DATASHEET Issue 1.0



Multifunction Meters
Transducers & Isolators
Temperature Controllers
Converters & Recorders
Digital Panel Meters
Current Transformers
Analogue Panel Meters
Shunts
Digital Multimeters
Clamp Meters
Insulation Testers

SIGMA SERIES DE METER

The range of DE 48/72/96/144 series moving iron panel meters are suitable for the measurement of AC currents for frequency range of 15...400Hz and AC voltages in the frequency range of 15...100Hz which are housed in a moulded UL 94 V-0 polycarbonate case.

Features

- Scale interchangeability
- Near linear scale
- Glass filled polycarbonate housing (UL 94 V-0)
- Knife edge pointer
- Easily replace able glass and bezel.

SUBJECT TO CHANGE WITHOUT NOTICE
This manual superseded all previous versions – please keep for future reference



1. Application

The moving iron panel meters, DE 48/72/96/144 housed in moulded polycarbonate cases are suitable for the measurement of AC currents for frequency range of 15...400Hz and voltages in the frequency range of 15...100Hz.

2. Movement

Moving iron movement has pivots of very high hardness.Movement suspended between spring loaded sapphire jewel and silicon jewel.Movement is critically damped by use of silicon oil.

3. Technical Specifications

Applicable Standards	
Nominal case and cutout dimensions for indicating Electrical instruments	DIN IEC 61554
Scale and pointer for electrical measuring instruments	DIN 43802
Connections and Terminal markings	DIN 43807
Terminal bolts/leads	DIN 46200/46282
Safety requirements and protective measures for Electrical indicating. instruments and their accessories	DIN 40050, VDE 0110, VDE 0410 IEC 529, IEC 1010
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IEC51/DINEN60051 DIN 43701
Environmental conditions	VDE / VDI 3540
Front frames for indicating measuring instruments Principle dimensions	DIN 43718
UL Compatibility	UL 94 V-0

Comply with following European directives 2004 / 108 / EC (EMC directive), 2006 / 95/EC (low voltage directive) & amendment 93/68/EEC, For CE Marking.

Scale and Pointer				
Pointer	Knife - edge pointer			
Pointer detection	0...90			
Scale characteristics	Near Linear above 10% of nominal full Scale value			
Scale division	Coarse - fine			
Scale length	DE48	DE72	DE96	DE144
	41mm	63mm	97mm	146mm

Over Range	
Ammeters	2 times nominal current
Voltmeters	1.2 times nominal voltage
Scale Interchangeability	Interchangeable
Flame retardant & drip proof	As per UL 94 V-0
Mechanical Data	
Case details	Moulded square case suitable for mounting in Control / switchgear panels Machinery consoles.
Case material	Polycarbonate , ame retardant and drip proof as per UL 94 V-0.
Front facia	Glass
Colour of bezel	Black
Position of use	Vertical
Panel fixing	Mounting Clamp
Mounting	Stackable in a single cutout
Panel thickness	< 25 mm
Terminals	
Voltmeters and Ammeters < 30 A	Hexagon studs, M4 screws and wire clamps E3
Ammeters < 30 A	Threaded studs M6 with Nuts
Ammeters < 60A	Threaded Studs M8 with Nuts

Electrical Data	
Measured Quantity Power Consumption	AC Voltage or current
Voltmeters	< 4.5 VA
Ammeters < 15A	< 0.5 VA
Ammeters > 15A	< 0.8 VA
Continuous Overload Capacity	I (acc. to IEC 51) 1.2 times rated voltage /current.
Short Duration	
Voltameters	2 times for 0.5 sec : 9 overloads 2 times 5 sec : 1 overloads
Ammeters	10 times for 0.5 sec : 9 overloads 10 times for 5 sec : 1 overload
Enclosure code (IEC 529)	IP 52 case IP 00 for terminals without back cover IP 20 for terminals with back cover
Insulation class	Group A according to VDE 0110
Rated insulation	DE 48 : 660V DE 72/96 : 1KV
Proof voltage	DE 48 : 2KV DE 72/96 : 3KV
Installation category	> 50 Mohm at 500 V DC
Reference Conditions	
Accuracy class	0.5 according to IEC 51/DIN EN 60051)
Ambient temperature	23 C ± 2°C
Position of use	Nominal position ±1°
Input Waveform	Rated value of measured quantity sine wave, distortion factor < 5%
Frequency	65Hz
Other Conditions	IEC 51/DIN EN 60051
Nominal Range of use	
Ambient Temperature	0 ...50 °C
Position of use	Vertical ± 5°
Frequency	45 ...65Hz
External Magnetic Field	At 0.4 kA/m

