

# Selector Switch Meter With Moving Iron Movement

EQ SWT 72  
EQ SWT 96

## Data Sheet

Analogue Meter With  
Built In Selector Switch  
With Moving-Iron  
Movement



## Application

The moving iron, panel meters, EQ 72/96 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 100KHz.

These meters offer several advantages in switchboards and Generating Set Panels. Number of meters can be mounted in a Panel cut out (Mosaic mounting). For CT operated ammeters, dials can be fitted based on CT ratio. Front window glass and bezel can be easily replaced.

## Features

- 3 ph 3 wire & 4 wire voltage & current measurement possible.
- Near Linear scale.
- Knife edge pointer.
- Glass filled polycarbonate housing(UL 94 V-0).
- Easy installation with swivel screws.

## 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.

## Specifications

### Mechanical Data

<b>Case details</b>	:	Moulded square case suitable for mounting in Control / Switchgear panels, Machinery consoles.
<b>Case material</b>	:	10% Glass filled Polycarbonate, flame retardant and drip proof as per UL 94 V-0.
<b>Front facia</b>	:	Glass
<b>Colour of bezel</b>	:	Black
<b>Position of use</b>	:	Vertical
<b>Panel fixing</b>	:	Swivel Screw
<b>Mounting</b>	:	Stackable in a single cutout
<b>Panel thickness</b>	:	≤ 25 mm
<b>Terminals</b>	:	
<b>Voltmeters and ammeters</b>	:	Hexagon studs, M4 screws and Wire clamps E3

### Electrical Data

**Measured quantity** : AC voltage or current

#### Power consumption(Approx):-

Voltmeters : < 4.5VA  
Ammeters \_ : < 0.5VA

#### 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** : 10times for 0.5 sec : 9 overloads  
10times for 5 sec : 1 overload

**Enclosures code (IEC 529)** : IP 40 for 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:** SWT 72/96 : 1KV

**Proof voltage** : SWT 72/96 : 3KV

**Installation category** : SWT 72/96 : 600V CAT III

**Insulation resistance** : > 50 Mohm at 500 V DC

### Standard Measuring Ranges

A.C. Voltage	A.C. Current
100	1A
120	5A
150	(Option : 1AX.. , 5AX.. Suppressions)
300	
500	
600	

Non-Standard ranges available on request.

For Single phase system there will be 4 switch positions as-OFF L1 L2 L3

For 3 phase 3 wire system, 4 switch positions are as-OFF L1-L2 L2-L3 L3-L1

For 3 phase 4 wire system, 6 switch positions are as-L1-L3 L2-L3 L1-L2 L1-N L2-N L3-N

(Option : 3 ph. 4w in 7 switch positions)

### Scale and Pointer

<b>Pointer</b>	:	Knife - edge pointer
<b>Pointer deflection</b>	:	0 ... 90°
<b>Scale characteristics</b>	:	Near Linear above 10% of nominal full Scale value
<b>Scale length</b>	:	SWT 72 54 mm SWT 96 97 mm
<b>Ammeters</b>	:	2 times nominal current
<b>Voltmeters</b>	:	1.2 times nominal voltage
<b>Scale Interchangeability</b>	:	Scales are interchangeable.
<b>Scale Division</b>	:	Coarse - fine

## Reference Conditions

<b>Accuracy class</b>	: 1.5 according to IS : 1248 (IEC 51/ DIN EN 60051)
<b>Ambient temperature</b>	: $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$
<b>Position of use</b>	: Nominal position $\pm 1^{\circ}$
<b>Input Waveform</b>	: Rated value of measured quantity sine wave, distortion factor $\leq 5\%$
<b>Frequency</b>	: 45...65HZ
<b>Other Conditions</b>	: IS : 1248 (IEC 51/ DIN EN 60051)

## Nominal Range of Use

<b>Ambient Temperature</b>	: 0...50 $^{\circ}\text{C}$
<b>Position of use</b>	: Vertical $\pm 5^{\circ}$
<b>Frequency</b>	: 15 ... 100 Hz (voltage) 15 ... 400 Hz (current)
<b>External magnetic field :</b>	At 0.4 kA/m

## Environmental Conditions

<b>Climatic suitability</b>	: Climate category II as per IS : 1248, IEC 60051 (climatic class 3 according to VDE/VDI 3540)
<b>Operating temperature</b>	: - 10... + 55 $^{\circ}\text{C}$
<b>Storage temperature</b>	: - 25... + 65 $^{\circ}\text{C}$
<b>Relative humidity</b>	: $\leq 75\%$ annual average, non-condensing
<b>Shock resistance</b>	: 15g <sub>n</sub> for pulse duration 11 ms
<b>Vibration resistance</b>	: 10-55-10Hz for ampli. 0.15mm (1.5 g at 50Hz)
<b>Pollution degree</b>	: 2

