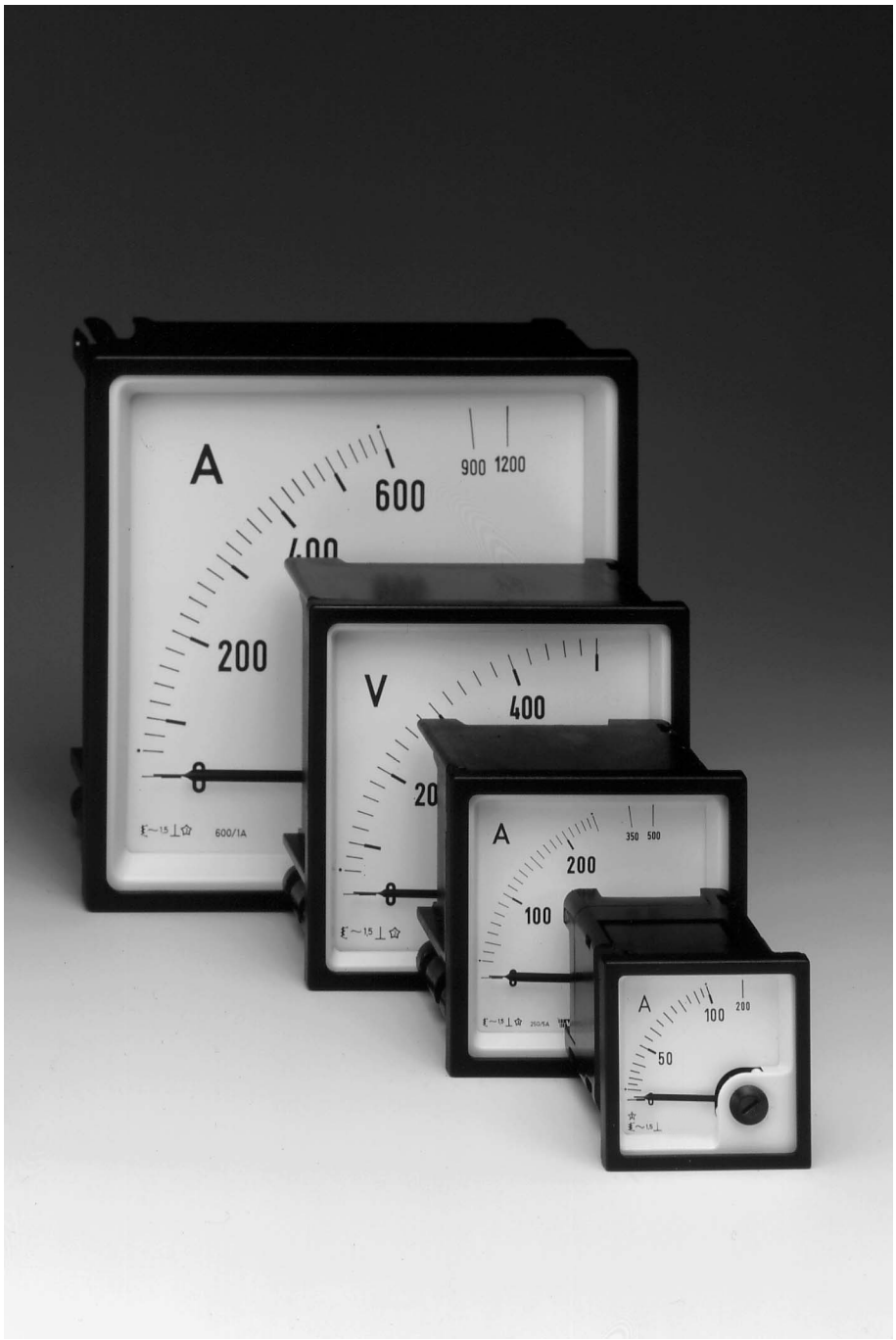
Data Sheet

Analog Meters with Moving-Iron Movement 90° – Dial

EQ 48
EQ 72
EQ 96
EQ 144

with Slide-In-Dial



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 $16^2/_3$ ... 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 ±5° ➧
panel fixing	screw clamps or spring clamps (except EQ 144)
mounting	stackable next to each other
panel thickness	≤ 40 mm
terminals	
voltmeters and ammeters <25 A	hexagon studs, M4 screws and wire clamps E3
ammeters ≥ 25 A	threaded studs M6 with nuts
ammeters ≥ 60 A	threaded studs M8 with nuts

