User Manual

EXTECH INSTRUMENTS

Power and Harmonics Analyzer
Model 382095
EN 61010-2-032
CAT III 600V
Pollution Degree 2

Definition of Symbols:

⚠️ Caution: Refer to Accompanying Documents

⚡️ Caution: Risk of Electric Shock

⬜️ Double Insulation

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.

⚠️ **Please read the following instructions before use**

1. Do not operate this instrument in wet or dusty environments.
2. Do not operate this instrument in the presence of combustible or explosive gas.
3. Do not touch exposed metal parts or unused terminals.
4. Consider the use of rubber gloves in operation.
5. Do not operate in excess of AC 500V (Phase to Neutral), or AC 600V (Phase to Phase).
6. Do not operate this instrument if it appears to be malfunctioning.
# Table of Contents

**FEATURES** 4  
**PANEL DESCRIPTION** 5  
**OPERATING INSTRUCTIONS** 10  
  - Power Quality of a 3 Phase 4 Wire (3P4W) System 11  
  - Power Quality of a 3 Phase 3 Wire (3P3W) System 12  
  - Power Quality of a Single Phase (1P2W) System 13  
  - Power Quality of a 1 Phase 3 Wire (1P3W) System 14  
  - Measurement of a System with CT or VT 15  
  - Harmonic Analysis of Voltage or Current 16  
  - Display the Phase Angle of Harmonics 17  
  - Measurement of Maximum Demand 18  
  - Waveform of Voltage and Current 18  
  - Waveform of Voltage Only 19  
  - Graphic Phase Diagram 20  
  - Phase Sequence of a 3 Phase System 21  
  - Balanced and Unbalanced 3 Phase (3P3W, 3P4W) Power Source System 21  
  - Balanced and Unbalanced 3 Phase (3P3W or 3P4W) Load System 22  
  - Transient Capture (Dips, Swells, Outage) 23  
  - Down Load Transient Data 24  
  - Data Logging of Power Data (3P4W, 3P3W, 1P2W, 1P3W) 25  
  - Down Load Power Data 25  
  - Data Logging of Harmonics 25  
  - Down Load Harmonics Data 26  
**HARDCOPY of SCREEN** 27  
**READ the SAVED SCREEN** 28  
**SET THE CT AND VT RATIO** 29  
**SET THE TIME INTERVAL FOR MAXIMUM DEMAND** 30  
**SET THE SAMPLING TIME FOR DATA LOGGING** 31  
**SET THE CALENDAR CLOCK** 32  
**PROTOCOL OF RS-232C INTERFACE** 33  
**SPECIFICATIONS** 33  
**BATTERY REPLACEMENT** 41  
**MAINTENANCE & CLEANING** 42  
**Nomenclature** 42
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 ($\phi$)
- 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
- Maximum Demand (MD KW, MW, KVA, MVA) with Programmable Period
- Harmonic Analysis ($V_{123}$ and $I_{123}$) 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 Phase 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 Unbalanced Ratio (VUR, IUR)
- 3 Phase Voltage or Current Unbalanced Factor (d0%, d2%)
- Calculated Unbalanced Current through Neutral Line (In)
- 512K Memory with Programmable Interval (Sampling time from 2 to 6000 seconds, data logging time from 4.7 hours to 1180 days for 3P4W system)
- Output of Waveform, Power Parameters and Harmonics on Command
- Large Dot Matrix LCD Display with Backlight
- Optical Isolated RS-232C Interface
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. Indication of locations where SEC., CT, VT, and SETUP are displayed in LCD.
7. Buttons
8. RS-232C Window
9. Stand Holder
10. Stand
11. Battery Cover
12. Battery Compartment

- **EXIT TRANSIENT**: Press this button to exit transient detection mode. Also used to exit the SETUP menu.
- **TRANSIENT**: Press this button to perform transient detection.
- **HOLD**: Press this button to hold the data displayed in LCD, press again to continue operation.
- **HARMO MAG.**: Press this button to begin the measurement of harmonics in magnitude.
- **VI 1-2-3**: 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 to enter the Main Menu (also used to navigate menu items).

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.

In harmonic analysis mode, use these buttons to move the cursor left or right.

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

In the power mode, press this button to display the phase. In the harmonic analysis mode, 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 begin measuring power.

Press this button to display the waveforms for voltage and current.

Press this button to display the waveform for voltage only.

In the power mode, press this button to select the appropriate system (3P4W, 3P3W, 1P2W or 1P3W). In the waveform mode, press to select (V1, i1), (V2, i2), or (V3, i3).

Press this button to turn the power on or off.
Current Probe (100A)

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

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

Current Probe (1000A)

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

NOTE: To select the 1000A current probe, press the SETUP button to select CLAMP. When the CLAMP is reverse video, press the ▲ or ▼ button to select 1000.
Flexible Current Probe (3000A)

NOTE: The flexible current probe has a maximum input of 3000A however the maximum input current of the 382095 Power and Harmonics Analyzer is 1000A.

1. Control Box
2. Output Range Select Switch
3. Flexible Loop
4. Coupling Assembly

NOTE: To select the 3000A flexible current probe, press the SETUP button to select CLAMP. When the CLAMP is reverse video, press the ▲ or ▼ button to select 3000.
NOTE: Select the correct CLAMP in the SETUP menu. When the current probe is connected to the power analyzer, the power analyzer will automatically detect the range selected.

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

WARNING: All the current probes connected to the power analyzer must be of the same model and same range. Mixed models and different ranges will yield incorrect measurement results.
Power Quality of a 3 Phase 4 Wire (3P4W) System

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

For a description of each parameter, refer to section XIV. NOMENCLATURE.
Power Quality of a 3 Phase 3 Wire (3P3W) System

a. Turn the power on. Press the POWER and the 3Φ3W buttons to select the 3P3W system. The type of system will be displayed at the bottom right of the LCD.
b. Connect the four test leads to the voltage terminals L1, L2, and L3 of the system.
c. Connect the three current probes to the power analyzer input terminal I1, I2, and I3.
d. Clamp on to the L1, L2, and L3. Make sure the current flows from the front of the current probe to the back.
e. All parameters of the system will be shown in the LCD

For a description of each parameter, refer to XIV. NOMENCLATURE.
Power Quality of a Single Phase (1P2W) System

1. Press POWER and then 1Φ3Φ to select the 1P2W system. The type of system will be displayed at the bottom right of the LCD.

