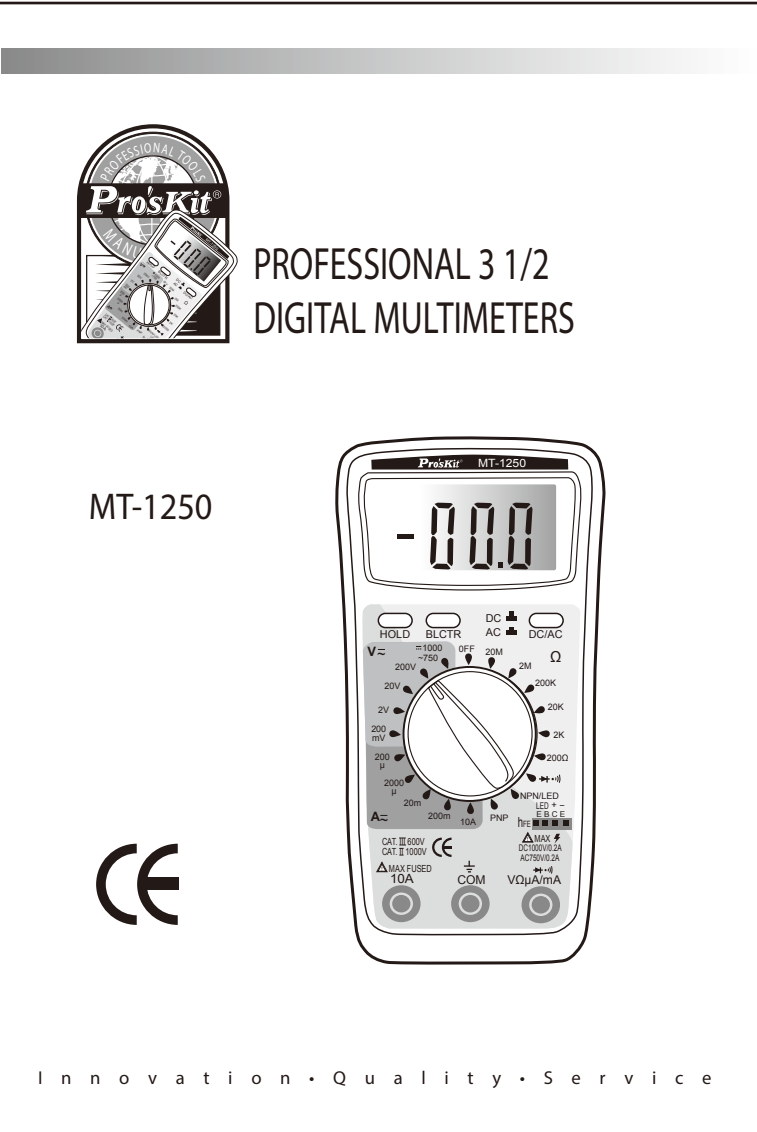


型號/Model No.:MT-1250

料號/Part No.:無

Size:200x150mm



Thank you for purchasing the **Pro'sKit® MT-1250 PROFESSIONAL 3 1/2 DIGITAL MULTIMETERS**. Please read this manual before operating the MT-1250 the manual in a safe, easily accessible place for future reference.

1. INTRODUCTION
This instrument is compact, durable, battery operated, handheld 3 1/2 digits digital multimeter with double-injection plastics case for measuring DC and AC Voltage, DC and AC Current, Resistance, Diode, LED & Transistor and Continuity Test. The Dual-slope A-D Converter plus C-MOS band-gap reference technology is taken into use for auto-zeroing, polarity selection and over-range indication. Reliable-perfect Overload Protection is provided with PTC, Diode & two Fuses for both of small current and big current. It is designed for the professional at work in the field of laboratory and for in-door use.

2. GENERAL CHARACTERISTICS
• Maximum Indication: 1999 counts (3 1/2 digits) with large LCD display.
• Accuracies are (% reading + No. of digits)
• Sampling rate: 2-3 times reading per second (approximate).
• Push-type Switch buttons respectively for Data Hold-on(HOLD), Back-lighting(BLCTR) and AC/DC Inter-change.
• Single 20 positions easy to use rotary switch for Ten Functions and Range selection.
• High sensitivity of 100 μ V.
• Impedance: 10M ohm on all DCV & ACV Ranges.
• Automatic over-range indication with the "1" displayed.
• Automatic low battery power (6.4V) indication with the mark "LO BAT".
• Automatic polarity indication on DC ranges.
• Continuity Test by Beeper sounding below 50 ohm.
• Maximum common mode voltage: 500V DC/AC rms.

