

**Drawing of Three-Phase Electronic Energy Meter Test System with ICTs for Smart Meter –  
YC1893D Accuracy Class 0.02%**



**Features:**

1. The meter test system can measure mechanical meters, electronic mechanical meters and electronic meter by the way of automatic, semi-automatic or manual operation.
2. Aluminum alloy material, light and strong and corrosion resistant.
3. Automatic positioning rotor mark of disc of mechanical meter, with more efficiency.
4. The swing together of the scanning heads simplifies the control.
5. Fully automatic completion of the following tests:
  - a) Accuracy test in all four quadrants (active, reactive and apparent energy)
  - b) Creep test (No-load test)
  - c) Starting current test
  - d) Dial test (Register test)
  - e) Meter constant test
  - f) Influence quantity test (voltage, frequency, harmonic distortion, etc.)
  - g) Calibration of reference standard meter having lower accuracy than the employed reference standard
  - h) Pre-warming
  - i) Dips and Interruptions
  - j) Testing single-phase meters under tampered conditions
6. Measuring different constants of meters synchronously.
7. With the protection function of overload, short voltage circuit and open current circuit.

**Functions:**

The YC1893D meter test system is a full-automatic test system for testing and calibration of both single-phase and three-phase electric energy meters, which composes of:

- Three-phase Power source
- Three-phase Reference standard meter
- Meter suspension test rack
- Tariffs control system (fixed voltages, optical port reader, ripple control box)
- Other necessary parts
- PC and software controlling the whole system

The YC1893D meter test system is fully compliant with the IEC 60736 standard and is suitable for testing meters according to the following standards:

- IEC 62052-11 and IEC 62053-11, -21, -22, -23, -24
- IEC 62056
- EN 50470-1, EN 50470-2, EN-50470-3
- IEC 61010

**Technical specification for Three-Phase Electronic Energy Meter Test System with ICTs for Smart Meter – YC1893D Accuracy Class 0.02%**

Power Supply	
Voltage	3×240±15%
Frequency	50 Hz ±15%
Power capacity	> 6 kVA
Power efficient(at full load)	≥85%
Ambient temperature	-10 °C -- +40 °C
Relative humidity	35% -- 85%
Power Source	
Voltage	
Test voltage output (Phase-Neutral)	3×(24 V – 480 V) or 600 V F-F customized
Power of the voltage output	3×1000VA
Resolution	Better than 0.01% of full scale value of range
Setting accuracy	Better than 0.05% at the final range value
Stability	Better than 0.005%/h (integration time 150 s)
Load regulation from 0-max. load	< 0.01%
Distortion factor	< 0.3% for linear resistance load
Harmonics	2nd – 21st free programmable
Current	
Test current output	1 mA – 120 A
Power of the current output	3×2000VA
Resolution	Better than 0.01% of full scale value of range
Setting accuracy	Better than 0.05% at the final range value
Stability	Better than 0.005%/h (integration time 150 s)
Load regulation from 0-max. load	< 0.01%
Distortion factor	< 0.3% for linear resistance load
Harmonics	2nd – 21st free programmable
Phase Angle	
Range	0 -- 360°
Resolution	0.01°
Setting accuracy	0.1°
Frequency	
Range	45 Hz – 65 Hz
Resolution	0.01 Hz

**\* Standard Meter**

**1.1 General Introduction:** The SZ-03A-K8 series three phase standard meter utilize such lasted technology as high-speed DSP, CPLD, MCU and ADC with self-calibration, etc. Thus, the meter can sample AC signal in high speed and treat them with special digital arithmetic. All of these make the meter's structure simply and measure 0.02% accuracy of the relative error.



**1.2 Features:**

**1.1.1 High accuracy:** Measuring error of three phase voltage, current, power and electric energy error  $\leq \pm 0.02\%$

**1.1.2 Wide measurement range**

Voltage from 5V to 480V  
Current from 10mA to 120A

**1.1.3 Multi-parameter measurement:** Testing three-phase voltage, current, power, electric energy, power factor, phase and frequency synchronously

**1.1.4 Multi-mode measurement:**

Three-phase four wire (3P4W) & three phase three wire (3P3W) active  
Three-phase four wire (3P4W) & three phase three wire (3P3W) reactive  
Three-phase four wire (3P4W) & three phase three wire (3P3W) cross connected reactive  
Single phase two wire (1P2W) active & Single phase two wire (1P2W) reactive  
Single phase three wire (1P3W) active & single phase three wire (1P3W) reactive  
Two-phase three wire (2P3W) active & two phase three wire (2P3W) reactive

**1.1.5 Harmonic measuring and analyse :** Testing waveform distortion factor and 2nd - 21st harmonic content and displaying rod chart.

