



**Residential**

Grilles, Registers & Diffusers

Edition 6



### RESIDENTIAL

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**RESIDENTIAL**

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## Residential Registers, Grilles & Diffusers

No one satisfies the demands for air distribution solutions better than Hart & Cooley. Our wide selection of registers, grilles, diffusers and accessories includes a variety of shapes and sizes to meet any application and budget requirement.

Our products are offered in steel, aluminum or plastic construction, and are designed for installation ease. They are made with an attention to detail that contributes to unmatched performance.

For example: an electro-deposition paint finish creates a flawless appearance; stamped face margins eliminate mitered corners and rough edges; each product is identified with a unique bar code label; and shrink-wrap packaging makes sure products are delivered in perfect condition. The wide variety of fin spacings, air patterns, and damper controls assures an appropriate solution for each application.

A nationwide distribution network provides for consistent product availability and timely delivery.

# Floor Registers & Grilles



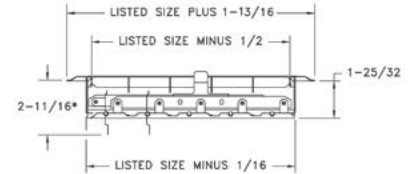
## 210 Floor Register

- All-steel construction
- Provides firm, smooth surface
- Extremely rigid
- Free area averages over 75%
- Toe-operated valve control
- Golden Sand enamel finish

| 210 Standard Sizes (in.) |       |   |    |    |    |    |
|--------------------------|-------|---|----|----|----|----|
| HT                       | WIDTH |   |    |    |    |    |
|                          | 6     | 8 | 10 | 12 | 14 | 16 |
| 4                        |       | X | X  | X  | X  |    |
| 6                        | X     | X | X  | X  | X  | X  |
| 8                        |       | X | X  | X  | X  |    |
| 9                        |       |   |    | X  |    |    |
| 10                       |       |   | X  | X  | X  |    |
| 12                       |       |   |    | X  | X  |    |

Contact factory for sizes not listed.

### End View Showing Depth with Valve Open:



\*3-9/16 FOR SIZES OVER 14 x 20

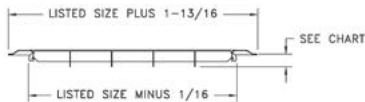


## 265 Floor Return Air Grille

- All-steel construction
- Provides firm, smooth surface
- Extremely rigid
- Free area averages over 75%
- Golden Sand enamel finish

| 265 Standard Sizes (in.) |       |    |    |    |    |    |    |    |    |    |    |  |
|--------------------------|-------|----|----|----|----|----|----|----|----|----|----|--|
| HT                       | WIDTH |    |    |    |    |    |    |    |    |    |    |  |
|                          | 8     | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 25 | 30 | 36 |  |
| 4                        | X     | X  | X  | X  |    | X  |    | X  |    | X  |    |  |
| 6                        | X     | X  | X  | X  | X  | X  | X  | X  |    | X  | X  |  |
| 8                        | X     | X  | X  | X  | X  | X  | X  | X  |    | X  |    |  |
| 9                        |       |    | X  |    |    |    |    |    |    |    |    |  |
| 10                       |       | X  | X  | X  | X  | X  | X  | X  |    | X  |    |  |
| 12                       |       |    | X  | X  | X  | X  | X  | X  |    | X  |    |  |
| 14                       |       |    |    | X  | X  |    | X  | X  |    | X  |    |  |
| 16                       |       |    |    |    | X  |    | X  | X  |    | X  |    |  |
| 18                       |       |    |    |    |    | X  |    | X  |    | X  |    |  |
| 20                       |       |    |    |    |    |    | X  | X  | X  | X  |    |  |
| 24                       |       |    |    |    |    |    |    | X  |    | X  | X  |  |

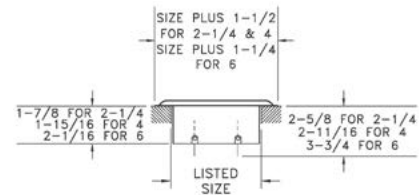
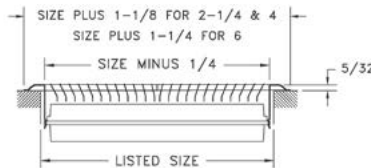
Contact factory for sizes not listed.



## 411 Deluxe Floor Diffuser

- All-steel construction
- Heavy-gauge individually welded diffusion vanes
- Multi-angle fin setting
- Foot-operated dial control
- Can be used in high traffic areas
- Golden Sand or Bright White enamel finish

| 411 Available Sizes (in.) |                   |
|---------------------------|-------------------|
| Size                      | Free Area Sq. In. |
| 2 x 10                    | 15                |
| 2 x 12                    | 19                |
| 2 x 14                    | 22                |
| 4 x 10                    | 29                |
| 4 x 12                    | 35                |
| 4 x 14                    | 40                |
| 6 x 10                    | 44                |
| 6 x 12                    | 53                |
| 6 x 14                    | 60                |

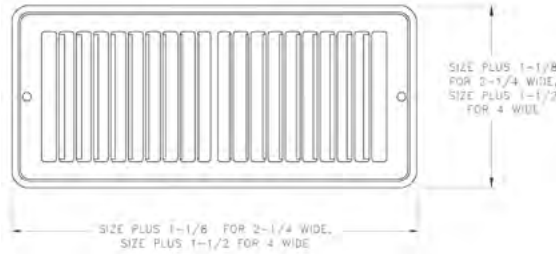
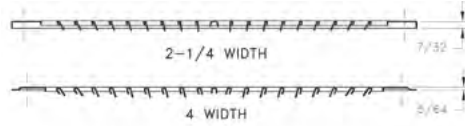


# Floor Registers & Grilles

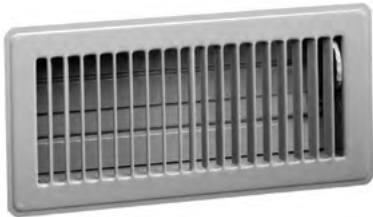


## 420 Toe-Space Grille

- All-steel construction
- Heavy-gauge stamped face
- Multi-angle fins
- Golden Sand or Bright White enamel finish

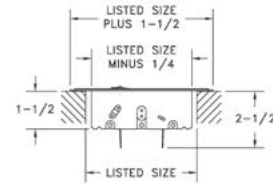
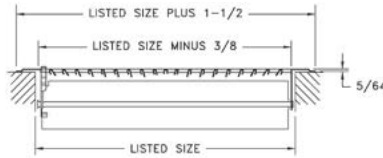


| 420 Available Sizes (in.) |                   |
|---------------------------|-------------------|
| Size                      | Free Area Sq. In. |
| 10 x 2                    | 15                |
| 12 x 2                    | 17                |
| 14 x 2                    | 20                |
| 10 x 4                    | 27                |
| 12 x 4                    | 32                |
| 14 x 4                    | 37                |



## 421 Floor Diffuser

- All-steel construction
- Multi-angle fin setting
- Rolled fin for strength and safety
- Welded construction
- Foot-operated dial control
- Heavy-gauge stamped face
- Golden Sand or Bright White enamel finish

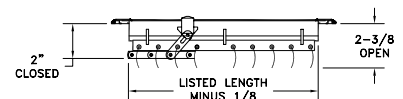
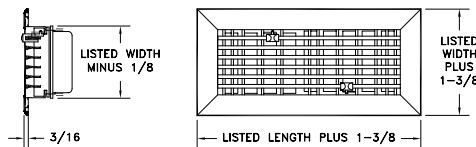


| 421 Available Sizes (in.) |                   |
|---------------------------|-------------------|
| Size                      | Free Area Sq. In. |
| 2 x 10                    | 15                |
| 2 x 12                    | 17                |
| 2 x 14                    | 20                |
| 4 x 8                     | 22                |
| 4 x 10                    | 27                |
| 4 x 12                    | 32                |
| 4 x 14                    | 37                |
| 6 x 10                    | 39                |
| 6 x 12                    | 48                |
| 6 x 14                    | 56                |



## 531 Royaleire® Floor Diffuser

- Extruded aluminum construction
- Corrosion-resistant, high strength
- Heavy cross-bracing at strategic intervals
- Dual multi-shutter valves for adjustable air pattern
- Nylon slide valve operators
- Satin-anodized finish



| 531 Available Sizes (in.) |                   |
|---------------------------|-------------------|
| Size                      | Free Area Sq. In. |
| 2.25 x 10                 | 10                |
| 2.25 x 12                 | 12                |
| 2.25 x 14                 | 14                |
| 4 x 10                    | 19                |
| 4 x 12                    | 23                |
| 4 x 14                    | 27                |
| 6 x 10                    | 31                |
| 6 x 12                    | 37                |
| 6 x 14                    | 44                |

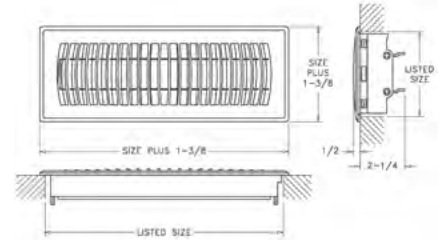
# Floor Registers & Grilles



## RZ421 Plastic Floor Diffuser

- Solid ABS construction for floor use
- Multi-angled fins for fan pattern of air distribution
- Foot-operated, opposed-blade damper
- Bright White or Golden Sand finish

| RZ421 Available Sizes (in.) |       |    |
|-----------------------------|-------|----|
| HT                          | WIDTH |    |
|                             |       | 10 |
| 2                           |       | X  |
| 4                           | X     | X  |



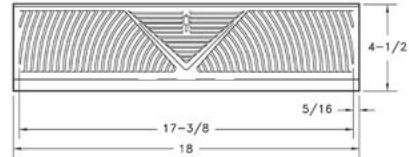




### 406 Baseboard Diffuser

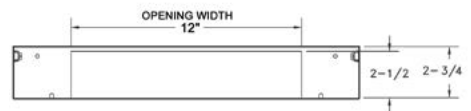
- All-steel construction
- Blankets wall or window area
- Golden Sand or Bright White enamel finish

| Model Number | Size | Free Area Sq. In. | Overall Length | Height | Base Projection | Opening Width |
|--------------|------|-------------------|----------------|--------|-----------------|---------------|
| 406          | 15"  | 32                | 15             | 4 1/2  | 2 3/4           | 12            |
| 406          | 18"  | 38                | 18             | 4 1/2  | 2 13/16         | 12            |
| 407          | 18"  | 38                | 18             | 4 1/2  | 2 13/16         | 12            |



### 407 Matching Return Air Grille

- All-steel construction
- Complementary return air grille for Model 406 supply
- Golden Sand or Bright White enamel finish



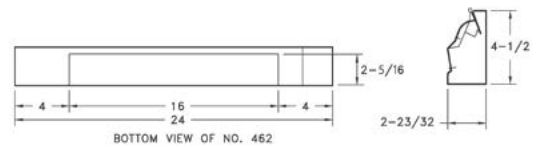
**406 18" Shown**



### 462 Baseboard Diffuser

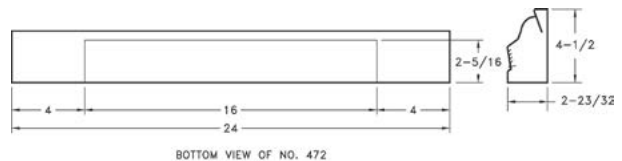
- All-steel construction
- Two-foot length
- Airfoil valves reduce resistance
- Equal air distribution over the length of the diffuser
- Face can be easily removed
- Golden Sand or Bright White enamel finish

| Model Number | Size | Free Area Sq. In. | Overall Length | Height | Base Projection | Bottom Opening |
|--------------|------|-------------------|----------------|--------|-----------------|----------------|
| 462          | 2'   | 27                | 24             | 4 1/2  | 2 23/32         | 2 5/16 X 16    |
| 472          | 2'   | 42                | 24             | 4 1/2  | 2 23/32         | 2 5/16 X 16    |



### 472 Matching Return Air Grille

- All-steel construction
- Two-foot length
- Complementary return air grille for Model 462 supply
- Golden Sand or Bright White enamel finish





### 464 Baseboard Diffuser

- All-steel construction
- Four-foot length
- Airfoil valves reduce resistance
- Equal air distribution over the length of the diffuser
- Dual valves
- Face can be easily removed
- Golden Sand or Bright White enamel finish

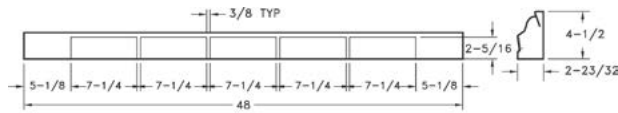


### 474 Matching Return Air Grille

- All-steel construction
- Four-foot length
- Complementary return air grille for Model 464 supply
- Golden Sand or Bright White enamel finish



BOTTOM VIEW OF NO. 464



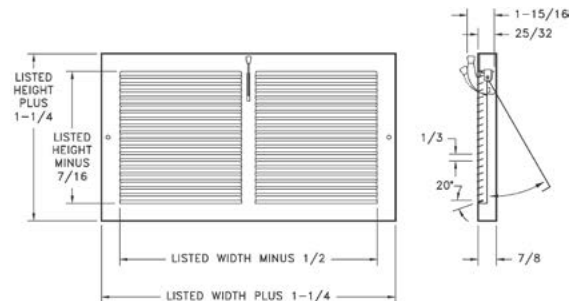
BOTTOM VIEW OF NO. 474

| Model Number | Size | Free Area Sq. In. | Overall Length | Height | Base Projection                 | Bottom Opening  |
|--------------|------|-------------------|----------------|--------|---------------------------------|---|
| 464          | 4'   | 54                | 48             | 4 1/2  | 2 <sup>23</sup> / <sub>32</sub> | 2 <sup>5</sup> / <sub>16</sub> X 24                             |
| 474          | 4'   | 84                | 48             | 4 1/2  | 2 <sup>23</sup> / <sub>32</sub> | 2 <sup>5</sup> / <sub>16</sub> X 36 <sup>1</sup> / <sub>4</sub> |



### 654 Baseboard Register with Damper

- One-piece steel construction
- 1/3" spaced fins set at 20 degrees
- 7/8" margin turnback
- Exceptional free area
- Positive volume-control damper
- Bright White enamel finish



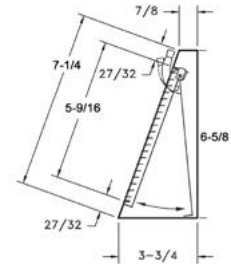
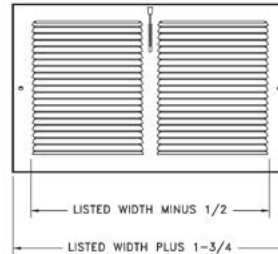
# Baseboard Registers & Grilles



### 655 Baseboard Register with Damper

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Volume-control damper
- Bright White enamel finish

| 655 Available Sizes (in.) |       |   |   |   |
|---------------------------|-------|---|---|---|
| HT                        | WIDTH |   |   |   |
|                           | 6     | X | X | X |

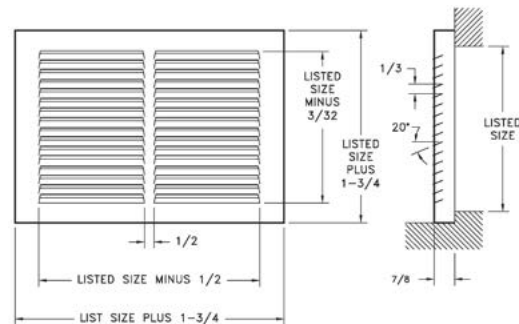


### 657 Baseboard Return Air Grille

- One-piece steel construction
- 1/3" spaced fins set at 20 degrees
- 7/8" margin turnback
- Exceptional free area
- Install with fins upward or downward for best duct concealment
- Complementary return air grille for Model 654 or 664 supply
- Golden Sand or Bright White enamel finish

| 657 Standard Sizes (in.) |       |   |   |   |   |   |   |   |
|--------------------------|-------|---|---|---|---|---|---|---|
| HT                       | WIDTH |   |   |   |   |   |   |   |
|                          | 4     |   |   | X |   |   |   |   |
| 6                        | X     | X | X | X | X | X | X | X |
| 8                        | X     | X | X | X | X | X | X | X |
| 10                       |       |   | X |   | X | X | X |   |
| 12                       |       |   | X |   |   | X | X |   |

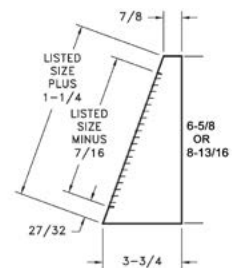
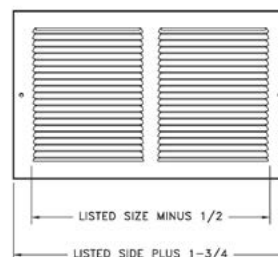
Contact factory for sizes not listed.



### 658 Baseboard Return Air Grille

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Complementary return air grille for Model 655 supply
- Bright White enamel finish

| 658 Available Sizes (in.) |       |   |   |   |   |
|---------------------------|-------|---|---|---|---|
| HT                        | WIDTH |   |   |   |   |
|                           | 6     | X | X | X | X |
| 8                         |       |   | X | X | X |



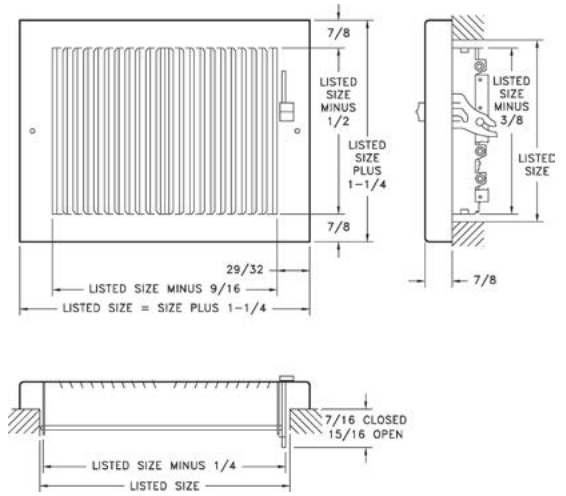


**664 Baseboard Register**

- All-steel construction
- 1/3"-spaced fins set at 20 degrees
- 7/8" margin turnback
- 1-5/8" depth when fully opened
- Exceptional free area
- Ideal for shallow duct installations
- Multi-shutter valve
- Bright White enamel finish

| 664 Available Sizes (in.) |       |    |    |    |
|---------------------------|-------|----|----|----|
| HT                        | WIDTH |    |    |    |
|                           | 8     | 10 | 12 | 14 |
| 6                         | X     | X  | X  | X  |
| 8                         |       |    | X  |    |

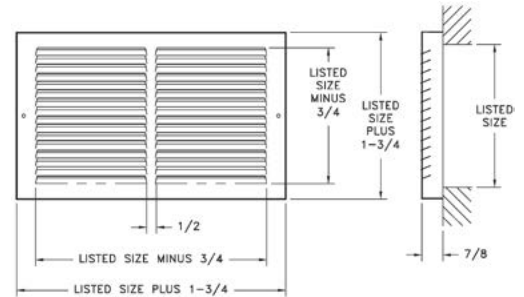
Contact factory for sizes not listed

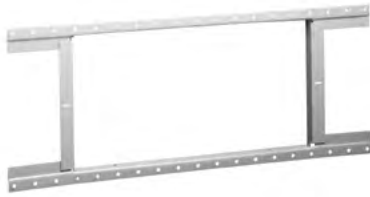


**674 Return Air Grille**

- One-piece steel construction
- 1/2"-spaced fins set at 40 degrees
- 7/8" margin turnback
- Complementary return air grille for 1/2"-spaced products
- Bright White enamel finish

| 674 Available Sizes (in.) |       |    |    |
|---------------------------|-------|----|----|
| HT                        | WIDTH |    |    |
|                           | 14    | 24 | 30 |
| 6                         | X     | X  | X  |
| 8                         | X     | X  | X  |





### Model 3 Sidewall Stud Frame

- All-steel construction
- Extension arms fasten directly to studs
- Provides solid foundation for register and stackhead
- Permits good plaster base right up to frame

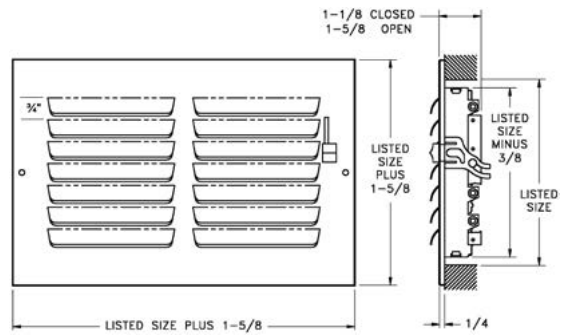
| Model 3 Available Sizes (in.) |       |    |    |    |    |
|-------------------------------|-------|----|----|----|----|
| HT                            | WIDTH |    |    |    |    |
|                               |       | 10 | 12 | 14 | 24 |
| 4                             |       | X  |    |    |    |
| 6                             | X     | X  | X  | X  | X  |



### 301 Register

- All-steel one-piece stamped-face curved-blade construction
- One-way deflection
- One-way air pattern
- For sidewall or ceiling application
- Multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

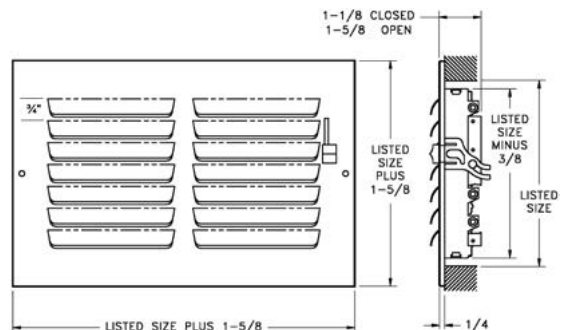
| 301 Available Sizes (in.) |       |   |   |    |    |
|---------------------------|-------|---|---|----|----|
| HT                        | WIDTH |   |   |    |    |
|                           |       | 6 | 8 | 10 | 12 |
| 4                         |       | X | X | X  | X  |
| 6                         | X     | X | X | X  | X  |
| 8                         |       | X | X | X  | X  |
| 10                        |       |   | X |    |    |
| 12                        |       |   |   | X  |    |



### A301 Register

- Aluminum one-piece stamped-face curved-blade construction
- For sidewall or ceiling application
- One-way deflection
- One-way air pattern
- Galvanized multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

| A301 Available Sizes (in.) |       |   |   |    |    |
|----------------------------|-------|---|---|----|----|
| HT                         | WIDTH |   |   |    |    |
|                            |       | 6 | 8 | 10 | 12 |
| 4                          |       | X | X | X  |    |
| 6                          | X     | X | X | X  | X  |
| 8                          |       | X | X | X  | X  |
| 10                         |       |   | X |    |    |



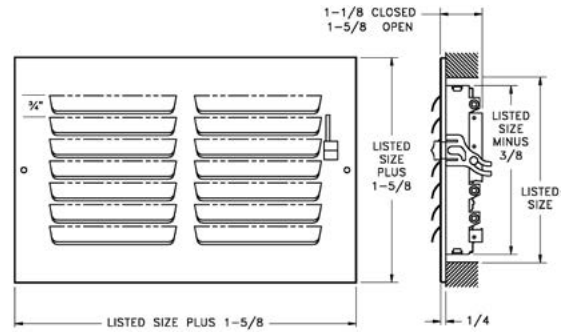
# Sidewall Registers & Grilles



### 302 Register

- All-steel one-piece stamped-face curved-blade construction
- Two-way deflection
- Two-way air pattern
- For sidewall or ceiling application
- Multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

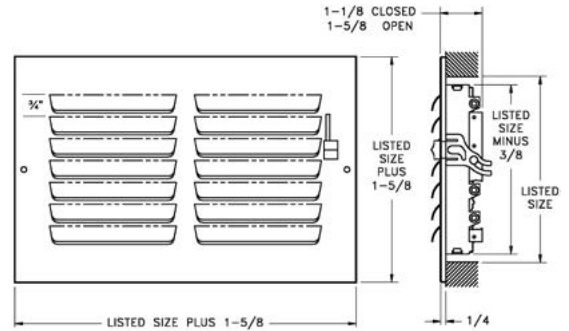
| 302 Available Sizes (in.) |       |   |    |    |
|---------------------------|-------|---|----|----|
| HT                        | WIDTH |   |    |    |
|                           |       | 8 | 10 | 12 |
| 4                         | X     |   |    |    |
| 6                         | X     | X | X  | X  |
| 8                         | X     | X | X  | X  |



### A302 Register

- Aluminum one-piece stamped-face curved-blade construction
- For sidewall or ceiling application
- Two-way deflection
- Two-way air pattern
- Galvanized multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

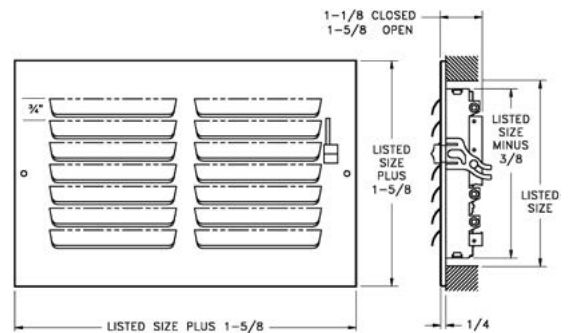
| A302 Available Sizes (in.) |       |    |
|----------------------------|-------|----|
| HT                         | WIDTH |    |
|                            |       | 10 |
| 6                          | X     | X  |
| 8                          |       | X  |
| 10                         | X     |    |



### 303 Register

- All-steel one-piece stamped-face curved-blade construction
- Three-way deflection
- Three-way air pattern
- For sidewall or ceiling application
- Multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

| 303 Available Sizes (in.) |       |   |   |    |    |    |
|---------------------------|-------|---|---|----|----|----|
| HT                        | WIDTH |   |   |    |    |    |
|                           |       | 6 | 8 | 10 | 12 | 14 |
| 4                         |       | X | X |    | X  |    |
| 6                         | X     | X | X | X  | X  | X  |
| 8                         |       | X | X | X  | X  |    |
| 10                        |       |   | X |    |    |    |
| 12                        |       |   |   | X  |    |    |

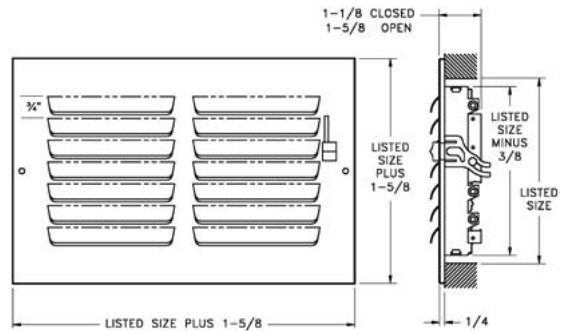




### A303 Register

- Aluminum one-piece stamped-face curved-blade construction
- For sidewall or ceiling application
- Three-way deflection
- Three-way air pattern
- Galvanized multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

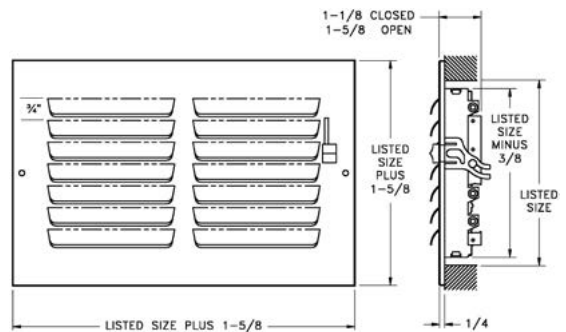
| A303 Available Sizes (in.) |       |   |   |    |    |
|----------------------------|-------|---|---|----|----|
| HT                         | WIDTH |   |   |    |    |
|                            |       | 6 | 8 | 10 | 12 |
| 4                          |       | X |   |    |    |
| 6                          | X     |   | X | X  | X  |
| 8                          |       | X | X | X  |    |
| 10                         |       |   | X |    |    |
| 12                         |       |   |   | X  |    |



### 304 Register

- All-steel one-piece stamped-face curved-blade construction
- Four-way deflection
- Four-way air pattern
- For sidewall or ceiling application
- Multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

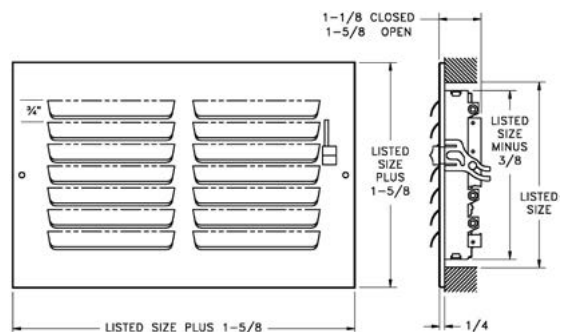
| 304 Available Sizes (in.) |       |   |   |    |    |
|---------------------------|-------|---|---|----|----|
| HT                        | WIDTH |   |   |    |    |
|                           |       | 6 | 8 | 10 | 12 |
| 6                         | X     |   |   |    |    |
| 8                         |       | X |   |    |    |
| 10                        |       |   | X |    |    |
| 12                        |       |   |   | X  |    |
| 14                        |       |   |   |    | X  |



### A304 Register

- Aluminum one-piece stamped-face curved-blade construction
- For sidewall or ceiling application
- Four-way deflection
- Four-way air pattern
- Galvanized multi-shutter valve
- Listed heights 10" and larger require double valves
- Bright White enamel finish

| A304 Available Sizes (in.) |       |   |   |    |
|----------------------------|-------|---|---|----|
| HT                         | WIDTH |   |   |    |
|                            |       | 6 | 8 | 10 |
| 6                          | X     |   |   |    |
| 8                          |       | X |   |    |
| 10                         |       |   | X |    |
| 12                         |       |   |   | X  |

