

3 phase/4 wire, 3 phase/3 wire, RS232/USB  
1 phase/2 wire, 1 phase/3 wire, SD card memory

# 3 PHASE POWER ANALYZER with harmonic measurement

Model : DW-6095

ISO-9001, CE, IEC1010

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*The Art of Measurement*

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# 3 PHASE POWER ANALYZER with harmonic measurement

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## FEATURE

- \* Analysis for 3 phase multi-power system, 1P/2W, 1P/3W, 3P/3W, 3P/4W.
- \* 3 current probes ( CP-1201 ) are included, if change the current probes, the calibration procedures are not necessary.
- \* Current probe input signal/ranges with selection :  
Input signal(ACV) : 200 mV/300 mV/500 mV/1 V/2 V/3 V.  
Ranges (ACA) : 20 A/200 A/2000 A/30 A/300 A/ 3000 A.
- \* Meter can cooperate the universal current probes.
- \* Complete set with 4 PCs Test Leads, 4 PCs Alligator clips, 3 PCs Clamp Probe ( CP 1201 ), AC to DC 9V adapter, 2 G SD memory card and Carrying bag.
- \* Measurement : V (phase-to-phase), V (phase-to-ground) A (phase-to-ground) KW / KVA / KVAR / PF (phase) KW / KVA / KVAR / PF (system) KWH / KVAH / KVARH / PFH (system) Phase angle
- \* Harmonics display (1-50th order).
- \* Simultaneous display of Harmonics and Wave form.
- \* Display of Waveform with Peak Values.
- \* Analysis of Total Harmonic Distortion ( THD ).
- \* Graphic Phase diagram with 3-Phase system parameters.
- \* 3 phase Voltage or Current Unbalanced Ratio ( VUR, AUR ) and Unbalanced Factor.
- \* Calculated Unbalanced Current through Neutral Line ( An )
- \* Capture Transient events (including Dip, Swell and Outage ) with programmable threshold ( % ).
- \* Programmable CT ratio ( 1 to 600 ) and PT ratio ( 1 to 1000 ).
- \* ACV input impedance is 10 Mega ohms.
- \* Safety Standard : IEC 1010, CAT III 600V.
- \* Built-in clock and Calendar, real time data record with SD memory card , sampling time set from 2 to 7200 seconds. Just slot in the SD card into the computer, it can down load the all the measured value with the time information ( year, month, data, hour, minute, second ) to the Excel directly, then user can make the further data analysis by themselves.
- \* Powered by AA ( UM-3 ) DC 1.5 V X 8 batteries ( Alkaline type ) or DC 9V adapter.
- \* Computer data output, can cooperate with optional USB Cable/USB-01, RS232 cable/UPCB-02 and Data Acquisition software, SW-811.
- \* Optional current probes : CP-1201, CP-2000, CP-200, CP-3000, detail specification.
- \* User can order the meter only ( without the current probes ) with the special request as intend to cooperate their own current probes.
- \* Patented.

## GENERAL SPECIFICATION

Circuit	Custom one-chip of microprocessor LSI circuit
Display	* LCD Size : 81.4 X 61 mm ( 3.2 X 2.4 inch ) * Dot Matrix LCD (320 X 240 pixels ) with back light.
Measurement	* V (phase-to-phase) * V (phase-to-ground) * A (phase-to-ground) * KW / KVA / KVAR / PF (phase) KW / KVA / KVAR / PF (system) KWH / KVAH / KVARH / PFH (system) * Power factor * Phase angle * Frequency

