

# Ziegler

Redefine Innovative Metering

## BM 48 | 72 | 96 EB 72 | 96

Analogue  
Maximum Demand Ammeters  
with Bimetallic Movement,  
Combined Bimetallic  
and Moving - Iron Ammeter



### Application

The maximum demand ammeters BM 48 and BM/EB 72/96 housed in moulded polycarbonate cases, monitor the most economic use of transformer stations & LT distribution feeders by indicating the thermal/time characteristics of the load.

The high torque of the thermal movement drive a red slave pointer linked to the instrument pointer. The slave pointer will remain at the maximum value reached for a subsequent reading until being manually reset by a sealable reset knob to the position of the instrument pointer.

Where the instantaneous and maximum demand currents are required, the EB 72/96 instrument, which combines a thermal bimetallic and a moving - iron movement in the same case mounted diagonally opposite to each other. These instruments are suitable for frequency range of 15-400Hz.

These meters offer several advantages in Switchboard and Generating Set panels. Number of meters can be mounted in a Panel Cut out (Mosaic Mounting). The bezel, glass and dial can be easily replaced.

### Features

- Scale Interchangeability.
- Near linear scale for MI scale in EB.
- User accessible reset Knob.
- Knife edge pointers.
- Easily replaceable glass and bezel.

### Applicable Standards

Nominal case and cutout dimensions for indicating measuring instruments.	IS 2419
Scale and pointer for electrical measuring instruments.	DIN IEC 61554
Connections and Terminal markings for panel meters	IS 1248
Terminal bolts / leads	DIN 43802
Clamp straps for connections.	IS 1248
Safety requirements for Electrical indicating instruments and their accessories.	DIN 43807
	DIN 46200/46282
	DIN 46282
	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
Environmental conditions	IEC 51/DIN EN 60051
	DIN 43701
	IS 1248
	IS: 9000
	VDE / VDI 3540
	DIN 43718
Front frames for indicating measuring instruments principle dimensions.	UL 94 V-O
UL Combustibility class.	DIN 43701
Technical conditions of delivery for electrical instruments.	
Mechanical strength (Free fall test, vibration test)	IS 1248, IEC 51, 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.

### Scale and Pointer

Pointer	Knife - edge pointer
Pointer deflection	0...90°
Over range	Bimetallic Moving - iron
	1.2 times 2 times
Scale division	Coarse - fine

Scale length	BM 48 Bimetallic	—
	38 mm	
	EB 72 Bimetallic	—
	63 mm	
	EB 96 Bimetallic	—
	97 mm	
	BM 72 Bimetallic Moving - iron	
	52 mm	61 mm
	EB 96 Bimetallic Moving - iron	
	71 mm	97 mm

### 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
Panel fixing	Position of use Vertical
Mounting	Mounting Clamp.
Panel thickness	Stackable in a single cutout < 25 mm
Terminals	Hexagon studs, M4 screws and wire clamps E3

### Electrical Data

Measuring quantity	AC currents
Thermal time delay (blimetallic)	15 minutes (8, 20, 30 min on request)

<b>Response time (moving iron) &lt; 4 sec</b>		
Power consumption	BM	EB
1 A rated current	< 1.6 VA	< 2.5 VA
5 A rated current	< 2.5 VA	< 3.4 VA

<b>Overload capacity (acc to IS 1248 / IEC 51)</b>	
Continuously	1.2 times rated current
Short duration	10 times for 0.5 sec : 9 overloads 10 times for 5 sec : 1 overload

Enclosure code (IEC 529)	IP 52 case IP 00 for terminals without backcover IP 20 for terminals with backcover Group A according to VDE 0110
Insulation class	660V
Rated insulation voltage	3 kV
Proof voltage testing	300V CAT III
Installation category (IEC 1010)	
Insulation resistance	> 50 Mohm at 500V DC

### Accuracy at Reference Conditions

Accuracy class acc to IS : 1248/ IEC 51/DIN EN 60051	3 (bimetallic movement referred to slave pointer) 1.5 (moving - iron movement)
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### Reference conditions

Ambient temperature	23°C ± 2°C
Position of use	Nominal position ± 1°
Input	Rated value of current
Frequency	45...65 Hz
Other conditions	As per IS:1248 (IEC 51/ DIN EN 60051)

### Nominal range of use

Ambient temperature	0 ... 50°C
Position of use	Nominal position ± 5°
External magnetic field	At 0.4 kA/m
Frequency	40...65Hz.

