



3510PHW-AUTO

Features

- Check 3 ϕ Phase Sequence
- 4 Digit LCD, 9999 Count, Autoranging
- Data Hold, Auto Power Off
- Dual Display KW+HP, KW+PF, KW+KVAR, KVA+ ϕ , V+A, A+Hz, V+Hz
- Cable of Diameter upto 43mm / Busbar upto 65mm x 16mm

Applications

- 1 ϕ & 3 ϕ (3 ϕ 3w / 3 ϕ 4w) Power Analyzer
- Ideal for Electrical Audit of Heating, Ventilation & Aircon Systems (HVAC)
- Check Current drawn in Motors and Compressors
- Test Run / Start Capacitors
- Check for Energized Circuits & Balance Loads
- Capture Motor In-Rush Current Readings
- Determine Peak Power Demand Periods
- Analyze Temperature Data with the Aid of the Time Stamp
- Resistance upto 100M Ω
- Use MAX / MIN / REC in Temperature Mode to Assess Efficiency
- Evaluate Electrical Contacts
- Verify the Stability of Voltage
- Check Motor Run / Start Capacitor Values
- To Identify Low Voltage Control Signal
- To Identify Power Sources

1 ϕ /3 ϕ TRUE Power (KW) : (PF lag 1.000~0.000~lead 1.000 or 00.00°~360.0°) (1 hp=0.7457KW)			
Range	Resolution	Accuracy $\pm$ (%rdg+dgts)	Overload Protection
99.99KW	0.01KW	$\pm$ (5% + 30)	600VAC/ 1000AAC
600.0KW	0.1KW	[50, 60Hz]	

1 ϕ /3 ϕ HP (1HP=745.7W) : (PF lag 1.000~0.000~lead 1.000 or 00.00°~360.0°)			
Range	Resolution	Accuracy $\pm$ (%rdg+dgts)	Overload Protection
99.99HP	0.01 HP	$\pm$ (5% + 30)	600VAC/ 1000AAC
800.0HP	0.1 HP	[50, 60Hz]	

1 ϕ /3 ϕ Apparent Power (KVA)			
Range	Resolution	Accuracy $\pm$ (%rdg+dgts)	Overload Protection
99.99KVA	0.01 KVA	$\pm$ (2.5% + 30)	600VAC/ 1000AAC
600.0KVA	0.1 KVA		

1 ϕ /3 ϕ Reactive Power (KVAR) : (PF lag 1.000~0.000~lead 1.000 or 00.00°~360.0°)			
Range	Resolution	Accuracy $\pm$ (%rdg+dgts)	Overload Protection
99.99KVAR	0.01KVAR	$\pm$ (5% + 50dgts)	600V AC/1000AAC
600.0KVAR	0.1KVAR	[50, 60Hz]	

3 ϕ Phase Sequence Indication		
Range	Frequency Response	Overload Protection
80V to 480V	[50Hz / 60Hz]	600V

ACA Inrush Current				
Range	Resolution	Sensitivity	Measurement Time	Overload Protection
99.99A	0.01A	>5A	100ms	1000A AC
999.9A	0.1A	>50A		

1 ϕ /3 ϕ PF & Phase Angle (50Hz, 60Hz)				
Range	Resolution	Accuracy	Sensitivity	
00.00°~99.99°	0.01°	$\pm$ 6.0°	ACV>100V, ACA>10A	
100.0°~360.0°	0.1°			
lag 1.000~0.000~lead 1.000	0.001			

Frequency				
Range	Resolution	Accuracy $\pm$ (%rdg+dgts)	Sensitivity	
40.00Hz~999.9Hz	0.01Hz/0.1Hz	$\pm$ (0.5% + 2)	ACV>1.2V, ACA>6A	

AC Current (50Hz to 400Hz) : TRMS				
Range	Resolution	Accuracy $\pm$ (%rdg+dgts)	Sensitivity	Overload Protection
99.99A	0.01A	$\pm$ (2% + 30) [50,60Hz]	0.10A	1000A
999.9A	0.1A	$\pm$ (4% + 30) [40-400Hz]	1.0A	

