

QUIET-DUCT SILENCERS

with **FORWARD**
and **REVERSE FLOW**
AERO-ACOUSTIC
RATING CERTIFIED

in accordance with
ASTM E 477 and **ISO 7235**
and **BRITISH STANDARD 4718**

**ENGINEERED
NOISE
CONTROL
FOR
AIR-HANDLING
SYSTEMS**



Represented by:



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IAC SILENCERS: LABORATORY TESTED AND FIELD PROVEN

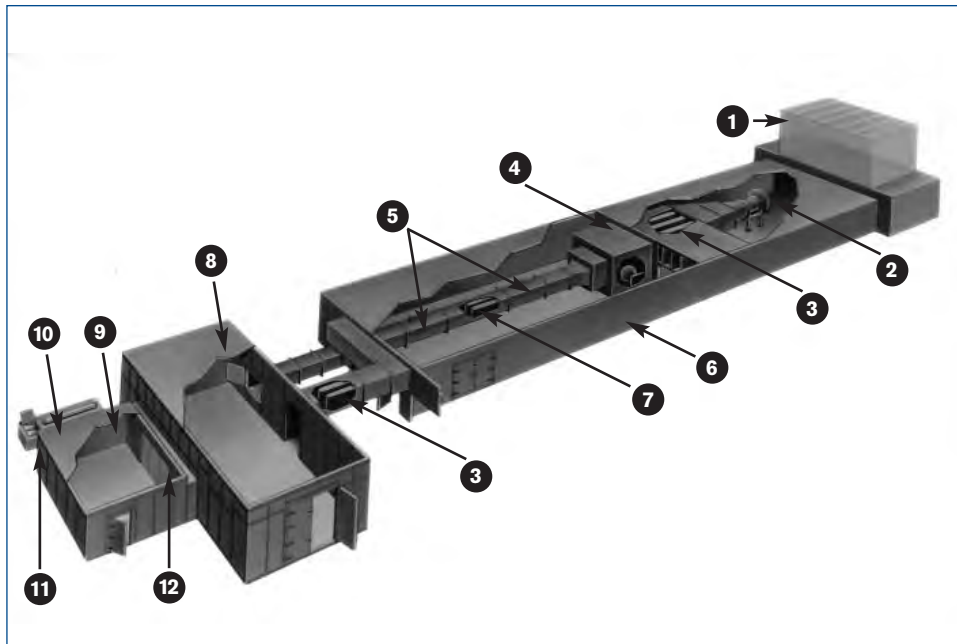
IAC America offers the broadest range of silencers in the industry. New additions within this manual include the Modular Elbow Silencer and the new Quiet-Duct Ultra Series. Performance data for these silencers is based on NVLAP-accredited laboratory tests conducted in strict accordance with ASTM E477-99

The ELB Modular Elbow Silencer features the capability to both nest and stack elbow silencer modules so the size is scalable while aerodynamic and acoustic performance are maintained. The silencer is cost-effective and can accept added acoustic extension sections.

The Quiet-Duct Ultra™ /Low line of silencers offers the industry's first published and guaranteed performance data in the 31.5 Hz full-octave-band center frequencies. The tests were conducted using scale modeling developed by IAC America in cooperation with K. Uno Ingard, co-author of Theoretical Acoustics.

The Quiet-Duct Ultra™ /Green line was developed in response to the trend for environmentally friendly building products. This 100% environmentally friendly attenuation solution uses recycled acoustic fill material and delivers performance that meets or exceeds that of a standard Quiet-Duct silencer.

The Quiet-Duct Ultra™ /ZAPD line was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer is ideal for high velocity systems or systems that have little or no room for additional pressure drop.



IAC AMERICA'S NVLAP-RATED LABORATORY

Given today's highly specialized markets, it is essential that an engineering and manufacturing organization operate its own development and test facilities to advance the existing technology and assure the quality of its products.

IAC America's labs are accredited for nine tests under the National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program (NVLAP). IAC's research and development team continuously designs new products and reengineers existing products to address unique noise-control requirements. The IAC laboratory provided a major impetus for the ASTM standard method of testing (E477-99) for pre-fabricated silencers. All IAC silencers are tested in accordance with applicable portions of the ASTM, British, and International Industry Standards.

The wind tunnel and reverberation room combined, measure more than 160 ft. (48.8m) long. Silencers as large as 50 in. (1524mm) in diameter and 120 in. (3048mm) in length have been tested in IAC America's aero-acoustic laboratory.

1. Removable hatch-in roof for testing silencers up to 10 ft. x 10 ft. (3.05m x 3.05m) cross section
2. 25,000 cfm (42,480m³/hr) vane-axial fan
3. Systemic silencer
4. Plenum with loudspeaker and flow diffuser
5. Test unit pitot tube ports
6. Super-Noise-Lock® housing
7. Test silencer
8. 10,000 ft³ (283m³) reverberation receiving room
9. 3,000 ft³ (85m³) reverberation source room
10. 3 in. (76mm) impedance tube
11. 24 in. x 24 in. (610mm x 610mm) anechoic wedge impedance tunnel
12. 14 ft. x 9 ft. (4.3m x 2.7m) test frame for transmission loss tests

IAC America's aero-acoustic research center permits forward- and reverse-flow dynamic insertion loss, self-noise, and pressure drop rating of silencers and other elements in closed-loop wind tunnels and other facilities. Dual reverberation rooms permit testing of system components or assembled air handling units.

Because they are laboratory developed and tested under controlled conditions, all of IAC's duct silencers provide effective, predictable noise reduction. They are manufactured to specific metal tolerances and with controlled acoustic infill flow resistances to achieve consistent results.

To assure consistency, production line silencers are periodically tested in IAC's aero-acoustic laboratory. This practice of quality control performance testing ensures that all silencers exhibit catalogued Dynamic Insertion Loss (DIL), Self-Noise (SN), and Pressure Drop Performance Data. IAC always guarantees the in-field performance of the specification.

MILESTONES IN LABORATORY TESTING AT IAC

1963

IAC builds the first full-sized dynamic duct-to-reverberant room test facility.

1965

IAC offers duct silencers accurately rated for acoustic performance with air flowing through them.

IAC introduces the terms "Dynamic Insertion Loss" (DIL) and "Self Noise" (SN).

1972

IAC confirms the in-field performance of its first product developed with model-testing.

IAC adds testing in the reverse flow mode.

1974

The laboratory is moved to IAC America's current facility, equipped with a controllable-pitch, vane-axial fan, and made part of a closed-loop system.

1981

A series of new vane-axial fan diffuser silencers is developed with complete aerodynamic and acoustic ratings.

1984

IAC develops a new low-frequency resonator silencer with substantial sound attenuation below 90 Hz.

1986

LF low-frequency and tubular packless lines of silencers are developed.

1991

IAC achieves significant improvement in techniques for predicting low-frequency performance of power flow splitter silencers.

1996

Most standard silencers are retested for quality control and to support domestic and overseas business.

NVLAP accreditation maintained for six standard testing procedures.

1997

New Sentry™ Quiet-Duct TLS and RFS silencers meet STC ratings of critical environments and offer the added advantage of RF shielding.

2003

IAC's new Quiet-Elbow® modular system enables silencer banks to be economically constructed from standard-size elbow modules while ensuring consistency and repeatability of acoustic and aerodynamic performance.

2004

The IAC Aero-Acoustic Laboratory begins offering third-party testing services.

2005

Quiet-Duct Ultra™ /Low silencers introduced.

Quiet-Duct Ultra™ /Green silencers offer 100% environmentally friendly attenuation solutions.

2006

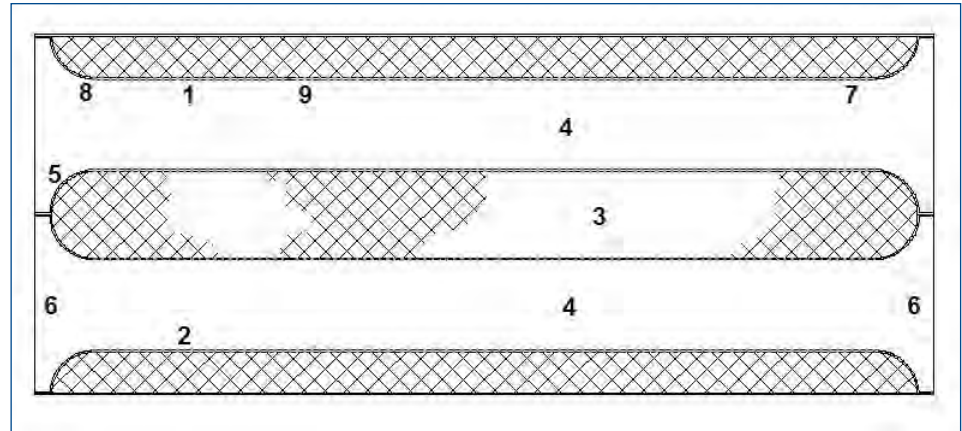
Quiet-Duct Ultra™ /ZAPD silencers are introduced.

IAC: LEADERSHIP IN SILENCER DEVELOPMENT AND TECHNOLOGY

PERFORMANCE: DUCT LINING VS. SILENCER

A question frequently asked by our customers is whether duct lining alone can provide sufficient attenuation from noise handling equipment. In most cases the answer is “no.”

As an example based on the guidelines from the 1999 ASHRAE Fundamentals Handbook, in the 250 Hz octave band, an 18 in. x 54 in. duct would require 57 feet of one-inch-thick, 1.5 lb/ft.³-density, surface-coated, duct-liner material to achieve as much insertion loss (i.e. 32 dB) as one five-foot-long IAC 5 LFS Silencer. In the lower frequencies, such as 125 Hz, even greater lengths of duct lining would be required to achieve the 10 - 20 dB insertion loss typically achievable by many of the broad range of IAC silencers including the LFS series.



DYNAMICS OF DUCT SILENCER DESIGN

Proper structural design assures long, trouble-free life. The attributes of a typical Quiet-Duct Silencer include:

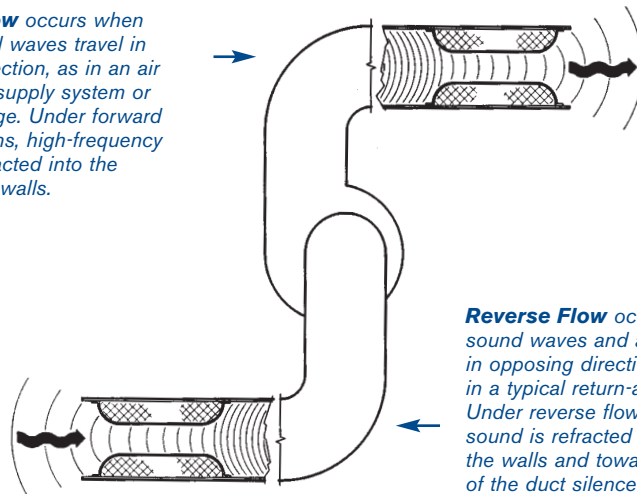
1. Die-formed, single-piece splitter construction throughout.
2. Shell-noise radiation minimized by double-skin or splitter construction in most models.
3. Acoustic baffles designed for maximum attenuation at low frequencies, the toughest job of all.
4. Straight-through air passages designed for maximum air handling at minimum pressure drop.
5. Solid, rounded noses that increase noise reduction.
6. Bell-mouth entrance and exit to minimize turbulence, pressure drop and self noise.
7. No protruding fastener heads to cause turbulence or self-noise.
8. Solid air-impingement surfaces and self-cleaning air passages to minimize dirt entrapment.
9. Acoustic fill protected against erosion by perforated metal containments.

FORWARD AND REVERSE FLOW

In 1972, IAC developed silencer Dynamic Insertion Loss and Self-Noise ratings both under Forward Flow (+) and Reverse Flow (-) conditions for rectangular and cylindrical silencers.

Since attenuation values are generally higher in the first five octave bands in the reverse flow mode compared to the forward flow mode, more economical silencer selections can often be made on return air systems.

Forward Flow occurs when air and sound waves travel in the same direction, as in an air conditioning supply system or a fan discharge. Under forward flow conditions, high-frequency sound is refracted into the duct-silencer walls.



Reverse Flow occurs when sound waves and air travel in opposing directions, as in a typical return-air system. Under reverse flow conditions, sound is refracted away from the walls and toward the center of the duct silencer.

A COMPLETE FAMILY OF SILENCERS

All of IAC's silencers were developed in response to specific requirements from acoustical consultants, consulting engineers, owners, and contractors. Having been pre-tested for performance, they provide the most economical

choices for solving the wide variety of noise control problems encountered in HVAC engineering.

IAC standard, rectangular silencer-cross sections range from 6 in. x 6 in. to 48 in. x 48 in. For small mains,

branches, and duct run-outs, module sizes fit every need. When large silencer banks are required, multiple-module assemblies can be arranged to provide almost limitless dimensional flexibility.

| SILENCER | APPLICATION |
|---|---|
| Quiet-Duct Ultra™ /Low | <i>For conventional applications where guaranteed performance is required down to 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring full octave band performance to match specific sound sources.</i> |
| Quiet-Duct Ultra™ /Green | <i>A 100% environmentally friendly attenuation solution. Silence is achieved through the use of recycled acoustic fill material. Ideal for any clean and green application.</i> |
| Quiet-Duct Ultra™ /ZAPD | <i>For applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer is ideal for high velocity systems or systems that have little or no room for additional pressure drop.</i> |
| Quiet-Duct Commercial Series | <i>For conventional applications including low frequency. Silencers are specifically engineered to enhance insertion loss in the 63 Hz, 125 Hz, and 250 Hz octave bands.</i> |
| Clean-Flow Rectangular Silencers | <i>For systems requiring a higher degree of cleanliness and hygiene such as in hospitals or clean rooms. Linings on the fill material guard against erosion of particulate matter into the air-stream. Specific internal construction features protect the lining against chafing or premature failure and are necessary to maintain the rated aero-acoustic performance.</i> |
| Conic-Flow® Tubular Silencers | <i>For silencer applications including low frequency. Silencers are specifically engineered to enhance insertion loss in the 63 Hz, 125 Hz, and 250 Hz octave bands.</i> |
| D-Duct™ Acoustic Diffuser Silencers | <i>For use on axial-fan systems. The combined interior diffuser cone and exterior square jacket casing make these units aerodynamic-regain devices as well as silencers.</i> |
| Ultra-Pals™ Rectangular Packless Silencers | <p><i>The ultimate solution for ultra-clean environments and corrosive/flammable environments. The complete absence of fill makes Ultra-Pals Packless Silencers ideally suited for any application where particulate matter or fiber erosion from conventional fill materials could contaminate the air/gas streams.</i></p> <p><i>The complete absence of fill, combined with ease of cleaning and draining, make Ultra-Pals™ Silencers ideal in corrosive/flammable environments and for facilities handling gasoline, grease, solvents, and other hazardous materials.</i></p> |
| Ultra-Pals Tubular Packless Silencers | <i>For small-diameter circular duct systems such as fume hoods. Additionally, the packless design of these units makes them equally applicable to the types of systems mentioned for the Rectangular Ultra-Pals Silencers.</i> |

IAC: ONE STOP FOR SILENCER INFORMATION AND SPECIFICATION

BENEFITS OF PASSIVE SILENCER DESIGN

All of the silencers manufactured by IAC are of passive design which means that they do not require mechanical or electrical means to function. They work by providing a trouble-free static means for dissipating sound energy by converting it into minute quantities of heat. Passive silencers provide low first-cost, simple installation, and maintenance-free lifetime operation to make them the natural choice in HVAC-engineered noise control.

SOURCES OF DESIGN INFORMATION

The effective and economical application of noise control methods depends on an accurate knowledge of the system's silencing requirements. There are several sources of information available for determining the required noise reduction for a wide range of HVAC applications.

The ASHRAE Handbook presents a procedure for calculating the noise reduction required. IAC also offers several methods which conform to the guide and quickly yield accurate results for specific issues.



The IAC SNAP form is programmed with calculations that enable the user to evaluate the entire HVAC distribution system. Request from HVACinfo@industrialacoustics.com.

HVAC NOISE-CONTROL ISSUE

Evaluation of the Entire HVAC Air Distribution System

Cross-Talk Noise Transmission

Cooling Tower Noise

Louver Applications

Deciding Among Silencers

Additional Questions or Unusual Noise Control Products

METHODOLOGY

The IAC Snap Form
The analysis starts with the acoustic criterion for the occupied space and then accounts for the system effects of each component such as terminals, mixing boxes, branch take-offs, elbows, ductwork, fan sources, plus room characteristics.

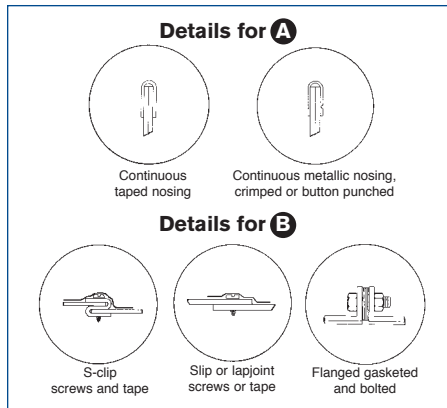
The IAC Quiet-Vent® Catalogue
Silencers installed in the connecting ductwork between spaces must provide airborne noise reduction to at least match the sound transmission loss of the separating structure (wall, window, door, whichever is the least effective noise barrier). This catalogue of air-transfer silencers includes relevant comparative transmission loss data.

IAC Noise Control for Cooling Towers,
Bulletin 1.0401.1, explains how to calculate the noise reduction required and how to apply the noise control equipment selected.

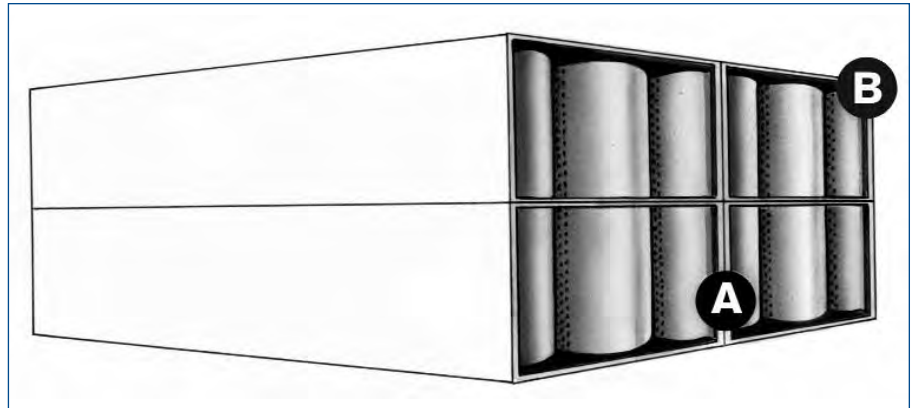
IAC Noishield® Louvers, Bulletin 1.0502 and the SNAP II Form,
Bulletin 1.0503.

Short-Form Silencer Availability Guide.
This guide suggests the most effective model of silencer configuration based on 250 Hz octave band DIL attenuation. It also lists typical applications where the individual silencer models would most often be used. When a particular model has been selected, more complete aero-acoustic data can be found on the technical data sheet for that model contained in this manual.

Consult Your Local IAC Representative
or Contact the HVAC Product Manager: HVACinfo@industrialacoustics.com (718) 931-8000.



Multiple units are easily field-assembled using these types of connections.



LOCATING SILENCERS IN RELATION TO OTHER SYSTEM COMPONENTS

The two following pages provide guidelines for locating silencers in air handling systems. In addition, they provide a rapid means of estimating the combined pressure drop (ΔP) due to air flow through the silencer as it is affected by the silencer's location with respect to the other system components such as fans, coils, elbows, etc.

The airflow and ΔP data contained on these pages is based on tests run in accordance with applicable ASTM, AMCA, ASME and ADC test codes. These specify minimum lengths of straight duct connections up and downstream of the component under test. However, in practice, because of space considerations, it is often necessary to install silencers under conditions which vary significantly from the test procedure. Therefore, the effect of these variations must be included to determine the resultant ΔP of air flow through the silencer. The tables which follow provide multiplication factors essentially based on empirical considerations to be applied to cataloged ΔP 's.

NOTES:

1. For maximum structural integrity, Quiet-Duct™ Silencer splitters should be installed vertically. When vertical installation is not feasible, structural reinforcement is required for silencers wider than 24 in.
2. Unless otherwise indicated, connecting ductwork is assumed to have the same dimensions as fan intake or discharge openings.
3. When elbows are directly connected to the entrance of the silencers, the direction of the splitters should be parallel to the plane of the elbow turn.
4. L_1 = Distance from fan exhaust to entrance of discharge silencer.
 L_2 = Distance from fan inlet to exit of intake silencer.
5. ΔP Factor = Pressure Drop multiplier relative to silencer laboratory-rated-data and as specified by ASHRAE.
6. D = Diameter of round duct or equivalent diameter of rectangular duct.

7. Unless otherwise noted, multipliers shown do not include pressure drop of other components (elbows, transitions, dump losses, etc.), which must be calculated separately.
8. The ΔP Factors given are subject to minimum duct runs of 2.5 D after discharge silencers and 2.5 D before intake silencers. Otherwise, use additional multipliers as shown, such as for fans, elbows, silencers immediately at system entrance or exit, or other system components.

Note: These ΔP factors represent IAC's suggested benchmarks based on previous laboratory and field experience. While seemingly aggressive benchmarks, they will allow the user to achieve optimal performance from the silencer. In some situations, where these factors cannot be applied it may still be possible to achieve these published performance levels from your attenuator. The results will vary on a case-by-case basis and efficacy should be determined by the HVAC system engineer or by an IAC representative.

GUIDELINES FOR LOCATING SILENCERS

DUCTED CENTRIFUGAL FANS

Discharge Quiet-Duct-Rectangular Silencers

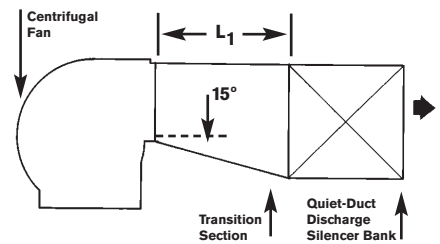
- L_1 = one duct diameter for every 1000 fpm (5m/s) average duct velocity including suitably designed transition section for maximum regain.
- If space is limited, velocity distribution vanes, diffusers, or other flow equalizers will have to be provided by system designer. Allow minimum $L_1=0.75 D$.

Intake Quiet-Duct Rectangular Silencers

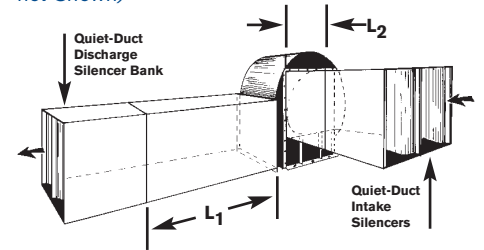
Use minimum $L_2 = 0.75 D$ including suitably designed transition sections if required.

ΔP FACTOR SILENCER

| UP STREAM | DOWN STREAM |
|--------------|----------------|
| – | 1.0 |
| – | 1.0 |
| 1.0 | – |



Recommended Transition Section Arrangement Between Centrifugal Fan and Silencer Bank (Ducting not Shown)



Intake and Discharge Silencers for Centrifugal Fans (Ducting not Shown)

DUCTED 50% HUB-VANE AXIAL FANS

Discharge Quiet-Duct Rectangular Silencers

- L_1 = one duct diameter for every 1000 fpm (5m/s) average duct velocity including suitably designed transition section for maximum regain
- If space is limited, velocity distribution vanes, diffusers, or other flow equalizers will have to be provided by system designer. Allow minimum $L_1=0.75 D$.

Discharge Conic-Flow Tubular Silencers

$L_1 = 0$ when fan hub is matched to silencer center body

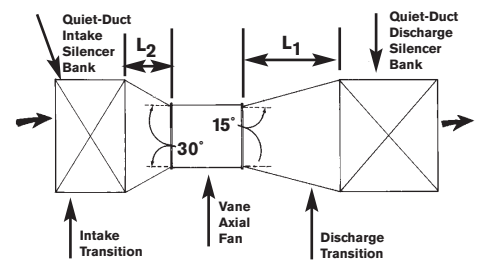
Intake Quiet-Duct Rectangular Silencers

Use minimum $L_2 = 0.75 D$ including intake cones of not more than 60° included angle

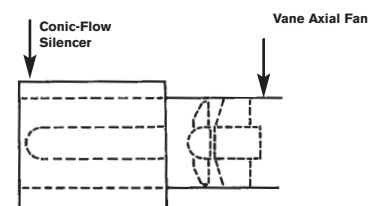
Intake Conic-Flow Tubular Silencers

$L_2 = 0$ when fan hub is matched to silencer center body

| | |
|-----|-----|
| – | 1.0 |
| – | 1.0 |
| – | 1.0 |
| 1.0 | – |
| 1.0 | – |



Recommended Transition Section Arrangement Between Vane-Axial Fan and Silencer Bank (Ducting not Shown)



Conic-Flow Tubular Silencer Center Body Matched to Axial Fan Hub (Ducting not Shown)

ELBOWS (WITHOUT TURNING VANES)

Distance of silencer from elbow

D x 3

D x 2

D x 1

| | |
|-----|-----|
| 1.0 | 1.0 |
| 1.5 | 1.5 |
| 2.0 | 2.0 |

ELBOWS (WITH TURNING VANES)

Distance of silencer from elbow

D x 3

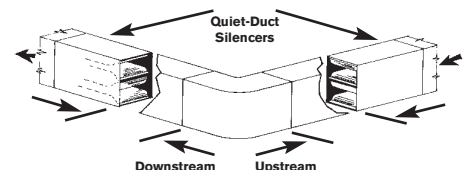
D x 2

D x 1

D x 0.5

Directly connected

| | |
|------|----------------|
| 1.0 | 1.0 |
| 1.2 | 1.2 |
| 1.75 | 1.75 |
| 3.0 | 3.0 |
| 4.0 | Not Advised |



Silencers Before and After Elbows

Note: Silencer baffles should be parallel to the plane of the elbow turn.

TRANSITIONS

With 15° included angle (7.5° slope)
 With 30° included angle (15° slope)
 With 60° included angle (30° slope)

COILS AND FILTERS

Downstream – 12 in. from face
 Upstream – 24 in. from face

COOLING TOWERS AND CONDENSERS

All IAC Silencers

The pressure drop increase due to the addition of silencers to a cooling tower is partially offset by the resulting decrease in the entrance and discharge losses of the system.

IMMEDIATELY AT SYSTEM ENTRANCE OR EXIT

Silencer Type or Model

CL, FCL

NL

ML

CS, FCS, NS, L, HL, LFL, HLFL, KB

MS, LFM, HLFM, KM, KL

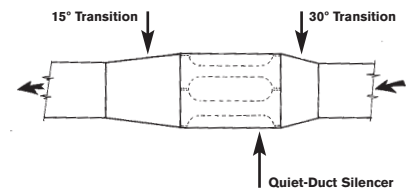
S, ES, LFS, HLFS, XM, XL

The relatively higher multipliers for the lower pressure drop silencers, such as the CL and L type P, for instance, are due to the dump losses to the atmosphere being significantly higher relative to their rated values.

Pressure-drop factors for silencers at the entrance to a system can be materially reduced by use of a smooth converging bell mouth with sides having a radius equal to at least 20% of its outlet dimension.

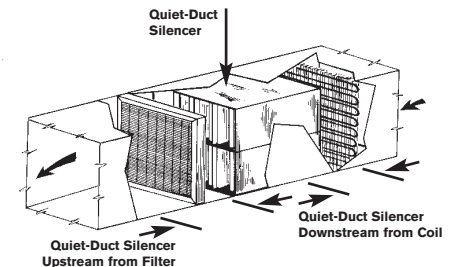
ΔP FACTOR SILENCER

| UP STREAM | DOWN STREAM |
|--------------|----------------|
| 1.0 | 1.0 |
| 1.25 | 1.0 |
| 1.5 | 1.0 |



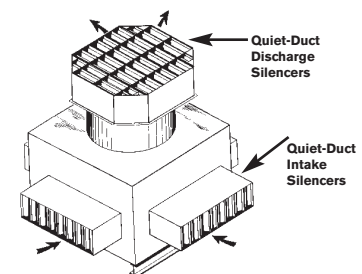
Silencer between Upstream and Downstream Transitions

| | |
|-----|-----|
| – | 1.0 |
| 1.0 | – |

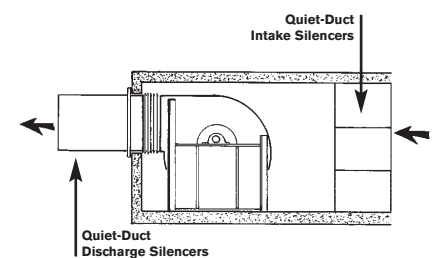


| | |
|-----|-----|
| 2.0 | 2.0 |
|-----|-----|

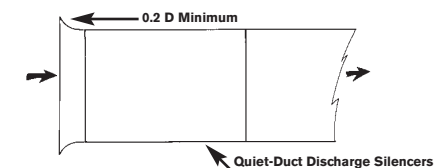
This multiplier includes typical allowance for intake and discharge dump losses.



| SILENCER AT INTAKE | SILENCER AT DISCHARGE |
|--------------------------|-----------------------------|
| 2.0 | 5.0 |
| 2.0 | 4.0 |
| 1.5 | 3.5 |
| 1.5 | 3.0 |
| 1.5 | 2.0 |
| 1.5 | 1.5 |



Silencers Immediately at Intake and Discharge of Equipment Room



OPERATION AND MAINTENANCE INSTRUCTIONS

1. IAC Silencers have no moving parts and therefore require no lubrication or routine maintenance.
2. All silencers are furnished rigidly constructed, well-made and free of any defects in materials or workmanship. To ensure continuing proper operation, the silencers should be visually inspected at least once a year to verify that:
 - a. Perforated acoustic splitters are undamaged, remaining parallel and true.
 - b. Airspaces between the acoustic splitters are free of any debris.
 - c. The holes in the perforated steel are open and free of dust or other foreign material.
3. In the event that debris must be cleaned from the airspaces or the perforated metal, the silencer should be vacuum-cleaned or wiped clean with a cloth dampened in a mild detergent solution.
4. In no event should solutions that might affect the galvanized protection on the steel be used to clean IAC Silencers.
5. The occurrence of "White Rust" (zinc oxide) on galvanized silencers is a normal event and not a maintenance item. It occurs when the zinc in the galvanizing reacts electrolytically with moisture to protect the steel.
6. In the event of fire, flood, structural damage or other severe occurrences, contact your local IAC Representative or the IAC Factory direct for specific instructions and recommendations.

QUIET-DUCT ULTRA™ /LOW SILENCERS

1.01 GENERAL

- A. Furnish and install "Quiet-Duct Ultra™/Low" (rectangular) silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 MATERIALS

- A. Casings of rectangular silencers shall be made of 22 gauge type #G-90 lock-former-quality galvanized steel.
- B. Interior partitions for rectangular silencers shall be not less than 26 gauge type #G-90 galvanized lock-former-quality perforated steel.
- C. Filler material shall be inorganic glass fiber of a proper density to obtain the specified acoustic performance and be packed under not less than 5% compression to eliminate voids due to vibration and settling. Material shall be inert, vermin- and moisture-proof.
- D. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:
Flamespread Classification 20
Smoke Development Rating 20

3.01 CONSTRUCTION

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Seams shall be lock formed and mastic filled. Rectangular casing seams shall be in the corners of the silencer shell to provide maximum unit strength and rigidity. Interior partitions shall be fabricated from single-piece, margin-perforated sheets and shall have die-formed entrance and exit shapes so as to provide the maximum aerodynamic efficiency and minimum self-noise characteristics in the sound attenuator. Blunt noses or squared off partitions will not be accepted.
- B. Attachment of the interior partitions to the casing shall be by means of an interlocking track assembly. Tracks shall be solid galvanized steel and shall be welded to the outer casing. Attachment of the interior partitions to the tracks shall be such that a minimum of 4 thicknesses of metal exist at this location. The track assembly shall stiffen the exterior casing, provide a reinforced attachment detail for the interior partitions, and shall maintain a uniform airspace width along the length of the silencer for consistent aerodynamic and acoustic performance. Interior partitions shall be additionally secured to the outer casing with welded nose clips at both ends of the sound attenuator.

- C. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing. Airtight construction shall be provided by use of a duct sealing compound on the job-site material and labor furnished by the contractor.

4.01 ACOUSTIC PERFORMANCE

- A. All silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated. Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity. Data for rectangular and tubular type silencers shall be presented for tests conducted using silencers no smaller than the following cross-sections:
Rectangular, inch: 24x24, 24x30, or 24x36

5.01 AERODYNAMIC PERFORMANCE

- A. Static pressure loss of silencers shall not exceed those listed in the silencer schedule as the airflow indicates. Airflow measurements shall be made in accordance with ASTM specification E477-99 and applicable portions of ASME, AMCA, and ADC airflow test codes.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

7.01 DUCT TRANSITIONS

- A. When transitions are required to adapt silencer dimensions to connecting duct work they shall be furnished by the installing contractor.

**QUIET-DUCT ULTRA™/LOW SILENCERS****TYPE: ULS1****LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings**

The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULS1-24-18

Length: 5' Type: ULS1 Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULS1 | -750 | 3 | 6 | 15 | 22 | 24 | 22 | 17 | 14 | 13 |
| | -500 | 2 | 6 | 15 | 22 | 24 | 22 | 18 | 14 | 13 |
| | -250 | 2 | 6 | 14 | 21 | 24 | 22 | 18 | 14 | 13 |
| | 250 | 2 | 6 | 14 | 21 | 24 | 22 | 18 | 14 | 13 |
| | 500 | 2 | 6 | 14 | 21 | 23 | 22 | 18 | 14 | 13 |
| | 750 | 2 | 5 | 13 | 20 | 23 | 22 | 18 | 14 | 13 |
| 5ULS1 | -750 | 4 | 10 | 22 | 35 | 38 | 34 | 25 | 17 | 16 |
| | -500 | 4 | 10 | 22 | 34 | 38 | 34 | 25 | 17 | 16 |
| | -250 | 4 | 10 | 21 | 34 | 38 | 34 | 25 | 18 | 16 |
| | 250 | 4 | 9 | 20 | 33 | 37 | 34 | 25 | 18 | 16 |
| | 500 | 3 | 9 | 20 | 32 | 37 | 34 | 25 | 18 | 16 |
| | 750 | 3 | 9 | 20 | 32 | 36 | 34 | 25 | 18 | 16 |
| 7ULS1 | -750 | 6 | 14 | 29 | 43 | 47 | 43 | 31 | 20 | 17 |
| | -500 | 6 | 13 | 28 | 42 | 46 | 42 | 31 | 20 | 18 |
| | -250 | 5 | 13 | 28 | 42 | 46 | 42 | 31 | 20 | 18 |
| | 250 | 5 | 12 | 27 | 41 | 45 | 42 | 31 | 21 | 18 |
| | 500 | 5 | 12 | 26 | 41 | 45 | 42 | 31 | 21 | 19 |
| | 750 | 4 | 11 | 25 | 40 | 45 | 42 | 31 | 21 | 19 |
| 10ULS1 | -750 | 8 | 19 | 39 | 52 | 54 | 52 | 38 | 24 | 21 |
| | -500 | 8 | 19 | 38 | 52 | 54 | 52 | 38 | 24 | 21 |
| | -250 | 8 | 18 | 37 | 51 | 54 | 52 | 38 | 25 | 21 |
| | 250 | 7 | 17 | 36 | 51 | 54 | 51 | 38 | 25 | 22 |
| | 500 | 6 | 16 | 35 | 50 | 54 | 51 | 38 | 25 | 22 |
| | 750 | 6 | 15 | 34 | 50 | 53 | 51 | 38 | 25 | 23 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W, in. H, in. | 15 12 | 15 18 | 15 24 | 15 30 | 15 36 | 15 42 | 15 48 | 30 12 | 30 18 | 30 24 | 30 30 | 30 36 | 30 42 | 30 48 |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 Feet | Wt, lb. | 35 | 43 | 51 | 58 | 66 | 74 | 82 | 57 | 68 | 79 | 91 | 102 | 113 | 124 |
| 5 Feet | | 57 | 69 | 82 | 94 | 106 | 118 | 131 | 93 | 110 | 127 | 144 | 161 | 178 | 195 |
| 7 Feet | | 79 | 96 | 113 | 129 | 146 | 163 | 179 | 129 | 152 | 175 | 198 | 221 | 244 | 267 |
| 10 Feet | | 113 | 136 | 159 | 183 | 206 | 229 | 253 | 183 | 215 | 246 | 278 | 310 | NA | NA |

*Note: Widths are available from 12" to 18" and from 24" to 36"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | | Static Pressure Drop, i.w.g. | | | | | |
|-----------------------------|--------|------------------------------|------|------|------|------|------|
| ULS1 | 3 ft. | 0.07 | 0.29 | 0.66 | NA | NA | NA |
| | 5 ft. | 0.09 | 0.35 | 0.78 | NA | NA | NA |
| | 7 ft. | 0.10 | 0.40 | 0.90 | NA | NA | NA |
| | 10 ft. | 0.12 | 0.48 | NA | NA | NA | NA |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | Silencer Face Velocity, fpm | | | | | | |
| 3ULS1 | -750 | 2 | 2 | 3 | 5 | 6 | 9 |
| | -500 | 2 | 2 | 3 | 5 | 6 | 9 |
| | -250 | 2 | 2 | 3 | 4 | 6 | 9 |
| | 250 | 2 | 2 | 3 | 4 | 6 | 8 |
| | 500 | 2 | 2 | 3 | 4 | 5 | 8 |
| | 750 | 2 | 2 | 3 | 4 | 5 | 8 |
| 5ULS1 | -750 | 3 | 4 | 6 | 8 | 11 | 14 |
| | -500 | 3 | 4 | 5 | 8 | 10 | 14 |
| | -250 | 3 | 4 | 5 | 7 | 10 | 14 |
| | 250 | 3 | 4 | 5 | 7 | 9 | 13 |
| | 500 | 3 | 3 | 5 | 7 | 9 | 13 |
| | 750 | 3 | 3 | 4 | 6 | 9 | 12 |
| 7ULS1 | -750 | 5 | 6 | 8 | 11 | 15 | 20 |
| | -500 | 4 | 6 | 8 | 11 | 14 | 19 |
| | -250 | 4 | 5 | 7 | 10 | 14 | 19 |
| | 250 | 4 | 5 | 7 | 9 | 13 | 18 |
| | 500 | 4 | 5 | 6 | 9 | 12 | 17 |
| | 750 | 3 | 4 | 6 | 9 | 12 | 17 |
| 10ULS1 | -750 | 6 | 8 | 12 | 16 | 21 | 28 |
| | -500 | 6 | 8 | 11 | 15 | 20 | 27 |
| | -250 | 6 | 8 | 11 | 15 | 20 | 26 |
| | 250 | 5 | 7 | 10 | 13 | 18 | 24 |
| | 500 | 5 | 6 | 9 | 13 | 17 | 24 |
| | 750 | 4 | 6 | 9 | 12 | 17 | 23 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

**Table V: Self-Noise Power Levels,
dB re: 10-12 Watts**

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|-----|-----|
| | | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | | |
| ULS1 | -750 | 54 | 51 | 50 | 48 | 48 | 51 | 54 | 47 | 40 |
| | -250 | 34 | 31 | 24 | 24 | 24 | 32 | 34 | <20 | <20 |
| | +250 | 33 | 30 | 23 | 23 | 23 | 31 | 33 | <20 | <20 |
| | +750 | 53 | 50 | 49 | 47 | 47 | 50 | 53 | 46 | 39 |

*Estimated

Self-Noise values are shown for a five-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.



QUIET-DUCT ULTRA™/LOW SILENCERS

TYPE: ULS2

LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings



The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULS2-24-18

Length: 5' Type: ULS2 Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULS2 | -750 | 3 | 8 | 16 | 19 | 19 | 16 | 14 | 12 | 11 |
| | -500 | 3 | 8 | 15 | 19 | 19 | 16 | 14 | 12 | 11 |
| | -250 | 3 | 8 | 15 | 19 | 19 | 17 | 14 | 12 | 11 |
| | 250 | 3 | 7 | 15 | 18 | 19 | 17 | 14 | 12 | 11 |
| | 500 | 3 | 7 | 15 | 18 | 19 | 17 | 14 | 12 | 11 |
| | 750 | 3 | 7 | 14 | 18 | 19 | 17 | 14 | 12 | 11 |
| 5ULS2 | -750 | 5 | 12 | 23 | 29 | 29 | 23 | 18 | 15 | 13 |
| | -500 | 5 | 12 | 23 | 29 | 29 | 23 | 18 | 15 | 13 |
| | -250 | 5 | 11 | 22 | 28 | 29 | 24 | 18 | 15 | 13 |
| | 250 | 4 | 11 | 22 | 28 | 29 | 24 | 18 | 15 | 13 |
| | 500 | 4 | 11 | 21 | 27 | 29 | 24 | 18 | 15 | 14 |
| | 750 | 4 | 10 | 21 | 27 | 29 | 24 | 18 | 15 | 14 |
| 7ULS2 | -750 | 7 | 16 | 30 | 39 | 39 | 30 | 22 | 17 | 15 |
| | -500 | 6 | 15 | 30 | 38 | 39 | 30 | 22 | 18 | 15 |
| | -250 | 6 | 15 | 29 | 38 | 39 | 31 | 22 | 18 | 16 |
| | 250 | 6 | 14 | 28 | 37 | 38 | 31 | 22 | 18 | 16 |
| | 500 | 6 | 14 | 28 | 36 | 38 | 31 | 22 | 18 | 16 |
| | 750 | 5 | 14 | 27 | 36 | 38 | 31 | 22 | 18 | 16 |
| 10ULS2 | -750 | 9 | 21 | 38 | 46 | 47 | 38 | 26 | 20 | 18 |
| | -500 | 9 | 21 | 38 | 46 | 47 | 38 | 26 | 20 | 18 |
| | -250 | 9 | 20 | 37 | 46 | 47 | 38 | 26 | 21 | 18 |
| | 250 | 8 | 19 | 36 | 45 | 46 | 38 | 26 | 21 | 19 |
| | 500 | 8 | 18 | 36 | 45 | 46 | 38 | 26 | 21 | 19 |
| | 750 | 7 | 18 | 35 | 44 | 46 | 38 | 26 | 21 | 19 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W/ in. H/ in. | 21 12 | 21 18 | 21 24 | 21 30 | 21 36 | 21 42 | 21 48 | 42 12 | 42 18 | 42 24 | 42 30 | 42 36 | 42 42 | 42 48 |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 Feet | | 42 | 50 | 59 | 67 | 76 | 84 | 93 | 70 | 83 | 96 | 108 | 121 | 134 | 147 |
| 5 Feet | Wt/ lb. | 68 | 81 | 94 | 108 | 121 | 134 | 147 | 114 | 133 | 153 | 172 | 191 | 210 | 229 |
| 7 Feet | | 94 | 112 | 130 | 148 | 166 | 184 | 202 | 158 | 184 | 210 | 235 | 261 | NA | NA |
| 10 Feet | | 134 | 159 | 184 | 209 | 234 | 259 | 284 | 224 | 260 | 295 | NA | NA | NA | NA |

*Note: Widths are available from 18" to 24" and from 36" to 48"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | Static Pressure Drop, i.w.g. | | | | | | |
|-----------------------------|------------------------------|------|------|------|------|------|------|
| ULS2 | 3 ft. | 0.07 | 0.27 | 0.60 | NA | NA | NA |
| | 5 ft. | 0.08 | 0.30 | 0.68 | NA | NA | NA |
| | 7 ft. | 0.08 | 0.34 | 0.76 | NA | NA | NA |
| | 10 ft. | 0.10 | 0.39 | 0.88 | NA | NA | NA |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | Silencer Face Velocity, fpm | | | | | | |
| 3ULS2 | -750 | 2 | 3 | 4 | 6 | 9 | 12 |
| | -500 | 2 | 3 | 4 | 6 | 9 | 11 |
| | -250 | 2 | 3 | 4 | 6 | 8 | 11 |
| | 250 | 2 | 3 | 4 | 5 | 8 | 11 |
| | 500 | 2 | 3 | 4 | 5 | 8 | 11 |
| | 750 | 2 | 3 | 4 | 5 | 8 | 10 |
| 5ULS2 | -750 | 4 | 5 | 7 | 9 | 13 | 17 |
| | -500 | 3 | 5 | 7 | 9 | 13 | 16 |
| | -250 | 3 | 5 | 6 | 9 | 12 | 16 |
| | 250 | 3 | 4 | 6 | 8 | 12 | 15 |
| | 500 | 3 | 4 | 6 | 8 | 11 | 15 |
| | 750 | 3 | 4 | 6 | 8 | 11 | 15 |
| 7ULS2 | -750 | 5 | 7 | 9 | 13 | 17 | 22 |
| | -500 | 5 | 7 | 9 | 12 | 17 | 21 |
| | -250 | 5 | 6 | 9 | 12 | 16 | 21 |
| | 250 | 4 | 6 | 8 | 11 | 15 | 20 |
| | 500 | 4 | 6 | 8 | 11 | 15 | 19 |
| | 750 | 4 | 5 | 8 | 11 | 15 | 19 |
| 10ULS2 | -750 | 7 | 10 | 13 | 18 | 23 | 29 |
| | -500 | 7 | 9 | 13 | 17 | 23 | 29 |
| | -250 | 6 | 9 | 12 | 17 | 22 | 28 |
| | 250 | 6 | 8 | 11 | 16 | 21 | 27 |
| | 500 | 6 | 8 | 11 | 15 | 20 | 26 |
| | 750 | 5 | 8 | 11 | 15 | 20 | 26 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

Table V: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|-----|-----|
| | | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | | |
| ULS2 | -750 | 55 | 52 | 52 | 49 | 49 | 53 | 55 | 48 | 42 |
| | -250 | 35 | 32 | 25 | 26 | 25 | 33 | 36 | <20 | <20 |
| | +250 | 33 | 30 | 23 | 23 | 23 | 31 | 33 | <20 | <20 |
| | +750 | 53 | 50 | 49 | 47 | 47 | 50 | 53 | 46 | 39 |

*Estimated

Self-Noise values are shown for a seven-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.

