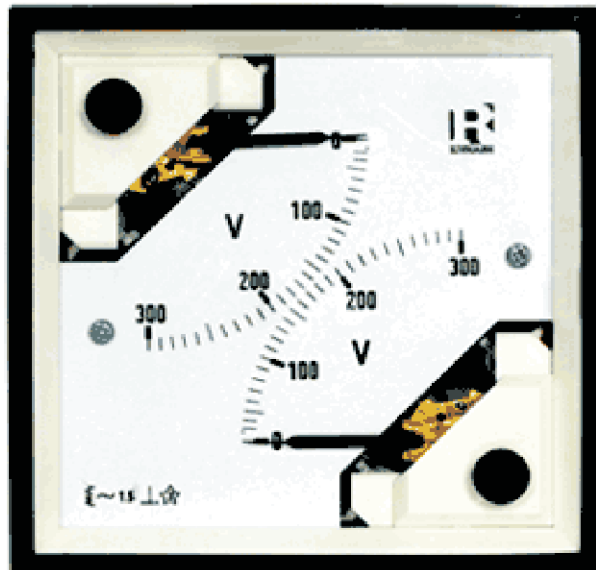


2 IN 1 MOVING IRON MOVEMENT METER DE - 96/144

Two in One
DE - 96/144

Data Sheet

DE 96/144 2 in 1 Analogue Meters
With Moving Iron Movement



Application

The moving iron panel meters, 2-in-1 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 100Hz.

These meters offer several advantages in switchboards and Generating Set Panels. Number of meters can be mounted in a single cut out (Mosaic mounting). Front window, Glass and bezel can be easily replaced.

Features

- Two different meters in one case.
- Near linear scale.
- Glass filled polycarbonate housing(UL 94 V-0).
- Easily replaceable glass & bezel.
- Knife edge pointer

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.

Specifications

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 | : 54mm |
| Over Range | |
| Ammeters | : 2 times nominal current |
| Voltmeters | : 1.2 times nominal voltage |

Mechanical Data

| | |
|------------------------|--|
| Case details | : Moulded square case suitable for mounting in Control / switchgear panels Machinery consoles. |
| Case material | : Polycarbonate , Flame 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 < 30A | : Hexagon studs, M4 screws and wire clamps E3 |
| Ammeters ≥ 30A | : Threaded studs M6 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 voltage | : 2 in 1 DE 1000V |
| Proof voltage | : 3KV |
| Installation category | : 600V CAT III |
| Insulation resistance | : > 50 Mohm at 500 V DC |

Reference Conditions

| | |
|----------------------------|---|
| Accuracy class | : 1.5 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 | 100mA |
| 10V | 150mA |
| 15V | 250mA |
| 25V | 400mA |
| 40V | 600mA |
| 60V | 1A |
| 100V | 1.5A |
| 120V | 2.5A |
| 132V | 3A |

| | |
|--------------------------------|----------------------------------|
| 150V | 4A |
| 250V | 5A |
| 300V | 6A |
| 400V | 10A |
| 500V | 15A |
| 600V | 20A |
| | 25A |
| | 30A |
| For use on voltage transformer | 40A |
| .../100 V secondary | 50A |
| .../110 V secondary | 60A |
| | For use with Current transformer |
| | .../1A secondary or |
| | .../5A secondary |
| Any combination | Ammeter / Ammeter |
| | Voltmeter / Voltmeter |
| | Ammeter / Voltmeter |

In case of Ammeter / Ammeter 1 meter could be upto 60A but 2nd one will be only upto 10A

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 0°...180° |

Dial

| | |
|------------------------------|--|
| Blank dial | : With initial and end values marked. |
| Special markings | : Numbering / Lettering. |
| Division markings | : Basic divisions without numbering. |
| Colour markings/bands | : Red or green |
| Over range (Ammeters) | : Two, three and five times over range Six times over range |

Applicable Standards

| | |
|--|--|
| Nominal case and cutout dimensions for indicating Electrical instruments | : IS 2419 DIN 43700 |
| Scale and pointer for electrical measuring instruments | : IS 1248 DIN 43802 |
| Connections and Terminal markings for panel meters | : IS 1248 DIN 43807 |
| Terminal bolts / leads. | : DIN 46200/ 46282 |
| Safety requirements and protective measures for Electrical indicating instruments and their accessories. | : IS 9249 DIN 40050 VDE 0110 VDE 0410 IEC 529, IEC 1010 |
| Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories | : IS 1248 IEC51/DINEN 60051 |
| Environmental conditions | : DIN 43701 IS 1248 IS : 9000 VDE / VDI 3540 |
| Front frames for indicating measuring instruments Principle dimensions | : DIN 43718 |
| UL Combustibility Class | : 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. |

Accessories

Safety Terminal Protection

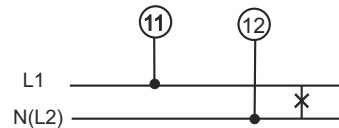
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers).

