

AC Watt & Var Meters



Features

True power system design compliants ANSI-IEEE IEC & VDE standards
 High over cpability to assure reliable operation
 Available of 3-3/4 & 4-1/2 digits
 High accuracy of 0.5% & 0.25%
 Distorted waveform signal measurement
 Display with super rate LED

Applied standards & rules

Measruing & conversion	IEC 688
Dielectric strength	IEC 688
Impulse & Surge test	ANSI c37.90/1989 IEC 255-3 (1989)
Adaptability for power sytem	IEC 0110
Measruing reliability	VDE 3540

Description

Model MW & MK series, designed for general performance measruing active & reactive power, accepts ac voltage & current signals with conversion to use a time division multiplier principle of an accurate detection the measured input power. The conversional process adopts pulse width modulation for voltage input & amplitude chopping modulation for current input to form a happed current pulse which as a multipling function of instant variables for input voltage & current.

The integration of the instantaneous sample-conversion applied to MW series as a real power detection is able to measure a distorted sinusoidal wave with high harmonics even for a chopped SCR-controlled waveform. The unit series include of the ratio input type & direct input type, the former defined to accept the secondary signal from CT & PT & to scale to primary reading display, the later calibrated to a reading to follow input. The designed specification , truely a real power system configuration, compliants ANSI-IEEE & DIN-IEC, VDE those standards with full protection for surge intrusion & accident input over to assure reliable operation.

Specifications

Accuracy (23± 3°C)	0.5% fs or 5 cts. which ever great:MWX, MWY,MWZ, MWQ,MKX,MKY,MKQ(3-3/4 digits) 0.25% fs + 1 count: MWX4,MWY4,MWZ4,MWQ4,MKY4,MKZ4,MKQ4 (4-1/2 digits)
Stability	Temperature coefficient < 60 ppm per degree C Long term draft < 0.2% per year
Digits & counts	3-3/4 digits 3999 counts maximum, 4-1/2 digits 19999 counts maximum
Display	0.56" super rate LED
Response time	Sample rate 1 pf per sec typically
input over	Current input: 3 time rating-continuous, 10 time rating-30sec, 25 time rating-3sec. Voltage input: maximum continuous 750V or 1.5 rating which ever great
Frequency	Watt version normal ±5Hz Var version normal ±0.5 hz < 0.2% change for 0.1 hz deviated of center frequency
Creat factor	Normally O 3, MW.. series only
Waveform	3rd 30% for watt version only
Dielectric strength	2.5 KVRms/ 1 minute, all terminals to reference ground (case) 2 KVRms/ 1 minute, input terminals to power terminals
Surge test	ANSI c37.90/1989, IEC 255-3 (1989) Impulse voltage 1.2x50 us 4 KV Oscillating wave 0.5 us-100 KHz 3KV or 1 MHz - 0.25 ms 2.5KV
Operating condition	Operating temperature range -10 to 55°C, humidity 0-99% RH non-condensed
storage condition	-25 to 70°C, humidity 20-99% RH non-condensed
Ausiliary power	AC ±15% < 6 VA, DC ±20% < 6 watts

