



PA39 PANEL POWER METER

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APPLICATION

The PA39 power meter is a mowing-coil meter with a built-in measuring transducer. It is destined to measure active or reactive power in a.c. power networks. The measured power is indicated by a magnetoelectric (moving-coil) measuring system.

These meters are delivered in following versions:

- for measuring the active power in single-phase systems,
- for measuring the active or reactive power in three-phase three-wire or four-wire symmetrically or asymmetrically loaded systems,
- with the zero graduation on the left side of the scale for measuring the unidirectional power flow,
- with the zero graduation in the middle of the scale for measuring the bidirectional power flow.

TECHNICAL DATA

Measuring

ranges acc. the series 1, 1.2, 1.5, 2, 2.5, 3, 4, 5, 6, 7.5, 8,

or the decimal multiplication of one of these numbers

Input voltage $100 \sqrt{3} (x/100/\sqrt{3}), 100 (x/100),$

133, 230, 280, 400, 500, 690 V

Input current 1 A (x/1 A) or 5 A (x/5 A)

Active power factor $\cos \phi$: $1...0.5_{ind}$ Reactive power factor $\sin \phi$: $1...0.5_{ind}$

Accuracy class 1.5

Rated operating conditions:

- ambient temperature -10...<u>23</u>...55°C

- relative humidity ≤ 75%

- frequency of the

input quantities acc. order (table 2)
- working position acc. order \pm 5° (table 3)

Additional errors acc. EN 60051-1 standard

Power consumption:

- voltage circuit \leq 4.3 VA - current circuit \leq 0.2 VA

Protection Grade acc. to EN60529

- front protection grade: IP 52

- terminal protection: IP00

Housing material thermoplastic,

self-extinguishing plastic (UL 94V-O)

Glass material glass (in standard)

anti-reflective glass on request

Electromagnetic compatibility:

- emission acc. EN 61000-6-4 standard - immunity acc. EN 61000-6-2 standard

The meter fulfils CE mark requirements.

Safety requirements acc. EN 61010-1:

- installation category III - level of pollution 2

- working voltage

in relation to the earth 660 V a.c. **Weight** 650-750 g

ACCESSORIES

We deliver with the meter:

CHOICE OF MEASURING RANGE

1. Calculate the power from the formulas:

P = Un x Infor single-phase networks

 $P = \sqrt{3} \times U_n \times I_n$ for three-phase networks

where:

U - network rated voltage:

- for three-phase networks phase-to-phase voltage,
- when connected through transformers-primary rated voltage.

In - rated current:

- 5 A or 1 A,
- when connected through transformers-primary rated voltage.
- Round the calculated power value to the nearest value from the given sequence of numbers for the measuring range.
- 3. Example of measuring range choice.

Three-phase network; rated values of transformers:

15 000/100 V and 400/5 A

 $P = \sqrt{3} \times 15\,000 \text{ V} \times 400 \text{ A} = 10{,}39 \text{ MW (Mvar)}$

Selected measuring range: 10 MW (Mvar)



EXTERNAL DIMENSIONS

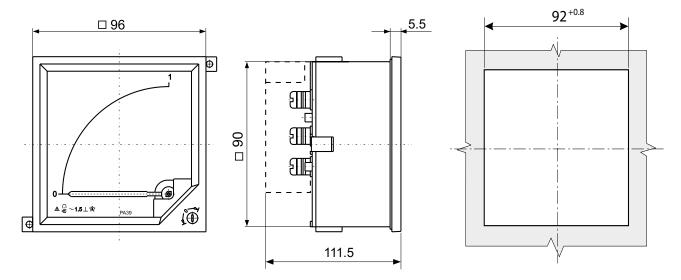


Fig 1. External dimensions of PA39 meter.

WAY OF THE METER FIXATION ON THE PANEL

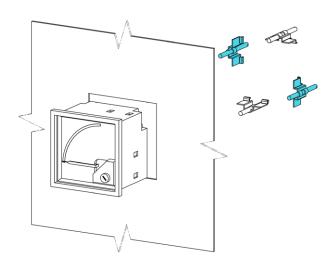


Fig. 2. Fixing of meters PA39in the panel.

