

# ES933PMH & ES933PMWH

Hypercardioid Condenser Hanging Microphones

 audio-technica

engineered sound® microphones



## Features

- Wall/ceiling plate power module permits permanent installation in standard, single-gang electrical box
- Uniform hypercardioid polar pattern with 100° acceptance angle
- Low-profile design with low-reflectance finish for minimum visibility
- Superior off-axis rejection for maximum gain before feedback
- UniGuard® RFI-shielding technology offers outstanding rejection of radio frequency interference (RFI)
- UniSteep® filter provides a steep low-frequency attenuation to minimize pickup of undesired ambient noise
- Available interchangeable elements permit angle of acceptance from 90° to 360°
- Steel hanger positions microphone over choirs, instrumental groups and theater stages
- Available in two colors: black (ES933PMH) and white (ES933PMWH)

## Description

The ES933PMH is a wide-range miniature condenser microphone with a hypercardioid polar pattern. It is designed for quality sound reinforcement, professional recording, television and other demanding sound pickup applications. The combination of small size and excellent response makes the microphone ideal for suspension over choirs, instrumental groups or theater stages.

The microphone requires 11V to 52V phantom power for operation.

The microphone is equipped with UniGuard® RFI-shielding technology, which offers outstanding rejection of radio frequency interference (RFI).

The microphone's hypercardioid polar pattern provides a 100° angle of acceptance. Additional interchangeable elements with omnidirectional (360°), cardioid (120°) and MicroLine® (90°) pickup patterns are available.

The microphone includes a 15.2 m (50') permanently attached miniature cable. Its free end connects to the provided AT8534 wall/ceiling plate power module via a special TA3F-type connector designed to optimize RFI immunity. The power module features a white-finished standard electrical cover plate for easy, secure installation. Output connections on the power module are screw terminals.

Switches in the power module permit a +10 dB gain setting for extra sensitive pickup as well as a choice of flat response or low-frequency roll-off (via integral 80 Hz high-pass UniSteep® filter) to help control undesired ambient noise.

The microphone comes equipped with a wall/ceiling plate power module, a vinyl-coated steel hanger for positioning over a choir/orchestra/stage, and a two-stage foam windscreen. The microphone is enclosed in a rugged housing with a low-reflectance black finish. It is also available with white housing, cable, hanger and windscreen as the ES933PMWH.

## Installation and Operation

The ES933PMH requires 11V to 52V phantom power for operation.

A uniform 100° angle of acceptance provides well-balanced audio pickup. The microphone should be located forward of the front-most source, above the rear-most source, and "aimed" between them (Fig. 1). Increasing the height of the mic above the sources will tend to equalize sound levels between them, but may also increase background/reverberant sound pickup. When possible, the distance from the mic to the rear-most source should be no more than twice the distance to the front source, to maintain front-to-rear balance (Fig. 1).

Width of pickup is approximately 2.5 times the distance to the closest performer. If additional mics are needed for wide sources, they should be positioned apart laterally at least 2.5 times the distance to the front source, to avoid phase cancellation (Fig. 2). To orient the microphone in the proper direction, twist the housing slightly in its wire holder. (Clockwise rotation moves the microphone to the right; counterclockwise rotation moves it to the left.)

The provided two-stage foam windscreen simply snaps over the head of the microphone, effectively reducing noise from wind or ventilation air currents.

An integral 80 Hz high-pass UniSteep® filter provides easy switching from a flat frequency response to a low-end roll-off. The roll-off position reduces the pickup of low-frequency ambient noise (such as traffic, air-handling systems, etc.), room reverberation and mechanically coupled vibrations. To engage the UniSteep® filter, slide the switch toward the "bent" line. A 10 dB gain switch is provided for situations that demand extra sensitive pickup. The +10 position increases the microphone's overall output by 10 dB. To engage the 10 dB gain, slide the switch toward the +10 position.

The AT8534 wall/ceiling plate power module is designed to be mounted in a standard metal U.S. single-gang electrical box. For safety and best performance, use the electrical box only for the AT8534; do not include any AC power conductors. (Also route the mic cable as far away from AC power cables as possible.)

