

# UT673PV

## User Manual



## Preface

Thank you for purchasing this brand new product. In order to use this product safely and correctly, please read the User Manual thoroughly, especially the “Safety Information” section. It is recommended to keep this manual at an easily accessible place, preferably close to the device, for future reference

## I . Overview

UT673PV Solar MPPT Meter can measure the maximum power of solar module rapidly. It has the ability to measure maximum power (Pmax) of solar module, open-circuit voltage (Voc), and short-circuit current (Isc) at the same time and display all parameters on the screen. MPPT is the most important indicator for judging if a solar panel generates power in low efficiency, and is commonly used for measuring solar panel or troubleshooting faulty module.

Application fields: Manufacturers of solar panel, users of solar panel, etc.

## II. Features

- 1) Small external dimensions; easy to carry
- 2) Designed with large LCD to display all parameters
- 3) Without needing battery, the Meter powers on with it connected to solar panel.
- 4) Manual/Auto mode
- 5) Protection against overtemperature, overvoltage, and overcurrent
- 6) Protection against reverse connection
- 7) Overload protection

Please carefully read the contents associated with “Safety” and “Warning” included in this User Manual, and observe all precautions strictly.



**Warning: Please read the “Safety Information” carefully before use.**

## III. Accessories

Relevant safety information and warnings are included in this User Manual. Please read the related contents thoroughly and follow all warning and precautions. Please contact your supplier if any accessory listed below is missing or damaged.

- |                             |                  |
|-----------------------------|------------------|
| 1. User Manual              | 1 pc             |
| 2. MC4 cables (UT-L101)     | 1 pair           |
| 3. Special solar tool       | 1 set            |
| 4. Magnetic hanger (UT-B23) | 1 set (optional) |

## IV. Safety Information

Please pay attention to “Warning labels and sentences”. A Warning identifies conditions and procedures that are dangerous to the user, and that cause damage to the Meter or the equipment under test.

The Meter is designed in accordance with Double Insulation and no measurement category, for solar panel only, the maximum working voltage is 60VDC. The Meter is for indoor use. The protection supplied by the

Meter may be compromised or lost without following the operating instructions.

- 1) Please check the Meter and test leads before use to avoid any damage or problem. Please stop use if exposed test lead, damaged case, abnormal display and other problems occur.
- 2) It is forbidden to use without the cover closed in place. Otherwise it may present a risk of electric shock.
- 3) If the test lead is damaged, please replace it with the one of same model or specification.
- 4) Do not touch the exposed wire, connector, unused input terminal or circuit during measurement.
- 5) Use caution when working with voltage over 30V DC. Please hold the test lead behind the tactile barrier to prevent electric shock.
- 6) Do not exert voltage over the specified value between terminals or between any terminal and earth ground
- 7) Use only test leads (MC4 cables) with rated voltage and current same as that of the Meter or test leads (MC4 cables) approved by certification body.
- 8) Do not keep or use the Meter in environments with high temperature, high humidity, strong electromagnetic field, or inflammable and explosive substances.
- 9) Do not alter the internal wiring without authorization to avoid damaging the Meter or causing safety hazard.
- 10) Please measure a known intrinsic voltage or current before use to ensure the Meter works normally.

