

ANALOGUE METERS CQ0X07 CQ0107, CQ0207, CQ0307, CQ0407 & CQ0507¹⁾

- FOR MEASUREMENT OF AC CURRENTS AND VOLTAGES
- LINEAR SCALE
- GOOD READ-OUT SURVEY ON LARGER DISTANCE
-  CQ MOVING-COIL PANEL INSTRUMENTS WITH EXCHANGEABLE SCALES
- PANEL MOUNTED INSTRUMENTS WITH 90° SCALE
- RESISTANCE TO MECHANICAL VIBRATIONS
- PROTECTIVE COVER FOR TERMINALS

PROPERTIES

- For measurement of AC currents and voltages
- Linear scale
- Good read-out survey on larger distance
- Moving-coil Panel instruments with exchangeable scales
- Panel mounted instruments with 90° scale
- Resistance to mechanical vibrations
- Protective cover for terminals (optional)

APPLICATION

Instruments with moving-coil and rectifier are designed for mounting into supervision panels and A.C. current and voltage measuring equipment, where small internal consumption of the instrument is required. They are provided for measurement of A.C. currents and voltages of sinuous curve within a 40 ... 65 Hz frequency range.

CONSTRUCTION

The instrument measure mean value of rectified current or voltage. The scale is expressed in effective values at sine form of the measure quantity. Distortion or deviation from the sine form for more than 1% entails additional errors.

Rectifying is based on the use of germanium diodes with very low reverse current. The instrument scale graduation is practically linear, only in case of voltmeters with measuring ranges below 10 V, the beginning of the scale is slightly squeezed. Ammeters are provided with a built-on transformer for measurement with measuring transformers .../1 A and .../5 A.

The instrument design enables quick replacement of the scale, therefore different scale versions are available for measurement of electrical and non-electrical quantities within the same measuring range. If, for example, with instruments that are connected via measuring transformers (1 A, 5 A, 100 V ranges), at unchanged value of the transformer secondary current the value of its primary current is changed, this does not require any replacement of the whole instrument but only of the scale. The same implies to the instruments that are connected to A.C. output of transducers.

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 VERSION

Special "ship version" is available for building into ships. These are mechanically resistive instruments which correspond to the rules of construction of seagoing ships (Bureau Veritas certified – except CQ0507). The instrument case is marked by an anchor: ⚓ and a capital letter L at the end of the type designation. (e.g. CQ0207L).

¹⁾ For assembly CQ0507 rail mounting according to DIN 46277 and EN 50022. Bezel measures are 45x45 mm. Technical data are the same as for CQ0407.

²⁾ At reference conditions for size 96x96 (CQ0207) and 144x144 mm (CQ0107) 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 (V _{rms})	III 600 V (V-meter 300-600 V) II 600 V/ III 300 V (all other type)

AMBIENT CONDITIONS:

Climatic conditions:	JVF (DIN 40040)
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)
Standards:	EN 60051-1 EN 60051-2 EN 60051-9

EU DIRECTIVES

Directive **2014/35/EU** on low voltage.

Directive **2014/30/EU** on electromagnetic compatibility.

Directive on RoHS 2011/65/EU.

MEASURING RANGE:

AMMETERS:

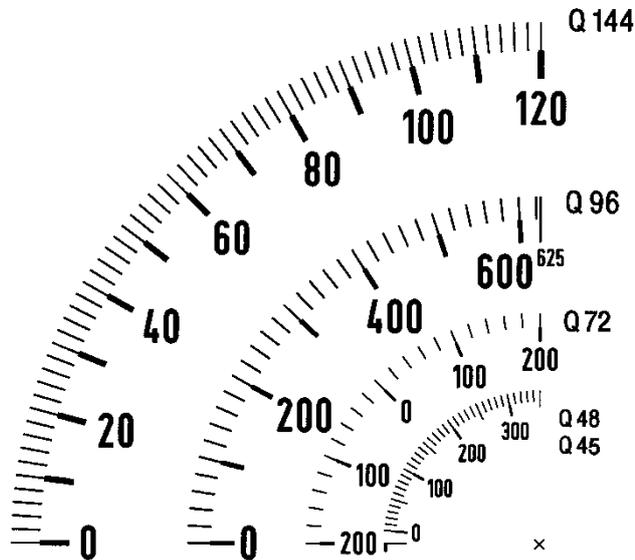
Measuring range (μA)	100 150 250 400 500 600
Voltage drop (V)	1.5 V
Measuring range (mA)	1 1.5 2.5 4 5 6 10
Voltage drop (V)	1.5 V
Measuring range (A)	1 5
Voltage drop (V)	0.1 V 0.03 V

VOLTMETERS:

Measuring range (V)	2.5 6 10 15 25 40 60 100 150 250
Sensitivity	1 k Ω / V
Measuring range (V)	400 500 600
Sensitivity	4 k Ω / V

