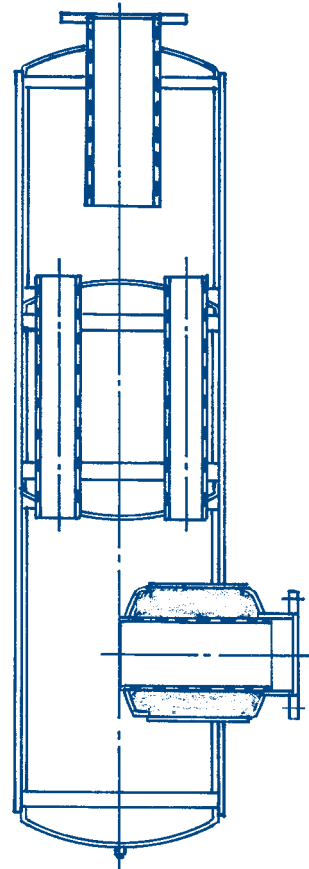




Specialists in Industrial Silencing

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ROTARY BLOWER DISCHARGE SILENCERS





Series "D"

Rotary Blower Discharge Silencers

Discharge silencers are essential to good system performance on all rotary blower systems. The belief that the discharge creates less noise than the inlet is erroneous because the discharge pulsations and noise are normally contained in a closed system.

The rotary positive blower does not compress the air as it moves from the blower inlet to the blower discharge. Compression takes place when line pressure backs up into the open port — thus compressed air is then pushed out into the line. This action takes place in a very short period of time and produces steep wave forms that can be destructive to piping and other equipment unless properly treated.

Blower displacement and speed are the major

parameters in designing discharge silencers that perform their assigned function and will live throughout the useful life of the blower. Normally for good silencing the discharge silencer should have an internal volume to blower displacement ratio of 18 to 1.

Blower speed dictates the model used. When the blower speed is below the transition speed the multi-chamber type is recommended to properly treat the noise emitted from the blower discharge. When the blower speed is above the transition speed, the intensity of the high frequencies is increased, requiring a modified design incorporating acoustic materials to absorb these frequencies. Normally acceptable discharge silencer pressure drop is in the range of 3 to 12 inches of water.

Discharge Silencer Size Selection Chart

| Discharge Silencer Size | ICFM Range at Blower Inlet | | | | | |
|-------------------------|----------------------------|------------------|------------------|-------------------|-------------------|-------------------|
| | 4 PSIG 112° F | 6 PSIG 134° F | 8 PSIG 156° F | 10 PSIG 178° F | 12 PSIG 200° F | 15 PSIG 233° F |
| 1 | 0 - 38 | 0 - 40 | 0 - 42 | 0 - 44 | 0 - 46 | 0 - 49 |
| 1½ | 39 - 89 | 41 - 95 | 43 - 101 | 45 - 106 | 47 - 110 | 50 - 117 |
| 2 | 90 - 148 | 96 - 158 | 102 - 167 | 107 - 175 | 111 - 183 | 118 - 194 |
| 2½ | 149 - 210 | 159 - 224 | 168 - 237 | 176 - 249 | 184 - 260 | 195 - 275 |
| 3 | 211 - 325 | 225 - 347 | 238 - 367 | 250 - 385 | 261 - 402 | 276 - 426 |
| 4 | 326 - 564 | 348 - 601 | 368 - 636 | 386 - 667 | 403 - 697 | 427 - 738 |
| 5 | 565 - 881 | 602 - 939 | 637 - 994 | 668 - 1042 | 698 - 1090 | 739 - 1153 |
| 6 | 882 - 1265 | 940 - 1348 | 995 - 1427 | 1043 - 1497 | 1091 - 1565 | 1154 - 1656 |
| 8 | 1266 - 2204 | 1349 - 2349 | 1428 - 2486 | 1498 - 2608 | 1566 - 2726 | 1657 - 2885 |
| 10 | 2205 - 3474 | 2350 - 3702 | 2487 - 3918 | 2609 - 4110 | 2727 - 4296 | 2886 - 4548 |
| 12 | 3475 - 4983 | 3703 - 5301 | 3919 - 5619 | 4111 - 5895 | 4297 - 6162 | 4549 - 6523 |
| 14 | 4984 - 6421 | 5302 - 6842 | 5620 - 7241 | 5896 - 7596 | 6163 - 7941 | 6524 - 8405 |
| 16 | 6422 - 8452 | 6843 - 9006 | 7242 - 9531 | 7597 - 9998 | 7942 - 10451 | 8406 - 11063 |
| 18 | 8453 - 10749 | 9007 - 11453 | 9532 - 12121 | 9999 - 12716 | 10452 - 13292 | 11064 - 14070 |
| 20 | 10750 - 13769 | 11454 - 14671 | 12122 - 15526 | 12717 - 16288 | 13293 - 17026 | 14071 - 18022 |
| 22 | 13770 - 16186 | 14672 - 17246 | 15527 - 18252 | 16289 - 19147 | 17027 - 20015 | 18023 - 21186 |
| 24 | 16187 - 19313 | 17247 - 20579 | 18253 - 21779 | 19148 - 22847 | 20016 - 23883 | 21187 - 25280 |

