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
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.

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 ♦
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 BI ... GD only)

dimensions BI 144
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 bimetallic bimetallic and moving-iron movement
sizes 72 and 96 size 144
5 A rated current <5 VA <5.8 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 overloadings 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

<table>
<thead>
<tr>
<th>bimetallic movement</th>
<th>0 ... 1/1.2 A or 0 ... 5/6 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>moving-iron movem.</td>
<td>0 ... 1/1.2 A or 0 ... 5/6 A</td>
</tr>
</tbody>
</table>

for use on current transformer (scale to standard series)

<table>
<thead>
<tr>
<th>bimetallic movement</th>
<th>0 ... N/1.2 A or 0 ... N/5/6 A</th>
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<td>0 ... N/1.2 A or 0 ... N/5/6 A</td>
</tr>
</tbody>
</table>

(overload scaling) ♦ Please indicate current transformer ratio.

BIW72GD BIW96GD BIW144GD
operating voltage 150 V 300 V 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

biometric 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”
## Accuracy at Reference Conditions

<table>
<thead>
<tr>
<th>accuracy class</th>
<th>according to DIN EN 60 051-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>bimetallic movement</td>
<td>3° (referred to slave pointer)</td>
</tr>
<tr>
<td>moving-iron movement</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### Reference Conditions

<table>
<thead>
<tr>
<th>reference conditions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ambient temperature</td>
<td>23°C ±2K</td>
</tr>
<tr>
<td>position of use</td>
<td>nominal position ±1°</td>
</tr>
<tr>
<td>input</td>
<td>rated measuring value</td>
</tr>
<tr>
<td>others</td>
<td>DIN EN 60 051-1</td>
</tr>
</tbody>
</table>

### Influences

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

## Environmental

### Climatic Suitability

<table>
<thead>
<tr>
<th>climatic class</th>
<th>according to VDE/VDI 3540 sheet 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>operating temperature range</td>
<td>−25°C to +40°C</td>
</tr>
<tr>
<td>storage temperature range</td>
<td>−25°C to +65°C</td>
</tr>
</tbody>
</table>

### Shock and Vibration Resistance

| shock resistance | 15 g, 11 ms |
| vibration resistance | 2.5 g, 5 ... 55 Hz |

## 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
  - Part 1: Definitions and general requirements common to all parts
  - Part 2: Special requirements for ammeters and voltmeters
  - 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
- 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)

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### Options

#### Measuring range BI 144

- bimetallic movement: 0 ... 1 A or 0 ... 5 A
- moving-iron 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 movement: 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: 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

#### 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

#### Other

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

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### 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

#### 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**

![Diagram of direct-connected connections]

* BIW 72 GD

for use on current transformer

## Dimensions

**dimensions (in mm)**

<table>
<thead>
<tr>
<th></th>
<th>BI 144</th>
<th></th>
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<tbody>
<tr>
<td>a</td>
<td>144</td>
<td>b</td>
<td>137</td>
</tr>
<tr>
<td>c</td>
<td>60</td>
<td></td>
<td></td>
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**dimensions (in mm)**

<table>
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<td>98</td>
<td>95</td>
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## Ordering Information

<table>
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<tr>
<th>type</th>
<th>BI</th>
<th>BIW</th>
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<td>maximum demand indicator with bimetallic movement</td>
<td>combined M.D.I. &amp; moving-iron ammeter</td>
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| 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 | 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 |

| terminal protection | none ¹) | OEM logo ²) |

| 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 –