Data Sheet

Edgewise Series

Analog Meters
Slim Edgewise with Moving-Coil Movement and Rectifier

MG 48x24
MG 72x24
MG 96x24 K
G 144x36

MG 96x24 K

with Slide-In-Dial
Application

The edgewise moving-coil panel meters MG 48x24, MG 72x24, MG 96x24 K and G 144x36 with a slim-line dial are used for measurement of sinusoidal AC currents or voltages.

Moving-coil rectifier instruments measure average values and are scaled to indicate r.m.s., assuming a sinusoidal wave form.

The moving-coil movement is manufactured to newest findings and distinguishes in a small power consumption, a high accuracy and a very good damping.

The instruments are suitable to be mounted in switchboards, control panels, machine tool consoles and mosaic panels (except G 144x36).

With MG 96x24 K the front panel, the front window and the dial as well as the dial illumination (optional) can be exchanged easily. On the rear side a cable grip for the connecting leads is integrated.

Movements


Mechanical Data

case details edgewise case suitable to be mounted in control panels, machine tool consoles or mosaic panels (except G144x36), stackable
material of case thermoplastics
material of window glass ♦
colour of bezel black (similar to RAL 9005) ♦
position of use vertical ±5° ♦
panel fixing screw clamps ♦
mounting stackable next to each other
panel thickness 1 ... 25 mm
terminals connector blades 6.3 x 0.8 or connector blades 2.8 x 0.8 (MG 96x24 K)
dimensions (in mm)
bezel MG 48x24 MG 72x24 MG 96x24 K G 144x36
48 x 24 72 x 24 96 x 24 144 x 36

Electrical Data

measuring unit AC voltage or AC current
frequency range 40 Hz ... 60 Hz ... 10 kHz
overload capacity (acc. to DIN EN 60 051-1) continuously 1.2 times rated voltage / current
5 s max. 2 times rated voltage
amperimeters 10 times rated current
measurement category CAT III
operating voltage refer to Measuring Ranges
pollution level 2
enclosure code IP 52 case front side ♦
IP 00 for terminals without protection against accidental contact
IP 20 for terminals protected against accidental contact

Measuring Ranges

For mains use
AC current
100 µA, 150 µA, 250 µA, 400 µA, 600 µA, 1 mA, 1.5 mA, 2.5 mA, 4 mA, 6 mA, 10 mA, 15 mA, 25 mA, 40 mA, 60 mA, 100 mA, 150 mA, 250 mA, 400 mA, 600 mA (voltage drop approx. 1.5 V)
with separate miniature current transformer 50 Hz, 10 mA sec.
1 A, 1.5 A, 2.5 A (voltage drop approx. 0.2 V)
4 A, 5 A, 6 A, 10 A, 15 A, 25 A (voltage drop approx. 0.3 V)
for use on current transformer (scale without overload range) separate miniature current transformer 50 Hz, 10 mA sec. inclusive N/1 A (voltage drop approx. 0.2 V)
N/5 A (voltage drop approx. 0.3 V)
operating MG 48x24 MG 72x24 MG 96x24 K G 144x36 voltage 300 V 600 V 300 V 300 V 300 V
AC voltage operating voltage >5V MG 48x24 MG 72x24 MG 96x24 K G 144x36
6 V 1) 300 V 600 V 300 V 300 V
10 V 1) 300 V 600 V 300 V 300 V
15 V 1) 300 V 600 V 300 V 300 V
25 V 1) 300 V 600 V 300 V 300 V
40 V 1) 300 V 600 V 300 V 300 V
60 V 1) 300 V 600 V 300 V 300 V
100 V 1) 300 V 600 V 300 V 300 V
150 V 1) 300 V 600 V 300 V 300 V
250 V 1) 300 V 600 V 300 V 300 V
400 V 1) 300 V 600 V 300 V 300 V
500 V 1) 300 V 600 V 300 V 300 V
600 V 1) 300 V 600 V 300 V 300 V
Not for mains use
AC voltage operating voltage ≤5V MG 48x24 MG 72x24 MG 96x24 K G 144x36
2.5 V 1) 300 V 600 V 300 V 300 V
4 V 1) 300 V 600 V 300 V 300 V
1) Sensitivity 900 V/V ♦
The resistance values are limited to a tolerance of ±20% ♦

