



T200A Single Phase Secondary Injection Test Set

PONOVO POWER CO., LTD.
www.ponovo.net





T200A Single Phase Secondary Injection Test Set



T200A Single Phase Secondary Injection Test Set is the best universal test system for engineers who need to do all single-phase relay testing and other basic primary testings.

All testings could be done by T200A itself, no need external meters to assist. In this way, the complicated wiring shall be avoided, which helps engineers save a lot of time in the field testings.

It is integrated design with local control panel with many test functions that make testing more efficient. All test result shall be presented in the easy-to-ready local display screen.

For example, T200A's unique feature, output 250Aac continuously for 120 seconds, could be used for testing motor overload relay easily. Also, it could automatically set the change of frequency in its local software and do automatic testing for frequency relay, no need any manual operation.

T200A supports all single-phase relay testing, such as directional, differential, distance, overcurrent, synchronization relay, thermal relays, etc. Meanwhile, automatic reclosing devices could be tested easily as well.

Also, T200A is equipped with other field test functions, such as CT ratio test, polarity test, secondary impedance test, winding resistance test, excitation curve test, injection function, etc.

Besides the local control software, there's communication interface on T200A so that it could be connected with PC to use its PC report tool software, in which engineers shall be able to manage the testing reports on PC.

Features

- The best automatic testing assistant for all single-phase relay test.
- Unique Feature: Continuous output 250Aac for 120 seconds.
- Integrated design in one toolbox, no external accessory needed.
- Equipped with test functions for basic primary testing.



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Applications

Examples of what T200A can test

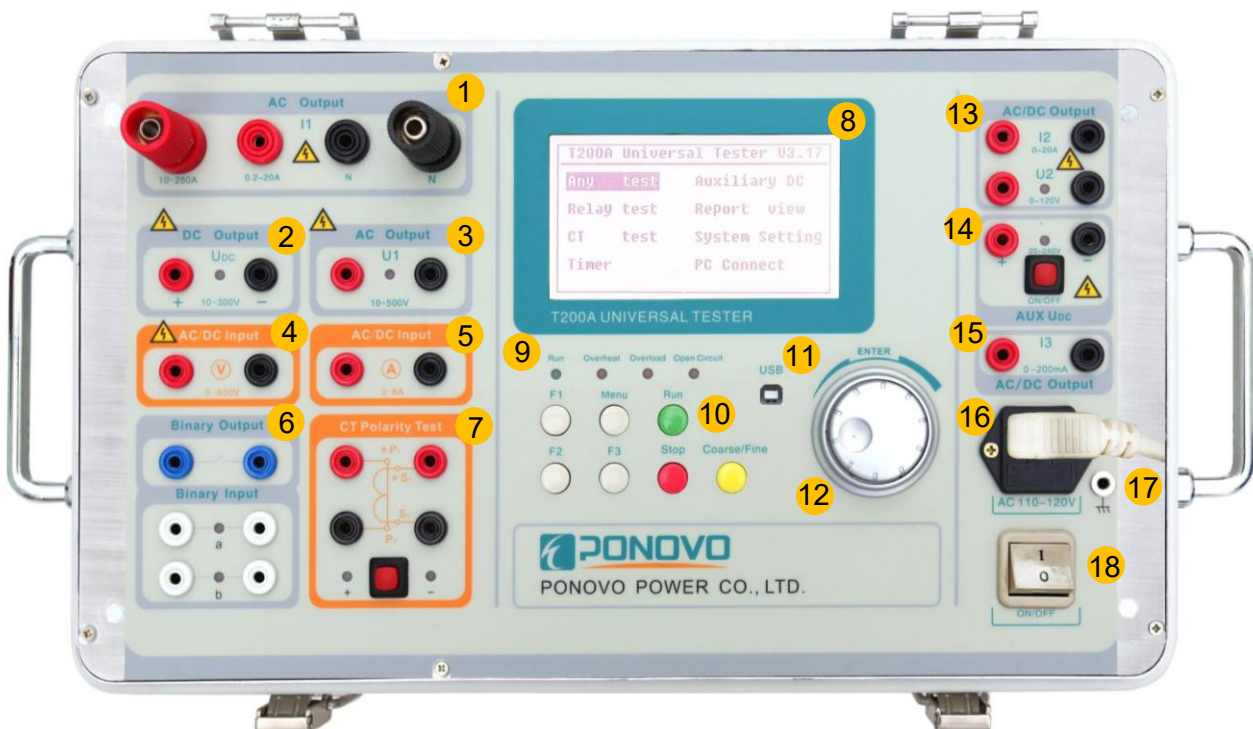
Relay	ANSI/IEEE
Overcurrent relays	50
Inverse time overcurrent relays	51
Undercurrent relays	37
Ground fault relays	50N,51N
Directional overcurrent relays	67
Directional ground fault relays	67N
Overvoltage relays	59
Undervoltage relays	27
Directional power relays	32
Power factor relays	55
Differential protection (differential circuits)	87
Distance protection equipment (phase by phase)	21
Negative sequence overcurrent relays	46
Motor overload protection	51/66
Automatic reclosing devices	79
Tripping relays	94
Under impedance relays	21
Thermal relays	49
Frequency relays	81
Synchronization relays	25

