EA16, EB16, EA17, EA19, EA12

MOVING-IRON METERS
Ammeters and Voltmeters



EA12



EA19


EA17


EA16


EB16

APPLICATION

EA16, EB16, EA17, EA19 and EA12 moving-iron meters are intended for measuring AC voltage or AC current. These meters measure the true RMS value and their indications are highly independent of the measured value curve shape.

EA16, EA17, EA19 and EA12 meters are designed for mounting into panels with thickness not exceeding 25 mm in the holes according to figure 3 and 4. EB16 meters are adapted for a fast assembly rail mounting (35 mm rail) in compliance with EN 60715 standards.

EA16, EA17 and EA19 meters are designed to interchangeable dials.

TECHNICAL DATA

Accuracy class 1.5

Measuring ranges, self-consumption, front frame dimensions, length of scale, weight acc. to tab. 1, 2

Rated operating conditions:

- ambient temperature 5...23...55°C
- relative air humidity 25...85%
- frequency of measured quantity 40...45...65...72 Hz

Execution of ammeters normal scale version or version with 100% overload. Other overcurrent scale, on request after agreement.

Additional errors according to EN 60051-2

The interchangeable scale
The interchangeable scale is inserted and removed by the sliding gap in the top or side of the housing.

Categories of meter climatic versions
If it is not written otherwise in the order, these meters are intended to use in moderate climatic conditions.
On customers' request, meters can be adapted to use in conditions of a dry or wet tropical climat.
Then, they are marked with the T III symbol.

Requirements concerning safety acc.EN 61010-1 standard:

- installation category III
- pollution degree 2
- maximal phase-earth working voltage 600 V (for EA17, EA19, EA12)
  300 V (for EA16)

Electromagnetic Compatibility:

- meters meet requirements CE mark
- noise immunity acc. to EN 61000-6-2
- noise emissions acc. to EN 61000-6-4

Electrical overload:

- long-term 120% In, 120% Un
- short-time current measurement 10 times for 5s (max. 200A for EA16)
- short-term voltage measurement 2 times for 5s (max. 1000V)

Impact resistance

- peak acceleration 15 g
- duration of impact 11 ms

Shock resistance

- range of vibration frequency 10-55-10Hz
- vibration amplitude 0.15 mm (corresponds to 1.5 g at 50 Hz)

Protection Grade acc. to EN 60529 ensureb by:

- case: standard IP 52
  custom-made **IP 65 - EA19, EA17, EA16**
- terminals IP 20

Case material thermoplastic material, self-extinguishing plastic (UL 94V-O)

Meter glass material glass (in standard) anti-reflective glass on request

ACCESSORIES

Screw holders - 2 pcs. (for EA16, EA17, EA19) or 4 pcs. (for EA12).
Terminal protection cover (not applicable to EB16).

Additional setting pointer
On customers' request EA17 and EA19 meters can be equiped with an additional. setting red pointer fixed on the glass.

