

DE 48
DE 72
DE 96
DE 144

Data Sheet

Analogue Meter With
Moving Iron Movement - DE



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.

Moving iron meters indicate rms-values practically independent of waveform even of high harmonics. Error of indication may occur for extreme waveforms (e.g. phase gating controls) & for frequencies above 100KHz.

These meters offer several advantages in switchboards and Generating Set Panels. Number of meters can be mounted in a Panel cut out Mosaic mounting). For CT operated ammeters, dials can be fitted based on CT ratio. Glass and bezel can be easily replaced.

Features

- Scale interchangeability.
- Near linear scale.
- Glass filled polycarbonate housing.
- Knife edge pointer.
- Easily replace able glass and bezel.

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.

Applicable Standards

Nominal case and cutout dimensions for indicating Electrical instruments	IS 2419 DIN IEC 61554
Scale and pointer for electrical measuring instruments	IS 1248
Connections and Terminal markings for panel meters	DIN 43802 IS 1248
Terminal bolts / leads.	DIN 43807
Safety requirements and protective measures for Electrical indicating instruments and their accessories.	DIN 46200/46282 IS 9249
Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories	IS 9249 DIN 40050 VDE 0110 VDE 0410 IEC 529, IEC 1010 IS 1248
Environmental conditions	IEC51/DINEN60051 DIN 43701
Front frames for indicating measuring instruments Principle dimensions	IS 1248 IS : 9000 VDE / VDI 3540 DIN 43718

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 deflection	0...90°
Scale characteristics	Near Linear above 10% of nominal full Scale value
Scale division	Coarse - fine
Scale length	DE48 DE72 DE96 DE144 41 mm 63mm 97mm 146mm

Over Range

Ammeters	2 times nominal current
Voltmeters	1.2 times nominal voltage
Scale Interchangeability	Interchangeable

Mechanical Data

Case details	Moulded square case suitable for mounting in Control / switchgear panels Machinery consoles.
Case material	Polycarbonate, flame retardant and drip proof
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 < 30A	Hexagon studs, M4 screws and wire clamps E3
Ammeters > 30A	Threaded studs M6 with Nuts
Ammeters > 60A	Threaded Studs M8 with Nuts

Electrical Data

Measured quantity	AC voltage or current
Power consumption	
Voltmeters	< 4.5VA
Ammeters < 15A	< 0.5VA
Ammeters > 15A	< 0.8 VA
Overload capacity	(acc. to IS: 1248 / IEC 51)
Continuously	1.2 times rated voltage /current

Short duration

Voltmeters	2 times for 0.5 sec : 9 overloads 2 times for 5 sec : 1 overload
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	.5 according to IS : 1248 (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	45...65HZ
Other conditions	IS : 1248 (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 IS : 1248, 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, non-condensing
Shock resistance	15g _n for pulse duration 11 ms
Vibration resistance	10-55-10Hz for ampli. 0.15mm (1.5 g at 50Hz)
Pollution degree	2

Standard Measuring Ranges

A. C. Voltage	A. C. Current
6V	1A
10V	5A
15V	6A
100V	10A
150V	15A
300V	20A
500V	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

Non-Standard ranges available on request.

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).

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.

Accessories

Safety Terminal Protection

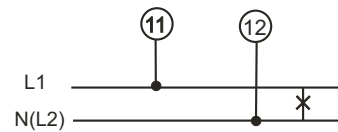
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers) acc.to IS 9249, VDE 0410.

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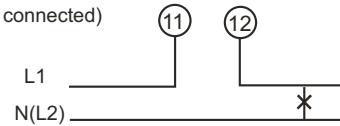
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Connections

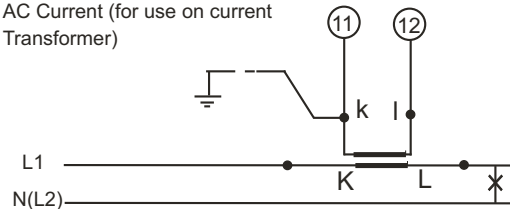
AC Voltage (Direct connected)



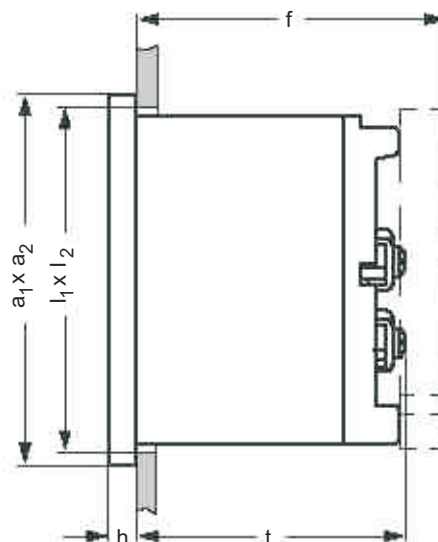
AC Current (Direct connected)



AC Current (for use on current Transformer)



Dimensions



Front in mm	Nominal Dimensions, mm		Cutout, mm l ₁ x l ₂	Installation Depth Including Terminal (t), mm			Installation Depth Incl. Full back Cover (f), mm	
	a ₁ x a ₂	h		< 30A (M4)	30...60A(M6)	100A (M8)	< 30A	30...100A
48 x 48	48 x 48	5.5	45 ^{+0.6} x 45 ^{+0.6}	54	72	-	62.5	75(upto 60A)
72 x 72	72 x 72	5.5	68 ^{+0.7} x 68 ^{+0.7}	54	62	66	62.5	70
96 x 96	96 x 96	5.5	92 ^{+0.8} x 92 ^{+0.8}	54	62	66	62.5	70
144 x 144	144 x 144	5.5	138 ⁺¹ x 138 ⁺¹	54	62	67	62.5	70

Ordering Information

Type DE	Moving-Iron panel meter
Front Dimension 48 72 96 144	48mm x 48mm 72mm x 72mm 96mm x 96mm 144mm x 144mm
Over range (Ammeters)	2 times, 3 times 6 times, 5 times
Measuring Ranges	Refer to table inside
Terminal Protection	Full sized polycarbonate back cover
Panel Fixing	Mounting Clamps
Red Index Pointer	None ¹ Required ³
Front facia	Normal glass ¹ Antiglare glass ³ Polycarbonate glass ³
Colour of Bezel	Black ¹ Red, Blue, Yellow, White ³
Position of use	Vertical ¹ on request 0....180 ³
Dial	Standard scale same as measuring range ¹ Blank dial with division ³ Additional lettering on request ³ Additional numbering on request ³ Coloured marking red or green ³ Coloured sector red or green ³
Logo	SHANTI ¹

¹Standard

³Please clearly add the desired specifications while ordering

Ordering example

DE 72 Measuring range 150 V, dial 0 - 100%

Specifications are subject to change without notice (07/09)