**QUIET-DUCT ULTRA™/LOW SILENCERS****TYPE: ULS3****LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings**

The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULS3-24-18

Length: 5' Type: ULS3 Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULS3 | -750 | 4 | 10 | 15 | 17 | 16 | 14 | 12 | 11 | 9 |
| | -500 | 4 | 10 | 15 | 17 | 16 | 14 | 12 | 11 | 9 |
| | -250 | 4 | 10 | 15 | 17 | 16 | 14 | 12 | 11 | 9 |
| | 250 | 3 | 9 | 14 | 17 | 16 | 15 | 12 | 11 | 9 |
| | 500 | 3 | 9 | 14 | 16 | 16 | 15 | 12 | 11 | 9 |
| | 750 | 3 | 9 | 14 | 16 | 16 | 15 | 12 | 11 | 9 |
| 5ULS3 | -750 | 6 | 14 | 22 | 25 | 23 | 18 | 15 | 13 | 11 |
| | -500 | 6 | 14 | 22 | 25 | 23 | 18 | 15 | 13 | 11 |
| | -250 | 5 | 13 | 21 | 25 | 23 | 19 | 15 | 13 | 11 |
| | 250 | 5 | 13 | 21 | 24 | 23 | 19 | 15 | 13 | 11 |
| | 500 | 5 | 13 | 20 | 24 | 23 | 19 | 15 | 13 | 11 |
| | 750 | 5 | 12 | 20 | 24 | 23 | 19 | 15 | 13 | 11 |
| 7ULS3 | -750 | 8 | 17 | 29 | 33 | 30 | 23 | 17 | 15 | 13 |
| | -500 | 7 | 17 | 28 | 32 | 30 | 23 | 17 | 15 | 13 |
| | -250 | 7 | 17 | 28 | 32 | 30 | 23 | 17 | 15 | 13 |
| | 250 | 7 | 16 | 27 | 31 | 30 | 23 | 17 | 15 | 13 |
| | 500 | 7 | 16 | 27 | 31 | 30 | 23 | 17 | 15 | 14 |
| | 750 | 6 | 15 | 26 | 31 | 30 | 23 | 17 | 15 | 14 |
| 10ULS3 | -750 | 10 | 23 | 38 | 44 | 40 | 29 | 20 | 18 | 15 |
| | -500 | 10 | 22 | 37 | 43 | 40 | 30 | 20 | 18 | 15 |
| | -250 | 10 | 22 | 37 | 43 | 40 | 30 | 20 | 18 | 15 |
| | 250 | 9 | 21 | 36 | 42 | 40 | 30 | 21 | 19 | 15 |
| | 500 | 9 | 20 | 35 | 41 | 40 | 30 | 21 | 19 | 15 |
| | 750 | 8 | 20 | 35 | 41 | 40 | 30 | 21 | 19 | 16 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W/ in. H/ in. | 27 12 | 27 18 | 27 24 | 27 30 | 27 36 | 27 42 | 27 48 | 54 12 | 54 18 | 54 24 | 54 30 | 54 36 | 54 42 | 54 48 |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 Feet | | 48 | 58 | 67 | 76 | 86 | 95 | 104 | 83 | 98 | 112 | 126 | 141 | 155 | 169 |
| 5 Feet | Wt/ lb. | 79 | 93 | 107 | 121 | 136 | 150 | 164 | 136 | 157 | 178 | 199 | 221 | 242 | 263 |
| 7 Feet | | 109 | 128 | 147 | 167 | 186 | 205 | 224 | 178 | 216 | 244 | 272 | 301 | NA | NA |
| 10 Feet | | 154 | 181 | 208 | 236 | 261 | 288 | 315 | NA | NA | NA | NA | NA | NA | NA |

*Note: Widths are available from 24" to 30" and from 48" to 54"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | Static Pressure Drop, i.w.g. | | | | | | |
|-----------------------------|------------------------------|------|------|------|------|------|------|
| ULS3 | 3 ft. | 0.06 | 0.25 | 0.57 | NA | NA | NA |
| | 5 ft. | 0.07 | 0.28 | 0.63 | NA | NA | NA |
| | 7 ft. | 0.08 | 0.30 | 0.68 | NA | NA | NA |
| | 10 ft. | 0.09 | 0.34 | 0.77 | NA | NA | NA |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | Silencer Face Velocity, fpm | | | | | | |
| 3ULS3 | -750 | 3 | 4 | 5 | 8 | 11 | 13 |
| | -500 | 3 | 4 | 5 | 8 | 10 | 12 |
| | -250 | 3 | 3 | 5 | 8 | 10 | 12 |
| | 250 | 2 | 3 | 5 | 7 | 10 | 12 |
| | 500 | 2 | 3 | 5 | 7 | 10 | 12 |
| | 750 | 2 | 3 | 4 | 7 | 9 | 11 |
| 5ULS3 | -750 | 4 | 6 | 8 | 11 | 15 | 18 |
| | -500 | 4 | 6 | 8 | 11 | 14 | 18 |
| | -250 | 4 | 5 | 7 | 11 | 14 | 17 |
| | 250 | 4 | 5 | 7 | 10 | 14 | 17 |
| | 500 | 4 | 5 | 7 | 10 | 13 | 16 |
| | 750 | 3 | 5 | 7 | 10 | 13 | 16 |
| 7ULS3 | -750 | 6 | 8 | 11 | 15 | 19 | 23 |
| | -500 | 6 | 8 | 10 | 14 | 18 | 23 |
| | -250 | 5 | 7 | 10 | 14 | 18 | 22 |
| | 250 | 5 | 7 | 10 | 13 | 17 | 21 |
| | 500 | 5 | 7 | 9 | 13 | 17 | 21 |
| | 750 | 5 | 6 | 9 | 13 | 16 | 21 |
| 10ULS3 | -750 | 8 | 11 | 15 | 19 | 24 | 30 |
| | -500 | 8 | 11 | 14 | 19 | 24 | 30 |
| | -250 | 7 | 10 | 14 | 19 | 23 | 29 |
| | 250 | 7 | 10 | 13 | 18 | 22 | 28 |
| | 500 | 7 | 9 | 13 | 17 | 22 | 28 |
| | 750 | 6 | 9 | 12 | 17 | 22 | 27 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

Table V: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|-----|-----|
| | | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | | |
| ULS3 | -750 | 56 | 53 | 53 | 50 | 51 | 54 | 56 | 50 | 43 |
| | -250 | 37 | 34 | 26 | 27 | 27 | 34 | 37 | 20 | <20 |
| | +250 | 33 | 30 | 23 | 23 | 23 | 31 | 33 | <20 | <20 |
| | +750 | 53 | 50 | 49 | 47 | 47 | 50 | 53 | 46 | 39 |

*Estimated

Self-Noise values are shown for a nine-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.

**QUIET-DUCT ULTRA™/LOW SILENCERS****TYPE: ULM1****LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings**

The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULM1-24-18

Length: 5' Type: ULM1 Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULM1 | -1000 | 2 | 6 | 14 | 20 | 23 | 20 | 16 | 13 | 12 |
| | -750 | 2 | 6 | 13 | 20 | 22 | 20 | 16 | 13 | 12 |
| | -500 | 2 | 6 | 13 | 20 | 22 | 20 | 16 | 13 | 12 |
| | 500 | 2 | 5 | 12 | 19 | 22 | 20 | 17 | 13 | 12 |
| | 750 | 2 | 5 | 12 | 18 | 21 | 20 | 17 | 13 | 12 |
| | 1000 | 2 | 5 | 12 | 18 | 21 | 21 | 17 | 13 | 12 |
| 5ULM1 | -1000 | 4 | 9 | 20 | 32 | 36 | 31 | 23 | 16 | 14 |
| | -750 | 4 | 9 | 20 | 32 | 35 | 31 | 23 | 16 | 14 |
| | -500 | 4 | 9 | 19 | 31 | 35 | 31 | 23 | 16 | 14 |
| | 500 | 3 | 8 | 18 | 29 | 34 | 31 | 23 | 16 | 15 |
| | 750 | 3 | 8 | 18 | 29 | 33 | 31 | 23 | 16 | 15 |
| | 1000 | 3 | 7 | 17 | 29 | 33 | 31 | 23 | 16 | 15 |
| 7ULM1 | -1000 | 5 | 13 | 27 | 40 | 44 | 39 | 28 | 19 | 16 |
| | -750 | 5 | 12 | 26 | 40 | 43 | 39 | 28 | 19 | 16 |
| | -500 | 5 | 12 | 26 | 39 | 43 | 39 | 28 | 19 | 16 |
| | 500 | 4 | 11 | 24 | 37 | 42 | 39 | 28 | 19 | 17 |
| | 750 | 4 | 10 | 23 | 37 | 42 | 39 | 28 | 19 | 17 |
| | 1000 | 4 | 10 | 22 | 36 | 41 | 39 | 28 | 20 | 18 |
| 10ULM1 | -1000 | 8 | 18 | 36 | 49 | 52 | 48 | 35 | 23 | 18 |
| | -750 | 7 | 17 | 35 | 49 | 52 | 48 | 35 | 23 | 19 |
| | -500 | 7 | 17 | 34 | 48 | 52 | 48 | 35 | 23 | 19 |
| | 500 | 6 | 14 | 32 | 47 | 51 | 48 | 35 | 23 | 20 |
| | 750 | 5 | 14 | 31 | 47 | 51 | 48 | 35 | 24 | 21 |
| | 1000 | 5 | 13 | 30 | 46 | 51 | 48 | 35 | 24 | 21 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W/ in. H/ in. | 15 12 | 15 18 | 15 24 | 15 30 | 15 36 | 15 42 | 15 48 | 30 12 | 30 18 | 30 24 | 30 30 | 30 36 | 30 42 | 30 48 |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 Feet | Wt/ lb. | 35 | 43 | 50 | 58 | 66 | 73 | 81 | 57 | 68 | 79 | 90 | 101 | 112 | 123 |
| 5 Feet | | 58 | 70 | 82 | 94 | 106 | 118 | 130 | 94 | 111 | 127 | 144 | 161 | 178 | 194 |
| 7 Feet | | 80 | 97 | 113 | 130 | 146 | 162 | 179 | 131 | 153 | 176 | 198 | 221 | 243 | 266 |
| 10 Feet | | 114 | 137 | 160 | 183 | 206 | 229 | 252 | 185 | 217 | 248 | 279 | 311 | NA | NA |

*Note: Widths are available from 12" to 18" and from 24" to 36"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | | Static Pressure Drop, i.w.g. | | | | | |
|-----------------------------|--------|------------------------------|------|------|------|------|------|
| ULM1 | 3 ft. | 0.04 | 0.14 | 0.32 | 0.57 | NA | NA |
| | 5 ft. | 0.04 | 0.16 | 0.36 | 0.64 | NA | NA |
| | 7 ft. | 0.04 | 0.18 | 0.40 | 0.71 | NA | NA |
| | 10 ft. | 0.05 | 0.20 | 0.46 | 0.82 | NA | NA |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | Silencer Face Velocity, fpm | | | | | | |
| 3ULM1 | -1000 | 2 | 2 | 3 | 4 | 6 | 8 |
| | -750 | 2 | 2 | 3 | 4 | 6 | 8 |
| | -500 | 2 | 2 | 3 | 4 | 5 | 8 |
| | 500 | 1 | 2 | 3 | 4 | 5 | 7 |
| | 750 | 1 | 2 | 2 | 3 | 5 | 7 |
| | 1000 | 1 | 2 | 2 | 3 | 5 | 7 |
| 5ULM1 | -1000 | 3 | 4 | 5 | 7 | 10 | 13 |
| | -750 | 3 | 4 | 5 | 7 | 9 | 13 |
| | -500 | 3 | 4 | 5 | 7 | 9 | 12 |
| | 500 | 2 | 3 | 4 | 6 | 8 | 11 |
| | 750 | 2 | 3 | 4 | 6 | 8 | 11 |
| | 1000 | 2 | 3 | 4 | 5 | 8 | 11 |
| 7ULM1 | -1000 | 4 | 5 | 7 | 10 | 13 | 18 |
| | -750 | 4 | 5 | 7 | 10 | 13 | 17 |
| | -500 | 4 | 5 | 7 | 9 | 13 | 17 |
| | 500 | 3 | 4 | 6 | 8 | 11 | 15 |
| | 750 | 3 | 4 | 5 | 8 | 11 | 15 |
| | 1000 | 3 | 4 | 5 | 7 | 10 | 14 |
| 10ULM1 | -1000 | 6 | 8 | 11 | 14 | 19 | 25 |
| | -750 | 5 | 7 | 10 | 14 | 19 | 25 |
| | -500 | 5 | 7 | 10 | 13 | 18 | 24 |
| | 500 | 4 | 6 | 8 | 11 | 16 | 21 |
| | 750 | 4 | 5 | 8 | 11 | 15 | 20 |
| | 1000 | 4 | 5 | 7 | 10 | 14 | 20 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

Table V: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|----|-----|
| | | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | | |
| ULM1 | -1000 | 55 | 52 | 52 | 49 | 49 | 53 | 55 | 49 | 43 |
| | -500 | 42 | 39 | 35 | 34 | 34 | 40 | 43 | 30 | <20 |
| | +500 | 41 | 38 | 34 | 33 | 33 | 39 | 42 | 29 | <20 |
| | +1000 | 54 | 51 | 51 | 48 | 48 | 52 | 54 | 48 | 42 |

*Estimated

Self-Noise values are shown for a five-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.

**QUIET-DUCT ULTRA™/LOW SILENCERS****TYPE: ULM2****LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings**

The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULM2-24-18

Length: 5'

Type: ULM2

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULM2 | -1000 | 3 | 7 | 14 | 18 | 18 | 15 | 13 | 11 | 10 |
| | -750 | 3 | 7 | 14 | 17 | 18 | 15 | 13 | 11 | 10 |
| | -500 | 3 | 7 | 14 | 17 | 18 | 15 | 13 | 11 | 10 |
| | 500 | 2 | 7 | 13 | 16 | 18 | 16 | 13 | 11 | 10 |
| | 750 | 2 | 6 | 13 | 16 | 18 | 16 | 13 | 11 | 10 |
| | 1000 | 2 | 6 | 13 | 16 | 17 | 16 | 13 | 11 | 10 |
| 5ULM2 | -1000 | 5 | 11 | 21 | 27 | 27 | 21 | 16 | 13 | 12 |
| | -750 | 4 | 11 | 21 | 26 | 27 | 21 | 16 | 13 | 12 |
| | -500 | 4 | 11 | 20 | 26 | 27 | 21 | 16 | 13 | 12 |
| | 500 | 4 | 10 | 19 | 25 | 26 | 22 | 17 | 14 | 12 |
| | 750 | 4 | 9 | 19 | 25 | 26 | 22 | 17 | 14 | 12 |
| | 1000 | 3 | 9 | 19 | 24 | 26 | 22 | 17 | 14 | 12 |
| 7ULM2 | -1000 | 6 | 14 | 28 | 36 | 36 | 28 | 20 | 16 | 14 |
| | -750 | 6 | 14 | 27 | 36 | 36 | 28 | 20 | 16 | 14 |
| | -500 | 6 | 14 | 27 | 35 | 36 | 28 | 20 | 16 | 14 |
| | 500 | 5 | 13 | 25 | 33 | 35 | 28 | 20 | 16 | 14 |
| | 750 | 5 | 12 | 25 | 33 | 35 | 28 | 20 | 16 | 14 |
| | 1000 | 5 | 12 | 24 | 33 | 35 | 28 | 20 | 16 | 14 |
| 10ULM2 | -1000 | 9 | 19 | 36 | 44 | 44 | 35 | 24 | 18 | 15 |
| | -750 | 8 | 19 | 35 | 43 | 44 | 35 | 24 | 19 | 15 |
| | -500 | 8 | 19 | 34 | 43 | 44 | 35 | 24 | 19 | 15 |
| | 500 | 7 | 17 | 32 | 41 | 43 | 35 | 24 | 19 | 16 |
| | 750 | 7 | 16 | 32 | 41 | 43 | 35 | 24 | 19 | 16 |
| | 1000 | 6 | 16 | 31 | 41 | 43 | 35 | 24 | 19 | 16 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W/ in. H/ in. | 21 12 | 21 18 | 21 24 | 21 30 | 21 36 | 21 42 | 21 48 | 42 12 | 42 18 | 42 24 | 42 30 | 42 36 | 42 42 | 42 48 |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 Feet | | 42 | 50 | 59 | 67 | 75 | 84 | 92 | 71 | 83 | 96 | 108 | 120 | 133 | 145 |
| 5 Feet | Wt/ lb. | 69 | 82 | 95 | 108 | 121 | 134 | 147 | 116 | 135 | 153 | 172 | 191 | 210 | 228 |
| 7 Feet | | 95 | 113 | 131 | 149 | 166 | 184 | 202 | 166 | 186 | 211 | 236 | 261 | NA | NA |
| 10 Feet | | 136 | 160 | 185 | 210 | 234 | 259 | 284 | 228 | 263 | 298 | NA | NA | NA | NA |

*Note: Widths are available from 18" to 24" and from 36" to 48"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | Static Pressure Drop, i.w.g. | | | | | | |
|-----------------------------|------------------------------|------|------|------|------|------|------|
| ULM2 | 3 ft. | 0.03 | 0.13 | 0.30 | 0.53 | 0.83 | NA |
| | 5 ft. | 0.04 | 0.14 | 0.33 | 0.58 | 0.91 | NA |
| | 7 ft. | 0.04 | 0.16 | 0.35 | 0.63 | NA | NA |
| | 10 ft. | 0.04 | 0.17 | 0.39 | 0.70 | NA | NA |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | Silencer Face Velocity, fpm | | | | | | |
| 3ULM2 | -1000 | 2 | 3 | 4 | 5 | 8 | 10 |
| | -750 | 2 | 3 | 4 | 5 | 8 | 10 |
| | -500 | 2 | 3 | 4 | 5 | 8 | 10 |
| | 500 | 2 | 2 | 3 | 5 | 7 | 9 |
| | 750 | 2 | 2 | 3 | 4 | 7 | 9 |
| | 1000 | 2 | 2 | 3 | 4 | 7 | 9 |
| 5ULM2 | -1000 | 3 | 5 | 6 | 8 | 12 | 15 |
| | -750 | 3 | 4 | 6 | 8 | 11 | 15 |
| | -500 | 3 | 4 | 6 | 8 | 11 | 15 |
| | 500 | 3 | 4 | 5 | 7 | 10 | 13 |
| | 750 | 3 | 4 | 5 | 7 | 10 | 13 |
| | 1000 | 2 | 3 | 5 | 7 | 10 | 13 |
| 7ULM2 | -1000 | 5 | 6 | 9 | 12 | 15 | 20 |
| | -750 | 4 | 6 | 8 | 11 | 15 | 19 |
| | -500 | 4 | 6 | 8 | 11 | 15 | 19 |
| | 500 | 4 | 5 | 7 | 10 | 13 | 17 |
| | 750 | 3 | 5 | 7 | 10 | 13 | 17 |
| | 1000 | 3 | 5 | 7 | 9 | 13 | 17 |
| 10ULM2 | -1000 | 6 | 9 | 12 | 16 | 21 | 27 |
| | -750 | 6 | 9 | 12 | 16 | 21 | 26 |
| | -500 | 6 | 8 | 11 | 15 | 20 | 26 |
| | 500 | 5 | 7 | 10 | 14 | 18 | 24 |
| | 750 | 5 | 7 | 9 | 13 | 18 | 23 |
| | 1000 | 4 | 6 | 9 | 13 | 17 | 22 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

Table V: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|----|-----|
| | | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | | |
| ULM2 | -1000 | 56 | 53 | 53 | 51 | 51 | 54 | 56 | 50 | 44 |
| | -500 | 44 | 41 | 37 | 36 | 36 | 42 | 44 | 32 | <20 |
| | +500 | 41 | 38 | 34 | 33 | 33 | 39 | 42 | 29 | <20 |
| | +1000 | 54 | 51 | 51 | 48 | 48 | 52 | 54 | 48 | 42 |

*Estimated

Self-Noise values are shown for a seven-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.

**QUIET-DUCT ULTRA™/LOW SILENCERS****TYPE: ULM3****LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings**

The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULM3-24-18

Length: 5' Type: ULM3 Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULM3 | -1000 | 3 | 9 | 14 | 16 | 14 | 12 | 11 | 10 | 8 |
| | -750 | 3 | 9 | 13 | 16 | 15 | 13 | 11 | 10 | 8 |
| | -500 | 3 | 9 | 13 | 16 | 15 | 13 | 11 | 9 | 8 |
| | 500 | 3 | 8 | 13 | 15 | 15 | 14 | 11 | 9 | 8 |
| | 750 | 3 | 8 | 13 | 15 | 15 | 14 | 11 | 9 | 8 |
| | 1000 | 3 | 8 | 12 | 15 | 15 | 14 | 11 | 9 | 8 |
| 5ULM3 | -1000 | 5 | 13 | 20 | 23 | 21 | 17 | 13 | 12 | 9 |
| | -750 | 5 | 12 | 20 | 23 | 21 | 17 | 13 | 11 | 9 |
| | -500 | 5 | 12 | 19 | 23 | 21 | 17 | 13 | 11 | 9 |
| | 500 | 4 | 11 | 18 | 22 | 21 | 17 | 14 | 11 | 9 |
| | 750 | 4 | 11 | 18 | 22 | 21 | 18 | 14 | 11 | 9 |
| | 1000 | 4 | 11 | 18 | 21 | 21 | 18 | 14 | 11 | 9 |
| 7ULM3 | -1000 | 7 | 16 | 26 | 30 | 28 | 21 | 16 | 13 | 11 |
| | -750 | 7 | 16 | 26 | 30 | 28 | 21 | 16 | 13 | 11 |
| | -500 | 7 | 15 | 26 | 30 | 28 | 21 | 16 | 13 | 11 |
| | 500 | 6 | 14 | 24 | 29 | 28 | 21 | 16 | 13 | 11 |
| | 750 | 6 | 14 | 24 | 28 | 28 | 21 | 16 | 13 | 11 |
| | 1000 | 5 | 14 | 24 | 28 | 28 | 22 | 16 | 13 | 11 |
| 10ULM3 | -1000 | 9 | 21 | 35 | 41 | 37 | 27 | 19 | 16 | 12 |
| | -750 | 9 | 20 | 35 | 40 | 37 | 27 | 19 | 16 | 12 |
| | -500 | 9 | 20 | 34 | 40 | 37 | 27 | 19 | 16 | 12 |
| | 500 | 8 | 18 | 32 | 38 | 37 | 27 | 19 | 16 | 12 |
| | 750 | 8 | 18 | 32 | 38 | 37 | 27 | 19 | 16 | 12 |
| | 1000 | 7 | 18 | 31 | 38 | 37 | 27 | 19 | 16 | 12 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W/ in. H/ in. | 27 12 | 27 18 | 27 24 | 27 30 | 27 36 | 27 42 | 27 48 | 54 12 | 54 18 | 54 24 | 54 30 | 54 36 | 54 42 | 54 48 |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 Feet | Wt/ lb. | 48 | 57 | 67 | 76 | 85 | 94 | 103 | 84 | 98 | 112 | 125 | 139 | 153 | 167 |
| 5 Feet | | 79 | 93 | 107 | 121 | 135 | 149 | 163 | 137 | 158 | 178 | 199 | 219 | 240 | 261 |
| 7 Feet | | 110 | 129 | 148 | 167 | 186 | 204 | 223 | 191 | 218 | 245 | 273 | 300 | NA | NA |
| 10 Feet | | 157 | 183 | 209 | 235 | 261 | 287 | 313 | NA | NA | NA | NA | NA | NA | NA |

*Note: Widths are available from 24" to 30" and from 48" to 54"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | Static Pressure Drop, i.w.g. | | | | | | |
|-----------------------------|------------------------------|------|------|------|------|------|------|
| ULM3 | 3 ft. | 0.03 | 0.13 | 0.29 | 0.51 | 0.80 | NA |
| | 5 ft. | 0.03 | 0.14 | 0.31 | 0.55 | 0.86 | NA |
| | 7 ft. | 0.04 | 0.15 | 0.33 | 0.58 | 0.91 | NA |
| | 10 ft. | 0.04 | 0.16 | 0.36 | 0.64 | 0.99 | NA |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | Silencer Face Velocity, fpm | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | | | | | | | |
| 3ULM3 | -1000 | 2 | 3 | 5 | 7 | 9 | 11 |
| | -750 | 2 | 3 | 5 | 7 | 9 | 11 |
| | -500 | 2 | 3 | 4 | 7 | 9 | 11 |
| | 500 | 2 | 3 | 4 | 6 | 9 | 10 |
| | 750 | 2 | 3 | 4 | 6 | 8 | 10 |
| | 1000 | 2 | 3 | 4 | 6 | 8 | 10 |
| 5ULM3 | -1000 | 4 | 5 | 7 | 10 | 13 | 16 |
| | -750 | 4 | 5 | 7 | 10 | 13 | 16 |
| | -500 | 4 | 5 | 7 | 10 | 13 | 16 |
| | 500 | 3 | 4 | 6 | 9 | 12 | 15 |
| | 750 | 3 | 4 | 6 | 9 | 12 | 14 |
| | 1000 | 3 | 4 | 6 | 9 | 11 | 14 |
| 7ULM3 | -1000 | 5 | 7 | 10 | 13 | 17 | 21 |
| | -750 | 5 | 7 | 9 | 13 | 17 | 21 |
| | -500 | 5 | 7 | 9 | 13 | 16 | 20 |
| | 500 | 4 | 6 | 8 | 12 | 15 | 19 |
| | 750 | 4 | 6 | 8 | 11 | 15 | 19 |
| | 1000 | 4 | 6 | 8 | 11 | 14 | 18 |
| 10ULM3 | -1000 | 7 | 10 | 13 | 18 | 22 | 28 |
| | -750 | 7 | 10 | 13 | 17 | 22 | 27 |
| | -500 | 7 | 9 | 13 | 17 | 22 | 27 |
| | 500 | 6 | 8 | 11 | 15 | 20 | 25 |
| | 750 | 6 | 8 | 11 | 15 | 19 | 25 |
| | 1000 | 5 | 8 | 11 | 15 | 19 | 24 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

Table V: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|----|-----|
| | Silencer Face Velocity, fpm | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | | | | | | | | | | |
| ULM3 | -750 | 57 | 54 | 55 | 52 | 52 | 55 | 57 | 51 | 45 |
| | -250 | 45 | 42 | 38 | 37 | 37 | 43 | 45 | 33 | 21 |
| | +250 | 41 | 38 | 34 | 33 | 33 | 39 | 42 | 29 | <20 |
| | +750 | 54 | 51 | 51 | 48 | 48 | 52 | 54 | 48 | 42 |

*Estimated

Self-Noise values are shown for a nine-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.

**QUIET-DUCT ULTRA™/LOW SILENCERS****TYPE: ULL1****LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings**

The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULL1-24-18

Length: 5'

Type: ULL1

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULL1 | -1250 | 2 | 5 | 12 | 18 | 21 | 18 | 14 | 11 | 11 |
| | -1000 | 2 | 5 | 12 | 18 | 21 | 18 | 14 | 11 | 11 |
| | -750 | 2 | 5 | 12 | 18 | 20 | 18 | 15 | 11 | 11 |
| | 750 | 2 | 4 | 11 | 17 | 19 | 19 | 15 | 12 | 11 |
| | 1000 | 2 | 4 | 10 | 16 | 19 | 19 | 15 | 12 | 11 |
| | 1250 | 2 | 4 | 10 | 16 | 19 | 19 | 15 | 12 | 11 |
| 5ULL1 | -1250 | 3 | 8 | 18 | 29 | 33 | 28 | 20 | 15 | 13 |
| | -1000 | 3 | 8 | 18 | 29 | 32 | 28 | 20 | 15 | 13 |
| | -750 | 3 | 8 | 18 | 28 | 32 | 28 | 21 | 15 | 13 |
| | 750 | 3 | 7 | 16 | 26 | 31 | 28 | 21 | 15 | 13 |
| | 1000 | 2 | 7 | 16 | 26 | 30 | 28 | 21 | 15 | 13 |
| | 1250 | 2 | 6 | 15 | 26 | 30 | 28 | 21 | 15 | 13 |
| 7ULL1 | -1250 | 5 | 11 | 24 | 37 | 41 | 36 | 25 | 17 | 15 |
| | -1000 | 5 | 11 | 24 | 36 | 41 | 36 | 25 | 17 | 15 |
| | -750 | 4 | 11 | 23 | 36 | 40 | 36 | 25 | 18 | 15 |
| | 750 | 3 | 9 | 21 | 34 | 39 | 35 | 26 | 18 | 16 |
| | 1000 | 3 | 9 | 20 | 33 | 38 | 35 | 26 | 18 | 16 |
| | 1250 | 3 | 8 | 20 | 33 | 38 | 35 | 26 | 18 | 16 |
| 10ULL1 | -1250 | 7 | 16 | 33 | 46 | 49 | 44 | 31 | 21 | 17 |
| | -1000 | 6 | 16 | 32 | 46 | 49 | 44 | 31 | 21 | 17 |
| | -750 | 6 | 15 | 31 | 45 | 49 | 44 | 32 | 21 | 17 |
| | 750 | 5 | 12 | 28 | 43 | 48 | 44 | 32 | 22 | 19 |
| | 1000 | 4 | 12 | 27 | 43 | 48 | 44 | 32 | 22 | 19 |
| | 1250 | 4 | 11 | 26 | 43 | 48 | 44 | 32 | 22 | 19 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W/ in. H/ in. | 15 12 | 15 18 | 15 24 | 15 30 | 15 36 | 15 42 | 15 48 | 30 12 | 30 18 | 30 24 | 30 30 | 30 36 | 30 42 | 30 48 |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 Feet | | 35 | 43 | 50 | 58 | 65 | 73 | 80 | 58 | 68 | 79 | 90 | 100 | 111 | 122 |
| 5 Feet | Wt/ lb. | 58 | 70 | 82 | 94 | 106 | 118 | 129 | 95 | 111 | 128 | 144 | 160 | 177 | 193 |
| 7 Feet | | 81 | 97 | 114 | 130 | 146 | 162 | 178 | 132 | 154 | 177 | 199 | 221 | 243 | 265 |
| 10 Feet | | 116 | 138 | 161 | 184 | 206 | 229 | 252 | 188 | 219 | 250 | 280 | 311 | NA | NA |

*Note: Widths are available from 12" to 18" and from 24" to 36"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | Static Pressure Drop, i.w.g. | | | | | | |
|-----------------------------|------------------------------|------|------|------|------|------|------|
| ULL1 | 3 ft. | 0.03 | 0.10 | 0.23 | 0.41 | 0.64 | NA |
| | 5 ft. | 0.03 | 0.12 | 0.26 | 0.47 | 0.73 | NA |
| | 7 ft. | 0.03 | 0.13 | 0.29 | 0.52 | 0.82 | NA |
| | 10 ft. | 0.04 | 0.15 | 0.34 | 0.60 | 0.94 | NA |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | Silencer Face Velocity, fpm | | | | | | |
| 3ULL1 | -1250 | 1 | 2 | 3 | 4 | 5 | 7 |
| | -1000 | 1 | 2 | 3 | 4 | 5 | 7 |
| | -750 | 1 | 2 | 3 | 4 | 5 | 7 |
| | 750 | 1 | 2 | 2 | 3 | 4 | 6 |
| | 1000 | 1 | 2 | 2 | 3 | 4 | 6 |
| | 1250 | 1 | 1 | 2 | 3 | 4 | 6 |
| 5ULL1 | -1250 | 3 | 3 | 5 | 6 | 9 | 12 |
| | -1000 | 2 | 3 | 4 | 6 | 8 | 11 |
| | -750 | 2 | 3 | 4 | 6 | 8 | 11 |
| | 750 | 2 | 2 | 3 | 5 | 7 | 10 |
| | 1000 | 2 | 2 | 3 | 5 | 7 | 9 |
| | 1250 | 2 | 2 | 3 | 5 | 6 | 9 |
| 7ULL1 | -1250 | 4 | 5 | 6 | 9 | 12 | 16 |
| | -1000 | 3 | 5 | 6 | 9 | 12 | 16 |
| | -750 | 3 | 4 | 6 | 8 | 11 | 15 |
| | 750 | 2 | 3 | 5 | 7 | 9 | 13 |
| | 1000 | 2 | 3 | 5 | 6 | 9 | 13 |
| | 1250 | 2 | 3 | 4 | 6 | 9 | 12 |
| 10ULL1 | -1250 | 5 | 7 | 9 | 13 | 17 | 23 |
| | -1000 | 5 | 6 | 9 | 12 | 17 | 22 |
| | -750 | 5 | 6 | 9 | 12 | 16 | 22 |
| | 750 | 3 | 5 | 7 | 9 | 13 | 18 |
| | 1000 | 3 | 4 | 6 | 9 | 13 | 17 |
| | 1250 | 3 | 4 | 6 | 9 | 12 | 17 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

Table V: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|----|----|
| | | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | | |
| ULL1 | -1250 | 55 | 52 | 53 | 50 | 50 | 53 | 56 | 50 | 44 |
| | -750 | 46 | 43 | 41 | 39 | 39 | 44 | 47 | 36 | 26 |
| | +750 | 45 | 42 | 40 | 38 | 38 | 43 | 46 | 35 | 25 |
| | +1250 | 55 | 52 | 52 | 49 | 49 | 52 | 55 | 49 | 43 |

*Estimated

Self-Noise values are shown for a five-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.

**QUIET-DUCT ULTRA™/LOW SILENCERS****TYPE: ULL2****LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings**

The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULL2-24-18

Length: 5'

Type: ULL2

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULL2 | -1250 | 3 | 7 | 13 | 16 | 16 | 13 | 11 | 10 | 9 |
| | -1000 | 2 | 6 | 13 | 16 | 16 | 14 | 11 | 10 | 9 |
| | -750 | 2 | 6 | 12 | 16 | 16 | 14 | 11 | 10 | 9 |
| | 750 | 2 | 6 | 11 | 15 | 16 | 15 | 12 | 10 | 8 |
| | 1000 | 2 | 6 | 11 | 15 | 16 | 15 | 12 | 10 | 8 |
| | 1250 | 2 | 5 | 11 | 14 | 16 | 15 | 12 | 10 | 8 |
| 5ULL2 | -1250 | 4 | 10 | 19 | 25 | 25 | 19 | 15 | 12 | 10 |
| | -1000 | 4 | 10 | 19 | 24 | 25 | 19 | 15 | 12 | 10 |
| | -750 | 4 | 9 | 19 | 24 | 24 | 19 | 15 | 12 | 10 |
| | 750 | 3 | 8 | 17 | 22 | 24 | 20 | 15 | 12 | 10 |
| | 1000 | 3 | 8 | 17 | 22 | 24 | 20 | 15 | 12 | 10 |
| | 1250 | 3 | 8 | 16 | 22 | 24 | 20 | 15 | 12 | 10 |
| 7ULL2 | -1250 | 5 | 13 | 25 | 33 | 33 | 25 | 18 | 14 | 12 |
| | -1000 | 5 | 13 | 25 | 33 | 33 | 25 | 18 | 14 | 12 |
| | -750 | 5 | 12 | 24 | 32 | 33 | 25 | 18 | 14 | 12 |
| | 750 | 4 | 11 | 22 | 30 | 32 | 25 | 18 | 14 | 12 |
| | 1000 | 4 | 11 | 22 | 30 | 32 | 25 | 18 | 14 | 12 |
| | 1250 | 4 | 10 | 22 | 29 | 32 | 25 | 18 | 14 | 12 |
| 10ULL2 | -1250 | 8 | 18 | 32 | 41 | 41 | 31 | 22 | 17 | 13 |
| | -1000 | 7 | 17 | 32 | 40 | 41 | 31 | 22 | 17 | 13 |
| | -750 | 7 | 17 | 32 | 40 | 41 | 31 | 22 | 17 | 13 |
| | 750 | 6 | 14 | 29 | 38 | 40 | 31 | 22 | 17 | 13 |
| | 1000 | 5 | 14 | 28 | 38 | 40 | 31 | 22 | 18 | 14 |
| | 1250 | 5 | 14 | 28 | 37 | 39 | 31 | 23 | 18 | 14 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W/ in. H/ in. | 21 12 | 21 18 | 21 24 | 21 30 | 21 36 | 21 42 | 21 48 | 42 12 | 42 18 | 42 24 | 42 30 | 42 36 | 42 42 | 42 48 |
|----------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 Feet | | 42 | 50 | 58 | 67 | 75 | 83 | 91 | 71 | 83 | 95 | 107 | 119 | 131 | 143 |
| 5 Feet | Wt/ lb. | 69 | 82 | 95 | 107 | 120 | 133 | 146 | 117 | 135 | 153 | 171 | 189 | 208 | 226 |
| 7 Feet | | 96 | 114 | 131 | 148 | 166 | 183 | 200 | 163 | 187 | 211 | 236 | 260 | NA | NA |
| 10 Feet | | 137 | 161 | 185 | 210 | 234 | 258 | 282 | 232 | 265 | 299 | NA | NA | NA | NA |

*Note: Widths are available from 18" to 24" and from 36" to 48"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | Static Pressure Drop, i.w.g. | | | | | | |
|-----------------------------|------------------------------|------|------|------|------|------|------|
| ULL2 | 3 ft. | 0.02 | 0.10 | 0.22 | 0.38 | 0.60 | 0.87 |
| | 5 ft. | 0.03 | 0.11 | 0.24 | 0.42 | 0.66 | 0.95 |
| | 7 ft. | 0.02 | 0.11 | 0.26 | 0.46 | 0.72 | NA |
| | 10 ft. | 0.03 | 0.13 | 0.29 | 0.51 | 0.80 | NA |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | Silencer Face Velocity, fpm | | | | | | |
| 3ULL2 | -1250 | 2 | 3 | 3 | 5 | 7 | 9 |
| | -1000 | 2 | 2 | 3 | 5 | 7 | 9 |
| | -750 | 2 | 2 | 3 | 5 | 7 | 9 |
| | 750 | 1 | 2 | 3 | 4 | 6 | 8 |
| | 1000 | 1 | 2 | 3 | 4 | 6 | 8 |
| | 1250 | 1 | 2 | 3 | 4 | 6 | 8 |
| 5ULL2 | -1250 | 3 | 4 | 6 | 8 | 10 | 14 |
| | -1000 | 3 | 4 | 5 | 7 | 10 | 13 |
| | -750 | 3 | 4 | 5 | 7 | 10 | 13 |
| | 750 | 2 | 3 | 4 | 6 | 9 | 12 |
| | 1000 | 2 | 3 | 4 | 6 | 9 | 11 |
| | 1250 | 2 | 3 | 4 | 6 | 8 | 11 |
| 7ULL2 | -1250 | 4 | 6 | 8 | 10 | 14 | 18 |
| | -1000 | 4 | 5 | 7 | 10 | 14 | 17 |
| | -750 | 4 | 5 | 7 | 10 | 13 | 17 |
| | 750 | 3 | 4 | 6 | 8 | 12 | 15 |
| | 1000 | 3 | 4 | 6 | 8 | 11 | 15 |
| | 1250 | 3 | 4 | 6 | 8 | 11 | 15 |
| 10ULL2 | -1250 | 6 | 8 | 11 | 15 | 19 | 24 |
| | -1000 | 6 | 8 | 10 | 14 | 19 | 24 |
| | -750 | 5 | 7 | 10 | 14 | 18 | 23 |
| | 750 | 4 | 6 | 8 | 12 | 16 | 21 |
| | 1000 | 4 | 6 | 8 | 11 | 15 | 20 |
| | 1250 | 4 | 5 | 8 | 11 | 15 | 20 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

Table V: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|----|----|
| | | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | | |
| ULL2 | -1250 | 57 | 54 | 54 | 52 | 52 | 55 | 57 | 51 | 45 |
| | -750 | 48 | 45 | 42 | 41 | 41 | 46 | 48 | 38 | 27 |
| | +750 | 45 | 42 | 40 | 38 | 38 | 43 | 46 | 35 | 25 |
| | +1250 | 55 | 52 | 52 | 49 | 49 | 52 | 55 | 49 | 43 |

*Estimated

Self-Noise values are shown for a seven-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.

**QUIET-DUCT ULTRA™/LOW SILENCERS****TYPE: ULL3****LOW FREQUENCY SILENCERS with FORWARD and REVERSE FLOW Ratings**

The Quiet-Duct Ultra™/Low line of modular silencers, introduced in 2005, has been designed to optimize Dynamic Insertion Loss (DIL) performance for frequencies between 25 Hz and 80 Hz. The tests were conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory. IAC is the first manufacturer to publish guaranteed test data at 31.5 Hz, including finer resolution of one-third-octave-band data for applications requiring narrow-band performance to match specific sound sources.