2. Connect the test leads to the voltage terminals L1 and V_N (Neutral) of the system.

3. Connect one current probe to the power analyzer input terminal I1.

4. Clamp on to the L1. Make sure the current flows from the front of the current probe to the back (see arrow labeled on clamp probe).

5. All of the parameters of the system will be shown in the LCD.

   ![Voltage and Current Readings]

   For a description of each parameter, refer to XIV. NOMENCLATURE.
Power Quality of a 1 Phase 3 Wire (1P3W) System

a. Turn the power on. Press the POWER and the 1Φ3Φ buttons to select the 1P3W system. The type of system will be displayed at the bottom right of the LCD.

b. Connect the test leads to the voltage terminals L1, L2 and V_N (Neutral) of the system.

c. Connect the two current probes to the power analyzer input terminal I1 and I2.

d. Clamp on to the L1 and L2. Make sure the current flows from the front of the current probe to the back.

e. All of the system parameters will be shown in the LCD

For a description of each parameter, refer to XIV. NOMENCLATURE.
Measurement of a System with CT or VT (PT)

a. Turn the power on. Press the POWER and the $\Phi_3\Phi_3$ buttons to select the 3P4W system. The type of system will be displayed at the bottom right of the LCD.

b. Connect the four test leads to the secondary voltage terminals L1, L2, L3 and the $V_N$ (Neutral) of the system.

c. Clamp on to the secondary coils of L1, L2, and L3. Make sure the current flows from the front of the current probe to the back (see the arrow label on the clamp probe).

d. Press "SETUP" to enter the SETUP menu.

e. Press "SETUP" several times until the CT symbol is highlighted.

f. Press the ▲ or ▼ button to increment or decrement the RATIO specified by the CT.
g. Press the **SETUP** button several times until the VT symbol is highlighted.

h. Press the ▲ or ▼ button to increment or decrement the RATIO specified by the VT.

i. All 35 system parameters will be shown in the LCD

For a description of each parameter, refer to XIV. NOMENCLATURE.

**Harmonic Analysis of Voltage or Current**

(a) Setup the analyzer for measurement of any power system (3P4W, 3P3W, 1P2W, or 1P3W). To view the
harmonic analysis of voltage or current, press the HARMO button.

b. Once the HARMO button is pressed, the waveform will be shown in the left-hand portion of the LCD, and the 1st to 50th order harmonics will be shown in the right-hand portion of the LCD.

c. The positive and negative peak values will be shown in the waveform (Vpk).

d. The true RMS value & total harmonic distortion of voltage or current is shown under the waveform.

e. The cursor (↑ arrow) will point to the current order of harmonics. The frequency (HZ) will be displayed next to the cursor. The percentage of harmonics (%) will be displayed below the cursor. The magnitude of the harmonics (V or A) or phase angle will be displayed next to the %.

f. Press the SETUP button several times until HAR is highlighted.

g. To move the cursor to the next harmonic, use the ◄ or ► button.

h. To see the next page (51st to 99th order) press the ► button to pass the 50th order or press the ◄ button to pass the 1st order.

NOTE: If the waveform is clipped at the peak or too small in the LCD, press the RANGE button to select HIGH or LOW range for a better display. The range indicator is the symbol after the unit of RMS value, L or H.

Display the Phase Angle of Harmonics

When the HARMO button is pressed the magnitude of each harmonic is displayed. To review the phase angle of each harmonic, press the PHASE button. The phase angle will be displayed next to the % display icon. V1 does not trigger at exactly 0 degrees; it may be a few degrees after '0'. The remaining signals (V2, V3, I1, I2, I3) are sampled when V1 is triggered. In other words, the phase angles for V2, V3, I1, I2, and I3 are sampled with respect to V1. For example, if V1, I1 have a phase difference of 30 degrees, they are displayed as V1 (2 degrees), I1 (32 degrees) in the harmonics analysis.

NOTE: If the waveform is clipped at the peak or too small in the LCD, press the RANGE button to select HIGH or LOW range for a better display. The range indicator is the symbol after the unit of RMS value, L or H.
Measurement of Maximum Demand

1. Set the time interval for maximum demand (refer to section V)
2. The analyzer will integrate the KW and KVA over the specified interval.
3. The maximum demand (MD) updates if new demand is greater than the previous value.

In the following example, the maximum demand is 527.4VA and 527.4W. The time interval for maximum demand is 2 minutes.

<table>
<thead>
<tr>
<th>Time</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Power (W)</th>
<th>VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00</td>
<td>123.4 V</td>
<td>56.7 A</td>
<td>71.8 W</td>
<td>324 V</td>
</tr>
<tr>
<td>00:02</td>
<td>135.6 V</td>
<td>67.8 A</td>
<td>89.0 W</td>
<td>369 V</td>
</tr>
<tr>
<td>00:04</td>
<td>147.8 V</td>
<td>78.9 A</td>
<td>107.1 W</td>
<td>414 V</td>
</tr>
</tbody>
</table>

Waveform of Voltage and Current

Press this button to display the waveforms for voltage and current simultaneously.

Press this to select different inputs (V1, I1), (V2, I2), or (V3, I3).

NOTE: The triggering point is the zero crossing point of V1 for V2, V3, I2, and I3. The triggering point for I1 is its own zero crossing point in case V1 is not present.

NOTE: In the waveform display mode, one period/cycle of 1024 data points is displayed.
Waveform for Voltage Only

Press this button to display the voltage waveform only. The true RMS value of voltage will be displayed at the bottom of the LCD.

Press this button to select V1, V2, or V3.

NOTE: The triggering point is the zero crossing point of V1 for V2 and V3.