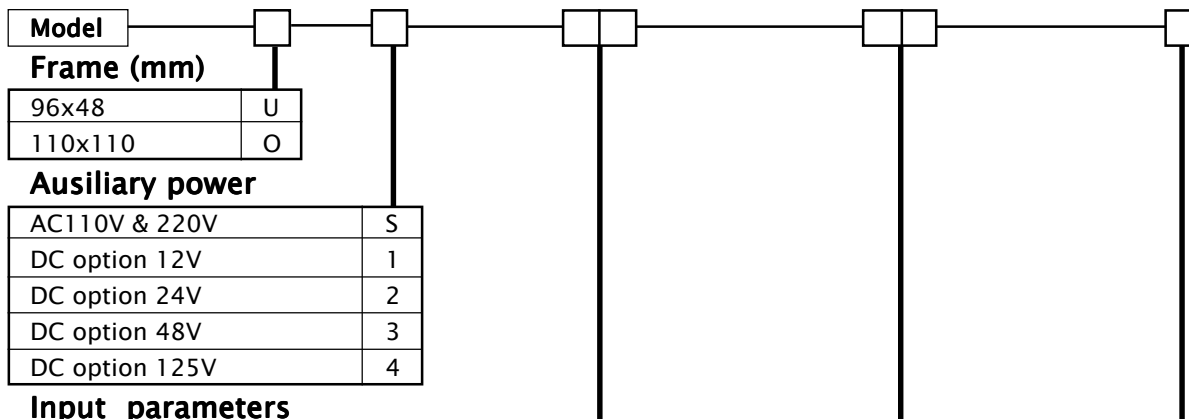
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Order from of Watt meters

System	Model	Digit	Flow	Class	Model	Digit	Flow	Class
1 phase 2 wire	MWX	3-3/4	UNI	0.5%	MWX4	4-1/2	BI	0.25%
3 phase 3 wire	MWY	3-3/4	UNI	0.5%	MWY4	4-1/2	BI	0.25%
3 phase 4 wire	MWZ	3-3/4	UNI	0.5%	MWZ4	4-1/2	BI	0.25%
3 phase 4 wire*	MWQ	3-3/4	UNI	0.5%	MWQ4	4-1/2	BI	0.25%

Note : 1. Uni-display of forward status. Bi-display of forward & reversed status.2.*: Voltage input of V-V connection. 3. auxiliary power: standard only ac 110v for 3 phase 4 wires, 220v for customer specified.

Calibration



Input parameters

Voltage (PT ratio & direct ranges)		Current			Frequency	
P/S: line voltage/ line voltage MWX / MWY / MWX4 / MWY4		CT ratio P/S	P / 5A	P / 1A		
3.30KV/110=3.45KV/115=3.60KV/120	AL	20A/S	A5	A1	50HZ	A
6.60KV/110=6.90KV/115=7.20KV/120	BL	25A/S	B5	B1	60HZ	B
11.0KV/110=11.5KV/115=12.0KV/120	CL	30A/S	C5	C1		
13.2KV/110=13.8KV/115=14.4KV/120	DL	40A/S	D5	D1		
22.0KV/110=23.0KV/115=24.0KV/120	EL	50A/S	E5	E1		
33.0KV/110=34.5KV/115=36.0KV/120	FL	60A/S	F5	F1		
66.0KV/110=69.0KV/115=72.0KV/120	GL	75A/S	G5	G1		
154KV/110=161KV/115=168KV/120	HL	80A/S	H5	H1		
330KV/110=345KV/115=360KV/120	IL	100A/S	I5	I1		
P/S: phase voltage/ phase voltage MWZ / MWQ / MWZ4 / MWQ4		150A/S	J5	J1		
		200A/S	K5	K1		
3.30KV/110=3.45KV/115=3.60KV/120	AP	300A/S	L5	L1		
6.60KV/110=6.90KV/115=7.20KV/120	BP	400A/S	M5	M1		
11.0KV/110=11.5KV/115=12.0KV/120	CP	500A/S	N5	N1		
13.2KV/110=13.8KV/115=14.4KV/120	DP	600A/S	O5	O1		
22.0KV/110=23.0KV/115=24.0KV/120	EP	750A/S	P5	P1		
33.0KV/110=34.5KV/115=36.0KV/120	FP	800A/S	Q5	Q1		
66.0KV/110=69.0KV/115=72.0KV/120	GP	1000A/S	R5	R1		
154KV/110=161KV/115=168KV/120	HP	1200A/S	S5	S1		
$D=1/\sqrt{3}$		1500A/S	T5	T1		
3.30KV/110D=3.45KV/115D=3.60KV/120D	AD	1600A/S	U5	U1		
6.60KV/110D=6.90KV/115D=7.20KV/120D	BD	2000A/S	V5	V1		
11.0KV/110D=11.5KV/115D=12.0KV/120D	CD	2400A/S	W5	W1		
13.2KV/110D=13.8KV/115D=14.4KV/120D	DD	2500A/S	X5	X1		
22.0KV/110D=23.0KV/115D=24.0KV/120D	ED	3000A/S	Y5	Y1		
33.0KV/110D=34.5KV/115D=36.0KV/120D	FD	3600A/S	Z5	Z1		
66.0KV/110D=69.0KV/115D=72.0KV/120D	GD					
154KV/110D=161KV/115D=168KV/120D	HD					
Direct input	15-150V	V1	0-1.5A	A2		
	30-300V	V2	0-7.5A	A3		
	50-500V	V3	0-12A	A4		
Other specified ratio ranges		VY		AY		