DESIGNATING SILENCERS

Model: 5ULL3-24-18

Length: 5'

Type: ULL3

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|------|----|-----|-----|-----|----|----|----|----|
| | Hz | 31.5 | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | | |
| 3ULL3 | -1250 | 3 | 8 | 12 | 14 | 13 | 11 | 10 | 8 | 7 |
| | -1000 | 3 | 8 | 12 | 14 | 13 | 11 | 10 | 8 | 7 |
| | -750 | 3 | 8 | 12 | 14 | 13 | 12 | 10 | 8 | 7 |
| | 750 | 2 | 7 | 11 | 13 | 14 | 12 | 10 | 8 | 6 |
| | 1000 | 2 | 7 | 11 | 13 | 14 | 13 | 10 | 8 | 6 |
| | 1250 | 2 | 7 | 11 | 13 | 14 | 13 | 10 | 7 | 6 |
| 5ULL3 | -1250 | 5 | 11 | 18 | 21 | 19 | 15 | 12 | 10 | 7 |
| | -1000 | 5 | 11 | 18 | 21 | 19 | 15 | 12 | 9 | 7 |
| | -750 | 4 | 11 | 18 | 21 | 19 | 15 | 12 | 9 | 7 |
| | 750 | 4 | 10 | 16 | 20 | 20 | 16 | 12 | 9 | 7 |
| | 1000 | 4 | 10 | 16 | 20 | 20 | 16 | 12 | 9 | 7 |
| | 1250 | 4 | 9 | 16 | 19 | 20 | 16 | 12 | 9 | 7 |
| 7ULL3 | -1250 | 6 | 14 | 24 | 28 | 25 | 19 | 14 | 10 | 9 |
| | -1000 | 6 | 14 | 24 | 28 | 25 | 19 | 14 | 10 | 9 |
| | -750 | 6 | 14 | 23 | 27 | 25 | 19 | 14 | 10 | 9 |
| | 750 | 5 | 12 | 22 | 26 | 25 | 19 | 14 | 9 | 8 |
| | 1000 | 5 | 12 | 21 | 26 | 25 | 19 | 15 | 9 | 8 |
| | 1250 | 5 | 12 | 21 | 25 | 25 | 20 | 15 | 9 | 8 |
| 10ULL3 | -1250 | 8 | 19 | 32 | 37 | 34 | 24 | 17 | 14 | 10 |
| | -1000 | 8 | 19 | 32 | 37 | 34 | 24 | 17 | 13 | 9 |
| | -750 | 8 | 18 | 31 | 37 | 34 | 24 | 17 | 13 | 9 |
| | 750 | 7 | 16 | 29 | 35 | 33 | 24 | 18 | 13 | 9 |
| | 1000 | 6 | 16 | 28 | 34 | 33 | 24 | 18 | 13 | 9 |
| | 1250 | 6 | 15 | 28 | 34 | 33 | 24 | 18 | 13 | 8 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures*

| Nominal Length | W/ in. H/ in. | 27 12 | 27 18 | 27 24 | 27 30 | 27 36 | 27 42 | 27 48 | 54 12 | 54 18 | 54 24 | 54 30 | 54 36 | 54 42 | 54 48 |
|----------------|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 Feet | Wt/ lb. | 49 | 57 | 66 | 75 | 84 | 93 | 102 | 84 | 98 | 111 | 124 | 138 | 151 | 164 |
| 5 Feet | | 80 | 94 | 107 | 121 | 135 | 148 | 162 | 139 | 159 | 179 | 198 | 218 | 238 | 258 |
| 7 Feet | | 112 | 130 | 148 | 167 | 185 | 204 | 222 | 193 | 220 | 246 | 273 | 299 | NA | NA |
| 10 Feet | | 159 | 184 | 210 | 236 | 261 | 287 | 312 | NA | NA | NA | NA | NA | NA | NA |

*Note: Widths are available from 24" to 30" and from 48" to 54"

Table III: Aerodynamic Performance

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

PD values are per ASTM E477 test standard. For the smaller widths available add 15% and subtract 5% for the larger widths available. If silencers are near elbows, transitions or other non-ideal conditions sufficient allowances must be made to account for system effects when calculating the overall silencer pressure loss.

| Model | | Static Pressure Drop, i.w.g. | | | | | |
|-----------------------------|--------|------------------------------|------|------|------|------|------|
| ULL3 | 3 ft. | 0.02 | 0.09 | 0.21 | 0.37 | 0.58 | 0.83 |
| | 5 ft. | 0.02 | 0.10 | 0.22 | 0.40 | 0.62 | 0.89 |
| | 7 ft. | 0.03 | 0.11 | 0.24 | 0.42 | 0.66 | 0.96 |
| | 10 ft. | 0.03 | 0.12 | 0.26 | 0.47 | 0.73 | 1.05 |
| Silencer Face Velocity, fpm | | 250 | 500 | 750 | 1000 | 1250 | 1500 |

Table IV: 1/3 Octave Band DIL Data

| IAC Model | Octave Band Hz | 31.5 Hz | | | 63 Hz | | |
|-----------|-----------------------------|---------|------|----|-------|----|----|
| | | 25 | 31.5 | 40 | 50 | 63 | 80 |
| | Silencer Face Velocity, fpm | | | | | | |
| 3ULL3 | -1250 | 2 | 3 | 4 | 6 | 8 | 10 |
| | -1000 | 2 | 3 | 4 | 6 | 8 | 10 |
| | -750 | 2 | 3 | 4 | 6 | 8 | 10 |
| | 750 | 2 | 2 | 3 | 5 | 7 | 9 |
| | 1000 | 2 | 2 | 3 | 5 | 7 | 9 |
| | 1250 | 2 | 2 | 3 | 5 | 7 | 9 |
| 5ULL3 | -1250 | 3 | 5 | 6 | 9 | 12 | 15 |
| | -1000 | 3 | 5 | 6 | 9 | 12 | 14 |
| | -750 | 3 | 4 | 6 | 9 | 11 | 14 |
| | 750 | 3 | 4 | 5 | 8 | 10 | 13 |
| | 1000 | 3 | 4 | 5 | 8 | 10 | 13 |
| | 1250 | 3 | 3 | 5 | 7 | 10 | 12 |
| 7ULL3 | -1250 | 5 | 6 | 9 | 12 | 15 | 19 |
| | -1000 | 4 | 6 | 8 | 12 | 15 | 19 |
| | -750 | 4 | 6 | 8 | 11 | 15 | 18 |
| | 750 | 4 | 5 | 7 | 10 | 13 | 17 |
| | 1000 | 3 | 5 | 7 | 10 | 13 | 16 |
| | 1250 | 3 | 5 | 7 | 9 | 13 | 16 |
| 10ULL3 | -1250 | 6 | 9 | 12 | 16 | 20 | 25 |
| | -1000 | 6 | 9 | 12 | 15 | 20 | 25 |
| | -750 | 6 | 8 | 11 | 15 | 19 | 24 |
| | 750 | 5 | 7 | 10 | 13 | 17 | 22 |
| | 1000 | 5 | 7 | 9 | 13 | 17 | 22 |
| | 1250 | 4 | 6 | 9 | 13 | 17 | 21 |

One-Third (1/3) Octave Band data for IAC Quiet-Duct Ultra™/Low silencers is provided for those applications where Dynamic Insertion Loss performance in more discrete frequencies is required to effectively control narrow-band noise sources. Table IV presents the 1/3 Octave Band DIL components that combine to comprise the Full Octave Band DIL values.

Table V: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|-------|----|-----|-----|-----|----|----|----|----|
| | | 31.5* | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | | |
| ULL3 | -1250 | 58 | 55 | 56 | 53 | 53 | 56 | 58 | 52 | 47 |
| | -750 | 49 | 46 | 43 | 42 | 42 | 47 | 49 | 39 | 28 |
| | +750 | 45 | 42 | 40 | 38 | 38 | 43 | 46 | 35 | 25 |
| | +1250 | 55 | 52 | 52 | 49 | 49 | 52 | 55 | 49 | 43 |

*Estimated

Self-Noise values are shown for a nine-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table V.



QUIET-DUCT ULTRA™ /GREEN SILENCERS

1.01 GENERAL

- A. Furnish and install "IAC Quiet-Duct ULTRA™ /Green " (rectangular) silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 MATERIALS

- A. Outer casings of rectangular silencers shall be made of 22 gauge type #G-90 lock-former-quality galvanized steel.
- B. Interior partitions for rectangular silencers shall be not less than 26 gauge type #G-90 galvanized lock-former-quality perforated steel.
- C. Acoustic fill material shall be 100% environmentally friendly, and constructed of recycled natural fibers. Each fiber shall be treated with an EPA registered fungal inhibitor in order to prevent mold, mildew, fungi, and pest protection. The fill material must not contain any harmful chemicals, irritants, and/or volatile organic compounds (VOCs) in order to prevent off-gassing.
- D. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:
- | | |
|--------------------------------------|----|
| Flamespread Classification | 5 |
| Smoke Development Rating | 35 |

3.01 CONSTRUCTION

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Seams shall be lock formed and mastic filled. Rectangular casing seams shall be in the corners of the silencer shell to provide maximum unit strength and rigidity. Interior partitions shall be fabricated from single-piece, margin-perforated sheets and shall have die-formed entrance and exit shapes so as to provide the maximum aerodynamic efficiency and minimum self-noise characteristics in the sound attenuator. Blunt noses or squared off partitions will not be accepted.
- B. Attachment of the interior partitions to the casing shall be by means of an interlocking track assembly. Tracks shall be solid galvanized steel and shall be welded to the outer casing. Attachment of the interior partitions to the tracks shall be such that a minimum of 4 thicknesses of metal exist at this location. The track assembly shall stiffen the exterior casing, provide a reinforced attachment detail for the interior partitions, and shall maintain a uniform airspace width along the length of the silencer for consistent aerodynamic and acoustic performance. Interior partitions shall be additionally secured to the outer casing with welded nose clips at both ends of the sound attenuator.

- C. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing. Airtight construction shall be provided by use of a duct sealing compound on the job-site material and labor furnished by the contractor.

4.01 ACOUSTIC PERFORMANCE

- A. All silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves, and test chamber sound absorption are eliminated.

Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity. Data for rectangular and tubular type silencers shall be presented for tests conducted using silencers no smaller than the following cross-sections:

| | | | | |
|--------------------|--------|--------|-----|--------|
| Rectangular, inch: | 24x24, | 24x30, | or | 24x36, |
| and | | | | |
| Tubular, inch: | 12, | 24, | 36, | and 48 |

5.01 AERODYNAMIC PERFORMANCE

- A. Static pressure loss of silencers shall not exceed those listed in the silencer schedule as the airflow indicates. Airflow measurements shall be made in accordance with ASTM specification E477-99 and applicable portions of ASME, AMCA, and ADC airflow test codes. Tests shall be reported on the identical units for which acoustic data is presented.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

7.01 DUCT TRANSITIONS

- A. When transitions are required to adapt silencer dimensions to connecting duct work they shall be furnished by the installing contractor.

**QUIET-DUCT ULTRA™ /GREEN SILENCERS****TYPE: UGLFS****ENVIRONMENTALLY SOUND SILENCERS with FORWARD and REVERSE FLOW Ratings**

In response to the current trend for environmentally friendly building products, IAC America introduces Quiet-Duct Ultra™ /Green, a 100% environmentally friendly attenuation solution which uses recycled acoustic fill material. Quiet-Duct Ultra™ /Green delivers performance that meets or exceeds that of a standard Quiet-Duct™ silencer in almost every situation. The tests were measured in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory.

DESIGNATING SILENCERS

Model: 5UGLFS-24-18

Length: 5' Type: UGLFS Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3UGLFS | -2000 | 6 | 13 | 25 | 32 | 28 | 20 | 17 | 14 |
| | -1000 | 6 | 12 | 24 | 32 | 27 | 20 | 19 | 14 |
| | 0 | 5 | 12 | 24 | 32 | 28 | 21 | 19 | 14 |
| | 1000 | 6 | 11 | 22 | 30 | 27 | 21 | 18 | 14 |
| | 2000 | 5 | 9 | 20 | 29 | 26 | 20 | 18 | 14 |
| 5UGLFS | -2000 | 11 | 23 | 39 | 46 | 44 | 27 | 24 | 19 |
| | -1000 | 11 | 22 | 36 | 45 | 44 | 29 | 25 | 18 |
| | 0 | 10 | 20 | 35 | 43 | 43 | 29 | 24 | 17 |
| | 1000 | 10 | 17 | 31 | 40 | 41 | 28 | 22 | 14 |
| | 2000 | 9 | 14 | 29 | 38 | 39 | 29 | 20 | 14 |
| 7UGLFS | -2000 | 12 | 27 | 43 | 50 | 49 | 33 | 21 | 18 |
| | -1000 | 12 | 23 | 43 | 48 | 49 | 36 | 25 | 17 |
| | 0 | 10 | 24 | 40 | 45 | 46 | 32 | 23 | 16 |
| | 1000 | 10 | 22 | 35 | 42 | 43 | 29 | 20 | 17 |
| | 2000 | 10 | 23 | 37 | 45 | 44 | 28 | 19 | 16 |
| 10UGLFS | -2000 | 16 | 32 | 48 | 52 | 52 | 43 | 24 | 18 |
| | -1000 | 15 | 31 | 52 | 51 | 54 | 45 | 30 | 19 |
| | 0 | 16 | 30 | 51 | 52 | 54 | 47 | 32 | 20 |
| | 1000 | 14 | 26 | 48 | 54 | 53 | 49 | 33 | 24 |
| | 2000 | 13 | 24 | 47 | 56 | 55 | 49 | 36 | 26 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | - | - | 117 | 140 | 167 | 190 | - | - | 178 | 209 | 250 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | - | - | - | - | - | - | - | - |
| 10 feet | | 280 | - | - | 295 | 349 | 417 | 470 | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| UGLFS | 3 | 0.04 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.36 | 0.41 | 0.46 | 0.51 | 0.57 |
| | 5 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.26 | 0.31 | 0.35 | 0.40 | 0.45 | 0.51 | 0.56 | 0.62 |
| | 7 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.20 | 0.23 | 0.28 | 0.32 | 0.37 | 0.42 | 0.47 | 0.53 | 0.59 | 0.65 |
| | 10 | 0.04 | 0.06 | 0.09 | 0.11 | 0.14 | 0.18 | 0.21 | 0.26 | 0.30 | 0.35 | 0.40 | 0.45 | 0.51 | 0.57 | 0.64 | 0.71 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Silencer Face Velocity, fpm | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| UGLFS All Sizes | -2,000 | 58 | 54 | 58 | 61 | 62 | 62 | 65 | 63 |
| | -1,500 | 51 | 49 | 53 | 56 | 56 | 59 | 60 | 53 |
| | -1,000 | 45 | 42 | 45 | 43 | 45 | 49 | 44 | 37 |
| | 1,000 | 46 | 42 | 45 | 43 | 45 | 49 | 44 | 37 |
| | 1,500 | 56 | 54 | 57 | 56 | 52 | 56 | 57 | 51 |
| | 2,000 | 68 | 64 | 65 | 66 | 61 | 61 | 64 | 61 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**QUIET-DUCT ULTRA™ /GREEN SILENCERS****TYPE: UGLFM****ENVIRONMENTALLY SOUND SILENCERS with FORWARD and REVERSE FLOW Ratings**

In response to the current trend for environmentally friendly building products, IAC America introduces Quiet-Duct Ultra™ /Green, a 100% environmentally friendly attenuation solution which uses recycled acoustic fill material. Quiet-Duct Ultra™ /Green delivers performance that meets or exceeds that of a standard Quiet-Duct™ silencer in almost every situation. The tests were measured in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory.

DESIGNATING SILENCERS

Model: 5UGLFM-24-18

Length: 5' Type: UGLFM Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3ULFM | -2000 | 5 | 9 | 17 | 24 | 20 | 13 | 14 | 12 |
| | -1000 | 4 | 8 | 17 | 25 | 20 | 14 | 15 | 11 |
| | 0 | 3 | 8 | 16 | 24 | 20 | 14 | 14 | 10 |
| | 1000 | 2 | 6 | 14 | 22 | 18 | 13 | 12 | 10 |
| | 2000 | 2 | 6 | 14 | 22 | 18 | 12 | 12 | 10 |
| 5ULFM | -2000 | 6 | 17 | 28 | 37 | 31 | 16 | 18 | 16 |
| | -1000 | 6 | 15 | 27 | 37 | 31 | 18 | 21 | 15 |
| | 0 | 6 | 14 | 27 | 36 | 30 | 18 | 19 | 14 |
| | 1000 | 6 | 12 | 24 | 34 | 30 | 18 | 15 | 10 |
| | 2000 | 5 | 10 | 23 | 32 | 30 | 18 | 15 | 9 |
| 7ULFM | -2000 | 10 | 21 | 35 | 44 | 38 | 20 | 16 | 16 |
| | -1000 | 9 | 19 | 33 | 42 | 40 | 22 | 20 | 15 |
| | 0 | 9 | 19 | 32 | 42 | 40 | 22 | 19 | 14 |
| | 1000 | 9 | 15 | 29 | 43 | 39 | 23 | 18 | 16 |
| | 2000 | 8 | 14 | 28 | 42 | 40 | 23 | 18 | 16 |
| 10ULFM | -2000 | 13 | 26 | 43 | 51 | 49 | 25 | 19 | 17 |
| | -1000 | 12 | 23 | 42 | 50 | 50 | 28 | 24 | 17 |
| | 0 | 13 | 23 | 41 | 51 | 51 | 28 | 23 | 16 |
| | 1000 | 12 | 20 | 39 | 52 | 51 | 29 | 22 | 17 |
| | 2000 | 11 | 19 | 37 | 52 | 52 | 29 | 22 | 19 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | - | - | 117 | 140 | 167 | 190 | - | - | 178 | 209 | 250 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | - | - | - | - | - | - | - | - |
| 10 feet | | 280 | - | - | 295 | 349 | 417 | 470 | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| UGLFM | 3 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.32 | 0.37 | 0.42 | 0.48 | 0.55 | 0.61 | 0.68 | 0.76 |
| | 5 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 | 0.20 | 0.24 | 0.29 | 0.34 | 0.39 | 0.45 | 0.51 | 0.57 | 0.64 | 0.72 | 0.79 |
| | 7 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.53 | 0.60 | 0.67 | 0.75 | 0.83 |
| | 10 | 0.06 | 0.08 | 0.12 | 0.15 | 0.19 | 0.24 | 0.29 | 0.34 | 0.40 | 0.46 | 0.53 | 0.60 | 0.68 | 0.76 | 0.85 | 0.94 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
|-----------------------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| UGLFM All Sizes | -3,000 | 64 | 62 | 64 | 66 | 65 | 64 | 66 | 62 |
| | -2,000 | 53 | 50 | 54 | 56 | 56 | 59 | 58 | 51 |
| | -1,000 | 42 | 40 | 43 | 45 | 47 | 46 | 37 | 27 |
| | 1,000 | 47 | 34 | 36 | 35 | 40 | 37 | 27 | 20 |
| | 2,000 | 54 | 52 | 58 | 56 | 51 | 56 | 55 | 50 |
| | 3,000 | 68 | 64 | 64 | 63 | 61 | 63 | 66 | 63 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT ULTRA™/GREEN SILENCERS

TYPE: UGLFL

ENVIRONMENTALLY SOUND SILENCERS with FORWARD and REVERSE FLOW Ratings



In response to the current trend for environmentally friendly building products, IAC America introduces Quiet-Duct Ultra™ /Green, a 100% environmentally friendly attenuation solution which uses recycled acoustic fill material. Quiet-Duct Ultra™ /Green delivers performance that meets or exceeds that of a standard Quiet-Duct™ silencer in almost every situation. The tests were measured in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory.

DESIGNATING SILENCERS

Model: 5UGLFL-24-18

Length: 5' Type: UGLFL Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3UGLFL | -2000 | 3 | 7 | 15 | 20 | 19 | 11 | 14 | 12 |
| | -1000 | 3 | 8 | 14 | 20 | 18 | 12 | 15 | 11 |
| | 0 | 3 | 9 | 16 | 23 | 23 | 16 | 14 | 10 |
| | 1000 | 3 | 9 | 16 | 25 | 26 | 20 | 13 | 10 |
| | 2000 | 3 | 8 | 15 | 25 | 25 | 13 | 13 | 10 |
| 5UGLFL | -2000 | 5 | 12 | 22 | 31 | 31 | 14 | 20 | 16 |
| | -1000 | 5 | 12 | 20 | 31 | 30 | 17 | 21 | 15 |
| | 0 | 5 | 11 | 20 | 30 | 29 | 16 | 18 | 13 |
| | 1000 | 4 | 8 | 17 | 27 | 26 | 15 | 13 | 9 |
| | 2000 | 4 | 7 | 16 | 27 | 25 | 14 | 13 | 8 |
| 7UGLFL | -2000 | 8 | 18 | 28 | 38 | 31 | 16 | 16 | 15 |
| | -1000 | 7 | 15 | 25 | 37 | 32 | 18 | 18 | 14 |
| | 0 | 6 | 15 | 25 | 38 | 32 | 18 | 17 | 13 |
| | 1000 | 6 | 12 | 23 | 39 | 31 | 19 | 16 | 15 |
| | 2000 | 5 | 10 | 20 | 38 | 32 | 18 | 16 | 15 |
| 10UGLFL | -2000 | 10 | 23 | 34 | 42 | 41 | 18 | 19 | 17 |
| | -1000 | 9 | 20 | 33 | 41 | 43 | 21 | 21 | 16 |
| | 0 | 9 | 19 | 31 | 43 | 43 | 21 | 20 | 15 |
| | 1000 | 9 | 15 | 28 | 46 | 42 | 22 | 19 | 16 |
| | 2000 | 7 | 13 | 26 | 47 | 43 | 21 | 18 | 16 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | - | - | 117 | 140 | 167 | 190 | - | - | 178 | 209 | 250 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | - | - | - | - | - | - | - | - |
| 10 feet | | 280 | - | - | 295 | 349 | 417 | 470 | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| UGLFL | 3 | 0.01 | 0.05 | 0.08 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.51 | 0.59 | 0.68 | 0.77 | 0.87 | 0.97 |
| | 5 | 0.01 | 0.05 | 0.08 | 0.12 | 0.16 | 0.20 | 0.26 | 0.32 | 0.39 | 0.46 | 0.54 | 0.63 | 0.72 | 0.82 | 0.92 | 1.04 |
| | 7 | 0.01 | 0.05 | 0.09 | 0.12 | 0.17 | 0.22 | 0.28 | 0.34 | 0.41 | 0.49 | 0.57 | 0.67 | 0.77 | 0.87 | 0.98 | 1.10 |
| | 10 | 0.02 | 0.06 | 0.10 | 0.14 | 0.19 | 0.24 | 0.31 | 0.38 | 0.46 | 0.55 | 0.64 | 0.74 | 0.86 | 0.97 | 1.10 | 1.23 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 400 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 |
|-----------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| UGLFL All Sizes | -3,000 | 55 | 54 | 56 | 57 | 56 | 59 | 61 | 56 |
| | -2,000 | 46 | 45 | 48 | 49 | 50 | 54 | 49 | 42 |
| | -1,000 | 31 | 30 | 34 | 35 | 40 | 45 | 28 | 20 |
| | 1,000 | 32 | 24 | 32 | 25 | 34 | 39 | 24 | 20 |
| | 2,000 | 47 | 42 | 46 | 44 | 46 | 51 | 46 | 38 |
| | 3,000 | 56 | 53 | 54 | 55 | 53 | 58 | 59 | 53 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT ULTRA™/GREEN SILENCERS

TYPE: UGS

ENVIRONMENTALLY SOUND SILENCERS with FORWARD and REVERSE FLOW Ratings



In response to the current trend for environmentally friendly building products, IAC America introduces Quiet-Duct Ultra™ /Green, a 100% environmentally friendly attenuation solution which uses recycled acoustic fill material. Quiet-Duct Ultra™ /Green delivers performance that meets or exceeds that of a standard Quiet-Duct™ silencer in almost every situation. The tests were measured in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory.

DESIGNATING SILENCERS

Model: 5UGS-24-18

Length: 5' Type: UGS Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3UGS | -1500 | 4 | 9 | 18 | 35 | 41 | 36 | 22 | 14 |
| | -1000 | 3 | 9 | 17 | 35 | 40 | 36 | 23 | 15 |
| | -750 | 3 | 8 | 16 | 34 | 41 | 36 | 24 | 16 |
| | 750 | 3 | 6 | 14 | 31 | 39 | 35 | 25 | 16 |
| | 1000 | 3 | 6 | 14 | 31 | 39 | 35 | 25 | 16 |
| | 1500 | 3 | 6 | 13 | 29 | 38 | 35 | 25 | 16 |
| 5UGS | -1500 | 8 | 15 | 28 | 46 | 47 | 42 | 35 | 21 |
| | -1000 | 8 | 14 | 26 | 45 | 46 | 45 | 37 | 22 |
| | -750 | 8 | 13 | 26 | 45 | 46 | 45 | 37 | 22 |
| | 750 | 6 | 10 | 23 | 44 | 46 | 45 | 38 | 23 |
| | 1000 | 6 | 10 | 22 | 43 | 46 | 45 | 38 | 24 |
| | 1500 | 5 | 9 | 21 | 42 | 46 | 45 | 39 | 24 |
| 7UGS | -1500 | 12 | 22 | 35 | 48 | 46 | 44 | 39 | 24 |
| | -1000 | 11 | 20 | 33 | 47 | 47 | 46 | 44 | 25 |
| | -750 | 10 | 19 | 33 | 47 | 47 | 46 | 44 | 26 |
| | 750 | 7 | 15 | 28 | 48 | 47 | 46 | 44 | 32 |
| | 1000 | 7 | 15 | 27 | 48 | 47 | 46 | 44 | 33 |
| | 1500 | 6 | 14 | 27 | 48 | 48 | 46 | 45 | 34 |
| 10UGS | -1500 | 14 | 27 | 43 | 45 | 47 | 46 | 41 | 31 |
| | -1000 | 14 | 30 | 42 | 45 | 47 | 46 | 46 | 32 |
| | -750 | 13 | 27 | 41 | 45 | 47 | 46 | 46 | 33 |
| | 750 | 10 | 21 | 40 | 47 | 48 | 46 | 47 | 42 |
| | 1000 | 10 | 21 | 39 | 46 | 48 | 46 | 47 | 43 |
| | 1500 | 9 | 19 | 39 | 47 | 48 | 47 | 46 | 44 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 12 | 6 24 | 6 36 | 12 12 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 22 | 35 | 49 | 33 | 43 | 52 | 62 | 74 | 83 | 93 |
| 5 feet | | 40 | 63 | 87 | 56 | 73 | 89 | 107 | 125 | 141 | 158 |
| 7 feet | | 55 | 88 | 122 | 78 | 102 | 125 | 150 | 176 | 199 | 226 |
| 10 feet | | 77 | 123 | 171 | 111 | 155 | 177 | 212 | 250 | - | - |
| Nominal Length | W, In H, In | 24 18 | 24 24 | 24 30 | 24 36 | 24 42 | 24 48 | 36 30 | 36 36 | 36 42 | 36 48 |
| 3 feet | Wt/ lb. | 71 | 86 | 102 | 117 | 132 | 147 | 142 | 162 | 182 | 204 |
| 5 feet | | 121 | 147 | 173 | 204 | 230 | 256 | 249 | 284 | 319 | 355 |
| 7 feet | | 170 | 207 | 243 | 288 | 325 | 362 | - | - | - | - |
| 10 feet | | 241 | 293 | 345 | 405 | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | Static Pressure Drop, i.w.g. | | | | | | |
|-----------------------------|------------------------------|-------|-------|------|------|------|------|
| UGS | 3 ft. | 0.88 | 0.40 | 0.22 | 0.25 | 0.43 | 0.93 |
| | 5 ft. | 1.10 | 0.49 | 0.25 | 0.25 | 0.47 | 1.08 |
| | 7 ft. | 1.40 | 0.61 | 0.31 | 0.29 | 0.54 | 1.30 |
| | 10 ft. | 1.98 | 0.80 | 0.42 | 0.40 | 0.71 | 1.65 |
| Silencer Face Velocity, fpm | | -1500 | -1000 | -750 | 750 | 1000 | 1500 |

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band Hz | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 3UGS | -1500 | 42 | 49 | 53 | 56 | 57 | 66 | 65 | 46 |
| | -1000 | 33 | 41 | 45 | 47 | 51 | 54 | 43 | 32 |
| | -750 | 34 | 35 | 38 | 41 | 44 | 42 | 29 | 26 |
| | 750 | 36 | 36 | 37 | 40 | 45 | 42 | 31 | 25 |
| | 1000 | 38 | 42 | 43 | 45 | 48 | 50 | 42 | 31 |
| | 1500 | 47 | 53 | 52 | 54 | 55 | 57 | 55 | 46 |
| 5UGS | -1500 | 41 | 48 | 53 | 56 | 57 | 66 | 65 | 47 |
| | -1000 | 35 | 42 | 45 | 47 | 49 | 54 | 41 | 31 |
| | -750 | 35 | 36 | 38 | 40 | 43 | 39 | 28 | 26 |
| | 750 | 31 | 33 | 37 | 38 | 42 | 37 | 26 | 25 |
| | 1000 | 34 | 42 | 44 | 45 | 47 | 48 | 40 | 31 |
| | 1500 | 47 | 54 | 53 | 54 | 53 | 56 | 54 | 46 |
| 7UGS | -1500 | 43 | 49 | 54 | 56 | 57 | 63 | 62 | 49 |
| | -1000 | 34 | 43 | 46 | 48 | 50 | 54 | 43 | 33 |
| | -750 | 32 | 37 | 39 | 39 | 44 | 41 | 28 | 26 |
| | 750 | 37 | 38 | 38 | 37 | 42 | 39 | 28 | 25 |
| | 1000 | 38 | 45 | 46 | 45 | 46 | 48 | 40 | 30 |
| | 1500 | 50 | 56 | 56 | 57 | 54 | 56 | 56 | 48 |
| 10UGS | -1500 | 40 | 46 | 51 | 56 | 57 | 61 | 62 | 49 |
| | -1000 | 35 | 40 | 45 | 48 | 49 | 54 | 43 | 34 |
| | -750 | 35 | 36 | 39 | 41 | 43 | 42 | 30 | 26 |
| | 750 | 35 | 39 | 40 | 41 | 44 | 42 | 30 | 25 |
| | 1000 | 38 | 46 | 47 | 47 | 48 | 50 | 43 | 33 |
| | 1500 | 53 | 58 | 58 | 58 | 55 | 58 | 57 | 49 |

Self-Noise values shown are for a four-square-foot area silencer. For each doubling of the face area add three dB; for each halving of the face area, subtract three dB from the values in Table IV.

**QUIET-DUCT ULTRA™/GREEN SILENCERS****TYPE: UGMS****ENVIRONMENTALLY SOUND SILENCERS with FORWARD and REVERSE FLOW Ratings**

In response to the current trend for environmentally friendly building products, IAC America introduces Quiet-Duct Ultra™ /Green, a 100% environmentally friendly attenuation solution which uses recycled acoustic fill material. Quiet-Duct Ultra™ /Green delivers performance that meets or exceeds that of a standard Quiet-Duct™ silencer in almost every situation. The tests were measured in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory.

DESIGNATING SILENCERS

Model: 5UGMS-24-18

Length: 5' Type: UGMS Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3UGMS | -3,000 | 4 | 6 | 13 | 25 | 27 | 19 | 12 | 9 |
| | -2,000 | 4 | 6 | 13 | 25 | 26 | 17 | 11 | 8 |
| | -1,000 | 5 | 5 | 12 | 24 | 25 | 18 | 11 | 9 |
| | 1,000 | 4 | 5 | 11 | 23 | 24 | 19 | 14 | 10 |
| | 2,000 | 4 | 4 | 11 | 21 | 24 | 20 | 15 | 11 |
| | 3,000 | 3 | 4 | 10 | 20 | 23 | 21 | 15 | 11 |
| 5UGMS | -3,000 | 4 | 11 | 21 | 41 | 42 | 30 | 16 | 11 |
| | -2,000 | 3 | 10 | 20 | 40 | 45 | 29 | 16 | 11 |
| | -1,000 | 2 | 9 | 19 | 39 | 43 | 28 | 16 | 9 |
| | 1,000 | 2 | 7 | 16 | 37 | 42 | 31 | 20 | 13 |
| | 2,000 | 2 | 7 | 15 | 35 | 42 | 31 | 20 | 14 |
| | 3,000 | 2 | 7 | 15 | 34 | 42 | 33 | 20 | 14 |
| 7UGMS | -3,000 | 4 | 18 | 28 | 43 | 41 | 41 | 21 | 13 |
| | -2,000 | 4 | 14 | 26 | 47 | 48 | 40 | 21 | 12 |
| | -1,000 | 3 | 13 | 24 | 47 | 51 | 40 | 20 | 11 |
| | 1,000 | 2 | 11 | 21 | 45 | 50 | 43 | 25 | 16 |
| | 2,000 | 3 | 10 | 20 | 44 | 50 | 42 | 26 | 16 |
| | 3,000 | 2 | 9 | 20 | 44 | 50 | 45 | 28 | 18 |
| 10UGMS | -3,000 | 6 | 18 | 33 | 42 | 41 | 44 | 28 | 16 |
| | -2,000 | 6 | 19 | 35 | 47 | 49 | 47 | 28 | 15 |
| | -1,000 | 5 | 16 | 32 | 47 | 51 | 50 | 28 | 14 |
| | 1,000 | 4 | 14 | 29 | 47 | 51 | 51 | 32 | 19 |
| | 2,000 | 4 | 12 | 26 | 47 | 51 | 50 | 34 | 21 |
| | 3,000 | 4 | 12 | 25 | 46 | 46 | 46 | 37 | 23 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/In H/In | 7.5 18 | 7.5 24 | 7.5 30 | 7.5 36 | 7.5 42 | 7.5 48 | 15 18 | 15 24 | 15 30 | 15 36 | 15 42 | 15 48 | 30 18 | 30 24 | 30 30 |
|----------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/Lb. | 26 | 40 | 45 | 51 | 66 | 80 | 47 | 57 | 67 | 80 | 89 | 100 | 80 | 95 | 110 |
| 5 feet | | 46 | 67 | 80 | 91 | 112 | 134 | 80 | 96 | 114 | 134 | 150 | 167 | 135 | 161 | 187 |
| 7 feet | | 65 | 95 | 100 | 129 | 158 | 190 | 112 | 135 | 159 | 193 | 216 | 240 | 188 | 224 | 261 |
| 10 feet | | 90 | 135 | 157 | 180 | 223 | 270 | 159 | 192 | 226 | 273 | – | – | 220 | 319 | 371 |
| Nominal Length | W/In H/In | 30 36 | 30 42 | 30 48 | 45 18 | 45 24 | 45 30 | 45 36 | 45 42 | 45 48 | 60 18 | 60 24 | 60 30 | 60 36 | 60 42 | 60 48 |
| 3 feet | Wt/Lb. | 130 | 145 | 160 | 127 | 152 | 156 | 177 | 197 | 218 | 160 | 190 | 220 | 260 | 290 | 320 |
| 5 feet | | 22 | 248 | 274 | 215 | 257 | 275 | 310 | 345 | 381 | 270 | 322 | 374 | 44 | 496 | 548 |
| 7 feet | | 310 | 347 | 384 | 300 | 359 | – | – | – | – | 376 | 448 | 522 | 620 | 694 | 768 |
| 10 feet | | 440 | – | – | – | – | – | – | – | – | 440 | 638 | 742 | 880 | – | – |

Table III: Aerodynamic Performance

| Model | L/Ft. | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| UGMS | 3 | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.26 | 0.29 | 0.33 | 0.36 | 0.40 | 0.44 | 0.49 | 0.53 |
| | 5 | 0.08 | 0.10 | 0.12 | 0.15 | 0.17 | 0.20 | 0.24 | 0.27 | 0.31 | 0.35 | 0.39 | 0.44 | 0.48 | 0.53 | 0.58 | 0.64 |
| | 7 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.26 | 0.30 | 0.34 | 0.39 | 0.44 | 0.49 | 0.54 | 0.60 | 0.67 | 0.73 | 0.80 |
| | 10 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | 0.54 | 0.60 | 0.67 | 0.74 | 0.82 | 0.90 | 0.98 |
| Silencer Face Velocity, fpm | | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 |

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation:

$$PD = (\text{Actual FV/Catalog FV})^2 (\text{Catalog PD}).$$

**Table IV: Self-Noise Power Levels,
dB re: 10-12 Watts**

| IAC MODEL | Octave Band Hz | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------------------|----|-----|-----|-----|----|----|----|----|
| | | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 3UGMS | -3,000 | 46 | 58 | 60 | 64 | 63 | 63 | 65 | 57 |
| | -2,000 | 35 | 50 | 53 | 56 | 58 | 61 | 56 | 43 |
| | -1,000 | 36 | 38 | 39 | 44 | 43 | 37 | 25 | 26 |
| | 1,000 | 40 | 33 | 30 | 34 | 35 | 32 | 22 | 25 |
| | 2,000 | 40 | 45 | 45 | 47 | 48 | 52 | 49 | 40 |
| | 3,000 | 49 | 58 | 56 | 57 | 57 | 59 | 60 | 54 |
| 5UGMS | -3,000 | 45 | 56 | 59 | 63 | 63 | 64 | 66 | 58 |
| | -2,000 | 37 | 48 | 53 | 56 | 57 | 61 | 57 | 43 |
| | -1,000 | 33 | 37 | 40 | 42 | 43 | 39 | 26 | 26 |
| | 1,000 | 34 | 32 | 30 | 32 | 35 | 29 | 22 | 25 |
| | 2,000 | 36 | 44 | 46 | 46 | 47 | 52 | 48 | 38 |
| | 3,000 | 50 | 57 | 56 | 57 | 55 | 59 | 61 | 54 |
| 7UGMS | -3,000 | 45 | 60 | 63 | 67 | 66 | 65 | 68 | 60 |
| | -2,000 | 37 | 53 | 56 | 59 | 58 | 62 | 59 | 46 |
| | -1,000 | 34 | 39 | 41 | 42 | 43 | 39 | 27 | 26 |
| | 1,000 | 36 | 32 | 30 | 32 | 36 | 32 | 23 | 26 |
| | 2,000 | 39 | 47 | 47 | 47 | 47 | 53 | 49 | 40 |
| | 3,000 | 52 | 59 | 57 | 58 | 56 | 58 | 61 | 54 |
| 10UGMS | -3,000 | 46 | 59 | 64 | 66 | 65 | 63 | 67 | 58 |
| | -2,000 | 38 | 53 | 56 | 58 | 56 | 60 | 57 | 43 |
| | -1,000 | 35 | 42 | 43 | 43 | 43 | 39 | 27 | 26 |
| | 1,000 | 34 | 33 | 36 | 37 | 37 | 31 | 23 | 26 |
| | 2,000 | 38 | 49 | 51 | 53 | 52 | 54 | 50 | 41 |
| | 3,000 | 53 | 61 | 61 | 62 | 61 | 61 | 62 | 55 |

Self-Noise values shown are for a four-square-foot area silencer. For each doubling of the face area add 3dB; for each halving of the face area, subtract 3dB from the values in Table IV.



QUIET-DUCT ULTRA™/GREEN SILENCERS

TYPE: UGML

ENVIRONMENTALLY SOUND SILENCERS with FORWARD and REVERSE FLOW Ratings



In response to the current trend for environmentally friendly building products, IAC America introduces Quiet-Duct Ultra™ /Green, a 100% environmentally friendly attenuation solution which uses recycled acoustic fill material. Quiet-Duct Ultra™ /Green delivers performance that meets or exceeds that of a standard Quiet-Duct™ silencer in almost every situation. The tests were measured in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory.

DESIGNATING SILENCERS

Model: 5UGML-24-18

Length: 5' Type: UGML Width: 24" Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3UGML | -3,000 | 3 | 4 | 11 | 21 | 17 | 10 | 7 | 5 |
| | -2,000 | 2 | 4 | 10 | 21 | 17 | 11 | 7 | 5 |
| | -1,000 | 4 | 3 | 10 | 21 | 17 | 11 | 8 | 6 |
| | 1,000 | 4 | 3 | 8 | 19 | 16 | 11 | 8 | 6 |
| | 2,000 | 3 | 3 | 8 | 18 | 16 | 11 | 8 | 7 |
| | 3,000 | 2 | 3 | 7 | 17 | 16 | 12 | 9 | 8 |
| 5UGML | -3,000 | 6 | 8 | 17 | 35 | 30 | 16 | 7 | 4 |
| | -2,000 | 6 | 7 | 16 | 34 | 29 | 16 | 8 | 4 |
| | -1,000 | 5 | 7 | 16 | 34 | 29 | 17 | 9 | 5 |
| | 1,000 | 4 | 6 | 14 | 32 | 28 | 18 | 10 | 9 |
| | 2,000 | 4 | 6 | 13 | 31 | 29 | 18 | 11 | 9 |
| | 3,000 | 4 | 5 | 13 | 29 | 29 | 19 | 12 | 10 |
| 7UGML | -3,000 | 6 | 10 | 21 | 44 | 41 | 24 | 14 | 10 |
| | -2,000 | 6 | 9 | 20 | 43 | 40 | 23 | 14 | 10 |
| | -1,000 | 6 | 9 | 20 | 42 | 40 | 23 | 13 | 10 |
| | 1,000 | 5 | 7 | 18 | 40 | 39 | 24 | 13 | 10 |
| | 2,000 | 5 | 7 | 17 | 38 | 39 | 24 | 13 | 11 |
| | 3,000 | 5 | 7 | 16 | 37 | 39 | 24 | 14 | 12 |
| 10UGML | -3,000 | 7 | 14 | 28 | 44 | 44 | 33 | 17 | 11 |
| | -2,000 | 7 | 14 | 27 | 48 | 50 | 30 | 17 | 12 |
| | -1,000 | 7 | 12 | 25 | 47 | 51 | 30 | 14 | 11 |
| | 1,000 | 6 | 10 | 23 | 48 | 51 | 30 | 15 | 11 |
| | 2,000 | 6 | 10 | 22 | 48 | 51 | 31 | 16 | 12 |
| | 3,000 | 6 | 9 | 22 | 48 | 53 | 32 | 17 | 14 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/In H/In | 9 18 | 9 24 | 9 30 | 9 36 | 9 42 | 9 48 | 18 18 | 18 24 | 18 30 | 18 36 | 18 42 | 18 48 | 36 18 | 36 24 | 36 30 |
|----------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/Lb. | 35 | 41 | 52 | 57 | 65 | 73 | 52 | 61 | 71 | 84 | 94 | 104 | 69 | 103 | 120 |
| 5 feet | | 60 | 71 | 82 | 95 | 107 | 119 | 87 | 103 | 121 | 142 | 158 | 175 | 120 | 175 | 201 |
| 7 feet | | 84 | 100 | 116 | 133 | 150 | 167 | 122 | 144 | 168 | 200 | 223 | 247 | 169 | 246 | 283 |
| 10 feet | | 118 | 141 | 167 | 190 | 240 | 215 | 174 | 203 | 239 | 284 | – | – | 238 | 349 | 403 |
| Nominal Length | W/In H/In | 36 36 | 36 42 | 36 48 | 54 18 | 54 24 | 54 30 | 54 36 | 54 42 | 54 48 | 72 18 | 72 24 | 72 30 | 72 36 | 72 42 | 72 48 |
| 3 feet | Wt/Lb. | 138 | 153 | 168 | 121 | 164 | 191 | 222 | 247 | 272 | 138 | 206 | 240 | 276 | 306 | 336 |
| 5 feet | | 239 | 265 | 291 | 207 | 278 | 322 | 381 | 423 | 466 | 239 | 350 | 402 | 478 | 530 | 582 |
| 7 feet | | 337 | 374 | 411 | 291 | 390 | 451 | 537 | 597 | 658 | 337 | 492 | 566 | 674 | 748 | 822 |
| 10 feet | | 475 | – | – | 412 | 554 | 642 | 759 | – | – | 475 | 698 | 806 | 950 | – | – |

Table III: Aerodynamic Performance

| Model | L/Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | |
|-----------------------------|------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| UGML | 3 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 | 0.20 | 0.24 | 0.28 | 0.33 | 0.38 | 0.44 | 0.50 | 0.57 | 0.64 | 0.71 |
| | 5 | 0.06 | 0.08 | 0.12 | 0.15 | 0.19 | 0.24 | 0.28 | 0.34 | 0.40 | 0.46 | 0.53 | 0.60 | 0.68 | 0.76 | 0.85 |
| | 7 | 0.07 | 0.11 | 0.14 | 0.19 | 0.24 | 0.29 | 0.36 | 0.42 | 0.50 | 0.58 | 0.66 | 0.75 | 0.85 | 0.95 | 1.06 |
| | 10 | 0.09 | 0.13 | 0.18 | 0.23 | 0.29 | 0.36 | 0.44 | 0.52 | 0.61 | 0.71 | 0.82 | 0.93 | 1.05 | 1.18 | 1.45 |
| Silencer Face Velocity, fpm | | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 4000 |

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation:

$$PD = (\text{Actual FV/Catalog FV})^2 (\text{Catalog PD}).$$

**Table IV: Self-Noise Power Levels,
dB re: 10-12 Watts**

| IAC MODEL | Octave Band Hz | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------------------|----|-----|-----|-----|----|----|----|----|
| | | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 3UGML | -3,000 | 42 | 53 | 56 | 60 | 61 | 62 | 61 | 51 |
| | -2,000 | 33 | 47 | 51 | 55 | 56 | 57 | 50 | 36 |
| | -1,000 | 31 | 35 | 38 | 43 | 40 | 31 | 22 | 24 |
| | 1,000 | 35 | 30 | 30 | 33 | 33 | 26 | 21 | 25 |
| | 2,000 | 36 | 41 | 43 | 45 | 48 | 50 | 45 | 35 |
| | 3,000 | 44 | 52 | 51 | 53 | 53 | 58 | 58 | 51 |
| 5UGML | -3,000 | 41 | 59 | 62 | 66 | 61 | 62 | 64 | 51 |
| | -2,000 | 37 | 50 | 53 | 55 | 55 | 58 | 48 | 36 |
| | -1,000 | 34 | 37 | 37 | 40 | 39 | 30 | 22 | 25 |
| | 1,000 | 33 | 32 | 32 | 35 | 35 | 26 | 22 | 24 |
| | 2,000 | 34 | 44 | 46 | 48 | 49 | 51 | 45 | 36 |
| | 3,000 | 44 | 53 | 55 | 57 | 56 | 60 | 59 | 52 |
| 7UGML | -3,000 | 42 | 54 | 58 | 62 | 61 | 62 | 62 | 52 |
| | -2,000 | 38 | 48 | 52 | 55 | 55 | 57 | 50 | 38 |
| | -1,000 | 35 | 36 | 40 | 43 | 41 | 33 | 22 | 25 |
| | 1,000 | 34 | 28 | 27 | 28 | 31 | 23 | 24 | 27 |
| | 2,000 | 35 | 41 | 41 | 42 | 45 | 49 | 43 | 32 |
| | 3,000 | 45 | 52 | 51 | 52 | 51 | 57 | 57 | 49 |
| 10UGML | -3,000 | 42 | 57 | 61 | 65 | 63 | 62 | 64 | 54 |
| | -2,000 | 36 | 50 | 53 | 56 | 55 | 58 | 50 | 39 |
| | -1,000 | 35 | 38 | 38 | 40 | 39 | 30 | 22 | 24 |
| | 1,000 | 33 | 30 | 27 | 28 | 30 | 21 | 21 | 24 |
| | 2,000 | 35 | 40 | 40 | 42 | 45 | 50 | 43 | 33 |
| | 3,000 | 47 | 53 | 51 | 52 | 51 | 57 | 58 | 51 |

Self-Noise values shown are for a four-square-foot area silencer. For each doubling of the face area add 3dB; for each halving of the face area, subtract 3dB from the values in Table IV.