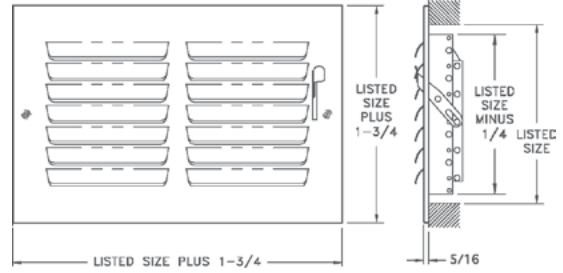




### 300M Series Register

- All-steel construction with metal handle
- Stamped curved-blade supply register with multi-louver damper for ceiling or sidewall installation
- Stamped, one-piece face with multi-louver damper for volume control
- Available in 1-way, 2-way, 3-way and 4-way airflow patterns
- Bright White finish

| 301M Available Sizes (in.) |       |   |    |    |    |
|----------------------------|-------|---|----|----|----|
| HT                         | WIDTH |   |    |    |    |
|                            | 6     | 8 | 10 | 12 | 14 |
| 4                          |       | X |    | X  |    |
| 6                          | X     | X | X  | X  | X  |
| 8                          |       | X | X  | X  | X  |
| 10                         |       |   | X  |    | X  |
| 12                         |       |   |    | X  |    |



| 302M Available Sizes (in.) |       |    |
|----------------------------|-------|----|
| HT                         | WIDTH |    |
|                            | 10    | 12 |
| 6                          | X     | X  |
| 8                          | X     | X  |
| 10                         | X     |    |
| 12                         |       | X  |

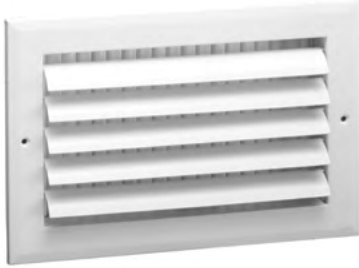


| 303M Available Sizes (in.) |       |   |    |    |    |
|----------------------------|-------|---|----|----|----|
| HT                         | WIDTH |   |    |    |    |
|                            | 6     | 8 | 10 | 12 | 14 |
| 4                          |       | X |    |    |    |
| 6                          | X     | X | X  | X  | X  |
| 8                          |       | X | X  | X  | X  |
| 10                         |       |   | X  |    | X  |
| 12                         |       |   |    | X  |    |



| 304M Available Sizes (in.) |       |   |    |    |    |
|----------------------------|-------|---|----|----|----|
| HT                         | WIDTH |   |    |    |    |
|                            | 6     | 8 | 10 | 12 | 14 |
| 6                          | X     |   |    |    |    |
| 8                          |       | X |    |    |    |
| 10                         |       |   | X  |    |    |
| 12                         |       |   |    | X  |    |
| 14                         |       |   |    |    | X  |

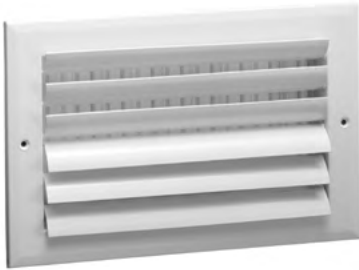
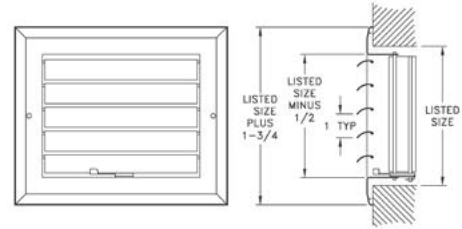
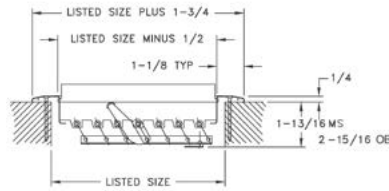




### A611MS/A611OB Register

- Aluminum face/fin construction
- For sidewall or ceiling application
- One-way deflection
- One-way air pattern
- Adjustable curved blades increase deflection control
- Galvanized multi-shutter valve or opposed-blade damper
- Bright White finish

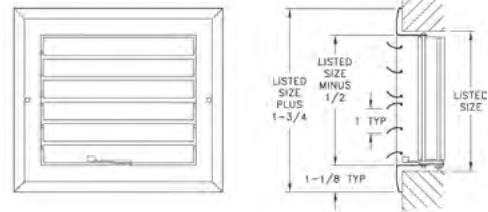
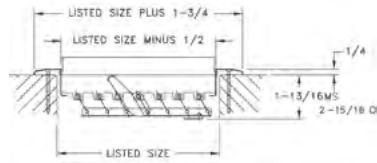
| A611 Available Sizes (in.) |       |   |   |    |    |
|----------------------------|-------|---|---|----|----|
| HT                         | WIDTH |   |   |    |    |
|                            |       | 6 | 8 | 10 | 12 |
| 4                          |       | X | X | X  |    |
| 6                          | X     |   | X | X  | X  |
| 8                          |       | X | X | X  | X  |
| 10                         |       |   | X |    |    |
| 12                         |       |   |   | X  |    |



### A612MS/A612OB Register

- Aluminum face/fin construction
- For sidewall or ceiling application
- Two-way deflection
- Two-way air pattern
- Adjustable curved blades increase deflection control
- Galvanized multi-shutter valve or opposed-blade damper
- Bright White finish

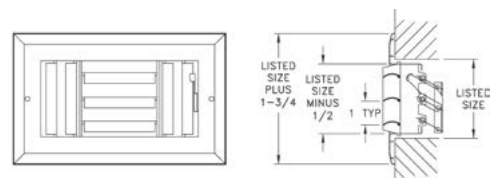
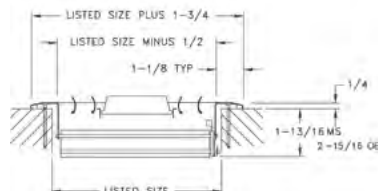
| A612 Available Sizes (in.) |       |   |    |    |
|----------------------------|-------|---|----|----|
| HT                         | WIDTH |   |    |    |
|                            |       | 8 | 10 | 12 |
| 6                          |       | X | X  | X  |
| 8                          | X     |   | X  | X  |
| 10                         |       | X |    |    |
| 12                         |       |   | X  |    |



### A613MS/A613OB Register

- Aluminum face/fin construction
- For sidewall or ceiling application
- Three-way deflection
- Three-way air pattern
- Adjustable curved blades increase deflection control
- Galvanized multi-shutter valve or opposed-blade damper
- Bright White finish

| A613 Available Sizes (in.) |       |   |   |    |    |
|----------------------------|-------|---|---|----|----|
| HT                         | WIDTH |   |   |    |    |
|                            |       | 6 | 8 | 10 | 12 |
| 4                          |       | X | X |    |    |
| 6                          | X     |   | X | X  | X  |
| 8                          |       | X |   | X  | X  |
| 10                         |       |   | X |    |    |
| 12                         |       |   |   | X  |    |
| 14                         |       |   |   |    | X  |



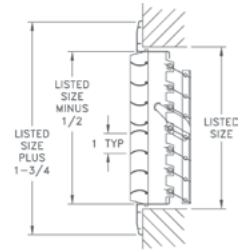
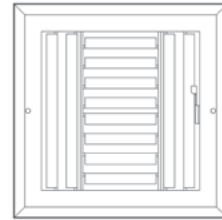
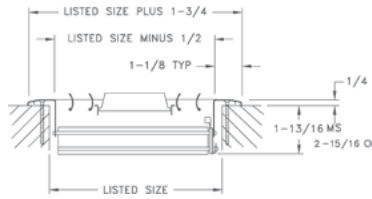
# Sidewall Registers & Grilles



## A614MS/A614OB Register

- Aluminum face/fin construction
- For sidewall or ceiling application
- Four-way deflection
- Four-way air pattern
- Adjustable curved blades increase deflection control
- Galvanized multi-shutter valve or opposed-blade damper
- Bright White finish

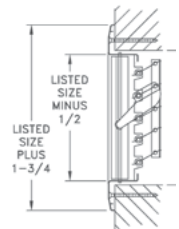
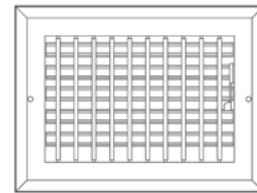
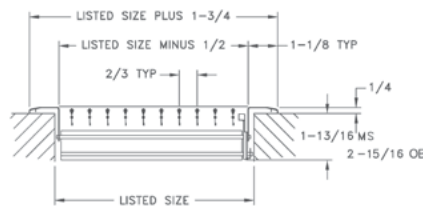
| A614 Available Sizes (in.) |       |   |    |    |    |
|----------------------------|-------|---|----|----|----|
| HT                         | WIDTH |   |    |    |    |
|                            | 6     | 8 | 10 | 12 | 14 |
| 6                          | X     |   |    |    |    |
| 8                          |       | X |    |    |    |
| 10                         |       |   | X  |    |    |
| 12                         |       |   |    | X  |    |
| 14                         |       |   |    |    | X  |



## A618MS/A618OB Register

- Aluminum face/fin construction
- Adjustable straight fins provides individual deflection control
- Stamped face margins eliminate mitered corners and rough edges
- Galvanized multi-shutter valve or opposed-blade damper
- Bright White finish

| A618 Available Sizes (in.) |       |   |    |    |    |
|----------------------------|-------|---|----|----|----|
| HT                         | WIDTH |   |    |    |    |
|                            | 6     | 8 | 10 | 12 | 14 |
| 4                          |       | X | X  | X  | X  |
| 6                          | X     | X | X  | X  | X  |
| 8                          |       | X | X  | X  | X  |
| 10                         |       |   | X  |    |    |
| 12                         |       |   |    | X  |    |
| 14                         |       |   |    |    | X  |

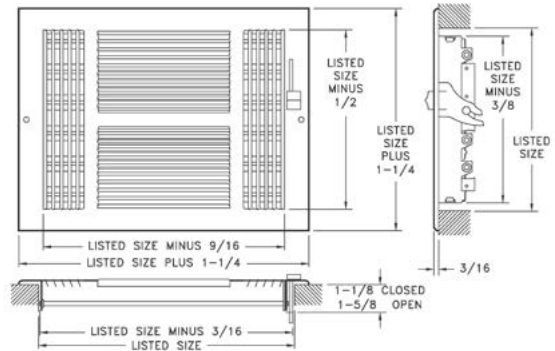




### 621 Register

- All-steel construction
- For heating or cooling
- Ideal for shallow duct installations
- Used for ceiling or sidewall installations
- Four-way deflection
- 1/3" spaced fins set at 20 degrees
- Multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Bright White finish

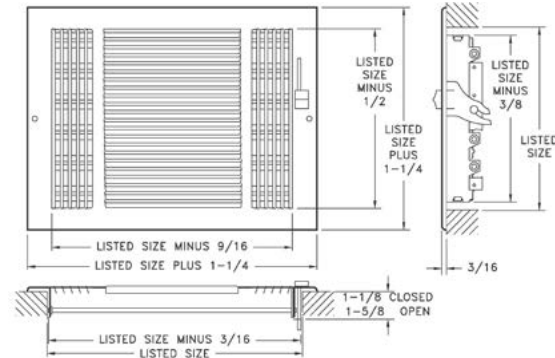
| 621 Available Sizes (in.) |       |   |    |    |    |    |
|---------------------------|-------|---|----|----|----|----|
| HT                        | WIDTH |   |    |    |    |    |
|                           | 6     | 8 | 10 | 12 | 14 | 16 |
| 6                         | X     |   |    |    |    |    |
| 8                         |       | X |    |    |    |    |
| 10                        |       |   | X  |    |    |    |
| 12                        |       |   |    | X  |    |    |
| 14                        |       |   |    |    | X  |    |
| 16                        |       |   |    |    |    | X  |



### 631 Register

- All-steel construction
- Ideal for shallow duct installations
- Used for ceiling or sidewall installations
- For heating or cooling
- Three-way deflection
- 1/3" spaced fins set at 20 degrees
- Multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Bright White finish

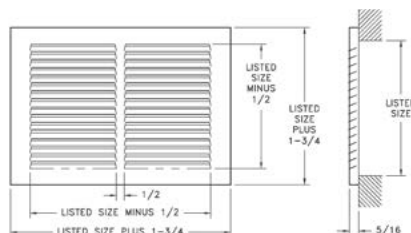
| 631 Available Sizes (in.) |       |    |    |    |    |
|---------------------------|-------|----|----|----|----|
| HT                        | WIDTH |    |    |    |    |
|                           | 8     | 10 | 12 | 14 | 16 |
| 4                         | X     | X  | X  | X  |    |
| 6                         | X     | X  | X  | X  | X  |
| 8                         |       | X  | X  | X  |    |



### 650 Return Air Grille

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Exceptional free area
- 5/16" Margin Turnback
- Bright White finish

| 650 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  |    |
| 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  | X  |
| 12                        |       |   | X  | X  | X  | X  | X  | X  | X  | X  | X  |
| 14                        | X     | X | X  | X  | X  | X  | X  | X  | X  | X  |    |
| 16                        |       |   |    | X  | X  | X  | X  | X  | X  |    |    |
| 18                        |       |   |    | X  | X  |    | X  | X  | X  |    |    |
| 20                        |       |   | X  | X  | X  | X  |    | X  | X  | X  |    |
| 24                        | X     |   | X  | X  | X  | X  | X  | X  | X  |    |    |
| 25                        |       |   |    |    |    |    |    | X  |    |    |    |
| 30                        |       |   |    |    | X  |    |    | X  | X  | X  |    |



Contact factory for sizes not listed.

**Note:** When ordering, specify horizontal dimension first.

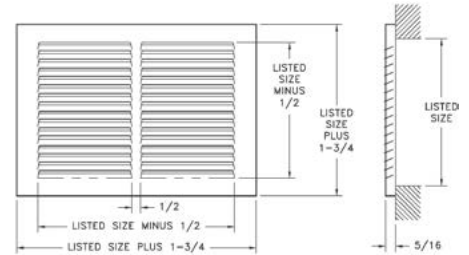
# Sidewall Registers & Grilles



## A650 Return Air Grille

- Aluminum construction
- 1/3" spaced fins set at 20 degrees
- Exceptional free area
- 5/16" Margin Turnback
- Bright White finish

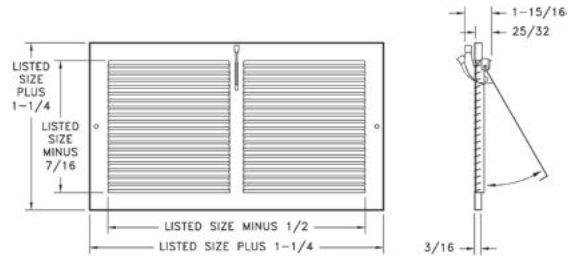
| A650 Available Sizes (in.) |       |   |    |    |    |
|----------------------------|-------|---|----|----|----|
| HT                         | WIDTH |   |    |    |    |
|                            |       | 6 | 10 | 12 | 14 |
| 6                          | X     |   | X  |    |    |
| 8                          |       |   |    | X  |    |
| 10                         |       | X |    |    |    |
| 12                         |       |   | X  |    | X  |
| 14                         |       |   |    | X  |    |



## 651 Register

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Volume-control damper
- Bright White finish

| 651 Available Sizes (in.) |       |   |    |    |
|---------------------------|-------|---|----|----|
| HT                        | WIDTH |   |    |    |
|                           |       | 8 | 10 | 12 |
| 4                         | X     | X | X  |    |
| 6                         | X     | X | X  | X  |



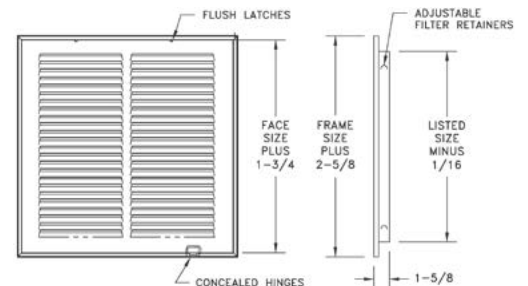
## 659 Return Air Filter Grille

- All-steel construction
- 1/3" spaced fins set at 20 degrees
- Effectively conceals filter
- Use standard 1" thick disposable filters (not included)
- Removable face for easy installation and cleaning
- Equipped with adjustable filter retainers
- Bright White finish
- Some sizes are available factory installed filters (Model 659FIL). Contact factory for details.

| 659 Standard Sizes (in.) |       |    |    |    |    |    |    |    |    |    |
|--------------------------|-------|----|----|----|----|----|----|----|----|----|
| HT                       | WIDTH |    |    |    |    |    |    |    |    |    |
|                          |       | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 25 | 30 |
| 6                        |       | X  | X  |    |    |    | X  |    | X  |    |
| 8                        |       |    |    |    |    |    | X  |    | X  |    |
| 10                       | X     |    |    |    |    | X  | X  |    | X  |    |
| 12                       |       | X  |    |    | X  | X  | X  |    | X  |    |
| 14                       |       |    | X  |    |    | X  | X  | X  | X  | X  |
| 16                       |       |    |    | X  |    | X  | X  | X  | X  |    |
| 18                       |       |    |    |    | 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:** When ordering, specify horizontal dimension first.

Contact factory for sizes not listed.



# Sidewall Registers & Grilles



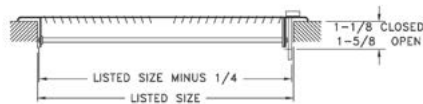
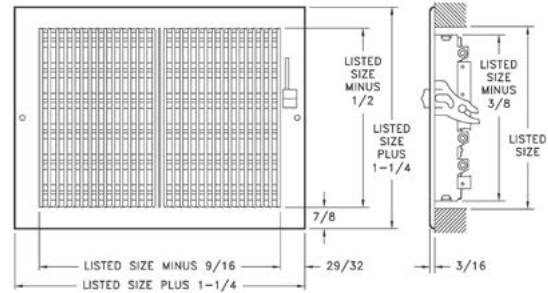
## 661 Register

- All-steel construction
- Used for ceiling or sidewall installations
- For heating or cooling
- Ideal for shallow duct installations
- Two-way deflection
- 1/3" spaced fins set at 20 degrees
- Galvanized multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Bright White finish

Available with fusible link option, limited sizes (not UL-listed or fire-rated)

| 661 Standard Sizes (in.) |       |   |    |    |    |    |    |    |    |    |
|--------------------------|-------|---|----|----|----|----|----|----|----|----|
| HT                       | WIDTH |   |    |    |    |    |    |    |    |    |
|                          | 6     | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 |
| 4                        | X     | X | X  | X  | X  | X  |    |    | X  |    |
| 5                        |       | X | X  | X  | X  |    |    |    |    |    |
| 6                        | X     | X | X  | X  | X  | X  | X  | X  | X  | X  |
| 8                        |       | X | X  | X  | X  | X  | X  | X  | X  | X  |
| 10                       |       |   | X  | X  |    |    |    |    |    |    |
| 12                       |       |   |    | X  |    |    |    |    |    |    |

**Note:** When ordering sidewall products, specify horizontal (width) dimension first.

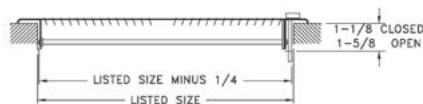
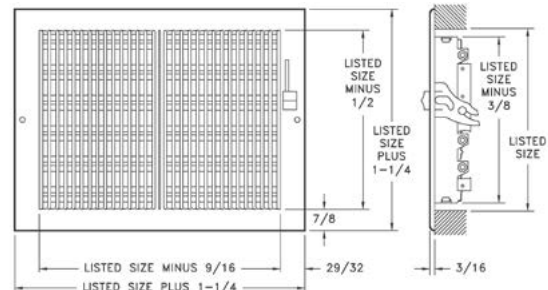


## A661 Register

- Stamped aluminum construction
- Used for ceiling or sidewall installations
- For heating or cooling
- Ideal for shallow duct installations
- Two-way deflection
- 1/3" spaced fins set at 20 degrees
- Galvanized multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Bright White finish

| A661 Available Sizes (in.) |       |    |    |    |
|----------------------------|-------|----|----|----|
| HT                         | WIDTH |    |    |    |
|                            | 8     | 10 | 12 | 14 |
| 4                          | X     | X  | X  |    |
| 6                          |       | X  | X  | X  |

Contact factory for sizes not listed.



# Sidewall Registers & Grilles

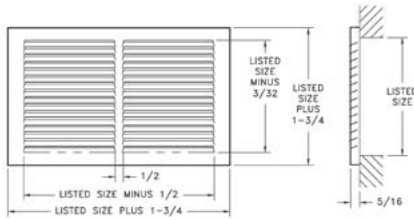


## 672 Return Air Grille

- All-steel construction
- 1/2" spaced fins set at 40 degrees
- Exceptional free area
- 5/16" Margin Turnback
- Bright White finish

| 672 Available Sizes (in.) |       |   |    |    |    |    |    |    |    |    |    |    |
|---------------------------|-------|---|----|----|----|----|----|----|----|----|----|----|
| HT                        | WIDTH |   |    |    |    |    |    |    |    |    |    |    |
|                           | 6     | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 25 | 30 | 36 |
| 4                         | X     | X | X  | X  | X  |    | X  |    | X  |    | X  |    |
| 6                         | X     | X | X  | X  | X  | X  | X  | X  |    |    | X  |    |
| 8                         |       | X | X  | X  | X  | X  | X  | X  |    |    | X  | X  |
| 10                        |       |   | X  | X  | X  | X  | X  | X  |    |    | X  | X  |
| 12                        | 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  |    |    |
| 18                        |       |   |    | X  | X  |    | X  | X  | X  |    | X  |    |
| 20                        |       |   | X  | X  | X  | X  |    | X  | X  | X  | X  |    |
| 24                        |       |   | X  | X  | X  | X  | X  | X  | X  |    | X  |    |
| 25                        |       |   |    |    | X  | X  |    | X  |    | X  |    |    |
| 30                        |       |   |    |    | X  | X  |    | X  | X  |    | X  |    |

Contact factory for sizes not listed.

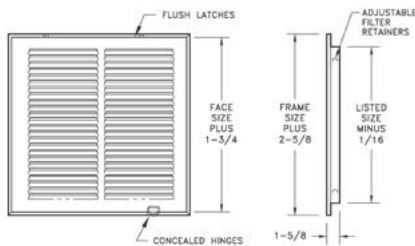


## 673 Return Air Filter Grille

- All-steel construction
- 1/2" spaced fins set at 40 degrees
- Effectively conceals filter
- Use standard 1" thick disposable filters (not included)
- Removable face for easy installation and cleaning
- Equipped with adjustable filter retainers
- Bright White finish

| 673 Standard Sizes (in.) |       |    |    |    |    |    |    |    |    |    |    |    |
|--------------------------|-------|----|----|----|----|----|----|----|----|----|----|----|
| HT                       | WIDTH |    |    |    |    |    |    |    |    |    |    |    |
|                          | 10    | 12 | 14 | 16 | 18 | 20 | 24 | 25 | 30 | 32 | 36 | 40 |
| 6                        | X     |    | X  |    |    |    | X  |    | X  |    |    |    |
| 8                        |       |    | X  |    |    | X  |    | X  |    |    |    |    |
| 10                       | X     |    |    |    |    | X  | X  |    | X  |    |    |    |
| 12                       |       | X  |    |    | X  | X  | X  |    | X  |    | X  |    |
| 14                       |       |    | X  |    |    | X  | X  | X  | X  |    | X  |    |
| 16                       |       |    | X  | X  |    | X  | X  | X  | X  |    | X  |    |
| 18                       |       | X  |    |    | X  | X  | X  |    | X  |    |    |    |
| 20                       | X     | X  | X  | X  | X  | X  | X  | X  | X  |    |    | X  |
| 24                       |       | X  | X  | X  | X  | X  | X  |    | X  |    | X  |    |
| 25                       |       |    | X  | X  |    | X  |    | X  |    | X  |    |    |
| 30                       |       | X  | X  | X  |    | X  | X  | X  | X  |    |    |    |
| 32                       |       |    |    | X  |    | X  |    | X  |    |    |    |    |
| 36                       |       | X  |    | X  |    | X  | X  |    |    |    |    |    |
| 40                       |       |    |    |    |    | X  |    |    |    |    |    |    |

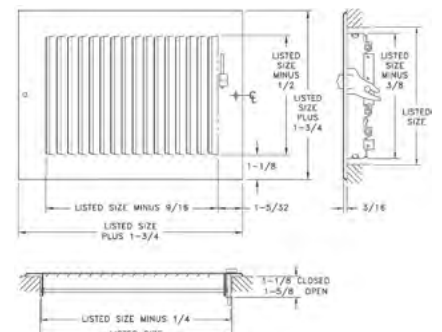
Contact factory for sizes not listed.



## 681/A681 Register

- All-steel construction
- Aluminum face steel damper (A681)
- Used for ceiling or sidewall installations
- Ideal for shallow duct installations
- One-way deflection
- 1/2" spaced fins set at 40 degrees
- Multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Bright White finish

| 681 Available Sizes (in.) |       |    |    |    |    |    |    |
|---------------------------|-------|----|----|----|----|----|----|
| HT                        | WIDTH |    |    |    |    |    |    |
|                           | 8     | 10 | 12 | 14 | 16 | 18 | 20 |
| 4                         | X     |    |    |    |    |    |    |
| 6                         | X     | X  | X  | X  | X  | X  | X  |



Engineering Data on Page 48-49

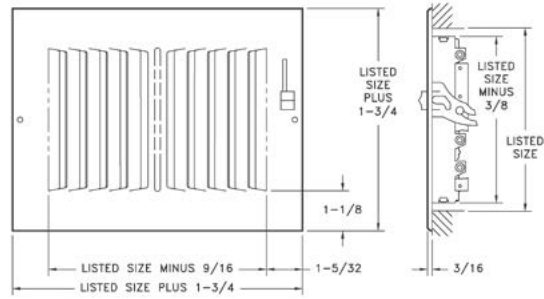


## 682/A682 Register

- All-steel construction
- Aluminum face steel damper (A682)
- Used for ceiling or sidewall installations
- Ideal for shallow duct installations
- Two-way deflection
- 1/2" spaced fins set at 40 degrees
- Multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Bright White finish

Available with fusible link option, limited sizes (not UL-listed or fire-rated)

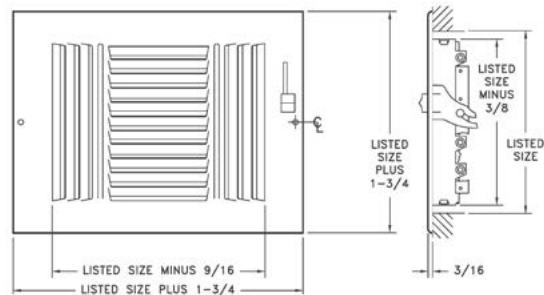
| 682 Available Sizes (in.) |       |   |    |    |    |    |    |    |    |
|---------------------------|-------|---|----|----|----|----|----|----|----|
| HT                        | WIDTH |   |    |    |    |    |    |    |    |
|                           | 6     | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
| 4                         | X     | X | X  | X  | X  |    |    |    |    |
| 5                         |       |   | X  | X  |    |    |    |    |    |
| 6                         | X     | X | X  | X  | X  | X  | X  | X  | X  |
| 8                         |       | X | X  | X  | X  | X  | X  | X  | X  |
| 10                        |       |   | X  |    |    |    |    |    |    |
| 12                        |       |   |    | X  |    |    |    |    |    |



## 683/A683 Register

- All-steel construction
- Aluminum face steel damper (A683)
- Used for ceiling or sidewall installations
- Ideal for shallow duct installations
- Three-way deflection
- 1/2" spaced fins set at 40 degrees
- Multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Bright White finish

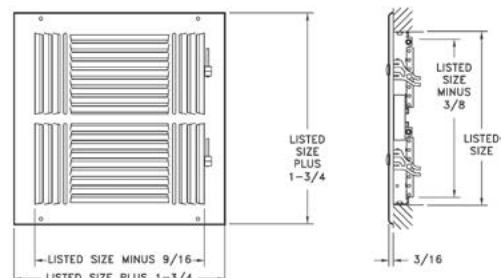
| 683 Available Sizes (in.) |       |   |    |    |    |    |
|---------------------------|-------|---|----|----|----|----|
| HT                        | WIDTH |   |    |    |    |    |
|                           | 6     | 8 | 10 | 12 | 14 | 16 |
| 4                         |       | X | X  | X  | X  |    |
| 6                         | X     | X | X  | X  | X  | X  |
| 8                         |       | X | X  | X  | X  | X  |
| 10                        |       |   | X  |    |    |    |
| 12                        |       |   |    | X  |    |    |
| 14                        |       |   |    |    | X  |    |
| 16                        |       |   |    |    |    | X  |



## 684/A684 Register

- All-steel construction
- Aluminum face steel damper (A684)
- Used for ceiling or sidewall installations
- Ideal for shallow duct installations
- Four-way deflection
- 1/2" spaced fins set at 40 degrees
- Multi-shutter valve
- 1-5/8" depth when fully opened
- Interlocking valve louvers for positive shut-off
- Listed heights 10" and larger require double valves
- Bright White finish

| 684 Available Sizes (in.) |       |   |    |    |    |    |
|---------------------------|-------|---|----|----|----|----|
| HT                        | WIDTH |   |    |    |    |    |
|                           | 6     | 8 | 10 | 12 | 14 | 16 |
| 6                         | X     |   |    |    |    |    |
| 8                         |       | X |    |    |    |    |
| 10                        |       |   | X  |    |    |    |
| 12                        |       |   |    | X  |    |    |
| 14                        |       |   |    |    | X  |    |
| 16                        |       |   |    |    |    | X  |



