The velocity microphone, also known as the "pressure gradient" type, responds to the difference in instantaneous sound pressure on the front and back of the moving element.

The velocity microphone has a bidirectional pick-up pattern and an inherently flat frequency response. It is a type of microphone widely used in studio broadcasting and recording.

In Model V-1A proper coordination of ribbon fabrication, pole piece design, magnetic circuit placement and correct transformer coupling provides a high fidelity response characteristic. The frequency response curve is ideally adapted to voice and music reproduction. Bidirectional polar pattern is shown in Figure 2.

ELECTRICAL

It is an inherent characteristic of the ribbon velocity microphone (Model V-1A) that the output level is somewhat lower than that of a pressure microphone, consequently it is usually advisable to use the gain control on the amplifier in a correspondingly higher position. The gain of the V-2A and V-3 is sufficiently high so that the microphones can be used with any amplifier interchangeably with crystal or dynamic microphones.

The velocity microphone retains its excellent frequency characteristic when used at distances of more than six inches from the sound source. When used at less than this distance, the microphone has a tendency to accentuate the lower frequencies. This, however, may be desirable in certain instances, to compensate for associated equipment deficient in low frequencies or a voice that lacks depth, for example.

FIG. 3 — TILTING MICROPHONE REDUCES ACOUSTIC FEEDBACK
The bidirectional characteristic of the velocity gives equal pickup at the front and back of the microphone and zero pickup at the sides, top and bottom. Figure 2 indicates the output in decibels versus angle of pickup. For all practical purposes the frequency response remains constant at all angles. The null or zero pickup at the sides gives the velocity microphone the following advantages:

1. Pickup is increased 1.7 times over that of the conventional pressure microphone for average conditions of reverberation, acoustic feedback and room noise. For public address applications this pickup range may be increased considerably through proper placement of speakers so that direct and reflected sounds strike the microphone at the null points (sides, top or bottom).

2. Random room noise and reverberation are reduced 5 db.

3. The microphone may be placed so as to almost completely eliminate unwanted sounds.

4. Acoustic feedback can be further reduced by tilting the microphone to place the null sides in the direction of the interfering sounds. See Figure 3.

5. The microphone can be worked from both front and back simultaneously.

APPLICATIONS

EV velocity microphones are recommended for all types of music and voice reproduction — in public address, broadcasting and recording. Wide frequency response, high fidelity characteristics, wide-range front pickup and pickup range make these microphones ideal for solo or orchestra — for individual or chorus — for single speaker or groups. Very popular with singers and band leaders. Mounted in footlights or on overhead booms, they are used in reinforcing stage plays.

MECHANICAL

"On-Off" Switch: Sliding contact type switch is an integral part of all models. Switch short circuits the transformer secondary in "Off" position.

Shock Absorber: V-2A and V-3: Built into head.
V-1A: Built into stand coupler.

Grille: Steel reinforced. Permits tilting and locking of microphone in any position.

Stand Coupler: Standard 3/8"-27 thread.

Cable Connector: Models V-3 and V-2A — Locking three contact, wiring type built into microphone cradle. Permits tilting microphone without strain on connector or cable.
Model V-1A — Locking single run contact, pressure type, built into microphone cradle. Permits tilting microphone without strain on connector.

Cable Connections: Model V-3 — Terminal No. 1, shield (ground); No. 2 and 3, line. When switch is in HI-Z position, Terminals No. 1 and 2 are ground, No. 3 is line.
Model V-2A — High impedance: Terminal No. 1 shield (ground); Terminal No. 2 blank; No. 3, line. Low impedance: Terminal No. 1 shield (ground); No. 2 and 3 line.

Cable: Standard high impedance models equipped with 20 feet of well shielded cable. (Total capacity .007 millimhos.) As high impedance output of velocity type microphones is approximately 25,000 or 55,000 ohms, long cables should be avoided. When cable lengths of more than 40 or 50 feet are required, it is recommended that low impedance models with suitable coupling transformer (such as ELECTRO-VOICE Model 502) be used. The attenuation effect of extra cable length on high impedance types is shown in Figure 4.

