

# TK3100 Installed Single-Phase Standard Energy Meter



## 1. Summary

The TK3100 miniature installed single-phase standard energy meter is a standard energy meter with the same physical dimensions as conventional installed single-phase energy meters. It is specially used to verify the AC energy meter calibration devices or energy measurement calibration units in AC energy meter automated test system. It can complete testing items such as basic error and multi-channel output consistency.

## 2. Features

- Accuracy **class 0.02** and **class 0.05** are optional.
- Voltage measurement range: 50 V ~ 288 V.
- Current measurement range: 5 mA~120 A.
- Voltage and current support fully automatic switching of range.
- Phase measurement uncertainty typical value:0.006°.
- Lithium battery power supply to avoid the impact of PT power taking on measurement.
- The battery can last for 8 hours and the charging time is less than 2 hours.
- Optional manual charging or automatic charging. The automatic charging standard version requires an optional charging system.
- Supports RS485 communication and RS232 communication.
- An external display screen (optional) can be connected to display the measured power.

### 3. Applications

#### ☆ Calibration of Single-Phase Energy Meter Device

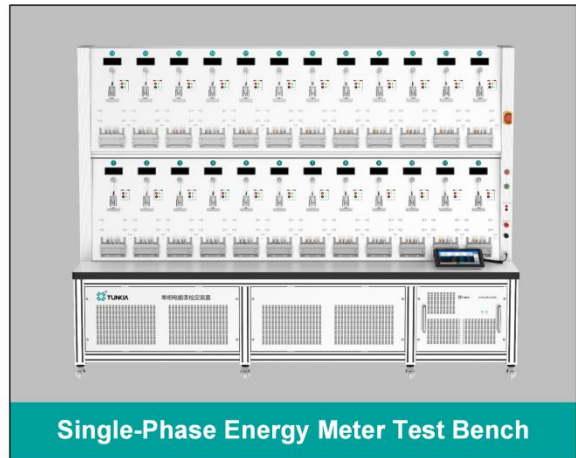


**Multiple Installed Miniature Standard Meters**

Calibration



Intermediate Check



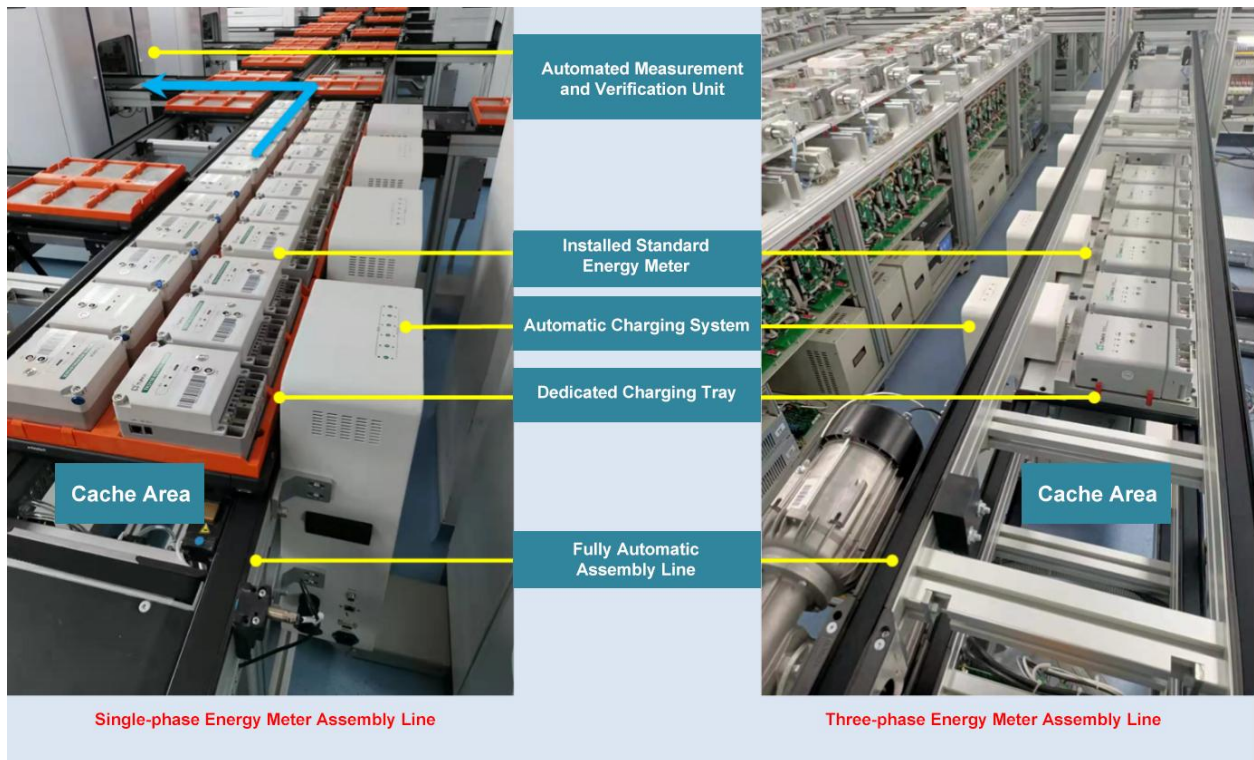
**Single-Phase Energy Meter Test Bench**