— Environment for guaranteed accuracy: 23°C±5 C, less than 75% RH.
— Temperature Scope: Operating 0°C to 40°C, 32°F to 104°F. Max. RH 80% to 31°C decreasing linear to 50% RH at 40°C.
Storage: -10°C to 50°C, 14°F to 122°F at < 80% relative humidity(w/o battery).
— Power Supply: One 6F22 DC 9V battery or equivalent.
— Battery Power Life: 30 hours approx.
— Size & Weight: 75(W) x 147(L) x 40(H) mm and 260g (including battery).
— Accessories: Operating manual.
— 1Set of test leads with 20AWG 1000V Class PVC Wire
— This instrument complies with insulation category (over voltage category), CAT II 1000V.

導通測量

1. 將旋鈕開關轉到 "→" "檔位元區域。
2. 紅色測試棒插入 "VΩmA" 插孔，而黑色測試棒插入 "COM" 插孔。
3. 將測試棒的另外兩端以並聯方式接觸待測的電路。如果電路內的阻抗值小於50Ω，蜂鳴器將會發出聲音。

二極體測量 (檢測電流1mA)

1. 將旋鈕開關轉到 "→" "檔位元區域。
2. 紅色測試棒插入 "VΩmA" 插孔，而黑色測試棒插入 "COM" 插孔。
3. 將紅色測試棒的另外一端接觸二極體的陽極，黑色測試棒的另一端接觸二極體的陰極。
4. 從液晶顯示器 (LCD) 讀取測試值。

若測試棒與二極體反接，則液晶顯示器顯示 "1"。

電晶體 (hFE) 和LED測量

- A. 電晶體 (hFE) 測量 (基準電流10uA, VCE為2.8V)
1. 轉動旋鈕開關到 "hFE" (NPN或PNP) 區域。
 2. 依照LCD顯示將電晶體的腳插入 "hFE" 區。
 3. 從液晶顯示器 (LCD) 讀取測試值。
- B. LED檢測
1. 轉動旋鈕開關到 hFE(LED) 檔區域。
 2. 將LED燈的兩個管腳分別插入表面板上的電晶體 (hFE/LED) 插座中的右邊 "+"，"- " 兩個孔中 (注意LED燈的極性)。
 3. 觀察觀察LED燈是否明亮發光，既可判定LED的好壞。

液晶顯示器LCD背光顯示操作

若需要在昏暗環境下進行測量，本電錶提供了液晶顯示器LCD背光功能。只要按下電錶LCD顯示幕下的 "HOLD" 開關按鈕，則背光功能開啟。約3秒後，自動關閉，以節省電池電力。

資料保持操作

當使用者進行測量，不使直接觀察液晶顯示器LCD上的讀數時，本電錶提供了測量資料保持功能。只要按下電錶LCD顯示幕下的 "HOLD" 開關按鈕，則測量資料被記錄在LCD上並顯示 "HOLD" 字，並有蜂鳴器將會發聲提示。當再次按下 "HOLD" 開關按鈕，則此功能解除。

保養須知

警告！更換電池、保險絲或做任何維修之前，必須先拿掉測試棒，並將電錶檔位放在 "OFF" 檔。

1. 電池更換

1. 電源由一顆6F22 DC 9V電池供電，當 "LO BAT" 符號顯現時表示電池需要換新。卸下底蓋的四顆螺絲，拿起底蓋，然後更換同類電池。
2. 保險絲更換
如果電錶無法進行，請檢查保護用保險絲是否已燒壞。
保險絲管位於 "PTC" 電路板上的保險絲座內。本產品設有兩個保險絲管，更換保險絲管時，卸下底蓋的4顆螺絲，拿起底蓋，然後進行更換。保險絲管須用同等級0.5A/250V或10A/250V快熔保險絲更換。

清潔須知

本機表面外觀，可用乾淨軟布 (沾酒精) 進行清潔。請勿碰利器或硬物，勿進水或受熱，以免損壞產品。
更換保險絲管時，卸下底蓋的兩顆螺絲，拿起底蓋，然後進行更換。保險絲管須用同等級0.5A/250V或10A/250V快熔保險絲更換。

