



**Electro-Voice®**  
a gulton company

## Model CO15P Omnidirectional Electret Condenser Microphone

### SPECIFICATIONS

**Element:**

Electret condenser

**Frequency Response:**

20 Hz – 18 kHz  $\pm$  2.5 dB

**Polar Pattern:**

Omnidirectional  
(see figure 3)

**Impedance:**

150 ohms nominal (balanced)

**Element Capacitance:**

18 pF

**Output Level:**

–49 dB Ref:

(0 dB = 1 mW/10 dynes/cm<sup>2</sup>)

**EIA Sensitivity Rating:**

–141 dB

**Self Noise:**

1.5 mV

**Equivalent Noise Level:**

Less than 26 dB re  
.0002 dynes/cm<sup>2</sup>

**S/N Ratio:**

66 dB

**Dynamic Range:**

119 dB  
(145 dB input open circuit)

**Maximum SPL for 1% THD:**

145 dB (SPL)

**Case Material:**

Steel

**Dimensions:**

174.5 mm (6.87") long,  
27 mm (1.06") max. dia.,  
19 mm (.75") shank dia.

**Weight:**

212.6 g (7.5 oz)

**Finish:**

Fawn beige micomatte

**Cable:**

4.6 m (15'), two-conductor, shielded,  
brown rubber-jacketed cable with  
Switchcraft A3F connector

**Operating Voltage:**

8 to 50 VDC (standard 48 V remote  
powering accepted)

**Current Required:**

3 to 12 mA (depending on supply  
voltage)

**Accessories Furnished:**

315A windscreen  
310A stand clamp

**Optional Accessories:**

AC24 power supply  
BS9 battery supply  
CA10 attenuator  
313A shock mount  
340 security clamp  
312A stand clamp

### DESCRIPTION & APPLICATIONS

The Electro-Voice Model CO15P is a professional remotely powered electret condenser omnidirectional microphone intended for professional recording and broadcast applications. The CO15P features an extremely smooth wide-range frequency response both on axis and any angle off axis.

The CO15P is for special purposes, yet its wide frequency response and ideal polar pattern make it versatile. Use it for voice or instruments, for recording or live performances, for ensembles or full orchestras, even for special instrument miking such as drums, or cymbals, or acoustic guitars. The extended low frequency response makes the CO15P ideal for pipe organ recording. In addition, the wide flat frequency response and ideal directivity index make the CO15P an excellent instrumentation microphone for use with real-time analyzers in measuring room acoustics.

The frequency response for the CO15P is shown in figure 2 which gives the on-axis response. The polar response as shown in figure 3 is measured with the microphone facing (aimed at) 0° then rotated through 360°. The sound source is 1.5 m (5') from the microphone diaphragm.



