PSM Series
AC/DC Standard Meter
User Manual
V1.7

Founded in 2017, Shenzhen Hangzhi Precision Electronics Co., Ltd. is a technology-leading enterprise dedicated to the development, production, sales and customization of high-precision current transducers and measuring instruments. We will strive to build a well-known brand of precision current transducers and precision instruments in the DC field, and become a leading international leader in precision electronics in the field of DC systems.

Based on multi-faceted technology integration and innovation, Shenzhen Hangzhi Precision Electronics Co., Ltd. has developed the industry's first high-precision digital current transducer and an analog current transducer featuring high precision, low costs, low zero drift and low temperature drift. This series of products reduces industry costs, improves industry efficiency, enhances user experience, and creates value for customers. The company's products have won many achievements in the national innovation and entrepreneurial competition, and won wide attention and support from all walks of life.

As a company with strong sense of responsibility and mission, we adhere to multi-point zero-flux technology-led approach, with client-oriented service and customized products, and improve the operating quality by successfully capital financing. We are making our efforts to build an innovative sharing enterprise.

HANGZHI

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2 Summary

2.1 Product summary

PSM series AC/DC standard meter is a new generation of standard meter produced by our company. The product adopts a new software and hardware design, which can simultaneously measure single-phase AC and DC voltage, current, frequency, phase, active power, reactive power, inspecting power, power factor, active energy, and reactive energy etc., at the same time, high-order harmonic distortion (up to 63 harmonics) can be measured. It can be widely used in metrology research institutes, government inspection agencies and other metrology fields for the metrological verification of single-phase AC and DC voltmeters, ammeters, electric energy meters and power meters. The module complies with national metrological verification procedures and industry standards as follows:

- Metrological verification regulations

《JJG 842-2017 Electronic DC energy meter》
《JJG 597-2005 AC energy meter verification device》
《JJG 566-2012 Electronic AC energy meter》

2.2 Product characteristics

- To measure single-phase AC and DC voltage, current, frequency, phase, active power, reactive power, inspecting power, power factor, active energy, and reactive energy etc.
- To detect power error and daily timing error
- To perform electric energy test
- To record curve in real time U(t), I(t), P(t), E(t)
- Ripple test can be performed to detect AC ripple below 1 kHz
- To measure the stability of single-phase AC and DC voltage, current and power
- To measure the distortion of voltage and current, perform 2~63 harmonic analysis, display real-time harmonic components, harmonic content, harmonic distortion, etc.
- Equipped with energy pulse input interface which can be used for real-time verification of various active energy meters, reactive energy meters, etc.
- Equipped with standard energy pulse output interface for automatic setting of pulse constant
- Equipped with RS232, RS485 and CAN communication interfaces, so that it can communicate directly with PC
- Built-in high-precision temperature and humidity sensor for easy correction of environmental temperature and humidity error
- Multi-range can be switched automatically for voltage and current, and 120% of measuring range limit can be reached
- Equipped with product program online upgrade function

2.3 Product composition

Front

1	Company logo	Company logo
2	Product model	The model and name of the corresponding product
3	Current measuring hole	Perforation in the specified direction when measuring large currents
4	Small current measuring terminal block	Terminals that are directly inserted during small current measurement, with red terminals connected to current input, and black terminals connected to current output.
5	Display area	For user interaction, display measurement data, parameter settings, etc.

Back

6	Product serial number	The unique serial number of the product
7	Vents	For body cooling

Left

8	DB9 interface	Used for RS232, RS485, CAN communication
9	USB interface	Used for display program upgrade
10	Aviation interface	For pulse input and output
11	Manufacturing nameplate	For management purpose, please don't peel off.
12	Ground terminal	Used to connect to the ground when using this instrument

Right

13	Voltage measurement terminal	Terminals that are directly inserted during voltage measurement, with red terminals connected to positive voltage, and black terminals connected to negative voltage.
14	Power input and main power switch	To connect power and for ON/OFF of the main power
15	Fan hole	For body cooling

