- Steel 0° (RSRB, RTRB)
- Aluminum 0° (RARM, RNRM)
- Stainless Steel 0° (RLRB, RMRB, RKRB)
- Steel 45° (RSAB, RTAB)
- Aluminum 45° (RAAM, RNAM)
- Stainless Steel 45° (RLAB, RMAB, RKAB)

Correction Factors for Grille Performance

Total Pressure (P_t)
- For a 0° deflection grille, use the data unchanged from the table.
- For a 45° deflection grille, multiply the table data by 1.8.

Sound Level (NC)
- For a 0° deflection grille, use the table data unchanged.
- For a 45° deflection grille, add 5db to the table data.

Correction Factors for Register Performance

Total Pressure (P_t)
- For a 0° deflection register with a wide open damper, multiply the table data by 1.2.
- For a 45° deflection register with a wide open damper, multiply the table data by 2.0.

Sound Level (NC)
- For a 0° deflection register with a wide open damper, add 2db to the table data.
- For a 45° deflection register with a wide open damper, add 7db to the table data.

Duct Velocity (fpm)		200	400	600	800	1000
Total Pressure (w. g.)		0.020	0.050	0.090	0.140	0.200
4x4	Flow (CFM)	**22**	**44**	**66**	**88**	**110**
(.11 ft²)	Sound (NC)	—	—	—	—	—
6x6	Flow (CFM)	**50**	**100**	**150**	**200**	**250**
(.25 ft²)	Sound (NC)	—	—	—	—	21
8x6	Flow (CFM)	**65**	**130**	**200**	**270**	**340**
(.33 ft²)	Sound (NC)	—	—	—	—	24
10x6	Flow (CFM)	**80**	**160**	**240**	**320**	**400**
(.42 ft²)	Sound (NC)	—	—	—	20	26
12x6	Flow (CFM)	**90**	**180**	**260**	**350**	**440**
(.50 ft²)	Sound (NC)	—	—	—	21	27
14x6	Flow (CFM)	**110**	**220**	**330**	**440**	**550**
(.58 ft²)	Sound (NC)	—	—	—	23	29
12x8	Flow (CFM)	**140**	**280**	**400**	**550**	**690**
(.67 ft²)	Sound (NC)	—	—	—	25	32
12x10	Flow (CFM)	**160**	**320**	**480**	**640**	**800**
(.83 ft²)	Sound (NC)	—	—	—	26	33
12x12	Flow (CFM)	**200**	**400**	**600**	**800**	**1000**
(1.00 ft²)	Sound (NC)	—	—	21	29	35
14x14	Flow (CFM)	**270**	**540**	**820**	**1090**	**1360**
(1.36 ft²)	Sound (NC)	—	—	23	31	37
18x12	Flow (CFM)	**310**	**620**	**930**	**1240**	**1550**
(1.50 ft²)	Sound (NC)	—	—	24	32	39
16x16	Flow (CFM)	**360**	**710**	**1070**	**1420**	**1780**
(1.77 ft²)	Sound (NC)	—	—	26	34	41

Performance Data Notes:
- Sound values are given in NC, are based on a room absorption of 10db re 10^{-12} watts.
- Pressure values are given in inches of water.
- Flow values are given in cubic feet per minute.
- Actual performance in the field may vary.

- Steel 0° (RSRB, RTRB) • Aluminum 0° (RARM, RNRM) • Stainless Steel 0° (RLRB, RMRB, RKRB)
- Steel 45° (RSAB, RTAB) • Aluminum 45° (RAAM, RNAM) • Stainless Steel 45° (RLAB, RMAB, RKAB)

Duct Velocity (fpm)		200	400	600	800	1000
Total Pressure (w. g.)		0.020	0.050	0.090	0.140	0.200
18x16, 24x12	Flow (CFM)	**400**	**800**	**1200**	**1600**	**2000**
(2.00 ft²)	Sound (NC)	—	—	27	35	42
18x18	Flow (CFM)	**450**	**900**	**1200**	**1800**	**2200**
(2.25 ft²)	Sound (NC)	—	—	28	36	43
36x12, 24x18	Flow (CFM)	**600**	**1200**	**1800**	**2400**	**3000**
(3.00 ft²)	Sound (NC)	—	—	30	39	45
24x24	Flow (CFM)	**800**	**1600**	**2400**	**3200**	**4000**
(4.00 ft²)	Sound (NC)	—	21	33	42	48
36x18	Flow (CFM)	**900**	**1800**	**2700**	**3600**	**4500**
(4.50 ft²)	Sound (NC)	—	22	34	43	49
30x24, 36x20	Flow (CFM)	**1000**	**2000**	**3000**	**4000**	**5000**
(5.00 ft²)	Sound (NC)	—	23	35	44	50
36x24, 48x18	Flow (CFM)	**1200**	**2400**	**3600**	**4800**	**6000**
(6.00 ft²)	Sound (NC)	—	24	36	45	52
36x36	Flow (CFM)	**1800**	**3600**	**5400**	**7200**	**9000**
(9.00 ft²)	Sound (NC)	—	29	41	49	56
40x36	Flow (CFM)	**2000**	**4000**	**6000**	**8000**	**10000**
(10.00 ft²)	Sound (NC)	—	30	42	50	57
44x36	Flow (CFM)	**2200**	**4400**	**6600**	**8800**	**11000**
(11.00 ft²)	Sound (NC)	—	31	43	52	59
48x36	Flow (CFM)	**2400**	**4800**	**7200**	**9600**	**12000**
(12.00 ft²)	Sound (NC)	—	33	45	54	61

