



Figure 1



Figure 2

| Functions  | Range | Resolution | Accuracy<br>$\pm(a\% \text{ readings} + b \text{ digits})$ | Input Protection    | Description                            |
|------------|-------|------------|--|---------------------|--|
| DC Voltage | 4V    | 1mV        | $\pm(0.8\%+1)$   | 600V DC<br>600 V AC | Input Impedance<br>$\geq 10M \Omega$ ; |
|            | 40V   | 10mV       |  |                     |  |
|            | 400V  | 100mV      |  |                     |  |
|            | 600V  | 1V         | $\pm(1\%+3)$   |                     |  |

| Functions              | Range         | Resolution   | Accuracy<br>$\pm(a\% \text{ readings} + b \text{ digits})$ | Input Protection    | Description   |
|------------------------|---------------|--------------|--|---------------------|---|
| AC Voltage<br>ACV      | 4V            | 1mV          | $\pm(1.2\%+3)$   | 600V DC<br>600 V AC | Input Impedance<br>$\geq 10M \Omega$ ; Frequency<br>Response: 40 ~ 400Hz;<br>Display: RMS of Sine<br>wave(Mean Value<br>Response) |
|                        | 40V           | 10mV         |  |                     |   |
|                        | 400V          | 100mV        |  |                     |   |
|                        | 600V          | 1V           | $\pm(1.5\%+5)$   |                     |   |
| Resistance<br>$\Omega$ | 400 $\Omega$  | 0.1 $\Omega$ | $\pm(1.2\%+2)$   | 600 V AC            | Open circuit<br>voltage is about<br>0.45V.  |
|                        | 4K $\Omega$   | 1 $\Omega$   | $\pm(1\%+2)$   |                     |   |
|                        | 40K $\Omega$  | 10 $\Omega$  |  |                     |   |
|                        | 400K $\Omega$ | 100 $\Omega$ |  |                     |   |
|                        | 4M $\Omega$   | 1K $\Omega$  | $\pm(1.2\%+2)$   |                     |   |
|                        | 40M $\Omega$  | 10K $\Omega$ | $\pm(1.5\%+2)$   |                     |   |

| Functions             | Range         | Resolution    | Accuracy<br>$\pm$ (a% readings<br>+ b digits) | Input<br>Protection | Description  |
|-----------------------|---------------|---------------|---|---------------------|--|
| Capacitance<br>CAP(F) | 4.000nF       | 0.001nF       | $\pm$ (4%+3)                                  | 600 V AC            | For reference  |
|                       | 40.00nF       | 0.01nF        |   |                     | Measured under<br>relative<br>measurement,<br>0.45V for open<br>circuit                |
|                       | 400.0nF       | 0.1nF         |   |                     |  |
|                       | 4.000 $\mu$ F | 0.001 $\mu$ F |   |                     |  |
|                       | 40.00 $\mu$ F | 0.01 $\mu$ F  |   |                     |  |
|                       | 100 $\mu$ F   | 0.1 $\mu$ F   | $\pm$ (5%+10)                                 |                     | Just for reading<br>reference when<br>measured<br>capacitance above<br>"100 $\mu$ F" . |

| Functions       | Range   | Resolution | Accuracy<br>$\pm$ (a% readings<br>+ b digits) | Input<br>Protection | Description   |
|-----------------|---|------------|---|---------------------|---|
| Frequency<br>Hz | 99.9Hz  | 0.1Hz      | $\pm$ (0.5%+3)                                | 600 V AC            | Input sine wave<br>10Hz~10kHz:<br>$\geq$ 1V RMS<br>10kHz~100kHz:<br>$\geq$ 30VRMS   |
|                 | 0.999kHz  | 0.001kHz   |   |                     |   |
|                 | 9.99kHz   | 0.01kHz    |   |                     |   |
|                 | 99.9kHz   | 0.1kHz     |   |                     |   |
| Duty Cycle      | 0.1%~<br>99.9%  | 0.10%      |   | 600 V AC            | Use DUTY knob switch<br>to shift to DUTY<br>measurement mode when<br>under AC/DC function<br>(reading for reference only) |
| Diode           |  | 1mV        | 0.5V~0.8v                                     | 600V AC             | 1.5 V for open<br>circuit status  |

| Functions                    | Range   | Resolution   | Accuracy<br>$\pm$ (a% readings<br>+ b digits) | Input<br>Protection | Description  |
|------------------------------|---|--------------|---|---------------------|--|
| Buzzer<br>Continuity         |  | 0.1 $\Omega$ | About $\leq 60 \Omega$                        | 600V AC             | Continuity Resistance<br>$\leq 60 \Omega$ : buzzer beeps;<br>$> 60 \Omega$ : not necessarily<br>to beep, resistance<br>approximate value<br>is displayed, unit is $\Omega$ |
| Low<br>Voltage<br>Indication |   |              | About $< 2.4V$                                |                     |  icon appears   |

|                   |     |
|-------------------|-----|
| English.....      | 8   |
| Svenska.....      | 19  |
| Norsk .....       | 25  |
| Dansk .....       | 29  |
| Suomi .....       | 37  |
| Deutsch .....     | 44  |
| Netherlands ..... | 52  |
| Français.....     | 60  |
| Italiano .....    | 68  |
| Español.....      | 76  |
| Português .....   | 83  |
| Ελληνικά .....    | 90  |
| Polski .....      | 98  |
| Eesti.....        | 106 |
| Lietuviškai.....  | 113 |
| Latviski.....     | 121 |

## Limit 210

### Contents

Overview

General specification

Safety information

Button function

Voltage DC and AC

Resistance

Diode testing

Continuity test

Frequency

Capacitance

Battery

## Overview

This Operating Manual covers information on safety and cautions. Please read the relevant information carefully and observe all the Warnings and Notes strictly.

