315	370	420	475	525	580	630	685	735	840	945	1050
Ak. 526	Throw	12.0	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	48.0	54.0	60.0
24 x 5	CFM	255	315	380	445	505	570	635	695	760	825	890	1015	1140	1270
Ak. 634	Throw	13.0	16.0	20.0	23.0	26.0	30.0	33.0	36.0	40.0	43.0	46.0	53.0	59.0	66.0
20 x 6	CFM	260	325	385	450	515	580	645	710	775	840	905	1030	1160	1290
Ak. 645	Throw	13.0	17.0	20.0	23.0	27.0	30.0	33.0	37.0	40.0	43.0	47.0	53.0	60.0	67.0
24 x 6	CFM	310	390	465	545	620	700	775	855	930	1010	1090	1245	1400	1555
Ak. 777	Throw	15.0	18.0	22.0	26.0	29.0	33.0	37.0	40.0	44.0	48.0	51.0	59.0	66.0	73.0
20 x 8	CFM	355	440	530	615	705	795	880	970	1060	1145	1235	1410	1590	1765
Ak. 882	Throw	16.0	19.0	23.0	27.0	31.0	35.0	39.0	43.0	47.0	51.0	55.0	62.0	70.0	78.0
30 x 6	CFM	390	490	585	685	780	880	975	1075	1170	1270	1365	1560	1755	1950
Ak. 976	Throw	16.0	21.0	25.0	29.0	33.0	37.0	41.0	45.0	49.0	53.0	57.0	66.0	74.0	82.0
24 x 8	CFM	425	530	635	740	850	955	1060	1165	1270	1380	1485	1695	1910	2120
Ak. 1,060	Throw	17.0	21.0	25.0	30.0	34.0	38.0	43.0	47.0	51.0	56.0	60.0	68.0	77.0	85.0
30 x 8	CFM	535	670	805	940	1070	1205	1340	1475	1610	1740	1875	2145	2410	2680
Ak. 1,350	Throw	19.0	24.0	29.0	34.0	38.0	43.0	48.0	53.0	58.0	62.0	67.0	77.0	87.0	96.0
24 x 10	CFM	540	675	810	945	1080	1215	1350	1485	1620	1755	1890	2160	2430	2700
Ak. 1,450	Throw	19.0	24.0	29.0	34.0	39.0	43.0	48.0	53.0	58.0	63.0	68.0	77.0	87.0	97.0
36 x 8	CFM	645	805	965	1125	1290	1450	1610	1770	1930	2095	2255	2575	2900	3220
Ak. 1,610	Throw	21.0	26.0	32.0	37.0	42.0	47.0	52.0	58.0	63.0	68.0	73.0	84.0	94.0	105.0
24 x 12	CFM	655	820	985	1150	1310	1475	1640	1805	1970	2130	2295	2625	2950	3280
Ak. 1,640	Throw	21.0	27.0	32.0	37.0	43.0	48.0	53.0	59.0	64.0	69.0	75.0	85.0	96.0	107.0
30 x 10	CFM	675	845	1015	1185	1350	1520	1690	1860	2030	2195	2365	2705	3040	3380
Ak. 1,690	Throw	21.0	27.0	32.0	38.0	43.0	48.0	54.0	59.0	65.0	70.0	75.0	86.0	97.0	108.0
36 x 10	CFM	815	1020	1225	1430	1630	1835	2040	2245	2450	2650	2855	3285	3670	4080
Ak. 2,040	Throw	24.0	30.0	36.0	42.0	47.0	53.0	59.0	65.0	71.0	77.0	83.0	95.0	107.0	119.0
30 x 12	CFM	820	1025	1230	1435	1640	1845	2050	2255	2460	2665	2870	3280	3690	4100
Ak. 2,050	Throw	24.0	30.0	36.0	42.0	48.0	54.0	59.0	65.0	71.0	77.0	83.0	95.0	107.0	119.0
36 x 12	CFM	990	1235	1480	1730	1975	2225	2470	2715	2965	3210	3460	3950	4451	4940
Ak. 2,470	Throw	26.0	33.0	39.0	46.0	52.0	59.0	65.0	72.0	78.0	85.0	91.0	104.0	114.0	130.0

For sizes not listed and sizing tips see page 78

Terminal Velocity of 75 FPM



Deflection C

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8 x 4	CFM	55	70	85	100	115	125	140	155	170	185	195	225	255	280
Ak. 141	Throw	5.0	6.5	7.5	9.0	10.0	11.0	13.0	14.0	15.0	17.0	18.0	20.0	23.0	25.0
10 x 4	CFM	70	90	105	125	140	160	180	195	215	230	250	285	320	355
Ak. 178	Throw	5.5	7.0	8.5	10.0	11.0	13.0	14.0	16.0	17.0	18.0	20.0	23.0	26.0	29.0
12 x 4	CFM	85	110	130	150	175	195	215	240	260	280	300	345	390	430
Ak. 216	Throw	6.0	8.0	9.5	11.0	13.0	14.0	16.0	18.0	19.0	20.0	22.0	25.0	28.0	31.0
14 x 4	CFM	100	125	150	180	205	230	255	280	305	330	355	405	455	510
Ak. 254	Throw	7.0	8.5	10.0	12.0	14.0	16.0	17.0	19.0	21.0	22.0	24.0	27.0	31.0	34.0
12 x 5	CFM	110	140	165	195	225	250	280	305	335	365	390	445	500	560
Ak. 279	Throw	7.0	9.0	11.0	13.0	14.0	16.0	18.0	20.0	22.0	23.0	25.0	29.0	32.0	36.0
10 x 6	CFM	115	140	170	195	225	255	280	310	340	365	395	450	510	565
Ak. 282	Throw	7.5	9.0	11.0	12.0	14.0	16.0	18.0	20.0	22.0	23.0	25.0	29.0	33.0	36.0
14 x 5	CFM	130	165	195	230	260	295	330	360	395	425	460	525	590	655
Ak. 328	Throw	7.5	10.0	12.0	14.0	15.0	17.0	20.0	21.0	23.0	25.0	27.0	31.0	35.0	39.0
12 x 6	CFM	135	170	205	240	275	310	340	375	410	445	480	545	615	685
Ak. 342	Throw	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	32.0	36.0	40.0
16 x 5	CFM	150	190	225	265	300	340	375	415	450	490	525	605	680	755
Ak. 377	Throw	8.5	11.0	12.0	15.0	17.0	19.0	21.0	23.0						

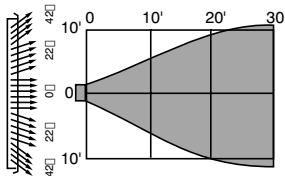
H and V Series (Page 12-16)

Deflection E

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8 x 4	CFM	45	60	70	85	95	105	120	130	140	155	165	190	210	235
Ak_127	Throw	2.5	3.5	4.0	5.0	5.5	6.0	6.5	7.5	8.0	8.5	9.5	11.0	12.0	13.0
10 x 4	CFM	60	75	90	105	120	135	150	165	180	195	210	240	270	300
Ak_162	Throw	3.0	3.5	4.5	5.0	6.0	6.5	7.5	8.0	9.0	9.5	10.0	12.0	13.0	15.0
12 x 4	CFM	80	100	120	140	160	175	195	215	235	255	275	315	355	395
Ak_197	Throw	4.5	6.0	7.5	8.5	10.0	11.0	12.0	13.0	14.0	16.0	17.0	19.0	22.0	24.0
14 x 4	CFM	90	115	140	160	185	210	230	255	275	300	325	370	415	460
Ak_231	Throw	5.0	6.5	8.0	9.0	11.0	12.0	13.0	14.0	16.0	17.0	18.0	21.0	23.0	26.0
12 x 5	CFM	100	125	150	180	205	230	255	280	305	330	355	405	455	510
Ak_254	Throw	5.5	6.5	8.0	9.5	12.0	12.0	14.0	15.0	16.0	18.0	19.0	22.0	25.0	27.0
10 x 6	CFM	105	130	155	180	205	230	255	285	310	335	360	410	465	515
Ak_257	Throw	5.5	7.5	8.5	9.5	11.0	12.0	14.0	15.0	17.0	18.0	19.0	22.0	25.0	28.0
14 x 5	CFM	120	150	180	210	240	270	300	330	360	385	415	475	535	595
Ak_291	Throw	6.0	7.5	9.0	10.0	12.0	13.0	15.0	16.0	18.0	19.0	21.0	24.0	27.0	30.0
12 x 6	CFM	125	155	185	220	250	280	310	340	375	405	435	500	560	620
Ak_311	Throw	6.0	7.5	9.0	11.0	12.0	14.0	15.0	17.0	18.0	20.0	21.0	24.0	28.0	30.0
16 x 5	CFM	135	170	205	240	275	310	345	375	410	445	480	550	615	685
Ak_343	Throw	6.5	8.0	9.5	11.0	13.0	14.0	16.0	17.0	19.0	21.0	22.0	26.0	29.0	32.0
14 x 6	CFM	145	185	220	255	290	330	365	400	440	475	510	585	655	730
Ak_365	Throw	6.5	8.5	10.0	11.0	13.0	15.0	16.0	18.0	20.0	21.0	23.0	26.0	29.0	33.0
16 x 6	CFM	170	215	240	300	345	390	430	475	545	560	605	690	775	860
Ak_431	Throw	7.0	9.0	11.0	12.0	14.0	16.0	18.0	20.0	21.0	23.0	25.0	28.0	32.0	36.0
20 x 5	CFM	190	235	280	330	375	425	470	515	565	610	660	750	845	940
Ak_470	Throw	7.5	9.5	11.0	13.0	15.0	17.0	19.0	20.0	22.0	24.0	26.0	30.0	33.0	37.0
24 x 5	CFM	210	260	310	365	415	470	520	570	625	675	730	830	935	1040
Ak_520	Throw	8.0	10.0	12.0	14.0	16.0	18.0	20.0	21.0	24.0	25.0	27.0	31.0	35.0	39.0
20 x 6	CFM	210	265	315	370	420	475	530	580	635	685	740	845	950	1055
Ak_528	Throw	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	32.0	35.0	39.0
24 x 6	CFM	255	320	380	445	510	575	635	700	765	830	890	1020	1145	1275
Ak_637	Throw	8.5	11.0	13.0	15.0	17.0	20.0	22.0	24.0	26.0	28.0	30.0	35.0	39.0	43.0
20 x 8	CFM	290	360	435	505	580	650	725	795	870	940	1010	1155	1300	1445
Ak_723	Throw	9.0	12.0	14.0	16.0	19.0	21.0	23.0	25.0	28.0	30.0	32.0	37.0	42.0	46.0
30 x 6	CFM	320	400	480	560	640	720	800	880	960	1040	1120	1280	1440	1600
Ak_800	Throw	10.0	12.0	15.0	17.0	19.0	22.0	24.0	27.0	29.0	32.0	34.0	39.0	44.0	49.0
24 x 8	CFM	350	435	525	610	700	785	870	960	1045	1135	1220	1400	1570	1745
Ak_872	Throw	10.0	13.0	15.0	18.0	20.0	23.0	25.0	28.0	30.0	33.0	36.0	41.0	46.0	51.0
30 x 8	CFM	435	545	655	765	870	980	1090	1200	1310	1415	1525	1745	1960	2180
Ak_1090	Throw	11.0	14.0	17.0	20.0	23.0	25.0	28.0	31.0	34.0	37.0	40.0	45.0	51.0	57.0
24 x 10	CFM	445	555	665	775	890	1000	1110	1220	1330	1445	1555	1775	2000	2220
Ak_1110	Throw	11.0	14.0	17.0	20.0	23.0	26.0	29.0	31.0	34.0	37.0	40.0	46.0	52.0	57.0
36 x 8	CFM	530	660	790	925	1055	1190	1320	1450	1585	1715	1850	2110	2375	2640
Ak_1320	Throw	14.0	17.0	21.0	24.0	27.0	31.0	34.0	38.0	41.0	45.0	48.0	55.0	62.0	69.0
24 x 12	CFM	535	670	805	940	1070	1205	1340	1475	1610	1740	1875	2145	2410	2680
Ak_1340	Throw	13.0	16.0	19.0	22.0	25.0	28.0	31.0	35.0	38.0	41.0	44.0	50.0	57.0	63.0
30 x 10	CFM	555	695	835	975	1110	1250	1390	1530	1670	1805	1945	2225	2500	2780
Ak_1390	Throw	13.0	16.0	19.0	22.0	26.0	29.0	32.0	38.0	38.0	42.0	45.0	51.0	58.0	64.0
36 x 10	CFM	670	835	1000	1170	1335	1505	1670	1835	2005	2170	2340	2670	3005	3340
Ak_1670	Throw	14.0	18.0	21.0	25.0	28.0	32.0	35.0	39.0	42.0	46.0	49.0	56.0	63.0	70.0
30 x 12	CFM	670	840	1010	1175	1345	1510	1680	1850	2015	2185	2350	2690	3025	3360
Ak_1680	Throw	14.0	16.0	21.0	25.0	28.0	32.0	35.0	39.0	42.0	46.0	49.0	56.0	63.0	70.0
36 x 12	CFM	810	1015	1220	1420	1625	1825	2030	2235	2435	2640	2840	3250	3655	4060
Ak_2030	Throw	15.0	19.0	23.0	27.0	31.0	35.0	39.0	43.0	46.0	50.0	54.0	62.0	70.0	78.0

For sizes not listed and sizing tips see page 78

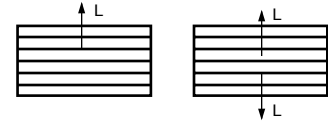
Terminal Velocity of 75 FPM



Deflection G

Face Velocity		400	500	600	700	800	900	1000	1100	1200	1300	1400	1600	1800	2000
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090	.105	.122	.160	.202	.249
8 x 4	CFM	45	60	70	85	95	105	120	130	140	155	165	190	210	235
Ak_118	Throw	2.5	3.5	4.0	5.0	5.5	6.0	6.5	7.5	8.0	8.5	9.5	11.0	12.0	13.0
10 x 4	CFM	60	75	90	105	120	135	150	165	180	195	210	240	270	300
Ak_149	Throw	3.0	3.5	4.5	5.0	6.0	6.5	7.5	8.0	9.0	9.5	10.0	12.0	13.0	15.0
12 x 4	CFM	70	90	110	125	145	165	180	200	215	235	255	290	325	360
Ak_181	Throw	3.0	4.0	5.0	5.5	6.5	7.5	8.0	9.0	10.0	11.0	12.0	13.0	15.0	16.0
14 x 4	CFM	85	105	125	150	170	190	210	235	255	275	300	340	380	425
Ak_212	Throw	3.5	4.5	5.5	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	16.0	18.0
12 x 5	CFM	95	115	140	165	185	210	235	255	280	305	325	375	420	465
Ak_236	Throw	4.0	4.5	5.5	6.5	7.5	8.5	9.5	10.0	11.0	12.0	13.0	15.0	17.0	19.0
10 x 6	CFM	95	120	140	165	190	210	235	260	285	305	330	380	425	470
Ak_236	Throw	4.0	5.0	5.5	6.5	7.5	8.5	9.5	10.0	11.0	12.0	13.0	15.0	17.0	19.0
14 x 5	CFM	110	135	165	190	220	245	275	300	330	355	385	440	495	550
Ak_274	Throw	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	16.0	18.0	20.0
12 x 6	CFM	115	145	170	200	230	255	285	315	345	370	400	460	515	570
Ak_286	Throw	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	17.0	19.0	21.0
16 x 5	CFM	125	160	190	220	250	285	315	345	380	410	440	505	565	630
Ak_315	Throw	4.5	5.5	6.5	7.5	8.5	10.0	11.0	12.0	13.0	14.0	15.0	17.0	19.0	22.0
14 x 6	CFM	135	170	200	235	270	300	335	370	405	435	470	540	605	670
Ak_336	Throw	4.5	5.5	6.5	8.0	9.0	10.0	11.0	12.0	13.0	16.0	18.0	20.0	22.0	24.0
16 x 6	CFM	155	195	230	270	310	345	385	425	465	500	540	620	695	770
Ak_386	Throw	4.5	5.5	6.5	8.0	9.0	10.0	11.0	12.0	14.0	15.0	16.0	18.0	20.0	23.0
20 x 5	CFM	160	200	240	280	320	355	395	435	475	515	555	635	715	795
Ak_397	Throw	5.0	6.0	7.5	8.5	10.0	11.0	12.0	13.0	15.0	16.0	17.0	19.0	22.0	24.0
24 x 5	CFM	190	240	285	335	380	430	480	525	575	620	670	765	860	955
Ak_478	Throw	5.5	6.5	8.0	9.5	11.0	12.0	13.0	15.0	16.0	17.0	19.0	21.0	24.0	27.0
20 x 6	CFM	195	245	290	340	390	435	485	535	585	630	680	780	875	970
Ak_486	Throw	5.5	7.0	8.0	9.5	11.0	12.0	13.0	15.0	16.0	17.0	19.0	22.0	24.0	27.0
24 x 6	CFM	235	295	350	410	470									

C Series Curved-Blade Diffusers (Page 17-21)



C Series Curved-Blade Diffusers Selection Procedure

One-Way, Two-Way

1. Determine the diffuser air pattern best suited to the duct layout and room area to be served.
2. Select the air pattern type and CFM per outlet. The tables give the recommended limits of air volume per outlet for various ceiling heights. Choose the correct table for the style diffuser selected. Outlets are assumed to be mounted flush on the ceiling and no obstruction to the air stream.
3. Turn to the proper SIZE SELECTION TABLE for the air pattern desired.
4. Determine the appropriate size based on the CFM, Throw, Pressure Loss, and Face Velocity requirements.

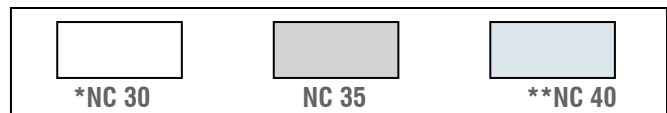
Face Velocity		400	500	600	700	800	900	1000	1100	1200
Pressure Loss		.010	.016	.022	.031	.040	.050	.062	.075	.090
6 x 6	CFM	35	45	55	65	70	80	90	100	110
Ak .090	Throw 1/2	3.5/2.5	5.0/3.5	6.0/4.0	7.0/5.0	7.5/5.5	8.5/6.0	9.5/7.0	11.0/7.5	11.5/8.5
8 x 6	CFM	40	50	60	70	80	90	100	110	120
Ak .100	Throw 1/2	3.5/2.5	4.5/3.0	5.5/4.0	6.5/4.5	7.0/5.0	8.0/6.0	9.0/6.5	10.0/7.0	11.0/7.5
10 x 6	CFM	60	75	90	105	120	135	150	165	180
Ak .150	Throw 1/2	5.0/3.5	6.0/4.5	7.0/5.0	8.5/6.0	9.5/7.0	11.0/7.5	12.0/8.5	13.0/9.5	14.0/10.0
8 x 8	CFM	65	80	95	110	130	145	160	175	190
Ak .160	Throw 1/2	5.0/3.5	6.0/4.5	7.5/5.0	8.5/6.0	10.0/7.0	11.0/8.0	12.0/9.0	14.0/9.5	15.0/10.0
12 x 6	CFM	70	90	110	125	145	160	180	200	215
Ak .180	Throw 1/2	5.0/3.5	6.5/4.5	8.0/5.5	9.0/6.5	11.0/7.5	12.0/8.5	13.0/9.5	15.0/10.0	16.0/11.0
14 x 6	CFM	85	105	125	145	170	190	210	230	250
Ak .210	Throw 1/2	5.5/4.0	7.0/5.0	8.5/6.0	10.0/7.0	11.0/8.0	13.0/9.0	14.0/10.0	16.0/11.0	17.0/12.0
10 x 10	CFM	95	120	145	170	190	215	240	265	290
Ak .240	Throw 1/2	6.0/4.0	7.5/5.0	9.0/6.5	10.0/7.5	12.0/8.0	13.0/9.5	15.0/10.0	16.0/11.0	18.0/13.0
12 x 10	CFM	115	145	175	205	230	260	290	320	350
Ak .290	Throw 1/2	6.5/4.5	8.0/5.5	9.5/7.0	11.0/8.0	13.0/9.0	14.0/10.0	16.0/11.0	18.0/13.0	19.0/14.0
16 x 8	CFM	125	155	185	215	250	280	310	340	370
Ak .310	Throw 1/2	6.5/5.0	8.5/6.0	10.0/7.0	12.0/8.0	13.0/9.5	15.0/11.0	17.0/12.0	18.0/13.0	20.0/14.0
12 x 12	CFM	140	175	210	245	280	315	350	385	420
Ak .350	Throw 1/2	7.0/5.0	9.0/6.0	11.0/7.5	12.0/8.5	14.0/10.0	16.0/11.0	18.0/12.0	19.0/14.0	21.0/15.0
16 x 12	CFM	185	230	275	320	370	415	460	505	550
Ak .460	Throw 1/2	8.0/5.5	10.0/7.5	12.0/9.0	14.0/10.0	16.0/11.0	18.0/13.0	20.0/14.0	22.0/16.0	24.0/17.0
14 x 14	CFM	190	240	290	335	385	430	480	530	575
Ak .480	Throw 1/2	8.0/5.5	10.0/7.5	12.0/9.0	14.0/10.0	17.0/12.0	18.0/13.0	21.0/15.0	23.0/16.0	25.0/17.0
16 x 16	CFM	250	315	380	440	505	565	630	695	755
Ak .630	Throw 1/2	9.5/6.5	12.0/8.5	14.0/10.0	16.0/12.0	19.0/13.0	21.0/15.0	23.0/17.0	26.0/18.0	28.0/20.0
20 x 14	CFM	270	340	410	475	545	610	680	750	815
Ak .680	Throw 1/2	9.5/7.0	12.0/8.5	15.0/10.0	17.0/12.0	19.0/14.0	22.0/15.0	24.0/17.0	27.0/19.0	29.0/21.0
24 x 12	CFM	280	350	420	490	560	630	700	770	840
Ak .700	Throw 1/2	10.0/7.0	12.0/8.5	15.0/10.0	17.0/12.0	20.0/14.0	22.0/16.0	25.0/17.0	27.0/19.0	30.0/21.0
30 x 10	CFM	290	365	440	510	585	655	730	805	875
Ak .730	Throw 1/2	10.0/7.0	13.0/9.0	15.0/11.0	18.0/12.0	20.0/14.0	23.0/16.0	25.0/18.0	28.0/20.0	30.0/21.0
36 x 10	CFM	350	440	530	615	705	790	880	970	1055
Ak .880	Throw 1/2	11.0/8.0	14.0/10.0	17.0/12.0	19.0/14.0	22.0/16.0	25.0/18.0	28.0/20.0	31.0/22.0	33.0/24.0
36 x 12	CFM	420	525	630	735	840	945	1050	1155	1260
Ak 1.050	Throw 1/2	12.0/8.5	15.0/11.0	18.0/13.0	21.0/15.0	24.0/17.0	27.0/19.0	30.0/21.0	33.0/23.0	36.0/25.0
30 x 16	CFM	460	575	690	805	920	1035	1150	1265	1380
Ak 1.150	Throw 1/2	12.0/9.0	16.0/11.0	19.0/13.0	22.0/15.0	25.0/18.0	28.0/20.0	31.0/22.0	34.0/24.0	37.0/26.0
36 x 16	CFM	560	700	840	980	1120	1260	1400	1540	1680
Ak 1.400	Throw 1/2	14.0/9.5	17.0/12.0	21.0/15.0	24.0/17.0	27.0/19.0	31.0/22.0	34.0/24.0	38.0/27.0	41.0/29.0

For sizes not listed and sizing tips see page(s) 78

Terminal Velocity of 75 FPM

Curved-Blade – C Series

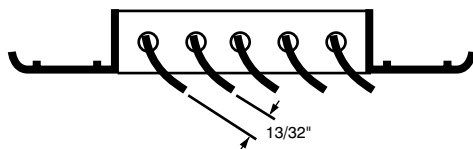
Ceiling Height In Feet	Maximum Cooling Temperature Differential (°F)	Maximum CFM per outlet			
		1 way	2 way	3 way	4 way
7	15°	75	150	225	300
8	18°	100	200	300	400
9	20°	200	400	600	800
10	22°	300	600	900	1200
11	25°	400	800	1200	1600
12	25°	500	1000	1500	2000
14	25°	700	1400	2100	2800
16	25°	900	1800	2700	3600



* less than or equal to

** greater than or equal to

The Face Bars on the Curved-Blade Diffuser should be pre-set to the dimension shown below.



RH45, RH45T, RHD45, RHF45 ER45 Registers and Grilles
(Page 24, 25, 56)

RCB Series: RCBF, RCBFT, RCBT Return Air Registers and Grilles
(Page 22, 56)

Face Velocity		400	500	600	700	800	900	1000
6 x 6	CFM	40	60	70	80	90	100	110
Ak .110	Ps	.037	.058	.083	.113	.148	.189	.232
8 x 8	CFM	100	120	140	170	190	220	240
Ak .240	Ps	.032	.050	.072	.098	.128	.163	.200
12 x 6	CFM	110	140	170	190	220	250	280
Ak .280	Ps	.031	.048	.069	.094	.122	.155	.191
14 x 6	CFM	30	170	200	230	270	300	330
Ak .330	Ps	.029	.045	.065	.088	.114	.145	.179
14 x 8	CFM	190	230	280	330	370	420	460
Ak .460	Ps	.025	.039	.055	.075	.097	.123	.152
12 x 12	CFM	250	310	370	430	490	550	610
Ak .610	Ps	.021	.032	.046	.062	.079	.100	.125
24 x 8	CFM	340	420	500	590	670	760	840
Ak .840	Ps	.020	.032	.046	.061	.079	.100	.124
18 x 12	CFM	380	480	570	670	760	860	950
Ak .950	Ps	.020	.032	.046	.061	.080	.101	.124
30 x 8	CFM	430	530	640	750	850	960	1100
Ak 1.070	Ps	.020	.032	.046	.061	.080	.101	.124
24 x 12	CFM	520	650	780	900	1000	1200	1300
Ak 1.290	Ps	.020	.032	.046	.062	.081	.102	.124
18 x 18	CFM	580	730	880	1000	1200	1300	1500
Ak 1.460	Ps	.020	.032	.046	.062	.081	.102	.124
30 x 12	CFM	650	820	980	1100	1300	1500	1600
Ak 1.630	Ps	.021	.032	.046	.062	.082	.103	.124
20 x 20	CFM	730	910	1100	1300	1500	1600	1800
Ak 1.820	Ps	.021	.032	.046	.063	.083	.104	.124
36 x 12	CFM	790	990	1200	1400	1600	1800	2000
Ak 1.980	Ps	.021	.032	.046	.063	.084	.105	.125
24 x 20	CFM	880	1100	1300	1500	1800	2000	2200
Ak 2.210	Ps	.021	.032	.047	.064	.085	.107	.126
30 x 18	CFM	1000	1200	1500	1700	2000	2200	2500
Ak 2.500	Ps	.021	.033	.048	.065	.087	.109	.128
24 x 24	CFM	1100	1300	1600	1900	2100	2400	2700
Ak 2.670	Ps	.022	.033	.048	.066	.088	.110	.130
36 x 18	CFM	1200	1500	1800	2100	2400	2700	3000
Ak 3.020	Ps	.023	.035	.051	.069	.092	.116	.137
30 x 24	CFM	1300	1700	2000	2400	2700	3000	3400
Ak 3.370	Ps	.024	.037	.053	.074	.096	.121	.144
36 x 24	CFM	1600	2000	2400	2900	3300	3700	4100
Ak 4.080	Ps	.027	.040	.058	.080	.105	.132	.158
30 x 30	CFM	1700	2100	2600	3000	3400	3800	4300
Ak 4.260	Ps	.027	.041	.060	.081	.107	.135	.162
36 x 30	CFM	2100	2600	3100	3600	4100	4600	5200
Ak 5.150	Ps	.030	.045	.066	.090	.117	.149	.179
48 x 24	CFM	2200	2800	3300	3900	4400	5000	5500
Ak 5.510	Ps	.031	.047	.069	.093	.122	.154	.186
36 x 36	CFM	2500	3100	3700	4400	5000	5600	6200
Ak 6.240	Ps	.034	.051	.074	.100	.130	.165	.200
48 x 36	CFM	3400	4200	5100	5900	6800	7600	8500
Ak 8.480	Ps	.025	.038	.055	.075	.098	.124	.153
48 x 48	CFM	4600	5800	6900	8100	9200	10000	12000
Ak 11.600	Ps	.022	.034	.048	.066	.086	.109	.134

For sizes not listed and sizing tips see page(s) 78

Face Velocity		200	300	400	500	600	700	800	900	1000
6 x 6	CFM	25	37	50	62	75	87	100	112	124
Ak .120	Ps	.005	.014	.024	.037	.053	.084	.113	.150	.180
8 x 8	CFM	49	74	99	124	148	173	198	223	247
Ak .250	Ps	.006	.014	.024	.037	.054	.085	.114	.150	.181
12 x 6	CFM	56	85	113	141	169	198	226	254	282
Ak .280	Ps	.006	.014	.024	.038	.054	.085	.114	.150	.181
14 x 6	CFM	67	101	134	168	201	235	268	302	335
Ak .340	Ps	.006	.014	.024	.038	.054	.085	.114	.150	.182
14 x 8	CFM	92	138	184	230	276	322	368	414	460
Ak .460	Ps	.006	.015	.025	.039	.056	.086	.115	.150	.183
12 x 12	CFM	121	181	241	301	362	422	482	542	603
Ak .600	Ps	.006	.015	.025	.039	.057	.087	.115	.150	.184
24 x 8	CFM	164	246	328	409	491	573	655	737	819
Ak .820	Ps	.006	.015	.026	.040	.059	.089	.116	.151	.186
18 x 12	CFM	186	278	371	464	557	649	742	835	928
Ak .930	Ps	.006	.016	.026	.041	.059	.089	.117	.151	.187
30 x 8	CFM	207	311	415	519	622	726	830	934	1037
Ak 1.040	Ps	.006	.016	.026	.042	.060	.090	.117	.152	.188
24 x 12	CFM	252	377	503	629	755	881	1007	1132	1258
Ak 1.260	Ps	.006	.016	.027	.043	.062	.092	.119	.152	.191
18 x 18	CFM	285	428	570	713	855	998	1140	1283	1426
Ak 1.430	Ps	.006	.017	.027	.043	.063	.093	.119	.153	.192
30 x 12	CFM	319	478	638	797	956	1116	1275	1435	1594
Ak 1.590	Ps	.006	.017	.028	.044	.064	.094	.120	.154	.194
20 x 20	CFM	357	535	713	891	1070	1248	1426	1605	1783
Ak 1.780	Ps	.007	.018	.028	.045	.065	.095	.121	.155	.196
36 x 12	CFM	387	581	774	968	1161	1355	1548	1742	1935
Ak 1.940	Ps	.007	.018	.028	.046	.066	.096	.122	.156	.197
24 x 20	CFM	433	650	866	1083	1299	1516	1732	1949	2165
Ak 2.170	Ps	.007	.018	.029	.046	.067	.098	.124	.157	.200
30 x 18	CFM	491	737	983	1228	1474	1720	1965	2211	2456
Ak 2.460	Ps	.007	.019	.029	.047	.069	.099	.126	.159	.203
24 x 24	CFM	527	790	1053	1316	1580	1843	2106	2370	2633
Ak 2.630	Ps	.007	.019	.030	.048	.069	.101	.127	.160	.205
36 x 18	CFM	598	897	1196	1495	1794	2093	2392	2691	2990
Ak 2.990	Ps	.007	.020	.030	.049	.071	.103	.129	.163	.208
30 x 24	CFM	670	1006	1341	1676	2011	2346	2681	3017	3352
Ak 3.350	Ps	.007	.021	.031	.050	.072	.105	.132	.166	.212
36 x 24	CFM	818	1227	1637	2046	2455	2864	3273	3682	4092
Ak 4.090	Ps	.008	.023	.032	.052	.074	.110	.137	.172	.220
30 x 30	CFM	856	1284	1712	2140	2568	2996	3424	3852	4280
Ak 4.280	Ps	.008	.023	.032	.052	.074	.111	.139	.174	.222
36 x 30	CFM	1048	1572	2096	2620	3144	3668	4192	4717	5241
Ak 5.240	Ps	.008	.026	.033	.054	.075	.117	.147	.185	.233
48 x 24	CFM	1127	1690	2254	2817	3380	3944	4507	5071	5634
Ak 5.630	Ps	.009	.027	.033	.054	.075	.120	.150	.190	.237
36 x 36	CFM	1287	1931	2575	3218	3862	4506	5150	5793	6437
Ak 6.440	Ps	.009	.029	.034	.055	.074	.125	.158	.200	.247
48 x 36	CFM	1794	2691	3589	4486	5383	6280	7177	8074	8971
Ak 8.970	Ps	.009	.029	.034	.055	.068	.125	.158	.200	.247
48 x 48	CFM	2529	3793	5058	6322	7587	8851	10116	11380	12645
Ak 12.600	Ps	.009	.029	.034	.055	.068	.125	.158	.200	.247

For sizes not listed and sizing tips see page(s) 78

RH90, RHD90 Registers and Grilles (Page 26)

