

Product Data Section

High Performance Noise Control For HVAC And Industrial Ventilation Equipment



HVAC in-line circular model CM4 silencers with sound absorbing center bullets ready for shipment.



Industrial forced draft fan with model 3RL rectangular inlet silencer, support legs and transition.

Advantages:

- Predictable acoustic and aerodynamic (pressure loss) performance
- Source and path control
- Suitable for new and retrofit applications
- Available in round, rectangular, oval and custom configurations
- Durable galvanized steel construction (other materials also available)
- Special designs for hospital, pharmaceutical and food processing
- Standard lab tested designs available
- Can be customized with flanges, brackets, transitions, etc.
- Spot weld construction for low pressure applications and continuous weld construction for high pressure service over 15" w.g.

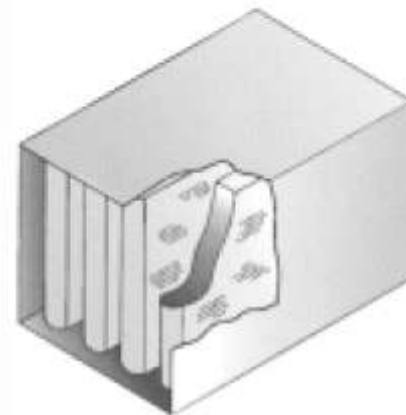
Applications:

- Building ventilation systems
- Laboratory hood exhaust systems
- Process/industrial fans, blowers and compressors
- Dust collectors
- Incinerator systems
- Atmospheric vents
- Enclosure and mechanical space ventilation systems (louvers)
- Clean air emissions control systems
- Induced draft and forced draft fans
- Highway tunnel ventilation systems
- Glass tempering/quenching operations
- Fan powered VAV boxes
- Fan inlet box silencers
- Fan filter silencers

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About BRD HUSH DUCT Silencers:

BRD silencers consist of parallel baffles or bullets constructed of perforated metal with rounded aerofoil design. The baffles are filled with sound absorptive material. A durable outside casing (solid sheet) provides the structural integrity of the unit while acting as a barrier to contain and reflect sound waves into the packed sections. Controlling the baffle and air flow passage thickness and spacing allows HUSH DUCT™ silencers to be tuned to reduce the most offending tones or frequencies. BRD sales engineers have the experience and knowledge to help you determine the requirements of your project and select the most cost-effective standard or custom design for the application. Thin profile acoustical louvers (4" to 12") are available for building ventilation applications to/from mechanical equipment rooms.



Schematic representations of series C circular silencers (top) and series R rectangular silencers (bottom).

Selecting Your HUSH DUCT™ Ventilation Silencer:

- 1) **IDENTIFY** desired performance for noise reduction and aerodynamic pressure loss that is allowable for the silencer. BRD can help you identify the noise reduction criteria if we are supplied with
 - a) published and/or measured decibel levels by frequency and overall for the air moving equipment.
 - b) the targeted overall silenced noise level or criteria.
- 2) **VERIFY** size of duct or air flow opening.
- 3) **DETERMINE** air flow velocity in feet per minute (FPM) where FPM = total air flow
- 4) **REFER** to the following application guides for rectangular and round HUSH DUCT™ silencers.
- 5) **SELECT** the appropriate HUSH DUCT™ silencer model/type to concurrently meet the noise reduction, pressure loss and self-generated noise requirements.
- 6) **CONSULT** BRD for pricing, confirmation of selection and further assistance on custom applications.

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Model Type	Recommended Velocity In (FPM)	Noise Reduction Range In Decibels (dB) ²	Pressure Loss Type ¹	Pressure Loss At 1500 FPM In Inches Water Column ²	See Figure	Standard Lengths
RXL	≤ 2,500	7 to 9 dB	XL	0.14"	1	3', 5', 7' & 10'
RL	≤ 2,500	8 to 10 dB	L	0.15"	1	3', 5', 7' & 10'
RM	≤ 2,500	7 to 9 dB	M	0.18"	1	3', 5', 7' & 10'
RR	≤ 2,000	9 to 11 dB	R	0.24"	1	3', 5', 7' & 10'
RH	≤ 1,500	14 to 16 dB	H	0.71"	1	3', 5', 7' & 10'

¹Pressure loss types: XL= extra low, L = low, M = medium, R = regular, H = high

²Data listed is for 3' long models only. Consult BRD for 5', 7' and 10' long performance data.