**QUIET-DUCT ULTRA™/GREEN SILENCERS****TYPE: UGL****ENVIRONMENTALLY SOUND SILENCERS with FORWARD and REVERSE FLOW Ratings**

In response to the current trend for environmentally friendly building products, IAC America introduces Quiet-Duct Ultra™ /Green, a 100% environmentally friendly attenuation solution which uses recycled acoustic fill material. Quiet-Duct Ultra™ /Green delivers performance that meets or exceeds that of a standard Quiet-Duct™ silencer in almost every situation. The tests were measured in strict accordance with ASTM E477-99 in IAC America's NVLAP Accredited Acoustical Laboratory.

DESIGNATING SILENCERS

Model: 5UGL-24-18

Length: 5'

Type: UGL

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3UGL | -3000 | 1 | 5 | 9 | 16 | 21 | 18 | 10 | 7 |
| | -2000 | 1 | 5 | 9 | 15 | 20 | 18 | 10 | 7 |
| | -1000 | 1 | 4 | 8 | 15 | 19 | 18 | 10 | 7 |
| | 1000 | 1 | 4 | 7 | 14 | 18 | 19 | 11 | 8 |
| | 2000 | 1 | 4 | 7 | 13 | 18 | 19 | 11 | 8 |
| | 3000 | 1 | 4 | 7 | 13 | 17 | 19 | 12 | 8 |
| 5UGL | -3000 | 3 | 9 | 15 | 26 | 35 | 31 | 14 | 8 |
| | -2000 | 4 | 8 | 14 | 25 | 33 | 31 | 14 | 9 |
| | -1000 | 3 | 7 | 13 | 24 | 33 | 31 | 14 | 9 |
| | 1000 | 3 | 6 | 12 | 23 | 30 | 31 | 15 | 12 |
| | 2000 | 2 | 6 | 11 | 22 | 29 | 31 | 16 | 11 |
| | 3000 | 3 | 5 | 11 | 21 | 28 | 31 | 17 | 11 |
| 7UGL | -3000 | 3 | 13 | 19 | 35 | 40 | 38 | 17 | 10 |
| | -2000 | 4 | 10 | 18 | 34 | 41 | 39 | 16 | 10 |
| | -1000 | 4 | 9 | 17 | 32 | 40 | 38 | 16 | 10 |
| | 1000 | 3 | 8 | 14 | 30 | 38 | 39 | 18 | 12 |
| | 2000 | 3 | 8 | 14 | 29 | 37 | 39 | 19 | 12 |
| | 3000 | 2 | 7 | 14 | 28 | 35 | 39 | 20 | 12 |
| 10UGL | -3000 | 5 | 18 | 28 | 47 | 44 | 42 | 21 | 11 |
| | -2000 | 7 | 14 | 25 | 45 | 47 | 46 | 21 | 11 |
| | -1000 | 7 | 12 | 23 | 43 | 47 | 46 | 21 | 12 |
| | 1000 | 7 | 10 | 21 | 41 | 48 | 47 | 23 | 16 |
| | 2000 | 6 | 10 | 20 | 40 | 47 | 47 | 25 | 17 |
| | 3000 | 5 | 10 | 19 | 39 | 47 | 47 | 27 | 18 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/In H/In | 6 12 | 12 12 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 |
|----------------|--------------|---------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/Lb. | 24 | 33 | 43 | 52 | 62 | 74 | 83 | 93 |
| 5 feet | | 41 | 56 | 73 | 89 | 107 | 125 | 141 | 158 |
| 7 feet | | 59 | 78 | 102 | 125 | 150 | 176 | 199 | 266 |
| 10 feet | | 81 | 111 | 155 | 177 | 212 | 250 | – | – |

| Nominal Length | W/In H/In | 24 18 | 24 24 | 24 30 | 24 36 | 24 42 | 24 48 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/Lb. | 71 | 86 | 102 | 117 | 132 | 147 | 121 | 143 | 163 | 184 | 205 | 182 | 209 | 235 | 261 |
| 5 feet | | 121 | 147 | 173 | 204 | 230 | 256 | 211 | 245 | 279 | 312 | 346 | 312 | 353 | 395 | 438 |
| 7 feet | | 170 | 207 | 243 | 288 | 325 | 362 | 286 | 351 | 398 | 445 | 492 | – | – | – | – |
| 10 feet | | 241 | 293 | 345 | 405 | – | – | – | – | – | – | – | – | – | – | – |

Table III: Aerodynamic Performance

| Model | L/Ft | Static Pressure Drop, i.w.g. | | | | | |
|-----------------------------|------|------------------------------|-------|-------|------|------|------|
| UGL | 3 | 0.48 | 0.21 | 0.05 | 0.06 | 0.25 | 0.61 |
| | 5 | 0.60 | 0.26 | 0.06 | 0.07 | 0.27 | 0.64 |
| | 7 | 0.75 | 0.30 | 0.07 | 0.08 | 0.30 | 0.72 |
| | 10 | 0.99 | 0.41 | 0.10 | 0.09 | 0.35 | 0.83 |
| Silencer Face Velocity, fpm | | -3000 | -2000 | -1000 | 1000 | 2000 | 3000 |

Silencer Face Area is the cross-sectional area at the air entering face of the module or bank of modules. The Face Velocity is the CFM of airflow divided by the Face Area (in square feet). Pressure Drop for any face velocity can be calculated from the equation: $PD = (Actual\ FV/Catalog\ FV)^2 (Catalog\ PD)$.

**Table IV: Self-Noise Power Levels,
dB re: 10-12 Watts**

| IAC MODEL | Octave Band Hz | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------------------|----|-----|-----|-----|----|----|----|----|
| | | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 3UGL | -3,000 | 50 | 55 | 58 | 61 | 64 | 69 | 66 | 52 |
| | -2,000 | 37 | 49 | 53 | 56 | 61 | 61 | 48 | 34 |
| | -1,000 | 38 | 34 | 38 | 41 | 41 | 31 | 23 | 26 |
| | 1,000 | 33 | 30 | 33 | 36 | 36 | 28 | 23 | 26 |
| | 2,000 | 41 | 45 | 47 | 49 | 52 | 52 | 45 | 32 |
| | 3,000 | 62 | 64 | 58 | 59 | 60 | 61 | 59 | 50 |
| 5UGL | -3,000 | 48 | 53 | 55 | 58 | 62 | 65 | 64 | 52 |
| | -2,000 | 36 | 46 | 51 | 53 | 59 | 60 | 50 | 35 |
| | -1,000 | 34 | 35 | 37 | 40 | 42 | 31 | 23 | 26 |
| | 1,000 | 34 | 30 | 29 | 32 | 33 | 24 | 24 | 25 |
| | 2,000 | 35 | 43 | 43 | 43 | 49 | 50 | 42 | 30 |
| | 3,000 | 48 | 54 | 54 | 54 | 56 | 59 | 57 | 49 |
| 7UGL | -3,000 | 48 | 54 | 56 | 59 | 63 | 69 | 66 | 52 |
| | -2,000 | 42 | 46 | 52 | 53 | 60 | 60 | 48 | 35 |
| | -1,000 | 33 | 31 | 34 | 38 | 41 | 30 | 23 | 26 |
| | 1,000 | 32 | 31 | 30 | 33 | 34 | 23 | 22 | 26 |
| | 2,000 | 36 | 45 | 45 | 45 | 50 | 52 | 43 | 31 |
| | 3,000 | 54 | 56 | 56 | 56 | 57 | 61 | 59 | 50 |
| 10UGL | -3,000 | 51 | 54 | 55 | 57 | 61 | 66 | 64 | 52 |
| | -2,000 | 37 | 47 | 51 | 52 | 58 | 59 | 48 | 37 |
| | -1,000 | 34 | 32 | 35 | 39 | 40 | 29 | 23 | 26 |
| | 1,000 | 32 | 28 | 26 | 31 | 32 | 22 | 23 | 26 |
| | 2,000 | 35 | 44 | 44 | 43 | 49 | 50 | 41 | 30 |
| | 3,000 | 52 | 56 | 56 | 55 | 55 | 60 | 57 | 49 |

Self-Noise values shown are for a four-square-foot area silencer. For each doubling of the face area add 3dB; for each halving of the face area, subtract 3dB from the values in Table IV.

QUIET-DUCT ULTRA™ /ZAPD SILENCERS

1.01 GENERAL

- A. Furnish and install "Quiet-Duct Ultra™ /ZAPD" (rectangular) silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 MATERIALS

- A. Outer casings of rectangular silencers shall be made of 22 gauge type #G-90 lock-former-quality galvanized steel.
- B. Interior partitions for rectangular silencers shall be not less than 26 gauge type #G-90 galvanized lock-former-quality perforated steel.
- C. Filler material shall be inorganic glass fiber of a proper density to obtain the specified acoustic performance and be packed under not less than 5% compression to eliminate voids due to vibration and settling. Material shall be inert, vermin- and moisture-proof.
- D. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:
Flamespread Classification 20
Smoke Development Rating 20

3.01 CONSTRUCTION

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Seams shall be lock formed and mastic filled. Rectangular casing seams shall be in the corners of the silencer shell to provide maximum unit strength and rigidity. Interior partitions shall be fabricated from single-piece, margin-perforated sheets and shall have die-formed entrance and exit shapes so as to provide the maximum aerodynamic efficiency and minimum self-noise characteristics in the sound attenuator. Blunt noses or squared off partitions will not be accepted.
- B. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing. Airtight construction shall be provided by use of a duct sealing compound on the job-site material and labor furnished by the contractor.

4.01 ACOUSTIC PERFORMANCE

- A. All silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated. Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity. Data for rectangular and tubular type silencers shall be presented for tests conducted using silencers no smaller than the following cross-sections:
Rectangular, inch: 24x24, 24x30, or 24x36.

5.01 AERODYNAMIC PERFORMANCE

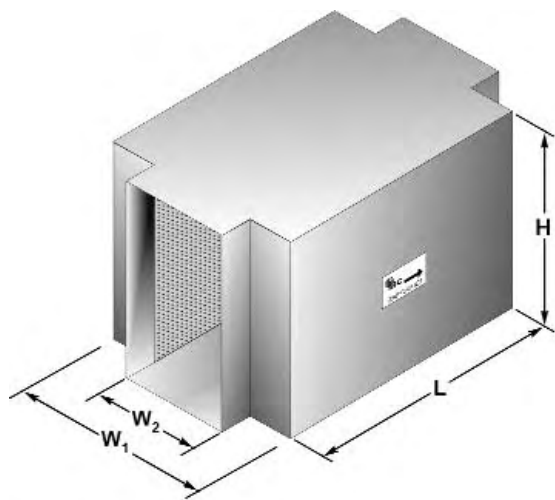
- A. IAC Quiet-Duct Ultra™ /ZAPD silencers do not introduce any additional pressure drop into the system.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

7.01 DUCT TRANSITIONS

- A. When transitions are required to adapt silencer dimensions to connecting duct work they shall be furnished by the installing contractor.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z6A****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

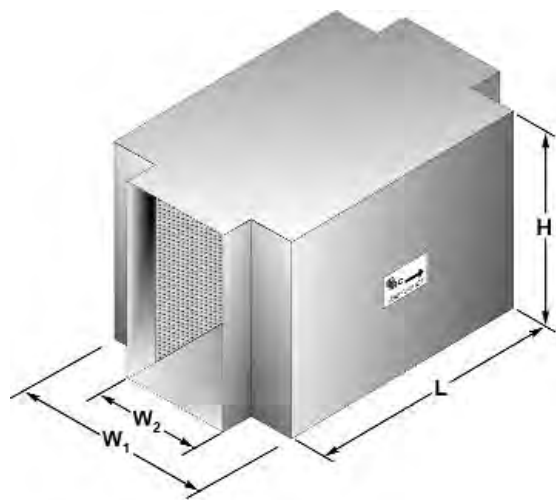
Model: 5 Z6A 6 x 12

Length: 5' Type: Z6A W₂: 6" Height: 12"All Z6A Silencers have W₁ = 12"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 1 | 3 | 7 | 14 | 9 | 10 | 4 | 4 |
| | -1,000 | 1 | 3 | 7 | 14 | 9 | 11 | 5 | 4 |
| | 0 | 1 | 3 | 7 | 14 | 8 | 12 | 6 | 4 |
| | 1,000 | 1 | 3 | 7 | 14 | 7 | 13 | 7 | 4 |
| | 2,000 | 1 | 3 | 6 | 14 | 8 | 13 | 7 | 4 |
| 5 | -2,000 | 1 | 5 | 13 | 26 | 22 | 20 | 10 | 7 |
| | -1,000 | 1 | 5 | 12 | 26 | 23 | 19 | 12 | 8 |
| | 0 | 1 | 5 | 12 | 26 | 23 | 21 | 12 | 7 |
| | 1,000 | 1 | 5 | 12 | 26 | 23 | 22 | 12 | 6 |
| | 2,000 | 2 | 5 | 12 | 26 | 23 | 22 | 12 | 7 |
| 7 | -2,000 | 2 | 7 | 17 | 36 | 29 | 27 | 13 | 10 |
| | -1,000 | 2 | 7 | 17 | 36 | 30 | 28 | 15 | 11 |
| | 0 | 2 | 7 | 17 | 36 | 29 | 29 | 16 | 10 |
| | 1,000 | 2 | 7 | 16 | 36 | 29 | 31 | 17 | 9 |
| | 2,000 | 2 | 7 | 16 | 36 | 30 | 31 | 17 | 9 |
| 10 | -2,000 | 4 | 10 | 24 | 50 | 37 | 37 | 17 | 13 |
| | -1,000 | 4 | 10 | 24 | 50 | 38 | 38 | 20 | 16 |
| | 0 | 4 | 10 | 23 | 49 | 36 | 41 | 22 | 14 |
| | 1,000 | 4 | 10 | 23 | 49 | 35 | 43 | 24 | 12 |
| | 2,000 | 4 | 10 | 22 | 49 | 36 | 43 | 24 | 13 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z6B****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

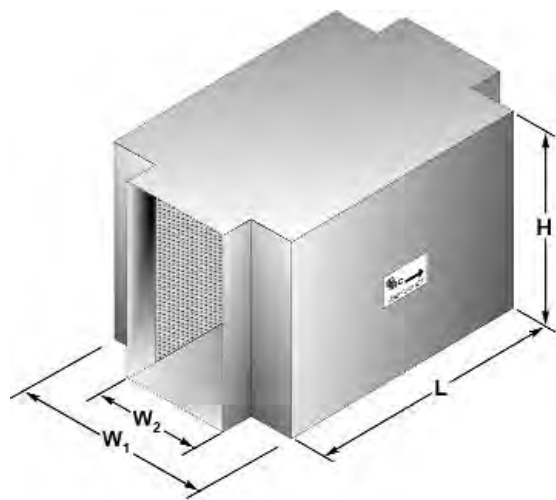
Model: 5 Z6B 6 x 12

Length: 5' Type: Z6B W₂: 6" Height: 12"All Z6B Silencers have W₁ = 15"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 2 | 5 | 9 | 12 | 9 | 11 | 5 | 4 |
| | -1,000 | 2 | 5 | 9 | 13 | 9 | 11 | 5 | 4 |
| | 0 | 2 | 5 | 9 | 13 | 8 | 12 | 6 | 4 |
| | 1,000 | 2 | 5 | 9 | 13 | 7 | 13 | 7 | 3 |
| | 2,000 | 2 | 4 | 9 | 13 | 8 | 13 | 7 | 4 |
| 5 | -2,000 | 4 | 9 | 18 | 25 | 22 | 20 | 11 | 8 |
| | -1,000 | 4 | 9 | 18 | 25 | 23 | 19 | 12 | 9 |
| | 0 | 3 | 8 | 17 | 25 | 23 | 21 | 12 | 8 |
| | 1,000 | 3 | 8 | 17 | 25 | 23 | 22 | 12 | 6 |
| | 2,000 | 3 | 8 | 17 | 25 | 23 | 22 | 12 | 7 |
| 7 | -2,000 | 5 | 13 | 25 | 35 | 29 | 27 | 14 | 10 |
| | -1,000 | 5 | 12 | 25 | 35 | 30 | 28 | 16 | 12 |
| | 0 | 5 | 12 | 24 | 35 | 29 | 29 | 16 | 10 |
| | 1,000 | 5 | 11 | 24 | 35 | 29 | 31 | 17 | 9 |
| | 2,000 | 4 | 11 | 24 | 35 | 29 | 31 | 17 | 9 |
| 10 | -2,000 | 8 | 18 | 33 | 46 | 37 | 38 | 18 | 14 |
| | -1,000 | 7 | 17 | 33 | 46 | 38 | 39 | 21 | 16 |
| | 0 | 7 | 16 | 33 | 47 | 36 | 41 | 22 | 14 |
| | 1,000 | 7 | 16 | 33 | 47 | 35 | 43 | 23 | 12 |
| | 2,000 | 6 | 15 | 33 | 47 | 35 | 43 | 24 | 13 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z6C****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

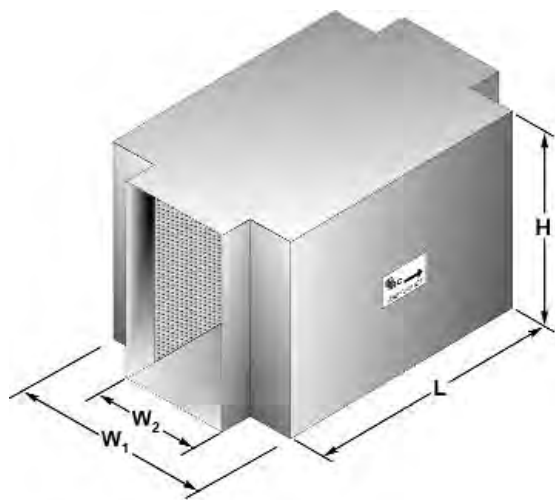
Model: 5 Z6C 6 x 12

Length: 5' Type: Z6C W₂: 6" Height: 12"All Z6C Silencers have W₁ = 20"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 4 | 7 | 10 | 10 | 9 | 11 | 5 | 4 |
| | -1,000 | 4 | 7 | 11 | 10 | 9 | 12 | 5 | 4 |
| | 0 | 3 | 7 | 11 | 11 | 8 | 12 | 6 | 4 |
| | 1,000 | 3 | 7 | 11 | 11 | 7 | 13 | 7 | 3 |
| | 2,000 | 3 | 7 | 11 | 11 | 7 | 13 | 7 | 4 |
| 5 | -2,000 | 6 | 13 | 21 | 23 | 23 | 19 | 11 | 8 |
| | -1,000 | 6 | 13 | 21 | 24 | 23 | 20 | 12 | 9 |
| | 0 | 6 | 12 | 21 | 24 | 23 | 21 | 12 | 8 |
| | 1,000 | 5 | 12 | 21 | 24 | 23 | 22 | 12 | 6 |
| | 2,000 | 5 | 12 | 20 | 24 | 23 | 22 | 12 | 7 |
| 7 | -2,000 | 9 | 19 | 30 | 32 | 29 | 27 | 15 | 11 |
| | -1,000 | 8 | 18 | 30 | 32 | 30 | 28 | 16 | 12 |
| | 0 | 8 | 18 | 30 | 33 | 30 | 30 | 16 | 10 |
| | 1,000 | 8 | 17 | 29 | 33 | 29 | 31 | 17 | 9 |
| | 2,000 | 7 | 16 | 29 | 33 | 29 | 31 | 17 | 9 |
| 10 | -2,000 | 13 | 26 | 38 | 41 | 37 | 38 | 20 | 15 |
| | -1,000 | 12 | 25 | 38 | 41 | 38 | 39 | 21 | 16 |
| | 0 | 11 | 24 | 38 | 41 | 37 | 41 | 22 | 14 |
| | 1,000 | 11 | 24 | 38 | 42 | 35 | 43 | 23 | 12 |
| | 2,000 | 10 | 23 | 38 | 42 | 35 | 44 | 24 | 13 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z6D****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

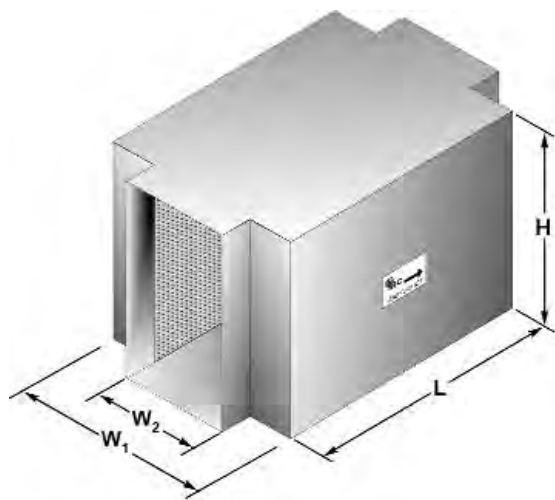
Model: 5 Z6D 6 x 12

Length: 5' Type: Z6D W₂: 6" Height: 12"All Z6D Silencers have W₁ = 24"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 4 | 9 | 11 | 9 | 9 | 11 | 5 | 4 |
| | -1,000 | 4 | 8 | 11 | 9 | 9 | 12 | 6 | 5 |
| | 0 | 4 | 8 | 11 | 10 | 8 | 12 | 6 | 4 |
| | 1,000 | 4 | 8 | 11 | 10 | 7 | 13 | 7 | 3 |
| | 2,000 | 4 | 8 | 11 | 10 | 7 | 13 | 7 | 4 |
| 5 | -2,000 | 8 | 15 | 23 | 24 | 22 | 19 | 12 | 8 |
| | -1,000 | 7 | 15 | 22 | 24 | 23 | 20 | 12 | 9 |
| | 0 | 7 | 14 | 22 | 24 | 23 | 21 | 12 | 7 |
| | 1,000 | 7 | 14 | 22 | 24 | 23 | 22 | 11 | 6 |
| | 2,000 | 6 | 14 | 22 | 24 | 23 | 22 | 12 | 6 |
| 7 | -2,000 | 11 | 21 | 31 | 31 | 30 | 28 | 15 | 11 |
| | -1,000 | 10 | 21 | 31 | 31 | 31 | 28 | 16 | 12 |
| | 0 | 10 | 20 | 30 | 31 | 30 | 30 | 16 | 10 |
| | 1,000 | 9 | 20 | 30 | 31 | 29 | 31 | 17 | 8 |
| | 2,000 | 9 | 19 | 30 | 31 | 29 | 31 | 17 | 9 |
| 10 | -2,000 | 15 | 30 | 40 | 39 | 38 | 38 | 20 | 16 |
| | -1,000 | 14 | 29 | 40 | 40 | 39 | 39 | 21 | 16 |
| | 0 | 14 | 28 | 40 | 40 | 37 | 41 | 22 | 14 |
| | 1,000 | 13 | 27 | 40 | 40 | 35 | 43 | 23 | 12 |
| | 2,000 | 12 | 27 | 40 | 41 | 35 | 43 | 24 | 12 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z6E****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

Model: 5 Z6E 6 x 12

Length: 5' Type: Z6E W₂: 6" Height: 12"All Z6E Silencers have W₁ = 30"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 5 | 10 | 11 | 10 | 9 | 11 | 5 | 4 |
| | -1,000 | 5 | 10 | 11 | 10 | 9 | 12 | 6 | 5 |
| | 0 | 5 | 9 | 11 | 10 | 8 | 12 | 6 | 4 |
| | 1,000 | 5 | 9 | 11 | 10 | 7 | 13 | 7 | 3 |
| | 2,000 | 4 | 9 | 11 | 10 | 7 | 13 | 7 | 3 |
| 5 | -2,000 | 9 | 17 | 23 | 23 | 23 | 19 | 12 | 9 |
| | -1,000 | 9 | 16 | 23 | 23 | 23 | 20 | 12 | 9 |
| | 0 | 8 | 16 | 23 | 23 | 23 | 21 | 12 | 7 |
| | 1,000 | 8 | 16 | 23 | 23 | 23 | 21 | 11 | 6 |
| | 2,000 | 8 | 15 | 23 | 23 | 23 | 22 | 12 | 6 |
| 7 | -2,000 | 12 | 23 | 31 | 32 | 30 | 28 | 16 | 12 |
| | -1,000 | 12 | 23 | 31 | 32 | 31 | 29 | 16 | 12 |
| | 0 | 12 | 22 | 31 | 32 | 30 | 30 | 16 | 10 |
| | 1,000 | 11 | 22 | 31 | 32 | 29 | 31 | 17 | 8 |
| | 2,000 | 11 | 21 | 31 | 32 | 29 | 31 | 17 | 9 |
| 10 | -2,000 | 17 | 33 | 41 | 40 | 38 | 39 | 21 | 16 |
| | -1,000 | 17 | 32 | 41 | 40 | 39 | 40 | 21 | 17 |
| | 0 | 16 | 32 | 41 | 40 | 37 | 41 | 22 | 14 |
| | 1,000 | 16 | 31 | 41 | 40 | 35 | 43 | 23 | 11 |
| | 2,000 | 15 | 30 | 41 | 40 | 35 | 43 | 23 | 12 |



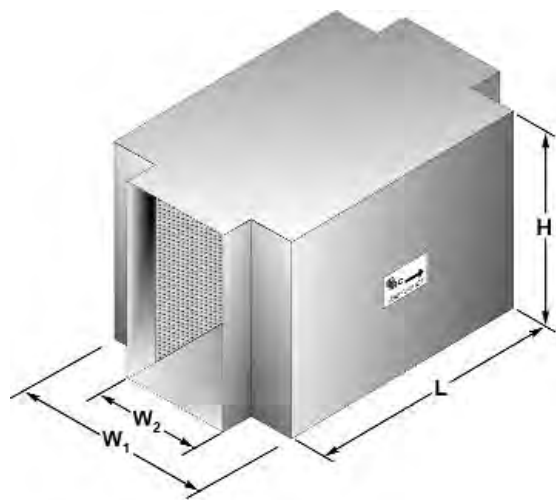
(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.



QUIET-DUCT ULTRA™/ZAPD SILENCERS

TYPE: Z9A

with FORWARD and REVERSE FLOW Ratings



The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

Model: 5 Z9A 6 x 12

Length: 5' Type: Z9A W₂: 9" Height: 12"

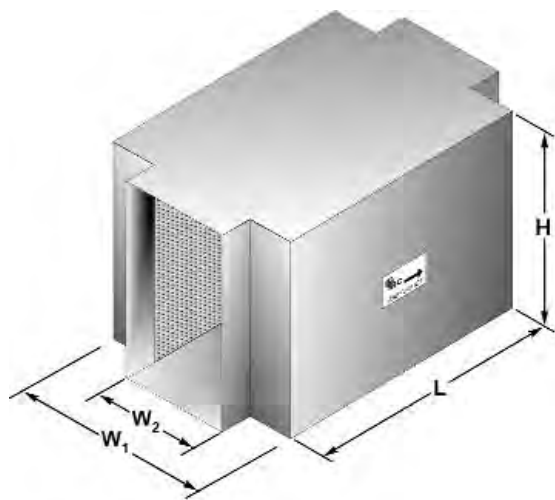
All Z9A Silencers have W₁ = 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 1 | 3 | 9 | 13 | 13 | 6 | 3 | 4 |
| | -1,000 | 1 | 3 | 8 | 13 | 14 | 7 | 4 | 4 |
| | 0 | 1 | 3 | 8 | 13 | 13 | 7 | 4 | 3 |
| | 1,000 | 1 | 3 | 8 | 13 | 13 | 7 | 4 | 2 |
| | 2,000 | 1 | 3 | 8 | 13 | 13 | 7 | 4 | 3 |
| 5 | -2,000 | 2 | 6 | 15 | 25 | 23 | 11 | 6 | 7 |
| | -1,000 | 2 | 6 | 15 | 25 | 23 | 11 | 7 | 7 |
| | 0 | 2 | 6 | 14 | 24 | 24 | 11 | 7 | 6 |
| | 1,000 | 2 | 6 | 14 | 24 | 24 | 11 | 7 | 4 |
| | 2,000 | 2 | 6 | 14 | 24 | 24 | 11 | 7 | 4 |
| 7 | -2,000 | 3 | 9 | 21 | 35 | 33 | 15 | 9 | 10 |
| | -1,000 | 3 | 8 | 21 | 35 | 34 | 16 | 11 | 10 |
| | 0 | 3 | 8 | 20 | 34 | 33 | 16 | 10 | 8 |
| | 1,000 | 3 | 8 | 20 | 34 | 33 | 16 | 10 | 6 |
| | 2,000 | 3 | 8 | 19 | 33 | 33 | 17 | 10 | 6 |
| 10 | -2,000 | 5 | 12 | 29 | 47 | 45 | 21 | 12 | 14 |
| | -1,000 | 5 | 12 | 29 | 46 | 46 | 22 | 14 | 14 |
| | 0 | 5 | 11 | 28 | 46 | 46 | 23 | 14 | 11 |
| | 1,000 | 5 | 11 | 28 | 46 | 46 | 23 | 14 | 8 |
| | 2,000 | 4 | 11 | 27 | 46 | 46 | 23 | 14 | 9 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z9B****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

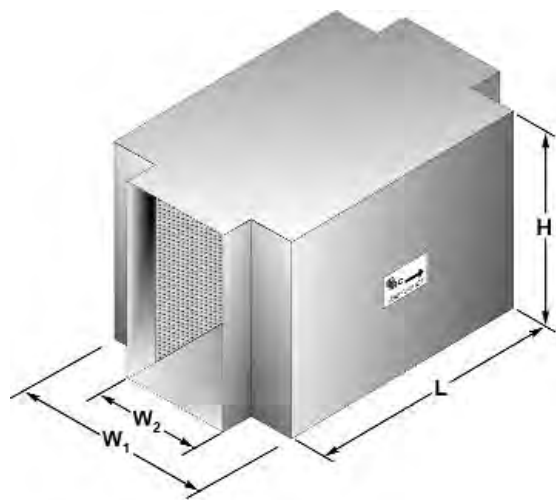
Model: 5 Z9B 6 x 12

Length: 5' Type: Z9B W₂: 9" Height: 12"All Z9B Silencers have W₁ = 20"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 2 | 5 | 9 | 12 | 13 | 6 | 3 | 4 |
| | -1,000 | 2 | 5 | 9 | 12 | 14 | 7 | 4 | 4 |
| | 0 | 2 | 4 | 9 | 12 | 14 | 7 | 4 | 3 |
| | 1,000 | 2 | 4 | 9 | 12 | 13 | 7 | 4 | 2 |
| | 2,000 | 2 | 4 | 9 | 12 | 13 | 7 | 4 | 3 |
| 5 | -2,000 | 3 | 8 | 17 | 24 | 23 | 11 | 6 | 7 |
| | -1,000 | 3 | 8 | 16 | 24 | 23 | 11 | 7 | 7 |
| | 0 | 3 | 8 | 16 | 24 | 23 | 11 | 7 | 6 |
| | 1,000 | 3 | 7 | 16 | 23 | 24 | 11 | 7 | 4 |
| | 2,000 | 3 | 7 | 16 | 23 | 24 | 11 | 7 | 4 |
| 7 | -2,000 | 5 | 12 | 24 | 34 | 33 | 16 | 9 | 10 |
| | -1,000 | 5 | 11 | 23 | 33 | 34 | 16 | 11 | 10 |
| | 0 | 4 | 11 | 23 | 33 | 33 | 16 | 10 | 8 |
| | 1,000 | 4 | 10 | 23 | 33 | 33 | 16 | 10 | 6 |
| | 2,000 | 4 | 10 | 22 | 33 | 33 | 17 | 10 | 6 |
| 10 | -2,000 | 7 | 16 | 32 | 44 | 45 | 22 | 12 | 14 |
| | -1,000 | 7 | 16 | 32 | 44 | 47 | 22 | 14 | 14 |
| | 0 | 7 | 15 | 31 | 44 | 46 | 23 | 14 | 11 |
| | 1,000 | 6 | 15 | 31 | 44 | 46 | 23 | 14 | 8 |
| | 2,000 | 6 | 14 | 31 | 44 | 46 | 23 | 14 | 9 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z9C****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

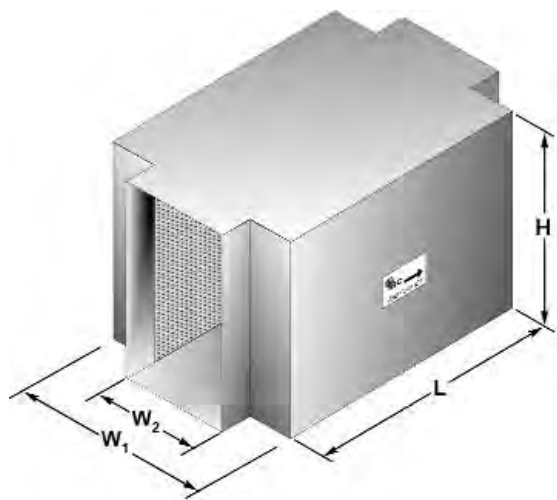
Model: 5 Z6C 6 x 12

Length: 5' Type: Z9C W₂: 9" Height: 12"All Z9C Silencers have W₁ = 22 1/2"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 3 | 6 | 10 | 11 | 13 | 6 | 3 | 4 |
| | -1,000 | 3 | 6 | 10 | 11 | 14 | 7 | 4 | 4 |
| | 0 | 3 | 6 | 10 | 12 | 14 | 7 | 4 | 3 |
| | 1,000 | 2 | 5 | 10 | 12 | 13 | 7 | 4 | 2 |
| | 2,000 | 2 | 5 | 10 | 12 | 13 | 7 | 4 | 3 |
| 5 | -2,000 | 5 | 10 | 18 | 23 | 23 | 11 | 7 | 7 |
| | -1,000 | 4 | 10 | 18 | 23 | 23 | 11 | 7 | 7 |
| | 0 | 4 | 10 | 18 | 23 | 24 | 11 | 7 | 6 |
| | 1,000 | 4 | 9 | 18 | 23 | 24 | 11 | 7 | 4 |
| | 2,000 | 4 | 9 | 18 | 23 | 24 | 11 | 7 | 4 |
| 7 | -2,000 | 7 | 15 | 26 | 32 | 33 | 16 | 9 | 10 |
| | -1,000 | 6 | 14 | 26 | 32 | 34 | 16 | 11 | 10 |
| | 0 | 6 | 14 | 25 | 32 | 34 | 16 | 10 | 8 |
| | 1,000 | 6 | 13 | 25 | 32 | 33 | 16 | 10 | 6 |
| | 2,000 | 5 | 13 | 25 | 32 | 33 | 17 | 10 | 6 |
| 10 | -2,000 | 9 | 20 | 35 | 42 | 45 | 22 | 12 | 14 |
| | -1,000 | 9 | 20 | 34 | 42 | 47 | 22 | 14 | 14 |
| | 0 | 8 | 19 | 34 | 42 | 46 | 23 | 14 | 11 |
| | 1,000 | 8 | 18 | 34 | 42 | 46 | 23 | 14 | 8 |
| | 2,000 | 8 | 18 | 34 | 42 | 46 | 23 | 14 | 9 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z9D****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

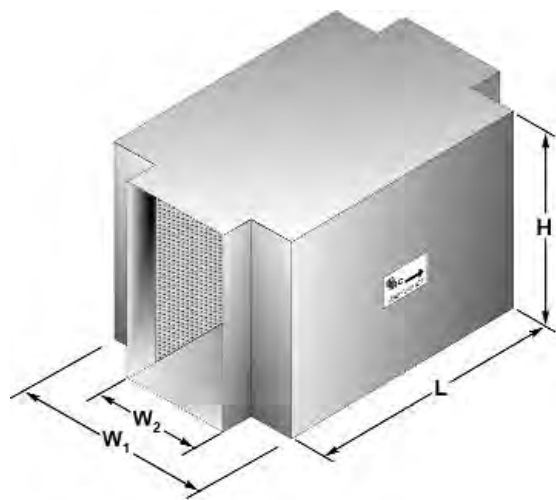
Model: 5 Z9D 6 x 12

Length: 5' Type: Z9D W₂: 9" Height: 12"All Z9D Silencers have W₁ = 30"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 4 | 8 | 10 | 10 | 13 | 7 | 4 | 4 |
| | -1,000 | 4 | 8 | 10 | 10 | 14 | 7 | 4 | 4 |
| | 0 | 4 | 8 | 10 | 10 | 14 | 7 | 4 | 3 |
| | 1,000 | 4 | 7 | 10 | 10 | 13 | 7 | 4 | 2 |
| | 2,000 | 3 | 7 | 10 | 10 | 13 | 7 | 4 | 2 |
| 5 | -2,000 | 7 | 14 | 21 | 22 | 23 | 11 | 7 | 7 |
| | -1,000 | 7 | 14 | 20 | 22 | 23 | 11 | 7 | 7 |
| | 0 | 7 | 13 | 20 | 22 | 24 | 11 | 7 | 6 |
| | 1,000 | 6 | 13 | 20 | 22 | 24 | 11 | 7 | 4 |
| | 2,000 | 6 | 13 | 20 | 22 | 24 | 11 | 7 | 4 |
| 7 | -2,000 | 10 | 19 | 28 | 30 | 33 | 16 | 10 | 10 |
| | -1,000 | 10 | 19 | 28 | 30 | 34 | 16 | 11 | 10 |
| | 0 | 9 | 18 | 28 | 30 | 34 | 16 | 10 | 8 |
| | 1,000 | 9 | 18 | 28 | 30 | 33 | 16 | 10 | 6 |
| | 2,000 | 8 | 17 | 27 | 30 | 33 | 17 | 10 | 6 |
| 10 | -2,000 | 14 | 28 | 37 | 39 | 45 | 22 | 14 | 14 |
| | -1,000 | 13 | 27 | 37 | 39 | 48 | 22 | 14 | 14 |
| | 0 | 13 | 26 | 37 | 39 | 47 | 22 | 14 | 11 |
| | 1,000 | 12 | 25 | 37 | 39 | 46 | 23 | 14 | 8 |
| | 2,000 | 12 | 25 | 37 | 39 | 46 | 23 | 14 | 8 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z9E****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

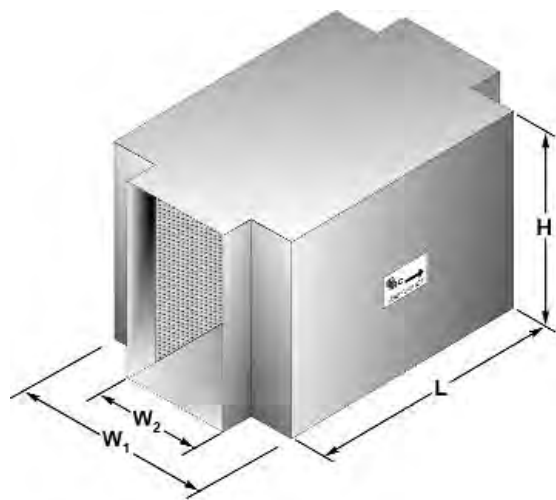
Model: 5 Z9E 6 x 12

Length: 5' Type: Z9E W₂: 9" Height: 12"All Z9E Silencers have W₁ = 36"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 5 | 9 | 10 | 10 | 14 | 7 | 4 | 4 |
| | -1,000 | 5 | 8 | 10 | 10 | 15 | 7 | 4 | 4 |
| | 0 | 4 | 8 | 10 | 10 | 14 | 7 | 4 | 3 |
| | 1,000 | 4 | 8 | 10 | 10 | 13 | 7 | 4 | 2 |
| | 2,000 | 4 | 8 | 10 | 10 | 13 | 7 | 4 | 2 |
| 5 | -2,000 | 8 | 15 | 20 | 21 | 23 | 11 | 7 | 7 |
| | -1,000 | 8 | 15 | 20 | 21 | 24 | 11 | 7 | 7 |
| | 0 | 8 | 15 | 20 | 20 | 24 | 11 | 7 | 6 |
| | 1,000 | 7 | 14 | 20 | 20 | 24 | 11 | 7 | 4 |
| | 2,000 | 7 | 14 | 20 | 20 | 24 | 11 | 7 | 4 |
| 7 | -2,000 | 11 | 21 | 29 | 30 | 34 | 16 | 11 | 10 |
| | -1,000 | 11 | 21 | 29 | 30 | 34 | 16 | 11 | 10 |
| | 0 | 11 | 21 | 29 | 30 | 34 | 16 | 10 | 8 |
| | 1,000 | 10 | 20 | 29 | 30 | 33 | 16 | 10 | 6 |
| | 2,000 | 10 | 20 | 28 | 30 | 33 | 16 | 10 | 6 |
| 10 | -2,000 | 16 | 30 | 37 | 37 | 47 | 22 | 14 | 14 |
| | -1,000 | 16 | 29 | 37 | 37 | 48 | 22 | 14 | 14 |
| | 0 | 15 | 29 | 36 | 37 | 47 | 22 | 14 | 11 |
| | 1,000 | 15 | 28 | 36 | 37 | 46 | 22 | 14 | 8 |
| | 2,000 | 14 | 27 | 36 | 37 | 46 | 23 | 14 | 8 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z12A****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

