



## ⚡ FQ - MOVING-IRON PANEL INSTRUMENTS

### FEATURES:

- For measurement of AC currents and voltages
- Good read-out survey on larger distance
- Exchangeable dial
- Resistance to mechanical vibrations
- Protective cover for terminals (optional)



Picture 1: Ammeters and voltmeters for a.c. current and voltage FQ0107, FQ0207, FQ0307, FQ0407, FQ0507<sup>1)</sup>

### 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 (xA/1A, xA/5A, xV/100V, xV/110 V).

#### The exchangeable dial 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)

<sup>1)</sup>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.

### TECHNICAL DATA

#### ACCURACY:

- accuracy class 1,5

#### 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**: 1989
- Operating position Vertical
- Test voltage 2 kV rms  
in accordance with **EN 61010-1**: 1990
- Consumption: Ammeters 0.3 ... 1.2 VA  
Voltmeters 1.5 ... 4 VA

#### AMBIENT CONDITIONS JVF (DIN 40 040)

- Climatic conditions: Standards **EN 60051-1**: 1995/01  
**EN 60051-2**: 1984  
**EN 60051-9**: 1988
- 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:**

**Ammeters<sup>2)</sup>**

Measuring range (mA)				100	150	250	400	600				
Measuring range (A)			1	1,5	2,5	4	6	10	15	25	40 <sup>1)</sup>	60
Measuring range (A)	xA / 1 A	xA / 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)	xV / 100V	xV / 110V													for connection to instrument transformer

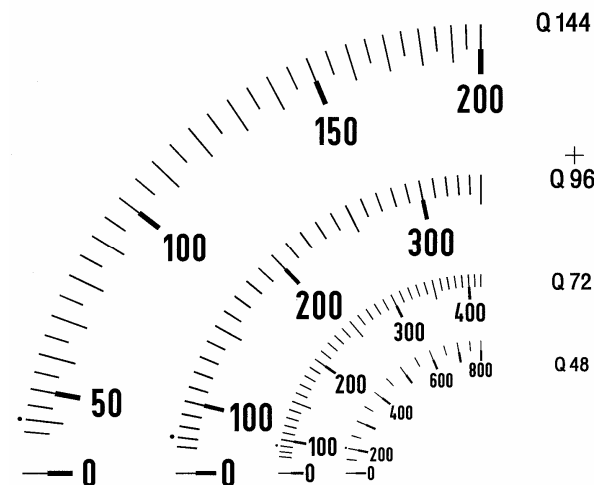
<sup>1)</sup> Not available for size 48x48 mm

<sup>2)</sup> Available also with 100% overload

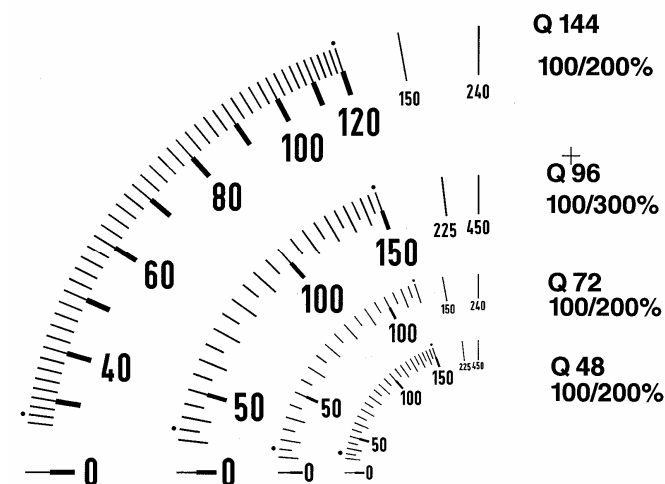
Instruments for connection to instrument transformers have the following measuring ranges:

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

**SCALE**



Picture 2: Drawing of scale: Normal version (voltmeters, ammeters)

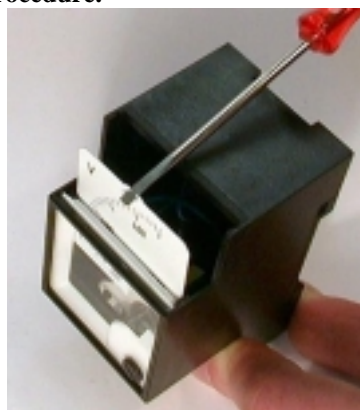


Picture 3: Drawing of scale: Version with overload (ammeters)

**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.**



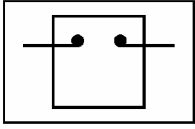
Picture 4: Exchanging of scales



Picture 5: Exchanging of dial

## 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 DATA:

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

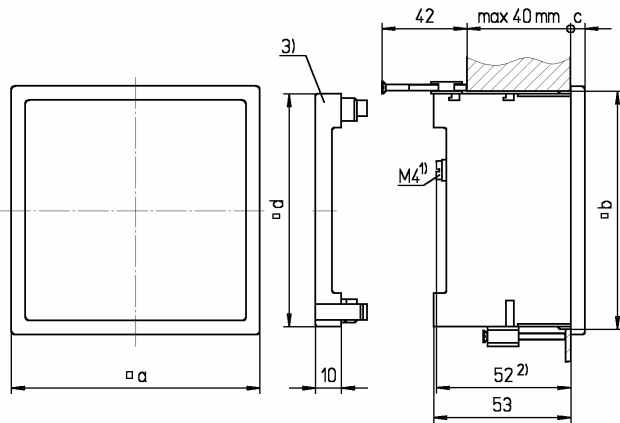
## ORDERING EXAMPLE:

- 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.

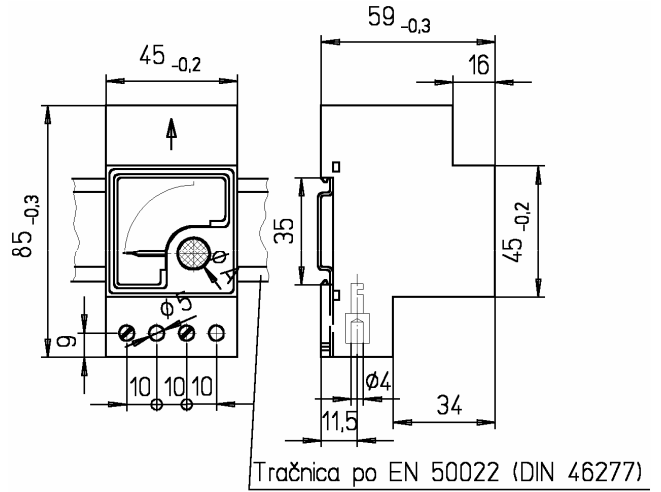
- Scale for ammeter FQ0207; 250/5 A - 250 A
- Scale for ammeter FQ0207, 1500/5 A - 3000 A (overcurrent scale)

## DIMENSIONAL DRAWINGS:



Picture 7: Dimensional drawing FQ0107, FQ0207, FQ0307 in 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 8: Dimensional drawing FQ0507 (all dimensions are in mm)

Type		FQ0107	FQ0207	FQ0307	FQ0407	FQ0507
Bezel height (mm)	□ a	144	96	72	48	45
Panel cut-out (mm)	□ b	138 <sup>+1,0</sup>	92 <sup>+0,8</sup>	68 <sup>+0,8</sup>	45 <sup>+0,6</sup>	--
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



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