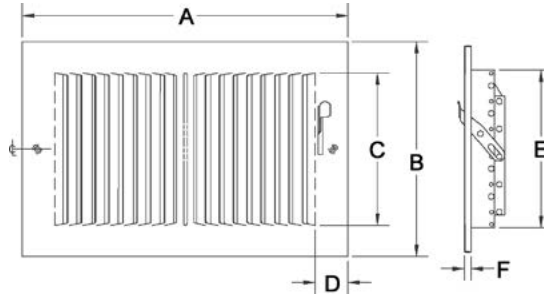
# Sidewall Registers & Grilles



## 680M Series Register

- All-steel construction with metal handle
- Stamped, straight-blade supply register with multi-louver damper for ceiling or sidewall installation
- Stamped, one-piece face with multi-louver damper for volume control
- Fins spaced on 1/2" centers at 40 degrees
- Available in 1-way, 2-way, 3-way and 4-way airflow patterns
- Bright White finish

| 681M Available Sizes (in.) |       |    |    |    |    |    |    |
|----------------------------|-------|----|----|----|----|----|----|
| HT                         | WIDTH |    |    |    |    |    |    |
|                            | 8     | 10 | 12 | 14 | 16 | 18 | 20 |
| 4                          | X     |    |    |    |    |    |    |
| 6                          |       | X  | X  | X  | X  |    | X  |
| 8                          |       |    | X  |    |    |    |    |



| A                       | B                       | C                      | D       | E                      | F     |
|-------------------------|-------------------------|------------------------|---------|------------------------|-------|
| LISTED SIZE PLUS 1-3/4" | LISTED SIZE PLUS 1-3/4" | LISTED SIZE MINUS 5/8" | 1-3/16" | LISTED SIZE MINUS 1/4" | 5/16" |



| 682M Available Sizes (in.) |       |   |    |    |    |    |
|----------------------------|-------|---|----|----|----|----|
| HT                         | WIDTH |   |    |    |    |    |
|                            | 6     | 8 | 10 | 12 | 14 | 16 |
| 4                          | X     | X | X  | X  | X  |    |
| 6                          | X     | X | X  | X  | X  | X  |
| 8                          |       | X | X  | X  | X  | X  |
| 10                         |       |   | X  |    | X  |    |



| 683M Available Sizes (in.) |       |   |    |    |    |    |
|----------------------------|-------|---|----|----|----|----|
| HT                         | WIDTH |   |    |    |    |    |
|                            | 6     | 8 | 10 | 12 | 14 | 16 |
| 4                          |       | X | X  | X  | X  |    |
| 6                          | X     | X | X  | X  | X  | X  |
| 8                          |       | X | X  | X  | X  | X  |
| 10                         |       |   | X  |    | X  |    |
| 12                         |       |   |    | X  |    |    |



| 684M Available Sizes (in.) |       |   |    |    |    |
|----------------------------|-------|---|----|----|----|
| HT                         | WIDTH |   |    |    |    |
|                            | 6     | 8 | 10 | 12 | 14 |
| 6                          | X     |   |    |    |    |
| 8                          |       | X |    |    |    |
| 10                         |       |   | X  |    |    |
| 12                         |       |   |    | X  |    |
| 14                         |       |   |    |    | X  |

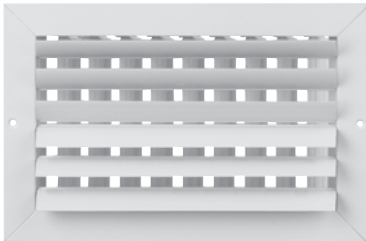




## A711MS Register

- Aluminum construction
- Used for ceiling or sidewall installations
- One-way deflection
- One-way air pattern
- Adjustable curved blades increase deflection control
- Multi-shutter valve
- Bright White finish

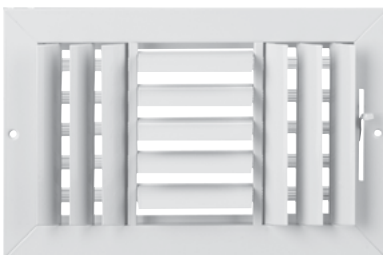
| A711 Available Sizes (inches) |       |   |    |    |    |
|-------------------------------|-------|---|----|----|----|
| Height                        | Width |   |    |    |    |
|                               | 6     | 8 | 10 | 12 | 14 |
| 4                             |       | X | X  |    |    |
| 6                             | X     |   | X  | X  | X  |
| 8                             |       | X | X  | X  | X  |
| 10                            |       |   | X  |    |    |
| 12                            |       |   |    | X  |    |



## A712MS Register

- Aluminum construction
- Used for ceiling or sidewall installations
- Two-way deflection
- Two-way air pattern
- Adjustable curved blades increase deflection control
- Multi-shutter valve
- Bright White finish

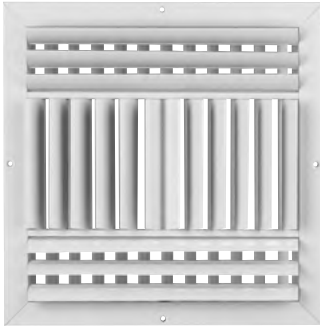
| A712 Available Sizes (inches) |       |    |
|-------------------------------|-------|----|
| Height                        | Width |    |
|                               | 10    | 12 |
| 6                             | X     | X  |
| 8                             |       | X  |
| 10                            | X     |    |
| 12                            |       | X  |



## A713 Register

- Available in a 10" x 10" size
- Aluminum construction
- Used for ceiling or sidewall installations
- Three-way deflection
- Three-way air pattern
- Adjustable curved blades increase deflection control
- Multi-shutter valve
- Bright White finish

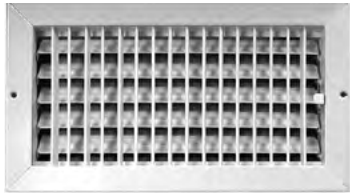
# Sidewall Registers & Grilles



## A714MS Register

- Aluminum construction
- Used for ceiling or sidewall installations
- Four-way deflection
- Four-way air pattern
- Adjustable curved blades increase deflection control
- Multi-shutter valve
- Bright White finish

| A714 Available Sizes (inches) |       |   |    |    |    |
|-------------------------------|-------|---|----|----|----|
| Height                        | Width |   |    |    |    |
|                               | 6     | 8 | 10 | 12 | 14 |
| 6                             | X     |   |    |    |    |
| 8                             |       | X |    |    |    |
| 10                            |       |   | X  |    |    |
| 12                            |       |   |    | X  |    |
| 14                            |       |   |    |    | X  |



## A718MS Register

- Aluminum construction
- Adjustable straight fins provides individual deflection control
- Stamped face margins eliminate mitered corners and rough edges
- Multi-shutter valve
- Bright White finish

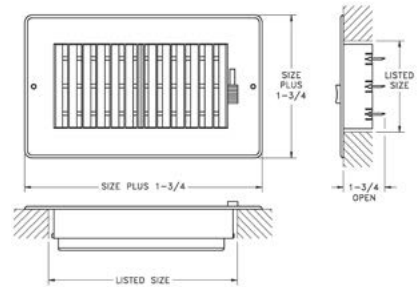
| A718 Available Sizes (inches) |       |    |    |    |
|-------------------------------|-------|----|----|----|
| Height                        | Width |    |    |    |
|                               | 8     | 10 | 12 | 14 |
| 4                             | X     | X  | X  | X  |
| 6                             |       | X  | X  | X  |
| 8                             |       | X  | X  | X  |
| 10                            |       |    |    |    |
| 12                            |       |    |    |    |



### RZ682 Plastic Sidewall/ Ceiling Register

- Engineered polymer construction
- Two-way deflection
- Traditional styling
- Integral multi-shutter damper with easy-to-use damper handle
- For heating or cooling applications
- Bright White finish

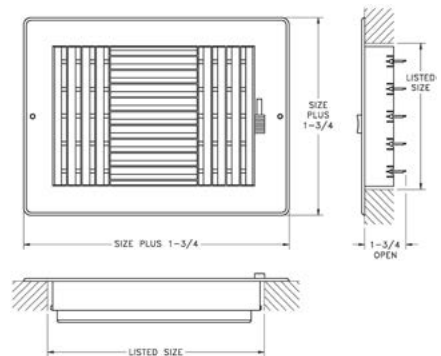
| RZ682 Available Sizes (in.) |       |   |    |    |
|-----------------------------|-------|---|----|----|
| HT                          | WIDTH |   |    |    |
|                             |       | 8 | 10 | 12 |
| 4                           | X     | X |    |    |
| 6                           |       | X | X  | X  |
| 8                           |       | X |    | X  |



### RZ683 Plastic Sidewall/ Ceiling Register

- Engineered polymer construction
- Three-way deflection
- Traditional styling
- Integral multi-shutter damper with easy-to-use damper handle
- For heating or cooling applications
- Bright White finish

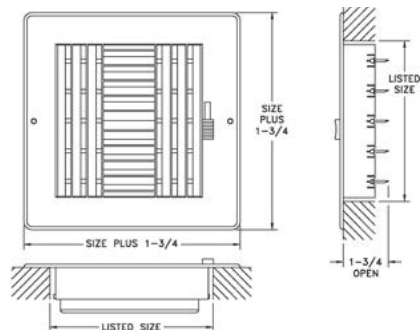
| RZ683 Available Sizes (in.) |       |   |    |    |
|-----------------------------|-------|---|----|----|
| HT                          | WIDTH |   |    |    |
|                             |       | 8 | 10 | 12 |
| 4                           | X     |   |    |    |
| 6                           |       | X | X  | X  |
| 8                           |       | X |    | X  |



### RZ684 Plastic Sidewall/Ceiling Register

- Engineered polymer construction
- Four-way deflection
- Traditional styling
- Integral multi-shutter damper with easy-to-use damper handle
- For heating or cooling applications
- Bright White finish

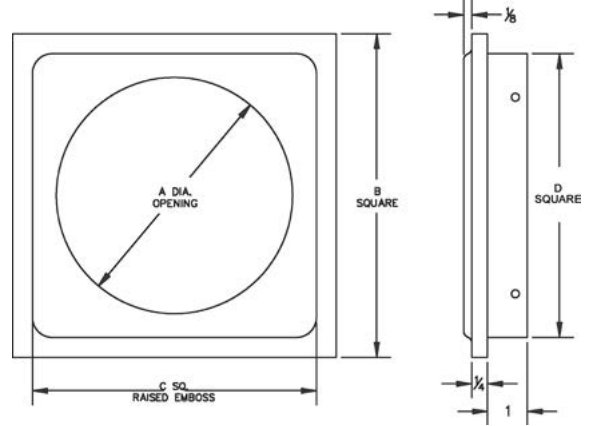
| RZ684 Available Sizes (in.) |       |   |   |    |
|-----------------------------|-------|---|---|----|
| HT                          | WIDTH |   |   |    |
|                             |       | 6 | 8 | 10 |
| 6                           | X     |   |   |    |
| 8                           |       | X |   |    |
| 10                          |       |   | X |    |
| 12                          |       |   |   | X  |





**Laundry Chute Door (LCD)**

- Steel construction
- Spring-hinged, push-in door
- Quiet closing, inner rubber guards
- White, baked enamel finish
- Two sizes available, 10" and 12"
- Not fire-rated



| Model | A<br>Diameter | B<br>Diameter | C<br>Diameter | D<br>Diameter |
|-------|---------------|---------------|---------------|---------------|
| LCD10 | 8-1/2         | 12            | 11            | 9-3/4         |
| LCD12 | 10            | 13-3/4        | 12-1/4        | 11-1/4        |

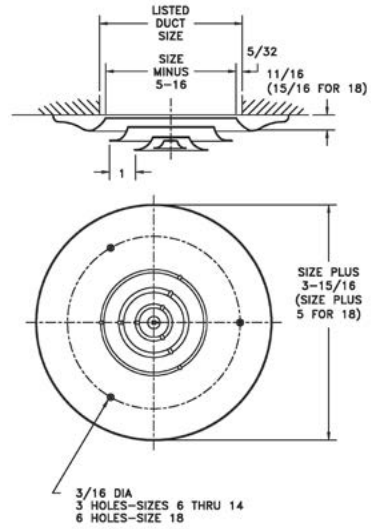


## 16 Ceiling Diffuser

- All-steel construction
- Step-down diffuser rings deflect air stream 360 degrees
- Bright White finish

Only available in sizes shown

| 16 Available Sizes (in.) |  |
|--------------------------|--|
| 6, 8, 10, 12, 14, 18     |  |



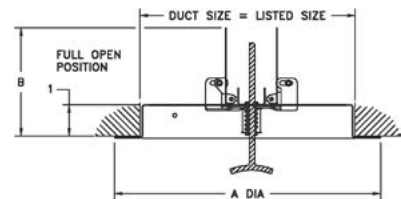
## 12 Butterfly Damper

- All-steel construction
- Controls air volume evenly over entire #16 diffuser
- Removable knob operator for adjustment from closed to fully open
- Golden Sand enamel finish

**Note:** Knob permits diffuser to be held in position while attaching face screws.

Only available in sizes shown

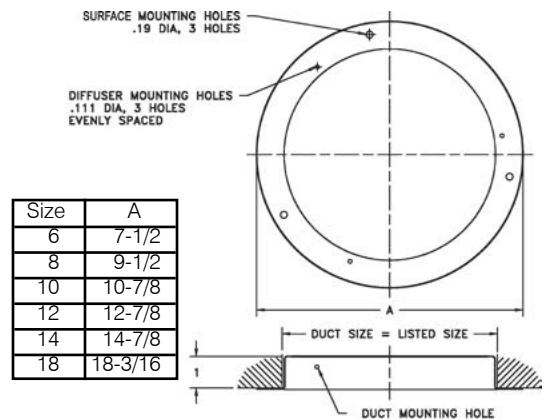
| 12 Available Sizes (in.) |                                 |                                 |
|--------------------------|---------------------------------|---------------------------------|
| Size                     | A                               | B                               |
| 6                        | 7 <sup>1</sup> / <sub>2</sub>   | 3 <sup>11</sup> / <sub>16</sub> |
| 8                        | 9 <sup>1</sup> / <sub>2</sub>   | 4 <sup>11</sup> / <sub>16</sub> |
| 10                       | 10 <sup>7</sup> / <sub>8</sub>  | 5 <sup>11</sup> / <sub>16</sub> |
| 12                       | 12 <sup>7</sup> / <sub>8</sub>  | 6 <sup>11</sup> / <sub>16</sub> |
| 14                       | 14 <sup>7</sup> / <sub>8</sub>  | 7 <sup>11</sup> / <sub>16</sub> |
| 18                       | 18 <sup>3</sup> / <sub>16</sub> | 9 <sup>11</sup> / <sub>16</sub> |



## 11 Duct Ring

- All-steel construction
- For installation of #16 diffuser when not using a damper
- Golden Sand enamel finish

| 11 Available Sizes (in.) |  |
|--------------------------|--|
| 6, 8, 10, 12, 14, 18     |  |

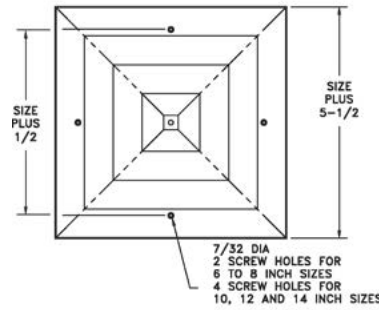
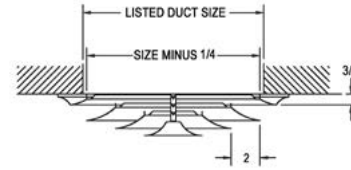




### 24 Square Ceiling Diffuser

- 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            |



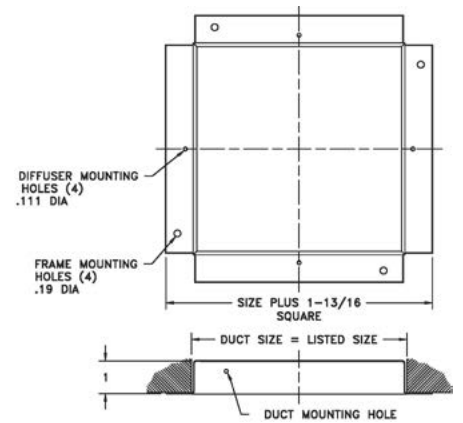
### 21 Installation Frame

- 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 and SDD.**

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

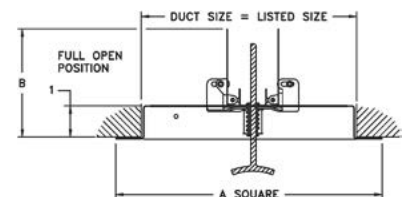


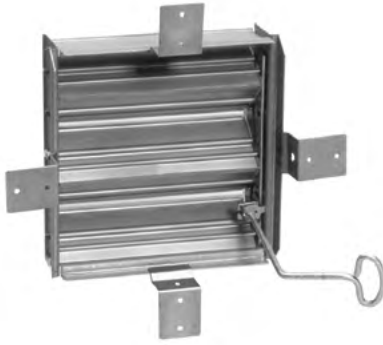
### 22 Butterfly Damper

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

Only available in sizes shown.

| 22 Available Sizes (in.) |                                 |                                 |
|--------------------------|---------------------------------|---------------------------------|
| Size                     | A                               | B                               |
| 6                        | 6 <sup>3</sup> / <sub>16</sub>  | 3 <sup>11</sup> / <sub>16</sub> |
| 8                        | 8 <sup>7</sup> / <sub>16</sub>  | 4 <sup>11</sup> / <sub>16</sub> |
| 10                       | 10 <sup>2</sup> / <sub>16</sub> | 5 <sup>11</sup> / <sub>16</sub> |
| 12                       | 12 <sup>3</sup> / <sub>16</sub> | 6 <sup>11</sup> / <sub>16</sub> |
| 14                       | 14 <sup>3</sup> / <sub>16</sub> | 7 <sup>11</sup> / <sub>16</sub> |

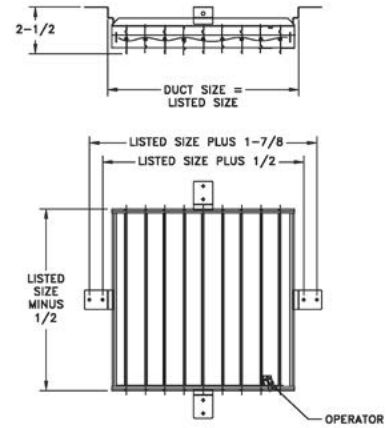




### 23 Opposed-Blade Damper

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

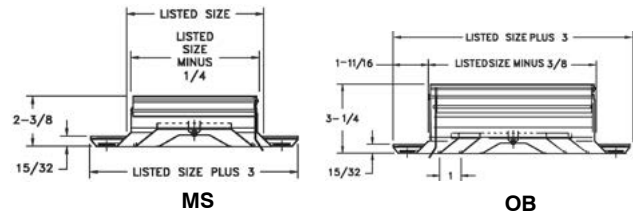
| 23 Available Sizes (in.)             |  |
|--------------------------------------|--|
| 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 |  |



### A501MS/A501OB Square Ceiling Diffuser

- 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

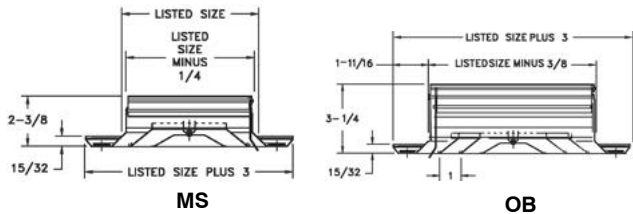
|    |       | A501MS/A501OB (in.) |    |    |    |  |
|----|-------|---------------------|----|----|----|--|
| HT | WIDTH |                     |    |    |    |  |
|    | 6     | 8                   | 10 | 12 | 14 |  |
| 6  | X     |                     |    |    |    |  |
| 8  |       | X                   |    |    |    |  |
| 10 |       |                     | X  |    |    |  |
| 12 |       |                     |    | X  |    |  |
| 14 |       |                     |    |    | X  |  |



### A502MS/A502OB Square Ceiling Diffuser

- Extruded aluminum construction
- Cores flush with margin
- Two-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

|    |       | A502MS/A502OB (in.) |    |    |    |  |
|----|-------|---------------------|----|----|----|--|
| HT | WIDTH |                     |    |    |    |  |
|    | 6     | 8                   | 10 | 12 | 14 |  |
| 6  | X     |                     |    |    |    |  |
| 8  |       | X                   |    |    |    |  |
| 10 |       |                     | X  |    |    |  |
| 12 |       |                     |    | X  |    |  |
| 14 |       |                     |    |    | X  |  |

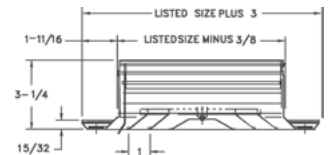
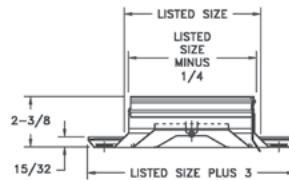




**A503MS/A503OB  
Square Ceiling Diffuser**

- Extruded aluminum construction
- Cores flush with margin
- Three-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

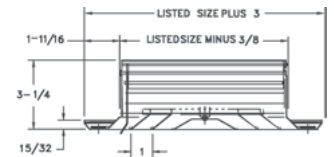
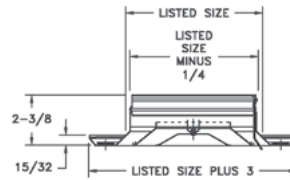
| A503MS/A503OB (in.) |       |   |    |    |    |
|---------------------|-------|---|----|----|----|
| HT                  | WIDTH |   |    |    |    |
|                     | 6     | 8 | 10 | 12 | 14 |
| 6                   | X     |   |    |    |    |
| 8                   |       | X |    |    |    |
| 10                  |       |   | X  |    |    |
| 12                  |       |   |    | X  |    |
| 14                  |       |   |    |    | X  |



**A504MS/A504OB  
Square Ceiling Diffuser**

- Extruded aluminum construction
- Cores flush with margin
- Four-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

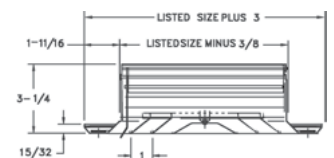
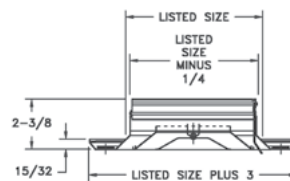
| A504MS/A504OB (in.) |       |   |    |    |    |
|---------------------|-------|---|----|----|----|
| HT                  | WIDTH |   |    |    |    |
|                     | 6     | 8 | 10 | 12 | 14 |
| 6                   | X     |   |    |    |    |
| 8                   |       | X |    |    |    |
| 10                  |       |   | X  |    |    |
| 12                  |       |   |    | X  |    |
| 14                  |       |   |    |    | X  |



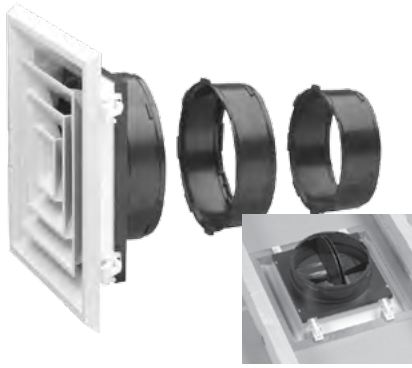
**A505MS/A505OB  
Square Ceiling Diffuser**

- Extruded aluminum construction
- Cores flush with margin
- Two-way corner 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

| A505MS/A505OB (in.) |       |   |    |    |    |
|---------------------|-------|---|----|----|----|
| HT                  | WIDTH |   |    |    |    |
|                     | 6     | 8 | 10 | 12 | 14 |
| 6                   | X     |   |    |    |    |
| 8                   |       | X |    |    |    |
| 10                  |       |   | X  |    |    |
| 12                  |       |   |    | X  |    |
| 14                  |       |   |    |    | X  |





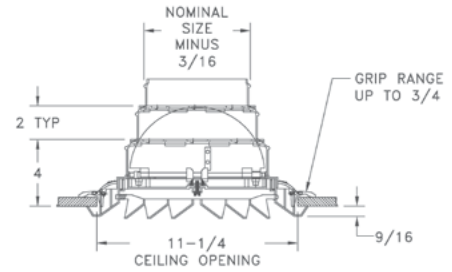


T-Bar Backer Plate or Rafter Rough-In Plate Available

## RZ500 Plastic 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

| RZ500 Available Size (in.) |
|----------------------------|
| 12 x 12                    |



4-WAY



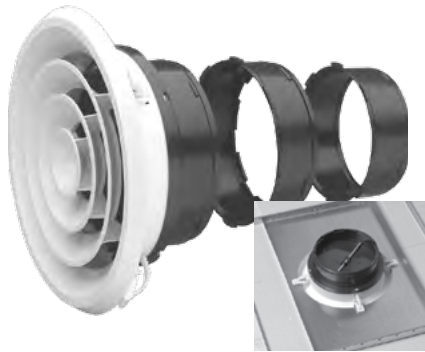
RZ503



RZ504



RZ505

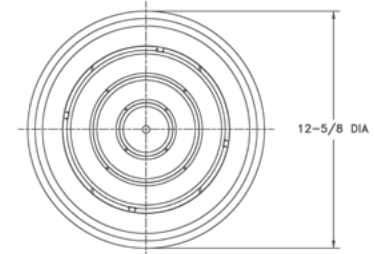
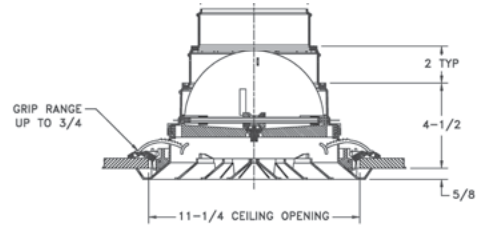


T-Bar Backer Plate or Rafter Rough-In Plate Available

## RZ16 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

| RZ16 Available Size (in.) |
|---------------------------|
| 12                        |



# Ceiling Diffusers



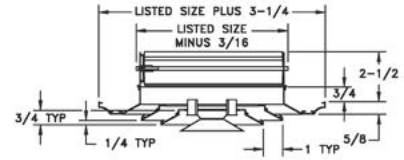
## SD/SDD Diffuser

- Extruded aluminum construction
- Annular rings to provide minimum resistance
- Face only on SD
- Opposed-blade aluminum damper available with SDD
- Bright White finish

Only available in sizes shown

**Note:** SDD in size 20" x 20" is furnished with two separate dampers and operators.

| SD/SDD Available Sizes (in.) |       |   |    |    |    |    |    |    |
|------------------------------|-------|---|----|----|----|----|----|----|
| HT                           | WIDTH |   |    |    |    |    |    |    |
|                              | 6     | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 6                            | X     |   |    |    |    |    |    |    |
| 8                            |       | X |    |    |    |    |    |    |
| 10                           |       |   | X  |    |    |    |    |    |
| 12                           |       |   |    | X  |    |    |    |    |
| 14                           |       |   |    |    | X  |    |    |    |
| 16                           |       |   |    |    |    | X  |    |    |
| 18                           |       |   |    |    |    |    | X  |    |
| 20                           |       |   |    |    |    |    |    | X  |



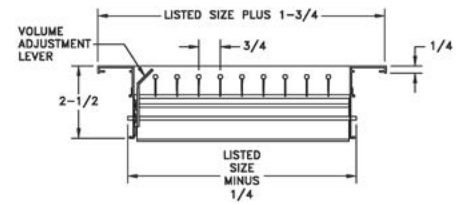
SDD



## ECFM Aluminum Diffuser

- Integral opposed-blade damper with lever for face operation
- Center mullions provided on sizes over 18" x 18"
- All extruded aluminum construction
- Furnished with mounting screws and optional gasket
- Adjustable bars
- Bright White finish

| ECFM Available Sizes (in.)                      |
|---|
| 12x12, 14x14, 16x16, 18x18, 20x20, 22x22, 24x24 |



## ECBX 4-way Ceiling Diffuser Box

| ECBX Available Sizes (in.)                             |
|--|
| 14x14, 16x16, 18x18, 20x20, 22x22, 24x24, 30x30, 36x36 |



- Adjustable dampers provide directional airflow or closure capabilities
- Mounting holes provided for easy installation
- Heavy-duty steel construction
- For 24x24 T-Bar installation, order ECBX-T
- Bright White finish
- Available in T-Bar version, see page 102

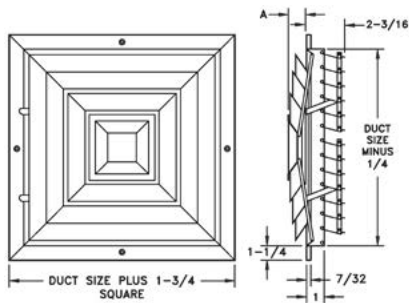
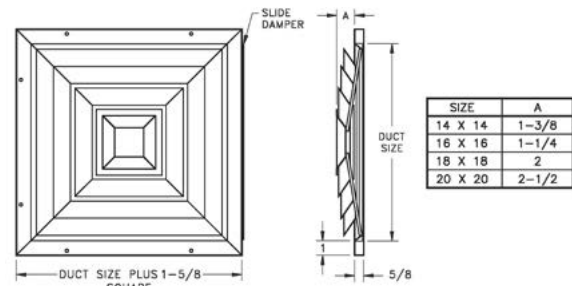


## ECSD/ECSDD Diffuser

| ECSD/ECSDD Available Sizes (in.) |
|----------------------------------|
| 14x14, 16x16, 18x18, 20x20       |



- Heavy-duty steel construction
- For evaporative coolers or central blower systems
- Step-down design louvers provide four-way air delivery
- Face only ECSD with slide in plate for off-season closure
- Multi-shutter damper on ECSDD
- Countersunk mounting holes for flush appearance with screws provided (ECSDD only)
- Bright White finish





### 65 & 66 Damper

- For use in 5" (65) to 6" (66) round pipe
- Furnished with handle, washer and wing nut
- Has one bearing



### 607/608 Damper

- Two bearings
- For use in 7" (607) to 8" (608) round pipe
- Furnished with handle, washer and wing nut



### 506/507/508 Damper

- Steel warm-air damper
- 6" (506), 7" (507) and 8" (508) sizes
- Spindle is reversible and may be inserted from either end
- The heavy spring holds damper securely under most conditions

### 69 Regulator Set

- 704 Washer
- 705 Handle
- 706 Wing Nut
- 708 (one) 5/16" Bearing
- For small dampers



69 and 70 regulator sets are furnished with retractable bolt bearing for fast, easy assembly. Merely slip bearing over edge of damper at the bearing line, lay the bearing on any firm surface, and drive the prong through the damper. The prong firmly clinches the bearing to the damper. 5/16" bearings are ample for most damper installations. Maximum damper thickness: .022" galv.