Safety Precautions

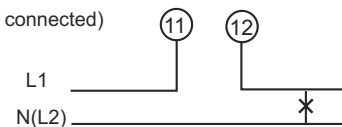
- 1) Instruments with damaged bezel or glasses must be disconnected from the mains.
- 2) Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing. If non - insulated connector wires are used.
- 3) The back cover must be snapped into place after connector wires 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.

Connections

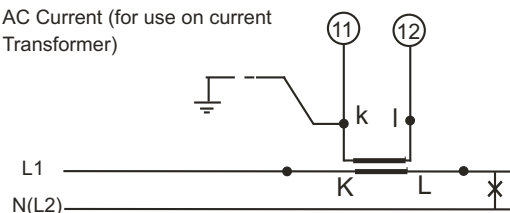
AC Voltage (Direct connected)



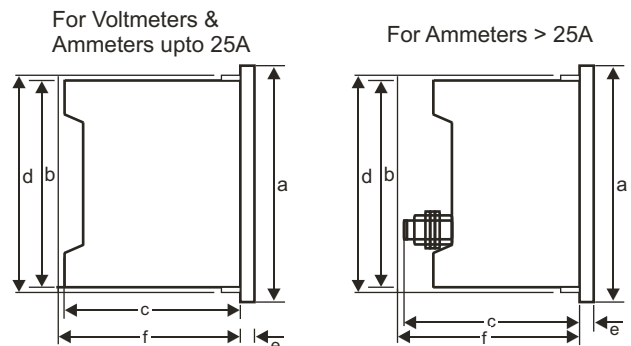
AC Current (Direct connected)



AC Current (for use on current Transformer)



Dimensions



| Dimensions (in mm) | | DE 96 | | | (in mm) | DE 144 |
|--------------------------|-----|-------------------------------------|--------------------------|-----|-------------------|--------|
| Bezel | a | 96 | Bezel | a | 144 | |
| Case | b | 90 | Case | b | 136 | |
| Depth | c* | 53 | Depth | c* | 53 | |
| | d | 91.5 | | d | 137.5 | |
| | e | 5.5 | | e | 5.5 | |
| cutout size | | 92 ^{+0.8} | cutout size | | 138 ^{*1} | |
| Depth with back cover | f** | 64 | Depth with back cover | f** | 64 | |
| | | * c = 62 mm, for I > 30A & upto 60A | | | | |
| Weight approx. | | 0.2 kg | Weight approx. | | 0.4 kg | |

Ordering Information

| Type DE | Moving-iron panel meter | Moving-iron panel meter |
|--------------------------|---|---|
| Front dimension 96 | 96 mm x 96 mm | 144 mm x 144 mm |
| Over range (Ammeters) | 2 times, 3 times 6 times, 5 times | 2 times, 3 times 6 times, 5 times |
| Measuring Ranges | Refer to table inside | Refer to table inside |
| Terminal protection | full sized polycarbonate backcover | full sized polycarbonate backcover |
| Panel Fixing | Mounting Clamps | Mounting Clamps |
| Red Index Pointer | None ^{*1} Required ^{*3} | None ^{*1} Required ^{*3} |
| Housings color | white, ^{*1} Black ^{*3} | Black ^{*1} , White ^{*3} |
| Front facia | Normal glass ^{*1} Antiglare glass ^{*3} Polycarbonate glass ^{*3} | Normal glass ^{*1} Antiglare glass ^{*3} Polycarbonate glass ^{*3} |
| Colour of bezel | Black ^{*1} Red,Blue, Yellow,White ^{*3} | Black ^{*1} Red,Blue, Yellow,White ^{*3} |
| Position of use | Vertical ^{*1} On request 0 180° ^{*3} | 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} | 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 | RISHABH ^{*1} | RISHABH ^{*1} |

*1 standard

*3 Please clearly add the desired specifications while ordering

Ordering example

DE 30A - DE 500V
DE 300V - DE 500V
DE 30A - DE 5A

Specifications are subject to change without notice



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