

# 209 Series



## 8 inch Full-Range Ceiling Loudspeakers

COMMERCIAL

### General Product Description

The Electro-Voice® 209 is a high-quality 8 inch, full-range loudspeaker for distributed sound systems.

An acoustically transparent dome encloses a small, centrally mounted free-edge cone which is used to improve high-frequency dispersion.

The 209 is suitable for use in applications requiring highly intelligible speech or smooth musical reproduction.

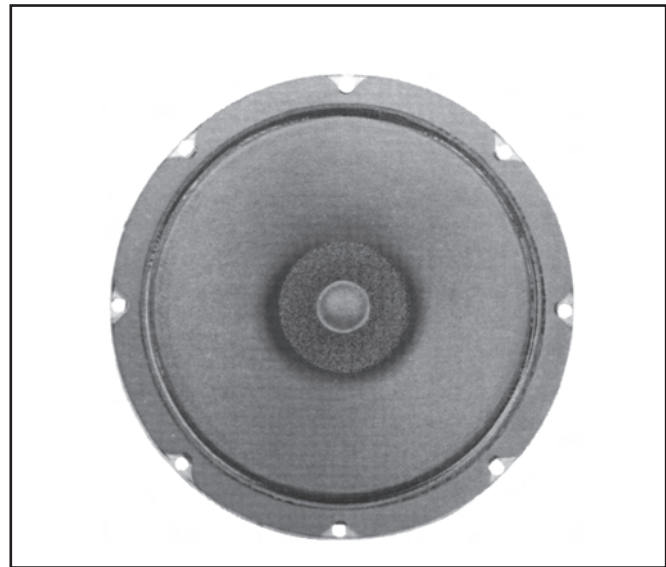
To ensure long-term reliability in installations, the 209-8A is designed to handle 10 watts continuous power (40 watts peak) of shaped white noise signal for eight hours per EIA RS-426-A 1980.

The 209-4T includes a transformer, allowing connection to 25/70/100-volt line, with taps of 0.5 to 4 watts. The 209-4TWB offers the same performance as the 209-4T and includes a premounted ceiling grille.

### Architects' and Engineers' Specifications

The loudspeaker shall be a dual-cone loudspeaker with a nominal diameter of 20.6 cm (8.1 in.), an overall depth of 7.0 cm (2.75 in.), and shall weigh no more than 1.0 kg (2.2 lb). The voice coil shall have a nominal diameter of 2.54 cm (1.0 in.) and depth of 7.6 mm (0.3 in.) and shall operate in a gap of not less than 1.0 T (10,000 Gauss). High frequencies shall be reproduced by 5.7 cm (2.2 in.) free-edge cone attached to the apex of the low-frequency device and protected from dust by a dust dome fastened to the low frequency cone.

The loudspeaker shall exhibit a sensitivity (SPL, 1 W at 1 m (3.28 ft) averaged 200 - 4,000 Hz) of no less than 94 dB on axis maintaining an essentially flat frequency response with 3 dB-down points at 115 Hz and 12,000 Hz in a 12-cubic-foot sealed box in a free field. The half-space reference efficiency



shall be 1.9%. The nominal impedance shall be 8 ohms and the do resistance shall be 6.5 ohms. The loudspeaker shall be capable of handling a continuous 10-watt (8.6 volts true RMS) shaped white-noise signal (as per EIA RS-426A 1980) with a 6 dB crest factor for eight hours.

The loudspeaker shall be the Electro-Voice® model 209-8A. When fitted with a transformer that allows connection to 25/70.7/100-volt systems of 0.5 to 4 watts, the loudspeaker shall be referred to as the Electro-Voice® model 209-4T and the 209-4TWB with transformer and grille.

### Specifications:

**Frequency Response:** 80 - 15,000 Hz, ±5 dB (see Page 4)

**Power-Handling Capacity:** .....10 watts  
(per EIA RS-426-A 1980 (80 - 15,000 Hz bandlimited pink noise, 6 dB crest factor):

#### Impedance:

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

**Minimum:** ..... 7 ohms (230 Hz)

**Sound Pressure Level:** ..... 94 dB

(at 1 Meter, 1 Watt Input, 200-4,000 Hz Average)

**Maximum SPL:** ..... 104 dB for 10W @ 1M

**Voice-Coil Diameter:** ..... 2.54 cm (1.0 in.)

**Magnet Weight:** ..... 0.32 kg (0.72 lb)

**Magnet Material:** ..... Barium Ferrite

**Flux Density:** ..... 1.0 Tesla

**Speaker Frame:** ..... 22-gauge stamped steel

**Frame Color:** ..... Black

#### Dimensions:

##### 209-8A / 209-4T

**Diameter:** ..... 20.6 cm (8.1 in.)

**Height:** ..... 7.0 cm (2.75 in.)

##### 209-4TWB

**Diameter:** ..... 33.0 cm (13.0 in.)

**Height:** ..... 7.6 cm (3.0 in.)

#### Net Weight:

209-8A: ..... 1.0 kg (2.2 lb)

