

# PA39

## PANEL POWER METER



### APPLICATION

The PA39 power meter is a moving-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

<b>Measuring ranges acc. the series</b>	1, 1.2, 1.5, 2, 2.5, 3, 4, 5, 6, 7.5, 8, or the decimal multiplication of one of these numbers
<b>Input voltage</b>	100 $\sqrt{3}$ (x/100 $\sqrt{3}$ ), 100 (x/100), 133, 230, 280, 400, 500, 690 V
<b>Input current</b>	1 A (x/1 A) or 5 A (x/5 A)
<b>Active power factor</b>	cos $\varphi$ : 1...0.5 <sub>ind</sub>
<b>Reactive power factor</b>	sin $\varphi$ : 1...0.5 <sub>ind</sub>
<b>Accuracy class</b>	1.5
<b>Rated operating conditions:</b>	
- ambient temperature	-10...23...55°C
- relative humidity	≤ 75%
- frequency of the input quantities	acc. order (table 2)
- working position	acc. order ± 5° (table 3)
- external magnetic field	≤ 400 A/m
<b>Additional errors</b>	acc. EN 60051-1 standard
<b>Power consumption:</b>	
- voltage circuit	≤ 4.3 VA
- current circuit	≤ 0.2 VA

### Protection Grade acc. to EN60529

- front protection grade: IP 52
- terminal protection: IP20

**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:

- screw holders ..... 2 pcs

### CHOICE OF MEASURING RANGE

1. Calculate the power from the formulas:

$$P = U_n \times I_n \text{ for single-phase networks}$$

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

where:

$U_n$  - network rated voltage:

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

$I_n$  - rated current:

- 5 A or 1 A,
- when connected through transformers-primary rated voltage.

2. Round the calculated power value to the nearest value from the given sequence of numbers for the measuring range.

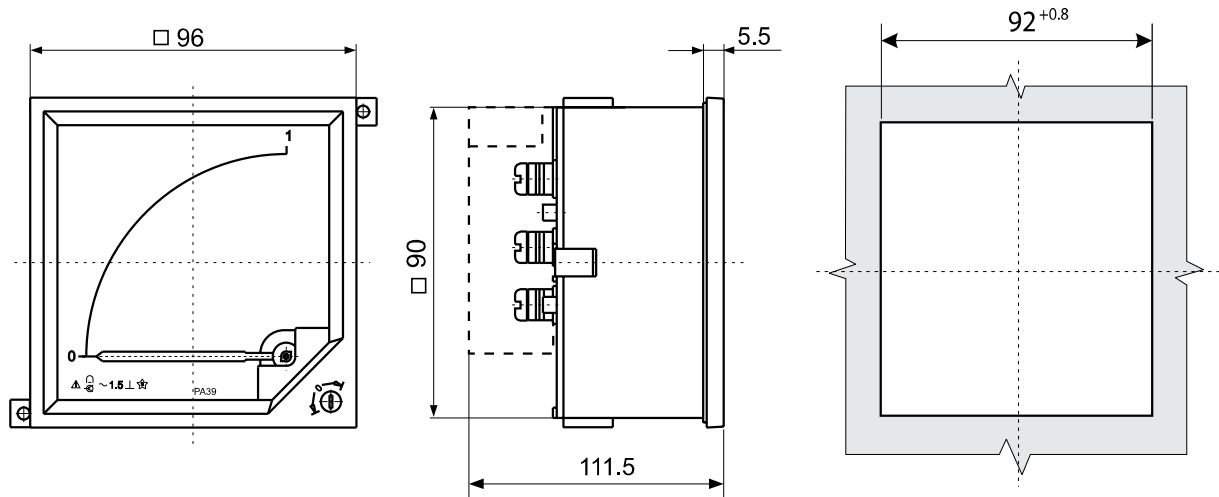
3. Example of measuring range choice.

Three-phase network; rated values of transformers:  
15 000/100 V and 400/5 A

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

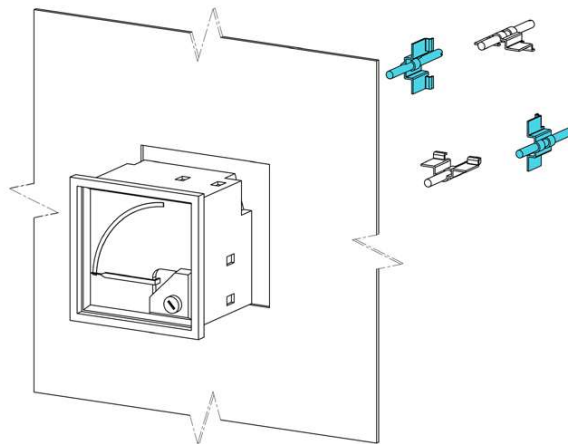
Selected measuring range: 10 MW (Mvar)

