

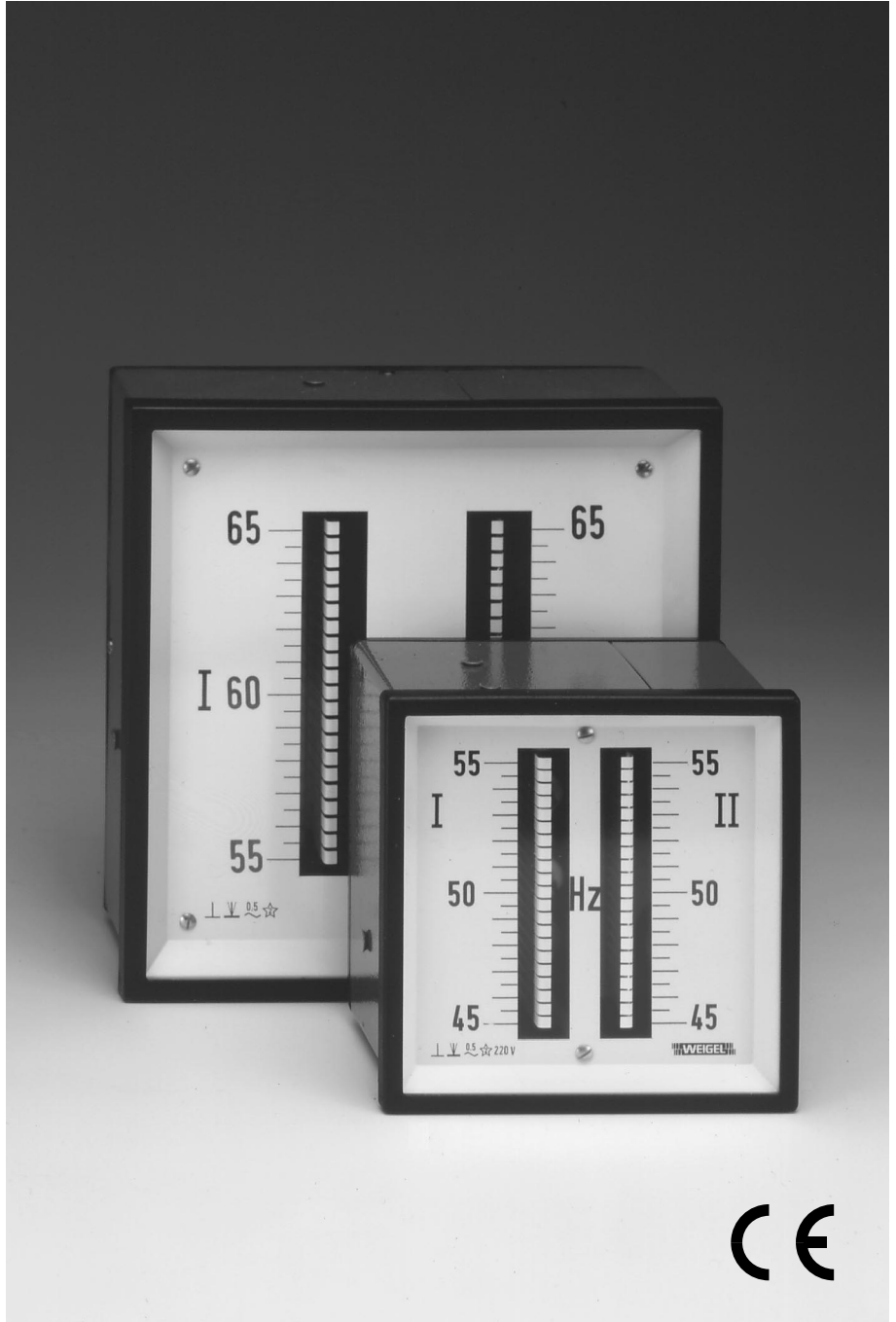


Data Sheet

M – Series
031.D.101.03

Analog Meters Reed – Type Double Frequency Indicator

FQ 96 / 2
FQ 144 / 2



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 ^{+0.8} mm	□ 138 ⁺¹ mm
weight approx.	0.65 kg	1.0 kg

