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Manual PCE-830 power analyzer



1. Definition of Symbols:



Caution: Refer to Accompanying Documents



Double Insulation



Caution: Risk of Electric Shock

2. Over-voltage category III (CAT III):

equipment in fixed installations.

WARNING: If the power analyzer is used in a manner Not specified by the manufacturer, the protection Provided by the clamp meter may be impaired.

3. Please read the following instructions before usage

1. Do not operate in wet or dusty environments.
2. Do not operate in presence of combustible or explosive gas
3. Do not touch exposed metal parts, unused terminals.
4. Consider the use of rubber glove in operation.
5. Do not operate in excess of AC 500V (Phase to Neutral), or AC 600V (Phase to Phase)
1. Do not operate when the unit seems to be mal-functioning

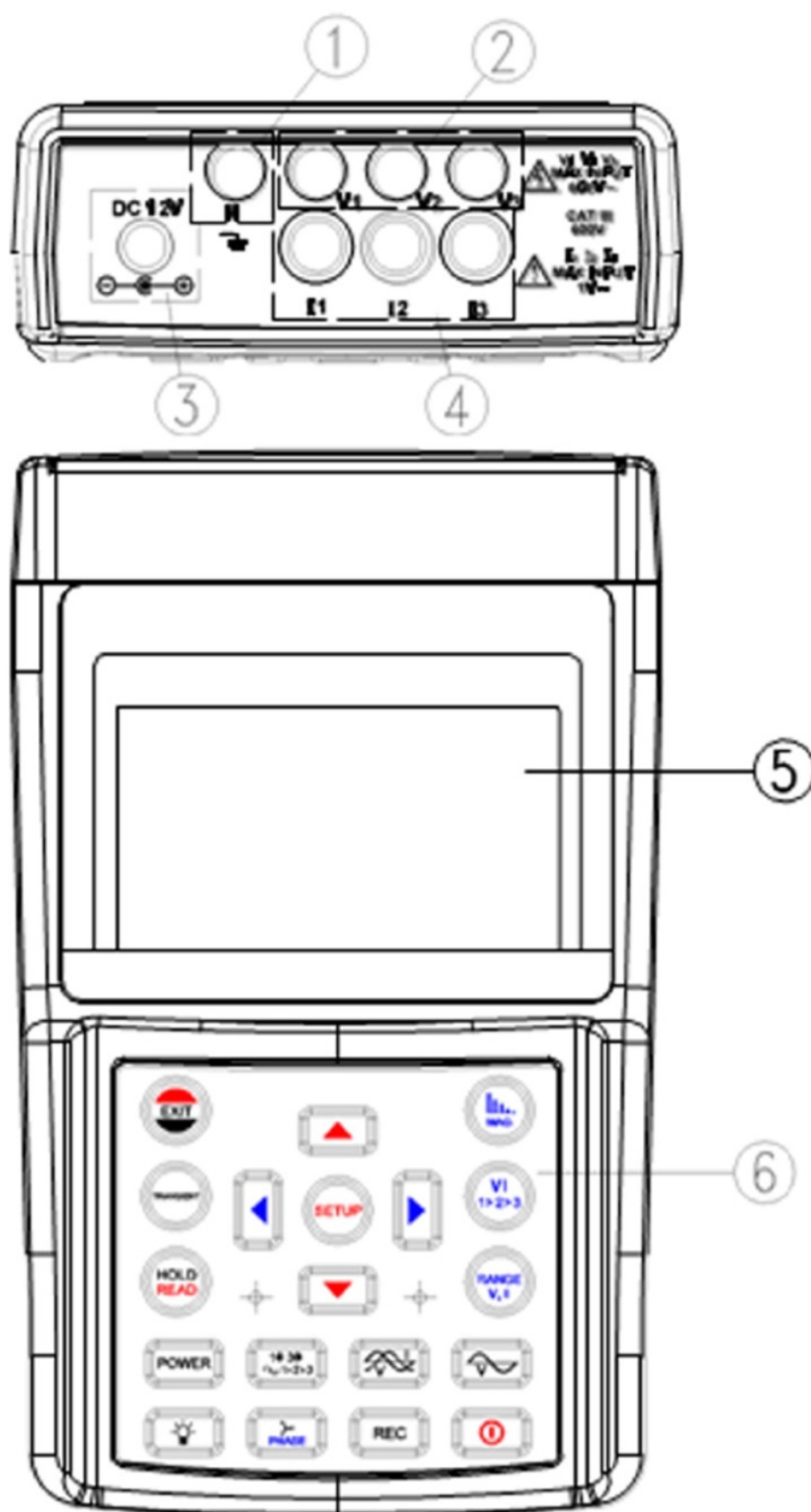
4. Don't use the flexible current probe before you read the following instructions.

