Data Sheet

M Series

Frequency Meters with Vibrating Reed Movement

FQ 48
FQ 72
FQ 96
FQ 144
**Application**

The frequency indicators FQ 48/72/96/144 (M series) are used to measure frequencies of power supplies and/or generator sets in spans of rated frequencies 50 Hz or 60 Hz.

The indicators are suitable to be mounted in switchboards, generator sets, machine tool consoles or mosaic grid panels.

**Movement**

Vibrating reed movement. Each reed is tuned to a different value in the frequency span.

**Mechanical Data**

- **case details**: square case suitable to be mounted in control / switchgear panels, machine tool consoles or mosaic grid panels, stackable
- **material of case**: thermoplastics, flame retardant (FQ 48) pressed steel (FQ 72/96/144)
- **material of window**: glass
- **colour of bezel**: black (similar to RAL 9005)
- **position of use**: vertical
- **panel fixing**: plate springs (FQ 48)
- **panel thickness**: 1 ... 15 mm stackable next to each other
- **terminals**: hexagon studs, M3 x 6 screws and WEIGEL screw clamps (FQ 72/96/144)

**Dimensions (in mm)**

<table>
<thead>
<tr>
<th>FQ 48</th>
<th>FQ 72</th>
<th>FQ 96</th>
<th>FQ 144</th>
</tr>
</thead>
<tbody>
<tr>
<td>bezel</td>
<td>48</td>
<td>72</td>
<td>96</td>
</tr>
<tr>
<td>case</td>
<td>45</td>
<td>66.5</td>
<td>90.5</td>
</tr>
<tr>
<td>depth</td>
<td>61</td>
<td>52</td>
<td>58</td>
</tr>
<tr>
<td>panel cutout</td>
<td>45.210.3</td>
<td>68.30.4</td>
<td>9210.8</td>
</tr>
<tr>
<td>weight approx.</td>
<td>0.15 kg</td>
<td>0.3 kg</td>
<td>0.4 kg</td>
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</tbody>
</table>

**Electrical Data**

- **measuring unit**: frequency
- **variation permissible**: rated voltage ±10%
- **overload capacity**: 0.5 VA (FQ 48), 1.0 VA (FQ 72/96/144), 1.5 VA (FQ 144)
- **continuously**: 2 times rated voltage
- **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**

<table>
<thead>
<tr>
<th>frequency ranges</th>
<th>resolution</th>
<th>number of reeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>47 ... 50 Hz</td>
<td>1 Hz</td>
<td>7 (FQ 48 only)</td>
</tr>
<tr>
<td>47 ... 50 Hz</td>
<td>½ Hz</td>
<td>13 (except FQ 48)</td>
</tr>
<tr>
<td>54 ... 60 Hz</td>
<td>1 Hz</td>
<td>13 (except FQ 48)</td>
</tr>
<tr>
<td>55 ... 60 Hz</td>
<td>½ Hz</td>
<td>21 (except FQ 48/72)</td>
</tr>
</tbody>
</table>

**Scaling**

- **scale division**: coarse–fine
- **reed arrangement**: horizontal

**Accuracy at Reference Conditions**

- **accuracy class**: 0.5 acc. to DIN EN 60 051-1
- **reference conditions**: ambient temperature 23°C, position of use nominal position ±1°, input rated measuring value
- **others**: DIN EN 60 051-1

**Environmental**

- **climatic suitability**: climatic class 2 acc. 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

♦ for other ratings refer to “Options”
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
  --4  Part 4: Special requirements for frequency meters
  --9  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
  --1  Part 1: General requirements
  --2–030  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
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

case
window  non–glaring glass
colour of bezel  gray (similar to RAL 7037)
position of use  to be specified 15°...165°
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
enclosure code  IP 54 splash–water protected front
dial
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 to be specified

measuring ranges
rated voltage  from 57.7 V up to 600 V on request

accessories
projection mounting outfit
terminal protection against accidental contact
full–sized rear cover or protective sleeves SW6
terminals  connector blades 6.3 x 0.8

Connections

Dimensions

Connections

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## Ordering Information

<table>
<thead>
<tr>
<th>Type</th>
<th>FQ</th>
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</thead>
<tbody>
<tr>
<td>Reeds type frequency indicator</td>
<td></td>
</tr>
</tbody>
</table>

### Front Dimensions

<table>
<thead>
<tr>
<th>48</th>
<th>72</th>
<th>96</th>
<th>144</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 mm x 48 mm</td>
<td>72 mm x 72 mm</td>
<td>96 mm x 96 mm</td>
<td>144 mm x 144 mm</td>
</tr>
</tbody>
</table>

### Measuring Ranges

Refer to preceding table.

### Rated Voltage

Refer to preceding table.

### Window

- Glass 1)
- Non-glaring glass
- Gray (similar to RAL 7037)

### Colour of Bezel

- Black (similar to RAL 9005) 1)
- Gray (similar to RAL 7037)

### Position of Use

- Vertical 1)
- To special order 15 ... 165 2)

### Performance Loads

- Shock 15 g, vibration 2.5 g 1)
- Shock 30 g, vibration 5 g

### Climatic Suitability

- Class 2, –25 ... +40°C 1)
- Class 3, –10 ... +55°C

### Marine Application

- None 1)
- Non-certified

### Enclosure Code

- IP 52 1)
- IP 54 splash-water protected front

### Terminal Safety Protection

- None 1)
- Full-sized rear cover
- Protective sleeves SW6

### Terminals

- Screws M3 x 6 and wire clamps 1)
- Connector blades 6.3 x 0.8

### Dial

- Scale division & measuring range alike 1)
- Additional lettering to be specified 2)
- Additional figuring to be specified 2)
- Coloured marks red, green or blue 2)
- Coloured sector red, green or blue 2)

### Logo

- WEIGEL 1)
- None
- OEM logo 2)

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

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**Ordering Example**

FQ 144, measuring range 47 ... 50 ... 53 Hz, 13 reeds, rated voltage 230 V AC, window non-glaring glass, WEIGEL logo.