NOTE: In the waveform mode, one period/cycle of 1024 data points is displayed.

Graphic Phase Diagram

Press this button to display the phase diagram.

The voltage and current signals are displayed in phase format (magnitude, angle). V1 is the reference. The V1 angle is always 0 degrees.
The phase angles of \(V_2\), \(V_3\), \(I_1\), \(I_2\), and \(I_3\) are displayed with respect to \(V_1\).

\(V_1\), \(V_2\), \(V_3\), \(I_1\), \(I_2\), \(I_3\), \(V_{12}\), \(V_{23}\), and \(V_{31}\) are displayed in vector form graphically.

\(V_1\), \(V_2\), \(V_3\): Phase voltages in phase format with respect to \(V_1\).

\(I_1\), \(I_2\), \(I_3\): Line currents in phase format with respect to \(V_1\).

\(V_{1n}\): Calculated voltage and current of the neutral with respect to ground.

\(V_{12}\), \(V_{23}\), \(V_{31}\): Line voltage in phase format with respect to \(V_1\).

\(\text{Ave}\): Average of line voltage \(V_{12}\), \(V_{23}\), and \(V_{31}\) and line current \(I_1\), \(I_2\), and \(I_3\).

\(dV\%\): Historical maximum \% value of \((\text{Max} (V_1, V_2, V_3) – \text{Min} (V_1, V_2, V_3)) / \text{Min} (V_1, V_2, V_3)\) * 100\%

\(\text{VUR}\): Voltage (Unbalanced Ratio)

\(d2\): The first number is Zero Sequence Unbalanced Ratio in \% (d0) of voltage; the second number is the Negative Sequence Unbalanced Ratio in \% (d2) of voltage. When \(\text{VUR}\) is displayed before \(d2\), \(d2\) represents the Zero and Negative Sequence Unbalanced Ratios for voltage.

\(\text{REF}\): Nominal voltage for transient detection reference

\(Sd\%\): Threshold in \% for transient detection with respect to nominal voltage (\(\text{REF}\)).

**NOTE:** The phase is drawn only when the reading exceeds 200 counts. If \(V\) is zero, the phase of the current will not be drawn.

Press this button to change the display from VUR to IUR

\(d\%\): Historical max \% value of \((\text{Max} (I_1, I_2, I_3) – \text{Min} (I_1, I_2, I_3)) / \text{Min} (I_1, I_2, I_3)\) * 100\%

\(\text{IUR}\): Current Unbalance Ratio

\(d2\): The first number is Zero Sequence Unbalanced Ratio in \% (d0) for current; the second number is the Negative Sequence Unbalanced Ratio in \% (d2) for current. When \(\text{IUR}\) is displayed before \(d2\), \(d2\) represents the Zero (d0) and Negative (d2) Sequence Unbalanced Ratios for current.

\(\text{REF}\): Nominal voltage for transient detection reference

\(Sd\%\): Threshold in \% for transient detection with respect to nominal voltage (\(\text{REF}\)).

**NOTE:** If the voltage of \(L_1\), \(L_2\), and \(L_3\) is not connected in the correct sequence, the analyzer will show \(L_1-3-2\) in the right top corner, and it will beep to warn of an incorrect phase sequence.
Phase Sequence of a 3 Phase System

Press this button to display the phase diagram.

In this mode, the analyzer also detects the phase sequence. If the voltage of L1, L2, and L3 is not connected in the correct sequence, the analyzer will show L1-3-2 in the right top corner, and it will beep to warn of an incorrect phase sequence.

Balanced and Unbalanced 3 Phase (3P3W, 3P4W) Power Source System

Balanced System

If a 3 phase power source system is balanced, the parameters should be as follows:

- $V_1 = V_2 = V_3$
- $V_{12} = V_{23} = V_{31}$
- The phase angle of $V_2 = -120\,\text{deg}$; the phase angle of $V_3 = 120\,\text{deg}$
- $V_n$ (voltage of neutral with respect to ground) = 0V
- $VUR = 0\%$
- $d0\% = 0\%$
Unbalanced Systems

If the values differ from the numbers above, an unbalanced power source system may be the reason. The magnitude of the differences can be used as an indication of an unbalanced power source system. The larger the difference, the further unbalanced the system will be.

Balanced and Unbalanced 3 Phase (3P3W or 3P4W) Load System

Balanced System

If a 3 phase load system is balanced, the parameters should be as follows:

\[ I_1 = I_2 = I_3 \]

The phase angle for \( I_2 \) and \( I_1 \) (\( I_2 \pm I_1 \)) = ±120

The phase angles of \( I_3 \) and \( I_2 \) (\( I_3 \pm I_2 \)) = ±120

\( I_n \) (current of neutral) = 0A

IUR = 0%

d0% = 0%

d2% = 0%

Unbalanced Systems

If the values differ from the numbers above, an unbalanced load system may be the reason. The magnitude of the difference can be used as an indication of an unbalanced power source system. The larger the difference, the more unbalanced the load will be.
### Transient Capture (Dips, Swells, Outage)

1. Press to enter the PHASE DIAGRAM mode.
2. Press the **SETUP** button until TRANS REF in reverse video is shown in the LCD.

<table>
<thead>
<tr>
<th>NO.</th>
<th>ELAPSED TIME (DAYS: HOURS: MINUTES)</th>
<th>CYCLES</th>
<th>TRANSIENT CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0d 2: 1</td>
<td>42</td>
<td>62</td>
</tr>
<tr>
<td>2</td>
<td>2d 6: 32</td>
<td>21</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>45d 12: 59</td>
<td>212</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>2d 9: 2</td>
<td>21</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>45d 12: 59</td>
<td>218</td>
<td>6</td>
</tr>
</tbody>
</table>

**REF:** 100.0 V  
**NOMINAL VOLTAGE:** 50.0  
**ID:** 1  
**CT:** 1  
**SECP:** 2  
**CLAMP:** 100  
**MD TIME:** 15  
**TRANS REF:**110.0 V  
**SDVP:** 5%  

3. Press the ▲ or ▼ button to increment or decrement the nominal voltage for a reference. To exit, press the EXIT button.

