

LUMEL

MOVING-IRON VOLTMETERS with a change-over switch

EP27 (72 x 72 mm)

EP29 (96 x 96 mm)



SERVICE MANUAL

CE

MOVING-IRON VOLTMETERS

with a change-over switch

EP27 (72 x 72 mm)

EP29 (96 x 96 mm)

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1. APPLICATION

The EP27 and EP29 moving-iron panel voltmeters with a change-over switch are adapted for measuring line-to-line and phase-to-phase RMS voltages in 3-phase 4-wire power networks.

A six-positional switch installed on the meter frontal side enables the choice of the measured voltage in six different points of the network system.

2. BASIC REQUIREMENTS, USER'S SAFETY

These moving-iron voltmeters are destined to be installed on panels or switchboards.

They are in conformity with EN 61010-1: 1999 and EN 61010-1/A2:1999 standard requirements.

Remarks concerning the safety:

- The meter installation should be carried out by a qualified staff.
One must consider all accessible aspects of the protection
- Before the voltage switching on, one must check the correctness of meter connections.
- The disassembling of the meter case causes the cancellation of the granted guarantee.

3. OVERALL DIMENSIONS

Narrow frontal frame according DIN 43718

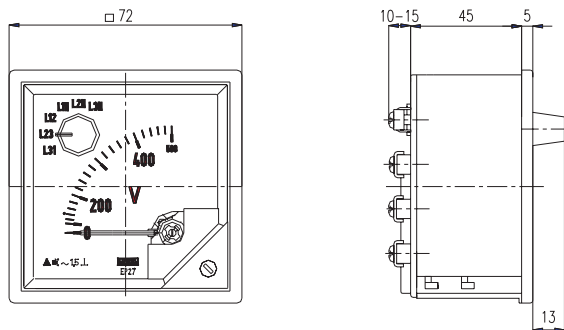


Fig. 1. Overall dimensions of the EP27 voltmeter

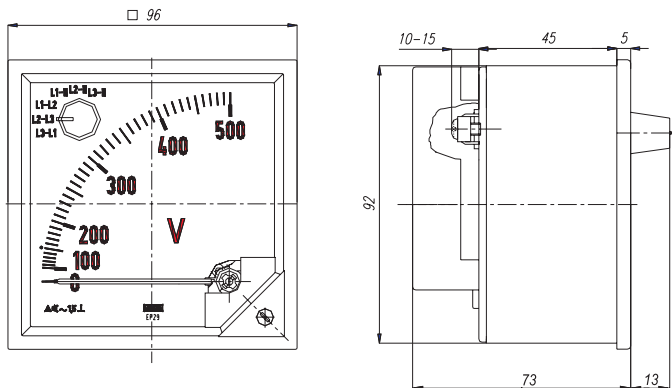


Fig. 2. Overall dimensions of the EP29 voltmeter

4. INSTALLATION IN THE PANEL AND FASTENING OF SCREW HOLDERS

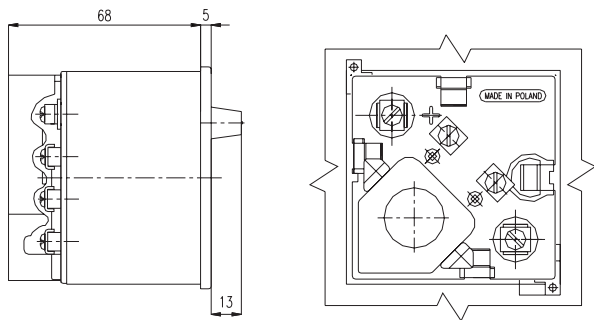


Fig. 3. Way of the EP27 voltmeter assembly on the panel.

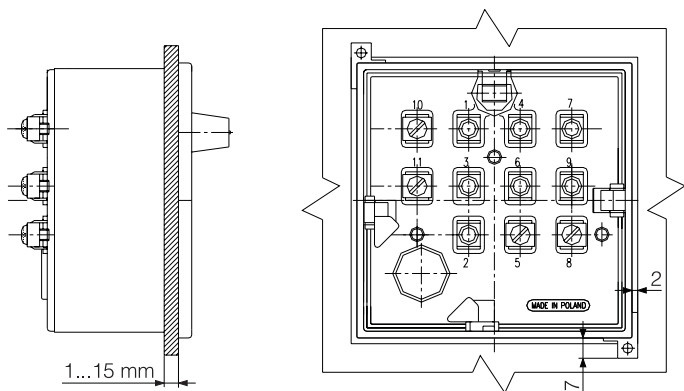


Fig. 4. Way of the EP29 voltmeter assembly on the panel.

One should prepare in the panel a hole at dimensions:

$68^{+0.7} \times 68^{+0.7}$ mm for the EP27 type

$92^{+0.8} \times 92^{+0.8}$ mm for the EP29 type.

The thickness of the material of which the panel is made, cannot exceed 15mm. The meter is fixed on the panel by two screw holders situated freely on opposite corners of the case.

