

### General Introduction

The SY 3630 Energy Meter Testing Instrument (hereinafter "meter") is used to calibrate three phase, single phase, active or reactive energy meter under work, and also it can be used as voltage, current and power meter to measure AC parameter of three phase power line.

### Main Features

- Three phase active or reactive electricity energy meter;
- Calibrate three phase, single phase, active or reactive meter;
- Measure Vrms of three phase or single phase;
- Measure Irms of three phase or single phase;
- Measure active power of three phase or single phase;
- Measure reactive power of three phase or single phase;
- Measure apparent power of three phase or single phase;
- Measure power factor of three phase or single phase;
- Measure phase angle between voltage and current;
- Measure frequency of power line;
- Display vector diagram;
- Display waveform of U and I;
- Analyze and display content of harmonic of U and I;
- Store, look and transmit measured data;
- Connect to PC, reading record data and real-time measured data by PC, and download calibration parameter.

### Configurations

The set of SY 3630 Energy Meter Testing Instrument includes the following three parts: the meter, accessories, and carry case



### Technical Specifications

#### Measure Range and Input Impedance

	Voltage	Current	Frequency	Phase
Range	5-450V	0.02-100A	45-65Hz	0-360°

#### Test Accuracy class, Resolution, and Basic Error

	Accuracy Class	Resolution	Basic Error
	0.2 / 0.5		Class 0.2 / Class 0.5
Voltage (R.M.S)	0.2 / 0.5	0.01V	0.2% / 0.5%
Current (R.M.S)	0.2 / 0.5	0.001A	0.2% / 0.5%
Active Power	0.2 / 0.5	0.01W	0.2% / 0.5%
Active Energy	0.2 / 0.5	---	0.2% / 0.5%
Reactive Power	0.5 / 1.0	0.01var	0.2% / 1.0%
Reactive Energy	0.5 / 1.0	---	0.5% / 1.0%
Phase Angle	0.2 / 0.5	0.01°	0.2% / 0.5%
Frequency	0.1 / 0.1	0.002Hz	0.005Hz

#### Operation and Storage Environment

	Temperature (°C)	Humidity (RH%)
Operation Temperature	0-40°	15-90%
Storage temperature	-20-65°C	10-95%

#### Weight and Dimensions

	Meter	Carry case
Dimension	220*140*65mm	450*300*140mm
Net weight	1.8kg	4.2kg

#### Power Supply

	AC Power	DC Power
Voltage Supply	85-265VAC	4.5-5.35VDC
Power Consumption	<7.5VA	<6W
Internal Batteries	4/3AA/6/10/16, using time is about 4 hours	



### Main Features

- **LCD display**  
It can simultaneously display with the parameters of voltage, current, power, power factor.
- **On-line energy test**  
Use the photo pick up or pulse input to test the accuracy 1 or 2 of energy meters
- **Clamp CT**  
Current input use clamp CT, which can be set up for several kinds of measure, and it is very convenience and safety for filed test.
- **Data management**  
It can save the test data, and send it to the PC by port RS232.
- **Small volume and light weight:**  
less than 600g.

### Specification

- **Effective voltage (U)**  
Measurement (Un) 220V  
Measure range: 165-242V  
Basic error: 0.5% Un
- **Effective current (I)**  
Current CT measure (Ib):  
5A; (option: 20A, 40A, 50A, 100A)  
Measure range: (5%-120%) Ib  
Basic error: 0.5% Ib
- **Active power (P)**  
Measure range: (5%-120%) Ib and 165-242V  
Basic error: 0.5% rated power
- **Active energy (E)**  
Basic error: 0.5%
- **Temperature**  
Basic error: 20°C ±2°C; Humidity: <80% RH  
Working temperature: 0-40°C;  
Humidity: <90% RH  
Temperature coefficient: <50ppm/°C
- **Power supply:**  
105-265VAC, 50Hz ±2.5Hz or 60Hz ±2.5Hz  
Power wear: about 5VA.
- **Warm up**  
Normal condition: 15min  
Outdoor condition: 10min  
Volume (mm): 220x85(113)x38(48.5)  
Weight: <600g

# SY3803

## Single Phase Precision Reference Standard



### Introduction:

The SY3803 Single Phase Energy Reference Meter is a new generation of advanced electronics intelligent instruments. Based on digital signal processing DSP technology, the SY3803 is a multi-function precision power meter for single-phase measurements. The measurement are comprehensive & fully auto-ranging covering voltage, current, active power (kW + kWh), reactive power (kVar + kVarh), apparent power (kVA), frequency, phase, phase angle and power factor.