4. Press the **SETUP** button several times until SDVP is shown in the right bottom corner of the LCD.

5. Press the ▲ or ▼ button to increment or decrement the threshold in % (SDVP). To exit, press the EXIT button.
6. Press the **TRANSIENT** button to start the “Transient Capture”

7. The backlight will switch off when the **TRANSIENT** button is pressed.

8. If the analyzer captures any transient events (DIP, SWELL, or OUTAGE), the backlight will switch on. Press the **TRANSIENT** button to review the recorded TRANSIENT events.

9. To exit TRANSIENT CAPTURE, press the **EXIT TRANSIENT** button.

**Definition of SWELL, DIP, and OUTAGE:**

**SWELL:** \[ V_{\text{RMS}} > [V_{\text{REF}} + (V_{\text{REF}} \times SD\%)] \]

Code for SWELL: 1

If the true RMS value of either phase (V1, V2, or V3) rises above the nominal value plus the threshold (REF + SD%), it is regarded as SWELL. Code for SWELL is 1.

**DIP:** \[ V_{\text{RMS}} < [V_{\text{REF}} - (V_{\text{REF}} \times SD\%)] \]

Code for DIP: 2

If the true RMS value of either phase (V1, V2, or V3) falls below the nominal value plus the threshold, it is regarded as DIP. The code for DIP is 2.

**OUTAGE:** \[ V_{\text{RMS}} < 30\text{ to } 40\text{V} \]

Code for OUTAGE: 4

If the true RMS value of either phase is less than 30 to 40V, it is regarded as OUTAGE. The code for OUTAGE is 4.

**Code Table:**

<table>
<thead>
<tr>
<th>CODE</th>
<th>SWELL</th>
<th>DIP</th>
<th>OUTAGE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>2</td>
<td>4</td>
<td>Codes can be added together</td>
</tr>
</tbody>
</table>

**DISPLAY FORMAT:**

First column: Sequential number of events.

Second column: Elapsed time (the elapsed time format is DAYS, HOURS, MINUTES) 99 days 24 hours 60 minutes max

The third column: Number of cycles.

The fourth column: Code of transient events. There can be more than one transient condition occurring in one event.

**NOTE:** In the TRANSIENT CAPTURE mode, the analyzer takes 128 samples of each cycle for each phase continuously.

**NOTE:** When the user presses the TRANSIENT button to review the recorded events, the capture operation is paused until TRANSIENT is pressed again. The timer is also stopped when TRANSIENT is pressed. Therefore, the time stamp is not correct when the user presses the TRANSIENT button to resume operation.

**NOTE:** The analyzer can record up to 28 events. When the analyzer has recorded 28 events, it stops the capture operation, turns the backlight on, and displays the 28 transient events.

**NOTE:** The codes can be summed to indicate two or three conditions. For example, if the code is 6, DIP and OUTAGE (2+4) have been added.

**NOTE:** The longest duration for a capture operation is 99 days. Use the external 12V DC power adaptor for long capture operation.

**WARNING:** Select 50 or 60 Hz for transient capture. If AUTO is selected for frequency, the unit will not allow entrance to the TRANSIENT capture mode (an audible beep will sound).

**Down Load Transient Data**

When the TRANSIENT button is pressed to display CAPTURED EVENTS, the data is also output through the RS-232 interface simultaneously.
The data output is in the same format as the LCD display format (ASCII)

YEAR MONTH DAY HOUR MINUTE SECOND CT REF CODE
01 ELAPSED TIME CYCLES CODE
02 ELAPSED TIME CYCLES CODE
03 ELAPSED TIME CYCLES CODE
04 ELAPSED TIME CYCLES CODE

**Datalogging Power Data (3P4W, 3P3W, 1P2W, 1P3W)**

1. Set the datalogger sampling time (rate)
2. Press the **POWER** button to enter the power measurement mode.
3. Press the **[3]** button to select the appropriate system (3P4W, 3P3W, 1P3W, or 1P2W).
4. Press the **REC** button to start logging. A **REC** symbol will display.
5. To stop logging, press the **REC** button again.

**NOTE:** To download data, send a CTRL+D command to the analyzer through RS-232C interface.

**WARNING:** The sampling time could be longer than the set value if there is no input at V1.

**Download Power Data**

1. Press the **SETUP** button.
2. “Download File” will be shown in reverse video.
3. Press the ▲ or ▼ button to select the file number.
4. If the data stored in a selected file is power data, a leading symbol “P” will precede the file name
5. Press the **EXIT** button.
6. When a CTRL D command is received through the RS-232C port, it downloads stored power data.

**NOTE:** In the setup mode, the unit will not accept commands through the RS-232C port. To download data, press the **EXIT** button to return to normal measurement mode.

**Data Logging Harmonics Data**

1. Set the sampling time (rate) for data logging
2. Press the **HARMO** button to enter the harmonics measurement mode.
3. Press the **VI** button to select the desired input (V1, I1, V2, I2, V3, or I3).
4. Press the **REC** button to start data logging. A **REC** symbol will be displayed at the bottom of the LCD.
5. To stop data logging, press the **REC** button again.

**WARNING:** If there is no input at V1, the sampling rate could be longer than the programmed value.

---

**Down Load Harmonics Data**

1. Press the **SETUP** button.
2. “Down Load File” will be shown in reverse video.
3. Press the ▲ or▼ button to select the file number.
4. If the data stored in a selected file is harmonics data, a leading symbol “H” will precede the file name.
5. Press the **EXIT** button.
6. When the unit receives a CTRL D command through the RS-232C port, it will down load previously saved harmonic data.

**NOTE:** In the setup mode, the unit will not accept any commands through the RS-232C port. To down load data, press the **EXIT** button to return to normal measurement mode.
1. Press the **HOLD** button.

2. Press the **REC** button. It takes a few seconds to hardcopy the screen, and store the screen in an internal file. The LCD will show **REC** in reverse video when in operation. The number following **REC** is the file number.