Face Velocity		400	500	600	700	800	900	1000
6 x 6	CFM	50	63	76	88	101	113	126
Ak .130	Ps	.012	.019	.029	.038	.048	.055	.065
8 x 8	CFM	103	129	155	181	207	233	259
Ak .260	Ps	.011	.018	.028	.037	.046	.053	.063
12 x 6	CFM	119	148	178	208	237	267	297
Ak .300	Ps	.011	.018	.027	.036	.046	.053	.063
14 x 6	CFM	141	177	212	248	283	318	354
Ak .350	Ps	.011	.018	.027	.036	.045	.052	.062
14 x 8	CFM	195	244	292	341	390	438	487
Ak .490	Ps	.011	.018	.026	.035	.044	.051	.061
12 x 12	CFM	256	320	384	448	512	576	640
Ak .640	Ps	.011	.017	.025	.033	.042	.049	.059
24 x 8	CFM	348	435	523	610	697	784	871
Ak .870	Ps	.010	.017	.024	.032	.040	.047	.057
18 x 12	CFM	395	493	592	691	789	888	987
Ak .990	Ps	.010	.016	.023	.031	.039	.046	.056
30 x 8	CFM	441	552	662	772	882	993	1103
Ak 1.100	Ps	.010	.016	.023	.030	.038	.045	.055
24 x 12	CFM	535	668	802	936	1069	1203	1337
Ak 1.340	Ps	.010	.016	.021	.028	.036	.043	.053
18 x 18	CFM	605	756	907	1059	1210	1361	1512
Ak 1.510	Ps	.010	.016	.021	.027	.035	.042	.052
30 x 12	CFM	676	845	1014	1182	1351	1520	1689
Ak 1.690	Ps	.010	.016	.020	.026	.034	.041	.051
20 x 20	CFM	755	943	1132	1321	1509	1698	1887
Ak 1.890	Ps	.010	.016	.019	.026	.033	.040	.050
36 x 12	CFM	818	1023	1227	1432	1636	1841	2045
Ak 2.050	Ps	.010	.015	.019	.025	.032	.039	.049
24 x 20	CFM	914	1142	1370	1599	1827	2055	2284
Ak 2.280	Ps	.010	.015	.018	.024	.031	.038	.048
30 x 18	CFM	1034	1292	1551	1809	2068	2326	2584
Ak 2.580	Ps	.010	.015	.017	.023	.030	.037	.047
24 x 24	CFM	1106	1383	1659	1936	2213	2489	2766
Ak 2.770	Ps	.009	.015	.017	.023	.030	.037	.047
36 x 18	CFM	1252	1565	1878	2191	2505	2818	3131
Ak 3.130	Ps	.009	.015	.016	.022	.029	.036	.046
30 x 24	CFM	1399	1749	2099	2449	2799	3149	3499
Ak 3.500	Ps	.009	.015	.016	.022	.029	.036	.046
36 x 24	CFM	1697	2122	2546	2971	3395	3819	4244
Ak 4.240	Ps	.009	.014	.016	.023	.031	.038	.048
30 x 30	CFM	1773	2216	2659	3102	3546	3989	4432
Ak 4.430	Ps	.009	.014	.016	.023	.031	.038	.048
36 x 30	CFM	2154	2692	3231	3769	4307	4846	5384
Ak 5.380	Ps	.009	.014	.018	.026	.036	.043	.053
48 x 24	CFM	2308	2885	3462	4039	4616	5193	5771
Ak 5.770	Ps	.009	.014	.020	.028	.039	.046	.056
36 x 36	CFM	2621	3276	3931	4587	5242	5897	6552
Ak 6.550	Ps	.009	.014	.023	.033	.045	.052	.062
48 x 36	CFM	3588	4485	5382	6279	7176	8073	8971
Ak 8.970	Ps	.009	.014	.023	.033	.045	.052	.062
48 x 48	CFM	4946	6183	7419	8656	9893	11129	12366
Ak 12.400	Ps	.008	.013	.023	.033	.045	.052	.062
For sizes not listed and sizing tips see page(s) 78								

RE5, RED5, REF5 Series Return Air Registers and Grilles (Pages 23-24)
 Performance based on nominal sizes shown in bold

Nominal Duct Size (in.)	Nominal Duct Area sq. ft	Core Area sq. ft	Core Velocity Velocity Pressure 1x1x1 Neg. Ps ½x½x½ Neg. Ps	300		400		500		600		700		800		1000		1200		1400			
				0.006	0.01	0.016	0.022	0.031	0.04	0.051	0.062	0.073	0.084	0.096	0.107	0.118	0.129	0.140	0.151	0.162	0.173	0.184	0.195
				0.013	0.024	0.037	0.054	0.073	0.096	0.118	0.140	0.162	0.184	0.206	0.228	0.250	0.272	0.294	0.316	0.338	0.360	0.382	0.404
6x6	0.25	0.19	Airflow, cfm NC	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380		
8x6	0.33	0.26	Airflow, cfm NC	78	104	130	156	182	208	234	260	286	312	338	364	390	416	442	468	494	520		
10x6	0.42	0.34	Airflow, cfm NC	102	136	170	204	238	272	306	340	374	408	442	476	510	544	578	612	646	680		
8x8	0.44	0.37	Airflow, cfm NC	111	148	185	222	259	296	333	370	407	444	481	518	555	592	629	666	703	740		
12x6	0.50	0.41	Airflow, cfm NC	123	164	205	246	287	328	369	410	451	492	533	574	615	656	697	738	779	820		
14x6	0.58	0.48	Airflow, cfm NC	144	192	240	288	336	384	432	480	528	576	624	672	720	768	816	864	912	960		
16x6	0.67	0.57	Airflow, cfm	171	228	285	342	399	456	513	570	627	684	741	798	855	912	969	1026	1083	1140		
12x8			NC	-	-	-	12	18	23	29	35	41	47	53	59	65	71	77	83	89	95		
10x10	0.69	0.59	Airflow, cfm NC	177	236	295	354	413	472	531	590	649	708	767	826	885	944	1003	1062	1121	1180		
18x6	0.75	0.63	Airflow, cfm NC	189	252	315	378	441	504	567	630	693	756	819	882	945	1008	1071	1134	1197	1260		
20x6	0.83	0.72	Airflow, cfm	216	288	360	432	504	576	648	720	792	864	936	1008	1080	1152	1224	1296	1368	1440		
12x10			NC	-	-	-	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96		
22x6	0.92	0.77	Airflow, cfm NC	231	308	385	462	539	616	693	770	847	924	1001	1078	1155	1232	1309	1386	1463	1540		
24x6	1.00	0.88	Airflow, cfm	264	352	440	528	616	704	792	880	968	1056	1144	1232	1320	1408	1496	1584	1672	1760		
12x12			NC	-	-	-	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96		
30x6	1.25	1.11	Airflow, cfm	333	444	555	666	777	888	999	1110	1221	1332	1443	1554	1665	1776	1887	1998	2109	2220		
18x10			NC	-	-	-	13	19	25	31	37	43	49	55	61	67	73	79	85	91	97		
14x14	1.36	1.22	Airflow, cfm NC	366	488	610	732	854	976	1098	1220	1342	1464	1586	1708	1830	1952	2074	2196	2318	2440		
36x6	1.50	1.35	Airflow, cfm	405	540	675	810	945	1080	1215	1350	1485	1620	1755	1890	2025	2160	2295	2430	2565	2700		
18x12			NC	-	-	-	13	19	25	31	37	43	49	55	61	67	73	79	85	91	97		
22x10	1.53	1.37	Airflow, cfm NC	411	548	685	822	959	1096	1233	1370	1507	1644	1781	1918	2055	2192	2329	2466	2603	2740		
30x8	1.67	1.49	Airflow, cfm	447	596	745	894	1043	1192	1341	1490	1639	1788	1937	2086	2235	2384	2533	2682	2831	2980		
24x10			NC	-	-	-	13	19	25	31	37	43	49	55	61	67	73	79	85	91	97		
42x6	1.75	1.59	Airflow, cfm	477	636	795	954	1113	1272	1431	1590	1749	1908	2067	2226	2385	2544	2703	2862	3021	3180		
18x14			NC	-	-	-	13	19	25	31	37	43	49	55	61	67	73	79	85	91	97		
16x16	1.78	1.62	Airflow, cfm NC	486	648	810	972	1134	1296	1458	1620	1782	1944	2106	2268	2430	2592	2754	2916	3078	3240		
24x12	2.00	1.82	Airflow, cfm	546	728	910	1092	1274	1456	1638	1820	2002	2184	2366	2548	2730	2912	3094	3276	3458	3640		
18x16			NC	-	-	-	13	19	25	31	37	43	49	55	61	67	73	79	85	91	97		
18x18	2.25	2.07	Airflow, cfm NC	621	828	1035	1242	1449	1656	1863	2070	2277	2484	2691	2898	3105	3312	3519	3726	3933	4140		
24x14	2.33	2.14	Airflow, cfm NC	642	856	1070	1284	1498	1712	1926	2140	2354	2568	2782	2996	3210	3424	3638	3852	4066	4280		
30x12	2.50	2.29	Airflow, cfm NC	687	916	1145	1374	1603	1832	2061	2290	2519	2748	2977	3206	3435	3664	3893	4122	4351	4580		
24x16	2.67	2.46	Airflow, cfm NC	738	984	1230	1476	1722	1968	2214	2460	2706	2952	3198	3444	3690	3936	4182	4428	4674	4920		
20x20	2.78	2.57	Airflow, cfm NC	771	1028	1285	1542	1799	2056	2313	2570	2827	3084	3341	3598	3855	4112	4369	4626	4883	5140		
36x12	3.00	2.75	Airflow, cfm NC	825	1100	1375	1650	1925	2200	2475	2750	3025	3300	3575	3850	4125	4400	4675	4950	5225	5500		
30x16	3.33	3.11	Airflow, cfm	933	1244	1555	1866	2177	2488	2799	3110	3421	3732	4043	4354	4665	4976	5287	5598	5909	6220		
24x20			NC	-	-	-	14	20	26	32	38	44	50	56	62	68	74	80	86	92	98		
22x22	3.36	3.14	Airflow, cfm NC	942	1256	1570	1884	2198	2512	2826	3140	3454	3768	4082	4396	4710	5024	5338	5652	5966	6280		
42x12	3.50	3.22	Airflow, cfm	966	1288	1610	1932	2254	2576	2898	3220	3542	3864	4186	4508	4830	5152	5474	5796	6118	6440		
36x14			NC	-	-	-	14	20	26	32	38	44	50	56	62	68	74	80	86	92	98		
24x22	3.67	3.43	Airflow, cfm NC	1029	1372	1715	2058	2401	2744	3087	3430	3773	4116	4459	4802	5145	5488	5831	6174	6517	6860		
30x18	3.75	3.50	Airflow, cfm NC	1050	1400	1750	2100	2450	2800	3150	3500	3850	4200	4550	4900	5250	5600	5950	6300	6650	7000		

- Static pressures are negative, in inches of water, measured per ANSI/ASHRAE Standard 70-2006
- NC based on room absorption of 10dB, re 10⁻¹² watts, measured per ANSI/ASHRAE Standard 70-2006

RE5, RED5, REF5 Series Return Air Registers and Grilles (Pages 23-24)
 Performance based on nominal sizes shown in bold

Nominal Duct Size (in.)	Nominal Duct Area sq. ft	Core Area sq. ft	Core Velocity Velocity Pressure 1x1x1 Neg. Ps ½x½ Neg. Ps	NC 20			NC 30			NC 40		
				300	400	500	600	700	800	1000	1200	1400
				0.006 0.013 0.013	0.01 0.024 0.024	0.016 0.037 0.037	0.022 0.054 0.053	0.031 0.073 0.073	0.04 0.096 0.095	0.062 0.15 0.148	0.09 0.216 0.213	0.122 0.294 0.29
48x12 24x24	4.00	3.75	Airflow, cfm NC	1125 -	1500 -	1875 -	2250 14	2625 20	3000 26	3750 35	4500 42	5250 49
36x18	4.50	4.22	Airflow, cfm NC	1266 -	1688 -	2110 -	2532 14	2954 20	3376 26	4220 35	5064 42	5908 49
36x20 30x24	5.00	4.71	Airflow, cfm NC	1413 -	1884 -	2355 -	2826 14	3297 21	3768 26	4710 35	5652 43	6594 49
42x18	5.25	4.94	Airflow, cfm NC	1482 -	1976 -	2470 -	2964 14	3458 21	3952 26	4940 35	5928 43	6916 49
28x28	5.44	5.16	Airflow, cfm NC	1548 -	2064 -	2580 -	3096 14	3612 21	4128 26	5160 35	6192 43	7224 49
42x20 30x28	5.83	5.51	Airflow, cfm NC	1653 -	2204 -	2755 -	3306 14	3857 21	4408 26	5510 35	6612 43	7714 49
48x18 36x24	6.00	5.66	Airflow, cfm NC	1698 -	2264 -	2830 -	3396 14	3962 21	4528 26	5660 35	6792 43	7924 49
30x30	6.25	5.94	Airflow, cfm NC	1782 -	2376 -	2970 -	3564 15	4158 21	4752 26	5940 35	7128 43	8316 49
42x24 36x28	7.00	6.66	Airflow, cfm NC	1998 -	2664 -	3330 -	3996 15	4662 21	5328 26	6660 36	7992 43	9324 49
46x22	7.03	6.68	Airflow, cfm NC	2004 -	2672 -	3340 -	4008 15	4676 21	5344 26	6680 36	8016 43	9352 49
32x32	7.11	6.78	Airflow, cfm NC	2034 -	2712 -	3390 -	4068 15	4746 21	5424 27	6780 36	8136 43	9492 49
36x30	7.50	7.16	Airflow, cfm NC	2148 -	2864 -	3580 -	4296 15	5012 21	5728 27	7160 36	8592 43	10024 49
48x24 36x32	8.00	7.63	Airflow, cfm NC	2289 -	3052 -	3815 -	4578 15	5341 21	6104 27	7630 36	9156 43	10682 49
34x34	8.03	7.68	Airflow, cfm NC	2304 -	3072 -	3840 -	4608 15	5376 21	6144 27	7680 36	9216 43	10752 49
36x34	8.50	8.14	Airflow, cfm NC	2442 -	3256 -	4070 -	4884 15	5698 21	6512 27	8140 36	9768 43	11396 50
42x30	8.75	8.38	Airflow, cfm NC	2514 -	3352 -	4190 -	5028 15	5866 21	6704 27	8380 36	10056 43	11732 50
36x36	9.00	8.63	Airflow, cfm NC	2589 -	3452 -	4315 -	5178 15	6041 21	6904 27	8630 36	10356 43	12082 50
42x34 48x30	10.00	9.60	Airflow, cfm NC	2880 -	3840 -	4800 -	5760 15	6720 21	7680 27	9600 36	11520 43	13440 50
38x38	10.03	9.64	Airflow, cfm NC	2892 -	3856 -	4820 -	5784 15	6748 21	7712 27	9640 36	11568 43	13496 50
42x36	10.50	10.10	Airflow, cfm NC	3030 -	4040 -	5050 -	6060 15	7070 22	8080 27	10100 36	12120 44	14140 50
46x34	10.86	10.45	Airflow, cfm NC	3135 -	4180 -	5225 -	6270 15	7315 22	8360 27	10450 36	12540 44	14630 50
42x38	11.08	10.67	Airflow, cfm NC	3201 -	4268 -	5335 -	6402 15	7469 22	8536 27	10670 36	12804 44	14938 50
40x40	11.11	10.70	Airflow, cfm NC	3210 -	4280 -	5350 -	6420 15	7490 22	8560 27	10700 36	12840 44	14980 50
48x36	12.00	11.57	Airflow, cfm NC	3471 -	4628 -	5785 -	6942 15	8099 22	9256 27	11570 36	13884 44	16198 50
42x42	12.25	11.82	Airflow, cfm NC	3546 -	4728 -	5910 -	7092 15	8274 22	9456 27	11820 36	14184 44	16548 50
44x44	13.44	12.99	Airflow, cfm NC	3897 -	5196 -	6495 -	7794 16	9093 22	10392 27	12990 36	15588 44	18186 50
48x42	14.00	13.54	Airflow, cfm NC	4062 -	5416 -	6770 -	8124 16	9478 22	10832 27	13540 37	16248 44	18956 50
46x46	14.69	14.22	Airflow, cfm NC	4266 -	5688 -	7110 -	8532 16	9954 22	11376 27	14220 37	17064 44	19908 50
48x46	15.33	14.85	Airflow, cfm NC	4455 -	5940 -	7425 -	8910 16	10395 22	11880 27	14850 37	17820 44	20790 50
48x48	16.00	15.50	Airflow, cfm NC	4650 -	6200 -	7750 -	9300 16	10850 22	12400 28	15500 37	18600 44	21700 50

• Static pressures are negative, in inches of water, measured per ANSI/ASHRAE Standard 70-2006

• NC based on room absorption of 10dB, re 10⁻¹² watts, measured per ANSI/ASHRAE Standard 70-2006

TG, TGF Transfer Grilles (Page 27)

Face Velocity*		500	600	700	800	900	1000	1200	1400	1600	1800	2000	2200	2400	2600
10X6	CFM	145	174	203	232	261	290	348	406	464	522	580	638	696	754
Ak 0.29	Ps	0.2	0.3	0.4	0.5	0.7	0.8	1.1	1.3	1.6	1.8	2.1	2.3	2.6	2.9
8X8	CFM	150	180	210	240	270	300	360	420	480	540	600	660	720	780
Ak 0.3	Ps	0.1	0.3	0.4	0.5	0.6	0.8	1	1.3	1.5	1.7	2	2.2	2.5	2.7
12X6	CFM	170	204	238	272	306	340	408	476	544	612	680	748	816	884
Ak 0.34	Ps	0	0.1	0.2	0.3	0.4	0.6	0.8	1	1.2	1.4	1.6	1.9	2.1	2.3
14X6	CFM	200	240	280	320	360	400	480	560	640	720	800	880	960	1040
Ak 0.4	Ps	0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1	1.2	1.4	1.6	1.8	1.9
14X8	CFM	265	318	371	424	477	530	636	742	848	954	1060	1166	1272	1378
Ak 0.53	Ps	-0.1	0	0.1	0.2	0.2	0.3	0.5	0.6	0.8	1	1.1	1.3	1.5	1.6
20X6	CFM	285	342	399	456	513	570	684	798	912	1026	1140	1254	1368	1482
Ak 0.57	Ps	-0.1	0	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3
12X12	CFM	345	414	483	552	621	690	828	966	1104	1242	1380	1518	1656	1794
Ak 0.69	Ps	-0.1	-0.1	0	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.8	0.9	1	1.2
30X6	CFM	430	516	602	688	774	860	1032	1204	1376	1548	1720	1892	2064	2236
Ak 0.86	Ps	-0.1	0	0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
16X12	CFM	460	552	644	736	828	920	1104	1288	1472	1656	1840	2024	2208	2392
Ak 0.92	Ps	-0.1	-0.1	0	0	0	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7
18X12	CFM	515	618	721	824	927	1030	1236	1442	1648	1854	2060	2266	2472	2678
Ak 1.03	Ps	-0.2	-0.1	-0.1	-0.1	0	0	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6
20X12	CFM	575	690	805	920	1035	1150	1380	1610	1840	2070	2300	2530	2760	2990
Ak 1.15	Ps	-0.2	-0.1	-0.1	-0.1	0	0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5

*Velocity measured 1" from face.

20 Round Diffuser (Page 28)

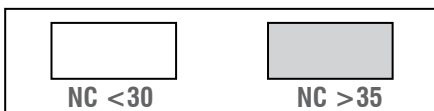
Neck Velocity		400	500	600	700	800	900	1000	1200	1400
6"	CFM	80	100	120	140	160	180	200	235	275
Ak .160	Ps	<.010	<.010	<.010	<.010	0.014	0.02	0.02	0.03	0.03
	Throw	2.00	2.00	2.0	3.0	3.0	4.0	4.0	5.0	6.0
8"	CFM	140	175	210	245	280	315	350	420	490
Ak .280	Ps	<.010	<.010	<.010	<.010	0.01	0.02	0.02	0.03	0.04
	Throw	3.5	3.0	3.0	4.0	4.0	5.0	5.0	7.0	8.0
10"	CFM	218	273	327	382	436	491	545	654	763
Ak .440	Ps	<.010	<.010	<.010	0.01	0.01	0.02	0.02	0.03	0.04
	Throw	3.0	3.0	4.0	5.0	5.0	6.0	7.0	8.0	10.0
12"	CFM	315	390	470	550	630	705	785	940	1100
Ak .660	Ps	<.010	<.010	<.010	0.01	0.01	0.02	0.02	0.03	0.04
	Throw	3.0	4.0	5.0	6.0	7.0	7.0	8.0	10.0	11.0
14"	CFM	425	530	635	745	850	955	1060	1270	1490
Ak .910	Ps	<.010	<.010	<.010	0.01	0.01	0.02	0.02	0.03	0.04
	Throw	4.0	5.0	6.0	7.0	8.0	8.0	9.0	11.0	13.0
16"	CFM	560	700	840	980	1120	1260	1400	1680	1960
Ak 1.200	Ps	<.010	<.010	<.010	0.01	0.01	0.02	0.02	0.03	0.04
	Throw	4.0	5.0	7.0	8.0	9.0	10.0	11.0	13.0	15.0
18"	CFM	710	885	1060	1240	1420	1590	1770	2120	2480
Ak 1.500	Ps	<.010	<.010	<.010	0.01	0.01	0.02	0.02	0.03	0.04
	Throw	5.0	6.0	7.0	9.0	10.0	11.0	12.0	15.0	17.0

24 Square Ceiling Diffuser (Page 29)

Face Velocity		300	400	500	600	700	800	900	1000
Pressure Loss		.006	.010	.016	.022	.031	.040	.050	.062
Neck Size 6"	CFM	50	65	85	100	115	130	150	165
Ak .165	Throw	3.5	4.5	5.5	6.5	8.0	9.0	10.0	11.0
Neck Size 8"	CFM	85	110	140	170	195	225	250	280
Ak .280	Throw	4.5	5.5	7.0	8.5	10.0	11.0	12.0	14.0
Neck Size 10"	CFM	125	170	210	250	295	335	380	420
Ak .420	Throw	5.0	6.5	8.0	9.5	11.5	13.0	15.0	16.0
Neck Size 12"	CFM	180	240	300	355	415	475	535	595
Ak .595	Throw	6.0	8.0	10.0	11.5	13.5	15.5	17.5	19.0
Neck Size 14"	CFM	245	330	410	490	575	655	740	820
Ak .820	Throw	7.0	9.0	11.5	13.5	16.0	18.0	20.0	22.5
Neck Size 16"	CFM	310	410	515	620	720	825	925	1030
Ak 1.030	Throw	7.5	10.0	12.5	15.0	18.0	20.0	22.0	25.0
Neck Size 18"	CFM	400	530	665	800	930	1065	1200	1330
Ak 1.330	Throw	8.5	11.0	14.0	17.0	20.0	23.0	26.0	28.0
Neck Size 20"	CFM	480	640	800	960	1120	1280	1440	1600
Ak 1.600	Throw	9.5	12.0	16.0	18.0	22.0	25.0	28.0	31.0
Neck Size 22"	CFM	570	760	950	1140	1330	1520	1710	1900
Ak 1.900	Throw	10.5	13.5	17.0	19.0	24.0	27.0	30.0	33.0
Neck Size 24"	CFM	690	920	1150	1380	1610	1840	2070	2300
Ak 2.300	Throw	11.0	14.5	18.5	22.0	26.0	30.0	33.0	36.0

Terminal Velocity of 50 FPM

NOTE: The use of a balancing hood is recommended to balance the system.
 Ak = Effective Area in square feet
 Ps = Static Pressure Loss in inches of water
 NC = Noise Criteria, based on a 10dB room attenuation (Re: 10⁻¹² watts) ASHRAE 90-72.
 Terminal Velocity of 100 fpm
 Product tested with core in "out" position.
 When diffusers are used on an exposed duct, multiply throw by 0.7

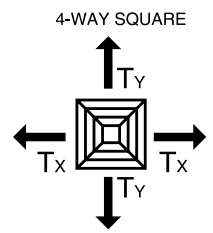


Recommended Noise Criteria and Face Velocity Ranges are on page 75

AR Series: ARE, ARF, ARS, ART (Page 31-33, 68)
Square & Rectangular Ceiling Diffusers — Steel/Aluminum

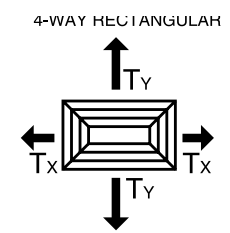
Four-Way Square

Face Velocity	500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss	.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6 CFM	50	60	70	80	90	100	120	140	160	180	200
Ak .100 Throw X/Y	2-3/2-3	2-3/2-3	2-4/2-4	2-4/2-4	3-5/3-5	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11
9 x 9 CFM	110	135	155	180	205	225	270	315	360	410	450
Ak .220 Throw X/Y	2-4/2-4	2-4/2-4	3-5/3-5	3-5/3-5	4-6/4-6	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-14/8-14
12 x 12 CFM	200	240	280	320	360	400	480	560	640	725	800
Ak .400 Throw X/Y	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-15/8-15	9-17/9-17	10-19/10-19
15 x 15 CFM	310	375	440	500	565	625	750	875	1000	1125	1250
Ak .620 Throw X/Y	4-6/4-6	4-8/4-8	5-9/5-9	6-11/6-11	6-11/6-11	6-12/6-12	8-15/8-15	10-18/10-18	10-19/10-19	12-21/12-21	13-23/13-23
18 x 18 CFM	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .900 Throw X/Y	4-8/4-8	5-9/5-9	5-11/5-11	6-12/6-12	7-13/7-13	8-15/8-15	10-17/10-17	11-20/11-20	13-23/13-23	15-27/15-27	16-30/16-30
21 x 21 CFM	615	740	860	985	1110	1230	1475	1725	1970	2220	2460
Ak 1.230 Throw X/Y	5-9/5-9	6-11/6-11	7-13/7-13	8-14/8-14	9-15/9-15	9-17/9-17	11-21/11-21	13-25/13-25	15-29/15-29	17-31/17-31	19-35/19-35
24 x 24 CFM	800	960	1120	1275	1440	1600	1925	2240	2570	2890	3200
Ak 1.600 Throw X/Y	5-11/5-11	7-13/7-13	7-14/7-14	8-15/8-15	9-17/9-17	10-19/10-19	12-23/12-23	14-29/14-29	16-31/16-31	18-35/18-35	20-39/20-39
27 x 27 CFM	1010	1215	1420	1615	1820	2020	2430	2840	3240	3650	4040
Ak 2.020 Throw X/Y	6-12/6-12	7-13/7-13	8-15/8-15	10-18/10-18	10-19/10-19	12-22/12-22	14-27/14-27	16-32/16-32	18-35/18-35	20-38/20-38	23-42/23-42
33 x 33 CFM	1370	1650	1925	2200	2470	2750	3300	3850	4400	4950	5500
Ak 2.750 Throw X/Y	7-13/7-13	9-16/9-16	10-18/10-18	21-21/12-21	14-24/14-24	16-27/16-27	18-33/18-33	19-37/19-37	23-41/23-41	27-46/27-46	31-50/31-50



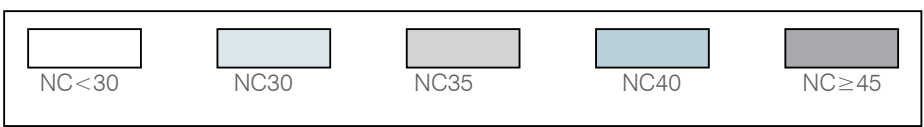
Four-Way Rectangular

Face Velocity	500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss	.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6 CFM	75	90	105	120	135	150	180	210	240	270	300
Ak .150 Throw X/Y	1-3/2-4	1-3/3-5	2-4/3-5	2-4/4-6	3-5/4-6	3-5/4-8	4-6/5-9	4-6/5-9	4-8/7-13	5-9/8-15	6-11/8-15
12 x 6 CFM	100	120	140	160	180	200	240	280	320	360	400
Ak .200 Throw X/Y	1-3/3-5	1-3/4-6	2-4/4-8	2-4/4-8	2-4/5-9	3-5/6-11	4-6/7-13	4-8/8-15	4-8/8-15	5-9/10-18	6-11/11-21
12 x 9 CFM	150	180	210	240	270	300	360	420	480	540	600
Ak .300 Throw X/Y	2-4/3-5	2-4/3-5	3-5/4-6	4-6/4-8	4-7/5-10	4-8/6-11	5-9/6-12	6-11/7-13	7-13/9-17	7-13/10-18	8-14/11-19
15 x 9 CFM	185	225	265	300	340	375	450	525	600	675	750
Ak .370 Throw X/Y	2-4/4-6	2-4/4-6	3-5/5-9	4-6/6-11	4-6/6-12	4-8/8-14	5-9/8-15	5-9/9-17	6-12/11-21	7-13/13-25	7-13/13-25
18 x 9 CFM	225	270	315	360	405	450	540	630	720	810	900
Ak .450 Throw X/Y	2-4/4-6	2-4/5-9	3-5/6-11	4-6/6-12	4-6/8-14	4-8/8-15	5-9/10-19	5-10/11-23	6-12/13-25	8-14/15-29	10-17/17-32
21 x 9 CFM	265	320	370	425	475	530	635	740	850	955	1060
Ak .530 Throw X/Y	2-4/5-9	2-4/6-11	3-5/8-14	4-6/8-15	4-8/10-18	4-8/10-19	5-9/11-21	6-17/13-25	8-13/16-31	9-15/19-35	10-17/21-38
15 x 12 CFM	250	300	350	400	450	500	600	700	800	900	1000
Ak .500 Throw X/Y	3-5/4-6	3-5/4-8	4-6/5-9	4-8/6-11	5-9/6-12	6-11/7-13	6-12/8-15	7-13/10-18	8-15/11-21	10-18/13-23	12-21/14-27
18 x 12 CFM	295	355	415	475	535	595	715	835	950	1070	1190
Ak .590 Throw X/Y	2-4/4-8	3-5/5-9	4-6/6-11	4-8/7-13	5-9/8-14	6-11/8-15	6-12/10-18	8-14/11-21	9-16/13-23	10-18/15-27	12-21/17-31
21 x 12 CFM	345	415	485	555	625	690	830	970	1100	1240	1375
Ak .690 Throw X/Y	3-5/5-9	3-5/6-11	4-6/7-13	4-8/8-14	4-8/8-15	5-9/10-18	6-11/11-21	7-13/14-26	8-15/16-29	9-17/17-31	10-19/19-35
24 x 12 CFM	400	480	560	640	720	800	960	1140	1280	1440	1600
Ak .800 Throw X/Y	2-4/6-11	4-6/7-13	4-6/8-14	4-8/9-16	4-8/10-18	5-9/11-21	6-12/14-26	8-14/15-29	9-17/17-31	10-19/19-35	10-19/21-39
18 x 15 CFM	375	450	525	600	675	750	900	1050	1200	1350	1500
Ak .75 Throw X/Y	4-6/4-8	4-8/5-9	5-9/6-11	6-11/6-12	6-12/8-14	7-13/8-15	8-15/10-18	9-17/10-19	10-19/13-23	12-22/15-26	14-25/17-29
24 x 15 CFM	500	600	700	800	900	1000	1200	1400	1600	1800	2000
Ak 1.000 Throw X/Y	4-6/6-11	4-8/6-12	5-9/8-14	6-11/9-17	6-12/10-18	7-13/11-21	8-15/13-25	10-18/15-29	11-21/17-32	13-23/20-36	15-27/22-39
24 x 18 CFM	600	720	840	960	1080	1200	1440	1680	1920	2160	2400
Ak 1.200 Throw X/Y	4-8/6-11	5-9/6-12	6-11/7-14	6-12/8-15	7-14/10-19	8-15/11-21	10-18/13-23	11-21/15-27	13-25/18-34	15-30/21-37	16-32/23-41
33 x 21 CFM	960	1150	1340	1530	1725	1920	2300	2690	3070	3450	3840
Ak 1.920 Throw X/Y	4-8/8-15	6-11/10-18	7-13/12-22	8-14/13-25	8-15/15-29	10-18/17-31	12-21/21-35	14-26/24-39	16-29/26-43	17-31/29-47	21-39/35-56
30 x 24 CFM	1000	1200	1400	1600	1800	2000	2400	2800	3200	3600	4000
Ak 2.000 Throw X/Y	6-11/7-13	6-12/8-15	8-14/10-18	8-15/11-21	10-18/13-23	10-19/14-26	12-23/16-29	15-28/19-35	16-31/21-39	19-35/24-43	22-40/29-51



Note 1: The minimum Throw Dimension is based on a terminal velocity of 200 fpm. The maximum Throw Dimension is based on a terminal velocity of 100 fpm.