Performance Data Notes:

- Sound values are given in NC, are based on a room absorption of 10db re 10^{-12} watts.
- Pressure values are given in inches of water.
- Flow values are given in cubic feet per minute.
- Actual performance in the field may vary.

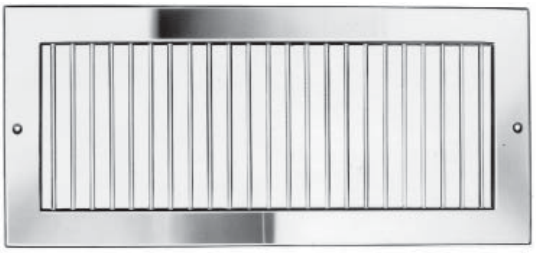
RETURN GRILLES and REGISTERS

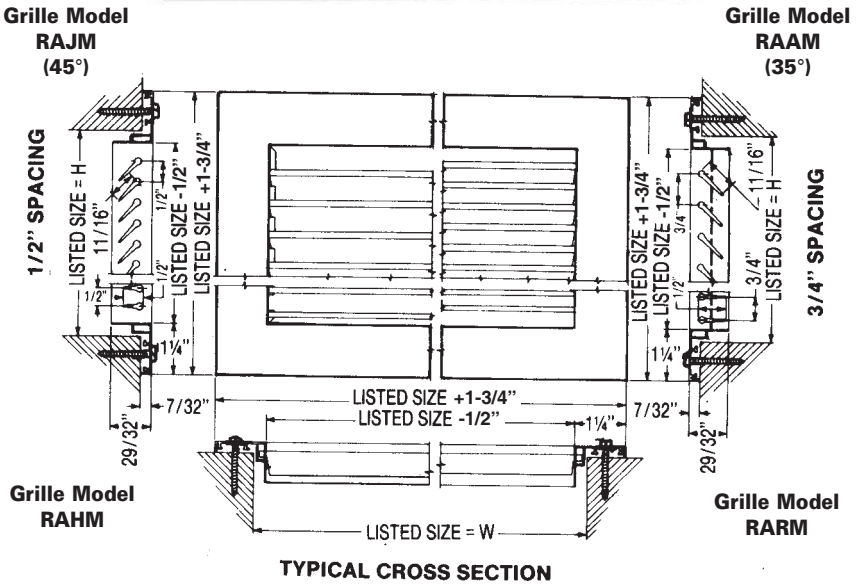
RETURN GRILLE

The return air grille is styled to match the Carnes extruded aluminum supply registers and grilles. The face bars are not adjustable but are locked into either a 0°, 35° or 45° position at the factory. The frame is flat with sharp square edges to harmonize with modern aesthetical design. Gaskets are not furnished with return grilles.

MODEL NOS.

GRILLES			
Blade Spacing	Blade Setting	Front Blades Horizontal	Front Blades Vertical
3/4"	0°	RNRMH	RARMV
	35°	RNAMH	RAAMV
1/2"	0°	RNHMH	RAHMV
	45°	RNJMH	RAJMV
Heavy Duty			
3/4"	0°	RARMJ	RARMK
	35°	RAAMJ	RAAMK
1/2"	0°	RAHMJ	RAHMK
	45°	RAJMJ	RAJMK





