Moving Coil Meters

Moving coil meters are suitable for measurement of DC current or voltage. All meters have a jewel and pivot movement which ensures reliability and accuracy. The moving coil meters are available in shortscale (90º) versions or longscale (240º) versions.

All meters have interchangeable scaleplates. Scales are linear and are calibrated from zero to full scale. Scaleplates are available in any process unit including A, V, °C, bar, rpm, kW and %, so meters can be driven from a transducer output.

Moving Coil – for measurement of DC current or voltage

<table>
<thead>
<tr>
<th>Connections</th>
<th>Voltmeter</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>–</td>
<td>+</td>
</tr>
<tr>
<td>Direct Connection</td>
<td>Ammeters Shunt Operated</td>
</tr>
</tbody>
</table>

Specification

Accuracy:
- Class 1.5 (±1.5% max. error)

Input Current, \( I_n \):
- 0-50μA to 0-40A direct connected
- FE48 25A maximum direct
- >40A use shunt and mV voltmeter
- 4-20mA

Input Voltage, \( U_n \):
- 0-50mV to 0-800V direct connected
- FE48 500V maximum

Scales:
- 0-1, 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10, 15, 20
- 25, 30, 40, 50, 60, 75, 80, 100, 120
- 150, 200, 250, 300, 400, 500, 600
- 800, 1000, 1200, 1500, 1600, 2000
- 2500, 3000 μA, mA, A, mV, V

Overload:
- 1.2 x \( I_n \) or \( U_n \) for 2 hours
- 10 x \( I_n \) or \( U_n \) for 5 seconds

Voltage Drop:
- Ammeter < 100mV

Current Consumption:
- Voltmeter < 200V 1mA, > 200V 200μA

Weight:
- FE48 140g, FE72 190g, FE96 280g
- FE72LS 310g, FE96LS 360g

Ordering information

<table>
<thead>
<tr>
<th>Code</th>
<th>DIN Square Size &amp; Movement Type</th>
<th>Meter Type</th>
<th>Input &amp; Scaling</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE48MC</td>
<td>48 x 48mm Shortscale (90º)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>FE72MC</td>
<td>72 x 72mm Shortscale (90º)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>FE96MC</td>
<td>96 x 96mm Shortscale (90º)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>FE72LS</td>
<td>72 x 72mm Longscale (240º)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>FE96LS</td>
<td>96 x 96mm Longscale (240º)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>A</td>
<td>–</td>
<td>Moving Coil Ammeter</td>
<td>–</td>
</tr>
<tr>
<td>V</td>
<td>–</td>
<td>Moving Coil Voltmeter</td>
<td>–</td>
</tr>
<tr>
<td>Specify</td>
<td>–</td>
<td>50μA to 40A direct (FE48 - 25A max.)</td>
<td></td>
</tr>
<tr>
<td>Specify</td>
<td>–</td>
<td>&gt;40A use shunt &amp; 50, 60, 75mV Voltmeter (c/w scale)</td>
<td></td>
</tr>
<tr>
<td>Specify</td>
<td>–</td>
<td>4-20mA (c/w scale)</td>
<td></td>
</tr>
<tr>
<td>Specify</td>
<td>–</td>
<td>50mV to 800V (FE48 - 500V max.)</td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td>FE72MC</td>
<td>V</td>
<td>100Vdc</td>
</tr>
</tbody>
</table>
**Meter Options**

**Meter Terminal Covers**
Available for FE72 and FE96* meters is a plastic terminal cover to finger-proof the terminals.
(Order Code: FE72TC, FE96TC)  *All FE48 meters are supplied with terminal covers

**Meter Terminal Covers**
Available for all sizes of FE72, FE96 and EL meter are a pair of plastic terminal covers to finger-proof the terminals.
(Order Code: MTC)

**DIN Square Blanking Plates**
Available on all sizes of meter is a black plastic blanking plate to cover a DIN square hole.
(Order code: FE48BP, FE72BP, FE96BP)

**Adjustable Red Pointer**
Available on all sizes of shortscale meter is an adjustable red pointer which can be adjusted by a screwdriver from the front fascia. Not available on longscale meters.
(Order code: ARP)

**Calibration Certificate**
Calibration certificates traceable to national standards can be supplied on all meters.
(Order code: CALCERT)