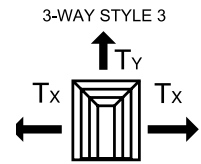
Ceiling Height in Feet	Maximum Recommended Cooling Temperature Differential	Maximum Recommended CFM Per Diffuser			
		SR/AR/ASR		SR/AR	
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



AR Series: ARE, ARF, ARS, ART (Page 31-33, 68) Square & Rectangular Ceiling Diffusers — Aluminum

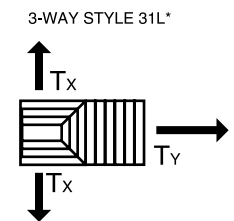
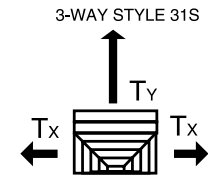
Three-Way Style 3

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM	50	60	70	80	90	100	120	140	160	180	200
Ak .100	Throw X/Y	2-4/1-2	2-4/1-2	3-5/2-3	3-5/2-3	4-7/2-4	4-7/2-4	5-9/3-6	6-10/3-6	6-11/4-7	6-11/4-7	7-13/4-8
9 x 9	CFM	110	135	155	180	205	225	270	315	360	410	450
Ak .220	Throw X/Y	2-4/2-3	3-6/2-3	4-7/2-4	4-8/2-4	5-9/3-6	5-9/3-6	6-12/4-7	7-13/5-9	9-15/6-10	10-18/6-11	11-20/7-12
12 x 12	CFM	200	240	280	320	360	400	480	560	640	725	800
Ak .400	Throw X/Y	4-7/2-5	5-9/3-6	6-10/4-7	6-10/4-7	6-11/4-8	7-13/5-9	9-16/6-10	12-21/7-12	13-22/8-13	14-24/8-14	16-27/9-15
15 x 15	CFM	310	375	440	500	565	625	750	875	1000	1125	1250
Ak .620	Throw X/Y	4-8/2-4	6-11/4-7	7-13/4-7	8-14/4-8	8-15/5-9	9-16/6-10	11-19/7-12	13-23/9-15	15-26/10-18	17-29/11-20	19-33/12-21
18 x 18	CFM	450	540	630	720	810	900	1080	1260	1440	1620	1800
Ak .900	Throw X/Y	4-9/3-5	6-11/4-7	7-13/5-9	9-15/6-10	10-18/6-11	11-20/7-12	13-24/9-15	15-26/10-18	18-32/11-20	20-35/12-22	23-40/14-25
21 x 21	CFM	615	740	860	985	1110	1230	1475	1725	1970	2220	2460
Ak 1.230	Throw X/Y	5-11/3-6	7-13/4-8	11-19/6-11	11-20/7-12	12-21/8-13	13-23-8-14	16-29/10-17	19-34/11-20	21-39/14-23	24-42/16-25	27-45/18-29
24 x 24	CFM	800	960	1120	1275	1440	1600	1925	2240	2570	2890	3200
Ak 1.600	Throw X/Y	7-14/5-9	9-16/6-11	11-19/7-13	13-21/8-14	14-24/9-15	16-27/9-16	17-31/11-19	21-35/14-24	25-39/16-27	28-43/18-31	32-47/20-33
27 x 27	CFM	1010	1215	1420	1615	1820	2020	2430	2840	3240	3650	4040
Ak 2.020	Throw X/Y	7-13/4-9	9-16/6-11	11-20/7-13	13-23/9-15	14-25/9-16	15-27/10-18	18-31/12-21	22-37/14-25	25-41/18-30	28-46/19-33	31-50/21-36



Three-Way Style 31S and Style 31L*

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	75	90	105	120	135	150	180	210	240	270	300
Ak .150	Throw X/Y	2-3/4-7	2-3/4-7	2-3/4-7	2-4/4-8	3-5/5-8	3-6/5-9	4-7/6-11	4-8/7-12	6-10/9-15	6-11/10-17	6-11/11-19
9 x 9*	CFM	115	135	155	180	200	225	270	315	360	405	450
Ak .220	Throw X/Y	1-3/4-7	2-3/5-9	2-3/6-11	2-4/7-12	3-6/8-14	3-6/9-16	4-7/10-18	4-8/12-21	5-9/14-24	6-10/16-28	6-11/18-32
12 x 9	CFM	150	180	210	240	210	300	360	420	480	540	600
Ak .300	Throw X/Y	2-3/4-8	2-4/5-9	3-6/6-10	4-7/7-12	4-8/8-14	4-8/8-14	5-9/9-16	6-10/11-20	7-12/14-24	8-13/15-26	9-15/16-28
12 x 12*	CFM	200	240	280	320	360	400	480	560	640	720	800
Ak .40	Throw X/Y	2-3/5-11	2-4/7-13	3-6/9-15	3-6/10-17	4-7/11-19	4-8/12-21	6-10/15-26	6-11/18-32	7-12/20-34	7-13/21-36	8-14/24-42
15 x 15*	CFM	310	375	440	500	565	625	750	875	1000	1125	1250
Ak .620	Throw X/Y	2-4/7-13	3-6/10-18	4-7/11-20	4-8/12-21	5-9/14-25	5-9/14-25	6-11/19-34	7-13/22-38	8-14/25-43	9-16/27-44	10-18/30-45
18 x 15	CFM	375	450	525	600	675	750	900	1050	1200	1350	1500
Ak .750	Throw X/Y	3-6/7-13	4-7/9-15	4-8/9-16	5-9/11-20	6-10/13-23	6-11/15-26	7-13/17-30	9-16/19-35	10-18/22-39	11-20/27-40	13-25/30-46
21 x 9	CFM	525	630	735	840	945	1050	1260	1475	1680	1890	2100
Ak 1.050	Throw X/Y	4-7/8-14	4-8/10-18	5-9/11-20	6-10/18-23	6-11/14-25	7-12/16-28	9-15/19-34	10-18/22-39	11-20/27-40	13-23/29-46	15-26/33-51
21 x 21*	CFM	615	740	860	985	1110	1230	1475	1725	1970	2210	2460
Ak 1.230	Throw X/Y	3-6/9-17	4-8/12-21	5-9/16-27	6-10/17-30	7-11/19-32	7-12/21-36	9-15/26-40	11-19/30-45	13-22/34-51	15-25/39-56	17-28/43-60
27 x 21	CFM	780	940	1080	1250	1400	1560	1870	2180	2500	2800	3120
Ak 1.560	Throw X/Y	5-9/10-18	5-9/11-20	6-10/13-22	7-12/15-26	8-14/18-32	9-16/21-36	11-19/23-40	13-21/25-43	15-24/29-47	17-29/34-53	19-33/38-59
30 x 24	CFM	1000	1200	1400	1600	1800	2000	2400	2800	3200	3500	4000
Ak 2.000	Throw X/Y	5-9/11-20	6-11/13-23	7-13/16-27	8-14/17-31	9-16/20-35	10-18/22-40	12-21/25-44	14-25/31-48	16-29/34-53	18-32/38-57	20-35/43-61
33 x 27	CFM	1230	1475	1725	1970	2220	2460	2950	3450	3925	4425	4920
Ak 2.460	Throw X/Y	6-10/13-23	7-13/17-28	8-14/19-33	9-16/21-35	11-18/23-39	12-20/25-44	14-25/29-47	16-29/33-51	18-33/37-56	22-37/42-59	25-41/47-64



Note 2: The minimum Throw Dimension is based on a terminal velocity of 170 fpm. The maximum Throw Dimension is based on a terminal velocity of 85 fpm.

*Style 31L not available in square configuration

Ceiling Height in Feet	Maximum Recommended Cooling Temperature Differential	Maximum Recommended CFM Per Diffuser			
		SR/AR/ASR	SR/AR		
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500

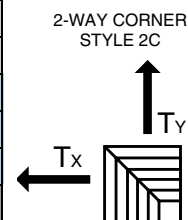


Engineering Data

AR Series: ARE, ARF, ARS, ART Square & Rectangular Ceiling Diffusers — Aluminum (Page 31-33, 68)

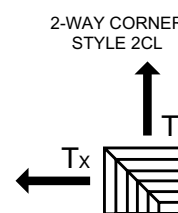
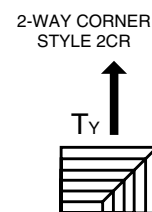
Two-Way Corner Style 2C

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM	45	55	60	70	80	90	105	125	140	160	180
Ak .090	Throw X/Y	1-3/1-3	2-5/2-5	2-5/2-5	3-7/3-7	3-7/3-7	5-8/5-8	5-8/5-8	6-11/6-11	7-12/7-12	8-13/8-13	9-14/9-14
9 x 9	CFM	95	115	135	155	175	195	235	275	315	350	390
Ak .190	Throw X/Y	4-6/4-6	4-6/4-6	5-7/5-7	5-8/5-8	6-10/6-10	6-11/6-11	8-13/8-13	9-14/9-14	10-16/10-16	13-20/13-20	14-22/14-22
12 x 12	CFM	175	210	245	280	315	350	420	480	560	635	700
Ak .350	Throw X/Y	5-7/5-7	5-8/5-8	6-11/6-11	8-13/8-13	8-13/8-13	9-14/9-14	10-16/10-16	13-19/13-19	14-22/14-22	16-26/16-26	19-29/19-29
15 x 15	CFM	275	330	385	440	495	550	660	775	885	995	1100
Ak .550	Throw X/Y	5-9/5-9	7-12/7-12	8-13/8-13	9-14/9-14	10-16/10-16	11-18/11-18	13-21/13-21	15-25/15-25	19-29/19-29	21-33/21-33	23-36/23-36
18 x 18	CFM	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .780	Throw X/Y	7-12/7-12	9-14/9-14	10-15/10-15	10-16/10-16	12-19/12-19	14-22/14-22	16-25/16-25	18-29/18-29	21-33/21-33	25-38/25-38	28-42/28-42
21 x 21	CFM	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.080	Throw X/Y	8-13/8-13	10-15/10-15	12-18/12-18	13-21/13-21	15-23/15-23	17-28/17-28	20-32/20-32	22-35/22-35	25-39/25-39	29-43/29-43	32-47/32-47
24 x 24	CFM	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.410	Throw X/Y	9-16/9-16	11-18/11-18	13-21/13-21	15-24/15-24	17-27/17-27	19-29/19-29	22-34/22-34	25-38/25-38	29-42/29-42	33-47/33-47	37-51/37-51
27 x 27	CFM	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.760	Throw X/Y	10-17/10-17	12-19/12-19	14-22/14-22	16-26/16-26	19-29/19-29	21-33/21-33	24-37/24-37	28-41/28-41	32-46/32-46	35-50/35-50	39-55/39-55



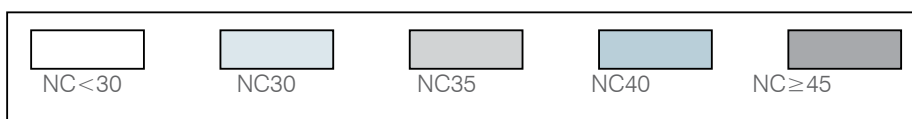
Two-Way Corner Style 2CR

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	260
Ak .130	Throw X/Y	2-4/3-5	3-5/4-7	4-6/5-8	4-6/5-8	5-7/6-11	5-7/6-11	6-9/8-13	6-10/9-14	7-12/11-16	8-13/13-21	10-16/16-25
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw X/Y	2-4/3-6	3-5/5-8	3-5/6-11	4-6/7-12	5-7/8-13	5-7/9-14	5-8/10-15	6-11/13-20	7-12/15-24	8-13/17-26	10-15/19-29
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw X/Y	2-4/5-8	3-5/6-10	3-5/7-12	4-6/8-13	5-7/10-15	5-8/11-17	6-9/13-20	6-10/15-24	8-12/17-27	10-14/20-30	11-17/22-34
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw X/Y	4-6/5-7	4-6/5-8	5-7/6-10	5-8/6-11	6-10/8-12	6-11/9-14	8-13/10-16	11-17/14-21	19-19-16/24	13-20/17-26	14-23/19-30
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw X/Y	4-6/6-10	5-7/6-11	6-8/8-12	6-9/10-14	6-11/10-16	7-12/12-19	9-14/14-22	10-15/16-25	12-17/19-29	13-20/21-33	14-22/23-35
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw X/Y	4-6/6-11	5-7/8-13	5-7/9-14	5-8/10-15	6-10/11-18	7-12/13-21	8-13/16-25	9-15/19-29	11-17/22-33	12-20/23-35	14-22/26-39
21 x 9	CFM	230	275	320	365	410	455	545	635	730	820	910
Ak .450	Throw X/Y	4-6/8-13	5-7/10-15	6-8/11-17	6-9/12-19	6-10/13-21	6-11/15-24	8-13/18-29	10-15/22-34	12-18/24-38	13-21/26-42	15-25/30-47
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw X/Y	5-7/5-8	5-8/6-11	6-10/8-13	7-12/9-14	8-13/10-16	9-14/12-19	11-18/14-22	13-20/16-25	15-24/19-29	16-26/21-32	18-29/24-37
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw X/Y	4-7/6-11	5-8/8-13	6-10/9-14	7-12/11-17	9-14/13-21	10-15/14-22	12-18/17-26	14-20/21-30	16-24/23-34	18-27/27-38	21-31/29-42
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw X/Y	6-10/8-13	6-11/9-14	8-13/11-18	9-14/13-20	10-16/15-24	12-19/16-26	13-21/19-29	15-26/22-33	18-29/25-38	21-33/29-44	25-38/32-49
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw X/Y	4-9/8-14	6-11/10-16	8-13/13-20	9-14/15-24	10-16/16-26	12-19/19-29	14-22/22-34	16-25/25-38	19-29/29-44	21-32/33-48	25-37/37-52
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .980	Throw X/Y	6-11/8-13	8-13/10-15	10-15/11-18	11-17/12-20	12-19/14-22	13-21/16-25	16-26/19-29	19-30/22-34	22-34/26-39	25-38/29-43	27-42/32-48
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.380	Throw X/Y	8-13/10-17	10-15/13-20	12-19/15-24	14-21/17-27	15-23/19-30	16-26/21-33	20-30/25-37	24-36/29-42	28-41/33-46	30-46/37-51	34-51/42-56



Note 3: The minimum Throw Dimension is based on a terminal velocity of 135 fpm. The maximum Throw Dimension is based on a terminal velocity of 65 fpm.

Ceiling Height in Feet	Maximum Recommended Cooling Temperature Differential	Maximum Recommended CFM Per Diffuser			
		SR/AR/ASR		SR/AR	
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500

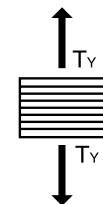


AR/SR Series: ARE, ARF, ARS, ART, SRE
Square & Rectangular Ceiling Diffusers — Steel/Aluminum (Page 30-33)

Two-Way Style 2L

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	260
Ak .130	Throw Y	3-5	3-5	5-7	6-8	7-10	7-10	8-12	10-14	11-17	14-20	16-23
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw Y	3-5	5-7	6-8	6-9	7-10	8-12	10-14	12-18	15-21	16-23	17-25
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw Y	4-6	6-8	6-9	7-10	9-13	10-14	10-15	13-19	15-21	18-26	21-30
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw Y	5-7	6-8	6-9	8-12	10-14	10-14	11-17	14-21	16-24	19-27	20-31
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw Y	6-8	7-10	8-12	9-13	10-15	12-18	14-20	16-24	18-26	21-31	24-35
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw Y	6-9	8-12	9-13	10-14	11-17	13-19	15-21	17-25	19-29	22-33	25-39
21 x 9	CFM	230	275	320	365	410	455	545	635	730	820	910
Ak .450	Throw Y	7-10	8-12	9-13	11-16	12-18	14-20	16-24	19-27	22-32	25-36	29-41
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw Y	6-9	8-12	10-14	10-15	12-18	14-20	15-24	18-27	22-32	24-36	28-41
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw Y	7-11	9-13	11-15	12-18	13-19	15-21	18-26	20-29	23-34	27-39	31-42
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw Y	9-13	10-15	12-18	14-20	15-23	17-25	20-30	23-34	27-40	31-44	34-48
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw Y	8-14	11-16	13-19	15-21	17-25	19-29	22-33	25-38	29-42	33-48	38-54
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .910	Throw Y	10-15	11-17	13-19	16-22	19-25	20-28	23-33	26-38	29-42	34-46	38-51
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.300	Throw Y	11-17	14-20	17-24	19-27	21-31	23-35	27-40	34-46	38-51	42-56	47-61

2-WAY STYLE 2L



Two-Way Style 2S

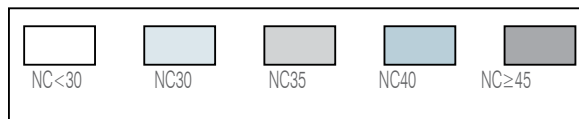
Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	265
Ak .130	Throw X	3-6	4-7	5-8	6-9	8-12	9-13	10-14	11-17	13-19	15-23	17-26
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw X	4-7	6-8	7-10	8-12	9-13	10-14	11-17	14-20	15-23	17-25	19-29
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw X	5-7	6-9	7-10	9-13	10-15	11-17	13-19	15-23	18-26	21-30	23-34
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw X	6-8	6-9	7-10	9-13	9-13	10-15	13-19	15-21	17-25	19-29	21-31
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw X	7-10	8-12	9-13	10-14	12-18	14-20	16-24	18-26	19-29	23-33	27-39
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw X	7-10	9-13	11-17	12-18	13-19	15-23	18-27	20-30	22-32	25-38	29-43
21 x 9	CFM	230	275	320	365	410	455	545	635	730	820	910
Ak .450	Throw X	9-13	9-14	10-15	12-18	15-21	16-24	19-29	22-33	26-38	29-42	32-47
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw X	7-10	8-12	10-14	11-17	13-19	15-21	16-24	19-27	22-33	25-38	29-42
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw X	8-11	10-14	10-15	12-18	14-20	15-23	18-27	23-33	25-37	29-42	32-47
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw X	10-15	11-17	14-20	15-23	18-26	20-29	22-33	26-38	29-42	35-46	39-51
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw X	9-14	11-17	15-21	17-25	19-29	22-32	25-37	28-41	33-45	38-51	43-56
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .910	Throw X	11-17	12-18	14-20	16-24	19-27	20-29	23-34	27-40	32-45	37-49	40-55
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.300	Throw X	12-18	15-21	18-25	21-29	23-33	25-37	29-43	33-48	38-53	43-59	49-63

2-WAY STYLE 2S



Note 3: The minimum Throw Dimension is based on a terminal velocity of 135 fpm. The maximum Throw Dimension is based on a terminal velocity of 65 fpm.

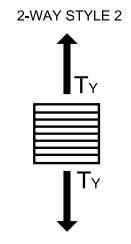
Ceiling Height in Feet	Maximum Recommended Cooling Temperature Differential	Maximum Recommended CFM Per Diffuser			
		SR/AR/ASR	SR/AR		
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



AR/SR Series: ARE, ARF, ARS, ART, SRE
Square & Rectangular Ceiling Diffusers — Steel/Aluminum (Page 30-33)

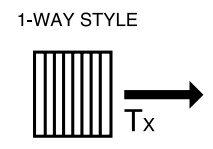
Two-Way Style 2

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM	45	55	60	70	80	90	105	125	140	160	180
Ak .090	Throw Y	3-5	3-5	4-7	4-7	5-8	5-8	6-9	9-13	10-15	11-17	12-18
9 x 9	CFM	95	115	135	155	175	195	235	275	315	350	390
Ak .190	Throw Y	5-7	6-8	6-8	6-9	8-12	9-13	11-17	12-18	14-20	16-24	18-26
12 x 12	CFM	175	210	245	280	315	350	420	480	560	635	700
Ak .350	Throw Y	4-7	6-9	9-13	10-15	11-17	12-18	14-20	17-23	18-27	21-31	23-35
15 x 15	CFM	275	330	385	440	495	550	660	775	885	995	1100
Ak .550	Throw Y	8-12	10-14	10-15	12-18	14-20	15-23	18-27	22-32	24-36	26-39	29-43
18 x 18	CFM	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .780	Throw Y	9-15	11-17	12-18	14-20	15-23	18-26	20-30	24-36	27-42	31-45	36-51
21 x 21	CFM	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.080	Throw Y	11-17	14-20	15-23	18-26	19-29	23-35	26-40	29-44	34-49	38-54	43-59
24 x 24	CFM	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.410	Throw Y	12-19	14-22	17-25	20-30	21-33	23-35	27-40	34-46	39-51	42-56	46-60
27 x 27	CFM	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.760	Throw Y	12-20	15-23	18-26	21-31	24-36	26-40	30-45	35-50	39-56	43-61	48-66



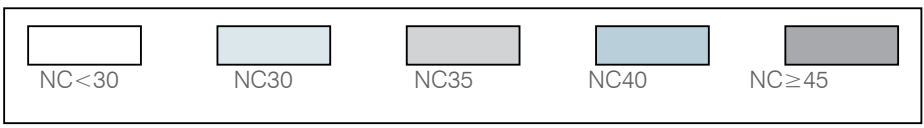
One-Way Style

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6	CFM	45	55	60	70	80	90	105	125	140	160	180
Ak .090	Throw	3-5	4-7	5-8	6-9	8-10	9-12	10-14	12-18	14-20	15-22	16-24
9 x 9	CFM	95	115	135	155	175	195	235	275	315	350	390
Ak .190	Throw	6-9	7-10	9-13	10-14	11-17	13-19	15-21	18-26	19-29	22-33	25-38
12 x 12	CFM	175	210	245	280	315	350	420	480	560	635	700
Ak .350	Throw	8-12	10-14	12-18	13-19	15-21	18-26	21-31	24-36	27-40	30-43	33-45
15 x 15	CFM	275	330	385	440	495	550	660	775	885	995	1100
Ak .550	Throw	10-16	13-19	14-22	18-26	19-29	21-31	25-37	30-43	35-46	38-50	42-56
18 x 18	CFM	390	470	545	625	700	780	935	1090	1250	1410	1560
Ak .780	Throw	13-21	15-23	18-26	19-29	22-33	25-38	29-42	35-46	42-49	44-52	49-56
21 x 21	CFM	540	650	760	865	975	1080	1300	1515	1730	1945	2160
Ak 1.080	Throw	14-23	17-25	21-30	24-36	27-40	30-43	34-48	39-54	44-60	48-64	53-68
24 x 24	CFM	705	845	990	1130	1270	1410	1690	1950	2250	2540	2820
Ak 1.410	Throw	20-29	23-33	24-36	27-40	30-44	35-48	39-54	43-60	48-65	52-69	56-74
27 x 27	CFM	880	1055	1230	1410	1585	1760	2110	2470	2820	3170	3520
Ak 1.760	Throw	19-27	22-31	25-38	28-42	33-47	36-53	43-58	49-63	54-68	60-73	65-77



Note 3: The minimum Throw Dimension is based on a terminal velocity of 135 fpm. The maximum Throw Dimension is based on a terminal velocity of 65 fpm.

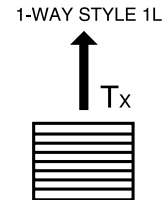
Ceiling Height in Feet	Maximum Recommended Cooling Temperature Differential	Maximum Recommended CFM Per Diffuser			
		SR/AR/ASR	SR/AR		
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



AR/SR Series: ARE, ARF, ARS, ART, SRE
Square & Rectangular Ceiling Diffusers — Steel/Aluminum (Page 30-33)

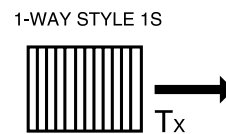
One-Way Style 1L

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	265
Ak .130	Throw	5-8	6-9	7-11	8-12	9-13	10-15	12-18	15-21	16-24	19-29	21-32
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw	5-8	6-9	6-13	9-14	10-15	12-18	14-20	17-25	18-27	20-30	23-35
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw	5-8	7-10	9-13	10-15	12-18	14-20	16-24	18-27	21-31	24-36	28-41
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw	7-10	8-12	10-14	11-17	12-18	14-20	17-25	19-29	22-23	25-37	28-41
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw	9-13	10-14	11-17	12-18	15-23	17-25	20-30	22-33	25-37	29-42	32-45
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw	9-13	10-15	12-18	14-20	16-24	18-26	20-30	25-37	27-40	31-44	36-48
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw	10-14	11-17	13-19	15-23	18-26	19-29	22-32	26-39	30-43	35-48	39-54
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw	10-15	12-18	14-20	17-25	19-27	21-30	25-36	28-41	32-45	36-49	42-54
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw	13-19	15-21	18-26	19-29	22-34	25-38	29-42	34-46	38-51	43-56	48-61
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw	14-22	16-24	18-27	21-31	24-36	27-40	30-43	35-47	41-52	46-57	53-61
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .910	Throw	14-20	16-24	19-29	22-32	24-36	26-39	30-43	35-47	41-51	45-56	49-62
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.380	Throw	17-27	19-29	23-35	26-40	30-45	34-49	38-54	43-60	48-67	54-72	59-80



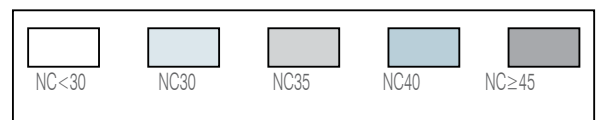
One-Way Style 1S

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
9 x 6	CFM	65	80	95	105	120	130	160	185	210	240	265
Ak .130	Throw	4-7	5-9	7-11	9-13	11-17	13-19	15-21	16-24	18-27	21-32	23-35
12 x 6	CFM	90	105	120	140	160	175	210	245	280	315	350
Ak .170	Throw	6-10	8-12	10-15	12-17	14-19	15-21	17-25	21-31	23-35	25-37	29-44
15 x 6	CFM	110	130	155	175	200	220	265	310	350	395	440
Ak .220	Throw	9-12	10-14	12-18	14-20	16-24	18-26	21-31	23-35	27-40	31-45	35-51
12 x 9	CFM	130	155	180	210	235	260	310	365	415	470	520
Ak .260	Throw	8-12	10-14	10-15	12-18	14-20	16-24	18-27	23-33	24-37	28-42	30-44
15 x 9	CFM	165	195	230	260	295	325	390	460	525	590	650
Ak .320	Throw	10-15	12-18	13-19	15-21	18-26	22-32	23-35	26-39	30-43	35-46	38-47
18 x 9	CFM	195	235	275	310	350	390	470	545	625	700	780
Ak .390	Throw	11-17	13-19	15-23	17-25	20-30	22-33	25-38	31-44	34-45	38-47	42-51
15 x 12	CFM	220	260	305	350	390	435	525	610	700	785	870
Ak .430	Throw	11-16	12-18	15-21	17-25	19-29	22-32	25-38	28-44	33-45	36-49	42-54
18 x 12	CFM	260	315	370	420	475	525	630	735	840	945	1050
Ak .520	Throw	12-18	14-20	16-24	19-27	21-31	22-33	27-40	32-45	37-47	42-50	45-56
21 x 15	CFM	380	455	530	605	685	760	915	1060	1220	1370	1520
Ak .760	Throw	14-20	16-24	19-29	22-32	24-37	28-41	33-45	39-48	43-52	48-58	54-63
24 x 15	CFM	440	525	615	700	790	875	1050	1225	1400	1575	1750
Ak .870	Throw	16-23	18-26	22-32	25-37	28-41	32-45	37-47	44-54	49-59	54-66	59-71
21 x 18	CFM	460	550	640	735	825	915	1100	1280	1465	1645	1830
Ak .910	Throw	18-24	18-26	21-31	24-33	26-38	28-41	33-47	39-53	44-58	48-63	54-69
27 x 21	CFM	690	830	965	1100	1245	1380	1655	1935	2210	2490	2760
Ak 1.380	Throw	19-29	21-32	25-38	31-44	37-49	40-51	42-55	46-61	51-66	56-71	61-77



Note 3: The minimum Throw Dimension is based on a terminal velocity of 135 fpm. The maximum Throw Dimension is based on a terminal velocity of 65 fpm.

Ceiling Height in Feet	Maximum Recommended Cooling Temperature Differential	Maximum Recommended CFM Per Diffuser			
		SR/AR/ASR	SR/AR		
		Four-Way	Three-Way	Two-Way	One-Way
7	15°	400	300	200	100
8	20°	600	450	300	150
9	25°	1200	900	600	300
10	25°	1800	1350	900	450
12	30°	3200	2400	1600	800
14	30°	4800	3600	2400	1200
16	30°	6000	4500	3000	1500



ASRE, ASRS Square Supply Return Diffuser — Aluminum (Page 34)

Four-Way Square

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
12 x 12 Ak .180	CFM	90	105	120	140	155	175	210	250	280	315	350
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	2-4/2-4	2-4/2-4	3-5/3-5	3-5/3-5	4-6/4-6	5-8/5-8	5-9/5-9	6-4/6-4	6-12/6-12	7-13/7-13	8-14/8-14
	NC	<30	<30	<30	<30	<30	<30	<35	<40	<45	<45	<45
Return Performance Data												
9 x 9 Grid Core Ak .340	CFM	65	80	90	105	115	130	160	190	210	235	260
	-Ps	<.01	<.01	<.01	<.01	<.01	<.01	.01	.02	.02	.03	.04
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
15 x 15 Ak .400	CFM	200	240	280	320	360	400	480	560	640	720	800
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-15/8-15	9-17/9-17	10-19/10-19
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45
Return Performance Data												
9 x 9 Grid Core Ak .340	CFM	150	180	210	240	270	300	360	420	480	540	600
	-Ps	.01	.02	.02	.03	.04	.05	.07	.09	.12	.16	.19
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
18 x 18 Ak .500	CFM	250	300	350	400	450	500	600	700	800	900	1000
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	4-6/4-6	4-8/4-8	5-8/5-8	5-9/5-9	6-11/6-11	6-12/6-12	7-13/7-13	8-15/8-15	9-17/9-17	10-19/10-19
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45
Return Performance Data												
12 x 12 Grid Core Ak .640	CFM	190	225	265	300	340	375	450	525	600	675	750
	-Ps	<.01	<.01	.01	.01	.02	.02	.03	.04	.06	.07	.09
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45

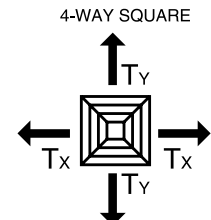
Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
21 x 21 Ak .600	CFM	300	360	420	480	540	600	720	845	960	1075	1200
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	3-7/3-7	4-7/4-7	4-8/4-8	5-9/5-9	5-11/5-11	6-12/6-12	7-14/7-14	8-16/8-16	19-18/9-18	11-21/11-21
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45
Return Performance Data												
15 x 15 Grid Core Ak 1.000	CFM	225	270	315	360	405	450	540	635	720	810	900
	-Ps	<.01	<.01	<.01	<.01	.01	.01	.02	.03	.03	.04	.05
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
24 x 24 Ak .700	CFM	350	420	490	560	630	700	840	980	1120	1260	1400
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y	3-5/3-5	3-7/3-7	4-7/4-7	4-9/4-9	5-11/5-11	5-11/5-11	6-12/6-12	7-15/7-15	9-17/9-17	11-21/11-21	13-25/13-25
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45
Return Performance Data												
18 x 18 Grid Core Ak 1.600	CFM	260	315	365	420	470	525	630	735	840	945	1050
	-Ps	<.01	<.01	<.01	<.01	<.01	<.01	.01	.01	.01	.02	.03
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45

Return CFM listed is 75% of supply.
NC re 8db room Attenuation

NOTES: The minimum Throw Dimension is based on a terminal velocity of 200 FPM. The maximum Throw Dimension is based on a terminal velocity of 100 FPM.

The minimum Throw Dimension in feet is based on a V^2 of 200 FPM with V^2 of 65 FPM.
The maximum Throw Dimension in feet is based on a V^2 of 100 FPM with V^2 of 35 FPM.



ASRE, ASRS Square Supply Return Diffuser — Aluminum (Page 34)

Four-Way Square

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
27 x 27 Ak 1.100	CFM	560	675	785	900	1020	1120	1345	1570	1790	2020	2240
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y NC	3-5/3-5 <30	3-5/3-5 <30	4-8/4-8 <30	5-11/5-11 <30	6-14/6-14 <30	7-15/7-15 <30	8-17/8-17 <35	9-18/9-18 <40	11-21/11-21 <45	13-25/13-25 <45	15-29/15-29 <45
Return Performance Data												
18 x 18 Grid Core Ak 1.600	CFM	345	505	590	675	765	840	1020	1180	1340	1520	1680
	-Ps	<.01	<.01	<.01	.01	.02	.02	.03	.04	.05	.06	.07
	NC	<30	<30	<30	<30	<30	<30	35	40	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
30 x 30 Ak 1.300	CFM	635	765	890	1015	1140	1270	1520	1775	2030	2290	2540
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y NC	3-7/3-7 <30	4-8/4-8 <30	4-10/4-10 <30	5-12/5-12 <30	6-14/6-14 <30	7-16/7-16 <30	9-17/9-17 35	10-19/10-29 40	12-23/12-23 >45	14-27/14-27 >45	16-31/16-31 >45
Return Performance Data												
21 x 21 Grid Core Ak 2.100	CFM	475	575	665	760	855	955	1140	1330	1520	1720	1900
	-Ps	<.01	<.01	<.01	<.01	.01	.01	.02	.03	.03	.04	.05
	NC	<30	<30	<30	<30	<30	<30	<35	40	45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
33 x 33 Ak 1.800	CFM	900	1080	1260	1440	1620	1800	2160	2520	2880	3250	3600
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y NC	4-8/4-8 <30	5-10/5-10 <30	6-12/6-12 <30	6-13/6-13 <30	7-15/7-15 <30	8-17/8-17 <30	11-23/11-23 35	14-29/14-29 45	16-31/16-31 >45	18-35/18-35 >45	20-39/20-39 >45
Return Performance Data												
21 x 21 Grid Core Ak 2.100	CFM	675	810	945	1080	1210	1350	1620	1885	2160	2440	2700
	-Ps	<.01	<.01	.01	.02	.02	.03	.04	.05	.07	.09	.10
	NC	<30	<30	<30	<30	<30	<30	<35	40	45	>45	>45

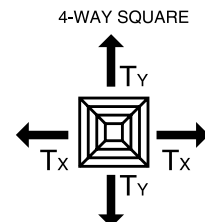
Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
36 x 36 Ak 2.000	CFM	1000	1200	1400	1600	1800	2000	2400	2800	3200	3600	4000
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y NC	3-8/3-8 <30	4-11/4-11 <30	5-12/5-12 <30	6-14/6-14 <30	7-16/7-16 <30	9-19/9-19 <30	12-23/12-23 40	14-27/14-27 45	16-31/16-31 >45	18-35/18-35 >45	22-39/22-39 >45
Return Performance Data												
24 x 24 Grid Core Ak 2.800	CFM	750	900	1050	1200	1350	1500	1800	2100	2400	2700	3000
	-Ps	<.01	<.01	<.01	.01	.01	.02	.03	.03	.05	.06	.07
	NC	<30	<30	<30	<30	<30	<35	40	45	>45	>45	>45

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
Supply Performance Data												
42 x 42 Ak 2.900	CFM	1450	1740	2030	2320	2610	2900	3480	4060	4640	5225	5800
	Ps	.01	.02	.02	.03	.04	.05	.07	.10	.13	.16	.20
	Throw X/Y NC	4-11/4-11 <30	5-13/5-13 <30	7-16/7-16 <30	10-21/10-21 <30	12-25/12-25 <30	15-29/15-29 <40	17-33/17-33 45	19-36/19-36 45	22-41/22-41 >45	25-48/25-48 >45	29-54/29-54 >45
Return Performance Data												
27 x 27 Grid Core Ak 3.600	CFM	1085	1300	1520	1735	1950	2170	2600	3040	3470	3900	4340
	-Ps	<.01	<.01	.01	.01	.02	.02	.03	.04	.06	.07	.09
	NC	<30	<30	<30	<30	<35	<40	40	45	>45	>45	>45

Return CFM listed is 75% of supply.
NC re 8db room Attenuation

NOTES: The minimum Throw Dimension is based on a terminal velocity of 200 FPM. The maximum Throw Dimension is based on a terminal velocity of 100 FPM.