The meter must be connected to the power network system according to the ordering code (see chapter 6 connection diagrams of external circuits).

These voltmeters can be mounted on panels or switchboards of any kind of materials.

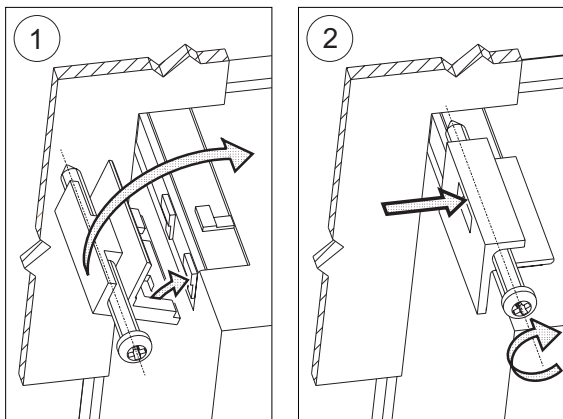


Fig. 5. Fastening of screw holders.

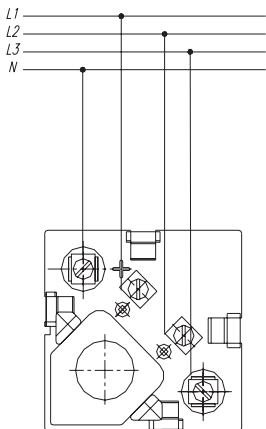
5. ACCESSORIES

We deliver together with the meter:

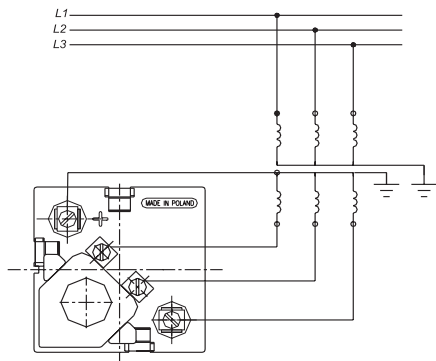
- two screw holders to fix the meter on the panel,
- a terminal cover (only for EP29 voltmeter),
- a voltage transformer (on request, if ordered),
- a service manual,
- a guarantee certificate.

6. CONNECTION DIAGRAMS OF EXTERNAL CIRCUITS

1) Connections of EP27 voltmeters:

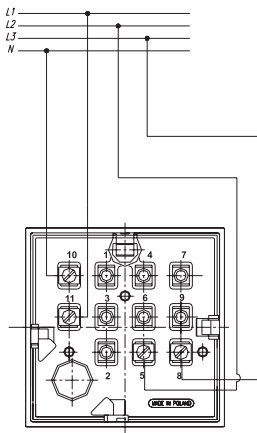


a) Direct connection

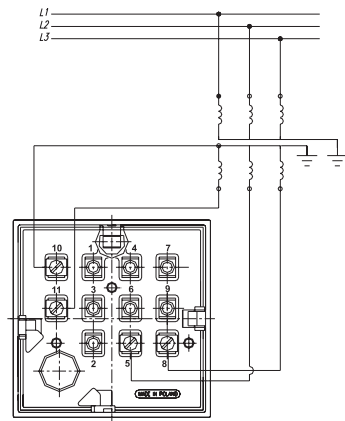


b) Connection through a voltage measuring transformer

1) Connections of EP29 voltmeters:



a) Direct connection



b) Connection through a voltage measuring transformer

7. TECHNICAL DATA

- **Frontal frame** narrow, acc. DIN 43718
EP27 - 72 x 72 mm, EP29 - 96 x 96 mm
- **Accuracy class** 1.5
- **Measuring range:**
 - for direct interfacial connection 500 V
 - at the position of the switch on L1-N, L2-N or L3-N 300 max
 - through a voltage transformer x/100 V or x/110 V
- **Working position** given on the meter $\pm 5^\circ$ (see table 1)
- **Panel material** any
- **Power consumption** ≤ 4.5 VA ($U_n = 500$ V)
- **Rated operating conditions:** acc. IEC-60051-1
 - ambient temperature 5...23...40°C
 - working position acc. order $\pm 5^\circ$ (given on the scale)
- **Additional errors in the limits of rated operating conditions** acc. IEC 60051-1
- **Working temperature range** These meters are working satisfactorily without damage in the temperature range from -25°C up to +40°C, acc. standards being in force. In this range, additional errors are not defined if they are not differently agreed with the customer.

- **Safety requirements** acc. EN 61010-1:1999
and EN 61010-1/A2:1999
 - installation category III
 - level of pollution 2
 - maximal working voltage
in relation to the earth 300 V a.c.