電阻

| 檔位 | 精確度 | 解析度 | 超載保護PTC |
|----------|---------------------------|---------|------------------------|
| 200 ohm | ±(1.2% of rdg. +2 digits) | 0.1 ohm | Max DC/AC 380V rms. |
| 2K ohm | | 1 ohm | |
| 20K ohm | | 10 ohm | |
| 200K ohm | ±(1.0% of rdg. +2 digits) | 100 ohm | |
| 2M ohm | | 1K ohm | |
| 20M ohm | ±(2.5% of rdg. +4 digits) | 10K ohm | |

操作說明

安全守則

- 下列安全守則必須被注意，以便於確保使用者在最安全的情況下使用本電錶。
1. 如果測試棒外觀類似受損或電錶操作類似不正常時，請勿使用本電錶。
 2. 進行與電有關的測試時，請勿使自己成為接地。請勿接觸裸露的金屬片、插座或裝備等，因該物可能成為接地媒介。為使身體與地隔離，請穿柔軟的衣物、橡膠鞋或利用橡膠地墊或任何可以絕緣的材料。
 3. 當測試中，在切割、穿鑿或拆卸中斷電路之前，請關閉電源，因少量電流也可能造成危險。
 4. 使用測試棒時要注意手指放在測試棒的後面。
 5. 凡測試超額電錶量或確定電錶外的電路時，可能會損壞本電錶或可能使使用者觸電。每次使用前請確認電錶的電壓使用範圍限制。

直流電壓/交流電壓 (DCV/ACV) 測量

1. 紅色測試棒插入 "VΩmA" 插孔，而黑色測試棒插入 "COM" 插孔。
2. 依所需將旋鈕開關轉到 "ACV/DCV" 檔位元區域。
3. 檢查電錶LCD顯示幕下的AC/DC切換開關按鈕，依次遞減選擇最適合的檔位，以保證正確測量。
4. 將測試棒的另外兩端以並聯方式接觸待測的電路。
5. 從液晶顯示器 (LCD) 讀取測試值。

直流電流/交流電流(DCA/ACA) 測量

1. 紅色測試棒插入 "VΩmA" 插孔，而黑色測試棒插入 "COM" 插孔。若測量電流大於200mA時，則必須將紅色測試棒插入 "10A" 插孔。
2. 依所需將旋鈕開關轉到 "ACA/DCA" 檔位元區域。
3. 檢查電錶LCD顯示幕下的AC/DC切換開關按鈕，並確定選擇正確的AC/DC按鍵狀態，以保證正確測量。
4. 將測試棒的另外兩端以串聯方式接觸待測的電路。
5. 從液晶顯示器 (LCD) 讀取測試值。

電阻測量

1. 紅色測試棒插入 "VΩmA" 插孔，而黑色測試棒插入 "COM" 插孔。
2. 依所需將旋鈕開關轉到 "Ω" 檔位元區域。
3. 將測試棒的另外兩端以並聯方式接觸待測的物體。
4. 從液晶顯示器 (LCD) 讀取測試值。

— Pollution degree 2 in accordance with IEC-664

| Function | Test Leads connected | Overload Maximum |
|----------------|----------------------------|----------------------|
| V / DC | V/OHM + COM | 1000V DC |
| V / AC | V/OHM + COM | 750V rms. AC |
| OHM | V/OHM + COM | 380V DC/AC Protected |
| mA,uA / DC, AC | mA/uA + COM | 0.5A 250V DC/AC |
| 10A / DC, AC | 10A + COM | 10A 250V DC/AC |
| Diode, Buzz | V/OHM + COM | 380V DC/AC Protected |
| hFE | Special Transistor Sockets | 1000 |

3. SPECIFICATIONS:

| DC Voltage | | | |
|------------|---------------------------|-------------|---------------------|
| RANGE | ACCURACY | RESOLUTION | Overload Protection |
| 200mV | ±(0.5% of rdg. +1 digit) | 100 μ V | AC/DC 300V rms.. |
| 2.000V | | 1mV | |
| 20.00V | ±(1.0% of rdg. +2 digits) | 10mV | DC 1000V |
| 200.0V | | 100mV | |
| 1000V | ±(1.5% of rdg. +2 digits) | 1V | AC 750V rms. |

Input impedance: 10M ohm on all ranges.

| AC Voltage | | | |
|------------|---------------------------|-------------|---------------------|
| RANGE | ACCURACY | RESOLUTION | Overload Protection |
| 200mV | ±(1.0% of rdg. +3 digit) | 100 μ V | AC/DC 300V rms. |
| 2V | | 1mV | |
| 20V | ±(1.5% of rdg. +3 digits) | 10mV | DC 1000V |
| 200V | | 100mV | |
| 750V | ±(2.5% of rdg. +4 digits) | 1V | AC 750V rms. |

Input impedance: 10M ohm on all ranges.