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1 phase 2 wire	MKX	3-3/4	C&L	0.5%	MKX4	4-1/2	C&L	0.25%
3 phase 3 wire	MKY	3-3/4	C&L	0.5%	MKY4	4-1/2	C&L	0.25%
3 phase 4 wire	MKZ	3-3/4	C&L	0.5%	MKZ4	4-1/2	C&L	0.25%
3 phase 4 wire*	MKQ	3-3/4	C&L	0.5%	MKQ4	4-1/2	C&L	0.25%

Note : 1. C&L – display of leading & lagging status. 2. * : voltage input of V – V connection.
 3. Auxiliary power : standard only AC 110V for 3 phase 4 wires, AC 220V for customer specified.

Calibration

Model	
Frame (mm)	
96x48	U
110x110	O
Ausiliary power	
AC110V & 220V	S
DC option 12V	1
DC option 24V	2
DC option 48V	3
DC option 125V	4

Input parameters

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3.30KV/110=3.45KV/115=3.60KV/120	AL	20A/S	A5	A1	50HZ	A
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11.0KV/110=11.5KV/115=12.0KV/120	CL	30A/S	C5	C1		
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P/S: phase voltage/ phase voltage MKZ / MKQ / MKZ4 / MKQ4		150A/S	J5	J1		
		200A/S	K5	K1		
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3.30KV/110D=3.45KV/115D=3.60KV/120D	AD	1600A/S	U5	U1		
6.60KV/110D=6.90KV/115D=7.20KV/120D	BD	2000A/S	V5	V1		
11.0KV/110D=11.5KV/115D=12.0KV/120D	CD	2400A/S	W5	W1		
13.2KV/110D=13.8KV/115D=14.4KV/120D	DD	2500A/S	X5	X1		
22.0KV/110D=23.0KV/115D=24.0KV/120D	ED	3000A/S	Y5	Y1		
33.0KV/110D=34.5KV/115D=36.0KV/120D	FD	3600A/S	Z5	Z1		
66.0KV/110D=69.0KV/115D=72.0KV/120D	GD					
154KV/110D=161KV/115D=168KV/120D	HD					
Direct input	15-150V	V1	0-1.5A	A2		
	30-300V	V2	0-7.5A	A3		
	50-500V	V3	0-12A	A4		
Other specified ratio ranges		VY		AY		