Other fields test T200A can do

√ Excitation curve test
√ CT ratio test
√ Burden measurement for protective relay test equipment
√ Secondary impedance test
√ Harmonics test
√ Polarity test
√ Winding resistance test
√ Timer function
√ Injection
• Manually
Manually start and stop
• Auto
Injection automatically with set time
√ Voltage regulating relays
√ Time-delay relays



Panel



T200A Single Phase Secondary Injection Test Set

- ① High power output (I1): AC 10A~250A output ports and AC 0.2A~20A output ports. It's mainly applied for CT test and primary side injection.
- ② High power output (U_{DC}): DC 10V~300V output ports. It's mainly applied for DC act time testing and low voltage operation test to the tripping coil on intermedia/high voltage breaker.
- ③ High power output (U1): AC 10V~500V output ports. It's mainly applied for CT test and primary side injection.
- ④ AC/DC voltmeter: AC/DC 0V~600V input ports for measurement. They can be applied for measuring both internal and external outputs. Used for realizing the DC resistance and impedance measurement, excitation characteristic test etc.
- ⑤ AC/DC ammeter: AC/DC 0A~6A input ports for measurement. They can be applied for measuring both internal and external outputs. Used for realizing the DC resistance and impedance measurement, excitation characteristic test etc.
- ⑥ Binary output: one pair, relay contacts.
Binary input: two pairs with no polarity. It can not only receive protection acting contacts, but be applied for timer test, pick up value test, with single channel and double channels for options.
- ⑦ CT polarity test
- ⑧ Display screen
- ⑨ Indicators for Run, Overheat, Overload, Open circuit.
Running lamp: it's used for the equipment to output indications.
Overheat lamp: it will turn on the lamp, alarm and close the output, if the operation temperature of the power module inside the equipment exceeds 80°C.
Overload lamp: it will turn on the lamp and close the output when an overload of current and/or voltage occurs.
Open-circuit lamp: it will flame if an open circuit is detected at the current output .
- ⑩ Menu selection, parameter setting and adjustment's output control areas.
- ⑪ USB port: it is applied for reading report and updating the local software.
- ⑫ Rotary knob, Coarse/fine button
- ⑬ High precision current (I2) and voltage (U2) output: AC/DC 0A~20A output and AC/DC 0V~120V output.
It gives high precision, adjusted angle and frequency, good waveform and transient characteristic and is mainly applied for protection tests, auto reclosing, under frequency, and directional power relay etc.
- ⑭ Auxiliary DC power supply: DC20V~240V output. It's mainly used to provide power supply to protection relay with the load of 0.5A continuously.
- ⑮ High precision AC/DC current output (I3): 0A~200mA, DC relay, mA level, AC&DC test.
- ⑯ Power socket: 220Vac or 110Vac, 50/60Hz, used for connecting the power supply cable, and with one spared fuse.
- ⑰ Earthed terminal: used for connecting the T series instrument to the rigid grounded point.
- ⑱ Power On/Off switch, used for controlling the power supply.