**Single-Phase Energy Meter Assembly Line**

- Install standard meters in batches to conduct calibration or intermediate check on the platform or assembly line equipment.
- Test items include basic errors, multi-channel output consistency, etc.

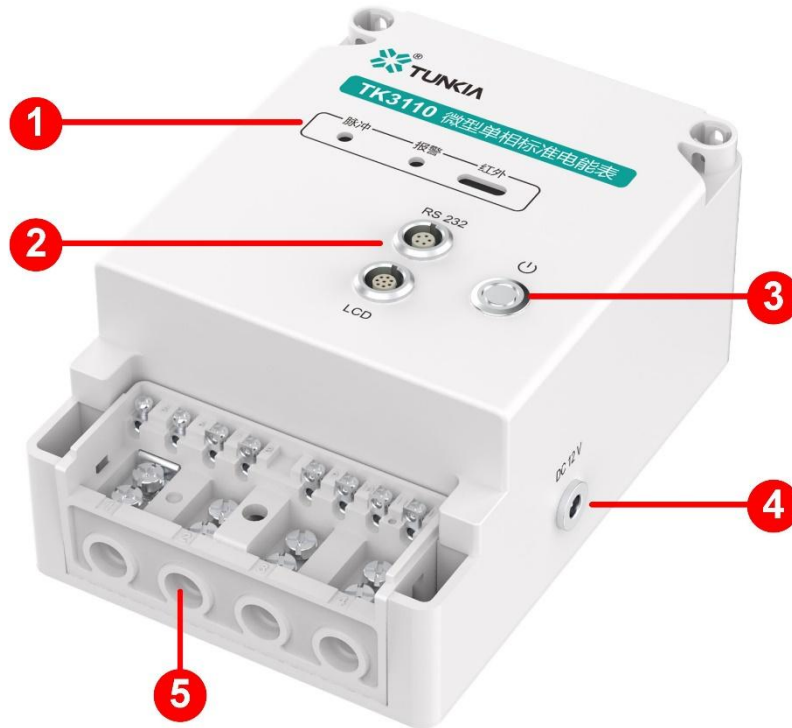
☆ Fully Automatic Intermediate Check



- Equipped with installed standard meters and automatic charging systems in batches
- Fully automatically complete the intermediate check of the assembly line equipment without manual participation.

## 4. Instrument Appearance

### ☆ Instrument Front Panel



S/N	Function
1	Indicator lights, including pulse indicator lights, alarm indicators, and infrared indicators.
2	232 Interface, used to configure standard energy meter energy constants, etc.; LCD Interface, used to connect the display screen;
3	Power button.
4	Power charging port.
5	Terminals.

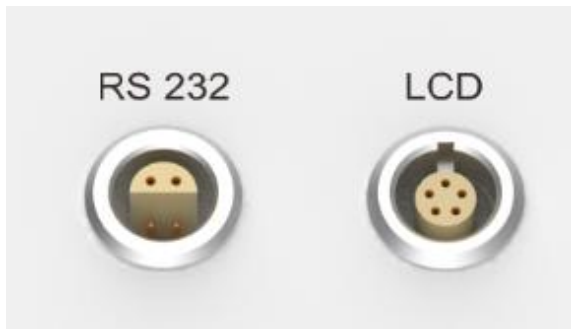
## 5. Characteristics

### ☆ Complies with Installed Meter Standard Dimensions



- The size, wiring terminals and pulse lamp position of the installed energy meter are consistent.
- It can be directly crimped to the meter position of the device without separate wiring, meeting the needs of automated detection.

### ☆ Communication Interface



- Supports RS485 and RS232 communication.
- Set the energy pulse constant and read the power information.
- An external LCD display (optional) can be connected to display the measured power value in real time.