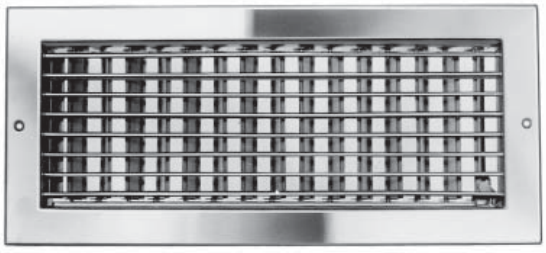
TYPICAL CROSS SECTION

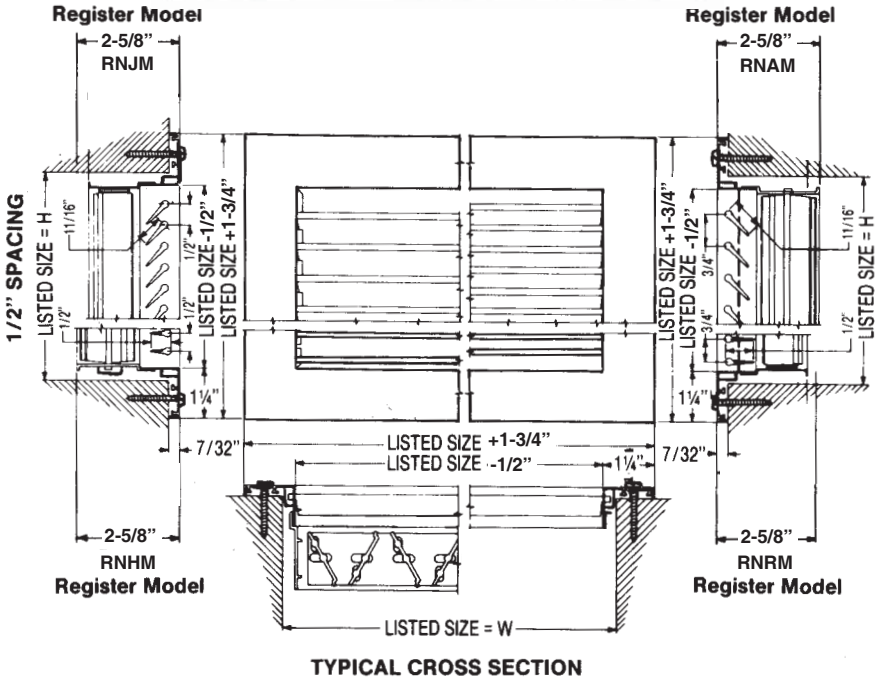
RETURN REGISTER

The return air register is a combination of grille with fixed face bars and an opposed blade extruded aluminum damper. The blades are gang operated by means of a key and assure positive control of air passing through the register for systems where precise balancing is required. Gaskets are not furnished on return models.

MODEL NOS.

WITH ALUMINUM DAMPERS			
Blade Spacing	Blade Setting	Front Blades Horizontal	Front Blades Vertical
3/4"	0°	RNRMH	RNRMV
	35°	RNAMH	RNAMV
1/2"	0°	RNHMH	RNHMV
	45°	RNJMH	RNJMV
Heavy Duty			
3/4"	0°	RNRMJ	RNRMK
	35°	RNAMJ	RNAMK
1/2"	0°	RNHMJ	RNHMK
	45°	RNKMJ	RNJMK





TYPICAL CROSS SECTION

MODEL NUMBERING SYSTEM - M-Series Aluminum Return Registers and Grilles

OPTIONS: (Must be present in order shown, left justified. Default is standard and applies if not entry is made)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
R	A	R	M	H	0	1	2	0	1	2	0	5	1				

1: R - Register & Grille

2: A - Alum. Grille; N - Alum. Register w/Alum. Damper

3: R - 0° Setting 3/4" Spacing Return; A - 45° Setting 3/4" Spacing Return; H - 0° Setting 1/2" Spacing Return; J - 45° Setting 1/2" Spacing Return

4: DESIGN SERIES

5: BLADE DEFLECTION
H - Horizontal (Blades Parallel to Width)
V - Vertical (Blades Parallel to Height)
J - Heavy Duty Horizontal (Blades Parallel to Width)
K - Heavy Duty Vertical (Blades Parallel to Height)

6, 7, 8: SIZE WIDTH
004 - 4" Minimum

9, 10, 11, 12: SIZE HEIGHT
04 - 4" Minimum

9, 10, 11: FRACTIONAL SIZE
0 - 0"
1 - 1/8"
2 - 1/4"
3 - 3/8"
4 - 1/2"
5 - 5/8"
6 - 3/4"
7 - 7/8"

13, 14: 51 - Natural Anodize (Standard)
11 - Bright White
04 - Gray
(For Other Finishes See Master Finish List)

15: F - Fusible Link
G - Gasket
Q - Gasket & Fusible Link

16: MOUNTING
N - No Screw Holes
B - Tamper-Proof Screws
C - Concealed Hangers
S - Sheared Frame for T-bar
T - T-bar Panel 23-3/4"x23-3/4"
Y - Standard Screws (Default)

17: DAMPER OPERATION
X - Standard Operator (Default)

18: HINGED
8 - Plaster Frame with 1/4 Turn Fasteners, No Hinge
H - Long Side to Plaster Frame
J - Short Side to Plaster Frame
D - Long Side to Plaster Frame w/1" Filter Clips
E - Short Side to Plaster Frame w/1" Filter Clips
K - Long Side to Plaster Frame w/2" Filter Clips
L - Short Side to Plaster Frame w/2" Filter Clips

