Technical Features - Square Type

Ambient temperature:	-10 ... +55 °C
Storage temperature:	-25 ... 65 °C
Reference temperature:	+23° C
Relative humidity:	75 % annual average, non-condensing
Climate Class 2:	according to VDE/VDI 3540
External Magnetic field:	0.5 mT
	0.4 kA/m lesser than 6% of the reference value for EQ..n/EQD..n

Accuracy class according to IEC- 60051 and EN- 60051:

Moving iron panel instruments (EQ..n)

- Class	1.5
- Frequency range Voltmeter:	15 ... 100 Hz
- Frequency range Ammeter:	15 ... 400 Hz

Bi-metallic instruments (BIQ..n / BOQ..n):

- Class 3:	for bi-metallic meter movements
- Class 1.5:	for moving iron panel instruments.

Pointer type frequency instruments (FA..n / FAG..n):

- Class	0.5
- Input voltage	+/- 20 %
- Heating period	lesser than 5 minutes

Moving-coil measuring instrument (PQ..n):

- Class 1.5	except for 15, 25, 40 and 60 µA class 2.5

Constructive Features

For vertical front panel mounting:

+/- 5 %

+/- 10 % in EQ/EQD/PR/PQ/PAQ..n

Housing according to DIN IEC 61554:

Housing consists of self-extinguishing plastic according to UL 94-VO .

Fixing

48n- instruments:	2x grip screw
72n- and 96n-instruments:	2x snap closure (plastic clamp)
144n- instruments:	4x grip screw

Front frame according to DIN 43718:

Narrow frame colour black, similar to RAL 9005.

Front panel

The instruments are standard delivered with simple glass. The instruments can be delivered, if possible, with anti reflexing glass on request.

Degree of protection

IP 52	for EQ/PQ/FA housing front
IP 40	for BIQ/BOQ housing front
IP 00	for clamps without electric shock protection
IP 10	for clamps with fixing electric shock protection (except for 48 and EQ/PQ aminstruments higher than 6A)
IP 20	for clamps with electric shock protection

Shaking resistance and mechanical shock resistance

Shaking resistance:	1.5 g at 50 Hz (10-150-10 Hz / 0,15 mm)
Shock resistance:	15 g 11 ms

(Gravitational acceleration 1 g = 9,81 m/s2)

This can be obtained by sprung bearing jewels of the highest quality (which are saved against crushes of jewel storage).

Electrical Features

Overload according to IEC 60051 and EN 60051

Moving iron instruments (EQ..n):

	1,2 x In: continuously
- Voltmeter:	2 x Un (max. 1000 V): 5 seconds
- Ammeter 48:	10 x In: (max. 200 A) 5 seconds0
- Ammeter others:	10 x In: 5 second

Bi-metallic instruments (BIQ..n/BOQ..n):	1,2 x In: continuously
	10 x In: 1 second
Frequency instruments (FA..n/FAG..n):	1,2 x Un: continuously
	2 x Un: 1 second
Moving-coil instruments (PQ..n):	1,2 x In: continuously
- Voltmeter:	2 x Un: 5 seconds
- Ammeter:	10 x In: 5 seconds

Testing voltage according to IEC 61010-1 and EN 61010-1

Meter type Range	Test voltage U_{eff}; 50 Hz	Test voltage class
48n (300 / 600 V)	3,32 / 2,21 k V	CAT III / CAT II
72n-, 96n-, 144n (300/ 600V)	3,32 / 2,21 k V	CAT III / CAT II

Pointers and scales according to DIN 43802

Moving iron panel instruments (EQ..n):

90° scale. From 10 % of the scale practically linear. Coarse-fine division.

Pointer according to DIN 43802 - 3. In case of aminstruments with doubled overload range the overload range corresponds to approximately 20 % of the full scale length.

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ANALOGUE MEASURING INSTRUMENTS

Bimetallic-instruments (BIQ..n/BOQ..n):
Bi-metallic meter movements: 90° scale. The final scale value is 1.2 x I
meter movements: see moving iron panel instruments
Coarse-fine division. Knife bar pointer according to DIN 43802 - 3.

Frequency instruments (FA..n, FAG..n):
90° scales (FA..n), 240° scales (FAG..n). Practically linear. Coarse-fine division. Knife bar pointer according to DIN 43802 - 3.

Moving-coil measuring instruments (PQ..n, PAQ..n):
90° scales (PQ..n), 240° scales (PAQ..n). Practically linear. Coarse-fine division. Knife bar pointer according to DIN 43802 - 3.

Scales

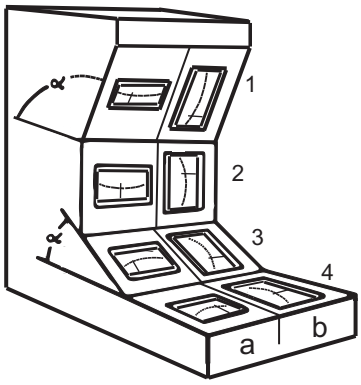
The final scale values are determined according to the following norm line: 1-1,2-1,5-2-2,5-3-4-5-6-7,5-8 and decade multiples.
In case of instruments for current transformer connection this norm line is additionally supplemented with the standard values 1,25-1,6-1,8 and decade multiples.

Special adjustment according to norm line in any measuring size, as for example „%“, „m/s“, „Upm“, „bar“ etc.
Special adjustment beyond the norm line, measuring size in any order.
Special adjustment after equation, curve or table, measuring size in any order.

Position

The instruments are calibrated - if not indicated differently - for vertical purpose (pos.2). Other purposes, horizontal or diagonal, under indication of the angle against the horizontal are considered on demand. The exact storing of the instruments enables installation positions in all angles.

Standard execution: Cross scale, vertical installation



1	∝ > 90°
2	⊥ = 90°
3	∝ < 90°
4	⌐ = 0°

Position sign	Nominal position
⊥	upright position
⌐	across position
∠60°	inclined position (Installation angle indicate to the across position, for example 60°)
∠120°	

Testing voltage for executions with steel plate housing

Test voltage of the measuring range	Test voltage U_{eff}; 50 Hz	Test voltage sign
660 V	2000 V	☆
1000 V	3000 V	☆

Instructions

DIN 43700	Instruments for table installation, nominal and cut-out dimensions and sample size
DIN 43701	Electrical control panel measuring instruments
DIN 43718	Front frame and front plates
DIN 43780	Performance specifications for direct acting indicating instruments and their accessories
DIN 43802	Scales and pointers for electrical measuring instruments
DIN 16257	Nominal positons and position signs for measuring instruments
DIN 57410/VDE 0410	Safety requirements for indicating and writing measuring instruments and their accessories
VDE 0411	Protective measures for electronic measuring instruments
VDE 0110	Determinations for the measurements of the air and leakage path of electrical resources
DIN 40050	Degrees of protection; foreign material and waterproofing for electrical resources
VDE/VDI 3540 sheet 2	Reliability of measuring - control- and regulation instruments climatic classes for instruments and accessories).
DIN 43807	Connections and clamps
DIN 46200/46282	Connecting bolts
UL 94 V-0	According to the UL Burning property class
2006/95/EG	Rule of low tension
2004/108/EG	Rule of EMV

CE certified

Increasing Accuracy

Measuring accuracy on the increase 1 % (as far as possible)

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