

MM2  
MM2F



Submergence-Proof  
Speakers

COMMERCIAL

**General Product Description**

The Models MM2 and MM2F are submergence-proof speakers rated at 25 watts, for use in public address or paging applications.

The drivers employ a diaphragm with a phenolic impregnated linen-base and 2.0-inch voice coil, with a “W” shaped Alnico V magnet structure.

The MM2 is equipped with a serrated swivel mounting bracket and the MM2F is made with six holes in its outer flange for flush mounting.

The voice-coil/diaphragm assembly is protected by a special anti-fungicide treatment and is easily accessible for cleaning by removal of the diecast reflector on the front of the speaker.

The MM2 (MM2F) is self-draining and designed to withstand fungus, dust, salt spray, live steam, and gases. It is built to penetrate high noise levels in boiler rooms, mines, railroads, etc.

**Architects’ and Engineers’ Specifications**

The loudspeaker shall be integral driver and submergence-proof speaker with a phenolic impregnated linen-base diaphragm and rugged two-inch voice coil.

The axial frequency response will extend from 800 to 5,000 Hz and the horn shall exhibit a low-frequency cutoff of 600 Hz. Sound pressure level will be 104 dB (1 W/1 M) with an 800 to 5,000 Hz pink noise signal applied. Dispersion shall be 82° for the MM2/MM2F.

Outer housing shall be spun aluminum and center assembly of diecast aluminum. All metal parts of speaker shall be of anodized aluminum with baked-on acrylic for maximum protection.



Mounting of the MM2 shall be by means of a swivel bracket capable of at least 90° vertical adjustment.

Mounting of the MM2F shall be by means of six 7/32 inch diameter holes around a 6.625 inch diameter circle on the flange.

MM2 dimensions shall be 15.2 cm (6.0 in.) in diameter, by 12.8 cm (5.0 in.) deep. Net weight shall not exceed 2.4 kg (5.3 lb). The loudspeaker shall be the MM2.

MM2F dimensions shall be 18.4 cm (7.3 in.) in diameter, by 9.5 cm (3.8 in.) deep. Net weight shall not exceed 2.8 kg (6.0 lb). The loudspeaker shall be the MM2F.

**Specifications:**

**Frequency Response:** ..... 800-5,000 Hz ±5 dB

**Power Handling, 8 Hours, 6 dB Crest Factor:**  
..... 25 watts (500-5,000 Hz pink noise)

**Impedance:** ..... Nominal: 16 ohms

**Sound Pressure Level at 1 Meter, 1 Watt Input Averaged, Pink Noise Band-Limited from 500 to 5,000 Hz:**  
..... 104 dB

**Horizontal Beamwidth:**  
..... 82° @ 2 kHz (see Figure 2)

**Vertical Beamwidth:**  
..... 82° @ 2 kHz (see Figure 2)

**Directivity Factor R<sub>θ</sub> (Q):** ..... 10.25 @ 2 kHz

**Usable Low-Frequency Limit:** ..... 600 Hz

**Construction:**

Heavy-gauge spun aluminum case and die-cast aluminum center assembly. All metal speaker parts are of anodized aluminum with baked-on acrylic paint. Diaphragm is phenolic impregnated linen-base.

**Voice-Coil Diameter:** ..... 5.1 cm (2.0 in.)

**Magnet Weight:** ..... 0.93 kg (0.42 lb) with plates

**Magnet Material:** ..... Alnico V

**Flux Density:** ..... 1.30 Tesla

**Dimensions:**

**Diameter:**

MM2 ..... 15.2 cm (6.0 in.)

MM2F ..... 18.4 cm (7.3 in.)

**Depth:**

MM2 ..... 12.8 cm (5.0 in.)

MM2F ..... 9.5 cm (3.8 in.)

**Net Weight:**

MM2 ..... 2.4 kg (5.3 lb)

MM2F ..... 2.8 kg (6.0 lb)

**Shipping Weight:**

MM2 ..... 2.8 kg (6.0 lb)

MM2F ..... 4.1 kg (9.0 lb)

## Installation

### MM2

A serrated swivel mounting bracket with locking nut is furnished for installing the MM2 and is designed so the speaker can be moved through an angle of at least 90°. Three mounting holes are present in the base of the mount.

