

# Data Sheet

M Series  
050.D.101.06

## Maximum Demand Indicators with Bimetallic Movement or Combined M.D.I. and Moving-Iron Ammeters

**BI 144**  
**BIW 72 GD**  
**BIW 96 GD**  
**BIW 144 GD**



**WEIGEL**

## Application

The maximum demand indicator **BI 144** and the maximum demand indicators combined with moving-iron movement **BIW 72/96/144 GD** (M series) are housed in pressed steel cases. They are suitable to monitor the thermal load of transformer stations and L.T. distribution feeders.

The bimetallic movement displays the mean r.m.s. value of the current due to its time-delayed thermic characteristics. It will therefore only display continuous loads and no peak currents.

The high torque of the bimetallic movement offers the possibility to 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.

Where the instantaneous and maximum demand currents are required, the **BIW 72/96/144 GD** instruments combine a bimetallic and a moving-iron movement in one case. These ammeters have the movements arranged coaxial one behind the other. The moving-iron movement has a response time of approx. 1 s.

The maximum demand indicators are suitable to be installed in switchboards, control panels and mosaic grid panels.

## Functional Principle

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

For the measurement of instantaneous values, a moving-iron movement with pivot suspension, spring loaded shock absorbing jewel bearings and silicon oil damping is incorporated.

## Mechanical Data

case details	square case suitable to be mounted in control / switchgear panels or mosaic panels, stackable
material of case	pressed steel
material of window	glass (BI 144, BIW 144 GD) ♦ plastics (BIW 72/96 GD)
colour of bezel	black (similar to RAL 9005) ♦
position of use	vertical $\pm 5^\circ$ ♦
panel fixing	screw clamps
panel thickness	1 ... 15 mm
mounting	stackable next to each other
terminals	hexagon studs, M5 screws and wire clamps ♦ connector blades 6.3 x 0.8 for protective wire (directly connected BIW ... GD only)

### dimensions

bezel	□ 144 mm
case	□ 137 mm
depth	60 mm
panel cutout	□ 138 <sup>+1</sup> mm
weight approx.	0.65 kg

### dimensions

	BIW 72 GD	BIW 96 GD	BIW 144 GD
bezel	□ 72 mm	□ 96 mm	□ 144 mm
case	□ 66 mm	□ 90 mm	□ 137 mm
depth	94 mm	98 mm	95 mm
panel cutout	□ 68 <sup>+0.7</sup> mm	□ 92 <sup>+0.8</sup> mm	□ 138 <sup>+1</sup> mm
weight approx.	0.3 kg	0.5 kg	0.9 kg

## Electrical Data

measuring unit	AC current	
frequency range	50 ... 100 Hz ♦	
power consumption at 1 A rated current	bimetallic movement	moving-iron movement
sizes 72 and 96	<1.3 VA	<2 VA
size 144	<5 VA	<5.8 VA
5 A rated current	<3.5 VA	<4.2 VA
overload range (acc. to DIN EN 60 051)	continuously 1.2 times rated current	
1 s max.	10 times rated current	
Saturating current transformers shall be used to protect the movements against overloads exceeding specified overload ratings.		
measurement category CAT III		
operating voltage	refer to Measuring Ranges	
pollution level	2	
enclosure code	IP 40 case	
	IP 00 for terminals without protection against accidental contact	
	IP 20 for terminals protected against accidental contact	

## Measuring Ranges

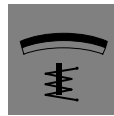
### Measuring ranges AC current

bimetallic movement	0 ... 1 / 1,2 A	or	0 ... 5 / 6 A
moving-iron movem.	0 ... 1 / 1,2 A	or	0 ... 5 / 6 A
for use on <b>current transformer</b> (scale to standard series)			
bimetallic movement	0 ... N/1 / 1,2 A	or	0 ... N/5 / 6 A
moving-iron movem.	0 ... N/1 / 1,2 A	or	0 ... N/5 / 6 A
(overload scaling ♦)	Please indicate current transformer ratio.		
operating voltage	BIW 72 GD 150 V	BIW 96 GD 300 V	BIW 144 GD BI 144 150 V 150 V