AC CURRENT AND AC VOLTAGE DIRECT MEASUREMENT RANGES

Table 1

Frontal frame dimensions [mm]	**48 x 48*)**	**72 x 72**	**96 x 96**	**144 x 144**
Scale lenght [mm]	41	63	97	146
Weight [kg]	0.1	0.16	0.2	0.4
Type	**EA16, EB16**	**EA17**	**EA19**	**EA12**
Measuring range	self-consumption			
100 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
150 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
250 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
400 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
600 mA	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
1 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
1.5 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
2.5 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
4 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
6 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
10 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
15 A	< 0.8 VA	< 0.8 VA	< 0.8 VA	< 0.8 VA
25 A	< 0.8 VA	< 0.8 VA	< 0.8 VA	< 0.8 VA
40 A	–	< 0.8 VA	< 0.8 VA	< 0.8 VA
60 A	–	< 0.8 VA	< 0.8 VA	< 0.8 VA
100 A	–	< 0.8 VA	< 0.8 VA	< 0.8 VA
For a transformer. Measuring ranges acc. to table 2 (for current and voltage ranges)				
... x/1 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
... x/5 A	< 0.5 VA	< 0.5 VA	< 0.5 VA	< 0.5 VA
6 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
10 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
15 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
25 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
40 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
60 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
100 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
150 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
250 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
400 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
500 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
600 V	< 4.5 VA	< 4.5 VA	< 4.5 VA	< 4.5 VA
800 V [1)]	–	< 4.5 VA	< 4.5 VA	< 4.5 VA
1000 V [1)]	–	< 4.5 VA	< 4.5 VA	< 4.5 VA
For a transformer. Measuring ranges acc. to table 5				
.../100 V		< 4,5 VA	< 4,5 VA	< 4,5 VA
.../110 V		< 4,5 VA	< 4,5 VA	< 4,5 VA

*) It concerns EA16 meters, for the frontal frame dimensions of EB16 meters, see Fig.1.

[1)]Applies only to phase-to-phase voltage measurements in a 3-phase network

MEASURING RANGES WITH MEASURING TRANSFORMERS

Table 2

Ammeters			Voltmeters	
Measuring range	Transformer		Measuring range	Transformer
1 A	–	1/1	**4 kV**	3000/100 V
5 A	5/5	5/1	**6 kV**	6000/100 V
6 A	6/5	6/1	**10 kV**	10 000/100 V
6 A	5/5	–	**15 kV**	15 000/100 V
10 A	10/5	10/1	**20 kV**	20 000/100 V
15 A	15/5	15/1	**40 kV**	30 000/100 V
20 A	20/5	20/1	**60 kV**	60 000/100 V
30 A	30/5	30/1	**150 kV**	150 000/100 V
40 A	40/5	40/1	**250 kV**	250 000/100 V
50 A	50/5	50/1	**400 kV**	400 000/100 V
60 A	60/5	60/1		
80 A	75/5	–	**4 kV**	4000/100 V
100 A	100/5	100/1	**8 kV**	6000/100 V
150 A	150/5	150/1	**20 kV**	15 000/100 V
200 A	200/5	200/1	**150 kV**	110 000/100 V
300 A	300/5	300/1	**250 kV**	220 000/100 V
400 A	400/5	400/1		
500 A	500/5	500/1		
600 A	600/5	600/1		
800 A	800/5	–		
1 kA	1000/5	1000/1		
1.2 kA	1200/5	1200/1		
1.5 kA	1500/5	1500/1		
2 kA	2000/5	2000/1		
3 kA	3000/5	3000/1		
4 kA	4000/5	4000/1		
5 kA	5000/5	5000/1		
6 kA	6000/5	6000/1		
8 kA	8000/5	8000/1		
10 kA	10 000/5	10 000/1		

For meters that work with current transformers, the lumel company can provide transformers as part of the assembly.

ORDERING PROCEDURE

In the order one must specify: name and type of meter, measuring range, measuring transformer data - if the meter is foreseen to co-operate with a measuring transformer, kind of climat - only for tropical or similar to marine version, kind of holders - only for EA16 meters and eventual additional requirements.

Example of order:
EA17 voltmeter, measuring reange 500 V, direct measurement, scale according to the scope wtihout additional requirements.