### EXTERNAL DIMENSIONS



*Fig 1. External dimensions of PA39 meter.*

### WAY OF THE METER FIXATION ON THE PANEL

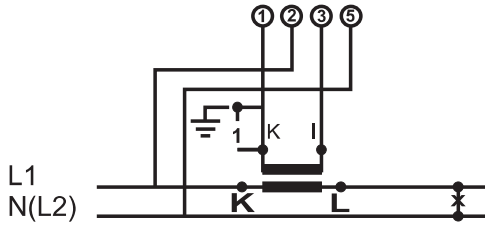


*Fig. 2. Fixing of meters PA39 in the panel.*

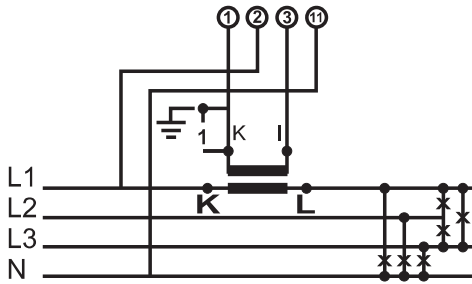
*Included are two screw holders which should be fixed on arbitrary, opposite case corners*



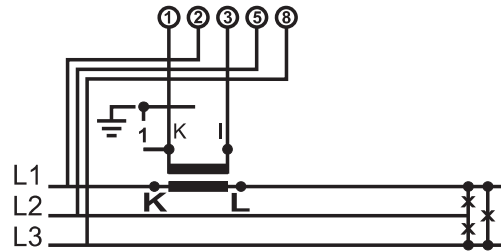
**ELECTRICAL CONNECTIONS**



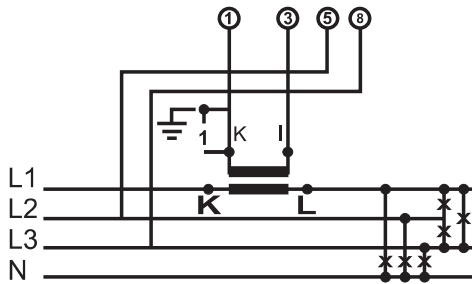
Active/reactive power measurement  
in single phase AC network



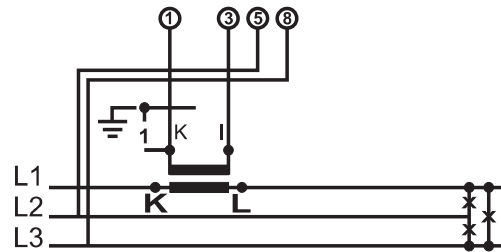
Active power measurement  
in 3-phase, 4-wire network  
balanced load



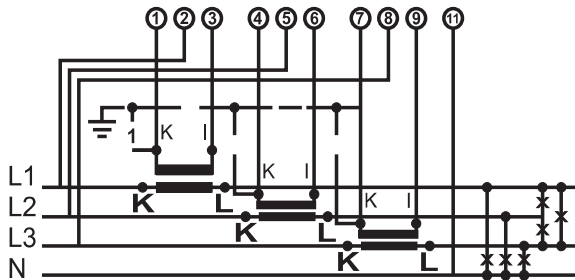
Active power measurement  
in 3-phase, 3-wire network  
balanced load



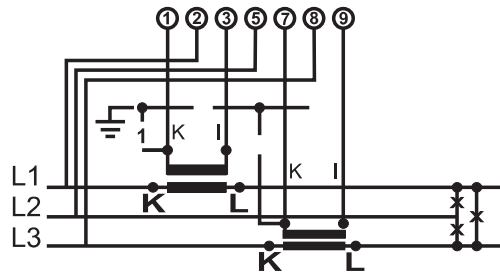
Reactive power measurement  
in 3-phase, 4-wire network  
balanced load



Reactive power measurement  
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	X	X	X	XX	X	X	XX	X
<b>Kind of measured power and measuring system:</b>								
Measurement of active power in a single-phase network.....	A							
Measurement of active power in a 3-phase 3-wire symmetrically loaded network .....	B							
Measurement of active power in a 3-phase 3-wire asymmetrically loaded network .....	C							
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 .....	E							
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 .....	H							
Measurement of reactive power in a 3-phase 4-wire asymmetrically loaded network .....	K							
<b>Input voltage</b>								
write in the Un range code from the table 3.....	X							
<b>Frequency of the input voltage</b>								
write in the frequency code from the table 1 .....	X							
<b>Input current</b>								
write in the In range code from the table 3 .....	XX							
<b>Flow direction of the power</b>								
- unidirectional, zero on the left side of the scale .....	0							
- bidirectional, zero in the middle of the scale .....	1							
<b>Working position</b>								
write in the working position from the table 2 .....	X							
<b>Versions:</b>								
catalogue .....	00							
custom-made <sup>1)</sup> .....	XX							
<b>Acceptance tests:</b>								
without additional requirements.....	8							
with a quality inspection certificate .....	7							
other requirements <sup>2)</sup> .....	X							

<sup>1)</sup> The ordering code is given by the manufacturer after agreement.

<sup>2)</sup> The number code is given acc. customer's 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 - H - F - 0 - L5 - 0 - 0 - 00 - 8**, 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/ $\sqrt{3}$  V** voltage transformers.

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

PA39-19\_en