Test Function

Software main interface

- ❖ Include Any test, Auxiliary DC power supply, Relay test, Report view, CT test, System setting, Timer and PC control.

T200A Universal Tester V3.00	
Any test	Auxiliary DC
Relay test	Report view
CT test	System Setting
Timer	PC control

System setting interface

- ❖ Can set time, voltage, frequency and external CT ratio.
- ❖ Time can be represented by second or cycles.

System setting F1 ↑	
Time <input checked="" type="checkbox"/> s	<input type="checkbox"/> cycles
Volt 057.74V	Fre 50Hz
<input type="checkbox"/> Ext.CT	0100A/5A
Date 2013-11-27 15:36:04	
F2-Time Set	F3-Time Save

Auxiliary DC

- ❖ Mainly provide power supply for protection relay.
- ❖ Can output DC 20V~240V.
- ❖ The ON/OFF button on the panel can control the output voltage.
- ❖ Continuous output current 0.5A.

Aux DC F1 ↑	
Aux DC:	020.00V
Press Run button to →	
Press ON/OFF button to control the output	

Any test

Any test

- ❖ Include Manual & Meter, Shot, Linear Ramp and Pulse Ramp interface.

Any test F1 ↑	
Manual & Meter	
Shot	
Linear Ramp	
Pulse Ramp	

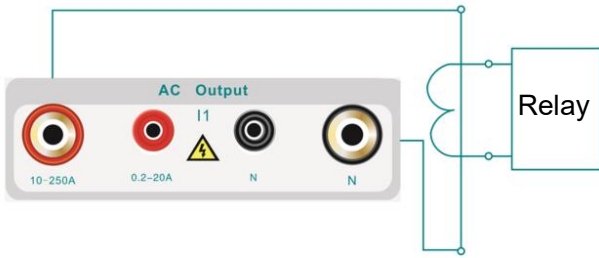
Any test - Manual & Meter

- ❖ Can output high power AC voltage/current, high power DC voltage, high precision voltage/current.
- ❖ Can display the reading values of voltmeter and ammeter.
- ❖ Can realize manual control AC/DC variables by the step.

Manual & Meter F1 ↑	
I1-250A ▼	I1 00.00A
AC ▼ 50.00Hz	(V) 005.00V
U2 100.00V 000°	(A) 001.00A
I2 001.00A 120°	005.000Ω
I3 002.00mA 120°	

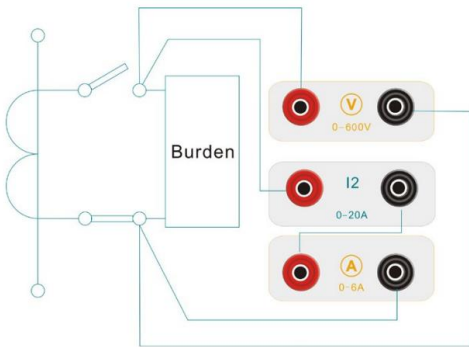
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Application examples 1 - Primary side injection



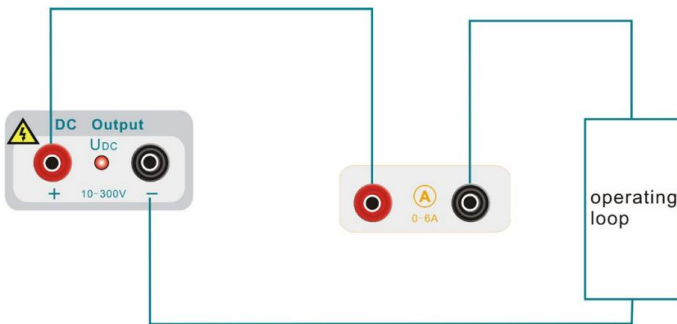
Manual & Meter		F1 ↑
I1-250A ▼	I1	50.00A
AC ▼	50.00Hz	V 000.00V
U2	000.00V 000°	A 000.00A
I2	000.00A 120°	000.000Ω
I3	000.00mA 120°	

Application examples 2 - Secondary impedance test



Manual & Meter		F1 ↑
I1-250A ▼	I1	00.00A
AC ▼	50.00Hz	V 005.00V
U2	100.00V 000°	A 001.00A
I2	001.00A 120°	005.000Ω
I3	002.00mA 120°	

