

# Data Sheet

Analog Meters with  
Moving-Iron Movement  
90° – Dial

**EQ 48**  
**EQ 72**  
**EQ 96**  
**EQ 144**

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**with Slide-In-Dial**

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## Application

The moving-iron panel meters **EQ 48/72/96/144** housed in moulded thermoplastic cases are mainly used for the measurement of AC currents and voltages in the usual technical frequency range of  $16\frac{2}{3}$  ... 100 Hz.

Moving-iron meters indicate rms-values practically independent of wave form even of high harmonics. Error of indication may occur for extreme wave forms (e.g. phase gating controls) and / or frequencies above 100 Hz

These meters are **not** suitable for use with shunts or tachogenerators due to their high power consumption.

The K-series meters offer application-oriented advantages in switchboard and generating set production, also suitable for mosaic panel mounting. The bezel, the glass window and the dial can be easily exchanged on site.

## Movements

Moving-iron movement with pivot suspension, spring loaded shock absorbing jewel bearings and silicon oil damping.

## Mechanical Data

case details	moulded square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic panels, stackable			
material of case	polycarbonate thermoplastics, flame retardant with UL rating of 94 V - 0			
material of window	glass ↗			
colour of bezel	black (similar to RAL 9005) ↗			
position of use	vertical $\pm 5^\circ$ ↗			
panel fixing	screw clamps or spring clamps (except EQ 144)			
mounting	stackable next to each other			
panel thickness	$\leq 40$ mm			
terminals				
voltmeters and ammeters $< 25$ A	hexagon studs, M4 screws and wire clamps E3			
ammeters $\geq 25$ A	threaded studs M6 with nuts			
ammeters $\geq 60$ A	threaded studs M8 with nuts			
<b>dimensions (in mm)</b>	<b>EQ 48</b>	<b>EQ 72</b>	<b>EQ 96</b>	<b>EQ 144</b>
bezel	<input type="checkbox"/> 48	<input type="checkbox"/> 72	<input type="checkbox"/> 96	<input type="checkbox"/> 144
case	<input type="checkbox"/> 42.5	<input type="checkbox"/> 66	<input type="checkbox"/> 90	<input type="checkbox"/> 136
depth	53	53	53	53
panel cutout	<input type="checkbox"/> $45^{+0.6}$	<input type="checkbox"/> $68^{+0.7}$	<input type="checkbox"/> $92^{+0.8}$	<input type="checkbox"/> $138^{+1}$
weight approx.	0.1 kg	0.15 kg	0.2 kg	0.25 kg

## **Electrical Data**

measuring unit	AC voltage / current				
frequency range	16 <sup>2/3</sup> ... 100 Hz				
power consumption					
voltmeters	<4.5 VA				
ammeters ≤ 15 A	<0.5 VA				
ammeters > 15 A	<0.8 VA				
overload capacity (acc. to DIN EN 60 051)					
continuously	1.2 times rated voltage / current				
voltmeters					
5 s max.	2 times, 1000 V max.				
ammeters	EQ 48 K	EQ 72/96/144 K			
5 s max.	10 times, 200 A max.	10 times			
1 s max.	—	40 times, up to 250 A			
pollution level	2				
operating voltage	refer to Measuring Ranges				
measurement category	CAT III				
enclosure code					
	IP 52 case				
	IP 00 for terminals without protection against accidental contact				
	IP 20 for terminals protected against accidental contact				

## Measuring Ranges

measuring ranges	operating voltage			
<b>AC current</b>	EQ 48	EQ 72	EQ 96	EQ 144
1; 1,5; 2,5; 4; 5; 6; 10; 15; 25 A <sup>1)</sup>	300 V	300 V	300 V	600 V
40; 60; 100 A <sup>1)</sup> *)	—	300 V	300 V	600 V
<b>AC voltage</b>	EQ 48	EQ 72	EQ 96	EQ 144
60 V, 100 V	150 V	150 V	150 V	150 V
150 V	150 V	150 V	150 V	150 V
250 V	300 V	300 V	300 V	600 V
400 V, 500 V	300 V	600 V	600 V	600 V
600 V *)	—	600 V	600 V	600 V
<b>for use on VT/CT</b>	EQ 48	EQ 72	EQ 96	EQ 144
N/1 A, N/5 A <sup>1)</sup>	150 V	150 V	150 V	150 V
N/100 V, N/110 V <sup>2)</sup>	150 V	150 V	150 V	150 V

Please state transformer ratio when ordering

Please state trial  
\*) not for EO 148

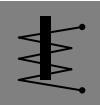
<sup>1)</sup> full scale value = 2 times rated value (overload scaling) 

② full scale value = 1.2 times rated value (overload scaling)

## Scaling

pointer	bar / knife-edge pointer
pointer deflection	0 ... 90°
scale characteristics	practically linear above 10% of rated full-scale value
scale division	coarse-fine
scale length	EQ 48      EQ 72      EQ 96      EQ 144 41 mm      61 mm      97 mm      146 mm
overload scaling	
ammeters	2 times rated current 
voltmeters for use on voltage transformers	1.2 times rated voltage

► also refer to "Options"



# Data Sheet

## Analog Meters with Moving-Iron Movement 90° – Dial

### Accuracy at Reference Conditions

accuracy class 1.5 according to DIN EN 60 051

#### reference conditions

ambient temperature  $23^{\circ}\text{C} \pm 1\text{K}$

position of use nominal position  $\pm 1^{\circ}$

input rated measuring value

wave form sinusoidal, distortion factor  $\leq 5\%$

frequency 45 ... 65 Hz

others DIN EN 60 051

#### influences

ambient temperature  $-10^{\circ}\text{C} \dots +23^{\circ}\text{C} \dots +55^{\circ}\text{C}$

position of use nominal position  $\pm 5^{\circ}$

frequency 15 ... 100 Hz (voltage)