3. Users can store up to 85 screens (if no power or harmonics data is stored).
READ the SAVED SCREEN

1. Press the [SETUP] button. ‘DOWNLOAD FILE’ is displayed in reverse video. If the data in the selected file is a hardcopy of the screen, a leading symbol of H is displayed in reverse video.

2. Press the ▲ or ▼ to select the saved screen.

3. Press the HOLD/READ button to restore the saved screen.

NOTE: If the data saved in a specific file is a HARDCOPY of a screen, a leading symbol of H is displayed in reverse video.

NOTE: Hardcopy data can not be downloaded.
SET THE CT AND VT (PT) RATIO

Press the [SETUP] button several times until CT or VT is shown in reverse video.

Press the ▲ or ▼ button to increment or decrement the value by 1. Holding the ▲ or ▼ button will speed up the process of incrementing or decrementing. To exit, press the EXIT button.

The CT ratio range is 1 to 600. The VT ratio range is 1 to 3000. Once the CT or VT (PT) is set, the voltage and current readings are as follows:

\[
\text{CURRENT (displayed)} = \text{CURRENT (measured)} \times \text{CT Ratio}
\]
\[
\text{VOLTAGE (displayed)} = \text{VOLTAGE (measured)} \times \text{VT Ratio}
\]
Press the **SETUP** button until **MD TIME** is displayed in reverse video.

Press the ▲ or ▼ button to increment or decrement the value by 1.

Holding the ▲ or ▼ button will speed up the process of incrementing or decrementing. To exit, press the **EXIT** button.

The **MD** (max. demand) time interval range is 1 to 60 minutes. Once the time interval is set, the unit will calculate the maximum demand and average demand in watts (W) or VA. To toggle between W and VA, press the **POWER** button.
SET THE SAMPLING TIME FOR DATA LOGGING

Press the **SETUP** button several times until SEC is displayed in reverse video.

Press the ▲ or ▼ button to increment or decrement the value by 2.

Holding the ▲ or ▼ button will speed up the process of incrementing or decrementing.

To exit, press the **EXIT** button.
1. Press the SETUP button to select (Year, Month, Date, Hour, and Minute).

2. Press the ▲ or ▼ to increment or decrement the number.

Note: The 'seconds' field cannot be adjusted.
PROTOCOL (RS-232C INTERFACE)

RS-232C Interface:
Baud Rate 19200
Data bits 8
Stop bit 1
No Parity

SPECIFICATIONS (23°C ± 5°C)

AC Watts (50 or 60 Hz, PF 0.5 to 1. CT = 1, Voltage > AC 20V, Current > AC 4A for 100A range, Current > AC 40A for 1000A range and continuous waveform)
Model 382095 + 1000A clamp

<table>
<thead>
<tr>
<th>Range (0 to 1000A)</th>
<th>Resolution</th>
<th>Accuracy of Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0 – 999.9 W</td>
<td>0.1W</td>
<td>±1% ± 0.8W</td>
</tr>
<tr>
<td>1.000 – 9.999 KW</td>
<td>0.001 KW</td>
<td>±1% ± 8W</td>
</tr>
<tr>
<td>10.00 – 99.99 KW</td>
<td>0.1 KW</td>
<td>±1% ± 80W</td>
</tr>
<tr>
<td>100.0 – 999.9 KW</td>
<td>1 KW</td>
<td>±1% ± 800W</td>
</tr>
<tr>
<td>0.000 – 9.999MW</td>
<td>0.001MW</td>
<td>±1% ± 8000W</td>
</tr>
</tbody>
</table>

AC Watt (50 or 60 Hz, PF 0.5 to 1. CT = 1, Voltage > AC 20V, Current > AC 4mA for 1A range, and Current > AC 0.4A for 10A range, Current > AC 04A for 100A range and continuous waveform)
Model 382095 + 100A clamp

<table>
<thead>
<tr>
<th>Range (0 to 100A)</th>
<th>Resolution</th>
<th>Accuracy of Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0 – 999.9 W</td>
<td>0.1W</td>
<td>±1% ± 0.8W</td>
</tr>
<tr>
<td>1.000 – 9.999 KW</td>
<td>0.001 KW</td>
<td>±1% ± 8W</td>
</tr>
<tr>
<td>10.00 – 99.99 KW</td>
<td>0.1 KW</td>
<td>±1% ± 80W</td>
</tr>
<tr>
<td>100.0 – 999.9 KW</td>
<td>1 KW</td>
<td>±1% ± 800W</td>
</tr>
</tbody>
</table>

For CT ≠ 1, the accuracy in percentage is the same (±1%). The additional digits should be multiplied by the CT ratio. For example, ±8dgts becomes ±8dgts * CT ratio

Range of CT (Current Transformer) Ratio: 1 to 600
Model 382095 + 3000A flexible clamp

<table>
<thead>
<tr>
<th>Range (0 to 3000A)</th>
<th>Resolution</th>
<th>Accuracy of Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0 – 999.9 W</td>
<td>0.1W</td>
<td>±1% of range</td>
</tr>
<tr>
<td>1.000 – 99.99 KW</td>
<td>0.001 KW</td>
<td>±1% of range</td>
</tr>
<tr>
<td>10.00 – 999.9 KW</td>
<td>0.1 KW</td>
<td>±1% of range</td>
</tr>
<tr>
<td>100.0 – 999.9 KW</td>
<td>1 KW</td>
<td>±1% of range</td>
</tr>
</tbody>
</table>

For VT ≠ 1, the accuracy in percentage is the same (±1%). The additional wattage should be multiplied by the VT ratio. For example, ±0.2W becomes ±0.2W * VT ratio
AC Apparent Power (VA, from 0.000VA to 9999 KVA)

\[ VA = V \text{ r.m.s.} \times A \text{ r.m.s} \]

AC Reactive Power (VAR, from 0.000 VAR to 9999 KVAR)

\[ \text{VAR} = \sqrt{(\text{VA}^2 - \text{W}^2)} \]

