



## Technical Data Sheet

# *Sigma Series DS Meter*



The moving coil panel meters, DS 48/72/96/144 housed in moulded polycarbonate cases are suitable for the measurement of DC currents and voltages. These instruments offer several advantages in switchboards and Generating Set Panels. Number of meters can be mounted in a Panel Cut out (Mosaic mounting). Front glass, Bezel & Dial can be easily replaced.

### Special Features

- Linear scale.
- Glass filled polycarbonate housing (UL 94-V-0)
- Knife edge pointer.
- Easily replaceable glass and bezel.

## Application

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

## Movement

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

## 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 < 5 A Ammeters > 5A	Hexagon studs, M4 screws and wire clamps E3 (DIN 46282) Threaded studs M6 with nuts
Ammeters > 60A	Threaded studs M8 with nuts

## Electrical Data

Measured Quantity	AC voltage or current
Overload capacity	acc. to IEC 51
Continuously	1.2 times rated voltage /current
<b>Short Duration</b>	
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	IP 52 case cover
(IEC 529)	IP 00 for terminals without back IP 20 for terminals with back cover
Insulation class	Group A according to VDE 0110
Rated insulation voltage	DS 48 : 660V DS 72/96 : 1KV

Proof Voltage	DS 48 : 2KV DS72/96 : 3KV	
Installation category	DS 48 300 V 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		
<b>Burden</b>		
Connection to shunt	Power Consumption: 6mA Lead resistance: 0.06 W	+10%
1A ... 60 A	Voltage drop : 60 mV	+10%
> 1V	1000 W/V	+5%

## 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 for panel meters	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 43701
UL Combustibility	UL 94 V-0
Technical conditions of delivery for electrical instruments	DIN 43701

<b>Mechanical strength (Free fall test,vibration test)</b>	VDE-0411, IEC 61010
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Comply with following European directives : 2004 / 108 / EC (EMC directive ), 2006 / 95 / EC (low voltage directive) & amendment 93/68/EEC, For CE Marking.

## Reference Conditions

<b>Accuracy class</b>	1.5 according to IEC 51/DIN EN 60051
<b>Ambient temperature</b>	23° C ± 2°C
<b>Position of use</b>	Nominal position ±1°
<b>Input</b>	Rated value of measured quantity
<b>Other Conditions</b>	IEC 51/DIN EN 60051

## Nominal Range of use

<b>Ambient Temperature</b>	0°...50°C
<b>Position of use</b>	Vertical ± 5°
<b>External Magnetic Field</b>	At 0.4 kA/m

## Scale and Pointer

<b>Pointer</b>	Knife - edge pointer			
<b>Pointer deflection</b>	0...90°			
<b>Scale characteristics</b>	Linear*1			
<b>Scale division</b>	Coarse - fine			
<b>Scale length</b>	DS 48	DS 72	DS 96	DS 144
	41 mm	63 mm	97mm	146mm
<b>Scale Interchangeability</b>	Interchangeable*			

## Environmental Conditions

<b>Climatic Suitability</b>	Climate category II as per IS : 1248 (climatic class 3 according to VDE/VDI 3540)
<b>Operating Temperature</b>	- 10... + 55° C
<b>Storage temperature</b>	- 25...+65° C
<b>Relative humidity</b>	≤ 75% annual average, non condensing
<b>Shock resistance</b>	15 g. for pulse duration 11ms
<b>Vibration resistance</b>	10-55-10Hz for ampli. 0.15mm (1.5g at50Hz)
<b>Pollution degree</b>	2