Screw-terminal output connections of the AT8534 are the same as those of an XLR-type plug: shield to Terminal 1, balanced signal and phantom power to Terminals 2 and 3. Output is phased so that positive acoustic pressure produces positive voltage at Terminal 2, in accordance with industry convention. **Do not connect the output cable shield to the box.** Double-check to make certain that all input and output leads have no bare wires or loose strands that could touch each other, the circuit board or the electrical box. Then attach the power module plate to the electrical box.

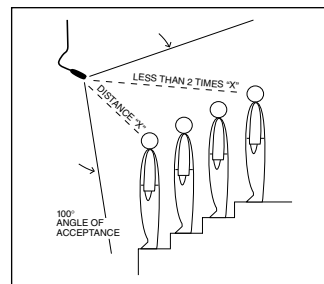


Figure 1

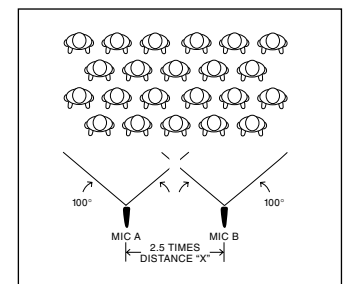


Figure 2

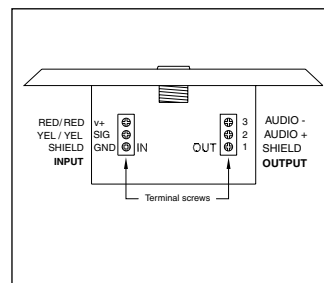


Figure 3

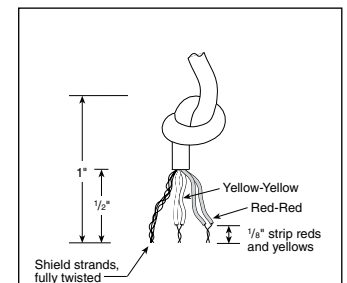


Figure 4

# ES933PMH & ES933PMWH

Connect the TA3F-type connector from the microphone's cable to the TA3M-type connector in the power module plate.

**Note:** Audio-Technica has developed a special RFI-shielding mechanism that is an integral part of the connectors in the Engineered Sound® line. If you remove or incorrectly replace the connector, you may adversely affect the unit's RFI immunity. Audio-Technica offers a crimp tool (ATCT) and RFI shields that enable you to shorten the cable and correctly reinstall the connector while maintaining the highest level of RFI immunity.

If you need to shorten the cable between the microphone and power module, it can be done two ways:

a. To maintain original RFI shielding (see note above), the TA3F-type connector can be removed from the cable end, the cable shortened and the connector replaced using Audio-Technica's available crimp tool and RFI shield for TA3F-type connector.

b. If RFI immunity is not required, the TA3M-type connector on the plate can be removed and discarded (save the back nut and washer). Assemble the included plastic ferrule into the hole left from the TA3M-type connector, using the washer and nut from the connector to secure the ferrule. Cut the cable to the desired length plus a few inches. Thread the cable through the ferrule and tie a knot in the cable behind the ferrule to secure it. Carefully strip the ends of the cable and connect the wires to the terminals formerly occupied by the TA3M-type connector. Maintain color coding (Shield - S, Yellow - Y, Red - R) and connect the microphone wires to the appropriate terminal screws (Fig. 3).

**Note:** The cable has two red wires and two yellow wires. Twist the two red wires together and the two yellow wires together (Fig. 4).

Avoid leaving the microphone in the open sun or in areas where temperatures exceed 110° F (43° C) for extended periods. Extremely high humidity should also be avoided.

## Architect's and Engineer's Specifications

The microphone shall be a fixed-charge condenser designed for permanent installation. It shall have a hypercardioid polar pattern with a uniform 100° angle of acceptance and a frequency response of 80 Hz to 20,000 Hz. It shall be capable of accepting optional interchangeable elements for additional polar patterns. The microphone shall operate from an external 11V to 52V DC phantom power source. It shall be capable of handling sound input levels up to 128 dB with a dynamic range of 102 dB. Nominal open-circuit output voltage shall be 10.0 mV at 1 V, 1 Pascal. Output shall be low impedance balanced (200 ohms). It shall offer outstanding rejection of radio frequency interference (RFI).