## V. Electrical Symbols

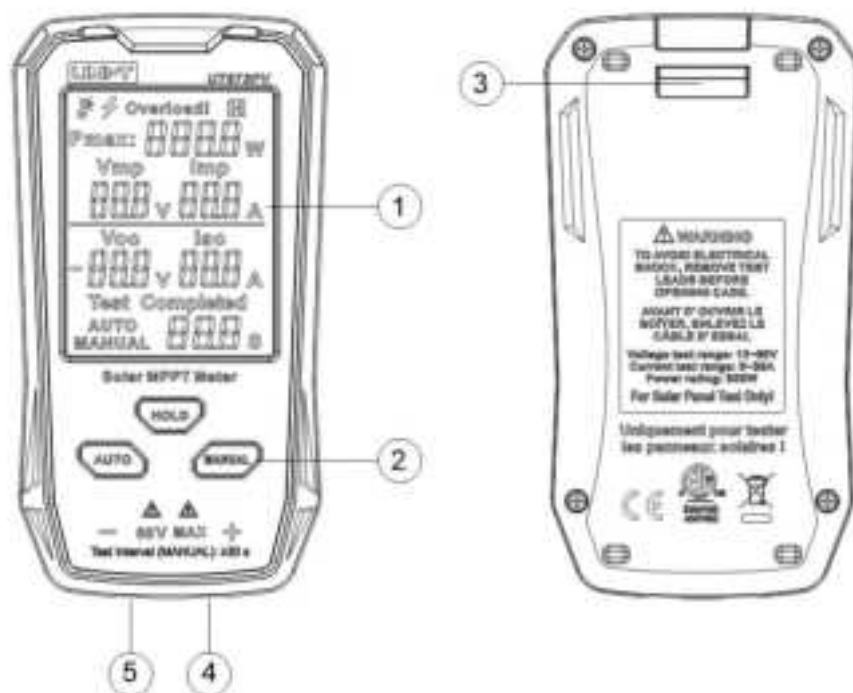
| Symbol                                                                              | Description           |
|-------------------------------------------------------------------------------------|-----------------------|
|  | Danger! High voltage! |
|  | Warning               |
|  | DC (Direct Current)   |

## VI. General Characteristics

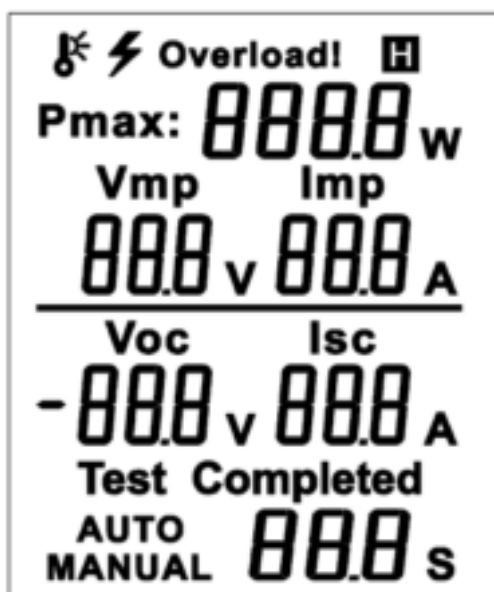
1. Maximum voltage between signal input terminal and COM terminal: 60VDC
2. Range: Auto/Manual
3. Polarity display: Protection against reverse connection
4. Overrange indication: "OL"
5. Drop proof: 1m
6. Operating temperature: 0°C ~ 40°C (32°F ~ 104°F)
7. Storage temperature: -10°C ~ 50°C (14°F ~ 122°F)
8. Relative humidity: ≤75% (0°C ~ 30°C below); ≤50% (30°C ~ 40°C)
9. Operating altitude: ≤2000m
10. External dimensions: About 142mm x 76mm x 22mm
11. Weight: About 154g
12. Measurement category: no measurement category, for solar panel only, the maximum working voltage is 60VDC
13. Pollution degree: 2
14. Application field: Solar panel

## VII. External Structure (Figure 1)

1. LCD display
2. Functional buttons
3. Hanging hook
4. Positive input terminal
5. Negative input terminal



## VIII. LCD Display



| Symbol                                                                                     | Description                                                                                                                                    |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|  Overload | Overload                                                                                                                                       |
|           | Data hold                                                                                                                                      |
|           | Overtemperature                                                                                                                                |
| <b>Pmax:</b>                                                                               | Maximum displayed measured power: This is the maximum power when a solar panel generates power under the condition of current light intensity. |
| <b>Vmp</b>                                                                                 | Voltage of maximum power point: This is the maximum voltage when a solar panel generates power under the condition of current light intensity. |
| <b>Imp</b>                                                                                 | Current of maximum power point: This is the current when a solar panel generates power under the condition of current light intensity.         |
| <b>Voc</b>                                                                                 | Open-circuit voltage: The voltage without load                                                                                                 |
| <b>Isc</b>                                                                                 | Short-circuit current: The current of shorted positive and negative poles of solar panel                                                       |
| <b>Test Completed</b>                                                                      | Test is completed                                                                                                                              |
| <b>AUTO</b>                                                                                | Automatic test                                                                                                                                 |
| <b>MANUAL</b>                                                                              | Manual test                                                                                                                                    |
| <b>000 s</b>                                                                               | Countdown for test                                                                                                                             |