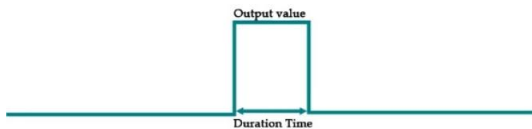
Application examples 3 - DC test of operating loop



Manual & Meter		F1 ↑
Udc-2.5A ▼	Udc	000.00V
AC ▼	050.00Hz	V 000.000V
U2	000.00V 000.0°	A 0.0000A
I2	00.00A 000.0°	000.000Ω
I3	000.00mA 000.0°	

Any test - Shot

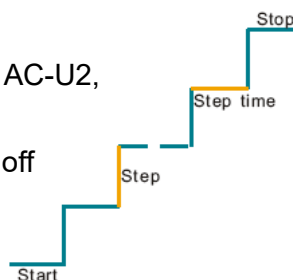
- ❖ Can output AC-I1-250A, AC-I1-20A, AC-U1, Udc-2.5A, Udc-0.5A, AC/DC-I2, AC/DC-U2, AC/DC-I3.



Shot		F1 ↑
Shot	AC-I1-250 ▼	
Start	100.00A	
Duration	1.00s	

Any test - Linear ramp

- ❖ Can output Udc-0.5A, AC-I2, AC-U2, DC-I2, DC-U2, AC-I3, DC-I3.
- ❖ Can test Pick up value, Drop off Value and ratio.



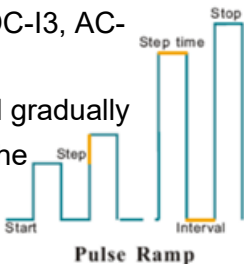
Linear Ramp

Linear Ramp		F1 ↑
Source	AC-I1 250A ▼	Pick up
Start	000.00A	Drop off
Stop	005.00A	Ratio
Step	01.00A	
Step time	01.00s	

T200A Single Phase Secondary Injection Test Set

Any test - Pulse ramp

- ❖ Can output AC-I2, DC-I2, AC-I3, DC-I3, AC-U2, DC-U2.
- ❖ When start output, the variable will gradually increase in the mode of pulse on the step. When receives binary input signal then recording action value.



Pulse Ramp		F1 ↑
Source	AC-I2 ▼	Trip No Action
Start	000.00A	
Stop	005.00A	
Step	01.00A	
Step time	01.00s	
Interval	01.00s	

Relay test

Relay test

- ❖ Include pick up value test, trip time test, trip time + pulse length test and advanced test.

Relay test	F1 ↑
Pick up	
Trip time	
Trip Time + Pulse length	
Advanced	

Relay test – Pick up

- ❖ Output models are AC-I1, AC Test, AC-U1, DC Test, UDC-2.5A, AC-I3, UDC-0.5A, DC-I3.
- ❖ Can test Pick up value, Drop off Value and ratio.
- ❖ Manually control AC variables and DC variables to change on the step.

AC Test	F1 ↑
U2 057.74V 000°	Pick up Drop off Ratio
I2 02.00A 120°	
Fre 50.00Hz	

Relay test – Pick up

- ❖ When output model is selected as AC Test, also can be done Directional test.

AC Test	F1 ↑
U2 057.74V 000°	Boundary 1 Boundary 2 MS Angle
I2 02.00A 120°	
Fre 50.00Hz	

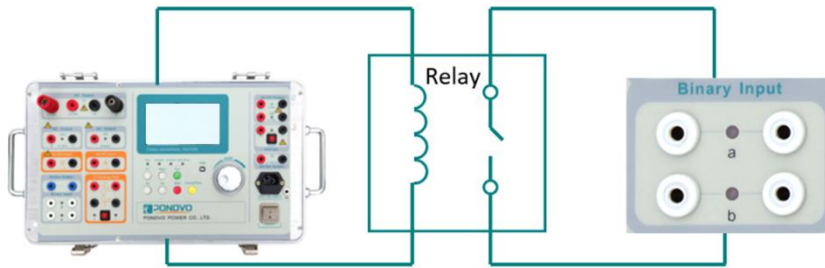
Relay test – Trip time

- ❖ Output models are AC-I1, AC Test, AC-U1, DC Test, UDC-0.5A, AC-I3, DC-I3.
- ❖ Perform tests on the action time in all kinds of over-voltage/current and under-voltage/current relays.

