PRODUCT DATA SHEET - SPECIFICATIONS

ELECTRO MECHANICAL DEVICES, INC.

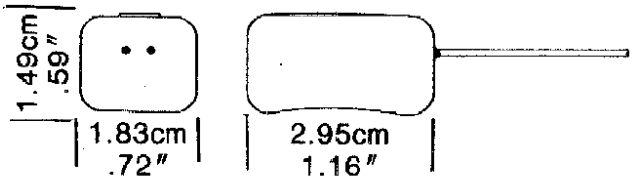
M-10 AND M-10-E AUDIO TRANSDUCERS

GENERAL

The transducers are designed for industrial applications including underwater communications operating in the speech frequency range. They are exceptionally rugged and stable. The devices can be used as either an output transducer, converting an electrical input to vibratory force or sound pressure, or as an input transducer, converting sound pressure or vibratory force to electrical energy. When used as an output transducer the device can function as a speaker or bone vibrator. In the bone vibrator mode the unit is placed against the user's head, normally the mastoid or cheek bone areas, and audio information is transferred directly to the inner ear. In this application air borne acoustic energy and a conducting medium are not required. Conversely as an input transducer the unit functions as a microphone picking up air-borne or vibratory energy.

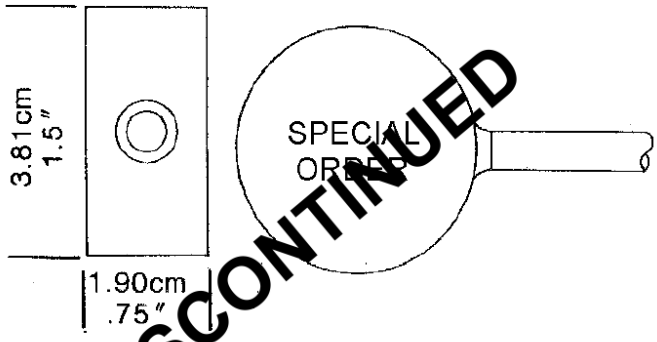
MECHANICAL

M-10



Weight - 15.5G - .55 oz
Leads - 3″L, 18AWG, Bare solid tinned copper wire. Unterminated.
Case - Plenco Melamine - Phenolic, Beige.

M-10-E



DISCONTINUED

Weight - 57G - 2.01 oz
Leads - 3″L, 2 conductor, black polyurethane jacketed cable. Unterminated. Conductors are stranded tinned Copper with insulation.
Shell - Diallyl Phthalate, plastic, black.
Encapsulant - Semi-flexible, Shore A 88, Urethane.

DESCRIPTIONS

The transducers are electro magnetic devices operating on the mass reaction principle. Very small air gaps provide high efficiency and are held accurately in position with a four-leg leaf spring. A highly permeable nickel alloy armature and an Alnico magnet are also a part of the rugged system.

The M-10 has solid wire leads for attachment. All case seams and openings are sealed with epoxy to prevent device contamination. The device can be encapsulated or potted to provide additional protection.

The M-10-E is an encapsulated version of the basic M-10 unit. The encapsulating material and shell housing were selected to provide exceptional hydrolytic stability. A vacuum degasing technique is employed to avoid air pockets in the encapsulant. The cable is manufactured specifically for marine use. The M-10-E has been tested for device integrity to water depths of 1000′, 450 P.S.I., without failure.

MECHANICAL OPTIONS

The lead type and length can be varied on either device to satisfy any special requirements. In addition the M-10 can be supplied with solder terminals rather than leads. Appropriate lead terminations, connectors or lugs are available. Customer terminology: name, part numbers, etc., can be added.

Available from: Lubell Labs Inc.
21 N. Stanwood Rd.
Columbus, Ohio 43209
(614) 235-6740

ELECTRICAL

A.C. Impedance - the nominal 1000Hz impedance for the standard device is 10 ohms.

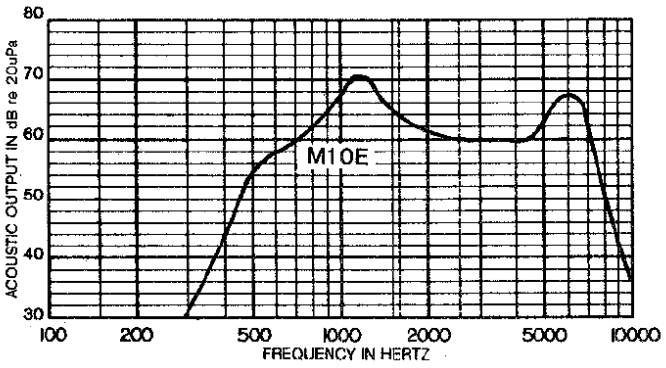
D.C. Resistance - 3.0 ohms nominal.

ELECTRICAL OPTIONS

A.C. Impedances in the range of 6 ohms to 1000 ohms are readily available. Higher impedances are possible, consult factory. Center tapped units are also available.

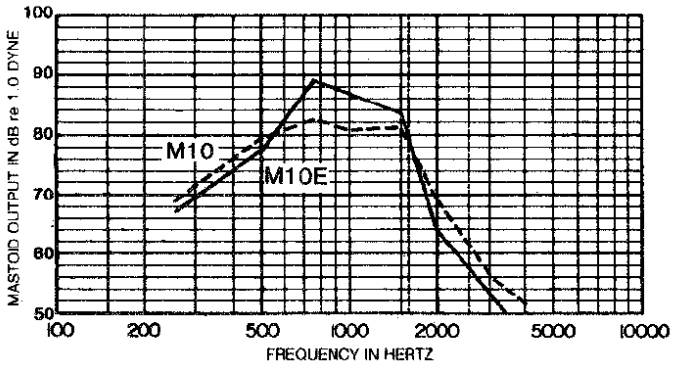
PERFORMANCE CURVES

ACOUSTIC RESPONSE



Test conditions - units mounted in an anechoic chamber one inch from a sound source. This is a typical in situ distance. The units were driven through a matching transformer with 0.1 Vac rms. (1.0mW for 10 ohm devices.) The input level was held constant as the frequency varied.

VIBRATORY RESPONSE



Test conditions - units mounted on an artificial mastoid such as a Bruel & Kjaer #4930. The static load is 5.4 Newton. The units were driven from a low impedance source with 0.1 Vac rms. (1.0mW for 10 ohm devices.) The input level remained constant as the frequency varied.

The mass of the devices have been adjusted to provide maximum output through the human speech range. The response falls rapidly below and above this range enhancing the signal to noise ratio. The units excel in the higher speech frequencies, 1500 HZ and above. These frequencies normally improve hearing discrimination.

MAXIMUM RATING

Input levels 20dB in excess of the test levels given can be employed with no measurable effect on the devices. Levels significantly higher than the 20dBs may cause distortion and perhaps heating. This depends on the type signal applied and it's duration. In these situations peak clipping diodes can be utilized to prevent overdriving. The M-10-E can be supplied with the diodes installed internally.

WARRANTY

All EMD transducers are code dated and are guaranteed against defects in material and workmanship for one year from date of shipment.

QUALITY ASSURANCE

All units are tested for sensitivity prior to shipment. Sampling techniques, per MIL-Std 105 "Sampling Procedures", are utilized for distortion & impedance specifications. Other testing parameters and device qualifications are available.

OTHER APPLICATIONS

The devices have been used in numerous industrial and commercial applications. These include vibration sensing, communications in high noise environments and in other difficult circumstances in addition to underwater, machine to operator signaling and others. The sealed attribute of the transducers permits operation in otherwise difficult to impossible situations.