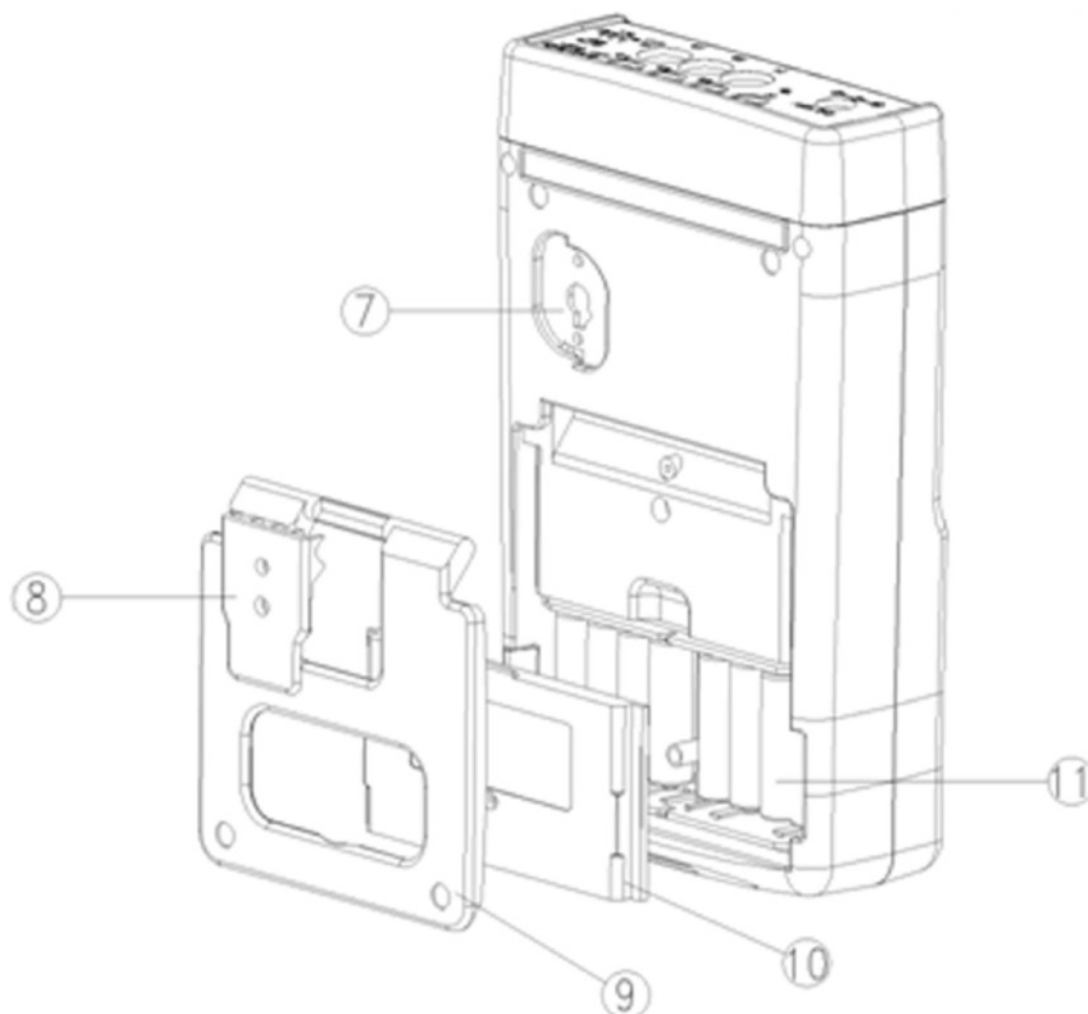
1. Don't install the flexible current probe around bare conductors carrying a voltage from 30V to 600V unless you are wearing protective clothing and glove suitable for high-voltage work.
2. Always inspect and check any damage of the current probe assembly before usage. Don't use the flexible current probe if any damage is found.
3. Don't use the flexible current probe on circuit rated higher than 600V in installation category III.