Environmental Conditions	
Climatic Suitability	Climate category II as per IEC 60051 (climatic class 3 according to VDE/VDI 3540)
Operating Temperature	- 10... + 55 C
Storage temperature	- 25...+65 C
Relative humidity	< 75% annual average, noncondensing
Shock resistance	15 g. for pulse duration 11ms
Vibration resistance	10-55-10Hz for ampli. 0.15mm (1.5gat50Hz)
Pollution degree	Stackable in a single cutout
Standard Measuring Ranges	
A.C. Voltage	**A.C. Current**
6V	100mA
10V	150mA
15V	250mA
25V	400mA
40V	600mA
60V	1A
100V	1.5A
120V	2.5A
132V	4A
150V	5A
250V	6A
400V	10A
500V	15A
600V	20A
1000V	25A
for use with PT	40A
.../100 V secondary	50A (except DE 48)
.../110 V secondary	60A (except DE 48)
	100A (except DE 48)
	For use with CT
	.../1A secondary
	.../5A secondary

4. Options

Case	
Front Facia	Antiglare glass
Colour of bezel	Red, yellow, blue, white
Red index pointer	Front adjustable on site
Position of use	on request 15°...180°
Dial	
Blank dial	With initial and end values marked
Special markings	Numbering/Lettering
Division dials	Basic divisions without numbering
Colour markings/bands	Red or green
Over range	Two, three and five times over range
(Ammeters)	Six times over range

Accessories

Safety Terminal Protection

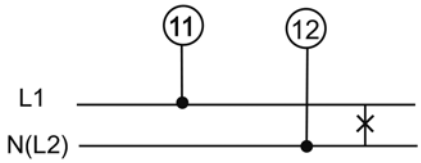
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc.to VDE 0410.

Safety Precautions

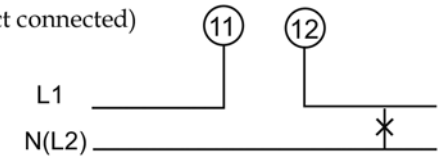
1) Instruments with damaged bezel or glasses must be disconnected from the mains.
2) Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing. If non - insulated connector wires are used.
3) The back cover must be snapped into place after connector wires have been clamped for protection against accidental contact.
4) Bezel, Scale and Glass may only be replaced under voltage free conditions.
5) Instruments to be used in grounded panel.

5. Electrical Connections

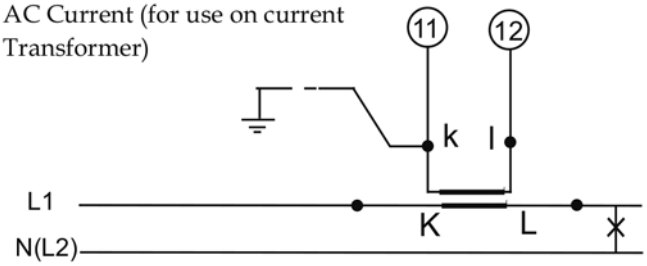
AC Voltage (Direct connected)



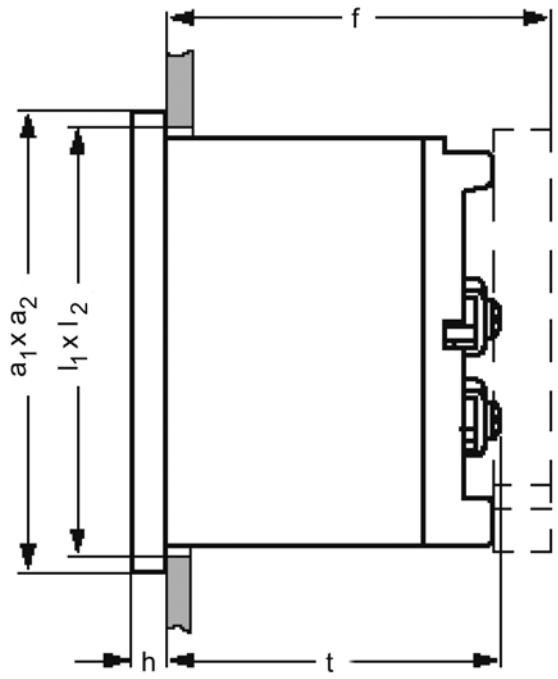
AC Current (Direct connected)



AC Current (for use on current Transformer)



6. Dimensions



Front in mm	Nominal Dimensions, mm		Cutout, mm	Installation Depth Including Terminal (t), mm			Installation Depth Incl. Full back Cover (f), mm	
	$a_1 \times a_2$	h	$l_1 \times l_2$	< 30A (M4)	30...60A(M6)	100A (M8)	< 30A	30...100A
48 x 48	48 x 48	5.5	$45^{+0.6} \times 45^{+0.6}$	54	72	-	62.5	75(upto 60A)
72 x 72	72 x 72	5.5	$68^{+0.7} \times 68^{+0.7}$	54	62	66	62.5	70
96 x 96	96 x 96	5.5	$92^{+0.8} \times 92^{+0.8}$	54	62	66	62.5	70

