

## *Analogue Meters BQ0x07 series*

### **BQ - Moving-coil Panel instruments BQ0107, BQ0207, BQ0307, BQ0407 & BQ0507<sup>1)</sup>**

- For measurement of DC 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

## PROPERTIES

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

## APPLICATION

These instruments are designed for mounting into supervision panels of power distribution or transformer stations where D.C. current and voltage measuring instrument is required.

## CONSTRUCTION

The measuring system includes a core magnet, which is insensitive to external fields. The moving-coil is mounted on spring bearings, therefore the measuring system is highly resistive to mechanical shocks and vibrations. The scale graduation is practically linear throughout the whole range.

Special instrument design enables quick replacement of the scale both in case of a new or an already used instrument. This is especially suitable for instruments that are connected to a transducers with standard type current output or to separate shunts with rated voltage drop (e.g. 60 mV).

### 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. BQ0207L)

<sup>1)</sup> For assembly BQ0507 rail mounting according to DIN 46277 and EN 50022. Bezel measures are 45x45 mm. Technical data are the same as for BQ0407.

<sup>2)</sup> At reference conditions for size 96x96 (BQ0207) and 144x144 mm (BQ0107) only.

## TECHNICAL DATA

### ACCURACY:

Accuracy class	1.5 (standard)
Accuracy – on request	1.0 <sup>2)</sup> (optional)

### DESIGN:

Material of housing:	PC uninflammable, according to <b>UL 94 V-0</b>
Enclosure protection:	Case IP 52, terminal contacts IP 00 (IP 20 for connection terminals) according to <b>EN 60529</b>
Operating position	Vertical
Installation category (Vrms)	<b>III 600 V</b> (V-meter 300-600 V) <b>II 600 V/III 300 V</b> (all other type)

### AMBIENT CONDITIONS

### JVF (DIN 40 040)

Climatic conditions:	Standards <b>EN 60051-1</b> <b>EN 60051-2</b> <b>EN 60051-9</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:**

**AMMETERS:**

Measuring range ( $\mu\text{A}$ )		40 <sup>3)</sup>	60 <sup>3)</sup>	100	150	250	400	600	
Internal resistance ( $\Omega$ )	BQ0107-0307	5650	4710	2260	1930	990	350	150	
	BQ0407, BQ0507	3820	2750	2060	1050	1050	405	177	
Measuring range (mA)		1	1.5	2.5	4	5	6	10 4-20	
Internal resistance ( $\Omega$ )	BQ0107-0307	65	25	10.8	5.9	4.3	3.6	2.6 75 <sup>5)</sup>	
	BQ0407, BQ0507	69	30	12.5	6.5	5	4.1	3 75 <sup>5)</sup>	
Measuring range (mA)		15	20	25	40	50	60	100 150 250 400 600	
Voltage drop (mV)									60mV
Measuring range (A) <sup>4)</sup>		1	1.5	2,5	4	5	6	10 15 20 25 40 60 100	
Voltage drop (mV)									60mV

**VOLTMETERS:**

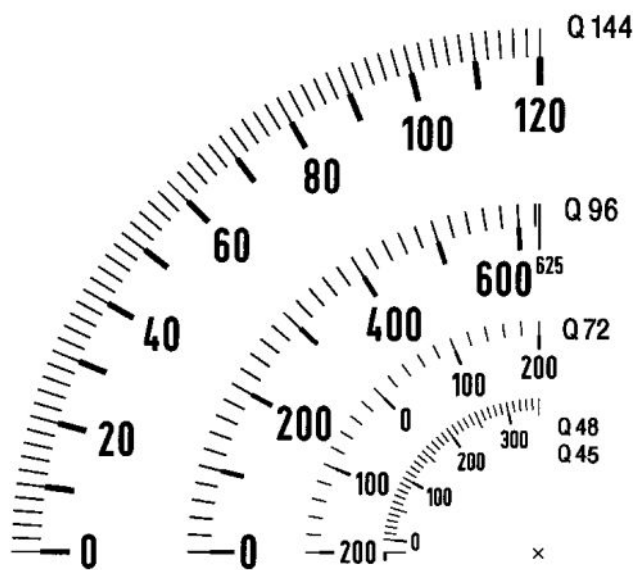
Measuring range (mV)		100	150	250	400	600										
Measuring range (V)		1	1.5	2.5	4	6	10	15	25	40	60	100	150	250		
Sensitivity														1 k $\Omega$ /V		
Measuring range (V)														400	500	600
Sensitivity														4 k $\Omega$ /V		

