

## CH230X CH230WX Condenser Cardioid Hanging Microphone

- Available in black or white
- Braided cable shield maintains horizontal aiming, even when temperature and humidity vary
- Three-pin male XLR-type output connector
- Enclosed shielded preamp gives high resistance to electrical noise and radio-frequency-interference

### Description and Application

The CH230X and CH230WX hanging microphones, black and white respectively, utilize back-electret condenser technology to provide an extended, flat frequency response with a controlled cardioid polar pattern for high-quality sound reinforcement. The CH230X/CH230WX was specifically designed to mic choirs, instrumental and vocal groups, and live theater. The size and color (black/white) of the transducer and cable allow the microphone to blend in with its surroundings.

The CH230X's and CH230WX's low self-noise and high-output signal level combine to produce an excellent signal-to-noise ratio. Exceptionally high sensitivity, a uniform cardioid polar response, and smooth frequency response make the CH230X and CH230WX ideally suited for distant sound pick-up. The cardioid polar response is precisely controlled and is highly effective in suppressing feedback without coloration of sound. Additionally, unwanted low-frequency noise such as the rumble from air-moving equipment is reduced with the fixed high-pass filter. The filter's corner frequency (75 Hz) is low enough to have essentially no

effect on voice quality. Power for the microphone is obtained from any phantom source supplying 12 to 52 volts.

The CH230X and CH230WX are furnished with 25 feet of black (CH230X) or white (CH230WX) miniature braided shielded cable. The design of the cable ensures the microphone's horizontal position will be held stable without the need for fish-line tethering.

The CH230X and CH230WX are easily aimed at the performance with the supplied steel wire hanger and holding nut. The wire hanger attached to the microphone element and cable can be bent to aim the microphone in the vertical plane. To position the microphone on the horizontal plane, loosen the holding nut on the back of the microphone and slightly twist the microphone on the wire holder (clockwise rotation moves the microphone to the left; counterclockwise rotation moves the microphone to the right). Secure this position by tightening the holding nut.

**Note:** For fixed installations, allow the microphone cable to hang for at least 24 hours so the cable can completely relax and establish a set. This allows the microphone to be accurately positioned over a choir, stage or orchestra.

### Application Notes

When hanging one or more microphones to provide coverage for a choir, instrumental or theater group, the best microphone position for optimum sound quality and feedback control depends on many factors—sound system characteristics, construction of the auditorium or theater and the size and nature of the performing group. Two general rules to observe for the best sound coverage are (1) microphone position and (2) the "3-to-1 rule."

The first rule is to suspend the microphone approximately two to three feet in front of the first row of performers and two to three feet higher than the heads of the last row of performers. The microphones are usually aimed to point at the last row of performers (see Figure 3).

The second rule, the "3-to-1 rule," should be applied when more than one microphone is required, and their outputs are combined (as with a mixer). Following the 3-to-1 rule avoids the deep voids and dips in frequency response that occur when two or more microphones "see" the same signal from slightly different distances. The 3-to-1 rule is as follows: when multiple microphones

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are used, place them at least three times as far apart as any one of them is from the nearest sound source. Figure 4 shows a proper application of the 3-to-1 rule.

The CH230X and CH230WX may also be used to provide coverage for live theater applications (Figure 5). Most of the action occurs at center stage, so the microphone should be positioned above and pointed to the center of the stage.

### Architectural & Engineering Specifications

The microphone shall be a back-electret condenser type with a frequency response of 75 Hz to 20 kHz. The microphone shall have a cardioid polar pattern with a rear response which is typically 20 dB below the front response at 1.0 kHz. The microphone shall have an output power level of -21.7 dB, where 0 dB = 1 milliwatt per pascal, and output shall not be appreciably affected by the following temperature and humidity extremes: -29° to 74°C (-20° to 165°F) when the relative humidity is 0-50%; -29° to 57°C (-20° to 135°F) when relative humidity is 0-95%. The microphone shall have a nominal, balanced output impedance of 200 ohms when connected to its electronics module. The microphone shall have a low-gloss black finish (CH230X) or a low-gloss white finish (CH230WX). The cable color shall match the transducer. A fixed, two-pole high-pass filter ( $f_0=75\text{Hz}$ ) shall be provided. The transducer shall have a wire hanger for directing the microphone. Dimensions: the transducer shall be 10.5 mm (0.42 in.) wide and 41.9 mm (1.65 in.) long; the cable shall be 9.1 m (30 ft) long and 2.6 mm (0.106 in.) in diameter. The electronics module shall be a metal cylinder 105 mm (4.13 in.) long and 20.6 mm (.81 in.) in diameter. Termina-

tion to the electronics module shall be a 3-pin male XLR type connector.

