

Analogue Meters FQ0x07 series

 **FQ - Moving-iron panel instruments
with exchangeable scales
FQ0107, FQ0207, FQ0307, FQ0407 &
FQ0507¹⁾**

- For measurement of AC currents and voltages
- Good read-out survey on larger distance
- Moving-coil Panel instruments with exchangeable scales
- Resistance to mechanical vibrations
- Protective cover for terminals (optional)

PROPERTIES

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APPLICATION

Moving-iron instruments are intended for installation in supervision panels of power distribution stations and transformer stations or wherever a.c. voltages and currents are to be measured in heavy-current installation. The incorporated moving-iron mechanism measures r.m.s. values of a.c. currents in frequency range 15 to 100 Hz, independent of curve shape, on requests and voltages.

CONSTRUCTION

The mechanism is a sprung pivot bearing type with silicon oil damping.

Non-linear graduations at the beginning of the scale allows reading from approximately 15 % of measuring range onwards.

Ammeters also have indicator range for double value of rated current (overcurrent scale) whereby the overload range is non-linearly graduated. Both versions are available. For milliammeters the measuring and indicator ranges coincide.

The special case design allows quick dial exchange for either new or old model. This is especially suitable for instruments which are connected to current or voltage transformers (x A/1 A, x A/5 A, x V/100 V, x V/110 V).

THE EXCHANGEABLE SCALE HAS A NUMBER OF ADVANTAGES:

- quick and simple adaptation of the instrument to variable user technical requirements
- shorter delivery time
- allows flexible planning

SHIP'S VERSION

Special versions are available for panel mounting into ships. These are mechanically resistant and additionally sealed instruments which comply with the requirements of Lloyd registers. The instrument case is marked by an anchor: ⚓ and a capital letter L at the end of the type designation. (e.g. FQ0207L)

¹⁾ For assembly FQ0507 rail mounting according to DIN 46277 and EN 50022. Bezel measures are 45x45 mm. Technical data are the same as for FQ0407.

²⁾ At reference conditions for size 96x96 (FQx207) and 144x144 mm (FQx107) only.

TECHNICAL DATA

ACCURACY:

Accuracy class	1.5 (standard)
Accuracy – on request	1.0 ²⁾ (optional)

DESIGN:

Material of housing:	PC unflammable, according to UL 94 V-0
Enclosure protection:	Case IP 52, terminal contacts IP 00 (IP 20 for connection terminals) according to EN 60529
Operating position	Vertical
Installation category (Vrms):	CAT III 600 V (FQ0407 CAT II 600 V/ III 300 V)
Consumption:	Ammeters 0.3 ... 1.2 VA Voltmeters 1.5 ... 4 VA

AMBIENT CONDITIONS

JVF (DIN 40 040)

Climatic conditions:	Standards EN 60051-1 EN 60051-2 EN 60051-9
Temperature:	
Reference range of operation	+18 ... +28°C
Nominal range of operation	-25 ... +55°C
Storing	-40 ... +70°C
Humidity	up to 80% (without condensing)

MEASURING RANGE:

AMMETERS²⁾:

Measuring range (mA)				100	150	250	400	600					
Measuring range (A)				1	1.5	2.5	4	6	10	15	25	40 ¹⁾	60
Measuring range (A)		x A / 1 A	x A / 5 A	for connection to instrument transformer									

VOLTMETERS:

Measuring range (V)									6	10	15	25	40	60	100	150	250	400	600	
Measuring range (V)																		400	500	600
		x V / 100 A	x V / 110 V	for connection to instrument transformer																