209-4T: ..... 1.4 kg (3.0 lb)

209-4TWB: ..... 1.6 kg (3.59 lb)

#### Shipping Weight:

209-8A: ..... 1.3 kg (2.9 lb)

209-4T: ..... 1.7 kg (3.7 lb)

209-4TWB: ..... 1.9 kg (4.1 lb)

#### Transformer Input:

209-4T ..... 25/70.7 (100 volt operation)

### Recommended Connections

The 209 is a nominal 8-ohm impedance loudspeaker with a 10-watt input capability. However, it is also available with transformer, the 209-4T, and with transformer and grille, the 209-4TWB.

The 209-4T utilizes a 4-watt, 25/70.7/100-volt universal line matching transformer with power taps ranging from 0.5 to 4 watts as indicated in the table below. The transformer is mounted to the frame and the primary winding is accessible for the user to select any of the power taps indicated in the table below.

All wattages marked for the various taps refer to the load on the amplifier, with the insertion loss of the transformer being less than 2 dB.

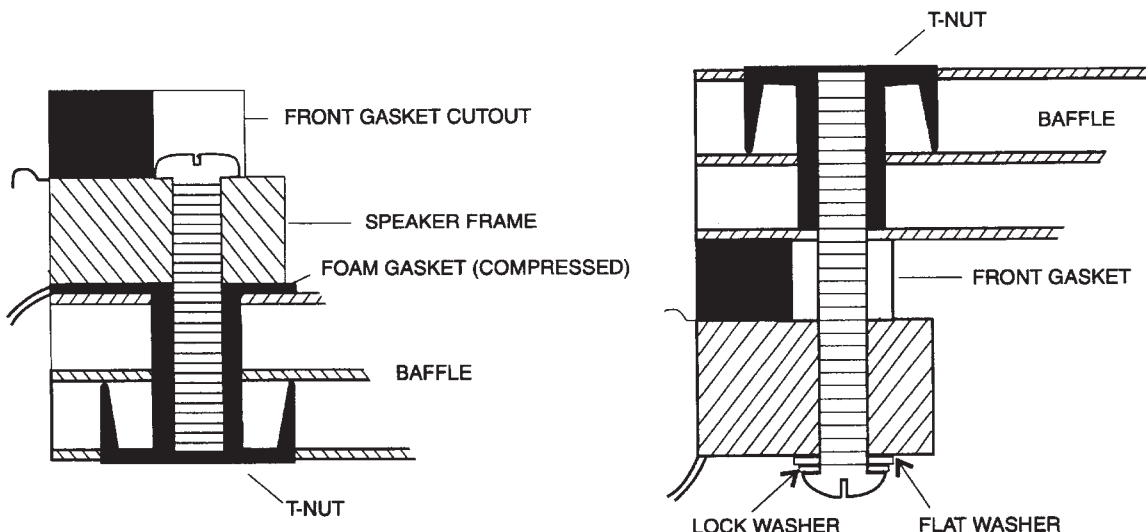
### Recommended Enclosures and Baffles

209-8A and 209-4T are designed to fit on standard 8-inch ceiling speaker baffles. Additionally, the 209 series loudspeakers will accommodate the use of any standard back enclosure with a diameter of 8.6 inches or greater and a depth of at least 3.5 inches.

Larger back volumes will increase the low-frequency output. The frequency response of a 209 in a typical 0.25-cubic-foot and 1.8-cubic-foot back enclosure are shown on page 4.

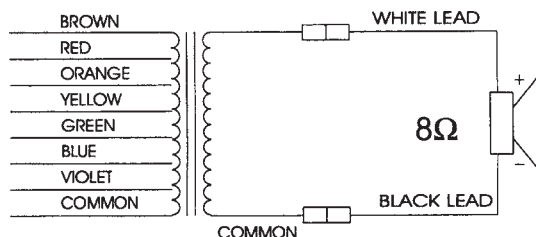
### Mounting

The 209 may be front- or rear-mounted against either surface of its mounting flange and requires a 18.4 cm (7.25 in.) diameter cutout and a 19.5 cm (7.68 in.) bolt circle. Normal fasteners up to 5 mm (0.20 in.) will fit through the eight holes in the frame. The 209 is designed for mounting on standard ceiling speaker baffles.