### Standard Measuring Ranges

Bimetallic	Moving - Iron	For use on CT
1 A	1 A	----/ 1 A
5 A	5 A	----/ 5 A

**Over range**

Moving Iron 2 times rated current  
 Bimetal movement 1.2 times rated current  
 Moving iron & bimetal 1.2 times rated current  
 Non-Standard ranges available on request.

**Environmental Conditions**

Climatic suitability 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, for pulse duration 11 ms  
 Vibration resistance 10-55-10Hz for ampli. 0.15mm (1.5 g at 50Hz)  
 Pollution degree 2

**Options**

**Case**

Front facia Antiglare glass  
 Colour of bezel Black  
 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.

**Other**

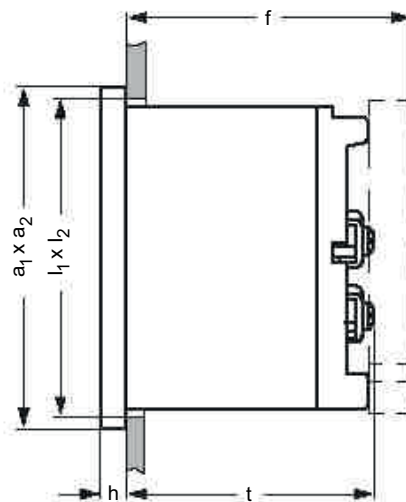
Calibration For other frequencies 15Hz...400 Hz.  
 Thermal time delay 8 min / 20 min / 30 min

**Accessories**

**Safety Terminal Protection**

Full sized polycarbonat back cover, to provide protection against accidental contact (han and fingers )

**Dimensions**



Front in mm	Nominal Dimensions, mm		Cutout, mm l <sub>1</sub> x l <sub>2</sub>	Installation Depth Including Terminal (t), mm	Installation Depth Incl. Full back Cover (f), mm
	a <sub>1</sub> x a <sub>2</sub>	h			
48 x 48	48 x 48	5.5	45 <sup>+0.6</sup> x 45 <sup>+0.6</sup>	51	54
72 x 72	72 x 72	5.5	68 <sup>+0.7</sup> x 68 <sup>+0.7</sup>	54	62.5
96 x 96	96 x 96	5.5	92 <sup>+0.8</sup> x 92 <sup>+0.8</sup>	54	62.5

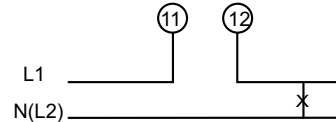
**Functional Principle**

The thermal bimetallic movement indicates the mean rms value over 15 minutes (optional 8 min, 20 min & 30 min.) and deflects a resettable red slave pointer which shows the maximum value reached.

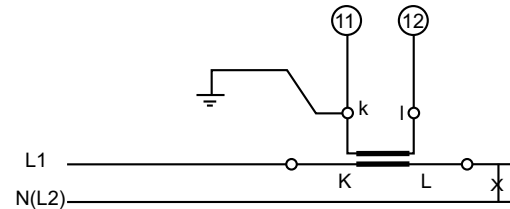
Bimetallic instruments have a specific inertia due to their thermal time lag making these instruments especially suitable to indicate maximum demands or to control long - lasting peak loads. For the measurement of instantaneous rms values, moving - iron movement with pivot suspension, spring loaded shock absorbing jewel bearing and silicon oil damping is incorporated. The moving - iron movement has a response time < 4 sec.

**Connections**

Direct - connected



For use on current Transformer



### 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	BM 48 BM 72/96 EB 72/96	Maximum demand indicator with bimetallic movement Maximum demand indicator with bimetallic movement Maximum demand indicator with bimetallic movement and moving iron
Front Dimension		48mm x 48mm 72mm x 72mm 96mm x 96mm
Measuring Ranges		1 A 5 A --- /1 A for use on Current transformer — /5A for use on Current transformer
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>03</sup>
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>
Over range		
Moving Iron		2 times rated current <sup>1</sup>
Bimetal movment		1.2 times rated current <sup>1</sup>
Moving iron & bimetal		1.2 times rated current <sup>3</sup>
Calibration		50 Hz <sup>1</sup> For frequency 15 - 400 Hz <sup>3</sup>
Calibration		15 min. <sup>1</sup> 8 min. <sup>3</sup> 20 min. <sup>3</sup> 30 min. <sup>3</sup>
Logo		ZIEGLER <sup>1</sup>
Terminal Protection		Full sized polycarbonate back cover

<sup>1</sup>Standard

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

### Ordering example

EB 96 for use on current transformer 300/5A thermal time delay 15 min.

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

## ZIEGLER INSTRUMENTS

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