## IX. Functional Buttons

| Button                                                                              | Description          |
|-------------------------------------------------------------------------------------|----------------------|
|  | HOLD: Data hold      |
|  | AUTO: Automatic test |
|  | MANUAL: Manual test  |

### Descriptions:

- 
  - 1) In automatic sampling mode "AUTO": When the current data is held, the Meter keeps counting down until 0.0s is reached, but sampling is not triggered. Sampling will proceed for 1s of countdown when HOLD is disabled.
- 
  - 1) Test is started 3s after the AUTO button is pressed. The Meter adjusts the test interval automatically based on the value of the current power, and refreshes the display (refresh once at intervals of 5S for  $\leq 100W$ ; and 15S for  $> 100W$ ).
  - 2) To stop automatic test, please power on the Meter, then press the AUTO/MANUAL button when the first countdown of 15s is up. "Test Completed" flashes on the screen for three times if the button is triggered within the set waiting time. The triggering of the AUTO/MANUAL button is enabled when pressed after the countdown is up.
- 
  - 1) Test is started 3s after the MANUAL button is pressed. The Meter starts scanning the maximum power point once and refreshes the display.
  - 2) To avoid damage to the Meter caused by triggering the MANUAL button frequently, a sampling

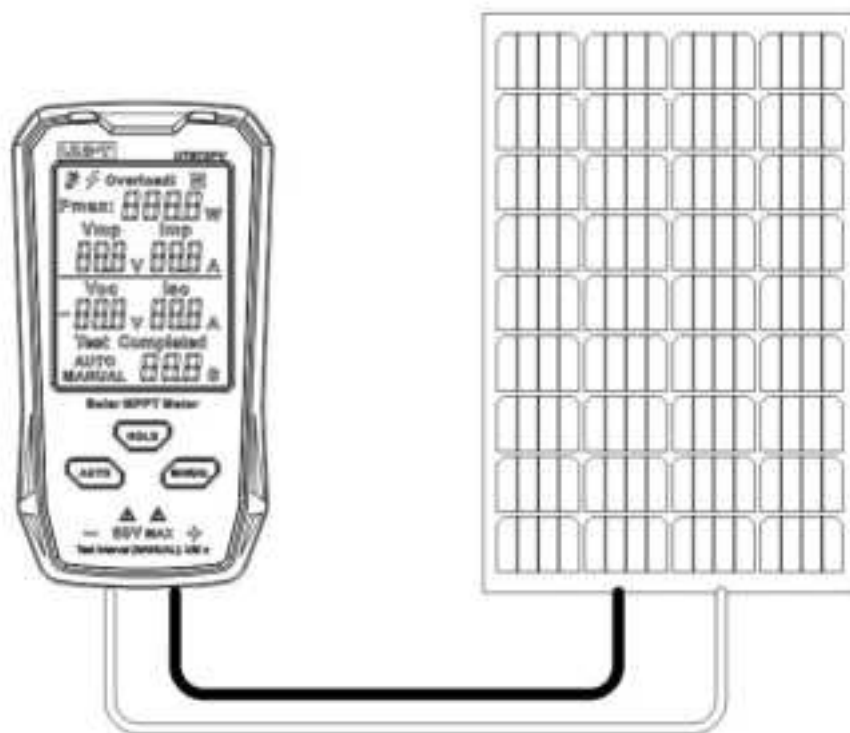
interval for protecting the Meter is designed (the triggering of MANUAL button is enabled when pressed at intervals of 5S for  $\leq 100W$ ; and 15S for  $> 100W$ ). "Test Completed" flashes on the screen for three times if the AUTO/MANUAL button is triggered within the set waiting time. The triggering of the AUTO/MANUAL button is enabled when pressed after the countdown is up (the countdown is not displayed on the LCD).

