

# 409 Series

## 8-inch Premium High Performance Ceiling Loudspeakers



COMMERCIAL

### General Product Description

The Electro-Voice® 409 series 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 series utilize a single section crossover network, centered at 2500 Hz, providing 6 dB of attenuation for each element outside the operating range.

The 409-8E is an 8 ohm, 32 watt speaker. 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.

### Architects' and Engineers' Specifications

409 Series Loudspeakers. The loudspeaker shall have an 8-inch low-frequency cone and a high temperature voice coil assembly coaxially mounted with a wide dispersion cone tweeter. The 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 f<sub>3</sub> kHz (ref.



20 uPa). Minimum impedance, 6.0 ohms. The loudspeaker shall be 8.13 in (20.6 diameter and in ( \_cm) deep and shall weigh lbs ( \_ kg). For dimensions see next page.

The loudspeakers shall be EV (Electro-Voice®) 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).

### Specifications:

**Power Rating:** ..... 32 watts, 85 Hz - 18kHz, AES method

**Frequency Response:** ..... 85 - 18 kHz

**Pressure Sensitivity:** ..... 97 dB SPL

Measured at one meter on axis with 1 watt input of pink noise, band-limited from 500 - 3000 Hz (Ref.: 20 µPa)

**Maximum SPL:** ..... 112 dB for 32W @ 1M

**Impedance:**

**Minimum** ..... 6 ohms

**Nominal** ..... 8 ohms

**Components:**

    8-inch, high-efficiency, low frequency driver with a coaxially mounted 2.5 inch cone tweeter.

**Crossover Network:**

    Two-way at 2500 Hz with 6 dB per octave tweeter protection

**Input Terminals:**

**Speaker:** ..... 0.212 in. push-on type connectors

**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:

Diameter: 206.5 mm (8.13 in.)

|         | Depth             | Net Weight       | Shipping Weight  |
|---------|-------------------|------------------|------------------|
| 409-8E  | 83 mm (3.25 in.)  | 2.8 lbs (1.3 kg) | 3.3 lbs (1.5 kg) |
| 409-ST  | 98 mm (3.86 in.)  | 3.1 lbs (1.4 kg) | 3.6 lbs (1.6 kg) |
| 4094T   | 105 mm (4.13 in.) | 3.3 lbs (1.5 kg) | 3.8 lbs (1.7 kg) |
| 409-8T  | 114 mm (4.50 in.) | 4.0 lbs (1.8 kg) | 4.5 lbs (2.0 kg) |
| 409-16T | 124 mm (4.86 in.) | 4.5 lbs (2.0 kg) | 5.0 lbs (2.3 kg) |
| 409-32T | 137 mm (5.38 in.) | 5.0 lbs (2.3 kg) | 5.5 lbs (2.5 kg) |

##### Finish:

Black

Transformer Specifications

Frequency Response:  
15700: ..... 100 Hz to 10 kHz, +/-1 dB  
15704, 15708, 15716, 15732: ..... 50 Hz to 15 kHz, +/-1 dB  
Insertion Loss:  
15700: ..... 1.0 dB  
15704, 15708, 15716, 15732: ..... 0.5 dB  
Secondary Impedance: ..... 8 ohms (all)  
Primary Impedances and Power Drawn, nominal 70v:

| 15700<br>15704   | 15708            | 15716            | 15732            |
|------------------|------------------|------------------|------------------|
| 10 kohm (0.5 W)  | 5 kohm (1.0 W)   | 2500 ohm (2.0 W) | 1250 ohm (4.0 W) |
| 5000 ohm (1.0 W) | 2500 ohm (2.0 W) | 1250 ohm (4.0 W) | 625 ohm (8.0 W)  |
| 2500 ohm (2.0 W) | 1250 ohm (4.0 W) | 625 ohm (8.0 W)  | 312 ohm (16 W)   |
| 1250 ohm (4.0 W) | 625 ohm (8.0 W)  | 312 ohm (16 W)   | 156 ohm (32 W)   |

409 Theile-Small Parameters

Free Air Resonance, fs: ..... 90 Hz  
Equivalent Volume Compliance, Vas: ..... 0.61 ft.<sup>3</sup>  
Total Q, Qts: ..... 1.54  
Electrical Q, Qes: ..... 1.78  
Mechanical Q, Qms: ..... 11.53  
Volume Displacement, VD ..... 1.95 in<sup>3</sup>  
Reference Efficiency: ..... 0.71%

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.