- **Protection grade:**
 - case IP 50
 - terminals IP 20 (with the terminal cover)

- **Electromagnetic compatibility:**

The EP27 and EP29 voltmeters fulfils CE mark requirements:

 - emission acc. EN50081-2
 - immunity acc. EN50082-2

- **External dimensions:**
 - EP27 72 x 72 x 78 mm
(without a terminal cover)
 - EP29 96 x 96 x 87 mm
(with a terminal cover)

- **Panel cut-out:**
 - EP27 $68^{+0.7} \times 68^{+0.7}$ mm
 - EP29 $92^{+0.8} \times 92^{+0.8}$ mm

- **Case material** ABS thermoplastics

- **Weight**
 - EP27 200 g (without a terminal cover)
 - EP29 290 g (with a terminal cover)

Category of climate executions

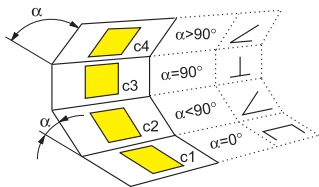
If it is not stipulated in another way, these meters are destined to be applied in closed rooms, without air conditioning systems and in conditions of a moderate climate acc. IEC-60051-1 standard.

On customers' request, these meters can be adapted to be applied in dry or wet tropical climate conditions and also in closed rooms without air conditioning.

Then, they are marked with the TIII symbol.

8. CODING OF THE WORKING POSITION

Table 1



Code	Working position
O	c3
A	c1
B	c2, $\alpha = 15^\circ$
C	c2, $\alpha = 30^\circ$
D	c2, $\alpha = 45^\circ$
E	c2, $\alpha = 60^\circ$
F	c2, $\alpha = 75^\circ$
H	c4, $\alpha = 105^\circ$
I	c4, $\alpha = 120^\circ$

9. ORDERING PROCEDURE AND CODING

MOVING-IRON PANEL VOLTMETERS EP27 and EP29 TYPES -	X	XXXX	X	XX	X
Climate version:					
tropical	M				
normal for climate zone N3	N				
tropical for climate zone T3	T				
Voltage range:					
acc. to the table 2		XXXX			
Working position:					
acc. to the table 1			X		
Version:					
standard				00	
custom-made ¹⁾				XX	
Acceptance test:					
without additional requirements					0
with a quality inspection certificate					1
other requirements ²⁾					2

¹⁾The number code is established by the producer.

²⁾Additional requirements must be agreed with the producer

Ordering example: code **EP27NC700C000** means:

an EP27 voltmeter with voltage range 1kV to co-operate with a 1000/100 V measuring voltage transformer, working position: $\alpha=30^\circ$ from the horizontal position, standard execution, without additional requirements.

Table 2

Measuring range	CT	Code	CT	Code	CT	Code
1 kV	1000/100V	C700				
7.5 kV	7500/100V	C701	6000/100V	C742		
10 kV	6000/100V	C702	6000/57.7V	C752	10 000/100V	E703
					10 000/110V	E803
15 kV	10 000/100V	C703	15 000/100V	E704	15 000/110V	E804
17.5kV	15 000/100V	C704				
40 kV	30 000/100V	E707	35 000/100V	C707	30 000/110V	E807
50 kV	50 000/100V	C708				
2.5 kV	2500/100V	C718				
25 kV	25 000/100V	C720	22 000/100V	C722	20000/57.7V	C756
18 kV	15 000/100V	C721				
132 kV	110000/100V	C723				
150 kV	100000/100V	C724	150 000/100V	E709	150 000/110V	E809
			110 000/100V	E723	110 000/110V	E823
110 kV	110000/100V	C725				
8 kV	6300/100V	C733	6000/100V	E721	6000/110V	E821
250 kV	220000/100V	C734	250 000/100V	E710	220 000/100V	E724
			250 000/110V	E810	220 000/110V	E824
450 kV	400 000/100V	C735				
400 kV	300 000/100V	C736	400 000/100V	E711	400 000/110V	E811
7.2 kV	6000/100V	C741				
12 kV	10 000/100V	C743				
6.3 kV	6300/57.7V	C751				
100 V		E611				
500 V		E615				
XV	X/100V	E7				
4 kV	3000/100V	E701	3000/110V	E801		
6 kV	6000/100V	E702	6000/110V	E802		
20 kV	20 000/100V	E705	15 000/100V	E722	20 000/110V	E805
					15 000/110V	E822
60 kV	60 000/100V	E708	60 000/110V	E808		
XV	X/110V	E8				

10. MAINTENANCE

The EP27 and EP29 voltmeters do not required any periodical maintenance.

In case of some incorrect meter working one should to take it down from the panel and turn over to a certified service workshop.

1. In the period of 12 months from the date of purchase:

One should take the meter down from the installation and return to the LUMEL's Quality Control Dept. If the unit has been used in compliance with the instructions, LUMEL S.A. guarantees to repair it free of charge.

2. After the guarantee period:

One should turn over the meter to repair in a certified service workshop. The disassembling of the unit housing causes the cancellation of the granted guarantee. Spare parts are available for the period of 10 years from the date of purchase.

Lumel S.A. reserves the right to make changes in design and specifications of any products as engineering advances or necessity requires.



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