	* Harmonics display.
Wire connections	1P/2W, 1P/3W, 3P/3W, 3P/4W.
Voltage ranges	10 ACV to 600 ACV, auto range.
Current probe input signal and range	- Current probe input signal voltage ( ACV ) : 200mV/300mV/500mV/1V/2V/3V. - Current probe input current range ( ACA ) : 20 A/200A/2000A (1200 A)/30A/300A/3000A * Meter can cooperate the universal current probe.
Safety standard	IEC1010 CAT III 600 V.
ACV input impedance	10 Mega ohms.
Range select	ACV    Auto range.
	ACA    Manual range.
Clamp frequency response	40 Hz to 1 KHz.
Spec. tested frequency	45 to 65 Hz.
Over load protection	ACV    720 ACV rms
	ACA    1300 ACA with clamp probe * For the Clamp ,CP-1201
Data Hold	Freeze the display reading.
Data Record	SD Card Record.
Sampling Time	Approx. 1 second.
Power ON/OFF	Manual OFF by push button.
Over Indicator	* LCD display show " OL ". * The data save into the SD card will show " 9999 " or " 999 "( overleap the decimal point ).
Under Indicator	* LCD display show " UR ". * The data save into the SD card will show " 9999 " or " 999 " ( overleap the decimal point ).
Real time data logger	* Real time data logger, saved the data into SD memory card and down load the all the measured value with the time information ( year/month/data/hour/minute/second ) down load to the Excel
	* Sampling time for data logger : 2 seconds to 7200 seconds, the during of setting step are 2 seconds.
Data Output USB/RS232 * Computer interface	RS232 computer serial interface : * Connect the optional USB cable USB-01 will get the USB plug. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug.
Operating Temperature	0 to 50°C ( 32 to 122°F ).
Operating Humidity	Less than 80% R.H..
Power Supply	* DC 1.5V, AA ( UM-3 ) Battery X 8 PCs (Alkaline or heavy-duty battery). * AC to DC 9V power adapter.
Power Consumption	* Meter : 500 DCmA. Clamp : 34 DCmA.
Clamp max. conductor Size	50 mm ( 2.0 inch ) Dia. * For the Clamp ,CP-1201
Weight	* Meter : 948g ( includes batteries ) Clamp ( included cable ) : 467g
Dimension	Meter : 225 X 125 X 64 mm ( 8.86 X 4.92 X 2.52 inch )
	Clamp : 210 X 64 X 33mm ( 8.3 X 2.5 X 1.3 inch )
	Clamp Jaw : 86 mm (3.4 inch)- outside
Accessories Included	* Instruction manual..... 1 PC * Test Leads (TL88-4AT)..... 1 Set (4 PCs) * Alligator clips (TL88-4AC)    1 Set (4 PCs) * Clamp Probe ( CP-1201 )..... 3 PCs * AC to DC 9V adapter..... 1 PC * SD card ( 2 G )..... 1 PC * Carrying bag..... 1 PC

Optional Accessories	<ul style="list-style-type: none"> <li>* 2000 Amp current probe, CP-2000</li> <li>* 200 Amp current probe, CP-200</li> <li>* Flexible 3000 Amp current probe, CP-3000</li> <li>* USB Cable , USB-01</li> <li>* RS232 cable, UPCB-02</li> <li>* Data Acquisition software, SW-U811</li> </ul>
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## ELECTRICAL SPECIFICATIONS (23± 5 °C)

### ACV

Range	Resolution	Accuracy
10.0V to 600.0V * Phase to neutral line	0.1V	± (0.5%+0.5V)
10.0V to 600.0V * Phase to phase		

### ACA

Range	Resolution	Accuracy
20A	0.001A , < 10 A	Meter + CP-1201 ± (1 %+0.1A)
	0.01A, ≥ 10 A	Meter only ± (0.5 %+0.02A)
200A	0.01A, < 100 A	Meter + CP-1201 ± (1 %+0.5A)
	0.1A, ≥ 100 A	Meter only ± (0.5 %+0.2A)
1200A	0.1A, < 1000 A	Meter + CP-1201 ± (1 %+5A)
	1A, ≥ 1000 A	Meter only ± (0.5 %+2A)

### Power factor

Range	Resolution	Accuracy
0.00 to 1.00	0.01	± 0.04
<b>Remark :</b>		
* <b>PFH : Long term power factor</b>		
* <b>PFΣ : For 3Φ 4W, 3Φ 3W PFΣ= ( PF1 + PF2 + PF3 )/3      For 1Φ 3W PFΣ= ( PF1 + PF2 )/2</b>		

### Φ ( Phase angle )

Range	Resolution	Accuracy
-180° to 180°	0.1°	± 1° * ACOS ( PF )

### Active (Real) Power

Range	Resolution	Accuracy
0.000 to 9.999 KW	*0.001/0.01/0.1 KW	± (1%+0.008KW)
10.00 to 99.99 KW	*0.01/0.1 KW	± (1%+0.08KW)
100.0 to 999.9 KW	0.1 KW	± (1%+0.8KW)
1.000 to 9.999 MW	0.001 MW	± (1%+0.008MW)
* The resolution is changed according the different ACA range.		