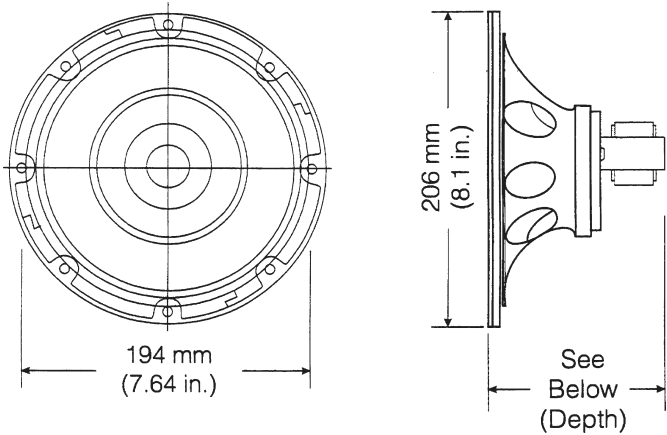
Recommended Enclosures and Baffles

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.

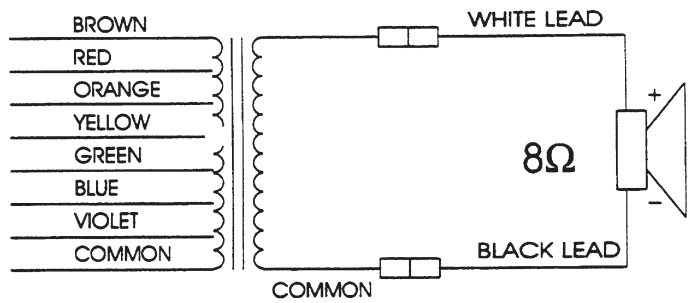
Mounting

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

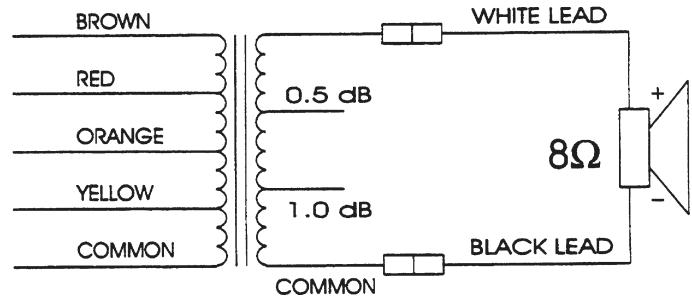


Dimensions

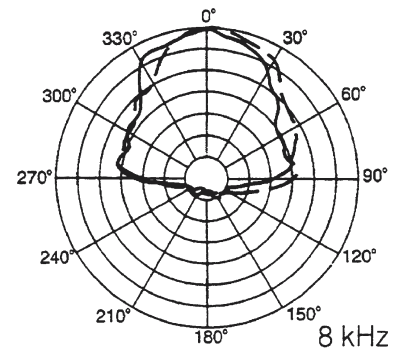
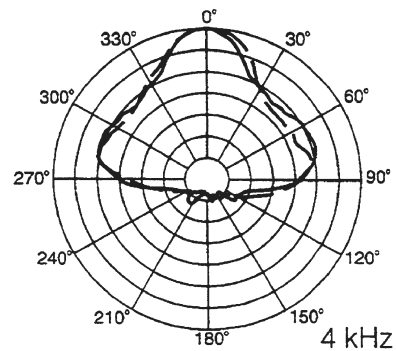
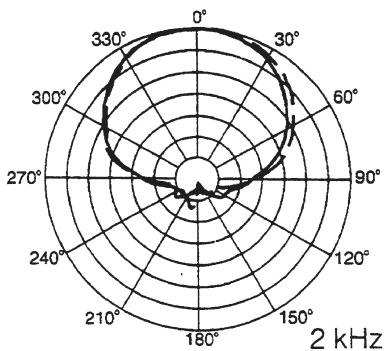
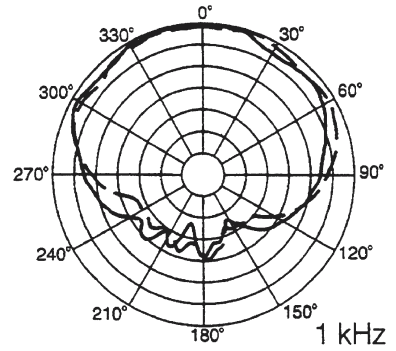
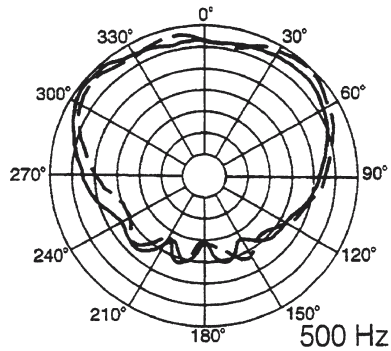
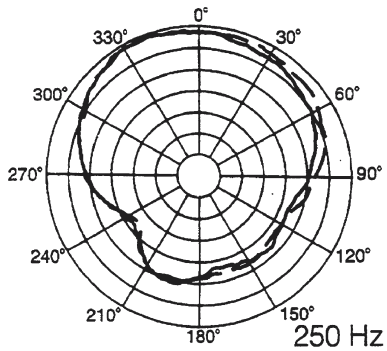
| 409-ST | 25V    | 70V    | 100V   |
|--------|--------|--------|--------|
| 4.0W   | Brown  | Yellow | Green  |
| 2.0W   | Red    | Green  | Blue   |
| 1.0W   | Orange | Blue   | Violet |