Case: Microphone case is of highest purity (99.99%) pressure-cast metal.

Finish: Models V-3 and V-2A. Gray baked enamel.
Model V-1A. Satin chromium.

![Fig. 4. Attenuation Effect of Extra Cable Length when Incorporated on 35,000 ohm (Hi-Z) Microphones. Based on cable capacity of .007 millimhos. 20 feet. (DB loss = 20 log[1/(RC)^2] + 1).](image)

Output Level: Models V-3 and V-2A. Voltage: Hi-Z (25,000 ohms) ± 0 db = 1 volt/dyne/cm² - 53 db. RMS Sensitivity Rating ± 49 db. Voltage developed by normal speech .022 volt across Hi-Z output.

Model V-1A. Voltage: Hi-Z (35,000 ohms) ± 0 db = 1 volt/dyne/cm² - 53 db. RMS Sensitivity Rating ± 39 db. Voltage developed by normal speech .007 volt across Hi-Z output.

Internal Impedance: Model V-3: Variable. Selectable mounted on rear of case. Permits selection of 250, 500 or Hi-Z (25,000 ohms) output impedances. Low impedances are balanced to ground. High impedance tap provides single input lead and ground.

Model V-2A. Single impedance only. Hi-Z (direct to grid, 25,000 ohms) or 50, 500 or 500 ohms. Low impedances balanced to ground.

Model V-1A. Single impedance only. Hi-Z (direct to grid, 35,000 ohms) or 250, 500 or 500 ohms. Low impedances not balanced to ground.

Frequency Response: Models V-3 and V-2A: 40-10,000 c.p.s., substantially flat.
Model V-1A: 40-9,000 c.p.s., substantially flat.

Polar Pattern: Bidirectional voltage output proportional to cosine of angle of pick-up. For all practical purposes, the frequency response remains constant at all angles of pick-up. See Figure 2.

Dimensions: See Figure 5. Models V-3 and V-2A. Dimension A: 2". Dimension B: 5 1/4". Dimension X: 8". Dimension Y: 2 1/2".

Model V-1A. Dimension A: 2". Dimension B: 2 1/4". Dimension X: 6 1/4". Dimension Y: 2 1/2".

Net Weight: Models V-3 and V-2A: 2 1/2 pounds.
Model V-1A: 2 pounds.

![Fig. 5. — Dimension Drawing](image)

See proper dimensions for each model in paragraph above.
Electro-Voice MICROPHONE PHASING CHART

MODELS 605, 611, 615

VC

CONNECTOR PIN CABLE
MCIF CONNECTOR
SHIELD CENTER CONDUCTOR

MODELS 630, V2A

HI-Z

CASE GND

MC3M CONNECTOR

LO-Z ALSO 611 LO-Z

CASE GND

MC3M CONNECTOR

SHIELD CENTER CONDUCTOR
N.C.

SHIELD WHITE BLACK

OUTPUT 2-3

MODELS 635, 645, 650, 654

VC

CASE GND.

XL-3-II CANNON CONNECTOR

OUTPUT-PINS 2-3

MODELS 726, 731, V3

VC

HI-Z

ON

OFF

CASE GND

HEAD GND

WHITE SHIELD BLACK

726 & V3 USE MC3M CONNECTOR
731 USE CANNON XL-3-II

MODELS 636

HI-Z

150

ON

OFF

MC4M CONNECTOR

SHIELD WHITE N.C.

OUTPUT 2-3

MODELS 655

VC

HEAD GND

250

50

SHIELD WHITE BLACK

NOTE:
POSITIVE VOLTAGE WITH POSITIVE PRESSURE—WHITE CABLE LEADS OR CENTER CONDUCTOR