SY3803 also provides energy/power calibration functions with energy pulse input and output, can be used as a master or sub reference in measurement as best solution for field calibration. To meet current field environment, the meter is equipped with a serial port (RS232), to allow connection and control on PC and all of the testing parameters also could be acquired from PC as auto-measurement.

### Specification:

1. Voltage input: 40V – 480V (60/120/240/480).
2. Current input: 0.01A – 120A. CT work scope: 50% – 120%  
(100/50/25/10/5/2.5/1/0.5/0.25/0.1/0.05/0.025)
3. Test Mode: 1P2W Watt, 1P2W Var
4. Communication: RS232C Communication port
5. Fout:  $f_H = CH.p/3600$  (Hz)  
 $f_L = f_H/10000$  (Hz)  
Output mode: TTL
6. Accuracy:  
Class 0.05: Active power (energy) 0.05%, Reactive power (energy) 0.1%  
Class 0.1: Active power(energy) 0.1%, Reactive power(energy) 0.2%
7. Display:  
U(V) / I(A) / P(Watt) / S(VA) / Q(var) / Pf (-1.0000 – 1.0000) /  $\theta(0^\circ - 360^\circ)$ /F(Hz)
8. Power supply: 220V $\pm$ 10% 50Hz/60 Hz
9. Power Consumption: 15VA
10. Working environment: Temperature: 50 $^\circ$ C – 400 $^\circ$ C, Humidity:  $\leq$  85%
11. Size: 482mm  $\times$  420mm  $\times$  140mm
12. Weight: 7kg

# SY 2103

## Portable Three Phase Phantom Load Stable Power Source

### General Introduction

The new SY2103 series portable three phase phantom load stable power source, designed from new DIGITAL WAVE COMPOUND TECHNOLOGY and according to International Standard, is newly intelligent equipment for energy meters. The equipment includes voltage & current source & standard meter, operated easily through front panel to preset directly all data of meter under test and test process.



### Main Features

- Anthropomorphize design, Large size LCD display, easy operation
- High stability, good reliability. Reasonable internal structure
- Compliance with IEC736 & ISO9001 certificate
- Automatic switchover of voltage or current output to protect equipment when voltage circuit short or current circuit open and alarm display on LCD
- Voltage/current output soft start/stop
- Auto test
- Report data store & transfer to PC

### Technical Specifications

- Output Voltage: 220V/240V  
Regulative range: 0 -120% adjustable  
Minimum adjustable step: 0.01%
- Output Current range: 0.1A - 100A (Max 120A)  
Regulative range: 0 -120% adjustable  
Minimum adjustable step: 0.01%  
Current load point: 5%, 10%, 20%, 50%, 100%, 200%, 400%, 600%, 0.5Imax, Imax

- Output frequency: 45.0 - 65.0Hz  
0.01Hz adjustable
- Output U/I phase: 0 - 359.9°  
0.1° adjustable
- Test point : 0.5(c), 0.8(c), 1.0, 0.8(L), 0.5(L)
- Output power stabilization:  
< 0.1% (3 minutes, pf=1.0)
- Output Wave distortion degree: < 1%
- Harmonic wave output  
2-21 sub-harmonic wave  
Phase angle control (odd sub-harmonic wave)  
Wave group control (sub-harmonic wave)
- Output voltage circuit capacity: 30VA
- Output current circuit capacity: 100VA
- Power supply: 220V(240V)  $\pm$  10%,  
AC 50Hz / 60Hz,  
Maximum input power: 600VA
- Working ambient  
Temp. Range: 25°C  $\pm$  5°C  
Humidity Range: 85% RH
- Dimension: 480  $\times$  200  $\times$  550mm
- Weight: 30kg

# Three-Phase Energy Meter Test Bench Auto-Calibration System

# SY 8320D



(Integration Test Bench)



(Fission Test Bench)