Scaling

pointer bar pointer
zero adjustment front accessible ♦
response time 1 s for full-scale deflection
scale arrangement horizontal (left-hand zero) ♦
scale characteristics practically linear for voltages >20 V
initial scale compressed for voltages ≤20 V
scale division coarse–fine
scale length MG 48x24 MG 72x24 MG 96x24 K G 144x36
30 mm 52 mm 60 mm 95 mm

♦ for other ratings refer to "Options"
**Data Sheet**

**Edgewise Series**

**Analog Meters**

**Slim Edgewise with Moving-Coil Movement and Rectifier**

### Accuracy at Reference Conditions

<table>
<thead>
<tr>
<th>accuracy class</th>
<th>1.5 according to DIN EN 60 051-1</th>
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<tbody>
<tr>
<td>reference conditions</td>
<td></td>
</tr>
<tr>
<td>ambient temperature</td>
<td>23 °C</td>
</tr>
<tr>
<td>position of use</td>
<td>nominal position ±1 °</td>
</tr>
<tr>
<td>input rated measuring value</td>
<td></td>
</tr>
<tr>
<td>frequency</td>
<td>50±2 Hz</td>
</tr>
<tr>
<td>wave form</td>
<td>sinusoidal, distortion factor &lt;5%</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 ° |
| frequency | 40 Hz ... 45 Hz ... 60 Hz ... 10 kHz |
| 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 43 718**: 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
  - designs and dimensions
  - scale graduation and numbering
- **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**: Safety requirements for electrical measuring, control and laboratory equipment
  - Part 1: General requirements
  - Part 2: 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
  - IEC 61 000-4-3 evaluation criterion B
- **DIN IEC 61 554**: Panel mounted equipment –
  - Electrical measuring instruments –
  - Dimensions for panel mounting

### Options

- **measuring range**: special measuring range
- **internal resistance**: adjustment to ±1% at 23 °C
- **increased sensitivity**: for voltmeters to 2 kΩ/V, 5 kΩ/V, 10 kΩ/V or 20 kΩ/V (as far as possible)
- **case**: window non-glaring glass
- **colour of bezel**: gray (similar to RAL 7037)
- **position of use**: horizontal or on request 15...165 °
- **mounting**: blade springs on the narrow sides

### Terminal Protection

- **terminal protection against accidental contact:** protective sleeves B6 for connector blades 6.3 x 0.8 protective sleeves 110 for connector blades 2.8 x 0.8

### Dial

- **scale arrangement**: vertical (bottom zero)
- **blank dial**: pencil-marked on initial and end values
- **scale division**: 0 ... 100%, and
- **additional figuring on request**: linear, full-scale values acc. to standardized series (1 - 1.2 - 1.5 - 2 - 2.5 - 3 - 4 - 5 - 6 - 7.5 and their decimal multiples e.g. 150 m³/h) or deviating from standard; captions on request
- **2nd scale division**: including figuring (on request)
- ** coloured scale**: scale in black; pointer, scale division and additional figuring: lettering yellow or white
- ** coloured marks**: red, green or blue for important scale values
- ** coloured segment**: red, green or blue within scale division
- ** logo on the dial**: none or on request
- **zero position**: mechanically suppressed zero, no zero adjustment, max. 40% of full-scale value for ammeters ≥ 100 μA, voltmeters ≥ 1.5 V
- **zero adjustment**: rear accessible
- **expanded scale**: expanded initial scale division
  - by means of electronic circuits up to approx. 5% of full-scale value in centre of scale for MG 72x24 / 96x24 K, P 144x36
- **dial illumination**: internal LED 24 V DC
  - for MG 48x24
  - for MG 96x24
  - for G 144x36
  - 1 lamp 6 V, 12 V or 24 V
  - 2 lamps 6 V, 12 V or 24 V
Connections