The Electro-Voice CH230X (CH230WX) is specified.

### Warranty (Limited)

Electro-Voice 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 Mark IV Audio Service or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Mark IV 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 Mark IV 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. Electro-Voice 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.

**Electro-Voice Wired Microphones** are guaranteed against malfunction from any cause for two (2) years from the date of original purchase. In addition, the Limited Warranty for the acoustic system contained in these microphones shall apply for the life of the product, defined as a period of ten (10) years from the date that the manufacture of the specific microphone has been discontinued. Any and all active electronics incorporated in these microphones are guaranteed against malfunction due to defects in materials or workmanship for a period of three (3) years from the date of original purchase. The Limited Warranty does not extend to cables, cable connectors, or switches. Additional details are included in the Uniform Limited Warranty statement.

For warranty repair, service information, or a listing of the repair facilities nearest you, 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.

# CH230X/CH230WX Condenser Cardioid Hanging Microphone

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Figure 1—Frequency Response

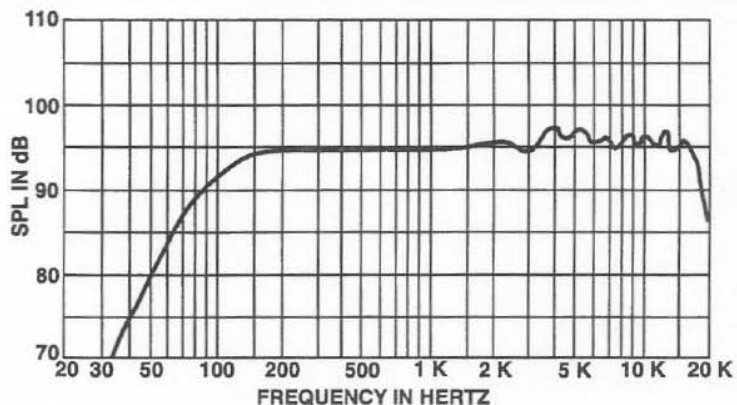


Figure 2—Polar Response

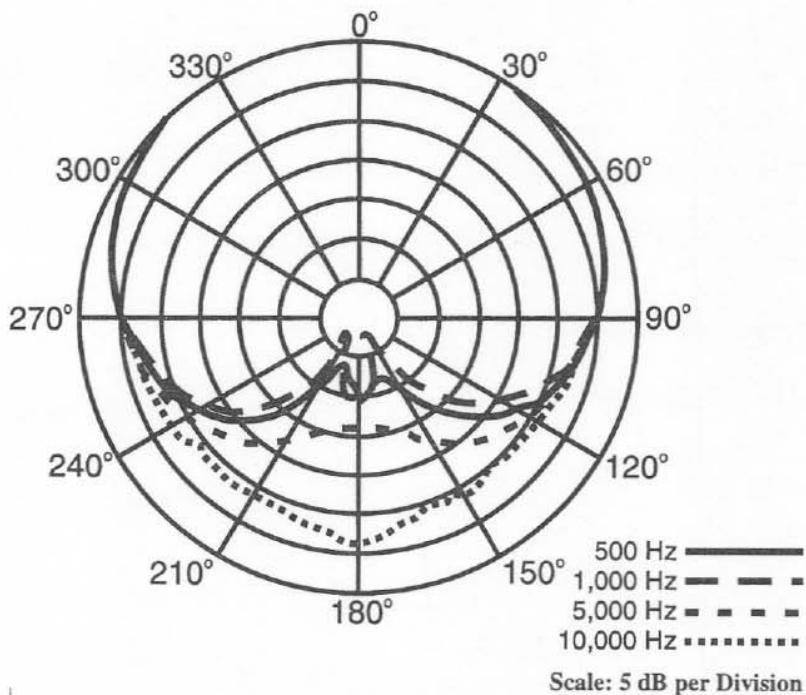
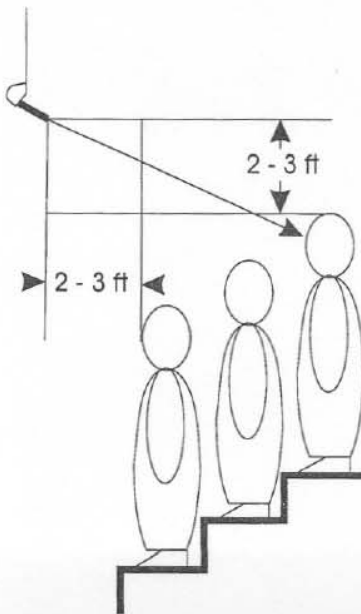


