



# Data Sheet

## 240° Frequency Meters

ZL



Measure



Control



Record



Analyze



Optimize

## Application

The pointer type frequency meters, ZL 96/144 housed in moulded polycarbonate cases are used for the measurement of frequencies in the range of 45 to 450 Hz.

For maximum accuracy, the essential measuring range is obtained by suppressing the unwanted frequency span.

These instruments offer several advantages in switchboards and Generating Set Panels. Number of meters can be mounted in a single Cut out (Mosaic mounting). Front glass, Bezel & Dial can be easily replaced.

## Features

- Better resolution.
- Linear Scale
- Glass filled polycarbonate (UL 94-V-0)
- Knife edge pointer.
- Easily replicable glass and bezel.
- Easy installation with swivel screws.

## Specifications

### Scale and Pointer

Pointer	:	Knife -edge pointer
Pointer deflection	:	0 ... 240°
Scale characteristics	:	Linear
Scale division	:	Coarse - fine
Scale length	:	ZL 96    ZL 144 142 mm   230 mm
Scale Interchangeability	:	Scales are interchangeable.

### Mechanical Data

Case details	:	Moulded square case suitable for mounting in Control / Switchgear panels, Machinery consoles.
Case material	:	Glass filled 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	:	Swivel screws.
Mounting	:	Stackable in a single cutout
Panel thickness	:	≤ 25 mm
Terminals	:	Hexagon studs, M4 screws and wire clamps E3

### Electrical Data

Measured quantity	:	Frequency
Overload capacity	:	(acc to IS : 1248/ IEC 51)
Continuously	:	1.2 times rated voltage
Short duration	:	2 times rated voltage, 5 Sec
Input quantity	:	Alternating voltage in sine waveform
Enclosure code	:	IP 52 case
(IEC 529)	:	IP 00 for terminals
Insulation class	:	Group A according to VDE 0110
Rated insulation voltage	:	660 V
Proof voltage	:	2 kV

installation category	:	300 V CAT III
Power consumption	:	≤ 7VA
Insulation resistance	:	> 50 Mohm at 500 V d.c.

### Accuracy at Reference Conditions

Accuracy class	:	0.5 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 voltage of measured quantity
Voltage	:	Rated voltage ± 2%
Other conditions	:	IS : 1248 (IEC 51/DIN EN 60051)
Preheating time	:	≥ 5 min
Nominal range of use	:	
Ambient temperature	:	0 ... 50°C
Position of use	:	Normal position ± 5°
External magnetic field	:	0.5 mT
Voltage	:	Rated voltage ± 15%

### 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.

## Standard Measuring Ranges

Frequency Range	:	45.....50.....55Hz
	:	45.....55.....65Hz
	:	55.....60.....65Hz
	:	360...400...440Hz
	:	380...400...420Hz

## Rated input voltage

57.7 V  
63.5V  
100 V  
110 V  
115 V  
120 V  
127V  
208 V  
220 V  
230 V  
240 V  
289 V  
380 V  
400 V  
415 V  
440 V  
500 V

## Functional Principle

Frequencies are measured with a built in electronic transducer & moving coil indicator. 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 43700
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 / 8-70 VDE 0110 /11-72 VDE 0410 /10-76 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, Part 5, 7, 8, VDE / VDI 3540
Front frames for indicating measuring instruments principle dimensions.	: DIN 43718
UL Combustibility class.	: UL 94 V-O
Technical conditions of delivery for electrical instruments.	: DIN 43701
Mechanical strength (Free fall test, vibration test)	: IS 1248/IEC 51 IS 9000-1979 VDE 0411, part I, Sec.43/44, IEC 1010

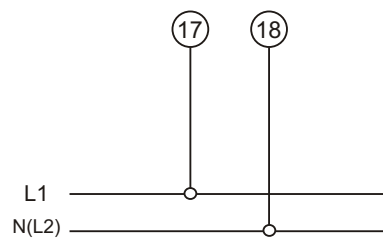
E M C compliance as per following standards:  
E N 50081-2,EN 50082-2,EN 55011/CISPR 11,  
EN 60555-2,IEC 555-2  
EN 61000-4-4/IEC 1000-4-4,  
EN 61000-4-2/IEC 1000-4-2,  
EN 61000-4-5/IEC 1000-4-5,ENV 50140.

Comply with following European directives : 89 / 336/ EEC (EMC directive), 73 / 23 / EEC (low voltage directive) & amendment 93 / 68 / EEC, for CE marking.

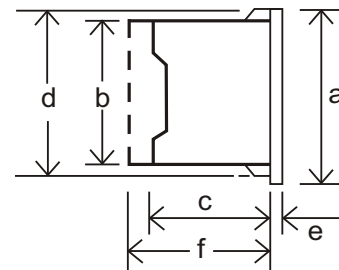
## Safety Precautions

- Instruments with damaged bezels or window glasses must be disconnected from mains.
- Adequate safety clearance must be maintained to control panel fasteners and to sheet metal housing, if non - insulated connector wires are used.
- The back cover must be snapped into place after the connector wires have been clamped for protection against accidental contact.
- Scales should be replaced under Voltage - free conditions.
- Bezels and window glasses should be replaced under Voltage - free conditions

## Connections



## Dimensions



Dimensions (in mm)	ZL 96	ZL 144	
Bezel	a	96	144
Case	b	90	136
Depth	c	53	53
	d	91.5	137.5
	e	5.5	5.5
Cutout Size		92 <sup>+0.8</sup>	138 <sup>+1</sup>
Weight (approx.)		0.45 kg	0.6 kg

## Ordering Information

Type ZL	Pointer type frequency meter , 240°scale
Front dimension 96 144	96 mm x 96 mm 144 mm x 144 mm
Measuring ranges	refer to table inside
Front facia	Normal glass <sup>*1</sup> Antiglare 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
Rated voltages	Refer to table inside
Dial	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>
Logo	RISHABH <sup>*1</sup> , for Indian sales Others <sup>*3</sup>

<sup>\*1</sup> standard

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

## Ordering example

ZL 96 measuring range 45 ... 50 ... 55Hz, rated voltage AC 230V.

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



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