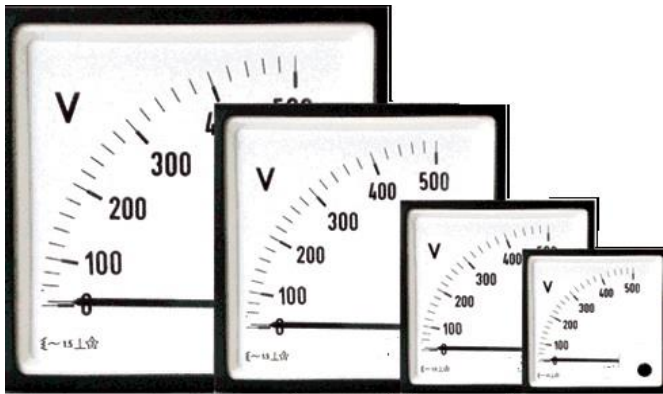


Application:

The moving iron panel meters, DE 48/72/96/144 housed in molded polycarbonate cases are suitable for the measurement of AC currents for frequency range of 15 to 400 Hz and voltages in the frequency range of 15 to 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 switch boards and generating set panels. A number of meters can be mounted in a panel cutout mosaic mounting). For CT operated ammeters, dials can be fitted based on CT ratio. Glass and bezel can easily be replaced.

Features:

- Scale Interchangeability
- Near Linear Scale
- Knife edge pointer
- Easily replicable glass and bezel
- Glass filled polycarbonate housing (UL 94 V-0)

Movement:

Moving iron movement has pivots of very high hardness. Movement is 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.	IS2419 DIN IEC 61554
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.	IS 9249 DIN 40050
Instruments and their accessories.	VDE 0110 VDE 0410 IEC 529, IEC 1010

Applicable Standards Cont.:

Performance specifications for direct acting indicating analogue electrical measuring instruments and their accessories.	IS 1248 IEC51/DINEN60051 DIN 43701
Environmental conditions	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.

Scale and Pointer:

Pointer	Knife-edge pointer
Pointer Deflection	0 to 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
ND drip proof as per UL 94 V-0	

Mechanical Data:

Case details	Molded 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 fascia	Glass
Color of bezel	Black
Position of use	Vertical
Panel fixing	Mounting Clamp
Mounting	Stackable in a single cutout
Panel thickness	≤25 mm

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Mechanical Data Cont.:

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	< 4.5 VA
Ammeters < 15A	< 0.5 VA
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 to 65 Hz
Other conditions	IS : 1248 (IEC 51/DIN EN 60051)

Nominal Range of Use:

Ambient Temperature	0 to 50° C
Position of use	Vertical ± 5°
Frequency	45 to 65 Hz
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 to + 55°C
Storage Temperature	-25 to + 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	1 A
100V	1.5 A
120V	2.5 A
132V	4 A
150V	5 A
250V	6 A
400V	10 A
500V	15 A
600V	20 A
1000V	25 A
	40 A
For use with PT	50 A (except DE48)
.... /100 V secondary	60 A (except DE48)
.... /110 V secondary	100A (except DE48)
	For use with CT
 /1 A secondary
 /5 A secondary

Non-Standard ranges are available on request.

Options:

Case	
Front fascia	Antiglare glass
Color of bezel	Red, Yellow, Blue, White
Red index pointer	Front adjustable on site
Position of use	On request 15° to 180°
Dial	
Blank dial	With initial and end values marked
Special markings	Numbering/Lettering
Division dials	Basic divisions without numbering
Color markings/bands	Red or Green
Over range	Two, three and five times over range
(Ammeters)	Six times over range

Accessories:

Safety Terminal Protection

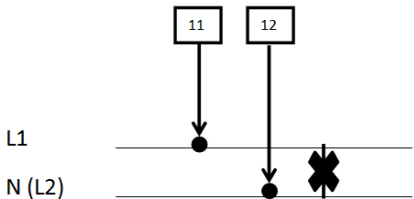
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers).

Safety Precautions:

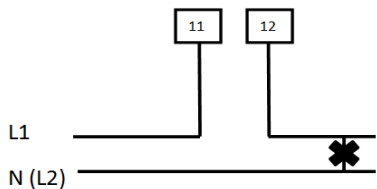
1.) Instruments with damaged bezel or glass must be disconnected from the mains.
2.) Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing. If non-insulated connector wires are used.
3.) The back cover must be snapped into place after connector wires have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

Connections:

AC Voltage (Direct connected)

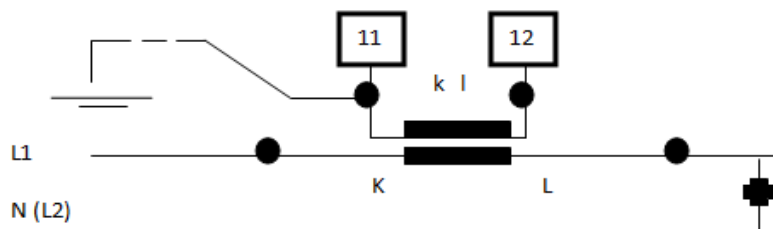


AC Current (Direct connected)

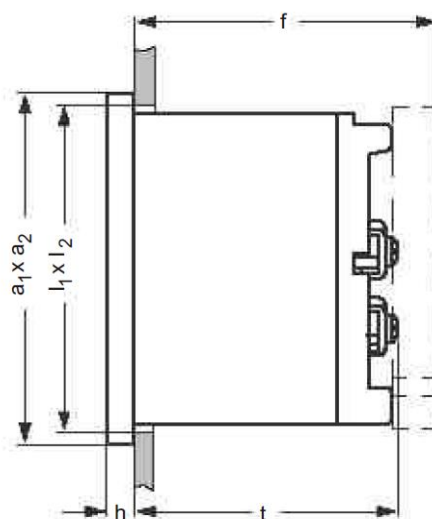


Connections Cont.:

AC Current (for use on current transformer)



Dimensions:



Front in mm	Nominal Dimensions, mm		Cutout, mm $l_1 \times l_2$	Installation Depth Including Terminal (t), mm			Installation Depth Incl. Full back cover (f), mm	
	$a_1 \times a_2$	h		<30A (M4)	30 to 60A (M6)	100A (M8)	< 30A	30 to 100A
48 X 48	48 X 48	5.5	$45^{+0.6} \times 45^{+0.6}$	54	72	-	62.5	75 (up to 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
144 X 144	144 X 144	5.5	$138^{+1} \times 138^{+1}$	54	62	67	62.5	70

Ordering Information:

Type DE	Moving-Iron panel meter
Front	Dimension
48	48mm x 48mm
72	72mm x 72mm
96	96mm x 96mm
144	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 Fascia	Normal glass ^{*1} Antiglare glass ^{*3} Polycarbonate glass ^{*3}
Color of bezel	Black ^{*1} Red, Blue, Yellow, White ^{*3}
Position of use	Vertical ^{*1} On request 0 to 180° ^{*3}
Dial	Standard scale same as measuring range ^{*1} Blank dial with division ^{*3} Additional lettering on request ^{*3} Colored marking red or green ^{*3} Colored sector red or green ^{*3}
Logo	Jewell Instruments ^{*1}

^{*1} Standard

^{*3} Please clarify and add the desired specifications while ordering

Ordering Example:

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

Specifications are subject to change without notice