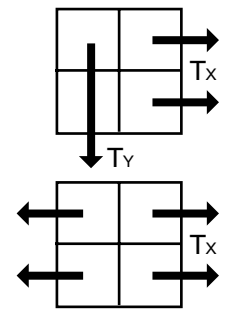
The minimum Throw Dimension in feet is based on a V_r of 200 FPM with V_s of 65 FPM.
The maximum Throw Dimension in feet is based on a V_r of 100 FPM with V_s of 35 FPM.



MCD, MCDD, MCDS, MCSDS, MCDST, MCSDST (Page 35, 36, 68, 69)
Modular Ceiling Diffuser — Aluminum

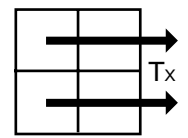
Two Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6 Ak .090	CFM Throw X/Y NC	45 2-5/2-5 <20	55 3-5/3-5 <20	65 3-6/3-6 <20	70 3-6/3-6 <20	80 5-8/5-8 <20	90 5-9/5-9 <20	110 5-11/5-11 21	125 6-12/6-12 24	145 6-14/6-14 28	160 8-15/8-15 31	180 9-17/9-17 34
8 x 8 Ak .150	CFM Throw X/Y NC	80 3-6/3-6 <20	95 3-6/3-6 <20	110 5-8/5-8 <20	130 5-9/5-9 <20	145 5-11/5-11 <20	160 6-11/6-11 <20	190 6-14/6-14 22	225 8-15/8-15 26	255 9-17/9-17 29	290 11-18/11-18 32	320 11-20/11-20 35
10 x 10 Ak .250	CFM Throw X/Y NC	130 3-8/3-8 <20	155 5-9/5-9 <20	180 5-11/5-11 <20	210 6-11/6-11 <20	235 6-12/6-12 <20	260 8-12/8-12 <20	310 9-15/9-15 23	365 11-17/11-17 27	415 12-20/12-20 30	470 14-21/14-21 33	520 15-23/15-23 36
12 x 12 Ak .370	CFM Throw X/Y NC	190 5-9/5-9 <20	230 5-11/5-11 <20	265 6-12/6-12 <20	305 8-14/8-14 <20	340 8-15/8-15 <20	380 9-17/9-17 20	455 11-18/11-18 24	530 12-21/12-21 28	610 14-23/14-23 31	685 15-24/15-24 35	760 17-26/17-26 37
14 x 14 Ak .520	CFM Throw X/Y NC	260 5-11/5-11 <20	310 6-12/6-12 <20	365 8-14/8-14 <20	415 8-17/8-17 <20	470 9-18/9-18 <20	520 11-20/11-20 20	625 12-21/12-21 25	730 14-23/14-23 29	830 17-24/17-24 32	935 18-27/18-27 35	1040 20-29/20-29 38
16 x 16 Ak .700	CFM Throw X/Y NC	350 6-12/6-12 <20	420 8-14/8-14 <20	490 8-17/8-17 <20	560 9-18/9-18 <20	630 11-21/11-21 <20	700 12-23/12-23 21	840 14-26/14-26 26	980 17-29/17-29 30	1120 18-30/18-30 33	1260 21-32/21-32 36	1400 24-33/24-33 39
18 x 18 Ak .900	CFM Throw X/Y NC	450 6-14/6-14 <20	540 8-17/8-17 <20	630 9-18/9-18 <20	720 11-21/11-21 <20	810 12-23/12-23 20	900 14-24/14-24 22	1080 17-27/17-27 27	1260 18-30/18-30 31	1440 21-33/21-33 34	1620 24-35/24-35 37	1800 27-36/27-36 40
20 x 20 Ak 1.100	CFM Throw X/Y NC	555 8-15/8-15 <20	665 9-18/9-18 <20	775 11-21/11-21 <20	890 12-24/12-24 <20	1000 14-26/14-26 21	1110 15-29/15-29 24	1330 18-32/18-32 28	1555 21-35/21-35 32	1775 24-38/24-38 36	2000 27-39/27-39 39	2220 30-41/30-41 42
22 x 22 Ak 1.330	CFM Throw X/Y NC	665 8-17/8-17 <20	800 9-20/9-20 <20	930 12-23/12-23 <20	1065 14-26/14-26 22	1195 15-27/15-27 25	1330 17-30/17-30 28	1595 20-35/20-35 32	1860 23-38/23-38 36	2130 27-41/27-41 40	2395 29-44/29-44 43	2660 33-45/33-45 46



One-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6 Ak .090	CFM Throw NC	45 2-6 <20	55 4-6 <20	65 4-8 <20	70 4-8 <20	80 6-10 <20	90 6-12 <20	110 6-14 21	125 8-16 24	145 8-18 28	160 10-20 31	180 12-22 34
8 x 8 Ak .150	CFM Throw NC	80 4-8 <20	95 4-8 <20	110 6-10 <20	130 6-12 <20	145 6-14 <20	160 8-14 <20	190 8-18 22	225 10-20 26	255 12-22 29	290 14-24 32	320 14-26 35
10 x 10 Ak .250	CFM Throw NC	130 4-10 <20	155 6-12 <20	180 6-14 <20	210 8-14 <20	235 8-16 <20	260 10-16 <20	310 12-20 23	365 14-22 27	415 16-26 30	470 18-28 33	520 20-30 36
12 x 12 Ak .370	CFM Throw NC	190 6-12 <20	230 6-14 <20	265 8-16 <20	305 10-18 <20	340 10-20 <20	380 12-20 20	455 12-22 24	530 14-24 28	610 16-28 31	685 18-30 35	760 20-30 37
14 x 14 Ak .520	CFM Throw NC	260 6-14 <20	310 8-16 <20	365 10-18 <20	415 10-22 <20	470 12-24 <20	520 14-26 20	625 16-28 25	730 18-30 29	830 22-32 32	935 24-36 35	1040 26-38 38
16 x 16 Ak .700	CFM Throw NC	350 8-16 <20	420 10-18 <20	490 10-22 <20	560 12-24 <20	630 14-28 <20	700 16-30 21	840 18-34 26	980 22-38 30	1120 24-40 33	1260 28-42 36	1400 32-44 39
18 x 18 Ak .900	CFM Throw NC	450 8-18 <20	540 10-22 <20	630 12-24 <20	720 14-28 <20	810 16-30 20	900 18-36 22	1080 22-36 27	1260 24-40 31	1440 28-44 34	1620 32-46 37	1800 35-48 40
20 x 20 Ak 1.100	CFM Throw NC	555 10-20 <20	665 12-24 <20	775 14-28 <20	890 16-32 <20	1000 18-34 21	1110 20-38 24	1330 24-42 28	1555 28-46 32	1775 32-50 36	2000 36-52 39	2220 40-54 42
22 x 22 Ak 1.330	CFM Throw NC	665 10-22 <20	800 12-26 <20	930 16-30 <20	1065 18-34 20	1195 20-36 23	1330 22-40 26	1595 26-46 30	1860 30-50 34	2130 36-54 38	2395 38-58 41	2660 44-60 44

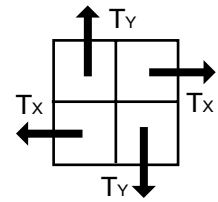


NOTES: The minimum Throw Dimension is based on a terminal velocity of 250 FPM. The maximum Throw Dimension is based on a terminal velocity of 125 FPM.
 NC re 10db room Attenuation (LW10⁻¹²W)

MCD, MCDD, MCDS, MCDSD, MCDST, MCDSDT (Page 35, 36, 68, 69)
Modular Ceiling Diffuser — Aluminum

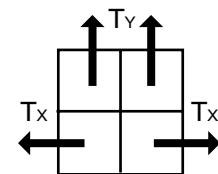
Four-Way

Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6 Ak .090	CFM	45	55	65	70	80	90	110	125	145	160	180
	Throw X/Y	1-3/1-3	2-3/2-3	2-4/2-4	2-4/2-4	3-5/3-5	3-6/3-6	3-7/3-7	4-8/4-8	4-9/4-9	5-10/5-10	6-11/6-11
	NC	<20	<20	<20	<20	<20	<20	21	24	28	31	34
8 x 8 Ak .150	CFM	80	95	110	130	145	160	190	225	255	290	320
	Throw X/Y	2-4/2-4	2-4/2-4	3-5/3-5	3-6/3-6	3-7/3-7	4-7/4-7	4-9/4-9	5-10/5-10	6-11/6-11	7-12/7-12	7-13/7-13
	NC	<20	<20	<20	<20	<20	<20	22	26	29	32	35
10 x 10 Ak .250	CFM	130	155	180	210	235	260	310	365	415	470	520
	Throw X/Y	2-5/2-5	3-6/3-6	3-7/3-7	4-7/4-7	4-8/4-8	5-8/5-8	6-10/6-10	7-11/7-11	8-13/8-13	9-14/9-14	10-15/10-15
	NC	<20	<20	<20	<20	<20	<20	23	27	30	33	36
12 x 12 Ak .370	CFM	190	230	265	305	340	380	455	530	610	685	760
	Throw X/Y	3-6/3-6	3-7/3-7	4-8/4-8	5-9/5-9	5-10/5-10	6-11/6-11	7-12/7-12	8-14/8-14	8-15/8-15	10-16/10-16	11-17/11-17
	NC	<20	<20	<20	<20	<20	<20	24	28	31	35	37
14 x 14 Ak .520	CFM	260	310	365	415	470	520	625	730	830	935	1040
	Throw X/Y	3-7/3-7	4-8/4-8	5-9/5-9	5-11/5-11	6-12/6-12	7-13/7-13	8-14/8-14	9-15/9-15	11-16/11-16	12-18/12-18	13-19/13-19
	NC	<20	<20	<20	<20	<20	<20	25	29	32	35	38
16 x 16 Ak .700	CFM	350	420	490	560	630	700	840	980	1120	1260	1400
	Throw X/Y	4-8/4-8	5-9/5-9	5-11/5-11	6-12/6-12	7-14/7-14	8-15/8-15	9-17/9-17	11-19/11-19	12-20/12-20	14-21/14-21	16-22/16-22
	NC	<20	<20	<20	<20	<20	<20	21	26	30	33	36
18 x 18 Ak .900	CFM	450	540	630	720	810	900	1080	1260	1440	1620	1800
	Throw X/Y	4-9/4-9	5-11/5-11	6-12/6-12	7-14/7-14	8-15/8-15	9-16/9-16	11-18/11-18	12-20/12-20	14-22/14-22	16-23/16-23	18-24/18-24
	NC	<20	<20	<20	<20	<20	<20	22	27	31	34	40
20 x 20 Ak 1.100	CFM	555	665	775	890	1000	1110	1330	1555	1775	2000	2220
	Throw X/Y	5-10/5-10	6-12/6-12	7-14/7-14	8-16/8-16	9-17/9-17	10-19/10-19	12-21/12-21	14-23/14-23	16-25/16-25	18-26/18-26	20-27/20-27
	NC	<20	<20	<20	<20	<20	<20	28	32	36	39	42
22 x 22 Ak 1.330	CFM	665	800	930	1065	1195	1330	1595	1860	2130	2395	2660
	Throw X/Y	5-11/5-11	6-13/6-13	8-15/8-15	9-17/9-17	10-18/10-18	11-20/11-20	13-23/13-23	15-25/15-25	18-27/18-27	19-29/19-29	22-30/22-30
	NC	<20	<20	<20	<20	<20	<20	26	30	34	41	44



Three-Way

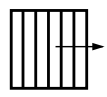
Face Velocity		500	600	700	800	900	1000	1200	1400	1600	1800	2000
Pressure Loss		.020	.020	.030	.040	.050	.060	.090	.120	.160	.200	.250
6 x 6 Ak .090	CFM	45	55	65	70	80	90	110	125	145	160	180
	Throw	1-3/2-5	2-3/3-5	2-4/3-6	2-4/3-6	3-5/5-8	3-6/5-9	3-7/5-11	4-8/6-12	4-9/6-14	5-10/8-15	6-11/9-17
	NC	<20	<20	<20	<20	<20	<20	<20	21	24	28	31
8 x 8 Ak .150	CFM	80	95	110	130	145	160	190	225	255	290	320
	Throw	2-4/3-6	2-4/3-6	3-5/5-8	3-6/5-9	3-7/5-11	4-7/6-11	4-9/6-14	5-10/8-15	6-11/9-17	7-12/11-18	7-13/11-20
	NC	<20	<20	<20	<20	<20	<20	<20	22	26	29	32
10 x 10 Ak .250	CFM	130	155	180	210	235	260	310	365	415	470	520
	Throw	2-5/3-8	3-6/5-9	3-7/5-11	4-7/6-11	4-8/6-12	5-8/8-12	6-10/9-15	7-11/11-17	8-13/12-20	9-14/14-21	10-15/15-23
	NC	<20	<20	<20	<20	<20	<20	23	27	30	33	36
12 x 12 Ak .370	CFM	190	230	265	305	340	380	455	530	610	685	760
	Throw	3-6/5-9	3-7/5-11	4-8/6-12	5-9/8-14	5-10/8-15	6-11/9-17	7-12/11-18	8-14/12-21	9-15/14-23	10-16/15-24	11-17/17-26
	NC	<20	<20	<20	<20	<20	<20	24	28	31	35	37
14 x 14 Ak .520	CFM	260	310	365	415	470	520	625	730	830	935	1040
	Throw	3-7/5-11	4-8/6-12	5-9/8-14	5-11/8-17	6-12/9-18	7-13/11-20	8-14/12-21	9-15/14-23	11-16/17-24	12-18/18-27	13-19/20-29
	NC	<20	<20	<20	<20	<20	<20	25	29	32	35	38
16 x 16 Ak .700	CFM	350	420	490	560	630	700	840	980	1120	1260	1400
	Throw	4-8/6-12	5-9/8-14	5-11/8-17	6-12/9-18	7-14/11-21	8-15/12-23	9-17/14-26	11-19/17-29	12-20/18-30	14-21/21-32	16-22/24-33
	NC	<20	<20	<20	<20	<20	<20	21	26	30	33	36
18 x 18 Ak .900	CFM	450	540	630	720	810	900	1080	1260	1440	1620	1800
	Throw	4-9/6-14	5-11/8-17	6-12/9-18	7-14/11-21	8-15/12-23	9-16/14-24	11-18/17-27	12-20/18-30	14-22/21-33	16-23/24-35	18-24/27-36
	NC	<20	<20	<20	<20	<20	<20	22	27	31	34	40
20 x 20 Ak 1.100	CFM	555	665	775	890	1000	1110	1330	1555	1775	2000	2220
	Throw	5-10/8-15	6-12/9-18	7-14/11-21	8-16/12-24	9-17/14-26	10-19/15-29	12-21/18-32	14-23/21-35	16-25/24-38	18-26/27-39	20-27/30-41
	NC	<20	<20	<20	<20	<20	<20	24	28	32	36	39
22 x 22 Ak 1.330	CFM	665	800	930	1065	1195	1330	1595	1860	2130	2395	2660
	Throw	5-11/8-17	6-13/9-20	8-15/12-23	9-17/14-26	10-18/15-27	11-20/17-30	13-23/20-35	15-25/23-38	18-27/27-41	19-29/29-44	22-30/33-45
	NC	<20	<20	<20	<20	<20	<20	26	30	34	41	44



NOTES: The minimum Throw Dimension is based on a terminal velocity of 250 FPM. The maximum Throw Dimension is based on a terminal velocity of 125 FPM.
 NC re 10db room Attenuation (LW10¹²W)

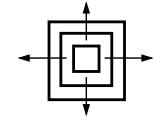
A500 Series (Page 70)

A501MS/A501OB
One-Way Diffuser



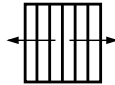
Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw	5.0	6.0	7.0	8.0	10.0	12.0	15.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw	6.0	7.0	8.0	10.0	12.0	15.0	18.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw	7.0	8.0	10.0	12.0	15.0	19.0	24.0
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw	8.0	10.0	12.0	15.0	19.0	24.0	29.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw	11.0	13.0	15.0	18.0	24.0	30.0	35.0

A504MS/A504OB
Four-Way Diffuser



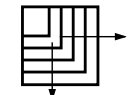
Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw	2.0	3.0	4.0	5.0	6.0	7.0	9.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw	3.0	4.0	5.0	6.0	8.0	10.0	13.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw	4.0	5.0	6.0	7.0	9.0	12.0	14.0
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw	5.0	6.0	7.0	8.0	10.0	12.0	15.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw	6.0	7.0	8.0	9.0	11.0	14.0	18.0

A502MS/A502OB
Two-Way Diffuser



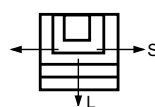
Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw	3.0	4.0	5.0	6.0	7.0	9.0	12.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw	4.0	5.0	6.0	7.0	9.0	12.0	16.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw	5.0	6.0	7.0	8.0	10.0	14.0	20.0
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw	6.0	7.0	8.0	10.0	13.0	17.0	23.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw	7.0	9.0	11.0	13.0	16.0	19.0	27.0

A505MS/A505OB
Two-Way Corner Diffuser

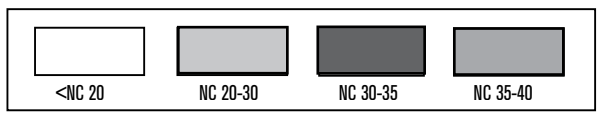


Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw	3.0	4.0	5.0	6.0	7.0	9.0	12.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw	4.0	5.0	6.0	7.0	9.0	12.0	16.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw	5.0	6.0	7.0	8.0	10.0	14.0	20.0
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw	6.0	7.0	8.0	10.0	13.0	17.0	23.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw	7.0	9.0	11.0	13.0	16.0	19.0	27.0

A503MS/A503OB
Three-Way Diffuser



Face Velocity		400	500	600	700	900	1100	1500
Pressure Loss		.010	.016	.022	.031	.050	.075	.140
6 x 6	CFM	55	65	75	90	120	140	195
Ak .13	Throw L/S	3.5/2.5	4.0/3.0	5.0/3.5	5.5/4.0	7.0/5.0	9.0/6.0	12.0/9.0
8 x 8	CFM	75	90	105	120	150	180	240
Ak .20	Throw L/S	4.0/2.0	5.0/2.5	6.0/3.5	7.0/4.0	8.0/4.5	10.0/5.5	12.0/7.0
10 x 10	CFM	115	135	155	175	235	290	395
Ak .29	Throw L/S	5.0/3.0	7.0/4.0	8.0/4.5	10.0/5.5	12.0/7.0	14.0/8.5	18.0/10.5
12 x 12	CFM	170	210	255	300	380	470	610
Ak .42	Throw L/S	7.0/4.0	8.5/4.5	10.0/5.5	12.0/6.5	15.0/8.5	18.0/10.0	23.0/14.0
14 x 14	CFM	250	305	360	410	505	610	800
Ak .59	Throw L/S	8.0/5.5	10.0/6.0	11.5/7.0	13.0/7.5	15.5/9.0	20.0/11.0	27.0/16.0



Terminal velocity of FPM
 NC Noise criteria rating. NC is based on 10db room absorption (ref. 10⁻¹² watts).
 Tested in accordance with ASHRAE 36-72, ADC 1062: GRD84 and ISO 3741.

SS Spiral Diffuser (Page 38)

1/2" wide slot–nonducted

See notes on next page and see page 38 for min. duct diameter.

1-Slot	Airflow Rate (CFM/Linear Foot)	7	10	13	17	20	23	27	30	33	37
	Static Pressure	.002	.003	.006	.009	.016	.018	.024	.030	.037	.045
	Horizontal Throw	7-4-2	11-6-4	15-7-5	19-9-6	22-11-7	26-13-9	30-15-10	33-17-11	37-19-12	41-20-14
	Noise Criteria	<15	<15	<15	<15	<15	<15	19	21	23	25

2-Slot	Airflow Rate (CFM/Linear Foot)	10	17	23	30	37	43	50	57	63	70
	Static Pressure	.001	.002	.004	.007	.011	.015	.020	.026	.032	.039
	Horizontal Throw	6-3-2	9-5-3	13-6-4	17-8-6	20-10-7	24-12-8	28-14-9	31-16-10	35-18-12	39-19-13
	Noise Criteria	<15	<15	<15	<15	<15	<15	19	23	27	31

3-Slot	Airflow Rate (CFM/Linear Foot)	13	23	33	43	53	63	73	83	93	103
	Static Pressure	.001	.002	.004	.006	.009	.012	.017	.021	.027	.033
	Horizontal Throw	5-3-2	10-5-3	14-7-5	18-9-6	22-11-7	26-13-9	30-15-10	34-17-11	38-19-13	42-21-14
	Noise Criteria	<15	<15	<15	<15	<15	18	21	25	30	33

4-Slot	Airflow Rate (CFM/Linear Foot)	17	30	43	57	70	83	97	110	123	137
	Static Pressure	.001	.002	.003	.005	.008	.012	.016	.020	.025	.031
	Horizontal Throw	6-3-2	10-5-3	15-8-5	20-10-7	24-12-8	29-14-10	31-17-11	38-19-13	43-21-14	47-24-16
	Noise Criteria	<15	<15	<15	<15	18	20	22	27	32	34

3/4" wide slot–nonducted

See notes on next page and see page 38 for min. duct diameter.

1-Slot	Airflow Rate (CFM/Linear Foot)	10	15	20	25	30	35	40	45	50	55
	Static Pressure	.002	.004	.007	.011	.015	.020	.027	.034	.042	.050
	Horizontal Throw	6-3-2	9-5-3	12-6-4	15-8-5	18-9-6	22-11-7	25-12-8	28-14-9	31-15-10	34-17-11
	Noise Criteria	<15	<15	<15	<15	19	21	25	30	34	39

2-Slot	Airflow Rate (CFM/Linear Foot)	15	25	35	45	55	65	75	85	95	105
	Static Pressure	.001	.003	.005	.008	.012	.017	.022	.029	.036	.044
	Horizontal Throw	5-2-2	8-4-3	11-5-4	14-7-5	17-8-6	20-10-7	23-12-8	26-13-9	29-15-10	32-16-11
	Noise Criteria	<15	<15	<15	<15	19	26	32	35	38	41

3-Slot	Airflow Rate (CFM/Linear Foot)	20	35	50	65	80	95	110	125	140	155
	Static Pressure	.001	.002	.004	.007	.010	.014	.019	.024	.030	.037
	Horizontal Throw	5-2-2	8-4-3	11-6-4	15-7-5	18-9-6	22-11-7	25-12-8	28-14-9	32-16-11	35-18-12
	Noise Criteria	<15	<15	<15	18	23	28	33	37	40	43

4-Slot	Airflow Rate (CFM/Linear Foot)	25	45	65	85	105	125	145	165	185	205
	Static Pressure	.001	.002	.004	.006	.009	.013	.017	.023	.028	.035
	Horizontal Throw	5-2-2	9-4-3	13-6-4	16-8-5	20-10-7	24-12-8	28-14-9	32-16-11	38-19-12	40-20-13
	Noise Criteria	<15	<15	17	22	25	29	33	37	40	43

1" wide slot–nonducted

See notes on next page and see page 38 for min. duct diameter.

1-Slot	Airflow Rate (CFM/Linear Foot)	13	20	27	33	40	47	53	60	67	73
	Static Pressure	.002	.005	.009	.014	.020	.027	.036	.045	.056	.067
	Horizontal Throw	5-2-2	7-4-2	10-5-3	12-6-4	15-7-5	17-9-6	20-10-7	22-11-7	25-12-8	27-14-9
	Noise Criteria	<15	<15	<15	20	25	31	37	41	43	45

2-Slot	Airflow Rate (CFM/Linear Foot)	20	33	47	60	79	87	100	113	127	140
	Static Pressure	.001	.003	.007	.011	.016	.023	.030	.038	.048	.059
	Horizontal Throw	4-2-1	6-3-2	9-4-3	11-6-4	14-7-5	16-8-5	19-9-6	21-10-7	23-12-8	26-13-9
	Noise Criteria	<15	<15	<15	23	32	35	40	44	48	51

3-Slot	Airflow Rate (CFM/Linear Foot)	27	47	67	87	107	127	147	167	187	207
	Static Pressure	.001	.003	.005	.009	.013	.019	.025	.032	.040	.049
	Horizontal Throw	4-2-1	6-3-2	9-5-3	12-6-4	15-7-5	17-9-6	20-10-7	23-11-8	25-13-8	28-14-9
	Noise Criteria	<15	<15	<15	23	32	35	40	44	48	51

4-Slot	Airflow Rate (CFM/Linear Foot)	33	60	87	113	140	167	193	220	247	273
	Static Pressure	.001	.002	.005	.008	.012	.017	.023	.030	.038	.046
	Horizontal Throw	4-2-1	7-3-2	10-5-3	13-7-4	16-8-5	19-10-8	22-11-7	25-13-8	29-14-10	32-16-11
	Noise Criteria	<15	16	22	27	31	37	42	46	50	54

Engineering Data

SS Spiral Diffuser (Page 38)

Notes:

1. Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.
2. Engineering Units: Airflow Rate = CFM/linear foot
 Static Pressure = in. w.c.
 Throw = ft. at 50, 100, and 150 FPM terminal velocity
3. Noise Criteria is based on 10 dB room absorption (Re: 10^{12} watts) evaluated at 125 through 4000 Hz octave bands.
4. Throw data are based on a horizontal discharge in one direction only. For two-way discharge pattern, the throw is determined from the published engineering data based on the number of slots and CFM/linear feet discharging in each direction.
5. Throw data are for 4-foot active diffuser lengths. For other active lengths, throw may be determined by applying the following multiplication factors.
6. Sound data are for 4-foot active diffuser lengths. For other lengths, add or deduct the following values to or from the reported NC level.

Diffuser Length (Feet)	Multiplication Factor
1	0.50
2	0.85
3	0.95
4	1.00

Diffuser Length (Feet)	NC Correction
1	-2
2	-2
3	-1
4	0

SV and SVH Spiral Diffusers
USV, USVH Universal Spiral Diffusers
 (Page 37-38)

See page 38 for min. duct diameter.

Face Velocity		300	400	500	600	700	800	1000	1200
Total Pressure		.016	.029	.046	.066	.090	.117	.183	.263
10 x 3 Ak .14	CFM	42	56	70	84	98	112	140	168
	Horizontal Throw	7-3	8-4	9-5	10-6	11-7	12-8	13-9	14-10
	Noise Criteria	-	-	-	-	-	23	29	35
12 x 3 Ak .18	CFM	54	72	90	108	126	144	180	216
	Horizontal Throw	8-5	9-6	10-7	11-8	12-8	13-9	14-10	16-11
	Noise Criteria	-	-	-	-	20	24	31	36
10 x 4 14 x 3 Ak .21	CFM	63	84	105	126	147	168	210	252
	Horizontal Throw	8-5	10-7	11-8	12-8	13-9	14-10	16-11	17-12
	Noise Criteria	-	-	-	-	21	25	31	37
16 x 3 12 x 4 Ak .25	CFM	75	100	125	150	175	200	250	300
	Horizontal Throw	9-5	11-7	12-8	13-9	14-10	15-11	17-12	19-13
	Noise Criteria	-	-	-	-	21	25	32	37
24 x 3 12 x 6 Ak .39	CFM	117	156	195	234	273	312	390	468
	Horizontal Throw	12-7	13-9	15-10	17-11	18-12	19-13	21-15	24-16
	Noise Criteria	-	-	-	-	23	27	34	39
24 x 4 16 x 6 Ak .52	CFM	156	208	260	312	364	416	520	624
	Horizontal Throw	13-8	16-11	18-12	19-13	21-14	22-15	25-17	27-19
	Noise Criteria	-	-	-	20	24	28	35	40
14 x 8 18 x 6 Ak .63	CFM	189	252	315	378	441	504	630	756
	Horizontal Throw	15-8	17-12	19-13	21-14	23-16	24-17	27-19	30-20
	Noise Criteria	-	-	-	20	25	29	36	41
20 x 6 Ak .66	CFM	198	264	330	396	462	528	660	792
	Horizontal Throw	15-9	18-12	20-13	22-15	24-16	25-17	28-19	31-21
	Noise Criteria	-	-	-	21	25	29	36	41
16 x 8 Ak .71	CFM	213	284	355	426	497	568	710	852
	Horizontal Throw	16-9	18-13	20-14	23-15	24-17	26-18	30-20	35-22
	Noise Criteria	-	-	-	21	26	30	36	42
24 x 6 18 x 8 Ak .88	CFM	264	352	440	528	616	704	880	1056
	Horizontal Throw	18-10	20-14	23-16	25-17	27-18	29-20	32-22	36-24
	Noise Criteria	-	-	-	22	26	30	37	43
20 x 8 16 x 10 Ak .98	CFM	294	392	490	588	686	784	980	1176
	Horizontal Throw	19-10	21-15	24-17	26-18	28-19	30-21	34-23	38-25
	Noise Criteria	-	-	-	23	27	31	38	44
18 x 10 Ak 1.11	CFM	333	444	555	666	777	888	1110	1332
	Horizontal Throw	20-11	23-16	25-18	28-19	30-21	32-22	36-25	40-27
	Noise Criteria	-	-	-	23	27	31	38	44
36 x 6 18 x 12 Ak 1.35	CFM	405	540	675	810	945	1080	1350	1620
	Horizontal Throw	22-12	25-17	28-19	31-21	34-23	36-24	40-27	44-30
	Noise Criteria	-	-	-	24	28	32	39	44
24 x 10 20 x 12 Ak 1.49	CFM	447	596	745	894	1043	1192	1490	1788
	Horizontal Throw	23-13	26-18	30-20	32-22	35-24	37-26	42-29	46-31
	Noise Criteria	-	-	-	24	29	33	39	45
24 x 12 Ak 1.82	CFM	546	728	910	1092	1274	1456	1820	2184
	Horizontal Throw	25-14	30-20	33-22	36-25	39-27	42-28	47-32	51-35
	Noise Criteria	-	-	-	25	30	34	40	46
36 x 10 30 x 12 Ak 2.29	CFM	687	916	1145	1374	1603	1832	2290	2748
	Horizontal Throw	29-16	33-22	37-25	41-28	44-30	47-32	53-36	61-42
	Noise Criteria	-	-	20	26	30	34	41	47
36 x 12 Ak 2.75	CFM	825	1100	1375	1650	1925	2200	2750	3300
	Horizontal Throw	31-18	36-25	41-28	44-30	48-33	51-35	57-39	63-43
	Noise Criteria	-	-	21	27	31	35	42	47

Terminal Velocity of 75 and 150 FPM, respectively

NOTES:

1. Total Pressure in inches water column.
2. Throw data are in feet at terminal velocities of 75 and 150 FPM, respectively.
3. Noise Criteria based on a 10 dB room attenuation (Re: 10⁻¹² watts).

L Series (Page 39-42)

NOTES:

- Table 1 based on up to 4-foot grille length. For longer lengths, correct throw and NC per **Table 2**.
- When using continuous grille lengths with alternate active and inactive sections, a reduction in throw can be obtained by omitting the factors contained in **Table 2**.
- Bar style 30 and 0
Increase **Table 1** NC + 5 NC
- Supply air temperature effect on horizontal throw is shown in Table 3. vertical down-throw at varying supply temperatures is shown in Table 4.
- When spreading the air path with a horizontal deflection of 22° per side in grille lengths up to 4 feet:
 Multiply **Table 1** Throw x .75
 Increase **Table 1** NC + 5 NC
 Multiply **Table 1** P_S x 1.20
 Multiply **Table 5** A_k x .90
- Terminal velocities (V_t) at the minimum and maximum throw (T) values are rated at 125 FPM and 75 FPM respectively with corresponding room velocities (V_r) of 50 FPM and 35 FPM.