Discharge Silencer Model Selection Chart

| Blower Gear Size | Discharge Transition Speed - RPM (2700 FPM)* | Below Transition Speed | | Above Transition Speed | |
|------------------|--|------------------------|-----------------------|------------------------|-----------------------|
| | | Standard Silencing | High Degree Silencing | Standard Silencing | High Degree Silencing |
| 2 | 5152 | D12 | D13 | D32 | D71 D33 |
| 2½ | 4125 | | | | |
| 3 | 3435 | | | | |
| 3½ | 2945 | | | | |
| 4 | 2580 | | | | |
| 5 | 2060 | | | | |
| 6 | 1720 | | | | |
| 7 | 1470 | | | | |
| 8 | 1285 | | | | |
| 10 | 1030 | | | | |
| 12 | 860 | | | | |
| 14 | 735 | | | | |
| 16 | 645 | | | | |
| 18 | 573 | | | | |
| 20 | 515 | | | | |

*Transition speeds shown are for two lobe rotary blowers. For three lobe blowers use 67% of the rpm shown.

Discharge Silencer Pressure Drop Calculations

Tabulated Pressure Drop in Inches of Water for Various Velocities Thru Silencer - Models D12, D13, D32, D33

| Blower Discharge | | Silencer Discharge Velocity - FPM | | | | | | |
|------------------|-----|-----------------------------------|------|------|------|-------|-------|-------|
| PSIG | °F | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 |
| 4 | 112 | 2.77 | 3.78 | 4.95 | 6.24 | 7.70 | 9.33 | 11.09 |
| 5 | 123 | 2.87 | 3.90 | 5.12 | 6.45 | 7.97 | 9.64 | 11.47 |
| 6 | 134 | 2.96 | 4.03 | 5.28 | 6.65 | 8.22 | 9.94 | 11.83 |
| 7 | 145 | 3.04 | 4.14 | 5.43 | 6.85 | 8.46 | 10.23 | 12.18 |
| 8 | 156 | 3.13 | 4.26 | 5.58 | 7.04 | 8.69 | 10.51 | 12.51 |
| 9 | 167 | 3.21 | 4.37 | 5.72 | 7.22 | 8.91 | 10.78 | 12.83 |
| 10 | 178 | 3.29 | 4.47 | 5.86 | 7.39 | 9.13 | 11.04 | 13.14 |
| 11 | 189 | 3.36 | 4.57 | 5.99 | 7.56 | 9.34 | 11.30 | 13.44 |
| 12 | 200 | 3.43 | 4.67 | 6.13 | 7.72 | 9.54 | 11.54 | 13.73 |
| 13 | 211 | 3.50 | 4.77 | 6.25 | 7.88 | 9.73 | 11.78 | 14.01 |
| 14 | 222 | 3.57 | 4.86 | 6.37 | 8.04 | 9.92 | 12.00 | 14.29 |
| 15 | 233 | 3.64 | 4.95 | 6.49 | 8.18 | 10.10 | 12.23 | 14.55 |

Discharge Silencer Pressure Drop Calculations (Data Required - Blower ICFM, Discharge Pressure & Temperature)

- Determine Discharge velocity in feet per minute for silencer size selected from sizing chart.

