

**ALTEC
LANSING®**



405 SERIES

4-Inch Full-Range High Performance Ceiling Loudspeakers

- **405-8H**, 8ohm, 16 watts (EIA RS-426-A)
- **405-4T**, with 4 watt multi-tap transformer
- High efficiency: 90 dB for 1W @ 1M
- Maximum SPL: 102 dB for 16W @ 1M
- Frequency response: 60 Hz - 15 kHz
- Wide dispersion

Description

The Altec Lansing Model 405-8H and 405-4T loudspeakers are compact 4" speakers that provide the utmost in performance obtainable from speakers of this size. Clear, intelligible speech and good music reproduction are ensured because of the extended 60-15,000 Hz range.

The loudspeaker has an 8 ohm voice coil. The model 405-4T has a factory mounted matching transformer allowing the loudspeaker to be run from 70.7 V or 100 V transmission lines, drawing 0.5, 1, 2, or 4 watts. These quality loudspeakers are designed for continuous, trouble-free service. The die cast aluminum frame houses a magnetic structure fabricated of heavy gauge steel. The small size of the speakers allows either front or rear mounting in walls, partitions, ceilings, and into volumes as low as 0.1 cubic feet.

Directional Performance

The directional characteristics of the 405 in a 1.8 cubic-foot vented enclosure were measured by running a set of polar responses in Altec Lansing's large anechoic chamber. The test signal was one-third-octave-band-limited pseudo-random pink noise centered at

the ISO standard frequencies indicated in Figure 1.

Additional typical data is provided in Figures 4 and 5, which indicate 6-dB-down beamwidth versus frequency and directivity factor, respectively, for a 405 in the test enclosure.

Power-Handling Test

The 405 is designed to withstand the power test described in ANSI/EIA RS-426-A 1980. The EIA test spectrum is applied for eight hours. To obtain the spectrum, the output of a white-noise generator (white noise is a particular type of random noise with equal energy per bandwidth in Hz) is fed to a shaping filter with 6-dB-per-octave slopes below 40 Hz and above 318 Hz. When measured with a usual constant-percentage-bandwidth analyzer (one-third-octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1,200 Hz, with a 3-dB-per-octave slope above 1,200 Hz. This shaped signal is sent to the power amplifier with the continuous power set at 16 watts into the EIA equivalent impedance (11.3 volts true RMS). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 64-watts peak (22.6 volts peak).

This procedure provides a rigorous test of both thermal and mechanical failure modes.

Recommended Connections

The 405-8H is a nominal 8-ohm impedance loudspeaker with a 16-watt input capability. The 405-4T utilizes an 4-watt, 70.7-, 100-volt universal line-matching transformer with power taps ranging from 1 to 4 watts.

Recommended Enclosures and Baffles

The 405-8H, 405-4T are designed to fit on standard 4-inch ceiling speaker baffles. Additionally, these loudspeakers will accommodate the use of any standard back enclosure with a diameter of 5.5-inches or greater and a depth of at least 4.5 inches. Larger back volumes will increase the low-frequency output. The frequency response of a 405 in a typical 0.5-cubic-foot back enclosure is shown in Figure 1.

Mounting

The 405 may be front or rear mounted against either surface of its mounting flange and requires a 110-mm (4.35-in.) diameter cutout and a 120-mm (4.72-in.) bolt circle, as shown in Figure 7. Normal fasteners up to 5 mm (0.20 in.) will fit through the four holes in

405 Series 4-Inch Full-Range High Performance Ceiling Loudspeakers

the frame. The 405 is designed for mounting on standard ceiling speaker baffles.

Architects' and Engineers' Specifications

MODEL 405-8H

The loudspeaker shall meet the following performance and structural criteria. Power rating, 16 watts. Frequency response, uniform from 60-15,000 Hz. Pressure sensitivity, 90 dB-SPL when measured at one meter on axis with 1 watt input of band-limited pink noise from 500-3000 Hz (Ref.: 20 uPa). Impedance, 8 ohms. Nominal free-air cone resonance, 90 Hz. The voice coil shall have a diameter of 1" and shall operate in a magnetic field of 1.05 tesla derived from a Ferrite (V) magnet weighing at least 9.4 ounces. The loudspeaker shall be able to perform efficiently in a volume as low as 0.1 cubic feet. The loudspeaker frame shall be of die cast aluminum construction. The speaker terminals shall be of the spade lug type. Dimensions, 5.312" diameter x 2.125" deep. (See page 6)

The loudspeaker shall be the Altec Lansing Model 405-8H.