Table 1 - Supply Air

CFM/Ft of total Linear length	Listed Width in Inches	Min. P _s in H ₂ O		Face Velocity (V _f) FPM		Throw (T) in Feet		Minimum Ceiling Height in Feet		NC		
		Bar Style		Bar Style		Sidewall	Sill/Floor	@ -18F	T		@ -25F	T
		00 and 15	30 and 01	00 and 15	30 and 01	Min.-Max.	Min.-Max.					
20	1½	.01	.01	500	575	6-9	1-2	8	9	<20		
30	1½	.03	.04	750	865	7-10	2-3	9	10	25		
	2	.01	.01	475	545	6-9	1-2			20		
40	1½	.05	.07	1000	1150	9-13	3-5	9	11	30		
	2	.02	.03	635	730	8-11	2-4			25		
	2½	.01	.01	460	530	7-10	2-3			20		
50	1½	.03	.12	1250	1440	11-16	4-9	9½	11	30		
	2	.03	.04	790	910	10-14	3-7			25		
	2½	.02	.03	575	660	9-13	2-6			20		
	3	<.01	.01	440	505	8-12	2-5			<20		
60	2	.05	.07	950	1090	12-18	5-11	9½	12	30		
	2½	.02	.03	690	795	11-16	4-9			25		
	3	.01	.01	530	610	10-14	3-7			20		
	4	<.01	.01	370	425	8-12	2-5			<20		
70	2	.06	.08	1110	1275	14-20	7-13	10	12	30		
	2½	.03	.04	810	935	13-19	6-12			30		
	3	.02	.03	660	760	11-16	4-9			25		
	4	<.01	.01	435	500	10-14	3-7			<20		
80	2	.08	.10	1275	1450	16-23	9-16	10½	12½	30		
	2½	.04	.05	920	1060	15-21	8-14			30		
	3	.03	.04	700	805	13-18	6-11			25		
	4	.01	.01	495	570	11-16	4-9			20		
90	2½	.05	.07	1030	1185	17-24	10-17	11	13	30		
	3	.04	.05	785	905	15-21	8-14			30		
	4	.01	.02	550	635	13-18	6-11			25		
	5	<.01	.01	450	520	11-16	4-9			20		
	2½	.06	.08	1150	1325	19-27	12-20			11	13	30
3	.04	.05	875	1010	16-23	9-16	30					
4	.02	.03	620	715	14-20	7-13	25					
100	5	.01	.01	500	575	12-18	5-11	11	13	20		
	3	.06	.08	1050	1210	19-28	11-20			11½	13	30
	4	.03	.04	745	855	17-24	9-16					30
	5	.02	.03	600	680	15-22	7-14					25
	6	<.01	.01	480	550	13-19	5-11					20
140	3	.08	.11	1220	1410	22-32	14-24	11½	14			35
	4	.04	.05	870	1000	19-28	11-20			30		
	5	.02	.03	700	810	17-25	9-17			25		
	6	.01	.01	560	645	15-22	7-14			20		
160	4	.05	.07	990	1140	22-32	13-23	12	15	35		
	5	.03	.04	800	925	19-29	10-20			30		
	6	.02	.03	640	735	18-26	9-17			25		
	8	.01	.01	460	530	15-22	6-13			20		
180	4	.07	.09	1110	1275	25-36	16-27	12	15	35		
	5	.04	.05	900	1035	22-33	13-24			30		
	6	.03	.04	725	835	20-30	11-21			25		
	8	.02	.03	520	600	17-25	8-16			20		
200	4	.08	.11	1240	1425	28-41	-	12	15	40		
	5	.05	.07	1000	1150	24-36	-			35		
	6	.04	.05	800	925	23-33	-			30		
	8	.02	.03	575	665	20-28	-			25		
250	5	.08	.11	1250	1440	30-46	-	13	15	40		
	6	.05	.07	1000	1150	27-39	-			35		
	8	.03	.04	720	830	25-35	-			30		
	10	.01	.01	550	625	21-32	-			25		
300	6	.07	.09	1200	1375	33-48	-	13	15	40		
	8	.04	.05	865	1000	29-42	-			35		
	10	.02	.03	665	765	25-39	-			30		
	12	.01	.01	545	630	23-33	-			25		
350	8	.05	.08	1020	1175	34-48	-	13	15	40		
	10	.03	.04	780	900	29-45	-			35		
	12	.02	.03	640	735	26-38	-			30		
400	8	.08	.11	1170	1350	40-55	-	14	16	45		
	10	.04	.05	890	1025	33-50	-			40		
	12	.03	.04	730	845	33-44	-			35		

Symbols:

- V_t Terminal Velocity in FPM
- V_r Room Velocity in FPM
- V_k Face Velocity in FPM
- A_k Outlet Area in Square Feet
- A_n Neck Area in Square Feet
- P_s Static Pressure in H₂O
- NC 18dB Room Attenuation
- T Throw in Feet: see Note 6.
- ΔT Temperature Differential

L Series (Page 39-42)

Table 2 - Continuous Grille Length Factors

Modify Table 1 by listed values for grille lengths above 4 feet.			
Grille Length in Feet	Throw (T)		NC
	Sidewall Min.-Max.	Sill/Floor Min.-Max.	
4-6	No Change		+0
7-20	T x 1.10		+5
21-100	T x 1.15		+10

Table 3 - Supply Air Temperature Factors

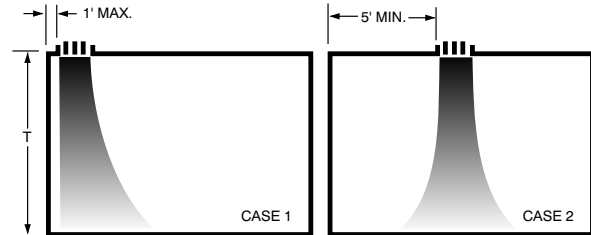
Multiply Throw in Table 1 (or factor in Table 2 if used) by listed value.			
Sidewall Sill/Floor	@-20F T	@ 0F T	@+25F T
	T x 1.00	T x 1.10	T x 1.20

Table 4 - Vertical Down-Throw and Supply Air Temperature Factors

Multiply Throw-Sidewall in Table 1 (or factor in Table 2 if used) by listed value.			
Case	@-20F T Cooling	@ 0F T Ventilating	@+25F T Heating
Case 1	T x 1.00	T x .90	T x .60
Case 2	T x .70	T x .60	T x .40

Table 5 - Supply Grille Areas (per foot of length)

A _n	Listed Width in Inches																
	1½	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	30	36
A _n	.13	.17	.21	.25	.33	.42	.50	.67	.84	1.00	1.20	1.30	1.50	1.70	2.00	2.50	3.00
00 and 15 Bar Styles																	
A _k	.04	.06	.09	.11	.16	.20	.25	.35	.45	.55	.68	.79	.90	1.00	1.30	1.60	2.10
30 and 01 Bar Styles																	
A _k	.03	.05	.08	.09	.14	.17	.21	.30	.38	.47	.58	.67	.77	.85	1.10	1.40	1.80



Return Air CFM per Foot of Length

Listed Width in Inches	A _k Area	Bar Style	NC 20-25 Nonducted		NC 30 Ducted		NC 35-40 Ducted	
			-.02" P _s CFM	-.03" P _s CFM	-.08" P _s CFM	-.10" P _s CFM	-.15" P _s CFM	-.20" P _s CFM
1½	.13	00 and 15	20	25	40	45	55	65
		01 and 30	15	20	35	40	45	55
2	.18	00 and 15	30	40	65	70	90	100
		01 and 30	25	35	55	60	75	85
2½	.23	00 and 15	45	50	85	95	115	135
		01 and 30	35	45	70	80	100	115
3	.27	00 and 15	55	65	105	120	145	165
		01 and 30	45	55	90	100	120	140
4	.34	00 and 15	75	90	150	165	205	235
		01 and 30	60	75	125	140	170	195
5	.41	00 and 15	95	120	190	215	260	305
		01 and 30	80	100	160	180	220	255
6	.46	00 and 15	120	145	240	265	325	375
		01 and 30	100	120	200	220	270	315
8	.57	00 and 15	160	200	325	360	445	515
		01 and 30	135	165	270	305	370	430
10	.68	00 and 15	210	255	415	465	570	655
		01 and 30	175	215	350	390	475	550
12	.76	00 and 15	255	310	510	565	695	800
		01 and 30	210	260	425	475	580	670
16	.93	00 and 15	350	430	700	785	960	1100
		01 and 30	285	350	570	635	780	900
20	1.10	00 and 15	445	545	885	990	1220	1410
		01 and 30	365	445	730	815	1000	1160
24	1.25	00 and 15	540	660	1080	1210	1475	1710
		01 and 30	440	540	880	985	1200	1390

S Series (Page 43-46)

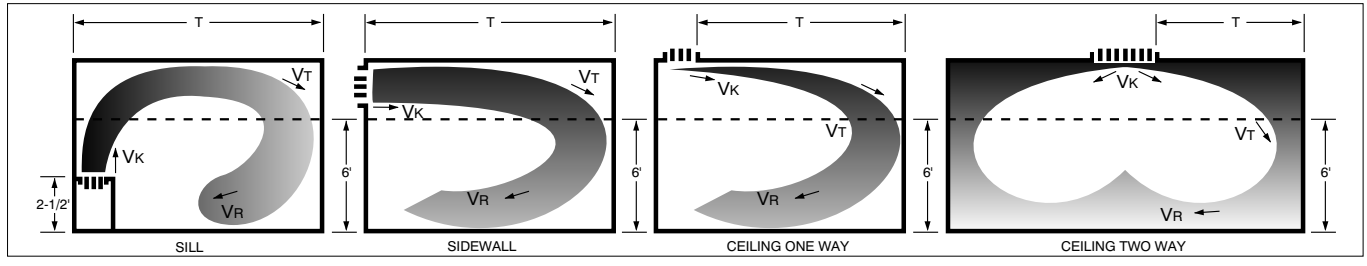


Table 1 - Supply Air
Type 50 (1/2" Slot)

CFM/Ft of total Slot length	Number of Slots	Min. P _s in H ₂ O	Outlet Velocity (V _k) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet		NC
				Ceiling		Sidewall	Sill		
				Min.-Max.	Min.-Max.	Min.-Max.	@ -18F	T		@ -25F	T
10	1	.02	500	5-7	3-5	1-2	7½	9	<20
	2	<.01	335	4-6	2-4	1-2			
20	1	.08	1000	10-13	8-11	1-3	8	9	<20
	2	.02	670	8-11	6-9	2-3			
	3	.01	400	6-9	4-7	1-2			
30	1	.08	1500	11-16	10-14	4-6	9	10	<20
	2	.05	1000	10-14	8-12	3-4			
	3	.02	600	8-11	6-9	2-3			
	4	.01	430	7-9	5-7	1-2			
40	2	.08	1330	13-17	11-15	4-6	9	11	<20
	3	.04	800	10-14	8-12	3-5			
	4	.02	570	9-12	7-10	2-3			
	5	.01	445	8-11	6-9	2-3			
	3	.06	1000	11-15	9-13	4-6			
50	4	.03	710	10-14	8-12	3-4	9½	11	<20
	5	.02	560	9-13	7-11	2-4			
	6	.01	500	8-12	7-10	1-3			
	3	.08	1200	13-17	11-15	5-8			
	4	.05	855	12-16	10-14	4-7			
	5	.03	670	11-15	9-13	3-6			
60	6	.02	600	10-14	8-12	3-5	9½	12	<20
	7	.01	500	9-13	7-11	2-4			
	3	.12	1400	15-20	13-18	6-11			
	4	.06	1000	13-18	11-16	5-9			
	5	.04	780	12-16	10-14	4-7			
	6	.03	700	11-15	9-13	3-6			
	7	.02	580	10-15	8-13	2-5			
80	4	.08	1140	14-20	12-18	6-11	10½	12½	<20
	5	.05	890	13-19	11-17	5-10			
	6	.04	800	13-18	11-16	5-9			
	7	.03	670	13-17	11-15	4-8			
	8	.02	570	12-16	10-14	3-7			
	4	.10	1280	17-24	15-21	8-14			
	5	.07	1000	16-22	14-20	7-13			
	6	.05	900	16-21	14-19	7-12			
90	7	.04	750	15-20	13-18	6-11	11	13	<20
	8	.03	640	14-18	12-16	5-9			
	9	.02	600	13-17	11-15	5-8			
	5	.09	1120	18-25	16-22	9-15			
	6	.06	1000	17-24	15-21	8-14			
	7	.05	830	16-23	14-20	7-13			
	8	.03	710	14-20	12-18	6-11			
	9	.03	670	13-19	11-17	5-10			
	10	.02	590	12-18	10-16	5-10			
120	6	.09	1200	19-27	17-24	10-16	11½	13	<20
	7	.07	1000	18-25	16-23	8-15			
	8	.05	860	17-25	15-22	7-14			
	9	.04	800	16-24	14-21	6-13			
	10	.03	705	15-22	13-19	5-11			
	7	.10	1170	20-30	18-27	10-19			
	8	.06	1000	19-28	17-25	9-17			
	9	.05	930	18-27	16-24	8-16			
	10	.04	825	17-25	15-22	7-14			
	160	8	.08	1140	21-32	19-29				10-20	12	15	<20
9		.07	1070	20-30	18-27	9-18			
10		.05	940	19-28	17-25	8-17			
8		.10	1280	24-35	21-31	12-22			
9		.08	1200	23-34	20-30	11-21			
10		.07	1060	22-32	19-29	10-20			
9		.10	1335	25-39	22-35	-			
10		.08	1175	24-37	21-33	-			

Outlet Velocity (V _k) FPM										
500	600	700	800	900	1000	1200	1400	1600	1800	2000
Total Pressure (P _s) inches H ₂ O										
.02	.02	.03	.04	.05	.06	.09	.12	.16	.20	.25

- Symbols:**
V_t Terminal Velocity in FPM
V_r Room Velocity in FPM
V_k Face Velocity in FPM
A_k Outlet Area in Square Feet
A_n Neck Area in Square Feet
P_s Static Pressure in H₂O
NC 18dB Room Attenuation
T Throw in Feet: see Note 6.
ΔT Temperature Differential

S Series (Page 43-46)

Table 1 - Supply Air

Type 75 (3/4" Slot)

CFM per Foot	Number of Slots	Min. P _s in H ₂ O	Outlet Velocity (V _k) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet				NC		
				Ceiling	Sidewall	Sill	@ -18F		@ -25F				
				Min.-Max.	Min.-Max.	Min.-Max.	T	T	T	T			
10	1	.01	335	4-6	2-4	1-2	7½		9	<20			
20	1	.04	670	8-11	6-9	2-3	8		9	20			
	2	<.01	400	6-9	4-7	1-2				<20			
30	1	.09	1000	10-14	8-12	3-4	9		10	25			
	2	.02	600	8-11	6-9	2-3				20			
	3	<.01	430	7-9	5-7	1-2				<20			
40	1	.16	1340	13-17	11-15	4-6	9		11	30			
	2	.04	800	10-14	8-12	3-4				25			
	3	.02	575	9-12	7-10	2-3				20			
	4	.01	445	8-11	6-9	2-3				<20			
50	2	.06	1000	11-15	9-13	4-6	9½		11	25			
	3	.03	715	10-14	8-12	3-4				20			
	4	.02	555	9-13	7-11	2-4				<20			
	5	<.01	415	7-12	6-10	2-3				<20			
	2	.09	1200	13-17	11-15	5-8				9½		12	30
3	.04	860	12-16	10-14	4-7	25							
4	.02	665	11-15	9-13	3-6	20							
5	.01	500	9-13	7-11	3-4	<20							
70	2	.13	1400	15-20	13-18	6-11	10		12	30			
	3	.06	1000	13-18	11-16	5-9				25			
	4	.03	775	12-16	10-14	4-7				20			
	5	.02	585	10-15	8-13	3-5				<20			
	6	.01	500	9-14	7-12	2-5				<20			
	3	.07	1140	14-20	12-18	6-11				10½		12½	30
4	.04	885	13-19	11-17	5-10	25							
5	.03	685	13-17	11-15	4-8	20							
6	.02	575	12-16	10-14	3-7	<20							
80	7	<.01	500	11-15	9-13	3-6	<20						
	3	.09	1290	17-24	15-21	8-14	11		13	30			
	4	.05	1000	16-22	14-20	7-13				25			
	5	.03	750	15-20	13-18	6-11				20			
6	.02	645	14-18	12-16	5-9	20							
90	7	.01	560	13-17	11-15	4-8	<20						
	3	.13	1430	19-26	17-23	10-16	11		13	35			
	4	.06	1110	18-25	16-22	9-15				30			
	5	.04	830	16-23	14-20	7-13				25			
	6	.03	715	14-20	12-18	6-11				20			
	7	.02	630	13-19	11-17	5-10				<20			
	4	.09	1330	19-27	17-24	10-16				11½		13	30
5	.06	1000	18-26	16-23	8-15	25							
6	.04	860	17-25	15-22	7-14	20							
7	.03	750	16-23	14-20	6-12	20							
120	8	.02	630	15-20	13-18	5-10	<20						
	5	.08	1170	20-30	18-27	10-19	11½		14	30			
	6	.06	1000	19-28	17-25	9-17				25			
	7	.04	875	18-26	16-23	8-15				20			
	8	.03	740	16-24	14-21	6-13				20			
	9	.02	665	15-21	13-19	5-11				<20			
	6	.07	1150	21-32	19-29	10-20				12		15	25
	7	.05	1000	20-30	18-27	9-18							20
8	.04	840	18-27	16-24	8-16	20							
9	.03	760	17-26	15-23	6-14	<20							
160	10	.02	695	16-25	14-22	5-13	<20						
	6	.09	1290	24-35	21-31	12-22	12		15	30			
	7	.07	1130	23-34	20-30	11-21				30			
	8	.05	950	20-31	18-28	9-19				25			
	9	.04	860	19-30	17-27	8-18				20			
	10	.03	780	18-29	16-26	7-17				<20			
	6	.11	1440	26-40	23-36	-				12		15	30
	7	.08	1250	25-38	22-34	-							30
	8	.06	1110	24-36	21-32	-							25
	9	.05	955	22-33	20-30	-							20
200	10	.04	870	21-31	19-28	-				<20			
	8	.10	1315	26-46	23-41	-	13		15	35			
	9	.07	1190	25-42	22-38	-				30			
	9	.07	1190	25-42	22-38	-				25			
10	.06	1085	24-39	21-35	-	<20							

S Series (Page 43-46)

Table 1 - Supply Air
Type 10 (1" Slot)

CFM per Foot	Number of Slots	Min. P _s in H ₂ O	Outlet Velocity (V _k) FPM	Throw (T) in Feet			Minimum Ceiling Height in Feet				NC
				Ceiling	Sidewall	Sill	@ -18F		T @ -25F		
				Min.-Max.	Min.-Max.	Min.-Max.	T	T	T	T	
20	1	.02	500	6-8	4-7	1-2	8		9		20
30	1	.03	750	9-13	7-10	2-3	9		10		20
	2	.02	500	7-9	5-7	1-2					20
40	1	.06	1000	10-14	9-14	4-6	9		11		25
	2	.03	670	8-10	6-9	2-3					20
50	1	.09	1250	12-15	10-14	3-5					30
	2	.04	835	10-14	8-12	3-4	9½		11		20
	3	.02	555	9-11	7-10	2-3					20
60	2	.06	1000	13-15	9-13	4-6					30
	3	.03	665	10-13	7-11	2-4	9½		12		20
	4	.02	500	8-11	6-9	2-3					20
70	2	.09	1165	13-17	11-15	5-8					30
	3	.04	780	11-16	9-14	4-6	10		12		25
	4	.02	585	10-14	7-11	3-4					20
80	2	.11	1335	15-19	14-17	6-10					35
	3	.05	890	12-17	10-14	4-7	10½		12½		25
	4	.03	665	10-14	8-12	3-5					20
	5	.02	533	9-13	7-11	2-4					20
90	3	.06	1000	14-19	11-17	5-10					30
	4	.04	750	13-18	11-15	4-8	11		13		20
	5	.02	600	12-16	10-14	3-7					20
	6	.02	500	11-15	9-13	3-6					20
100	3	.08	1110	16-21	14-20	7-12					30
	4	.04	835	15-20	13-28	6-11	11		13		25
	5	.03	665	14-18	12-16	5-9					20
	6	.02	555	13-17	11-15	4-8					20
120	3	.11	1335	18-25	16-22	8-13					35
	4	.06	1000	17-24	15-20	7-13	11½		13		30
	5	.04	800	16-23	14-21	6-12					25
	6	.03	665	15-21	13-19	5-11					20
	7	.02	570	14-20	12-17	4-10					20
140	4	.09	1165	18-25	16-21	8-15					30
	5	.05	935	18-26	16-22	8-14	11½		14		30
	6	.04	780	17-25	15-22	7-14					25
	7	.03	665	16-23	14-20	6-12					20
160	8	.02	585	15-20	13-20	5-10					20
	4	.11	1335	19-27	17-24	10-16					35
	5	.07	1065	18-26	16-23	8-15	12		15		30
	6	.05	890	17-25	15-22	7-14					25
	7	.04	760	16-23	14-20	6-12					25
180	8	.03	665	15-20	13-18	5-10					20
	9	.02	590	14-19	12-17	4-9					20
	5	.09	1200	20-30	18-27	10-19	12		15		35
	6	.06	1000	19-28	17-25	9-17					30
	7	.05	850	18-26	16-23	8-15					25
	8	.04	750	16-24	14-21	6-13					20
200	9	.03	665	15-21	13-19	5-11					20
	10	.02	600	14-19	12-18	4-10					20
	5	.11	1335	23-33	20-30	12-21	12		15		35
	6	.08	1110	21-32	19-29	10-20					30
	7	.06	950	20-31	18-27	9-18					30
250	8	.04	835	18-27	16-24	8-16					25
	9	.03	740	17-26	15-23	6-14					20
	10	.03	665	16-25	14-22	5-10					20
	6	.12	1390	24-35	21-31	-					35
300	7	.09	1190	23-34	20-30	-	13		15		35
	8	.07	1040	21-32	19-28	-					30
	9	.05	925	20-31	18-27	-					25
	10	.04	833	19-30	17-26	-					25
350	7	.13	1430	25-40	23-35	-	13		16		35
	8	.10	1250	24-36	22-32	-					35
	9	.08	1110	23-34	20-30	-					30
	10	.06	1000	22-32	19-28	-					30
350	8	.13	1460	27-47	24-43	-	14		16		40
	9	.11	1300	26-45	23-41	-					35
	10	.09	1165	25-42	22-39	-					30

S Series (Page 43-46)

NOTES:

- Table 1 based on 4-foot diffuser length. For longer lengths, correct throw and NC per Table 2.
- For 2-way ceiling throw, proportion cfm and number of slots in each direction of T and select from 1-way data, Table 1.
- When using continuous diffuser lengths with alternate active and inactive sections, a reduction in throw can be obtained by omitting the factors contained in Table 2.
- P_s constant for horizontal 1-way, 2-way and vertical pattern adjustment.
- Supply air temperature effect on horizontal throw is shown in Table 3. Vertical throw at varying supply air temperatures is shown in Table 4.
- Terminal velocities (V_t) at the minimum and maximum throw (T) positions are rated at 150 FPM and 100 FPM respectively with corresponding room velocities (V_r) of 50 FPM and 35 FPM.

Table 2 - Continuous Diffuser Length Factors

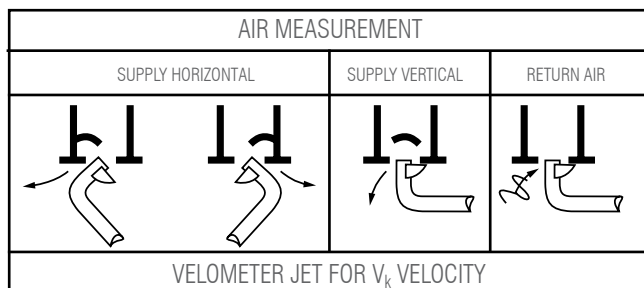
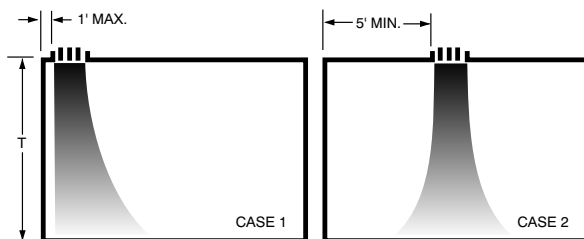
Diffuser Length in Feet	Throw (T)			NC
	Ceiling Min.-Max.	Sidewall Min.-Max.	Sill Min.-Max.	
4-6	No change			+ 0
7-20	T x 1.10			+ 5
21-100	T x 1.15			+ 10

Table 3 - Supply Air Temperature Factors

Ceiling Sidewall Sill	Multiply Throw in Table 1 (or factor in Table 2 if used) by listed value.		
	@-20F T	@ 0F T	@+25F T
	T x 1.00	T x 1.10	T x 1.20

Table 4 - Vertical Down-Throw and Supply Air Temperature Factors

Case	Multiply Throw-Sidewall in Table 1 (or factor in Table 2 if used) by listed value.		
	@-20F T Cooling	@ 0F T Ventilating	@+25F T Heating
Case 1	T x 1.00	T x .90	T x .60
Case 2	T x .70	T x .60	T x .40



Type 50 Supply Diffuser Areas per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
A_k Area	.02	.03	.05	.07	.09	.10	.12	.14	.15	.17
A_n Area	.08	.17	.25	.33	.42	.50	.58	.67	.75	.84

Type 75 Supply Diffuser Areas per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
A_k Area	.03	.05	.07	.09	.12	.14	.16	.19	.21	.23
A_n Area	.12	.24	.36	.48	.60	.72	.84	.96	1.10	1.20

Type 10 Supply Diffuser Areas per Foot of Length

	No. of Slots									
	1	2	3	4	5	6	7	8	9	10
A_k Area	.04	.06	.09	.12	.15	.18	.21	.24	.27	.30
A_n Area	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67

A_k constant for horizontal 1-way, 2-way, and vertical pattern.
CFM = A_k x length in feet x V_k

Type 50 Return Air CFM per Foot of Length*

No. of Slots	A_k Area	NC 20-25 Application Nonducted		NC 30 Application Ducted		NC 35-40 Application Ducted	
		-.02" P_s	-.03" P_s	-.08" P_s	-.10" P_s	-.15" P_s	-.20" P_s
		CFM	CFM	CFM	CFM	CFM	CFM
1	.03	15	20	30	35	40	45
2	.06	35	45	70	80	95	110
3	.08	55	70	110	125	150	175
4	.11	70	85	140	155	190	220
5	.14	90	110	180	200	245	285
6	.16	110	135	220	245	300	345
7	.20	130	160	260	290	355	410
8	.22	140	170	280	310	385	440
9	.25	165	200	330	370	450	520
10	.28	185	225	370	415	505	585

Type 75 Return Air CFM per Foot of Length*

No. of Slots	A_k Area	NC 20-25 Application Nonducted		NC 30 Application Ducted		NC 35-40 Application Ducted	
		-.02" P_s	-.03" P_s	-.08" P_s	-.10" P_s	-.15" P_s	-.20" P_s
		CFM	CFM	CFM	CFM	CFM	CFM
1	.04	25	35	50	65	75	90
2	.08	50	60	100	110	135	160
3	.12	80	100	160	180	220	250
4	.16	100	120	200	225	275	320
5	.20	130	160	260	295	360	420
6	.24	160	195	320	360	440	510
7	.28	175	215	350	390	475	550
8	.32	200	245	400	445	545	630
9	.36	235	290	470	525	640	740
10	.40	260	320	520	580	710	820

Type 10 Return Air CFM per Foot of Length*

No. of Slots	A_k Area	NC 20-25 Application Nonducted		NC 30 Application Ducted		NC 35-40 Application Ducted	
		-.02" P_s	-.03" P_s	-.08" P_s	-.10" P_s	-.15" P_s	-.20" P_s
		CFM	CFM	CFM	CFM	CFM	CFM
1	.06	35	43	70	80	95	110
2	.11	70	85	140	155	190	220
3	.17	105	130	210	235	285	330
4	.23	140	170	280	310	380	440
5	.28	175	215	350	390	475	550
6	.33	210	255	420	465	570	660
7	.39	245	300	490	545	665	770
8	.44	280	340	560	620	760	880
9	.50	315	385	630	700	855	990
10	.55	350	425	700	775	950	1100

* Capacity based on diffuser without pattern controller. When pattern controller is used, CFM capacities are reduced by 65% at listed P_s , NC, and A_k .

DL Drum Louver (Page 47)

6-Inch

Size (H x W)	A _k Area	Neck Area (Ft ²)	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
			Static Pressure	.007	.010	.015	.025	.030	.040	.052
			Total Pressure	.039	.065	.100	.147	.194	.254	.330
6 x 9	.16	.375	CFM	128	160	192	224	256	228	336
			Throw	6-7-13	8-11-14	10-14-23	12-17-26	4-19-29	16-21-32	17-23-35
6 x 12	.21	.500	CFM	168	210	252	294	336	378	441
			Throw	8-10-18	10-15-24	12-17-27	14-18-30	15-20-33	17-22-37	18-23-41
6 x 18	.32	.750	CFM	256	320	384	448	512	576	672
			Throw	10-14-23	13-18-30	15-20-34	18-23-38	20-26-43	23-30-48	25-32-52
6 x 24	.41	1.000	CFM	328	410	492	574	656	738	861
			Throw	12-17-28	16-21-35	19-25-40	22-29-45	24-33-51	27-36-56	30-38-61
6 x 30	.52	1.250	CFM	416	520	624	728	832	936	1092
			Throw	15-20-33	18-24-39	22-28-44	25-32-50	27-37-56	30-40-61	33-43-66
6 x 36	.62	1.500	CFM	496	620	744	868	992	1116	1302
			Throw	17-23-37	20-26-43	24-30-47	28-35-54	31-40-60	34-44-65	37-46-72
6 x 48	.83	2.000	CFM	664	830	996	1162	1328	1494	1743
			Throw	20-26-41	23-29-47	26-35-55	32-41-62	36-45-66	40-49-72	44-53-78
6 x 60	1.05	2.500	CFM	840	1000	1260	1470	1680	1890	2205
			Throw	22-29-45	25-32-52	29-39-61	36-46-70	41-50-79	46-54-86	49-59-96

Data based on 8dB room attenuation

10-Inch

Size (H x W)	A _k Area	Neck Area (Ft ²)	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
			Static Pressure	.007	.010	.015	.025	.030	.040	.052
			Total Pressure	.039	.065	.100	.147	.194	.254	.330
10 x 10	.60	1.390	CFM	480	600	720	840	960	1080	1260
			Throw	19-23-33	23-27-40	26-31-46	29-35-53	32-39-58	35-42-64	38-46-69
10 x 25	.75	1.740	CFM	600	750	900	1050	1200	1350	1575
			Throw	21-24-38	25-29-46	28-34-53	32-38-60	35-42-66	38-46-73	41-50-79
10 x 30	.90	1.080	CFM	720	900	1080	1260	1440	1620	1890
			Throw	22-25-41	27-31-51	31-36-58	35-41-66	39-46-74	42-50-81	46-54-88
10 x 35	1.05	2.440	CFM	840	1050	1260	1470	1680	1890	2205
			Throw	22-27-43	27-33-53	32-39-62	37-45-71	41-50-81	45-54-89	49-59-98
10 x 40	1.20	2.780	CFM	960	1200	1440	1680	1920	2160	2520
			Throw	23-28-47	28-34-58	34-41-59	39-48-79	44-59-88	48-59-96	53-65-105
10 x 50	1.50	3.470	CFM	1200	1500	1800	2100	2400	2700	3150
			Throw	25-31-52	31-39-63	37-46-74	44-53-82	48-59-91	54-65-100	60-72-110
10 x 60	1.85	4.170	CFM	1480	1850	2220	2590	2960	3330	3885
			Throw	25-33-59	33-42-73	40-50-84	47-58-95	54-55-108	61-74-118	68-81-128
10 x 70	2.15	4.860	CFM	1720	2150	2580	3010	3440	3870	4515
			Throw	28-36-62	35-46-78	43-54-93	50-63-108	58-71-123	65-79-135	72-87-147

Data based on 8dB room attenuation

*Outlet velocity and Ak based on 15° deflection

Throw data is based on Terminal Velocities of 150 FPM, 100 FPM, and 50 FPM respectively.

THROW-NC-TOTAL PRESSURE are based on 15° blade deflection. For 0° or 30° deflection the following correction factors should be applied to the table values.

	Throw	Total Pressure	NC
0°	1.2	0.795	-4
30°	0.8	1.430	+5



DL Drum Louver (Page 47)

12-Inch

Size (H x W)	A _k Area	Neck Area (Ft ²)	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
			Static Pressure	.007	.010	.015	.025	.030	.040	.052
			Total Pressure	.039	.065	.100	.147	.194	.254	.330
12 x 20	.70	1.670	CFM	560	700	840	980	1120	1260	1470
			Throw	10-20-35	18-25-43	23-31-51	26-35-58	29-39-64	33-44-71	36-49-78
12 x 30	1.05	2.500	CFM	840	1050	1260	1470	1680	1890	2205
			Throw	17-25-42	24-32-53	28-38-63	33-43-72	38-49-81	43-55-90	48-60-99
12 x 40	1.40	3.330	CFM	1120	1400	1680	1960	2240	2520	2940
			Throw	20-28-49	27-36-62	32-43-74	38-50-86	44-57-97	49-64-107	55-61-120
12 x 50	1.75	4.160	CFM	1400	1750	2100	2450	2800	3150	3675
			Throw	22-29-56	29-39-71	37-48-85	44-56-99	51-64-117	58-73-127	64-81-138
12 x 60	2.15	5.000	CFM	1720	2150	2580	3010	3440	3870	4515
			Throw	25-33-61	33-44-78	42-53-94	49-63-110	58-74-125	66-83-140	75-92-155
12 x 70	2.50	5.830	CFM	2000	2500	3000	3500	4000	4500	5250
			Throw	28-37-68	37-49-87	47-61-107	57-73-125	67-86-142	76-97-160	86-110-180

Data based on 8dB room attenuation

15-Inch

Size (H x W)	A _k Area	Neck Area (Ft ²)	Outlet* Velocity	800	1000	1200	1400	1600	1800	2100
			Static Pressure	.007	.010	.015	.025	.030	.040	.052
			Total Pressure	.039	.065	.100	.147	.194	.254	.330
15 x 15	.75	1.560	CFM	600	750	900	1050	1200	1350	1575
			Throw	3-10-28	9-18-36	14-24-36	21-27-50	24-30-56	25-32-58	29-38-69
15 x 20	1.00	2.080	CFM	800	1000	1200	1400	1600	1800	2100
			Throw	9-17-35	17-24-43	22-28-52	25-32-60	29-37-68	31-40-72	35-44-80
15 x 25	1.25	2.600	CFM	1000	1250	1500	1750	2000	2250	2625
			Throw	13-21-38	21-26-48	25-32-58	29-38-68	34-43-77	38-48-86	42-54-95
15 x 30	1.55	3.120	CFM	1240	1550	1860	2170	2480	2790	3255
			Throw	14-23-42	22-28-54	27-35-65	32-41-76	37-47-86	41-54-97	46-59-107
15 x 40	2.05	4.170	CFM	1640	2050	2460	2870	3280	3690	4305
			Throw	19-25-48	27-35-66	35-43-79	39-50-93	45-58-105	51-65-118	57-72-130
15 x 50	2.55	5.210	CFM	2040	2550	3060	3570	4080	4590	5355
			Throw	24-30-61	31-40-78	38-48-96	45-58-114	52-66-130	58-75-145	65-83-163
15 x 60	3.00	6.250	CFM	2400	3000	3600	4200	4800	5400	6300
			Throw	27-34-68	35-46-88	43-58-106	52-68-125	60-79-143	68-89-160	76-100-176
15 x 70	3.50	7.300	CFM	2800	3500	4200	4900	5600	6300	7350
			Throw	29-38-72	40-51-95	50-64-118	60-76-140	71-89-160	81-101-184	90-112-195

Data based on 8dB room attenuation

*Outlet velocity and Ak based on 15° deflection

Throw data is based on Terminal Velocities of 150 FPM, 100 FPM, and 50 FPM respectively.

