



PA39 PANEL POWER METER



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 √3 (x/100/√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	cosφ: 10.5 _{ind}
Reactive power factor	sinφ: 10.5 _{ind}
Accuracy class	1.5
Rated operating conditions:	
- ambient temperature	-10 <u>23</u> 55°C
- relative humidity	≤ 75%
 frequency of the input quantities working position external magnetic field 	acc. order (table 2) acc. order \pm 5° (table 3) \leq 400 A/m

Additional errors	acc. EN 60051-1 standard
Power consumption:	
- voltage circuit	≤ 4.3 VA
- current circuit	\leq 0.2 VA

Protection Grade acc. to	o EN60529									
- front protection grade: II	P 52									
- terminal protection: IP00										
Housing material	thermoplastic, self-extinguishing plastic (UL 94V-O)									
Glass material	glass (in standard) anti-reflective glass on request									
Electromagnetic compa	tibility:									
- emission	acc. EN 61000-6-4 standard									
- immunity	acc. EN 61000-6-2 standard									
The meter fulfils CE mark	requirements.									
Safety requirements ac	c. EN 61010-1:									
 installation category 	III									
- level of pollution	2									
- working voltage	202.14									
in relation to the earth	660 V a.c.									
Weight	650-750 g									

ACCESSORIES

We deliver with the meter:

- screw holders	2 nrs

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_a 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

 $P = \sqrt{3} \times 15000 V \times 400 A = 10,39 MW (Mvar)$ Selected measuring range: 10 MW (Mvar)



EXTERNAL DIMENSIONS

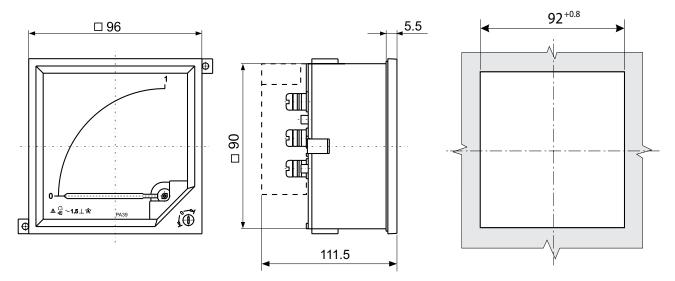


Fig 1. External dimensions of PA39 meter.

WAY OF THE METER FIXATION ON THE PANEL

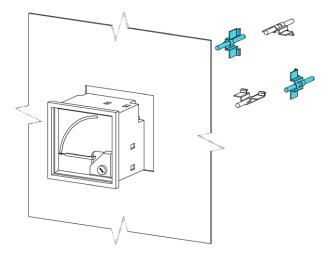


Fig. 2. Fixing of meters PA39in the panel.

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

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Table 3

MEASURING RANGES

	Single p active p			A	<u>100</u> √3	100	230	280	400															
	3-phase active p symme	ower		в						230	400	500	600	3000	6000	10000	15000	20000	30000	40000	60000	110000	220000	400000
	3-phase active p asymm	ower		dc						230	400	500	690	100	100	100	100	100	100	100	100	100	100	100
	3-phase active p symme	ower		D						<u>133</u>	<u>230</u>	<u>280</u>	<u>400</u>	3000	6000							<u>110000</u>		
Un	3-phase active p asymm	ower		d 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 powe	r	F						230	400	500	690	3000	6000	10000	15000	20000	30000	40000	60000	<u>110000</u>	<u>220000</u>	<u>400000</u>
	3-phase reactive asymm	e powe	r	G						200	-00	500	000	100	100	100	100	100	100	100	100	100	100	100
	3-phase reactive symme	e powe	r	н						<u>133</u>	<u>230</u>	<u>280</u>	<u>400</u>	3000	6000							110000		
	3-phase reactive asymm	e powe	r,	ĸ						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
	ln/x	IN C	ode	Power unit										U	n Code)								
		x=5	x=1	Po	Т	U	Α	V	W	В	С	D	Е	F	G	Н	I	к	L	М	Ν	Р	R	S
	1	-	A1		50			250			600		1.2	5	10	15	25	30	50	80	100	200	400	800
	5; 5/x 10/x	B5 C5	B1 C1	W		500	1	1.2 2.5	2	2	3 6	4 8	6 12	25 50	50	60	120 250	150 300	250	400	500 1	1	2	4 8
	15/x	D5	D1		500 800	1 1.5	2	2.5 4	6	4 8	10	。 12	12	80	100 150	150 250	400	500 500	500 800	800 1.2	1.5	2.5	4 5	0 12
	20/x	E5	E1		1.2	2	4	6	8	8	12	15	20	100	200	300	500	600	1	1.5	2	4	8	15
	30/x	F5	F1		1.5	3	6	8	12	12	20	25	30	150	300	500	800	1	1.5	2	3	5	10	20
	50/x	G5	G1							20	30	40	50	250	500	800	1.2	1.5	2.5	4	5	10	20	40
_	75/x	H5	H1							30	50	60	80	400	800	1.2	2	2.5	4	5	8	15	25	50
_	100/x 150/x	15 J5	 	ar						40 60	60 100	80 120	100 150	500 800	1 1.5	1.5 2.5	2.5 4	3 5	5 8	8 12	10 15	20 25	40 50	80 120
-	200/x	55 K5	K1	/; kvar						80	120			1	2	3	5	6	10	12	20	40	80	150
	300/x	L5	L1	kW;						120		250		1.5	3	5	8	10	15	20	30	50	100	200
	400/x	M5	M1							150	250	300	400	2	4	6	10	12	20	30	40	80	150	300
	600/x	N5	N1							200	400	500	600	3	6	10	15	20	30	40	60	100	200	400
	800/x	P5	P1								500			4	8	12	20	25	40	60	80	150	300	600
	000/x 200/x	R5	R1								600 800			5	10	15	25	30	50 60	80	100	200	400	800
	200/x 500/x	S5 T5	S1 T1							500 600	800 1	1 1.2	1.2 1.5	6 8	12 15	20 25	30 40	40 50	60 80	100 120	120 150	250 300	500 600	1000
		U5	U1							800		1.5	2	10	20	30	40 50	60	100	150	200	400	800	
	UUU/X I											2.5	3	15	30	50	80	100	150	200	300	600	1000	
	000/x 000/x	V5	V1							1.2	2	2.0								200	000	000	1000	
3			V1 W1	lvar								3	20	20	40	60	100	120	200	300	400	800	1000	1
3 4 6	000/x 000/x 000/x	V5	W1 X1	v; Mvar													100 150						1000	1
3 4 6 10	000/x 000/x	V5 W5	W1	MW; Mvar						1.5	2.5	3	20	20	40	60		120	200	300 400 800	400	800 1000	1000	1