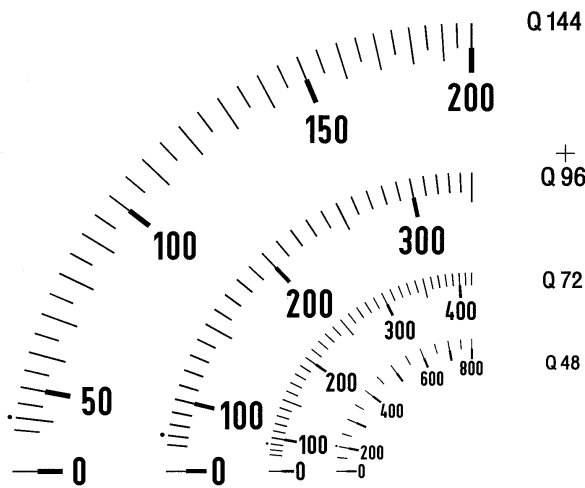
¹⁾ Not available for size 48x48 mm

²⁾ Available also with 100% overload

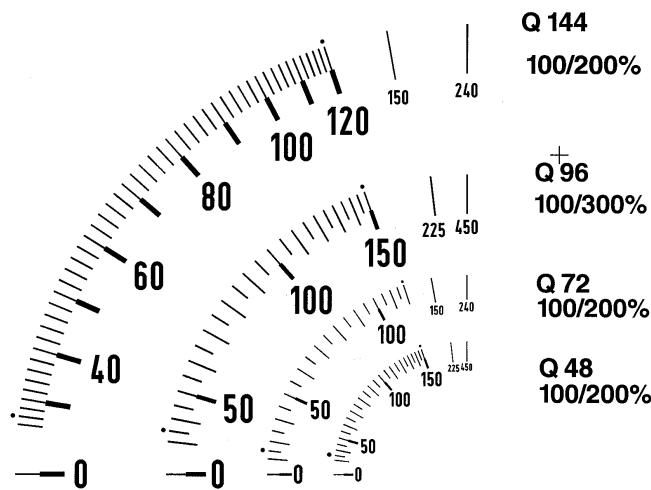
Instruments for connection to instrument transformers have the following measuring ranges:

1 – 1.2 – 1.5 – 2 – 2.5 – 3 – 4 – 5 – 6 – 7.5 (8) and decade multiples.

SCALE



Picture 1: Drawing of scale: FQ0107, FQ0207, FQ0307, FQ0407 & FQ0507 (voltmeters, ammeters)

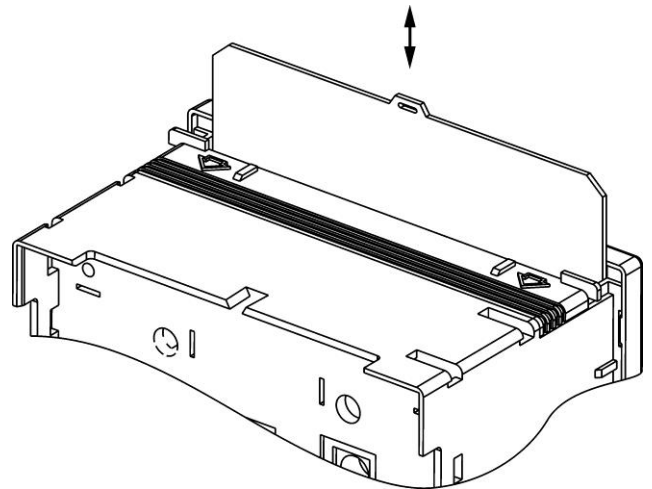


Picture 2: Drawing of scale: Version with overload (ammeters)

EXCHANGING OF SCALES

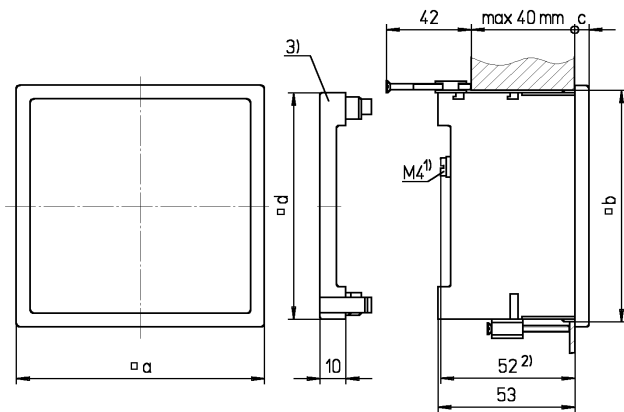
Press the cover, on top of the instrument, in the direction of the arrow and extract the scale with a suitable tool. After exchanging the scale, carefully close the opening with the cover.

The instrument must be disconnected during the dial exchange procedure.