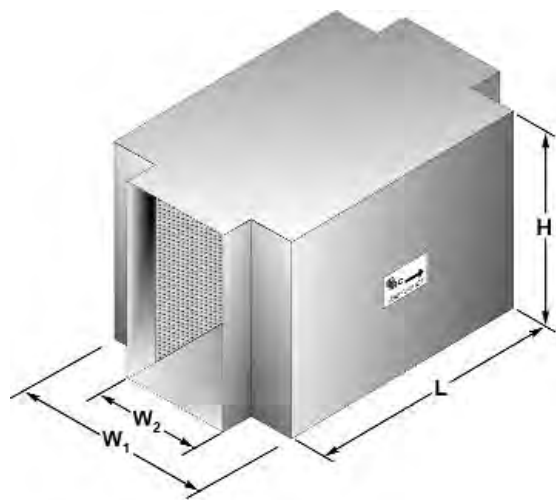
Model: 5 Z12A 6 x 12

Length: 5' Type: Z12A W₂: 12" Height: 12"All Z12A Silencers have W₁ = 24"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 2 | 4 | 9 | 13 | 11 | 5 | 3 | 4 |
| | -1,000 | 2 | 4 | 9 | 13 | 11 | 5 | 3 | 4 |
| | 0 | 2 | 4 | 9 | 13 | 10 | 4 | 3 | 3 |
| | 1,000 | 2 | 4 | 9 | 12 | 9 | 4 | 3 | 2 |
| | 2,000 | 1 | 4 | 9 | 12 | 9 | 4 | 3 | 3 |
| 5 | -2,000 | 3 | 7 | 16 | 22 | 17 | 9 | 5 | 7 |
| | -1,000 | 3 | 7 | 16 | 22 | 18 | 9 | 6 | 7 |
| | 0 | 2 | 7 | 15 | 22 | 18 | 8 | 6 | 6 |
| | 1,000 | 2 | 7 | 15 | 22 | 19 | 8 | 5 | 5 |
| | 2,000 | 2 | 6 | 15 | 21 | 19 | 8 | 5 | 6 |
| 7 | -2,000 | 4 | 10 | 22 | 32 | 25 | 13 | 7 | 10 |
| | -1,000 | 4 | 10 | 22 | 32 | 26 | 12 | 8 | 10 |
| | 0 | 4 | 10 | 21 | 31 | 25 | 12 | 8 | 8 |
| | 1,000 | 3 | 9 | 21 | 31 | 25 | 11 | 7 | 7 |
| | 2,000 | 3 | 9 | 21 | 30 | 25 | 11 | 7 | 7 |
| 10 | -2,000 | 5 | 14 | 31 | 44 | 36 | 17 | 10 | 13 |
| | -1,000 | 5 | 14 | 31 | 43 | 36 | 17 | 12 | 13 |
| | 0 | 5 | 14 | 30 | 43 | 35 | 16 | 11 | 11 |
| | 1,000 | 5 | 13 | 30 | 42 | 34 | 14 | 10 | 10 |
| | 2,000 | 5 | 13 | 29 | 42 | 35 | 15 | 10 | 10 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z12B****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

Model: 5 Z12B 6 x 12

Length: 5' Type: Z12B W₂: 12" Height: 12"

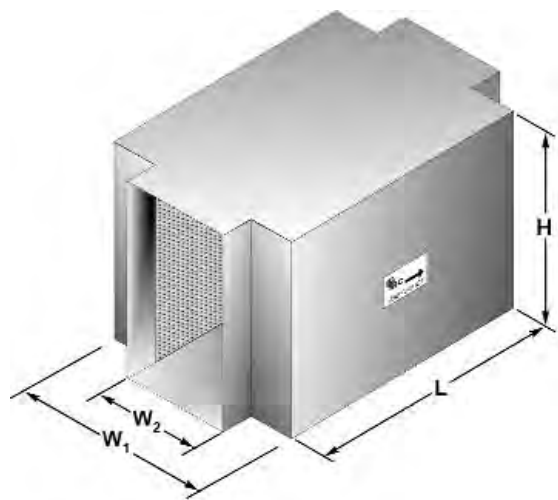
All Z12B Silencers have W₁ = 30"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 3 | 6 | 10 | 11 | 11 | 5 | 3 | 4 |
| | -1,000 | 3 | 6 | 9 | 11 | 11 | 5 | 3 | 4 |
| | 0 | 3 | 6 | 9 | 11 | 10 | 4 | 3 | 3 |
| | 1,000 | 3 | 6 | 9 | 11 | 9 | 4 | 3 | 2 |
| | 2,000 | 2 | 6 | 9 | 11 | 9 | 4 | 3 | 3 |
| 5 | -2,000 | 5 | 11 | 18 | 20 | 17 | 9 | 5 | 7 |
| | -1,000 | 5 | 11 | 18 | 20 | 18 | 9 | 6 | 7 |
| | 0 | 5 | 10 | 18 | 20 | 18 | 8 | 6 | 6 |
| | 1,000 | 4 | 10 | 17 | 20 | 19 | 8 | 5 | 5 |
| | 2,000 | 4 | 10 | 17 | 20 | 19 | 8 | 5 | 6 |
| 7 | -2,000 | 7 | 15 | 25 | 28 | 25 | 13 | 7 | 10 |
| | -1,000 | 7 | 15 | 25 | 28 | 26 | 12 | 8 | 10 |
| | 0 | 7 | 14 | 24 | 28 | 25 | 12 | 8 | 8 |
| | 1,000 | 6 | 14 | 24 | 28 | 25 | 11 | 7 | 7 |
| | 2,000 | 6 | 14 | 24 | 28 | 25 | 11 | 7 | 7 |
| 10 | -2,000 | 10 | 22 | 34 | 38 | 35 | 17 | 10 | 13 |
| | -1,000 | 10 | 21 | 34 | 38 | 36 | 17 | 12 | 13 |
| | 0 | 9 | 20 | 33 | 38 | 35 | 16 | 11 | 11 |
| | 1,000 | 9 | 20 | 33 | 38 | 33 | 14 | 10 | 9 |
| | 2,000 | 8 | 19 | 33 | 38 | 34 | 15 | 10 | 10 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z12C****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

Model: 5 Z12C 6 x 12

Length: 5' Type: Z12C W₂: 12" Height: 12"

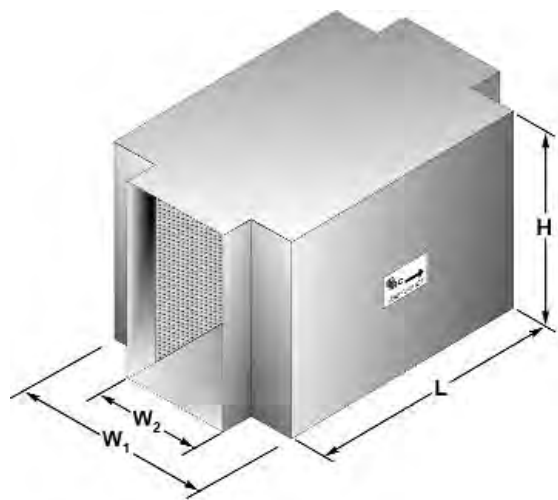
All Z12C Silencers have W₁ = 40"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 4 | 8 | 10 | 10 | 10 | 5 | 3 | 4 |
| | -1,000 | 4 | 8 | 9 | 10 | 11 | 5 | 4 | 3 |
| | 0 | 4 | 7 | 9 | 10 | 10 | 4 | 3 | 3 |
| | 1,000 | 4 | 7 | 9 | 9 | 9 | 4 | 3 | 2 |
| | 2,000 | 4 | 7 | 9 | 9 | 9 | 4 | 3 | 3 |
| 5 | -2,000 | 7 | 14 | 18 | 18 | 18 | 9 | 6 | 7 |
| | -1,000 | 7 | 14 | 18 | 18 | 18 | 9 | 6 | 7 |
| | 0 | 7 | 13 | 18 | 18 | 18 | 8 | 6 | 6 |
| | 1,000 | 7 | 13 | 18 | 18 | 19 | 8 | 5 | 5 |
| | 2,000 | 6 | 13 | 18 | 18 | 19 | 8 | 5 | 6 |
| 7 | -2,000 | 10 | 20 | 27 | 27 | 25 | 13 | 8 | 10 |
| | -1,000 | 10 | 19 | 26 | 27 | 26 | 12 | 9 | 10 |
| | 0 | 10 | 19 | 26 | 27 | 25 | 11 | 8 | 8 |
| | 1,000 | 9 | 18 | 26 | 27 | 24 | 11 | 7 | 7 |
| | 2,000 | 9 | 18 | 26 | 26 | 25 | 11 | 7 | 7 |
| 10 | -2,000 | 15 | 27 | 34 | 35 | 35 | 17 | 12 | 13 |
| | -1,000 | 14 | 26 | 34 | 34 | 36 | 16 | 12 | 13 |
| | 0 | 14 | 26 | 34 | 34 | 34 | 15 | 11 | 11 |
| | 1,000 | 13 | 25 | 34 | 34 | 33 | 14 | 10 | 9 |
| | 2,000 | 13 | 25 | 33 | 34 | 34 | 14 | 10 | 10 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-DUCT ULTRA™/ZAPD SILENCERS****TYPE: Z12D****with FORWARD and REVERSE FLOW Ratings**

The IAC Quiet-Duct Ultra™/ZAPD line of silencers, introduced in 2006, was designed for applications in which acoustic attenuation is required and no allowance can be made for pressure loss. A Zero-Added-Pressure-Drop silencer (ZAPD) is ideal for high velocity systems, or systems that have little or no room for additional pressure drop.

The IAC Quiet-Duct Ultra™/ZAPD silencers do not create any additional pressure drop in the system.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels.

DESIGNATING A SILENCER

Model: 5 Z12D 6 x 12

Length: 5' Type: Z12D W₂: 12" Height: 12"All Z12D Silencers have W₁ = 48"**Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow**

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3 | -2,000 | 5 | 8 | 10 | 10 | 11 | 5 | 3 | 4 |
| | -1,000 | 5 | 8 | 10 | 10 | 10 | 5 | 4 | 3 |
| | 0 | 5 | 8 | 10 | 10 | 9 | 4 | 3 | 3 |
| | 1,000 | 4 | 8 | 10 | 10 | 9 | 4 | 3 | 2 |
| | 2,000 | 4 | 8 | 10 | 10 | 9 | 4 | 3 | 2 |
| 5 | -2,000 | 8 | 15 | 18 | 18 | 18 | 9 | 6 | 7 |
| | -1,000 | 8 | 15 | 18 | 17 | 18 | 9 | 6 | 7 |
| | 0 | 8 | 14 | 18 | 17 | 18 | 8 | 6 | 6 |
| | 1,000 | 8 | 14 | 18 | 17 | 19 | 8 | 5 | 5 |
| | 2,000 | 7 | 14 | 17 | 17 | 19 | 8 | 5 | 5 |
| 7 | -2,000 | 11 | 21 | 26 | 25 | 26 | 12 | 8 | 10 |
| | -1,000 | 11 | 21 | 26 | 25 | 26 | 12 | 9 | 10 |
| | 0 | 11 | 21 | 25 | 25 | 25 | 11 | 8 | 8 |
| | 1,000 | 11 | 20 | 25 | 25 | 24 | 11 | 7 | 7 |
| | 2,000 | 10 | 20 | 25 | 25 | 25 | 11 | 7 | 7 |
| 10 | -2,000 | 16 | 29 | 35 | 34 | 36 | 17 | 12 | 13 |
| | -1,000 | 16 | 29 | 35 | 34 | 35 | 16 | 12 | 13 |
| | 0 | 15 | 28 | 34 | 34 | 34 | 15 | 11 | 11 |
| | 1,000 | 15 | 28 | 34 | 33 | 33 | 14 | 10 | 9 |
| | 2,000 | 15 | 27 | 34 | 33 | 34 | 14 | 10 | 10 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

QUIET-DUCT COMMERCIAL™ SERIES SILENCERS

1.01 GENERAL

- A. Furnish and install "Quiet-Duct" (rectangular) silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 MATERIALS

- A. Outer casings of rectangular silencers shall be made of 22 gauge type #G-90 lock-former-quality galvanized steel.
- B. Interior partitions for rectangular silencers shall be not less than 26 gauge type #G-90 galvanized lock-former-quality perforated steel.
- C. Filler material shall be inorganic glass fiber of a proper density to obtain the specified acoustic performance and be packed under not less than 5% compression to eliminate voids due to vibration and settling. Material shall be inert, vermin- and moisture-proof.
- D. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:

Flamespread Classification 20

Smoke Development Rating 20

3.01 CONSTRUCTION

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Seams shall be lock formed and mastic filled. Rectangular casing seams shall be in the corners of the silencer shell to provide maximum unit strength and rigidity. Interior partitions shall be fabricated from single-piece, margin-perforated sheets and shall have die-formed entrance and exit shapes so as to provide the maximum aerodynamic efficiency and minimum self-noise characteristics in the sound attenuator. Blunt noses or squared off partitions will not be accepted.
- B. Attachment of the interior partitions to the casing shall be by means of an interlocking track assembly. Tracks shall be solid galvanized steel and shall be welded to the outer casing. Attachment of the interior partitions to the tracks shall be such that a minimum of 4 thicknesses of metal exist at this location. The track assembly shall stiffen the exterior casing, provide a reinforced attachment detail for the interior partitions, and shall maintain a uniform airspace width along the length of the silencer for consistent aerodynamic and acoustic performance. Interior partitions shall be additionally secured to the outer casing with welded nose clips at both ends of the sound attenuator.

- C. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing. Airtight construction shall be provided by use of a duct sealing compound on the job-site material and labor furnished by the contractor.

4.01 ACOUSTIC PERFORMANCE

- A. All silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated.

Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity. Data for rectangular and tubular type silencers shall be presented for tests conducted using silencers no smaller than the following cross-sections:

Rectangular, inch: 24x24, 24x30, or 24x36,
and

Tubular, inch: 12, 24, 36, and 48

5.01 AERODYNAMIC PERFORMANCE

- A. Static pressure loss of silencers shall not exceed those listed in the silencer schedule as the airflow indicates. Airflow measurements shall be made in accordance with ASTM specification E477-99 and applicable portions of ASME, AMCA, and ADC airflow test codes. Tests shall be reported on the identical units for which acoustic data is presented.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

7.01 DUCT TRANSITIONS

- A. When transitions are required to adapt silencer dimensions to connecting duct work they shall be furnished by the installing contractor.



QUIET-DUCT SILENCERS

TYPE: LFS**with FORWARD and REVERSE FLOW Ratings**

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 LFS 24 x 18

Length: 5'

Type: LFS

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3LFS | -2000 | 8 | 14 | 25 | 29 | 27 | 20 | 16 | 12 |
| | -1000 | 7 | 13 | 23 | 28 | 26 | 20 | 16 | 14 |
| | 0 | 8 | 13 | 23 | 28 | 27 | 21 | 17 | 14 |
| | 1000 | 9 | 12 | 22 | 28 | 27 | 21 | 18 | 14 |
| | 2000 | 7 | 11 | 21 | 25 | 25 | 21 | 17 | 14 |
| 5LFS | -2000 | 13 | 23 | 36 | 42 | 42 | 28 | 19 | 14 |
| | -1000 | 13 | 21 | 35 | 41 | 41 | 28 | 21 | 15 |
| | 0 | 13 | 20 | 33 | 39 | 41 | 28 | 22 | 16 |
| | 1000 | 12 | 19 | 31 | 36 | 40 | 27 | 22 | 16 |
| | 2000 | 10 | 17 | 28 | 33 | 37 | 29 | 20 | 16 |
| 7LFS | -2000 | 14 | 25 | 40 | 50 | 51 | 35 | 22 | 16 |
| | -1000 | 14 | 24 | 42 | 49 | 49 | 35 | 24 | 17 |
| | 0 | 13 | 24 | 40 | 47 | 47 | 34 | 25 | 17 |
| | 1000 | 12 | 23 | 37 | 44 | 45 | 33 | 25 | 17 |
| | 2000 | 10 | 22 | 37 | 44 | 45 | 34 | 24 | 17 |
| 10LFS | -2000 | 19 | 30 | 46 | 52 | 53 | 43 | 25 | 17 |
| | -1000 | 18 | 32 | 50 | 52 | 53 | 45 | 29 | 19 |
| | 0 | 18 | 30 | 49 | 52 | 53 | 46 | 32 | 21 |
| | 1000 | 17 | 28 | 47 | 52 | 53 | 47 | 35 | 23 |
| | 2000 | 16 | 25 | 46 | 53 | 53 | 48 | 36 | 24 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | - | - | 117 | 140 | 167 | 190 | - | - | 178 | 209 | 250 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | - | - | - | - | - | - | - | - |
| 10 feet | | 280 | - | - | 295 | 349 | 417 | 470 | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LFS | 3 | 0.04 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.36 | 0.41 | 0.46 | 0.51 | 0.57 |
| | 5 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.26 | 0.31 | 0.35 | 0.40 | 0.45 | 0.51 | 0.56 | 0.62 |
| | 7 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.20 | 0.23 | 0.28 | 0.32 | 0.37 | 0.42 | 0.47 | 0.53 | 0.59 | 0.65 |
| | 10 | 0.04 | 0.06 | 0.09 | 0.11 | 0.14 | 0.18 | 0.21 | 0.26 | 0.30 | 0.35 | 0.40 | 0.45 | 0.51 | 0.57 | 0.64 | 0.71 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Silencer Face Velocity, fpm | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| LFS All Sizes | -2,000 | 58 | 54 | 58 | 61 | 62 | 62 | 65 | 63 |
| | -1,500 | 51 | 49 | 53 | 56 | 56 | 59 | 60 | 53 |
| | -1,000 | 45 | 42 | 45 | 43 | 45 | 49 | 44 | 37 |
| | 1,000 | 46 | 42 | 45 | 43 | 45 | 49 | 44 | 37 |
| | 1,500 | 56 | 54 | 57 | 56 | 52 | 56 | 57 | 51 |
| | 2,000 | 68 | 64 | 65 | 66 | 61 | 61 | 64 | 61 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT SILENCERS

TYPE: LFM

with **FORWARD** and **REVERSE FLOW** Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 LFM 24 x 18

Length: 5'

Type: LFM

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3LFM | -2000 | 6 | 9 | 17 | 22 | 19 | 14 | 12 | 10 |
| | -1000 | 6 | 8 | 16 | 21 | 18 | 13 | 12 | 11 |
| | 0 | 5 | 8 | 16 | 21 | 18 | 13 | 12 | 11 |
| | 1000 | 4 | 7 | 15 | 20 | 17 | 13 | 11 | 10 |
| | 2000 | 4 | 7 | 14 | 19 | 17 | 12 | 11 | 10 |
| 5LFM | -2000 | 9 | 16 | 26 | 32 | 29 | 17 | 13 | 13 |
| | -1000 | 9 | 15 | 26 | 31 | 30 | 17 | 15 | 13 |
| | 0 | 9 | 14 | 25 | 30 | 29 | 17 | 15 | 13 |
| | 1000 | 8 | 13 | 23 | 29 | 28 | 17 | 14 | 13 |
| | 2000 | 7 | 12 | 22 | 28 | 28 | 17 | 14 | 12 |
| 7LFM | -2000 | 12 | 18 | 32 | 44 | 39 | 21 | 16 | 14 |
| | -1000 | 12 | 18 | 32 | 43 | 39 | 21 | 18 | 15 |
| | 0 | 12 | 17 | 31 | 42 | 39 | 22 | 18 | 15 |
| | 1000 | 12 | 16 | 30 | 41 | 38 | 22 | 17 | 14 |
| | 2000 | 11 | 15 | 28 | 39 | 38 | 23 | 17 | 15 |
| 10LFM | -2000 | 16 | 24 | 41 | 51 | 51 | 26 | 20 | 16 |
| | -1000 | 16 | 24 | 42 | 51 | 50 | 27 | 22 | 17 |
| | 0 | 16 | 23 | 41 | 51 | 50 | 28 | 22 | 17 |
| | 1000 | 15 | 22 | 39 | 50 | 50 | 28 | 21 | 16 |
| | 2000 | 14 | 20 | 38 | 50 | 50 | 28 | 22 | 17 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | - | - | 117 | 140 | 167 | 190 | - | - | 178 | 209 | 250 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | - | - | - | - | - | - | - | - |
| 10 feet | | 280 | - | - | 295 | 349 | 417 | 470 | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LFM | 3 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.32 | 0.37 | 0.42 | 0.48 | 0.55 | 0.61 | 0.68 | 0.76 |
| | 5 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 | 0.20 | 0.24 | 0.29 | 0.34 | 0.39 | 0.45 | 0.51 | 0.57 | 0.64 | 0.72 | 0.79 |
| | 7 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.53 | 0.60 | 0.67 | 0.75 | 0.83 |
| | 10 | 0.06 | 0.08 | 0.12 | 0.15 | 0.19 | 0.24 | 0.29 | 0.34 | 0.40 | 0.46 | 0.53 | 0.60 | 0.68 | 0.76 | 0.85 | 0.94 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
|-----------------------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| LFM All Sizes | -3,000 | 64 | 62 | 64 | 66 | 65 | 64 | 66 | 62 |
| | -2,000 | 53 | 50 | 54 | 56 | 56 | 59 | 58 | 51 |
| | -1,000 | 42 | 40 | 43 | 45 | 47 | 46 | 37 | 27 |
| | 1,000 | 47 | 34 | 36 | 35 | 40 | 37 | 27 | 20 |
| | 2,000 | 54 | 52 | 58 | 56 | 51 | 56 | 55 | 50 |
| | 3,000 | 68 | 64 | 64 | 63 | 61 | 63 | 66 | 63 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT SILENCERS

TYPE: S

with **FORWARD** and **REVERSE FLOW** Ratings



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DESIGNATING A SILENCER

Model: 5 S 24 x 18

Length: 5'

Type: S

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3S | -2000 | 6 | 12 | 20 | 33 | 39 | 35 | 23 | 14 |
| | -1000 | 5 | 11 | 17 | 33 | 38 | 35 | 25 | 14 |
| | 0 | 5 | 10 | 16 | 32 | 38 | 35 | 26 | 16 |
| | 1000 | 5 | 9 | 15 | 30 | 37 | 35 | 27 | 17 |
| | 2000 | 5 | 8 | 14 | 27 | 36 | 35 | 27 | 17 |
| 5S | -2000 | 10 | 20 | 27 | 45 | 48 | 43 | 36 | 22 |
| | -1000 | 10 | 19 | 26 | 44 | 47 | 45 | 38 | 22 |
| | 0 | 9 | 17 | 25 | 43 | 47 | 46 | 39 | 24 |
| | 1000 | 7 | 17 | 23 | 42 | 46 | 46 | 40 | 25 |
| | 2000 | 6 | 16 | 22 | 40 | 46 | 46 | 40 | 25 |
| 7S | -2000 | 12 | 23 | 37 | 48 | 50 | 45 | 41 | 27 |
| | -1000 | 12 | 22 | 35 | 47 | 49 | 47 | 44 | 28 |
| | 0 | 11 | 20 | 33 | 47 | 49 | 47 | 45 | 31 |
| | 1000 | 9 | 18 | 31 | 47 | 49 | 47 | 45 | 34 |
| | 2000 | 8 | 16 | 31 | 46 | 49 | 48 | 45 | 35 |
| 10S | -2000 | 14 | 26 | 43 | 50 | 51 | 50 | 45 | 37 |
| | -1000 | 14 | 28 | 42 | 49 | 51 | 50 | 49 | 37 |
| | 0 | 13 | 25 | 42 | 49 | 52 | 50 | 49 | 41 |
| | 1000 | 12 | 22 | 41 | 49 | 52 | 50 | 49 | 44 |
| | 2000 | 11 | 19 | 40 | 50 | 52 | 50 | 49 | 46 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|-------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 25 | 35 | 42 | 49 | 60 | 70 | 43 | 52 | 62 | 74 | 83 | 93 | 71 | 86 | 102 |
| 5 feet | | 44 | 63 | 75 | 87 | 105 | 126 | 73 | 89 | 107 | 125 | 141 | 158 | 121 | 147 | 173 |
| 7 feet | | 61 | 88 | 102 | 122 | 147 | 176 | 102 | 125 | 150 | 176 | 199 | 226 | 170 | 207 | 243 |
| 10 feet | | 86 | 123 | 150 | 171 | 206 | 246 | 155 | 177 | 212 | 250 | - | - | 241 | 293 | 345 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 117 | 132 | 147 | 81 | 102 | 142 | 162 | 182 | 204 | 142 | 172 | 204 | 234 | 264 | 294 |
| 5 feet | | 204 | 230 | 256 | 142 | 177.5 | 249 | 284 | 319 | 355 | 242 | 294 | 346 | 408 | 460 | 512 |
| 7 feet | | 288 | 325 | 362 | - | - | - | - | - | - | 340 | 414 | 486 | 576 | 650 | 724 |
| 10 feet | | 405 | - | - | - | - | - | - | - | - | 482 | 586 | 690 | 810 | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|----------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| S | 3 | 0.01 | 0.03 | 0.06 | 0.09 | 0.13 | 0.18 | 0.23 | 0.29 | 0.36 | 0.44 | 0.52 | 0.61 | 0.71 | 0.82 | 0.93 | 1.05 |
| | 5 | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.33 | 0.41 | 0.49 | 0.59 | 0.69 | 0.80 | 0.91 | 1.04 | 1.17 |
| | 7 | 0.02 | 0.04 | 0.07 | 0.11 | 0.16 | 0.21 | 0.28 | 0.35 | 0.44 | 0.53 | 0.63 | 0.74 | 0.85 | 0.98 | 1.11 | 1.26 |
| | 10 | 0.02 | 0.04 | 0.08 | 0.12 | 0.18 | 0.24 | 0.32 | 0.40 | 0.49 | 0.60 | 0.71 | 0.83 | 0.97 | 1.11 | 1.26 | 1.43 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| S All Sizes | -2,000 | 68 | 62 | 61 | 66 | 61 | 64 | 67 | 66 |
| | -1,000 | 54 | 51 | 50 | 51 | 54 | 56 | 52 | 40 |
| | -500 | 40 | 40 | 39 | 36 | 47 | 48 | 37 | 20 |
| | 500 | 36 | 29 | 35 | 30 | 31 | 35 | 22 | 20 |
| | 1,000 | 55 | 49 | 49 | 47 | 46 | 49 | 42 | 32 |
| | 2,000 | 74 | 69 | 63 | 64 | 61 | 63 | 62 | 56 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT SILENCERS

TYPE: ES

with **FORWARD** and **REVERSE FLOW** Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 ES 24 x 18

Length: 5'

Type: ES

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|-----------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3ES | -2000 | 5 | 8 | 18 | 31 | 38 | 36 | 22 | 16 |
| | -1000 | 3 | 8 | 17 | 31 | 38 | 36 | 22 | 17 |
| | 0 | 3 | 6 | 16 | 29 | 38 | 35 | 22 | 18 |
| | 1000 | 2 | 5 | 14 | 27 | 36 | 34 | 23 | 17 |
| | 2000 | 2 | 5 | 12 | 25 | 34 | 34 | 23 | 18 |
| 5ES | -2000 | 10 | 16 | 25 | 41 | 52 | 48 | 26 | 17 |
| | -1000 | 10 | 15 | 24 | 40 | 50 | 50 | 31 | 20 |
| | 0 | 9 | 12 | 22 | 38 | 51 | 50 | 33 | 22 |
| | 1000 | 7 | 12 | 19 | 37 | 51 | 49 | 35 | 23 |
| | 2000 | 6 | 12 | 19 | 35 | 49 | 49 | 35 | 24 |
| 7ES | -2000 | 11 | 20 | 39 | 53 | 51 | 53 | 37 | 21 |
| | -1000 | 11 | 21 | 36 | 51 | 53 | 53 | 43 | 25 |
| | 0 | 10 | 19 | 33 | 50 | 53 | 53 | 46 | 29 |
| | 1000 | 7 | 16 | 31 | 50 | 53 | 52 | 46 | 32 |
| | 2000 | 6 | 15 | 29 | 48 | 54 | 50 | 48 | 34 |
| 10ES | -2000 | 15 | 31 | 40 | 53 | 54 | 53 | 43 | 24 |
| | -1000 | 13 | 33 | 44 | 51 | 51 | 53 | 48 | 26 |
| | 0 | 11 | 28 | 43 | 52 | 52 | 53 | 49 | 32 |
| | 1000 | 9 | 25 | 41 | 52 | 51 | 54 | 49 | 37 |
| | 2000 | 7 | 24 | 38 | 53 | 51 | 54 | 50 | 39 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|-------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 25 | 35 | 42 | 49 | 60 | 70 | 43 | 52 | 62 | 74 | 83 | 93 | 71 | 86 | 102 |
| 5 feet | | 44 | 63 | 75 | 87 | 105 | 126 | 73 | 89 | 107 | 125 | 141 | 158 | 121 | 147 | 173 |
| 7 feet | | 61 | 88 | 102 | 122 | 147 | 176 | 102 | 125 | 150 | 176 | 199 | 226 | 170 | 207 | 243 |
| 10 feet | | 86 | 123 | 150 | 171 | 206 | 246 | 155 | 177 | 212 | 250 | - | - | 241 | 293 | 345 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 117 | 132 | 147 | 81 | 102 | 142 | 162 | 182 | 204 | 142 | 172 | 204 | 234 | 264 | 294 |
| 5 feet | | 204 | 230 | 256 | 142 | 177.5 | 249 | 284 | 319 | 355 | 242 | 294 | 346 | 408 | 460 | 512 |
| 7 feet | | 288 | 325 | 362 | - | - | - | - | - | - | 340 | 414 | 486 | 576 | 650 | 724 |
| 10 feet | | 405 | - | - | - | - | - | - | - | - | 482 | 586 | 690 | 810 | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| ES | 3 | 0.01 | 0.02 | 0.04 | 0.06 | 0.08 | 0.11 | 0.14 | 0.18 | 0.22 | 0.27 | 0.32 | 0.37 | 0.43 | 0.50 | 0.57 | 0.64 |
| | 5 | 0.01 | 0.02 | 0.04 | 0.06 | 0.09 | 0.12 | 0.15 | 0.19 | 0.24 | 0.29 | 0.34 | 0.40 | 0.46 | 0.53 | 0.60 | 0.68 |
| | 7 | 0.01 | 0.03 | 0.05 | 0.08 | 0.12 | 0.17 | 0.22 | 0.28 | 0.34 | 0.41 | 0.49 | 0.57 | 0.67 | 0.76 | 0.87 | 0.98 |
| | 10 | 0.02 | 0.04 | 0.07 | 0.11 | 0.16 | 0.22 | 0.28 | 0.36 | 0.44 | 0.54 | 0.64 | 0.75 | 0.87 | 1.00 | 1.13 | 1.28 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| ES All Sizes | -2,000 | 56 | 54 | 58 | 60 | 61 | 65 | 69 | 64 |
| | -1,500 | 47 | 47 | 52 | 55 | 57 | 63 | 64 | 54 |
| | -1,000 | 41 | 41 | 45 | 47 | 52 | 60 | 48 | 38 |
| | 1,000 | 42 | 35 | 33 | 32 | 34 | 33 | 27 | 22 |
| | 1,500 | 50 | 47 | 44 | 41 | 43 | 45 | 43 | 41 |
| | 2,000 | 60 | 57 | 54 | 50 | 49 | 53 | 53 | 50 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT SILENCERS

TYPE: MS

with **FORWARD** and **REVERSE FLOW** Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 MS 30 x 18

Length: 5'

Type: MS

Width: 30"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3MS | -4000 | 5 | 7 | 14 | 24 | 27 | 20 | 12 | 9 |
| | -2000 | 6 | 7 | 13 | 24 | 26 | 19 | 13 | 9 |
| | 0 | 5 | 7 | 13 | 23 | 25 | 20 | 15 | 10 |
| | 2000 | 4 | 6 | 12 | 21 | 24 | 21 | 16 | 11 |
| | 4000 | 3 | 5 | 11 | 18 | 23 | 22 | 17 | 11 |
| 5MS | -4000 | 7 | 12 | 21 | 38 | 43 | 32 | 19 | 10 |
| | -2000 | 5 | 10 | 19 | 36 | 43 | 31 | 19 | 10 |
| | 0 | 5 | 10 | 18 | 35 | 43 | 32 | 21 | 12 |
| | 2000 | 4 | 9 | 17 | 34 | 42 | 33 | 22 | 14 |
| | 4000 | 3 | 8 | 16 | 32 | 40 | 34 | 22 | 15 |
| 7MS | -4000 | 8 | 17 | 28 | 41 | 46 | 41 | 24 | 13 |
| | -2000 | 7 | 14 | 25 | 42 | 50 | 40 | 24 | 13 |
| | 0 | 7 | 14 | 24 | 42 | 50 | 42 | 26 | 15 |
| | 2000 | 7 | 13 | 23 | 41 | 49 | 44 | 28 | 17 |
| | 4000 | 6 | 11 | 21 | 40 | 49 | 45 | 30 | 19 |
| 10MS | -4000 | 12 | 21 | 35 | 43 | 52 | 47 | 31 | 18 |
| | -2000 | 11 | 19 | 34 | 45 | 52 | 50 | 33 | 17 |
| | 0 | 11 | 18 | 33 | 45 | 52 | 51 | 36 | 19 |
| | 2000 | 10 | 17 | 32 | 45 | 51 | 52 | 38 | 21 |
| | 4000 | 9 | 14 | 29 | 44 | 48 | 50 | 40 | 23 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 7.5 18 | 7.5 24 | 7.5 30 | 7.5 36 | 7.5 42 | 7.5 48 | 15 18 | 15 24 | 15 30 | 15 36 | 15 42 | 15 48 | 30 18 | 30 24 | 30 30 |
|----------------|-------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 26 | 40 | 45 | 51 | 66 | 80 | 47 | 57 | 67 | 80 | 89 | 100 | 80 | 95 | 110 |
| 5 feet | | 46 | 67 | 80 | 91 | 112 | 134 | 80 | 96 | 114 | 134 | 150 | 167 | 135 | 161 | 187 |
| 7 feet | | 65 | 95 | 100 | 129 | 158 | 190 | 112 | 135 | 159 | 193 | 216 | 240 | 188 | 224 | 261 |
| 10 feet | | 90 | 135 | 157 | 180 | 223 | 270 | 159 | 192 | 226 | 273 | - | - | 220 | 319 | 371 |

| Nominal Length | W/ In H/ In | 30 36 | 30 42 | 30 48 | 45 18 | 45 24 | 45 30 | 45 36 | 45 42 | 45 48 | 60 18 | 60 24 | 60 30 | 60 36 | 60 42 | 60 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 130 | 145 | 160 | 127 | 152 | 156 | 177 | 197 | 218 | 160 | 190 | 220 | 260 | 290 | 320 |
| 5 feet | | 22 | 248 | 274 | 215 | 257 | 275 | 310 | 345 | 381 | 270 | 322 | 374 | 44 | 496 | 548 |
| 7 feet | | 310 | 347 | 384 | 300 | 359 | - | - | - | - | 376 | 448 | 522 | 620 | 694 | 768 |
| 10 feet | | 440 | - | - | - | - | - | - | - | - | 440 | 638 | 742 | 880 | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| MS | 3 | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.26 | 0.29 | 0.33 | 0.36 | 0.40 | 0.44 | 0.49 | 0.53 |
| | 5 | 0.08 | 0.10 | 0.12 | 0.15 | 0.17 | 0.20 | 0.24 | 0.27 | 0.31 | 0.35 | 0.39 | 0.44 | 0.48 | 0.53 | 0.58 | 0.64 |
| | 7 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.26 | 0.30 | 0.34 | 0.39 | 0.44 | 0.49 | 0.54 | 0.60 | 0.67 | 0.73 | 0.80 |
| | 10 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | 0.54 | 0.60 | 0.67 | 0.74 | 0.82 | 0.90 | 0.98 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 |
|-----------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| MS All Sizes | -3,000 | 67 | 63 | 61 | 66 | 61 | 64 | 67 | 67 |
| | -2,000 | 60 | 56 | 56 | 56 | 57 | 59 | 58 | 49 |
| | -1,000 | 46 | 45 | 45 | 41 | 50 | 51 | 43 | 23 |
| | 1,000 | 44 | 32 | 36 | 34 | 31 | 32 | 29 | 21 |
| | 2,000 | 63 | 54 | 52 | 50 | 47 | 48 | 47 | 44 |
| | 3,000 | 74 | 64 | 60 | 58 | 56 | 58 | 59 | 57 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a two-and-a-half square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT SILENCERS

TYPE: LFL

with **FORWARD** and **REVERSE FLOW** Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 LFL 24 x 18

Length: 5'

Type: LFL

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3LFL | -2000 | 5 | 7 | 14 | 17 | 17 | 11 | 12 | 10 |
| | -1000 | 4 | 7 | 13 | 17 | 17 | 11 | 11 | 10 |
| | 0 | 4 | 8 | 14 | 19 | 19 | 13 | 11 | 10 |
| | 1000 | 4 | 8 | 14 | 20 | 20 | 15 | 11 | 10 |
| | 2000 | 4 | 8 | 13 | 19 | 20 | 12 | 11 | 9 |
| 5LFL | -2000 | 6 | 12 | 19 | 27 | 28 | 15 | 15 | 13 |
| | -1000 | 7 | 12 | 19 | 27 | 27 | 15 | 14 | 13 |
| | 0 | 7 | 11 | 18 | 26 | 26 | 15 | 13 | 12 |
| | 1000 | 6 | 10 | 17 | 24 | 25 | 14 | 12 | 11 |
| | 2000 | 5 | 10 | 16 | 23 | 25 | 14 | 12 | 11 |
| 7LFL | -2000 | 9 | 15 | 25 | 38 | 32 | 17 | 15 | 13 |
| | -1000 | 9 | 14 | 24 | 38 | 32 | 17 | 15 | 14 |
| | 0 | 8 | 13 | 23 | 38 | 32 | 17 | 15 | 14 |
| | 1000 | 7 | 12 | 22 | 37 | 31 | 17 | 15 | 13 |
| | 2000 | 6 | 12 | 20 | 36 | 31 | 18 | 14 | 13 |
| 10LFL | -2000 | 12 | 20 | 32 | 43 | 42 | 20 | 18 | 15 |
| | -1000 | 11 | 19 | 32 | 44 | 42 | 21 | 17 | 15 |
| | 0 | 11 | 18 | 31 | 44 | 42 | 21 | 17 | 15 |
| | 1000 | 10 | 17 | 29 | 44 | 41 | 21 | 17 | 15 |
| | 2000 | 9 | 16 | 27 | 44 | 41 | 21 | 16 | 15 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | - | - | 117 | 140 | 167 | 190 | - | - | 178 | 209 | 250 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | - | - | - | - | - | - | - | - |
| 10 feet | | 280 | - | - | 295 | 349 | 417 | 470 | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LFL | 3 | 0.01 | 0.05 | 0.08 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.51 | 0.59 | 0.68 | 0.77 | 0.87 | 0.97 |
| | 5 | 0.01 | 0.05 | 0.08 | 0.12 | 0.16 | 0.20 | 0.26 | 0.32 | 0.39 | 0.46 | 0.54 | 0.63 | 0.72 | 0.82 | 0.92 | 1.04 |
| | 7 | 0.01 | 0.05 | 0.09 | 0.12 | 0.17 | 0.22 | 0.28 | 0.34 | 0.41 | 0.49 | 0.57 | 0.67 | 0.77 | 0.87 | 0.98 | 1.10 |
| | 10 | 0.02 | 0.06 | 0.10 | 0.14 | 0.19 | 0.24 | 0.31 | 0.38 | 0.46 | 0.55 | 0.64 | 0.74 | 0.86 | 0.97 | 1.10 | 1.23 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 400 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 |
|-----------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| LFL All Sizes | -3,000 | 55 | 54 | 56 | 57 | 56 | 59 | 61 | 56 |
| | -2,000 | 46 | 45 | 48 | 49 | 50 | 54 | 49 | 42 |
| | -1,000 | 31 | 30 | 34 | 35 | 40 | 45 | 28 | 20 |
| | 1,000 | 32 | 24 | 32 | 25 | 34 | 39 | 24 | 20 |
| | 2,000 | 47 | 42 | 46 | 44 | 46 | 51 | 46 | 38 |
| | 3,000 | 56 | 53 | 54 | 55 | 53 | 58 | 59 | 53 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT SILENCERS

TYPE: ML

with **FORWARD** and **REVERSE FLOW** Ratings



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DESIGNATING A SILENCER

Model: 5 ML 36 x 18

Length: 5'

Type: ML

Width: 36"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3ML | -5000 | 4 | 5 | 12 | 20 | 18 | 11 | 7 | 5 |
| | -2000 | 3 | 5 | 10 | 19 | 18 | 12 | 8 | 6 |
| | 0 | 3 | 5 | 10 | 19 | 18 | 12 | 9 | 7 |
| | 2000 | 3 | 4 | 9 | 18 | 17 | 12 | 9 | 8 |
| | 5000 | 2 | 4 | 8 | 16 | 17 | 13 | 10 | 9 |
| 5ML | -5000 | 6 | 9 | 18 | 32 | 32 | 17 | 9 | 6 |
| | -2000 | 5 | 8 | 16 | 31 | 31 | 17 | 10 | 7 |
| | 0 | 5 | 8 | 15 | 31 | 31 | 19 | 12 | 9 |
| | 2000 | 4 | 7 | 14 | 30 | 30 | 20 | 13 | 10 |
| | 5000 | 3 | 6 | 14 | 28 | 29 | 22 | 13 | 11 |
| 7ML | -5000 | 6 | 12 | 22 | 42 | 43 | 24 | 14 | 10 |
| | -2000 | 6 | 11 | 21 | 41 | 40 | 23 | 15 | 10 |
| | 0 | 6 | 11 | 20 | 39 | 40 | 25 | 16 | 11 |
| | 2000 | 5 | 10 | 19 | 37 | 39 | 26 | 16 | 12 |
| | 5000 | 5 | 9 | 17 | 36 | 38 | 28 | 16 | 12 |
| 10ML | -5000 | 9 | 18 | 28 | 46 | 47 | 34 | 19 | 11 |
| | -2000 | 8 | 17 | 27 | 47 | 50 | 33 | 20 | 12 |
| | 0 | 8 | 16 | 26 | 46 | 50 | 35 | 20 | 12 |
| | 2000 | 7 | 15 | 25 | 45 | 49 | 36 | 20 | 12 |
| | 5000 | 7 | 15 | 23 | 44 | 50 | 36 | 21 | 14 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/In H/In | 9 18 | 9 24 | 9 30 | 9 36 | 9 42 | 9 48 | 18 18 | 18 24 | 18 30 | 18 36 | 18 42 | 18 48 | 36 18 | 36 24 | 36 30 |
|----------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/Lb. | 35 | 41 | 52 | 57 | 65 | 73 | 52 | 61 | 71 | 84 | 94 | 104 | 69 | 103 | 120 |
| 5 feet | | 60 | 71 | 82 | 95 | 107 | 119 | 87 | 103 | 121 | 142 | 158 | 175 | 120 | 175 | 201 |
| 7 feet | | 84 | 100 | 116 | 133 | 150 | 167 | 122 | 144 | 168 | 200 | 223 | 247 | 169 | 246 | 283 |
| 10 feet | | 118 | 141 | 167 | 190 | 240 | 215 | 174 | 205 | 239 | 284 | – | – | 238 | 349 | 403 |
| Nominal Length | W/In H/In | 36 36 | 36 42 | 36 48 | 54 18 | 54 24 | 54 30 | 54 36 | 54 42 | 54 48 | 72 18 | 72 24 | 72 30 | 72 36 | 72 42 | 72 48 |
| 3 feet | Wt/Lb. | 138 | 153 | 168 | 121 | 164 | 191 | 222 | 247 | 272 | 138 | 206 | 240 | 276 | 306 | 336 |
| 5 feet | | 239 | 265 | 291 | 207 | 278 | 322 | 381 | 423 | 466 | 239 | 350 | 402 | 478 | 530 | 582 |
| 7 feet | | 337 | 374 | 411 | 291 | 390 | 451 | 537 | 597 | 658 | 337 | 492 | 566 | 674 | 748 | 822 |
| 10 feet | | 475 | – | – | 412 | 554 | 642 | 759 | – | – | 475 | 698 | 806 | 950 | – | – |