| 0.5W   | Yellow | Violet | N/A    |
| Common | Black  |        |        |
| 8 Ohms | White  |        |        |
| Common | Black  |        |        |



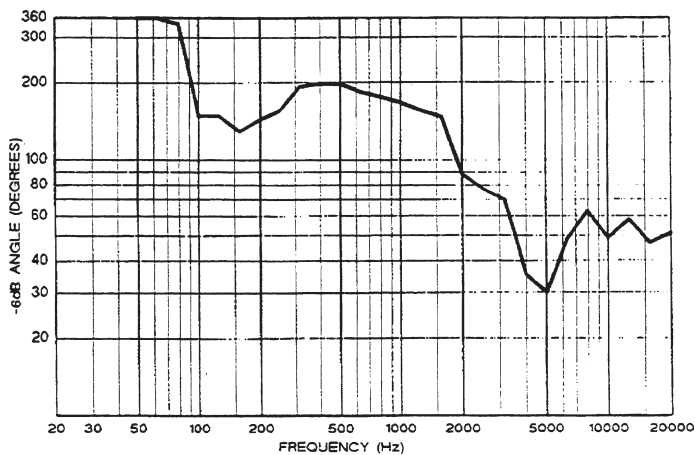
| 409-4T | 409-8T | 409-16T | 409-32T | 70V    | 100V   |
|--------|--------|---------|---------|--------|--------|
| 4.0W   | 8.0W   | 16.0W   | 32.0W   | Brown  | Red    |
| 2.0W   | 4.0W   | 8.0W    | 16.0W   | Red    | Orange |
| 1.0W   | 2.0W   | 4.0W    | 8.0W    | Orange | Yellow |
| 0.5W   | 1.0W   | 2.0W    | 4.0W    | Yellow | N/A    |
| Common |        |         |         | Black  |        |
| 8 Ohms |        |         |         | White  |        |
| Common |        |         |         | Black  |        |