## Scaling

pointer	bar / knife-edge pointer		
pointer deflection	0 ... 90°		
scale characteristics	scales are calibrated down to 1/5 th rated current		
bimetallic movement	quadratic		
moving-iron m.	practically linear		
overload scaling	1.2 times rated current ♦		
thermal time delay	15 min (bimetallic movement) ♦		
response time	approx. 1 s (moving-iron movement)		
scale division	coarse-fine		
<b>scale length</b>	<b>BI 144</b>		
bimetallic movement	145 mm		
<b>scale length</b>	<b>BIW 72 GD</b>	<b>BIW 96 GD</b>	<b>BIW 144 GD</b>
bimetallic movement	46 mm	66 mm	104 mm
moving-iron m.	56 mm	80 mm	128 mm

♦for other ratings refer to "Options"



## Maximum Demand Indicators with Bimetallic Movement or Combined M.D.I. and Moving-Iron Ammeters

### Accuracy at Reference Conditions

accuracy class according to DIN EN 60 051  
 bimetallic movement 3 (referred to slave pointer)  
 moving-iron movement 1.5

#### reference conditions

ambient temperature 23°C ± 1K  
 position of use nominal position ± 1°  
 input rated measuring value  
 others DIN EN 60 051

#### influences

ambient temperature -25°C ... +23°C ... +40°C  
 position of use nominal position ± 5°  
 stray magnetic field 0.5 mT

### Environmental

climatic suitability climatic class 2 ↗  
 according to VDE/VDI 3540 sheet 2  
 operating temperature range -25 ... +40°C ↗  
 storage temperature range -25 ... +65°C  
 relative humidity ≤ 75% annual average, non-condensing  
 shock resistance 15 g, 11 ms ↗  
 vibration resistance 2.5 g, 5 ... 55 Hz ↗

### Rules and Standards

DIN 43 700 measuring and control instruments for panel mounting; nominal case and cutout dimensions  
 DIN 43 701 electrical switchboard instruments  
 DIN 43 718 bezels and front panels  
 DIN 16 257 nominal position of use and position symbols applicable for measuring instruments  
 DIN 40 050 enclosure codes; protection of electrical equipment against ingress of solid foreign bodies and of water  
 DIN EN 60 051 direct acting indicating electrical measuring instruments and their accessories  
 DIN EN 61 010 safety requirements for electrically operated measuring, control and laboratory equipment  
 VDE/VDI 3540 sheet 2 reliability of measuring and control equipment (classification of climates)

↗ for other ratings refer to "Options"

### Options

#### Measuring range BI 144

bimetallic movement 0 ... 1 A or 0 ... 5 A  
 or  
 bimetallic movement 0 ... 1 / 1.5 A or 0 ... 5 / 7.5 A

#### Measuring range BIW 72/96/144 GD

bimetallic movement 0 ... 1 / 1.2 A or 0 ... 5 / 6 A  
 moving-iron movem. 0 ... 1 / 2 A or 0 ... 5 / 10 A  
 or  
 bimetallic movement 0 ... 1 / 1.5 A or 0 ... 5 / 7.5 A  
 moving-iron movem. 0 ... 1 / 2 A or 0 ... 5 / 10 A

#### case

window non-glaring glass  
 colour of bezel gray (similar to RAL 7037)  
 position of use on request 15° ... 165°

#### performance

increased mechanical loads shock 30 g, 11 ms  
 vibration 5 g, 5 ... 55 Hz  
 marine application non-certified  
 climatic suitability limited use in the tropics climatic class 3 according to VDE/VDI 3540 sheet 2  
 with operating temperature range -10 ... +55°C

#### dial

non-calibrated with dial symbols  
 blank dial pencil-marked on initial and end values  
 scale division 0 ... 100%  
 and figuring  
 additional lettering on request e.g. "generator"  
 additional figuring on request  
 coloured marks red, green or blue for important scale values  
 coloured sector red, green or blue within scale division  
 logo on the dial none or on request  
 overload scaling no overload range or overload range 1.5 times rated current

#### others

calibration for a definite frequency 100 ... 1000 Hz  
 thermal time delay 8 min

### Accessories

#### terminal protection against accidental contact

full-sized rear cover or protective sleeves SW10

terminals connector blades 6.3 x 0.8

#### saturating current transformer

saturating current transformer accuracy class 3, 50 Hz to protect the movements against overloads up to 100 times rated current (1 s max). to be mounted to the meter rear case