Electrical Data

measuring units two frequencies

overload capacity (acc. to DIN EN 60 051)
continuously 1.2 times rated voltages
5 s max. 2 times rated voltages

protection class I

enclosure code IP 52 case
IP 00 for terminals without protection against accidental contact
IP 20 for terminals protected against accidental contact

excess voltage category CAT II

pollution level 2

operating voltage 600 V

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 per movement
FQ 96 /2 FQ 144 /2

100 V < 1.1 VA < 1.1 VA

110 V < 1.1 VA < 1.1 VA

230 V < 1.2 VA < 1.2 VA

400 V < 2.0 VA < 1.8 VA

500 V < 2.5 VA < 2.4 VA

600 V < 2.9 VA < 2.9 VA

Scaling

scale division coarse-fine

reed arrangement vertical

Accuracy at Reference Conditions

accuracy class 0.5 acc. to DIN EN 60 051

reference conditions

ambient temperature 23°C \pm 1K

position of use nominal position $\pm 1^\circ$

input rated measuring value

others DIN EN 60 051

influence quantities

ambient temperature -25°C ... +23°C ... +40°C

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

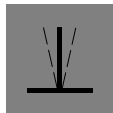
operating temperature range -25 ... +40°C

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



Analog Meters Reed–Type Double Frequency Indicator

Rules and Standards

DIN 43 700	measuring and control instruments for panel mounting; nominal case and cutout dimensions
DIN 43 701	electrical switchboard instruments
DIN 43 718	bezels and front panels
DIN 43 802	scales and pointers for electrical measuring instruments
DIN 16 257	nominal position of use and position symbols applicable for measuring instruments
DIN 40 050	enclosure codes; protection of electrical equipment against ingress of solid foreign bodies and of water
DIN EN 60 051	direct acting indicating electrical measuring instruments and their accessories
DIN EN 61 010	safety requirements for electrically operated measuring, control and laboratory equipment
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	on request 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
with operating temperature range	–10 ... +55° C
marine application	non–certified
enclosure code	IP 54 splash–water protected front

dial

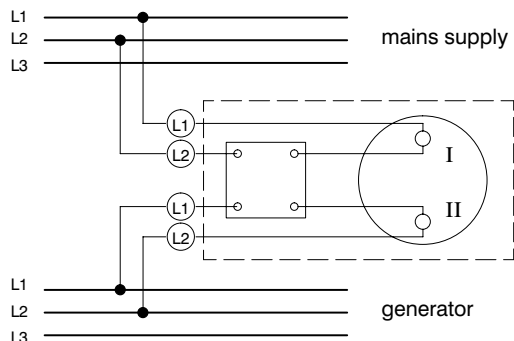
reed arrangement	horizontal
additional lettering	on request e.g. "generator"
additional figuring	on request
coloured marks	red, green or blue for important scale values
coloured sector	red, green or blue within scale division
logo on the dial	none or on request

accessories

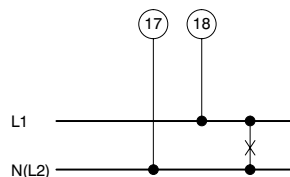
terminal protection against accidental contact	full–sized rear cover or protective sleeves SW6
terminals	connector blades 6.3 x 0.8

Connections

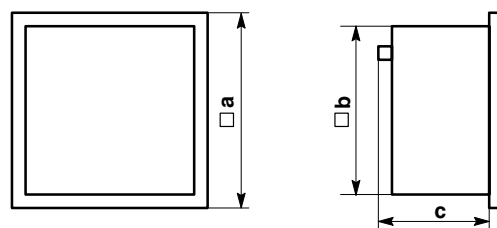
two AC voltages



one AC voltage



Dimensions



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

Ordering Information

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

*) standard

**) Please clearly add the desired specifications.

***) 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

– specifications subject to change without notice; date of issue 04/03 –

WEIGEL – MESSGERÄTE GmbH

P.O.B. 720 154 • D-90241 Nürnberg • Telephone: 0911 / 423 47-0
Erlenstraße 14 • D-90441 Nürnberg • Fax: 0911 / 423 47-39
Internet: <http://www.weigel-messgeraete.de>
e-mail: vertrieb@weigel-messgeraete.de