THROW-NC-TOTAL PRESSURE are based on 15° blade deflection. For 0° or 30° deflection the following correction factors should be applied to the table values.

	Throw	Total Pressure	NC
0°	1.2	0.795	-4
30°	0.8	1.430	+5



Stationary Louvers

1530ZC, 1530ZF (Page 49)

		Free Area in Square Feet															
		WIDTH															
		12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	
HEIGHT	12	0.37	0.58	0.80	0.98	1.19	1.41	1.62	1.80	2.02	2.23	2.45	2.63	2.84	3.06	3.27	
	18	0.60	0.96	1.31	1.60	1.96	2.31	2.66	2.95	3.31	3.66	4.01	4.31	4.66	5.01	5.37	
	24	0.84	1.33	1.82	2.23	2.72	3.21	3.70	4.11	4.60	5.09	5.58	5.99	6.48	6.97	7.46	
	30	1.07	1.70	2.33	2.85	3.48	4.11	4.73	5.26	5.89	6.51	7.14	7.66	8.29	8.92	9.55	
	36	1.31	2.07	2.84	3.48	4.24	5.01	5.77	6.41	7.18	7.94	8.71	9.34	10.11	10.87	11.64	
	42	1.54	2.45	3.35	4.10	5.00	5.91	6.81	7.56	8.46	9.37	10.27	11.02	11.92	12.83	13.73	
	48	1.78	2.82	3.86	4.72	5.77	6.81	7.85	8.71	9.75	10.79	11.83	12.70	13.74	14.78	15.82	
	54	2.01	3.19	4.37	5.35	6.53	7.70	8.88	9.86	11.04	12.22	13.40	14.38	15.56	16.74	17.91	
	60	2.25	3.56	4.88	5.97	7.29	8.60	9.92	11.02	12.33	13.65	14.96	16.06	17.37	18.69	20.00	
	66	2.48	3.93	5.39	6.60	8.05	9.50	10.96	12.17	13.62	15.07	16.53	17.74	19.19	20.64	22.10	
72	2.72	4.31	5.90	7.22	8.81	10.40	11.99	13.32	14.91	16.50	18.09	19.42	21.01	22.60	24.19		
78	2.95	4.68	6.41	7.85	9.58	11.30	13.03	14.47	16.20	17.93	19.65	21.09	22.82	24.55	26.28		
84	3.19	5.05	6.92	8.47	10.34	12.20	14.07	15.62	17.49	19.35	21.22	22.77	24.64	26.50	28.37		
90	3.42	5.42	7.43	9.10	11.10	13.10	15.10	16.77	18.78	20.78	22.78	24.45	26.45	28.46	30.46		

245ZC, 245ZF (Page 50)

		Free Area in Square Feet															
		WIDTH															
		12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	
HEIGHT	12	0.26	0.41	0.56	0.71	0.86	1.01	1.16	1.31	1.46	1.61	1.76	1.91	2.06	2.21	2.36	
	18	0.45	0.71	0.96	1.22	1.48	1.73	1.99	2.25	2.50	2.76	3.02	3.27	3.53	3.79	4.05	
	24	0.76	1.20	1.63	2.07	2.50	2.94	3.37	3.81	4.24	4.68	5.11	5.55	5.98	6.42	6.86	
	30	0.95	1.49	2.03	2.57	3.12	3.66	4.20	4.74	5.29	5.83	6.37	6.91	7.45	8.00	8.54	
	36	1.14	1.78	2.43	3.08	3.73	4.38	5.03	5.68	6.33	6.98	7.62	8.27	8.92	9.57	10.22	
	42	1.32	2.08	2.83	3.59	4.35	5.10	5.86	6.61	7.37	8.12	8.88	9.64	10.39	11.15	11.90	
	48	1.51	2.37	3.23	4.10	4.96	5.82	6.69	7.55	8.41	9.27	10.14	11.00	11.86	12.72	13.59	
	54	1.70	2.67	3.64	4.60	5.57	6.54	7.51	8.48	9.45	10.42	11.39	12.36	13.33	14.30	15.27	
	60	1.88	2.96	4.04	5.11	6.19	7.26	8.34	9.42	10.49	11.57	12.65	13.72	14.80	15.87	16.95	
	66	2.20	3.45	4.71	5.96	7.21	8.47	9.72	10.98	12.23	13.49	14.74	16.00	17.25	18.51	19.76	
72	2.38	3.74	5.11	6.47	7.83	9.19	10.55	11.91	13.27	14.64	16.00	17.36	18.72	20.08	21.44		
78	2.57	4.04	5.51	6.97	8.44	9.91	11.38	12.85	14.32	15.78	17.25	18.72	20.19	21.66	23.13		
84	2.76	4.33	5.91	7.48	9.06	10.63	12.21	13.78	15.36	16.93	18.51	20.08	21.66	23.23	24.81		
90	2.94	4.63	6.31	7.99	9.67	11.35	13.04	14.72	16.40	18.08	19.76	21.45	23.13	24.81	26.49		

1545ZC, 1545ZF (Page 49)

		Free Area in Square Feet															
		WIDTH															
		12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	
HEIGHT	12	0.30	0.47	0.64	0.79	0.96	1.14	1.31	1.45	1.63	1.80	1.97	2.12	2.29	2.47	2.64	
	18	0.50	0.79	1.08	1.32	1.61	1.90	2.20	2.44	2.73	3.02	3.31	3.55	3.85	4.14	4.43	
	24	0.70	1.11	1.52	1.86	2.26	2.67	3.08	3.42	3.83	4.24	4.65	4.99	5.40	5.81	6.21	
	30	0.90	1.42	1.95	2.39	2.92	3.44	3.97	4.41	4.93	5.46	5.98	6.42	6.95	7.48	8.00	
	36	1.10	1.74	2.39	2.92	3.57	4.21	4.85	5.39	6.03	6.68	7.32	7.86	8.50	9.14	9.79	
	42	1.30	2.06	2.82	3.46	4.22	4.98	5.74	6.37	7.14	7.90	8.66	9.29	10.05	10.81	11.58	
	48	1.50	2.38	3.26	3.99	4.87	5.75	6.63	7.36	8.24	9.12	9.99	10.73	11.61	12.48	13.36	
	54	1.70	2.70	3.69	4.52	5.52	6.52	7.51	8.34	9.34	10.33	11.33	12.16	13.16	14.15	15.15	
	60	1.90	3.02	4.13	5.06	6.17	7.28	8.40	9.33	10.44	11.55	12.67	13.60	14.71	15.82	16.94	
	66	2.10	3.33	4.57	5.59	6.82	8.05	9.28	10.31	11.54	12.77	14.00	15.03	16.26	17.49	18.72	
72	2.30	3.65	5.00	6.13	7.47	8.82	10.17	11.29	12.64	13.99	15.34	16.46	17.81	19.16	20.51		
78	2.50	3.97	5.44	6.66	8.12	9.59	11.06	12.28	13.74	15.21	16.68	17.90	19.37	20.83	22.30		
84	2.71	4.29	5.87	7.19	8.78	10.36	11.94	13.26	14.85	16.43	18.01	19.33	20.92	22.50	24.08		
90	2.91	4.61	6.31	7.73	9.43	11.13	12.83	14.25	15.95	17.65	19.35	20.77	22.47	24.17	25.87		

445ZC, 445ZF (Page 50)

		Free Area in Square Feet															
		WIDTH															
		12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	
HEIGHT	12	0.33	0.53	0.73	0.93	1.13	1.34	1.54	1.74	1.94	2.07	2.28	2.48	2.68	2.88	3.08	
	18	0.55	0.89	1.22	1.56	1.90	2.23	2.57	2.91	3.25	3.47	3.81	4.25	4.48	4.82	5.16	
	24	0.82	1.32	1.82	2.32	2.82	3.32	3.82	4.32	4.83	5.16	5.66	6.16	6.66	7.16	7.67	
	30	1.04	1.67	2.31	2.95	3.58	4.22	4.86	5.49	6.13	6.56	7.19	7.83	8.47	9.10	9.74	
	36	1.30	2.10	2.90	3.71	4.51	5.31	6.11	6.91	7.71	8.24	9.05	9.85	10.65	11.45	12.25	
	42	1.52	2.46	3.40	4.33	5.27	6.21	7.14	8.08	9.02	9.64	10.58	11.51	12.45	13.39	14.32	
	48	1.79	2.89	3.99	5.09	6.19	7.29	8.39	9.49	10.60	11.33	12.43	13.53	14.63	15.73	16.83	
	54	2.01	3.25	4.48	5.72	6.96	8.19	9.43	10.66	11.90	12.73	13.96	15.20	16.45	17.67	18.91	
	60	2.28	3.68	5.08	6.48	7.88	9.28	10.68	12.08	13.48	14.41	15.81	17.22	18.62	20.02	21.42	
	66	2.56	4.03	5.57	7.10	8.64	10.18	11.71	13.25	14.79	15.81	17.35	18.88	20.42	21.95	23.49	
72	2.70	4.46	6.16	7.86	9.56	11.26	12.97	14.67	16.37	17.50	19.20	20.99	22.60	24.30	26.00		
78	2.98	4.82	6.66	8.49	10.33	12.16	14.00	15.84	17.67	18.90	20.73	22.57	24.40	26.24	28.07		
84	3.25	5.25	7.25	9.25	11.25	13.25	15.25	17.25	19.25	20.58	22.58	24.48	26.58	28.58	30.58		
90	3.47	5.61	7.74	9.88	12.01	14.15	16.28	18.42	20.56	21.98	24.12	26.25	28.39	30.52	32.66		

Adjustable Louvers

4ABC (Page 49)

		Free Area in Square Feet															
		WIDTH															
		12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	
HEIGHT	12	0.24	0.38	0.53	0.67	0.82	0.96	1.11	1.25	1.40	1.54	1.68	1.83	1.97	2.12	2.26	
	18	0.42	0.68	0.93	1.19	1.45	1.71	1.96	2.22	2.48	2.73	2.99	3.25	3.51	3.76	4.02	
	24	0.55	0.88	1.22	1.55	1.88	2.22	2.55	2.89	3.22	3.56	3.89	4.23	4.56	4.89	5.23	
	30	0.76	1.23	1.69	2.16	2.62	3.09	3.55	4.02	4.48	4.95	5.41	5.88	6.34	6.81	7.27	
	36	0.93	1.49	2.06	2.62	3.19	3.76	4.32	4.89	5.45	6.02	6.58	7.15	7.72	8.28	8.85	
	42	1.11	1.79	2.47	3.15	3.83	4.51	5.19	5.87	6.55	7.23	7.91	8.59	9.27	9.95	10.63	
	48	1.30	2.09	2.88	3.67	4.46	5.26	6.05	6.84	7.63	8.42	9.22	10.01	10.80	11.59	12.38	
	54	1.42	2.29	3.16	4.03	4.90	5.77	6.64	7.51	8.38	9.25	10.11	10.98	11.85	12.73	13.59	
	60	1.64	2.64	3.64	4.64	5.64	6.64	7.64	8.64	9.64	10.64	11.64	12.64	13.64	14.64	15.64	
	66	1.80	2.90	4.00	5.10	6.20	7.30	8.40	9.51	10.61	11.71	12.81	13.91	15.01	16.11	17.21	
72	1.99	3.20	4.42	5.63	6.84	8.06	9.27	10.49	11.70	12.92	14.15	15.34	16.56	17.77	18.99		
78	2.17	3.50	4.82	6.15	7.48	8.80	10.13	11.46	12.78	14.11	15.44	16.76	18.09	19.42	20.74		
84	2.30	3.70	5.11	6.51	7.91	9.32	10.72	12.13	13.53	14.93	16.34	17.74	19.14	20.55	21.95		
90	2.51	4.05	5.58	7.12	8.65	10.19	11.72	13.25	14.79	16.32	17.86	19.39	20.93	22.46	24.00		
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4-Way Rezzin TBar Diffuser (Page 59)

		Neck Velocity FPM									
		400	500	600	700	800	900	1000	1200	1400	1600
6"	CFM	79	98	118	137	157	177	196	236	275	314
	Static Pressure	.003	.005	.006	.008	.011	.013	.016	.023	.031	.041
	Total Pressure	.015	.024	.034	.046	.060	.076	.094	.134	.183	.238
	NC	-	-	-	-	-	-	15	22	26	31
8"	CFM	140	175	209	244	279	314	349	419	489	559
	Static Pressure	.009	.014	.021	.028	.037	.046	.057	.082	.111	.145
	Total Pressure	.019	.030	.043	.058	.076	.096	.118	.170	.231	.301
	NC	-	-	-	-	18	22	23	31	35	39
10"	CFM	218	273	327	382	436	491	545	654	764	873
	Static Pressure	.009	.014	.021	.028	.037	.047	.058	.083	.113	.148
	Total Pressure	.019	.029	.042	.058	.075	.095	.117	.169	.230	.300
	NC	-	-	-	-	18	22	26	31	36	40
12"	CFM	314	393	471	550	628	707	785	942	1100	1257
	Static Pressure	.015	.022	.032	.044	.059	.076	.095	.142	.198	.264
	Total Pressure	.025	.038	.054	.074	.098	.126	.157	.231	.319	.422
	NC	-	-	-	-	18	20	26	29	36	41
14"	CFM	428	535	641	748	855	962	1069	1283	1497	1710
	Static Pressure	.015	.023	.033	.044	.057	.072	.089	.128	.175	.228
	Total Pressure	.025	.037	.053	.072	.094	.119	.146	.211	.287	.375
	NC	-	-	-	15	21	25	29	35	40	44

Throw Data - Terminal Velocity of 75 FPM

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	79	98	118	137	157	177	196	236	275	314
6"	3.1	3.9	4.6	5.4	6.2	7.0	7.7	9.3	10.8	12.4
CFM	140	175	209	244	279	314	349	419	489	559
8"	5.3	6.7	8.0	9.3	10.7	12.0	13.3	16.0	18.7	21.3
CFM	218	273	327	382	436	491	545	654	764	873
10"	6.3	7.9	9.4	11.0	12.6	14.1	15.7	18.8	22.0	25.1
CFM	314	393	471	550	628	707	785	942	1100	1257
12"	7.1	8.8	10.6	12.4	14.2	15.9	17.7	21.2	24.8	28.3
CFM	428	535	641	748	855	962	1069	1283	1497	1710
14"	9.1	11.3	13.6	15.9	18.1	20.4	22.7	27.2	31.8	36.3

Throw Data - Terminal Velocity of 150 FPM

Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
CFM	79	98	118	137	157	177	196	236	275	314
6"	1.3	1.7	2.0	2.4	2.7	3.0	3.4	4.0	4.7	5.4
CFM	140	175	209	244	279	314	349	419	489	559
8"	2.2	2.7	3.3	3.8	4.4	4.9	5.5	6.6	7.7	8.8
CFM	218	273	327	382	436	491	545	654	764	873
10"	2.5	3.1	3.7	4.4	5.0	5.6	6.2	7.5	8.7	10.0
CFM	314	393	471	550	628	707	785	942	1100	1257
12"	3.8	4.8	5.8	6.7	7.7	8.6	9.6	11.5	13.4	15.3
CFM	428	535	641	748	855	962	1069	1283	1497	1710
14"	4.2	5.2	6.3	7.3	8.3	9.4	10.4	12.5	14.6	16.7

Rezzin Modular Core Tbar Diffuser (Page 59)

		Neck Velocity FPM									
		400	500	600	700	800	900	1000	1200	1400	1600
6"	CFM	79	98	118	137	157	177	196	236	275	314
	Static Pressure	.003	.005	.007	.010	.013	.017	.021	.030	.041	.054
	Total Pressure	.018	.023	.026	.035	.043	.067	.086	.120	.166	.209
	NC	-	-	-	-	-	16	20	24	30	34
8"	CFM	140	175	209	244	279	314	349	419	489	559
	Static Pressure	.004	.006	.008	.011	.014	.017	.020	.028	.036	.045
	Total Pressure	.013	.021	.030	.041	.053	.066	.081	.115	.155	.201
	NC	-	-	-	-	17	22	24	34	37	41
10"	CFM	218	273	327	382	436	491	545	654	764	873
	Static Pressure	.004	.007	.010	.013	.017	.022	.027	.039	.053	.069
	Total Pressure	.014	.021	.031	.042	.055	.070	.086	.124	.170	.222
	NC	-	-	-	17	22	26	34	42	44	48
12"	CFM	314	393	471	550	628	707	785	942	1100	1257
	Static Pressure	.006	.009	.012	.017	.022	.028	.034	.048	.065	.084
	Total Pressure	.015	.024	.035	.047	.061	.077	.095	.137	.186	.242
	NC	-	-	-	20	24	27	35	40	45	49
14"	CFM	428	535	641	748	855	962	1069	1283	1497	1710
	Static Pressure	.008	.013	.018	.024	.031	.040	.048	.069	.093	.120
	Total Pressure	.017	.030	.041	.056	.071	.090	.114	.144	.200	.278
	NC	-	-	15	23	27	34	39	44	48	51
16"	CFM	559	698	838	977	1117	1257	1396	1676	1955	2234
	Static Pressure	.012	.019	.028	.037	.048	.061	.075	.107	.145	.189
	Total Pressure	.022	.034	.049	.066	.086	.108	.134	.192	.260	.339
	NC	-	-	24	27	31	38	40	45	49	51

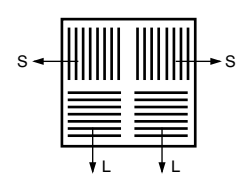
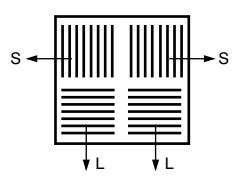
Rezzin Modular Core Tbar Diffuser (Page 59)

Throw Data - Terminal Velocity of 75 FPM

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
6"	CFM	79	98	118	137	157	177	196	236	275	314
	1-direction	3.5	4.4	5.3	6.2	7.1	7.9	8.8	10.6	12.4	14.1
	2-direction	4.5	5.6	6.8	7.9	9.0	10.2	11.3	13.6	15.8	18.1
	3-direction Short	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.6	3.0	3.5
	3-direction Long	1.2	1.5	1.8	2.1	2.5	2.8	3.1	3.7	4.3	4.9
	4-direction	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.8	2.1	2.5
8"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	140	175	209	244	279	314	349	419	489	559
	1-direction	3.1	3.9	4.6	5.4	6.2	7.0	7.7	9.3	10.8	12.4
	2-direction	4.4	5.5	6.6	7.7	8.8	9.9	11.0	13.2	15.4	17.6
	3-direction Short	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.1	8.1
	3-direction Long	3.5	4.4	5.3	6.2	7.0	7.9	8.8	10.6	12.3	14.1
4-direction	1.5	1.9	2.3	2.7	3.1	3.4	3.8	4.6	5.4	6.1	
10"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	218	273	327	382	436	491	545	654	764	873
	1-direction	6.1	7.6	9.2	10.7	12.2	13.7	15.3	18.3	21.4	24.4
	2-direction	7.1	8.9	10.7	12.5	14.3	16.1	17.8	21.4	25.0	28.5
	3-direction Short	2.1	2.6	3.1	3.7	4.2	4.7	5.2	6.3	7.3	8.4
	3-direction Long	6.4	8.0	9.6	11.2	12.8	14.4	16.0	19.2	22.4	25.6
4-direction	2.9	3.6	4.3	5.0	5.7	6.4	7.1	8.6	10.0	11.4	
12"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	314	393	471	550	628	707	785	942	1100	1257
	1-direction	9.8	12.2	14.7	17.1	19.6	22.0	24.5	29.3	34.2	39.1
	2-direction	9.1	11.4	13.6	15.9	18.2	20.5	22.7	27.3	31.8	36.4
	3-direction Short	3.6	4.5	5.4	6.3	7.2	8.1	9.0	10.8	12.6	14.4
	3-direction Long	8.0	10.0	12.0	14.0	16.0	18.0	20.1	24.1	28.1	32.1
4-direction	2.1	2.6	3.1	3.7	4.2	4.7	5.2	6.3	7.3	8.4	
14"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	428	535	641	748	855	962	1069	1283	1497	1710
	1-direction	12.1	15.1	18.2	21.2	24.2	27.3	30.3	36.3	42.4	48.5
	2-direction	8.4	10.5	12.6	14.7	16.8	18.9	21.0	25.2	29.4	33.6
	3-direction Short	3.9	4.9	5.9	6.8	7.8	8.8	9.8	11.7	13.7	15.7
	3-direction Long	7.0	8.8	10.5	12.3	14.0	15.8	17.5	21.0	24.5	28.0
4-direction	2.8	3.5	4.2	4.9	5.6	6.3	7.0	8.4	9.8	11.2	
16"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	559	698	838	977	1117	1257	1396	1676	1955	2234
	1-direction	24.3	30.4	36.5	42.5	48.6	54.7	60.8	72.9	85.1	97.2
	2-direction	14.1	17.6	21.1	24.6	28.1	31.7	35.2	42.2	49.3	56.3
	3-direction Short	11.2	14.0	16.8	19.7	22.5	25.3	28.1	33.7	39.3	44.9
	3-direction Long	16.3	20.4	24.5	28.6	32.7	36.7	40.8	49.0	57.1	65.3
4-direction	3.2	4.0	4.9	5.7	6.5	7.3	8.1	9.7	11.3	12.9	

Throw Data - Terminal Velocity of 150 FPM

	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
6"	CFM	79	98	118	137	157	177	196	236	275	314
	1-direction	1.5	1.9	2.3	2.6	3.0	3.4	3.8	4.2	4.5	4.9
	2-direction	1.7	2.1	2.5	3.0	3.4	3.8	4.2	4.7	5.1	5.5
	3-direction Short	0.6	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.8	1.9
	3-direction Long	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9
	4-direction	0.6	0.7	0.8	1.0	1.1	1.2	1.4	1.5	1.7	1.8
8"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	140	175	209	244	279	314	349	419	489	559
	1-direction	1.6	2.1	2.5	2.9	3.3	3.7	4.1	4.5	4.9	5.4
	2-direction	1.7	2.1	2.5	2.9	3.3	3.8	4.2	4.6	5.0	5.4
	3-direction Short	1.3	1.6	1.9	2.3	2.6	2.9	3.2	3.5	3.9	4.2
	3-direction Long	1.5	1.9	2.2	2.6	3.0	3.3	3.7	4.1	4.5	4.8
4-direction	1.1	1.4	1.6	1.9	2.2	2.5	2.7	3.0	3.3	3.6	
10"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	218	273	327	382	436	491	545	654	764	873
	1-direction	3.0	3.7	4.5	5.2	6.0	6.7	7.5	8.2	9.0	9.7
	2-direction	2.8	3.5	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0
	3-direction Short	1.5	1.9	2.2	2.6	3.0	3.4	3.7	4.1	4.5	4.8
	3-direction Long	2.5	3.1	3.7	4.3	5.0	5.6	6.2	6.8	7.4	8.1
4-direction	2.3	2.9	3.4	4.0	4.6	5.2	5.7	6.3	6.9	7.5	
12"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	314	393	471	550	628	707	785	942	1100	1257
	1-direction	3.4	4.3	5.2	6.0	6.9	7.8	8.6	9.5	10.3	11.2
	2-direction	2.1	2.6	3.1	3.6	4.1	4.7	5.2	5.7	6.2	6.7
	3-direction Short	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.7	7.3	7.9
	3-direction Long	2.1	2.6	3.1	3.6	4.1	4.7	5.2	5.7	6.2	6.7
4-direction	1.7	2.1	2.5	2.9	3.3	3.8	4.2	4.6	5.0	5.4	
14"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	428	535	641	748	855	962	1069	1283	1497	1710
	1-direction	5.3	6.6	7.9	9.3	10.6	11.9	13.2	14.5	15.9	17.2
	2-direction	3.0	3.8	4.6	5.3	6.1	6.8	7.6	8.3	9.1	9.9
	3-direction Short	2.3	2.9	3.5	4.1	4.6	5.2	5.8	6.4	6.9	7.5
	3-direction Long	2.6	3.2	3.9	4.5	5.1	5.8	6.4	7.1	7.7	8.4
4-direction	2.2	2.7	3.2	3.8	4.3	4.9	5.4	5.9	6.5	7.0	
16"	Neck Velocity	400	500	600	700	800	900	1000	1200	1400	1600
	CFM	559	698	838	977	1117	1257	1396	1676	1955	2234
	1-direction	14.9	18.6	22.3	26.0	29.7	33.5	37.2	40.9	44.6	48.3
	2-direction	7.0	8.7	10.4	12.2	13.9	15.6	17.4	19.1	20.9	22.6
	3-direction Short	5.2	6.5	7.8	9.1	10.4	11.7	13.0	14.3	15.6	16.9
	3-direction Long	6.7	8.4	10.0	11.7	13.4	15.1	16.7	18.4	20.1	21.8
4-direction	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.6	



Rezzin Square Ceiling Diffuser (Page 60)

Rezzin Square (two-way corner)

Neck Velocity		300	400	500	600	700
Neck Size 6"	CFM	60	80	100	120	135
Ak 0.284	Ps	0.002	0.004	0.006	0.008	0.011
Vt 75	Throw	2.5	3.5	4.0	5.0	6.0
Vt 100	Throw	2.5	3.0	4.0	4.5	5.5
Vt 150	Throw	1.5	2.0	2.5	3.0	3.5
Neck size 7"	CFM	82	109	136	164	191
Ak 0.267	Ps	0.009	0.016	0.025	0.037	0.050
Vt 75	Throw	4.0	5.0	6.0	7.5	8.5
Vt 100	Throw	3.5	4.5	5.5	7.0	8.0
Vt 150	Throw	2.5	3.0	4.0	4.5	5.5
Neck size 8"	CFM	105	140	175	209	244
Ak 0.251	Ps	0.016	0.029	0.045	0.065	0.088
Vt 75	Throw	5.0	6.5	8.0	9.5	11.0
Vt 100	Throw	4.5	6.0	7.5	9.0	10.5
Vt 150	Throw	3.0	4.0	5.0	6.0	7.0

Rezzin Square (three-way)

Neck Velocity		300	400	500	600	700
Neck Size 6"	CFM	60	80	100	120	135
Ak 0.247	Ps	0.002	0.004	0.006	0.008	0.011
Vt 75 S/L	Throw	2.0 2.5	3.0 3.5	3.5 4.5	4.5 5.5	5.0 6.0
Vt 100 S/L	Throw	2.0 2.5	3.0 3.5	3.5 4.0	4.0 5.0	5.0 6.0
Vt 150 S/L	Throw	1.5 1.5	2.0 2.0	2.5 3.0	3.0 3.5	3.0 4.0
Neck Size 7"	CFM	80	110	135	165	190
Ak 0.243	Ps	0.009	0.016	0.026	0.037	0.050
Vt 75 S/L	Throw	2.5 4.0	3.5 5.5	4.5 7.0	5.5 8.5	6.0 9.5
Vt 100 S/L	Throw	2.5 3.5	3.5 5.3	4.0 6.3	5.0 7.5	5.5 9.0
Vt 150 S/L	Throw	1.8 2.5	2.5 3.5	3.0 4.5	3.5 5.5	4.0 6.0
Neck Size 8"	CFM	105	140	175	210	245
Ak 0.239	Ps	0.016	0.029	0.046	0.066	0.090
Vt 75 S/L	Throw	3.0 5.5	4.0 7.5	5.0 9.0	6.0 11.0	7.0 13.0
Vt 100 S/L	Throw	3.0 5.0	3.5 7.0	4.5 8.5	5.5 10.5	6.5 12.0
Vt 150 S/L	Throw	2.0 3.5	2.5 4.5	3.0 6.0	3.5 7.0	4.5 8.0

Rezzin Square (four-way)

Neck Velocity		300	400	500	600	700
Neck Size 6"	CFM	60	80	100	120	135
Ak 0.210	Ps	0.001	0.002	0.003	0.005	0.006
Vt 75	Throw	3.0	3.5	4.5	5.5	6.5
Vt 100	Throw			4.5	5.0	6.0
Vt 150	Throw	1.5	2.5	3.0	3.5	4.0
Neck Size 7"	CFM	80	110	135	165	190
Ak 0.209	Ps	0.003	0.005	0.008	0.011	0.015
Vt 75	Throw			6.0	7.5	8.5
Vt 100	Throw	3.5	4.5	5.5	7.0	8.0
Vt 150	Throw	2.5	3.0	4.0	4.5	5.5
Neck Size 8"	CFM	105	140	175	210	245
Ak 0.209	Ps	0.005	0.008	0.013	0.018	0.025
Vt 75	Throw	4.5	6.0	7.5	9.0	10.5
Vt 100	Throw	4.0	5.5	7.0	8.5	10.0
Vt 150	Throw	3.0	3.5	4.5	5.5	6.5

Rezzin Round Ceiling Diffuser (Page 60)

Face Velocity		300	400	500	600	700	800	900	1000
Neck Size 6" Ak .224	CFM	67	89	112	134	157	179	201	224
	Ps	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
	Throw	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
Neck Size 7" Ak .229	CFM	69	92	115	137	160	183	206	229
	Ps	0.05	0.09	0.13	0.19	0.26	0.34	0.43	0.53
	Throw	1.75	2.25	2.75	3.25	3.75	4.25	5.00	5.50
Neck Size 8" Ak .235	CFM	70	94	117	141	164	188	211	235
	Ps	0.10	0.17	0.26	0.38	0.52	0.67	0.85	1.05
	Throw	2.00	2.50	3.00	3.50	4.00	4.50	5.50	6.00

Terminal Velocity of 50 FPM

659T/659TI/PFT/PFTI Series Performance (Page 52, 55)

Average Face Velocity		300	400	500	600
659T Ak 2.440	CFM	730	975	1220	1465
	-Ps	.017	.030	.047	.067
PFT Ak 2.740	CFM	820	1095	1370	1645
	-Ps	.028	.050	.078	.113
659-TI w/12" collar Ak 2.230	CFM	670	890	1115	1340
	-Ps	.084	.147	.230	.330
w/14" collar Ak 2.260	CFM	680	905	1130	1355
	-Ps	.060	.105	.165	.240
w/16" collar Ak 2.320	CFM	695	930	1160	1390
	-Ps	.039	.068	.106	.155
PFTI w/12" collar Ak 2.320	CFM	770	1025	1280	1535
	-Ps	.098	.170	.265	.380
w/14" collar Ak 2.590	CFM	775	1035	1295	1555
	-Ps	.076	.125	.200	.283
w/16" collar Ak 2.630	CFM	790	1050	1315	1580
	-Ps	.055	.094	.145	.210

Note: Tested without filters. Typical capacity is 2 CFM per square inch of nominal filter area. Recommended face velocity is 300-450 FPM. Velocities higher will decrease filter performance, increase flow resistance, and possibly be of noise concern. Velocity measured 1" from face.

96AFBT/96AFBTI (Page 53, 54)

Face Velocity		300	400	500	600	700
20 x 20 Ak 2.25	CFM	675	900	1125	1350	1575
	Static Pressure (in W.C.)	-0.024	-0.042	-0.065	-0.094	-0.128
	Total Pressure (in W.C.)	-0.018	-0.032	-0.050	-0.072	-0.098

Note: Tested without filters. Typical capacity is 2 CFM per square inch of nominal filter area. Recommended face velocity is 300-450 FPM. Velocities higher will decrease filter performance, increase flow resistance, and possibly be of noise concern. Velocity measured 1" from face.

