# DC Milli – Ohm Meter
## 微小電阻測試器

## MR-30


# INSTRUCTION MANUAL
## 使 用 說 明 書

# TABLE OF CONTENTS



# 目　　次

# MR-30

## DC Milli – Ohm Meter

# ⚠ SAFETY PRECAUTIONS

Normal usage of the equipment exposes you to a certain amount of danger from electric shock. Testing must sometimes be performed where exposed voltage is present. A voltage as low as 35V DC or AC rms should be considered dangerous and hazardous. You will significantly reduce the risk factor if you know and observe the following safety precaution:

**(1) Don't be exposed to high voltage needlessly. Remove housing and covers only when necessary.**

**(2) If possible, familiarize yourself with the equipment being tested and the location of its high voltage points. However, remember that high voltage may appear at unexpected points in defective equipment.**

**(3) Use an insulated floor material or a large insulated floor to stand on, and use an insulated work surface on which to place the equipment. Make certain that such surface is not damp or wet.**

**(4) Use the time proven "one-hand-in-the-pocket" technique while handling an instrument probe. Be particularly careful to avoid contacting metal objects which could be a good ground for return path.**

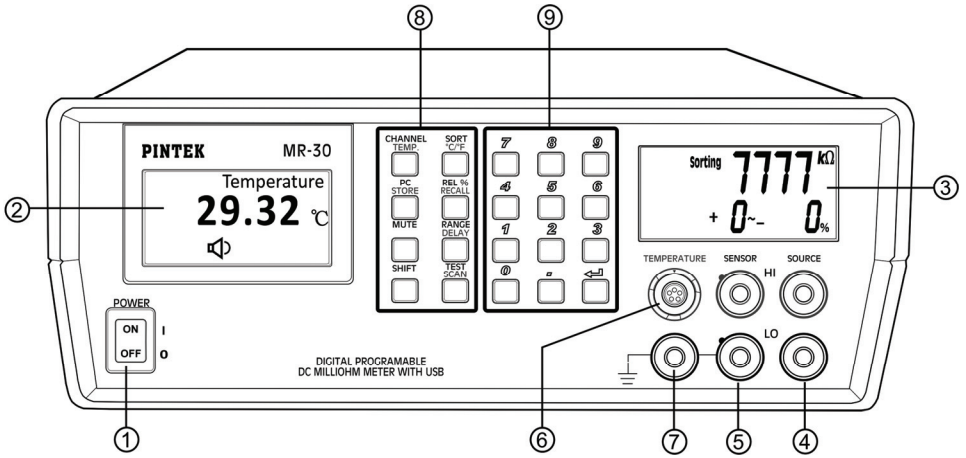
**(5) On the AC power equipment. Remember that AC line voltage is usually present on some power input circuits such as the on-off switch, the fuse, and the power transformer, and any time the equipment is connected to an AC outlet, even if the equipment is turned off.**

**(6) On test instruments with 3-wire AC power plugs, use only a 3-wire outlet. This is a safety feature to keep the housing or other exposed elements at earth ground.**

# FEATURES

- Double LCD display
- 300,000 counts resolution
- Measurement range: 30mΩ~3MΩ
- 0.05% accuracy
- 20 standard user setting memory sets
- Sorting function and relative percentage function
- PASS/FAIL test result alarm
- Computer remote manual and auto scan function
- Manual and auto channel select
- Sampling rate: 30 sample/sec
- High resolution temperature compensation and measurement
- DUT four-wire method
- USB interface

# Function Introduction of Front Panel



① **Power Switch:**

Push the switch “ON” will turn on both Major LCD and Minor LCD to indicate the power “ON”.

② **Major LCD:**

Major LCD will display the measurement result.

③ **Minor LCD:**

Minor LCD will display the value setting.

④ **Current Source Terminal:**

Source HI and Source LO terminals for resistance measurement.

⑤ **Measurement Terminal (Sensor Terminal)**

Sensor HI and Sensor LO terminals for resistance measurement.

⑥ **Temperature Terminal:**

The terminal for temperature measurement.