## Environmental Conditions

D. C. Voltage		D. C. Voltage	
Rated Value	Approx Voltage drop	Rated Value	Sensitivity (± 10%)
15uA <sup>-4</sup>	140 mV	15 mV <sup>-4+5</sup>	3.33kohm/V
25uA <sup>-4</sup>	240 mV	25 mV <sup>-4+5</sup>	3.33kohm/V
40 uA <sup>-4</sup>	374 mV	40 mV <sup>-4+5</sup>	3.33kohm/V
50 uA <sup>-4</sup>	424 mV	50 mV <sup>-5</sup>	3.33kohm/V
60 uA <sup>-4</sup>	600 mV	60 mV <sup>-5</sup>	1 kohm/V
100 uA	400 mV	75 mV <sup>-5</sup>	1 kohm/V
150 uA	600 mV	100 mV <sup>-5</sup>	1 kohm/V
250 uA	140 mV	150 mV <sup>-5</sup>	1 kohm/V
400 uA	540 mV	250 mV <sup>-5</sup>	1 kohm/V
500 uA	540 mV	400 mV <sup>-5</sup>	1 kohm/V
600 uA	540 mV	600 mV <sup>-5</sup>	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 shunt	
6 A	72 mV		
10 A	60 mV		
15 A	60 mV		
20 A	60 mV		
25 A	60 mV		
30 A	60 mV		
40 A	60 mV		
60 A	72 mV		
100 A <sup>6</sup>	60 mV		
For use on transducer			
4-20 mA	60 mV		

Non-Standard ranges available on request.

## Options

Case	
Front Facia	Antiglare glass
Color 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 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

Others	
Zero position	Centre zero or off-set zero
Increased sensitivity	4kohm/V for voltmeters 1...600V 10 kohm/V for Voltmeters
15..150V Adjustment of Resistance (Sensitivity)	Within $\pm 1\%$ at 23 °C

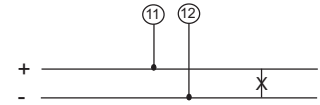
## Accessories

### Safety Terminal Protection

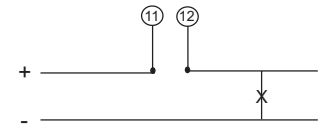
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers)

## Electrical Connections

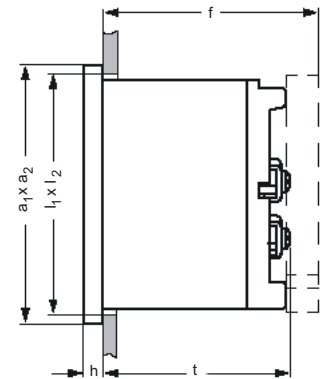
DC voltage



DC current



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

## Ordering Information\*

### Size: 48 x 48 Ammeter

Part No.	Description	Class
PQ44-I12L2N1CAW0ST	1mA DC indicator	CL-1
PQ44-I13L2N1CAW0ST	1.5mA DC indicator	CL-1
PQ44-I14L2N1CAW0ST	2.5mA DC indicator	CL-1
PQ44-I16L2N1CAW0ST	5mA DC indicator	CL-1
PQ44-I17L2N1CAW0ST	6mA DC indicator	CL-1
PQ44-I18L2N1CAW0ST	10mA DC indicator	CL-1
PQ44-I19L2N1CAW0ST	15mA DC indicator	CL-1
PQ44-I20L2N1CAW0ST	20mA DC indicator	CL-1
PQ44-I22L2N1CAW0ST	40mA DC indicator	CL-1
PQ44-I23L2N1CAW0ST	60mA DC indicator	CL-1
PQ44-I42L2N1CAW0ST	4-20mA DC indicator	CL-1

PQ94-I18L2N1CAW0ST	10mA DC indicator	CL-1
PQ94-I19L2N1CAW0ST	15mA DC indicator	CL-1
PQ94-I20L2N1CAW0ST	20mA DC indicator	CL-1
PQ94-I22L2N1CAW0ST	40mA DC indicator	CL-1
PQ94-I23L2N1CAW0ST	60mA DC indicator	CL-1
PQ94-I42L2N1CAW0ST	4-20mA DC indicator	CL-1

### Size: 48 x 48 Voltmeter

Part No.	Description	Class
PQ44-V0SL2N1CAW0ST	0-10V DC Voltmeter	CL-1
PQ44-V0TL2N1CAW0ST	0-15V DC Voltmeter	CL-1
PQ44-V0VL2N1CAW0ST	0-30V DC Voltmeter	CL-1
PQ44-V0XL2N1CAW0ST	0-50V DC Voltmeter	CL-1
PQ44-V0YL2N1CAW0ST	0-60V DC Voltmeter	CL-1
PQ44-V0ZL2N1CAW0ST	0-100V DC Voltmeter	CL-1
PQ44-V1AL2N1CAW0ST	0-150V DC Voltmeter	CL-1