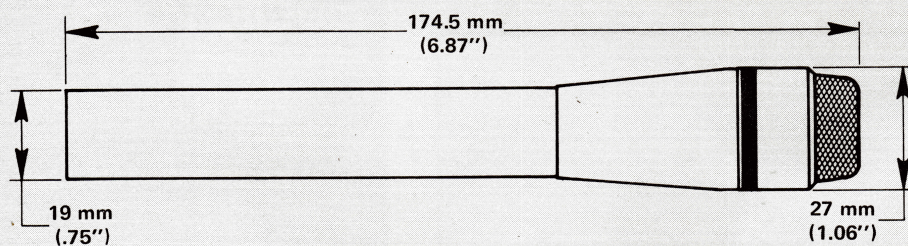


FIGURE 1 – Dimensions

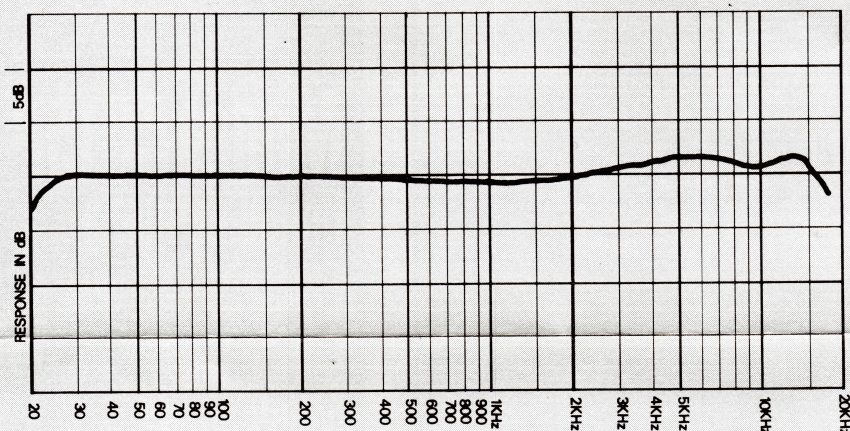


FIGURE 2 – Frequency Response  
(Frequency In Hertz)

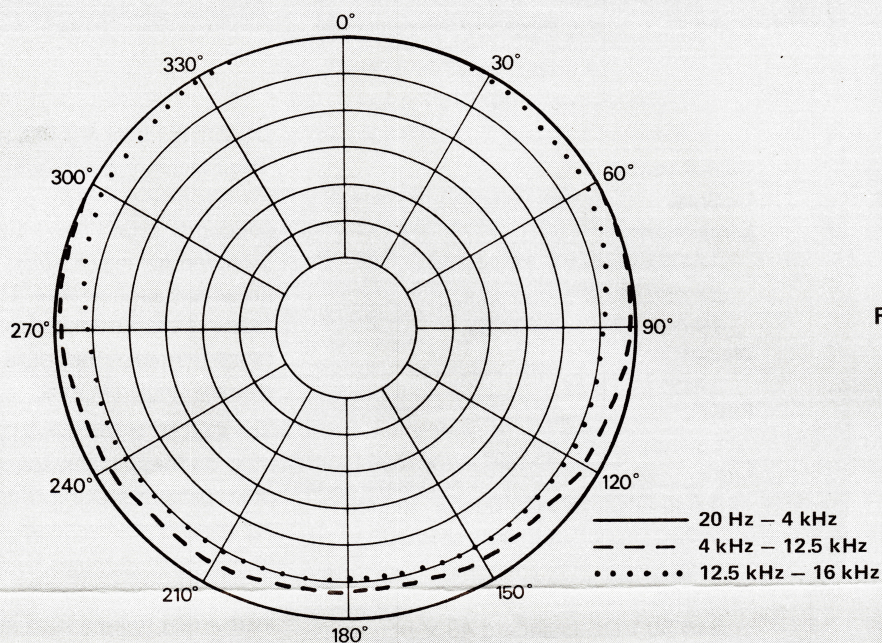


FIGURE 3 – Polar Response  
(5 dB Per Division)

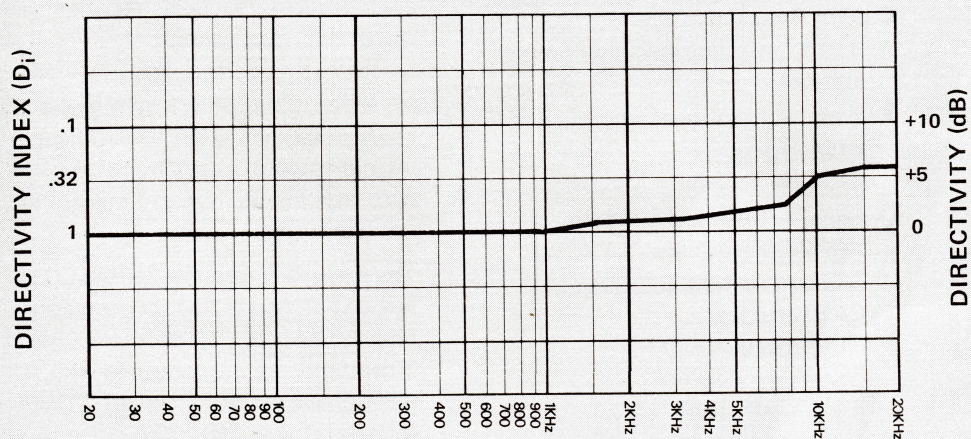


FIGURE 4 – Directivity Index  
(Frequency In Hertz)



## DIRECTIVITY INDEX

The directivity index for the CO15P (see figure 4) is computed from polar curves run at each one-third octave center frequency across the frequency range.  $D_i$  shows directivity in dB with respect to on-axis frequency response and may be applied to the on-axis response to show power response. (See Acoustical Engineering, Olsen, pp 331 & 332). This data is useful in pre-determining regenerative feedback conditions for directional elements and random incidence response for omnidirectional elements.