⑦ **Negative Terminal:**

This terminal has the same potential as earth, **but cannot be used as a substitute**.

⑧ **Key Pad:**

This key pad includes 0-9 keys and point key, enter keys.

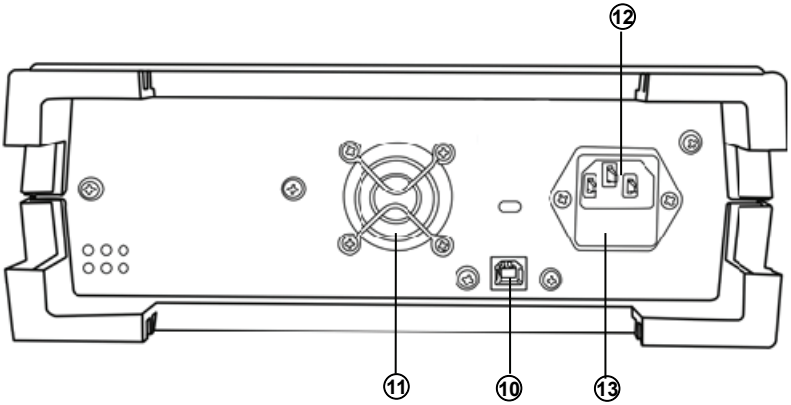
⑨ **Function Key**

These keys indicate Dual Functions.

In normal condition, the Keys will indication the black word function.

**After pressing the shift key, the keys will indicate the blue function.**

# REAR PANEL DESCRIPTION




**⑩ USB Terminal:**

Connect MR-30 with your computer with USB cable for Remote operation.

**⑪ DC Fan:**

For cooling.

**⑫ Input AC Power Socket and Fuse Plug:**

The power input socket for the input line voltage (115 / 230V).

**⑬ Fuse Socket:**

The selection input line Voltage (115 / 230V) depends on the insert fuse plug. Refer to the Arrow marks on the fuse plug and the marks on the panel.

# FUNCTION DESCRIPTION

**(1) The "0 -9, & ·(POINT)" key:**

Edit standard resistance and standard range value.

**(2) The "ENTER" key:**

Enter the standard resistance and standard range value.

**(3) The "CHANNEL" key:**

The **CHANNEL** key select "MANUAL/AUTO" mode.
In "AUTO" mode, Major LCD display "AUTO" and MR-30 select, resistance range automatically.

→ ~3MΩ→ ~300KΩ→ ~30KΩ→ 3KΩ→ ~300Ω→ ~30Ω→ ~3Ω → ~300mΩ→ ~30mΩ→

In "MANUAL" mode, if DUT is out of the input range, LCD will display "OL".

**(4) The "SORT" key:**

Press the **SORT** key enters sorting mode and edit the error range and the standard resistance value.

Press **SORT** key the first time, user can edits the +X% to –Y% error range. If user needs ± X% error range, press **SORT** key again (second time). After entered the error range, press **ENTER** key and then it will switch to edit standard resistance value.

**(5) The "REL %" key:**

The **REL %** key enter relative mode and edit use standard resistance value. After entered the standard resistance value, the relative mode will calculate the % (percentage) distinction resistance value between DUT and standard.

**(6) The "RANGE" key:**

The **RANGE** key changes the standard resistance value unit. The unit loop are MΩ→ KΩ→ Ω→ mΩ→ MΩ.

**(7) The "PC" key:**

The **PC** key actives the USB data transfer function. In PC function,

the MR-30 transfers the DUT value to the computer and receive command from computer.

**(8) The "MUTE " key:**

The **MUTE** key enables/disables the mute function. In MUTE function, the buzzer sound is turn off.

**(9) The "TEST" key:**

The **TEST** key compares the DUT resistance value with user standard resistance value in sorting mode. If DUT resistance value is inside the standard resistance error range, the minor LCD will display "PASS" and the MR-30 buzzer will beep sound. If DUT is out of the standard resistance error range, then the minor LCD will display "FAIL", and buzzer will beep twice sounds

**(10) The "SHIFT" key:**

The **SHIFT** key actives the external function.