RE5T/RE5TI (Page 57)

REF5T/REF5TI (Page 55)

Rezzin Egg Crate (Page 57)

RHF45T (Page 54)

RH45T (Page 56)

Average Face Velocity		300	400	500	600	700	800	900	1000
RE5T/RE5TI 22 x 22 Ak 3.14 46 x 22 Ak 6.68	CFM	942	1256	1570	1884	2198	4464	5022	5320
	-Ps	.006	.001	.016	.022	.031			
	CFM	2004	2672	3340	4008	4676			
	-Ps	.006	.001	.016	.022	.031			
RH45T 22 x 22 Ak 2.610 46 x 22 Ak 5.460	CFM	785	1045	1305	1565	1825			
	-Ps	.015	.030	.043	.062	.084			
	CFM	1635	2180	2725	3270	3815			
	-Ps	.006	.001	.016	.022	.031			
REF5T*/REF5TI* 20 x 20 Ak 2.57	CF	771	1028	1285	1542	1799			
	-Ps	.003	.006	.010	.014	.019			
	CFM	1674	2232	2790	3348	3906			
Rezzin Egg Crate 20 x 20 Ak 1.400	CFM	420	560	700	840	980			
	-Ps	.004	.008	.013	.018	.025			
RHF45T* 20 x 20 Ak 2.170	CFM	650	870	1085	1300	1520			
	-Ps	.015	.025	.040	.060	.080			
44 x 20 Ak 4.770	CFM	1430	1910	2385	2860	3340			
	-Ps	.015	.024	.039	.058	.078			

Note: Tested without filters. Typical capacity is 2 CFM per square inch of nominal filter area. Recommended face velocity is 300-450 FPM. Velocities higher will decrease filter performance, increase flow resistance, and possibly be of noise concern. Velocity measured 1" from face.

441 & 445 (Page 58)

Neck Velocity		250	350	450	550	650	750	850	1000	1200
6" Diameter Ak .370 Ak .430	CFM	50	70	90	110	130	145	165	195	235
	Ps	.004	.009	.014	.021	.029	.036	.046	.065	.092
	NC	<20	<20	<20	<20	<20	22	26	33	36
8" Diameter Ak .450 Ak .530	CFM	85	120	155	190	225	260	295	350	420
	Ps	.006	.011	.018	.027	.037	.050	.064	.090	.127
	NC	<20	<20	<20	<20	22	27	33	35	38
10" Diameter Ak .530 Ak .620	CFM	135	190	245	300	355	410	465	545	655
	Ps	.009	.018	.030	.044	.062	.082	.105	.145	.212
	NC	<20	<20	<20	24	31	34	37	42	44
12" Diameter Ak .590 Ak .700	CFM	195	275	355	430	510	590	670	785	940
	Ps	.013	.026	.044	.064	.090	.120	.155	.215	.300
	NC	<20	<20	26	33	38	42	44	46	48
14" Diameter Ak .640 Ak .750	CFM	265	375	480	590	695	800	910	1070	1285
	Ps	.018	.036	.059	.089	.125	.165	.210	.295	.410
	NC	<20	22	29	36	42	>45	>45	>45	>45

Note: The use of a balancing hood is recommended to balance the system.
NC is based on 10dB room attenuation (Re: 10⁻¹² watts) ASHRAE 36-72.
Terminal Velocity of 75 FPM

442, 443 & 444 SurfAire® (Page 58)

Neck Velocity		250	350	450	550	650	750	850	1000	1200
6" Diameter Ak .430 Ak .430 Ak .430	CFM	50	70	90	110	130	145	165	195	235
	Ps	.004	.009	.014	.021	.029	.036	.046	.065	.094
	NC	<20	<20	<20	<20	<20	23	27	31	35
8" Diameter Ak .530 Ak .530 Ak .530	CFM	85	120	155	190	225	260	295	350	420
	Ps	.006	.012	.019	.029	.040	.054	.070	.098	.140
	NC	<20	<20	<20	21	26	31	34	37	37
10" Diameter Ak .620 Ak .620 Ak .620	CFM	135	190	245	300	355	410	465	545	655
	Ps	.009	.017	.028	.043	.069	.078	.102	.140	.205
	NC	<20	<20	<20	22	29	35	38	42	46
12" Diameter Ak .700 Ak .700 Ak .700	CFM	195	275	355	430	510	590	670	785	940
	Ps	.013	.026	.044	.064	.090	.120	.155	.215	.300
	NC	<20	<20	<20	22	29	35	38	42	46
14" Diameter Ak .750 Ak .750 Ak .750	CFM	265	375	480	590	695	800	910	1070	1285
	Ps	.018	.036	.059	.089	.125	.165	.210	.295	.410
	NC	<20	22	29	36	42	>45	>45	>45	>45

Note: The use of a balancing hood is recommended to balance the system.
NC is based on 10dB room attenuation (Re: 10⁻¹² watts) ASHRAE 36-72.
Terminal Velocity of 75 FPM



673T, 673TI, 673TPI R6 (Page 52, 53)

6" Diameter Inlet Ak .730	CFM	100	150	200	225	250	275	300
	NC	<20	<20	21	24	27	30	32
	Static Pressure	-.057	-.127	-.226	-.287	-.354	-.428	-.509
8" Diameter Inlet Ak .795	CFM	150	200	250	300	400	500	550
	Static Pressure	-.040	-.072	-.112	-.161	-.287	-.448	-.542
10" Diameter Inlet Ak .880	CFM	300	400	500	600	700	800	850
	Static Pressure	-.066	-.117	-.183	-.264	-.359	-.469	-.530
12" Diameter Inlet Ak .980	CFM	400	500	600	700	800	1000	1200
	Static Pressure	-.057	-.088	-.127	-.173	-.226	-.354	-.509
14" Diameter Inlet Ak 1.105	CFM	600	700	800	1000	1200	1400	1600
	Static Pressure	-.069	-.094	-.122	-.191	-.275	-.374	-.489
16" Diameter Inlet Ak 1.240	CFM	800	1000	1200	1600	1800	2000	2200
	Static Pressure	-.072	-.112	-.161	-.287	-.363	-.448	-.542

REN4 (Page 58)

RENPS, RENPS 56, ARENPS, PDS (Page 64, 66)

Neck Velocity		180	220	300	350	400	450	500	580	650	700
6" Diameter Ak .430	CFM	35	45	60	70	80	90	100	115	130	135
	Ps	.002	.003	.004	.006	.008	.010	.012	.015	.020	.022
	NC	<20	<20	<20	<20	<20	<20	20	22	26	30
	Throw	3.0	3.5	4.5	5.5	6.5	7.5	8.0	9.0	11.0	11.0
8" Diameter Ak .530	CFM	65	75	105	120	140	155	175	200	225	245
	Ps	.002	.003	.006	.008	.010	.013	.016	.021	.027	.032
	NC	<20	<20	<20	<20	20	22	25	30	35	38
	Throw	4.0	5.0	6.0	7.0	8.5	9.5	11.0	12.0	13.0	15.0
10" Diameter Ak .620	CFM	100	120	165	190	220	245	275	315	355	380
	Ps	.003	.005	.009	.011	.015	.019	.024	.031	.040	.045
	NC	<20	<20	<20	<20	20	23	27	33	35	39
	Throw	4.0	5.5	7.0	8.0	9.5	11.0	12.0	13.0	15.0	16.0
12" Diameter Ak .700	CFM	140	175	235	275	315	355	395	455	510	550
	Ps	.005	.007	.013	.018	.023	.029	.036	.048	.061	.071
	NC	<20	<20	<20	<20	21	24	27	33	36	40
	Throw	4.5	5.5	7.0	8.0	10.0	11.0	12.0	14.0	15.0	17.0
14" Diameter Ak .750	CFM	190	235	320	375	430	480	535	620	695	750
	Ps	.007	.011	.020	.027	.036	.044	.055	.074	.094	.107
	NC	<20	<20	<20	<20	20	24	28	32	35	40
	Throw	4.5	5.5	7.0	8.5	10.0	11.0	12.0	14.0	16.0	17.0

Neck Velocity		300	400	500	600	700	800	900	1000	1100
6" Diameter An .200	CFM	60	80	100	120	140	160	180	200	220
	Ps	.008	.011	.017	.024	.032	.042	.054	.066	.080
	NC	<20	<20	<20	<20	24	27	32	36	38
	Throw	1.0	2.0	3.0	4.0	4.0	4.0	5.0	5.0	6.0
8" Diameter An .350	CFM	105	140	175	210	245	280	310	350	385
	Ps	.008	.011	.017	.024	.034	.043	.054	.068	.083
	NC	<20	<20	<20	20	24	27	30	34	38
	Throw	2.0	3.0	4.0	4.0	5.0	6.0	7.0	8.0	8.5
10" Diameter An .540	CFM	165	220	270	325	385	430	490	550	600
	Ps	.008	.012	.017	.024	.032	.043	.056	.068	.082
	NC	<20	<20	20	24	29	33	36	39	42
	Throw	2.0	3.0	4.0	5.0	5.0	6.0	7.0	8.0	9.0
12" Diameter An .780	CFM	230	310	390	470	550	610	700	780	870
	Ps	.009	.016	.026	.037	.050	.065	.080	.100	.125
	NC	<20	<20	20	23	26	31	34	37	40
	Throw	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0
14" Diameter An 1.070	CFM	315	430	535	640	750	855	960	1090	1200
	Ps	.009	.016	.026	.037	.050	.065	.083	.125	.150
	NC	<20	<20	25	30	35	39	43	45	48
	Throw	3.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0

Note: The use of a balancing hood is recommended to balance the system.

NC is based on 10dB room attenuation (Re: 10^{-12} watts) ASHRAE 36-72.
Terminal Velocity of 75 FPM

Note: The use of a balancing hood is recommended to balance the system.

NC is based on 10dB room attenuation (Re: 10^{-12} watts) ASHRAE 36-72.
Terminal Velocity of 75 FPM An = Neck Area in Sq. Ft.

AFPD, HVS/HVS R6, FPD/FPD R6, FPD3/FPD3 R6 (Page 61-62)

Neck Velocity		400	500	600	700	800	900	1000	1200	1400	1600
6" An .200 Ak .780	CFM	80	100	120	135	155	175	195	235	275	315
	Ps	.008	.012	.017	.021	.028	.035	.043	.063	.086	.112
	NC	<20	<20	<20	<20	<20	20	25	30	35	40
	Throw	2.0	3.0	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0
8" An .350 Ak .920	CFM	140	175	210	245	280	315	350	420	490	560
	Ps	.010	.015	.022	.029	.038	.049	.060	.086	.117	.150
	NC	<20	<20	<20	<20	20	25	30	35	35	40
	Throw	3.5	4.5	5.5	6.5	7.0	8.0	9.0	10.5	12.5	14.5
10" An .540 Ak 1.200	CFM	220	270	325	380	435	490	545	655	765	870
	Ps	.014	.021	.030	.041	.054	.068	.084	.122	.167	.212
	NC	<20	<20	<20	<20	25	30	35	40	45	45
	Throw	5.5	7.0	8.5	10.0	11.0	12.5	15.0	17.0	19.5	22.0
12" An .780 Ak 1.650	CFM	315	390	470	550	630	705	785	940	1100	1255
	Ps	.015	.023	.033	.045	.060	.072	.094	.132	.180	.230
	NC	<20	<20	20	25	30	35	35	40	45	45
	Throw	6.0	7.5	9.0	10.5	12.0	13.5	15.0	18.0	21.0	24.0
14" An 1.070 Ak 2.060	CFM	430	535	640	750	855	960	1070	1285	1500	1710
	Ps	.023	.036	.051	.071	.093	.115	.140	.205	.277	.350
	NC	<20	<20	20	25	30	35	40	40	45	45
	Throw	6.5	8.0	9.5	11.5	13.0	14.5	16.0	19.0	22.5	25.0

Terminal Velocity of 75 FPM

An = Neck Area in Sq. Ft.

NC = Noise Criteria based on 10dB room absorption (Re: 10^{-12} watts).

PDS (Page 66)

Neck Velocity		300	400	500	600	700	800	900	1000	1200
6" Diameter An .200	CFM	60	80	100	120	135	155	175	195	235
	Ps	.007	.013	.020	.029	.037	.048	.062	.076	.110
	NC	<20	<20	<20	20	21	24	28	33	37
	Throw	4.0	6.0	7.0	8.0	10.0	11.0	13.0	14.0	16.0
8" Diameter An .350	CFM	105	140	175	210	245	280	315	350	420
	Ps	.011	.019	.030	.043	.059	.077	.097	.120	.173
	NC	<20	<20	<20	20	22	27	31	35	40
	Throw	6.0	8.0	10.0	11.5	13.0	14.5	16.0	18.0	21.0
10" Diameter An .540	CFM	165	220	270	325	385	430	490	545	655
	Ps	.015	.026	.040	.046	.076	.100	.125	.115	.225
	NC	<20	<20	<20	21	27	33	37	40	45
	Throw	8.5	11.0	14.0	16.5	19.0	22.0	25.0	27.0	30.0
12" Diameter An .780	CFM	230	310	390	470	550	630	705	785	940
	Ps	.016	.029	.045	.068	.086	.113	.140	.170	.250
	NC	<20	<20	<20	20	25	32	35	38	44
	Throw	10.0	13.0	16.5	19.5	22.0	25.0	27.0	30.0	34.0
14" Diameter An 1.070	CFM	315	430	535	640	750	855	960	1070	1285
	Ps	.021	.037	.057	.082	.112	.145	.180	.225	.320
	NC	<20	<20	20	26	31	36	40	44	49
	Throw	11.0	15.0	19.0	22.5	26.0	29.0	32.0	35.0	39.0

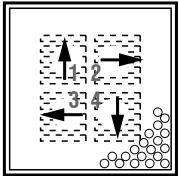
Notes: The use of a balancing hood is recommended to balance the system.

NC is based on 10dB room attenuation (Re: 10^{-12} watts) ASHRAE 36-72.
Terminal Velocity of 75 FPM

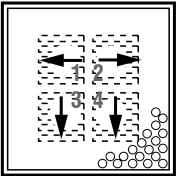
DPD/DPD R6, ADPD (Page 63)

Neck Velocity		400	500	600	700	800	900	1000	1200	1400	1600
6" An .200 Ak .279	CFM	80	100	120	135	155	175	195	235	275	315
	Ps	.006	.010	.014	.018	.023	.030	.037	.054	.073	.096
	NC	<20	<20	<20	<20	<20	20	25	30	35	40
	Throw	1.0	2.0	2.0	2.5	3.0	3.5	4.0	4.5	5.5	6.5
8" An .350 Ak .354	CFM	140	175	210	245	280	315	350	420	490	560
	Ps	.010	.015	.022	.029	.038	.049	.060	.086	.117	.150
	NC	<20	<20	<20	<20	20	25	30	35	40	45
	Throw	2.5	3.5	4.0	4.5	5.0	5.5	6.0	7.0	8.0	9.0
10" An .540 Ak .400	CFM	220	275	325	380	435	490	545	655	765	875
	Ps	.014	.021	.030	.041	.054	.068	.084	.122	.167	.212
	NC	<20	<20	<20	<20	20	25	30	35	40	45
	Throw	4.0	5.5	6.5	8.0	9.0	10.5	11.5	14.5	17.0	20.0
12" An .780 Ak .397	CFM	315	395	470	550	630	705	785	945	1100	1260
	Ps	.015	.023	.033	.045	.060	.072	.094	.132	.180	.230
	NC	<20	<20	20	25	30	35	35	40	45	50
	Throw	5.5	7.0	8.5	10.0	11.5	13.0	14.5	17.5	20.5	24.0
14" An 1.070 Ak .393	CFM	430	535	640	750	855	960	1070	1280	1500	1710
	Ps	.023	.036	.051	.071	.093	.115	.140	.205	.277	.350
	NC	<20	<20	25	30	35	35	40	45	50	55
	Throw	7.0	8.5	1							

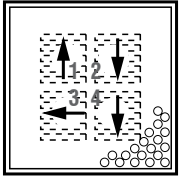
Probe Position: The probe is held 1 inch in from the outer edge of the diffuser, flush with the face.



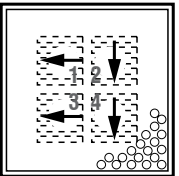
Four-Way (Short Throw)
 • For throw in all four directions, use short throw data.



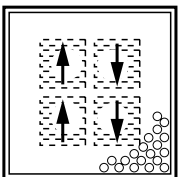
Three-Way (Short Throw)
 • For throw in all three directions, use short throw data.



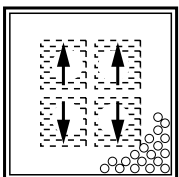
Three-Way (Long & Short)
 • For throw in the #2 & #4 direction use long throw data.
 • For throw in the #1 & #3 directions, use short throw data.



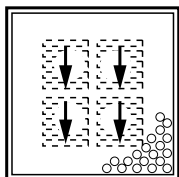
Two-Way Corner (Long & Short)
 • For throw in the #2 & #4 direction use long throw data.
 • For throw in the #1 & #3 directions, use short throw data.



Two-Way (Long Throw)
 • For throw in both directions use long throw data.



Two-Way (Short Throw)
 • For throw in both directions use short throw data.



One-Way (Long Throw)
 • For throw use long throw data.

SBP (Page 65)

Neck Velocity		300	400	500	600	700	800	900	1000	1200	1400
Velocity Pressure		.006	.010	.016	.022	.031	.040	.051	.062	.090	.122
6" Diameter	CFM	60	80	100	120	140	160	180	200	240	280
	Total Pressure	.005	.008	.013	.025	.025	.032	.041	.050	.027	.098
	Short Horizontal Throw	2-1-1	2-1-1	3-1-1	3-2-1	4-2-1	4-2-1	5-2-2	5-3-2	6-3-2	7-4-2
	Long Horizontal Throw	3-1-1	4-2-1	5-2-2	6-3-2	7-3-2	8-4-3	9-4-3	10-5-3	12-6-4	14-7-5
	Noise Criteria	<20	<20	<20	<20	<20	22	24	26	31	37
8" Diameter	CFM	105	140	175	210	245	280	315	350	420	490
	Total Pressure	.009	.015	.024	.034	.046	.061	.077	.095	.136	.185
	Short Horizontal Throw	3-1-1	4-2-1	5-2-2	6-4-3	7-3-2	8-4-3	9-4-3	10-5-3	12-6-4	14-7-5
	Long Horizontal Throw	5-3-2	7-4-2	9-5-3	11-5-4	13-6-4	15-7-5	16-8-5	18-9-6	22-11-7	25-13-8
	Noise Criteria	<20	<20	<20	<20	20	25	30	34	39	44
10" Diameter	CFM	165	220	275	330	385	440	495	550	660	770
	Total Pressure	.013	.023	.036	.052	.071	.092	.117	.144	.208	.283
	Short Horizontal Throw	5-2-2	6-3-2	8-4-3	10-5-3	11-6-4	13-6-4	14-7-5	16-8-5	19-10-6	23-11-8
	Long Horizontal Throw	9-5-3	12-6-4	15-8-5	18-9-6	21-11-7	24-12-8	27-14-9	30-15-10	36-18-12	42-21-14
	Noise Criteria	<20	<20	<20	22	25	28	33	36	41	47
12" Diameter	CFM	240	320	400	480	560	640	720	800	960	1120
	Total Pressure	.017	.030	.047	.068	.093	.121	.153	.189	.268	.371
	Short Horizontal Throw	7-4-2	10-5-3	12-6-4	15-7-5	17-9-6	20-10-7	22-11-7	25-12-8	30-15-10	35-17-12
	Long Horizontal Throw	14-7-5	19-9-6	23-12-8	28-14-9	33-16-11	37-19-12	42-21-14	47-23-16	56-28-19	65-33-22
	Noise Criteria	<20	<20	21	25	29	32	35	38	44	50
14" Diameter	CFM	330	440	550	660	770	880	990	1100	1320	1540
	Total Pressure	.020	.036	.057	.081	.111	.145	.183	.226	.326	.443
	Short Horizontal Throw	11-6-4	15-7-5	18-9-6	22-11-7	26-13-9	29-15-10	33-17-11	37-18-12	44-22-15	52-26-17
	Long Horizontal Throw	21-10-7	28-14-9	34-17-11	41-21-14	48-24-16	55-28-18	62-31-21	69-34-23	83-41-28	97-48-32
	Noise Criteria	<20	<20	25	31	36	40	43	45	48	53

Notes:

1. Tests conducted in accordance with ANSI/ASHRAE 70-1991 at isothermal conditions.
2. Tests conducted with a straight rigid inlet condition. Other inlet conditions may alter performance.
3. Unit of measure: Neck Velocity = FPM; Velocity Pressure = in. w.c. Air Flow Rate = CFM; Total Pressure = in. w.c. Throw = ft at 50, 100, and 150 fpm terminal velocity
4. Noise Criteria (NC) is based upon 10 dB room absorption (Re: 10⁻¹² watts) evaluated at 125 thru 4000 Hz octave bands.
5. Flow hoods are recommended for system balancing.

PD, PDR, RENP (Page 64, 67)

Neck Velocity		200	300	400	500	600	700	800
6" Diameter	CFM	40	60	80	100	120	135	155
	-Ps	.003	.007	.012	.019	.027	.034	.044
8" Diameter	CFM	70	105	140	175	210	245	380
	-Ps	.004	.010	.017	.026	.037	.051	.068
10" Diameter	CFM	110	165	220	275	325	380	435
	-Ps	.005	.011	.020	.030	.043	.058	.076
12" Diameter	CFM	155	235	315	395	470	550	630
	-Ps	.005	.012	.021	.033	.046	.063	.083
14" Diameter	CFM	215	320	430	535	640	750	855
	-Ps	.006	.013	.023	.035	.050	.069	.090
16" Diameter	CFM	280	420	560	700	840	975	1115
	-Ps	.008	.018	.031	.048	.070	.094	.120
18" Diameter	CFM	355	530	705	885	1060	1235	1415
	-Ps	.008	.018	.031	.049	.070	.092	.125
24" x 24"	CFM	735	1100	1470	1835	2200	2570	2935
	-Ps	.008	.018	.032	.050	.070	.095	.130

Note: The use of a balancing hood is recommended to balance the system.
 NC is based on 10 db room attenuation (Re: 10⁻¹² watts) ASHRAE 36-72.
 X=less than 20.
 Terminal velocity of 75 FPM.

CBPS Supply (Page 65)

One-Way Supply

Neck Size		Neck Velocity - V _N							
		300	400	500	600	700	800	1000	1200
6"	CFM	60	80	100	120	140	160	200	240
	Ps	.060	.080	.100	.150	.200	.260	.400	.580
	Throw	2.5-4.0-5.0	3.5-5.0-6.0	4.0-6.0-7.0	4.5-7.0-8.5	5.5-8.0-9.5	6.5-9.5-11.5	8.0-12.0-14.5	9.5-14.0-17.0
	NC	<20	<20	<20	22	26	30	40	>45
8"	CFM	105	140	175	210	245	280	350	420
	Ps	.080	.110	.160	.240	.320	.420	.650	.930
	Throw	4.0-6.0-7.0	5.5-8.0-9.5	6.5-10.0-12.0	8.0-12.0-14.5	7.5-14.0-17.0	10.5-10.6-19.0	13.5-20.0-24.0	16.0-24.0-29.0
	NC	<20	<20	21	26	31	39	>45	>45
10"	CFM	165	220	275	325	380	435	545	650
	Ps	.080	.110	.170	.250	.320	.430	.660	.940
	Throw	4.5-7.0-8.5	6.5-9.5-11.5	8.0-12.0-14.5	9.5-14.5-17.5	11.0-16.5-20.0	12.5-19.0-23.0	16.0-24.0-29.0	19.0-28.5-34.0
	NC	<20	<20	23	26	34	40	>45	>45
12"	CFM	235	315	395	470	550	630	790	940
	Ps	.080	.110	.170	.250	.340	.440	.690	.980
	Throw	5.5-8.5-10.0	7.5-11.0-13.5	9.5-14.0-17.0	11.0-16.5-20.0	13.0-19.5-26.5	14.5-22.0-26.5	18.5-27.5-33.0	22.0-33.0-39.5
	NC	<20	20	25	33	40	45	>45	>45
14"	CFM	325	430	535	640	750	860	1075	1275
	Ps	.110	.140	.210	.300	.420	.550	.860	1.200
	Throw	4.5-7.0-8.5	6.5-9.5-11.5	8.0-12.0-14.5	9.5-14.5-17.5	11.5-17.0-20.5	13.0-17.5-23.5	16.5-24.5-29.5	19.5-29.0-35.0
	NC	<20	20	25	30	38	44	>45	>45
16"	CFM	420	560	700	840	980	1120	1400	1680
	Ps	.020	.040	.060	.080	.110	.140	.220	.260
	Throw	5.0-8.0-10.0	7.0-10.0-12.0	10.0-13.0-16.0	12.0-15.0-18.0	13.0-18.0-21.0	14.0-19.0-24.0	18.0-26.0-30.0	20.0-31.0-36.0
	NC	<20	<20	26	34	39	43	>45	>45

Two-Way Supply

Neck Size		Neck Velocity - V _N							
		300	400	500	600	700	800	1000	1200
6"	CFM	60	80	100	120	140	160	200	240
	Ps	.050	.070	.090	.130	.170	.220	.340	.500
	Throw	2.0-3.0-3.5	2.5-3.5-4.5	3.5-5.0-6.0	4.0-5.5-6.5	4.5-6.5-8.0	5.0-7.5-9.0	6.5-9.5-11.5	7.5-11.5-13.5
	NC	<20	<20	<20	20	24	28	37	44
8"	CFM	105	140	175	210	245	280	350	420
	Ps	.400	.054	.084	.120	.165	.215	.330	.480
	Throw	3.0-4.5-5.5	3.5-5.5-6.5	4.5-7.0-8.5	5.5-8.5-10.0	6.5-9.5-11.5	7.5-11.0-13.0	9.5-14.0-17.0	11.0-16.5-20.0
	NC	<20	<20	<20	23	29	36	43	>45
10"	CFM	165	220	275	325	380	435	545	650
	Ps	.060	.080	.130	.180	.250	.310	.510	.730
	Throw	4.5-6.5-7.5	5.5-8.5-10.0	7.0-10.5-12.5	8.5-12.5-15.0	9.5-14.5-17.5	11.0-16.5-20.0	14.0-21.0-25.0	16.5-25.0-30.0
	NC	<20	<20	<20	25	29	37	45	>45
12"	CFM	235	315	395	470	550	630	790	940
	Ps	.050	.070	.110	.150	.210	.270	.430	.600
	Throw	4.5-6.5-7.5	5.5-8.5-10.0	7.0-10.5-12.5	8.5-12.5-15.0	10.0-15.0-18.0	11.5-17.0-20.5	14.5-21.5-26.0	17.0-25.5-30.5
	NC	<20	<20	23	30	37	43	>45	>45
14"	CFM	325	430	535	640	750	860	1075	1275
	Ps	.050	.070	.100	.150	.200	.260	.410	.570
	Throw	3.5-5.5-6.5	4.5-7.0-8.5	6.0-9.0-11.0	7.0-10.5-12.5	8.5-12.5-15.0	9.5-14.0-17.0	11.5-17.5-21.0	14.0-21.0-25.0
	NC	<20	<20	22	28	35	40	>45	>45
16"	CFM	420	560	700	840	980	1120	1400	1680
	Ps	.020	.040	.060	.080	.110	.140	.220	.260
	Throw	4.0-6.0-8.0	5.0-8.0-9.0	7.0-10.0-12.0	9.0-11.0-13.0	10.0-14.0-16.0	11.0-16.0-19.0	13.0-19.0-24.0	16.0-22.0-27.0
	NC	<20	<20	26	34	39	43	>45	>45

Three-Way Supply

Neck Size		Neck Velocity - V _N							
		300	400	500	600	700	800	1000	1200
6"	CFM	60	80	100	120	140	160	200	240
	Ps	.020	.030	.040	.060	.080	.100	.150	.230
	Throw	2.5-3.5-4.5	3.0-4.5-5.5	3.5-5.5-6.5	4.5-6.5-8.0	5.0-7.5-9.0	5.5-8.5-10.5	7.5-11.0-13.5	8.5-13.0-15.5
	NC	<20	<20	<20	<20	23	25	34	40
8"	CFM	105	140	175	210	245	280	350	420
	Ps	.020	.030	.040	.060	.080	.100	.160	.220
	Throw	3.0-4.0-5.0	4.0-5.5-6.5	4.5-7.0-8.5	5.5-8.0-9.5	6.5-9.5-11.5	7.5-11.0-13.5	9.0-13.5-16.0	11.0-16.5-20.0
	NC	<20	<20	<20	21	26	33	39	44
10"	CFM	165	220	275	325	380	435	545	650
	Ps	.030	.040	.060	.090	.120	.150	.240	.340
	Throw	4.5-6.5-8.0	5.5-8.5-10.5	7.0-10.5-12.5	8.5-12.5-15.0	9.5-14.5-17.5	11.5-17.0-20.5	14.0-21.0-25.0	17.0-25.0-30.0
	NC	<20	<20	<20	21	26	34	41	>45
12"	CFM	235	315	395	470	550	630	790	940
	Ps	.020	.030	.050	.070	.100	.130	.200	.290
	Throw	4.5-6.5-8.0	5.5-8.5-10.0	7.0-10.5-12.5	8.5-12.5-15.0	10.0-14.5-17.5	11.0-16.5-20.0	13.5-20.5-24.5	16.5-24.5-29.5
	NC	<20	<20	21	27	34	39	44	>45
14"	CFM	325	430	535	640	750	860	1075	1275
	Ps	.020	.030	.050	.070	.100	.130	.200	.280
	Throw	4.0-5.0-7.0	5.5-8.0-9.5	6.0-9.0-11.0	8.0-12.0-14.5	9.5-14.0-17.0	10.5-16.0-19.5	13.5-20.0-24.0	15.5-23.5-28.0
	NC	<20	<20	20	25	32	37	44	>45
16"	CFM	420	560	700	840	980	1120	1400	1680
	Ps	.020	.040	.060	.080	.110	.140	.220	.260
	Throw	5.0-6.0-8.0	6.0-9.0-10.0	7.0-9.0-12.0	9.0-13.0-15.0	10.0-13.0-16.0	11.0-15.0-18.0	12.0-18.0-21.0	15.0-21.0-26.0
	NC	<20	<20	26	34	39	43	>45	>45

NOTES:

1. Ps is static Pressure Loss in inches of H₂O
2. NC is based on 10db room attenuation (Re: 10⁻¹² watts)
3. Throw is iso-thermal air at 150, 100, 75 FPM terminal velocities.
4. The use of a balancing hood is recommended to balance the system.

Recommended Noise Criteria and Face Velocity Ranges are on page 75

CBPS Supply (Page 65)

Four-Way Supply

Neck Size		Neck Velocity - V _N								
		300	400	500	600	700	800	1000	1200	
6"	CFM	60	80	100	120	140	160	200	240	
	Ps	<.010	.010	.020	.030	.040	.050	.080	.120	
	Throw	1.5-2.0-2.5	1.5-2.5-3.0	2.0-3.0-4.0	2.5-3.5-4.5	3.0-4.5-5.5	3.5-5.0-6.0	4.0-6.0-7.0	5.0-7.5-9.0	
	NC	<20	<20	<20	<20	21	24	32	38	
8"	CFM	105	140	175	210	245	280	350	420	
	Ps	<.010	.010	.020	.030	.040	.060	.090	.120	
	Throw	1.5-2.5-3.0	2.0-3.0-4.0	2.5-4.0-5.0	3.5-5.0-6.0	4.0-5.5-7.0	4.5-6.5-8.0	5.5-8.0-10.0	6.5-9.5-11.5	
	NC	<20	<20	<20	<20	25	31	37	42	
10"	CFM	165	220	275	325	380	435	545	650	
	Ps	0.01	.020	.030	.040	.060	.070	.110	.160	
	Throw	3.0-4.0-5.0	3.5-5.5-6.5	4.5-6.5-8.0	5.5-8.0-10.0	6.0-9.0-11.0	7.0-10.5-12.5	9.0-13.0-15.5	10.5-15.5-18.5	
	NC	<20	<20	<20	21	27	32	39	44	
12"	CFM	235	315	395	470	550	630	790	940	
	Ps	.010	.020	.030	.040	.060	.080	.120	.170	
	Throw	2.5-3.5-4.0	3.0-4.5-5.5	3.5-5.5-6.5	4.5-7.0-8.5	5.5-8.0-9.5	6.0-7.0-11.0	7.5-11.5-14.0	9.0-13.5-16.0	
	NC	<20	<20	20	26	32	37	42	>45	
14"	CFM	325	430	535	640	750	860	1075	1275	
	Ps	.010	.020	.030	.050	.060	.080	.130	.180	
	Throw	2.0-3.0-3.5	2.5-4.0-5.0	3.5-5.0-6.0	4.0-6.0-7.0	4.5-7.0-8.5	5.5-8.0-10.0	6.5-10.0-12.0	7.5-11.5-14.0	
	NC	<20	<20	<20	24	30	35	42	>45	
16"	CFM	420	560	700	840	980	1120	1400	1680	
	Ps	.020	.040	.060	.080	.110	.140	.220	.260	
	Throw	3.0-4.0-5.0	4.0-6.0-7.0	5.0-8.0-11.0	6.0-9.0-12.0	8.0-11.0-14.0	9.0-13.0-16.0	10.0-15.0-19.0	12.0-17.0-22.0	
	NC	<20	<20	26	34	39	43	>45	>45	

NOTES:

1. **Ps** is static Pressure Loss in inches of H₂O
2. **NC** is based on 10db room attenuation (Re: 10⁻¹² watts)
3. Throw is iso-thermal air at 150, 100, 75 FPM terminal velocities.
4. The use of a balancing hood is recommended to balance the system.

