Data Sheet

M Series

050.D.251.05

M Series

Triple Combination
Meters with Moving-Iron,
Bimetallic or Bimetallic/
Moving-Iron Movements

W 192 RnS
W 192 RhS
BI 192 RnS
BI 192 RhS
BIW 192 RnS
BIW 192 RhS
**Application**

The moving-iron panel meters W 192 RnS/RhS (M series) are used in simultaneous measurement of three AC currents or AC voltages. They indicate rms values practically independent of wave form even of high harmonics. Error of indication may occur by extreme wave forms (e.g. phase gating controls) and/or frequencies above 100 Hz. The bimetallic maximum demand indicators BI 192 RnS/RhS monitor the most economic use of transformer stations and L.T. distribution feeders. Bimetallic instruments are thermally inert. They indicate the mean rms value over 15 (8) minute periods enabling to evaluate continuous loads rather than short-time current peaks.

The high torque of the thermal movement offers the possibility to drive a red slave pointer linked to the indicator pointer. Thereby, the highest current reached in the circuit can be read off at any time. The slave pointer will be reset to the position of the indicator pointer by means of a sealable reset knob.

Where the instantaneous and maximum demand currents are required, the BIW 192 RnS/RhS instruments have three each thermal bimetallic and moving-iron movements installed diametrically in one case. The meters are housed in pressed steel cases suitable to be mounted in switchboards, control panels, machine tool consoles and/or mosaic grid panels.

**Functional Principle**

Moving-iron movements with shell-type systems, pivot suspension. Spring loaded jewel bearings and silicon oil damping for vibration and shock resistance. The moving-iron movement has a response time of approx. 1 s.

Bimetallic movements with resettable red slave pointers and a thermally delayed indication enabling to measure the mean rms value within a time lag of 15 min (optional 8 min).

**Mechanical Data**

- **case details**: rectangular case suitable to be mounted in switchboards or mosaic grid panels, stackable
- **material of case**: pressed steel
- **material of window**: glass
- **colour of bezel**: black (similar to RAL 9005)
- **position of use**: vertical ± 5°
- **panel fixing**: screw clamps
- **panel thickness**: 1 ... 15 mm
- **mounting**: stackable next to each other

**terminals**

- voltmeters and ammeters < 3 A hexagon studs, M3 screws and wire clamps C6
- ammeters > 3 A
- hexagon studs, M5 screws and wire clamps C10
- connector blades 6.3 x 0.8 for protective wire

**dimensions**

- bezel: 192 mm x 96 mm
- case: 184 mm x 90.5 mm
- depth: 60 mm
- panel cutout: 186 x 1.1 mm x 92 x 0.8 mm
- weight approx.: W 192 RnS, BI 192 RnS, BIW 192 RnS: 0.9 kg
  - W 192 RhS, BI 192 RhS, BIW 192 RhS: 0.7 kg
  - BIW 192 RhS: 1.0 kg

* for other ratings refer to “Options”

**Electrical Data**

- **measuring unit**: W 192 RnS/RhS AC currents or AC voltages
- **BI/BIW 192 RnS/RhS AC currents**
- **frequency range**: 50 ... 100 Hz
- **power consumption**
  - per movement: moving-iron
  - per movement: bimetallic
  - voltmeters: approx. 1.5 ... 3 VA
  - ammeters: approx. 0.5 ... 1 VA
- **at 1 A rated current**: < 1.3 VA < 2 VA
- **at 5 A rated current**: < 3.5 VA < 4.2 VA
- **overload capacity (acc. to DIN EN 60 051-1)**
  - continuously 1.2 times rated voltage / current
  - 5 s max. moving-iron
  - 2 times rated voltage
  - 5 A max. bimetallic
  - 10 times rated current
- **Saturating current transformers shall be used to protect the movements against overloads exceeding specified ratings.**
- **response time**
  - bimetallic: 15 min
  - moving-iron: 1 s approx.
- **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**