3 Product selection guide and technical parameters

3.1 Product selection

PSM series product selection		
	PSM600	**PSM1000**
AC voltage measurement	1V~707V	
AC current measurement	200mA~424A	400mA~707A
DC voltage measurement	1V~1000V	
DC current measurement	200mA~600A	400mA~1000A
AC accuracy	0.05%	
DC accuracy	0.02%	

3.2 Technical parameters

PSM series technical parameter			
		PSM600	**PSM1000**
AC voltage measurement	Measuring limit	35V, 71V, 141V, 354V, 707V	
	Measuring range	(0~110%)RG	
	Accuracy	±0.05%RD (20V≤U≤707V) ±0.1%RD (1V≤U≤20V)	
	Resolution	0.01%RG	
AC current measurement	Measuring limit	200mA, 8A, 17A, 42A, 85A, 170A, 424A	400mA, 14A, 28A, 71A, 141A, 354A, 707A
	Measuring range	(0~110%)RG	
	Accuracy	±0.05%RD(200mA≤I≤424A)	±0.05%RD(400mA≤I≤707A)
	Resolution	0.01%RG	
DC voltage measurement	Measuring limit	10V, 20V, 50V, 100V, 200V, 500V, 1000V	
	Measuring range	(0~110%)RG	

	Accuracy	±0.02%RD(10V≤U≤1000V) ±0.05%RD(1V≤U≤10V)	
	Resolution	0.005%RG	
AC voltage measurement	Measuring limit	200mA, 12A, 24A, 60A, 120A, 240A, 600A	400mA, 40A, 100A, 200A, 400A, 1000A
	Measuring range	(0~110%)RG	
	Accuracy	±0.02%RD(200mA≤I≤600A)	±0.02%RD(400mA≤I≤1000A)
	Resolution	0.005%RG	
Power measurement	AC power measuring accuracy	±0.05%RD(20V≤U≤707V, 200mA≤I≤424A)	±0.05%RD(20V≤U≤707V, 400mA≤I≤707A)
	DC power measuring accuracy	±0.02%RD(10V≤U≤1000V, 200mA≤I≤600A)	±0.02%RD(10V≤U≤1000V, 400mA≤I≤1000A)
Electric energy measurement	AC Electric energy measuring accuracy	±0.05%RD(20V≤U≤707V, 200mA≤I≤424A)	±0.05%RD(20V≤U≤707V, 400mA≤I≤707A)
	DC Electric energy measuring accuracy	±0.02%RD(10V≤U≤1000V, 200mA≤I≤600A)	±0.02%RD(10V≤U≤1000V, 400mA≤I≤1000A)
Phase measurement	Measuring range	0.00°~359.99°	
	Accuracy	±0.02°(20V≤U≤707V, 200mA≤I≤424A)	±0.02°(20V≤U≤707V, 400mA≤I≤707A)
	Resolution	0.001°	
Frequency measurement	Measuring range	40Hz~70Hz	
	Accuracy	±0.01Hz	
	Resolution	0.001Hz	
Ripple measurement	Accuracy	±0.05%RG	
	Bandwidth	≤1kHz	

Power pulse output	Power pulse output parameter (r/kwh) can be set from 1 to 2,000,000,000，and the maximum pulse frequency is 160kHz. The power pulse is a TTL/CMOS compatible level output with a load capacity greater than 20 mA. The default pulse output frequency is 0.2Hz~160KHz.	
Power pulse input	The calibration of the energy meter pulse constant (r/kWh) is set from 1 to 2,000,000,000. The setting range of the check circle is from 1 to 999,999,999. The maximum received pulse frequency is 50 kHz	
Daily timing pulse input	Clock frequency (Hz) setting range is from 0.01 to 50,000.00. The setting range of the check circle is from 1 to 999,999,999. The maximum received pulse frequency is 50kHz。	
Other parameters	Working power voltage range	AC85V～265V，50/60Hz
	Power consumption	<30VA
	Preheat time	≤30 minutes
	Working temperature	10℃～35℃
	Relative humidity	≤85%，Non-corrosive gas
	Dimensions	Around 373mm×211.5mm×131.5mm(Length× Width× Depth)(No protrusions)
	Weight	1.5kg

Remarks：

1. Measuring range automatically switched
2. RD-Reading value，RG-Range value