## Features

- The bench accord with the standard of "IEC 60736: 1992 testing equipment for electrical energy meter", "IEC 62053".
- The bench can test the converted quantity which is caused by negative phase, voltage unbalance, harmonic wave and so on.
- The bench can auto-calibrate starting, no load, basic error and calibration tolerance and 3d deflection.
- The bench is using the SY 3100 standard power meter with comparison technology to offer the test the error of energy meters. The bench is using the error processor system to calculate the error of each energy meter by the sub-error system which can be connected by the internal RS485.
- The same specification but different constant energy meter can be tested at one time.
- For the installed pick-up equipment, can offer 3 ranges adjustment. It is also can be accepted the signal for both round-style energy meter and digital LED energy meter.
- The bench can choose to operate by keyboard or PC which is very convenient. The working status of bench can be seen very clear and easy operation.
- The bench is using the testing software complied with WinDO-W99/2000/XP which can auto-testing different energy meters.
- The software can realize the data from energy meter for statistics, search and management. It also can connect with online management for up load the data.
- The energy meter hanging rack is made by Aluminum compound. The whole device configuration is a reasonable design and nice outfit.

## Specification

- **Accuracy class:**  
0.2 class (close-link calibration, the range of current: 0.25A-100A)  
0.05/0.1 class (ordinary calibration)
- **Standard power testing equipment:**  
SY 3100 three phase multi-functions precision power reference meter  
Accuracy class 0.05/0.1 class
- **Output voltage:** 3x57.7/100/220/380V YΔ  
Range: 0-120%  
Fine adjustment: 0.01%
- **Output current:** 3x0.1-100A  
Fine adjustment: 0.0001A (min)
- **Range of phase:** 0-360° fine adjustment: 0.1°
- **Frequency:** 45Hz-65Hz; fine adjustment: 0.01Hz
- **Waveform distortion coefficient:**  
Voltage/ current < 0.5%
- **Output stability of voltage, current, power:**  
< 0.05% (180S)
- **Output capacity (each phase):**  
Current: 900VA (120A)  
Voltage: 300VA (8 positions)
- **Load:** capacitance, resistance, inductance (<4μF)
- **Harmonic wave output:**  
2-21 sub-harmonic wave contents<40%  
3, 5, 7 sub-harmonic wave coupling, total content<40%  
Phase angle control (odd sub-harmonic wave)  
Wave group control (sub-harmonic wave)
- **Starting current output:** 1mA (min), accuracy: 5%  
**Starting power:** accuracy 5%
- **Numbers of calibrated energy meter:**  
8 (16, 24, 32, 40 on requested)
- **Testing function:** basic error test, no load test, starting test, calibration tolerance test, harmonic test
- **Input power:** 3x220V/380V (Y) (10%, 50Hz)  
Max. Power consumption: 1800VA (8 positions)
- **Dimension:**

Type of Bench	Position	Number	Number of Row	Size
Integration	8	1	Single	2400x850x1850mm
	16	1	Double	2400x850x1920mm
Fission	8	1	Single	2400x600x1850mm
	16	1	Double	2400x600x1920mm
Console: 600x800x1920 mm				

# Single-Phase Close-link Energy Meter Test Bench Auto-Calibration System

# SY 8125D



## Features

- The devices are fully made by aluminum alloy materials and the table board is composed of fireproofing and heat-proof materials.
- The output voltage and current use soft startup and stop. It has the protection functions of voltage short circuit, current open circuit and power amplification exception.
- The device has the features of high stability, good reliability and large output power.
- High level of auto-immunization. The coexistence of special small keyboard and PCs, convenience to use.
- The electric meters of same type and different constants can be checked at the same time (each constant at up and down rows).
- It has the test and measurement items like time graduation-moving, ration graduation-moving, constants rectification and graduation-moving errors.
- PC software for Windows98 (Windows2000, Windows XP) is written by Delphi5. Control devices and data queries are efficient. It also has the perfect functions of reports print, data statistics and assets maintenance.

## Specification

- **The accuracy class of the devices:**  
0.05 grade, 0.1 grade
- **Output voltage:**  
0~220V, regulation step: <math>\leq 0.01\%</math>
- **Output current:**  
0.1A~100A, regulation step: <math>\leq 0.01\%</math>
- **Max output power:**  
Voltage loop 300VA (10 positions),  
Current loop 500VA (10 positions)
- **The stabilities of output voltage, current and power:**  
<math>\leq 0.05\%</math> (120S, PF=1)
- **Waveform distortion of output voltage, current:** <math>\leq 0.5\%</math>
- **Frequency range:**  
45Hz~65Hz, regulation step 0.1Hz
- **The range of phase displacement:**  
-180.0° ~ 180.0°, regulation step 0.1°
- **Monitor meters:** 0.5 grade
- **Total meters number:** 6, 12, 24, 48, and 72
- **Power supply:** 220V±10% 50Hz
- **Max power consumption:** 1800VA
- **Dimensions and weight:**  
Frame for meters (24 positions):  
2400X700X1920(mm) 450kg