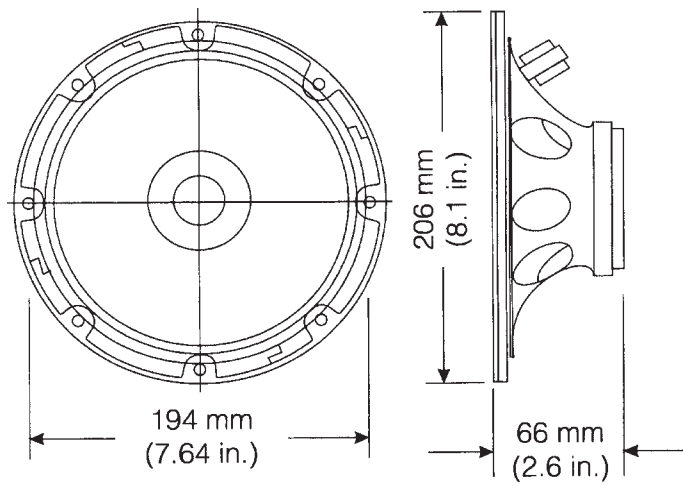


Mounting Diagram

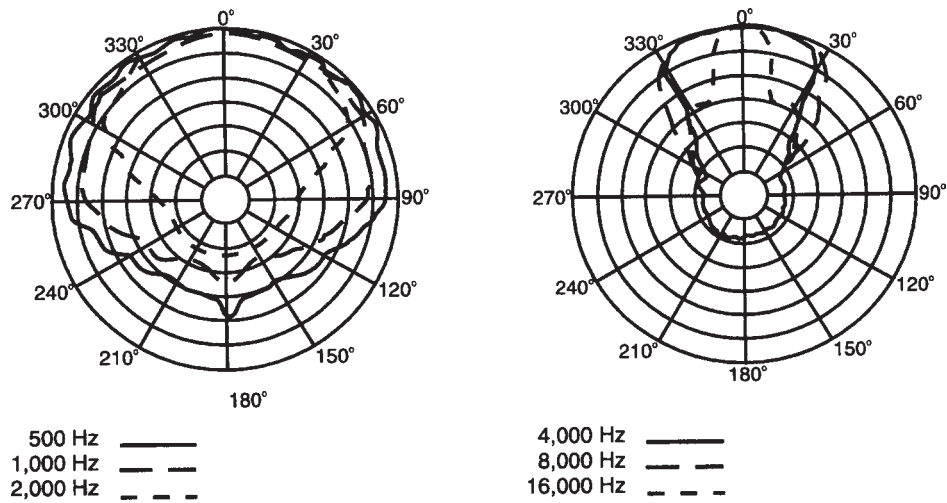
209-4T			
	25V	70V	100V
4.0W	Brown	Yellow	Green
2.0W	Red	Green	Blue
1.0W	Orange	Blue	Violet
.05W	Yellow	Violet	N/A
Common	Black	Black	Black
8 Ohms	White	White	White
Common	Black	Black	Black



