KEY FEATURES

★ Offers Wide Dispersion, High Efficiency
★ Dual Magnet Construction

DESCRIPTION

The Altec Lansing 409 "E" series Duplex® loudspeaker systems are two-way loudspeakers with 8-inch low-frequency cones and high-temperature voice-coil assemblies coaxially mounted with wide-dispersion cone tweeters. The dual magnet construction allows each speaker to be structurally, magnetically, electrically and mechanically independent of the other. The 409 "E" series utilize a single section crossover network, centered at 2500Hz and providing 6dB of attenuation for each element outside its operating range.

The 409-ST (with 15700 transformer) and the 409-4T (with 15704 transformer) both offer a selection of 0.5, 1, 2 and 4W. The 409-8T (with 15708 transformer) offers a selection of 1, 2, 4 and 8W. The 409-16T (with 15716 transformer) offers 2, 4, 8 and 16W and the 409-32T (with 15732 transformer) offers a 4, 8, 16, 32W selection.

The 5281-W grille is available as an accessory, and provides an attractive means to conceal the loudspeaker in ceiling or wall installations. The perforated grille is finished in semi-gloss white enamel. Other grilles available include the 5281-S (satin aluminum), 5282-W and 5284-WM (both are square grilles).

Five sealed, metal ceiling-type enclosures are offered with the 409 "E" series. Each is made of heavy-gauge, rugged cold rolled steel, under-coated to prevent panel resonance, and finished with rust-inhibiting paint. The enclosures are classified as Utility or Deluxe. Utility model numbers are as follows; 5183-X, 5184-E, and 5184-N. Deluxe enclosures are lined with glass wool blankets. Deluxe model numbers are as follows; 5181-XM, 5182-XM, 5184-X and 5189-X. These components are designed to work together as a complete system of in-ceiling loudspeakers and accessories. They give wide dispersion, high-efficiency, high-maximum output, ease of installation, and wide range reproduction of music or voice.
Figure 6. One-third Octave Polar Response Charts

NOTE: MEASUREMENTS WERE MADE IN A 1.5 FT³ CLOSED ENCLOSURE
The document contains specifications and performance data for a crossover network, input terminals, accessories, dimensions, and various measurements. The text includes tables with data such as "net weight," "shipping weight," and "finish." Diagrams illustrate amplitude response, impedance response, directivity and Q, as well as distortion response. The table with "409-16T" and "409-32T" provides weight details, with values in pounds and inches.

- **Crossover Network:** Two-way at 2500 Hz with 6dB per octave tweeter protection.
- **Input Terminals:** 0.212 inch push-on type connectors.
- **Accessories:**
  - **Grilles:** 5281-W, 5281-S, 5282-W, 5284-W
  - **Enclosures:** 5183-X, 5184-X, 5184-E, 5184-N
- **Dimensions:**
  - **Diameter:** 8.13 in (20.65 cm)
  - **Depth:**
    - 409-8E: 3.25 in (8.3 cm)
    - 409-ST: 3.86 in (9.8 cm)
    - 409-4T: 4.13 in (10.5 cm)
    - 409-8T: 4.50 in (11.4 cm)
- **Net Weight:**
  - 409-8E: 2.8 lbs (1.3 kg)
  - 409-ST: 3.1 lbs (1.4 kg)
  - 409-4T: 3.3 lbs (1.5 kg)
  - 409-8T: 4.0 lbs (1.8 kg)
  - 409-16T: 4.5 lbs (2.0 kg)
  - 409-32T: 5.0 lbs (2.3 kg)
- **Shipping Weight:**
  - 409-8E: 3.3 lbs (1.5 kg)
  - 409-ST: 3.6 lbs (1.6 kg)
  - 409-4T: 3.8 lbs (1.7 kg)
  - 409-8T: 4.5 lbs (2.0 kg)
  - 409-16T: 5.0 lbs (2.3 kg)
  - 409-32T: 5.5 lbs (2.5 kg)
- **Finish:** Black.