### ☆ Automatic Charging System (optional)



- The compact size does not affect the automatic operation of the assembly line.
- It is powered by lithium batteries when working.
- It can be automatically transferred to the cache area for charging when not working.
- It communicates and controls with the master control system through Ethernet.

- It has charging over-voltage, over-current and other fault alarm functions.
- It has automatic and manual start and stop functions.

## 6. Specifications

### 6.1 Voltage Measurement

Range	Measurement Uncertainty ( $k = 2$ ) ( ppm*RD + ppm*RG ) <sup>[1]</sup>		Temperature Coefficient @ (15~30)°C (ppm*RD+ppm*RG) /°C	
	Class 0.05	Class 0.02	Class 0.05	Class 0.02
240 V	120 + 80	60 + 40	< 15	< 6

Note [1]: RD is the reading value, RG is the range value, the same below.

- Measuring range: 50 V~288 V, 7-digit display, automatic range switching

### 6.2 Current Measurement

Range	Measurement Uncertainty ( $k = 2$ ) ( ppm*RD + ppm*RG ) <sup>[1]</sup>		Temperature Coefficient @ (15~30)°C (ppm*RD+ppm*RG) /°C	
	Class 0.05	Class 0.02	Class 0.05	Class 0.02
50 mA	250 + 150	120 + 80	< 20	< 10
100 mA	200 + 100	60 + 40	< 15	< 6
200 mA	200 + 100	60 + 40	< 15	< 6
500 mA	200 + 100	60 + 40	< 15	< 6
1 A	200 + 100	60 + 40	< 15	< 6
2 A	200 + 100	60 + 40	< 15	< 6
5 A	200 + 100	60 + 40	< 15	< 6
10 A	200 + 100	60 + 40	< 15	< 6
20 A	200 + 100	60 + 40	< 15	< 6
50 A	200 + 100	60 + 40	< 15	< 6
100 A	200 + 100	60 + 40	< 15	< 6

- Measuring range: 5 mA~120 A, 7-digit display, automatic range switching



### 6.3 Frequency/Phase Measurement

Frequency	Measuring Range		45 Hz~65 Hz
	Measurement Uncertainty (k=2)		0.005%*RD
Phase	Measuring Range		0~360° (I ≥ 50mA)
	Measurement Uncertainty (k=2)	Class 0.05	0.012°
		Class 0.02	0.006°

### 6.4 AC Power/Energy Measurement

Current Range	Power Factor	Measurement Uncertainty(k=2)	
		Class 0.05	Class 0.02
100 mA ≤ I ≤ 120 A	0.5L~1~0.5C	0.05%*RD	0.02%*RD
50 mA ≤ I < 100 mA	1	0.05%*RD	0.02%*RD
	0.5L~1~0.5C	0.08%*RD	0.04%*RD
5 mA ≤ I < 50 mA	1	0.08%*RD	0.04%*RD
	0.5L~1~0.5C	0.15%*RD	0.08%*RD

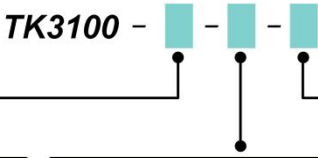
- Power/energy measurement range: combination of AC voltage range and AC current range
- Power factor measurement range: -1.000 000...0.000 000...1.000 000
- Standard energy pulse output: high frequency full scale value corresponds to 60 kHz, low frequency full scale value corresponds to 6 Hz



## 7. General Specifications

<b>Power Supply</b>	Built-in lithium battery power supply
<b>Warm up time</b>	30 minutes
<b>Temperature Performance</b>	Operating temperature: 5°C~45°C; Storage temperature: -10°C~55°C
<b>Humidity Performance</b>	Working humidity: < 80% @ 30°C, < 70% @ 40°C, < 40% @ 50°C Storage humidity: (20%~80%) R·H, no condensation.
<b>Altitude</b>	< 3000 m
<b>Weight</b>	About 0.5 kg
<b>Communication Interface</b>	RS232、RS485

## 8. Ordering Information



TK3100 - [ ] - [ ] - [ ]

Dimension		Accuracy Class		Charging Mode	
Code	Note	Code	Note	Code	Note
G	required by State Grid	500	Class 0.05	-	Manual Charging
S	required by the Southern Power Grid	200	Class 0.02	A	Automatic Charging

Eg. TK3100-G-200-A means that the device has the dimensions required by the State Grid, an accuracy of Class 0.02, and is an automatic charging type.

**Note: Selecting the automatic charging mode requires adding an automatic charging system.**