μ A : DC + AC TRMS (Burden Voltage : 5mV/ μ A) (50Hz to 400Hz)				
Range	Resolution	Accuracy $\pm$ (%rdg+dgts)	Sensitivity	Overload Protection
99.99 μ A	0.01 μ A	$\pm$ (1% + 30)	0.20 μ A	500V DC or AC rms for 1 min.
999.9 μ A	0.1 μ A		2.0 μ A	

AC Voltage (50Hz to 400Hz) : TRMS				
Range	Resolution	Accuracy ±(%rdg+dgts)	Sensitivity	Overload Protection
999.9mV	0.1mV	±(1% + 30) (50, 60Hz)	2.0mV	600V
9.999V	0.001V		0.020V	
99.99V	0.01V	±(2% + 30)	0.20V	
600.0V	0.1V	(40-400Hz)	2V	
Input Impedance : 3MΩ				

DC Voltage				
Range	Resolution	Accuracy $\pm(\%rdg+dgts)$	Sensitivity	Overload Protection
999.9mV	0.1mV	$\pm(1\% + 30)$	2.0mV	600V
9.999V	0.001V		0.020V	
99.99V	0.01V		0.20V	
600.0V	0.1V		2V	

Input Impedance : 3M Ω

Resistance (Continuity < 40 Ω on the 999.9 Ω range)			
Range	Resolution	Accuracy $\pm(\%rdg+dgts)$	Overload Protection
999.9 Ω	0.1 Ω	$\pm(1\% + 10)$	500V DC or AC rms for 1 min.
9.999K Ω	0.001K Ω		
99.99K Ω	0.01K Ω		
999.9K Ω	0.1K Ω		

M Ω (Auto Ranging)			
Range	Resolution	Accuracy $\pm(\%rdg+dgts)$	Overload Protection
9.999M Ω	0.001M Ω	$\pm(5\% + 10)$	500V DC or AC rms for 1 min.
99.99M Ω	0.01M Ω		

Capacitance			
Range	Resolution	Accuracy ±(%rdg+dgts)	Overload Protection
10.000μF	0.001μF	±(3.0% + 5)	500V DC or AC rms for 1 min.
100.00μF	0.01μF	±(1.5% + 5)	
1000.0μF	0.1μF		
7000μF	1μF	±(2.5% + 15)	

Diode (Continuity < 40mV)			
Range	Resolution	Accuracy $\pm(\%rdg+dgts)$	Overload Protection
2.000V	0.001V	$\pm(2\% + 1)$	500V DC or AC rms for 1 min.

Temperature (K-Type Thermocouple)			
Range	Resolution	Accuracy $\pm(\%rdg+dgts)$	Overload Protection
-50°C to 900°C	0.1°C	$\pm(1.2\% + 4^\circ\text{C})$	30VAC or 60VDC
-58°F to 1000°F	0.1°F	$\pm(1.2\% + 6^\circ\text{F})$	

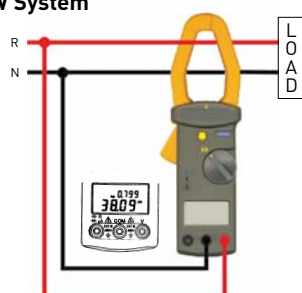
General Specifications

Numerical Dual Display : 4 Digit 9999 Count LCD
Low Battery Indication :  is displayed
Power : 9V Battery x 1
Sampling Rate : 2.5 times/sec. (Digital Display)
 1 times/6 sec. (on KW, KVA)
Operating Temperature and Humidity : 0°C to 50°C (32°F to 122°F)
 RH < 80% non-condensing
Storage Temperature and Humidity : -10°C to 60°C (14°F to 140°F)
 RH < 70% non-condensing
Dimensions : 247 x 90 x 40mm

