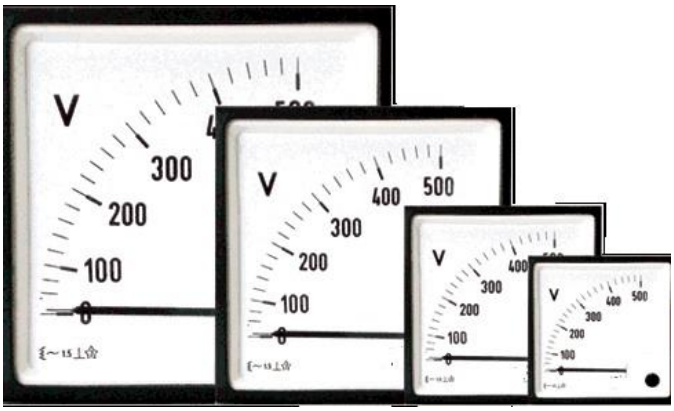
Jewell Analog Meter with Moving Coil Movement - DS

Jewell Instruments
BEST IN CLASS

Application:

The moving coil panel meters, DS 48/72/96/144 are housed in molded polycarbonate cases and are suitable for the measurement of DC current and voltages.

These instruments offer several advantages in switchboards and Generating Set panels. A number of meters can be mounted in a Panel Cut out (Mosaic mounting). The frontglass, bezel and dial can all easily be replaced.



Features:

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

Movement:

Moving coil movement has pivots of very high hardness. Movement is suspended between two spring loaded sapphire jewels. Movement is properly shielded and critically damped by eddy currents induced in coil former.

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 clamps
Mounting	Stackable in a single cutout
Panel thickness	≤ 25 mm
Terminals: Voltmeters and Ammeters <5A Ammeters >5A Ammeters >60A	 Hexagon studs, M4 screws and wire clamps E3. Threaded studs M6 with nuts. Threaded studs M8 with nuts.

Electrical Data:

Measured quantity	DC voltage or current
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 overloads
Ammeters	DS 48, 72, 96 10 times for 0.5 sec: 9 overloads 10 times for 5 sec: 1 overload
Enclosure code (IEC 529)	IP 52 case cover 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	DS 48: 660V DS 72/96: 1 KV
Proof Voltage	DS 48: 2KV DS72/96: 3 KV
Installation Category	DS 48: 300V CAT III (IEC 1010) DS 72/96: 600V CAT III (IEC 1010)
Insulation Resistance > 50 Mohm at 500 V d.c.	
*4 Accuracy class 2.5	
*5 Total lead resistance of 0.035 ohm or less considered for mV ranges while calibration.	
*6 Not applicable for DS 48	

Burden

Connection to shunt	Power Consumption: 6 mA Lead Resistance: 0.06 W	± 10%
1A.....60A	Voltage drop: 60 mVm	± 10%
≥ 1V	1000 W/V	± 5%

Standard Measuring Ranges:

D.C. Current		D.C. Voltage	
Rated Value	**Approx. Voltage Drop**	**Rated Value**	**Sensitivity (± 10%)**
15 µA*[4]	140 mV	15 mV*[4]*[5]	3.33 kohm/V
25 µA*[4]	240 mV	25 mV*[4]*[5]	3.33 kohm/V
40 µA*[4]	374 mV	40 mV*[4]*[5]	3.33 kohm/V
50 µA*[4]	424 mV	50 mV*[5]	3.33 kohm/V
60 µA*[4]	600 mV	60 mV*[5]	1 kohm/V
100 µA	400 mV	75 mV*[5]	1 kohm/V
150 µA	600 mV	100 mV*[5]	1 kohm/V
250 µA	140 mV	150 mV*[5]	1 kohm/V
400 µA	540 mV	250 mV*[5]	1 kohm/V
500 µA	540 mV	400 mV*[5]	1 kohm/V
600 µA	540 mV	600 mV*[5]	1 kohm/V
1 mA	37 mV	1 V	1 kohm/V
1.5 mA	196 mV	1.5 V	1 kohm/V
2.5 mA	196 mV	2.5 V	1 kohm/V
4 mA	196 mV	4 V	1 kohm/V
5 mA	196 mV	6 V	1 kohm/V
6 mA	196 mV	10 V	1 kohm/V
10 mA	196 mV	15 V	1 kohm/V
15 mA	11 mV	25 V	1 kohm/V
20 mA	60 mV	30 V	1 kohm/V
25 mA	60 mV	40 V	1 kohm/V
40 mA	60 mV	50 V	1 kohm/V
60 mA	60 mV	60 V	1 kohm/V
100 mA	60 mV	100 V	1 kohm/V
150 mA	60 mV	150 V	1 kohm/V
250 mA	60 mV	200 V	1 kohm/V
400 mA	60 mV	250 V	1 kohm/V
600 mA	60 mV	300 V	1 kohm/V
1 A	60 mV	400 V	1 kohm/V
1.5 A	60 mV	500 V	1 kohm/V
2.5 A	60 mV	600 V	1 kohm/V
4 A	60 mV	1000 V	1 kohm/V
5 A	60 mV	For use on external	
6 A	72 mV	shunt	
10 A	60 mV		
15 A	60 mV	60 mV*[5]	1 kohm/V
20 A	60 mV	75 mV*[5]	1 kohm/V
25 A	60 mV	150 mV*[5]	1 kohm/V
30 A	60 mV		
40 A	60 mV		
60 A	72 mV		
100 A*[6]	60 mV		
For use on transducer			
4-20 mA	60 mV		

Non-Standard ranges available on request.

Accuracy at Reference Conditions

Accuracy class	1.5 according to IS: 1248 (IEC 51/DIN EN 600051)
Reference Conditions:	
Ambient Temperature	23°C + 2°C
Position of Use	Nominal position + 1
Input	Rated value of measured quantity
Other Conditions	IS: 1248 (IEC 51/DIN EN 60051)
Nominal Range of Use:	
Ambient Temperature	0....50°C
Position of Use	Vertical ± 5°
External Magnetic Field	At 0.4 KA/m

Scale and Pointer

Pointer	Knife – edge pointer
Pointer Deflection	0....90°
Scale Characteristics	Linear
Scale Division	Coarse - Fine
Scale Length	DS 96 DS 48 DS 72 DS 144 41 mm 63 mm 97 mm 146 mm
Scale Interchangeability	Interchangeable

Environmental Conditions

Climatic Suitability	Climate category II as per IS:1248 (climatic class III 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	10-55-10 Hz for amplification 0.15mm (1.5g at 50Hz)
Pollution Degree	2

Applicable Standards

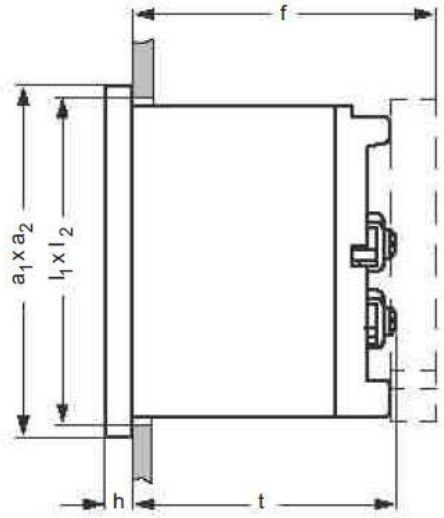
Nominal case and cutout dimensions for indicating electrical instruments	IS 2419 DIN IEC 61554
Scale and pointer for electrical measuring instruments	IS 1248 DIN 43802
Connections and Terminal markings for panel meters	IS 1248 DIN 43807
Terminal bolts/leads	DIN 46200/46282
Clamp straps for connections	DIN 46282
Safety requirements and protective measures for electrical measuring instruments & there accessories.	IS 9249 DIN 40050 VDE 0110 VDE 0410 IEC 529, IEC 1010

Applicable Standards Cont.