EXTERNAL DIMENSIONS

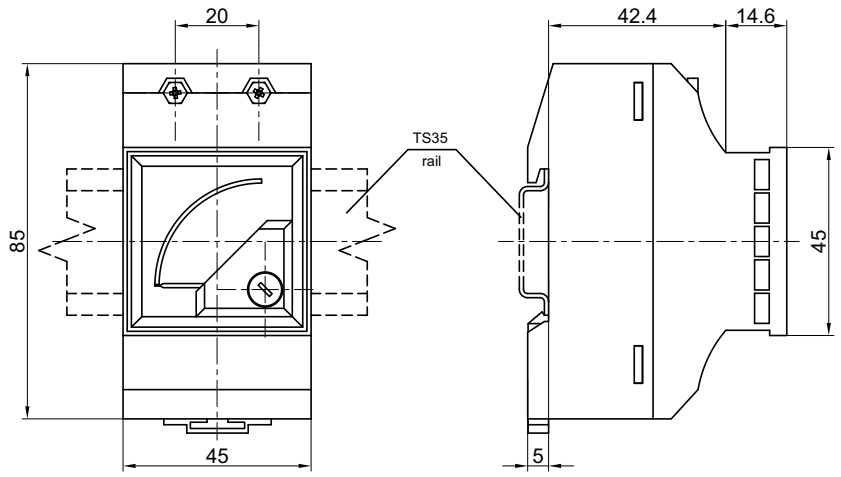


Fig. 1. External dimensions of EB16.

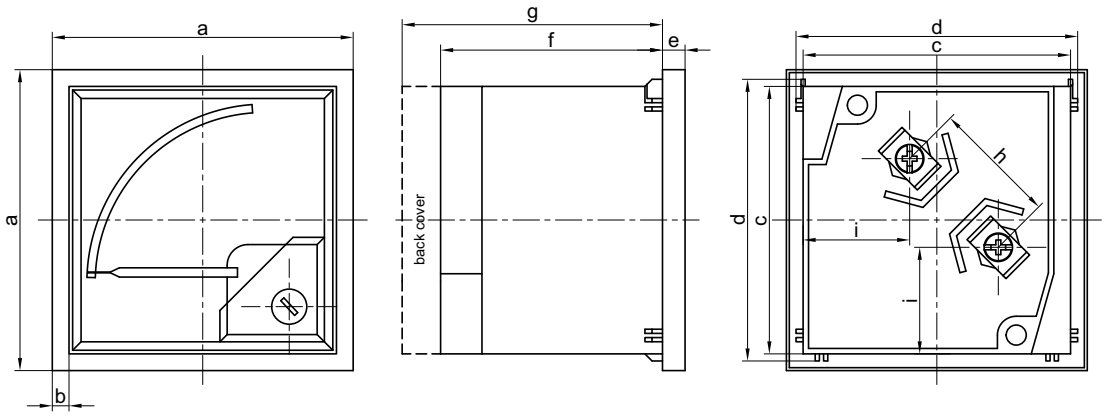


Fig. 2. External dimensions of EA16, EA17, EA19, EA12.