AC Test	F1 ↑
U2 057.74V 000.0°	Time
I2 00.00A 120.0°	
2nd▼ 00.00A	
Test> Press Enter	
U2 057.74V 000.0°	No Space
I2 02.00A 120.0°	
2nd▼ 00.00A	

T200A Single Phase Secondary Injection Test Set

Application examples 4 – trip time of AC relay



AC Test			F1 ↑
U2	057.74V	000.0°	Time
I2	00.00A	120.0°	
2nd	00.00A		
Test> Press Enter			
U2	057.74V	000.0°	No Space
I2	02.00A	120.0°	
2nd	00.00A		

Relay test – Trip time + pulse length

- ❖ Output models are AC-I1, AC Test, AC-U1, DC Test, UDC-0.5A, AC-I3, DC-I3.
- ❖ Perform tests on the action time and pulse time in all kinds of over-voltage/current and under-voltage/current relays.

AC-I1			F1 ↑
Range AC-I1-20A▼			Time
I1 016.00A			
RelayTrip,ResetRelay PressRunButtonToTest			Pulse

Relay test – Advanced

- ❖ Including differential, under frequency, synchronous, harmonic, reclosing and motor overload test templates.

Advanced			F1 ↑
Differential Under freq Synchronous Harmonic Reclosing Motor overload			

Relay test – Advanced - Differential

- ❖ This function is designed to test differential relay with independent restraint coil and differential coil.
- ❖ The items, such as the trip value, time and differential current tripping value under different restraint current can be tested.

Dif 20A			F1 ↑
			Trip
I1	001.00A	000°	
I2	001.00A	180°	

Relay test – Advanced – Under frequency

- ❖ Can set end frequency, df/dt, frequency value.
- ❖ Can have a test on action value, action time, df/dt, under-voltage blocking value in under-cycle load-shedding device.

Under freq			F1 ↑
U2	057.74V	000.0°	Time
I2	00.00A	120.0°	
End Fre	45.00Hz		
df/dt	2.00Hz/s		
Freq Set	48.00Hz		

T200A Single Phase Secondary Injection Test Set

Relay test – Advanced – Synchronizing

- ❖ This function is for checking the performance of synchronism relay.
- ❖ Can set amplitude and phase angle of voltages.
- ❖ Output the voltage value, change the phase angle of voltage, if the relay trips, record the voltage value and phase angle difference.

Synchronizing			F1 ↑
			Trip
AC-U1	100.00V	000°	
AC-U2	100.00V	090°	

Relay test – Advanced – Harmonic

- ❖ This unit can have superposition of 2nd, 3rd, 5th, 7th harmonics on the fundamental to execute the harmonic surge blocking test and harmonic over flux blocking test of transformers.

Harmonic		F1 ↑
Fundamental	001.00A	Pick up
2 Harmonic	000.00A	00.00%
3 Harmonic	000.00A	2nd 00.00%
5 Harmonic	000.00A	3rd 00.00%
7 Harmonic	000.00A	5th 00.00%
U2	057.74V 000.0°	7th 00.00%
		No Space

Relay test – Advanced – Reclosing

- ❖ This unit can perform reclosing test.
- ❖ There are two states output.
- ❖ Maximum 4 times trip and reclose.

Reclose-1		F1 ↑
U2 050.00V 000.0°	T2	
I2 00.00A 120.0°	P2	
Test > Press Enter	T3	
U2 050.00V 000.0°	P3	
I2 02.00A 120.0°	T4	
T1	P4	
P1		

Relay test – Advanced – Motor overload test

- ❖ This unit can test trip time of motor.
- ❖ The output current values can be set in two states.
- ❖ In this unit, AC250A can output 120s.