Range of VT (Voltage Transformer) Ratio: 1 to 3000

AC Active Energy (WH, or KWH, from 0 WH to 999,999 KWH)

\[ \text{WH} = \text{W} \times \text{Time (in hours)} \]

AC Current (50 or 60 Hz, Auto Range, True RMS, Crest Factor < 4, CT=1)

1000A Clamp (Overload Protection AC 2000A)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy of Readings$^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.00A</td>
<td>0.001A/0.01A</td>
<td>–</td>
</tr>
<tr>
<td>100.0A</td>
<td>0.01A/0.1A</td>
<td>±0.5% ± 0.5A</td>
</tr>
<tr>
<td>40A to 1000A</td>
<td>0.1A/1A</td>
<td>±0.5% ± 5A</td>
</tr>
</tbody>
</table>

100A Clamp (Overload Protection AC 200A)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy of Readings$^4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.04A to 1A</td>
<td>0.001 A</td>
<td>±0.5% ± 0.05A</td>
</tr>
<tr>
<td>0.4A to 10A</td>
<td>0.01 A</td>
<td>±0.5% ± 0.5A</td>
</tr>
<tr>
<td>4A to 100A</td>
<td>0.1 A</td>
<td>±1.0% ± 0.5A</td>
</tr>
</tbody>
</table>

$^3$For CT ≠ 1, the accuracy in percentage is the same (±0.5%). The additional digits should be multiplied by the CT ratio. For example, ±5 digits becomes ±5 digits * CT ratio

3000A Flexible Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy of Readings$^4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 300.0 A</td>
<td>0.1 A</td>
<td>±1% of range</td>
</tr>
<tr>
<td>300.0 to 999.9 A</td>
<td>0.1 A</td>
<td>±1% of range</td>
</tr>
<tr>
<td>1000 to 3000 A</td>
<td>1 A</td>
<td>±1% of range</td>
</tr>
</tbody>
</table>

$^4$For CT ≠ 1, the accuracy in percentage is the same (±1.0%).

AC Voltage (50 or 60 Hz, Auto Range, True RMS, Crest Factor < 4, Input Impedance 10 MΩ, VT (PT) = 1, Overload Protection AC 800V)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy of Readings$^5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.0 V to 500.0 V (Phase to Neutral)</td>
<td>0.1 V</td>
<td>±0.5% ± 5digits</td>
</tr>
<tr>
<td>20.0 V to 600.0 V (Phase to Phase)</td>
<td>0.1 V</td>
<td>±0.5% ± 5digits</td>
</tr>
</tbody>
</table>

$^5$For VT (PT) ≠ 1, the accuracy in percentage is the same (±0.5%). The additional digits should be multiplied by the CT ratio. For example, ±5 digits becomes ±5 digits * VT (PT) ratio
Harmonics of AC Voltage in Percentage (1 to 99th order, minimum voltage at 50 or 60 Hz > AC 80V. If the voltage is 0 at 50 or 60 Hz, all the percentage displays will be 0.)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 20th</td>
<td>0.1%</td>
<td>±2%</td>
</tr>
<tr>
<td>20 to 49th</td>
<td>0.1%</td>
<td>4% of reading ±2.0%</td>
</tr>
<tr>
<td>50 to 99th</td>
<td>0.1%</td>
<td>6% of reading ±2.0%</td>
</tr>
</tbody>
</table>

Harmonics of AC Voltage in Magnitude (1 to 99th order, minimum voltage at the 50 or 60 Hz > AC 80V, VT=1)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 20th</td>
<td>0.1V</td>
<td>±2% ± 0.5V</td>
</tr>
<tr>
<td>20 to 49th</td>
<td>0.1V</td>
<td>4% of reading ±0.5V</td>
</tr>
<tr>
<td>50 to 99th</td>
<td>0.1V</td>
<td>6% of reading ±0.5V</td>
</tr>
</tbody>
</table>

Harmonics of AC Current in Percentage (1 to 99th order, minimum current at the 50 or 60 Hz > 20 A. If the current is 0 at 50 or 60 Hz, all the percentage (%) display is 0.)

1000A Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 20th</td>
<td>0.1%</td>
<td>±2%</td>
</tr>
<tr>
<td>20 to 49th</td>
<td>0.1%</td>
<td>4% of reading ±2.0%</td>
</tr>
<tr>
<td>50 to 99th</td>
<td>0.1%</td>
<td>6% of reading ±2.0%</td>
</tr>
</tbody>
</table>

Harmonics of AC Current in Magnitude (1 to 99th order, minimum current at the 50 or 60 Hz > 20A, CT=1)

1000A Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 20th</td>
<td>0.1A</td>
<td>±2% of reading ±0.4A</td>
</tr>
<tr>
<td>20 to 49th</td>
<td>0.1A</td>
<td>±4% of reading ±0.4A</td>
</tr>
<tr>
<td>50 to 99th</td>
<td>0.1A</td>
<td>±6% of reading ±0.4A</td>
</tr>
</tbody>
</table>

Harmonic of AC Current in Percentage (1 to 99th order, minimum current at the 50 or 60 Hz > 20 A. If the current is 0 at 50 or 60 Hz, all the percentage (%) display is 0.)