### 70 Regulator Set

- 704 Washer
- 705 Handle
- 706 Wing Nut
- 708 (two) 5/16" Bearings
- For large dampers



69 and 70 regulator sets are furnished with retractable bolt bearing for fast, easy assembly. Merely slip bearing over edge of damper at the bearing line, lay the bearing on any firm surface, and drive the prong through the damper. The prong firmly clinches the bearing to the damper. 5/16" bearings are ample for most damper installations. Maximum damper thickness: .022" galv.

### 80-3/8 Regulator Set

- 60 - 3/8" Regulator
- 56 - 3/8" Square Shank Bearing
- 80 - 3/8" Dial Regulator set
- For large dampers



80-3/8 regular sets are furnished with two solid bearings, six rivets and three sheet metal screws. Dial regulator, inner disc, handle, bolt and wing nut assembled and packaged individually. Inner disc prevents air leakage.



### 102 Damper Tip

- Has same fastening features as No. 708 retractable bolt bearing



### 2 Casing Clip

- For fastening casings and drawbands
- 14-gauge steel



### 27 Casing Clip

- For fastening casings and drawbands
- 16-gauge steel

## Accessories

- 704 Washer
- 705 Handle
- 706 Wing Nut
- 708 - 5/16" Bearing only
- 60 - 3/8" Regulator only (square shank) - Same as furnished with 80-3/8 Regulator Set. Required separately when 3/8" square rod is used instead of bearings. Use No. 65 - 3/8" damper rod clips with both 1/4" and 3/8" square rod to fasten damper to rod.
- 65 - 3/8" Rod Clip ("U" Bolt) - Used with both 1/4" and 3/8" square rod to fasten damper to rod.

## Using the Engineering Data

For most of the models & sizes we've done the calculations for you.

421

| Face Velocity      |        | 300  | 400  | 500  | 600  | 700  | 800  |
|--------------------|--------|------|------|------|------|------|------|
| Pressure Loss      |        | .006 | .010 | .016 | .022 | .031 | .040 |
| 4x10<br>Ak<br>.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<br>Ak<br>1.045 | CFM   | 420  | 525  | 625  | 730  | 835  |
|                       | Throw | 17.0 | 21.0 | 25.0 | 29.0 | 33.0 |

Terminal velocity is 75 fpm

CFM = volume of air flow in cubic feet per minute

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 (in<sup>2</sup>) 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 in<sup>2</sup>) 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 (ft<sup>2</sup>) 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 applica-

tion. 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, in most cases, will 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

# Engineering Data

or exceed the total CFM capacity of all the supply diffusers.

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).
- You really can't oversize a single point return like you can with 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

| Filter Size | Area (in <sup>2</sup> ) | Ton (cfm) | Filter Size | Area (in <sup>2</sup> ) | 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)   |

against & reduces blower delivery volume (cfm)

- No one expects noise from a return.

### Location

- 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.  $Y = Y1 + \frac{(X - X1) * (Y2 - Y1)}{(X2 - X1)}$  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 in<sup>2</sup> (nominal area of 14x14)

X1 = 180 in<sup>2</sup> (nominal area of 18x10)

X2 = 200 in<sup>2</sup> (nominal area of 20x10)

Using equation above computes  $Y = 600 + \frac{(196 - 180) * (640 - 600)}{(200 - 180)} = 600 + \frac{16 * 40}{20} = 600 + 32 = 632$  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 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.



210 Floor Register (Page 6)

| Face Velocity       |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|---------------------|-------|------|------|------|------|------|------|------|------|
| Pressure Loss       |       | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 |
| 4 x 10              | CFM   | 60   | 80   | 100  | 120  | 140  | 160  | 180  | 200  |
| Ak .20              | Throw | 8    | 11   | 13   | 16   | 19   | 22   | 24   | 26   |
| 4 x 12 and 6 x 8    | CFM   | 75   | 100  | 125  | 150  | 175  | 200  | 225  | 250  |
| Ak .25              | Throw | 9    | 12   | 15   | 18   | 21   | 25   | 28   | 31   |
| 4 x 14              | CFM   | 85   | 110  | 140  | 170  | 195  | 225  | 250  | 280  |
| Ak .28              | Throw | 6    | 10   | 15   | 19   | 22   | 25   | 28   | 32   |
| 6 x 10 and 8 x 8    | CFM   | 95   | 130  | 160  | 190  | 225  | 255  | 290  | 320  |
| Ak .32              | Throw | 10   | 14   | 17   | 21   | 24   | 27   | 31   | 34   |
| 6 x 12              | CFM   | 115  | 150  | 190  | 230  | 265  | 305  | 340  | 380  |
| Ak .38              | Throw | 12   | 15   | 19   | 23   | 26   | 30   | 34   | 38   |
| 8 x 10              | CFM   | 125  | 170  | 210  | 250  | 295  | 335  | 380  | 420  |
| Ak .42              | Throw | 12   | 15   | 18   | 24   | 28   | 32   | 37   | 41   |
| 6 x 14              | CFM   | 130  | 175  | 220  | 265  | 310  | 350  | 395  | 440  |
| Ak .44              | Throw | 13   | 16   | 20   | 24   | 28   | 32   | 36   | 41   |
| 6 x 16              | CFM   | 145  | 195  | 245  | 295  | 345  | 390  | 440  | 490  |
| Ak .49              | Throw | 11   | 16   | 21   | 25   | 30   | 35   | 39   | 44   |
| 8 x 12 and 10 x 10  | CFM   | 160  | 210  | 265  | 320  | 370  | 425  | 475  | 530  |
| Ak .53              | Throw | 12   | 17   | 21   | 26   | 32   | 37   | 43   | 48   |
| 9 x 12 and 8 x 14   | CFM   | 180  | 240  | 300  | 360  | 420  | 480  | 540  | 600  |
| Ak .60              | Throw | 14   | 20   | 24   | 29   | 34   | 39   | 44   | 50   |
| 10 x 12             | CFM   | 195  | 260  | 325  | 390  | 455  | 520  | 585  | 650  |
| Ak .65              | Throw | 14   | 18   | 24   | 30   | 35   | 41   | 46   | 51   |
| 8 x 16 and 9 x 14   | CFM   | 205  | 275  | 345  | 415  | 485  | 550  | 620  | 690  |
| Ak .69              | Throw | 15   | 21   | 27   | 32   | 37   | 42   | 48   | 53   |
| 10 x 14 and 12 x 12 | CFM   | 235  | 310  | 390  | 470  | 545  | 625  | 700  | 780  |
| Ak .78              | Throw | 14   | 21   | 28   | 34   | 40   | 46   | 51   | 56   |
| 10 x 16             | CFM   | 265  | 350  | 440  | 530  | 615  | 705  | 790  | 880  |
| Ak .88              | Throw | 17   | 23   | 30   | 36   | 41   | 48   | 53   | 60   |
| 12 x 14             | CFM   | 280  | 370  | 465  | 560  | 650  | 745  | 835  | 930  |
| Ak .93              | Throw | 18   | 24   | 30   | 37   | 43   | 50   | 56   | 62   |
| 12 x 16 and 14 x 14 | CFM   | 320  | 430  | 535  | 640  | 750  | 855  | 965  | 1070 |
| Ak 1.07             | Throw | 20   | 26   | 32   | 39   | 46   | 53   | 59   | 64   |
| 12 x 18 and 14 x 16 | CFM   | 365  | 490  | 610  | 730  | 855  | 975  | 1100 | 1220 |
| Ak 1.22             | Throw | 21   | 28   | 34   | 42   | 49   | 56   | 62   | 68   |
| 14 x 18             | CFM   | 425  | 570  | 710  | 850  | 995  | 1135 | 1280 | 1420 |
| Ak 1.42             | Throw | 22   | 30   | 37   | 45   | 52   | 58   | 63   | 68   |
| 12 x 24 and 14 x 20 | CFM   | 475  | 635  | 795  | 955  | 1115 | 1270 | 1430 | 1590 |
| Ak 1.59             | Throw | 23   | 31   | 39   | 46   | 52   | 59   | 65   | 71   |

Terminal Velocity of 50 FPM

411 Floor Diffuser (Page 6)

| Face Velocity |        | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|---------------|--------|------|------|------|------|------|------|------|------|
| Pressure Loss |        | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 |
| 2 1/4 x 10    | CFM    | 25   | 35   | 45   | 55   | 60   | 70   | 80   | 90   |
| Ak .09        | Spread | 3.0  | 4.0  | 5.0  | 6.5  | 7.5  | 9.0  | 10.0 | 11.0 |
|               | Throw  | 2.0  | 2.5  | 3.0  | 4.0  | 4.5  | 5.0  | 6.0  | 6.5  |
| 2 1/4 x 12    | CFM    | 35   | 45   | 55   | 65   | 75   | 90   | 100  | 110  |
| Ak .11        | Spread | 3.0  | 4.5  | 6.0  | 7.0  | 8.5  | 9.5  | 11.0 | 12.0 |
|               | Throw  | 2.0  | 3.0  | 3.5  | 4.0  | 5.0  | 6.0  | 6.5  | 7.0  |
| 2 1/4 x 14    | CFM    | 40   | 50   | 65   | 80   | 90   | 105  | 115  | 130  |
| Ak .13        | Spread | 3.5  | 5.0  | 7.0  | 8.0  | 9.5  | 10.5 | 12.0 | 13.0 |
|               | Throw  | 2.5  | 3.0  | 4.0  | 4.5  | 5.5  | 6.5  | 7.0  | 8.0  |
| 4 x 10        | CFM    | 50   | 70   | 85   | 100  | 120  | 135  | 155  | 170  |
| Ak .17        | Spread | 4.0  | 6.0  | 7.5  | 9.0  | 11.0 | 12.0 | 13.5 | 15.5 |
|               | Throw  | 3.0  | 3.5  | 4.5  | 5.5  | 6.5  | 7.0  | 8.0  | 9.0  |
| 4 x 12        | CFM    | 65   | 85   | 105  | 125  | 145  | 170  | 190  | 210  |
| Ak .21        | Spread | 5.0  | 7.0  | 8.5  | 10.0 | 12.0 | 13.5 | 15.5 | 17.0 |
|               | Throw  | 3.0  | 4.0  | 5.0  | 6.0  | 7.0  | 8.0  | 9.0  | 10.0 |
| 4 x 14        | CFM    | 75   | 100  | 125  | 150  | 175  | 200  | 225  | 250  |
| Ak .25        | Spread | 5.5  | 7.5  | 9.5  | 11.0 | 13.0 | 15.0 | 17.0 | 18.5 |
|               | Throw  | 3.5  | 4.5  | 5.5  | 6.5  | 7.5  | 9.0  | 10.0 | 11.0 |
| 6 x 10        | CFM    | 80   | 110  | 135  | 160  | 190  | 215  | 245  | 270  |
| Ak .27        | Spread | 6.0  | 8.0  | 10.0 | 11.5 | 13.5 | 15.5 | 17.5 | 19.5 |
|               | Throw  | 3.5  | 4.5  | 6.0  | 7.0  | 8.0  | 9.0  | 10.5 | 11.5 |
| 6 x 12        | CFM    | 100  | 130  | 165  | 200  | 230  | 265  | 295  | 330  |
| Ak .33        | Spread | 6.5  | 8.5  | 11.0 | 13.0 | 15.0 | 17.0 | 19.5 | 21.5 |
|               | Throw  | 4.0  | 5.0  | 6.5  | 7.5  | 9.0  | 10.0 | 11.5 | 12.5 |
| 6 x 14        | CFM    | 115  | 155  | 195  | 235  | 275  | 310  | 350  | 390  |
| Ak .39        | Spread | 7.5  | 9.5  | 12.0 | 14.0 | 17.0 | 19.0 | 21.5 | 23.5 |
|               | Throw  | 4.5  | 5.5  | 7.0  | 8.5  | 10.0 | 11.0 | 12.5 | 14.0 |

Terminal Velocity of 50 FPM

265 Return Air Grille (Page 6)

| Average Face Velocity* |     | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|------------------------|-----|------|------|------|------|------|------|------|
| 4 x 12                 | CFM | 120  | 150  | 175  | 205  | 235  | 265  | 295  |
| Ak .295                | Pt  | .011 | .017 | .024 | .033 | .043 | .054 | .065 |
| 4 x 14                 | CFM | 135  | 170  | 200  | 235  | 270  | 300  | 335  |
| Ak .335                | Pt  | .011 | .016 | .023 | .032 | .042 | .052 | .064 |
| 6 x 10                 | CFM | 150  | 185  | 220  | 260  | 295  | 335  | 370  |
| Ak .37                 | Pt  | .010 | .016 | .022 | .031 | .041 | .051 | .063 |
| 6 x 12                 | CFM | 180  | 225  | 265  | 310  | 355  | 400  | 445  |
| Ak .445                | Pt  | .010 | .015 | .021 | .030 | .039 | .049 | .060 |
| 8 x 10                 | CFM | 195  | 245  | 295  | 345  | 390  | 440  | 490  |
| Ak .49                 | Pt  | .010 | .015 | .021 | .029 | .038 | .047 | .059 |
| 6 x 14                 | CFM | 205  | 255  | 305  | 355  | 410  | 460  | 510  |
| Ak .51                 | Pt  | .010 | .015 | .020 | .029 | .038 | .047 | .058 |
| 8 x 12                 | CFM | 235  | 295  | 350  | 410  | 470  | 525  | 585  |
| Ak .565                | Pt  | .009 | .014 | .020 | .028 | .036 | .046 | .057 |
| 8 x 14                 | CFM | 270  | 340  | 410  | 475  | 545  | 610  | 680  |
| Ak .68                 | Pt  | .009 | .014 | .019 | .027 | .035 | .045 | .055 |
| 10 x 12                | CFM | 290  | 360  | 430  | 505  | 575  | 650  | 720  |
| Ak .72                 | Pt  | .009 | .014 | .019 | .027 | .035 | .043 | .054 |
| 12 x 12 and 6 x 24     | CFM | 340  | 425  | 510  | 595  | 680  | 765  | 850  |
| Ak .85                 | Pt  | .009 | .013 | .019 | .026 | .033 | .042 | .053 |
| 6 x 30                 | CFM | 410  | 515  | 620  | 720  | 825  | 925  | 1030 |
| Ak 1.03                | Pt  | .008 | .012 | .018 | .024 | .032 | .040 | .049 |
| 8 x 24                 | CFM | 445  | 555  | 665  | 775  | 890  | 1000 | 1110 |
| Ak 1.11                | Pt  | .008 | .012 | .018 | .024 | .031 | .039 | .048 |
| 14 x 14                | CFM | 460  | 575  | 690  | 805  | 920  | 1035 | 1150 |
| Ak 1.15                | Pt  | .008 | .012 | .018 | .024 | .031 | .039 | .048 |
| 8 x 30                 | CFM | 540  | 675  | 810  | 945  | 1080 | 1215 | 1350 |
| Ak 1.35                | Pt  | .008 | .012 | .017 | .023 | .030 | .037 | .046 |
| 14 x 20                | CFM | 630  | 790  | 950  | 1105 | 1265 | 1420 | 1580 |
| Ak 1.58                | Pt  | .007 | .011 | .016 | .022 | .029 | .036 | .045 |
| 12 x 24                | CFM | 655  | 820  | 985  | 1150 | 1310 | 1475 | 1690 |
| Ak 1.64                | Pt  | .007 | .011 | .016 | .022 | .029 | .036 | .044 |
| 10 x 30                | CFM | 670  | 840  | 1010 | 1175 | 1345 | 1510 | 1680 |
| Ak 1.68                | Pt  | .007 | .011 | .016 | .022 | .029 | .036 | .044 |
| 18 x 18                | CFM | 720  | 900  | 1080 | 1260 | 1440 | 1620 | 1800 |
| Ak 1.80                | Pt  | .007 | .011 | .015 | .021 | .028 | .035 | .043 |
| 14 x 24                | CFM | 750  | 935  | 1120 | 1310 | 1495 | 1685 | 1870 |
| Ak 1.87                | Pt  | .007 | .011 | .015 | .021 | .028 | .035 | .043 |
| 12 x 30                | CFM | 800  | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
| Ak 2.00                | Pt  | .007 | .011 | .015 | .021 | .027 | .034 | .042 |
| 14 x 30                | CFM | 940  | 1175 | 1410 | 1645 | 1880 | 2115 | 2350 |
| Ak 2.35                | Pt  | .007 | .010 | .015 | .020 | .026 | .033 | .040 |
| 24 x 24                | CFM | 1240 | 1550 | 1860 | 2170 | 2480 | 2790 | 3100 |
| Ak 3.10                | Pt  | .006 | .010 | .014 | .019 | .024 | .031 | .038 |

For sizes not listed and sizing tips see page(s) 40

\*Velocity measured 1" from face

### 420/421 Floor Diffuser (Page 7)

| Face Velocity     |        | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|-------------------|--------|------|------|------|------|------|------|------|------|
| Pressure Loss     |        | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 |
| 2 x 10<br>Ak .085 | CFM    |      | 35   | 45   | 50   | 60   | 70   | 75   | 85   |
|                   | Spread |      | 3.0  | 5.0  | 5.0  | 6.0  | 7.0  | 8.0  | 9.0  |
|                   | Throw  |      | 4.0  | 4.5  | 6.0  | 7.0  | 8.0  | 9.0  | 10.0 |
| 2 x 12<br>Ak .100 | CFM    | 30   | 40   | 50   | 60   | 70   | 80   | 90   | 100  |
|                   | Spread | 3.0  | 4.0  | 4.5  | 5.5  | 6.5  | 7.0  | 8.0  | 9.0  |
|                   | Throw  | 3.5  | 4.5  | 5.5  | 7.0  | 8.0  | 9.0  | 10.0 | 11.0 |
| 2 x 14<br>Ak .115 | CFM    | 35   | 45   | 60   | 70   | 80   | 90   | 105  | 115  |
|                   | Spread | 3.5  | 4.0  | 5.0  | 7.0  | 7.0  | 8.0  | 9.0  | 10.0 |
|                   | Throw  | 3.5  | 4.5  | 6.0  | 8.0  | 8.0  | 9.5  | 10.5 | 12.0 |
| 4 x 8<br>Ak .130  | CFM    | 40   | 50   | 65   | 80   | 90   | 105  | 115  | 130  |
|                   | Spread | 3.0  | 4.0  | 5.0  | 6.5  | 7.5  | 8.5  | 9.5  | 11.0 |
|                   | Throw  | 4.0  | 4.5  | 6.0  | 7.5  | 8.5  | 10.0 | 11.0 | 13.0 |
| 4 x 10<br>Ak .170 | CFM    | 50   | 70   | 85   | 100  | 120  | 135  | 155  | 170  |
|                   | Spread | 4.5  | 5.0  | 6.5  | 7.5  | 9.0  | 10.0 | 11.5 | 13.0 |
|                   | Throw  | 4.0  | 6.0  | 8.0  | 10.0 | 11.0 | 12.5 | 14.0 | 15.5 |
| 4 x 12<br>Ak .195 | CFM    | 60   | 80   | 100  | 120  | 140  | 160  | 175  | 195  |
|                   | Spread | 5.0  | 6.5  | 8.0  | 9.5  | 11.5 | 13.0 | 14.5 | 16.0 |
|                   | Throw  | 4.0  | 5.5  | 7.0  | 8.0  | 9.5  | 11.0 | 12.0 | 13.0 |
| 4 x 14<br>Ak .230 | CFM    | 70   | 90   | 115  | 140  | 160  | 185  | 205  | 230  |
|                   | Spread | 5.5  | 7.0  | 8.5  | 10.0 | 12.0 | 13.5 | 15.5 | 17.0 |
|                   | Throw  | 4.5  | 5.5  | 7.0  | 8.5  | 10.0 | 11.5 | 12.5 | 14.0 |
| 6 x 10<br>Ak .240 | CFM    | 70   | 95   | 120  | 145  | 170  | 190  | 215  | 240  |
|                   | Spread | 5.5  | 7.0  | 8.0  | 10.0 | 12.0 | 14.0 | 15.0 | 17.0 |
|                   | Throw  | 4.0  | 5.5  | 7.0  | 8.5  | 10.0 | 11.0 | 12.5 | 14.0 |
| 6 x 12<br>Ak .285 | CFM    | 85   | 115  | 140  | 170  | 200  | 230  | 255  | 285  |
|                   | Spread | 6.0  | 7.5  | 9.0  | 11.0 | 13.0 | 15.0 | 17.0 | 19.0 |
|                   | Throw  | 4.5  | 6.0  | 7.5  | 9.0  | 10.0 | 12.0 | 14.0 | 16.0 |
| 6 x 14<br>Ak .330 | CFM    | 100  | 130  | 165  | 200  | 230  | 265  | 300  | 330  |
|                   | Spread | 6.5  | 8.0  | 9.0  | 12.0 | 14.0 | 16.5 | 18.0 | 20.0 |
|                   | Throw  | 4.5  | 6.5  | 8.0  | 9.5  | 11.0 | 13.0 | 15.0 | 17.0 |

Terminal Velocity of 50 FPM

### RZ421 Register (Page 8)

| Face Velocity     |        | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
|-------------------|--------|-----|-----|-----|-----|-----|-----|-----|------|
| 2 x 12<br>Ak .084 | CFM    | 25  | 34  | 42  | 50  | 59  | 67  | 76  | 84   |
|                   | Ps     | .01 | .02 | .03 | .05 | .06 | .08 | .10 | .12  |
|                   | Throw  | 2.0 | 2.5 | 3.5 | 4.0 | 4.5 | 5.5 | 6.0 | 6.5  |
|                   | Spread | 1.5 | 2.0 | 2.5 | 3.0 | 3.0 | 3.5 | 4.0 | 4.5  |
| 4 x 10<br>Ak .141 | CFM    | 42  | 56  | 71  | 85  | 99  | 113 | 127 | 141  |
|                   | Ps     | .02 | .02 | .03 | .04 | .06 | .07 | .09 | .11  |
|                   | Throw  | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 5.0 | 5.5 | 6.0  |
|                   | Spread | 0.5 | 1.5 | 2.5 | 3.0 | 4.0 | 5.0 | 5.5 | 6.5  |
| 4 x 12<br>Ak .157 | CFM    | 47  | 63  | 79  | 94  | 110 | 126 | 141 | 157  |
|                   | Ps     | .02 | .03 | .04 | .05 | .07 | .09 | .11 | .13  |
|                   | Throw  | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0  |
|                   | Spread | 0.5 | 1.5 | 2.5 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0  |

Terminal Velocity of 50 FPM

### 531 Royale® Floor Register (Page 7)

| Face Velocity                                |        | 300  |     | 400  |     | 500  |      | 600  |      | 700  |      | 800  |      | 900  |      | 1000 |      |
|--|--------|------|-----|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
|  |        | .006 |     | .010 |     | .016 |      | .022 |      | .031 |      | .040 |      | .050 |      | .062 |      |
|  |        | H    | C   | H    | C   | H    | C    | H    | C    | H    | C    | H    | C    | H    | C    | H    | C    |
| 2 x 10<br>Ak .055 Heating<br>Ak .060 Cooling | CFM    |      |     |      |     |      |      | 35   | 35   | 40   | 40   | 45   | 50   | 50   | 55   | 55   | 60   |
|  | Spread |      |     |      |     |      |      | 3.5  |      | 4.5  |      | 5.0  |      | 5.5  |      | 5.5  |      |
|  | Throw  |      |     |      |     |      |      | 4.0  | 6.0  | 5.5  | 7.5  | 6.0  | 8.5  | 6.5  | 9.0  | 7.0  | 10.0 |
| 2 x 12<br>Ak .067 Heating<br>Ak .074 Cooling | CFM    |      |     |      |     | 35   | 35   | 40   | 45   | 45   | 50   | 55   | 60   | 60   | 65   | 65   | 75   |
|  | Spread |      |     |      |     | 3.5  |      | 4.0  |      | 4.5  |      | 5.0  |      | 5.5  |      | 6.0* |      |
|  | Throw  |      |     |      |     | 4.0  | 6.0  | 5.0  | 6.5  | 5.5  | 7.5  | 6.0  | 9.0  | 7.0  | 10.0 | 8.0  | 11.0 |
| 2 x 14<br>Ak .079 Heating<br>Ak .087 Cooling | CFM    |      |     | 30   | 35  | 40   | 45   | 45   | 50   | 55   | 60   | 65   | 70   | 80   | 80   | 85   | 85   |
|  | Spread |      |     | 3.0  |     | 4.0  |      | 4.5  |      | 5.0  |      | 5.5  |      | 6.0* |      | 6.0* |      |
|  | Throw  |      |     | 3.5  | 4.5 | 5.0  | 6.0  | 5.5  | 7.0  | 6.5  | 8.5  | 7.5  | 10.0 | 8.0  | 11.5 | 8.5  | 12.5 |
| 4 x 10<br>Ak .115 Heating<br>Ak .125 Cooling | CFM    | 35   | 40  | 45   | 50  | 55   | 65   | 70   | 75   | 80   | 90   | 100  | 105  | 115  | 115  | 125  | 125  |
|  | Spread | 3.0  |     | 3.5  |     | 4.5  |      | 5.5  |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      |
|  | Throw  | 3.0  | 4.5 | 4.0  | 6.0 | 5.5  | 7.5  | 6.5  | 9.5  | 7.5  | 10.5 | 8.5  | 11.5 | 9.5  | 13.5 | 11.5 | 15.0 |
| 4 x 12<br>Ak .140 Heating<br>Ak .160 Cooling | CFM    | 40   | 50  | 55   | 65  | 70   | 80   | 85   | 95   | 100  | 110  | 115  | 130  | 125  | 145  | 140  | 160  |
|  | Spread | 3.0  |     | 4.0  |     | 5.0  |      | 5.5  |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      |
|  | Throw  | 3.5  | 5.0 | 4.5  | 6.5 | 6.0  | 8.5  | 7.5  | 10.0 | 11.0 | 11.5 | 10.0 | 13.0 | 11.0 | 15.0 | 12.0 | 17.0 |
| 4 x 14<br>Ak .165 Heating<br>Ak .180 Cooling | CFM    | 50   | 55  | 65   | 70  | 80   | 90   | 100  | 110  | 115  | 125  | 130  | 145  | 150  | 160  | 165  | 180  |
|  | Spread | 3.5  |     | 4.5  |     | 5.0  |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      |
|  | Throw  | 4.0  | 5.5 | 5.5  | 7.0 | 6.5  | 9.5  | 8.0  | 11.0 | 10.0 | 12.5 | 11.0 | 14.0 | 12.0 | 15.5 | 13.5 | 17.5 |
| 6 x 10<br>Ak .190 Heating<br>Ak .205 Cooling | CFM    | 60   | 60  | 75   | 80  | 95   | 105  | 115  | 125  | 135  | 145  | 150  | 165  | 170  | 185  | 190  | 205  |
|  | Spread | 3.5  |     | 4.5  |     | 5.5  |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      |
|  | Throw  | 4.5  | 6.0 | 5.5  | 7.5 | 7.0  | 9.5  | 8.5  | 11.0 | 10.0 | 13.0 | 11.0 | 15.0 | 12.5 | 16.5 | 14.0 | 18.5 |
| 6 x 12<br>Ak .225 Heating<br>Ak .250 Cooling | CFM    | 70   | 75  | 90   | 100 | 115  | 125  | 135  | 150  | 160  | 175  | 180  | 200  | 205  | 225  | 225  | 250  |
|  | Spread | 4.0  |     | 5.0  |     | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      |
|  | Throw  | 5.0  | 6.5 | 6.0  | 8.5 | 8.0  | 10.5 | 9.0  | 12.0 | 11.0 | 15.0 | 12.5 | 16.5 | 14.0 | 18.5 | 16.0 | 21.0 |
| 6 x 14<br>Ak .265 Heating<br>Ak .300 Cooling | CFM    | 80   | 90  | 105  | 120 | 135  | 150  | 160  | 180  | 185  | 210  | 210  | 240  | 240  | 270  | 265  | 300  |
|  | Spread | 4.5  |     | 5.0  |     | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      | 6.0* |      |
|  | Throw  | 5.0  | 7.0 | 7.0  | 9.5 | 8.5  | 11.5 | 10.0 | 13.5 | 12.0 | 16.0 | 13.5 | 18.0 | 16.0 | 20.5 | 17.5 | 23.5 |

The spread shown for the heating mode is for a valve setting of 22° left deflection. \*The maximum value given for spread for heating is that which occurs at the ceiling height (8 feet). The cooling spread is a straight vertical column of air and is not shown. Throw and spread values are based on a terminal velocity of 50 FPM.