SELECTION CHART RETURN REGISTERS AND GRILLES

MODELS: RNRM, RNAM, RNHM, RNJM RARM, RAAM, RAHM, RAJM

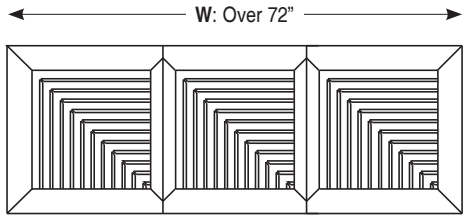
SIZE W x H	Area* Sq. Ft.	AIR CAPACITY CFM 300 FPM	400 FPM	500 FPM	600 FPM	700 FPM	800 FPM	900 FPM
10 x 6	.29	85	115	145	175	205	230	260
12 x 6	.35	105	140	175	210	245	280	315
10 x 8	.39	115	155	195	235	270	310	350
12 x 8	.47	140	190	235	280	330	375	425
18 x 6	.54	160	215	270	325	380	430	485
12 x 12	.72	215	290	360	430	505	575	650
18 x 12	1.10	330	440	550	660	770	880	990
24 x 12	1.47	440	590	735	880	1030	1175	1320
18 x 18	1.65	495	660	825	990	1155	1320	1485
30 x 12	1.85	550	740	925	1110	1295	1480	1665
24 x 18	2.28	685	910	1140	1370	1600	1825	2050
30 x 18	2.86	860	1145	1430	1715	2000	2290	2580
24 x 24	3.06	915	1225	1530	1840	2140	2450	2760
36 x 18	3.44	1030	1375	1720	2060	2410	2750	3100
30 x 24	3.86	1160	1545	1930	2320	2700	3090	3480
36 x 24	4.75	1425	1900	2375	2850	3320	3800	4280
36 x 30	5.85	1755	2340	2920	3510	4100	4680	5270
48 x 24	6.24	1870	2495	3120	3740	4370	4990	5620
48 x 30	7.99	2400	3200	4000	4800	5600	6400	7200
48 x 36	9.47	2840	3790	4740	5690	6640	7580	8520

** "Anemometer Effective Area" — Anemometer held directly against face.*

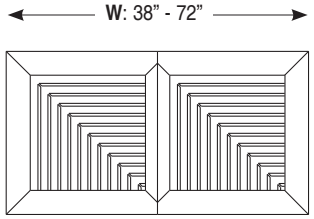
Multi-Panel Construction for the following Registers & Grilles

	Steel	Stainless Steel	Aluminum
Single Deflection	RSSB, RTSB	RLSB, RMSB, RKSB	RASM, RNSM
Double Deflection	RSDB, RTDB	RLDB, RMDB, RKDB	RADM, RNDM
0° Fixed Return	RSRB, RTRB	RLRB, RMRB, RKRB	RARM, RNRM
45° Fixed Return	RSAB, RTAB	RLAB, RMAB, RKAB	RAAM, RNAM

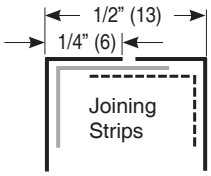
In-line Construction



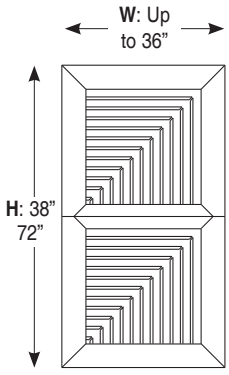
- Height: Up to 36"
- Width: Over 72"
- Three or more sections.
- Any blade alignment.



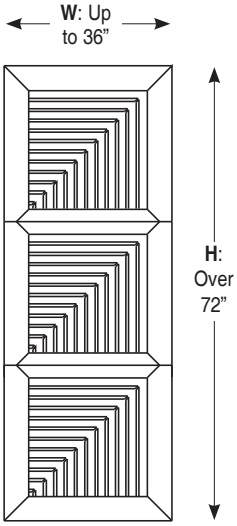
- Height: Up to 36"
- Width: 38" to 72"
- Two sections.
- Any blade alignment.



- Height: 38-72"
- Width: Up to 36"
- Two Sections
- Any blade alignment



- Height: Over 72"
- Width: Up to 36"
- Three or More Sections
- Any blade alignment



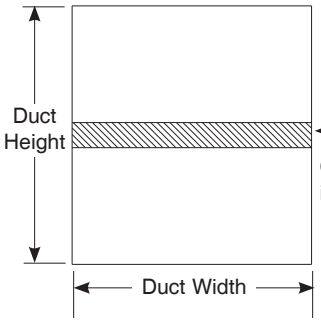
Notes:

1. Maximum single panel width and height is 36" listed size regardless of blade alignment.
2. Panels are made in even inch increments unless specified otherwise.
3. Front blade alignment is as pictured.
4. Grille height & width dimensions shown are listed size dimensions.
5. Panel flanges are sheared and aligned with joining strips.