AC voltage

```
L1  17  18
N (L2)
```

AC current

```
L1  17  18
N (L2)
```

Dimensions

```
dimension (in mm) | MG 48 x 24 | MG 72 x 24 | MG 96 x 24 | K 144 x 36
a  | 48         | 72         | 96          | 144
b  | 24         | 24         | 24          | 36

zero adjustment front

dial carrier
dial

cable grip

connector blades
6.3/2.8 x 0.8

zero adjustment rear (optional)

lamp for dial illumination (optional)
screw clamp
blade spring (optional)

scales and position of use

vertical mounting
I horizontal scale (standard)
II vertical scale
Inclined mounting
III horizontal scale
IV vertical scale
Horizontal mounting
V horizontal scale
VI vertical scale
## Ordering Information

<table>
<thead>
<tr>
<th>type (M)G</th>
<th>slim edgewise moving–coil panel meter for AC voltage or current</th>
</tr>
</thead>
<tbody>
<tr>
<td>front dimensions</td>
<td>48 mm x 24 mm&lt;br&gt;72 mm x 24 mm&lt;br&gt;96 mm x 24 mm&lt;br&gt;144 mm x 36 mm</td>
</tr>
<tr>
<td>measuring ranges</td>
<td>refer to preceding table</td>
</tr>
<tr>
<td>special measuring range</td>
<td>internal resistance ±20%&lt;sup&gt;1)&lt;/sup&gt; internal resistance ±1% at 23°C</td>
</tr>
<tr>
<td>sensitivity voltmeters</td>
<td>900 Ω/V&lt;sup&gt;1)&lt;/sup&gt; 2 kΩ/V 5 kΩ/V 10 kΩ/V 20 kΩ/V as far as possible</td>
</tr>
<tr>
<td>window</td>
<td>glass&lt;sup&gt;1)&lt;/sup&gt; non–glaring glass</td>
</tr>
<tr>
<td>colour of bezel</td>
<td>black (similar to RAL 9005)&lt;sup&gt;1)&lt;/sup&gt; gray (similar to RAL 7037)</td>
</tr>
<tr>
<td>position of use</td>
<td>vertical&lt;sup&gt;1)&lt;/sup&gt; horizontal on request 15 ... 165°&lt;sup&gt;2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>mounting</td>
<td>screw clamps&lt;sup&gt;1)&lt;/sup&gt; spring blades</td>
</tr>
<tr>
<td>climatic suitability</td>
<td>class 2, –25 ... +40°C&lt;sup&gt;1)&lt;/sup&gt; class 3, –10 ... +55°C</td>
</tr>
<tr>
<td>mechanical loads</td>
<td>shock 15 g, vibration 2.5 g&lt;sup&gt;1)&lt;/sup&gt; shock 30 g, vibration 5 g</td>
</tr>
<tr>
<td>marine application</td>
<td>none&lt;sup&gt;1)&lt;/sup&gt; non–certified</td>
</tr>
<tr>
<td>enclosure code</td>
<td>IP 52&lt;sup&gt;1)&lt;/sup&gt; IP 54 splash–water protected front</td>
</tr>
<tr>
<td>terminal protection</td>
<td>none&lt;sup&gt;1)&lt;/sup&gt; protective sleeves B6 (for 6.3 x 0.8) protective sleeves 110 (for 2.8 x 0.8)</td>
</tr>
<tr>
<td>scale arrangement</td>
<td>horizontal&lt;sup&gt;1)&lt;/sup&gt; vertical</td>
</tr>
<tr>
<td>dial</td>
<td>scale division &amp; measuring range alike&lt;sup&gt;1)&lt;/sup&gt; blank dial scale division and figuring 0 ..., 100% deviating from standard&lt;sup&gt;2)&lt;/sup&gt; 2 scale divisions on request&lt;sup&gt;2)&lt;/sup&gt; yellow on black dial&lt;sup&gt;3)&lt;/sup&gt; white on black dial&lt;sup&gt;3)&lt;/sup&gt; additional lettering on request&lt;sup&gt;2)&lt;/sup&gt; additional figuring on request&lt;sup&gt;2)&lt;/sup&gt; coloured marks red, green or blue&lt;sup&gt;2)&lt;/sup&gt; coloured sector red, green or blue&lt;sup&gt;2)&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

### Special Measuring Range

- internal resistance on request<sup>2)</sup>
- internal resistance at 23°C<sup>C</sup><sup>2)</sup>

### Expanded Scale

- none<sup>1)</sup>
- up to approx. 5% of full–scale value in center scale electronically<sup>2)</sup>

### Dial Illumination

- for MG 48x24 internal LED 24 V DC
- for MG 96x24 1 lamp 6 V, 12 V or 24 V
- for G 144x36 2 lamps 6 V, 12 V or 24 V

1) Standard
2) Please clearly add the desired specifications.
3) MG 96x24 K only

### Ordering Example

MG 72x24, measuring range 0 ... 250 V, horizontal scale, vertical mounting, window non–glaring glass, WEIGEL logo

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– specifications subject to change without notice; date of issue 02/16 –