**406 18" Baseboard Diffuser (Page 8)**

| Face Velocity |        | 300  | 400  | 500  | 600  | 700  | 800  |
|---------------|--------|------|------|------|------|------|------|
| Pressure Loss |        | .013 | .022 | .035 | .048 | .067 | .088 |
| Ak .260       | CFM    | 80   | 105  | 130  | 155  | 180  | 210  |
|               | Spread | 4.5  | 6.5  | 7.5  | 8.5  | 9.5  | 11.0 |
|               | Throw  | 5.0  | 7.0  | 8.0  | 9.0  | 10.0 | 11.0 |

Terminal Velocity of 50 FPM

**406 15" Baseboard Diffuser (Page 8)**

| Face Velocity |         | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|---------------|---------|------|------|------|------|------|------|------|------|
| 15" Ak .159   | CFM     | 48   | 63   | 79   | 95   | 111  | 127  | 143  | 159  |
|               | Ps      | .005 | .009 | .014 | .020 | .027 | .035 | .044 | .053 |
| Throw Spread  | 50 FPM  | 5.5  | 7.5  | 9.0  | 11.0 | 13.0 | 14.5 | 16.5 | 18.5 |
|               |         | 5.5  | 7.5  | 7.5  | 11.5 | 13.5 | 15.0 | 17.0 | 19.0 |
| Throw Spread  | 100 FPM | 3.0  | 3.5  | 4.5  | 5.5  | 6.5  | 7.5  | 8.5  | 9.0  |
|               |         | 3.0  | 3.5  | 4.5  | 5.5  | 6.5  | 7.5  | 9.0  | 9.5  |
| Throw Spread  | 150 FPM | 2.0  | 2.5  | 3.0  | 3.5  | 4.5  | 5.0  | 5.5  | 6.0  |
|               |         | 2.0  | 2.5  | 3.0  | 3.5  | 4.5  | 5.0  | 5.5  | 6.0  |

**462 & 464 Baseboard Diffusers (Page 9, 10)**

| Airflow (CFM)             |               | 300  | 400  | 500  | 600  | 700  | 800  |
|---------------------------|---------------|------|------|------|------|------|------|
| 2 feet 27 sq. in. Ak .187 | CFM           | 55   | 75   | 95   | 110  | 130  | 150  |
|                           | Spread        | 6.5  | 7.5  | 8.0  | 8.5  | 9.0  | 11.0 |
|                           | Throw         | 7.0  | 8.0  | 9.5  | 10.5 | 12.0 | 13.0 |
|                           | Pressure Loss | .009 | .017 | .029 | .038 | .054 | .072 |
| 4 feet 54 sq. in. Ak .375 | CFM           | 110  | 150  | 185  | 225  | 260  | 300  |
|                           | Spread        | 12.0 | 15.0 | 17.5 | 19.0 | 20.0 | 21.0 |
|                           | Throw         | 7.5  | 9.0  | 10.0 | 11.5 | 12.5 | 13.5 |
|                           | Pressure Loss | .031 | .058 | .090 | .124 | .178 | .224 |

Terminal Velocity of 50 FPM

**472 & 474 Baseboard Return (Page 9, 10)**

| Face Velocity  |     | 300  | 400  | 500  | 600  | 700  |
|----------------|-----|------|------|------|------|------|
| 2 feet Ak .325 | CFM | 100  | 130  | 165  | 195  | 230  |
|                | Ps  | .010 | .028 | .046 | .064 | .090 |
| 4 feet Ak .650 | CFM | 195  | 260  | 325  | 390  | 455  |
|                | Ps  | .015 | .026 | .040 | .060 | .078 |

Velocity measured on the face

**654, 655 Baseboard/Sidewall Registers (Page 11)**

| Face Velocity  |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|----------------|-------|------|------|------|------|------|------|------|------|
| Pressure Loss  |       | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 |
| 8 x 6 Ak .180  | CFM   | 55   | 72   | 90   | 108  | 125  | 145  | 162  | 180  |
|                | Throw | 7.5  | 10.0 | 12.5 | 15.0 | 17.5 | 20.5 | 23.0 | 25.0 |
| 10 x 6 Ak .230 | CFM   | 70   | 92   | 115  | 140  | 160  | 185  | 205  | 230  |
|                | Throw | 9.0  | 11.5 | 14.5 | 17.5 | 20.0 | 23.0 | 25.5 | 29.0 |
| 12 x 6 Ak .290 | CFM   | 85   | 115  | 145  | 175  | 205  | 230  | 260  | 290  |
|                | Throw | 10.0 | 13.0 | 17.0 | 20.0 | 23.5 | 26.5 | 30.0 | 33.0 |
| 14 x 6 Ak .340 | CFM   | 102  | 135  | 170  | 205  | 240  | 270  | 305  | 340  |
|                | Throw | 11.0 | 14.5 | 18.0 | 22.0 | 25.5 | 29.0 | 32.5 | 36.0 |

Terminal Velocity of 75 FPM

**657/658 Baseboard Return Grille (Page 11)**

| Average Face Velocity*     |     | 300  | 400  | 500  | 600  | 700  |
|----------------------------|-----|------|------|------|------|------|
| 10 x 6 Ak .38              | CFM | 115  | 150  | 190  | 225  | 265  |
|                            | Pt  | .013 | .023 | .037 | .052 | .072 |
| 12 x 6 Ak .46              | CFM | 135  | 180  | 230  | 280  | 320  |
|                            | Pt  | .013 | .022 | .035 | .051 | .070 |
| 12 x 8 Ak .51              | CFM | 150  | 205  | 255  | 305  | 355  |
|                            | Pt  | .012 | .022 | .035 | .050 | .068 |
| 14 x 6 Ak .53              | CFM | 160  | 210  | 265  | 320  | 370  |
|                            | Pt  | .012 | .022 | .035 | .050 | .068 |
| 12 x 8 Ak .61              | CFM | 180  | 245  | 305  | 355  | 430  |
|                            | Pt  | .012 | .022 | .034 | .049 | .066 |
| 14 x 8 Ak .72              | CFM | 215  | 288  | 360  | 430  | 505  |
|                            | Pt  | .012 | .021 | .033 | .047 | .065 |
| 20 x 6 Ak .75              | CFM | 225  | 300  | 375  | 450  | 525  |
|                            | Pt  | .012 | .021 | .033 | .047 | .064 |
| 16 x 8 Ak .83              | CFM | 250  | 330  | 415  | 500  | 580  |
|                            | Pt  | .012 | .021 | .033 | .046 | .063 |
| 14 x 10 and 24 x 6 Ak .92  | CFM | 275  | 365  | 460  | 550  | 640  |
|                            | Pt  | .011 | .020 | .032 | .045 | .062 |
| 14 x 12 Ak 1.08            | CFM | 320  | 430  | 540  | 650  | 755  |
|                            | Pt  | .011 | .020 | .031 | .045 | .060 |
| 30 x 6 Ak 1.12             | CFM | 335  | 445  | 560  | 670  | 780  |
|                            | Pt  | .011 | .020 | .031 | .044 | .060 |
| 24 x 8 Ak 1.21             | CFM | 365  | 485  | 605  | 730  | 850  |
|                            | Pt  | .011 | .020 | .031 | .044 | .059 |
| 20 x 10 Ak 1.25            | CFM | 375  | 500  | 630  | 750  | 880  |
|                            | Pt  | .011 | .019 | .030 | .043 | .059 |
| 24 x 10 and 30 x 8 Ak 1.50 | CFM | 450  | 600  | 750  | 890  | 1040 |
|                            | Pt  | .011 | .019 | .030 | .042 | .057 |
| 24 x 12 Ak 1.82            | CFM | 550  | 730  | 910  | 1100 | 1270 |
|                            | Pt  | .010 | .018 | .029 | .041 | .056 |
| 30 x 10 Ak 1.91            | CFM | 575  | 760  | 960  | 1150 | 1330 |
|                            | Pt  | .010 | .018 | .029 | .041 | .055 |
| 30 x 12 Ak 2.25            | CFM | 680  | 900  | 1130 | 1350 | 1570 |
|                            | Pt  | .010 | .018 | .028 | .040 | .054 |

\*Velocity measured 1" from face

**664 Baseboard Register (Page 12)**

| Face Velocity             |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|---------------------------|-------|------|------|------|------|------|------|------|------|
| Pressure Loss             |       | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 |
| 8 x 6 Ak .180             | CFM   | 55   | 70   | 90   | 110  | 125  | 145  | 160  | 180  |
|                           | Throw | 5.5  | 7.0  | 9.0  | 10.5 | 12.5 | 14.0 | 16.0 | 18.0 |
| 10 x 6 and 12 x 5 Ak .245 | CFM   | 75   | 100  | 125  | 145  | 170  | 195  | 220  | 245  |
|                           | Throw | 6.0  | 8.0  | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 |
| 14 x 6 Ak .360            | CFM   | 110  | 145  | 180  | 215  | 252  | 290  | 325  | 360  |
|                           | Throw | 7.0  | 9.5  | 12.0 | 14.0 | 16.5 | 19.0 | 21.5 | 24.0 |
| 12 x 8 Ak .425            | CFM   | 130  | 170  | 215  | 255  | 300  | 340  | 385  | 425  |
|                           | Throw | 7.5  | 10.0 | 12.5 | 15.0 | 18.0 | 20.5 | 23.0 | 25.5 |

Terminal Velocity of 75 FPM

### 301 Curved-Blade Register (Page 13)

| Face Velocity     |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|-------------------|-------|------|------|------|------|------|------|------|------|
| 6 x 6<br>Ak .09   | CFM   | 30   | 40   | 45   | 55   | 65   | 75   | 85   | 95   |
|                   | Ps    | .007 | .013 | .020 | .029 | .040 | .052 | .066 | .081 |
|                   | Throw | 6.0  | 8.0  | 10.0 | 11.0 | 13.0 | 15.0 | 17.0 | 19.0 |
| 8 x 4<br>Ak .11   | CFM   | 30   | 45   | 55   | 65   | 75   | 85   | 95   | 105  |
|                   | Ps    | .007 | .013 | .021 | .030 | .041 | .053 | .067 | .083 |
|                   | Throw | 6.0  | 8.0  | 11.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 |
| 8 x 6<br>Ak .12   | CFM   | 35   | 50   | 60   | 75   | 85   | 100  | 110  | 125  |
|                   | Ps    | .007 | .013 | .021 | .030 | .040 | .053 | .067 | .082 |
|                   | Throw | 7.0  | 9.0  | 11.0 | 13.0 | 15.0 | 17.0 | 19.0 | 22.0 |
| 8 x 8<br>Ak .16   | CFM   | 50   | 65   | 80   | 95   | 110  | 130  | 145  | 160  |
|                   | Ps    | .008 | .014 | .022 | .031 | .042 | .055 | .070 | .086 |
|                   | Throw | 8.0  | 10.0 | 12.0 | 15.0 | 17.0 | 20.0 | 22.0 | 25.0 |
| 10 x 4<br>Ak .12  | CFM   | 35   | 50   | 60   | 70   | 85   | 95   | 110  | 120  |
|                   | Ps    | .008 | .013 | .021 | .030 | .041 | .054 | .068 | .084 |
|                   | Throw | 6.0  | 9.0  | 11.0 | 13.0 | 15.0 | 17.0 | 19.0 | 21.0 |
| 10 x 6<br>Ak .14  | CFM   | 40   | 55   | 70   | 80   | 95   | 110  | 120  | 135  |
|                   | Ps    | .008 | .014 | .021 | .031 | .042 | .054 | .069 | .085 |
|                   | Throw | 7.0  | 9.0  | 11.0 | 14.0 | 16.0 | 18.0 | 20.0 | 23.0 |
| 10 x 8<br>Ak .19  | CFM   | 55   | 75   | 95   | 115  | 130  | 150  | 170  | 190  |
|                   | Ps    | .008 | .014 | .022 | .031 | .043 | .056 | .071 | .087 |
|                   | Throw | 8.0  | 11.0 | 13.0 | 16.0 | 19.0 | 21.0 | 24.0 | 27.0 |
| 10 x 10<br>Ak .24 | CFM   | 70   | 95   | 120  | 145  | 170  | 190  | 215  | 240  |
|                   | Ps    | .008 | .014 | .021 | .030 | .042 | .054 | .069 | .085 |
|                   | Throw | 8.0  | 11.0 | 14.0 | 16.0 | 19.0 | 22.0 | 24.0 | 27.0 |
| 12 x 4<br>Ak .13  | CFM   | 40   | 55   | 65   | 80   | 95   | 105  | 120  | 135  |
|                   | Ps    | .008 | .014 | .021 | .031 | .042 | .054 | .069 | .085 |
|                   | Throw | 9.0  | 12.0 | 15.0 | 18.0 | 21.0 | 24.0 | 27.0 | 30.0 |
| 12 x 6<br>Ak .18  | CFM   | 55   | 75   | 95   | 110  | 130  | 150  | 165  | 185  |
|                   | Ps    | .008 | .015 | .023 | .033 | .045 | .059 | .074 | .091 |
|                   | Throw | 7.0  | 9.0  | 11.0 | 13.0 | 16.0 | 18.0 | 20.0 | 22.0 |
| 12 x 8<br>Ak .22  | CFM   | 65   | 85   | 110  | 130  | 150  | 170  | 195  | 215  |
|                   | Ps    | .008 | .014 | .022 | .032 | .043 | .056 | .071 | .088 |
|                   | Throw | 8.0  | 11.0 | 13.0 | 16.0 | 19.0 | 21.0 | 24.0 | 26.0 |
| 12 x 12<br>Ak .30 | CFM   | 90   | 120  | 150  | 180  | 210  | 235  | 265  | 295  |
|                   | Ps    | .008 | .014 | .022 | .032 | .044 | .057 | .073 | .090 |
|                   | Throw | 10.0 | 13.0 | 16.0 | 19.0 | 22.0 | 25.0 | 28.0 | 31.0 |
| 14 x 4<br>Ak .15  | CFM   | 45   | 60   | 75   | 90   | 105  | 120  | 130  | 145  |
|                   | Ps    | .008 | .014 | .021 | .031 | .042 | .055 | .069 | .086 |
|                   | Throw | 10.0 | 14.0 | 17.0 | 20.0 | 24.0 | 27.0 | 30.0 | 34.0 |
| 14 x 6<br>Ak .22  | CFM   | 65   | 85   | 110  | 130  | 150  | 175  | 195  | 215  |
|                   | Ps    | .008 | .014 | .022 | .031 | .042 | .055 | .070 | .087 |
|                   | Throw | 7.0  | 9.0  | 12.0 | 14.0 | 16.0 | 19.0 | 21.0 | 23.0 |
| 14 x 8<br>Ak .24  | CFM   | 75   | 95   | 120  | 145  | 170  | 195  | 220  | 240  |
|                   | Ps    | .008 | .014 | .022 | .032 | .043 | .057 | .072 | .089 |
|                   | Throw | 9.0  | 12.0 | 14.0 | 17.0 | 20.0 | 23.0 | 26.0 | 29.0 |

Terminal Velocity of 75 FPM

### 302 Curved-Blade Register (Page 14)

| Face Velocity    |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|------------------|-------|------|------|------|------|------|------|------|------|
| 8 x 4<br>Ak .11  | CFM   | 30   | 40   | 50   | 65   | 75   | 85   | 95   | 105  |
|                  | Ps    | .012 | .021 | .033 | .047 | .064 | .083 | .106 | .013 |
|                  | Throw | 3.0  | 4.0  | 6.0  | 7.0  | 8.0  | 9.0  | 10.0 | 11.0 |
| 8 x 6<br>Ak .13  | CFM   | 40   | 50   | 65   | 75   | 90   | 100  | 115  | 125  |
|                  | Ps    | .012 | .020 | .032 | .046 | .063 | .082 | .104 | .128 |
|                  | Throw | 4.0  | 5.0  | 6.0  | 7.0  | 8.0  | 9.0  | 11.0 | 12.0 |
| 8 x 8<br>Ak .19  | CFM   | 55   | 75   | 90   | 110  | 130  | 150  | 165  | 185  |
|                  | Ps    | .011 | .020 | .031 | .045 | .061 | .080 | .101 | .125 |
|                  | Throw | 5.0  | 6.0  | 7.0  | 9.0  | 10.0 | 11.0 | 13.0 | 14.0 |
| 10 x 6<br>Ak .17 | CFM   | 50   | 65   | 85   | 100  | 115  | 130  | 150  | 165  |
|                  | Ps    | .011 | .020 | .031 | .045 | .062 | .080 | .102 | .126 |
|                  | Throw | 4.0  | 6.0  | 7.0  | 8.0  | 9.0  | 11.0 | 12.0 | 13.0 |
| 10 x 8<br>Ak .23 | CFM   | 65   | 90   | 110  | 135  | 155  | 180  | 200  | 225  |
|                  | Ps    | .011 | .020 | .031 | .044 | .061 | .079 | .100 | .124 |
|                  | Throw | 5.0  | 7.0  | 8.0  | 10.0 | 11.0 | 13.0 | 14.0 | 15.0 |
| 12 x 6<br>Ak .21 | CFM   | 60   | 80   | 100  | 125  | 145  | 165  | 15   | 205  |
|                  | Ps    | .011 | .020 | .031 | .045 | .061 | .079 | .101 | .124 |
|                  | Throw | 5.0  | 6.0  | 8.0  | 9.0  | 10.0 | 12.0 | 13.0 | 15.0 |
| 12 x 8<br>Ak .27 | CFM   | 80   | 105  | 130  | 160  | 185  | 210  | 240  | 265  |
|                  | Ps    | .011 | .020 | .031 | .044 | .060 | .079 | .099 | .123 |
|                  | Throw | 5.0  | 7.0  | 9.0  | 10.0 | 12.0 | 14.0 | 15.0 | 17.0 |
| 14 x 6<br>Ak .24 | CFM   | 70   | 95   | 115  | 140  | 165  | 190  | 210  | 235  |
|                  | Ps    | .011 | .020 | .031 | .044 | .060 | .079 | .100 | .123 |
|                  | Throw | 5.0  | 7.0  | 8.0  | 10.0 | 11.0 | 13.0 | 14.0 | 16.0 |
| 14 x 8<br>Ak .31 | CFM   | 90   | 120  | 150  | 185  | 215  | 245  | 275  | 305  |
|                  | Ps    | .011 | .020 | .031 | .044 | .060 | .078 | .099 | .122 |
|                  | Throw | 6.0  | 8.0  | 9.0  | 11.0 | 13.0 | 14.0 | 16.0 | 18.0 |

Terminal Velocity of 75 FPM

### 303 Curved-Blade Register (Page 14)

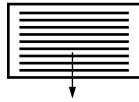
| Face Velocity     |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|-------------------|-------|------|------|------|------|------|------|------|------|
| 6 x 6<br>Ak .12   | CFM   | 35   | 50   | 60   | 75   | 85   | 100  | 110  | 125  |
|                   | Ps    | .014 | .025 | .039 | .056 | .077 | .100 | .126 | .156 |
|                   | Throw | 3.0  | 4.0  | 5.0  | 6.0  | 7.0  | 8.0  | 9.0  | 10.0 |
| 8 x 4<br>Ak .10   | CFM   | 30   | 40   | 50   | 65   | 75   | 85   | 95   | 105  |
|                   | Ps    | .015 | .027 | .041 | .060 | .081 | .106 | .134 | .166 |
|                   | Throw | 3.0  | 4.0  | 5.0  | 6.0  | 7.0  | 8.0  | 9.0  | 10.0 |
| 8 x 6<br>Ak .14   | CFM   | 40   | 55   | 70   | 85   | 100  | 115  | 125  | 140  |
|                   | Ps    | .015 | .026 | .041 | .059 | .080 | .104 | .132 | .163 |
|                   | Throw | 3.0  | 4.0  | 5.0  | 6.0  | 7.0  | 8.0  | 9.0  | 10.0 |
| 8 x 8<br>Ak .18   | CFM   | 55   | 75   | 90   | 110  | 130  | 145  | 165  | 185  |
|                   | Ps    | .013 | .022 | .035 | .050 | .069 | .090 | .114 | .140 |
|                   | Throw | 4.0  | 5.0  | 6.0  | 8.0  | 9.0  | 10.0 | 11.0 | 12.0 |
| 10 x 4<br>Ak .12  | CFM   | 35   | 50   | 60   | 75   | 85   | 100  | 110  | 125  |
|                   | Ps    | .014 | .025 | .039 | .056 | .076 | .100 | .126 | .156 |
|                   | Throw | 3.0  | 4.0  | 5.0  | 6.0  | 7.0  | 8.0  | 9.0  | 10.0 |
| 10 x 6<br>Ak .17  | CFM   | 50   | 70   | 85   | 105  | 120  | 140  | 155  | 175  |
|                   | Ps    | .015 | .027 | .043 | .062 | .084 | .110 | .139 | .171 |
|                   | Throw | 4.0  | 5.0  | 6.0  | 7.0  | 9.0  | 10.0 | 11.0 | 12.0 |
| 10 x 8<br>Ak .22  | CFM   | 65   | 90   | 110  | 135  | 155  | 180  | 200  | 225  |
|                   | Ps    | .012 | .022 | .034 | .049 | .066 | .086 | .109 | .135 |
|                   | Throw | 7.0  | 9.0  | 12.0 | 14.0 | 16.0 | 18.0 | 21.0 | 23.0 |
| 10 x 10<br>Ak .31 | CFM   | 95   | 125  | 155  | 185  | 220  | 250  | 280  | 310  |
|                   | Ps    | .015 | .027 | .043 | .062 | .084 | .110 | .139 | .172 |
|                   | Throw | 5.0  | 7.0  | 8.0  | 10.0 | 11.0 | 13.0 | 14.0 | 16.0 |
| 12 x 6<br>Ak .21  | CFM   | 60   | 85   | 105  | 125  | 145  | 165  | 185  | 205  |
|                   | Ps    | .012 | .022 | .034 | .049 | .066 | .086 | .109 | .135 |
|                   | Throw | 7.0  | 9.0  | 11.0 | 13.0 | 15.0 | 18.0 | 20.0 | 22.0 |
| 12 x 8<br>Ak .26  | CFM   | 80   | 105  | 130  | 160  | 185  | 210  | 240  | 265  |
|                   | Ps    | .008 | .014 | .022 | .032 | .044 | .057 | .072 | .089 |
|                   | Throw | 5.0  | 6.0  | 8.0  | 9.0  | 11.0 | 12.0 | 13.0 | 15.0 |
| 12 x 12<br>Ak .38 | CFM   | 115  | 155  | 190  | 230  | 270  | 305  | 345  | 385  |
|                   | Ps    | .008 | .014 | .023 | .033 | .044 | .058 | .073 | .090 |
|                   | Throw | 6.0  | 7.0  | 9.0  | 11.0 | 13.0 | 14.0 | 16.0 | 18.0 |
| 14 x 4<br>Ak .16  | CFM   | 50   | 65   | 80   | 100  | 115  | 130  | 150  | 165  |
|                   | Ps    | .008 | .014 | .022 | .031 | .042 | .055 | .070 | .086 |
|                   | Throw | 6.0  | 8.0  | 10.0 | 12.0 | 14.0 | 16.0 | 17.0 | 19.0 |
| 14 x 6<br>Ak .20  | CFM   | 60   | 80   | 100  | 120  | 145  | 165  | 185  | 205  |
|                   | Ps    | .009 | .017 | .026 | .037 | .051 | .066 | .084 | .104 |
|                   | Throw | 7.0  | 9.0  | 11.0 | 13.0 | 15.0 | 17.0 | 20.0 | 22.0 |
| 14 x 8<br>Ak .30  | CFM   | 90   | 120  | 150  | 185  | 215  | 245  | 275  | 305  |
|                   | Ps    | .008 | .014 | .022 | .032 | .044 | .057 | .073 | .090 |
|                   | Throw | 5.0  | 7.0  | 8.0  | 10.0 | 11.0 | 13.0 | 14.0 | 16.0 |
| 16 x 6<br>Ak .26  | CFM   | 80   | 105  | 130  | 160  | 185  | 210  | 240  | 265  |
|                   | Ps    | .008 | .014 | .022 | .032 | .044 | .057 | .072 | .089 |
|                   | Throw | 5.0  | 6.0  | 8.0  | 9.0  | 11.0 | 12.0 | 14.0 | 15.0 |

Terminal Velocity of 75 FPM

### 304 Curved-Blade Register (Page 15)

| Face Velocity   |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|-----------------|-------|------|------|------|------|------|------|------|------|
| 6 x 6<br>Ak .16 | CFM   | 50   | 65   | 80   | 95   | 110  | 125  | 145  | 160  |
|                 | Ps    | .040 | .072 | .112 | .161 | .219 | .287 | .363 | .448 |
|                 | Throw | 3.0  | 4.0  | 5.0  | 6.0  | 7.0  | 8.0  | 9.0  | 10.0 |
| 8 x 8<br>Ak .22 | CFM   | 65   | 85   | 110  | 130  | 155  | 175  | 195  | 220  |

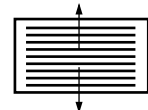
### A611 1-Way Adjustable Curved-Blade Register (Page 17)



| Face Velocity        |       | 300         | 400         | 500         | 600         | 700         | 800         | 900         | 1000        | 1100        | 1200        |
|----------------------|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Pressure Loss</b> |       | <b>.006</b> | <b>.010</b> | <b>.016</b> | <b>.022</b> | <b>.031</b> | <b>.040</b> | <b>.050</b> | <b>.062</b> | <b>.075</b> | <b>.090</b> |
| 8 x 4                | CFM   | 30          | 45          | 55          | 65          | 75          | 85          | 95          | 105         | 120         | 130         |
| Ak .107              | Throw | 3.5         | 5.5         | 6.5         | 7.5         | 9.0         | 10.0        | 11.5        | 12.5        | 14.0        | 15.5        |
| 10 x 4               | CFM   | 40          | 55          | 65          | 80          | 90          | 105         | 120         | 130         | 145         | 160         |
| Ak .132              | Throw | 4.0         | 6.0         | 7.0         | 8.5         | 9.5         | 11.0        | 12.5        | 13.5        | 15.5        | 17.0        |
| 10 x 6               | CFM   | 60          | 80          | 100         | 120         | 140         | 160         | 180         | 200         | 220         | 240         |
| Ak .200              | Throw | 5.0         | 6.5         | 8.5         | 10.0        | 11.5        | 13.5        | 15.0        | 16.0        | 18.0        | 20.0        |
| 12 x 6               | CFM   | 70          | 95          | 120         | 140         | 165         | 190         | 210         | 235         | 260         | 280         |
| Ak .235              | Throw | 5.5         | 7.0         | 9.0         | 10.5        | 12.5        | 14.5        | 16.0        | 18.0        | 20.0        | 22.0        |
| 10 x 8               | CFM   | 80          | 105         | 130         | 160         | 185         | 210         | 240         | 265         | 290         | 315         |
| Ak .264              | Throw | 5.5         | 7.5         | 9.5         | 11.5        | 13.0        | 15.0        | 17.0        | 19.0        | 21.0        | 23.0        |
| 12 x 8               | CFM   | 95          | 130         | 160         | 190         | 225         | 255         | 290         | 320         | 350         | 385         |
| Ak .320              | Throw | 6.0         | 8.5         | 10.5        | 12.5        | 14.5        | 16.5        | 19.0        | 21.0        | 23.0        | 25.0        |
| 14 x 8               | CFM   | 110         | 145         | 180         | 220         | 255         | 290         | 330         | 365         | 400         | 435         |
| Ak .364              | Throw | 6.5         | 8.5         | 11.0        | 13.0        | 15.5        | 17.5        | 20.0        | 22.0        | 24.0        | 26.0        |

For sizes not listed and sizing tips see page 40  
Terminal Velocity of 75 FPM

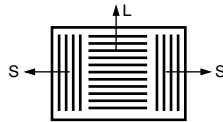
### A612 2-Way Adjustable Curved-Blade Register (Page 17)



| Face Velocity        |       | 300         | 400         | 500         | 600         | 700         | 800         | 900         | 1000        | 1100        | 1200        |
|----------------------|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Pressure Loss</b> |       | <b>.006</b> | <b>.010</b> | <b>.016</b> | <b>.022</b> | <b>.031</b> | <b>.040</b> | <b>.050</b> | <b>.062</b> | <b>.075</b> | <b>.090</b> |
| 10 x 6               | CFM   | 60          | 80          | 100         | 120         | 140         | 160         | 180         | 200         | 220         | 240         |
| Ak .200              | Throw | 3.5         | 4.5         | 6.0         | 7.0         | 8.5         | 9.5         | 10.5        | 12.0        | 13.0        | 14.0        |
| 12 x 6               | CFM   | 70          | 95          | 120         | 140         | 165         | 190         | 210         | 235         | 260         | 280         |
| Ak .235              | Throw | 4.0         | 5.0         | 6.5         | 7.5         | 9.0         | 10.0        | 11.5        | 12.5        | 14.0        | 15.0        |
| 12 x 8               | CFM   | 95          | 130         | 160         | 190         | 225         | 255         | 290         | 320         | 350         | 385         |
| Ak .320              | Throw | 4.5         | 6.0         | 7.5         | 8.5         | 10.5        | 11.5        | 13.5        | 14.5        | 16.0        | 18.0        |
| 14 x 8               | CFM   | 110         | 145         | 180         | 220         | 255         | 290         | 330         | 365         | 400         | 435         |
| Ak .364              | Throw | 4.5         | 6.0         | 7.5         | 9.5         | 11.0        | 12.5        | 14.0        | 15.5        | 17.0        | 19.0        |