5. FEATURES

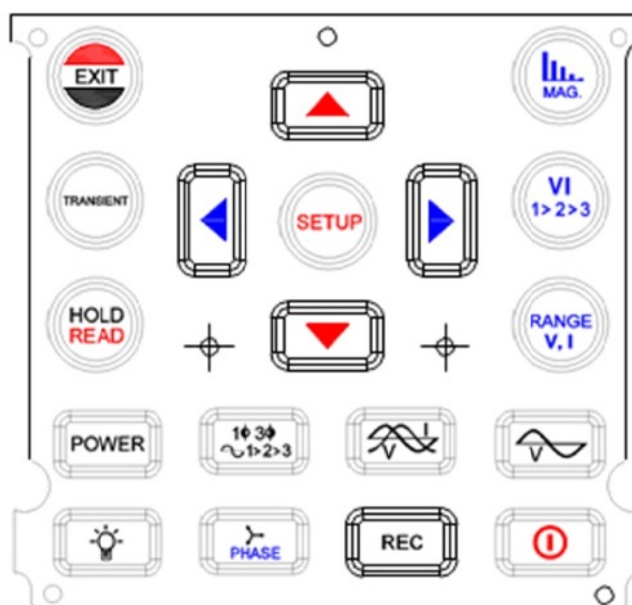
- Analysis for 3P4W, 3P3W, 1P2W, 1P3W
- True RMS value (V_{123} and I_{123})
- Active Power (W, KW, MW, GW)
- Apparent and Reactive Power (KVA, KVAR)
- Power Factor (PF), Phase Angle (Φ)
- Energy (WH, KWH, KVARH, PFH)
- Current measurement from 0.1mA to 1000A, capable of analyzing IT standby power consumption to the maximum demand of a factory
- Display of 35 Parameters in One Screen (3P4W)
- Programmable CT (1 to 600) and PT (1 to 3000) Ratios
- Display of Overlapped Voltage and Current Waveform
- Average Demand (AD in W, KW, MW)
- Maximum Demand (MD in KW, MW, KVA, MVA) with Programmable Period
- Harmonic Analysis to the 99th Order
- Display of 50 Harmonics in one Screen with Waveform
- Display of Waveform with Peak Values (1024 Samples / Period)
- Analysis of Total Harmonic Distortion (THD-F)
- Graphic Phasor Diagram with 3 Phase System Parameters
- Capture 28 Transient Events (Time + Cycles) with Programmable Threshold (%)
- DIP, SWELL, and OUTAGE are included in transient events.
- 3 Phase Voltage or Current Unbalance Ratio (VUR, IUR)
- 3 Phase Voltage or Current Unbalance Factor (d0%, d2%)
- Calculated Unbalanced Current through Neutral Line (In)
- 512K Memory with Programmable Interval
(Sampling time from 2 to 3000 seconds, 17,000 records for 3P4W system)
- Output of Waveform, Power Parameters and Harmonics at Command
- Large Dot Matrix LCD Display with Backlight
- Optical Isolated RS-232C to USB Interface
- Built-in timer and calendar for data logging
- **Option: 300XP Portable Thermal Printer**

6. PANEL DESCRIPTION





1. Input Terminal for Neutral Line (Voltage)
2. Voltage Input Terminals for Each Phase (V1, V2, V3)
3. External DC Input (The AC adaptor must be 600V isolated)
4. Current Input Terminals for Each Phase (I1, I2, I3)
5. LCD Display
6. Buttons
7. RS-232C Window
8. Stand Holder
9. Stand
10. Battery Cover
11. Battery Compartment



Press this button to exit transient detection or to exit SETUP menu.



Press this button to perform transient detection.