Table III: Aerodynamic Performance

| Model | L/Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| ML | 3 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 | 0.20 | 0.24 | 0.28 | 0.33 | 0.38 | 0.44 | 0.50 | 0.57 | 0.64 | 0.71 | 0.78 |
| | 5 | 0.06 | 0.08 | 0.12 | 0.15 | 0.19 | 0.24 | 0.28 | 0.34 | 0.40 | 0.46 | 0.53 | 0.60 | 0.68 | 0.76 | 0.85 | 0.94 |
| | 7 | 0.07 | 0.11 | 0.14 | 0.19 | 0.24 | 0.29 | 0.36 | 0.42 | 0.50 | 0.58 | 0.66 | 0.75 | 0.85 | 0.95 | 1.06 | 1.18 |
| | 10 | 0.09 | 0.13 | 0.18 | 0.23 | 0.29 | 0.36 | 0.44 | 0.52 | 0.61 | 0.71 | 0.82 | 0.93 | 1.05 | 1.18 | 1.31 | 1.45 |
| Silencer Face Velocity, fpm | | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| ML All Sizes | -3,000 | 64 | 59 | 59 | 63 | 60 | 62 | 63 | 59 |
| | -2,000 | 56 | 53 | 52 | 53 | 56 | 58 | 52 | 44 |
| | -1,000 | 42 | 42 | 41 | 38 | 49 | 50 | 37 | 20 |
| | 1,000 | 39 | 35 | 30 | 27 | 26 | 28 | 28 | 20 |
| | 2,000 | 58 | 52 | 46 | 43 | 42 | 45 | 45 | 39 |
| | 3,000 | 71 | 61 | 55 | 53 | 51 | 55 | 56 | 52 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV/Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a three-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



QUIET-DUCT SILENCERS

TYPE: L

with **FORWARD** and **REVERSE FLOW** Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 L 24 x 18

Length: 5'

Type: L

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3L | -5000 | 4 | 7 | 10 | 16 | 23 | 18 | 12 | 7 |
| | -2000 | 3 | 5 | 9 | 15 | 22 | 19 | 12 | 8 |
| | 0 | 3 | 5 | 9 | 15 | 22 | 21 | 13 | 9 |
| | 2000 | 3 | 5 | 8 | 14 | 21 | 22 | 13 | 9 |
| | 5000 | 2 | 4 | 7 | 13 | 19 | 22 | 14 | 10 |
| 5L | -5000 | 6 | 10 | 15 | 25 | 33 | 32 | 16 | 9 |
| | -2000 | 5 | 8 | 14 | 24 | 32 | 32 | 16 | 10 |
| | 0 | 5 | 8 | 14 | 23 | 31 | 34 | 17 | 12 |
| | 2000 | 5 | 7 | 13 | 22 | 30 | 35 | 18 | 13 |
| | 5000 | 4 | 6 | 11 | 20 | 28 | 35 | 19 | 13 |
| 7L | -5000 | 7 | 15 | 20 | 33 | 42 | 39 | 21 | 12 |
| | -2000 | 6 | 12 | 18 | 31 | 42 | 40 | 20 | 13 |
| | 0 | 6 | 12 | 17 | 30 | 41 | 42 | 21 | 14 |
| | 2000 | 6 | 11 | 16 | 29 | 39 | 43 | 22 | 15 |
| | 5000 | 5 | 8 | 15 | 28 | 37 | 43 | 24 | 16 |
| 10L | -5000 | 9 | 20 | 28 | 44 | 47 | 46 | 28 | 16 |
| | -2000 | 9 | 16 | 25 | 42 | 48 | 48 | 28 | 17 |
| | 0 | 9 | 15 | 24 | 41 | 48 | 49 | 29 | 19 |
| | 2000 | 9 | 14 | 23 | 40 | 48 | 49 | 29 | 20 |
| | 5000 | 8 | 12 | 21 | 39 | 47 | 49 | 32 | 22 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 29 | 35 | 42 | 49 | 56 | 63 | 43 | 52 | 62 | 74 | 83 | 93 | 71 | 86 | 102 |
| 5 feet | | 52 | 63 | 75 | 87 | 99 | 111 | 73 | 89 | 107 | 125 | 141 | 158 | 121 | 147 | 173 |
| 7 feet | | 72 | 88 | 105 | 122 | 139 | 156 | 102 | 125 | 150 | 176 | 199 | 226 | 170 | 207 | 243 |
| 10 feet | | 101 | 123 | 147 | 171 | 163 | 187 | 155 | 177 | 212 | 25 | - | - | 241 | 293 | 345 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 117 | 132 | 147 | 101 | 121 | 143 | 163 | 184 | 205 | 140 | 168 | 182 | 209 | 235 | 261 |
| 5 feet | | 204 | 230 | 256 | 180 | 211 | 245 | 279 | 312 | 346 | 242 | 284 | 312 | 353 | 395 | 438 |
| 7 feet | | 288 | 325 | 362 | 252 | 295 | 351 | 398 | 445 | 492 | - | - | - | - | - | - |
| 10 feet | | 405 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|----------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| L | 3 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 | 0.20 | 0.24 | 0.29 | 0.34 | 0.39 | 0.45 | 0.51 | 0.58 | 0.65 | 0.72 | 0.80 |
| | 5 | 0.06 | 0.08 | 0.11 | 0.14 | 0.18 | 0.22 | 0.27 | 0.32 | 0.37 | 0.43 | 0.50 | 0.56 | 0.64 | 0.71 | 0.79 | 0.88 |
| | 7 | 0.06 | 0.09 | 0.12 | 0.15 | 0.19 | 0.24 | 0.29 | 0.35 | 0.41 | 0.47 | 0.54 | 0.61 | 0.69 | 0.78 | 0.87 | 0.96 |
| | 10 | 0.07 | 0.10 | 0.13 | 0.17 | 0.22 | 0.27 | 0.33 | 0.39 | 0.46 | 0.53 | 0.61 | 0.69 | 0.78 | 0.87 | 0.97 | 1.08 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| L All Sizes | -3,000 | 64 | 59 | 58 | 62 | 60 | 62 | 62 | 58 |
| | -2,000 | 55 | 52 | 52 | 53 | 56 | 56 | 56 | 43 |
| | -1,000 | 41 | 41 | 41 | 38 | 49 | 48 | 38 | 20 |
| | 1,000 | 38 | 31 | 37 | 32 | 32 | 36 | 24 | 20 |
| | 2,000 | 57 | 51 | 51 | 49 | 47 | 50 | 44 | 35 |
| | 3,000 | 68 | 63 | 59 | 60 | 56 | 58 | 56 | 50 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

QUIET-DUCT CLEAN-FLOW™ SILENCERS

1.01 GENERAL

- A. Furnish and install "Clean-Flow" (rectangular) silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 MATERIALS

- A. Outer casings of rectangular silencers shall be made of 22 gauge type #G-90 lock-former-quality galvanized steel.
- B. Interior partitions for rectangular silencers shall be not less than 26 gauge type #G-90 galvanized lock-former-quality perforated steel.
- C. Filler material shall be inorganic glass fiber of a proper density to obtain the specified acoustic performance and be packed under not less than 5% compression to eliminate voids due to vibration and settling. Material shall be inert, vermin- and moisture-proof. Filler material shall be totally encapsulated and sealed with polymeric film of an appropriate thickness. The encapsulated fill material shall be separated from the interior perforated baffles by means of a non-combustible, erosion resistant, factory-installed, acoustic stand-off. It shall not be acceptable to omit the acoustic stand-off and try to compensate for its absence by means of corrugated baffles.
- D. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:

Flamespread Classification 20

Smoke Development Rating 20

3.01 CONSTRUCTION

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Seams shall be lock formed and mastic filled. Rectangular casing seams shall be in the corners of the silencer shell to provide maximum unit strength and rigidity. Interior partitions shall be fabricated from single-piece, margin-perforated sheets and shall have die-formed entrance and exit shapes so as to provide the maximum aerodynamic efficiency and minimum self-noise characteristics in the sound attenuator. Blunt noses or squared off partitions will not be accepted.
- B. Attachment of the interior partitions to the casing shall be by means of an interlocking track assembly. Tracks shall be solid galvanized steel and shall be welded to the outer casing. Attachment of the interior partitions to the tracks shall be such that a minimum of 4 thicknesses of metal exist at this location. The track assembly shall stiffen the exterior casing, provide a reinforced attachment detail for the interior partitions, and shall maintain a uniform airspace width along the length of the silencer for consistent aerodynamic and

acoustic performance. Interior partitions shall be additionally secured to the outer casing with welded nose clips at both ends of the sound attenuator.

- C. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing. Airtight construction shall be provided by use of a duct sealing compound on the job-site material and labor furnished by the contractor.

4.01 ACOUSTIC PERFORMANCE

- A. All silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated.

Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity. Data for rectangular and tubular type silencers shall be presented for tests conducted using silencers no smaller than the following cross-sections:

Rectangular, inch: 24x24, 24x30, or 24x36, and

Tubular, inch: 12, 24, 36, and 48

5.01 AERODYNAMIC PERFORMANCE

- A. Static pressure loss of silencers shall not exceed those listed in the silencer schedule as the airflow indicates. Airflow measurements shall be made in accordance with ASTM specification E477-99 and applicable portions of ASME, AMCA, and ADC airflow test codes. Tests shall be reported on the identical units for which acoustic data is presented.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

7.01 DUCT TRANSITIONS

- A. When transitions are required to adapt silencer dimensions to connecting duct work they shall be furnished by the installing contractor.

**QUIET-DUCT CLEAN-FLOW™ SILENCERS****TYPE: HLFS****with FORWARD and REVERSE FLOW Ratings**

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 HLFS 24 x 18

Length: 5'

Type: HLFS

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3HLFS | -2000 | 7 | 13 | 15 | 20 | 19 | 18 | 16 | 10 |
| | -1000 | 7 | 12 | 14 | 20 | 19 | 18 | 15 | 10 |
| | 0 | 9 | 14 | 15 | 21 | 19 | 18 | 15 | 11 |
| | 1000 | 7 | 11 | 14 | 20 | 18 | 15 | 15 | 10 |
| | 2000 | 7 | 11 | 14 | 18 | 17 | 16 | 14 | 9 |
| 5HLFS | -2000 | 11 | 18 | 22 | 26 | 25 | 21 | 19 | 13 |
| | -1000 | 11 | 16 | 23 | 26 | 25 | 21 | 19 | 14 |
| | 0 | 12 | 16 | 23 | 27 | 25 | 21 | 19 | 14 |
| | 1000 | 12 | 16 | 23 | 26 | 25 | 20 | 18 | 14 |
| | 2000 | 13 | 15 | 22 | 25 | 24 | 20 | 17 | 13 |
| 7HLFS | -2000 | 14 | 17 | 23 | 29 | 31 | 29 | 22 | 16 |
| | -1000 | 15 | 17 | 23 | 30 | 31 | 29 | 22 | 16 |
| | 0 | 15 | 18 | 23 | 28 | 29 | 27 | 20 | 15 |
| | 1000 | 15 | 18 | 22 | 25 | 27 | 24 | 18 | 14 |
| | 2000 | 15 | 20 | 23 | 26 | 26 | 23 | 17 | 13 |
| 10HLFS | -2000 | 17 | 24 | 29 | 35 | 38 | 37 | 28 | 19 |
| | -1000 | 15 | 23 | 30 | 36 | 39 | 36 | 28 | 18 |
| | 0 | 15 | 23 | 30 | 34 | 38 | 37 | 27 | 19 |
| | 1000 | 15 | 23 | 30 | 34 | 38 | 37 | 27 | 18 |
| | 2000 | 17 | 22 | 28 | 34 | 37 | 37 | 28 | 18 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | - | - | 117 | 140 | 167 | 190 | - | - | 178 | 209 | 250 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | - | - | - | - | - | - | - | - |
| 10 feet | | 280 | - | - | 295 | 349 | 417 | 470 | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HLFS | 3 | 0.04 | 0.05 | 0.07 | 0.09 | 0.11 | 0.14 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.36 | 0.41 | 0.46 | 0.51 | 0.57 |
| | 5 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.26 | 0.31 | 0.35 | 0.40 | 0.45 | 0.51 | 0.56 | 0.62 |
| | 7 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.16 | 0.20 | 0.23 | 0.28 | 0.32 | 0.37 | 0.42 | 0.47 | 0.53 | 0.59 | 0.65 |
| | 10 | 0.04 | 0.06 | 0.09 | 0.11 | 0.14 | 0.18 | 0.21 | 0.26 | 0.30 | 0.35 | 0.40 | 0.45 | 0.51 | 0.57 | 0.64 | 0.71 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Silencer Face Velocity, fpm | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| HLFS All Sizes | -2,000 | 58 | 54 | 58 | 61 | 62 | 62 | 65 | 63 |
| | -1,500 | 51 | 49 | 53 | 56 | 56 | 59 | 60 | 53 |
| | -1,000 | 45 | 42 | 45 | 43 | 45 | 49 | 44 | 37 |
| | 1,000 | 46 | 42 | 45 | 43 | 45 | 49 | 44 | 37 |
| | 1,500 | 56 | 54 | 57 | 56 | 52 | 56 | 57 | 51 |
| | 2,000 | 68 | 64 | 65 | 66 | 61 | 61 | 64 | 61 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**QUIET-DUCT CLEAN-FLOW™ SILENCERS****TYPE: HLFM****with FORWARD and REVERSE FLOW Ratings**

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 HLFS 24 x 18

Length: 5'

Type: HLFM

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3HLFM | -2000 | 6 | 8 | 11 | 15 | 15 | 14 | 13 | 8 |
| | -1000 | 6 | 8 | 11 | 15 | 15 | 13 | 12 | 8 |
| | 0 | 6 | 7 | 11 | 16 | 15 | 12 | 11 | 8 |
| | 1000 | 4 | 7 | 10 | 15 | 14 | 13 | 11 | 8 |
| | 2000 | 4 | 7 | 10 | 14 | 13 | 12 | 11 | 8 |
| 5HLFM | -2000 | 9 | 14 | 21 | 23 | 22 | 16 | 13 | 10 |
| | -1000 | 8 | 13 | 21 | 23 | 23 | 16 | 13 | 10 |
| | 0 | 9 | 12 | 22 | 23 | 23 | 16 | 14 | 10 |
| | 1000 | 8 | 12 | 20 | 23 | 22 | 16 | 13 | 10 |
| | 2000 | 7 | 11 | 19 | 22 | 22 | 16 | 13 | 9 |
| 7HLFM | -2000 | 11 | 16 | 23 | 29 | 29 | 19 | 18 | 13 |
| | -1000 | 11 | 16 | 24 | 29 | 29 | 19 | 19 | 14 |
| | 0 | 11 | 16 | 24 | 29 | 28 | 20 | 19 | 14 |
| | 1000 | 11 | 16 | 23 | 28 | 27 | 19 | 18 | 13 |
| | 2000 | 11 | 15 | 23 | 28 | 27 | 21 | 18 | 14 |
| 10HLFM | -2000 | 14 | 21 | 28 | 31 | 33 | 23 | 22 | 16 |
| | -1000 | 14 | 21 | 28 | 31 | 32 | 24 | 23 | 17 |
| | 0 | 15 | 21 | 28 | 32 | 31 | 25 | 23 | 17 |
| | 1000 | 15 | 21 | 27 | 30 | 32 | 25 | 23 | 16 |
| | 2000 | 13 | 20 | 27 | 30 | 32 | 25 | 23 | 16 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/In H/In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/Lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | — | — | 117 | 140 | 167 | 190 | — | — | 178 | 209 | 250 |
| Nominal Length | W/In H/In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
| 3 feet | Wt/Lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | — | — | — | — | — | — | — | — |
| 10 feet | | 280 | — | — | 295 | 349 | 417 | 470 | — | — | — | — | — | — | — | — |

Table III: Aerodynamic Performance

| Model | L/Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HLFM | 3 | 0.05 | 0.07 | 0.09 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.32 | 0.37 | 0.42 | 0.48 | 0.55 | 0.61 | 0.68 | 0.76 |
| | 5 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 | 0.20 | 0.24 | 0.29 | 0.34 | 0.39 | 0.45 | 0.51 | 0.57 | 0.64 | 0.72 | 0.79 |
| | 7 | 0.05 | 0.07 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.35 | 0.41 | 0.47 | 0.53 | 0.60 | 0.67 | 0.75 | 0.83 |
| | 10 | 0.06 | 0.08 | 0.12 | 0.15 | 0.18 | 0.24 | 0.29 | 0.34 | 0.40 | 0.46 | 0.53 | 0.60 | 0.68 | 0.76 | 0.85 | 0.94 |
| Silencer Face Velocity, fpm | | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| HLFM All Sizes | -3,000 | 64 | 62 | 64 | 66 | 65 | 64 | 66 | 62 |
| | -2,000 | 53 | 50 | 54 | 56 | 56 | 59 | 58 | 51 |
| | -1,000 | 42 | 40 | 43 | 45 | 47 | 46 | 37 | 27 |
| | 1,000 | 47 | 34 | 36 | 35 | 40 | 37 | 27 | 20 |
| | 2,000 | 54 | 52 | 58 | 56 | 51 | 56 | 55 | 50 |
| | 3,000 | 68 | 64 | 64 | 63 | 61 | 63 | 66 | 63 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**QUIET-DUCT CLEAN-FLOW™ SILENCERS****TYPE: HS****with FORWARD and REVERSE FLOW Ratings**

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 HLFS 24 x 18

Length: 5'

Type: HS

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3HS | -2000 | 7 | 12 | 15 | 22 | 26 | 30 | 28 | 14 |
| | -1000 | 5 | 9 | 17 | 25 | 27 | 32 | 29 | 14 |
| | 0 | 5 | 7 | 15 | 33 | 26 | 30 | 19 | 14 |
| | 1000 | 5 | 6 | 13 | 21 | 24 | 28 | 29 | 13 |
| | 2000 | 5 | 8 | 11 | 17 | 21 | 26 | 31 | 13 |
| 5HS | -2000 | 14 | 15 | 22 | 27 | 35 | 42 | 33 | 15 |
| | -1000 | 9 | 13 | 23 | 31 | 40 | 47 | 34 | 16 |
| | 0 | 8 | 11 | 22 | 29 | 38 | 46 | 34 | 16 |
| | 1000 | 8 | 12 | 18 | 28 | 36 | 44 | 34 | 14 |
| | 2000 | 8 | 12 | 16 | 23 | 32 | 40 | 33 | 15 |
| 7HS | -2000 | 15 | 18 | 23 | 31 | 45 | 49 | 34 | 13 |
| | -1000 | 15 | 17 | 25 | 41 | 48 | 50 | 36 | 14 |
| | 0 | 13 | 15 | 22 | 39 | 48 | 50 | 38 | 15 |
| | 1000 | 11 | 12 | 19 | 38 | 49 | 50 | 38 | 17 |
| | 2000 | 11 | 11 | 16 | 31 | 45 | 50 | 35 | 16 |
| 10HS | -2000 | 20 | 22 | 30 | 34 | 49 | 50 | 33 | 11 |
| | -1000 | 20 | 24 | 33 | 44 | 51 | 51 | 36 | 11 |
| | 0 | 17 | 20 | 31 | 42 | 52 | 51 | 38 | 15 |
| | 1000 | 14 | 16 | 27 | 40 | 51 | 50 | 39 | 19 |
| | 2000 | 14 | 17 | 24 | 34 | 48 | 50 | 36 | 17 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|-------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 25 | 35 | 42 | 49 | 60 | 70 | 43 | 52 | 62 | 74 | 83 | 93 | 71 | 86 | 102 |
| 5 feet | | 44 | 63 | 75 | 87 | 105 | 126 | 73 | 89 | 107 | 125 | 141 | 158 | 121 | 147 | 173 |
| 7 feet | | 61 | 88 | 102 | 122 | 147 | 176 | 102 | 125 | 150 | 176 | 199 | 226 | 170 | 207 | 243 |
| 10 feet | | 86 | 123 | 150 | 171 | 206 | 246 | 155 | 177 | 212 | 250 | - | - | 241 | 293 | 345 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 117 | 132 | 147 | 81 | 102 | 142 | 162 | 182 | 204 | 142 | 172 | 204 | 234 | 264 | 294 |
| 5 feet | | 204 | 230 | 256 | 142 | 177.5 | 249 | 284 | 319 | 355 | 242 | 294 | 346 | 408 | 460 | 512 |
| 7 feet | | 288 | 325 | 362 | - | - | - | - | - | - | 340 | 414 | 486 | 576 | 650 | 724 |
| 10 feet | | 405 | - | - | - | - | - | - | - | - | 482 | 586 | 690 | 810 | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HS | 3 | 0.01 | 0.03 | 0.06 | 0.09 | 0.13 | 0.18 | 0.23 | 0.29 | 0.36 | 0.44 | 0.52 | 0.61 | 0.71 | 0.82 | 0.93 | 1.05 |
| | 5 | 0.02 | 0.04 | 0.07 | 0.10 | 0.15 | 0.20 | 0.26 | 0.33 | 0.41 | 0.49 | 0.59 | 0.69 | 0.80 | 0.91 | 1.04 | 1.17 |
| | 7 | 0.02 | 0.04 | 0.07 | 0.11 | 0.16 | 0.21 | 0.28 | 0.35 | 0.44 | 0.53 | 0.63 | 0.74 | 0.85 | 0.98 | 1.11 | 1.26 |
| | 10 | 0.02 | 0.04 | 0.08 | 0.12 | 0.18 | 0.24 | 0.32 | 0.40 | 0.49 | 0.60 | 0.71 | 0.83 | 0.97 | 1.11 | 1.26 | 1.43 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| HS All Sizes | -2,000 | 68 | 62 | 61 | 66 | 61 | 64 | 67 | 66 |
| | -1,000 | 54 | 51 | 50 | 51 | 54 | 56 | 52 | 40 |
| | -500 | 40 | 40 | 39 | 36 | 47 | 48 | 37 | 20 |
| | 500 | 36 | 29 | 35 | 30 | 31 | 35 | 22 | 20 |
| | 1,000 | 55 | 49 | 49 | 47 | 46 | 49 | 42 | 32 |
| | 2,000 | 74 | 69 | 63 | 64 | 61 | 63 | 62 | 56 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**QUIET-DUCT CLEAN-FLOW™ SILENCERS****TYPE: HMS****with FORWARD and REVERSE FLOW Ratings**

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DESIGNATING A SILENCER

Model: 5 HMS 24 x 18

Length: 5'

Type: HMS

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3HMS | -4000 | 4 | 6 | 10 | 15 | 18 | 22 | 16 | 8 |
| | -2000 | 5 | 6 | 9 | 15 | 17 | 21 | 17 | 8 |
| | 0 | 5 | 6 | 9 | 15 | 17 | 18 | 17 | 8 |
| | 2000 | 4 | 4 | 8 | 14 | 17 | 17 | 16 | 8 |
| | 4000 | 4 | 3 | 7 | 13 | 16 | 18 | 17 | 8 |
| 5HMS | -4000 | 6 | 10 | 15 | 29 | 29 | 30 | 23 | 9 |
| | -2000 | 4 | 8 | 14 | 27 | 29 | 29 | 23 | 9 |
| | 0 | 4 | 9 | 13 | 25 | 29 | 28 | 23 | 10 |
| | 2000 | 3 | 7 | 11 | 24 | 27 | 27 | 22 | 12 |
| | 4000 | 3 | 6 | 10 | 22 | 28 | 28 | 22 | 12 |
| 7HMS | -4000 | 8 | 15 | 21 | 31 | 30 | 39 | 28 | 11 |
| | -2000 | 7 | 12 | 18 | 33 | 35 | 38 | 28 | 11 |
| | 0 | 7 | 13 | 17 | 32 | 34 | 37 | 26 | 12 |
| | 2000 | 7 | 11 | 16 | 30 | 33 | 34 | 24 | 13 |
| | 4000 | 6 | 11 | 15 | 29 | 34 | 35 | 26 | 14 |
| 10HMS | -4000 | 11 | 14 | 25 | 30 | 36 | 40 | 32 | 15 |
| | -2000 | 11 | 14 | 24 | 32 | 36 | 43 | 33 | 14 |
| | 0 | 12 | 14 | 23 | 33 | 35 | 41 | 30 | 15 |
| | 2000 | 10 | 12 | 23 | 32 | 34 | 40 | 28 | 16 |
| | 4000 | 9 | 13 | 21 | 31 | 32 | 37 | 30 | 18 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 7.5 18 | 7.5 24 | 7.5 30 | 7.5 36 | 7.5 42 | 7.5 48 | 15 18 | 15 24 | 15 30 | 15 36 | 15 42 | 15 48 | 30 18 | 30 24 | 30 30 |
|----------------|-------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 26 | 40 | 45 | 51 | 66 | 80 | 47 | 57 | 67 | 80 | 89 | 100 | 80 | 95 | 110 |
| 5 feet | | 46 | 67 | 80 | 91 | 112 | 134 | 80 | 96 | 114 | 134 | 150 | 167 | 135 | 161 | 187 |
| 7 feet | | 65 | 95 | 100 | 129 | 158 | 190 | 112 | 135 | 159 | 193 | 216 | 240 | 188 | 224 | 261 |
| 10 feet | | 90 | 135 | 157 | 180 | 223 | 270 | 159 | 192 | 226 | 273 | - | - | 220 | 319 | 371 |

| Nominal Length | W/ In H/ In | 30 36 | 30 42 | 30 48 | 45 18 | 45 24 | 45 30 | 45 36 | 45 42 | 45 48 | 60 18 | 60 24 | 60 30 | 60 36 | 60 42 | 60 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 130 | 145 | 160 | 127 | 152 | 156 | 177 | 197 | 218 | 160 | 190 | 220 | 260 | 290 | 320 |
| 5 feet | | 22 | 248 | 274 | 215 | 257 | 275 | 310 | 345 | 381 | 270 | 322 | 374 | 44 | 496 | 548 |
| 7 feet | | 310 | 347 | 384 | 300 | 359 | - | - | - | - | 376 | 448 | 522 | 620 | 694 | 768 |
| 10 feet | | 440 | - | - | - | - | - | - | - | - | 440 | 638 | 742 | 880 | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HMS | 3 | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.26 | 0.29 | 0.33 | 0.36 | 0.40 | 0.44 | 0.49 | 0.53 |
| | 5 | 0.08 | 0.10 | 0.12 | 0.15 | 0.17 | 0.20 | 0.24 | 0.27 | 0.31 | 0.35 | 0.39 | 0.44 | 0.48 | 0.53 | 0.58 | 0.64 |
| | 7 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.26 | 0.30 | 0.34 | 0.39 | 0.44 | 0.49 | 0.54 | 0.60 | 0.67 | 0.73 | 0.80 |
| | 10 | 0.12 | 0.15 | 0.19 | 0.23 | 0.27 | 0.31 | 0.36 | 0.42 | 0.48 | 0.54 | 0.60 | 0.67 | 0.74 | 0.82 | 0.90 | 0.98 |
| Silencer Face Velocity, fpm | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | 2100 | 2200 | 2300 | |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| HMS All Sizes | -3,000 | 67 | 63 | 61 | 66 | 61 | 64 | 67 | 67 |
| | -2,000 | 60 | 56 | 56 | 56 | 57 | 59 | 58 | 49 |
| | -1,000 | 46 | 45 | 45 | 41 | 50 | 51 | 43 | 23 |
| | 1,000 | 44 | 32 | 36 | 34 | 31 | 32 | 29 | 21 |
| | 2,000 | 63 | 54 | 52 | 50 | 47 | 48 | 47 | 44 |
| | 3,000 | 74 | 64 | 60 | 58 | 56 | 58 | 59 | 57 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**QUIET-DUCT CLEAN-FLOW™ SILENCERS****TYPE: HLFL****with FORWARD and REVERSE FLOW Ratings**

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DESIGNATING A SILENCER

Model: 5 HLFL 24 x 18

Length: 5'

Type: HLFL

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3HLFL | -2000 | 4 | 6 | 10 | 13 | 16 | 11 | 11 | 6 |
| | -1000 | 3 | 6 | 9 | 13 | 16 | 11 | 10 | 7 |
| | 0 | 3 | 6 | 10 | 16 | 16 | 13 | 10 | 7 |
| | 1000 | 3 | 6 | 10 | 17 | 18 | 15 | 10 | 7 |
| | 2000 | 3 | 6 | 9 | 16 | 18 | 12 | 10 | 5 |
| 5HLFL | -2000 | 6 | 8 | 15 | 20 | 23 | 16 | 14 | 10 |
| | -1000 | 7 | 9 | 15 | 20 | 23 | 17 | 13 | 10 |
| | 0 | 6 | 8 | 14 | 20 | 22 | 15 | 13 | 9 |
| | 1000 | 5 | 7 | 14 | 19 | 22 | 14 | 12 | 8 |
| | 2000 | 4 | 7 | 14 | 17 | 21 | 15 | 12 | 8 |
| 7HLFL | -2000 | 7 | 12 | 18 | 25 | 27 | 25 | 16 | 11 |
| | -1000 | 6 | 12 | 17 | 26 | 27 | 25 | 17 | 12 |
| | 0 | 6 | 12 | 16 | 26 | 26 | 24 | 16 | 11 |
| | 1000 | 6 | 10 | 16 | 25 | 25 | 24 | 18 | 11 |
| | 2000 | 6 | 10 | 15 | 23 | 24 | 26 | 16 | 11 |
| 10HLFL | -2000 | 10 | 15 | 24 | 33 | 36 | 25 | 19 | 12 |
| | -1000 | 8 | 15 | 24 | 35 | 36 | 26 | 18 | 12 |
| | 0 | 8 | 14 | 23 | 33 | 34 | 26 | 17 | 12 |
| | 1000 | 8 | 13 | 22 | 33 | 33 | 26 | 17 | 12 |
| | 2000 | 8 | 12 | 21 | 32 | 33 | 26 | 16 | 12 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 18 | 21 | 25 | 29 | 31 | 35 | 35 | 42 | 50 | 57 | 61 | 70 | 54 | 64 | 74 |
| 5 feet | | 29 | 35 | 42 | 47 | 52 | 59 | 58 | 70 | 83 | 94 | 104 | 117 | 89 | 104 | 121 |
| 7 feet | | 41 | 49 | 59 | 67 | 75 | 83 | 82 | 98 | 118 | 134 | 150 | 166 | 125 | 146 | 175 |
| 10 feet | | 59 | 70 | 84 | 95 | - | - | 117 | 140 | 167 | 190 | - | - | 178 | 209 | 250 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 82 | 92 | 102 | 89 | 106 | 124 | 139 | 153 | 172 | 108 | 128 | 148 | 164 | 184 | 204 |
| 5 feet | | 136 | 152 | 157 | 147 | 174 | 204 | 230 | 256 | 274 | 178 | 208 | 242 | 272 | 304 | 314 |
| 7 feet | | 196 | 218 | 240 | 207 | 244 | 293 | 330 | - | - | - | - | - | - | - | - |
| 10 feet | | 280 | - | - | 295 | 349 | 417 | 470 | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HLFL | 3 | 0.01 | 0.05 | 0.08 | 0.11 | 0.15 | 0.19 | 0.24 | 0.30 | 0.36 | 0.43 | 0.51 | 0.59 | 0.68 | 0.77 | 0.87 | 0.97 |
| | 5 | 0.01 | 0.05 | 0.08 | 0.12 | 0.16 | 0.20 | 0.26 | 0.32 | 0.39 | 0.46 | 0.54 | 0.63 | 0.72 | 0.82 | 0.92 | 1.04 |
| | 7 | 0.01 | 0.05 | 0.09 | 0.12 | 0.17 | 0.22 | 0.28 | 0.34 | 0.41 | 0.49 | 0.57 | 0.67 | 0.77 | 0.87 | 0.98 | 1.10 |
| | 10 | 0.02 | 0.06 | 0.10 | 0.14 | 0.19 | 0.24 | 0.31 | 0.38 | 0.46 | 0.55 | 0.64 | 0.74 | 0.86 | 0.97 | 1.10 | 1.23 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 400 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 |
|-----------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| HLFL All Sizes | -3,000 | 55 | 54 | 56 | 57 | 56 | 59 | 61 | 56 |
| | -2,000 | 46 | 45 | 48 | 49 | 50 | 54 | 49 | 42 |
| | -1,000 | 31 | 30 | 34 | 35 | 40 | 45 | 28 | 20 |
| | 1,000 | 32 | 24 | 32 | 25 | 34 | 39 | 24 | 20 |
| | 2,000 | 47 | 42 | 46 | 44 | 46 | 51 | 46 | 38 |
| | 3,000 | 56 | 53 | 54 | 55 | 53 | 58 | 59 | 53 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**QUIET-DUCT CLEAN-FLOW™ SILENCERS****TYPE: HML****with FORWARD and REVERSE FLOW Ratings**

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DESIGNATING A SILENCER

Model: 5 HML 24 x 18

Length: 5'

Type: HML

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3HML | -5000 | 4 | 4 | 7 | 14 | 12 | 7 | 8 | 4 |
| | -2000 | 3 | 4 | 7 | 13 | 12 | 8 | 8 | 4 |
| | 0 | 3 | 4 | 7 | 13 | 12 | 7 | 9 | 5 |
| | 2000 | 3 | 2 | 6 | 12 | 11 | 8 | 9 | 6 |
| | 5000 | 2 | 3 | 6 | 11 | 11 | 8 | 10 | |
| 5HML | -5000 | 5 | 7 | 12 | 25 | 25 | 11 | 7 | 5 |
| | -2000 | 4 | 6 | 12 | 23 | 24 | 11 | 8 | 5 |
| | 0 | 4 | 6 | 11 | 23 | 24 | 13 | 10 | 7 |
| | 2000 | 3 | 5 | 10 | 22 | 23 | 15 | 12 | 9 |
| | 5000 | 3 | 6 | 10 | 20 | 24 | 14 | 12 | 9 |
| 7HML | -5000 | 5 | 9 | 16 | 30 | 30 | 18 | 16 | 10 |
| | -2000 | 6 | 8 | 15 | 29 | 31 | 17 | 15 | 9 |
| | 0 | 6 | 9 | 14 | 27 | 31 | 18 | 16 | 10 |
| | 2000 | 5 | 7 | 12 | 24 | 31 | 21 | 16 | 11 |
| | 5000 | 5 | 7 | 10 | 25 | 29 | 21 | 16 | 11 |
| 10HML | -5000 | 9 | 12 | 20 | 32 | 34 | 24 | 15 | 12 |
| | -2000 | 8 | 12 | 19 | 33 | 37 | 23 | 16 | 12 |
| | 0 | 9 | 12 | 18 | 31 | 36 | 25 | 16 | 12 |
| | 2000 | 7 | 11 | 17 | 31 | 35 | 26 | 17 | 12 |
| | 5000 | 8 | 10 | 17 | 32 | 36 | 26 | 17 | 14 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 9 18 | 9 24 | 9 30 | 9 36 | 9 42 | 9 48 | 18 18 | 18 24 | 18 30 | 18 36 | 18 42 | 18 48 | 36 18 | 36 24 | 36 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 35 | 41 | 52 | 57 | 65 | 73 | 52 | 61 | 71 | 84 | 94 | 104 | 69 | 103 | 120 |
| 5 feet | | 60 | 71 | 82 | 95 | 107 | 119 | 87 | 103 | 121 | 142 | 158 | 175 | 119.5 | 175 | 201 |
| 7 feet | | 84 | 100 | 116 | 133 | 150 | 167 | 122 | 144 | 168 | 200 | 223 | 247 | 168.5 | 246 | 283 |
| 10 feet | | 118 | 141 | 167 | 190 | 240 | 215 | 174 | 205 | 239 | 284 | - | - | 237.5 | 349 | 403 |

| Nominal Length | W/ In H/ In | 36 36 | 36 42 | 36 48 | 54 18 | 54 24 | 54 30 | 54 36 | 54 42 | 54 48 | 72 18 | 72 24 | 72 30 | 72 36 | 72 42 | 72 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 138 | 153 | 168 | 121 | 164 | 191 | 222 | 247 | 272 | 138 | 206 | 240 | 276 | 306 | 336 |
| 5 feet | | 239 | 265 | 291 | 206.5 | 278 | 322 | 381 | 423 | 466 | 239 | 350 | 402 | 478 | 530 | 582 |
| 7 feet | | 337 | 374 | 411 | 290.5 | 390 | 451 | 537 | 597 | 658 | 337 | 492 | 566 | 674 | 748 | 822 |
| 10 feet | | 475 | - | - | 411.5 | 554 | 642 | 759 | - | - | 475 | 698 | 806 | 950 | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HML | 3 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 | 0.20 | 0.24 | 0.28 | 0.33 | 0.38 | 0.44 | 0.50 | 0.57 | 0.64 | 0.71 | 0.78 |
| | 5 | 0.06 | 0.08 | 0.12 | 0.15 | 0.19 | 0.24 | 0.28 | 0.34 | 0.40 | 0.46 | 0.53 | 0.60 | 0.68 | 0.76 | 0.85 | 0.94 |
| | 7 | 0.07 | 0.11 | 0.14 | 0.19 | 0.24 | 0.29 | 0.36 | 0.42 | 0.50 | 0.58 | 0.66 | 0.75 | 0.85 | 0.95 | 1.06 | 1.18 |
| | 10 | 0.09 | 0.13 | 0.18 | 0.23 | 0.29 | 0.36 | 0.44 | 0.52 | 0.61 | 0.71 | 0.82 | 0.93 | 1.05 | 1.18 | 1.31 | 1.45 |
| Silencer Face Velocity, fpm | | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| HML All Sizes | -3,000 | 64 | 59 | 59 | 63 | 60 | 62 | 63 | 59 |
| | -2,000 | 56 | 53 | 52 | 53 | 56 | 58 | 52 | 44 |
| | -1,000 | 42 | 42 | 41 | 38 | 49 | 50 | 37 | 20 |
| | 1,000 | 39 | 35 | 30 | 27 | 26 | 28 | 28 | 20 |
| | 2,000 | 58 | 52 | 46 | 43 | 42 | 45 | 45 | 39 |
| | 3,000 | 71 | 61 | 55 | 53 | 51 | 55 | 56 | 52 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**QUIET-DUCT CLEAN-FLOW™ SILENCERS****TYPE: HL****with FORWARD and REVERSE FLOW Ratings**

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 HL 24 x 18

Length: 5'

Type: HL

Width: 24"

Height: 18"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|-----------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3HL | -5000 | 1 | 2 | 3 | 8 | 9 | 20 | 17 | 10 |
| | -2000 | 2 | 3 | 3 | 8 | 8 | 19 | 17 | 9 |
| | 0 | 3 | 4 | 4 | 8 | 8 | 18 | 17 | 8 |
| | 2000 | 2 | 4 | 3 | 7 | 7 | 17 | 17 | 6 |
| | 5000 | 2 | 4 | 3 | 5 | 4 | 12 | 16 | 5 |
| 5HL | -5000 | 5 | 9 | 12 | 18 | 25 | 32 | 26 | 10 |
| | -2000 | 5 | 8 | 10 | 17 | 24 | 37 | 23 | 10 |
| | 0 | 5 | 8 | 10 | 16 | 22 | 36 | 22 | 10 |
| | 2000 | 4 | 6 | 7 | 15 | 20 | 33 | 22 | 9 |
| | 5000 | 4 | 5 | 6 | 11 | 16 | 28 | 23 | 8 |
| 7HL | -5000 | 5 | 10 | 13 | 21 | 27 | 32 | 20 | 10 |
| | -2000 | 6 | 7 | 10 | 19 | 25 | 42 | 21 | 10 |
| | 0 | 6 | 8 | 10 | 18 | 24 | 41 | 21 | 9 |
| | 2000 | 5 | 7 | 9 | 16 | 20 | 38 | 21 | 8 |
| | 5000 | 4 | 6 | 6 | 13 | 17 | 32 | 22 | 8 |
| 10HL | -5000 | 7 | 12 | 16 | 26 | 28 | 30 | 18 | 9 |
| | -2000 | 9 | 8 | 12 | 24 | 29 | 44 | 20 | 9 |
| | 0 | 9 | 8 | 12 | 23 | 29 | 46 | 20 | 9 |
| | 2000 | 8 | 6 | 11 | 22 | 28 | 47 | 20 | 8 |
| | 5000 | 5 | 6 | 7 | 18 | 23 | 40 | 21 | 9 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 6 18 | 6 24 | 6 30 | 6 36 | 6 42 | 6 48 | 12 18 | 12 24 | 12 30 | 12 36 | 12 42 | 12 48 | 24 18 | 24 24 | 24 30 |
|----------------|----------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 29 | 35 | 42 | 49 | 56 | 63 | 43 | 52 | 62 | 74 | 83 | 93 | 71 | 86 | 102 |
| 5 feet | | 52 | 63 | 75 | 87 | 99 | 111 | 73 | 89 | 107 | 125 | 141 | 158 | 121 | 147 | 173 |
| 7 feet | | 72 | 88 | 105 | 122 | 139 | 156 | 102 | 125 | 150 | 176 | 199 | 226 | 170 | 207 | 243 |
| 10 feet | | 101 | 123 | 147 | 171 | 163 | 187 | 155 | 177 | 212 | 25 | - | - | 241 | 293 | 345 |

| Nominal Length | W/ In H/ In | 24 36 | 24 42 | 24 48 | 36 18 | 36 24 | 36 30 | 36 36 | 36 42 | 36 48 | 48 18 | 48 24 | 48 30 | 48 36 | 48 42 | 48 48 |
|----------------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 feet | Wt/ lb. | 117 | 132 | 147 | 101 | 121 | 143 | 163 | 184 | 205 | 140 | 168 | 182 | 209 | 235 | 261 |
| 5 feet | | 204 | 230 | 256 | 180 | 211 | 245 | 279 | 312 | 346 | 242 | 284 | 312 | 353 | 395 | 438 |
| 7 feet | | 288 | 325 | 362 | 252 | 295 | 351 | 398 | 445 | 492 | - | - | - | - | - | - |
| 10 feet | | 405 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| HL | 3 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 | 0.20 | 0.24 | 0.29 | 0.34 | 0.39 | 0.45 | 0.51 | 0.58 | 0.65 | 0.72 | 0.80 |
| | 5 | 0.06 | 0.08 | 0.11 | 0.14 | 0.18 | 0.22 | 0.27 | 0.32 | 0.37 | 0.43 | 0.50 | 0.56 | 0.64 | 0.71 | 0.79 | 0.88 |
| | 7 | 0.06 | 0.09 | 0.12 | 0.15 | 0.19 | 0.24 | 0.29 | 0.35 | 0.41 | 0.47 | 0.54 | 0.61 | 0.69 | 0.78 | 0.87 | 0.96 |
| | 10 | 0.07 | 0.10 | 0.13 | 0.17 | 0.22 | 0.27 | 0.33 | 0.39 | 0.46 | 0.53 | 0.61 | 0.69 | 0.78 | 0.87 | 0.97 | 1.08 |

| | | | | | | | | | | | | | | | | |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Silencer Face Velocity, fpm | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| HL All Sizes | -3,000 | 64 | 59 | 58 | 62 | 60 | 62 | 62 | 58 |
| | -2,000 | 55 | 52 | 52 | 53 | 56 | 56 | 56 | 43 |
| | -1,000 | 41 | 41 | 41 | 38 | 49 | 48 | 38 | 20 |
| | 1,000 | 38 | 31 | 37 | 32 | 32 | 36 | 24 | 20 |
| | 2,000 | 57 | 51 | 51 | 49 | 47 | 50 | 44 | 35 |
| | 3,000 | 68 | 63 | 59 | 60 | 56 | 58 | 56 | 50 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

QUIET-DUCT CONIC-FLOW® SILENCERS

1.01 GENERAL

- A. Furnish and install "Conic-Flow" (tubular) silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 MATERIALS

- A. Outer casings of tubular silencers shall be made of type #G-90 lock-former-quality galvanized steel in the following gauges:

| Outside Diameter, in. | Metal Gauge | Outside Diameter, in. | Metal Gauge |
|-----------------------|-------------|-----------------------|-------------|
| 12-36 | 22 | 38-60 | 18 |

- B. Interior construction of tubular silencers shall be compatible with the respective outside casing.
- C. Filler material shall be inorganic glass fiber of a proper density to obtain the specified acoustic performance and be packed under not less than 5% compression to eliminate voids due to vibration and settling. Material shall be inert, vermin- and moisture-proof.
- D. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:

| | |
|--------------------------------------|----|
| Flamespread Classification | 20 |
| Smoke Development Rating | 20 |

3.01 CONSTRUCTION

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Seams shall be lock formed and mastic filled. Rectangular casing seams shall be in the corners of the silencer shell to provide maximum unit strength and rigidity. Interior partitions shall be fabricated from single-piece, margin-perforated sheets and shall have die-formed entrance and exit shapes so as to provide the maximum aerodynamic efficiency and minimum self-noise characteristics in the sound attenuator. Blunt noses or squared off partitions will not be accepted.
- B. Interior partitions for tubular silencers shall be secured with galvanized steel radial mounting brackets welded to the partition and the outer casing. The radial brackets shall be installed full length and at 120 degree angles to each other to assure uniform spacing for consistent aerodynamic and acoustic performance.