Limit 210 pocket sized 3  $\frac{3}{4}$  digits multimeter with steady operations, fashionable design and highly reliable hand-held measuring instrument.

## General Specifications

Measuring range and accuracy see page 2.

- Max Voltage 600 V.
- Auto ranging.
- Sleep mode. Automatic turn off if not in use for 10 minutes.
- Display 3  $\frac{3}{4}$  digits or 3999.
- Measurement Speed: Updates 3 times /second.
- Temperature:            Operating: 0°C~40°C (32°F~104°F).  
                                  Storage: -10°C~50°C (14°F~122°F).
- Battery Type: One pcs 3V type CR2032.
- Safety/Compliances: IEC61010 CAT II 600V.

- Certification: CE

## Safety Information

This Meter complies with the standards IEC61010. Isolation CAT II 600 V.

## Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules:

- Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastics. Pay attention to the insulation around the connectors.
- Inspect the test leads for damages insulation or exposed metal.
- Do not apply more than the rated voltage, as marked on the Meter.
- The rotary switch should be placed in the right position and no any changeover during measurement is conducted to prevent damage of the Meter.
- When the Meter working at an effective voltage over 60V in DC or 42V in AC, special care should be taken for there is danger of electric shock.

- Do not use or store the Meter in an environment of high temperature; humidity, explosive, inflammable and strong magnetic fields. The performance of the Meter may deteriorate after dampened.
- When using the test leads, keep your fingers behind the finger guards.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes and current.
- Replace the battery as soon as the battery indicator appears. When low battery, the Meter might produce false readings that can lead to electric shock and personal injury.

## Functional buttons

### SELECT

- Change between  $\Omega$ , Diodes test or Continuity test when rotary switch are selected for any of this functions.

### REL $\Delta$

- On/Off for relative mode in any measuring mode except frequency/duty mode. Display shows 0 and current reading is set as reference value.

### HOLD

- On/Off for hold function.

### Hz/%

- Change between measuring frequency in Hz or duty cycle in % when rotary switch is in DCV or ACV position.

Note. The meter will be at max DCV 400 mV or ACV 4 V when Hz/Duty mode is on. It is important to turn off and on again to resume to auto range mode when measuring higher voltage.

### **Voltage measurement DC and AC** (See fig 1)

1. Turn the rotary switch to DCV position for DC or ACV~ for AC.
2. Connect the test leads across with the object being measured. The measured value shows on the display.

### **Resistance measurement** (See fig 1)

1. Turn the rotary switch to  $\Omega$  ► » position.
2. Select  $\Omega$  with SELECT button. Display shows resistance symbol  $\Omega$ .
3. Connect the test leads across with the object being measured. The measured value shows on the display.

The test leads can add 0.1 $\Omega$  to 0.3 $\Omega$  of error to resistance measurement. To obtain precision readings in low-resistance measurement, that is the range of 400 $\Omega$ , short-circuit the input terminals beforehand and record the reading obtained. This is the additional resistance from the test lead.

**Diode test** (See fig 1)

Use the diode test to check diodes, transistors, and other semiconductor devices. The diode test sends a current through the semiconductor junction, and then measures the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V.

1. Turn the rotary switch to  $\Omega \blacktriangleright \gg$  position.
2. Select Diode with SELECT button. Display shows diode symbol  $\blacktriangleright$ .
3. Place the red test lead on the component's anode and place the black test lead on the component's cathode. The measured value shows on the display.

**Continuity test** (See fig 1)

1. Turn the rotary switch to  $\Omega \blacktriangleright \gg$  position.
2. Select Continuity with SELECT button. Display shows Continuity symbol  $\gg$ .
3. Connect the test leads across the object. The buzzer sounds if the resistance of a circuit under test is less than  $60\Omega$ .

## Frequency or Duty cycle measuring (See fig 1)

1. Turn the rotary switch to Hz% alternative DCV or ACV position.
2. Push the Hz/% button for Frequency Hz or Duty cycle %.

3. Connect the test leads across with the object being measured. The measured value shows on the display.

### **Capacitance** (See fig 1)

1. Turn the rotary switch to  $\parallel$  position.

3. Push REL  $\Delta$  button.

4. Connect the test leads across with the object being measured. The measured value shows on the display.

To minimize the measuring error caused by the distributed capacitor, the testing lead should be short as possible. For measuring capacitance higher than 10  $\mu$ F, it is normal taking several seconds to obtain a reading.

### **Replacing the battery** (See fig 2)

1. Disconnect the connection between the testing leads and the circuit under test when battery indicator appears on the display.

2. Turn the Meter to OFF position.

3. Remove the screw, and separate the case bottom.

4. Replace the battery with a new 3V battery type CR2032.