**1.1.6 Verify the test bench:** Measuring the asymmetry rate of voltage, current and phase in every phase and the stability of power.

**1.1.7 Wave form display:** Display voltage and current waveform synchronously.

**1.1.8 Ideal standard meter :** Energy pulse constant can be set automatic or manual, calculating and displaying the error and standard deviation of tested meter; have the function of electricity quantity add up, power on/off can be controlled by manual or external Synchronous pulse

**1.1.9 Software calibration:** Through software can calibrating full range and phase angle to improve the reliability and efficiency

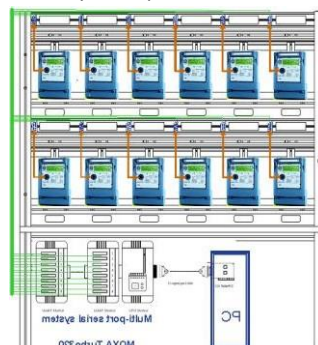
**1.1.10 Strong communication function:** There are two communication ports RS-232 and RS-485, can be connected to PC and test bench, realizing automatic measurement and calibration

**\* Suspension test Rack:**

- A. 24-meter position distribute on 2-meter racks, double side two rows, each row include 6 positions.
- B. There is a three-colour indicator light on the top of each rack.
- C. Each meter position installs a quick connector QCD, a push hand, a scanning head, an error display window, and a DB9M socket.



- D. All the current cable wiring in the rack is 30mm<sup>2</sup>
- E. DB9M socket is for RS232 port, RS232 is offered by Multiport Serial Server which extends 24 ports connect with 24 MUTs.



**F. Isolation Current Transformer (ICT):** Nowadays, more and more energy meter's current and voltage channel is fixed connection; it is close IP-link meter. For testing of meters with closed IP-link, the unit under test must be supplied with isolated and potential-free current and voltage signals. The previous test bench couldn't offer such signals, can only test open IP-link meter. TICT-100 series is a precision isolated current transformer (ICT) with active electronic error compensation, can offer the insulated high accuracy current, to test close IP-link meter. TICT-100 series can be installed on the new test bench or used to upgrading the old test bench.



**\* Technical data of ICT:**

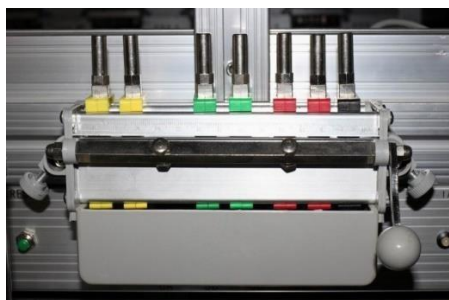
Current range	3× (10mA – 120A)
Accuracy	0.01 (100mA – 120A)
Ratio 1:1	(primary current = secondary current)
Frequency range	45Hz – 65Hz
Output burden voltage	3×0.6V (max)
Output power	3×60VA (max)
Communication port	RS-485
Power supply	+/- 12VDC
Power consumption	20 VA (max)
Operation temperature	- 10°C ... +50°C
Storage temperature	20°C ... +60°C
Dimensions (H×W×D)	290mm×275mm×296mm
Weight approx.	17kg

**G. Scanning head:** The light head can be adjustable and retractable for easy access when putting meters in place.



**H. Quick Connector Device (QCD)**

- QCD designed to be able to test three-phase and single-phase meter types
- Pins can be spring loaded to avoid too much stress to the meter terminal connection.
- Minimum distance between two adjacent pins (minimum pitch) can be down to 11mm apart.
- Entire row of pins can be shifted back and forth a small distance from its normal position.
- Current pins can withstand 120A for long periods
- Terminal pins designed for easy removal for cases when setup needs to be changed.
- LT-CT Operated Energy Meter to be support to connect



**Power Source Cabinet:**

A. Manual control device is installed on the front panel of power source cabinet



B. Main power switch and power supply switch for each module are installed on the back panel of cabinet, include:

- ž ● Power : Main power switch
- ž ● PC : Computer
- ž ● MOXA : MOXA system



C. All the current cable in cabinet are 30 mm<sup>2</sup>