The microphone shall have a 15.2 m (50') permanently attached miniature cable terminating in a special TA3F-type output connector designed to optimize RFI immunity. The output connector shall connect to a TB3M-type jack on the included power module. Output connections on the power module shall be screw terminals. The plate power module shall be designed to mount over a standard single-gang metal electrical box for ceiling or wall mounting. The power module shall contain a switch to permit choice of flat response or 80 Hz low-frequency roll-off. In addition, the power module shall incorporate a switchable +10 dB gain setting. The power module face plate shall be semi-gloss white and mounting screws shall be included.

An adjustable steel wire hanger shall be provided for suspended installations. The steel wire hanger shall attach to the microphone body and allow for the positioning of the microphone without the need for tools. A two-stage foam windscreen shall also be included.

The microphone shall be a hanging design, with overall length of 275 mm (1.08") and a head diameter of 8.4 mm (0.33"). Weight shall be 5.5 grams (0.2 oz) without cable. The microphone cable and steel hanger shall be black [white].

The Audio-Technica ES933PMH [ES933PMWH] is specified.

## Specifications

<b>Element</b>	Fixed-charge back plate, permanently polarized condenser
<b>Polar pattern</b>	Hypercardioid
<b>Frequency response</b>	80-20,000 Hz
<b>Low frequency roll-off</b>	80 Hz, 18 dB/octave
<b>Open circuit sensitivity</b>	-40 dB (10.0 mV) re 1V at 1 Pa
<b>Impedance</b>	200 ohms
<b>Maximum input sound level</b>	128 dB SPL, 1 kHz at 1% T.H.D.
<b>Dynamic range (typical)</b>	102 dB, 1 kHz at Max SPL
<b>Signal-to-noise ratio<sup>1</sup></b>	68 dB, 1 kHz at 1 Pa
<b>Phantom power requirements</b>	11-52V DC, 4 mA typical
<b>Switches</b>	Flat, roll-off; 0 dB, +10 dB gain setting
<b>Weight</b>	Microphone: 5.5 g (0.2 oz) Power module: 97 g (3.4 oz)
<b>Dimensions</b>	Microphone: 27.5 mm (1.08") long, 8.4 mm (0.33") head diameter Power module: 71.0 mm (2.80") W x 115.5 mm (4.55") H x 36.0 mm (1.42") D
<b>Output connector</b>	Power module: Screw-terminals
<b>Cable</b>	15.2 m (50') long (permanently attached to microphone), 3.2 mm (0.13") diameter, 2-conductor shielded cable, terminated with TA3F-type connector
<b>Optional interchangeable elements</b>	ESE-O omnidirectional (360°) ESE-C cardioid (120°) ESE-ML MicroLine® (90°)
<b>Audio-Technica case style</b>	M25
<b>Accessories furnished</b>	ES933PMH AT8534 wall/ceiling plate power module; AT8452 steel hanger; AT8109 two-stage foam windscreen
<b>ES933PMWH</b>	AT8534 wall/ceiling plate power module; AT8452(WH) steel hanger; AT8109(WH) two-stage foam windscreen

In the interest of standards development, A.T.U.S. offers full details on its test methods to other industry professionals on request.

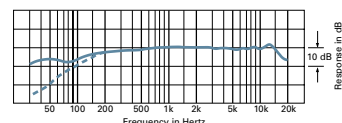
1 Pascal = 10 dynes/cm<sup>2</sup> = 10 microbars = 94 dB SPL

<sup>1</sup> Typical, A-weighted, using Audio Precision System One.

Specifications are subject to change without notice.

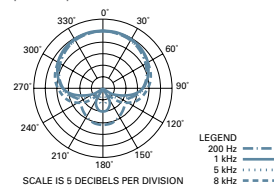


## frequency response: 80–20,000 Hz

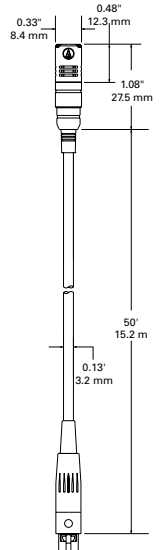


LEGEND — 12° or more on axis  
--- Roll-off

## polar pattern



SCALE IS 5 DECIBELS PER DIVISION



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