Included are two screw holders which should be fixed on arbitrary, opposite case corners



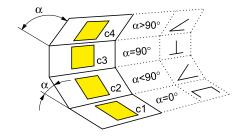
MEASURING RANGES Table 3

| | Single p | | | Α | <u>100</u> √3 | 100 | 230 | 280 | 400 | | | | | | | | | | | | | | | |
|---|--|---|--|------------|--------------------------|----------------------|------------------|----------------------|------------------|---|---|---|---|--|---|--|---|---|---|--|---|--|--|---|
| | 3-phase 3-wire active power symmetrically loaded | | В | | | | | | 230 | 400 | 500 | 690 | 3000 | 6000 | 10000 | 15000 | 20000 | 30000 | 40000 | 60000 | 110000 | 220000 | 400000 | |
| | 3-phase 3-wire active power asymmetrically loaded | | c | | | | | | 230 | 400 | 300 | 090 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| | 3-phase active p symme | ower | | D | | | | | | <u>133</u> | 230 | 280 | <u>400</u> | 3000 | 6000 | | | | | 40000 | | | | |
| Un | 3-phase active p asymm | ower | | E | | | | | | 230 | 400 | 500 | 690 | 100√3 | 100√3 | 100√3 | 100√3 | 100√3 | 100√3 | 100√3 | 100√3 | 100√3 | 100√3 | 100√3 |
| [V] | 3-phase reactive symme | e power | r | F | | | | | | 230 | 400 | 500 | 690 | 3000 | 6000 | 10000 | 15000 | 20000 | 30000 | 40000 | 60000 | 110000 | 220000 | 400000 |
| | 3-phase reactive asymm | e power | r | G | | | | | | 230 | 400 | 300 | 090 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 3-phase reactive symme | e power | r | н | | | | | | <u>133</u> | <u>230</u> | <u>280</u> | <u>400</u> | 3000 | 6000 | | | | | | | | | 400000 |
| | 3-phase reactive asymm | e power | r, | K | | | | | | 230 | 400 | 500 | 690 | 100₩3 | 100√3 | 100₩3 | 100₩3 | 100₩3 | 100#3 | 100₩3 | 100₩3 | 100₩3 | 100//3 | 100//3 |
| | n/x | IN Code | | Power unit | Un Code | | | | | | | | | | | | | | | | | | | |
| | | x=5 | x=1 | Ъ | Т | U | Α | ٧ | W | В | С | D | Е | F | G | Н | I | K | L | М | N | Р | R | S |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | _ | A1 | | 50 | | 200 | 250 | | 400 | | 800 | 1.2 | 5 | 10 | 15 | 25 | 30 | 50 | 80 | 100 | 200 | 400 | 800 |
| | 5; 5/x | _ В5 | В1 | W | 250 | 500 | 1 | 1.2 | 2 | 2 | 3 | 4 | 6 | 25 | 50 | 60 | 120 | 150 | 250 | 400 | 500 | 1 | 2 | 4 |
| , | 5; 5/x 10/x | C5 | B1 C1 | W | 250 500 | 500 1 | 1 | 1.2 2.5 | 2 | 2 | 3 6 | 4 8 | 6 12 | 25 50 | 50 100 | 60 150 | 120 250 | 150 300 | 250 500 | 400 800 | 500 1 | 1 2 | 2 | 4 8 |
| | 5; 5/x 10/x 15/x | C5 D5 | B1 C1 D1 | W | 250 500 800 | 500 1 1.5 | 1 2 3 | 1.2 2.5 4 | 2 4 6 | 2 4 8 | 3 6 10 | 4 8 12 | 6 12 15 | 25 50 80 | 50 100 150 | 60 150 250 | 120 250 400 | 150 300 500 | 250 500 800 | 400 800 1.2 | 500 1 1.5 | 1 2 2.5 | 2 4 5 | 4 8 12 |
| | 5; 5/x 10/x 15/x 20/x | C5 D5 E5 | B1 C1 D1 E1 | W | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 | 3 6 10 12 | 4 8 12 15 | 6 12 15 20 | 25 50 80 100 | 50 100 150 200 | 60 150 250 300 | 120 250 400 500 | 150 300 500 600 | 250 500 800 | 400 800 1.2 1.5 | 500 1 1.5 2 | 1 2 2.5 4 | 2 4 5 8 | 4 8 12 15 |
| | 5; 5/x 10/x 15/x 20/x 30/x | C5 D5 E5 F5 | B1 C1 D1 E1 F1 | W | 250 500 800 | 500 1 1.5 | 1 2 3 | 1.2 2.5 4 | 2 4 6 | 2 4 8 8 12 | 3 6 10 12 20 | 4 8 12 15 25 | 6 12 15 20 30 | 25 50 80 100 150 | 50 100 150 200 300 | 60 150 250 300 500 | 120 250 400 500 800 | 150 300 500 600 | 250 500 800 1 1.5 | 400 800 1.2 1.5 2 | 500 1 1.5 2 3 | 1 2 2.5 4 5 | 2 4 5 8 10 | 4 8 12 15 20 |
| | 5; 5/x 10/x 15/x 20/x | C5 D5 E5 | B1 C1 D1 E1 | W | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 | 3 6 10 12 | 4 8 12 15 | 6 12 15 20 | 25 50 80 100 | 50 100 150 200 | 60 150 250 300 | 120 250 400 500 | 150 300 500 600 | 250 500 800 | 400 800 1.2 1.5 | 500 1 1.5 2 | 1 2 2.5 4 | 2 4 5 8 | 4 8 12 15 |
| | 5; 5/x 10/x 15/x 20/x 30/x 50/x | C5 D5 E5 F5 G5 | B1 C1 D1 E1 F1 G1 | w | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 | 3 6 10 12 20 30 | 4 8 12 15 25 40 | 6 12 15 20 30 50 | 25 50 80 100 150 250 | 50 100 150 200 300 500 | 60 150 250 300 500 800 | 120 250 400 500 800 | 150 300 500 600 1 1.5 | 250 500 800 1 1.5 2.5 | 400 800 1.2 1.5 2 4 | 500 1 1.5 2 3 5 | 1 2 2.5 4 5 | 2 4 5 8 10 20 | 4 8 12 15 20 40 |
| | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x | C5 D5 E5 F5 G5 H5 | B1 C1 D1 E1 F1 G1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 | 3 6 10 12 20 30 50 | 4 8 12 15 25 40 60 80 | 6 12 15 20 30 50 80 100 | 25 50 80 100 150 250 400 | 50 100 150 200 300 500 800 | 60 150 250 300 500 800 | 120 250 400 500 800 1.2 | 150 300 500 600 1 1.5 2.5 | 250 500 800 1 1.5 2.5 4 | 400 800 1.2 1.5 2 4 5 | 500 1 1.5 2 3 5 | 1 2 2.5 4 5 10 | 2 4 5 8 10 20 25 | 4 8 12 15 20 40 50 |
| | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 | B1 C1 D1 E1 F1 G1 H1 I1 J1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 | 3 6 10 12 20 30 50 | 4 8 12 15 25 40 60 80 120 | 6 12 15 20 30 50 80 100 150 | 25 50 80 100 150 250 400 500 800 | 50 100 150 200 300 500 800 1 1.5 2 | 60 150 250 300 500 800 1.2 1.5 2.5 | 120 250 400 500 800 1.2 2 2.5 4 | 150 300 500 600 1 1.5 2.5 3 | 250 500 800 1 1.5 2.5 4 5 | 400 800 1.2 1.5 2 4 5 | 500 1 1.5 2 3 5 8 10 | 1 2 2.5 4 5 10 15 20 | 2 4 5 8 10 20 25 40 | 4 8 12 15 20 40 50 80 |
| | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x | C5 D5 E5 F5 G5 H5 J5 K5 L5 | B1 C1 D1 E1 F1 G1 H1 J1 K1 L1 | | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 | 3 6 10 12 20 30 50 60 100 120 200 | 4 8 12 15 25 40 60 80 120 150 250 | 6 12 15 20 30 50 80 100 150 200 300 | 25 50 80 100 150 250 400 500 800 1 | 50 100 150 200 300 500 800 1 1.5 2 | 60 150 250 300 500 800 1.2 1.5 2.5 3 | 120 250 400 500 800 1.2 2 2.5 4 5 | 150 300 500 600 1 1.5 2.5 3 5 6 | 250 500 800 1 1.5 2.5 4 5 8 10 | 400 800 1.2 1.5 2 4 5 8 12 15 20 | 500 1 1.5 2 3 5 8 10 15 20 30 | 1 2 2.5 4 5 10 15 20 25 40 | 2 4 5 8 10 20 25 40 50 80 | 4 8 12 15 20 40 50 80 120 150 200 |
| | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x | C5 D5 E5 F5 G5 H5 J5 K5 L5 M5 | B1 C1 D1 E1 F1 G1 H1 J1 K1 L1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 150 | 3 6 10 12 20 30 50 60 100 120 200 250 | 4 8 12 15 25 40 60 80 120 150 250 300 | 6 12 15 20 50 80 100 150 200 300 400 | 25 50 80 100 150 250 400 500 800 1 1.5 | 50 100 150 200 300 500 800 1 1.5 2 3 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 | 120 250 400 500 800 1.2 2 2.5 4 5 8 | 150 300 500 600 1 1.5 2.5 3 5 6 10 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 | 500 1 1.5 2 3 5 8 10 15 20 30 40 | 1 2 2.5 4 5 10 15 20 25 40 50 80 | 2 4 5 8 10 20 25 40 50 80 100 | 4 8 12 15 20 40 50 80 120 150 200 300 |
| | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 600/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 L5 M5 N5 | B1 C1 D1 E1 F1 G1 H1 J1 K1 L1 M1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 150 200 | 3 6 10 12 20 30 50 60 100 120 200 250 400 | 4 8 12 15 25 40 60 80 120 250 300 500 | 6 12 15 20 30 50 80 100 150 200 300 400 600 | 25 50 80 100 150 250 400 500 800 1 1.5 2 | 50 100 150 200 300 500 800 1 1.5 2 3 4 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 | 1 2 2.5 4 5 10 15 20 25 40 50 80 | 2 4 5 8 10 20 25 40 50 80 100 150 200 | 4 8 12 15 20 40 50 80 120 150 200 300 400 |
| | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 600/x 800/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 L5 M5 N5 | B1 C1 D1 E1 F1 G1 H1 I1 J1 K1 L1 M1 N1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 150 200 300 | 3 6 10 12 20 30 50 60 100 200 250 400 500 | 4 8 12 15 25 40 60 80 120 250 300 500 600 | 6 12 15 20 30 50 80 100 150 200 300 400 600 800 | 25 50 80 100 150 250 400 500 800 1 1.5 2 3 4 | 50 100 150 200 300 500 800 1 1.5 2 3 4 6 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 10 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 15 20 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 20 25 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 40 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 60 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 80 | 1 2 2.5 4 5 10 15 20 25 40 50 80 100 150 | 2 4 5 8 10 20 25 40 50 80 100 150 200 300 | 4 8 12 15 20 40 50 80 120 150 200 300 400 600 |