15 ... 400 Hz (current)

stray magnetic field 0.5 mT

### Environmental

climatic suitability climatic class 3 acc. to VDE/VDI 3540 sheet 2

operating temperature range  $-10 \dots +55^{\circ}\text{C}$

storage temperature range  $-25 \dots +65^{\circ}\text{C}$

relative humidity  $\leq 75\%$  annual average, non-condensing

shock resistance 15 g, 11 ms

vibration resistance 2.5 g, 5 ... 55 Hz

### Rules and Standards

DIN 43 700 measuring and control instruments for panel mounting;

nominal case and cutout dimensions

DIN 43 701 electrical switchboard instruments

bezels and front panels

DIN 43 802 scales and pointers for electrical measuring instruments

DIN 16 257 nominal position of use and

position symbols

applicable for measuring instruments

DIN 40 050 enclosure codes;

protection of electrical equipment against ingress of solid foreign bodies and of water

DIN EN 60 051 direct acting indicating electrical measuring instruments and their accessories

DIN EN 61 010 safety requirements for electrically operated measuring, control and laboratory equipment

VDE/VDI 3540 sheet 2 reliability of measuring and control equipment (classification of climates)

### Options

#### case

window non-glaring glass

colour of bezel gray (similar to RAL 7037)

index marking pointer red, front adjustable

position of use on request  $15^{\circ} \dots 165^{\circ}$

marine application non-certified or with approbation by "Germanischer Lloyd" (except EQ 48)

#### terminal safety protection

full-sized rear cover (except direct-connected ammeters > 25 A), protective sleeves to go on hexagon studs and M4 screws with wire clamps E3

protection against accidental contact (hand and fingers) acc. to VBG 4 / DIN 57 106, sec. 100

#### dial

non-calibrated with dial symbols

blank dial pencil-marked on initial and end values

scale division and figuring 0 ... 100%

linear scale division non-standard captions on request

additional lettering on request e.g. "generator"

additional figuring on request

coloured marks red, green or blue for important scale values

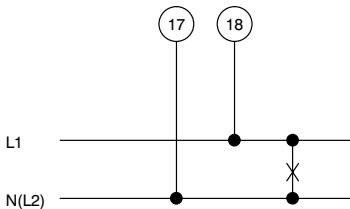
coloured sector red, green or blue within scale division

logo on the dial none or on request

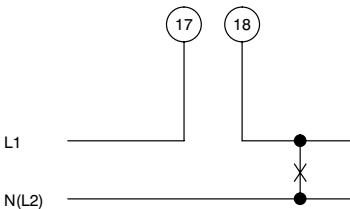
overload scaling (ammeters) no overload range or overload range 5 times rated current

## Connections

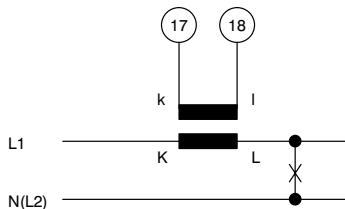
### AC voltage (direct-connected)



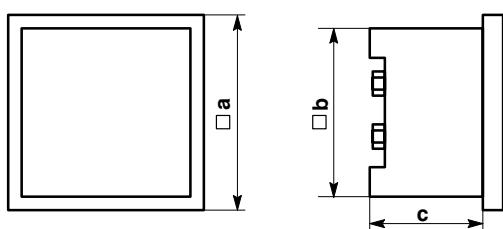
### AC current (direct-connected)



### AC current (for use on current transformer)



## Dimensions



dimensions (in mm)	EQ 48	EQ 72	EQ 96	EQ 144
a	48	72	96	144
b	42.5	66	90	136
c	53	53	53	53

## Ordering Information

<b>type</b> EQ	moving-iron panel meter
<b>front dimensions</b>	
48	48 mm x 48 mm
72	72 mm x 72 mm
96	96 mm x 96 mm
144	144 mm x 144 mm
<b>measuring ranges</b>	refer to preceding table
<b>window</b>	glass *) non-glaring glass
<b>colour of bezel</b>	black (similar to RAL 9005) *) gray (similar to RAL 7037)
<b>index marking pointer</b>	none *) red, front adjustable
<b>position of use</b>	vertical *) on request 15 ... 165° **)
<b>marine application</b>	none *) non-certified with approbation by "Germanischer Lloyd" (except EQ 48)
<b>panel fixing</b>	screw clamps *) spring clamps (except EQ 144 )
<b>terminal safety protection</b>	none *) full-sized rear cover protective sleeves
<b>dial</b>	according to measuring range resp. standard series for use on transformers *) non-calibrated, with dial symbols blank dial scale division and figuring 0 ... 100% according to standard series additional lettering on request **) additional figuring on request **) coloured marks red, green or blue **) coloured sector red, green or blue **)
<b>overload scaling (ammeters)</b>	no overload range 2 times rated current *) 5 times rated current
<b>logo</b>	none OEM logo **)

\*) standard

\*\*) Please clearly add the desired specifications.

### ordering example

EQ 72 , measuring range 0 ... 150 V, window non-glaring glass, dial 0 ... 100%, no logo

– specifications subject to change without notice; date of issue 12/05 –