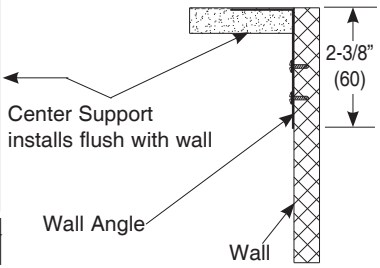
Ganged Construction

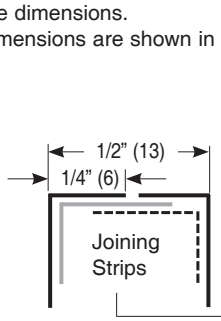
Notes:

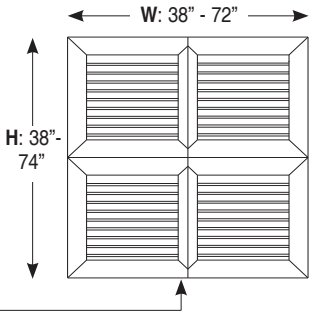
1. Maximum single panel width is 36" listed size.
2. Maximum single panel height is 36" listed size.
3. Panels will be made in even inch increments unless specified otherwise.
4. Front blade alignment is always parallel to center support.
5. Either the vertical or horizontal joint can be sheared down, but not both.
6. The center support can be aligned vertically or horizontally, depending on blade alignment desired. It is shown here mounted horizontally.
7. Grille height and width dimensions shown are listed size dimensions.
8. Metric dimensions are shown in millimeters.



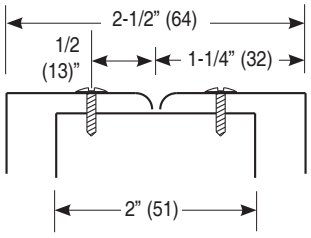
Center Support Attachment to Wall Opening







Cross-Sectional View of Center Support with Grilles Attached

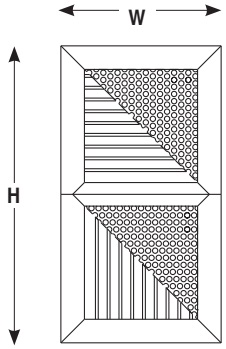


Multi-Panel Construction for the following Registers & Grilles

	Steel
Louvered Return	RSLA, RTLA
Perforated Return	RSFA, RTFA

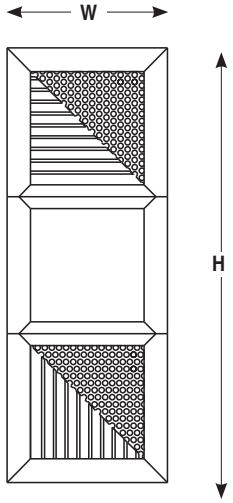
In-Line Construction

•Height: 38-72”
•Width: Up to 48”
•Horizontal Blade Alignment
•Two Sections



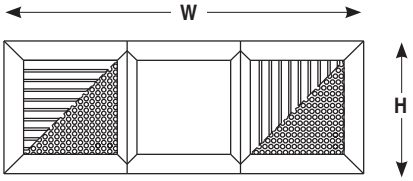
•Height: 50-96”
•Width: Up to 36”
•Vertical Blade Alignment
•Two Sections

•Height: Over 72”
•Width: Up to 48”
•Horizontal Blade Alignment
•Three or More Sections

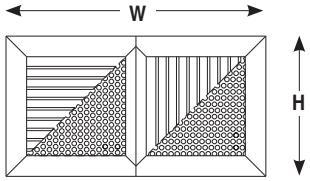


•Height: Over 96”
•Width: Up to 36”
•Vertical Blade Alignment
•Three or more Sections

•Height: Up to 36”
•Width: Over 96”
•Horizontal Blade Alignment
•Three or More Sections

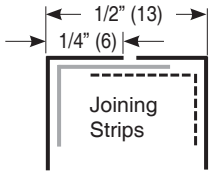


•Height: Up to 48”
•Width: Over 72”
•Vertical Blade Alignment
•Three or More Sections



•Height: Up to 36”
•Width: 50” to 96”
•Horizontal Blade Alignment
•Two Sections

•Height: Up to 48”
•Width: 38” to 72”
•Vertical Blade Alignment
•Two Sections



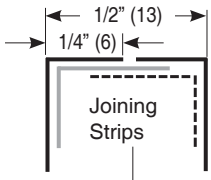
Notes:

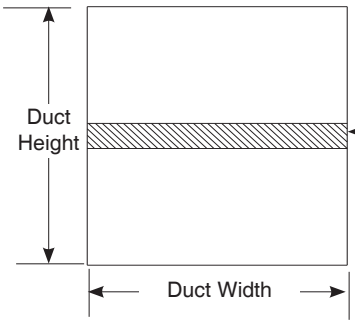
1. Panels will be made in even inch increments unless specified otherwise.
2. Dimensions shown are listed size dimensions.
3. Max. blade length on louvered face models is nominal 48”.
4. Panels are sheared and aligned with joining strips.