### Frequency

Range	Resolution	Accuracy
45 to 65 Hz	0.1 Hz	0.1 Hz

### Apparent Power

Range	Resolution	Accuracy
0.000 to 9.999 KVA	*0.001/0.01/0.1KVA	± (1%+0.008KVA)
10.00 to 99.99 KVA	*0.01/0.1 KVA	± (1%+0.08KVA)
100.0 to 999.9 KVA	0.1 KVA	± (1%+0.8KVA)
1.000 to 9.999 MVA	0.001 MVA	± (1%+0.008MVA)

\* The resolution is changed according the different ACA range.

### Reactive Power

Range	Resolution	Accuracy
0.000 to 9.999 KVAR	*0.001/0.01/0.1KVAR	± (1%+0.008 KVAR)
10.00 to 99.99 KVAR	*0.01/0.1 KVAR	± (1%+0.08 KVAR)
100.0 to 999.9 KVAR	0.1 KVAR	± (1%+0.8 KVAR)
1.000 to 9.999 MVAR	0.001 MVAR	± (1%+0.008 MVAR)

\* The resolution is changed according the different ACA range.

### Watt Hour ( Active Power Hour ) : WH

Range	Resolution	Accuracy
0.000 to 9.999 KWH	0.001 KWH	± (2%+0.008 KWH)
10.00 to 99.99 KWH	0.01 KWH	± (2%+0.08 KWH)
100.0 to 999.9 KWH	0.1 KWH	± (2%+0.8 KWH)
1.000 to 9.999 MWH	0.001 MWH	± (2%+0.008 MWH)

### VA Hour ( Apparent Power Hour ) : SH

Range	Resolution	Accuracy
0.000 to 9.999 KVAH	0.001 KVAH	± (2%+0.008 KVAH)
10.00 to 99.99 KVAH	0.01 KVAH	± (2%+0.08 KVAH)
100.0 to 999.9 KVAH	0.1 KVAH	± (2%+0.8 KVAH)
1.000 to 9.999 MVAH	0.001 MVAH	± (2%+0.008 MVAH)

### VAR Hour ( Reactive Power Hour ) : QH

Range	Resolution	Accuracy
0.000 to 9.999 KVARH	0.001 KVARH	± (2%+0.008 KVARH)
10.00 to 99.99 KVARH	0.01 KVARH	± (2%+0.08 KVARH)
100.0 to 999.9 KVARH	0.1 KVARH	± (2%+0.8 KVARH)
1.000 to 9.999 MVARH	0.001 MVARH	± (2%+0.008 MVARH)

### Harmonics of AC voltage in Magnitude \* Fundamental frequency 50 Hz, 60 Hz

Range	Resolution	Accuracy
1 to 20th	0.1 V	± ( 2 % + 0.5 V )
21 to 30th		± ( 4 % + 0.5 V )
31 to 50th		reference

### Harmonics of AC voltage in Percentage \* Fundamental frequency 50 Hz, 60 Hz

Range	Resolution	Accuracy
1 to 20th	0.1 %	± ( 2 % + 10 d )
21 to 30th		± ( 4 % + 20 d )
31 to 50th		reference

Harmonics of AC current in Magnitude \* Fundamental frequency 50 Hz, 60 Hz

Range	Resolution	Accuracy
1 to 20th	0.1 A	$\pm ( 2 \% + 0.5 A )$
21 to 30th		$\pm ( 4 \% + 0.5 A )$
31 to 50th		reference

Harmonics of AC current in Percentage \* Fundamental frequency 50 Hz, 60 Hz

Range	Resolution	Accuracy
1 to 20th	0.1 %	$\pm ( 2 \% + 10 d )$
21 to 30th		$\pm ( 4 \% + 20 d )$
31 to 50th		reference

Peak value of ACV or ACA

Range	Sample Time	Accuracy
50 Hz	19 us	$\pm ( 5 \% + 30 d )$
60 Hz	16 us	
* us = micro seconds		

Crest Factor of ACV or ACA

Range	Resolution	Accuracy
1.000 - 99.99	0.001	$\pm ( 5 \% + 30 d )$

Total Harmonic Distortion

Range	Resolution	Accuracy
0 to 20 %	0.1 %	$\pm ( 2 \% + 5 d )$
20.1 to 100 %		$\pm ( 6 \% + 10 d )$

\* Appearance and specifications listed in this brochure are subject to change without notice.

DW-6095+1409

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