MODEL 405-4T

The loudspeaker shall meet the following performance and structural criteria. Power rating, 4 watts. Frequency response, uniform from 60-15,000 Hz. Pressure sensitivity, 90 dB-SPL when measured at one meter on axis with 1 watt input of band-limited pink noise from 500-300K Hz (Ref.: 20 uPa). Impedance, 8 ohms. Nominal free-air cone resonance, 90 Hz. The voice coil shall have a diameter of 1" and shall operate in a magnetic field of 1.05 tesla derived from a ferrite (V) magnet weighing at least 9.4 ounces. The loudspeaker shall be able to perform efficiently in a volume as low as 0.1 cubic feet. The loudspeaker frame shall be of die cast aluminum construction. The

speaker terminals shall be of the spade lug type. Dimensions, 5.312" diameter x 4 1/2," deep. Weight, 2 pounds, 9 ounces.

A 70/25-volt line transformer shall be incorporated for use in distributed systems, and shall have a frequency response of +1 dB from 100-10,000 Hz, with maximum insertion loss of 1.0 dB and primary wattage taps of 4, 2, 1 and 0.5 watts.

The loudspeaker shall be the Altec Lansing Model 405-4T.

Limited Warranty

Altec Lansing products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than EVI Audio Service or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to EVI Audio Service or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list

of authorized service representatives is available from EVI Audio Service at 600 Cecil Street, Buchanan, MI 49107 (800/234-6831 or FAX 616/695-4743). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Altec Lansing shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Altec Lansing Speakers and Speaker Systems are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Altec Lansing active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

For warranty repair or service information, contact the service repair department at: 616/695-6831 or 800/685-2606.

For technical assistance, contact Technical Support at 800/234-6831 or 616/695-6831, M-F, 8:00 a.m. to 5:00 p.m. Eastern Standard Time.

Specifications subject to change without notice.

