

Electronic Phase-meters

Analogue indicator to measure $\cos \varphi$



Description

- Does not need an auxiliary power supply
- DIN box with dimensions 96 and 144 mm
- Class 1.5
- Built-in electronic converter
- Balanced single and three-phase circuits

Application

Measurement of $\cos \varphi$ in balanced or unbalanced single and three-phase circuits.

Features

	FEM / FETC	FMZ / FTZ
Voltage circuit		
Consumption	1 V·A	4 V·A
Frequency	40 ... 70 Hz	
Overloads	1.2 U_n permanent 2 U_n during 5 s	
Current circuit		
Nominal current	... 5 A	
Consumption	1.5 V·A	0.75 V·A
Frequency	20 ... 100 Hz	
Overloads	1.2 I_n permanent 5 I_n during 30 s 10 I_n during 5 s 40 I_n during 1 s	
Accuracy	± 1.5 % FS	
Ambient conditions		
Operating temperature	+10 ... +30 °C	
Limit temperature	- 25 ... +40 °C	
Altitude	2000 m	
Build features		
Dimensions	See the following table	
Weight	See the following table	
Type of box	panel	
Degree of protection:		
Front panel	IP 52	
Terminals	IP 00	
Insulation voltage	2 kV, during 1 min, between the mechanism and the box	
Standards	BS 89, EN 60051, IEC 144, UL 94, DIN 43780, IEC 51, UNE 21318	

Electronic phase-meters


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References


Single-phase phase-meters 90°



	FEMC 96	FEMC 144
Class	1,5	
Scale	90° P1 (Simple profile)	
Dimensions (mm)		
	a	96
	b	96
	c	62,9
Weight (g)	480	690
V	$\cos \varphi$ 0.5-1-0.5	
100/ $\sqrt{3}$	M13431	M13441
110/ $\sqrt{3}$	M13432	M13442
100	M13433	M13443
110	M13434	M13444
230	M13435	M13445
400	M13436	M13446
440	M13437	M13447
500	M13438	M13448


Single-phase phase-meters 240°



	FMZ 96	FMZ 144
Class	1,5	
Scale	240° P1 (Simple profile)	
Dimensions (mm)		
	a	96
	b	96
	c	101,2
Weight (g)	500	710
V	$\cos \varphi$ 0.5-1-0.5	
100/ $\sqrt{3}$	M13531	M13541
110/ $\sqrt{3}$	M13532	M13542
100	M13533	M13543
110	M13535	M13545
230	M13535	M13545
400	M13536	M13546
440	M13537	M13547
500	M13538	M13548


Three-phase phase-meters 90°



	FETC 96	FETC 144
Class	1,5	
Scale	90° P1 (Simple profile)	
Dimensions (mm)		
	a	96
	b	96
	c	62,9
Weight (g)	480	690
V	$\cos \varphi$ 0.5-1-0.5	
100/ $\sqrt{3}$	-	-
110/ $\sqrt{3}$	-	-
100	M1343C	M1344C
110	M1343D	M1344D
230	M1343E	M1344E
400	M1343F	M1344F
440	M1343G	M1344G
500	M1343H	M1344H

Three-phase phase-meters 240°



	FEMC 96	FEMC 144
Class	1,5	
Scale	240° P1 (Simple profile)	
Dimensions (mm)		
	a	96
	b	96
	c	62,9
Weight (g)	480	690
V	$\cos \varphi$ 0.5-1-0.5	
100/ $\sqrt{3}$	M13431	M13441
110/ $\sqrt{3}$	M13432	M13442
100	M13433	M13443
110	M13434	M13444
230	M13435	M13445
400	M13436	M13446
440	M13437	M13447
500	M13438	M13448