dimensions (in mm)	**EQ 48**	**EQ 72**	**EQ 96**	**EQ 144**
bezel	□ 48	□ 72	□ 96	□ 144
case	□ 42.5	□ 66	□ 90	□ 136
depth	53	53	53	53
panel cutout	□ $45^{+0.6}$	□ $68^{+0.7}$	□ $92^{+0.8}$	□ 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	$16^2/_3$ ... 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			
AC current	EQ 48	EQ 72	EQ 96	EQ 144
1; 1,5; 2,5; 4; 5; 6; 10; 15; 25 A [1]	300 V	300 V	300 V	600 V
40; 60; 100 A [1] *)	−	300 V	300 V	600 V
AC voltage	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
for use on VT/CT	EQ 48	EQ 72	EQ 96	EQ 144
N/1 A, N/5 A [1]	150 V	150 V	150 V	150 V
N/100 V, N/110 V [2]	150 V	150 V	150 V	150 V

Please state transformer ratio when ordering.

*) not for EQ 48

[1]) full scale value = 2 times rated value (overload scaling) ➧

[2]) full scale value = 1.2 times rated value (− " −)

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 41 mm	EQ 72 61 mm	EQ 96 97 mm	EQ 144 146 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°C±1K
position of use	nominal position ±1°
input	rated measuring value
wave form	sinusoidal, distortion factor ≤ 5%
frequency	45 ... 65 Hz
others	DIN EN 60 051
influences	
ambient temperature	−10°C ... +23°C ... +55°C
position of use	nominal position ±5°
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 ... +55°C
storage temperature range	−25 ... +65°C
relative humidity	≤ 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
DIN 43 718	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°...165°
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

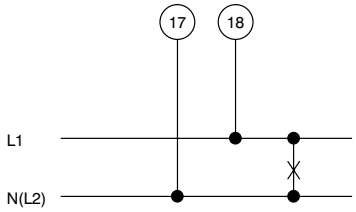
protection against accidental contact (hand and fingers) acc. to VBG 4 / DIN 57 106, sec. 100

dial

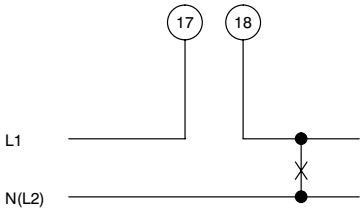
non−calibrated	with dial symbols
blank dial	pencil−marked on initial and end values
scale division and figuring	0 ... 100%
linear scale division	non−standard captions on request
additional lettering	on request e.g. "generator"
additional figuring	on request
coloured marks	red, green or blue for important 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

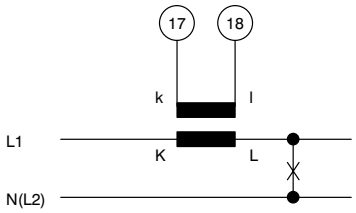
AC voltage (direct−connected)



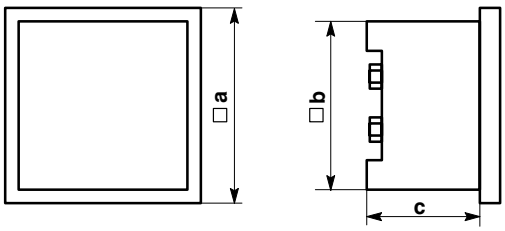
AC current (direct−connected)



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

type **EQ**	 moving−iron panel meter
front dimensions **48** **72** **96** **144**	 48 mm x 48 mm 72 mm x 72 mm 96 mm x 96 mm 144 mm x 144 mm
measuring ranges	refer to preceding table
window	glass *) non−glaring glass
colour of bezel	black (similar to RAL 9005) *) gray (similar to RAL 7037)
index marking pointer	none *) red, front adjustable
position of use	vertical *) on request 15 ... 165° **)
marine application	none *) non−certified with approbation by ”Germanischer Lloyd” (except EQ 48)
panel fixing	screw clamps *) spring clamps (except EQ 144)
terminal safety protection	none *) full−sized rear cover protective sleeves
dial	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 **)
overload scaling (ammeters)	no overload range 2 times rated current *) 5 times rated current
logo	 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 −

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