## Options

### Case

<b>Front facia</b>	: Antiglare glass
<b>Colour of bezel</b>	: Red, Yellow, Blue, White
<b>Red index pointer</b>	: Front adjustable on site
<b>Position of use</b>	: On request 0 $^{\circ}$ ...180 $^{\circ}$

### Dial

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

## 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

Safety requirements and protective measures for Electrical indicating instruments and their accessories.	: IS 9249 DIN 40050 VDE 0110 VDE 0410 IEC 529, IEC 1010
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Performance specifications for direct acting indicating analogue electrical measuring instruments & their accessories	: IS 1248 IEC 51/DIN EN 60051 DIN 43701
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Environmental conditions	: IS 1248 IS: 9000 VDE / VDI 3540
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Front frames for indicating measuring instruments principle dimensions	: DIN 43718
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UL Combustibility class.	: UL 94 V-O
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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.

## Safety Precautions

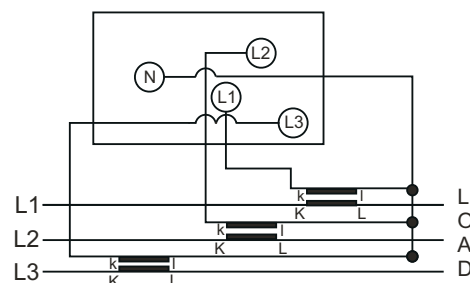
- 1) Instruments with damaged bezel or glasses must be disconnected from the mains.
- 2) Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing. If non - insulated connector wires are used.
- 3) The back cover must be snapped into place after connector wires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

## Safety Terminal Protection

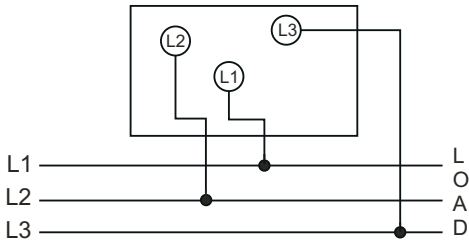
Full sized polycarbonate back cover to provide protection against accidental contact (hand and fingers)

## Connection Diagrams

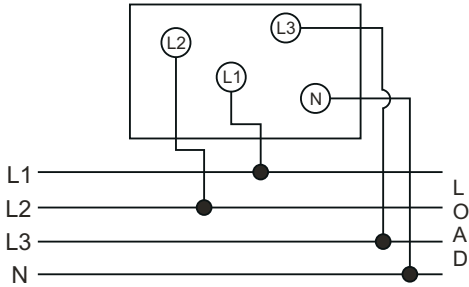
AC Ammeters With Selector Switch



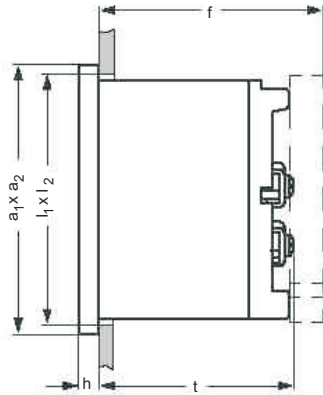
### AC Voltmeters 3 Phase 3 Wire



### AC Voltmeters 3 Phase 4 Wire



## 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			
72 x 72	72 x 72	5.5	$68^{+0.7} \times 68^{+0.7}$	53	64
96 x 96	96 x 96	5.5	$92^{+0.8} \times 92^{+0.8}$	53	64

## Ordering Information

<b>Type EQ SWT</b>	Moving-iron panel meter
<b>Front dimension</b> 72 96	72 mm x 72 mm 96 mm x 96 mm
<b>Over range (ammeters)</b>	no over range <sup>3</sup> 2 times nominal current <sup>1</sup> 6 times nominal current <sup>3</sup>
<b>Measuring Ranges</b>	Refer to table inside
<b>Terminal protection</b>	full sized polycarbonate backcover
<b>Panel Fixing</b>	Swivel Screw
<b>Red Index Pointer</b>	None <sup>1</sup>
<b>Front facia</b>	Normal glass <sup>1</sup> , PC glass <sup>3</sup> Antiglare glass <sup>3</sup>
<b>Colour of bezel</b>	Black <sup>1</sup> Red, Blue, Yellow, White <sup>3</sup>
<b>Position of use</b>	Vertical <sup>1</sup> On request 0° ... 180° <sup>3</sup>
<b>Dial</b>	Standard scale same as measuring range <sup>1</sup> 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>
<b>Logo</b>	RISHABH <sup>1</sup> Others <sup>3</sup>

\*1 standard

\*3 Please clearly add the desired specifications while ordering

## Ordering example

EQ SWT 72 Measuring range 150 V, dial 0 - 100%

**Specifications are subject to change without notice (11/11)**



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