**(11) The "TEMP" key (SHIFT+CHANNEL):**

The **TEMP** key enables/disables temperature detection.

**NOTE:** In TEMP function, resistor terminal is disabled.

**(12) The "STORE" key (SHIFT+PC):**

The **STORE** key edits the user value. In store function, user can select memory setting address from 1 to 20.

**(13) The "RECALL" key (SHIFT+REL %):**

The **RECALL** key activates the user value recall function. In recall function, user can select memory setting address from 1 to 20.

**(14) The "DELAY" key (SHIFT+REANG):**

The **DELAY** key edits the scan delay time. Delay time ranges from 1 to 10000 seconds.

**(15) The "SCAN" key (SHIFT+TEST):**

The **SCAN** key activates the auto scan function. In auto scan function, after each delay time, MR-30 will measure the DUT resistance and compare it with the standard value range then return the PASS/ FAIL result.

# DISPLAY DESCRIPTION

**(1) Main LCD:**

The Main LCD will display the following:

**OL**: Over Load, DUT is out of input range.

: Mute Mode Enabled

: Mute Mode Disabled

**Shift**: Shift Mode Enabled

**1234567890**: DUT resistance value

Ω: DUT resistance unit

**Delay**: Indicates MR-30 in operation mode

**(2) Minor LCD:**

**0 – 9**: shows edit standard resistance and the standard range value.
**Pass / Fail**: Indicates whether the DUT resistance value is inside the standard resistance value or out of the standard value.

# OPERATION

**(1) Resistance measure:**

MR-30 uses 4 wire connector measurement DUT resistance.

- Source HI: The Source HI terminal supply measures current. It is connected to the DUT + side.
- Source LO: Source LO terminal receive measuring current. It is connected to the DUT – side.
- Sense HI: The Sense HI terminal measures positive electrode.
- Sense Lo: The Sense LO terminal measures negative electrode.
- GND: If DUT has large metallic area and do not connect to either terminals, then connect it to GND.

- The resistance value will change while connecting or disconnecting the test. Therefore, please wait for 1 minute in order to obtain an accurate value.

**(2) Temperature measure:**

MR-30 uses 4 wire high sensitive temperature probe.

- Connect the temperature probe to the Temperature connector.
- Press **Temp** (SHIFT + CHANNEL) key to enable temperature mode.

# MAINTANCE

**(1) Preventive Maintenance:**

Please follow the following preventive steps to ensure the proper operation of your instrument.

- Never place heavy object on the instrument.
- Never place a hot soldering iron on or near the instrument.
- Never insert wires, pins or other metal objects into the ventilation fan.
- Never move or pull the instrument with the power cord or the input lead.

  Especially never move the instrument when the power cord is connected.
- Do not obstruct the ventilation holes on the rear panel.
- Clean and check the calibration of the instrument regularly to keep the instrument looking nice and working well.

**(2) Fuse Replacement:**

If the fuse blows up, both LCDs will not light up and the instrument will not operate. Replace only with the correct value fuse.
The fuse is located on the rear panel adjacent to the power cord receptacle.

- Unplug the power cord from the instrument.
- Insert a small screwdriver in the fuse holder solt (located between the fuse holder and the receptacle).
- Change the fuse and re-insert the holder.

**NOTE:**

When re-inserting the fuse holder, ensure that the correct line voltage is selected.

**(3) CLEANING:**

Remove any dirt, dust and grime whenever they become noticeable.

Clean the outside cover with a soft cloth moistened with a mild cleaning solution.

# SPECIFICATIONS

Conditions Background: The specifications are applicable under the following conditions:

- Operation temperature of 20°C to 28°C.
- Relative humidity of 15% - 80%.
- The instrument requires 30 minute warm-up time to achieve rated accuracy.
- The power cord protective grounding conductor must be connected to the ground.
- The resistance value will change while connecting or disconnecting the test. Therefore, please wait for 1 minute in order to obtain an accurate value.