Frequency Range: 40Hz to 1000Hz

| DC Current | | |
|-------------|---------------------------|-------------|
| RANGE | ACCURACY | RESOLUTION |
| 200 μ A | ±(1.2% of rdg. +2 digit) | 100 nA |
| 2mA | | 1 μ A |
| 20mA | | 10 μ A |
| 200mA | | 100 μ A |
| 10mA | ±(2.0% of rdg. +3 digits) | 1mA |

Overload Protection: Diode & 0.5A/250V Fuse of ordinary glass tube type but 10A range with 10A/250V fuse of ordinary glass tube type.

| AC Current | | |
|-------------|---------------------------|-------------|
| RANGE | ACCURACY | RESOLUTION |
| 200 μ A | ±(1.5% of rdg. +3 digit) | 100 nA |
| 2mA | | 1 μ A |
| 20mA | | 10 μ A |
| 200mA | | 100 μ A |
| 10mA | ±(2.5% of rdg. +5 digits) | 1mA |

Overload Protection: Diode & 0.5A/250V Fuse of ordinary glass tube type, but 10A range with 10A/250V fuse of ordinary glass tube type.
Frequency Range: 40Hz to 1000Hz.
Indication: Average (rms. of sine wave).

| Resistance | | | |
|------------|---------------------------|------------|-------------------------|
| RANGE | ACCURACY | RESOLUTION | Overload Protection |
| 200 ohm | ±(1.2% of rdg. +2 digits) | 0.1 ohm | Max. DC/AC 380V rms. |
| 2K ohm | | 1 ohm | |
| 20K ohm | | 10 ohm | |
| 200K ohm | ±(1.0% of rdg. +2 digits) | 100 ohm | |
| 2M ohm | | 1K ohm | |
| 20M ohm | ±(2.5% of rdg. +4 digits) | 10K ohm | |

Overload Protection by PTC: Max. AC/DC 380V rms.

- 4. OPERATIONS**
— SAFETY WARNINGS AND CAUTIONS
1. Check the 9-volt battery by setting the range switch to any other range but Off. If the battery is weak. A sign will appear on the display. If this does not appear on the display proceed as below. See MAINTENANCE if the battery has to be replaced.
2. The mark or sign "1" next to the test lead jacks is for warning that the input voltage or current should not exceed the indicated values. This is to prevent damage to the internal circuit.
3. The function switch should be set to the range to be tested before operation.
4. If the voltage or current range is not known beforehand set the RANGE switch to a high range and work down.
5. When only the figure "1" is displayed over-range is being indicated and the FUNCTION switch must be set to a higher range.
6. Please do not measure large current 10 amp lasting more than 15 seconds. Otherwise such long time action may cause damage to the instrument and or equipment being tested and or injury to the user.
7. To avoid electric shock, disconnect measuring terminals before removing back cover.

| 規格表 | | | |
|----------|---------------------------|-------------|-----------------|
| DCV 直流電壓 | | | |
| 檔位 | 精確度 | 解析度 | 最大超載範圍 |
| 200mV | ±(0.5% of rdg. +1 digit) | 100 μ V | AC/DC 300V rms. |
| 2.000V | | 1mV | DC 1000V |
| 20.00V | ±(1.0% of rdg. +2 digits) | 10mV | AC 750V rms. |
| 200.0V | | 100mV | |
| 1000V | ±(1.5% of rdg. +2 digits) | 1V | |

輸入阻抗: 10M ohm on all ranges.