Press this button to hold the data displayed in LCD. Press this button and then REC button to record the displayed data. Press HOLD button again to continue operation.



Press this button to start measurement of harmonics in magnitude.



Press this button to select V1, I1, V2, I2, V3, or I3 for harmonics analysis



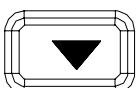
Press this button for the voltage or current input range



Press this button to enter SETUP mode and then select the parameter to be adjusted

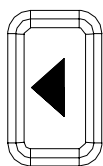


Press this button to increment value by one. Hold the button for two seconds or more to speed up the increment.

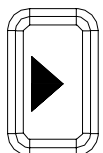


Press this button to decrement value by one. Hold the button for two seconds or more to speed up the

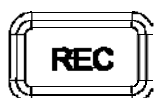
increment.



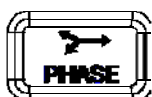
In the mode of harmonic analysis, press this button to move the cursor left to the previous order.



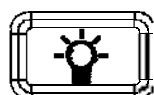
In the mode of harmonic analysis, press this button to move the cursor right to the previous order.



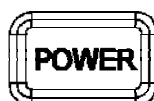
Press this button to start data logging. Press it again to stop data logging. The sampling interval is displayed in LCD pointed by SEC indicator.



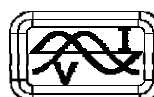
In the mode of power measurement, press this button to display the phasor diagram. In the mode of harmonic analysis, press this button to display phase angle instead of magnitude.



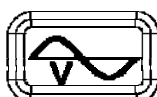
Press this button to turn the back light on. Press it again to turn the back light off.



Press this button to start measurement of power parameters.



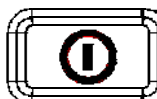
Press this button to display waveform of voltage and current.



Press this button to display waveform of voltage only



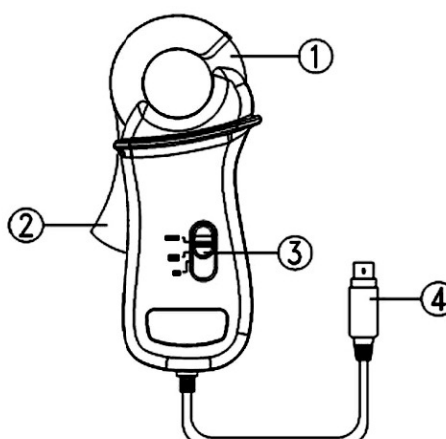
In the mode of power parameter measurement, press this button to select appropriate system (3P4W, 3P3W, 1P2W or 1P3W). In the mode of displaying waveform, press this button to select (V1, I1), (V2, I2), or (V3, I3).



Press this button to turn the power on or off.

7. 6801 Current Probe (100A)

1. Jaw Assembly
2. Trigger
3. Range Selector
4. 6 pin mini DIN connector



```

Down Load File: 1:19
REC DATE: 5- 7-22 10:14:50
HZ: 50
VT: 1
CT: 1
SEC: 2
CLAMP: 100
MD TIME: 15
TRANS REF:110.0 V
SDUP: 5%

Year Month Date Hour Minute Second
2005 7 22 13 22 42

```

NOTE: To setup 100 A current probe as selected probe, press the SETUP button to select CLAMP. When the CLAMP is reverse video, press the ▲ or ▼ button to select 100.

8. 6802 Current Probe (1000A)

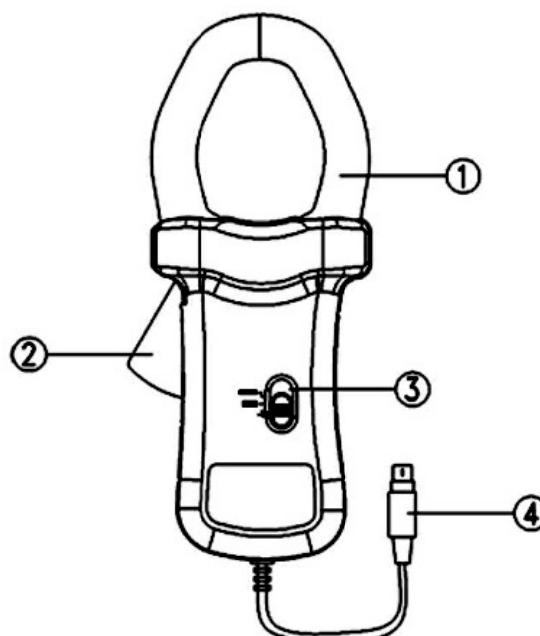
1. Jaw Assembly
2. Trigger
3. Range Selector
4. 6 pin mini DIN connector

```

Down Load File: 1:19
REC DATE: 5- 7-22 10:14:50
HZ: 50
VT: 1
CT: 1
SEC: 2
CLAMP: 1000
MD TIME: 15
TRANS REF:110.0 V
SDUP: 5%

Year Month Date Hour Minute Second
2005 7 22 13 21 16