**6x Overload**
Available on all ac ammeters is an overload reading of 6x the full scale current (2x is standard).
(Order Code: 6X O/L)

**Red Line On Scale**
Available on any scale is a red line marked at any point on the scale, as specified by the customer.
(Order Code: RL@ - specify)

**Coloured Sector On Scale**
One or more specified coloured (red, green, yellow) sectors on the scale are available on all meters.
(Order Code: Coloured Sector - specify)

**Heavily Damped Movements**
1A or 5A DIN96 moving iron ammeters are available with a damped viscous movement and all moving coil meters are available with an electronically damped movement.
(Order Code: HD movement)

**IP65 Sealing**
All meters are available with a front sealed to IP65 and a neoprene gasket to retain sealing against the panel.
(Order Code: IP65)

**Gaskets**
Gaskets are available for all meters.
(Order Code: G48F, G72F, G96F)

**Centre Zero Movement**
Moving coil meters are available with a bi-directional reading, centre zero movement and scale. Moving coil meters are also available with an offset centre zero movement and scale.
(Order Code: C/Z movement or O/Z movement)

**Suppressed Zero Movement**
Moving Coil meters are available with a suppressed zero movement and scale (e.g. 15Vdc with suppressed scale from 0 to 10Vdc).
(Order Code: S/Z movement)

**External Adjustable Trim Potentiometer**
All moving coil meters are available with an external trim multi-turn potentiometer which is accessible from the back of the meter and adjusts the full scale reading by a minimum of ±20%.
(Order Code: EXT. TRIM. POT.)

**Polycarbonate Window**
All sizes of FE meters have a glass window but a polycarbonate window is available. All sizes of EL meters have polycarbonate windows as standard.
(Order Code: POLY window)

**Anti-Glare Window**
Anti-glare windows are available for all meters.
(Order Code: AG window)
### Dimensions

#### FE48 Enclosure

- **Dimensions:**
  - 48.0 x 40.0 x 17.0 mm
- **Panel Fixing:** Clamp
- **Thumbnut:** M Full Nut & Washers
- **Terminal Cover:** (Standard except FE48PSI)
- **Max. Panel Thickness:** 12mm
- **Panel Cutout:** 45mm square

#### FE72/EL72 Enclosure

- **Dimensions:**
  - 72.0 x 68.0 x 37.0* mm
- **Panel Fixing:** Clamp
- **Thumbnut:** M Full Nut & Washers
- **Terminal Cover:** (Optional)
- **Max. Panel Thickness:** 10mm
- **Panel Cutout:** 68mm square

#### FE96/EL96 Enclosure

- **Dimensions:**
  - 96.0 x 80.0 x 45.0 mm
- **Panel Fixing:** Clamp
- **Thumbnut:** M Full Nut & Washers
- **Terminal Cover:** (Optional)
- **Max. Panel Thickness:** 9mm
- **Panel Cutout:** 92mm square

**Watt/Var/cosØ Converter Unit Enclosure**

- **Dimensions:**
  - 55.0 x 68.0 x 35.0 mm
- **M3.5 Terminals**
- **DIN-EN 50022 / BS558 Rail Fixing**

All dimensions in mm
General Specification

Reference Standards
Performance / Accuracy: BS EN 60051-1, BS 89 and DIN 43780
Enclosure: DIN 43700
Vibration Resistance: DIN 43780
Measuring Ranges: DIN 43701
Safety: IEC 414
Dial Symbols: IEC 51

Environmental
Calibration Temperature: 23°C
Operating Temperature: -25°C to 50°C
Temperature Coefficient: ±0.03%/ ºC
Relative Humidity: 0 - 90% non-condensing

Input
Input Burden: See individual specifications
Overload: See individual specifications
Response Time: < 2seconds

Scales
Dials: White with black legends
Reference Standard: DIN 43802
Scale Length: DIN48 - 37mm
DIN72 - 65mm
DIN96 - 90mm

Enclosure
Enclosure: Flame retardant white ABS plastic case with black bezel
Plain glass window is standard* but a polycarbonate window is available.
(*Polycarbonate window is standard on EL meters)
Enclosure Code: Case IP52 (IP65 with gasket optional) to IEC529 and BS5490
Insulation Test: 2kV rms 50Hz 1 min (to IEC 414)
Markings: CE marked

Specification subject to change without notice.