7. Ordering Information- Only For Representative Products

Size: 48 x 48 Ammeter		
Part No.	**Description**	**Class**
EQ44-I1112N1CAW0ST	5A, Scale 0-5A	CL-1
EQ44-I1312N1CAW0ST	10A, Scale 0-10A	CL-1
EQ44-I1412N1CAW0ST	15A, scale 0-15A	CL-1
EQ44-I1512N1CAW0ST	20A, Scale 0-20A	CL-1
EQ44-I1612N1CAW0ST	25A, Scale 0-25A	CL-1
EQ44-I1812N1CAW0ST	40A, Scale 0-40A	CL-1
EQ44-I2012N1CAW0ST	60A, Scale 0-60A	CL-1
Size: 72 x 72 Ammeter		
Part No.	**Description**	**Class**
EQ74-I11X2N1CAW0ST	5A, Scale 0-5A	CL-1
EQ74-I13X2N1CAW0ST	10A, Scale 0-10A	CL-1
EQ74-I14X2N1CAW0ST	15A, scale 0-15A	CL-1
EQ74-I15X2N1CAW0ST	20A, Scale 0-20A	CL-1
EQ74-I16X2N1CAW0ST	25A, Scale 0-25A	CL-1
EQ74-I18X2N1CAW0ST	40A, Scale 0-40A	CL-1
EQ74-I20X2N1CAW0ST	60A, Scale 0-60A	CL-1
Size: 96 x 96 Ammeter		
Part No.	**Description**	**Class**
EQ94-I1112N1CAW0ST	5A, Scale 0-5A	CL-1
EQ94-I1312N1CAW0ST	10A, Scale 0-10A	CL-1
EQ94-I1412N1CAW0ST	15A, scale 0-15A	CL-1
EQ94-I1512N1CAW0ST	20A, Scale 0-20A	CL-1
EQ94-I1612N1CAW0ST	25A, Scale 0-25A	CL-1
EQ94-I1812N1CAW0ST	40A, Scale 0-40A	CL-1
EQ94-I2012N1CAW0ST	60A, Scale 0-60A	CL-1
Size: 48 x 48 Voltmeter		
Part No.	**Description**	**Class**
EQ44-V60X2N1CAW0ST	120V, Scale 0 -120V	CL-1
EQ44-V61X2N1CAW0ST	132V, Scale 0 -132V	CL-1
EQ44-V63X2N1CAW0ST	150V, Scale 0 - 150V	CL-1
EQ44-V65X2N1CAW0ST	200V, Scale 0 - 200V	CL-1
EQ44-V66X2N1CAW0ST	230V, Scale 0 - 230V	CL-1
EQ44-V67X2N1CAW0ST	250V, Scale 0 - 250V	CL-1
EQ44-V68X2N1CAW0ST	300V, Scale 0- 300V	CL-1
EQ44-V69X2N1CAW0ST	400V, Scale 0 - 400V	CL-1
EQ44-V70X2N1CAW0ST	500V, Scale 0 - 500V	CL-1
EQ44-V71X2N1CAW0ST	600V, Scale 0 - 600V	CL-1

Size: 72 x 72 Voltmeter		
Part No.	**Description**	**Class**
EQ74-V60X2N1CAW0ST	120V, Scale 0 -120V	CL-1
EQ74-V61X2N1CAW0ST	132V, Scale 0 -132V	CL-1
EQ74-V63X2N1CAW0ST	150V, Scale 0 - 150V	CL-1
EQ74-V65X2N1CAW0ST	200V, Scale 0 - 200V	CL-1
EQ74-V66X2N1CAW0ST	230V, Scale 0 - 230V	CL-1
EQ74-V67X2N1CAW0ST	250V, Scale 0 - 250V	CL-1
EQ74-V68X2N1CAW0ST	300V, Scale 0- 300V	CL-1
EQ74-V69X2N1CAW0ST	400V, Scale 0 - 400V	CL-1
EQ74-V70X2N1CAW0ST	500V, Scale 0 - 500V	CL-1
EQ74-V71X2N1CAW0ST	600V, Scale 0 - 600V	CL-1
Size: 96 x 96 Voltmeter		
Part No.	**Description**	**Class**
EQ94-V60X2N1CAW0ST	120V, Scale 0 -120V	CL-1
EQ94-V61X2N1CAW0ST	132V, Scale 0 -132V	CL-1
EQ94-V63X2N1CAW0ST	150V, Scale 0 - 150V	CL-1
EQ94-V65X2N1CAW0ST	200V, Scale 0 - 200V	CL-1
EQ94-V66X2N1CAW0ST	230V, Scale 0 - 230V	CL-1
EQ94-V67X2N1CAW0ST	250V, Scale 0 - 250V	CL-1
EQ94-V68X2N1CAW0ST	300V, Scale 0- 300V	CL-1
EQ94-V69X2N1CAW0ST	400V, Scale 0 - 400V	CL-1
EQ94-V70X2N1CAW0ST	500V, Scale 0 - 500V	CL-1
EQ94-V71X2N1CAW0ST	600V, Scale 0 - 600V	CL-1

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