

Description moving-coil panel meters

Application	<p>Moving-coil measuring instruments serve for measuring direct current and direct voltage. For extending the measuring range, shunts, series resistors or voltage dividers are used. The energy consumption of moving-coil measuring instruments is very low; they may thus be connected to shunts, speed sensors, thermocouples, measuring transducers or similar.</p> <p>Moving-coil measuring instruments with rectifier serve for measuring alternating current and alternating voltage. They measure the arithmetic mean value, but are designed in a way to indicate the rms value in case of sinusoidal variables.</p> <p>In case of non-sinusoidal variables, an rms-value rectifier is provided. It is able to still process crest factors of max. 8 without problem. The max. error amounts to less than 1% in this case.</p>
Measuring systems	<ul style="list-style-type: none"> ● Core-magnet measuring system ● Spring loaded toe bearing in ceramic stones ● High damping ● Independent of external fields ● Linear scale characteristics
Design	<p>Moving-coil measuring instruments are manufactured according to DIN 60 051 as well as according to the other relevant VDE and DIN regulations. The accuracy amounts to 1.5 % referred to the full scale.</p> <p>The energy consumption lies between 5 μW and 50 μW, the smallest possible measuring ranges lie around 25 μA and 10 mV. In case of smaller values than stated above, a measuring amplifier is provided.</p> <p>When adjusting moving-coil measuring instruments for their connection to shunts, an input lead resistance of 0.06 Ω is principally accounted for; this corresponds to an input lead of 1.3 m, 2 x 0.75 mm².</p> <p>Moving-coil measuring instruments are resistant to a permanent 1.2-fold overload, ammeters temporarily to a max. 10-fold overload voltmeters to a max. 2-fold overload; for the rest, DIN EN 60 051 applies.</p> <p>The connection is made using M4 screws for voltmeters and for ammeters up to 15 A max. 6 mm² M5 screws up to 60 A max. 16 mm² (back-of-hand-proof), with slim profile moving-coil measuring instruments via blade terminal.</p>

General special designs

Measuring range	<p>Outside of standard series</p> <p>Second measuring range</p> <p>for voltmeters and ammeters up to 15 A with additional numbering with additional graduation and numbering</p> <p>Electrical suppressed initial range starting from 10V, max. 60 % of full scale</p> <p>Extended initial range, up to 10 % of full screen in center scale</p> <p>Zero point at any position of scale</p> <p>Extended accuracy 1 %</p> <p>Extended accuracy 0,5 % in case of direct current or direct voltage for sizes 96 and 144 only</p>
Special adjustment	<p>With ammeters $\Delta U \pm 1 \%$</p> <p>With voltmeters $R_i \pm 1 \%$</p> <p>Input lead when connected to shunt different to 0,06 Ω</p> <p>Installed potentiometer for voltmeters starting from 60 mV</p> <ul style="list-style-type: none"> ● setting rang $\pm 10 \%$ of full scale ● setting range $\pm 20 \%$ to $\pm 50 \%$ of full scale
Increased input resistance	<p>ca. 2000 Ω / V</p> <p>ca. 4000 Ω / V</p> <p>ca. 10000 Ω / V</p> <p>ca. 20000 Ω / V (as far as possible)</p> <p>> 20000 Ω / V with measuring amplifier</p>
Averager	<p>e.g. in case of pulse packing controls for measuring ranges from 1 A to 25 A incl. current transformer (for types PQ 72 DIN, PQ 96 DIN and PQ 144 DIN only, basic price</p>