$$\text{Discharge Velocity} = \frac{5.17 \times \text{ICFM} \times (460 + \text{Discharge Temp. } ^\circ\text{F})}{(\text{Silencer Size})^2 \times (14.7 + \text{Discharge Press. PSIG})}$$

$$\text{Discharge Velocity} = \frac{5.17 \times \text{_____} \times (460 + \text{_____ } ^\circ\text{F})}{(\text{_____})^2 \times (14.7 + \text{_____ PSIG})}$$

$$\text{Discharge Velocity} = \text{_____ FPM}$$

- Convert Discharge Velocity (FPM) to Velocity Pressure. (inches of water)

$$\text{Velocity Pressure} = \left(\frac{\text{Discharge Velocity}}{4000} \right)^2$$

$$\text{Velocity Pressure} = \left(\frac{\text{_____}}{4000} \right)^2$$

$$\text{Velocity Pressure} = \text{_____ inches of water}$$

- Determine Discharge Silencer Pressure Drop - (inches of water)

$$\text{Pressure Drop} = \text{Velocity Pressure} \times C \times \frac{(14.7 + \text{Disch. Press. PSIG})}{(460 + \text{Disch. Temp. } ^\circ\text{F})}$$

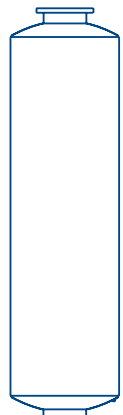
$$\text{Pressure Drop} = \text{_____} \times C \times \frac{(14.7 + \text{_____})}{(460 + \text{_____})}$$

$$\text{Pressure Drop} = \text{_____ inches of water}$$

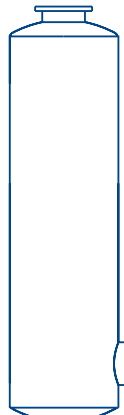
"C" - Pressure Drop Constant for Discharge Silencers

| Model | C | Model | C |
|------------|-----|------------|-----|
| D32 / D32H | 151 | D12 / D12H | 151 |
| D32T | 162 | D13 / D13H | 151 |
| D33 / D33H | 151 | D31H | 151 |
| D33T | 162 | D71 / D71J | 27 |

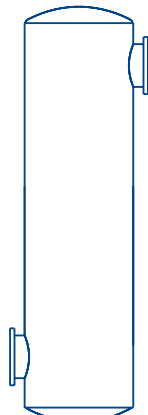
Basic Silencer Configurations



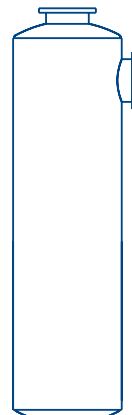
In-Line
Configuration



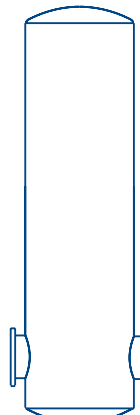
"H"
Configuration



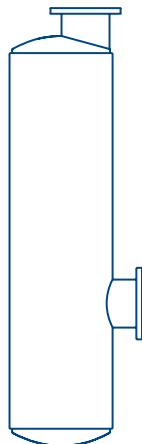
"R"
Configuration



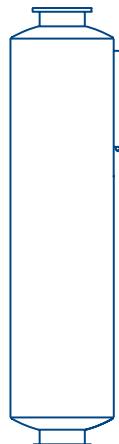
"G"
Configuration



"T"
Configuration



"HX"
Configuration

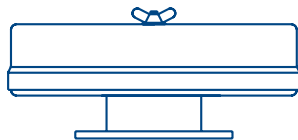


Spark
Arrester

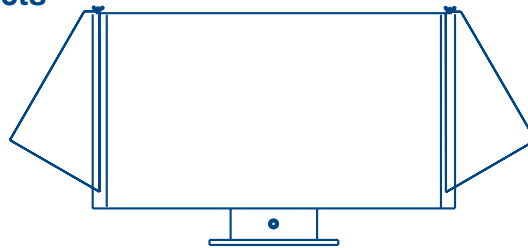
Flanged, NPT and plain pipe tubes inlet,
outlet are available

See Accessory Bulletin "A" for optional
mounting brackets, raincaps, and other
accessories

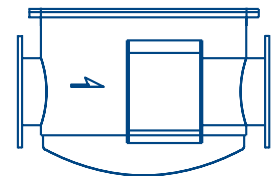
Other Stoddard Silencers Products



F64 Air Filters
Up to 5600 CFM



F21 Panel Air Filters
2500 CFM and Up



F65 In-Line Air Filters
Up to 5600 CFM



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