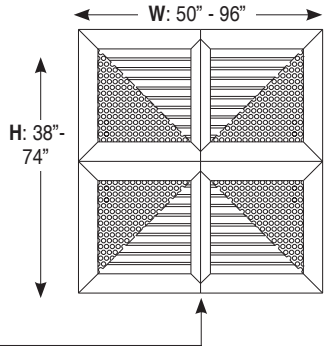
Ganged Construction

Notes:

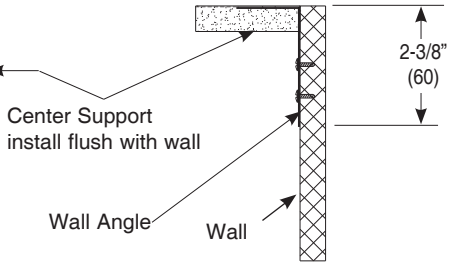
1. Either the vertical or horizontal joint can be sheared down, but not both.
2. Maximum single panel width is 48” listed size.
3. Maximum blade length on louvered face models is listed size 48”.
4. Maximum single panel height is 36” listed size.
5. Panels are made in even inch increments unless specified otherwise.
6. Blade alignment is always parallel to center support.
7. The center support can be aligned vertically or horizontally, depending on the blade alignment desired. It is shown here mounted horizontally.
8. Grille dimensions shown are listed size dimensions.



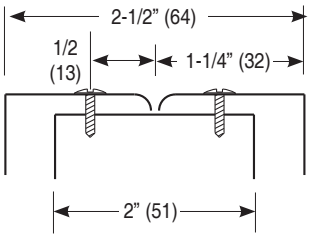




Center Support Attachment to Wall Opening



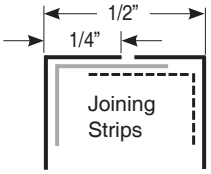
Cross-Sectional View of Center Support with Grilles Attached



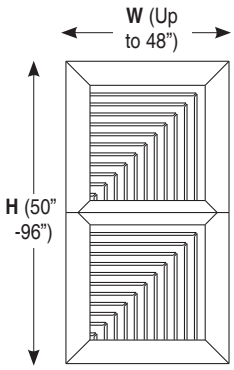
Multi-Panel In-Line Construction

Notes:

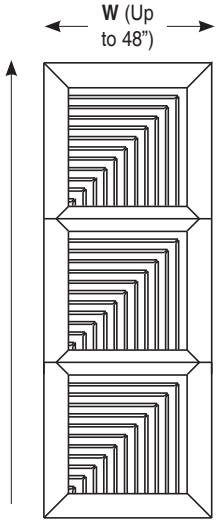
1. Maximum single panel width and height is 48" nominal size, regardless of blade alignment.
2. Panels are made in even inch increments unless specified otherwise.
3. Front blade alignment is as pictured.
4. Grille dimensions shown are nominal dimensions.
5. Panel flanges are sheared and aligned with joining strips.



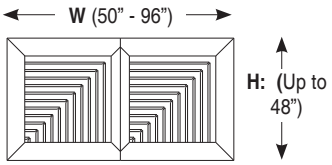
•Height: 50-96"
•Width: Up to 48"
•Two Sections
•Any Blade Alignment



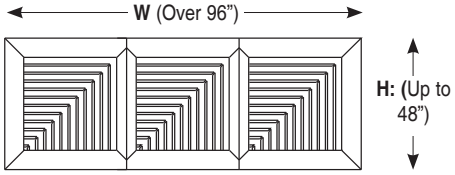
•Height: Over 96"
•Width: Up to 48"
•Three or more Sections
•Any Blade Alignment



•Height: Up to 48"
•Width: 50" - 96"
•Two Sections
•Any Blade Alignment



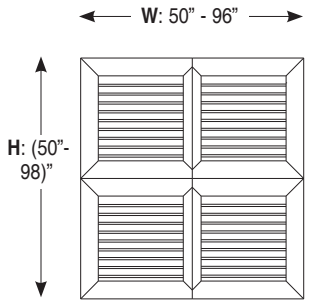
•Height: Up to 48"
•Width: Over 96"
•Three or more Sections
•Any Blade Alignment



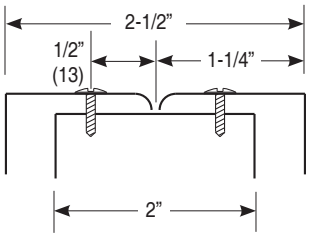
Multi-Panel Ganged Construction

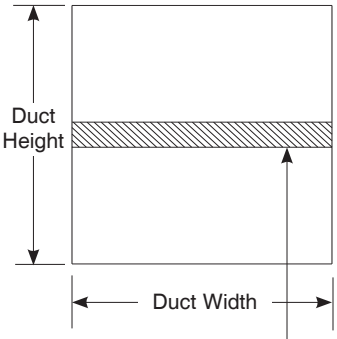
Notes:

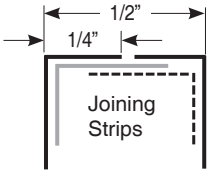
1. Maximum single panel width and height are 48" nominal size.
2. Panels are made in even inch increments unless specified otherwise.
3. Front blade alignment is always parallel to center support.
4. Either the vertical or horizontal joint can be sheared down, but not both.
5. The center support can be aligned vertically or horizontally, depending on blade alignment desired.
6. Grille dimensions shown are nominal dimensions.