```



NOTE: To setup 1000A current probe as selected probe, press the SETUP button to select CLAMP. When the CLAMP is reverse video, press the ▲ or ▼ button to select 1000

9. 3007 Current Probe (3000A)

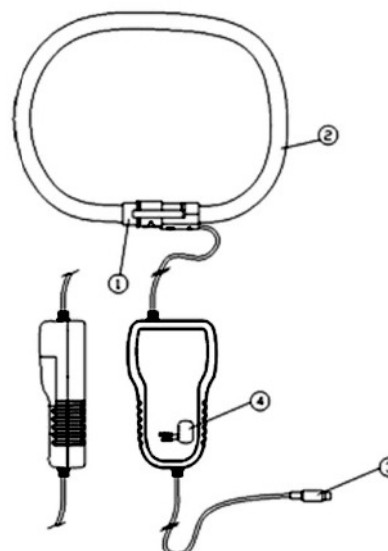
1. Coupling Assembly
2. Flexible Loop
3. Mini-DIN connector for Output
4. Output Range Select Switch

```

Down Load File: 1:19
REC DATE: 5- 7-22 10:14:50
HZ: 50
VT: 1
CT: 1
SEC: 2
CLAMP: 3000
MD TIME: 15
TRANS REF:110.0 V
SDUP: 5%

Year Month Date Hour Minute Second
2005 7 22 13 21 16

```



NOTE: To setup 3000A current probe as selected probe, press the SETUP button to select CLAMP. When the CLAMP is reverse video, press the ▲ or ▼ button to select 3000.

10. OPERATING INSTRUCTIONS

NOTE: Select the correct CLAMP in the SETUP menu. When the current probe is connected to the power analyzer, power analyzer will automatically detect the range selected.

NOTE:
Select the correct frequency (Hz) in the SETUP menu.

```

Down Load File: 1:19
REC DATE: 5- 7-22 10:14:50
HZ: 50
VT: 1
CT: 1
SEC: 2
CLAMP: 100
MD TIME: 15
TRANS REF: 110.0 U
SDVP: 5%

Year  Month  Date  Hour  Minute  Second
2005   7     22   13    21     58
  
```

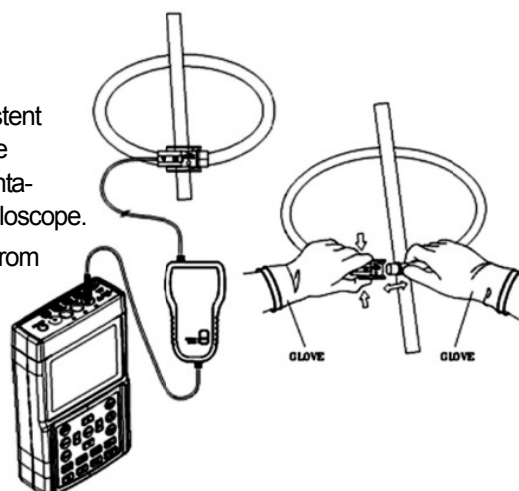
WARNING:

All the current probes connected to the power analyzer must be of the same model and same range. Mixed models and different ranges selected will cause incorrect result of measurement.