<sup>3)</sup> For horizontal mounting only

<sup>4)</sup> Measuring ranges above 60 A, (25 A at BQ0407) with separate shunt only, calibrated to 0.035  $\Omega$  connection wire resistance, current through a meter approx. 5mA

<sup>5)</sup> Electrical suppressed zero

**SCALE**

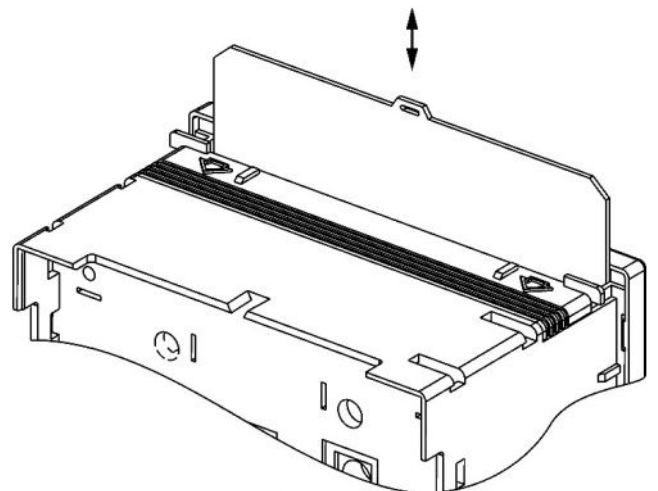


Picture 1: Drawing of scale: BQ0107, BQ0207, BQ0307, BQ0407, BQ0507 (voltmeters, ammeters)

**EXCHANGING OF SCALES**

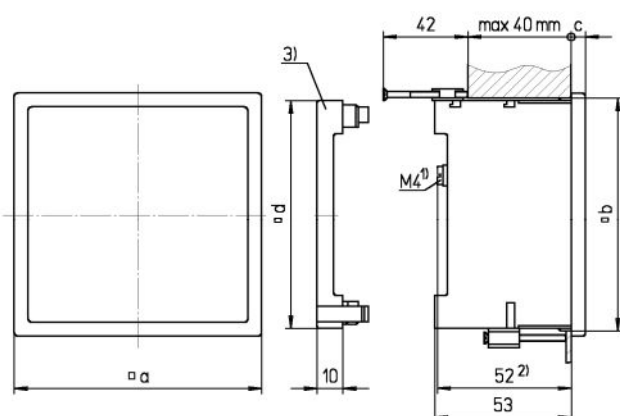
Press the cover, on top of the instrument, in the direction of the arrow and extract the scale with a suitable tool. After exchanging the scale, carefully close the opening with the cover.

**The instrument must be disconnected during the dial exchange procedure.**



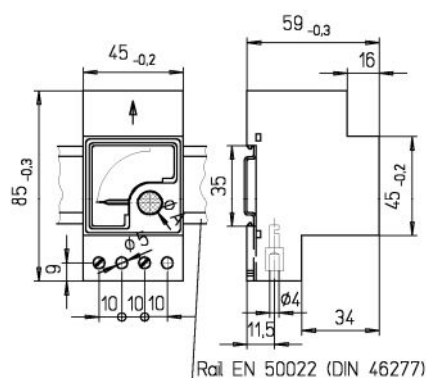
Picture 2: Exchanging of scales

## DIMENSIONAL DRAWING



Picture 3: Dimensional drawing BQ0107, BQ0207, BQ0307 and BQ0407 (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 BQ0507 (all dimensions are in mm)

Type		BQ0107	BQ0207	BQ0307	BQ0407	BQ0507
Bezel (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

## DATA FOR ORDERING

- Instrument type,
- Measuring range and scale.