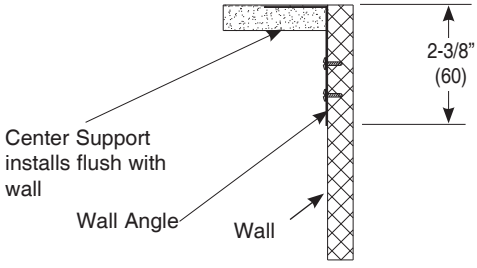


Cross-Sectional View of Center Support







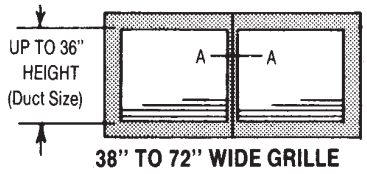


Center Support Mounted flush with wall (Shown aligned horizontally).

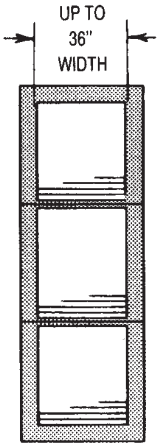
All Sections of Butted Grilles or Registers will be made in Listed Sizes as Standard.

STANDARD REGISTERS AND GRILLES

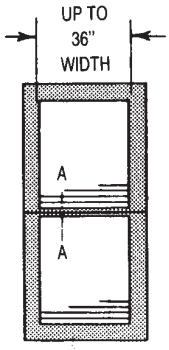
Applies to all models except louvered return air registers and grilles and door partition grilles. Registers and grilles over 36" x 36" butting two or more grilles together.



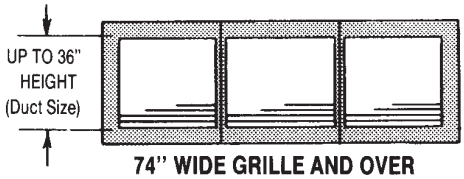
38" TO 72" WIDE GRILLE



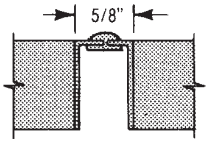
74" HIGH GRILLE AND OVER
(3 Or More Sections)



38" TO 72" HIGH GRILLE

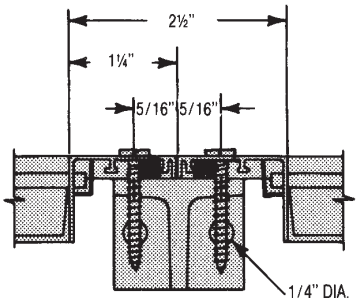


74" WIDE GRILLE AND OVER
(3 Or More Sections)

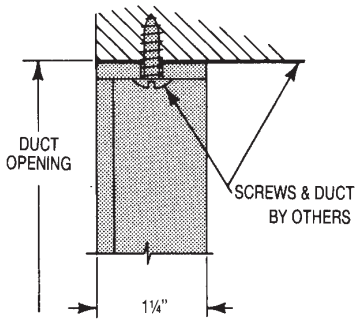


CROSS SECTION
AT BUTT A-A

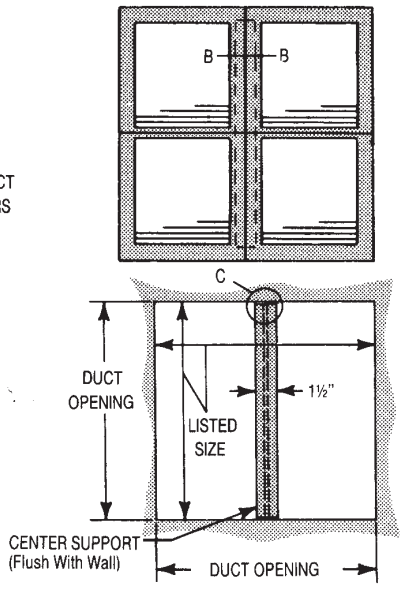
GRILLES AND REGISTERS HAVING FOUR SECTIONS AND OVER



CROSS SECTION AT
CENTER SUPPORT B-B



CENTER SUPPORT ATTACHED
TO WALL OPENING BY
CONTRACTOR
DETAIL AT "C"



NOTES:

Extruded aluminum supporting members with mounting angles, are furnished where required.