- C. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing. Airtight construction shall be provided by use of a duct sealing compound on the job-site material and labor furnished by the contractor.

4.01 ACOUSTIC PERFORMANCE

- A. All silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated.

Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity. Data for rectangular and tubular type silencers shall be presented for tests conducted using silencers no smaller than the following cross-sections:

| | | | | |
|--------------------|--------|--------|-----|--------|
| Rectangular, inch: | 24x24, | 24x30, | or | 24x36, |
| and | | | | |
| Tubular, inch: | 12, | 24, | 36, | and 48 |

5.01 AERODYNAMIC PERFORMANCE

- A. Static pressure loss of silencers shall not exceed those listed in the silencer schedule as the airflow indicates. Airflow measurements shall be made in accordance with ASTM specification E477-99 and applicable portions of ASME, AMCA, and ADC airflow test codes. Tests shall be reported on the identical units for which acoustic data is presented.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

7.01 DUCT TRANSITIONS

- A. When transitions are required to adapt silencer dimensions to connecting duct work they shall be furnished by the installing contractor.



LOW FREQUENCY CONIC-FLOW SILENCERS

TYPE: FCS

with **FORWARD** and **REVERSE FLOW** Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 12 FCS 36

Diameter: 12" Type: FCS Length: 36"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 12FCS | -4,000 | 10 | 18 | 29 | 42 | 40 | 35 | 31 | 21 |
| | -2,000 | 10 | 17 | 27 | 39 | 38 | 35 | 32 | 26 |
| | 0 | 10 | 16 | 26 | 36 | 36 | 36 | 33 | 26 |
| | 2,000 | 9 | 14 | 24 | 33 | 34 | 37 | 34 | 27 |
| | 4,000 | 8 | 12 | 22 | 29 | 33 | 39 | 35 | 27 |
| 24FCS | -4,000 | 10 | 18 | 31 | 41 | 42 | 35 | 21 | 15 |
| | -2,000 | 10 | 16 | 29 | 38 | 40 | 35 | 22 | 17 |
| | 0 | 9 | 15 | 27 | 36 | 38 | 36 | 22 | 18 |
| | 2,000 | 8 | 13 | 25 | 32 | 37 | 35 | 23 | 19 |
| | 4,000 | 7 | 12 | 23 | 29 | 35 | 35 | 23 | 20 |
| 36FCS | -4,000 | 12 | 21 | 35 | 41 | 40 | 27 | 19 | 14 |
| | -2,000 | 11 | 20 | 33 | 38 | 39 | 27 | 21 | 14 |
| | 0 | 10 | 18 | 31 | 37 | 38 | 27 | 22 | 15 |
| | 2,000 | 9 | 16 | 29 | 35 | 36 | 28 | 23 | 16 |
| | 4,000 | 8 | 14 | 27 | 33 | 34 | 28 | 24 | 17 |
| 48FCS | -4,000 | 15 | 25 | 39 | 41 | 37 | 23 | 15 | 11 |
| | -2,000 | 13 | 22 | 37 | 39 | 36 | 23 | 17 | 12 |
| | 0 | 12 | 20 | 35 | 37 | 36 | 24 | 19 | 16 |
| | 2,000 | 10 | 18 | 33 | 35 | 35 | 24 | 20 | 16 |
| | 4,000 | 9 | 16 | 30 | 34 | 35 | 25 | 21 | 17 |
| 60FCS | -4,000 | 18 | 30 | 43 | 41 | 35 | 16 | 12 | 10 |
| | -2,000 | 16 | 27 | 41 | 40 | 34 | 17 | 13 | 11 |
| | 0 | 14 | 25 | 39 | 39 | 33 | 19 | 15 | 13 |
| | 2,000 | 12 | 22 | 37 | 37 | 33 | 20 | 16 | 15 |
| | 4,000 | 10 | 20 | 34 | 35 | 33 | 22 | 18 | 16 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Model | Duct Dia., in. Silencer L, in. | 12 36 | 14 36 | 16 36 | 18 36 | 20 40 | 22 44 | 24 48 | 26 52 |
|-------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| FCS | Weight, lb. | 99 | 111 | 132 | 149 | 168 | 188 | 208 | 234 |
| Model | Duct Dia., in. Silencer L, in. | 28 56 | 30 60 | 32 64 | 36 72 | 40 80 | 44 88 | 48 96 | 60 120 |
| FCS | Weight, lb. | 255 | 374 | 495 | 600 | 746 | 951 | 1140 | 1873 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-----------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| FCS | All Sizes | 0.04 | 0.06 | 0.07 | 0.10 | 0.12 | 0.15 | 0.19 | 0.22 | 0.26 | 0.30 | 0.34 | 0.39 | 0.44 | 0.50 | 0.55 | 0.61 |
| Silencer Face Velocity, fpm | | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| FCS All Sizes | -3,000 | 57 | 58 | 58 | 57 | 56 | 57 | 56 | 52 |
| | -2,000 | 50 | 49 | 51 | 49 | 46 | 47 | 45 | 39 |
| | -1,000 | 38 | 34 | 39 | 35 | 29 | 30 | 26 | 20 |
| | 1,000 | 44 | 43 | 37 | 37 | 38 | 38 | 20 | 20 |
| | 2,000 | 56 | 54 | 50 | 50 | 50 | 50 | 41 | 31 |
| | 3,000 | 63 | 60 | 57 | 57 | 57 | 57 | 53 | 47 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

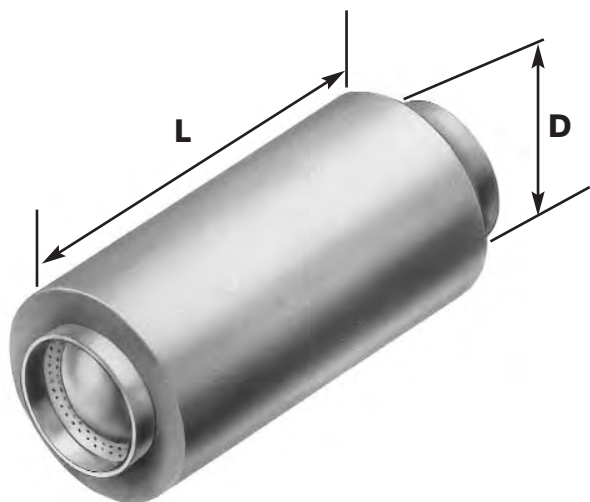
$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



LOW FREQUENCY CONIC-FLOW SILENCERS

TYPE: FCL

with **FORWARD** and **REVERSE FLOW** Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 12 FCL 36

Diameter: 12" Type: FCL Length: 36"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 12FCL | -4,000 | 8 | 17 | 25 | 30 | 35 | 34 | 23 | 18 |
| | -2,000 | 8 | 16 | 23 | 29 | 34 | 34 | 25 | 19 |
| | 0 | 8 | 15 | 22 | 27 | 33 | 31 | 26 | 21 |
| | 2,000 | 8 | 14 | 20 | 25 | 32 | 27 | 26 | 23 |
| | 4,000 | 7 | 12 | 18 | 23 | 31 | 29 | 27 | 23 |
| 24FCL | -4,000 | 9 | 16 | 26 | 31 | 35 | 21 | 15 | 12 |
| | -2,000 | 9 | 15 | 24 | 29 | 33 | 21 | 16 | 13 |
| | 0 | 8 | 14 | 23 | 28 | 34 | 23 | 19 | 15 |
| | 2,000 | 7 | 13 | 21 | 26 | 34 | 25 | 21 | 16 |
| | 4,000 | 6 | 12 | 20 | 24 | 32 | 25 | 21 | 17 |
| 36FCL | -4,000 | 11 | 20 | 29 | 33 | 30 | 20 | 17 | 12 |
| | -2,000 | 10 | 19 | 28 | 33 | 29 | 21 | 18 | 13 |
| | 0 | 9 | 17 | 26 | 32 | 29 | 23 | 19 | 15 |
| | 2,000 | 8 | 15 | 24 | 31 | 29 | 25 | 20 | 16 |
| | 4,000 | 7 | 13 | 22 | 30 | 28 | 25 | 20 | 16 |
| 48FCL | -4,000 | 12 | 22 | 33 | 37 | 30 | 17 | 13 | 11 |
| | -2,000 | 12 | 20 | 31 | 36 | 30 | 18 | 15 | 13 |
| | 0 | 11 | 19 | 29 | 35 | 30 | 20 | 17 | 15 |
| | 2,000 | 9 | 17 | 27 | 33 | 29 | 22 | 18 | 16 |
| | 4,000 | 9 | 16 | 24 | 32 | 28 | 23 | 18 | 17 |
| 60FCL | -4,000 | 15 | 26 | 36 | 38 | 29 | 15 | 11 | 10 |
| | -2,000 | 14 | 24 | 34 | 37 | 29 | 16 | 12 | 11 |
| | 0 | 13 | 22 | 33 | 36 | 28 | 19 | 15 | 14 |
| | 2,000 | 11 | 20 | 31 | 35 | 27 | 21 | 17 | 16 |
| | 4,000 | 10 | 18 | 28 | 35 | 26 | 20 | 17 | 17 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Model | Duct Dia., in. Silencer L, in. | 12 36 | 14 36 | 16 36 | 18 36 | 20 40 | 22 44 | 24 48 | 26 52 |
|------------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| FCL | Weight, lb. | 99 | 111 | 132 | 149 | 168 | 188 | 208 | 234 |

| Model | Duct Dia., in. Silencer L, in. | 28 56 | 30 60 | 32 64 | 36 72 | 40 80 | 44 88 | 48 96 | 60 120 |
|------------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| FCL | Weight, lb. | 255 | 374 | 495 | 600 | 746 | 951 | 1140 | 1873 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-----------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| FCL | All Sizes | 0.05 | 0.06 | 0.07 | 0.08 | 0.10 | 0.11 | 0.13 | 0.14 | 0.16 | 0.18 | 0.20 | 0.22 | 0.24 | 0.26 | 0.29 | 0.31 |
| Silencer Face Velocity, fpm | | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 | 4200 | 4400 | 4600 | 4800 | 5000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| FCL All Sizes | -3,000 | 56 | 56 | 55 | 56 | 55 | 55 | 50 | 45 |
| | -2,000 | 47 | 47 | 47 | 47 | 45 | 45 | 37 | 29 |
| | -1,000 | 31 | 32 | 32 | 31 | 30 | 30 | 20 | 20 |
| | 1,000 | 39 | 35 | 32 | 32 | 30 | 25 | 20 | 20 |
| | 2,000 | 52 | 48 | 46 | 46 | 45 | 42 | 39 | 25 |
| | 3,000 | 60 | 56 | 54 | 54 | 53 | 52 | 50 | 40 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

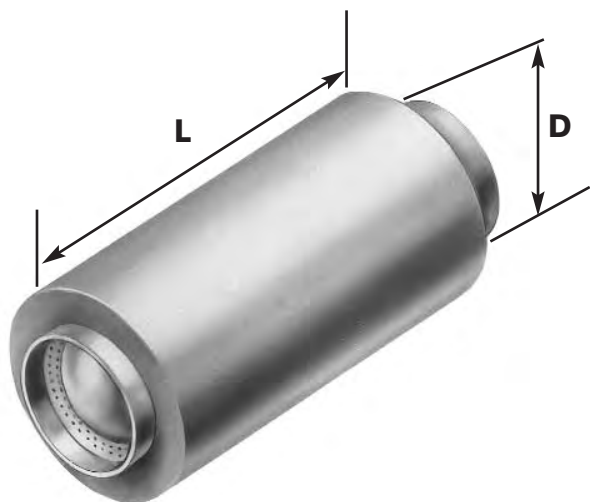
$$PD = (\text{Actual FV} / \text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



CONIC-FLOW SILENCERS

TYPE: CS

with **FORWARD** and **REVERSE FLOW** Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 12 CS 36

Diameter: 12" Type: CS Length: 36"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 12CS | -4,000 | 9 | 13 | 22 | 32 | 36 | 35 | 31 | 21 |
| | -2,000 | 7 | 10 | 19 | 31 | 34 | 35 | 32 | 26 |
| | 0 | 6 | 10 | 18 | 31 | 34 | 36 | 33 | 27 |
| | 2,000 | 4 | 9 | 16 | 30 | 34 | 37 | 33 | 27 |
| | 4,000 | 3 | 8 | 14 | 29 | 33 | 39 | 33 | 27 |
| 24CS | -4,000 | 10 | 12 | 20 | 34 | 43 | 34 | 20 | 11 |
| | -2,000 | 8 | 11 | 18 | 34 | 40 | 35 | 22 | 13 |
| | 0 | 7 | 11 | 18 | 30 | 38 | 36 | 23 | 17 |
| | 2,000 | 5 | 11 | 18 | 26 | 36 | 37 | 24 | 20 |
| | 4,000 | 4 | 10 | 17 | 25 | 34 | 37 | 27 | 21 |
| 36CS | -4,000 | 11 | 16 | 22 | 36 | 38 | 28 | 19 | 11 |
| | -2,000 | 10 | 15 | 20 | 35 | 37 | 29 | 21 | 12 |
| | 0 | 10 | 15 | 20 | 35 | 37 | 30 | 22 | 15 |
| | 2,000 | 9 | 14 | 19 | 35 | 36 | 31 | 23 | 17 |
| | 4,000 | 8 | 13 | 18 | 33 | 35 | 32 | 24 | 18 |
| 48CS | -4,000 | 12 | 18 | 23 | 37 | 36 | 20 | 13 | 11 |
| | -2,000 | 11 | 17 | 21 | 36 | 35 | 22 | 14 | 12 |
| | 0 | 11 | 17 | 21 | 35 | 35 | 24 | 17 | 14 |
| | 2,000 | 10 | 16 | 20 | 34 | 35 | 26 | 20 | 16 |
| | 4,000 | 9 | 14 | 19 | 34 | 35 | 27 | 21 | 17 |
| 60CS | -4,000 | 13 | 20 | 25 | 38 | 33 | 16 | 11 | 10 |
| | -2,000 | 12 | 19 | 24 | 36 | 32 | 18 | 12 | 11 |
| | 0 | 12 | 18 | 24 | 36 | 32 | 21 | 15 | 13 |
| | 2,000 | 11 | 17 | 23 | 35 | 31 | 23 | 17 | 15 |
| | 4,000 | 10 | 15 | 22 | 35 | 31 | 24 | 18 | 16 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Model | Duct Dia., in. Silencer L, in. | 12 36 | 14 36 | 16 36 | 18 36 | 20 40 | 22 44 | 24 48 | 26 52 |
|-------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| CS | Weight, lb. | 74 | 85 | 105 | 120 | 135 | 150 | 165 | 185 |
| Model | Duct Dia., in. Silencer L, in. | 28 56 | 30 60 | 32 64 | 36 72 | 40 80 | 44 88 | 48 96 | 60 120 |
| CS | Weight, lb. | 200 | 305 | 420 | 530 | 640 | 820 | 990 | 1660 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-----------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| CS | All Sizes | 0.06 | 0.08 | 0.11 | 0.15 | 0.19 | 0.23 | 0.28 | 0.33 | 0.39 | 0.45 | 0.52 | 0.59 | 0.67 | 0.75 | 0.83 | 0.92 |
| Silencer Face Velocity, fpm | | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| CS All Sizes | -3,000 | 57 | 58 | 58 | 57 | 56 | 57 | 56 | 52 |
| | -2,000 | 50 | 49 | 51 | 49 | 46 | 47 | 45 | 39 |
| | -1,000 | 38 | 34 | 39 | 35 | 29 | 30 | 26 | 20 |
| | 1,000 | 44 | 43 | 37 | 37 | 38 | 38 | 20 | 20 |
| | 2,000 | 56 | 54 | 50 | 50 | 50 | 50 | 41 | 31 |
| | 3,000 | 63 | 60 | 57 | 57 | 57 | 57 | 53 | 47 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



CONIC-FLOW SILENCERS

TYPE: CL

with **FORWARD** and **REVERSE FLOW** Ratings



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DESIGNATING A SILENCER

Model: 12 CL 36

Diameter: 12" Type: CL Length: 36"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 12CL | -4,000 | 7 | 9 | 17 | 32 | 35 | 34 | 22 | 12 |
| | -2,000 | 4 | 8 | 16 | 31 | 34 | 34 | 24 | 13 |
| | 0 | 4 | 7 | 15 | 30 | 34 | 35 | 24 | 15 |
| | 2,000 | 4 | 6 | 13 | 29 | 34 | 36 | 24 | 16 |
| | 4,000 | 4 | 6 | 13 | 26 | 33 | 36 | 24 | 17 |
| 24CL | -4,000 | 7 | 9 | 16 | 28 | 35 | 21 | 17 | 12 |
| | -2,000 | 6 | 9 | 14 | 27 | 35 | 23 | 18 | 13 |
| | 0 | 6 | 9 | 14 | 27 | 35 | 24 | 20 | 16 |
| | 2,000 | 5 | 8 | 13 | 26 | 34 | 25 | 22 | 18 |
| | 4,000 | 4 | 8 | 13 | 25 | 34 | 26 | 22 | 18 |
| 36CL | -4,000 | 9 | 12 | 18 | 32 | 30 | 19 | 16 | 11 |
| | -2,000 | 8 | 12 | 17 | 32 | 29 | 20 | 17 | 12 |
| | 0 | 8 | 12 | 17 | 32 | 29 | 23 | 19 | 15 |
| | 2,000 | 7 | 11 | 16 | 31 | 29 | 25 | 20 | 17 |
| | 4,000 | 7 | 10 | 15 | 31 | 28 | 25 | 20 | 17 |
| 48CL | -4,000 | 10 | 15 | 21 | 34 | 30 | 17 | 13 | 10 |
| | -2,000 | 10 | 14 | 20 | 33 | 30 | 18 | 14 | 11 |
| | 0 | 10 | 14 | 19 | 33 | 30 | 20 | 16 | 14 |
| | 2,000 | 9 | 14 | 18 | 33 | 29 | 22 | 18 | 16 |
| | 4,000 | 8 | 12 | 17 | 33 | 28 | 22 | 18 | 17 |
| 60CL | -4,000 | 12 | 17 | 22 | 35 | 29 | 15 | 11 | 10 |
| | -2,000 | 11 | 17 | 21 | 35 | 29 | 16 | 12 | 11 |
| | 0 | 11 | 17 | 21 | 35 | 28 | 18 | 14 | 13 |
| | 2,000 | 11 | 16 | 20 | 35 | 27 | 20 | 16 | 15 |
| | 4,000 | 10 | 14 | 19 | 35 | 26 | 20 | 16 | 16 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Model | Duct Dia., in. Silencer L, in. | 12 36 | 14 36 | 16 36 | 18 36 | 20 40 | 22 44 | 24 48 | 26 52 |
|-------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| CL | Weight, lb. | 74 | 85 | 105 | 120 | 135 | 150 | 165 | 185 |
| Model | Duct Dia., in. Silencer L, in. | 28 56 | 30 60 | 32 64 | 36 72 | 40 80 | 44 88 | 48 96 | 60 120 |
| CL | Weight, lb. | 200 | 305 | 420 | 530 | 640 | 820 | 990 | 1660 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-----------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| CL | All Sizes | 0.06 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 | 0.16 | 0.18 | 0.20 | 0.23 | 0.25 | 0.28 | 0.30 | 0.33 | 0.36 | 0.39 |
| Silencer Face Velocity, fpm | | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 | 4200 | 4400 | 4600 | 4800 | 5000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| CL All Sizes | -3,000 | 56 | 56 | 55 | 56 | 55 | 55 | 50 | 45 |
| | -2,000 | 47 | 47 | 47 | 47 | 45 | 45 | 37 | 29 |
| | -1,000 | 31 | 32 | 32 | 31 | 30 | 30 | 20 | 20 |
| | 1,000 | 39 | 35 | 32 | 32 | 30 | 25 | 20 | 20 |
| | 2,000 | 52 | 48 | 46 | 46 | 45 | 42 | 39 | 25 |
| | 3,000 | 60 | 56 | 54 | 54 | 53 | 52 | 50 | 40 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

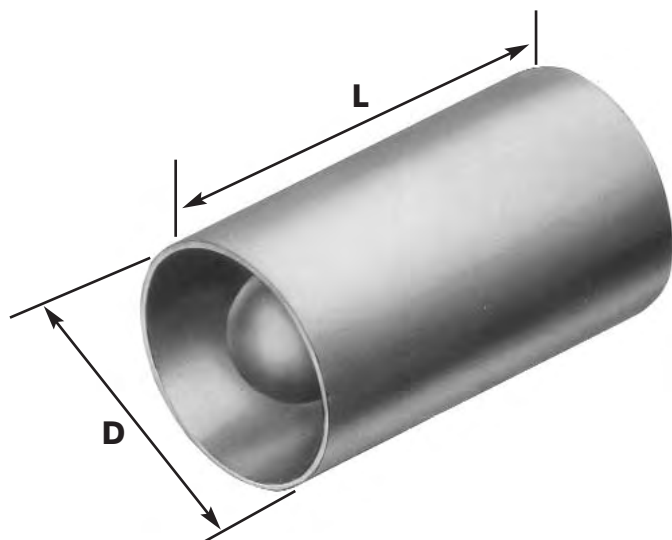
$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



CONIC-FLOW SILENCERS

TYPE: NS

with **FORWARD** and **REVERSE FLOW** Ratings



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DESIGNATING A SILENCER

Model: 12 NS 36

Diameter: 12" Type: NS Length: 36"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 12NS | -4,000 | 3 | 4 | 9 | 15 | 24 | 21 | 13 | 8 |
| | -2,000 | 3 | 4 | 9 | 14 | 24 | 21 | 13 | 8 |
| | 0 | 3 | 4 | 9 | 14 | 22 | 21 | 14 | 10 |
| | 2,000 | 3 | 4 | 9 | 14 | 19 | 21 | 14 | 12 |
| | 4,000 | 3 | 4 | 9 | 14 | 17 | 21 | 14 | 12 |
| 24NS | -4,000 | 4 | 11 | 16 | 22 | 25 | 19 | 11 | 10 |
| | -2,000 | 4 | 10 | 15 | 20 | 24 | 21 | 12 | 11 |
| | 0 | 4 | 10 | 15 | 19 | 24 | 21 | 12 | 12 |
| | 2,000 | 4 | 10 | 14 | 18 | 23 | 21 | 12 | 12 |
| | 4,000 | 4 | 9 | 13 | 17 | 23 | 21 | 12 | 12 |
| 36NS | -4,000 | 6 | 13 | 17 | 23 | 23 | 15 | 10 | 8 |
| | -2,000 | 6 | 13 | 17 | 22 | 23 | 16 | 11 | 9 |
| | 0 | 6 | 13 | 17 | 21 | 23 | 17 | 11 | 10 |
| | 2,000 | 6 | 13 | 17 | 20 | 22 | 17 | 11 | 10 |
| | 4,000 | 6 | 12 | 16 | 19 | 22 | 17 | 11 | 10 |
| 48NS | -4,000 | 7 | 15 | 19 | 25 | 22 | 11 | 9 | 7 |
| | -2,000 | 7 | 15 | 19 | 23 | 20 | 12 | 10 | 8 |
| | 0 | 7 | 15 | 19 | 23 | 20 | 12 | 10 | 8 |
| | 2,000 | 7 | 15 | 19 | 23 | 20 | 12 | 10 | 8 |
| | 4,000 | 7 | 15 | 19 | 22 | 20 | 12 | 10 | 8 |
| 60NS | -4,000 | 10 | 17 | 21 | 23 | 19 | 8 | 7 | 6 |
| | -2,000 | 10 | 17 | 20 | 23 | 18 | 9 | 8 | 7 |
| | 0 | 10 | 17 | 20 | 23 | 18 | 10 | 9 | 8 |
| | 2,000 | 10 | 17 | 20 | 22 | 17 | 10 | 9 | 8 |
| | 4,000 | 9 | 16 | 19 | 22 | 17 | 10 | 10 | 9 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Model | Duct Dia., in. Silencer L, in. | 12 36 | 14 36 | 16 36 | 18 36 | 20 40 | 22 44 | 24 48 | 26 52 |
|-------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| NS | Weight, lb. | 40 | 55 | 75 | 95 | 110 | 125 | 140 | 200 |

| Model | Duct Dia., in. Silencer L, in. | 28 56 | 30 60 | 32 64 | 36 72 | 40 80 | 44 88 | 48 96 | 60 120 |
|-------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| NS | Weight, lb. | 255 | 310 | 365 | 425 | 480 | 565 | 650 | 1640 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-----------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| NS | All Sizes | 0.05 | 0.08 | 0.10 | 0.13 | 0.17 | 0.21 | 0.25 | 0.30 | 0.36 | 0.41 | 0.47 | 0.54 | 0.61 | 0.68 | 0.76 | 0.84 |
| Silencer Face Velocity, fpm | | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| NS All Sizes | -3,000 | 59 | 56 | 55 | 57 | 57 | 59 | 55 | 50 |
| | -2,000 | 51 | 48 | 47 | 48 | 49 | 51 | 44 | 36 |
| | -1,000 | 37 | 34 | 33 | 33 | 35 | 38 | 26 | 20 |
| | 1,000 | 44 | 37 | 33 | 32 | 35 | 31 | 20 | 20 |
| | 2,000 | 56 | 48 | 45 | 45 | 47 | 46 | 38 | 28 |
| | 3,000 | 63 | 54 | 52 | 53 | 54 | 55 | 50 | 43 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

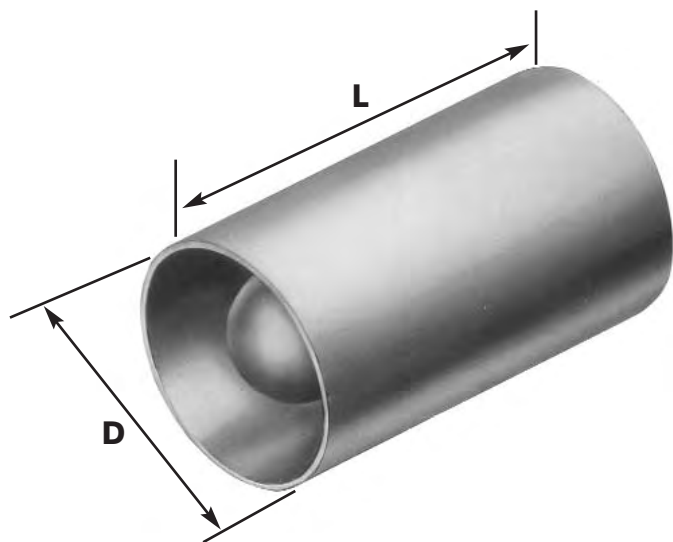
TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



LOW FREQUENCY CONIC-FLOW SILENCERS

TYPE: NL**with FORWARD and REVERSE FLOW Ratings**

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DESIGNATING A SILENCER

Model: 12 NL 36

Diameter: 12" Type: NL Length: 36"

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| IAC MODEL | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 12NL | -4,000 | 2 | 5 | 10 | 11 | 17 | 15 | 9 | 8 |
| | -2,000 | 1 | 3 | 9 | 11 | 16 | 15 | 9 | 9 |
| | 0 | 1 | 3 | 9 | 11 | 16 | 15 | 10 | 10 |
| | 2,000 | 1 | 3 | 9 | 11 | 15 | 15 | 10 | 10 |
| | 4,000 | 1 | 3 | 8 | 10 | 14 | 15 | 10 | 10 |
| 24NL | -4,000 | 5 | 11 | 14 | 17 | 18 | 14 | 10 | 8 |
| | -2,000 | 3 | 10 | 12 | 16 | 17 | 14 | 10 | 9 |
| | 0 | 3 | 10 | 12 | 16 | 17 | 14 | 11 | 10 |
| | 2,000 | 3 | 9 | 11 | 15 | 16 | 14 | 11 | 10 |
| | 4,000 | 3 | 9 | 11 | 15 | 16 | 14 | 11 | 10 |
| 36NL | -4,000 | 6 | 12 | 16 | 18 | 16 | 12 | 9 | 6 |
| | -2,000 | 4 | 11 | 14 | 17 | 15 | 12 | 9 | 7 |
| | 0 | 4 | 11 | 14 | 17 | 15 | 12 | 10 | 8 |
| | 2,000 | 4 | 10 | 13 | 16 | 15 | 12 | 10 | 8 |
| | 4,000 | 4 | 10 | 13 | 16 | 15 | 13 | 11 | 8 |
| 48NL | -4,000 | 8 | 13 | 18 | 17 | 14 | 10 | 8 | 4 |
| | -2,000 | 5 | 11 | 16 | 16 | 14 | 10 | 9 | 6 |
| | 0 | 5 | 11 | 16 | 16 | 14 | 11 | 9 | 7 |
| | 2,000 | 5 | 11 | 15 | 15 | 14 | 11 | 9 | 7 |
| | 4,000 | 5 | 11 | 15 | 15 | 14 | 11 | 10 | 7 |
| 60NL | -4,000 | 10 | 14 | 18 | 17 | 11 | 9 | 6 | 4 |
| | -2,000 | 7 | 13 | 16 | 16 | 11 | 9 | 7 | 5 |
| | 0 | 7 | 13 | 16 | 16 | 11 | 10 | 7 | 6 |
| | 2,000 | 7 | 13 | 15 | 15 | 11 | 10 | 7 | 6 |
| | 4,000 | 7 | 13 | 15 | 15 | 11 | 10 | 8 | 7 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Model | Duct Dia., in. Silencer L, in. | 12 36 | 14 36 | 16 36 | 18 36 | 20 40 | 22 44 | 24 48 | 26 52 |
|-------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| NL | Weight, lb. | 40 | 55 | 75 | 95 | 110 | 125 | 140 | 200 |

| Model | Duct Dia., in. Silencer L, in. | 28 56 | 30 60 | 32 64 | 36 72 | 40 80 | 44 88 | 48 96 | 60 120 |
|-------|-----------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| NL | Weight, lb. | 255 | 310 | 365 | 425 | 480 | 565 | 650 | 1640 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-----------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| NL | All Sizes | 0.11 | 0.13 | 0.15 | 0.18 | 0.21 | 0.24 | 0.27 | 0.30 | 0.34 | 0.38 | 0.42 | 0.46 | 0.51 | 0.56 | 0.61 | 0.66 |
| Silencer Face Velocity, fpm | | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3800 | 4000 | 4200 | 4400 | 4600 | 4800 | 5000 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| NL All Sizes | -3,000 | 60 | 59 | 59 | 58 | 59 | 58 | 53 | 43 |
| | -2,000 | 53 | 51 | 51 | 51 | 51 | 50 | 41 | 32 |
| | -1,000 | 40 | 38 | 38 | 38 | 38 | 36 | 20 | 20 |
| | 1,000 | 39 | 35 | 32 | 32 | 30 | 25 | 21 | 20 |
| | 2,000 | 52 | 48 | 46 | 46 | 45 | 42 | 39 | 26 |
| | 3,000 | 59 | 56 | 54 | 54 | 53 | 52 | 50 | 40 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

1.01 GENERAL

- A. Furnish and install "D-Duct" acoustic diffuser silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 MATERIALS

- A. Outer casings of tubular silencers shall be made of type #G-90 lock-former-quality galvanized steel in the following gauges based on the smallest diameter of the internal diffuser cone:

| Cone Diameter, in. Up to 35.5 | Metal Gauge 22 | Cone Diameter, in. Up to 35.5 | Metal Gauge 22 |
|----------------------------------|-------------------|----------------------------------|-------------------|
| > 36 | 18 | > 36 | 18 |

- B. Diffuser silencers shall include an internal core of consistent diameter along the entire length in the direction of airflow. The core diameter shall be selected based on the adjacent hub diameter or, in the case of C-frame mounted motors, the motor frame size for the respective fan system on which the diffuser silencer is installed.
- C. The internal core shall be constructed from lock-former-quality type G-90 galvanized perforated steel in the same gauge as the internal diffuser cone. The core shall be supported by a minimum of three (3) welded radial attachment brackets installed at 120 degree angles to each other to provide uniform support.
- D. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:
- Flamespread Classification 20
- Smoke Development Rating 20

3.01 CONSTRUCTION

- A. Four inch long, 11 gauge, sleeved end connections shall be provided as standard. When noted, rolled angle flanges shall be factory welded to the sleeve.
- B. For units where the minimum diffuser cone diameter is 36" or greater, an additional support rod shall be welded between the radial bracket and the sleeve to prevent a twist from being exerted on the internal core by the fan's air flow.
- C. All welds shall be touched-up with zinc-rich paint after fabrication by the manufacturer.

- D. The internal core and the rectangular outer jacket of the Diffuser Silencers shall be filled with glass fiber of a density sufficient to obtain the specified acoustic performance. The fill shall be packed under not less than 5% compression to eliminate voids due to vibration or settling. The fill material shall be inert, vermin- and moisture-proof.

4.01 ACOUSTIC PERFORMANCE

- A. All silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated.
- Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity.

5.01 AERODYNAMIC PERFORMANCE

- A. Diffuser Silencers shall function as pressure regain devices to minimize system pressure losses at the fan. Fan selections are based on the regain performance of the Diffuser Silencer configurations specified. Any deviations in configuration which adversely affect the fan performance efficiency will not be accepted.
- B. Silencers shall not fail structurally when exposed to a differential air pressure of 8 inches water gauge inside to outside the casing.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

7.01 DUCT TRANSITIONS

- A. When transitions are required to adapt silencer dimensions to connecting duct work they shall be furnished by the installing contractor.



D-DUCT DIFFUSER SILENCERS

TYPE: DDS

with **FORWARD** and **REVERSE FLOW** Ratings

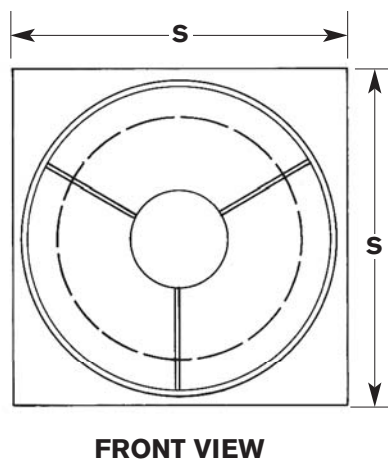
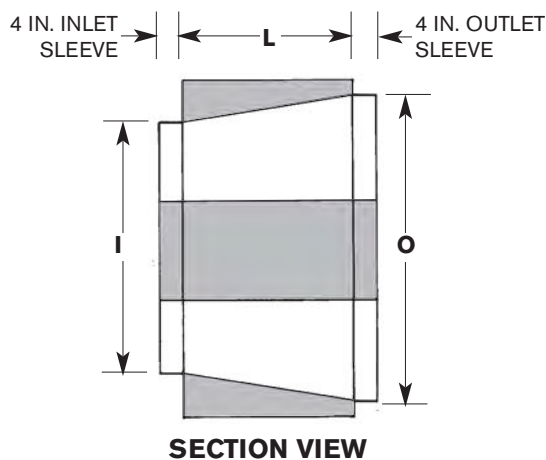


Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Model | PHYSICAL DATA | | | | | DYNAMIC INSERTION LOSS, Db | | | | | | | |
|-------|-------------------------|--------------------------|----------|----------|--------------|----------------------------------|-----|-----|-----|------|------|------|------|
| | I Inlet Dia., in, | O Outlet Dia., in, | S in. | L in. | Weight lb | Octave Band Center Frequency, Hz | | | | | | | |
| | | | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| 18-A | 18.5 | 24 | 28 | 20.0 | 125 | - | 3 | 13 | 22 | 27 | 23 | 17 | 13 |
| 20-A | 20.5 | 28 | 32 | 20.0 | 140 | - | 2 | 12 | 20 | 26 | 22 | 16 | 12 |
| 24-A | 24.5 | 30 | 34 | 24.0 | 165 | 1 | 4 | 14 | 20 | 24 | 20 | 15 | 12 |
| 24-B | 24.5 | 30 | 34 | 24.0 | 180 | 1 | 5 | 15 | 20 | 25 | 21 | 15 | 12 |
| 30-A | 30.5 | 40 | 44 | 30.0 | 225 | 1 | 7 | 15 | 19 | 21 | 17 | 14 | 12 |
| 30-B | 30.5 | 40 | 44 | 30.0 | 240 | 1 | 8 | 15 | 19 | 21 | 17 | 14 | 12 |
| 30-C | 30.5 | 40 | 44 | 30.0 | 260 | 2 | 8 | 15 | 19 | 21 | 18 | 14 | 12 |
| 36-A | 36.5 | 46 | 50 | 37.75 | 290 | 2 | 8 | 15 | 18 | 17 | 13 | 12 | 11 |
| 36-B | 36.5 | 46 | 50 | 37.75 | 300 | 2 | 9 | 15 | 18 | 17 | 13 | 11 | 10 |
| 36-C | 36.5 | 46 | 50 | 37.75 | 310 | 2 | 9 | 15 | 18 | 18 | 14 | 11 | 10 |
| 36-D | 36.5 | 46 | 50 | 37.75 | 325 | 2 | 9 | 16 | 18 | 19 | 14 | 11 | 10 |
| 42-A | 42.5 | 52 | 56 | 36.0 | 400 | 3 | 10 | 16 | 17 | 16 | 12 | 10 | 9 |
| 42-B | 42.5 | 52 | 56 | 36.0 | 410 | 3 | 10 | 16 | 17 | 16 | 12 | 11 | 10 |
| 42-C | 42.5 | 52 | 56 | 36.0 | 430 | 3 | 10 | 16 | 18 | 16 | 13 | 11 | 10 |
| 48-A | 48.5 | 60 | 64 | 43.5 | 550 | 3 | 11 | 17 | 18 | 16 | 12 | 10 | 10 |
| 48-B | 48.5 | 60 | 64 | 43.5 | 580 | 3 | 11 | 17 | 18 | 16 | 12 | 11 | 10 |
| 48-C | 48.5 | 60 | 64 | 43.5 | 610 | 3 | 11 | 18 | 19 | 17 | 13 | 12 | 10 |
| 54-A | 55.25 | 68 | 72 | 48.0 | 700 | 3 | 11 | 17 | 18 | 16 | 12 | 10 | 10 |
| 54-B | 55.25 | 68 | 72 | 48.0 | 750 | 3 | 11 | 17 | 18 | 16 | 12 | 11 | 10 |
| 54-C | 55.25 | 68 | 72 | 48.0 | 790 | 3 | 11 | 17 | 19 | 17 | 12 | 12 | 10 |
| 60-A | 61.0 | 74 | 78 | 52.75 | 750 | 4 | 12 | 18 | 19 | 14 | 10 | 10 | 10 |
| 60-B | 61.0 | 74 | 78 | 52.75 | 790 | 4 | 12 | 18 | 20 | 16 | 12 | 11 | 10 |
| 66-A | 67.0 | 82 | 86 | 58.5 | 1190 | 4 | 12 | 18 | 19 | 14 | 10 | 10 | 10 |
| 66-B | 67.0 | 82 | 86 | 58.5 | 1250 | 4 | 12 | 18 | 20 | 16 | 12 | 11 | 10 |
| 70-A | 73.0 | 90 | 94 | 68.0 | 1400 | 4 | 12 | 17 | 16 | 12 | 10 | 10 | 10 |
| 70-B | 73.0 | 90 | 94 | 68.0 | 1500 | 4 | 12 | 18 | 18 | 15 | 10 | 10 | 10 |

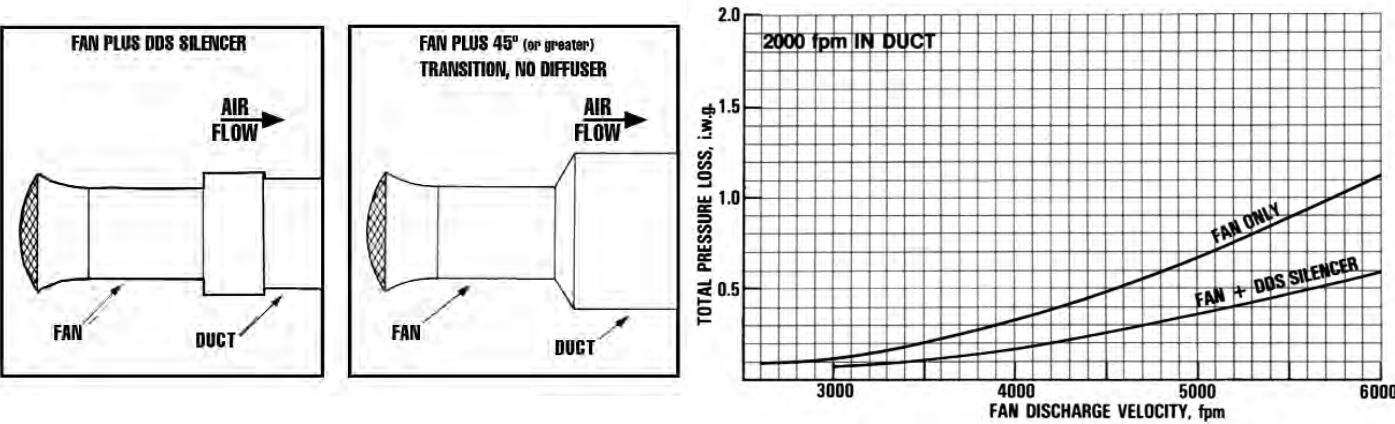
Custom sizes are available. Please contact an IAC representative for details.