The diagrams include graphs for amplitude response, beamwidth vs. frequency, impedance response, directivity and Q, and distortion response. The "409-8E - THEILE-SMALL PARAMETERS" section lists:

- Free Air Resonance, $f$: 90 Hz
- Equivalent Volume Compliance, $V_s$: 0.61 ft$^3$
- Total Q, $Q_t$: 1.54
- Electrical Q, $Q_e$: 1.78
- Mechanical Q, $Q_m$: 11.53
- Volume Displacement, $V_o$: 1.95 in$^3$
- Reference Efficiency: 0.71%
NOTES ON MEASUREMENT CONDITIONS

1. Pink noise signal, one Watt calculated using E²/ Zmin, 3.16 measurement distance referred to one meter.
2. On-axis, one Watt calculated using E²/ Zmin, 3.16 meter measurement distance referred to one meter, low frequencies corrected for anechoic chamber error.
3. This system rating patterned after the A.E.S method for individual driver, where the test signal is pink noise with a 6dB crest factor over the bandwidth of the system, with power calculated using the E²/ Zmin, for two hours.
4. This measurement made under the same conditions as Pressure Sensitivity, but at rated power, and takes into account any power compression effects due to non-linearities in the system.
5. Distortion components invalid above 10kHz. The distortion at any given frequency may be found by graphically taking the difference between the fundamental and harmonic, and adding the number of Decibels which the harmonic has been raised on the graph and apply the formula:
   \[ \text{percent distortion} = 100 \times 10 - \frac{\text{difference in dB}}{20} \]

SPECIFICATIONS - TRANSFORMERS

<table>
<thead>
<tr>
<th>Frequency Response:</th>
<th>15700: 100 Hz to 10 kHz, +/−1 dB</th>
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<tbody>
<tr>
<td>15704, 15708</td>
<td>50 Hz to 15 kHz, +/−1 dB</td>
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<tr>
<td>15716, 15732</td>
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</tr>
<tr>
<td>Insertion Loss:</td>
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<tr>
<td>15700:</td>
<td>1.0 dB</td>
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<tr>
<td>15704</td>
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<tr>
<td>15708</td>
<td></td>
</tr>
<tr>
<td>15716, 15732</td>
<td>0.5 dB</td>
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<tr>
<td>Secondary Impedance:</td>
<td>8 ohms (all)</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Impedances and Power Drawn, nominal 70v:</td>
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<td>15700</td>
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<tr>
<td>15704</td>
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<td>15704</td>
<td>4.0 W</td>
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<tr>
<td>Connection Type:</td>
<td>Bunch tinned wires for soldering or crimping.</td>
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</table>

ARCHITECT’S AND ENGINEER’S SPECIFICATIONS

409 "E" SERIES
DUPLEX LOUDSPEAKERS

The loudspeaker shall be a Duplex® type with a 8-inch low-frequency cone and a high-temperature voice coil assembly coaxially mounted with a wide dispersion cone tweeter. The Duplex® loudspeaker shall meet the following criteria. AES power rating shall be 32 watts of band limited pink noise (85 Hz to 18 kHz, 6 dB crest factor). Frequency response, uniform from 85 Hz to 18 kHz. Pressure sensitivity, 97 dB SPL at 1 meter (95 dB at 4 feet) on axis with one watt of band-limited pink noise from 500 Hz to 3 kHz (ref. 20 μPa). Minimum impedance, 6.0 ohms. The loudspeaker shall be 8.13 in (20.65 cm) in diameter and ___ in (___ cm) deep and shall weigh ___ lbs (___ kg).

The Duplex® loudspeakers shall be the Altec Lansing models 409-8E, 409-ST (with 15700 transformer), 409-4T (with 15704 transformer), 409-8T (with 15708 transformer), 409-16T (with 15716 transformer) and the 409-32T (with 15732 transformer).