GENERAL
83 instruments are a series of compact pocket-sized 3½ digit multimeters for measuring DC and ac voltage, DC current, resistance and diode. Some of those also provide temperature, transistor measurement and audible continuity test function or can be used as a signal generator (see table). Full range overload protection and low battery voltage indication are provided. They are ideal instruments for use in fields, such as laboratory, workshop, hobby and home applications.

FRONT PANEL DESCRIPTION
1. FUNCTION AND RANGE SWITCH
This switch is used to select the function and desired range as well as to turn on the instrument.

    To extend the life of this battery, the switch should be in the "OFF" position when the instrument is not in use.

2. DISPLAY
3½ digit, 7 segment, 0.5" high LCD.

3. "Common" JACK
Plug in connector for black (negative) test lead.

4. "V  Ω mA" JACK
Plug in connector for red (positive) test lead for all voltage and resistance and current (except 10A) measurements.

5. "10A" JACK
Plug in connector for red (positive) test lead for 10A measurement.

SPECIFICATIONS
Accuracies are guaranteed for 1 year, 23°C±5°C, less than 75% RH.

<table>
<thead>
<tr>
<th>DC VOLTAGE</th>
<th>RESOLUTION</th>
<th>ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>200mV</td>
<td>100μV</td>
<td>±0.5% of rdg±2D</td>
</tr>
<tr>
<td>2000mV</td>
<td>1mV</td>
<td>±0.5% of rdg±2D</td>
</tr>
<tr>
<td>20V</td>
<td>10mV</td>
<td>±0.5% of rdg±2D</td>
</tr>
<tr>
<td>200V</td>
<td>100mV</td>
<td>±0.5% of rdg±2D</td>
</tr>
<tr>
<td>1000V</td>
<td>1V</td>
<td>±0.5% of rdg±2D</td>
</tr>
</tbody>
</table>

OVERLOAD PROTECTION: 220V rms AC for 200mV range and 1000V DC or 750V rms AC for other ranges.

AC VOLTAGE

<table>
<thead>
<tr>
<th>RANGE</th>
<th>RESOLUTION</th>
<th>ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>200V</td>
<td>100mV</td>
<td>±1.2% of rdg±10D</td>
</tr>
<tr>
<td>750V</td>
<td>1V</td>
<td>±1.2% of rdg±10D</td>
</tr>
</tbody>
</table>

OVERLOAD PROTECTION: 1000V DC or 750Vrms for all ranges.

RESPONSE: Average responding, calibrated in rms of a sine wave.

FREQUENCY RANGE: 45Hz-450Hz.

DC CURRENT

<table>
<thead>
<tr>
<th>RANGE</th>
<th>RESOLUTION</th>
<th>ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>200μA</td>
<td>1μA</td>
<td>±1% of rdg±2D</td>
</tr>
<tr>
<td>20mA</td>
<td>10μA</td>
<td>±1% of rdg±2D</td>
</tr>
<tr>
<td>200mA</td>
<td>100μA</td>
<td>±1.2% of rdg±2D</td>
</tr>
<tr>
<td>10A</td>
<td>10mA</td>
<td>±2.5% of rdg±2D</td>
</tr>
</tbody>
</table>

OVERLOAD PROTECTION: 200mA 250V fuse.

MEASURING VOLTAGE DROP: 200mV.

RESISTANCE

<table>
<thead>
<tr>
<th>RANGE</th>
<th>RESOLUTION</th>
<th>ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>200ohm</td>
<td>1000 ohm</td>
<td>±0.8% of rdg±2D</td>
</tr>
<tr>
<td>20k ohm</td>
<td>10 ohm</td>
<td>±0.8% of rdg±2D</td>
</tr>
<tr>
<td>200k ohm</td>
<td>100 ohm</td>
<td>±0.8% of rdg±2D</td>
</tr>
<tr>
<td>2000k ohm</td>
<td>1k ohm</td>
<td>±1.0% of rdg±2D</td>
</tr>
<tr>
<td>20M ohm</td>
<td>10k ohm</td>
<td>±1.5% of rdg±2D</td>
</tr>
</tbody>
</table>

MAXIMUM OPEN CIRCUIT VOLTAGE: 2.8V.

OVERLOAD PROTECTION: 15 seconds maximum 220V rms on all ranges.

AUDIBLE CONTINUITY

RANGE  DESCRIPTION
1) Built-in buzzer sounds if resistance is less than 100 ohm.
OVERLOAD PROTECTION: 15 seconds maximum 220V rms Sounds alarm.

