

# Quiet-Duct Ultra™ / ZAPD Silencers

## Section 15000 Specifications

### 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 IAC Acoustics. 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: 24 x 24, 24 x 30, or 24 x 36

### 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.

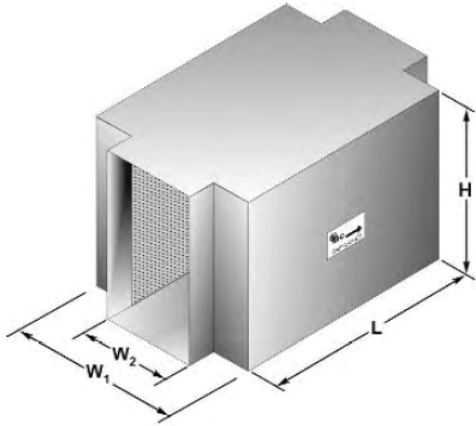
### 7.01 Duct Transitions

- 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: Z9E

### Forward & Reverse Flow Ratings



### Designating Silencers

**Model:** 5Z9E 6 x 12

**Type:** Z9E **Length:** 5' **W<sub>2</sub>:** 9" **Height:** 12"

**All Z9E Silencers W<sub>1</sub> = 36"**

This specific line of silencers has been designed for applications in which acoustics attenuation is required and no allowance can be made for pressure drop 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. The IAC Quiet-Duct ZAPD series of silencers do not create any additional pressure drop in the system and have negligible Self-Noise Sound Power Levels. All Quiet-Duct Ultra™/ZAPD silencers have been rated with procedures certified in strict accordance with ASTM E477-99 in a NVLAP Accredited Acoustical Laboratory.

IAC Quiet-Duct Ultra™/ZAPD silencers have negligible Self Noise Sound Power levels. The Z9E has a 9" wide opening and two 13.5" baffles on each side, having a combined total width of 36", for effective acoustic attenuation.

**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	Dynamic Insertion Loss, dB							
3	-2000	5	9	10	10	14	7	4	4
	-1000	5	8	10	10	15	7	4	4
	0	4	8	10	10	14	7	4	3
	1000	4	8	10	10	13	7	4	2
	2000	4	8	10	10	13	7	4	2
5	-2000	8	15	20	21	23	11	7	7
	-1000	8	15	20	21	24	11	7	7
	0	8	15	20	20	24	11	7	6
	1000	7	14	20	20	24	11	7	4
	2000	7	14	20	20	24	11	7	4
7	-2000	11	21	29	30	34	16	11	10
	-1000	11	21	29	30	34	16	11	10
	0	11	21	29	30	34	16	10	8
	1000	10	20	29	30	33	16	10	6
	2000	10	20	28	30	33	16	10	6
10	-2000	16	30	37	37	47	22	14	14
	-1000	16	29	37	37	48	22	14	14
	0	15	29	36	37	47	22	14	11
	1000	15	28	36	37	46	22	14	8
	2000	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.