Nomenclature Example:

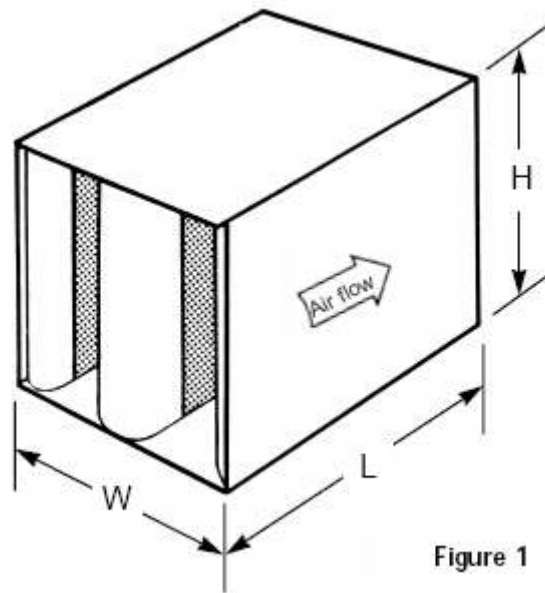
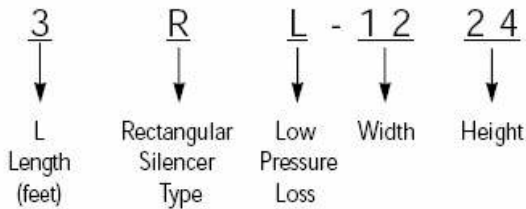


Figure 1

Special Models:

XXX - MS - XXXX	Mylar and spacer for acoustic insulation
XXX - FS - XXXX	Fiberglass cloth and spacer for acoustic insulation
XXX - LF - XXXX	Low frequency design; best performance in first three octave bands
XXX - FF - XXXX	Fiber free packless no-fill design
Consult BRD for acoustic performance and pressure loss ratings on all special models.	

Product Data Section

Model Type	Recommended Velocity In (FPM)	Noise Reduction Range In Decibels (dB)	Pressure ¹ Loss Type	Pressure Loss At 1500 FPM In Inches Water Column	See Figure	Standard Sizes		
						D1 Diameter	D2 Diameter	L Length
CL4	≤ 4,000	10 to 12 dB	L	0.18"	2	12" TO 60"	D1 + 8"	2 X D1 (not < 36")
CM4	≤ 4,000	14 to 16 dB	M	0.20"	2	12" TO 60"	D1 + 8"	2 X D1 (not < 36")
CH4	≤ 4,000	16 to 18 dB	H	0.40"	2	12" TO 60"	D1 + 8"	2 X D1 (not < 36")
CL8	≤ 4,000	16 to 18 dB	L	0.18"	2	12" TO 60"	D1 + 16"	2 X D1 (not < 36")
CM8	≤ 4,000	18 to 20 dB	M	0.20"	2	12" TO 60"	D1 + 16"	2 X D1 (not < 36")
CH8	≤ 4,000	22 to 24 dB	H	0.40"	2	12" TO 60"	D1 + 16"	2 X D1 (not < 36")
CL0	≤ 4,000	8 to 10 dB	L	0.25"	3	12" TO 60"	NA	3 X D1 (not < 36")
CH0	≤ 4,000	12 to 14 dB	H	0.40"	3	12" TO 60"	NA	3 X D1 (not < 36")