For sizes not listed and sizing tips see page 40  
Terminal Velocity of 75 FPM

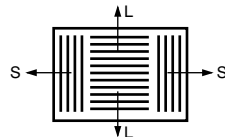
### A613 3-Way Adjustable Curved-Blade Register (Page 17)



| Face Velocity        |           | 300         | 400         | 500         | 600         | 700         | 800         | 900         | 1000        | 1100        | 1200        |
|----------------------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Pressure Loss</b> |           | <b>.006</b> | <b>.010</b> | <b>.016</b> | <b>.022</b> | <b>.031</b> | <b>.040</b> | <b>.050</b> | <b>.062</b> | <b>.075</b> | <b>.090</b> |
| 10 x 6               | Total CFM | 60          | 80          | 100         | 120         | 140         | 160         | 180         | 200         | 220         | 240         |
| Ak .200              | CFM L/S   | 22/19       | 29/26       | 36/32       | 43/38       | 50/45       | 58/51       | 65/58       | 72/64       | 79/70       | 86/77       |
|                      | Throw L/S | 3.0/2.0     | 4.0/4.0     | 5.0/4.5     | 6.0/5.0     | 7.0/6.5     | 8.0/7.5     | 9.0/8.5     | 10.0/9.5    | 11.0/10.5   | 12.0/11.5   |
| 8 x 8                | Total CFM | 65          | 85          | 110         | 130         | 150         | 170         | 195         | 215         | 235         | 260         |
| Ak .215              | CFM L/S   | 30/18       | 39/23       | 50/30       | 60/35       | 68/41       | 78/46       | 89/53       | 98/58       | 108/64      | 119/70      |
|                      | Throw L/S | 3.5/3.0     | 4.5/3.5     | 6.0/4.5     | 7.0/5.5     | 8.0/6.5     | 9.5/7.0     | 10.5/8.0    | 11.5/9.0    | 13.0/10.0   | 14.0/11.0   |
| 12 x 6               | Total CFM | 70          | 95          | 120         | 140         | 165         | 190         | 210         | 235         | 260         | 280         |
| Ak .235              | CFM L/S   | 21/25       | 28/33       | 36/42       | 42/49       | 49/58       | 57/67       | 63/74       | 70/82       | 77/91       | 83/98       |
|                      | Throw L/S | 3.0/3.0     | 4.0/4.0     | 5.0/5.0     | 6.0/6.5     | 7.0/7.5     | 8.0/8.5     | 9.0/9.5     | 9.5/10.5    | 10.5/11.5   | 11.5/12.5   |
| 10 x 10              | Total CFM | 100         | 130         | 165         | 200         | 230         | 265         | 295         | 330         | 365         | 395         |
| Ak .330              | CFM L/S   | 36/32       | 47/42       | 59/63       | 72/64       | 83/74       | 95/85       | 106/94      | 119/106     | 131/117     | 142/126     |
|                      | Throw L/S | 4.0/3.5     | 5.0/4.5     | 6.5/6.0     | 7.5/7.0     | 9.0/8.5     | 10.0/9.5    | 11.0/10.5   | 12.5/12.0   | 14.0/13.0   | 15.0/14.0   |

For sizes not listed or sizing tips see page 40  
Terminal Velocity of 75 FPM

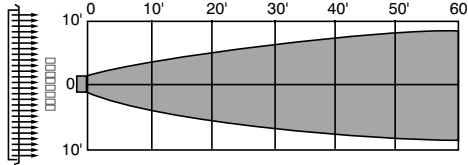
### A614 4-Way Adjustable Curved-Blade Register (Page 18)



| Face Velocity        |           | 300         | 400         | 500         | 600         | 700         | 800         | 900         | 1000        | 1100        | 1200        |
|----------------------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Pressure Loss</b> |           | <b>.006</b> | <b>.010</b> | <b>.016</b> | <b>.022</b> | <b>.031</b> | <b>.040</b> | <b>.050</b> | <b>.062</b> | <b>.075</b> | <b>.090</b> |
| 8 x 8                | Total CFM | 65          | 85          | 110         | 130         | 150         | 170         | 195         | 215         | 235         | 260         |
| Ak .215              | CFM L/S   | 15/18       | 20/23       | 25/30       | 30/35       | 35/41       | 39/46       | 45/53       | 49/58       | 54/64       | 60/70       |
|                      | Throw L/S | 2.5/3.0     | 3.5/3.5     | 4.0/4.5     | 5.0/5.5     | 6.0/6.5     | 6.5/7.0     | 7.5/8.0     | 8.0/9.0     | 9.0/10.0    | 10.0/11.0   |
| 10 x 10              | Total CFM | 100         | 130         | 165         | 200         | 230         | 265         | 295         | 330         | 365         | 395         |
| Ak .330              | CFM L/S   | 18/32       | 24/42       | 30/53       | 36/64       | 42/74       | 48/85       | 53/94       | 60/106      | 66/117      | 71/126      |
|                      | Throw L/S | 2.5/3.5     | 3.5/4.5     | 4.5/6.0     | 5.5/7.0     | 6.5/8.5     | 7.0/9.5     | 8.0/10.5    | 9.0/12.0    | 10.0/13.0   | 10.5/14.0   |
| 12 x 12              | Total CFM | 135         | 180         | 225         | 270         | 315         | 360         | 405         | 450         | 495         | 540         |
| Ak .452              | CFM L/S   | 20/47       | 27/63       | 34/79       | 40/95       | 47/111      | 54/126      | 61/142      | 67/158      | 74/174      | 81/190      |
|                      | Throw L/S | 2.5/4.0     | 3.5/5.5     | 4.5/7.0     | 5.5/8.5     | 6.5/10.0    | 7.5/11.0    | 8.5/12.5    | 9.0/14.0    | 10.0/15.5   | 11.0/17.0   |

For sizes not listed or sizing tips see page 40  
Terminal Velocity of 75 FPM

## A618 Adjustable Fin Register (Page 18) Deflection A



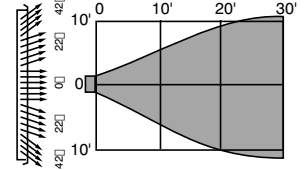
| Face Velocity | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Pressure Loss | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 | .075 | .090 |
| 8 x 4 CFM     | 45   | 60   | 80   | 95   | 110  | 125  | 140  | 155  | 170  | 185  |
| Ak .156 Throw | 5.0  | 6.5  | 8.5  | 10.0 | 12.0 | 13.0 | 15.0 | 16.0 | 18.0 | 19.0 |
| 10 x 4 CFM    | 60   | 80   | 100  | 120  | 140  | 160  | 180  | 200  | 220  | 240  |
| Ak .198 Throw | 6.0  | 7.5  | 9.5  | 12.0 | 13.0 | 15.0 | 17.0 | 19.0 | 20.0 | 22.0 |
| 12 x 4 CFM    | 70   | 95   | 120  | 145  | 170  | 190  | 215  | 240  | 265  | 290  |
| Ak .240 Throw | 6.0  | 8.0  | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 25.0 |
| 10 x 6 CFM    | 95   | 125  | 155  | 190  | 220  | 250  | 280  | 315  | 345  | 375  |
| Ak .313 Throw | 7.0  | 9.0  | 12.0 | 14.0 | 16.0 | 19.0 | 21.0 | 23.0 | 26.0 | 28.0 |
| 12 x 6 CFM    | 115  | 150  | 190  | 225  | 265  | 305  | 340  | 380  | 415  | 455  |
| Ak .379 Throw | 8.0  | 10.0 | 13.0 | 15.0 | 18.0 | 21.0 | 23.0 | 26.0 | 28.0 | 31.0 |
| 10 x 8 CFM    | 130  | 170  | 210  | 255  | 300  | 340  | 385  | 425  | 470  | 510  |
| Ak .425 Throw | 8.0  | 11.0 | 14.0 | 16.0 | 19.0 | 21.0 | 24.0 | 27.0 | 30.0 | 32.0 |
| 14 x 6 CFM    | 135  | 180  | 225  | 270  | 310  | 355  | 400  | 445  | 490  | 545  |
| Ak .446 Throw | 8.0  | 11.0 | 14.0 | 17.0 | 19.0 | 22.0 | 25.0 | 28.0 | 30.0 | 33.0 |
| 12 x 8 CFM    | 160  | 200  | 265  | 320  | 370  | 425  | 475  | 530  | 585  | 635  |
| Ak .530 Throw | 9.0  | 11.0 | 15.0 | 18.0 | 21.0 | 24.0 | 27.0 | 30.0 | 33.0 | 36.0 |
| 14 x 8 CFM    | 185  | 250  | 310  | 370  | 435  | 495  | 560  | 620  | 680  | 745  |
| Ak .620 Throw | 10.0 | 13.0 | 16.0 | 20.0 | 23.0 | 26.0 | 30.0 | 33.0 | 36.0 | 39.0 |

For sizes not listed or sizing tips see page 40

Terminal Velocity of 75 FPM

| Face Velocity | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Pressure Loss | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 | .075 | .090 |

## A618 Adjustable Fin Register (Page 18) Deflection E



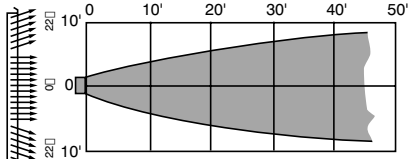
| Pressure Loss | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 | .075 | .090 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| 8 x 4 CFM     | 40   | 55   | 70   | 85   | 100  | 110  | 125  | 140  | 155  | 170  |
| Ak .141 Throw | 3.5  | 5.0  | 6.5  | 7.5  | 9.0  | 10.0 | 11.0 | 13.0 | 14.0 | 15.0 |
| 10 x 4 CFM    | 55   | 70   | 90   | 105  | 125  | 140  | 160  | 180  | 195  | 215  |
| Ak .178 Throw | 4.0  | 5.5  | 7.0  | 8.5  | 10.0 | 11.0 | 13.0 | 14.0 | 16.0 | 17.0 |
| 12 x 4 CFM    | 65   | 85   | 110  | 130  | 150  | 175  | 195  | 215  | 240  | 260  |
| Ak .216 Throw | 4.5  | 6.0  | 8.0  | 9.5  | 11.0 | 13.0 | 14.0 | 16.0 | 18.0 | 19.0 |
| 10 x 6 CFM    | 85   | 115  | 140  | 170  | 195  | 225  | 255  | 280  | 310  | 340  |
| Ak .282 Throw | 5.5  | 7.5  | 9.0  | 11.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 |
| 12 x 6 CFM    | 105  | 135  | 170  | 205  | 240  | 275  | 310  | 340  | 375  | 410  |
| Ak .342 Throw | 6.0  | 8.0  | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 24.0 |
| 10 x 8 CFM    | 115  | 155  | 195  | 235  | 275  | 310  | 350  | 390  | 430  | 470  |
| Ak .390 Throw | 6.0  | 8.0  | 11.0 | 13.0 | 15.0 | 17.0 | 19.0 | 21.0 | 23.0 | 26.0 |
| 14 x 6 CFM    | 125  | 165  | 205  | 245  | 290  | 330  | 370  | 410  | 455  | 495  |
| Ak .412 Throw | 7.0  | 9.0  | 11.0 | 13.0 | 16.0 | 18.0 | 20.0 | 22.0 | 24.0 | 27.0 |
| 12 x 8 CFM    | 140  | 190  | 235  | 280  | 330  | 375  | 425  | 470  | 515  | 565  |
| Ak .470 Throw | 7.0  | 9.0  | 12.0 | 14.0 | 16.0 | 19.0 | 21.0 | 23.0 | 25.0 | 28.0 |
| 14 x 8 CFM    | 165  | 220  | 275  | 330  | 385  | 440  | 495  | 550  | 605  | 660  |
| Ak .550 Throw | 8.0  | 10.0 | 13.0 | 15.0 | 18.0 | 20.0 | 23.0 | 25.0 | 28.0 | 30.0 |

For sizes not listed or sizing tips see page 40

Terminal Velocity of 75 FPM

| Face Velocity | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Pressure Loss | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 | .075 | .090 |

## A618 Adjustable Fin Register (Page 18) Deflection C



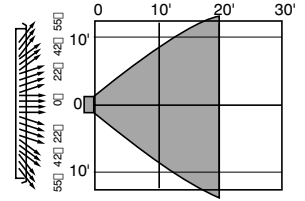
| Face Velocity | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Pressure Loss | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 | .075 | .090 |
| 8 x 4 CFM     | 40   | 55   | 70   | 85   | 100  | 110  | 125  | 140  | 155  | 170  |
| Ak .127 Throw | 3.0  | 4.0  | 5.0  | 5.5  | 7.0  | 7.5  | 8.5  | 9.5  | 11.0 | 11.5 |
| 10 x 4 CFM    | 50   | 65   | 80   | 95   | 115  | 130  | 145  | 160  | 180  | 195  |
| Ak .162 Throw | 3.0  | 4.5  | 6.0  | 6.5  | 7.5  | 8.5  | 9.5  | 11.0 | 12.0 | 13.0 |
| 12 x 4 CFM    | 60   | 80   | 100  | 120  | 140  | 160  | 175  | 195  | 215  | 235  |
| Ak .197 Throw | 4.0  | 4.5  | 6.0  | 7.5  | 8.5  | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 |
| 10 x 6 CFM    | 75   | 105  | 130  | 155  | 180  | 205  | 230  | 255  | 285  | 310  |
| Ak .257 Throw | 4.0  | 5.5  | 7.5  | 8.5  | 9.5  | 11.0 | 12.0 | 14.0 | 15.0 | 17.0 |
| 12 x 6 CFM    | 95   | 125  | 155  | 185  | 220  | 250  | 280  | 310  | 340  | 375  |
| Ak .311 Throw | 4.5  | 6.0  | 7.5  | 9.0  | 11.0 | 12.0 | 14.0 | 15.0 | 17.0 | 18.0 |
| 10 x 8 CFM    | 105  | 140  | 175  | 210  | 245  | 280  | 315  | 350  | 385  | 420  |
| Ak .350 Throw | 5.0  | 6.0  | 8.0  | 10.0 | 11.0 | 13.0 | 14.0 | 16.0 | 18.0 | 19.0 |
| 14 x 6 CFM    | 110  | 145  | 185  | 220  | 255  | 290  | 330  | 365  | 400  | 440  |
| Ak .365 Throw | 5.5  | 6.5  | 8.5  | 10.0 | 11.0 | 13.0 | 15.0 | 16.0 | 18.0 | 20.0 |
| 12 x 8 CFM    | 130  | 175  | 220  | 260  | 305  | 350  | 390  | 435  | 480  | 520  |
| Ak .435 Throw | 5.0  | 7.0  | 9.0  | 11.0 | 13.0 | 15.0 | 16.0 | 18.0 | 20.0 | 22.0 |
| 14 x 8 CFM    | 155  | 205  | 255  | 305  | 355  | 410  | 460  | 510  | 560  | 610  |
| Ak .510 Throw | 6.0  | 8.0  | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 23.0 |

For sizes not listed or sizing tips see page 40

Terminal Velocity of 75 FPM

| Face Velocity | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Pressure Loss | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 | .075 | .090 |
| 8 x 4 CFM     | 35   | 45   | 60   | 70   | 85   | 95   | 105  | 120  | 130  | 140  |

## A618 Adjustable Fin Register (Page 18) Deflection G



| Face Velocity | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Pressure Loss | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 | .075 | .090 |
| 10 x 4 CFM    | 45   | 60   | 75   | 90   | 105  | 120  | 135  | 150  | 165  | 180  |
| Ak .149 Throw | 2.0  | 3.0  | 3.5  | 4.5  | 5.0  | 6.0  | 6.5  | 7.5  | 8.0  | 9.0  |
| 12 x 4 CFM    | 55   | 70   | 90   | 110  | 125  | 145  | 165  | 180  | 200  | 215  |
| Ak .181 Throw | 2.5  | 3.0  | 4.0  | 5.0  | 5.5  | 6.5  | 7.5  | 8.0  | 9.0  | 10.0 |
| 10 x 6 CFM    | 70   | 95   | 120  | 140  | 165  | 190  | 210  | 235  | 260  | 285  |
| Ak .236 Throw | 3.0  | 4.0  | 5.0  | 5.5  | 6.5  | 7.5  | 8.5  | 9.5  | 10.0 | 11.0 |
| 12 x 6 CFM    | 85   | 115  | 145  | 170  | 200  | 230  | 255  | 285  | 315  | 345  |
| Ak .286 Throw | 3.0  | 4.0  | 5.0  | 6.0  | 7.0  | 8.5  | 9.0  | 10.0 | 11.0 | 12.0 |
| 10 x 8 CFM    | 95   | 130  | 160  | 190  | 225  | 255  | 290  | 320  | 350  | 385  |
| Ak .320 Throw | 3.0  | 4.5  | 5.5  | 6.5  | 7.5  | 8.5  | 10.0 | 11.0 | 12.0 | 13.0 |
| 14 x 6 CFM    | 100  | 135  | 170  | 200  | 235  | 270  | 300  | 335  | 370  | 405  |
| Ak .336 Throw | 3.5  | 4.5  | 5.5  | 6.5  | 8.0  | 9.0  | 10.0 | 11.0 | 12.0 | 13.0 |
| 12 x 8 CFM    | 120  | 160  | 200  | 235  | 275  | 315  | 355  | 395  | 435  | 475  |
| Ak .395 Throw | 3.5  | 5.0  | 6.0  | 7.0  | 8.0  | 10.0 | 11.0 | 12.0 | 13.0 | 15.0 |
| 14 x 8 CFM    | 140  | 185  | 230  | 275  | 320  | 370  | 415  | 460  | 505  | 550  |
| Ak .460 Throw | 4.0  | 5.5  | 6.5  | 8.0  | 9.0  | 10.5 | 11.5 | 13.0 | 14.5 | 15.5 |

For sizes not listed or sizing tips see page 40

Terminal Velocity of 75 FPM

| Face Velocity | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Pressure Loss | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 | .075 | .090 |

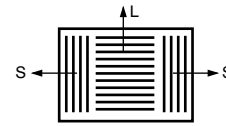
## 621 Sidewall/Ceiling Register 4-Way Deflection (Page 19)

| Face Velocity     | 300       | 400       | 500       | 600       | 700       | 800       | 900       | 1000      |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Pressure Loss     | .006      | .010      | .016      | .022      | .031      | .040      | .050      | .062      |
| 6 x 6 CFM         | 40        | 55        | 70        | 85        | 100       | 110       | 125       | 140       |
| Ak .14 Throw L/S  | 4.5/3.5   | 6.5/5.0   | 8.0/6.5   | 10.0/8.0  | 11.5/9.5  | 12.5/10.5 | 14.5/12.0 | 16.0/13.5 |
| 8 x 8 CFM         | 85        | 110       | 140       | 170       | 195       | 225       | 250       | 280       |
| Ak .28 Throw L/S  | 6.5/5.5   | 9.0/7.5   | 11.0/9.5  | 13.5/11.5 | 15.5/13.0 | 18.0/15.0 | 20.0/16.5 | 22.5/18.5 |
| 10 x 10 CFM       | 130       | 175       | 220       | 265       | 310       | 350       | 395       | 440       |
| Ak .44 Throw L/S  | 8.0/6.5   | 11.0/9.0  | 14.0/11.5 | 17.0/14.0 | 20.0/16.5 | 22.0/18.0 | 25.0/21.0 | 28.0/23.0 |
| 12 x 12 CFM       | 205       | 270       | 340       | 410       | 475       | 545       | 610       | 680       |
| Ak .68 Throw L/S  | 10.5/8.5  | 14.0/11.0 | 17.5/14.0 | 21.0/17.0 | 24.5/19.5 | 28.0/22.5 | 30.0/25.0 | 33.0/28.0 |
| 14 x 14 CFM       | 280       | 370       | 465       | 560       | 650       | 745       | 835       | 930       |
| Ak .93 Throw L/S  | 11.0/9.5  | 14.5/12.5 | 18.5/16.0 | 22.0/19.0 | 26.5/22.0 | 30.0/25.5 | 32.5/28.0 | 36.0/31.0 |
| 16 x 16 CFM       | 385       | 510       | 640       | 770       | 895       | 1025      | 1150      | 1280      |
| Ak 1.28 Throw L/S | 13.0/11.0 | 17.5/14.0 | 22.0/18.0 | 26.5/21.5 | 30.0/25.0 | 35.0/28.0 | 39.0/32.0 | 43.0/36.0 |

**631 Register (Page 19)**

| Face Velocity |           | 300      | 400      | 500      | 600      | 700       | 800       | 900       | 1000      |
|---------------|-----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| Pressure Loss |           | .006     | .010     | .016     | .022     | .031      | .040      | .050      | .062      |
| 10 x 6        | CFM       | 85       | 110      | 140      | 170      | 195       | 225       | 250       | 280       |
| Ak .18        | Throw L/S | 4.0/8.0  | 5.5/10.0 | 7.0/13.0 | 8.5/16.0 | 9.5/19.0  | 11.0/21.0 | 13.0/24.0 | 15.0/26.0 |
| 12 x 6        | CFM       | 100      | 135      | 170      | 205      | 240       | 275       | 305       | 340       |
| Ak .34        | Throw L/S | 4.0/8.0  | 5.0/10.0 | 6.0/13.0 | 7.5/16.0 | 9.0/20.0  | 10.0/22.0 | 11.5/24.0 | 13.0/28.0 |
| 10 x 8        | CFM       | 115      | 150      | 190      | 230      | 265       | 305       | 340       | 380       |
| Ak .38        | Throw L/S | 3.5/9.5  | 5.0/13.0 | 6.0/16.0 | 7.0/18.0 | 8.0/21.0  | 9.0/24.0  | 10.5/29.0 | 11.5/32.0 |
| 14 x 6        | CFM       | 120      | 160      | 200      | 240      | 280       | 320       | 360       | 400       |
| Ak .40        | Throw L/S | 4.0/10.0 | 5.0/12.0 | 6.5/16.0 | 8.0/19.0 | 9.0/22.0  | 10.0/24.0 | 11.0/27.0 | 12.5/30.0 |
| 12 x 8        | CFM       | 140      | 190      | 235      | 280      | 330       | 375       | 425       | 470       |
| Ak .47        | Throw L/S | 4.5/10.0 | 6.0/13.0 | 7.5/15.0 | 9.0/18.0 | 10.0/21.0 | 11.5/25.0 | 13.0/28.0 | 14.5/31.0 |
| 14 x 8        | CFM       | 165      | 220      | 275      | 330      | 385       | 440       | 495       | 550       |
| Ak .55        | Throw L/S | 4.0/10.0 | 5.5/13.5 | 7.5/18.0 | 8.5/22.0 | 10.0/25.0 | 11.5/29.0 | 13.0/33.0 | 15.0/36.0 |

Terminal Velocity of 75 FPM



**650 & A650 Return Air Grille (Page 19, 20)**

**659 Return Air Filter Grille (Page 20)**

| Face Velocity* |     | 300  | 400  | 500  | 600  |
|----------------|-----|------|------|------|------|
| 6 x 4          | CFM | 33   | 44   | 55   | 66   |
| Ak .111        | Ps  | .010 | .018 | .029 | .041 |
| 6 x 6          | CFM | 50   | 67   | 83   | 100  |
| Ak .167        | Ps  | .010 | .018 | .029 | .041 |
| 8 x 4          | CFM | 44   | 59   | 74   | 89   |
| Ak .148        | Ps  | .010 | .018 | .029 | .041 |
| 8 x 6          | CFM | 67   | 89   | 112  | 134  |
| Ak .223        | Ps  | .010 | .018 | .029 | .041 |
| 8 x 8          | CFM | 90   | 120  | 150  | 179  |
| Ak .299        | Ps  | .010 | .018 | .029 | .041 |
| 10 x 4         | CFM | 56   | 74   | 93   | 111  |
| Ak .186        | Ps  | .010 | .018 | .029 | .041 |
| 10 x 6         | CFM | 84   | 112  | 140  | 168  |
| Ak .280        | Ps  | .010 | .018 | .029 | .041 |
| 10 x 8         | CFM | 112  | 150  | 187  | 225  |
| Ak .375        | Ps  | .010 | .018 | .029 | .041 |
| 10 x 10        | CFM | 141  | 188  | 235  | 282  |
| Ak .470        | Ps  | .010 | .018 | .029 | .041 |
| 12 x 6         | CFM | 101  | 135  | 168  | 202  |
| Ak .337        | Ps  | .010 | .018 | .029 | .041 |
| 12 x 8         | CFM | 135  | 180  | 226  | 271  |
| Ak .451        | Ps  | .010 | .018 | .029 | .041 |
| 12 x 10        | CFM | 170  | 226  | 283  | 339  |
| Ak .566        | Ps  | .010 | .018 | .029 | .041 |
| 12 x 12        | CFM | 204  | 272  | 340  | 408  |
| Ak .681        | Ps  | .010 | .018 | .029 | .041 |
| 12 x 18        | CFM | 308  | 411  | 513  | 616  |
| Ak 1.027       | Ps  | .010 | .018 | .029 | .041 |
| 14 x 6         | CFM | 118  | 158  | 197  | 236  |
| Ak .394        | Ps  | .010 | .018 | .029 | .041 |
| 14 x 8         | CFM | 158  | 211  | 264  | 316  |
| Ak .527        | Ps  | .010 | .018 | .029 | .041 |
| 14 x 10        | CFM | 198  | 265  | 331  | 397  |
| Ak .661        | Ps  | .010 | .018 | .029 | .041 |
| 14 x 12        | CFM | 239  | 318  | 398  | 477  |
| Ak .796        | Ps  | .010 | .018 | .029 | .041 |
| 14 x 14        | CFM | 279  | 372  | 465  | 558  |
| Ak .930        | Ps  | .010 | .018 | .029 | .041 |
| 14 x 18        | CFM | 360  | 480  | 600  | 720  |
| Ak 1.200       | Ps  | .010 | .018 | .029 | .041 |

| Face Velocity* |     | 300  | 400  | 500  | 600  |
|----------------|-----|------|------|------|------|
| 16 x 6         | CFM | 135  | 180  | 226  | 271  |
| Ak .451        | Ps  | .010 | .018 | .029 | .041 |
| 16 x 8         | CFM | 181  | 242  | 302  | 362  |
| Ak .604        | Ps  | .010 | .018 | .029 | .041 |
| 16 x 10        | CFM | 227  | 303  | 379  | 454  |
| Ak .757        | Ps  | .010 | .018 | .029 | .041 |
| 16 x 12        | CFM | 273  | 364  | 455  | 547  |
| Ak .911        | Ps  | .010 | .018 | .029 | .041 |
| 16 x 14        | CFM | 320  | 426  | 533  | 639  |
| Ak 1.065       | Ps  | .010 | .018 | .029 | .041 |
| 16 x 16        | CFM | 366  | 488  | 610  | 732  |
| Ak 1.219       | Ps  | .010 | .018 | .029 | .041 |
| 16 x 24        | CFM | 552  | 736  | 920  | 1104 |
| Ak 1.840       | Ps  | .010 | .018 | .029 | .041 |
| 18 x 6         | CFM | 153  | 203  | 254  | 305  |
| Ak .508        | Ps  | .010 | .018 | .029 | .041 |
| 18 x 18        | CFM | 465  | 619  | 774  | 929  |
| Ak 1.548       | Ps  | .010 | .018 | .029 | .041 |
| 20 x 6         | CFM | 170  | 226  | 283  | 339  |
| Ak .566        | Ps  | .010 | .018 | .029 | .041 |
| 20 x 10        | CFM | 285  | 380  | 475  | 570  |
| Ak .949        | Ps  | .010 | .018 | .029 | .041 |
| 20 x 12        | CFM | 343  | 457  | 571  | 685  |
| Ak 1.142       | Ps  | .010 | .018 | .029 | .041 |
| 20 x 14        | CFM | 401  | 534  | 668  | 801  |
| Ak 1.335       | Ps  | .010 | .018 | .029 | .041 |
| 20 x 20        | CFM | 575  | 767  | 959  | 1150 |
| Ak 1.917       | Ps  | .010 | .018 | .029 | .041 |
| 20 x 24        | CFM | 692  | 923  | 1153 | 1384 |
| Ak 2.307       | Ps  | .010 | .019 | .029 | .042 |
| 20 x 25        | CFM | 721  | 962  | 1202 | 1442 |
| Ak 2.404       | Ps  | .010 | .019 | .029 | .042 |

For sizes not listed and sizing tips see page 40

| Face Velocity* |     | 300  | 400  | 500  | 600  |
|----------------|-----|------|------|------|------|
| 24 x 4         | CFM | 135  | 180  | 226  | 271  |
| Ak .451        | Ps  | .010 | .018 | .029 | .041 |
| 24 x 6         | CFM | 204  | 272  | 340  | 408  |
| Ak .681        | Ps  | .010 | .018 | .029 | .041 |
| 24 x 8         | CFM | 273  | 364  | 455  | 547  |
| Ak .911        | Ps  | .010 | .018 | .029 | .041 |
| 24 x 10        | CFM | 343  | 457  | 571  | 685  |
| Ak 1.142       | Ps  | .010 | .018 | .029 | .041 |
| 24 x 12        | CFM | 412  | 550  | 687  | 825  |
| Ak 1.374       | Ps  | .010 | .018 | .029 | .041 |
| 24 x 14        | CFM | 482  | 643  | 803  | 964  |
| Ak 1.607       | Ps  | .010 | .018 | .029 | .041 |
| 24 x 24        | CFM | 832  | 1110 | 1387 | 1665 |
| Ak 2.775       | Ps  | .010 | .019 | .029 | .042 |
| 30 x 4         | CFM | 170  | 226  | 283  | 339  |
| Ak .566        | Ps  | .010 | .018 | .029 | .041 |
| 30 x 6         | CFM | 256  | 341  | 427  | 512  |
| Ak .853        | Ps  | .010 | .018 | .029 | .041 |
| 30 x 8         | CFM | 343  | 457  | 571  | 685  |
| Ak 1.142       | Ps  | .010 | .018 | .029 | .041 |
| 30 x 10        | CFM | 430  | 573  | 716  | 859  |
| Ak 1.432       | Ps  | .010 | .018 | .029 | .041 |
| 30 x 12        | CFM | 517  | 689  | 862  | 1034 |
| Ak 1.723       | Ps  | .010 | .018 | .029 | .041 |
| 30 x 14        | CFM | 604  | 806  | 1007 | 1209 |
| Ak 2.015       | Ps  | .010 | .018 | .029 | .042 |
| 30 x 18        | CFM | 780  | 1040 | 1300 | 1560 |
| Ak 2.599       | Ps  | .010 | .019 | .029 | .042 |
| 30 x 20        | CFM | 868  | 1157 | 1446 | 1735 |
| Ak 2.892       | Ps  | .010 | .019 | .029 | .042 |
| 30 x 24        | CFM | 1044 | 1392 | 1740 | 2088 |
| Ak 3.479       | Ps  | .010 | .019 | .029 | .042 |
| 30 x 30        | CFM | 1309 | 1745 | 2181 | 2618 |
| Ak 4.363       | Ps  | .010 | .019 | .029 | .042 |
| 36 x 6         | CFM | 308  | 411  | 513  | 616  |
| Ak 1.027       | Ps  | .010 | .018 | .029 | .041 |
| 36 x 8         | CFM | 412  | 550  | 687  | 825  |
| Ak 1.374       | Ps  | .010 | .018 | .029 | .041 |

\*Filter grilles: 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.