CBPR Return (Page 65)

Neck Velocity - V _N		200	300	400	500	600	700	800
-Ps		.01	.02	.03	.05	.07	.10	.12
6" Diameter	CFM	40	60	80	100	120	140	160
8" Diameter	CFM	70	105	140	175	210	245	280
10" Diameter	CFM	110	165	220	275	330	385	440
12" Diameter	CFM	160	240	320	395	475	550	630
14" Diameter	CFM	215	320	430	535	640	750	855
16" Diameter	CFM	281	420	563	698	836	975	1114
18" Diameter	CFM	356	531	712	881	1056	1231	1406

DPD12 (Page 63)

Neck Velocity		400	500	600	700	800	900	1000	1200	1400
6"	CFM	80	100	120	135	155	175	195	235	275
	Ps	.006	.010	.014	.018	.023	.030	.037	.054	.073
	NC	<20	<20	<20	<20	<20	20	25	30	35
	Throw	1.0	2.0	2.0	2.5	3.0	3.5	4.0	4.5	5.5
7"	CFM	107	134	160	187	214	240	267	320	374
	Ps	.008	.012	.017	.025	.031	.043	.052	.075	.103
	NC	<20	<20	<20	20	25	30	30	35	40
	Throw	2.5	3.5	4.0	4.5	5.0	5.5	6.0	7.0	8.0
8"	CFM	140	175	210	245	280	315	350	420	490
	Ps	.010	.015	.022	.029	.038	.049	.060	.086	.117
	NC	<20	<20	<20	20	25	30	30	35	40
	Throw	2.5	3.5	4.0	4.5	5.0	5.5	6.0	7.0	8.0

Terminal Velocity of 75 FPM

An = Neck Area in Sq. Ft.

NC = Noise Criteria based on 10dB room absorption (Re: 10⁻¹² watts).

FPD12 (Page 62)

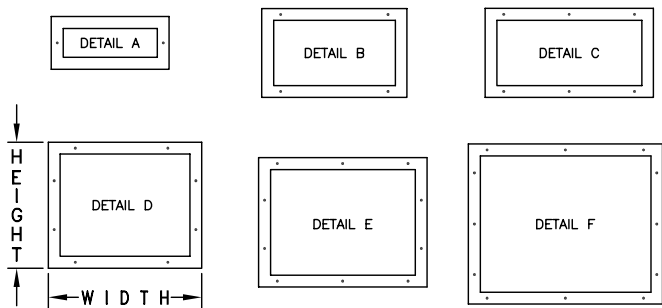
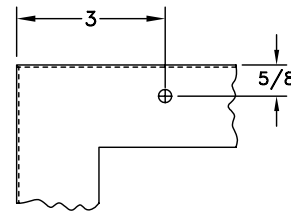
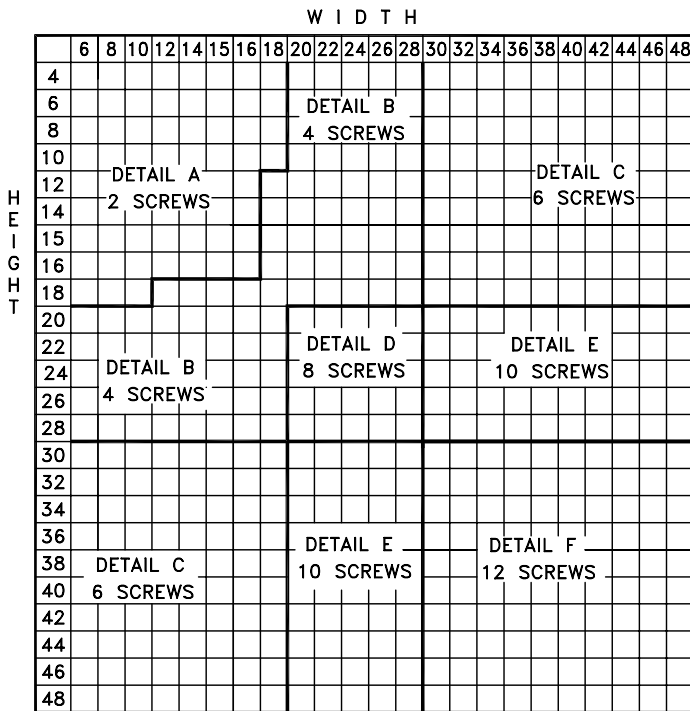
Neck Velocity		400	500	600	700	800	1000	1200	1400	1600
6"	CFM	80	100	120	135	155	195	235	275	315
	Ps	.008	.012	.019	.025	.033	.052	.074	.101	.131
	NC	<20	<20	<20	<20	<20	25	30	35	40
	Throw	4	5	5	6	7	8	9	10	11
7"	CFM	107	134	160	187	214	267	321	374	428
	Ps	.01	.015	.023	.031	.041	.064	.091	.125	.162
	NC	<20	<20	<20	<20	20	30	35	40	45
	Throw	4	5	6	7	8	10	11	12	13
8"	CFM	140	175	210	245	280	350	420	490	560
	Ps	.012	.019	.028	.038	.05	.078	.112	.153	.199
	NC	<20	<20	<20	<20	20	30	35	40	45
	Throw	5	6	7	8	9	11	12	14	15

Terminal Velocity of 75 FPM

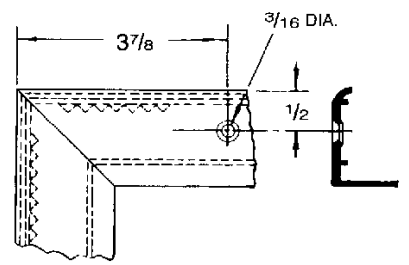
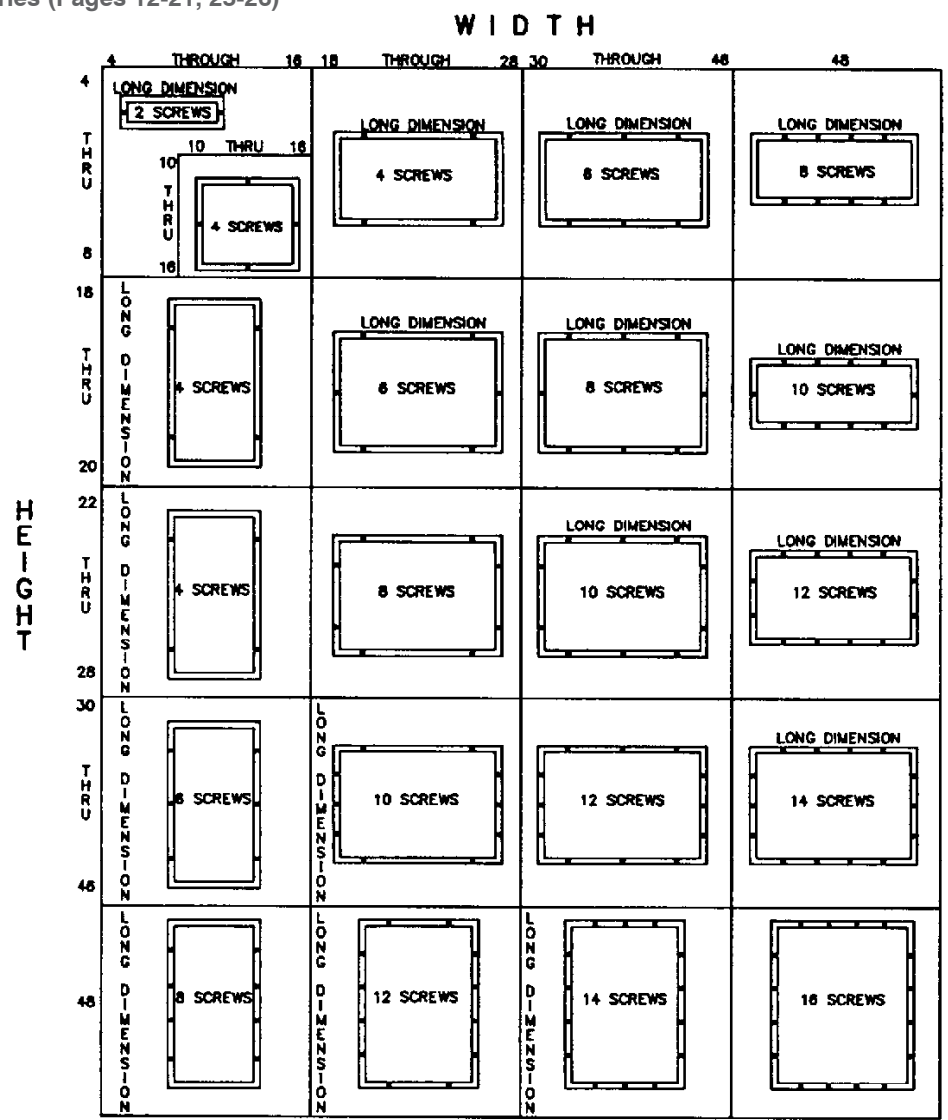
An = Neck Area in Sq. Ft.

NC = Noise Criteria based on 10dB room absorption (Re: 10⁻¹² watts).

Screw Hole Location Chart
92 Series, 94 Series, 821, 831 (Page 5-11)



Screw Hole Chart for Extruded Aluminum Line
 V Series, H Series, C Series, RH Series (Pages 12-21, 25-26)



Drop Chart, Use with size selection charts
821, 831, 92 Series, 98VOH, H and V Series (Page 7-16)

Instructions for use of Drop Chart

The drop of the air stream is determined by using the throw and velocity of the register selected. On the drop chart, lay a straight edge connecting these values. The total drop of the air stream will be the sum of the drop due to temperature (D_t) and the drop due to spread (D_s).

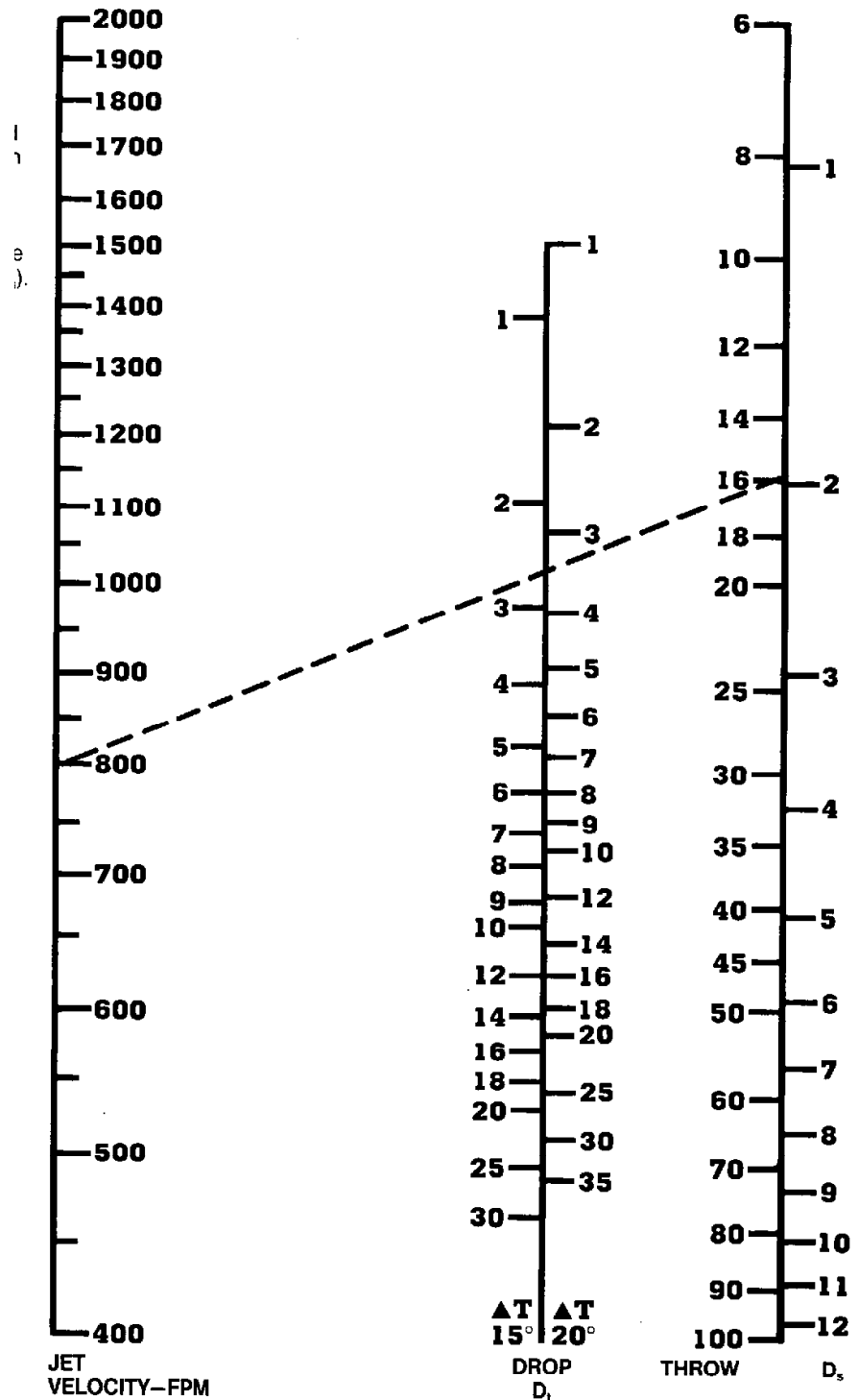
Example: The drop for a 92 Series register "C" deflection 16x5 size has an 800 fpm velocity and a 16 foot throw. Connect these two points on the chart and read the drops as follows:

$$D_t = 2.7' D_s = 2'$$

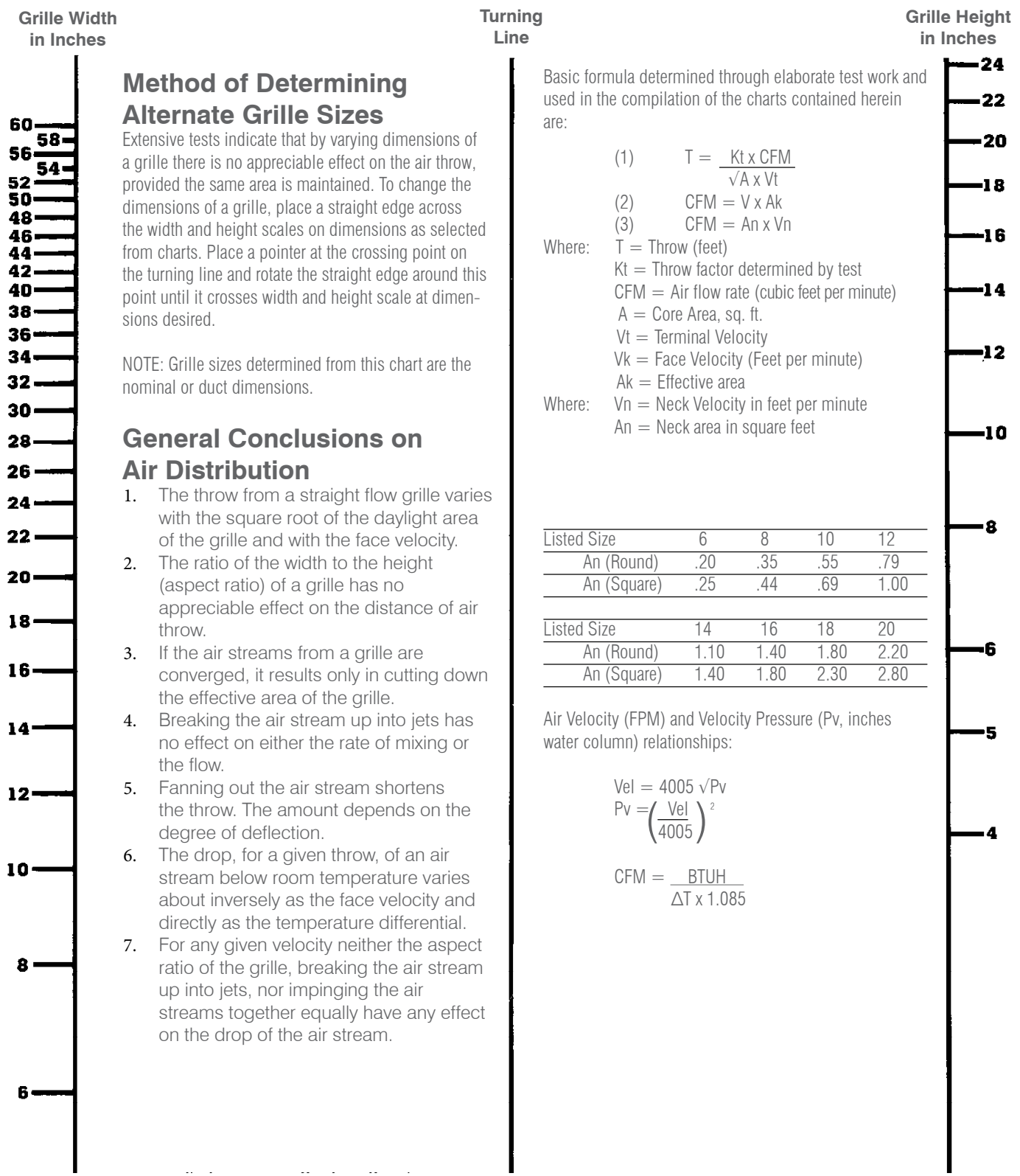
$$D_{total} = 2.7 + 2 = 4.7'$$

D_t = Drop along line of throw due to temperature difference.

D_s = Drop resulting from vertical spread.



92 Series, H and V Series Alternate Sizing Graph (Page 7-16)



Surfaire® T-Bar Diffusers

Furnish and install Hart & Cooley SurfAire® insulated ceiling diffusers as shown on the plans. The diffuser shall be a 2'x2' T-Bar lay-in. Face shall be stucco embossed aluminum with off-white baked enamel finish for ceiling aesthetics, corrosion protection and ease of cleaning. Face will have formed deflector apertures which distribute air in thin layers along the ceiling surface and which provide for optimum dispersion in one, two, three, four-way or two-way corner patterns.

Back panel shall be formed galvanized steel covered with glass fiber insulation and an aluminum foil vapor barrier. Insulation is held securely in place by face margin edge fold over. Insulation will be prescored to accept specified collar sizes.

5400 Series collars will be supplied providing efficient, tight attachment with bayonet fasteners to mating prepunched holes in back panel. Collars will provide flex duct locking tabs and damper mounting slots. Collar damper slots provide for damper attachment or removal at any time.

3800 Series, fully adjustable, butterfly dampers shall be supplied (if specified). Damper adjustment handle is inserted before or after damper is mounted and is removable at any time.

Perforated Insulated T-Bar Diffusers and Return Grilles

Contractor shall furnish and install Hart & Cooley PDS perforated diffuser or PDSD perforated diffuser with deflectors as indicated on the plans. Perforated diffusers shall be 2'x2' T-Bar lay-in. Exposed face will have a minimum 51% free area and be coated with off-white baked enamel finish. Deflectors (if specified) shall be fully adjustable, externally providing one, two, three, four-way or two-way corner air diffusion capability.

Back panel shall be black pre-coated formed steel covered with glass fiber insulation and an aluminum foil vapor barrier. Insulation is held securely in place by face margin edge fold over. Insulation is prescored to accept specified collar sizes.

5400 Series collars will be supplied providing efficient, tight attachment with bayonet fasteners to mating pre-punched holes in back panel. Collars will provide flex duct locking tabs and damper mounting slots. Collar damper slots provide for damper attachment or removal at any time.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified). Damper adjustment handle is inserted before or after damper is mounted and is removable at any time.

Matching Hart & Cooley PDR perforated return air grilles shall be furnished according to the plans.

Removable Face Perforated T-Bar Diffusers and Return Grilles

Contractor shall furnish and install Hart & Cooley RFPS series perforated diffusers as indicated on the plans. Exposed face will be of a removable hinged style with a minimum 51% free area and be coated with white baked enamel finish. Deflectors are to be the patented,

directable deflector to ensure proper adjustable air deflection. Back panel shall be black, pre-coated, formed steel to minimize sight into diffuser.

5400 Series collars will be supplied providing efficient, tight attachment with bayonet fasteners to mating pre-punched holes in back panel. Collars will provide flex duct locking tabs and damper mounting slots. Collar damper slots provide for damper attachment or removal at any time.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified). Damper adjustment handle is inserted before or after damper is mounted and is removable at any time.

Matching Hart & Cooley RFPR perforated return air grilles shall be furnished according to the plans.

High Volume Supply T-Bar Diffuser

Contractor shall furnish and install Hart & Cooley HVS high volume supply 2'x2' T-Bar lay-in diffuser as shown on the plans. This diffuser will consist of a formed back panel and three stepdown formed elements, all made of heavy gauge steel. Finish shall be an off-white baked enamel. Interior air diffusion elements are easily removable at any time without tools for access to damper control rod. The air diffusion pattern shall be a full 360°.

The back panel shall be fully insulated with fiberglass having an aluminum foil vapor barrier. Insulation is held rigidly in place with adhesive and will be prescored to accept specified collar sizes.

5400 Series collars will be supplied providing efficient, tight attachment with bayonet fasteners to mating pre-punched holes in back panel. Collars will provide flex duct locking tabs and damper mounting slots. Collar damper slots provide for damper attachment or removal at any time.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified). Damper adjustment handle is inserted before or after damper is mounted and is removable at any time.

Fixed Pattern T-Bar Diffuser

Contractor shall furnish and install Hart & Cooley FPD fixed pattern diffuser 2'x2' T-Bar lay-in as shown on the plans. This diffuser will consist of a formed back panel and two stepdown formed elements, all made of heavy gauge steel. Finish shall be an off-white baked enamel. Interior air diffusion elements are easily removable at any time without tools for access to damper or neck. The air diffusion pattern shall be a full 360°.

3800 Series fully adjustable butterfly dampers shall be supplied (if specified) and can be adjustable through the face.

Glossary of Terms

Ceiling or Wall Effect

The tendency of an air stream moving along a wall or ceiling surface to remain in contact with that surface.

Core Area

The total plane area of that portion of a grille, face, or register bounded by a line tangent to the outer opening through which air can pass. The core area is less than the register size. Example, a 14-in. x 8-in. register may have a core that is 1 in. less than the listed size; so, the core area is 13in. x 7in. – 91 sq. in.

Diffuser

An outlet discharging supply air in a spreading pattern.

Diffusion

Distribution of air within a space by an outlet discharging supply air in a spreading pattern.

Drop

The vertical distance between the base of the outlet and the bottom of the air stream at the end of the horizontal throw.

Effective Area, Ak (Sq. Ft.)

The calculated area of an outlet based on the average measured velocity between the fins.

Envelope

The outer boundary of an air stream moving at a specific velocity (for example, a 50 fpm envelope).

Free Area

The total minimum area of the openings in the air outlet or inlet through which air can pass.

Grille

A louvered covering for an opening through which air passes.

Induction

The process of drawing room air into the projected air stream due to the velocity of the projected air stream (sometimes called aspiration).

Jet Velocity, Fpm (Face Velocity)

The average measured velocity of air passing between the fins.

Natural Convection Currents

Air currents created by a buoyancy effect caused by the difference in temperature between the room air and the air in contact with a warm or cold surface.

Outlet

Any opening through which air is delivered to condition a space.

Outlet Velocity, Fpm

The average velocity of the supply air, measured as it passes through the plane of the opening in the supply outlet.

Pressure Loss, WG

Indicates how much total pressure is required to move air through a register.

Primary Air

The mixture of supply air from the outlet and room air within the 1 50 fpm envelope.

Radius of Diffusion, Ft.

The horizontal distance (throw) from a ceiling diffuser to the point of terminal velocity.

Register

A grille which is equipped with a damper or control valve, and which directs air in a nonspreading jet.

Return

Any opening through which air is removed from a conditioned space.

Spread, Ft.

The maximum width of the total air stream at the point of terminal velocity.

Static Pressure, PS

The outward force of air within a duct measured in inches of water.

Stratification Boundary

The boundary between room air currents moving faster than 1 5 fpm and the stratification zone.

Stratified Zone

A region in which room air velocity is less than 1 5 fpm.

Temperature Differential

The temperature difference between the primary and the room air.

Temperature Variation (ΔT)

The temperature difference between points within the same space.

Terminal Velocity, Fpm

When the velocity of total air drops to 50 or 75 fpm, depending on the particular application, it reaches terminal velocity. Terminal velocity is not sharply defined for all applications.

Throw (Blow), Ft.

The horizontal distance an air stream travels after leaving a horizontal sidewall outlet before maximum velocity is reduced to terminal velocity. For a perimeter outlet, throw is the vertical distance the air stream travels before maximum velocity is reduced to terminal velocity.

Total Air

The mixture of projected air and room air set in motion by the supply air.

Total Pressure, Pt

The sum of the velocity and static pressures measured in inches of water.

Vane Ratio

The ratio showing depth of vane to minimum width between two adjacent vanes.

Velocity Pressure, Pv

The forward-moving force of air within a duct measured in inches of water.

NC Noise Criteria

A single number noise rating system that indicates what Broad Band, continuous sounds are reasonably acceptable.

		Product Information	Engineering Data
A500P	Steel—Panel Extruded Aluminum Face	70	110
AD	Damper	73	NA
ADPD	Aluminum - Detachable Plate Diffuser Fixed Collar	63	127
AFPD	Square Two-Core Face Fixed Collar with molded R6 Insulation Option.....	61	127
APF	Aluminum Plaster Frame	74	NA
AR6	Control Grid	32	NA
AR7	OB Damper.....	32	NA
ARE	Directional, Flat Frame.....	31	NA
ARENPS	Aluminum—Perforated Face with Fiberglass Back.....	64	127
ARF	Directional, Flush Frame.....	31	100-105
ARS	Directional, Step Frame	32	100-105
ART	Extruded Aluminum—Square Neck.....	68	108-109
ASRE	Supply/Return, Flat Frame.....	34	106
ASRS	Supply/Return, Step Frame	34	106
BV	Brick/Block Vents.....	48	48
C3	Curved Blade Three-Way Horizontal	19	93-94
C4	Curved Blade Four-Way Horizontal	20	93-94
CBPR	Steel—Perforated Face	65	128-130
CBPS	Steel—Perforated Face with Curved Blade Deflection.....	65	128-130
CD3	Curved Blade Three-Way Horizontal, w/OB	19	93-94
CD4	Curved Blade Four-Way Horizontal, w/OB	21	93-94
CH1	Curved Blade One-Way Horizontal.....	17	93-94
CH2	Curved Blade Two-Way Horizontal.....	18	93-94
CHD1	Curved Blade One-Way Horizontal, w/OB.....	17	93-94
CHD2	Curved Blade Two-Way Horizontal, w/OB.....	18	93-94
CHM1	Curved Blade One-Way Horizontal, w/MS.....	17	93-94
CHM2	Curved Blade Two-Way Horizontal, w/MS.....	18	93-94
CM3	Curved Blade Three-Way Horizontal, w/MS	20	93-94
CM4	Curved Blade Four-Way Horizontal, w/MS	21	93-94
DL	Drum Louver	47	120-121
DP	Distribution Plenum.....	42	NA
DPD	Steel—Detachable Plate Diffuser, Fixed Collar	63	127
DPD R6	Steel—Detachable Plate Diffuser, Fixed Collar with Insulation	63	127
DPD12	Steel—Detachable Plate Diffuser 1' x 1'	63	130
DT	Air Diverter	73	NA
FPD/FPDR6	Steel—Square Two-Core Face, Fixed Collar, R6 Insulation Option.....	61	127
FPD12	Steel—Square Two-Core Face, Fixed Collar.....	62	130
FPD3/FPD3R6	Steel—Square Three-Core Face, Fixed Collar, R6 Insulation Option.....	62	127
FT	Flexiturn.....	74	NA
HD	Horizontal Single Deflector, w/OB	12	91-92
HV	Double Deflection Horizontal Face.....	13	91-92
HVD	Double Deflection Horizontal Face, w/OB.....	14	91-92
HVS/HVSR6	Steel—Square Three-Core Face Adjustable Collar with Insulation Options.....	61	91-92
HM	Horizontal Single Deflection, w/MS	13	91-92
HX	Horizontal Single Deflection.....	13	91-92
L	L Series	39	114-115
MCD/MCDD	Modular Diffuser (OB Option), Flat Frame	35	108-109
MCDS	Modular Diffuser, Step Frame	35	108-109
MCDSD	Modular Diffuser with OBD, Step Frame	36	108-109
MCDST	Extruded Aluminum—Curved-Blade Face	68	108-109
MCDSDT	Extruded Aluminum—Curved-Blade Face with Damper.....	69	108-109
MFB	Molded Fiberglass Back Features.....	53	NA

		Product Information	Engineering Data
P Panel	Filler Panel	73	NA
PD	Perforated Face Only	67	128
PDR	Steel—Perforated Face	67	128
PDS	Steel—Perforated Face with Fixed Deflector	66	127
PDS D	Steel—Perforated Face with Adjustable Deflector	66	127
PFT	Steel—Perforated Face	55	126
PFTI	Steel—Perforated Face with Fiberglass Back	55	126
PFG	Steel—Perforated Face Grille	11	90
RCB/RCBD	Curved Blade Return , w/OBD Option	22	95
RCBF	Curved Blade Filter Grille	22	95
RCBFT	Extruded Aluminum—Curved Blade Face	54	95
RCBT	Extruded Aluminum—Curved-Blade Face	56	95
RD	Radial Blade Damper	72	NA
RE5	1/2" Grid Core Return	23	97
RE5T	Extruded Aluminum—1/2" Core Grid Face	57	126
RE5TI	Extruded Aluminum—1/2" Core Grid Face with Fiberglass Back	57	126
RED5	1/2" Grid Core Return, w/OB	23	127
REF5	1/2" Grid Filter Grille	24	97
REF5T	Extruded Aluminum—1/2" Core Grid Face	55	126
REF5TI	Extruded Aluminum—1/2" Core Grid Face with Insulation	55	126
REN4	Aluminum—One-Piece Stamped Face with Fiberglass Back	58	127
RENP	Steel—Perforated Face	64	128
RENPS	Steel—Perforated Face with Deflector	64	127
RH45	Fixed Horizontal Deflected	25	95
RH45T	Extruded Aluminum—Fixed-Bar Face	56	126
RH90	Fixed Horizontal Return Grille	26	96
RHD90	Fixed Horizontal Return Grille, w/OB	26	96
RHF45	Fixed Horizontal Deflected Filter Grille	25	95
RHD45	Fixed Horizontal Deflected, w/OB	25	95
RHF45T	Extruded Aluminum—Fixed Bar Face	54	126
RZ-Round	Rezzin™ Plastic Round Ceiling Diffuser	60	125
RZ-Square	Rezzin™ Plastic Square Ceiling Diffuser	60	125
Back Panel	Rezzin™ Plastic Back Panel	59	NA
Mod Core	Rezzin™ Plastic T-Bar Modular Core Diffuser	59	123-124
Egg Crate	Rezzin™ Plastic T-Bar Egg Crate Filter Grille	57	126
Sq to Rd	Rezzin™ Plastic Square-to-Round Back Panel		123-124
4-Way Tbar	Rezzin™ Plastic T-Bar Directional Diffuser	59	123-124
S	S Series	42	116-119
SBP	Steel—Perforated Face Shallow Back	65	128
SMF	Extruded Aluminum—Surface Mount Frame	72	NA
SR/AR	Air Patterns and Listed Sizes	33	100-105
SR7	OB Damper	30	NA
SS	Linear Face Diffuser	38	113
SV	Single-Deflection Diffuser	37	113
SVH	Double-Deflection Diffuser	37	113
T19	Steel—Multi-Blade Damper	72	NA
T-Bar Panel	Panel for Modular Diffuser	36	NA
TG/TGF	Transfer Grille and Frame	27	99

		Product Information	Engineering Data
USV	Single-Deflection Universal Diffuser	37	113
USVH	Double-Deflection Universal Diffuser	38	113
VD	Vertical Single Deflector, w/OB	15	91-92
VH	Double Deflection Vertical Face	16	91-92
VHD	Double Deflection Vertical Face, w/OB	16	91-92
VM	Vertical Single Deflection, w/MS	15	91-92
VX	Vertical Single Deflection	14	91-92
4ABC	Adjustable Louver	49	122
19	Round OB Damper	28	NA
20	Round Adjustable	28	99
21	Steel Square Mounting Frame	29	NA
22	Steel Butterfly Damper with Mounting Frame	29	NA
23	Steel Opposed Blade Damper	29	NA
24	Steel Square (Ceiling) Diffuser	30	99
245	Stationary Louvers	50	122
444, 441-445	Aluminum—One-Piece Stamped Face	58	126
445	Stationary Louvers	50	122
645	Stationary Louvers	50	122
659T	Steel—Lanced Face	52	126
659TI	Steel—Lanced Face with Fiberglass Back	52	126
673T	Steel—Filter Grille	52	126
673TI	Steel—Filter Grille with Insulated Back	52	126
673TPI R6	Steel—Filter Grille with Steel Plenum, R6 Insulation	53	126
811-814	Curved Blade Steel One Through Four-Way	5	NA
821	Vertical Single Deflection, w/MS	6	79-85
831	Horizontal Single Deflection, w/MS	6	79-85
92HVO	Double Deflection Horizontal Face	7	79-85
92HVV	Double Deflection Horizontal Face, w/OB	7	79-85
92VHO	Double Deflection Vertical Face	8	79-85
92VHV	Double Deflection Vertical Face, w/OB	8	79-85
94A	Return Horizontal Deflected	9	86-89
94AHOV	Return Horizontal Deflected, w/OB	10	86-89
94HOV	Return Horizontal, w/OB	9	86-89
94AT	Steel—Fixed-Bar Face	56	87-89
96AFB	Steel Fixed-Bar Filter Grille	10	86-89
96AFBT	Steel—Fixed-Bar Face	53	126
96AFBTI	Steel—Fixed-Bar Face with Fiberglass Back	54	126
1530	Stationary Louvers	49	122
1545	Stationary Louvers	49	122
3800	Adjustable Butterfly Damper	71	NA
5400PP	Push Pins	71	NA
5400	Snap-In Collar Ring	71	NA
6400	Tab Collar	71	NA
9200V	Opposed-Blade Damper	11	NA



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