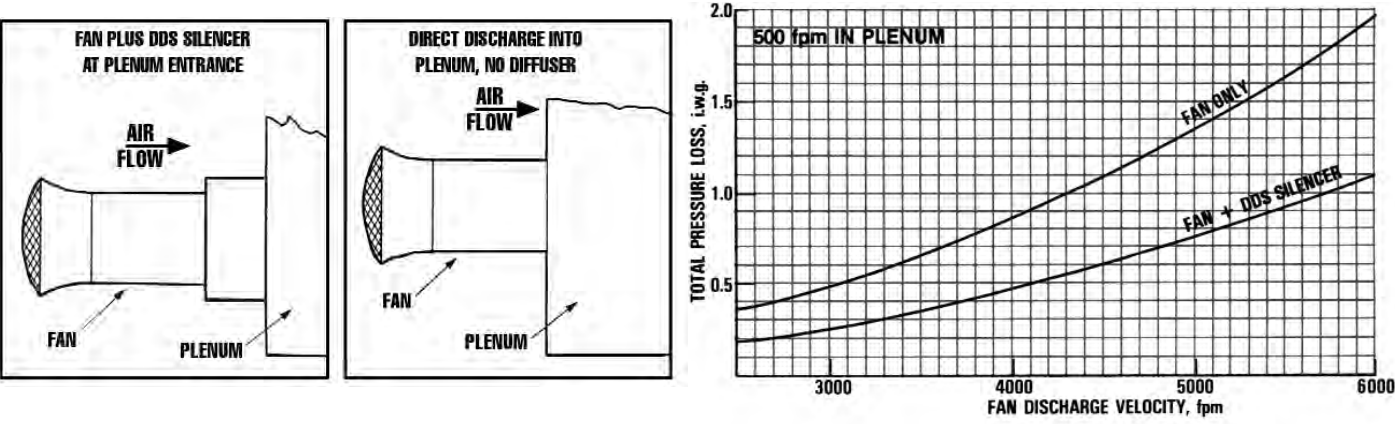
(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

The IAC D-Duct Diffuser Silencer (DDS) is designed for installation at the outlet of vane axial fans. Available in both standard and custom sizes, the DDS can be fitted directly to the fan and has excellent acoustic performance. The IAC DDS also acts as a pressure-regain device, so overall system performance will be improved with the addition of a D-Duct. Finally, the IAC DDS can also be used as an effective inlet cone and silencer. For further information on this product please contact an IAC representative.

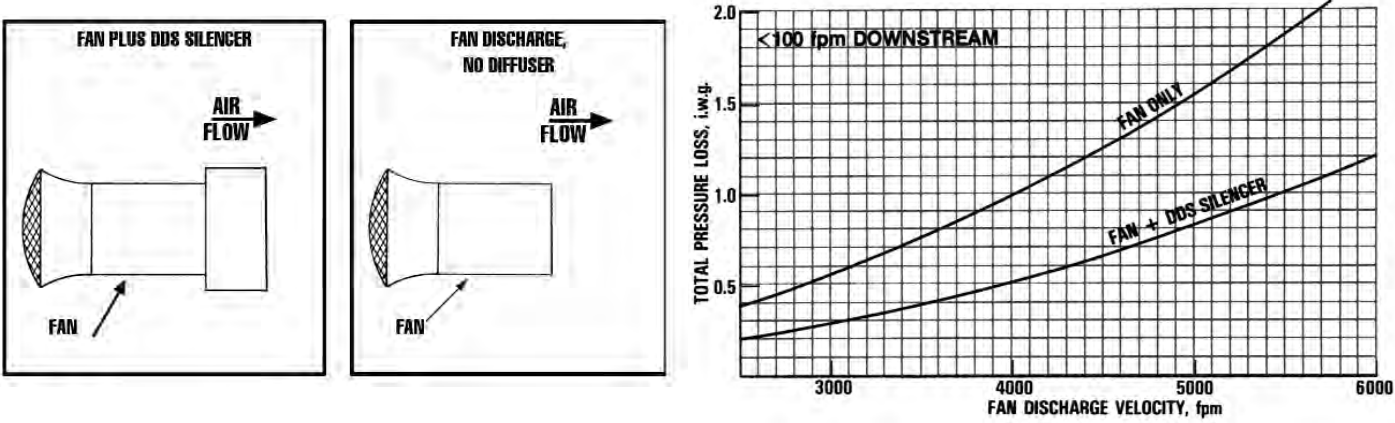
Ducted Discharge



Discharge Into Low Velocity Plenums



Free Discharge



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

QUIET-DUCT ULTRA PALS™ PACKLESS SILENCERS

1.01 GENERAL

- A. Furnish and install "Ultra-Pals" Packless Silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any change in this specification must be submitted in writing to and approved by the Architect/Engineer, in writing, at least 10 days prior to bid due-date.

2.01 MATERIALS

- A. Unless otherwise specified, the silencers shall be constructed of Type #G-90 lock-former-quality galvanized steel. The silencer casings shall be a minimum of #22 Gauge solid galvanized. The internal partitions shall be a minimum of #26 Gauge perforated galvanized.
- B. No sound absorptive material of any kind is to be used in the silencers. The silencers shall attenuate air/gas transmitted noise solely by virtue of controlled impedance membranes and broadly tuned resonators.
- C. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested to ASTM E 84, NFPA Standard 255, or UL No. 723:
- Flamespread Classification 0
- Smoke Development Rating 0

3.01 CONSTRUCTION

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Seams shall be lock formed and mastic filled. Rectangular casing seams shall be in the corners of the silencer shell to provide maximum unit strength and rigidity. Interior partitions shall be fabricated from single piece; margin perforated sheets and shall have die-formed entrance and exit shapes so as to provide the maximum aerodynamic efficiency and minimum self-noise characteristics in the sound attenuator. Blunt noses or squared off partitions will not be accepted.
- B. The interior partitions shall be attached to the casing by means of an interlocking track assembly. Tracks shall be solid galvanized steel and shall be welded to the outer casing. Attachment of the interior partitions to the tracks shall be such that a minimum of 4 thicknesses of metal exist at this location.
- C. The track assembly shall stiffen the exterior casing, provide a reinforced attachment detail for the interior partitions, and shall maintain a uniform airspace width along the length of the silencer for consistent aerodynamic and acoustic performance.

- D. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing.

4.01 ACOUSTIC PERFORMANCE

- A. Silencer ratings shall be determined in a duct-to-reverberant room test facility which provides for airflow in both directions through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated.
- B. Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 1000 fpm entering face velocity. Data for rectangular silencers shall be presented for tests conducted using silencers no smaller than the following cross-sections:
- Rectangular, inch: 24x24, 24x30, or 24x36.

5.01 AERODYNAMIC PERFORMANCE

- A. Static pressure loss of silencers shall not exceed those listed in the silencer schedule as the airflow indicates. Airflow measurements shall be made in accordance with ASTM specification E477-99 and applicable portions of ASME, AMCA, and ADC airflow test codes. Tests shall be reported on the identical units for which acoustic data is presented.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply certified test data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Reverse and Forward Flow test conditions. Test data shall be for a standard product. All rating tests shall be conducted in the same facility, shall utilize the same silencer, and shall be open to inspection upon request from the Architect/Engineer.

7.01 DUCT TRANSITIONS

- A. When transitions are required to adapt silencer dimensions to connecting duct work, they shall be furnished by the installing contractor.

**ULTRA-PALS™ PACKLESS SILENCERS****TYPE: XM****with FORWARD and REVERSE FLOW Ratings**

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 XM 24 x 18

Length: 5'

Type: XM

Width: 24"

Height: 18"

- NO FIBERGLASS
- NO FOAM
- NO MINERAL WOOL
- NO FILL OF ANY KIND

The complete absence of fill, combined with the ease of cleaning and draining, makes IAC Ultra-Pals Silencers well-suited for chemical plants, refineries and facilities handling gasoline, grease, solvents or other hazardous materials.

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3XM | -1,500 | 6 | 8 | 12 | 18 | 22 | 13 | 10 | 7 |
| | -1,000 | 6 | 6 | 10 | 17 | 20 | 12 | 9 | 8 |
| | 0 | 4 | 4 | 7 | 15 | 17 | 11 | 10 | 9 |
| | 1,000 | 6 | 4 | 10 | 17 | 20 | 12 | 10 | 9 |
| | 1,500 | 5 | 5 | 11 | 17 | 23 | 13 | 10 | 8 |
| 6XM | -1,500 | 10 | 15 | 23 | 33 | 30 | 16 | 11 | 10 |
| | -1,000 | 9 | 12 | 17 | 30 | 25 | 14 | 12 | 11 |
| | 0 | 5 | 7 | 11 | 25 | 22 | 14 | 13 | 12 |
| | 1,000 | 7 | 9 | 15 | 27 | 25 | 14 | 14 | 12 |
| | 1,500 | 7 | 11 | 17 | 30 | 29 | 16 | 14 | 13 |
| 9XM | -1,500 | 12 | 22 | 32 | 39 | 38 | 21 | 16 | 13 |
| | -1,000 | 10 | 19 | 26 | 36 | 31 | 19 | 18 | 16 |
| | 0 | 7 | 12 | 15 | 31 | 27 | 19 | 18 | 17 |
| | 1,000 | 8 | 16 | 22 | 35 | 29 | 20 | 19 | 18 |
| | 1,500 | 7 | 17 | 25 | 38 | 34 | 22 | 18 | 17 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 12 12 | 12 18 | 12 24 | 12 30 | 12 36 | 12 48 | 24 12 | 24 18 | 24 24 | 24 30 | 24 36 | 24 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 28 | 37 | 45 | 54 | 63 | 72 | 55 | 67 | 82 | 98 | 113 | 130 |
| 6 feet | | 56 | 74 | 90 | 108 | 126 | 144 | 110 | 134 | 164 | 196 | 226 | 258 |
| 9 feet | | 84 | 111 | 135 | 162 | 189 | 216 | 156 | 201 | 246 | 294 | 339 | 380 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| XM | 3 | 0.02 | 0.03 | 0.04 | 0.06 | 0.07 | 0.09 | 0.11 | 0.13 | 0.15 | 0.17 | 0.20 | 0.23 | 0.26 | 0.29 | 0.32 | 0.36 |
| | 6 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 | 0.15 | 0.17 | 0.20 | 0.24 | 0.27 | 0.31 | 0.35 | 0.39 | 0.43 | 0.48 |
| | 9 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.26 | 0.30 | 0.34 | 0.39 | 0.44 | 0.49 | 0.55 | 0.60 |
| Silencer Face Velocity, fpm | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 3XM | -1,500 | 54 | 52 | 56 | 58 | 59 | 64 | 65 | 58 |
| | -1,000 | 42 | 44 | 49 | 51 | 55 | 59 | 55 | 45 |
| | 1,000 | 46 | 42 | 44 | 46 | 52 | 57 | 55 | 52 |
| | 1,500 | 54 | 54 | 57 | 54 | 54 | 62 | 65 | 59 |
| 6XM 9XM | -2,000 | 64 | 61 | 58 | 59 | 60 | 64 | 67 | 64 |
| | -1,000 | 56 | 52 | 52 | 52 | 55 | 61 | 60 | 50 |
| | 1,000 | 58 | 54 | 49 | 46 | 52 | 60 | 60 | 50 |
| | 2,000 | 66 | 67 | 65 | 61 | 58 | 63 | 69 | 67 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**ULTRA-PALS™ PACKLESS SILENCERS****TYPE: XL****with FORWARD and REVERSE FLOW Ratings**

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 XL 24 x 18

Length: 5'

Type: XL

Width: 24"

Height: 18"

- NO FIBERGLASS
- NO FOAM
- NO MINERAL WOOL
- NO FILL OF ANY KIND

The complete absence of fill, combined with the ease of cleaning and draining, makes IAC Ultra-Pals Silencers well-suited for chemical plants, refineries and facilities handling gasoline, grease, solvents or other hazardous materials.

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3XL | -1,500 | 9 | 12 | 18 | 21 | 13 | 11 | 9 | 7 |
| | -1,000 | 8 | 10 | 16 | 20 | 12 | 11 | 9 | 7 |
| | 0 | 8 | 7 | 15 | 17 | 11 | 11 | 9 | 8 |
| | 1,000 | 7 | 8 | 17 | 21 | 13 | 11 | 9 | 8 |
| | 1,500 | 7 | 9 | 18 | 21 | 14 | 13 | 9 | 9 |
| 6XL | -1,500 | 12 | 20 | 25 | 30 | 19 | 16 | 13 | 10 |
| | -1,000 | 12 | 18 | 23 | 27 | 18 | 15 | 13 | 10 |
| | 0 | 8 | 11 | 19 | 23 | 16 | 14 | 13 | 11 |
| | 1,000 | 11 | 14 | 23 | 28 | 19 | 15 | 13 | 12 |
| | 1,500 | 10 | 15 | 24 | 30 | 21 | 17 | 14 | 12 |
| 9XL | -1,500 | 19 | 28 | 32 | 38 | 27 | 21 | 16 | 11 |
| | -1,000 | 16 | 25 | 29 | 34 | 24 | 19 | 16 | 12 |
| | 0 | 11 | 15 | 22 | 27 | 20 | 18 | 16 | 15 |
| | 1,000 | 13 | 20 | 29 | 33 | 25 | 20 | 16 | 16 |
| | 1,500 | 13 | 21 | 29 | 35 | 26 | 23 | 18 | 15 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 12 12 | 12 18 | 12 24 | 12 30 | 12 36 | 12 48 | 24 12 | 24 18 | 24 24 | 24 30 | 24 36 | 24 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 25 | 33 | 40 | 47 | 55 | 63 | 42 | 52 | 63 | 73 | 84 | 95 |
| 6 feet | | 50 | 66 | 80 | 94 | 110 | 125 | 85 | 104 | 126 | 146 | 168 | 188 |
| 9 feet | | 75 | 99 | 120 | 141 | 165 | 188 | 126 | 156 | 189 | 219 | 252 | 284 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| XL | 3 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 | 0.15 | 0.17 | 0.20 | 0.24 | 0.27 | 0.31 | 0.35 | 0.39 | 0.43 | 0.48 |
| | 6 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.26 | 0.30 | 0.34 | 0.39 | 0.44 | 0.49 | 0.55 | 0.60 |
| | 9 | 0.04 | 0.06 | 0.09 | 0.11 | 0.14 | 0.18 | 0.22 | 0.26 | 0.30 | 0.35 | 0.40 | 0.46 | 0.51 | 0.58 | 0.64 | 0.71 |
| Silencer Face Velocity, fpm | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 3XL | -1,500 | 54 | 52 | 56 | 58 | 59 | 64 | 65 | 58 |
| | -1,000 | 42 | 44 | 49 | 51 | 55 | 59 | 55 | 45 |
| | 1,000 | 46 | 42 | 44 | 46 | 52 | 57 | 55 | 52 |
| | 1,500 | 54 | 54 | 57 | 54 | 54 | 62 | 65 | 59 |
| 6XL 9XL | -2,000 | 64 | 61 | 58 | 59 | 60 | 64 | 67 | 64 |
| | -1,000 | 56 | 52 | 52 | 52 | 55 | 61 | 60 | 50 |
| | 1,000 | 58 | 54 | 49 | 46 | 52 | 60 | 60 | 50 |
| | 2,000 | 66 | 67 | 65 | 61 | 58 | 63 | 69 | 67 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**ULTRA-PALS™ PACKLESS SILENCERS****TYPE: KL****with FORWARD and REVERSE FLOW Ratings**

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 KL 24 x 18

Length: 5'

Type: KL

Width: 24"

Height: 18"

- NO FIBERGLASS
- NO FOAM
- NO MINERAL WOOL
- NO FILL OF ANY KIND

The complete absence of fill, combined with the ease of cleaning and draining, makes IAC Ultra-Pals Silencers well-suited for chemical plants, refineries and facilities handling gasoline, grease, solvents or other hazardous materials.

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3KL | -2,000 | 7 | 9 | 16 | 14 | 11 | 8 | 7 | 6 |
| | -1,000 | 4 | 6 | 14 | 12 | 8 | 7 | 7 | 6 |
| | 0 | 5 | 4 | 11 | 9 | 7 | 7 | 7 | 5 |
| | 1,000 | 4 | 5 | 13 | 11 | 7 | 7 | 6 | 4 |
| | 2,000 | 5 | 7 | 15 | 13 | 10 | 8 | 7 | 5 |
| 6KL | -2,000 | 9 | 10 | 22 | 16 | 11 | 9 | 8 | 9 |
| | -1,000 | 7 | 8 | 18 | 14 | 10 | 9 | 8 | 9 |
| | 0 | 6 | 6 | 16 | 14 | 9 | 9 | 9 | 8 |
| | 1,000 | 6 | 7 | 18 | 14 | 10 | 9 | 8 | 8 |
| | 2,000 | 8 | 8 | 21 | 16 | 12 | 10 | 8 | 7 |
| 9KL | -2,000 | 13 | 15 | 28 | 19 | 15 | 10 | 10 | 9 |
| | -1,000 | 11 | 11 | 24 | 17 | 13 | 10 | 10 | 9 |
| | 0 | 9 | 9 | 20 | 17 | 12 | 11 | 10 | 9 |
| | 1,000 | 10 | 9 | 24 | 17 | 13 | 11 | 10 | 8 |
| | 2,000 | 11 | 11 | 28 | 19 | 15 | 12 | 10 | 8 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 15 12 | 15 18 | 15 24 | 15 30 | 15 36 | 15 48 | 30 12 | 30 18 | 30 24 | 30 30 | 30 36 | 30 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 30 | 37 | 44 | 51 | 59 | 67 | 51 | 61 | 71 | 82 | 92 | 102 |
| 6 feet | | 60 | 74 | 88 | 102 | 118 | 132 | 101 | 122 | 142 | 164 | 184 | 204 |
| 9 feet | | 90 | 111 | 132 | 153 | 177 | 198 | 152 | 183 | 213 | 246 | 276 | 305 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| KL | 3 | 0.03 | 0.05 | 0.06 | 0.08 | 0.11 | 0.13 | 0.16 | 0.19 | 0.22 | 0.25 | 0.29 | 0.33 | 0.38 | 0.42 | 0.47 | 0.52 |
| | 6 | 0.04 | 0.05 | 0.07 | 0.10 | 0.12 | 0.15 | 0.18 | 0.22 | 0.25 | 0.29 | 0.34 | 0.38 | 0.43 | 0.49 | 0.54 | 0.60 |
| | 9 | 0.05 | 0.06 | 0.09 | 0.12 | 0.15 | 0.18 | 0.22 | 0.26 | 0.30 | 0.35 | 0.41 | 0.46 | 0.52 | 0.58 | 0.65 | 0.72 |
| Silencer Face Velocity, fpm | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 3KL | -2,000 | 49 | 51 | 54 | 58 | 59 | 63 | 63 | 54 |
| | -1,000 | 38 | 38 | 42 | 47 | 51 | 48 | 41 | 35 |
| | 1,000 | 36 | 36 | 38 | 43 | 49 | 46 | 38 | 35 |
| | 2,000 | 53 | 49 | 50 | 51 | 54 | 62 | 63 | 54 |
| 6KL | -2,000 | 54 | 55 | 55 | 57 | 58 | 62 | 62 | 54 |
| | -1,000 | 44 | 50 | 44 | 51 | 52 | 49 | 40 | 24 |
| | 1,000 | 52 | 43 | 40 | 44 | 50 | 50 | 42 | 25 |
| | 2,000 | 58 | 58 | 54 | 53 | 55 | 64 | 66 | 59 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.



ULTRA-PALS™ PACKLESS SILENCERS

TYPE: KM

with FORWARD and REVERSE FLOW Ratings



IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 KM 24 x 18

Length: 5'

Type: KM

Width: 24"

Height: 18"

- NO FIBERGLASS
- NO FOAM
- NO MINERAL WOOL
- NO FILL OF ANY KIND

The complete absence of fill, combined with the ease of cleaning and draining, makes IAC Ultra-Pals Silencers well-suited for chemical plants, refineries and facilities handling gasoline, grease, solvents or other hazardous materials.

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 3KM | -2,000 | 4 | 5 | 10 | 16 | 14 | 10 | 7 | 7 |
| | -1,000 | 3 | 3 | 7 | 13 | 12 | 8 | 7 | 7 |
| | 0 | 3 | 2 | 5 | 12 | 11 | 7 | 7 | 6 |
| | 1,000 | 3 | 3 | 6 | 13 | 11 | 7 | 6 | 5 |
| | 2,000 | 3 | 4 | 7 | 14 | 14 | 8 | 6 | 5 |
| 6KM | -2,000 | 9 | 9 | 17 | 24 | 21 | 9 | 9 | 8 |
| | -1,000 | 8 | 5 | 12 | 19 | 16 | 8 | 9 | 8 |
| | 0 | 5 | 4 | 9 | 18 | 15 | 9 | 9 | 8 |
| | 1,000 | 6 | 4 | 10 | 19 | 16 | 9 | 9 | 7 |
| | 2,000 | 7 | 5 | 13 | 23 | 20 | 10 | 9 | 8 |
| 9KM | -2,000 | 12 | 12 | 23 | 33 | 25 | 12 | 12 | 10 |
| | -1,000 | 10 | 8 | 16 | 27 | 20 | 11 | 13 | 10 |
| | 0 | 9 | 6 | 12 | 25 | 20 | 12 | 12 | 11 |
| | 1,000 | 9 | 7 | 15 | 26 | 21 | 12 | 12 | 10 |
| | 2,000 | 8 | 9 | 18 | 31 | 25 | 14 | 12 | 10 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Weights and Measures

| Nominal Length | W/ In H/ In | 15 15 | 15 18 | 15 30 | 15 30 | 15 36 | 15 48 | 30 15 | 30 18 | 30 30 | 30 30 | 30 36 | 30 48 |
|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 3 feet | Wt/ lb. | 32 | 41 | 50 | 58 | 67 | 76 | 53 | 76 | 91 | 106 | 121 | 126 |
| 6 feet | | 64 | 82 | 100 | 116 | 134 | 152 | 124 | 152 | 182 | 212 | 242 | 272 |
| 9 feet | | 96 | 123 | 150 | 174 | 201 | 226 | 185 | 228 | 273 | 318 | 363 | 408 |

Table III: Aerodynamic Performance

| Model | L/ Ft | Static Pressure Drop, i.w.g. | | | | | | | | | | | | | | | |
|-----------------------------|-------|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| KM | 3 | 0.03 | 0.04 | 0.05 | 0.07 | 0.09 | 0.11 | 0.13 | 0.15 | 0.18 | 0.21 | 0.24 | 0.27 | 0.31 | 0.35 | 0.39 | 0.43 |
| | 6 | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 | 0.15 | 0.18 | 0.21 | 0.24 | 0.28 | 0.32 | 0.36 | 0.40 | 0.45 | 0.50 |
| | 9 | 0.04 | 0.05 | 0.07 | 0.09 | 0.12 | 0.14 | 0.17 | 0.20 | 0.24 | 0.28 | 0.32 | 0.36 | 0.41 | 0.46 | 0.51 | 0.57 |
| Silencer Face Velocity, fpm | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 | |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 3KM | -2,000 | 49 | 51 | 54 | 58 | 59 | 63 | 63 | 54 |
| | -1,000 | 38 | 38 | 42 | 47 | 51 | 48 | 41 | 35 |
| | 1,000 | 36 | 36 | 38 | 43 | 49 | 46 | 38 | 35 |
| | 2,000 | 53 | 49 | 50 | 51 | 54 | 62 | 63 | 54 |
| 6KM 9KM | -2,000 | 54 | 55 | 55 | 57 | 58 | 62 | 62 | 54 |
| | -1,000 | 44 | 50 | 44 | 51 | 52 | 49 | 40 | 24 |
| | 1,000 | 52 | 43 | 40 | 44 | 50 | 50 | 42 | 25 |
| | 2,000 | 58 | 58 | 54 | 53 | 55 | 64 | 66 | 59 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**TUBULAR
ULTRA-PALS™ PACKLESS SILENCERS****TYPE: TXS/TXL**with **FORWARD** and **REVERSE FLOW** Ratings

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 12 TXS 36

Diameter: 12" Type: TXS Length: 36"

- **NO FIBERGLASS**
- **NO FOAM**
- **NO MINERAL WOOL**
- **NO FILL OF ANY KIND**

The complete absence of fill, combined with the ease of cleaning and draining, makes IAC Ultra-Pals Silencers well-suited for chemical plants, refineries and facilities handling gasoline, grease, solvents or other hazardous materials.

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 8TXS36 | -2,000 | 15 | 20 | 26 | 17 | 12 | 12 | 12 | 7 |
| | -1,000 | 15 | 18 | 26 | 16 | 11 | 12 | 12 | 8 |
| | 0 | 15 | 18 | 26 | 16 | 10 | 12 | 12 | 8 |
| | 1,000 | 15 | 18 | 26 | 16 | 10 | 12 | 11 | 7 |
| | 2,000 | 15 | 19 | 26 | 18 | 12 | 11 | 11 | 6 |
| 8TXL36 | -2,000 | 13 | 16 | 25 | 16 | 9 | 7 | 6 | 4 |
| | -1,000 | 13 | 16 | 25 | 15 | 8 | 7 | 6 | 3 |
| | 0 | 13 | 15 | 25 | 14 | 8 | 7 | 6 | 3 |
| | 1,000 | 13 | 15 | 25 | 14 | 8 | 7 | 6 | 4 |
| | 2,000 | 12 | 15 | 25 | 15 | 8 | 7 | 6 | 4 |
| 12TXS36 | -2,000 | 11 | 13 | 23 | 25 | 18 | 12 | 13 | 9 |
| | -1,000 | 9 | 11 | 19 | 22 | 14 | 11 | 13 | 9 |
| | 0 | 7 | 8 | 17 | 20 | 13 | 10 | 11 | 8 |
| | 1,000 | 7 | 8 | 17 | 20 | 13 | 10 | 11 | 8 |
| | 2,000 | 7 | 8 | 18 | 22 | 15 | 10 | 11 | 8 |
| 12TXL36 | -2,000 | 5 | 8 | 16 | 16 | 7 | 6 | 5 | 4 |
| | -1,000 | 5 | 8 | 16 | 16 | 7 | 6 | 5 | 4 |
| | 0 | 4 | 8 | 16 | 16 | 7 | 7 | 5 | 3 |
| | 1,000 | 4 | 8 | 16 | 16 | 7 | 7 | 5 | 3 |
| | 2,000 | 5 | 8 | 16 | 17 | 7 | 7 | 5 | 3 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Aerodynamic Performance

| Model | Diameter, in. | Width, in. | Height, in. | Length, in. | Weight, lb. | Static Pressure Drop, i.w.g. | | | | | | | |
|-----------------------------|------------------|---------------|----------------|----------------|----------------|------------------------------|------|------|------|------|------|------|------|
| TXS | 8 | 21 | 21 | 36 | 30 | 0.15 | 0.20 | 0.26 | 0.33 | 0.41 | 0.50 | 0.59 | 0.69 |
| TXL | 8 | 21 | 21 | 36 | 30 | 0.04 | 0.05 | 0.07 | 0.08 | 0.10 | 0.12 | 0.15 | 0.17 |
| TXS | 12 | 21 | 21 | 36 | 35 | 0.14 | 0.19 | 0.25 | 0.32 | 0.39 | 0.47 | 0.56 | 0.66 |
| TXL | 12 | 21 | 21 | 36 | 35 | 0.04 | 0.05 | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 0.17 |
| Silencer Face Velocity, fpm | | | | | | 1500 | 1750 | 2000 | 2250 | 2500 | 2750 | 3000 | 3250 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

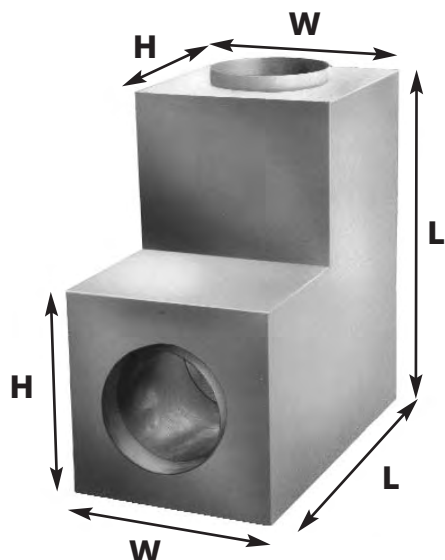
| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| TXS | -2,000 | 54 | 47 | 49 | 47 | 51 | 50 | 46 | 38 |
| | -1,000 | 20 | 35 | 37 | 37 | 37 | 32 | 20 | 20 |
| | 1,000 | 20 | 34 | 35 | 35 | 35 | 28 | 20 | 20 |
| | 2,000 | 54 | 47 | 45 | 45 | 49 | 50 | 45 | 34 |
| TXL | -2,000 | 20 | 33 | 37 | 39 | 36 | 31 | 20 | 20 |
| | -1,000 | 20 | 20 | 25 | 25 | 23 | 20 | 20 | 20 |
| | 1,000 | 20 | 22 | 28 | 28 | 25 | 20 | 20 | 20 |
| | 2,000 | 20 | 35 | 42 | 41 | 35 | 29 | 20 | 20 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

**TUBULAR ELBOW
ULTRA-PALS™ PACKLESS SILENCERS****TYPE: TXLB**with **FORWARD** and **REVERSE FLOW** Ratings

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 12 TXLB 36

Diameter: 12" Type: TXLB Length: 36"

- NO FIBERGLASS
- NO FOAM
- NO MINERAL WOOL
- NO FILL OF ANY KIND

The complete absence of fill, combined with the ease of cleaning and draining, makes IAC Ultra-Pals Silencers well-suited for chemical plants, refineries and facilities handling gasoline, grease, solvents or other hazardous materials.

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| 8TXLB36 | -2,000 | 10 | 14 | 26 | 20 | 17 | 14 | 12 | 9 |
| | -1,000 | 10 | 14 | 26 | 18 | 14 | 14 | 11 | 9 |
| | 0 | 9 | 13 | 25 | 17 | 14 | 13 | 10 | 8 |
| | 1,000 | 10 | 13 | 25 | 17 | 14 | 13 | 11 | 8 |
| | 2,000 | 10 | 13 | 24 | 19 | 16 | 14 | 12 | 8 |
| 12TXLB36 | -2,000 | 7 | 8 | 21 | 20 | 15 | 11 | 9 | 4 |
| | -1,000 | 7 | 8 | 20 | 19 | 13 | 10 | 8 | 4 |
| | 0 | 5 | 6 | 18 | 17 | 11 | 9 | 7 | 3 |
| | 1,000 | 5 | 6 | 18 | 17 | 11 | 9 | 7 | 3 |
| | 2,000 | 6 | 7 | 18 | 19 | 14 | 10 | 8 | 3 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

Table II: Aerodynamic Performance

| Model | Diameter, in. | Width, in. | Height, in. | Length, in. | Weight, lb. | Static Pressure Drop, i.w.g. | | | | | | | |
|-----------------------------|------------------|---------------|----------------|----------------|----------------|------------------------------|------|------|------|------|------|------|------|
| TXLB | 8 | 21 | 21 | 36 | 110 | 0.05 | 0.09 | 0.14 | 0.20 | 0.28 | 0.36 | 0.46 | 0.56 |
| | 12 | 21 | 21 | 36 | 120 | 0.05 | 0.09 | 0.14 | 0.20 | 0.28 | 0.36 | 0.46 | 0.56 |
| Silencer Face Velocity, fpm | | | | | | 750 | 1000 | 1250 | 1500 | 1750 | 2000 | 2250 | 2500 |

Table IV: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|--------------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| 8TXLB36 | -2,000 | 50 | 43 | 40 | 40 | 41 | 43 | 40 | 31 |
| | -1,000 | 42 | 32 | 32 | 26 | 23 | 20 | 20 | 20 |
| | 1,000 | 42 | 29 | 27 | 32 | 30 | 23 | 21 | 20 |
| | 2,000 | 51 | 43 | 41 | 43 | 45 | 49 | 45 | 33 |
| 12TXLB36 | -2,000 | 58 | 44 | 42 | 44 | 46 | 48 | 47 | 38 |
| | -1,000 | 50 | 40 | 34 | 35 | 31 | 27 | 20 | 20 |
| | 1,000 | 52 | 38 | 34 | 34 | 35 | 27 | 20 | 20 |
| | 2,000 | 62 | 47 | 43 | 45 | 49 | 52 | 49 | 38 |

(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99.

TAKE NOTE!

- Silencer Face Area is the cross-sectional area at the silencer entrance.
- Face Velocity is the CFM of airflow divided by the Face Area (in sq. ft.)
- Pressure Drop for any velocity can be calculated from this equation:

$$PD = (\text{Actual FV}/\text{Catalog FV})^2 \times (\text{Catalog PD})$$
- Self Noise values shown are for a four-square-foot face area silencer.
- For each doubling of the face area add 3 dB to the self-noise values listed.
- For each halving of the face area subtract 3 dB from the self-noise values listed.
- Weights and measures are listed for limited number of available sizes.

QUIET-DUCT® ELBOW SILENCERS

1.01 GENERAL

- A. Furnish and install "Quiet-Duct Elbow" style silencers of the types and sizes shown on the plans and/or listed in the schedule. Silencers shall be the product of Industrial Acoustics Company. Any specification change must be submitted in writing and approved by the Architect/Engineer, in writing, at least 10 days prior to the bid due-date.

2.01 MATERIALS

- A. Outer casing of the silencer shall be made of minimum 18 gauge type #G-90 lock-former-quality galvanized steel. Interior partitions for the silencer shall be not less than 22 gauge type #G-90 galvanized perforated steel.
- B. Filler material shall be of inorganic glass fiber of a proper density to obtain the specified acoustic performance and be packed under not less than 5% compression to eliminate voids due to vibration and settling. Material shall be inert, vermin- and moisture-proof.
- C. Combustion ratings for the silencer acoustic fill shall be not greater than the following when tested per ASTM E 84, NFPA Standard 255, or UL No. 723:
Flamespread Classification 20
Smoke Development Rating 20

3.01 CONSTRUCTION

- A. Units shall be constructed in accordance with the ASHRAE Guide recommendations for high pressure duct work. Casing seams shall be formed, welded, and mastic sealed. Interior acoustic baffles shall be perforated sheets with solid evase design entrance/exit shapes to provide maximum aerodynamic efficiency and minimum self-noise. Blunt shapes will not be accepted.
- B. Interior partitions shall be welded to the casing and shall be of radius design so as to provide a uniform elbow airway in the silencer.
- C. Sound attenuating units shall not fail structurally when subjected to a differential air pressure of 8 inches water gauge from inside to outside the casing.

4.01 ACOUSTIC PERFORMANCE

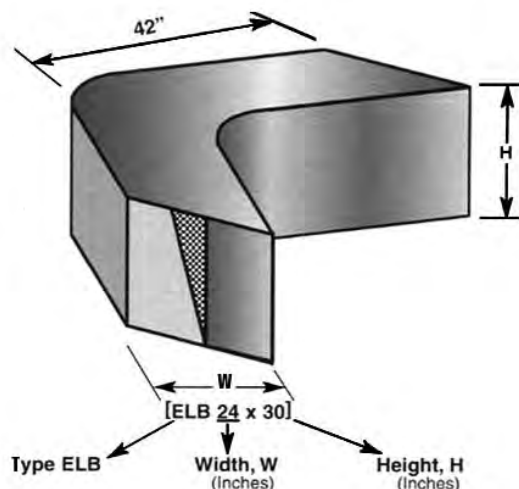
- A. Silencer ratings shall have been determined from data taken in a duct-to-reverberant room test facility which provides for airflow through the test silencer in accordance with ASTM Specification E477-99. The test facility shall be NVLAP accredited for the ASTM E477-99 test standard. Data from a non-accredited laboratory will not be acceptable. The test set-up and procedure shall be such that all effects due to end reflection, directivity, flanking transmission, standing waves and test chamber sound absorption are eliminated.
- B. Acoustic ratings shall include Dynamic Insertion Loss (DIL) and Self-Noise (SN) Power Levels both for FORWARD FLOW (air and noise in same direction) and REVERSE FLOW (air and noise in opposite directions) with airflow of at least 2000 fpm entering face velocity. Data for radius elbow silencers shall be presented for tests conducted using silencers no smaller than the following sizes:
Rectangular, inches: 24x24, 24x30, or 24x36.

5.01 AERODYNAMIC PERFORMANCE

- A. Static pressure loss of the silencer shall not exceed that listed in the schedule at the airflow indicated. Airflow measurements shall be made in accordance with ASTM specification E477-99 and applicable portions of ASME, AMCA, and ADC airflow test codes.

6.01 CERTIFICATION

- A. With submittals, the manufacturer shall supply data on Dynamic Insertion Loss, Self-Noise Power Levels, and Aerodynamic Performance for Forward and Reverse Flow test conditions. All rating tests shall be conducted in the same facility, shall have utilized the same silencer, and the facility shall be open to inspection upon request from the Architect/Engineer

**QUIET-ELBOW® SILENCERS****TYPE: ELB**with **FORWARD** and **REVERSE FLOW** Ratings

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 ELB 24 x 18

Length: 5' Type: ELB Width: 24" Height: 18"

Pressure loss for ELB Silencer is 0.2" at 1000 fpm

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|--------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity, fpm | | | | | | | | |
| ELB | -2,000 | 6 | 15 | 22 | 29 | 33 | 28 | 21 | 18 |
| | -1,000 | 6 | 14 | 21 | 28 | 33 | 28 | 22 | 18 |
| | 0 | 6 | 14 | 21 | 28 | 34 | 29 | 24 | 19 |
| | 1,000 | 6 | 13 | 20 | 27 | 34 | 30 | 25 | 20 |
| | 2,000 | 6 | 13 | 19 | 26 | 34 | 30 | 26 | 21 |

Table II: Weights and Measures

| Model | Width, in. | 18 | 18 | 18 | 18 | 24 | 24 | 24 | 24 |
|------------|-------------|----|----|----|-----|----|-----|-----|-----|
| | Height, in. | 12 | 18 | 24 | 30 | 18 | 24 | 30 | 36 |
| ELB | Weight, lb. | 56 | 74 | 93 | 112 | 86 | 105 | 124 | 143 |

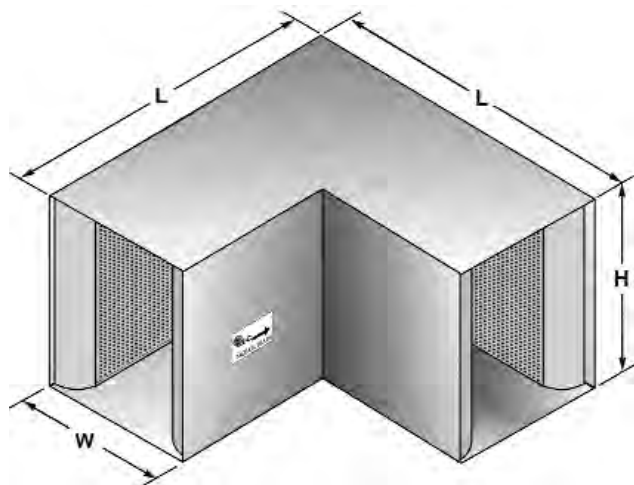
Nest and stack ELB silencers for larger duct sizes. For module to module connections seal with continuous taped nosing or metallis u-clip nosing crimped or button punched. For end connections use slip fit, S-Clip, or "TDC" style flanging.

**Table III: Self-Noise Power Levels, dB re: 10-12 Watts**

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| ELB All Sizes | -2,000 | 54 | 56 | 55 | 53 | 52 | 54 | 51 | 44 |
| | -1,000 | 40 | 42 | 40 | 37 | 40 | 36 | 25 | 24 |
| | 1,000 | 39 | 40 | 40 | 41 | 40 | 35 | 23 | 24 |
| | 2,000 | 54 | 56 | 55 | 55 | 55 | 55 | 50 | 42 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.

**QUIET-ELBOW® SILENCERS****TYPE: ELBM**with **FORWARD** and **REVERSE FLOW** Ratings

IAC has produced Quiet-Duct HVAC silencers for more than 50 years, and has developed many of the terms and test standards for rating silencer performance that are used today. These standards are dynamic documents that continue to change based on new developments and discoveries in the field of acoustic engineering. Today we continue our involvement in several of the industry's governing agencies, and we remain committed to ensuring that we are always providing product that is in accordance with all of the latest standards. All published acoustic and aerodynamic performance results are based on tests conducted in strict accordance with ASTM E477-99 in IAC America's NVLAP-Accredited laboratory.

DESIGNATING A SILENCER

Model: 5 ELBM 24 x 18

Length: 5' Type: ELBM Width: 24" Height: 18"
 Pressure loss for ELBM Silencers is 0.2" at 1000 fpm

Table I. Dynamic Insertion Loss (DIL) Ratings: Forward (+) / Reverse (-) Flow

| Silencer Length, ft | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------|---------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Face Velocity | | | | | | | | |
| 3ELBM | -2,000 | 6 | 8 | 17 | 27 | 30 | 30 | 20 | 16 |
| | -1,000 | 5 | 8 | 15 | 26 | 30 | 30 | 20 | 17 |
| | 0 | 5 | 8 | 15 | 26 | 28 | 30 | 22 | 17 |
| | 1,000 | 5 | 7 | 14 | 25 | 28 | 30 | 23 | 18 |
| | 2,000 | 5 | 7 | 13 | 25 | 28 | 31 | 24 | 19 |
| 5ELBM | -2,000 | 9 | 13 | 23 | 36 | 38 | 24 | 16 | 11 |
| | -1,000 | 9 | 13 | 23 | 36 | 38 | 25 | 17 | 12 |
| | 0 | 8 | 12 | 22 | 36 | 38 | 26 | 18 | 13 |
| | 1,000 | 8 | 12 | 22 | 36 | 38 | 26 | 18 | 13 |
| | 2,000 | 7 | 11 | 21 | 36 | 38 | 26 | 18 | 14 |

Table II: Weights and Measures

| Width, in. | 12 | 12 | 12 | 12 | 12 | 24 | 24 | 24 | 24 | 36 | 36 | 36 | 36 |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Height, in. | 12 | 18 | 24 | 30 | 36 | 18 | 24 | 30 | 36 | 18 | 24 | 30 | 36 |
| 3ELBM | 70 | 85 | 105 | 125 | 145 | 120 | 140 | 160 | 180 | - | - | - | - |
| 5ELBM | 105 | 125 | 160 | 185 | 220 | 180 | 210 | 240 | 270 | 225 | 265 | 300 | 340 |

Table III: Self-Noise Power Levels, dB re: 10-12 Watts

| IAC Model | Octave Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---------------------------------|-----------------------------|----|-----|-----|-----|----|----|----|----|
| | Hz | 63 | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| | Silencer Face Velocity, fpm | | | | | | | | |
| ELBM All Sizes | -2,000 | 66 | 69 | 66 | 66 | 64 | 65 | 61 | 52 |
| | -1,000 | 59 | 64 | 60 | 60 | 58 | 59 | 54 | 45 |
| | 1,000 | 57 | 59 | 54 | 54 | 54 | 55 | 50 | 40 |
| | 2,000 | 64 | 66 | 61 | 61 | 62 | 62 | 57 | 48 |



(+) Forward Flow / (-) Reverse Flow. Aero-acoustic performance data based on NVLAP accredited laboratory tests conducted in strict accordance with ASTM E477-99. Contact IAC if attenuation in excess of 50 dB is required.