405 SERIES 4-Inch Full-Range High Performance Ceiling Loudspeakers

Figure 1—Frequency Response

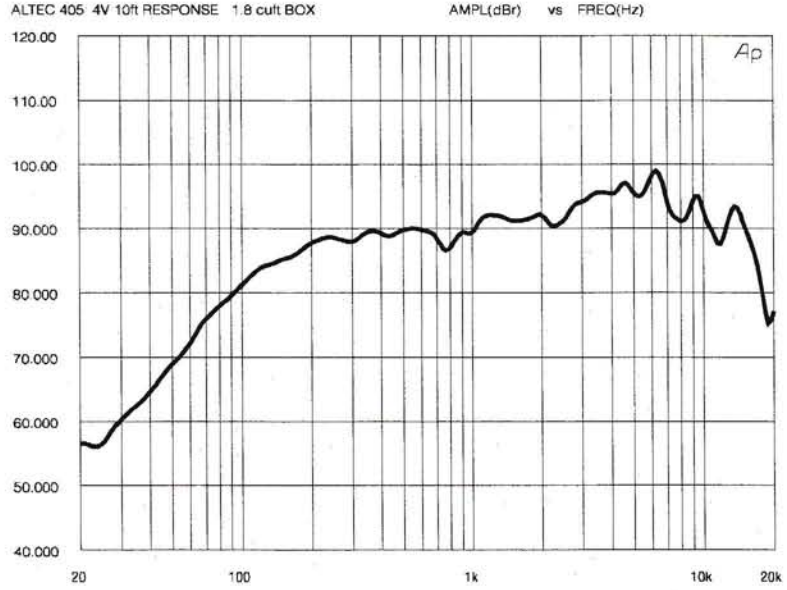
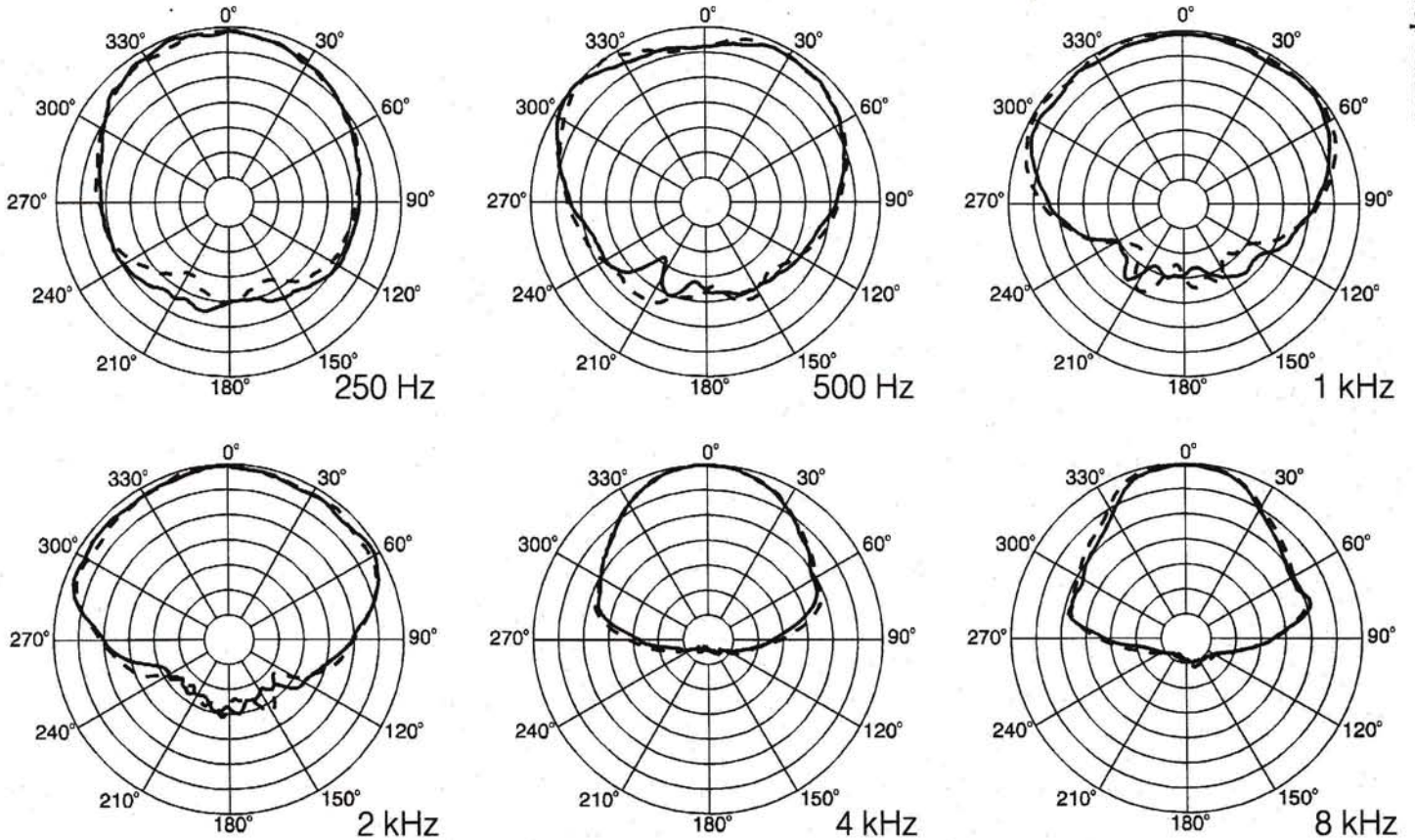


