Thanks for buying our products please go through the instruction manual before starting to use the meter.

I. INTRODUCTION:
1. DISPLAY: 3½ digit LCD.
2. SWITCH
2.1 FUNCTION and RANGE
   Our CMM adopt rotational switch which situated at the middle of the front case. It is used for the selection of FUNCTION and RANGE.
2.2 HOLD
   The switch is used to hold the display reading when the instrument is disconnected from whatever was being measured.
2.3 BACK LIGHT
2.3.1 It will be automatically turned off in about 5 seconds after the BACK LIGHT is turned on. It needs to be turned on and turned on again to continue the switch.
2.3.2 The BACK-LIGHT will be light when turn on the BLCTR switch. It needs to be turned off and turned on again to continue the switch.

4. “V/2mA” jack
   Voltage, resistance, not more 200mA current, temperature and battery input test jack.
5. “10A” jack
   For the input of more than 200mA current.

II. FEATURES:
   Display: 3½ LCD with maximum display 1999.
   Polarity: Auto polarization.
   Over-range: Maximum display “1”.
   Working environment: Temperature 0-40°C.
   Humidity ≤75%.
   Storing environment: -15~50°C.
   Battery: 9V.
   Low voltage indication: Left side LCD will show “1” symbol.

III. TECHNICAL SPECIFICATION:
   Accuracy: ±0.1% of reading ± 2 digits guaranteed for 1 year.
   Environmental temperature: 23°C±2°C.
   Relative Humidity: <75%.

1. DC Voltage (Over 50V only reference):

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>200mV</td>
<td>±0.8% of rdg±10 digits</td>
<td>100 µV</td>
</tr>
<tr>
<td>2V</td>
<td>±0.5% of rdg±10 digits</td>
<td>1mV</td>
</tr>
<tr>
<td>20V</td>
<td>±0.8% of rdg±10 digits</td>
<td>10mV</td>
</tr>
<tr>
<td>200V</td>
<td>±0.5% of rdg±10 digits</td>
<td>100mV</td>
</tr>
<tr>
<td>500V</td>
<td>±0.5% of rdg±10 digits</td>
<td>1V</td>
</tr>
</tbody>
</table>

Input impedance: 10MΩ on all ranges.

2. DC Current (Over 5A only reference):

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>200mA</td>
<td>±1.5% of rdg±10 digits</td>
<td>0.1mA</td>
</tr>
<tr>
<td>2mA</td>
<td>±1.5% of rdg±10 digits</td>
<td>1mA</td>
</tr>
<tr>
<td>20mA</td>
<td>±0.5% of rdg±10 digits</td>
<td>10mA</td>
</tr>
<tr>
<td>200mA</td>
<td>±2.0% of rdg±10 digits</td>
<td>100mA</td>
</tr>
<tr>
<td>10A</td>
<td>±5.0% of rdg±10 digits</td>
<td>10mA</td>
</tr>
</tbody>
</table>

Overload protection: 0.2A/250V fused, 10A range not fused.

3. AC Voltage (Over 50V only reference):

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>200V</td>
<td>±1.5% of rdg±10 digits</td>
<td>100mV</td>
</tr>
<tr>
<td>500V</td>
<td>±1.5% of rdg±10 digits</td>
<td>1V</td>
</tr>
</tbody>
</table>

Frequency range: 40Hz to 400Hz.
Overload protection: AC 50Vrms.
Indication: Average value (rms of sine wave).
4. Resistance:

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>200Ω</td>
<td>±0.8% of rdg ± 10 digits</td>
<td>0.1Ω</td>
</tr>
<tr>
<td>2kΩ</td>
<td>±0.8% of rdg ± 8 digits</td>
<td>1Ω</td>
</tr>
<tr>
<td>20kΩ</td>
<td>±0.9% of rdg ± 8 digits</td>
<td>10Ω</td>
</tr>
<tr>
<td>200kΩ</td>
<td>±0.9% of rdg ± 8 digits</td>
<td>100Ω</td>
</tr>
<tr>
<td>2MΩ</td>
<td>±2.0% of rdg ± 10 digits</td>
<td>1kΩ</td>
</tr>
</tbody>
</table>

Overload protection: 250V DC or AC rms. Less than 10 sec.
Maximum open circuit voltage: approx. 3V.