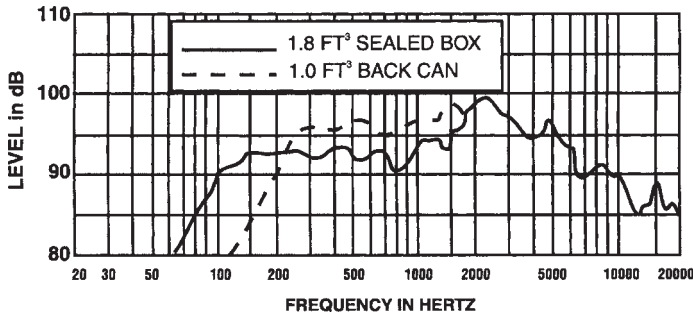
Wiring Diagram



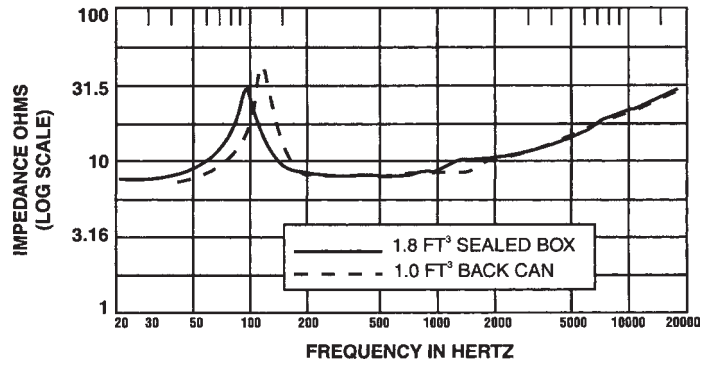
**Dimensions**



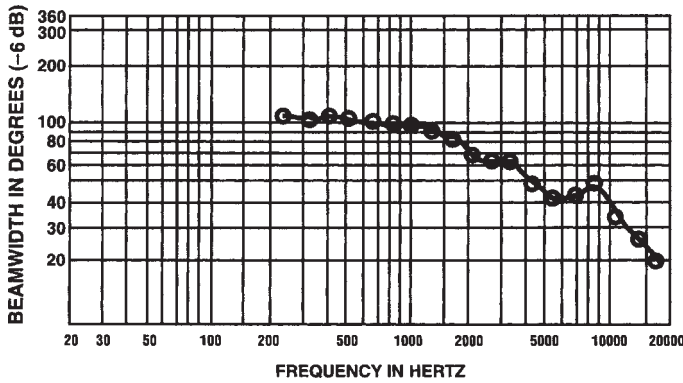
***Polar Response in 1.8 ft<sup>3</sup> Sealed box 4 volt RMS of 1/3 octave Band Limited Noise in Anechoic Environment, 20 feet on Axis.***



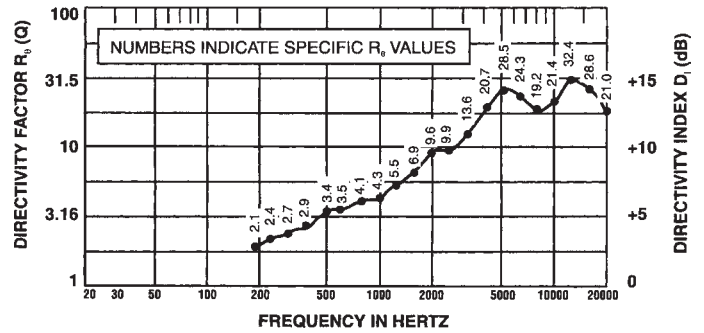
**Axial Frequency Response**  
(1 watt / 1 meter)



**Input Impedance vs. Frequency**



**Beamwidth vs. Frequency in 1.8 ft³ Sealed Box**



**Directivity Factor and Directivity Index vs. Frequency**

USA 12000 Portland Ave South, Burnsville, MN 55337, Phone: 952-884-4051, FAX: 952-884-0043  
 Canada 705 Progress Avenue, Unit 46, Scarborough, Ontario, Canada, M1H2X1, Phone: 416-431-4975, 800-881-1685, FAX: 416-431-4588  
 Switzerland Kellenstrasse 11, CH-2563 IPSACH, Switzerland, Phone: 41/32-331-6833, FAX: 41/32-331-1221  
 Germany Hirschberger Ring 45, D94315, Straubing, Germany, Phone: 49 9421-706 392, FAX: 49 9421-706 287  
 France Parc de Courcerin, Alle Lech Walesa, Lognes, 77185 Marne La Vallee, France, Phone: 33/1-6480-0090, FAX: 33/1-6480-4538  
 Australia Unit 23, Block C, Slough Business Park, Slough Avenue, Silverwater, N.S.W. 2128, Australia, Phone: 61/2-9648-3455, FAX: 61/2-9648-5585  
 Hong Kong Unit E & F, 21/F, Luk Hop Industrial Bldg., 8 Luk Hop St., San PO Kong, Kowloon, Hong Kong, Phone: 852-2351-3628, FAX: 852-2351-3329  
 Japan 2-5-60 Izumi, Suginami-ku, Tokyo, Japan 168, Phone: 81-3-3325-7900, FAX: 81-3-3325-7789  
 Singapore 3015A Ubi Rd 1, 05-10, Kampong Ubi Industrial Estate, Singapore 408705, Phone: 65-746-8760, FAX: 65-746-1206  
 Mexico Av. Parque Chapultepec #66-201, Col. El. Parque Edo. Mex. 53390, Phone: (52) 5358-5434, FAX: (52) 5358-5588  
 UK 4, The Willows Centre, Willow Lane, Mitcham, Surrey CR4 4NX, UK, Phone: 44 181 640 9600, FAX: 44 181 646 7084  
 Africa, Mid-East 12000 Portland Ave South, Burnsville, MN 55337, Phone: 952-887-7424, FAX: 952-887-9212  
 Latin America 12000 Portland Ave South, Burnsville, MN 55337, Phone: 952-887-7491, FAX: 952-887-9212

**www.electrovoice.com • Telex Communications, Inc. • www.telex.com**

© Telex Communications, Inc. 02/2001  
 Part Number 38109-930 Rev A



**Electro-Voice®**

U.S.A. and Canada only.  
 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 800/865-2606  
 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.