Motor 250A		F1 ↑
Offset		Time
I1	000.00A	
Test > Press Enter		
I1	050.00A	

CT test

CT test

- ❖ Including CT ratio, polarity, winding resistance and excitation curve test.

CT Test		F1 ↑
Ratio		
Polarity		
Winding Resistance		
Excitation Curve		

T200A Single Phase Secondary Injection Test Set

CT test- Ratio

- ❖ Connect I1 output to the CT primary side and CT secondary side to the current measuring terminal.
- ❖ Set the current for output, and CT secondary current rating.
- ❖ The tester will display the current it has measured and the ratio that has been calculated.

Ratio 250A		F1 ↑
<input checked="" type="checkbox"/> 1A	<input type="checkbox"/> 5A	Ratio 200/1
I1 200.00A	(A) 01.00A	

CT test – Polarity

- ❖ Employ the method of inputting the pulse voltage at CT primary side to have the CT polarity test.
- ❖ Connect the polarity terminals of CT primary and secondary sides correctly.

Polarity	F1 ↑
<input checked="" type="checkbox"/> +Polarity	
<input type="checkbox"/> -Polarity	
No Space	

CT test – Winding resistance test

- ❖ Set the DC current values for output, and environment temperature.
- ❖ The tester will display the DC voltage that has been measured and the secondary DC resistance that has been calculated.

Resistance		F1 ↑
DC-I2 01.00A	(V) 00.000V	25.0°C Res
		75.0°C Res

CT test – Excitation curve test

- ❖ According setting current output the start current, elevate the current gradually and record the corresponding voltages that have been measured and corresponding series of test points.

Excitation 20A				F1 ↑
Cur A	Vol V	Cur A	Vol V	
00.20	000.00	00.20	000.00	
00.50	000.00	02.20	000.00	
01.00	000.00	02.50	000.00	
01.20	000.00	03.00	000.00	
01.50	000.00	03.20	000.00	
Count 10			No Space	

Timer

Timer

- ❖ Support Single channel test and Double channels test.
- ❖ The action time will be measured automatically before the test has ended.

Timer	F1 ↑
<input checked="" type="checkbox"/> Start Input A	Time
<input type="checkbox"/> Stop Input A	
<input type="checkbox"/> Start Input B	
<input type="checkbox"/> Stop Input B	
No Space	

T200A Single Phase Secondary Injection Test Set

Report view

Report view and save locally

- ❖ Each page can display 10 reports. With total 3 pages, it can save 30 reports at most.
- ❖ After test, user can save test result. Both date and time will be saved in the report.

```

080406-181145    080206-121722
080406-181340    080118-175147
080406-181536    080212-092145
080405-181148    080309-141011
080406-181148    080403-151105
Pick up AC-I1          1/3
F1:↓   F2: Delete all  F3: Delete
    
```

PC control

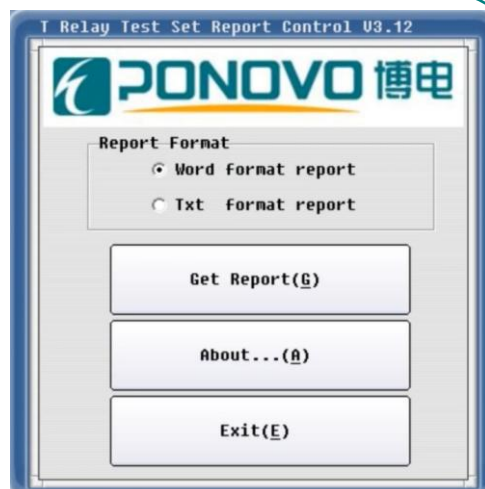
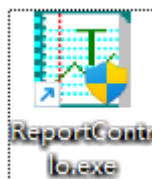
Report export and view on PC

- ❖ Press PC control then entering connection with PC state.

Computer...

PC report software

- ❖ Support Word format report and Txt format report.