**651 Baseboard Register (Page 20)**

| Face Velocity    |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|------------------|-------|------|------|------|------|------|------|------|------|
| Pressure Loss    |       | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 |
| 8 x 4            | CFM   | 33   | 44   | 55   | 66   | 77   | 88   | 100  | 110  |
| Ak .110          | Throw | 6.0  | 8.0  | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 |
| 10 x 4           | CFM   | 40   | 54   | 67   | 80   | 95   | 110  | 120  | 135  |
| Ak .135          | Throw | 6.5  | 8.5  | 10.5 | 12.5 | 15.0 | 17.5 | 19.0 | 21.0 |
| 12 x 4 and 8 x 6 | CFM   | 55   | 72   | 90   | 108  | 125  | 145  | 162  | 180  |
| Ak .180          | Throw | 7.5  | 10.0 | 12.5 | 15.0 | 17.5 | 20.5 | 23.0 | 25.0 |
| 10 x 6           | CFM   | 70   | 92   | 115  | 140  | 160  | 185  | 205  | 230  |
| Ak .230          | Throw | 9.0  | 11.5 | 14.5 | 17.5 | 20.0 | 23.0 | 25.5 | 29.0 |
| 12 x 6           | CFM   | 85   | 115  | 145  | 175  | 205  | 230  | 260  | 290  |
| Ak .290          | Throw | 10.0 | 13.0 | 17.0 | 20.0 | 23.5 | 26.5 | 30.0 | 33.0 |
| 14 x 6           | CFM   | 102  | 135  | 170  | 205  | 240  | 270  | 305  | 340  |
| Ak .340          | Throw | 11.0 | 14.5 | 18.0 | 22.0 | 25.5 | 29.0 | 32.5 | 36.0 |

Terminal Velocity of 75 FPM

**672/674 Return Air Grille (Page 22, 12)**

**673 Return Air Filter Grille (Page 22)**

| Face Velocity* |     | 300  | 400  | 500  | 600  |
|----------------|-----|------|------|------|------|
| 6 x 4          | CFM | 34   | 45   | 56   | 68   |
| Ak .110        | Ps  | .020 | .035 | .054 | .079 |
| 6 x 6          | CFM | 50   | 67   | 84   | 101  |
| Ak .170        | Ps  | .019 | .035 | .054 | .079 |
| 8 x 4          | CFM | 45   | 60   | 75   | 90   |
| Ak .150        | Ps  | .019 | .035 | .054 | .079 |
| 8 x 6          | CFM | 67   | 89   | 111  | 134  |
| Ak .220        | Ps  | .019 | .035 | .054 | .079 |
| 8 x 8          | CFM | 89   | 118  | 148  | 178  |
| Ak .300        | Ps  | .019 | .035 | .054 | .078 |
| 10 x 4         | CFM | 56   | 74   | 93   | 112  |
| Ak .190        | Ps  | .019 | .035 | .054 | .079 |
| 10 x 6         | CFM | 83   | 111  | 139  | 167  |
| Ak .280        | Ps  | .019 | .035 | .054 | .078 |
| 10 x 8         | CFM | 111  | 147  | 184  | 221  |
| Ak .370        | Ps  | .019 | .034 | .054 | .078 |
| 10 x 10        | CFM | 138  | 184  | 230  | 276  |
| Ak .460        | Ps  | .019 | .034 | .054 | .078 |
| 12 x 6         | CFM | 100  | 133  | 166  | 199  |
| Ak .330        | Ps  | .019 | .034 | .054 | .078 |
| 12 x 8         | CFM | 132  | 177  | 221  | 265  |
| Ak .440        | Ps  | .019 | .034 | .054 | .078 |
| 12 x 10        | CFM | 165  | 220  | 275  | 330  |
| Ak .550        | Ps  | .019 | .034 | .053 | .077 |
| 12 x 12        | CFM | 197  | 263  | 329  | 395  |
| Ak .660        | Ps  | .019 | .034 | .053 | .077 |
| 12 x 18        | CFM | 294  | 392  | 491  | 589  |
| Ak .980        | Ps  | .019 | .034 | .053 | .075 |
| 14 x 6         | CFM | 116  | 155  | 193  | 232  |
| Ak .390        | Ps  | .019 | .034 | .054 | .078 |
| 14 x 8         | CFM | 154  | 205  | 257  | 308  |
| Ak .510        | Ps  | .019 | .034 | .053 | .077 |
| 14 x 10        | CFM | 192  | 256  | 320  | 384  |
| Ak .640        | Ps  | .019 | .034 | .053 | .077 |
| 14 x 12        | CFM | 230  | 306  | 383  | 460  |
| Ak .770        | Ps  | .019 | .034 | .053 | .076 |
| 14 x 14        | CFM | 267  | 357  | 446  | 535  |
| Ak .890        | Ps  | .019 | .034 | .053 | .075 |
| 14 x 18        | CFM | 343  | 457  | 571  | 685  |
| Ak 1.140       | Ps  | .019 | .033 | .052 | .074 |

| Face Velocity* |     | 300  | 400  | 500  | 600  |
|----------------|-----|------|------|------|------|
| 16 x 6         | CFM | 132  | 177  | 221  | 265  |
| Ak .440        | Ps  | .019 | .034 | .054 | .078 |
| 16 x 8         | CFM | 176  | 234  | 293  | 352  |
| Ak .590        | Ps  | .019 | .034 | .053 | .077 |
| 16 x 10        | CFM | 219  | 292  | 365  | 438  |
| Ak .730        | Ps  | .019 | .034 | .053 | .076 |
| 16 x 12        | CFM | 262  | 349  | 437  | 524  |
| Ak .870        | Ps  | .019 | .034 | .053 | .076 |
| 16 x 14        | CFM | 305  | 407  | 509  | 610  |
| Ak 1.020       | Ps  | .019 | .034 | .052 | .075 |
| 16 x 16        | CFM | 348  | 464  | 580  | 696  |
| Ak 1.160       | Ps  | .019 | .033 | .052 | .074 |
| 16 x 24        | CFM | 519  | 692  | 865  | 1038 |
| Ak 1.730       | Ps  | .018 | .033 | .051 | .071 |
| 16 x 25        | CFM | 540  | 720  | 900  | 1081 |
| Ak 1.800       | Ps  | .018 | .033 | .051 | .071 |
| 18 x 6         | CFM | 149  | 198  | 248  | 297  |
| Ak .500        | Ps  | .019 | .034 | .054 | .077 |
| 18 x 18        | CFM | 439  | 585  | 732  | 878  |
| Ak 1.460       | Ps  | .019 | .033 | .052 | .073 |
| 18 x 24        | CFM | 583  | 777  | 971  | 1166 |
| Ak 1.940       | Ps  | .018 | .032 | .051 | .070 |
| 20 x 6         | CFM | 165  | 220  | 275  | 330  |
| Ak .550        | Ps  | .019 | .034 | .053 | .077 |
| 20 x 10        | CFM | 273  | 364  | 455  | 546  |
| Ak .910        | Ps  | .019 | .034 | .053 | .075 |
| 20 x 12        | CFM | 327  | 435  | 544  | 653  |
| Ak 1.090       | Ps  | .019 | .033 | .052 | .074 |
| 20 x 14        | CFM | 380  | 507  | 634  | 760  |
| Ak 1.270       | Ps  | .019 | .033 | .052 | .074 |
| 20 x 20        | CFM | 540  | 720  | 900  | 1081 |
| Ak 1.800       | Ps  | .018 | .033 | .051 | .071 |
| 20 x 24        | CFM | 647  | 862  | 1078 | 1293 |
| Ak 2.160       | Ps  | .018 | .032 | .050 | .069 |
| 20 x 25        | CFM | 673  | 898  | 1122 | 1346 |
| Ak 2.240       | Ps  | .018 | .032 | .050 | .069 |

| Face Velocity* |     | 300  | 400  | 500  | 600  |
|----------------|-----|------|------|------|------|
| 24 x 4         | CFM | 132  | 177  | 221  | 265  |
| Ak .440        | Ps  | .019 | .034 | .054 | .078 |
| 24 x 6         | CFM | 197  | 263  | 329  | 395  |
| Ak .660        | Ps  | .019 | .034 | .053 | .077 |
| 24 x 8         | CFM | 262  | 349  | 437  | 524  |
| Ak .870        | Ps  | .019 | .034 | .053 | .076 |
| 24 x 10        | CFM | 327  | 435  | 544  | 653  |
| Ak 1.090       | Ps  | .019 | .033 | .052 | .074 |
| 24 x 12        | CFM | 391  | 521  | 651  | 782  |
| Ak 1.300       | Ps  | .019 | .033 | .052 | .073 |
| 24 x 14        | CFM | 455  | 607  | 758  | 910  |
| Ak 1.520       | Ps  | .019 | .033 | .051 | .072 |
| 24 x 24        | CFM | 774  | 1032 | 1290 | 1548 |
| Ak 2.580       | Ps  | .018 | .032 | .049 | .067 |
| 30 x 4         | CFM | 165  | 220  | 275  | 330  |
| Ak .550        | Ps  | .019 | .034 | .053 | .077 |
| 30 x 6         | CFM | 246  | 328  | 410  | 492  |
| Ak .820        | Ps  | .019 | .034 | .053 | .076 |
| 30 x 8         | CFM | 327  | 435  | 544  | 653  |
| Ak 1.090       | Ps  | .019 | .033 | .052 | .074 |
| 30 x 10        | CFM | 407  | 543  | 678  | 814  |
| Ak 1.360       | Ps  | .019 | .033 | .052 | .073 |
| 30 x 12        | CFM | 487  | 649  | 812  | 974  |
| Ak 1.620       | Ps  | .018 | .033 | .051 | .072 |
| 30 x 14        | CFM | 567  | 756  | 945  | 1134 |
| Ak 1.890       | Ps  | .018 | .032 | .051 | .071 |
| 30 x 18        | CFM | 726  | 968  | 1210 | 1452 |
| Ak 2.420       | Ps  | .018 | .032 | .050 | .068 |
| 30 x 20        | CFM | 806  | 1074 | 1343 | 1611 |
| Ak 2.690       | Ps  | .018 | .031 | .049 | .067 |
| 30 x 24        | CFM | 964  | 1286 | 1607 | 1928 |
| Ak 3.210       | Ps  | .017 | .031 | .048 | .064 |
| 30 x 30        | CFM | 1201 | 1602 | 2002 | 2403 |
| Ak 4.000       | Ps  | .017 | .030 | .046 | .060 |
| 36 x 8         | CFM | 391  | 521  | 651  | 782  |
| Ak 1.300       | Ps  | .019 | .033 | .052 | .073 |

For sizes not listed and sizing tips see page 40

\*Filter grilles: 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.

**661 & A661 2-Way Supply Register (Page 21)**

| Face Velocity     |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|-------------------|-------|------|------|------|------|------|------|------|------|
| Pressure Loss     |       | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 |
| 6 x 4             | CFM   | 25   | 30   | 40   | 50   | 55   | 65   | 70   | 80   |
| Ak .080           | Throw | 4.0  | 4.5  | 6.0  | 7.0  | 8.5  | 10.0 | 11.0 | 12.5 |
| 8 x 4             | CFM   | 35   | 45   | 55   | 65   | 75   | 90   | 100  | 110  |
| Ak .110           | Throw | 4.5  | 5.5  | 7.0  | 8.5  | 10.0 | 11.5 | 13.0 | 14.5 |
| 10 x 4 and 8 x 5  | CFM   | 45   | 60   | 75   | 85   | 100  | 115  | 130  | 145  |
| Ak .145           | Throw | 5.0  | 6.5  | 8.0  | 9.5  | 11.5 | 13.0 | 14.5 | 16.0 |
| 12 x 4 and 8 x 6  | CFM   | 55   | 70   | 90   | 110  | 125  | 145  | 160  | 180  |
| Ak .180           | Throw | 5.5  | 7.0  | 9.0  | 10.5 | 12.5 | 14.0 | 16.0 | 18.0 |
| 14 x 4            | CFM   | 65   | 85   | 110  | 130  | 150  | 170  | 195  | 215  |
| Ak .215           | Throw | 6.0  | 7.5  | 9.5  | 11.5 | 13.5 | 15.5 | 17.0 | 19.0 |
| 10 x 6 and 12 x 5 | CFM   | 75   | 100  | 125  | 145  | 170  | 195  | 220  | 245  |
| Ak .245           | Throw | 6.0  | 8.0  | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 |
| 12 x 6 and 14 x 5 | CFM   | 90   | 120  | 150  | 175  | 205  | 235  | 265  | 295  |
| Ak .295           | Throw | 6.5  | 8.5  | 11.0 | 13.0 | 15.5 | 17.5 | 19.5 | 22.0 |
| 10 x 8            | CFM   | 105  | 140  | 175  | 205  | 240  | 275  | 310  | 345  |
| Ak .345           | Throw | 7.0  | 9.0  | 11.5 | 13.5 | 16.5 | 18.5 | 21.0 | 23.5 |
| 14 x 6            | CFM   | 110  | 145  | 180  | 215  | 250  | 290  | 325  | 360  |
| Ak .360           | Throw | 7.0  | 9.5  | 12.0 | 14.0 | 16.5 | 19.0 | 21.5 | 24.0 |

Terminal Velocity of 75 FPM

| Face Velocity     |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|-------------------|-------|------|------|------|------|------|------|------|------|
| Pressure Loss     |       | .006 | .010 | .016 | .022 | .031 | .040 | .050 | .062 |
| 16 x 6 and 12 x 8 | CFM   | 130  | 170  | 215  | 255  | 300  | 340  | 385  | 425  |
| Ak .425           | Throw | 7.5  | 10.0 | 12.5 | 15.0 | 18.0 | 20.5 | 23.0 | 25.5 |
| 14 x 8            | CFM   | 155  | 205  | 260  | 310  | 360  | 410  | 465  | 515  |
| Ak .515           | Throw | 8.0  | 10.5 | 14.0 | 16.0 | 19.5 | 22.0 | 25.0 | 28.0 |
| 20 x 6            | CFM   | 165  | 220  | 275  | 330  | 385  | 440  | 495  | 550  |
| Ak .550           | Throw | 8.5  | 11.0 | 14.5 | 17.0 | 20.0 | 23.0 | 25.5 | 29.0 |
| 16 x 8            | CFM   | 180  | 240  | 300  | 360  | 420  | 480  | 540  | 600  |
| Ak .600           | Throw | 8.5  | 11.0 | 14.5 | 17.0 | 20.0 | 23.0 | 25.5 | 29.0 |
| 24 x 6 and 18 x 8 | CFM   | 205  | 270  | 340  | 410  | 475  | 545  | 610  | 680  |
| Ak .680           | Throw | 9.5  | 12.0 | 15.5 | 18.5 | 22.0 | 25.0 | 28.0 | 31.5 |
| 20 x 8            | CFM   | 230  | 305  | 380  | 455  | 530  | 610  | 685  | 760  |
| Ak .760           | Throw | 10.0 | 13.0 | 16.5 | 19.0 | 23.0 | 26.0 | 28.5 | 33.0 |
| 30 x 6            | CFM   | 265  | 350  | 440  | 530  | 615  | 705  | 790  | 880  |
| Ak .880           | Throw | 10.5 | 14.0 | 17.5 | 20.5 | 24.5 | 28.0 | 31.5 | 35.0 |
| 24 x 8            | CFM   | 295  | 390  | 490  | 590  | 685  | 785  | 880  | 980  |
| Ak .980           | Throw | 11.0 | 14.0 | 18.0 | 21.5 | 25.5 | 29.0 | 33.0 | 37.0 |
| 30 x 8            | CFM   | 375  | 500  | 625  | 750  | 875  | 1000 | 1125 | 1250 |
| Ak 1.250          | Throw | 12.0 | 16.0 | 20.0 | 24.0 | 28.5 | 32.0 | 37.0 | 41.0 |



**681 One-Way Sidewall/Ceiling Register**  
(Page 22)

**681M One-Way Sidewall/Ceiling Register**  
(Page 22)

| Face Velocity        | 300         | 400         | 500         | 600         | 700         | 800         | 900         | 1000        |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Pressure Loss</b> | <b>.006</b> | <b>.010</b> | <b>.016</b> | <b>.022</b> | <b>.031</b> | <b>.040</b> | <b>.050</b> | <b>.062</b> |
| 8 x 6 CFM            | 40          | 55          | 70          | 90          | 100         | 110         | 125         | 140         |
| Ak .140 Throw        | 5.0         | 6.0         | 8.0         | 9.0         | 11.0        | 12.0        | 14.0        | 15.0        |
| 10 x 6 CFM           | 55          | 80          | 95          | 110         | 130         | 150         | 165         | 185         |
| Ak .185 Throw        | 5.0         | 7.0         | 10.0        | 11.0        | 13.0        | 14.0        | 16.0        | 18.0        |
| 12 x 6 CFM           | 70          | 90          | 115         | 135         | 160         | 180         | 205         | 225         |
| Ak .225 Throw        | 6.0         | 8.0         | 12.0        | 12.0        | 14.0        | 16.0        | 18.0        | 20.0        |
| 14 x 6 CFM           | 85          | 115         | 145         | 175         | 205         | 230         | 260         | 290         |
| Ak .290 Throw        | 7.0         | 9.0         | 16.0        | 14.0        | 17.0        | 19.0        | 21.0        | 24.0        |
| 16 x 6 CFM           | 100         | 130         | 165         | 200         | 230         | 265         | 295         | 330         |
| Ak .330 Throw        | 8.0         | 10.0        | 18.0        | 15.0        | 18.0        | 20.0        | 23.0        | 25.0        |
| 18 x 6 CFM           | 115         | 155         | 195         | 235         | 275         | 310         | 350         | 390         |
| Ak .390 Throw        | 8.0         | 11.0        | 21.0        | 17.0        | 20.0        | 22.0        | 25.0        | 28.0        |
| 20 x 6 CFM           | 130         | 175         | 220         | 265         | 310         | 360         | 395         | 440         |
| Ak .440 Throw        | 5.0         | 12.0        | 24.0        | 18.0        | 21.0        | 24.0        | 27.0        | 30.0        |

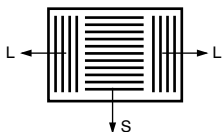
Terminal Velocity of 75 FPM

**683 Three-Way Sidewall/Ceiling Register**  
(Page 23)

**683M Three-Way Sidewall/Ceiling Register**  
(Page 23)

| Face Velocity        | 300   | 400                       | 500                         | 600                         | 700                         | 800                         | 900                         | 1000                        |
|----------------------|---|---------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| <b>Pressure Loss</b> | <b>.006</b>   | <b>.010</b>               | <b>.016</b>                 | <b>.022</b>                 | <b>.031</b>                 | <b>.040</b>                 | <b>.050</b>                 | <b>.062</b>                 |
| 8 x 4 Ak .090        | Total CFM 25<br>CFM L/S 13/6<br>Throw L/S 3.0/2.5     | 35<br>17/9<br>4.0/3.0     | 45<br>24/11<br>5.0/3.5      | 55<br>29/13<br>6.0/4.0      | 65<br>34/16<br>7.0/5.0      | 70<br>37/17<br>8.5/6.5      | 80<br>42/19<br>10.0/6.5     | 90<br>48/22                 |
| 6 x 6 Ak .105        | Total CFM 30<br>CFM L/S 10/10<br>Throw L/S 3.0/3.0    | 40<br>13/14<br>3.5/3.5    | 50<br>16/17<br>4.0/4.0      | 65<br>21/22<br>5.5/5.5      | 75<br>24/26<br>6.0/6.0      | 85<br>27/29<br>7.0/7.0      | 95<br>30/32<br>8.0/8.0      | 105<br>34/36<br>9.0/9.0     |
| 10 x 4 Ak .115       | Total CFM 35<br>CFM L/S 21/7<br>Throw L/S 4.0/2.0     | 45<br>29/8<br>5.0/2.5     | 60<br>38/11<br>6.0/3.5      | 70<br>45/13<br>7.5/4.0      | 80<br>51/14<br>8.5/4.5      | 90<br>58/16<br>9.5/5.0      | 105<br>67/19<br>11.0/6.0    | 115<br>74/21                |
| 12 x 4 Ak .140       | Total CFM 40<br>CFM L/S 21/10<br>Throw L/S 3.5/2.5    | 55<br>29/13<br>5.0/3.5    | 70<br>36/17<br>6.0/4.0      | 85<br>44/20<br>7.5/5.0      | 100<br>52/24<br>8.5/5.5     | 110<br>57/26<br>9.5/6.0     | 125<br>65/30<br>10.5/7.0    | 140<br>73/34<br>12.0/8.0    |
| 10 x 6 Ak .185       | Total CFM 55<br>CFM L/S 35/10<br>Throw L/S 4.5/2.5    | 75<br>48/14<br>6.5/3.5    | 95<br>61/17<br>8.0/4.0      | 110<br>70/20<br>9.0/5.0     | 130<br>83/23<br>11.0/5.5    | 150<br>96/27<br>12.5/6.5    | 165<br>106/30<br>14.0/7.5   | 185<br>118/33<br>15.5/8.0   |
| 8 x 8 Ak .200        | Total CFM 60<br>CFM L/S 31/14<br>Throw L/S 4.5/3.0    | 80<br>42/19<br>6.0/4.0    | 100<br>52/24<br>7.5/5.0     | 120<br>62/29<br>8.5/6.0     | 140<br>73/34<br>10.5/7.0    | 160<br>83/38<br>11.5/8.0    | 180<br>94/43<br>13.0/9.0    | 200<br>104/48<br>14.5/10.0  |
| 12 x 6 A .225        | Total CFM 70<br>CFM L/S 36/17<br>Throw L/S 4.5/3.5    | 90<br>47/22<br>6.0/4.0    | 115<br>60/28<br>8.0/5.5     | 135<br>70/32<br>9.0/6.0     | 160<br>83/38<br>11.0/7.5    | 180<br>94/43<br>12.5/8.0    | 205<br>107/49<br>14.0/6.5   | 225<br>117/54<br>15.5/10.5  |
| 14 x 6 Ak .290       | Total CFM 85<br>CFM L/S 51/17<br>Throw L/S 5.5/3.5    | 115<br>69/23<br>7.5/4.5   | 145<br>87/29<br>10.0/5.5    | 175<br>105/35<br>12.0/6.5   | 205<br>123/41<br>14.0/8.0   | 230<br>138/46<br>15.5/9.0   | 260<br>156/52<br>18.0/10.0  | 290<br>174/58<br>20.0/11.0  |
| 10 x 10 Ak .310      | Total CFM 95<br>CFM L/S 61/17<br>Throw L/S 6.0/3.5    | 125<br>80/23<br>8.0/4.5   | 155<br>99/28<br>10.0/5.5    | 185<br>118/33<br>12.0/6.5   | 215<br>138/39<br>14.0/7.5   | 250<br>160/45<br>16.5/9.0   | 280<br>179/50<br>20.0/10.5  | 310<br>198/56               |
| 12 x 8 Ak .320       | Total CFM 95<br>CFM L/S 49/23<br>Throw L/S 5.5/4.0    | 130<br>68/31<br>7.5/5.0   | 160<br>83/38<br>9.5/6.0     | 190<br>99/46<br>11.0/7.5    | 225<br>117/54<br>13.0/9.0   | 255<br>133/61<br>15.0/10.0  | 290<br>151/70<br>17.0/11.5  | 320<br>166/77<br>19.0/12.5  |
| 14 x 8 Ak .390       | Total CFM 115<br>CFM L/S 69/23<br>Throw L/S 6.5/4.0   | 155<br>93/31<br>9.0/5.0   | 195<br>117/39<br>11.0/6.0   | 235<br>141/47<br>13.5/7.5   | 275<br>165/55<br>16.0/9.0   | 310<br>186/62<br>18.0/10.0  | 350<br>210/70<br>22.0/12.5  | 390<br>234/78               |
| 12 x 12 Ak .470      | Total CFM 140<br>CFM L/S 73/34<br>Throw L/S 7.0/4.5   | 190<br>99/46<br>9.0/6.0   | 235<br>122/56<br>11.5/7.5   | 280<br>146/67<br>13.5/9.0   | 330<br>172/79<br>16.0/10.5  | 375<br>195/90<br>18.0/12.0  | 425<br>221/102<br>20.0/14.0 | 470<br>244/113<br>23.0/15.5 |
| 14 x 14 Ak .650      | Total CFM 195<br>CFM L/S 117/39<br>Throw L/S 8.5/5.0  | 260<br>156/52<br>11.5/6.5 | 325<br>195/65<br>14.0/8.0   | 390<br>234/78<br>17.0/9.5   | 455<br>273/91<br>20.0/11.5  | 520<br>312/104<br>23.0/13.0 | 585<br>351/117<br>26.0/14.5 | 650<br>390/130<br>28.0/16.0 |
| 16 x 16 Ak .930      | Total CFM 280<br>CFM L/S 164/67<br>Throw L/S 10.0/6.5 | 370<br>192/89<br>13.0/9.0 | 465<br>242/112<br>16.5/11.0 | 560<br>291/134<br>20.0/13.0 | 650<br>338/156<br>23.0/15.5 | 745<br>387/179<br>26.0/17.0 | 835<br>434/200<br>29.0/20.0 | 930<br>484/223<br>33.0/22.0 |