¹Pressure loss types: L = low, M = medium, H = high

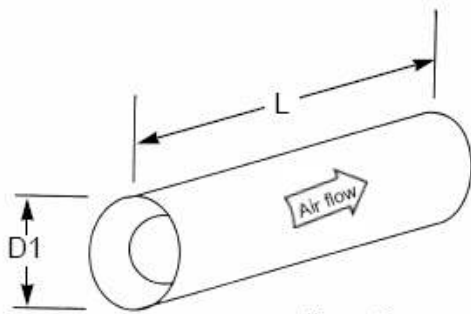


Figure 3

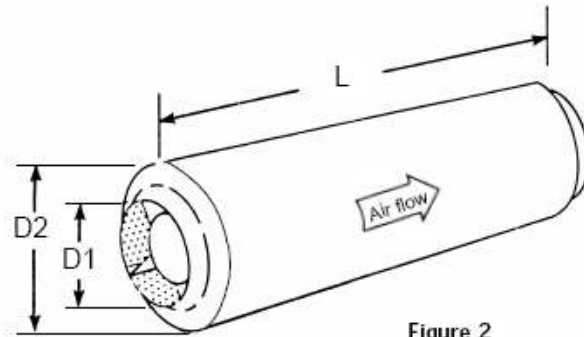
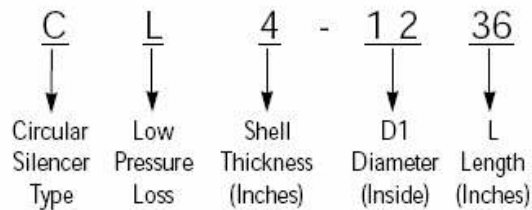


Figure 2

Nomenclature Example:



Special Models:

XXX - MS - XXXX	Mylar and spacer for acoustic insulation
XXX - FS - XXXX	Fiberglass cloth and spacer for acoustic insulation
XXX - LF - XXXX	Low frequency design; best performance in first three octave bands
XXX - FM - XXXX	Stainless steel fibermetal acoustic insulation
Consult BRD for acoustic performance and pressure loss ratings on all special/custom models.	

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Treatment Options for HVAC Condenser Fans



Unitary™ Perimeter System

Most economical solution supported around the top perimeter of the unit. Overall height ranges from 2' to 4' depending on desired performance. Perimeter panels are HUSH GUARD™ model HGU-400. Not recommended when receiver locations are at elevations higher than the fans. Panels are supported by the top of the HVAC unit or by an independent steel structure. Minimal pressure loss rating. Can be upgraded to a parallel baffle or silencer bank system.



Parallel Baffle System

High performance treatment using parallel acoustic baffles or splitters supported above the unit. Baffle thickness and spacing are determined by desired performance. The dept of baffles and plenum space above the unit are other variables used to balance acoustic performance and aerodynamic pressure loss requirements. Easily integrated with HUSH GUARD™ modular barrier walls and air intake HUSH DUCT™ model HDAL acoustical louvers for maximum overall reductions on critical projects.



Silencer Bank System

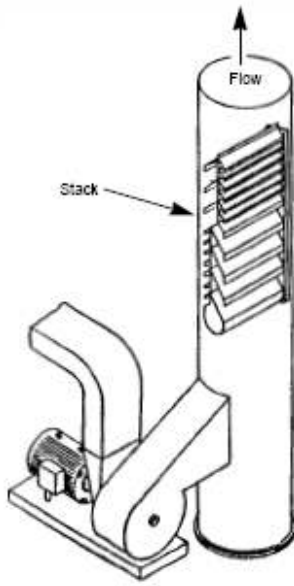
High performance solution installed directly above the footprint of the HVAC unit. Preferred method when perimeter barrier walls do not extend above the height of the condenser fans or where barrier walls are too far away from the equipment for the preferred Parallel Baffle System (see above). Requires plenum depth of 2' to 4' for best aerodynamic results. HUSH DUCT™ low frequency ventilation silencer modules are assembled together to form the larger silencer bank. Typical silencer bank height is 6' to 8' total from top of the unit.



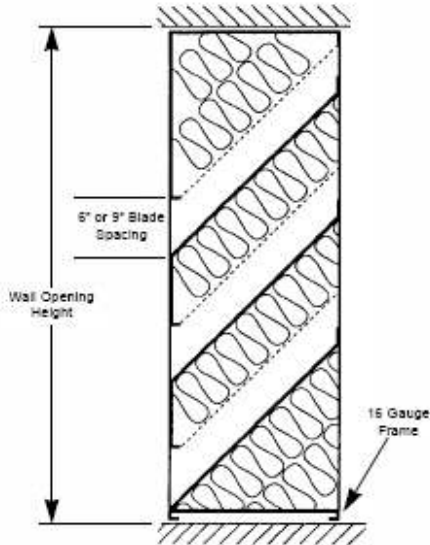
Silencer Stack System

Individual circular silencer stacks can be used above each individual condenser fan if there is sufficient clearance between fans and if equipment operating conditions have a higher tolerance for pressure loss. Excellent performance in heights of 24" to 30". Heights up to 48" can be used for critical applications. Best suited for condensing units and condensing sections on packaged air handling units. Uses HUSH DUCT™ model CM2 or CM4 design. Balance of height to diameter ratio is critical for optimum performance.

