

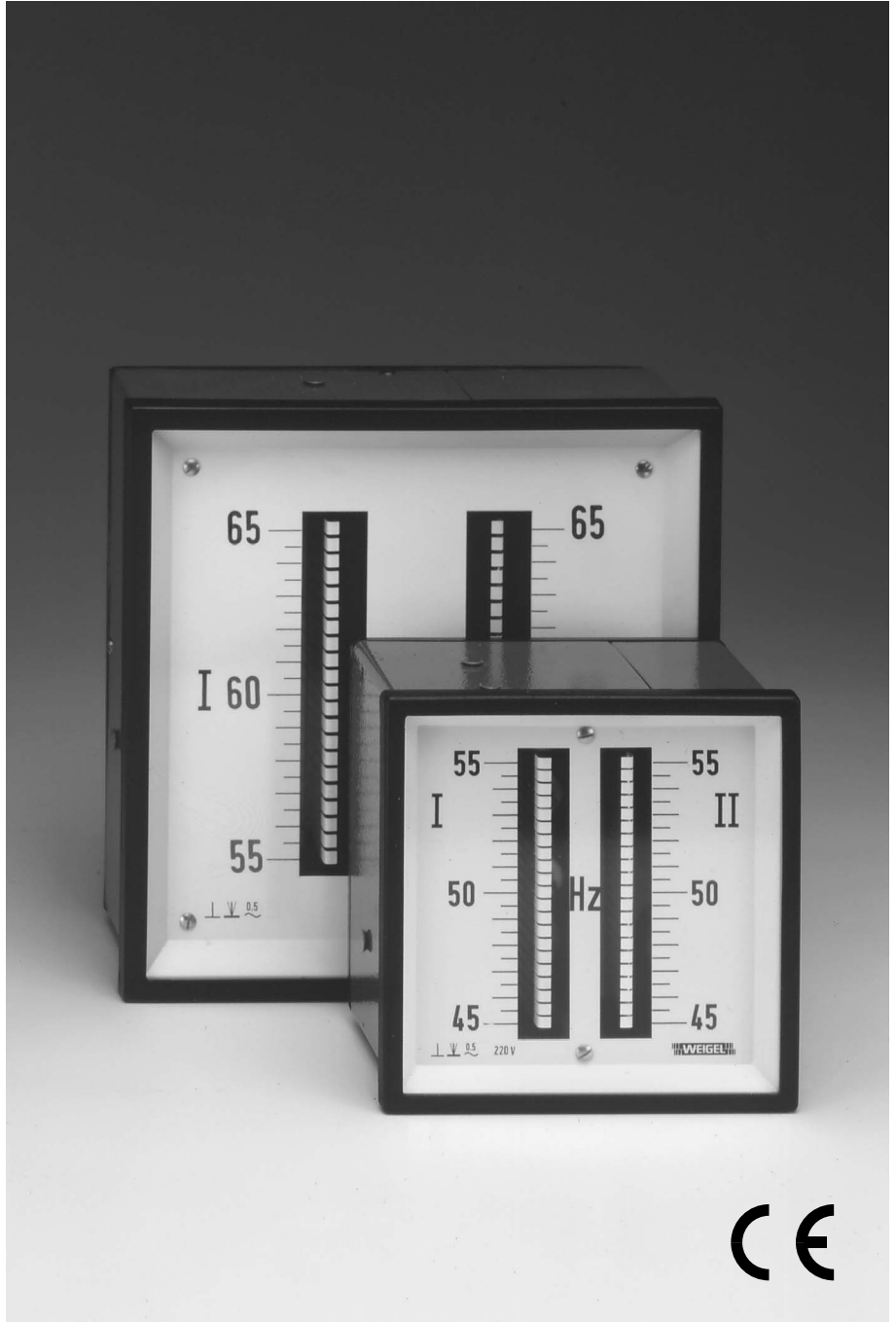


# Data Sheet

M Series  
031.D.101.07

## Double Frequency Meters with Vibrating Reed Movements

FQ 96 /2  
FQ 144 /2



**WEIGEL**

## Application

The double frequency indicators **FQ 96 /2** and **FQ 144 /2** (M series) comprise two electrically independent vibrating reed movements for simultaneously measuring the frequencies of two AC voltages, that of a generator and of a power supply system for instance.