| :: | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 600/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 L5 M5 N5 | B1 C1 D1 E1 F1 G1 H1 J1 K1 L1 M1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 200 300 400 | 3 6 10 12 20 30 50 60 120 200 250 400 500 600 | 4 8 12 15 25 40 60 80 120 250 300 500 600 | 6 12 15 20 30 50 80 100 150 200 300 400 600 800 | 25 50 80 100 150 250 400 500 800 1 1.5 2 | 50 100 150 200 300 500 800 1 1.5 2 3 4 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 | 1 2 2.5 4 5 10 15 20 25 40 50 80 | 2 4 5 8 10 20 25 40 50 80 100 150 200 | 4 8 12 15 20 40 50 80 120 150 200 300 400 600 800 |
| 110 | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 600/x 300/x 300/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 L5 M5 P5 R5 | B1 C1 D1 E1 F1 G1 H1 U1 M1 N1 P1 R1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 200 300 400 | 3 6 10 12 20 30 50 60 120 200 250 400 500 600 800 | 4 8 12 15 25 40 60 80 120 250 300 500 600 800 | 6 12 15 20 30 50 80 100 150 200 300 400 600 800 | 25 50 80 100 150 250 400 500 800 1 1.5 2 3 4 5 | 50 100 150 200 300 500 800 1 1.5 2 3 4 6 8 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 10 12 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 15 20 25 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 20 25 30 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 40 50 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 60 80 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 80 100 | 1 2 2.5 4 5 10 15 20 25 40 50 80 100 150 200 | 2 4 5 8 10 20 25 40 50 80 100 150 200 300 400 | 4 8 12 15 20 40 50 80 120 150 200 300 400 600 |
| 111111111111111111111111111111111111111 | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 600/x 600/x 300/x 200/x | C5 D5 E5 F5 G5 H5 I5 K5 L5 M5 N5 R5 R5 S5 | B1 C1 D1 E1 F1 G1 H1 J1 K1 L1 M1 N1 P1 R1 S1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 150 200 300 400 500 600 | 3 6 10 12 20 30 50 60 120 200 250 400 500 600 800 | 4 8 12 25 40 60 80 120 250 300 600 800 1 | 6 12 15 20 30 50 80 100 150 200 300 400 600 800 1 | 25 50 80 100 150 250 400 500 800 1 1.5 2 3 4 5 6 | 50 100 150 200 300 500 800 1 1.5 2 3 4 6 8 10 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 10 12 15 20 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 15 20 25 30 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 20 25 30 40 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 40 50 60 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 60 80 100 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 80 100 120 | 1 2 2.5 4 5 10 15 20 25 40 50 80 100 150 200 250 | 2 4 5 8 10 20 25 40 50 80 100 150 200 300 400 500 | 4 8 12 15 20 40 50 80 120 150 200 300 400 600 800 |
| 111111111111111111111111111111111111111 | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 300/x 400/x 500/x 500/x 500/x 500/x 500/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 L5 M5 N5 P5 R5 S5 T5 | B1 C1 D1 E1 F1 G1 H1 I1 J1 K1 L1 M1 N1 P1 R1 S1 | kW; kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 150 200 300 400 500 600 | 3 6 10 12 20 30 50 60 120 250 400 500 600 800 1 1.2 2 | 4 8 12 15 25 40 60 80 120 250 300 600 800 1 1.2 | 6 12 15 20 30 80 100 200 300 400 600 800 1.2 1.5 | 25 50 80 100 150 250 400 500 1 1.5 2 3 4 5 6 | 50 100 150 200 300 500 800 1 1.5 2 3 4 6 8 10 12 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 10 12 15 20 25 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 15 20 25 30 40 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 20 25 30 40 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 40 50 60 80 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 60 80 100 120 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 80 100 120 150 | 1 2 2.5 4 5 10 15 20 25 40 50 80 100 150 250 300 | 2 4 5 8 10 20 25 40 50 80 100 150 200 300 400 500 600 | 4 8 12 15 20 40 50 80 120 150 200 300 400 600 800 |