| ACV 交流電壓 | | | |
|----------|---------------------------|-------------|-----------------|
| 檔位 | 精確度 | 解析度 | 最大超載範圍 |
| 200mV | ±(1.0% of rdg. +3 digit) | 100 μ V | AC/DC 300V rms. |
| 2V | | 1mV | DC 1000V |
| 20V | ±(1.5% of rdg. +3 digits) | 10mV | AC 750V rms. |
| 200V | | 100mV | |
| 750V | ±(2.5% of rdg. +4 digits) | 1V | |

輸入阻抗: 10M ohm. 頻率範圍: 40Hz to 1000Hz

| DCA 直流電壓 | | | |
|-------------|--------------------------|---------------------------|-------------------------|
| 檔位 | 精確度 | 解析度 | 最大超載範圍 |
| 200 μ A | ±(1.2% of rdg. +1 digit) | 100 nA | Max. DC/AC 380V rms. |
| 2mA | | 1 μ A | |
| 20mA | | 10 μ A | |
| 200mA | | 100 μ A | |
| 10A | | ±(2.0% of rdg. +3 digits) | |

超載保護：小電流檔位0.5A/250V；大電流檔位 (>0.2A) 10A/250V

| ACA 交流電壓 | | | |
|-------------|--------------------------|---------------------------|-------------------------|
| 檔位 | 精確度 | 解析度 | 最大超載範圍 |
| 200 μ A | ±(1.5% of rdg. +3 digit) | 100 nA | Max. DC/AC 380V rms. |
| 2mA | | 1 μ A | |
| 20mA | | 10 μ A | |
| 200mA | | 100 μ A | |
| 10A | | ±(2.5% of rdg. +5 digits) | |

超載保護：小電流檔位0.5A/250V；大電流檔位 (>0.2A) 10A/250V。頻率範圍: 40Hz to 1000Hz。測量顯示值: 正交或平均值。

3 1/2 雙色防滑精巧電錶 型號：MT-1250

使用操作說明書

感謝您選購 **Pro'sKit® MT-1250 3 1/2 雙色防滑精巧電錶**。使用電錶前請詳閱本使用說明書，閱後請妥為收存，以備日後查閱。
本電錶為手持攜帶型3 1/2 位元顯示數位多功能電錶，以電池為電源，外殼為軟性防滑綠色成型，牢固耐用。
本機可以測量交流電壓、直流電壓、交流電流、直流電流、電阻、二極體、LED燈、電晶體等，並具有內置蜂鳴器的快速導通檢測、資料保持、LCD背光顯示、自動斷電、極性和過載顯示等功能。本機還設置了雙重保險絲及PTC和二極體，具備了完整的保護電路。適合專業人士或相關維修人員及家庭使用。

一般規格：

1. 顯示：3 1/2 位數液晶顯示器 (LCD)，最大讀值1999。
2. 準確度表示方式：(% reading + No. of digits)
3. 極性：“自動顯示” “+” “-” 符號表示正負。
4. 三線程式變壓：按此功能操作附加功能：資料保持功能 (HOLD)、背光功能 (BLCTR) 和交、直流切換 (AC/DC)。
5. 20個功能檔位，包括 "OFF" 檔。
6. 高響應率：100V。
7. 電壓空檔高阻抗，達到：10M Ω 。
8. "COM" 插孔，最大輸入電壓：500V。
9. 超載顯示：LCD顯示 "1"。
10. 低電池顯示：當LCD顯示 "LO BAT" 表示電池電壓低 (<6.4V)，需要更換電池。
11. 取樣速度：2~3次/秒。
12. 標準測試條件：23°C，相對濕度：<75%。
13. 操作環境：0°C~40°C，相對濕度<80RH。
14. 儲電溫度：-10°C~50°C，相對濕度0~80RH (電池須拿掉)。
15. 電源：4F22 9V電池一節。
16. 電池壽命：約30小時。
17. 電池壽命：約30小時。
18. 尺寸：147mm(長) x 75mm(寬) x 40mm(厚)。
19. 重量：約260克(包括電池)。
20. 材料：塑膠、鋼、銅。
21. 安規等級：CAT II 1000V

| 功能檔位 | 表筆插入插孔 | 最大允許輸入 |
|----------------|-------------|-----------------|
| V / DC | V/OHM + COM | 1000V DC |
| V / AC | V/OHM + COM | 750V rms. AC |
| OHM | V/OHM + COM | 380V DC/AC |
| mA,uA / DC, AC | mA/uA + COM | 0.5A 250V DC/AC |
| 10A / DC, AC | 10A + COM | 1.0A 250V DC/AC |
| Diode, Buzz | V/OHM + COM | 380V DC/AC |
| hFE | 專用電晶體插孔 | 1000 |

8. For continued protection against fire, replace only with fuses or components of the specified voltage, current, resistance, and other rated.