### Size: 72 x 72 Ammeter

Part No.	Description	Class
PQ74-I12L2N1CAW0ST	1mA DC indicator	CL-1
PQ74-I13L2N1CAW0ST	1.5mA DC indicator	CL-1
PQ74-I14L2N1CAW0ST	2.5mA DC indicator	CL-1
PQ74-I16L2N1CAW0ST	5mA DC indicator	CL-1
PQ74-I17L2N1CAW0ST	6mA DC indicator	CL-1
PQ74-I18L2N1CAW0ST	10mA DC indicator	CL-1
PQ74-I19L2N1CAW0ST	15mA DC indicator	CL-1
PQ74-I20L2N1CAW0ST	20mA DC indicator	CL-1
PQ74-I22L2N1CAW0ST	40mA DC indicator	CL-1
PQ74-I23L2N1CAW0ST	60mA DC indicator	CL-1
PQ74-I42L2N1CAW0ST	4-20mA DC indicator	CL-1

### Size: 72 x 72 Voltmeter

Part No.	Description	Class
PQ74-V0SL2N1CAW0ST	0-10V DC Voltmeter	CL-1
PQ74-V0TL2N1CAW0ST	0-15V DC Voltmeter	CL-1
PQ74-V0VL2N1CAW0ST	0-30V DC Voltmeter	CL-1
PQ74-V0XL2N1CAW0ST	0-50V DC Voltmeter	CL-1
PQ74-V0YL2N1CAW0ST	0-60V DC Voltmeter	CL-1
PQ74-V0ZL2N1CAW0ST	0-100V DC Voltmeter	CL-1
PQ74-V1AL2N1CAW0ST	0-150V DC Voltmeter	CL-1

### Size: 96 x 96 Ammeter

Part No.	Description	Class
PQ94-I12L2N1CAW0ST	1mA DC indicator	CL-1
PQ94-I13L2N1CAW0ST	1.5mA DC indicator	CL-1
PQ94-I14L2N1CAW0ST	2.5mA DC indicator	CL-1
PQ94-I16L2N1CAW0ST	5mA DC indicator	CL-1
PQ94-I17L2N1CAW0ST	6mA DC indicator	CL-1

### Size: 96 x 96 Voltmeter

Part No.	Description	Class
PQ94-V0SL2N1CAW0ST	0-10V DC Voltmeter	CL-1
PQ94-V0TL2N1CAW0ST	0-15V DC Voltmeter	CL-1
PQ94-V0VL2N1CAW0ST	0-30V DC Voltmeter	CL-1
PQ94-V0XL2N1CAW0ST	0-50V DC Voltmeter	CL-1
PQ94-V0YL2N1CAW0ST	0-60V DC Voltmeter	CL-1
PQ94-V0ZL2N1CAW0ST	0-100V DC Voltmeter	CL-1
PQ94-V1AL2N1CAW0ST	0-150V DC Voltmeter	CL-1

For the Size of 144 x 144, please contact our concerned person.

\*Part No. are subject to change without notice, kindly confirm the description (Range) before ordering.



**sifam tinsley**  
PRECISION INSTRUMENTATION

**Sifam Tinsley Instrumentation Inc.**  
3105, Creekside Village Drive,  
Suite No. 801, Kennesaw,  
Georgia 30144 (USA)  
**E-mail Id :** [psk@sifamtinsley.com](mailto:psk@sifamtinsley.com)  
**Web :** [www.sifamtinsley.com](http://www.sifamtinsley.com)  
**Contact No. :** +1 404 736 4903

**Sifam Tinsley Instrumentation Ltd**  
Unit 1 Warner Drive,  
Springwood Industrial Estate  
Braintree, Essex, UK, CM72YW  
**E-mail:** [sales@sifamtinsley.com](mailto:sales@sifamtinsley.com)  
**Web:** [www.sifamtinsley.com/uk](http://www.sifamtinsley.com/uk)  
**Contact:** +44(0)1803615139