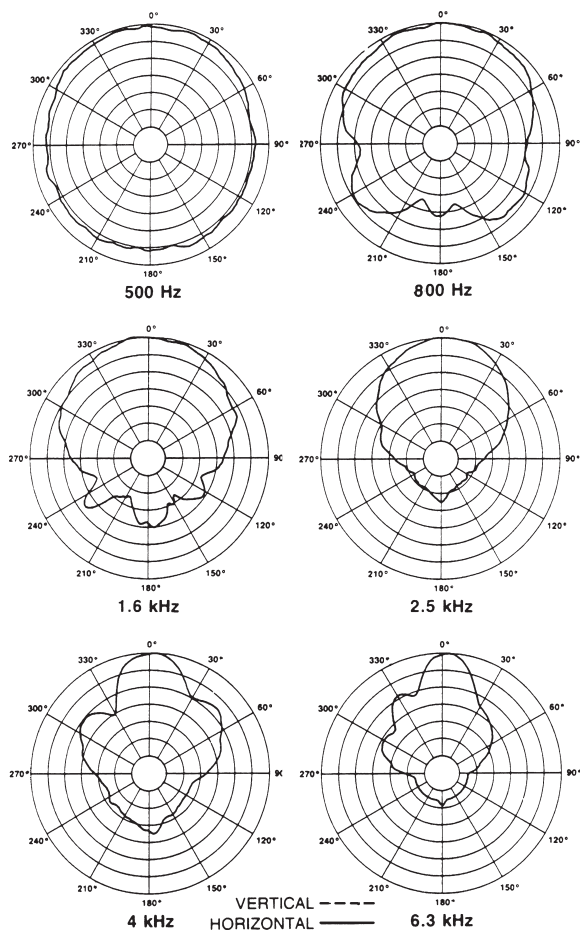
### MM2F

The MM2F is provided with six mounting holes 7/32 inch in diameter around a 6.625 inch circle, to be installed behind a 6-1/8 inch diameter hole.

## Directional Performance

The directional characteristics of the MM2/MM2F were measured by running a set of polar responses in a large anechoic chamber. The test signal was 1/3-octave-band-limited pseudo-random pink noise centered at the ISO standard frequencies indicated in Fig. 1.

Additional typical data is provided in Figure 2 that indicates 6 dB-down beamwidth versus frequency for the MM2/MM2F.



**Figure 1**  
**MM2F Polar Response**

## Frequency Response

Figure 3 shows the axial frequency response of the MM2/MM2F. It was measured at a distance of 1 meter, using a swept sine wave.

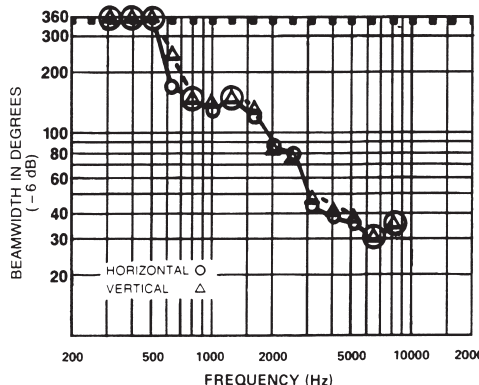
## Low-Frequency Driver Protection

When frequencies below the low-frequency cutoff for the horn assembly are fed to the driver, excessive current may be drawn by the driver. For protection of the driver and amplifier, a capacitor in series with driver is recommended.

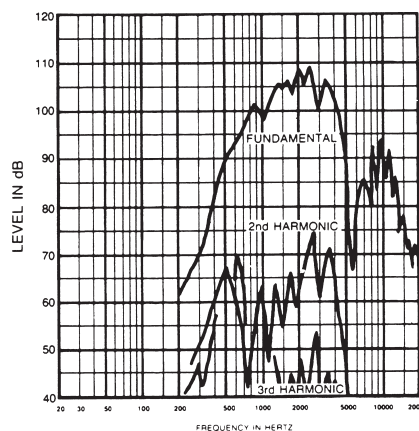
For drivers without transformers:

16-ohm driver 25 V - 100 mf

150 Vdc or 150 V non-polarized electrolytic, or two 150 V electrolytics of two times required value in series, back to back, for 70-volt lines.



**Figure 2**  
**MM2F Beamwidth vs. Frequency**



**Figure 3**  
**MM2F Frequency Response (1 watt at 1 meter)**

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 Please refer to the Engineering Data Sheet for warranty information.  
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