100A Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 10th</td>
<td>0.1%</td>
<td>±0.2% of reading ±1%</td>
</tr>
<tr>
<td>11 to 20th</td>
<td>0.1%</td>
<td>±2% of reading ±1%</td>
</tr>
<tr>
<td>21 to 50th (A range)</td>
<td>0.1%</td>
<td>±5% of reading ±1%</td>
</tr>
<tr>
<td>21 to 50th (mA range)</td>
<td>0.1%</td>
<td>±10% of reading ±1%</td>
</tr>
<tr>
<td>51 to 99th</td>
<td>0.1%</td>
<td>±35% of reading ±1%</td>
</tr>
</tbody>
</table>
### Harmonics of AC Current in Magnitude (1 to 99<sup>th</sup> order, minimum current at the 50 or 60 Hz > 20A, CT=1)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 10&lt;sup&gt;th&lt;/sup&gt;</td>
<td></td>
<td>±0.2% of reading ±7dgts</td>
</tr>
<tr>
<td>11 to 20&lt;sup&gt;th&lt;/sup&gt;</td>
<td>0.1mA / 0.1A</td>
<td>±2% of reading ±7dgts</td>
</tr>
<tr>
<td>21 to 50&lt;sup&gt;th&lt;/sup&gt; (A range)</td>
<td></td>
<td>±5% of reading ±7dgts</td>
</tr>
<tr>
<td>21 to 50&lt;sup&gt;th&lt;/sup&gt; (mA range)</td>
<td></td>
<td>±10% of reading ±7dgts</td>
</tr>
<tr>
<td>51 to 99&lt;sup&gt;th&lt;/sup&gt;</td>
<td></td>
<td>±35% of reading ±7dgts</td>
</tr>
</tbody>
</table>

### Harmonic of AC Current in Percentage (1 to 99<sup>th</sup> order, minimum current at 50 or 60 Hz is greater than 20A. If the current is 0 at 50 or 60 Hz, all the percentage (%) display is 0)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 20&lt;sup&gt;th&lt;/sup&gt;</td>
<td>0.1 %</td>
<td>±2%</td>
</tr>
<tr>
<td>21 to 50&lt;sup&gt;th&lt;/sup&gt;</td>
<td>0.1 %</td>
<td>±6%</td>
</tr>
<tr>
<td>51 to 99&lt;sup&gt;th&lt;/sup&gt;</td>
<td>0.1 %</td>
<td>±10%</td>
</tr>
</tbody>
</table>

### Harmonics of AC Current in Magnitude (1 to 99<sup>th</sup> order, minimum current at the 50 or 60 Hz > 20A, CT=1)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 20&lt;sup&gt;th&lt;/sup&gt;</td>
<td>0.1A</td>
<td>±2% of range ±0.4A</td>
</tr>
<tr>
<td>21 to 50&lt;sup&gt;th&lt;/sup&gt;</td>
<td></td>
<td>±4% of range ±0.4A</td>
</tr>
<tr>
<td>51 to 99&lt;sup&gt;th&lt;/sup&gt;</td>
<td></td>
<td>±6% of range ±0.4A</td>
</tr>
</tbody>
</table>

### Power Factor (PF)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 to 1.00</td>
<td>0.01</td>
<td>± 0.04 (&gt;20V and &gt;30A)</td>
</tr>
</tbody>
</table>

### Phase Angle (Φ)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>-180° to 180°</td>
<td>0.1°</td>
<td>± 1°</td>
</tr>
</tbody>
</table>
**Total Harmonic Distortion** (THD-F with respect to the 50 or 60 Hz, min. value at the 50 or 60 Hz > 80V and > 20 A, 1 to 50th Harmonics. If the voltage or current is 0 at 50 or 60 Hz, all of the percentage (%) displays are 0)

### 1000A Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 to 20%</td>
<td>0.1%</td>
<td>± 2%</td>
</tr>
<tr>
<td>20 to 100%</td>
<td>0.1%</td>
<td>± 6% of reading ± 1%</td>
</tr>
<tr>
<td>100 to 999.9 %</td>
<td>0.1%</td>
<td>± 10% of reading ± 1%</td>
</tr>
</tbody>
</table>

**Total Harmonic Distortion** (THD-F with respect to the fundamental frequency, min. value at 50 or 60 Hz is greater than AC 80V, greater than 10% of the range. Calculation is done over 1 to 50th Harmonics. If the voltage or current is 0 at 50 or 60 Hz, all the percentage (%) displays are 0).

### 100A Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 to 20%</td>
<td>0.1%</td>
<td>± 1%</td>
</tr>
<tr>
<td>20 to 100%</td>
<td>0.1%</td>
<td>±3% of reading ± 5%</td>
</tr>
<tr>
<td>100 to 999.9%</td>
<td>0.1%</td>
<td>±10% of reading ± 10%</td>
</tr>
</tbody>
</table>

### 3000A Flexible Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 to 20%</td>
<td>0.1%</td>
<td>± 2% of range</td>
</tr>
<tr>
<td>20 to 100%</td>
<td>0.1%</td>
<td>±6% of range ± 1%</td>
</tr>
<tr>
<td>100 to 999.9%</td>
<td>0.1%</td>
<td>±10% of range ±1%</td>
</tr>
</tbody>
</table>

**Peak Value of AC Voltage (peak value > 5V) or AC Current (peak value > 20A), VT=1**

### Model 382095 + 1000A Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Sampling Time</th>
<th>Accuracy of Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>39 μs</td>
<td>± 5% ± 30 digits</td>
</tr>
<tr>
<td>60 Hz</td>
<td>33 μs</td>
<td>± 5% ± 30 digits</td>
</tr>
</tbody>
</table>

**Peak Value of AC Voltage (peak value > 5V) or AC Current (peak value > 10% of the range), VT=1**

### Model 382095 + 100A Clamp

<table>
<thead>
<tr>
<th>Range</th>
<th>Sampling Time</th>
<th>Accuracy of Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>19μs</td>
<td>± 5% ± 30 digits</td>
</tr>
<tr>
<td>60 Hz</td>
<td>16μs</td>
<td>± 5% ± 30 digits</td>
</tr>
</tbody>
</table>
### Peak Value of AC Voltage (peak value > 5V) or AC Current (peak value > 20A), VT=1

**Model 382095 + 3000A Flexible Clamp**

<table>
<thead>
<tr>
<th>Range</th>
<th>Sampling Time</th>
<th>Accuracy of Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>39 µs</td>
<td>± 5% ± 30 digits</td>
</tr>
<tr>
<td>60 Hz</td>
<td>33 µs</td>
<td>± 5% ± 30 digits</td>
</tr>
</tbody>
</table>

### Crest Factor (C.F.) of AC Voltage (peak value > 5V) or AC Current (peak value > 20A), VT=1

**Model 382095 + 1000A Clamp**

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy of Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 to 99.99</td>
<td>0.01</td>
<td>± 5% ± 30 digits</td>
</tr>
</tbody>
</table>