NOTE:

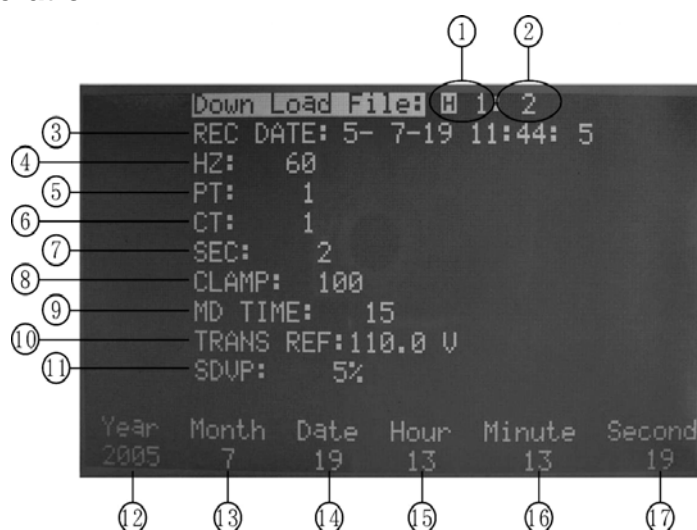
Please pay special attention to the flexible current probes (model 3007) connected to the power analyzer.

1. Connect the flexible probe around the conductor.
2. Make sure the current flowing direction is in consistent with the arrow marked on the probe coupling. If the flexible current probe is connected in the right orientation, the correct phase will be displayed in the oscilloscope.
3. Keep the probe coupling more than 25mm away from the conductor.



WARNING: Always wear appropriate gloves in operation.

11. Set up before operation



- Press SETUP button to enter setup screen. Press SETUP again to select the item for setting (the selected item will be displayed in reverse video).
- After selecting the item, press ▲ or ▼ buttons to set up its value.
- After finishing setting up, press EXIT button to leave setup mode.

1. Select the data for download:

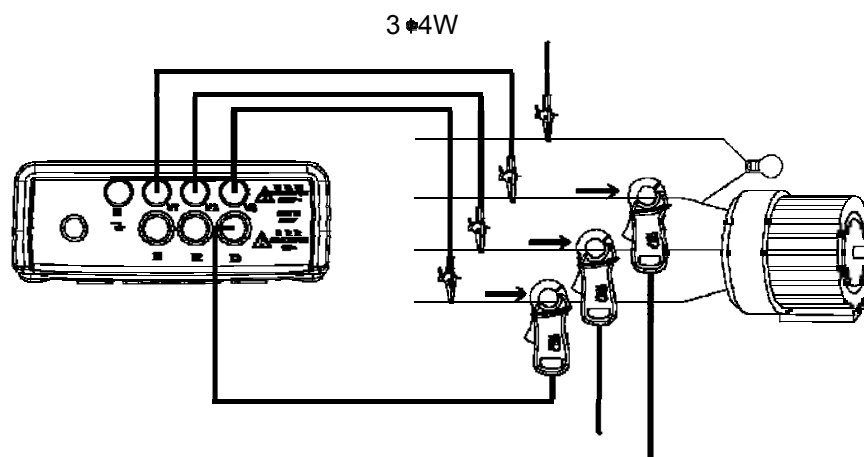
H means harmonics;

H in reverse video means HOLD screen data (if the data is the one you want, you can press HOLD button to display the data, and press HOLD button again to exit);

P means power data which can be a reference for downloading, the data in order is 0~84.

- Shows the total logged data in the analyzer:** max. 85 logging data.
- REC DATE:** shows the starting logging time of the 1st downloaded file.
- Hz:** set up the frequency (50, 60 or AUTO) of the system.
- PT:** set up PT value.
- CT:** set up CT value.
- SEC:** set up the interval seconds of logged data.
- CLAMP:** set up the clamps selected (100A, 1000A or 3000A).
- MD TIME:** set up the time of Maximum Demand (1~60 minutes).
- TRANS REF:** set up the transient voltage (which will be automatically changed in accordance with PT).
- SDVP:** set up upper and lower limits % of transient voltage detection.
- YEAR:** Set up "year" of calendar clock.
- MONTH:** Set up "month" of calendar clock.
- DATE:** Set up "date" of calendar clock.
- HOUR:** Set up "hour" of calendar clock.
- MINUTE:** Set up "minute" of calendar clock.
- SECOND:** Second can be displayed only (it can not be adjusted).