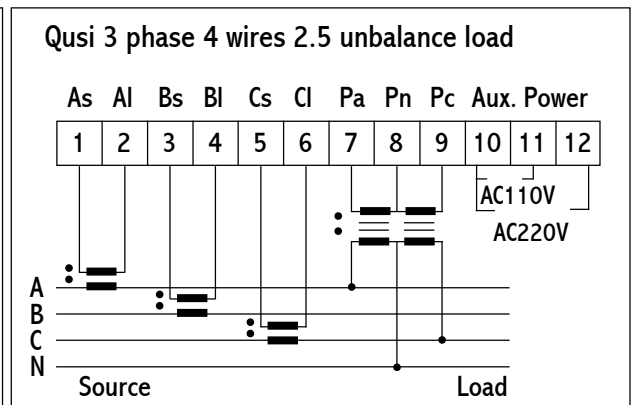
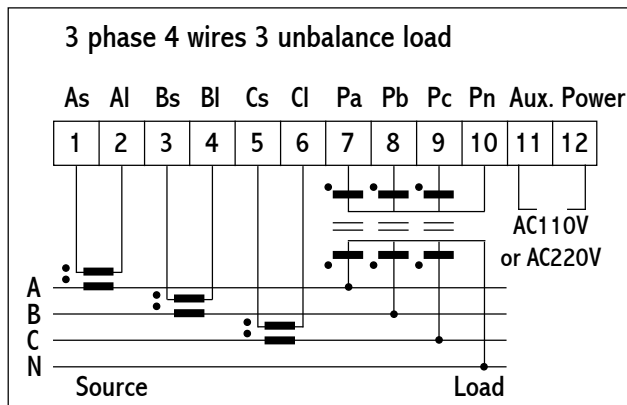
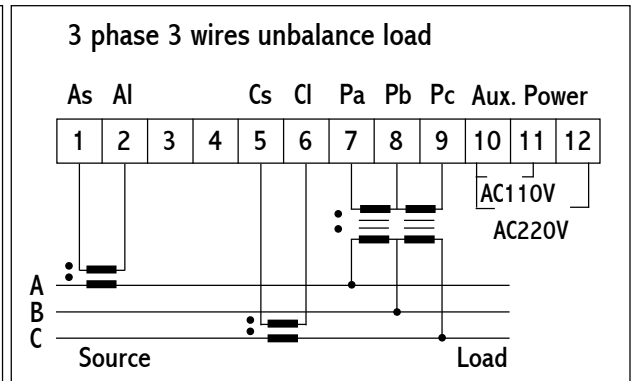
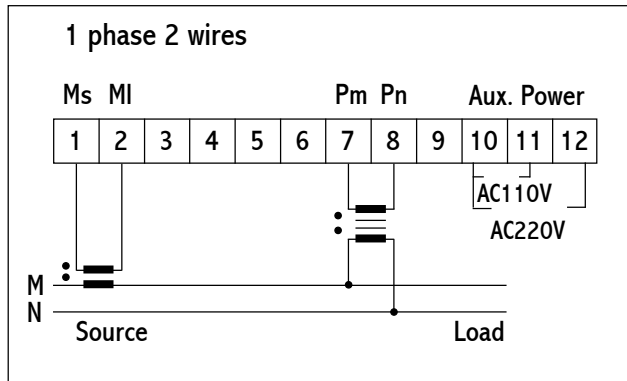
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Terminal connection.....Model MW / MK

Ratio input: voltage-secondary of PT/current-secondary of CT

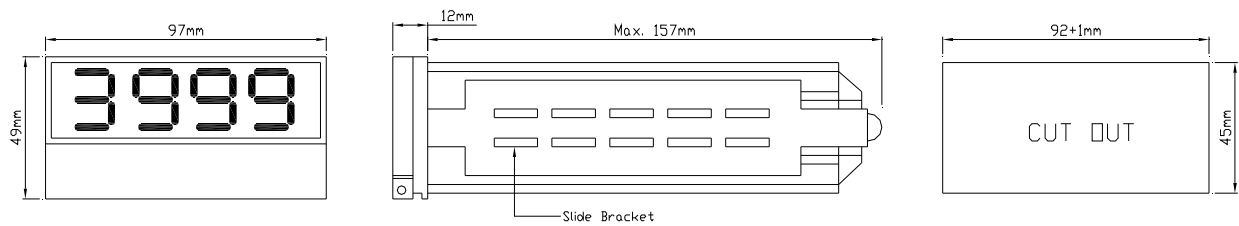
Direct input:voltage of direct input & current of secondary CT or direct input

Terminals 11 (+), 12 (-) for DC power option



Dimension

U Type



O Type