Weight : 425gms Including Battery (approx.)
Jaw Opening : Cable Dia 43mm (max.)
 Bus Bar 16mm x 65mm
Accessories : Carrying Case, Battery (installed),
 Test Leads Pair, K Type Thermocouple (Upto 260°C) (Optional), Instruction Manual
Auto Power off Time : Approx. 30 minutes
Temperature Coefficient : 0.1 x (specified accuracy) / °C
 (<18 or >28°C, <64 or >82°F)

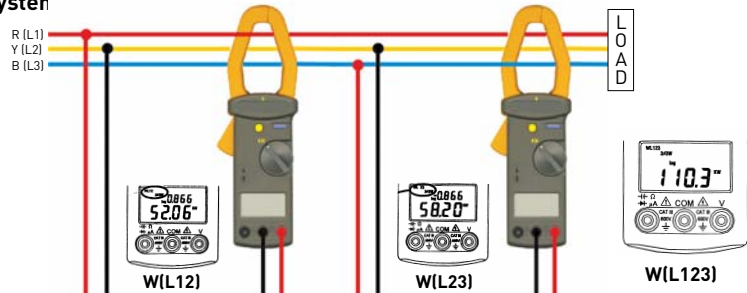
Usage

1 ϕ 2W System



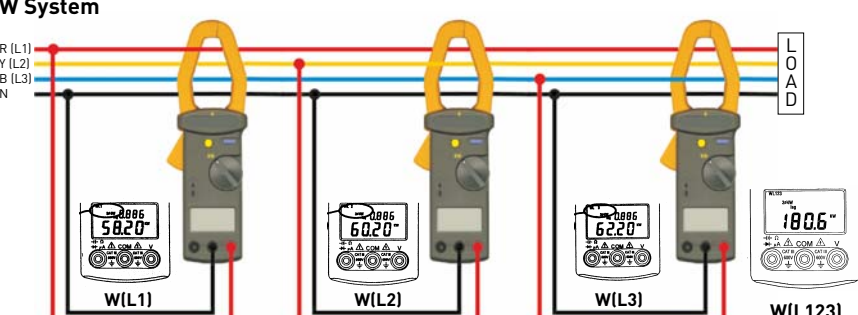
Press "RANGE" Key to Select KW+HP, KW+PF, KW+KVAR, KVA+ θ or A+V
 $PF = \frac{KW}{KVA} = \cos\theta$
 $HP = 746 \text{ watts}$
 $KVA = (V \times A) / 1000$
 $KVAR = KVA \times \sin\theta$

3 ϕ 3W System



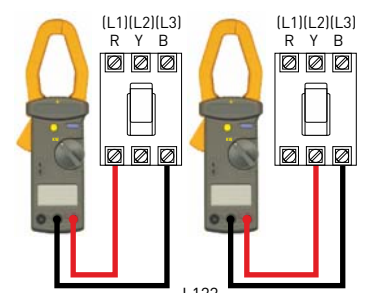
$W_3\phi 3W = W_R(L1L2) + W_B(L3L2)$
 $PF_{3\phi 3W} = \frac{KW_{3\phi 3W}}{KVA_{3\phi 3W}}$
 $KVA_{3\phi 3W} = \sqrt{KW^2_{3\phi 3W} + KVAR^2_{3\phi 3W}}$

3 ϕ 4W System



$W_3\phi 4W = W_R(L1) + W_Y(L2) + W_B(L3)$
 $KVA_{3\phi 4W} = \sqrt{KW^2_{3\phi 4W} + KVAR^2_{3\phi 4W}}$
 $PF_{3\phi 4W} = \frac{KW_{3\phi 4W}}{KVA_{3\phi 4W}}$

3 ϕ Phase Sequence Indication



Normal Phase: R $\rightarrow$ Y $\rightarrow$ B
 Reverse Phase: R $\rightarrow$ B $\rightarrow$ Y
 R:L1, Y:L2, B:L3