### ORDERING EXAMPLE FOR STANDARD VERSION:

- BQ0207 voltmeter, 150 V, 0 ... 150 V scale
- BQ0207 milliammeter, 10 mA, 0 ... 10 mA scale
- BQ0207 ammeter, 60 mV, for connection to separate 1500 A/60 mV shunt, 0 ... 1500 A scale
- BQ0207 ammeter, 0 ... 10 mA, for connection to temperature transducer 0 ... 100 °C scale.

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

- Scale for BQ0207 voltmeter, 150 V, 0 ... 150 V scale
- Scale for BQ0207 milliammeter, 10 mA, 0 ... 10 mA scale
- Scale for BQ0207 ammeter, 60 mV, for connection to separate 1500 A/60mV shunt, 0 ... 1500 A scale
- Scale for BQ0207 ammeter, 0 ... 10 mA, for connection to temperature transducer 0 ... 100 °C scale

On special demand a protective cover against live parts is provided. When ordering "ship's version" it is necessary to state beside the main dates still "ship's version" and a capital letter L at the end of the type designation.

### EXAMPLES FOR SHIP'S VERSION ORDER:

- Voltmeter, ship's version, BQ0207 L, 150 V, scale 0 ... 150 V.

### WITH CODE:

**BQ0307SL\_A7D5AASNSSSYS**

<b>BQ0307</b>	Type
<b>S</b>	Class 1.5
<b>L</b>	Left zero position
<b>_A</b>	Unit
<b>7D5</b>	Rating
<b>A</b>	Standard finish
<b>A</b>	Standard window
<b>S</b>	Standard dial
<b>N</b>	Without illuminated
<b>S</b>	Single scale
<b>S</b>	Black zero adjuster
<b>S</b>	Black frame
<b>Y</b>	With protection cover
<b>S</b>	Vertically mounting position

**ORDERING CODE**

\*Standard version.

Type	Class	Zero Position	Unit	Rating	Finish	Window	Dial	Illuminated Scale	Index Type	Zero Adjuster Colour	Frame Colour	Protection Cover	Mounting Position
<b>BQ0x07</b>	X	X	X	X	X	X	X	X	X	X	X	X	X
													<b>A</b> 30° <b>B</b> 60° <b>C</b> 0° - Horizontally <b>S</b> 90° - Vertically *
													<b>N</b> No <b>Y</b> Yes*
													<b>S</b> Black *
													<b>S</b> Black * <b>W</b> White
													<b>D</b> Double Scale <b>S</b> Single Scale *
													<b>N</b> No *
													<b>N</b> Bianco Dial <b>S</b> Standard with Scale * <b>W</b> Black, White Scale <b>X</b> No Dial <b>Y</b> Black, Yellow Scale
													<b>A</b> Clear Glass * <b>B</b> Clear Glass + Red Adj. Index <b>D</b> Anti-Glare + Red Adj. Index <b>L</b> Anti-Glare Glass <b>P</b> Polycarbonate Panel <b>R</b> Polycarbonate + Red Adj. Index
													<b>A</b> Standardna * <b>G</b> HVE + IP54 <b>H</b> HVE (Tropical Seal) <b>M</b> Inc. Mech. Resistance <b>P</b> IP54 <b>R</b> Ship Ver. + IP54 <b>S</b> Ship Ver. <b>T</b> Ship Ver. + HVE
													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
													<b>uA</b> rating selection limits 100 ... 800 <b>mA</b> " 1 ... 800 <b>_A</b> " 1 ... 7.5 <b>_V</b> " 1 ... 600
													<b>Left Hand Zero *</b>
													<b>H</b> cl. 1 <b>S</b> cl. 1.5 *

- BQ0107** Front frame (mm) 144x144
- BQ0207** Front frame (mm) 96x96
- BQ0307** Front frame (mm) 72x72
- BQ0407** Front frame (mm) 48x48
- BQ0507** Front frame (mm) 45x45