Figure 2—Polar Response



405 SERIES 4-Inch Full-Range Ceiling Loudspeakers

Figure 3—Impedance

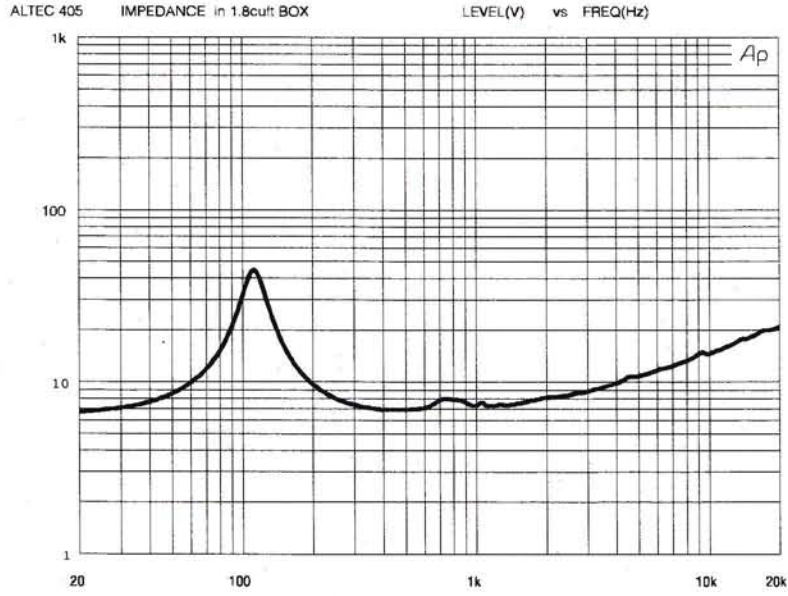


Figure 4—Beamwidth

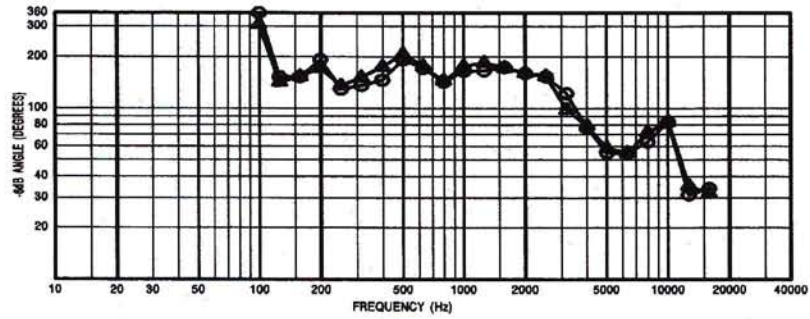
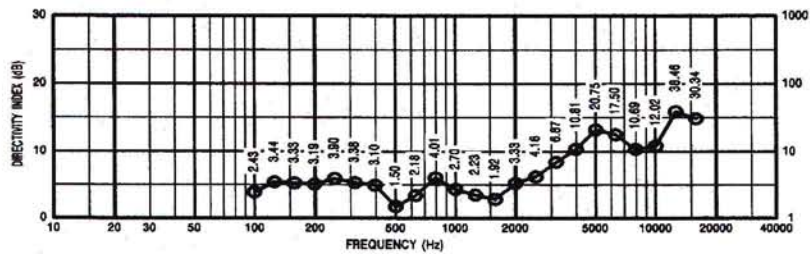


Figure 5—Directivity



405 SERIES 4-Inch Full-Range Ceiling Loudspeakers

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Figure 6—Wiring

405-4T

Table 1	70 V	100 V
4.0 W	BROWN	RED
2.0 W	RED	ORANGE
1.0 W	ORANGE	YELLOW
0.5 W	YELLOW	N/A
COMMON	BLACK	BLACK
8 ohms	White	White
Common	Black	Black

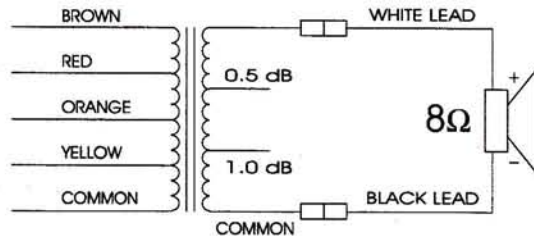
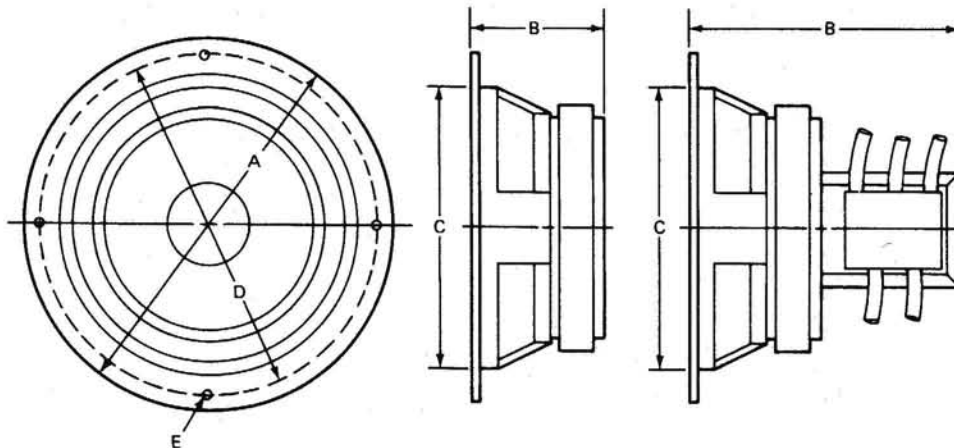