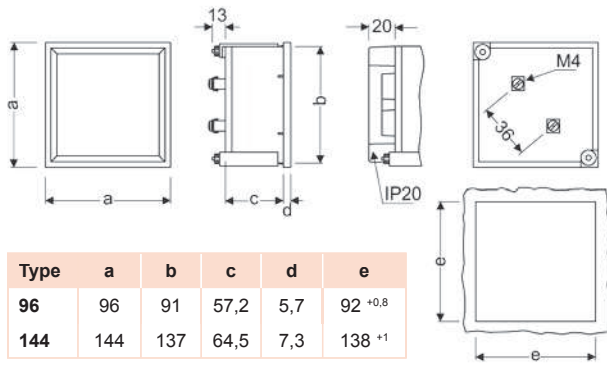
Electronic phase-meters

Analogue indicator to measure $\cos \varphi$



Dimensions

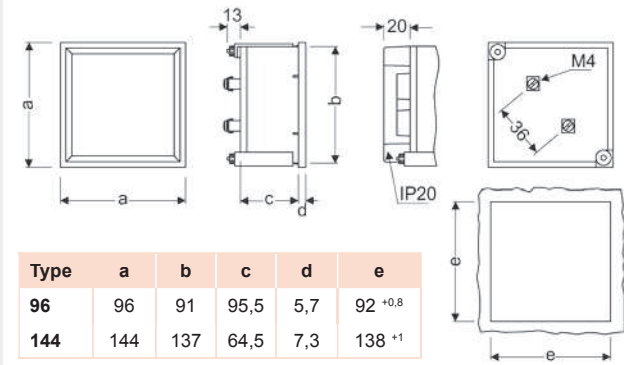
FEMC / FETC



Type	a	b	c	d	e
96	96	91	57,2	5,7	92 ^{+0,8}
144	144	137	64,5	7,3	138 ⁺¹

Dimensions (mm)

FMZ / FTZ

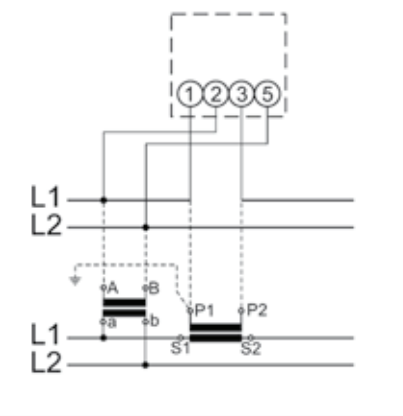


Type	a	b	c	d	e
96	96	91	95,5	5,7	92 ^{+0,8}
144	144	137	64,5	7,3	138 ⁺¹

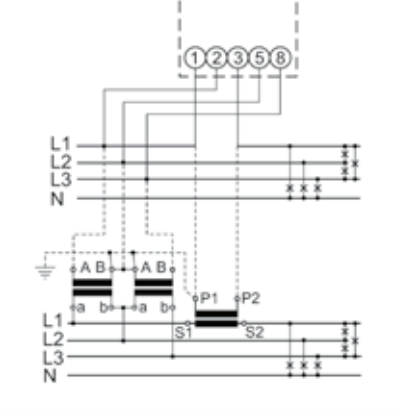
Dimensions (mm)

Connections

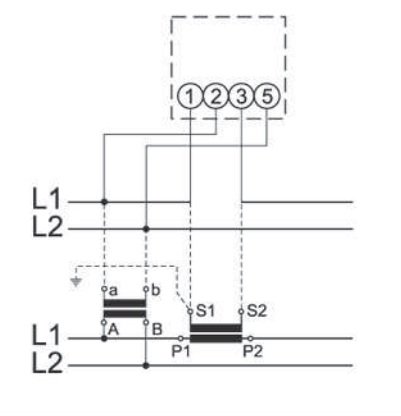
FEMC



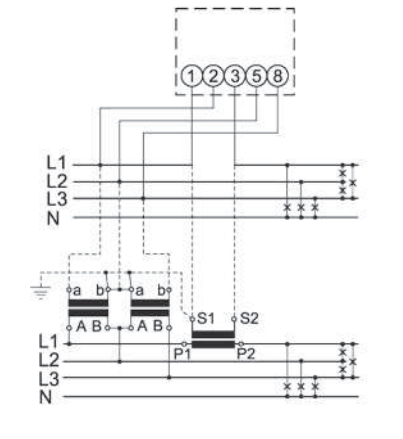
FETC



FMZ



FTZ



Coding table

Electronic phase-meters	M	1	X	X	X	X	0	0	X	X	
	Code						Internal Code		↑	↑	
	Secondary current		Standard ... / 5 A				0				
			... / 1 A				1				
Frequency		Standard (50 Hz)				0					
		60 Hz				1					

