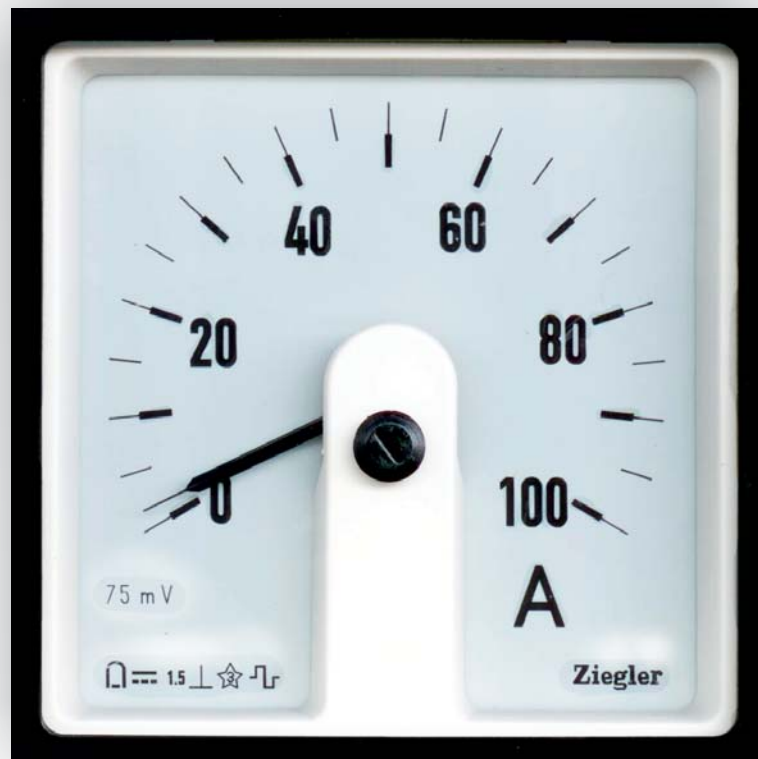


# Ziegler

Redefine Innovative Metering

## DSL 48 | 72 | 96 | 144

Analogue Meters With Moving Coil Movement 240° Scale - DSL



© Ziegler Instruments Order No. DSL\_240\_Deg Data sheet-EI.R0-920806-43-2013-EN



## Application

The moving coil panel meters, DSL 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.

## Features

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

## Movement

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

## Applicable Standards

Nominal case and cutout dimensions for indicating measuring 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 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 & their accessories.	IS 1248 IEC 51/DIN EN 60051 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
Technical conditions of delivery for electrical instruments.	DIN 43701
Mechanical strength (Free fall test, vibration test)	IS 1248 IS 9000 VDE 0411 IEC 1010

### 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 ... 240°
Scale characteristics	Linear
Scale division	Coarse - fine
Scale length	DSL48 70mm DSL72 106mm DSL96 142mm DSL144 230mm
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 as per UL 94 V-0.

Front facia  
Colour of bezel  
Position of use  
Panel fixing  
Mounting  
Panel thickness

Glass  
Black  
Vertical  
Mounting Clamp.  
Stackable in a single cutout  
≤ 25 mm

## Terminals

Voltmeters and ammeters < 5A  
Ammeters 3 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  
Overload capacity  
Continuously  
Short duration  
Ammeters

DC voltage or current  
(acc. to IS: 1248 / IEC 51)  
1.2 times rated voltage / current

Voltmeters

10 times for 5 sec : 1 overload  
10 times for 0.5 sec : 9 overloads  
2 times for 5 sec : 1 overload  
2 times for 0.5 sec : 9 overloads  
IP 52 case  
IP 00 for terminals without backcover

Enclosures code  
IEC 529)

IP 20 for terminals with backcover  
Group A according to VDE 0110  
1000 V  
3 kV  
600 VCAT III (IEC 1010)  
> 50 Mohm at 500V DC

Insulation class  
Rated insulation voltage  
Proof voltage testing  
Installation category  
Insulation resistance

## Accuracy at Reference Conditions

Accuracy class 1.5 according to IS:1248 (IEC 51/ DIN EN 60051)

## 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 0.5 mT

## Environmental Conditions

Climatic suitability Climate category II as per IS : 1248 (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. 11ms

Vibration resistance 10-55-10 Hz / 0.15 mm  
1.5 g at about 50 Hz.

## 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 dials Basic divisions without numbering.  
 Colour markings/bands Red or green.

