

General Information

Our meters comply with the "Rules For Electric / Electronic Meters", VDE 0410/3.68. For the majority of these meters DIN EN 61010-1 is applied.

The definitions and technical specifications base on the VDE-Rule.

Construction and design are subject to change without notice. In case of changes of drawings, dimensions and pictures this document won't be seized.

Technical Design

Housing:

Square front-mounted or rear-mounted instruments. Edgewise and slim-line meters. Panel-mounted meters compliant with DIN 43718 s.

Zero position:

All meters contain an adjusting screw for the zero position - accessible from outside.

Pointer:

Panel-mounted meters are fitted with a knife-edge pointer compliant with DIN 43802.

All other instruments are fitted with a tube pointer.

Scales:

For scales of panel-mounted meters a division with bold lines for main values compliant with DIN 43802 is used.

Other scales can be adjusted according to the norm or to all technically feasible customer requests.

Measuring ranges:

The end values are staggered compliant to DIN 43701 as follows:

1 – 1.5 – 2.5 – 4 – 6, decimal parts or multiples.

For moving iron meters with transformer connection also possible:

1 – 1.2 – 1.5 – 2 – 2.5 – 3 – 4 – 5 – 6 – 7.6 – 8.

Accuracy

Measuring instruments compliant to VDE 0410/3.68 have one of the following accuracy classes: 0.5 – 1 – 1.5 – 2.5 – 5. The accuracy class shows which percentage of the end value is accepted as measuring error. If the zero position is not at the beginning of the scale (e.g. central zero), the 'end value' will be the sum of both positive and negative range.

General Information

Technical Statements

Operating temperature:

Class 1 to 5 meters work fault-free at a temperature between -20°C and $+40^{\circ}\text{C}$.

Temperature influence:

Unless stated differently the nominal temperature is $+20^{\circ}\text{C}$ with a tolerance of $\pm 2\text{ K}$ for class 1 to 5 meters. Nominal usage range is the reference temperature $\pm 10\text{ K}$. The additional error within this temperature range must be smaller than the class accuracy.

Mounting position influence:

Nominal mounting position according to the mounting symbol (see page V) $\pm 5^{\circ}$.

Magnetic influence:

With the usage of core magnet movements and the magnetic shielding of the moving iron coils the magnetic influence is below accepted levels. Information about strong external magnetic fields (e.g. ferromagnetic mounting panels) can be useful for further reducing this influence though.

Testing voltage:

The test of voltage resistance is done according to the currently valid DIN norm.

Permanent overload capacity:

Class 1 to 5 current- and voltage meters can be permanently overloaded by the 1.2 fold of the end value at a temperature of 20°C (nominal temperature respectively).

General Information

Electrical shock resistance:

Class 1 to 5 meters are type tested with nine peaks of 0.5 seconds duration each and one peak of 5 seconds duration. The time between two peaks is one minute.

For ammeters the peaks are tenfold the end value, for voltage meters they are twice the end value.

Resistance to vibration:

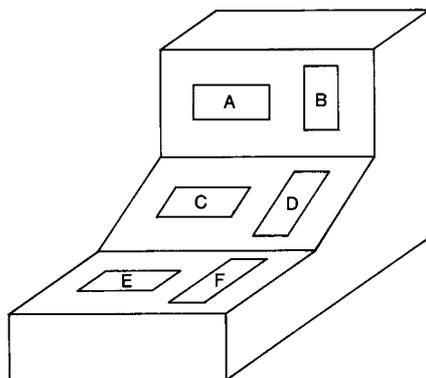
Class 1 to 5 meters are type tested with an amplitude of ± 0.25 mm and a frequency of 50 Hz sinusoidal; applied in 3 mutually perpendicular planes for 20 minutes.

Mechanical shock resistance:

Class 1 to 5 meters are type tested with five shocks of 15 g in each of three mutually perpendicular directions, if possible parallel to the housing edges.

Earthquake certified version:

A selection of our meters is available with increased shock resistance "earthquake-proof".



	position	format	symbol
A	vertical	landscape	┌
B	vertical	portrait	┐
C	angular	landscape	└
D	angular	portrait	┘
E	horizontal	landscape	┌
F	horizontal	portrait	┐

General Information

When ordering instruments please specify the following details:

1. Number of instruments
2. Housing size and type; switchboard instruments of the type "RQ" are delivered with slim frame by default
3. Accuracy
4. Type of **current** (AC / DC, for AC please specify the frequency if other than 50 Hz or non-sinusoidal)
5. **Measuring range** (please apply the DIN 43701 row as described on page III)
6. **Mounting position** (horizontal, vertical, angular - please specify the angle: 0° is horizontal, see figure on page V).
7. Pointer deflection 90° or 105°
8. **Scale design:** if the scale must show a different variable than the measured electrical value, we will need a graphic chart or table that specifies the relation between the non-electrical (displayed) and the electrical (measured) values. Any other than standard design according to DIN 43802 must be specified exactly, if possible by sketch or picture.
9. The calibrated **wire resistance** of moving coil ammeters for connecting to separate shunts is 0.035 Ohm by default.
10. Separate **shunts, current- or voltage transformers** are not included and have to be ordered separately.