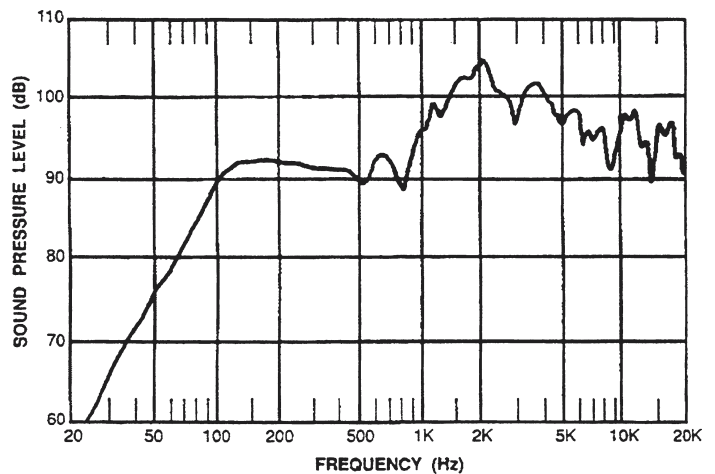
### Wiring Diagram



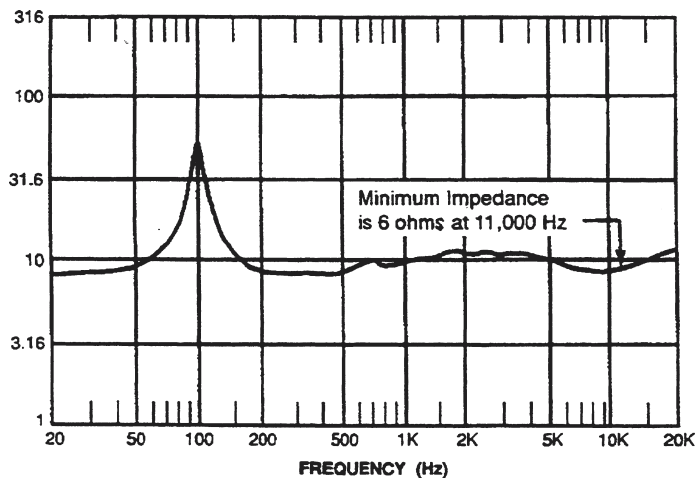
### Polar Response Charts



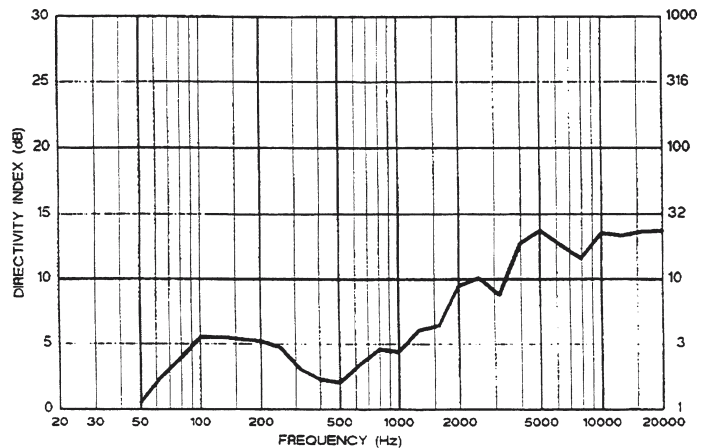
**Impedance Response**



**Frequency Response**



**Beamwidth vs Frequency**



**Directivity and Q**

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**Electro-Voice®**

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For customer orders, contact the Customer Service department at

800/392-3497 Fax: 800/955-6831

For warranty repair or service information, contact the Service

Repair department at 800/685-2606

For technical assistance, contact Technical Support at 866/78 AUDIO

Please refer to the Engineering Data Sheet for warranty information.

Specifications subject to change without notice.