Center support may run vertically or horizontally, depending upon combination of grilles used.

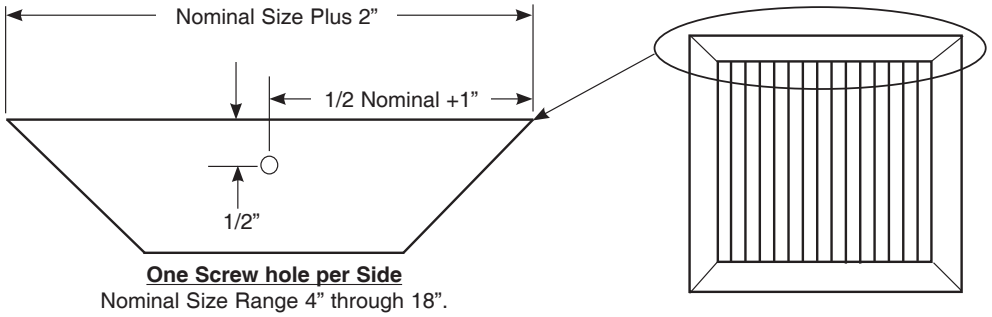
Combination of panels will be furnished to fit duct opening with satisfactory clearance.

Screw Hole Location for the following Registers & Grilles

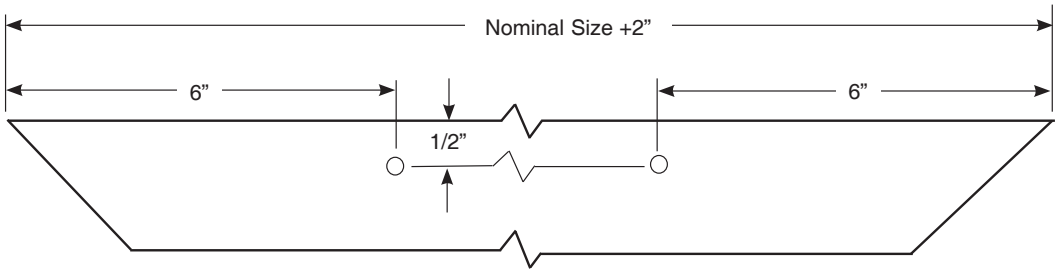
	Steel	Aluminum	Stainless Steel
Single Deflection	RSSB, RTSB	RASM, RNSM	RLSB, RMSB, RKSB
Double Deflection	RSDB, RTDB	RADM, RNDM	RLDB, RMDB, RKDB
0° Fixed Return	RSRB, RTRB	RARM, RNRM	RLRB, RMRB, RKRB
45° Fixed Return	RSAB, RTAB	RAAM, RNAM	RLAB, RMAB, RKAB
Louvered Return	RSLA, RTLA	— — — —	— — — —
Perforated Return	RSFA, RTFA	RAFM, RNFM	— — — —

Notes:

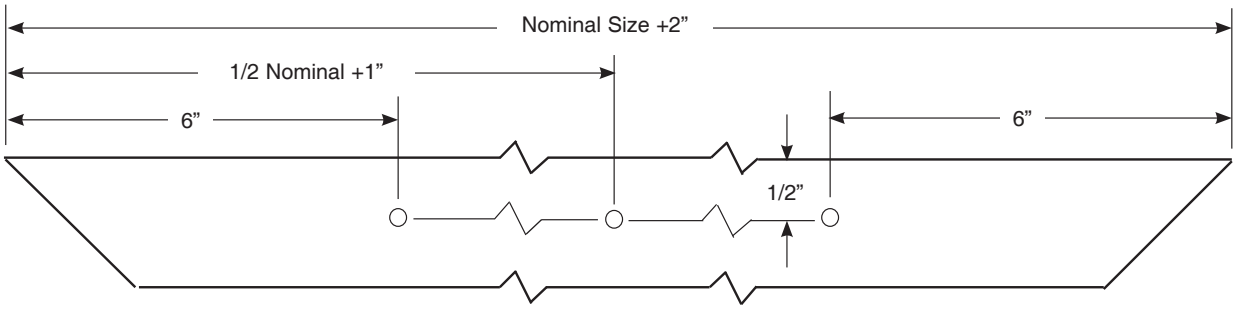
- Screw holes on the face are standard on Registers and Grilles.
- Steel R&G can be ordered without screw holes, for use with concealed hangers (Opt. N).
- The screw holes is 5/32" in diameter.
- Each Register or Grille is provided with the appropriate number of screws as standard.
- The standard screw is #8 x 1-1/4" pan head screw, with a flat blade head.
- Tamper-proof screws are available as an option (Opt. B).



One Screw hole per Side
Nominal Size Range 4" through 18".



Two Screw holes per Side
Nominal Size Range 19" through 31".



Three Screw holes per Side
Nominal Size Range 32" through 48".