Terminal Velocity of 75 FPM



**682 Two-Way Sidewall/Ceiling Register**  
(Page 23)

**682M Two-Way Sidewall/Ceiling Register**  
(Page 23)

| Face Velocity        | 300   | 400                       | 500                         | 600                         | 700                         | 800                         | 900                         | 1000                        |
|----------------------|---|---------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| <b>Pressure Loss</b> | <b>.006</b>   | <b>.010</b>               | <b>.016</b>                 | <b>.022</b>                 | <b>.031</b>                 | <b>.040</b>                 | <b>.050</b>                 | <b>.062</b>                 |
| 8 x 4 Ak .090        | Total CFM 25<br>CFM L/S 13/6<br>Throw L/S 3.0/2.5     | 35<br>17/9<br>4.0/3.0     | 45<br>24/11<br>5.0/3.5      | 55<br>29/13<br>6.0/4.0      | 65<br>34/16<br>7.0/5.0      | 70<br>37/17<br>8.5/6.5      | 80<br>42/19<br>10.0/6.5     | 90<br>48/22                 |
| 6 x 6 Ak .105        | Total CFM 30<br>CFM L/S 10/10<br>Throw L/S 3.0/3.0    | 40<br>13/14<br>3.5/3.5    | 50<br>16/17<br>4.0/4.0      | 65<br>21/22<br>5.5/5.5      | 75<br>24/26<br>6.0/6.0      | 85<br>27/29<br>7.0/7.0      | 95<br>30/32<br>8.0/8.0      | 105<br>34/36<br>9.0/9.0     |
| 10 x 4 Ak .115       | Total CFM 35<br>CFM L/S 21/7<br>Throw L/S 4.0/2.0     | 45<br>29/8<br>5.0/2.5     | 60<br>38/11<br>6.0/3.5      | 70<br>45/13<br>7.5/4.0      | 80<br>51/14<br>8.5/4.5      | 90<br>58/16<br>9.5/5.0      | 105<br>67/19<br>11.0/6.0    | 115<br>74/21                |
| 12 x 4 Ak .140       | Total CFM 40<br>CFM L/S 21/10<br>Throw L/S 3.5/2.5    | 55<br>29/13<br>5.0/3.5    | 70<br>36/17<br>6.0/4.0      | 85<br>44/20<br>7.5/5.0      | 100<br>52/24<br>8.5/5.5     | 110<br>57/26<br>9.5/6.0     | 125<br>65/30<br>10.5/7.0    | 140<br>73/34<br>12.0/8.0    |
| 10 x 6 Ak .185       | Total CFM 55<br>CFM L/S 35/10<br>Throw L/S 4.5/2.5    | 75<br>48/14<br>6.5/3.5    | 95<br>61/17<br>8.0/4.0      | 110<br>70/20<br>9.0/5.0     | 130<br>83/23<br>11.0/5.5    | 150<br>96/27<br>12.5/6.5    | 165<br>106/30<br>14.0/7.5   | 185<br>118/33<br>15.5/8.0   |
| 8 x 8 Ak .200        | Total CFM 60<br>CFM L/S 31/14<br>Throw L/S 4.5/3.0    | 80<br>42/19<br>6.0/4.0    | 100<br>52/24<br>7.5/5.0     | 120<br>62/29<br>8.5/6.0     | 140<br>73/34<br>10.5/7.0    | 160<br>83/38<br>11.5/8.0    | 180<br>94/43<br>13.0/9.0    | 200<br>104/48<br>14.5/10.0  |
| 12 x 6 Ak .225       | Total CFM 70<br>CFM L/S 36/17<br>Throw L/S 4.5/3.5    | 90<br>47/22<br>6.0/4.0    | 115<br>60/28<br>8.0/5.5     | 135<br>70/32<br>9.0/6.0     | 160<br>83/38<br>11.0/7.5    | 180<br>94/43<br>12.5/8.0    | 205<br>107/49<br>14.0/6.5   | 225<br>117/54<br>15.5/10.5  |
| 14 x 6 Ak .290       | Total CFM 85<br>CFM L/S 51/17<br>Throw L/S 5.5/3.5    | 115<br>69/23<br>7.5/4.5   | 145<br>87/29<br>10.0/5.5    | 175<br>105/35<br>12.0/6.5   | 205<br>123/41<br>14.0/8.0   | 230<br>138/46<br>15.5/9.0   | 260<br>156/52<br>18.0/10.0  | 290<br>174/58<br>20.0/11.0  |
| 10 x 10 Ak .310      | Total CFM 95<br>CFM L/S 61/17<br>Throw L/S 6.0/3.5    | 125<br>80/23<br>8.0/4.5   | 155<br>99/28<br>10.0/5.5    | 185<br>118/33<br>12.0/6.5   | 215<br>138/39<br>14.0/7.5   | 250<br>160/45<br>16.5/9.0   | 280<br>179/50<br>20.0/10.5  | 310<br>198/56               |
| 12 x 8 Ak .320       | Total CFM 95<br>CFM L/S 49/23<br>Throw L/S 5.5/4.0    | 130<br>68/31<br>7.5/5.0   | 160<br>83/38<br>9.5/6.0     | 190<br>99/46<br>11.0/7.5    | 225<br>117/54<br>13.0/9.0   | 255<br>133/61<br>15.0/10.0  | 290<br>151/70<br>17.0/11.5  | 320<br>166/77<br>19.0/12.5  |
| 14 x 8 Ak .390       | Total CFM 115<br>CFM L/S 69/23<br>Throw L/S 6.5/4.0   | 155<br>93/31<br>9.0/5.0   | 195<br>117/39<br>11.0/6.0   | 235<br>141/47<br>13.5/7.5   | 275<br>165/55<br>16.0/9.0   | 310<br>186/62<br>18.0/10.0  | 350<br>210/70<br>22.0/12.5  | 390<br>234/78               |
| 12 x 12 Ak .470      | Total CFM 140<br>CFM L/S 73/34<br>Throw L/S 7.0/4.5   | 190<br>99/46<br>9.0/6.0   | 235<br>122/56<br>11.5/7.5   | 280<br>146/67<br>13.5/9.0   | 330<br>172/79<br>16.0/10.5  | 375<br>195/90<br>18.0/12.0  | 425<br>221/102<br>20.0/14.0 | 470<br>244/113<br>23.0/15.5 |
| 14 x 14 Ak .650      | Total CFM 195<br>CFM L/S 117/39<br>Throw L/S 8.5/5.0  | 260<br>156/52<br>11.5/6.5 | 325<br>195/65<br>14.0/8.0   | 390<br>234/78<br>17.0/9.5   | 455<br>273/91<br>20.0/11.5  | 520<br>312/104<br>23.0/13.0 | 585<br>351/117<br>26.0/14.5 | 650<br>390/130<br>28.0/16.0 |
| 16 x 16 Ak .930      | Total CFM 280<br>CFM L/S 164/67<br>Throw L/S 10.0/6.5 | 370<br>192/89<br>13.0/9.0 | 465<br>242/112<br>16.5/11.0 | 560<br>291/134<br>20.0/13.0 | 650<br>338/156<br>23.0/15.5 | 745<br>387/179<br>26.0/17.0 | 835<br>434/200<br>29.0/20.0 | 930<br>484/223<br>33.0/22.0 |

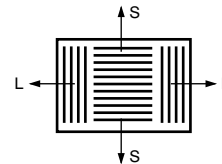
Terminal Velocity of 75 FPM

**684 Four-Way Sidewall/Ceiling Register**  
(Page 23)

**684 Four-Way Sidewall/Ceiling Register**  
(Page 23)

| Face Velocity        | 300   | 400                     | 500                         | 600                         | 700                         | 800                         | 900                         | 1000                        |
|----------------------|---|-------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| <b>Pressure Loss</b> | <b>.006</b>   | <b>.010</b>             | <b>.016</b>                 | <b>.022</b>                 | <b>.031</b>                 | <b>.040</b>                 | <b>.050</b>                 | <b>.062</b>                 |
| 6 x 6 Ak .105        | Total CFM 30<br>CFM L/S 4/11<br>Throw L/S 2.0/3.0   | 40<br>6/14<br>2.0/3.5   | 50<br>8/17<br>3.0/4.0       | 65<br>10/22<br>3.5/5.5      | 75<br>12/26<br>4.5/6.5      | 85<br>14/29<br>5.0/7.0      | 95<br>15/32<br>5.5/8.0      | 105<br>17/36<br>6.0/9.0     |
| 8 x 8 Ak .200        | Total CFM 60<br>CFM L/S 16/14<br>Throw L/S 3.0/3.0  | 80<br>21/19<br>4.0/4.0  | 100<br>26/24<br>5.0/5.0     | 120<br>31/29<br>6.0/6.0     | 140<br>37/34<br>7.5/7.0     | 160<br>42/38<br>8.5/8.0     | 180<br>47/43<br>9.5/9.0     | 200<br>52/48<br>10.5/10.0   |
| 10 x 10 Ak .310      | Total CFM 95<br>CFM L/S 31/17<br>Throw L/S 4.5/3.5  | 125<br>40/23<br>6.0/4.5 | 155<br>50/28<br>7.0/5.5     | 185<br>58/33<br>8.5/6.5     | 215<br>69/39<br>10.0/7.5    | 250<br>80/45<br>11.0/9.0    | 280<br>90/50<br>13.0/9.5    | 310<br>99/56<br>14.5/10.5   |
| 12 x 12 Ak .470      | Total CFM 140<br>CFM L/S 37/34<br>Throw L/S 5.0/4.5 | 190<br>50/46<br>6.5/6.0 | 235<br>61/56<br>8.0/7.5     | 280<br>73/67<br>9.5/9.0     | 330<br>86/79<br>11.5/10.5   | 375<br>98/90<br>13.0/12.0   | 425<br>111/102<br>14.5/14.0 | 470<br>122/113<br>16.0/15.5 |
| 14 x 14 Ak .650      | Total CFM 195<br>CFM L/S 59/39<br>Throw L/S 6.0/5.0 | 260<br>78/52<br>8.0/6.5 | 325<br>98/65<br>10.0/8.0    | 390<br>117/78<br>12.0/9.5   | 455<br>137/91<br>14.0/11.5  | 520<br>156/104<br>16.0/13.0 | 585<br>176/117<br>18.0/14.5 | 650<br>195/130<br>20.0/16.0 |
| 16 x 16 Ak .930      | Total CFM 280<br>CFM L/S 73/67<br>Throw L/S 7.0/6.5 | 370<br>96/89<br>9.0/9.0 | 465<br>121/112<br>11.5/11.0 | 560<br>146/134<br>14.0/13.0 | 650<br>169/156<br>16.0/15.5 | 745<br>194/179<br>19.0/17.0 | 835<br>217/200<br>21.0/20.0 | 930<br>242/223<br>23.0/22.0 |

Terminal Velocity of 75 FPM

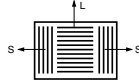


**RZ682 Register (Page 27)**

| Face Velocity     |       | 300 | 400 | 500 | 600  | 700  | 800  | 900  | 1000 |
|-------------------|-------|-----|-----|-----|------|------|------|------|------|
| 8 x 4<br>Ak .095  | CFM   | 28  | 38  | 47  | 57   | 66   | 76   | 85   | 95   |
|                   | Ps    | .02 | .02 | .02 | .03  | .04  | .05  | .06  | .07  |
|                   | Throw | 1.5 | 2.0 | 2.5 | 3.0  | 3.5  | 4.0  | 4.5  | 5.0  |
| 10 x 4<br>Ak .117 | CFM   | 35  | 47  | 59  | 70   | 82   | 94   | 105  | 117  |
|                   | Ps    | .01 | .01 | .02 | .02  | .03  | .04  | .05  | .06  |
|                   | Throw | 1.5 | 2.0 | 2.5 | 3.0  | 3.5  | 4.0  | 4.5  | 5.0  |
| 10 x 6<br>Ak .193 | CFM   | 58  | 77  | 97  | 116  | 135  | 154  | 174  | 193  |
|                   | Ps    | .01 | .01 | .02 | .02  | .03  | .04  | .05  | .06  |
|                   | Throw | 1.5 | 2.0 | 2.5 | 3.0  | 3.5  | 4.5  | 5.0  | 5.5  |
| 12 x 6<br>Ak .238 | CFM   | 71  | 95  | 119 | 143  | 167  | 190  | 214  | 238  |
|                   | Ps    | .01 | .01 | .01 | .02  | .03  | .04  | .05  | .06  |
|                   | Throw | 5.5 | 7.0 | 9.0 | 10.5 | 12.5 | 14.0 | 16.0 | 17.5 |
| 14 x 6<br>Ak .291 | CFM   | 87  | 116 | 145 | 174  | 204  | 233  | 262  | 291  |
|                   | Ps    | .01 | .01 | .02 | .02  | .03  | .04  | .05  | .06  |
|                   | Throw | NA  | NA  | NA  | NA   | NA   | NA   | NA   | NA   |
| 14 x 8<br>Ak .395 | CFM   | 119 | 158 | 198 | 237  | 277  | 316  | 356  | 395  |
|                   | Ps    | .01 | .01 | .01 | .02  | .03  | .04  | .05  | .06  |
|                   | Throw | NA  | NA  | NA  | NA   | NA   | NA   | NA   | NA   |

Terminal Velocity of 75 FPM

NA = Not Available



**RZ683 Register (Page 27)**

| Face Velocity     |             | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
|-------------------|-------------|-----|-----|-----|-----|-----|-----|-----|------|
| 8 x 4<br>Ak .108  | CFM         | 32  | 43  | 54  | 65  | 75  | 86  | 97  | 108  |
|                   | Ps          | .01 | .01 | .02 | .03 | .04 | .05 | .07 | .08  |
|                   | Throw Short | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |
|                   | Throw Long  | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |
| 10 x 6<br>Ak .193 | CFM         | 58  | 77  | 97  | 116 | 135 | 154 | 174 | 193  |
|                   | Ps          | .01 | .01 | .02 | .03 | .03 | .04 | .05 | .06  |
|                   | Throw Short | 2.0 | 3.0 | 3.5 | 4.0 | 5.0 | 5.5 | 6.5 | 7.0  |
|                   | Throw Long  | 1.0 | 1.5 | 2.0 | 2.5 | 2.5 | 3.0 | 3.5 | 4.0  |
| 10 x 8<br>Ak .246 | CFM         | 74  | 98  | 123 | 148 | 172 | 197 | 221 | 246  |
|                   | Ps          | .01 | .01 | .01 | .02 | .03 | .03 | .04 | .05  |
|                   | Throw Short | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0  |
|                   | Throw Long  | 2.5 | 3.5 | 4.5 | 5.0 | 6.0 | 7.0 | 7.5 | 8.5  |
| 12 x 6<br>Ak .238 | CFM         | 71  | 95  | 119 | 143 | 167 | 190 | 214 | 238  |
|                   | Ps          | .01 | .01 | .02 | .02 | .03 | .04 | .05 | .07  |
|                   | Throw Short | 2.5 | 3.5 | 4.5 | 5.0 | 6.0 | 7.0 | 7.5 | 8.5  |
|                   | Throw Long  | 2.5 | 3.5 | 4.5 | 5.0 | 6.0 | 7.0 | 7.5 | 8.5  |
| 14 x 6<br>Ak .297 | CFM         | 89  | 119 | 148 | 178 | 208 | 237 | 267 | 297  |
|                   | Ps          | .01 | .01 | .02 | .03 | .03 | .04 | .06 | .07  |
|                   | Throw Short | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |
|                   | Throw Long  | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |
| 14 x 8<br>Ak .399 | CFM         | 120 | 160 | 199 | 239 | 279 | 319 | 359 | 399  |
|                   | Ps          | .01 | .01 | .01 | .02 | .03 | .04 | .05 | .06  |
|                   | Throw Short | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |
|                   | Throw Long  | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |

Terminal Velocity of 75 FPM

NA = Not Available

**RZ684 Register (Page 27)**

| Face Velocity      |       | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
|--------------------|-------|-----|-----|-----|-----|-----|-----|-----|------|
| 6 x 6<br>Ak .124   | CFM   | 37  | 49  | 62  | 74  | 87  | 99  | 111 | 124  |
|                    | Ps    | .01 | .01 | .02 | .03 | .03 | .05 | .06 | .07  |
|                    | Throw | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |
| 8 x 8<br>Ak .231   | CFM   | 69  | 92  | 115 | 139 | 162 | 185 | 208 | 231  |
|                    | Ps    | .00 | .01 | .01 | .02 | .02 | .03 | .04 | .04  |
|                    | Throw | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |
| 10 x 10<br>Ak .347 | CFM   | 104 | 139 | 173 | 208 | 243 | 277 | 312 | 347  |
|                    | Ps    | .01 | .01 | .02 | .02 | .03 | .04 | .05 | .07  |
|                    | Throw | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |
| 12 x 12<br>Ak .510 | CFM   | 153 | 204 | 255 | 306 | 357 | 408 | 459 | 510  |
|                    | Ps    | .01 | .01 | .02 | .02 | .03 | .04 | .05 | .07  |
|                    | Throw | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA   |

Terminal Velocity of 75 FPM

NA = Not Available

**16 Round 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   |      | 55   | 65   | 80   | 95   | 105  | 120  | 135  |
| Ak .135       | Throw |      | 2.5  | 3.0  | 3.5  | 4.0  | 4.5  | 5.0  | 5.5  |
| Neck Size 8"  | CFM   | 70   | 90   | 115  | 135  | 160  | 180  | 200  | 225  |
| Ak .225       | Throw | 2.0  | 3.0  | 3.5  | 4.5  | 5.0  | 5.5  | 6.5  | 7.0  |
| Neck Size 10" | CFM   | 105  | 140  | 175  | 210  | 240  | 275  | 310  | 345  |
| Ak .345       | Throw | 2.5  | 3.5  | 4.5  | 5.0  | 6.0  | 7.0  | 8.0  | 8.5  |
| Neck Size 12" | CFM   | 150  | 200  | 250  | 300  | 350  | 400  | 450  | 500  |
| Ak .500       | Throw | 3.0  | 4.0  | 5.0  | 6.0  | 7.5  | 8.5  | 9.0  | 10.5 |
| Neck Size 14" | CFM   | 190  | 250  | 315  | 375  | 440  | 500  | 565  | 625  |
| Ak .625       | Throw | 3.5  | 4.5  | 5.5  | 6.5  | 8.0  | 9.0  | 10.0 | 11.0 |
| Neck Size 18" | CFM   | 310  | 415  | 520  | 625  | 730  | 830  | 935  | 1040 |
| Ak 1.040      | Throw | 4.5  | 6.0  | 7.0  | 8.5  | 10.0 | 11.5 | 13.0 | 14.5 |

Terminal Velocity of 50 FPM

**24 Square Ceiling Diffuser (Page 31)**

| 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

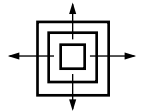
A500 Series (Page 31, 32)

**A501MS/A501OB**  
One-Way Diffuser



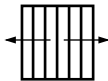
| Face Velocity |       | 400  | 500  | 600  | 700  | 900  | 1100 | 1500 |
|---------------|-------|------|------|------|------|------|------|------|
| Pressure Loss |       | .010 | .016 | .022 | .031 | .050 | .075 | .140 |
| 6 x 6         | CFM   | 55   | 65   | 75   | 90   | 120  | 140  | 195  |
| 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



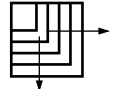
| Face Velocity |       | 400  | 500  | 600  | 700  | 900  | 1100 | 1500 |
|---------------|-------|------|------|------|------|------|------|------|
| Pressure Loss |       | .010 | .016 | .022 | .031 | .050 | .075 | .140 |
| 6 x 6         | CFM   | 55   | 65   | 75   | 90   | 120  | 140  | 195  |
| 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



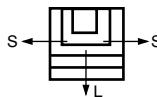
| Face Velocity |       | 400  | 500  | 600  | 700  | 900  | 1100 | 1500 |
|---------------|-------|------|------|------|------|------|------|------|
| Pressure Loss |       | .010 | .016 | .022 | .031 | .050 | .075 | .140 |
| 6 x 6         | CFM   | 55   | 65   | 75   | 90   | 120  | 140  | 195  |
| 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

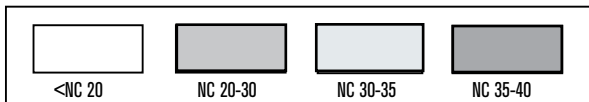


| Face Velocity |       | 400  | 500  | 600  | 700  | 900  | 1100 | 1500 |
|---------------|-------|------|------|------|------|------|------|------|
| Pressure Loss |       | .010 | .016 | .022 | .031 | .050 | .075 | .140 |
| 6 x 6         | CFM   | 55   | 65   | 75   | 90   | 120  | 140  | 195  |
| 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<sup>-12</sup> watts).  
 Tested in accordance with ASHRAE 36-72, ADC 1062: GRD84 and ISO 3741.

**RZ16 Round Ceiling Diffuser (Page 34)**

| Face Velocity           |       | 300  | 400  | 500  | 600  | 700  | 800  | 900  | 1000 |
|-------------------------|-------|------|------|------|------|------|------|------|------|
| Neck Size 6"<br>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"<br>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"<br>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

**RZ500 Square Ceiling Diffuser (Page 34)**

**RZ505 (two-way corner)**

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

**RZ503 (three-way)**

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

**RZ504 (four-way)**

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

### SD & SDD Ceiling Diffuser (Page 33)

| Face Velocity        |       | 400         | 500         | 600         | 700         | 800         | 900         | 1000        |
|----------------------|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Pressure Loss</b> |       | <b>.010</b> | <b>.016</b> | <b>.022</b> | <b>.031</b> | <b>.040</b> | <b>.050</b> | <b>.062</b> |
| 6 x 6                | CFM   | 60          | 80          | 95          | 110         | 125         | 140         | 155         |
| Ak .155              | Throw | 2.5         | 3.5         | 4.0         | 4.5         | 5.5         | 6.0         | 6.5         |
| 8 x 8                | CFM   | 110         | 135         | 160         | 190         | 215         | 245         | 270         |
| Ak .270              | Throw | 3.5         | 4.0         | 5.0         | 6.0         | 6.5         | 7.5         | 8.5         |
| 10 x 10              | CFM   | 170         | 215         | 255         | 300         | 340         | 385         | 425         |
| Ak .425              | Throw | 4.0         | 5.5         | 6.0         | 7.5         | 8.5         | 9.5         | 10.0        |
| 12 x 12              | CFM   | 240         | 300         | 360         | 420         | 480         | 540         | 600         |
| Ak .600              | Throw | 5.0         | 6.0         | 7.5         | 8.5         | 9.5         | 11.0        | 12.0        |
| 14 x 14              | CFM   | 320         | 400         | 480         | 560         | 640         | 720         | 800         |
| Ak .625              | Throw | 5.5         | 7.0         | 8.0         | 9.5         | 11.0        | 12.0        | 14.0        |
| 16 x 16              | CFM   | 425         | 530         | 635         | 740         | 850         | 955         | 1060        |
| Ak 1.060             | Throw | 6.5         | 8.0         | 9.5         | 11.0        | 13.0        | 14.0        | 16.0        |
| 18 x 18              | CFM   | 545         | 680         | 815         | 950         | 1090        | 1225        | 1360        |
| Ak 1.360             | Throw | 7.0         | 9.0         | 11.0        | 13.0        | 14.0        | 16.0        | 18.0        |
| 20 x 20              | CFM   | 660         | 825         | 990         | 1155        | 1320        | 1485        | 1650        |
| Ak 1.650             | Throw | 8.0         | 10.0        | 12.0        | 14.0        | 16.0        | 18.0        | 20.0        |

Terminal Velocity of 50 FPM

### ECFM Aluminum Diffuser (Page 33)

| Face Velocity |     | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|---------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| 14 x 14       | CFM | 368  | 460  | 552  | 644  | 736  | 828  | 920  | 1104 | 1288 | 1472 | 1656 | 1840 |
| Ak .920       | Pt  | .013 | .020 | .028 | .038 | .050 | .063 | .078 | .112 | .152 | .199 | .251 | .310 |
| 16 x 16       | CFM | 484  | 605  | 726  | 847  | 968  | 1089 | 1210 | 1452 | 1694 | 1936 | 2178 | 2420 |
| Ak 1.210      | Pt  | .013 | .020 | .028 | .038 | .050 | .063 | .078 | .112 | .153 | .199 | .252 | .311 |
| 18 x 18       | CFM | 564  | 705  | 846  | 987  | 1128 | 1269 | 1410 | 1692 | 1974 | 2256 | 2538 | 2820 |
| Ak 1.410      | Pt  | .012 | .019 | .027 | .036 | .047 | .060 | .074 | .106 | .144 | .188 | .235 | .294 |
| 20 x 20       | CFM | 756  | 945  | 1134 | 1323 | 1512 | 1701 | 1890 | 2268 | 2646 | 3024 | 3402 | 3780 |
| Ak 1.890      | Pt  | .013 | .020 | .028 | .038 | .050 | .063 | .078 | .113 | .153 | .200 | .252 | .311 |

**Notes:**

1. ECFM diffusers tested with damper fully open.
2. Pt = Total Pressure is the sum of the static pressure and velocity pressure.
3. Ak is the effective area of the diffuser face.

### ECBX Steel Box Diffuser (Page 34)

| Face Velocity |     | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|---------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| 14 x 14       | CFM | 383  | 479  | 574  | 670  | 766  | 861  | 957  | 1148 | 1340 | 1531 | 1723 | 1914 |
| Ak .960       | Pt  | .043 | .064 | .090 | .119 | .152 | .188 | .228 | .318 | .421 | .536 | .665 | .806 |
| 18 x 18       | CFM | 464  | 580  | 696  | 812  | 928  | 1044 | 1160 | 1392 | 1624 | 1856 | 2088 | 2320 |
| Ak 1.160      | Pt  | .028 | .042 | .056 | .075 | .094 | .115 | .138 | .190 | .248 | .313 | .383 | .460 |
| 20 x 20       | CFM | 537  | 670  | 804  | 938  | 1072 | 1206 | 1340 | 1608 | 1876 | 2144 | 2412 | 2680 |
| Ak 1.340      | Pt  | .028 | .042 | .059 | .077 | .098 | .121 | .146 | .203 | .267 | .339 | .419 | .505 |
| 22 x 22       | CFM | 668  | 836  | 1003 | 1170 | 1337 | 1504 | 1671 | 2005 | 2339 | 2674 | 3008 | 3342 |
| Ak 1.670      | Pt  | .017 | .027 | .040 | .056 | .075 | .097 | .121 | .179 | .250 | .333 | .428 | .537 |
| 24 x 24       | CFM | 730  | 912  | 1094 | 1277 | 1459 | 1642 | 1824 | 2189 | 2554 | 2918 | 3283 | 3648 |
| Ak 1.820      | Pt  | .032 | .048 | .066 | .086 | .109 | .134 | .161 | .222 | .291 | .367 | .452 | .544 |
| 30 x 30       | CFM | 1118 | 1398 | 1678 | 1957 | 2237 | 2516 | 2796 | 3355 | 3914 | 4474 | 5033 | 5592 |
| Ak 2.790      | Pt  | .026 | .040 | .057 | .076 | .098 | .122 | .149 | .211 | .283 | .365 | .457 | .558 |
| 36 x 36       | CFM | 1404 | 1756 | 2107 | 2458 | 2809 | 3160 | 3511 | 4213 | 4915 | 5618 | 6320 | 7022 |
| Ak 3.510      | Pt  | .030 | .043 | .060 | .078 | .098 | .120 | .144 | .197 | .257 | .324 | .397 | .477 |

**Notes:**

1. ECBX diffusers tested with damper fully open.
2. Pt = Total Pressure is the sum of the static pressure and velocity pressure.
3. Ak is the effective area of the diffuser face.
4. Tests conducted in accordance with ASHRAE 70-1991.

### ECSD & ECSDD Step-Down Evaporative Cooler Diffuser (Page 34)

| Face Velocity |     | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|---------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| 14 x 14       | CFM | 255  | 320  | 385  | 450  | 510  | 575  | 640  | 770  | 895  | 1025 | 1150 | 1280 |
| Ak .740       | Pt  | .012 | .018 | .023 | .035 | .044 | .051 | .067 | .094 | .130 | .171 | .210 | .250 |
| 16 x 16       | CFM | 370  | 465  | 560  | 650  | 745  | 835  | 930  | 1115 | 1300 | 1490 | 1675 | 1860 |
| Ak .930       | Pt  | .016 | .020 | .031 | .041 | .055 | .069 | .084 | .120 | .160 | .198 | .240 | .265 |
| 18 x 18       | CFM | 480  | 600  | 700  | 840  | 960  | 1080 | 1200 | 1440 | 1680 | 1920 | 2160 | 2400 |
| Ak 1.200      | Pt  | .015 | .022 | .031 | .044 | .057 | .072 | .088 | .122 | .164 | .205 | .250 | .290 |
| 20 x 20       | CFM | 600  | 750  | 900  | 1050 | 1200 | 1350 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 |
| Ak 1.500      | Pt  | .017 | .024 | .035 | .051 | .058 | .075 | .091 | .125 | .170 | .218 | .260 | .300 |

**Notes:**

1. ECSD diffusers tested with damper fully open.
2. Pt = Total Pressure is the sum of the static pressure and velocity pressure.
3. Ak is the effective area of the diffuser face.

| Face Velocity |     | 400  | 500  | 600  | 700  | 800  | 900  | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|---------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| 14 x 14       | CFM | 303  | 379  | 454  | 530  | 606  | 681  | 757  | 908  | 1060 | 1211 | 1363 | 1514 |
| Ak .760       | Ps  | .015 | .023 | .034 | .046 | .061 | .077 | .096 | .139 | .191 | .250 | .318 | .394 |
| 16 x 16       | CFM | 384  | 480  | 576  | 672  | 768  | 864  | 960  | 1152 | 1344 | 1536 | 1728 | 1920 |
| Ak .960       | Ps  | .019 | .029 | .041 | .055 | .071 | .089 | .109 | .156 | .210 | .271 | .341 | .418 |
| 18 x 18       | CFM | 495  | 619  | 743  | 867  | 990  | 1114 | 1238 | 1486 | 1733 | 1981 | 2228 | 2476 |
| Ak 1.240      | Ps  | .018 | .027 | .039 | .053 | .068 | .086 | .105 | .150 | .202 | .261 | .329 | .403 |
| 20 x 20       | CFM | 642  | 803  | 963  | 1124 | 1284 | 1445 | 1605 | 1926 | 2247 | 2568 | 2889 | 3210 |
| Ak 1.600      | Ps  | .015 | .025 | .036 | .050 | .066 | .084 | .105 | .154 | .213 | .282 | .361 | .450 |

**Notes:**

1. ECSDD diffusers tested with damper fully open.
2. Pt = Total Pressure is the sum of the static pressure and velocity pressure.
3. Ak is the effective area of the diffuser face.
4. Tests conducted in accordance with ASHRAE 70-1991.

**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 ( $\Delta T$ )**

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.

|             |   |       |    |
|-------------|---|-------|----|
| A301        | Steel (Stamped Aluminum) Curved Blade One-Way .....                   | 13    | 44 |
| A302        | Steel (Stamped Aluminum) Curved Blade Two-Way .....                   | 14    | 44 |
| A303        | Steel (Stamped Aluminum) Curved Blade Three-Way .....                 | 14-15 | 44 |
| A304        | Steel (Stamped Aluminum) Curved Blade Four-Way .....                  | 15    | 44 |
| A501        | Aluminum Square Diffuser One-Way, MS/OB .....                         | 31    | 52 |
| A502        | Aluminum Square Diffuser Two-Way, MS/OB .....                         | 31    | 52 |
| A503        | Aluminum Square Diffuser Three-Way, MS/OB .....                       | 32    | 52 |
| A504        | Aluminum Square Diffuser Four-Way, MS/OB .....                        | 32    | 52 |
| A505        | Aluminum Square Diffuser Four-Way Corner, MS/OB .....                 | 32    | 52 |
| A611        | Stamped Aluminum Curved Blade Register One-Way, MS/OB .....           | 17    | 45 |
| A612        | Stamped Aluminum Curved Blade Register Two-Way, MS/OB .....           | 17    | 45 |
| A613        | Stamped Aluminum Curved Blade Register Three-Way, MS/OB .....         | 17    | 45 |
| A614        | Stamped Aluminum Curved Blade Register Four-Way, MS/OB .....          | 18    | 45 |
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