Double frequency indicators are also available with consecutive frequency ranges to one voltage.

The instruments are suitable to be mounted in generating sets, power supply control panels, switchboards or mosaic panels.

## Functional Principle

Vibrating reed-type movements with two lines of steel reeds. 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 panels, stackable
material of case	pressed steel
material of window	glass
colour of bezel	black (similar to RAL 9005)
position of use	vertical $\pm 5^\circ$
panel fixing	WEIGEL screw clamps
panel thickness	1 ... 15 mm
mounting	stackable next to each other
terminals	hexagon studs, M3 x 6 screws and wire clamps

dimensions	FQ 96 /2	FQ 144 /2
bezel	□ 96 mm	□ 144 mm
case	□ 90 mm	□ 137 mm
depth	66 mm	58 mm
panel cutout	□ 92 <sup>+0.8</sup> mm	□ 138 <sup>+1</sup> mm
weight approx.	0.65 kg	1.0 kg

## Electrical Data

measuring units	two frequencies
overload capacity (acc. to DIN EN 60 051 - 1)	
continuously	1.2 times rated voltages
5 s max.	2 times rated voltages
measurement category	CAT III
operating voltage	refer to Measuring Ranges
pollution level	2
enclosure code	IP 52 case front side $\blacktriangleright$ IP 00 for terminals without protection against accidental contact IP 20 for terminals protected against accidental contact

$\blacktriangleright$  for other ratings refer to "Options"

## Measuring Ranges

**two identical measuring ranges** number of steel reeds

2x 47 ... 50 ... 53 Hz	2x 13
2x 45 ... 50 ... 55 Hz	2x 21
2x 57 ... 60 ... 63 Hz	2x 13
2x 55 ... 60 ... 65 Hz	2x 21

**two consecutive measuring ranges** number of steel reeds

left 47 ... 50 ... 53 Hz and right 57 ... 60 ... 63 Hz	2x 13
left 45 ... 50 ... 55 Hz and right 55 ... 60 ... 65 Hz	2x 21

rated voltage	power consumption each movement		operating voltage	
	FQ 96 /2	FQ 144 /2	FQ 96 /2	FQ 144 /2
100 V	< 1.1 VA	< 1.1 VA	300 V	300 V
110 V	< 1.1 VA	< 1.1 VA	300 V	300 V
230 V	< 1.2 VA	< 1.2 VA	300 V	300 V
400 V	< 2.0 VA	< 1.8 VA	300 V	300 V
500 V	< 2.5 VA	< 2.4 VA	300 V	300 V
600 V $\blacktriangleright$	< 2.9 VA	< 2.9 VA	600 V	600 V

## Scaling

scale division	coarse-fine
reed arrangement	vertical

## Accuracy at Reference Conditions

accuracy class 0.5 acc. to DIN EN 60 051 - 1

### reference conditions

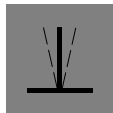
ambient temperature	23°C
position of use	nominal position $\pm 1^\circ$
input	rated measuring value
others	DIN EN 60 051 - 1

### influence quantities

ambient temperature	23°C $\pm 2$ K
position of use	nominal position $\pm 5^\circ$
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	$\leq 75\%$ annual average, non-condensing
shock resistance	15 g, 11 ms
vibration resistance	2.5 g, 5 ... 55 Hz



## Double Frequency Meters with Vibrating Reed Movements

### 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 - 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)

### Options

#### case

window	non-glaring glass
colour of bezel	gray (similar to RAL 7037)
position of use	15°...165° on request