### Crest Factor (C.F.) of AC Voltage (peak value > 5V) or AC Current (peak value > 10% of the range), VT=1

**Model 382095 + 100A Clamp**

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy of Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 to 99.99</td>
<td>0.01</td>
<td>± 5% ± 30 digits</td>
</tr>
</tbody>
</table>

### Crest Factor (C.F.) of AC Current (RMS value > 30A)

**Model 382095 + 3000A Flexible Clamp**

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy of Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 to 99.99</td>
<td>0.01</td>
<td>± 5% ± 30 digits</td>
</tr>
</tbody>
</table>

### Frequency in AUTO mode

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy of Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 – 65 Hz</td>
<td>0.1Hz</td>
<td>0.1Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.2Hz (3000A flex clamp)</td>
</tr>
</tbody>
</table>
Model 382095

For indoor use only

Battery Type: Eight (8) 1.5V ‘AA’ batteries

Display: Dot Matrix LCD (240x128) with backlight

LCD Update Rate: once per second

Power Consumption: 140mA (approx.)

No. of Samples: 1024 samples / period

Data Logging Capacity:
- 17474 records (3P4W, 3P3W)
- 26210 records (1P3W)
- 52420 records (1P2W)
- 4096 records (50 Harmonics / record)

Sampling Time: 2 to 3000 seconds for data logging

Low battery Indication: [Battery icon]

Overload Indication: OL

Dimensions: 257 (L) x 155 (W) x 57 (H) mm
- 10.1” (L) x 6.1” (W) x 2.3” (H)

Weight: 2.5 lbs. (1160g) Batteries included

Accessories:
- Four (4) test leads 9.8’ (3m) in length
- Alligator clips x 4
- Carrying bag x 1
- Users manual x 1
- Batteries ‘AA’ 1.5V x 8

1000A Current Probe

Conductor Size: 2.2” (55mm), 2.5” x 1.0” (64 x 24mm) bus bar

Range Selection: Manual (10A, 100A, 1000A)

Dimensions: 244mm (L) x 97mm (W) x 46mm (H)
- 9.6” (L) x 3.8” (W) x 1.8” (H)

Weight: 1.3 lbs. (600g)

Operating Temperature: 14 to 122°F (-10°C to 50°C)

Operating Humidity: < 85% relative humidity

Altitude: < 2000 meters

Storage Temperature: -4 to 140°F (-20°C to 60°C)

Storage Humidity: < 75% relative
100A Current Probe

Conductor Size: 1.2" (30mm) approx.
Range Selection: Manual (1A, 10A, 100A)
Dimensions: 210mm (L) x 62mm (W) x 36mm (H)
8.3" (L) x 2.5" (W) x 1.4" (H)
Weight: 7 oz. (200g)
Operating Temperature: 14 to 122°F (-10°C to 50°C)
Operating Humidity: < 85% relative humidity
Altitude: < 2000 meters
Storage Temperature: -4 to 140°F (-20°C to 60°C)
Storage Humidity: < 75% relative

3000A Flexible Current Probe

Probe Length: 24" (610mm)
Range Selection: Manual (300A, 3000A)
Minimum Bending Diameter 1.37" (35mm)
Connector Diameter 0.9" (23mm)
Cable Diameter 0.55" (14mm)
Cable Length 6.7"/170mm (probe to box)
6.7"/170mm (box to output)
Dimensions (box): 5.1" (L) x 3.1" (W) x 1.7" (H)
130mm (L) x 80mm (W) x 43mm (H)
Weight: 14.4 oz. (410g)
Operating Temperature: 14 to 185°F (-10°C to 85°C)
Operating Humidity: < 85% relative humidity
Altitude: < 2000 meters
Storage Temperature: -4 to 185°F (-20°C to 85°C)
Storage Humidity: < 85% relative
BATTERY REPLACEMENT

When the low battery symbol is displayed on the LCD, replace the batteries.

1. Turn power off and remove all of the test leads and current probes from the unit.
2. Remove the screw on the battery cover.
3. Lift and remove the battery cover.
4. Remove the old batteries.
5. Insert eight (8) new 1.5V 'AA' batteries.
6. Replace the battery cover and secure the screw.
MAINTENANCE & CLEANING

Service not covered in this manual should only be performed by qualified personnel. Repairs should only be performed by qualified personnel. Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents.

NOMENCLATURE

V12, V23, V31: Line Voltage
V1, V2, V3: Phase Voltage
I1, I2, I3: Line Current
P1, P2, P3: True Power (W) of Each Phase
S1, S2, S3: Apparent (VA) Power of Each Phase
Q1, Q2, Q3: Reactive Power (VAR) of Each Phase
PΣ: Total System Power (W)
SΣ: Total System Apparent Power (VA)
QΣ: Total Reactive Power (VAR)
PFS: Total System Power Factor (PF)
PF1, PF2, PF3: Power Factor of Each Phase
PFH: Long Term Average Power Factor (WH / SH)
ϕ1, ϕ2, ϕ3: Phase Angle of Each Phase
WH: Watt Hours
SH: VA hours
QH: VAR hours
HZ: Selected Frequency 50, 60 or Auto.
MD: Maximum Demand in W and VA over Specified Interval
3P4W: 3 Phase 4 Wire System
3P3W: 3 Phase 3 Wire System
1P2W: Single Phase 2 Wire System
1P3W: Single Phase 3 Wire System
SEC: sampling interval (0 to 3000 seconds) for data logging
CT: Current Transformer Ratio from 1 to 600
VT: Voltage Transformer Ratio from 1 to 3000
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Support Lines: U.S. (877) 439-8324; International: +1 (603) 324-7800

Technical Support: Option 3; E-mail: support@extech.com

Repair & Returns: Option 4; E-mail: repair@extech.com

Product specifications are subject to change without notice

Please visit our website for the most up-to-date information

www.extech.com

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Calibrage, réparation et services après-vente


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