

# ZQ0107, ZQ0207, ZQ0307, ZQ0407 ZQ2107, ZQ2207 and ZQ2307

## Pointer frequency meters with exchangeable scales

### ⚓ ZQ - POINTER FREQUENCY METERS WITH EXCHANGEABLE SCALES

#### FEATURES:

- Small self-consumption
- Electronic frequency measuring method
- Exchangeable dial
- Protective cover for terminals (optional)
- Power supply from measuring circuit

#### APPLICATION

Pointer frequency meters are designed for measurement of mains voltage frequency within the range of 45 Hz to 65 Hz. They are provided for mounting into supervision panels of power distribution stations (power plants, transformer distribution stations...) or wherever technical frequency measurement is required.

#### LAYOUT AND MODE OF OPERATION

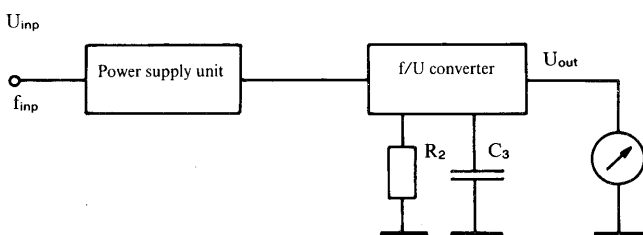
The frequency meter circuit consist of power supply unit, a frequency-voltage converter and analog display. The input section is an integral part of the power supply unit. The frequency meter is powered supplied from the input voltage converter input is provided with a pulse former. At the transition of voltage through zero the  $C_3$  measuring capacitor is charged or discharged with average current value that is proportional to the measured frequency:

$$i = C_3 \times U_{imp} \times f_{imp}$$

$i$  the current introduced via  $R_2$  resistor causes voltage drop, which results in the following output voltage

$$U_{out} = R_2 \times C_3 \times k \times U_{imp} \times f_{imp} = R_2 \times i$$

Special casing design enables quick replacement of the scale both in case of a new or an already used instrument, e.g. in case of instrument transformation to some other input voltage or measuring range.



Picture 2: Block diagram



Picture 1: Power factor meter ZQ0207, ZQ2207

#### Ship version (only ZQ0107, ZQ0207 and ZQ0307)

Special "ship version" are delivered for building into ships. These are mechanically resistive instruments, which correspond to the rules of construction of sea-going ships. The instrument case is marked by an anchor: ⚓ and a capital letter **L** at the end of the type designation.

#### Special versions

On special demand it is possible to deliver pointer frequency meters with measuring ranges (lower limit 10 Hz, upper limit 450 Hz) and rated input voltages different from specified. The accuracy class depends on the measuring range.

#### TECHNICAL DATA

##### ACCURACY:

- accuracy class:
 

45...55 Hz, 48...52 Hz, 55...65 Hz	class 0.5
45...65 Hz	class 1

##### 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  
according to **EN 61010-1: 1990**

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

- Climatic conditions:
 

Standards <b>EN 60051-1: 1995/01</b>	
<b>EN 60051-2: 1984</b>	
<b>EN 60051-9: 1988</b>	
- 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)

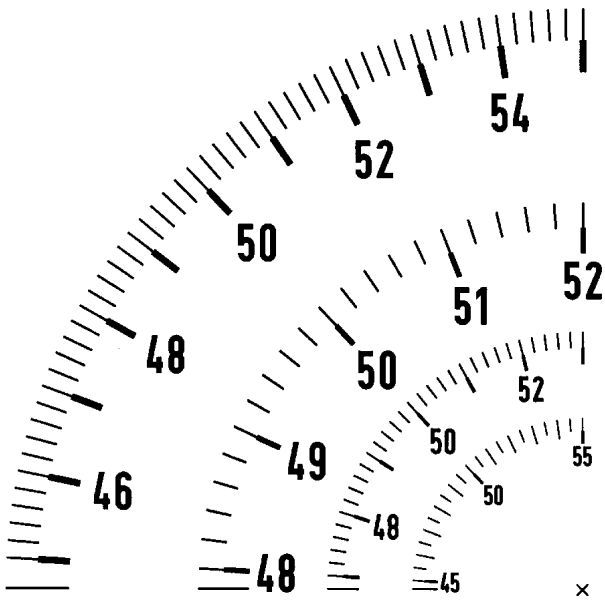
## MEASURING RANGE:

Measuring range	Input voltage	Type
45...55 Hz, 55...65 Hz, 48...52 Hz, 45...65 Hz	100V, 110V, 230V	ZQ0107, ZQ0207, ZQ0307, ZQ2107, ZQ2207, ZQ2307
	400V, 500V	ZQ0407

Table 1: Measuring range

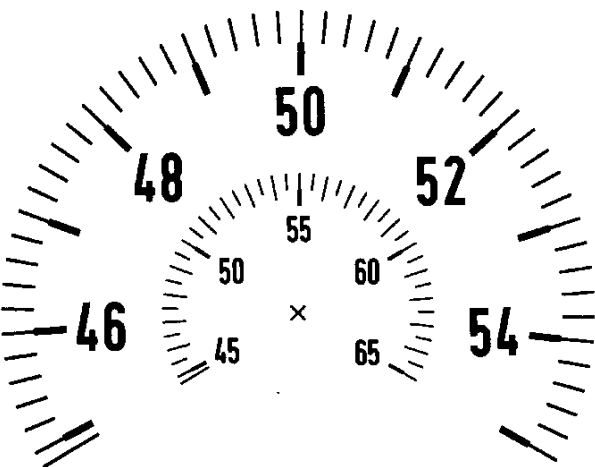
## SCALE:

- Scale for: ZQ0X07 meters



Picture 3: Drawing of scale for ZQ0X07

- Scale for: ZQ2X07 meters

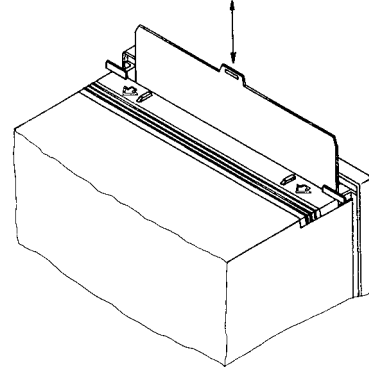


Picture 4: Drawing of scale for ZQ2X07

## 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 switched off during the exchange procedure.**



Picture 4: Exchanging of scales



Picture 5: Exchanging of scales

## ORDERING INFORMATION

For ordering it is necessary to declare type of the instrument (ZQxx07), measuring range and rated input voltage (voltage according to Table 1). When ordering "ship version" it is necessary to state beside the main ordering information "ship's version" and a capital letter L at the end of the type designation.

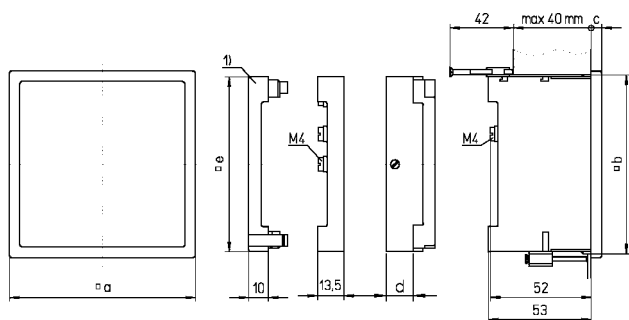
### ORDERING EXAMPLE:

- ZQ0107 45...55 Hz, 230V
- ZQ0107L 45...55 Hz, 230V, ship's version

When ordering scales the same data as in case of ordering the instrument must be state.

On special demand a protective cover against live parts is provided.

## DIMENSIONAL DRAWINGS:



Picture 6: Dimensional drawing ZQ0107, ZQ0207, ZQ0307 and ZQ0407  
(all dimensions are in mm)

Type		ZQ0107	ZQ0207	ZQ0307	ZQ0407	ZQ2107	ZQ2207	ZQ2307
Bezel height (mm)	□ a	144	96	72	48	144	96	72
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>	92 <sup>+0,8</sup>	138 <sup>+1,0</sup>	92 <sup>+0,8</sup>
Bezel height (mm)	c	8,0	5,5	5,5	5,0	8,0	5,5	5,5
Base (mm)	□ d	27,3	27,3	27,3	27,3	27,3	27,3	27,3
Protect cover (mm)	□ e	90	90	90	90	240	240	240
Scales length (mm)		135	95	65	41	220	135	101
Dimensions		150x155x80	102x102x75	80x75x75	55x55x75	150x150x137	160x105x102	100x90x120

Table 1: Dimensions and weight



Otoče 5a  
SI-4244 Podnart  
Slovenia  
Tel.: +386 4 5359 100  
Fax: +386 4 5359 205  
E-mail: [iskra-inst@siol.net](mailto:iskra-inst@siol.net)  
Internet: [www.iskra-inst.si](http://www.iskra-inst.si)

