

ANALOG PANEL METERS / SCALE: 90°



Moving-iron meters

	EB16	EA16	EA17	EA19	EA12
Type of scale	90°				
External dimensions	45 x 85 mm	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	-	✓*	✓*	✓*	-
Measuring ranges:	100 mA ... 25 A xA x/5 A; xA/1 A		100 mA ... 100 A xA x/5 A; xA x/1 A		
- current:	· direct · through a transformer*		· direct · through a transformer		
(on request, with twice or six-times overload)	6 V ... 600 V xV/100 V; xV/110 V		6 V ... 1000 V xV/100 V; xV/110 V		
- voltage:	3 kV		2 kV		
Proof voltage	3 kV		2 kV		
Frequency of measured value	40...45...65...72 Hz				
Protection rating	IP52	IP52 (on request IP65)			IP52
Climate version	normal or tropical		normal, tropical or similar to marine		
Class	1.5				

* for current measurement up to ranges: 1 A, 1/2 A, 5 A, 5/10A), for voltage measurement - all ranges

** see our current transformers (page 28)



Moving-iron meters

	MA17(P)	MA19(P)	MA12(P)
Type of scale	90°		
External dimensions	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	✓	✓
Measuring ranges (direct):	400 μA...1 A (30...1000...10 000 Hz) 1 A...6 A (49...50...51 Hz)		400 μA...1 A (30...1000...10 000 Hz)
- current:	60 mV...1.5 V (49...50...51 Hz) 2.5V...600V (30...1000...10 000 Hz)		2.5 V...600 V (30...1000...10 000 Hz)
- voltage:	2 kV		2 kV
Proof voltage	IP52 (on request IP65)		IP52
Protection rating	normal, tropical or similar to marine		
Climate version	1.5		
Class	1.5		



3-phase voltmeters

	EP27	EP29
Type of scale	90°	
External dimensions	72 x 72 mm	96 x 96 mm
Interchangeable scale	✓	✓
Voltage measuring ranges:	500 V xV/100 V; xV/110 V	
- direct phase-to-phase:	40...45...65...72 Hz	
- through a transformer:	3 kV	
Frequency	IP52	
Proof voltage	normal	
Protection rating	1.5	
Climate version	1.5	
Class	1.5	

Power meter

	PA39
Type of scale	90°
External dimensions	96 x 96 mm
Interchangeable scale	✓
Power measuring ranges	50W...1000 MW or 50 var...1000 Mvar
Frequency	50 Hz, 60 Hz or 400 Hz
Proof voltage	2 kV
Protection rating	IP52 (on request IP65)
Climate version	normal, tropical or similar to marine
Class	1.5

ANALOG PANEL METERS / SCALE: 90°



Moving-coil meters

	MB16	MA16	MA17	MA19	MA12
Type of scale	90°				
External dimensions	45 x 85 mm	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	-	✓	✓	✓	-
Measuring ranges:	- current: · direct measurement · indirect measurement (through the shunt*) - voltage: · direct measurement · indirect measurement (through the shunt*)				
	1 μA...6 A (MB16); 40 μA...25 A (MA16) 1 A...15 kA		100 μA...25 A 1 A...15 kA		
	60 mV...600 V		60 mV...1000 V		
Proof voltage	3 kV		2 kV		
Protection rating	IP52		IP52 (on request IP65)		IP52
Climate version	normal or tropical		normal, tropical or similar to marine		
Rated operational conditions:					
- ambient temperature	5...23...55°C				
- relative air humidity	25...85%				
Class	1.5				

* see our shunts (page 31)



Max demand ammeters - Bimetalic or Bimetalic and moving-iron

	BA27	BA39	BE27	BE39
Type of scale	90°			
External dimensions	72 x 72 mm	96 x 96 mm	72 x 72 mm	96 x 96 mm
Interchangeable scale	✓	✓	✓	✓
Measuring ranges:	- bimetalic element: · direct measurement · indirect measurement (through a transformers*) - moving-iron element: · direct measurement · indirect (through a transformer*)			
	0...1.2 A or 0...6 A 0...1.2(x) A x/1 A or 0...1.2(x) A x/5 A		0...1.2 A or 0...6 A 1.2(x) A x/1 A or 1.2(x) A x/5 A	
	-		0...1/2 A or 0...5/10 A 0...2(x) A x/1 A or 0...2(x) A x/5 A	
Proof voltage	3 kV			
Protection rating	IP40 (on request IP65)			
Climate version	normal or tropical			
Class	3		3 (1.5)	