5. Temperature:

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40°C - 400°C</td>
<td>±(1.2%+5)</td>
<td>1°C</td>
</tr>
<tr>
<td>401°C - 1000°C</td>
<td>±(1.8%+5)</td>
<td></td>
</tr>
</tbody>
</table>

6. Temperature: (only 830CL)

7. Transistor hFE:

- Vce approximately 3V, Ib approximately 10mA, Display show approximately hFE 1000.
- Diode and Audible Continuity:
  - Diode: Testing voltage approx 2.4V, current 1.5mA, indicate forward diode approx value.
  - Buzzer: Sounds when measure less than 70Ω±20Ω.

IV. OPERATING INSTRUCTION:

1. DC Voltage Measurement V-(DCV):
   - 1.1 Connect RED test lead to “VΩmA” jack, BLACK test lead to “COM”, jack.
   - 1.2 Set the FUNCTION switch to the desired V... (DCV) position. If not sure, set to the highest range.
   - 1.3 Connect the test leads across the source or load under measurement.

2. DC Current Measurement A==(DCA):
   - 2.1 Connect the RED test lead to “VΩmA” jack when the current is less than 200mA and “10A” jack when the current is larger than 200mA. Connect the BLACK test lead to the “COM”, jack.
   - 2.2 Set the FUNCTION switch to the desired DCA position.
   - 2.3 Connect the test leads across the source or load under measurement and read the display value.

3. AC Voltage Measurement V-(ACV):
   - 3.1 Connect the RED test lead to “VΩmA” and BLACK test lead to the “COM”, jack.
   - 3.2 Set the FUNCTION switch to the desired ACV position.
   - 3.3 Connect the test leads to measuring point and read the display value. The polarity of the red lead connection will be indicated at the same time as the voltage.

4. Resistance Measurement (Ω):
   - 4.1 Connect the RED test lead to “VΩmA” jack and BLACK test lead to “COM”, jack.
   - 4.2 Set the FUNCTION switch to the Ω position.
   - 4.3 Connect the test leads across the resistor under measurement and read the display value.

5. Temperature Measurement:
   - 5.1 Set the FUNCTION switch to T position. The built-in temperature sensor will show the room temperature.
   - 5.2 Insert the thermocouple plug into KPROBE socket and connect the object under measurement. The display will show the temperature value.

6. Transistor hFE Measurement:
   - 6.1 Set the FUNCTION switch to hFE position.
   - 6.2 Insert the E.B.C. of the PNP or NPN transistor to the proper jack in the socket on the front panel.

7. Diode and Audible Continuity Measurement:
   - 7.1 Connect RED test lead to the “VΩmA” jack and BLACK test lead to the “COM”, jack.
   - 7.2 Set the FUNCTION switch to the “+” position and connect the RED test lead to the ANODE of diode and BLACK to CATHODE. The display will then show the approx forward voltage of this diode. If connect the test leads on the other way round, the display will show an over-range figure “1”.
   - 7.3 Buzzer sounds if the resistance between the two probes less than approximately 70Ω±20Ω.

8. Battery Test
   - 8.1 Red lead to “mA”, Black lead to “COM”.
   - 8.2 Set the FUNCTION switch to “+” range, connect the test leads separately to the polar of the battery under test.

V. BATTERY AND FUSE REPLACEMENT:

When the voltage of the battery is low, the “+” symbol or BATT will appear on the display. Then the battery should be replaced, open the battery compartment cover, remove the spent battery and replace it with a battery of the same type. Should the fuse need replacement use only 200mA fuses identical in physical size to the original.