TEMPERATURE (K TYPE PROBE)

<table>
<thead>
<tr>
<th>RANGE</th>
<th>RESOLUTION</th>
<th>ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20°C to 1370°C</td>
<td>1°C</td>
<td>±3% ±2D (up to 150°C)</td>
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</tbody>
</table>

OVERLOAD PROTECTION: 220Vrms AC.

OPERATING INSTRUCTIONS

WARNING
1. To avoid electrical shock hazard and/or damage of the instrument, do not measure voltages that might exceed 500V above earth ground.
2. Before the use of instrument, inspect test leads, connectors and probes for cracks, breaks, or crazes in the insulation.

DC VOLTAGE MEASUREMENT

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DCV</th>
<th>ACV</th>
<th>DCA</th>
<th>Ω</th>
<th>BAT</th>
<th>HFE</th>
<th>TEMPERATURE</th>
<th>OPERATING INSTRUCTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>830B</td>
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<td>832B</td>
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</tr>
</tbody>
</table>
1. Connect red test lead to "V Ω mA" jack. Black lead to "COM" jack.
2. Set RANGE switch to desired DCV position. If the voltage to be measured is not known beforehand, set switch to the highest range and reduce it until satisfactory reading is obtained.
3. Connect test leads to device or circuit being measured.
4. Turn on power of the device or circuit being measured, voltage value will appear on Digital Display along with the voltage polarity.

AC VOLTAGE MEASUREMENT
1. Red lead to "V Ω mA". Black lead to "COM".
2. RANGE switch to desired ACV position.
3. Connect test leads to device or circuit being tested.
4. Read voltage value on Digital Display.

DC CURRENT MEASUREMENT
1. Red lead to "V Ω mA". Black lead to "COM". (For measurements between 200mA and 10A connect red lead to "10A" jack with fully depressed.)
2. RANGE switch to desired DCA position.
3. Open the circuit to be measured, and connect test leads IN SERIES with the load in which current is to be measured.
4. Read current value on Digital Display.

RESISTANCE MEASUREMENT
1. Red lead to "V Ω mA". Black lead to "COM".
2. RANGE switch to desired Ω position.
3. If the resistance being measured is connected to a circuit, turn off power and discharge all capacitors before measurement.
4. Connect test leads to circuit being measured.
5. Read resistance value on Digital Display.

DIODE MEASUREMENT
1. Red lead to "V Ω mA". Black lead to "COM".
2. RANGE switch to position.
3. Connect the red test lead to the anode of the diode to be measured and black test lead to cathode.
4. The forward voltage drop in mV will be displayed. If the diode is reversed, figure "1" will be shown.

TRANSISTOR hFE MEASUREMENT
1. RANGE switch to the hFE position.
2. Determine whether the transistor is NPN or PNP type and locate the Emitter, Base and Collector leads, insert the leads into the proper holes of the hFE Socket on the front panel.
3. The meter will display the approximate hFE value at the condition of base current 10μA and VCE 2.8V.

TEMPERATURE MEASUREMENT
1. Connect the k type thermoelectric couple to "V Ω mA" and "COM" jacks.
2. RANGE switch to TEMP position.
3. The display will read the approximate temperature value °C.

AUDIBLE CONTINUITY TEST
1. Red lead to "V Ω mA". Black lead to "COM".
2. RANGE switch to position.
3. Connect test leads to two points of circuit to be tested. If the resistance is lower than 100 ohm, buzzer will sound.

TEST SIGNAL USE
1. RANGE switch to position.
2. A test signal (50Hz for 832, 837 and 1000Hz for 838) appears between "V Ω mA" and "COM" jacks. The output voltage is approx 5V p-p with 50k ohm impedance.

BATTERY AND FUSE REPLACEMENT
Fuse rarely need replacement and blow almost always as a result of operator error.
If "BAT" appears on display, it indicates that the battery should be replaced.
To replace battery & Fuse (200mA/250V) remove the 2 screws in the bottom of the case. Simply remove the old, and replace with a new one. Be careful to observe polarity.

ACCESSORIES
- Operator's instruction manual
- Set of test leads
- Gift box
- K type thermoelectric couple (837, 838, only)
- 9 volt battery, NEDA 1604 6F22 TYPE (Optional).
- "AA" size batteries (83L series only)

WARNING
Before attempting to open the case of the instrument, be sure to disconnect test leads from any energized circuits to avoid shock hazard.

READ AND UNDERSTAND THIS MANUAL BEFORE USING THE INSTRUMENT. Failure to understand and comply with the WARNINGS and operating instructions can result in serious or fatal injuries and/or property damage.