## Three-Phase Close-link Energy Meter Test Bench Auto-Calibration System

# SY 8320E



(Fission Test Bench)

### Features

- The bench accord with the standard of "IEC 60736-1982 testing equipment for electrical energy meter", "IEC 62053".
- Close-link and ordinary calibration both can be used, ordinary calibration can be used to test single/three phase active and reactive energy meter (up to 0.5 class), close-link calibration can be used to test single/three phase active and reactive energy meter (up to 1 class).
- The bench can test the converted quantity which is caused by negative phase, voltage unbalance, harmonic wave and so on.
- The bench can auto-calibrate starting, no load, basic error and calibration tolerance and 24h deflection.
- Close-link calibration is using insulate current transformer and suitable for close-link energy meter.
- The bench is using the SY3100 standard power meter with comparison technology to offer the test the error of energy meters.
- The bench is using the error processor system to calculate the error of each energy meter by the sub-error system which can be connected by the internal RS485.
- The same specification but different constant energy meter can be tested at one time.
- For the installed pick-up equipment, can offer 3 ranges adjustment, it is also can be accepted the signal for both round-style energy meter and digital LED energy meter.
- The bench can choose to operate by keyboard or PC which is very convenient. The working status of bench can be seen very clear and easy operation.
- The bench is using the testing software complied with WINDOWS95/2000/XP which can auto-testing different energy meters.
- The software can realize the data from energy meter for statistics, search and management, it also can connect with on-line management for up load the data.
- The energy meter hanging rack is made by Aluminum compound. The whole device configuration is a reasonable design and nice outfit.

# Three-Phase Close-link Energy Meter Test Bench Auto-Calibration System

## SY 8320E



(Integration Test Bench)

### Specification

- Accuracy class:**  
0.2 class (close-link calibration, the range of current: 0.25A-100A)  
0.05/0.1 class (ordinary calibration)
- Standard power testing equipment:**  
SY3100 three phase multi-functions precision power reference meter.  
Accuracy class 0.05/0.1 class
- Isolated current transformer equipment:**  
Insulate current inductance  
Accuracy class:  
0.1 (COS $\phi$ =0.5C-1.0 5L, 0.25-100A)  
Primary current: 3x0.25-100A  
Secondary current: 3x0.25-100A  
Output power: 30VA (Max., 100A)
- Output voltage:** 3x57.7/100/220/380V Y/Δ  
Range: 0-120% Fine adjustment: 0.01%
- Output current:** 3x0.1-100A  
Fine adjustment: 0.0001A (min)
- Range of phase:**  
0-360° fine adjustment: 0.1°
- Frequency:**  
45Hz-65Hz fine adjustment: 0.01Hz
- Waveform distortion coefficient:**  
Voltage/current < 0.5%
- Output stability of voltage, current, power:** < 0.05% (180S)
- Output capacity (each phase):**  
Current: 900VA (120A)  
Voltage: 300VA (8 positions)  
Load: capacitance, resistance, inductance ( $\leq 4 \mu F$ )
- Harmonic wave output:**  
2-21 sub-harmonic wave contents $\leq 40\%$   
3, 5, 7 sub-harmonic wave coupling, total contents $\leq 40\%$   
Phase angle control (odd sub-harmonic wave)  
Wave group control (sub-harmonic wave)
- Starting current output:** 1mA (min), accuracy 5%,  
**Starting power:** accuracy 5%
- Numbers of calibrated energy meter:**  
8 (16 on requested)
- Testing function:**  
Basic error test, no load test, starting test, calibration tolerance test, harmonic test
- Input power:**  
3x220V/380V (Y)  $\pm 10\%$ , 50Hz;  
Max. Power consumption: 1800VA (8 positions)
- Dimension:**

Type of Bench	Positions	Number	Number of Rise	Size
Integration	8	1	Single	2400x950x1650mm
			Double	2400x950x1920mm
Fission	8	1	Single	2400x600x1650mm
			Double	2400x600x1920mm
Consolidate				600x600x1920mm