* see our current transformers (page 28)



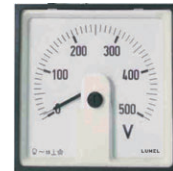
Power factor and frequency meters

	FA39	FA32	CA36	CA37	CA39	CA32
Type of scale	90°					
External dimensions	96 x 96 mm	144 x 144 mm	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	✓	✓	✓	✓	✓
Measuring ranges	45...55 Hz; 45...65 Hz; 48...52 Hz; 55...65 Hz; 360...440 Hz; 380...420 Hz					
Frequency	-					
Proof voltage	2 kV					
Protection rating	IP52 (IP65 on request)	IP52	IP52	IP52 (IP65 on request)		IP52
Climate version	normal, tropical or similar to marine					
Class	1.5			0.5		



Moving-coil meters

	MA16L	MA17L	MA19L	MA12L
Type of scale	240°			
External dimensions	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	✓	✓	✓
Measuring ranges:				
- current:	40 μA...60 A			
- voltage:	60 mV...600 V			
Proof voltage	2 kV	3 kV		
Protection rating	IP52 (IP65 on request)			IP52
Climate version	normal			
Rated operational conditions:				
- ambient temperature	5...23...55°C			
- relative air humidity	25...85%			
Class	1.5			



Moving-iron meters

	MA16L(P)	MA17L(P)	MA19L(P)	MA12L(P)
Type of scale	240°			
External dimensions	48 x 48 mm	72 x 72 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	-	-	-	-
Measuring ranges:				
- current:	100 mA, 1 A 5 A, 10 A			
- voltage:	6 V...600 V			
Proof voltage	2 kV			
Protection rating	IP52 (IP65 on request)			IP52
Climate version	normal			
Class	1.5			



Power factor and frequency meters

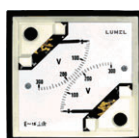
	FA39L	FA32L	CA39L	CA32L
Type of scale	240°			
External dimensions	96 x 96 mm	144 x 144 mm	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	✓	✓	✓
Measuring ranges	0.5 _{Cap} ...1...0.5 _{IND} 0.8 _{Cap} ...1...0.3 _{IND} 0.8 _{Cap} ...1...0.8 _{IND}		45...50...55Hz 45...55...65Hz 55...60...65Hz	
Frequency	49...51 Hz (1-phase) 45...65 Hz (3-phase)		360...400...440Hz 380...400...420Hz	
Proof voltage	2 kV			
Protection rating	IP52 (IP65 on request)	IP52	IP52 (IP65 on request)	IP52
Climate version	normal			
Class	0.5			

ANALOG PANEL METERS / SCALE: 240°



	Power meter	
	PA39L	PA32L
Type of scale	240°	
External dimensions	96 x 96 mm	144 x 144 mm
Interchangeable scale	✓	
Power measuring ranges	50 W...1000 MW or 50 var...1000 Mvar	
Frequency	50 Hz, 60 Hz or 400 Hz	
Proof voltage	2 kV	
Protection rating	IP52 (on request IP65)	IP52
Climate version	normal	
Class	1.5	

DUAL ANALOG PANEL METERS / 2 IN 1 / SCALE: 90°



	Dual moving-iron meters	Dual frequency meters	Dual moving-coil meters
	EA19D	CA39D	MA19D
Type of scale	90°		
External dimensions	96 x 96 mm		
Interchangeable scale	✓	✓	✓
Measuring ranges	150...600 V; xV/100V ; xV/110V 4...60 A; xA x/5A; xA/1A	45.....50.....55 Hz 45.....55.....65 Hz 55.....60.....65 Hz 360...400...440 Hz 380...400...420 Hz	1000 μA...30 A 60 mV...600 V 40 mV...1000 V
Proof voltage	3 kV	2 kV	3 kV
Parameters of measured signal	45...65 Hz	-	-
Protection rating	IP52 (on request IP65)		
Climate version	normal		
Class	1.5	0.5	1.5