<table>
<thead>
<tr>
<th>W 192 RnS/RhS</th>
<th>AC current 1)</th>
<th>AC voltage</th>
<th>operating voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 mA</td>
<td>300 V</td>
<td>6 V</td>
<td>300 V</td>
</tr>
<tr>
<td>150 mA</td>
<td>300 V</td>
<td>10 V</td>
<td>300 V</td>
</tr>
<tr>
<td>250 mA</td>
<td>300 V</td>
<td>15 V</td>
<td>300 V</td>
</tr>
<tr>
<td>400 mA</td>
<td>300 V</td>
<td>25 V</td>
<td>300 V</td>
</tr>
<tr>
<td>600 mA</td>
<td>300 V</td>
<td>40 V</td>
<td>300 V</td>
</tr>
<tr>
<td>1 A</td>
<td>300 V</td>
<td>60 V</td>
<td>300 V</td>
</tr>
<tr>
<td>1.5 A</td>
<td>300 V</td>
<td>100 V</td>
<td>300 V</td>
</tr>
<tr>
<td>2.5 A</td>
<td>300 V</td>
<td>150 V</td>
<td>300 V</td>
</tr>
<tr>
<td>4 A</td>
<td>300 V</td>
<td>250 V</td>
<td>300 V</td>
</tr>
<tr>
<td>6 A</td>
<td>300 V</td>
<td>400 V</td>
<td>300 V</td>
</tr>
<tr>
<td>10 A</td>
<td>300 V</td>
<td>500 V</td>
<td>300 V</td>
</tr>
<tr>
<td>15 A</td>
<td>300 V</td>
<td>600 V</td>
<td>600 V</td>
</tr>
<tr>
<td>25 A</td>
<td>300 V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) full-scale value = 2 times rated current (overload scaling) *

<table>
<thead>
<tr>
<th>BI/BIW 192 RnS/RhS</th>
<th>AC current 1)</th>
<th>AC voltage</th>
<th>operating voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A</td>
<td>1 A</td>
<td>300 V</td>
<td></td>
</tr>
<tr>
<td>5 A</td>
<td>5 A</td>
<td>300 V</td>
<td></td>
</tr>
</tbody>
</table>

Please state transformer ratio when ordering.

**BIW 192 RnS/RhS**

<table>
<thead>
<tr>
<th>AC current 2)</th>
<th>(BIW) operating voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A</td>
<td>1 A</td>
</tr>
<tr>
<td>5 A</td>
<td>5 A</td>
</tr>
</tbody>
</table>

Please state transformer ratio when ordering.

**for use on CT 1) for use on VT 2)**

<table>
<thead>
<tr>
<th>N/1 A</th>
<th>300 V</th>
<th>sec. 100 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/5 A</td>
<td>300 V</td>
<td>sec. 110 V</td>
</tr>
</tbody>
</table>

1) full-scale value = 1.2 times rated voltage (overload scaling) *
Data Sheet

M Series

Triple Combination
Meters with Moving-Iron, Bimetallic or Bimetallic/Moving-Iron Movements

Scaling

| pointer | bar / knife-edge pointer |
| pointer deflection | 0 ... 90° |
| scale characteristics | bimetallic moving-iron quadratic practically linear |
| overload scaling ammeters | bimetallic moving-iron 1.2 times rated current 2 times rated current |
| overloads for use on voltage transformers | bimetallic moving-iron |

Scaling characteristics:
- Bimetallic moving-iron: quadratic practically linear
- Scales are calibrated down to 1/5th of rated scale value

Overload scaling:
- Ammeters: 1.2 times rated current
- Voltmeters for use on voltage transformers: 1.2 times rated voltage

Accuracy at Reference Conditions

| accuracy class | 3 (bimetallic movement referred to slave pointer) |
| acc. to DIN EN 60 051-1 | 1.5 (moving-iron movement) |