Other measuring ranges available on special demand

SCALE

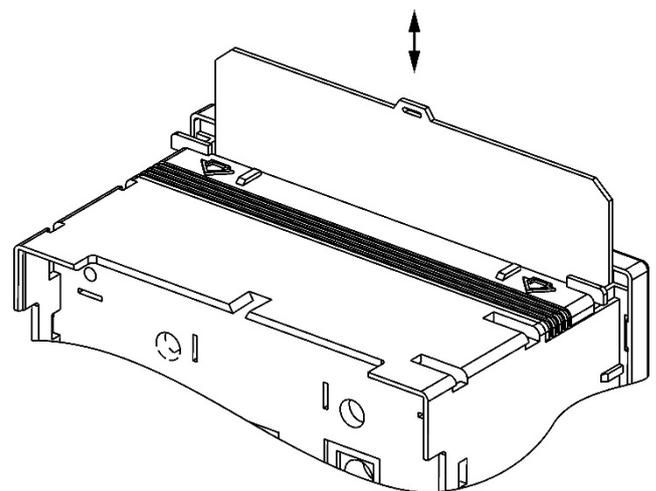


Picture 1: Drawing of scale: CQ0107, CQ0207, CQ0307, CQ0407, CQ0507 (voltmeters, ammeters)

EXCHANGING OF SCALES

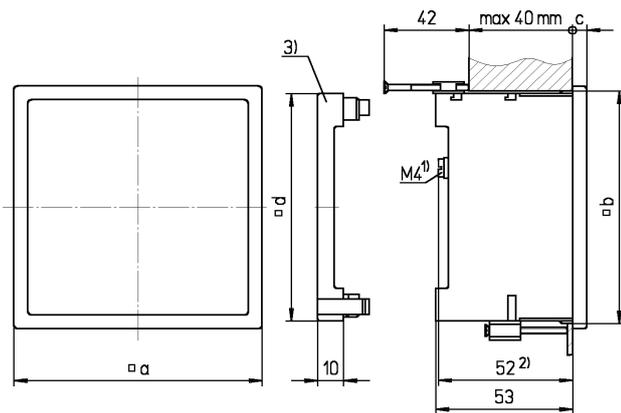
Press the cover, on top of the instrument, in the direction of the arrow and extract the scale with a suitable tool. After exchanging the scale, carefully close the opening with the cover.

The instrument must be disconnected during the dial exchange procedure.



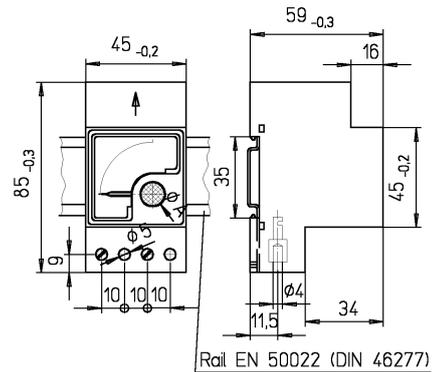
Picture 2: Exchanging of scales

DIMENSIONAL DRAWING



Picture 3: Dimensional drawing CQ0107, CQ0207, CQ0307 and CQ0407 (all dimensions are in mm)

- 1) Range 15 to 40 A M6
- 2) Range 15 to 40 A 59 mm
- 3) Protective cover (on special request)



Picture 4: Dimensional drawing CQ0507 (all dimensions are in mm)

Type		CQ0107	CQ0207	CQ0307	CQ0407	CQ0507
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

DATA FOR ORDERING

- Instrument type,
- Measuring range and scale.

ORDERING EXAMPLE FOR STANDARD VERSION:

- CQ0207 voltmeter, 60 V, 0 ... 60 V scale
- CQ0207 milliammeter, 2.5 mA, 0 ... 10 m/s scale

For ordering only the scale state the same data as in case of ordering the instrument.

- Scale for CQ0207 voltmeter, 60 V, 0 ... 60 V scale
- Scale for CQ0207 milliammeter, 2.5 mA, 0 ... 10 m/s scale

WITH CODE:

CQ0307SL_A7D5SAASNSSSYS

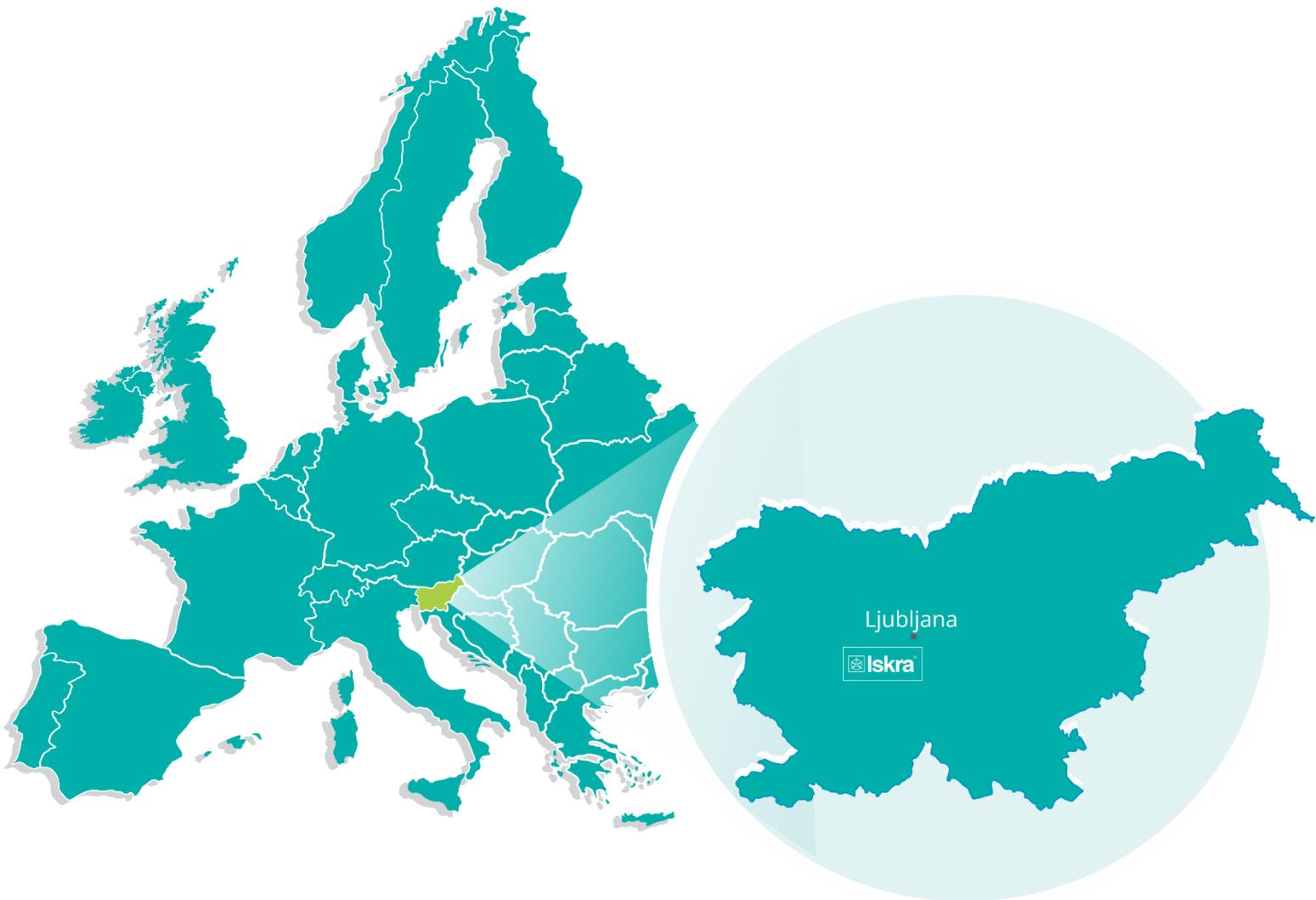
- CQ0307** Type
- S** Class 1.5
- L** Left zero position
- _A** Unit
- 7D5** Rating
- S** 40-65 Hz
- A** Standard finish
- A** Standard window
- S** Standard dial
- N** Without illuminated
- S** Single scale
- S** Black zero adjuster
- S** Black frame
- Y** With protection cover
- S** Vertically mounting position

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
CQ0x07	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 ¹
														D Double Scale S Single Scale *
														N No *
														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 ¹ D Anti-Glare + Red Adj. Index ¹ L Anti-Glare Glass P Polycarbonate Panel R Polycarbonate + Red Adj. Index ¹
														A Standardna * G HVE + IP54 ¹ H HVE (Tropical Seal) M Inc. Mech. Resistance P IP54 ¹ R Ship Ver. + IP54 ¹ S Ship Ver. T Ship Ver. + HVE
														S 40-65 Hz
														1 1.2 1.5 2 3 4 5 6 7.5 8 10 12 15 20 25 30 40 50 60 75 80 100 120 150 200 250 300 400 500 600 800
														uA rating selection limits 100 ... 800 mA " 1 ... 10 _A " 1 ... 7.5 _V " 2.5 ... 600
														Left Hand Zero *
														H cl. 1 S cl. 1.5 *
CQ0107														Front frame (mm) 144x144
CQ0207														Front frame (mm) 96x96
CQ0307														Front frame (mm) 72x72
CQ0407														Front frame (mm) 48x48
CQ0507														Front frame (mm) 45x45

¹ IP54 is not available with Red. Adj. Index and White Zero Adjuster



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