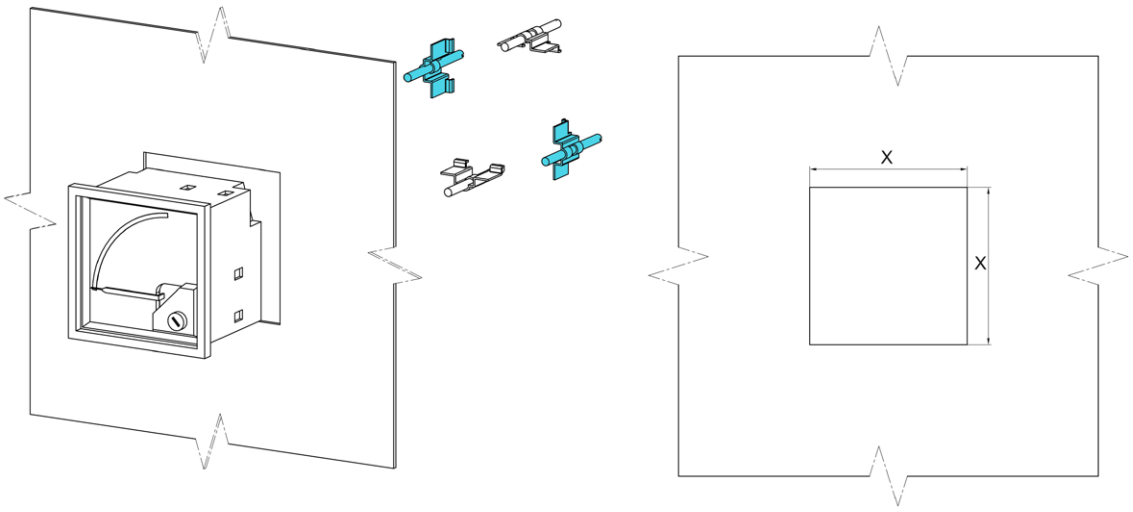


*Fig. 3. Panel mounting way of EA16, EA17, EA19 (version IP52)**

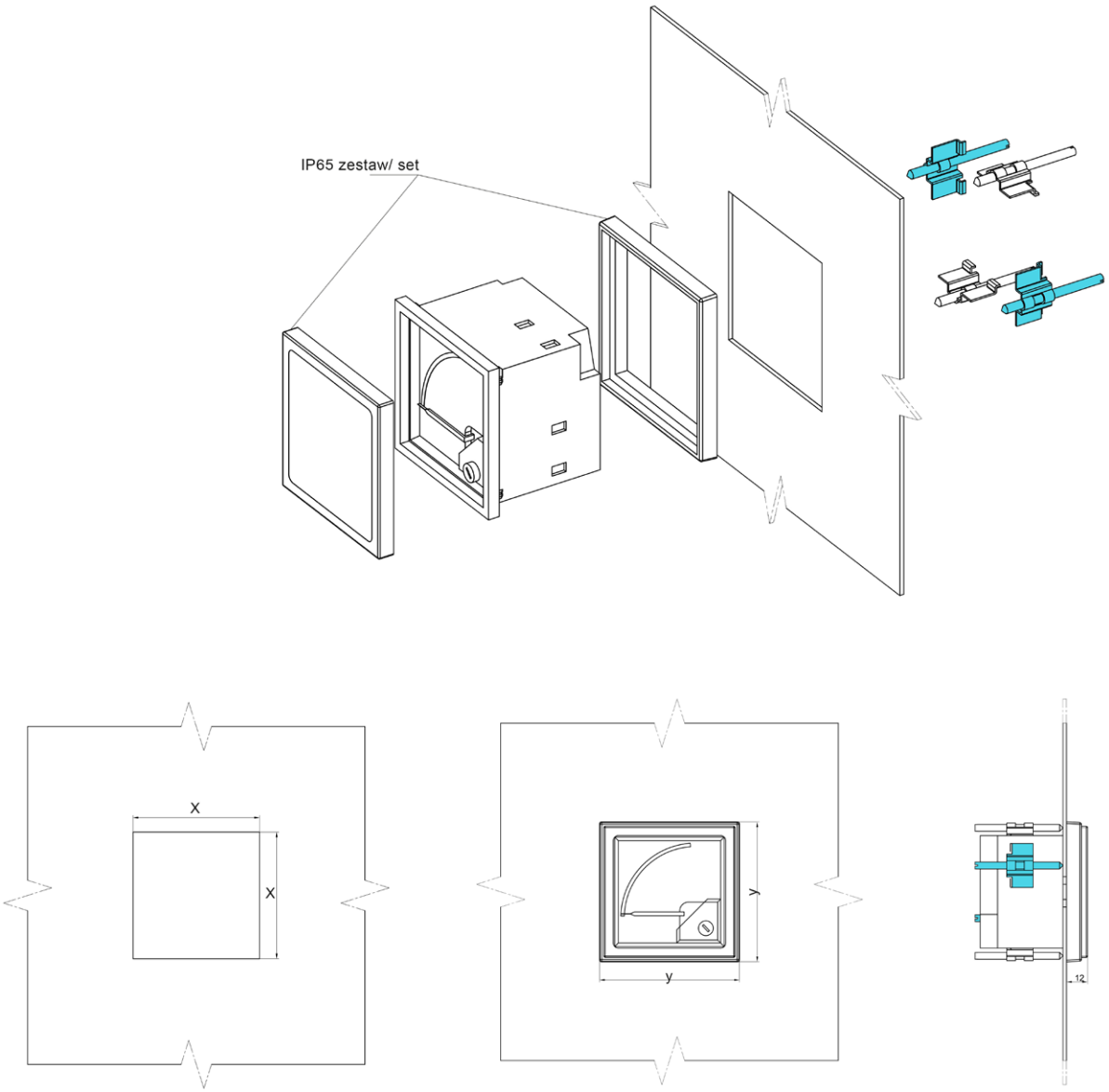


Fig. 4. Panel mounting way of EA16, EA17, EA19 (version IP65) *

*** Included are 2 screwdrivers. Use them on two opposite sides of the meter.***

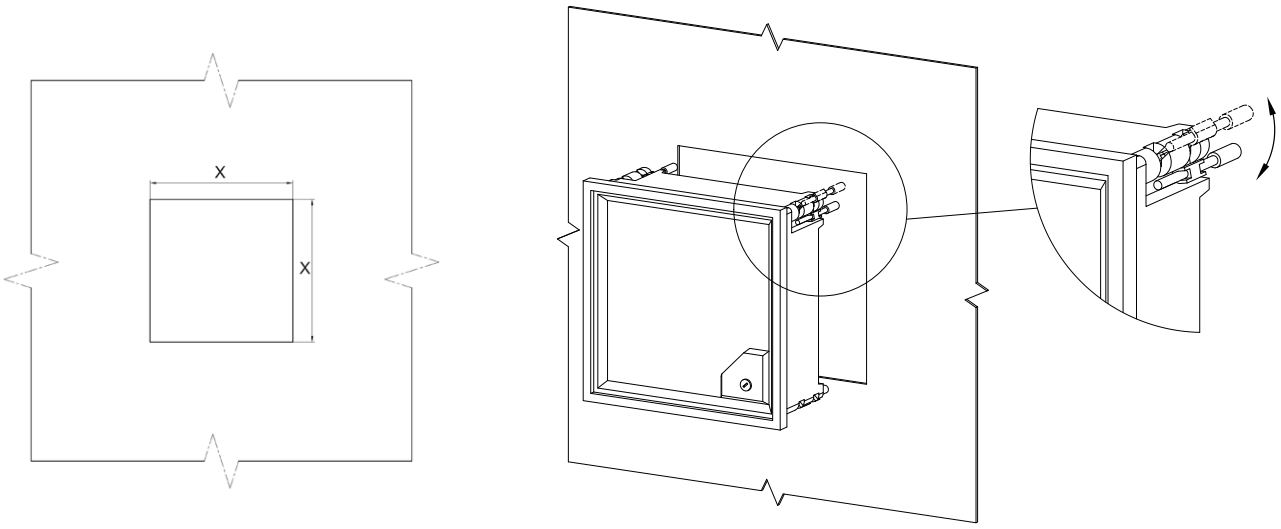


Fig. 5. Panel mounting way of EA12 (version IP52)

External dimensions of EA16, EA17, EA19, EA12 [mm]

Type	a	b	c	d	e	f			g			h	i	x	y
						<30A	30-60A	>60A		>30A	>60A				IP65 set
EA16	48	3	43,8	44.8	5.5	53	62	67	64	75		18.7	21.6	$45^{+0.6}$	54.8
EA17	72	4	64	67.5	5.5	53	62	67	64		69.5	30	25.7	$68^{+0.7}$	79.6
EA19	96	4	88	91.5	5.5	53	62	67	64		69.5	30	27.2	$92^{+0.8}$	103.6
EA12	144	5,5	136	137.5	8.5	53	62	67	64		69.5	30	37	138^{+1}	lack

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