Note: The triggering of button is disabled at the critical time "0.0s", as the Meter has entered into sampling state.

## X. Operating Instructions

The symbols " $\triangle$ " near the input terminals indicate that the voltage under test shall not be over the specified value!

- 1) Connect red test lead to red (+) terminal, connect black test lead to black (-) terminal, then connect the MC4 cable to the corresponding ports of at both ends of solar panel (connect to the load in parallel).



- 2) The value of Voc is displayed in real time when the Meter is powered on.
- 3) When the AUTO button is pressed for automatic test, the Meter adjusts the test interval automatically based on the current displayed power.
- 4) Press the MANUAL button for manual test. Test result can be obtained each time the MANUAL button is pressed.

### $\triangle$ Warning:

1. Please disconnect from the power grid for solar panel test. The Meter does not apply to tests in the measurement category "CAT II or above".
2. The Meter is used for solar panel test only!
3. Do not measure voltage over 60VDC or power over 800W, otherwise it may damage the Meter and cause personal injury!

4. If the symbol “” appears on the display, please stop use until the Meter cools down.

## X I . Specifications

Accuracy:  $\pm(a\% \text{ of reading} + b \text{ digits})$ ; guaranteed for 1 year

Ambient temperature:  $0^{\circ}\text{C} \sim 40^{\circ}\text{C}$  ( $32^{\circ}\text{F} \sim 104^{\circ}\text{F}$ ); relative temperature:  $\leq 75\%$

| Function                           | Range  | Resolution | Accuracy                                         | Input protection                                                                                                       | Remark                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------|--------|------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                    |        |            | $\pm(a\% \text{ of reading} + b \text{ digits})$ |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                            |
| Measuring open-circuit voltage (V) | 12~60V | 0.1V       | $\pm (1.5\%+5)$                                  | 100Vrms                                                                                                                | 1) Without needing battery, the Meter is powered by solar panel. The input voltage to the Meter shall be $\geq 12\text{V}$ .<br>2) DC voltage measurement serves as power measurement, but the input amplitude shall be $\geq 12\text{V}$ and $\leq 60\text{V}$ approximately.<br>3) The specified accuracy above is calculated on the condition of standard light source. |
| Measuring power (W)                | 5~800W | 0.1W       | 5~10W<br>$\pm (1.0\%+5)$                         | If 100V is inputted, entering into measurement mode will be limited and the symbol “OVERLOAD!” will appear on the LCD. |                                                                                                                                                                                                                                                                                                                                                                            |
|                                    |        |            | 11W~500W<br>$\pm (1.0\%+10)$                     |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                            |
|                                    |        |            | 501W~800W<br>$\pm (1.5\%+5)$                     |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                            |
| Short-circuit current (A)          | 0~35A  | 0.1A       | $\pm (1.5\%+5)$                                  |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                            |

### Warning:

- The temperature condition of accuracy is  $18^{\circ}\text{C} \sim 28^{\circ}\text{C}$ . The fluctuation range of ambient temperature stabilizes within  $\pm 1^{\circ}\text{C}$ . When the temperature is  $< 18^{\circ}\text{C}$  or  $> 28^{\circ}\text{C}$ , the error of temperature coefficient to be added will be “ $0.1 \times (\text{specified accuracy})/^{\circ}\text{C}$ ”.
- The Meter powers off automatically in about 10 minutes of inactivity. In auto-off state, the Meter can be restarted by pressing any button.

## XII. Maintenance

 Warning: Please have the rear cover opened by professionals only to avoid damage to the Meter or personal injury.

### 1. General maintenance

- Please clean the casing with wet cloth and mild detergent. Do not use abrasives or solvents!
- If there is any problem with the Meter, please stop use immediately and perform maintenance on it.
- The calibration and maintenance shall be performed by qualified professionals or designated service center.