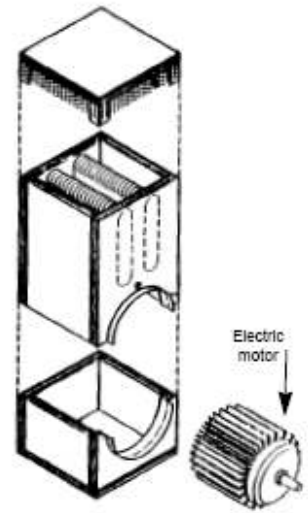
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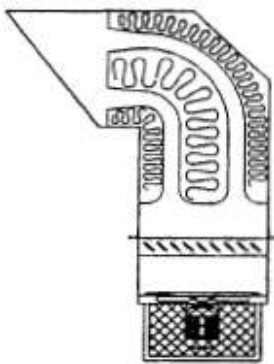
Tuned fan stack silencer.



Acoustic louver for building ventilation.

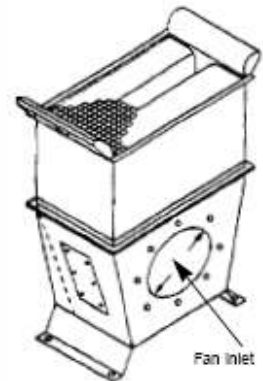


TEFC electric motor silencer.

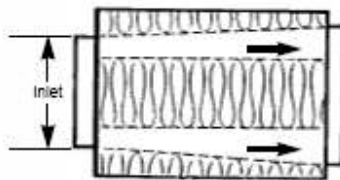


Combination vertical acoustical elbow silencer with damper and fan.

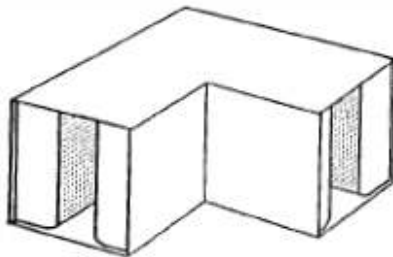
Let Us Design A
Custom
HUSH DUCT™
Silencer For
Your Air Moving
Equipment Or
System



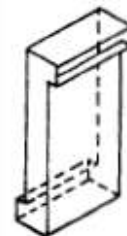
Scroll fan combination inlet box/silencer with bird screen and inlet bell.



Acoustical Diffuser Cone (ADC) for vane axial fan.



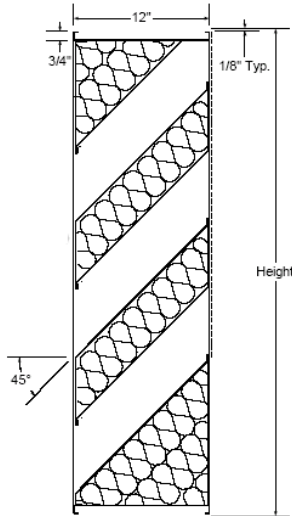
In-line horizontal elbow duct silencer.



Cross talk/air transfer silencer (Z configuration).

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HUSH DUCT™ Model HDAL Acoustical Louvers



Models HDAL-1206/HDAL-1209

HUSH DUCT™ model HDAL acoustical louvers are manufactured from galvanized steel with a standard mill finish. The HDAL-1206 and HDAL-1209 are both 12" thick designs manufactured in sizes from a minimum of 24" x 24" up to as large as 72" wide x 96" high. For shipping and handling reasons, a series of more economical module sizes are banked together to fill a specific opening size. Mullions and flashing are used to trim off as needed. Edge framing options are standard (SE) shown at left, flat edge (FE) and flanged (FL). Flanged edge options are specified as FLI for FLO depending on whether the flange is mounted on the inlet or outlet side of the louver. HUSH DUCT™ Acoustical Louvers are also available in 4", 6" & 8" thicknesses. Noise reduction values (NR) and pressure loss ratings for the HDAL-1206/1209 models are listed below.



Close-up view of HUSH DUCT™ HDAL-1206 banked modules.

Specifications:

Frame: 16 gauge galvanized steel channel
Blades: 16 gauge galvanized steel
Finish: Mill finish standard

Sizes

Dimensions: 45" w x 48" h
Depth: 12" frame standard

TYPICAL APPLICATIONS



Blower building air intakes with HDAL-1209 Acoustical Louvers



Dade County Compliant Hurricane Grade HUSH DUCT™ HDAL Louvers