#### 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
with operating temperature range	-10 ... +55 °C
marine application	non-certified
enclosure code	IP 54 splash-water protected front

#### dial

reed arrangement	horizontal
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

#### measuring ranges

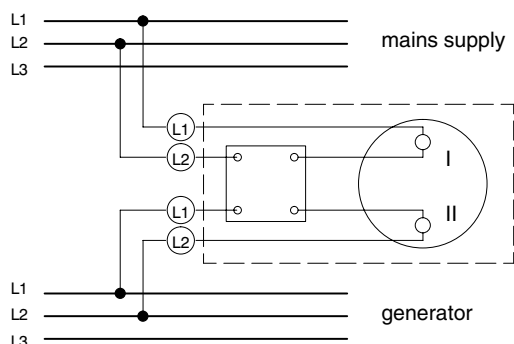
rated voltage	from 57.7 V up to 600 V on request
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#### accessories

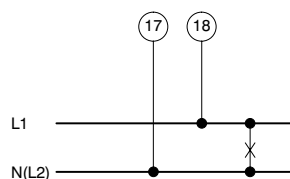
terminal protection against accidental contact	full-sized rear cover or protective sleeves SW6
terminals	connector blades 6.3 x 0.8

### Connections

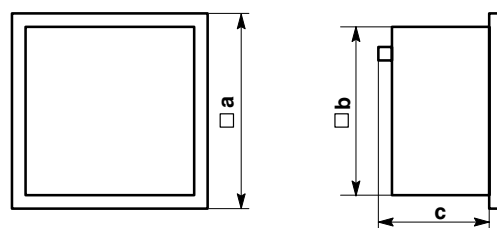
#### two AC voltages



#### one AC voltage



### Dimensions



dimensions (in mm)	FQ 96 /2	FQ 144 /2
a	96	144
b	90	137
c	66	58

## Ordering Information

<b>type</b> FQ	reed-type frequency meter
<b>front dimensions</b> 96 144	96 mm x 96 mm 144 mm x 144 mm
<b>version</b> /2	two movements
<b>measuring ranges</b>	refer to preceding table
<b>rated voltage</b>	refer to preceding table
<b>window</b>	glass <sup>1)</sup> non-glaring glass
<b>colour of bezel</b>	black (similar to RAL 9005) <sup>1)</sup> gray (similar to RAL 7037)
<b>position of use</b>	vertical <sup>1)</sup> on request 15 ... 165° <sup>2)</sup>
<b>increased mechanical loads</b>	shock 30 g, 11 ms vibration 5 g, 5 ... 55 Hz
<b>climatic suitability</b>	class 2, -25 ... +40°C <sup>1)</sup> class 3, -10 ... +55°C
<b>marine application</b>	none <sup>1)</sup> non-certified
<b>enclosure code</b>	IP 52 <sup>1)</sup> IP 54 splash-water protected front
<b>terminal protection</b>	none <sup>1)</sup> full-sized rear cover <sup>3)</sup> protective sleeves
<b>terminals</b>	screws M3 x 6 and wire clamps <sup>1)</sup> connector blades 6.3 x 0.8
<b>reed arrangement</b>	vertical <sup>1)</sup> horizontal
<b>dial</b>	scale division & measuring range alike <sup>1)</sup> additional lettering on request <sup>2)</sup> additional figuring on request <sup>2)</sup> coloured marks red, green or blue <sup>2)</sup> coloured sector red, green or blue <sup>2)</sup>
<b>logo</b>	WEIGEL <sup>1)</sup> none OEM logo <sup>2)</sup>

<sup>1)</sup> Standard

<sup>2)</sup> Please clearly add the desired specifications.

<sup>3)</sup> FQ 96 /2 only

### ordering example

FQ 96 /2. measuring range 2x 45 ... 50 ... 55 Hz,  
rated voltage AC 230 V, window non-glaring glass, no logo

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– specifications subject to change without notice; date of issue 12/10 –