| 11 11 11 22 36 44 | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 300/x 400/x 500/x 500/x 500/x 500/x 500/x 500/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 L5 M5 N5 F5 R5 S5 T5 U5 W5 | B1 C1 D1 E1 F1 G1 H1 H1 H1 H1 K1 M1 R1 S1 T1 U1 W1 | kW; kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 60 80 120 200 300 400 500 600 800 1.2 1.5 | 3 6 10 12 20 30 50 60 120 250 400 500 600 800 1 1.2 2 2.5 | 4 8 12 15 25 40 60 120 250 300 500 600 800 1 1.2 1.5 2.5 3 | 6 12 15 20 30 50 80 100 150 200 400 600 800 1 1.2 1.5 2 3 | 25 50 80 100 150 250 400 500 800 1 1.5 2 3 4 5 6 8 10 15 2 | 50 100 150 200 300 500 800 1 1.5 2 3 4 6 8 10 12 15 20 30 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 10 12 15 20 25 30 50 60 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 15 20 25 30 40 50 80 100 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 20 25 30 40 50 60 100 120 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 40 50 60 80 100 150 200 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 60 80 100 120 150 200 300 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 80 100 120 150 200 300 400 | 1 2 2.5 4 5 10 15 20 25 40 50 80 100 250 250 300 400 600 800 | 2 4 5 8 10 20 25 40 50 80 100 150 200 300 400 500 600 800 | 4 8 12 15 20 40 50 80 120 150 200 300 400 600 800 |
| 11. 1.1. 1.2. 3.0 4.0 | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 300/x 400/x 400/x 500/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 L5 M5 R5 R5 S5 T5 U5 V5 X5 | B1 C1 D1 E1 F1 G1 H1 J1 K1 L1 M1 S1 T1 U1 V1 X1 | kW; kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 40 60 80 120 200 500 600 800 1.2 1.5 2 | 3 6 10 12 20 30 50 60 120 200 250 400 600 800 1 1.2 2 2.5 4 | 4 8 12 15 25 40 60 120 150 250 300 500 600 800 1 1.2 1.5 2.5 3 5 | 6 12 15 20 30 50 80 100 150 200 400 600 800 1 1.2 1.5 2 3 20 6 | 25 50 80 100 150 250 400 500 800 1 1.5 2 3 4 5 6 8 10 15 2 3 4 5 6 8 10 10 10 10 10 10 10 10 10 10 | 50 100 150 200 300 500 800 1 1.5 2 3 4 6 8 10 12 15 20 30 40 60 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 10 12 15 20 25 30 60 100 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 15 20 25 30 40 50 80 100 150 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 20 25 30 40 50 60 100 120 200 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 40 50 60 80 100 150 200 300 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 60 80 100 120 150 200 300 400 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 80 120 150 200 300 400 600 | 1 2 2.5 4 5 10 15 20 25 40 50 80 100 150 200 250 300 400 600 | 2 4 5 8 10 20 25 40 50 80 100 150 200 300 400 500 600 800 | 4 8 12 15 20 40 50 80 120 150 200 300 400 600 800 |
| 10 10 10 10 10 | 5; 5/x 10/x 15/x 20/x 30/x 50/x 75/x 100/x 150/x 200/x 300/x 400/x 300/x 400/x 500/x 500/x 500/x 500/x 500/x 500/x | C5 D5 E5 F5 G5 H5 I5 J5 K5 L5 M5 N5 F5 R5 S5 T5 U5 W5 | B1 C1 D1 E1 F1 G1 H1 H1 H1 H1 K1 M1 R1 S1 T1 U1 W1 | kvar | 250 500 800 1.2 | 500 1 1.5 2 | 1 2 3 4 | 1.2 2.5 4 6 | 2 4 6 8 | 2 4 8 8 12 20 30 60 80 120 200 300 400 500 600 800 1.2 1.5 | 3 6 10 12 20 30 50 60 120 250 400 500 600 800 1 1.2 2 2.5 | 4 8 12 15 25 40 60 120 250 300 500 600 800 1 1.2 1.5 2.5 3 | 6 12 15 20 30 50 80 100 150 200 400 600 800 1 1.2 1.5 2 3 | 25 50 80 100 150 250 400 500 800 1 1.5 2 3 4 5 6 8 10 15 2 | 50 100 150 200 300 500 800 1 1.5 2 3 4 6 8 10 12 15 20 30 | 60 150 250 300 500 800 1.2 1.5 2.5 3 5 6 10 12 15 20 25 30 50 60 | 120 250 400 500 800 1.2 2 2.5 4 5 8 10 15 20 25 30 40 50 80 100 | 150 300 500 600 1 1.5 2.5 3 5 6 10 12 20 25 30 40 50 60 100 120 | 250 500 800 1 1.5 2.5 4 5 8 10 15 20 30 40 50 60 80 100 150 200 | 400 800 1.2 1.5 2 4 5 8 12 15 20 30 40 60 80 120 150 200 300 400 800 | 500 1 1.5 2 3 5 8 10 15 20 30 40 60 80 100 120 150 200 300 400 | 1 2 2.5 4 5 10 15 20 25 40 50 80 100 250 250 300 400 600 800 | 2 4 5 8 10 20 25 40 50 80 100 150 200 300 400 500 600 800 | 4 8 12 15 20 40 50 80 120 150 200 300 400 600 800 |