Word Format on PC

T Series Relay Protector Tester Test Report

Test Item Name	Time (YMD-HMS)	Test Result
Auto Test Linear Ramp Udc-0.5A	2025-11-10 10:38:28	Pick up: 15.000V Drop off: 14.000V Ratio: 0.933
Auto Test Pulse Ramp AC-I2	2025-11-10 11:18:20	Pick up: 0.700A
Pick Up AC-Test	2025-11-10 11:23:50	Pick up: 3.000A Drop off: 2.000A Ratio: 0.667

Txt Format on PC

```

-----T Series Relay Tester Test Report-----
Auto Test
Linear Ramp
Udc-0.5A
2025-11-10 10:38:28
Pick up: 15.000V
Drop off: 14.000V
Ratio: 0.933
-----
Auto Test
Pulse Ramp
AC-I2
2025-11-10 11:18:20
Pick up: 0.700A
    
```

T200A Single Phase Secondary Injection Test Set



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Specifications

High power AC current output (I1)

Range	0.5A~20A	10A~250A
Accuracy	±0.5%	
Output voltage	130V~100V	10V~8V
Power	2000VA(20A)	2000VA(250A)
Load time		
Output	250A	50A < 50A
Time	120s	3000s Continuous

High power AC voltage output (U1)

Range	10V~500V	
Accuracy	±0.5%	
Power	1200VA(400V)	
Load time		
Output	<1A	Continuous
	1~3A	Max 60min

High power DC voltage output (Udc)

Range	10V~300V	
Accuracy	±0.5%	
Power (300V)	750W(300V)	
Load time		
Output	<1A	Continuous
	>1A	Max 60min

Auxiliary DC voltage output (Aux Udc)

Range	20V~240V	
Accuracy	±1%	
Power	55W at 110V, 110W at 220V	
Load time	continuous at 0.5A	

AC/DC current output (I2)

Mode	AC output	DC output
Range	0~20A	0~20A
Accuracy	±0.5%	±0.5%
Power(20A)	200VA	200W
Frequency	20Hz~100Hz	---
Phase angle	0~360°	---
Phase angle accuracy	0.5°	---
Distortion 1A-20A	<0.5%	---
Transient response	500µs	
Load time 20A	60s	
10A	240s	
<10A	continuous	
Harmonic(2nd,3rd,5th,7th) accuracy	1%	

Certificates

EMC (Emission)	IEC-61000-3-2/3
EMC (Immunity)	IEC 61000-4-2/3/4/5/6/11
Safety	IEC 61010-1

AC/DC voltage output (U2)

Mode	AC output	DC output
Range	0~120V	0~120V
Accuracy	±0.5%	±0.5%
Power(120V)	60VA	80W
Frequency	20Hz~100Hz	---
Phase angle	0~360°	---
Phase angle accuracy	0.5°	---
Distortion 5V~120V	<0.5%	---
Transient response	500µs	500µs

High precision AC/DC current output (I3)

Mode	AC output	DC output
Range	0~200mA	0~200mA
Accuracy	±0.5%	±0.5%
Power(200mA)	3VA	3W
Frequency	20Hz~100Hz	---

Binary inputs

Number	2	
Input characteristics	30V~250V DC or dry contact	
Time resolution	±1ms(0.001~1s)	±0.1%(1~9999.999s)
Max. measuring time	9999.999s	

Binary output

Number	1	
Type	Potential free relay contacts	
Break capacity AC	Vmax 250V AC / Imax 8A / Pmax 2000VA	
Break capacity DC	Vmax 250V DC / Imax 8A / Pmax 150W	

Power supply

Nominal input voltage	110/220Vac
Permissible tolerance	-20% ~+15%
Nominal frequency	50/60Hz
Permissible frequency	45~65Hz

Voltmeter

Range	0~600V AC/DC
Accuracy	±1%

Ammeter

Range	0~6A AC/DC
Accuracy	±1%

Others

Operation temperature	-5 ~ +45°C
Operation humidity	5~95%, non-condensing
Weight	23kg
Dimensions (WxHxD)	440mmx255mmx255mm
PC connection	USB
Ground Socket (earth)	4 mm banana socket; front side

Specifications are subject to modification without notice

Professional Solution Provider For The Power World

Since 2001, Ponovo Power has been focusing on providing professional solutions to over 5000 clients in the fields of intelligent testing and power quality control in China and abroad



ISO 9001 QMS
ISO 14001 EMS
OHSAS 18001

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