ASW 1/1 A, 1.5 VA  
 ASW 1/1 A, 2.2 VA  
 ASW 5/5 A, 4.25 VA

with base fixing attachment for panel mounting

ESW 1/5 A, 4.25 VA  
 ESW 5/5 A, 4.25 VA

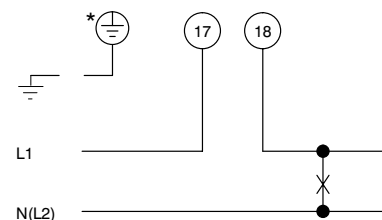
#### multiple factor disc for BI 144, BIW 96/144 GD

constant factors 1 - 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 8 - 10

These factors display the primary current ratings of current transformers 100 ... 1000 A. The factor selected appears in a dial cutout. The factor disc is set by a front accessible slotted screw.

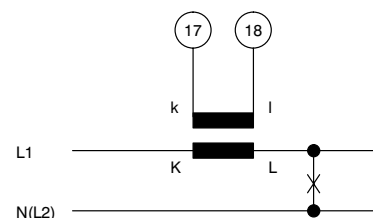
## Connections

### direct-connected

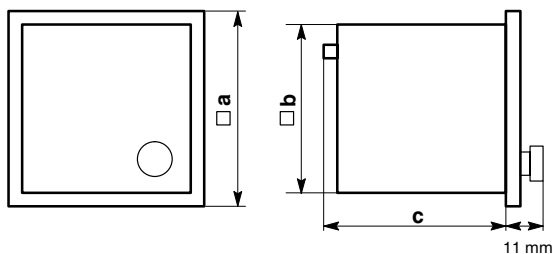


\* BIW 72 GD

### for use on current transformer



## Dimensions



### dimensions (in mm) BI 144

a	144
b	137
c	60

### dimensions (in mm) BIW 72 GD BI 96 GD BI 144 GD

a	72	96	144
b	66	90	137
c	94	98	95

## Ordering Information

<b>type</b> BI 144	maximum demand indicator with bimetallic movement
<b>BIW</b>	combined M.D.I. & moving-iron ammeter
<b>front dimensions</b> 72 96 144	72 mm x 72 mm 96 mm x 96 mm 144 mm x 144 mm
<b>version</b> GD	with coincident axes
<b>measuring ranges</b>	refer to preceding table
<b>window</b>	glass *) non-glaring glass
<b>colour of bezel</b>	black (similar to RAL 9005) *) gray (similar to RAL 7037)
<b>position of use</b>	vertical *) on request 15 ... 165° **)
<b>marine application</b>	none *) non-certified
<b>mechanical loads</b>	shock 15 g, vibration 2.5 g *) shock 30 g, vibration 5 g
<b>dial</b>	scale division & measuring range alike *) non-calibrated, with dial symbols blank dial scale division and figuring 0 ... 100% additional lettering on request **) additional figuring on request **) coloured marks red, green or blue **) coloured sector red, green or blue **)
<b>overload scaling</b> (bimetallic movement)	no overload range 1.2 times rated current *) 1.5 times rated current
<b>calibration</b>	50 Hz *) for a definite frequency 100 ... 1000 Hz
<b>thermal time delay</b>	15 min *) 8 min
<b>logo</b>	WEIGEL *) none OEM logo **)
<b>terminal protection</b>	none *) full-sized rear cover protective sleeves SW 10
<b>terminals</b>	screws and wire clamps *) connector blades 6.3 x 0.8
<b>saturating current transformer</b>	none *) ASW 1/1 A, 1.5 VA ASW 1/1 A, 2.2 VA ASW 5/5 A, 4.25 VA ESW 1/5 A, 4.25 VA ESW 5/5 A, 4.25 VA

\*) standard

\*\*) Please clearly add the desired specifications.

### ordering example

BIW 96 GD for use on current transformer 300/5 A,  
thermal time delay 15 min, WEIGEL logo

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– specifications subject to change without notice; date of issue 12/06 –