Reference conditions:
- Ambient temperature: 23°C 2K
- Position of use: nominal position ± 1°
- Input: rated measuring value
- Frequency: 50 Hz
- Wave form: sinusoidal, distortion factor <5%

Influences:
- Ambient temperature: 23°C ± 2K
- Position of use: nominal position ± 5°
- Frequency: 15 ... 100 Hz (voltage) 15 ... 400 Hz (current)

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 | −25 ... +65°C |
| temperature range | ≤ 75% annual average, non-condensing |
| 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 60 051-1 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 Safety requirements for electrical measuring, control and laboratory equipment
- Part 1: General requirements
- Part 2–030 Particular requirements for testing and measuring circuits

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)

Options

| measuring range | special measuring range deviating from standard series |
| calibration | for a definite frequency 100 ... 1000 Hz |
| thermal time delay | 8 min (bimetallic) |
| case | window non-glaring glass |
| colour of bezel | gray (similar to RAL 7037) |
| position of use | horizontal or to be specified 15 ... 165° |
| performance | increased mechanical loads shock 30 g, 11 ms vibration 5 g, 5 ... 55 Hz |
| climatic suitability | limited use in the tropics climatic class 3 according to VDE/VDI 3540 sheet 2 |
| with operating temperature range | −10 ... +55°C |
| marine application | non-certified |
| terminal protection against accidental contact | protective sleeves |
| terminals | connector blades 6.3 x 0.8 |
| dial | blank dial pencil marked initial and end values |
| scale division and figuring | 0 ... 100%, full-scale values acc. to standardized series (1–1.2–1.5–2–2.5–3–4–5–6–7.5 and any decimal multiple of these numbers e.g. 150 m3/h) or deviating from standard series; captions optional |
| additional lettering | to be specified e.g. “generator” |
| additional figuring | to be specified |
| 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 as specified |
| overload scaling | none or 1.5 times rated current (bimetallic) |
Connections

**AC voltage**

- L1
- N (L2)

**AC current**

- L1
- N (L2)

Dimensions

-(scaled in mm)-

**Ordering Information**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>triple combination meters with moving-iron movements</td>
</tr>
<tr>
<td>BI</td>
<td>bimetallic movements</td>
</tr>
<tr>
<td>BIW</td>
<td>bimetallic/moving-iron movements</td>
</tr>
</tbody>
</table>

**Front dimensions**

- 192 mm x 96 mm

**Type identification**

- RnS: movements arranged horizontally
- RhS: movements arranged vertically

**Measuring ranges**

- Refer to preceding table

**Special measuring range**

- To special order

**Calibration**

- 50 Hz for a defined frequency 100 ... 1000 Hz

**Thermal time lag**

- 15 min

**Window**

- Glass
- Non-glaring glass

**Colour of bezel**

- Black (similar to RAL 9005)
- Gray (similar to RAL 7037)

**Position of use**

- Vertical

**Mechanical loads**

- Shock 15 g, vibration 2.5 g
- Shock 30 g, vibration 5 g

**Climatic suitability**

- Class 2, –25 ... +40 °C
- Class 3, –10 ... +55 °C

**Marine application**

- None

**Terminal safety protection**

- None

**Terminals**

- Screws and wire clamps
- Connector blades 6.3 x 0.8

**Dial**

- Scale division and measuring range alike
- Full-scale values acc. to standardized series for use on transformer
- Blank dial
- Scale division and figuring
- 0 ... 100%
- Acc. to standardized series
- Deviating from standard
- Additional lettering to be specified
- Additional figuring to be specified
- Coloured marks red, green or blue
- Coloured sector red, green or blue

**Logo**

- WEIGEL
- None
- OEM logo

**Overload scaling**

- None (bimetallic and/or moving-iron)
- For 1.2 times rated current (bimetallic)
- For 2 times rated current (moving-iron)
- 1.5 times rated current (bimetallic)

**Saturating current transformer**

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

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1) Standard
2) Please clearly add the desired specifications.

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– specifications subject to change without notice; date of issue 12/15 –