## OPERATING INSTRUCTIONS

The CO15P condenser microphone requires a remote power supply in order to operate. Power may be obtained from a microphone input equipped with standard 48 VDC remote powering or from an accessory power supply placed in the line between the microphone and mixer input. The Electro-Voice AC24 power supply or the BS9 battery supply are intended for this purpose. See the PE15A engineering data sheet for further details.

## SPECIAL NOTE — MAINTENANCE INSTRUCTIONS

This electret condenser microphone should not be left in the open sun or other hot environments where temperatures may approach or exceed 130 degrees Fahrenheit for any period of time. Following this suggestion will prolong the life of the generating element, and insure reliable, trouble-free performance over the years.

## CO15P AND DISTORTION

Many times, microphones are unjustly accused of causing distortion. More often than not, the mixer preamp is the problem. Mixer or console preamps are designed to operate with a nominal input level of several millivolts. When this nominal input level is exceeded, the

preamp quickly goes into clipping, thus causing distortion. Both dynamic and condenser microphones are capable of delivering over one volt to the mixer input at less than .15 percent total harmonic distortion. Preamps, over the years, traditionally have been designed with dynamic microphones in mind. With condenser microphones having output levels 10 to 20 dB greater than dynamics, caution should be exercised so as not to overload the mike preamp.

## ELECTRET PRINCIPLE

The generating element of a condenser microphone is a capacitor, with one of its plates being the microphone's moving diaphragm; the other plate being the stationary backplate. When a charge is applied to the diaphragm, and changes in air pressure move the diaphragm, an output voltage is generated. All condenser microphones require a charge or difference of potential between diaphragm and backplate. The early condenser microphones achieved this by employing an external D.C. power source of approximately 200 volts. This system at best was awkward to use.

Today, condenser microphones operate from voltages of 48 volts and less. There are two methods of utilizing these lower voltages. One method increases the input voltage by employing some sophisticated electronic circuitry. Another method is to apply the 48 volts directly to the diaphragm, thus making the dynamic range and sensitivity of the microphones totally dependent upon the stability of the 48 volt supply. Still other methods have been devised.

In recent years, materials and techniques have been developed which allow placing a permanent charge on the condenser microphone capacitor element (diaphragm). This ability to permanently charge a material is known as the Electret Phenomenon. With a

permanent charge on the diaphragm, the only voltage now needed is to power the impedance converter. Because the output of any condenser microphone element is extremely high impedance, a means to convert the small fluctuations in capacitance into a usable output voltage is needed. The impedance converter provides this function and generally consists of a field effect transistor and its associated circuitry.

## ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The microphone shall be a condenser omnidirectional type. The microphone shall have a wide range uniform frequency response from 20 Hz — 18 kHz. The microphone will exhibit little if any off axis attenuation.

The microphone shall have an output of -49 dB (0 dB re 1 mW/10 dynes/cm<sup>2</sup>). The microphone shall have an electret diaphragm. A 4.6 m (15 foot), two-conductor, shielded, brown rubber-jacketed cable with a Switchcraft A3F connector installed in the microphone end shall be provided. Low impedance connections shall be balanced line configuration.

The microphone shall accept a 145 dB SPL input while providing no greater than 1% THD output (open circuit termination). Dynamic range shall be 119 dB or greater. Equivalent noise shall be less than 26 dB.

The case shall be machined steel. Dimensions shall be 174.5 mm (6.87") long, with a maximum diameter of 27 mm (1.06"), and a shank diameter of 19 mm (.75"). A removable windscreen, Model 315A, shall be provided along with a Model 310A stand clamp. Finish shall be fawn beige micomatte.

The Electro-Voice Model CO15P condenser microphone is specified.