**Others**

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

**Standard Measuring Ranges**

D. C. Current		D. C. Voltage	
Rated Value	Approx Voltage drop	Rated Value	Sensitivity (+ 10%)
50 uA <sup>4</sup>	540 mV	60 mV <sup>7</sup>	200 ohm/V
60 uA <sup>4</sup>	540 mV	75 mV <sup>7</sup>	200 ohm/V
75 mA	540 mV	100 mV <sup>7</sup>	200 ohm/V
100 uA <sup>7</sup>	970 mV	150 mV <sup>7</sup>	200 ohm/V
150 uA	970 mV	250 mV <sup>7</sup>	200 ohm/V
250 uA	810 mV	400 mV <sup>7</sup>	1 kohm/V
400 uA	900 mV	600 mV <sup>7</sup>	1 kohm/V
600 uA	900 mV	750 mV <sup>7</sup>	1 kohm/V
1 mA <sup>7</sup>	500 mV	1 V <sup>7</sup>	1 kohm/V
1.5 mA	500 mV	1.5 V <sup>7</sup>	1 kohm/V
2.5 mA	500 mV	2.5 V <sup>7</sup>	1 kohm/V
4 mA	500 mV	4 V <sup>7</sup>	1 kohm/V
5 mA <sup>7</sup>	40 mV	6 V <sup>7</sup>	1 kohm/V
6 mA	40 mV	10 V <sup>7</sup>	1 kohm/V
10 mA	75 mV	15 V <sup>7</sup>	1 Kohm/V
15 mA	60 mV	15 V <sup>7</sup>	1 kohm/V
20 mA	60 mV	25 V <sup>7</sup>	1 kohm/V
25 mA	60 mV	30 V <sup>7</sup>	1 kohm/V
40 mA	60 mV	40 V <sup>7</sup>	1 kohm/V
60 mA	60 mV	60 V <sup>7</sup>	1 kohm/V
100 mA	60 mV	100 V <sup>7</sup>	1 kohm/V
150 mA	60 mV	150 V <sup>7</sup>	1 kohm/V
200 mA	60 mV	200 V <sup>7</sup>	1 kohm/V
250 mA	60 mV	250 V <sup>7</sup>	1 kohm/V
300 mA	60 mV	300 V <sup>7</sup>	1 kohm/V
400 mA	60 mV	400 V <sup>7</sup>	1 kohm/V
500 mA	60 mV	500 V <sup>7</sup>	1 kohm/V
600 mA	60 mV	600 V <sup>7</sup>	1 kohm/V
750 mA	60 mV		
1 A	60 mV		
1.5 A	60 mV		
2.5 A	60 mV		
4 A	60 mV		
5 A	60 mV		
6 A	60 mV		
10 A	60 mV		
15 A	60 mV		
20 A	60 mV		
25 A	60 mV		
30 A	60 mV		
40 A <sup>5</sup>	60 mV		
60 A <sup>5</sup>	60 mV		
100 A <sup>5</sup>	60 mV		
		For use on external shunt	200 ohm/V
		50 mV <sup>6</sup>	200 ohm/V
		60 mV <sup>6</sup>	200 ohm/V
		75 mV <sup>6</sup>	200 ohm/V
		150 mV <sup>6</sup>	200 ohm/V

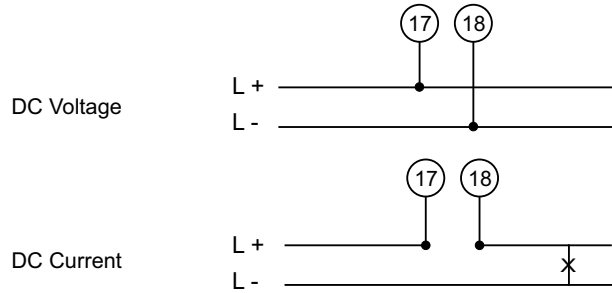
<sup>4</sup> Accuracy class 2.5  
<sup>5</sup> Not applicable for DSL 72  
<sup>6</sup> Total lead resistance of 0.035 ohm is considered for mV ranges while calibration.  
<sup>7</sup> Applicable for DSL 48

**Accessories**

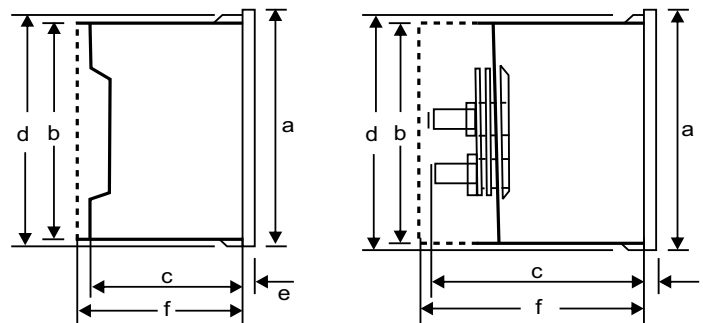
**Safety Terminal protection**

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

**Connections**



**Dimensions**



Dimensions (in mm)	DSL48	DSL72	DSL96
Bezel a	48	72	96
Case b	43.5	66	90
Depth c*	53	53	53
d	44.5	67.5	91.5
e	5.5	5.5	5.5
Cutout Size	45 <sup>+0.6</sup>	68 <sup>+0.7</sup>	92 <sup>+0.8</sup>
Weight (approx.)	0.13 kg.	0.25 kg.	0.30 kg.
Depth with Back cover f**	64	64	64
* c =	68mm, for I= 5 to 60 A		
* c =	78mm, for I> 60 A		
** f =	70mm, for I= 5 to 60 A		

**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.

### Ordering Information

Type	DSL	Moving-coil panel meter 240°scale
Front Dimension	48 96 72 144	48mm x 48mm 96mm x 96mm 72mm x 72mm 144mm x 144mm
Measuring Ranges		Refer to table inside
Front facia		Normal glass <sup>1</sup> Antiglare glass <sup>3</sup> Polycarbonate glass <sup>3</sup>
Colour of Bezel		Black <sup>1</sup> Red, Blue, Yellow, White <sup>3</sup>
Position of use		Vertical <sup>1</sup> on request 0...180° <sup>3</sup>
Terminal Protection		Full sized polycarbonate back cover
zero position		Centre <sup>1</sup> , Off-set zero <sup>3</sup>
Increased sensitivity		4 kohm/V for voltmeters 15...150 V <sup>3</sup>
Adjustment Resistance (Sensitivity)		Within ± 1 % at 23°C <sup>3</sup>
Dial		Standard scale same as measuring range Blank dial with division <sup>3</sup> Additional lettering on request <sup>3</sup> Additional numbering on request <sup>3</sup> Coloured marking red or green <sup>3</sup> Coloured sector red or green <sup>3</sup>
Logo		ZIEGLER <sup>1</sup>

<sup>1</sup>Standard

<sup>3</sup>Please clearly add the desired specifications while ordering

### Ordering example

DSL 72 measuring range 0... 20 mA, dial with 0...100°C, red mark at 37°C

**Specifications are subject to change without notice (04/10)**

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