Performance specifications for direct acting indicating analog electrical measuring instruments and there accessories.	IS 1248 IEC 51/DIN EN 60051 DIN 43701
Environmental Condition- IS: 1248 IS: 9000 VDE/VDI 3540	
Front frames for indicating measuring instruments principle dimensions	DIN 43718
UL Combustibility Class	UL 94 V-0
Technical conditions of delivery for electrical instruments	DIN 43701
Mechanical strength (free fall test, vibration test)	IS 1248 IS 9000 VDE 0411 IEC 61010

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

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 x a_2	h	l_1 x l_2	≤4A (M4)	5...60A (M6)	60...100A (M8)	≤4A	5..60A	60...100A
48 x 48	48 x 48	5.5	$45^{+0.6}$ x $45^{+0.6}$	54	72	----	62.5	75	----
72 x 72	72 x 72	5.5	$68^{+0.7}$ x $68^{+0.7}$	54	67	67	62.5	70	70
96 x 96	96 x 96	5.5	$92^{+0.8}$ x $92^{+0.8}$	54	67	67	62.5	70	70
144 x 144	144 x 144	5.5	138^{+1} x 138^{+1}	54	67	67	62.5	70	70

Options

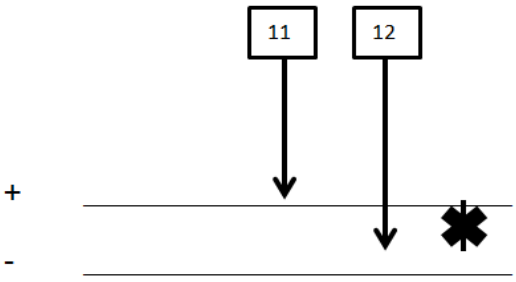
Case	
Front fascia	Antiglare glass
Color of bezel	Red, Yellow, Blue, White
Red index pointer	Front adjustable on site
Position of use	On request 0° to 180°
Dial	
Blank dial	With initial and end values marked
Special markings	Numbering/Lettering
Division dials	Basic divisions without numbering
Color markings/bands	Red or Green
Others	
Zero position	Center zero or off-set zero
Increased sensitivity	4 kohm/V for voltmeters 1 to 600V 10 kohm/V for Voltmeters 15 to 150V
Adjustment of Resistance (Sensitivity)	Within ± 1% at 23°C

Accessories

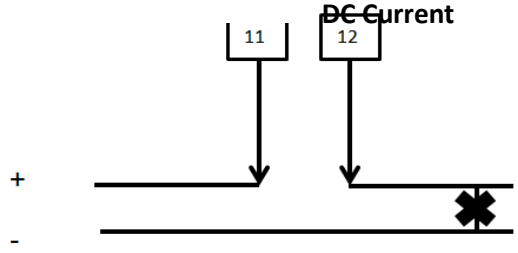
Safety Terminal protection
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers)

Connections

DC Voltage



DC Current



Jewell Analog Meter with Moving Coil Movement - DS

BEST IN CLASS

Ordering Information

Type DS	 Moving-coil panel meter
Front Dimension 48 72 96 144	 48mm X 48mm 72mm X 72mm 96mm X 96mm 144mm X 144mm
Measuring Range	Refer to table inside
Front Fascia	Normal glass*1 Antiglare glass*3
Color of Bezel	Black*1 Red, Blue, Yellow, White*3
Position of Use	Vertical*1 On request 0 to 180°*3
Terminal Protection	Full sized polycarbonate back cover
Zero Position	Left*1 Off-set Zero*3 Center*1
Increased Sensitivity	4 kohm/V for voltmeters 1 to 600V*3 10 kohm/V for voltmeters 15 to 150V*3
Adjustment Resistance (Sensitivity)	Within ± 1% at 23C*3
Dial	Standard scale same as measuring range*1 Blank dial with division*3 Additional lettering on request*3 Additional numbering on request*3 Colored marking red or green*3 Colored sector red or green*3
Logo	Jewell Instruments*1

*1 Standard

*3 Please clearly adf the desired specifications when ordering.

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 in to place after the 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.

Ordering Example

DS 72 Measuring Range 0 to 20 mA, dial with 0 to 100°C, red mark at 37°C.

Specifications are subject to change without notice.