

Data Sheet

M Series
050.D.101.08

**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 ⁺¹ mm
weight approx.	0.65 kg

dimensions

	BIW 72 GD	BIW 96 GD	BIW 144GD
bezel	□ 72 mm	□ 96 mm	□ 144 mm
case	□ 66 mm	□ 90 mm	□ 137 mm
depth	94 mm	98 mm	95 mm
panel cutout	□ 68 ^{+0.7} mm	□ 92 ^{+0.8} mm	□ 138 ⁺¹ 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	bimetallic and moving-iron movement
sizes 72 and 96	–	<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 - 1)		
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 front side 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 current transformer (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 GDBI 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		
scale length	BI 144		
bimetallic movement	145 mm		
scale length	BIW 72 GD	BIW 96 GD	BIW 144 GD
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 - 1
bimetallic movement	3 (referred to slave pointer)
moving-iron movement	1.5

reference conditions

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

influences

ambient temperature	23 °C ± 2K
position of use	nominal position ± 5°
stray magnetic field	0.5 mT

Environmental

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

Rules and Standards

DIN 43 718	Measurement and control; front-frames and frontpanels of measurement and control equipment; principal dimensions
DIN 43 802	Line scales and pointers for indicating electrical measuring instruments; general requirements
DIN 16 257	Nominal positions and position symbols used for measuring instruments
DIN EN 60 051	Direct acting indicating analogue electrical measuring instruments and their accessories
-1	Part 1: Definitions and general requirements common to all parts
-2	Part 2: Special requirements for ammeters and voltmeters
-9	Part 9: Recommended test methods
DIN EN 60 529	Enclosure codes by housings (IP - code)
DIN EN 61 010 - 1	Safety requirements for electrical measuring, control and laboratory equipment Part 1: General requirements
DIN EN 61 326 - 1	Electrical equipment for measurement, control and laboratory use – EMC requirements Part 1: General requirements
DIN IEC 61 554	Panel mounted equipment – Electrical measuring instruments – Dimensions for panel mounting
VDE/VDI 3540 sheet 2	reliability of measuring and control equipment (classification of climates)

\blacklozenge 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 and figuring	0 ... 100%
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

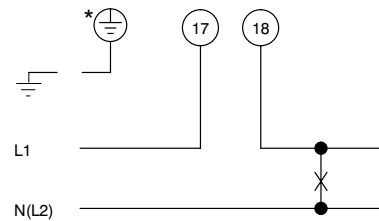
multiple factor disc for BI 144, BIW 96/144 GD

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.

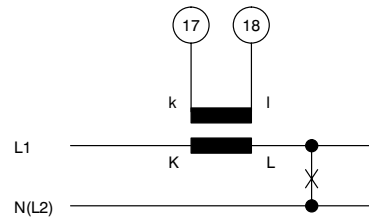
Connections

direct-connected

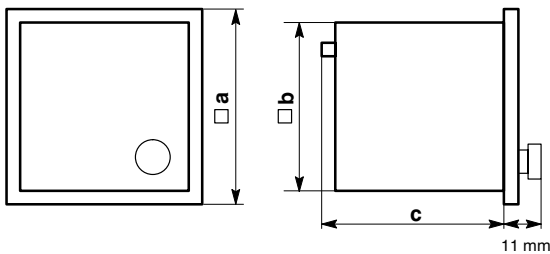


* BIW 72 GD

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

type BI	maximum demand indicator with bimetallic movement
BIW	combined M.D.I. & moving-iron ammeter
front dimensions 72 96 144	72 mm x 72 mm 96 mm x 96 mm 144 mm x 144 mm
version GD	with coincident axes
measuring ranges	refer to preceding table
window	glass ¹⁾ non-glaring glass
colour of bezel	black (similar to RAL 9005) ¹⁾ gray (similar to RAL 7037)
position of use	vertical ¹⁾ on request 15 ... 165° ²⁾
marine application	none ¹⁾ non-certified
mechanical loads	shock 15 g, vibration 2.5 g ¹⁾ shock 30 g, vibration 5 g
dial	scale division & measuring range alike ¹⁾ non-calibrated, with dial symbols blank dial scale division and figuring 0 ... 100% additional lettering on request ²⁾ additional figuring on request ²⁾ coloured marks red, green or blue ²⁾ coloured sector red, green or blue ²⁾
overload scaling (bimetallic movement)	no overload range 1.2 times rated current ¹⁾ 1.5 times rated current
calibration	50 Hz ¹⁾ for a definite frequency 100 ... 1000 Hz ²⁾
thermal time delay	15 min ¹⁾ 8 min
logo	WEIGEL ¹⁾ none OEM logo ²⁾
terminal protection	none ¹⁾ full-sized rear cover protective sleeves SW 10
terminals	screws and wire clamps ¹⁾ connector blades 6.3 x 0.8
saturating current transformer	none ¹⁾ 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

¹⁾ Standard

²⁾ 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 11/14 –