Table 2

| Input voltage frequency fn (Hz) | Codes |
|------------------------------------|-------|
| 50 | 0 |
| 60 | 1 |

OPERATING POSITIONS

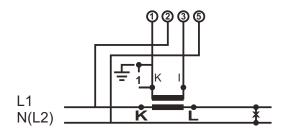


| Code | Position |
|------|------------------------------|
| Α | c1 α = 0° |
| В | $c2 \alpha = 15^{\circ}$ |
| С | c2 α = 30 $^{\circ}$ |
| D | c2 α = 45 $^{\circ}$ |
| E | $c2 \alpha = 60^{\circ}$ |
| F | c2 α = 75 $^{\circ}$ |
| 0 | $c3 \alpha = 90^{\circ}$ |
| Н | c4 α = 105 $^{\circ}$ |
| I | c4 α = 120° |

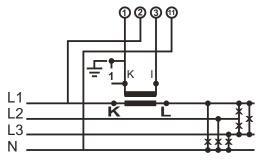
Table 3

LUMEL

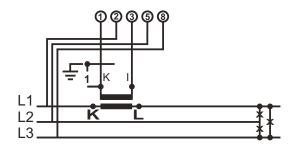
ELECTRICAL CONNECTIONS



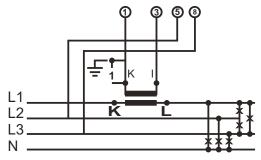
Active/reactive power mesurement in single phase AC network