Figure 3—Hanging Microphone Placement



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Figure 4—3-to-1 Rule

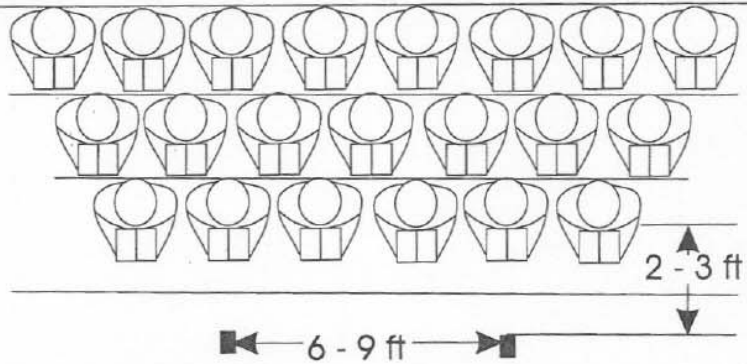
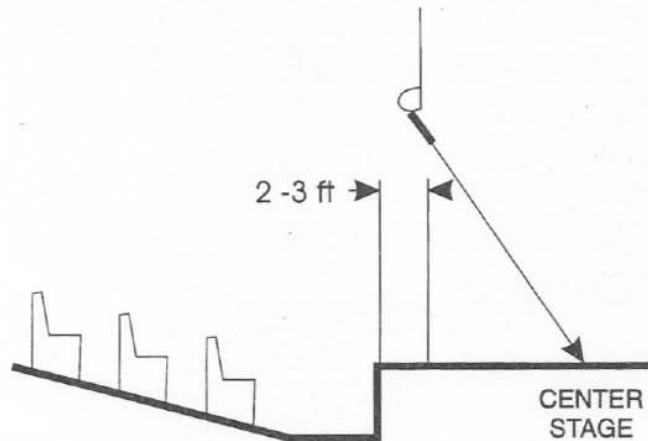


Figure 5—Live Theater Placement



CH230X/CH230WX Condenser Cardioid Hanging Microphone

## Specifications

### Generation Element:

Condenser, back electret

### Frequency Response (see Figure 1):

75 Hz to 20,000 Hz

### Polar Pattern:

Cardioid

### Sensitivity,

**Open Circuit Voltage, 1 kHz:**

30 mV/pascal

**Power Level, 1 kHz (0 dB =**

**1 mW/pascal):**

-21.7 dB

### Clipping Level (1% THD):

127 dB SPL

### Equivalent Noise:

22 dB SPL A weighted

### Dynamic Range:

105 dB

### Output Impedance, 1 kHz:

200 ohms

### Power Requirements:

12 to 52 V dc phantom supply

### Current Consumption:

2.1 mA

### Fixed High-Pass Filter,

**Corner Frequency:**

75 Hz

**Slope:**

12 dB per octave

### Polarity:

Pin 2 positive, referenced to pin 3, with positive pressure on the diaphragm

### Color,

**CH230X:**

Low-gloss black

**CH230WX:**

Low-gloss white

### Environmental Conditions,

**Relative Humidity 0-50%:**

-29° to 74°C (-20° to 165°F)

**Relative Humidity 0 to 95%:**

-29° to 57°C (-20° to 135°F)

### Dimensions,

**Transducer:**

10.5 mm (0.4 in.) diameter

41.9 mm (1.65 in.) long

**Microphone Cable:**

7.6 m (25 ft) long

**Electronics Module:**

105 mm (4.13 in.) long

20.6 mm (.81 in.) diameter

**Net Weight:**

151 grams (5.3 oz)

**Shipping Weight:**

318 grams (11.2 oz)

# Electro-Voice®

a MARK IV company

600 Cecil Street, Buchanan, MI 49107

800/234-6831, 616/695-6831, 616/695-1304 Fax

MICROPHONES - Condensers

Part Number 533923 - 9706

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