	Table 2
Input voltage frequency fn (Hz)	Codes
50	0
60	1

OPERATING POSITIONS

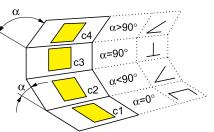
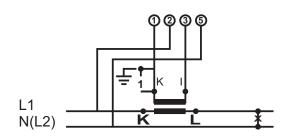


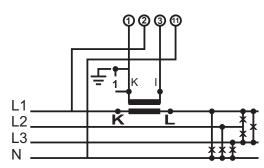
	Table 3
Code	Position
Α	c1 α = 0°
В	c2 α = 15°
С	c2 α = 30°
D	c2 α = 45°
E	c2 α = 60°
F	c2 α = 75°
0	c3 α = 90°
н	c4 α = 105°
I	c4 α = 120°



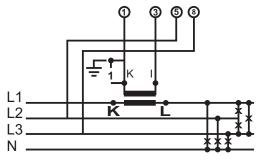
ELECTRICAL CONNECTIONS



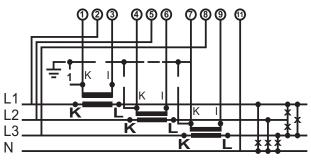
Active/reactive power mesurement in single phase AC network



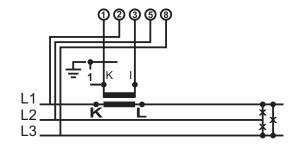
Active power mesurement in 3-phase, 4-wire network balanced load



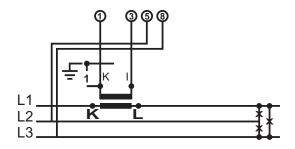
Reactive power mesurement in 3-phase, 4-wire network balanced load



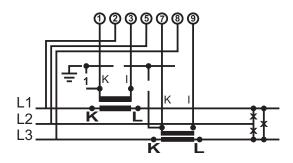
Active/reactive power measurement in 3-phase, 4-wire network unbalanced load

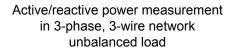


Active power mesurement in 3-phase, 3-wire network balanced load



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







ORDERING CODES

ORDERING CODES								Table
PANEL POWER METER - PA39	X	Х	Х	ХХ	X	Х	ХХ	X
Kind of measured power and measuring system:								
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	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	Н							
Measurement of reactive power in a 3-phase 4-wire asymmetrically loaded network								
Input voltage								
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								
- unidirectional, zero on the left side of the scale					0			
- bidirectional, zero in the middle of the scale					1			
Working position								
write in the working position from the table 2						X		
Versions:								
catalogue							00	
custom-made1)							XX	
Acceptance tests:								
without additional requirements								8
with a quality inspection certificate								7
other requirements 2)								X

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

²⁾ 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.
- Network rated voltage: 3000 V (from table 3). F
- **0** Frequency of the input voltage: 50 Hz (from table 1). L5 - Network rated current: 300 Å (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



LUMEL S.A. ul. Sulechowska 1, 65-022 Zielona Góra, POLAND tel.: +48 68 45 75 100, fax +48 68 45 75 508 www.lumel.com.pl

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