



## ZM2128T Photovoltaic Training Bench



### 1 Product Overview

#### 1.1 Overview

The training system can simulate the process of solar power generation, so that students have a preliminary intuitive understanding of the solar power system. The solar panels are driven by high-intensity LED lights. Through relevant experiments, students' knowledge and skills are cultivated, which is suitable for the teaching and skills training assessment of higher vocational colleges, higher vocational schools, secondary vocational schools and technical schools.

#### 1.2 Features

(1) The training platform adopts aluminum profile column frame structure, the measuring instrument and the training power supply are built-in integrated installation, and the



universal wheel is provided at the bottom. The units are flexible, easy to use and not easy to damage.

(2) The experimental circuit and device are fully equipped and can be used in combination to complete the training content of various courses.

(3) The training platform has a good security protection system.

## **2 performance parameters**

(1) Solar power generation device: all aluminum alloy structure, the angle of the photovoltaic panel can be adjusted, the analog light source can be adjusted in the vertical direction by 120 degrees, and the external dimension is 1230\*753\*1250mm (length, width and height)

(2) Training power box frame: aluminum frame structure, aluminum alloy box unit form, dimensions 1100mm × 300mm × 750mm (length, width and height)

(3) The parameters of a single solar panel are as follows:

Rated peak power: 30W

Short circuit current: 1.9A

Maximum current: 1.71A

Maximum voltage: 17.6V

Short circuit current: 1.87A

Open circuit voltage: 21.6V

(4) Battery technical parameters:



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Voltage: 12V

Capacity: 7AH

Battery loss:  $10V \pm 1V$

Executive standard: GB/T 9535

Relative humidity: 35~85% RH (no condensation)

(5) Working environment:

Temperature  $-10 \sim +40^{\circ}\text{C}$  Temperature  $\leq 80^{\circ}\text{C}$

Ambient air: non-corrosive, flammable, no large amount of conductive dust

(6) Power supply:

Power consumption:  $\leq 5000\text{W}$ ,

Working power supply:  $\text{AC}220 \pm 10\%$ ,

Power supply: single-phase three-wire  $\text{AC}220 \pm 10\%$ , 50HZ

Working method: continuous

(7) Overall weight:  $< 500\text{Kg}$

### **3 product composition**

The training platform unit includes a power box, a solar controller hanging box, an inverter hanging box, a load hanging box, a measuring instrument hanging box (2 pieces), and a transformer module.



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### 3.1 Training frame

The training platform adopts the aluminum profile column frame structure, the measuring instrument and the training power supply are built-in integrated installation, and the universal wheel is provided at the bottom. The units are flexible, easy to use and not easy to damage.

### 3.2 power box

1. Power circuit breaker 2. Emergency stop button unit 3. Battery unit 4. DC measuring instrument unit 5. Analog light source switch 6. Photovoltaic panel power unit 7. European socket

### 3.3 Companion devices

(1) controller hanging box 1 unit



(2) inverter hanging box (Note: The input voltage is prohibited from exceeding DC 24V) 1 unit



(3) lamp load box 1 unit



(4) instruments hanging boxes 4 units



(5) Transformer hanging box 1 unit

(6) Compass 1 unit



(7) Solar power meter 1 set



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(8) Solar height measurer 1 unit



(9) Installation tool 1 set



(10) Communication line and software CD 1 set



(11) Accessories and wiring 1 set







4 can complete the training content

- (1) Battery characteristics experiment: 1) Measurement of electrical parameters 2) Series and parallel connection of batteries
- (2) Charge controller experiment: 1) reverse protection experiment 2) controller overcharge protection experiment of battery 3) controller over-discharge protection experiment of battery 4) anti-back charge experiment
- (3) Measurement experiment of power generation
- (4) Photovoltaic panel power measurement experiment
- (5) Maximum power measurement experiment of photovoltaic panels under different illumination
- (6) Photovoltaic panel output characteristics experiment
- (7) Photovoltaic panel charging control principle experiment
- (8) Inverter basic principle experiment
- (9) Inverter basic principle experiment
- (10) Simple inverter output waveform test experiment
- (11) Inverter power supply driving AC load test