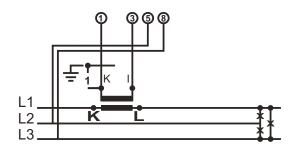
Active power mesurement in 3-phase, 4-wire network balanced load



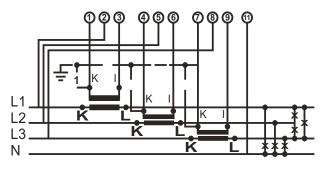
Active power mesurement in 3-phase, 3-wire network balanced load



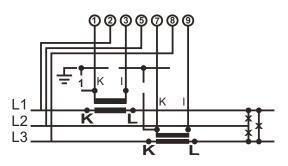
Reactive power mesurement in 3-phase, 4-wire network balanced load



Reactive power mesurement in 3-phase, 3-wire network balanced load



Active/reactive power measurement in 3-phase, 4-wire network unbalanced load



Active/reactive power measurement in 3-phase, 3-wire network unbalanced load



ORDERING CODES Table 4

| PANEL POWER METER - PA39 | Х | X | X | XX | Х | Х | XX | |
|---|---|---|---|-----------|---|---|----|---|
| Kind of measured power and measuring system: | Ī | | | | | | | Ī |
| Measurement of active power in a single-phase network | A | | | | | | | |
| Measurement of active power in a 3-phase 3-wire symmetrically loaded network | В | | | | | | | |
| Measurement of active power in a 3-phase 3-wire asymmetrically loaded network | с | | | | | | | |
| Measurement of active power in a 3-phase 4-wire symmetrically loaded network | D | | | | | | | |
| Measurement of active power in a 3-phase 4-wire asymmetrically loaded network | Е | | | | | | | |
| Measurement of reactive power in a 3-phase 3-wire symmetrically loaded network | F | | | | | | | |
| Measurement of reactive power in a 3-phase 3-wire asymmetrically loaded network | G | | | | | | | |
| Measurement of reactive power in a 3-phase 4-wire symmetrically loaded network | Н | | | | | | | |
| Measurement of reactive power in a 3-phase 4-wire asymmetrically loaded network | K | | | | | | | |
| Input voltage | | | | | | | | l |
| write in the Un range code from the table 3 | | X | | | | | | |
| Frequency of the input voltage | | | | | | | | |
| write in the frequency code from the table 1 | | | X | | | | | |
| Input current write in the In range code from the table 3 | | | | xx | | | | |
| Flow direction of the power | | | | | | | | l |
| - unidirectional, zero on the left side of the scale | | | | | 0 | | | |
| - bidirectional, zero in the middle of the scale | | | | | 1 | | | l |
| Working position | | | | | | • | | l |
| write in the working position from the table 2 | | | | | | X | | |
| Versions: | | | | | | | | l |
| with an additional adjustable pointer | | | | | | | 03 | l |
| catalogue | | | | | | | 00 | |
| custom-made ¹⁾ | | | | | | | XX | l |
| Acceptance tests: | | | | | | | | - |
| without additional requirements | | | | | | | | |
| with a quality inspection certificate | | | | | | | | |
| other requirements 2) | | | | | | | | |

¹⁾ The ordering code is given by the manufacturer after agreement.

ORDERING WAY

In any order one must specify the name and the ordering code of the power meter using the tables: 1, 2, 3, and 4.

Order example: PA39 HF0L500008, means:

- H Reactive PA39 power meter adapted to a three-phase four-wire symmetrically loaded network.
 F Network rated voltage: 3000 V (from table 3).
- 0 Frequency of the input voltage: 50 Hz (from table 1).
- L5 Network rated current: 300 A (from table 3).
- 0 Unidirectional power flow.
- **0** Working position: C3, vertical (from table 2).
- 00 Catalogue version.
- 8 without additional requirements concerning acceptance tests.

This power meter is destined to co-operate with 300 A/5 A transformers and a 3000 V/100/√3 V voltage transformers.

Note: concerning casing protection grade IP. When ordering, please precise the required grade option: IP50 or IP65

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Technical support: tel.: (+48 68) 45 75 143, 45 75 141, tel.: (+48 68) 45 75 130, 45 75 144, 45 75 140 e-mail: export@lumel.com.pl

Export department: 45 75 131, 45 75 132 e-mail: export@lumel.com.pl Calibration & Attestation: e-mail:laboratorium@lumel.com.pl

 $^{^{\}rm 2)}$ The number code is given acc. customer $^{\rm 2}$ agreement.