12. Power Quality of a 3 Phase 4 Wire (3P4W) System



- Turn the power on. Press the POWER and the 1Φ3Φ buttons to select the 3P4W system. The type of system will be displayed at the left bottom corner in the LCD.
- Connect the four test leads to the voltage terminals V1, V2, V3 and the VN (Neutral) of the system.
- Connect the test leads to L1, L2, and L3 of the 3P4W system.
- Connect the three current probes to the power analyzer input terminal I1, I2, and I3.
- Clamp on to the L1, L2, and L3 of the 3P4W system. Make sure the current flow from the front of the current probe to the back of it.
- All parameters of the system will be shown in LCD.

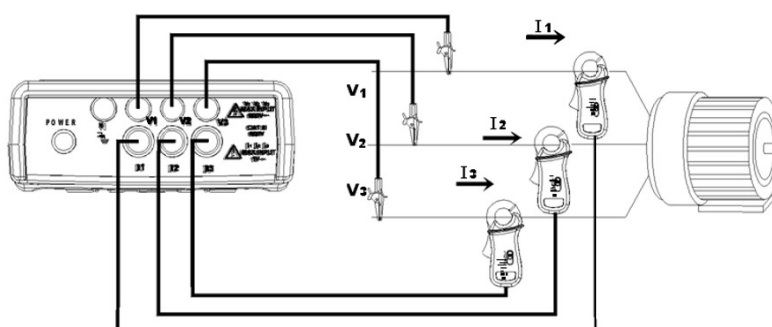
| | | |
|------------|--------------------|---------------|
| U12381.6 V | U12219.9 V | I1799.1mA |
| U23381.1 V | U2219.9 V | I2800.1mA |
| U31379.1 V | U3219.5 V | I3800.7mA |
| P1156.5 W | S1175.7 VA | Q1-79.8 VAR |
| P2154.0 W | S2175.9 VA | Q2-84.9 VAR |
| P3153.8 W | S3175.7 VA | Q3-84.9 VAR |
| PΣ464.4 W | SΣ527.1 VA | QΣ-249.4 VAR |
| PFΣ0.88 | PF1: 0.89 | PF2: 0.87 |
| PFH0.88 | φ1:- 26.9° | φ2:- 29.0° |
| WH127.7 WH | SH144.8 VAH | QH68.2 VARH |
| HZ: 50.0 | MD436.5 VA | MD385.1 W -15 |
| 3φ4W | SEC: 2 CT: 1 UT: 1 | |

For the meaning of each parameter, refer to XIV. NOMENCLATURE.

13. Power Quality of a 3 Phase 3 Wire (3P3W) System



3 ϕ 3W



- Turn the power on. Press the POWER and the 1 Φ 3 Φ buttons to select the 3P3W system. The type of system will be displayed at the bottom right of the LCD.
- Connect the four test leads to the voltage terminals L1, L2, and L3 of the system.
- Connect the three current probes to the power analyzer input terminal I1, I2, and I3.
- Clamp on to the L1, L2, and L3. Make sure the current flow from the front of the current probe to the back of it.
- All parameters of the system will be shown in LCD

| | |
|--------------------|------------------|
| U12: 381.1 V | I1: 799.2mA |
| U23: 381.4 V | I2: 800.6mA |
| U31: 379.6 V | I3: 801.0mA |
| PΣ: 464.6 W | SΣ: 527.4 VA |
| PFΣ: 0.88 | QΣ: -249.7 VAR |
| PFH: 0.88 | |
| WH: 9.8 WH | SH: 11.1 VAH |
| HZ: 50.0 | QH: 5.2 VARH |
| 3 ϕ 3W | MD: VA MD: W -15 |
| SEC: 2 CT: 1 UT: 1 | |

For the meaning of each parameter, refer to XIV. NOMENCLATURE.

In this direction will find a vision of the measurement technique:
<http://www.industrial-needs.com/measuring-instruments.htm>

NOTE: "This instrument doesn't have ATEX protection, so it should not be used in potentially explosive atmospheres (powder, flammable gases)."