Figure 7—Dimensions



MOUNTING DIMENSIONS

	405-8H	405-4T
(A) LOUDSPEAKER DIAMETER:	134.9 mm (5.312 in.)	134.9 mm (5.312 in.)
(B) LOUDSPEAKER DEPTH:	54.0 mm (2.125 in.)	103.2 mm (4.063 in.)
(C) BAFFLE OPENING DIAMETER: (Front Mounted)	104.8 mm (4.125 in.)	104.8 mm (4.125 in.)
(C) BAFFLE OPENING DIAMETER: (Rear Mounted)	96.8 mm (3.812 in.)	96.8 mm (3.812 in.)
(D) BOLT CIRCLE DIAMETER:	120.7 mm (4.75 in.)	120.7 mm (4.75 in.)
(E) BOLT HOLE SLOTS:	5.2 mm (0.20 in.) x 6.4 mm (0.25 in.)	5.2 mm (0.20 in.) x 6.4 mm (0.25 in.)

405 Series 4-Inch Full-Range High Performance Ceiling Loudspeakers

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Specifications

Power Rating:

16 watts continuous pink noise (above 50 Hz)

Frequency Response:

60-15,000 Hz

Pressure Sensitivity:

90 dB SPL measured at one meter on axis with 1 watt input of pink noise, band-limited from 500-3000 Hz (Ref.: 20 uPa)

Maximum SPL:

102 dB for 16W @ 1M

Impedance:

8 ohms

70.7/100 Volt Taps:

0.5, 1, 2, 4 watts (405-4T only)

Insertion Loss:

1.0 dB max. (405-4T only)

Transformer Frequency Response:

±1 dB, 100-10,000 Hz (405-4T only)

Nominal Free-Air

Cone Resonance:

120 Hz

Nominal Distribution Pattern:

90°

*Distribution Pattern With Polar to

Planer Correction:

107° at 2 kHz 69° at 4 kHz

Voice Coil Diameter:

25.4 mm (1.0 in.)

Magnet Structure,

Magnet Type:

Ferrite

Magnet Weight:

9.4 ounces

Flux Density:

1.05 tesla

Construction,

Frame (Basket):

Structurally reinforced die-cast aluminum

Cone:

Molded fiber

Cone Suspension:

High-compliance foam surround

Voice Coil:

Copper

Voice Coil Support Material:

Kapton®**

Cone Excursion:

0.125" max. peak to peak

Terminals,

Speaker:

5.2 mm (0.205 in.) spade lug type

Transformer:

Pigtails

Mounting Data,

Baffle Opening:

96.8 mm (3.812 in.) diameter (rear mounted) 104.8 mm (4.125 in.) diameter (front mounted)

Mounting Bolt Centers:

4 equally spaced slots 90° apart on 120.7 mm (4.75 in.) diameter circle

Dimensions,

134.9 mm (5.312 in.) diameter

405-8H:

54.0 mm (2.125 in.) depth

405-4T:

103.2 mm (4.063 in.) depth

Weight,

405-8H:

2 lbs. 1 oz. (0.94 kg)

405-4T:

2 lbs. 9 oz. (1.2 kg)

Color:

ALTEC black

*See Technical Letter No. 257, "Sound Distribution on a Plane Normal to a Loudspeaker Axis."

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