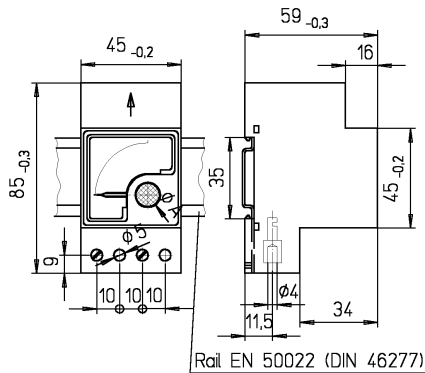
Picture 3: Exchanging of scales

DIMENSIONAL DRAWING



Picture 4: Dimensional drawing FQ0107, FQ0207, FQ0307 and FQ0407 (all dimensions are in mm)

- 1) Range 30 to 40 A M6
- 2) Range 30 to 40 A 59 mm
- 3) Protective cover (on special request)



Picture 5: Dimensional drawing FQ0507 (all dimensions are in mm)

DATA FOR ORDERING

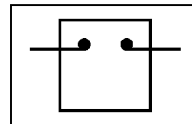
- Instrument type,
- Measuring range and scale,
- Transmission ratio of instrument transformer.

Type		FQ0107	FQ0207	FQ0307	FQ0407	FQ0507
Bezel (mm)	□ a	144	96	72	48	45
Panel cut-out (mm)	□ b	138 ^{+1.0}	92 ^{+0.8}	68 ^{+0.8}	45 ^{+0.6}	--
Bezel height (mm)	c	8.0	5.5	5.5	5.0	--
Protect cover (mm)	□ d	90	90	66.5	42.5	--
Scales length (mm)		135	92	62	41	41
Weight approx. (kg)		0.4	0.2	0.18	0.14	0.14

Table 1: Dimensions and weight

CONNECTION

Instruments with measuring ranges above 15 A must be connected as per lower drawing.
For different wire connections an inaccurate reading may be obtained.



Picture 6: Instruments with measuring ranges above 15 A

ORDERING EXAMPLE:

- Voltmeter FQ0207, 0 - 600 V
- Voltmeter FQ0207, 110/0.1 kV - 150 kV
- Ammeter FQ0207, 250/5 A - 250 A
- Ammeter FQ0207, 1500/5 A - 3000 A (overcurrent scale)

When ordering scales, state same data as when ordering the instrument.

- Scale for ammeter FQ0207; 250/5 A - 250 A
- Scale for ammeter FQ0207, 1500/5 A - 3000 A (overcurrent scale)

ORDERING CODE

*Standard version.

Type	Class	Zero Position	Unit	Rating	Frequency Range	Finish	Window	Dial	Illuminated Scale	Index Type	Zero Adjuster Colour	Frame Colour	Protection Cover	Mounting Position
FQ0x07	X	X	X	X	X	X	X	X	X	X	X	X	X	X
														A 30° B 60° C 0° - Horizontally S 90° - Vertically *
														N No Y Yes*
														S Black *
														S Black * W White
														D Double Scale S Single Scale *
														N No * A 6 V B 12 V C 24 V
														N Bianco Dial S Standard with Scale * W Black, White Scale X No Dial Y Black, Yellow Scale
														A Clear Glass * B Clear Glass + Red Adj. Index D Anti-Glare + Red Adj. Index L Anti-Glare Glass P Polycarbonate Panel R Polycarbonate + Red Adj. Index
														A Standardna * G HVE + IP54 H HVE (Tropical Seal) M Inc. Mech. Resistance P IP54 R Ship Ver. + IP54 S Ship Ver. T Ship Ver. + HVE
														S 15-100 Hz
														100 120 150 200 250 300 400 500 600 1 1.2 1.5 2 3 4 5 6 7.5 8 10 12 15 20 25 30 40 50 60 6 8 10 12 15 20 30 40 50 60 75 80 100 120 132 150 200 250 300 400 500 600
														mA " 100 ... 600 _A " 1 ... 60 _V " 6 ... 600
														Left Hand Zero *
														H cl. 1 S cl. 1.5 *
FQ0107														Front frame (mm) 144x144
FQ0207														Front frame (mm) 96x96
FQ0307														Front frame (mm) 72x72
FQ0407														Front frame (mm) 48x48

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