Induction Phase-meters

Analogue indicator to measure $\cos \varphi$



Description

- Does not need an auxiliary power supply
- DIN box with dimensions 96 and 144.
- Class 1.5
- Balanced and unbalanced single and three-phase circuits.
- 4 quadrants

Application

Measurement of $\cos \varphi$ in balanced or unbalanced single and three-phase circuits.

Features

	PIC A / PIC B	PIC E
Voltage circuit		
Consumption	5 V·A / 20 mA	15 mA
Frequency	49.5 ... 50.5 Hz	4 T - 5T
	59.4 ... 60.6 Hz	54 ... 66 Hz
Overloads		1.2 U_n permanent 2 U_n during 5 s
Current circuit		
Nominal current		... 5 A
Consumption	4 V·A	2.5 V·A
Frequency		20 ... 100 Hz
Overloads		1.2 I_n permanent 5 I_n during 30 s 10 I_n during 5 s 40 I_n during 1 s
Accuracy		± 1.5 % FS
Ambient conditions		
Operating temperature		+10 ... +30 °C
Limit temperature		- 25 ... +40 °C
Altitude		2000 m
Dimensions		See the following table
Weight		See the following table
Type of box		panel
Degree of protection:		
Front panel		IP 52
Terminals		IP 00
Insulation voltage		2 kV, during 1 min, between the mechanism and the box
Standards	BS 89, EN 60051, IEC 144, UL 94, DIN 43780, IEC 51, UNE 21318	

Induction Phase-meters

Analogue indicator to measure $\cos \varphi$



References

Induction Phase-meters 360°, single-phase



Type	PIC 96 A	PIC 144 A
Class	1,5	
Scale	360°, P1	
Dimensions (mm)		
a	96	144
b	96	144
c	101,2	102
Weight (g)	1 910	1 960
V	$\cos \varphi$ 0-1-0	
110	M13631	M13641
230	M13632	M13642
400	M13633	M13643

Induction Phase-meters 360°, three-phase



	BALANCED		UNBALANCED	
Type	PIC 96 B	PIC 144 B	PIC 96 E	PIC 144 E
Class	1,5			
Scale	360°, P1			
Dimensions (mm)				
a	96	144	96	144
b	96	144	96	144
c	101,2	102	101,2	102
Weight (g)	1 410	1 460	1 410	1 460
V	$\cos \varphi$ 0-1-0			
110	M13634	M13644	M13637	M13647
230	M13635	M13645	M13638	M13648
400	M13636	M13646	M13639	M13649

Dimensions

	C0	C1	C2	C3	C4	C5	C6	C7
a	48	72	96	144	72	96	96	144
b	44	66	89,6	137	66	89,6	89,6	137
c	41	43	43	64,5	57,2	57,2	95,5	94,7
d	5	5,2	5,2	7,1	5,2	5,2	5,2	7,1
e	45 ⁺¹	68 ⁺¹	92 ⁺¹	138 ⁺¹	68 ⁺¹	92 ⁺¹	92 ⁺¹	138 ⁺¹

Dimensions (mm)

Coding table

Induction Phase-meters	M	1	X	X	X	X	0	0	X
	Code						Internal Code		↑
	Secondary current						Standard ... / 5 A		0
						... / 1 A		1	

Connections

PIC 96A
PIC 144A

PIC 96B
PIC 144B

PIC 96C
PIC 144C

PIC 96E
PIC 144E