4.1) DC Voltage Measurement

1. Connect the BLACK test lead to the COM jack and the RED test lead to the V/Ω jack.
2. Make sure that the AC/DC switch Button is on DC position (UP).
3. Set the FUNCTION switch to the V range to be used and connect the test leads across the source or load under measurement. The polarity of the RED lead connection will be indicated at the same as the voltage.
4. Get the readings from the LCD.

Note:
Do not apply more than 1000V at all ranges to the input. Indication is possible at higher voltages there is danger of damaging the internal circuit.

4.2) AC Voltage Measurement

1. Connect the BLACK test lead to the COM jack and the RED test lead to the V/Ω jack.
2. Push down the AC/DC switch Button. Then all the ranges of voltage are AC type.
3. Set the FUNCTION switch to the V range to be used and connect the test leads across the source or load under measurement.
4. Get the readings from the LCD.

Note:
Do not apply more than 300V at 200mV range and 750V rms. at other ranges to the input. Indication is possible at higher voltages but there is danger of damaging the internal circuitry.

4.3) DC Current Measurement

1. Connect the BLACK test lead to the COM jack and the RED test lead to the mA/Ω jack for Current Maximum of 400mA.(Note: The polarity of the RED test lead is "+").
- For a maximum of 10A, move the red test lead to the 10A jack.
2. Make sure that the AC/DC switch Button is on DC position(UP)
3. Set the FUNCTION switch to the A range to be used and connect the test leads in series with the load under measurement.
4. Get the readings from the LCD.

Note:
A. The Maximum input current is 0.5A or 10A depending on the jack used. Excessive current will blow the fuse that must be replaced. Another fuse 10A protects the 10A range. The fuse rating should be 0.5A or 10A no more to prevent damage to the internal circuit. The Maximum terminal voltage drop is 200mV except for the 10A range.

4.4) AC Current Measurement

1. Connect the BLACK test lead to the COM jack and the RED test lead to the A jack for a maximum of 0.2A. For a maximum of 10A, Move the RED test lead to the 10A jack.

2. Push down the AC/DC switch Button. Then all the ranges of current are AC type.
3. Set the FUNCTION switch to the A range to be used and connect the test lead in series with the load under measurement.
4. Get the readings from the LCD.

Note:
A. The Maximum input current is 0.2A or 10A depending upon the jack used. Excessive current can blow the fuse that must be replaced. Another fuse 10A protects the 10A Range. The fuse rating should be 0.5A or 10A no more to prevent damage against the internal circuit. The maximum terminal voltage drop is 200mV except for the 10A range.

4.5) Resistance Measurement

1. Connect the BLACK test lead to the COM jack and the RED test lead to the V/Ω jack (Note: The polarity of the RED test lead is "+").
2. Set the FUNCTION switch to the Ω range to be used and connect the test leads across the resistance under measurement.
3. Get the readings from the LCD.

Note:
1. If the resistance value being measured exceeds the maximum value of the range selected, an over-range indication will be displayed ("1"), then select a higher range. For resistance of approximately 1M ohm and above the Meter may take a few seconds to become stable. This is normal for high resistance readings.

2. When the input is not connected i.e. at open circuit the figure "1" will be displayed for the over-range condition.

3. When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors are fully discharged.

4.6) Diode Measurement

1. 1. Connect the BLACK test lead to the COM jack and the RED test lead to the V/Ω jack.
- (Note: The polarity of the RED test lead is "+"; and testing fixed current 1mA)
2. Set the FUNCTION switch to the Diode range and connect the test leads across the diode under measurement display shows the approximate forward voltage of this diode.

4.7) Continuity Test

1. Connect the BLACK test lead to the COM jack and the RED test lead to the V/Ω jack.
 2. Set the FUNCTION switch to the "→" "range and then the LCD show the approximate resistance of the circuit.
 3. Connect the test leads to two points of circuit. If the resistance is lower than approx. 50 ohm, the buzzer sounds.
- Overload protection by PTC against high voltage across Max. DC/AC 380V rms. at this Diode range.
- 4.8) Transistor hFE & LED Test**