PONOVO

T200A Universal Single Phase Test Set

T200A Universal Single Phase Test Set

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

Description

T200A Single Phase 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 filed testings.

It is integrated design with local control panel with many test functions that make testings 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 support all single phase relay testings, 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 filed 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.

| Examples of whatt200A can test ANSI/IEEE	ANSI/IEEE	Other fields test T200A can do
Overcurrent relays	50	Excitation curve test
Inverse time overcurrent relays	51	CT ratio test
Undercurrent relays	37	Burden measurement for protective relay test equipment
Ground fault relays	50N, 51N	
Directional overcurrent relays	67	Secondary impedance test
Directional ground fault relays	67N	Harmonics test
Overvoltage relays	59	Polarity test
Undervoltage relays	27	Winding resistance test
Directional power relays	32	Timer function
Power factor relays	55	Injection
Differential protection (differential circuits)	87	• Manually
Distance protection equipment (phase by phase)	21	->manully start and stop
Negative sequence overcurrent relays	46	• Auto
Motor overload protection	51/66	->injection automatically with set time.
Automatic reclosing devices	79	Voltage regulating relays
Tripping relays	94	Time-delay relays
Under impedance relays	21	
Thermal relays	49	
Frequency relays	81	
Synchronization relays	25	

Panel introduction

1. High power output (I1): it's mainly applied for CT test and primary side injection.

2. High power output(UDC): 10~300V, 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): it's mainly applied for CT test and primary side injection.

4. AC/DC voltmeter: 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: 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. 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℃.

   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 updating the local software .

9. Menu selection, parameter setting and adjustment's output control areas.

10. USB port: it is applied for reading report and updating the local software.

11. High precision voltage and current 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.

12. Auxiliary DC power supply: it's mainly used to provide power supply to protection or relay with the load of 0.5A continuously.

13. High precision current AC/DC I3: DC relay, mA level, AC & DC test.

14. Power socket: used for connecting the power supply cable, and with one spared fuse.

15. Earthed terminal: this is used for connecting the T series instrument to the rigid grounded point.

16. Breaker: used for controlling the power supply.

T200A Application Example

1. Testing the pick-up and drop-off by using T200A

1) Connection diagram
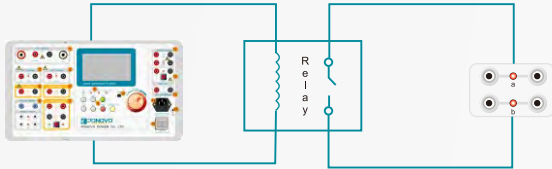
2) Two kinds of test method

Manual Test by using Relay Test Module

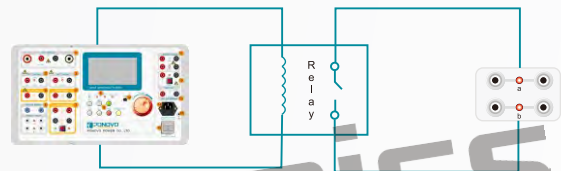| Pick up	F1 ↑
AC–I1	AC Test
AC–U1	DC Test
Udc–2.5A	AC–I3
Udc–0.5A	DC–I3

Test procedure

- Checking diagram , connect wires between kit and relay
- Select 'relay test'- > ,pick up
- Select relevant output channel in the software interface according to the connection of its output channel on the hardware
- Change to place of I2 amplitude
- Press 'Enter', then set the step resolution by 'Coarse/Fine' key
- Press 'Run' key to start the test
- Use the knob change value, slow up when near the pick up setting
- After pick up ,slow down to drop off value
- Press 'F3' key save report

Automatic Test by using Any Test-Linear/Pulse ramp Module Linear ramp

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

Pulse Ramp

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

Linear Ramp

Test procedure

- Checking diagram , connect wires between kit and relay
- Select 'Any test' - > ,'Linear ramp'
- Select relevant output channel in the software interface according to the connection of its output channel on the hardware
- Set 'Start' < setting value, and set 'End' > setting value
- 'Stemp time' > trip time
- 'Press Run' key to start the test
- After a while ,the screen will show up pick up and drop off value
- Press 'F3' key save report

2. Directional Test by using T200A

1) software interface

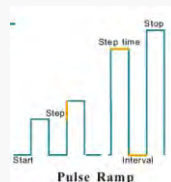| AC Test		F1 ↑
U2 057.74V 000°		Boundary 1
I2 02.00A 120°		Boundary 2
Fre 50.00Hz		MS Angle

This function can be realized in the AC test of Pick Up. This unit can make the boundary for power direction relay.
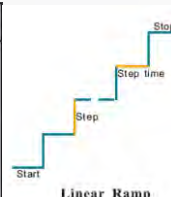
2) Test procedure

- Connect wires as above figure shown.
- Select high precision AC test menu as above figure shown.
- Set amplitude and phase of voltage/current in the non-action zone of power direction relay.
- Press the Run button to output voltage and current values. Change the phase to make the phase angle of voltage/current move from the non-action zone to the action zone. During the protection acting period, mark the boundary I; then change the moving direction of phase, which is also moving from non-action zone to action zone, then marks the boundary II during the protection acting period. Thus, calculate the sensitive angle with these measuring boundaries I and II by the software automatically.

3. Frequency Relay Test by using T200A

1) Connection diagram
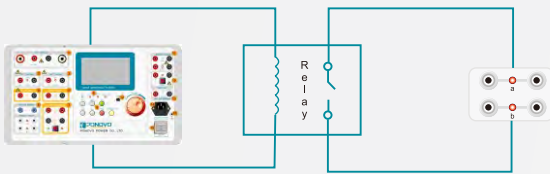
2) software interface

3) Test procedure

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

  1)Parameter setting

  - Voltage amplitude: it should be larger than the voltage blocking value of the relay, unless the voltage blocking value of the protection is under test.
  - Current amplitude: it should be larger than the current blocking value of the relay, unless the current blocking value of the protection is under test.
  - End frequency: it should be larger than the under-frequency blocking value and is suggested to be no less than 45Hz;
  - df/dt: it should be less than the df/dt of the protection unless the df/dt of relay is under test.
  - Frequency setting: it could be settled under-cycle action value, also could be actual measuring action frequency.

  2)Description of test process

  - Press the Run button, the tester will output the settled voltage and current values with frequency of 50Hz of 5 seconds.
  - When the 5s end, the voltage and current frequencies will drop from 50Hz at df/dt to the end frequency. At the same time, the tester will start to count time when the frequency has dropped to the frequency setting:
  - If the relay acts, while the action contacts are connected to the binary inputs of tripping, the tester will stop to count time and show the action time.
  - If the relay doesn't work, it will drop to the end frequency, hold for 30s and then stop the test.

4. DC pick up test by using T200A

1)Wiring method

Index mark of relay direction

2)Software interface

3)Test procedure

- Enter the main menu on T200A and choose "Any test" checkbox to open the testing interface as followings,

- Choose "Linear Ramp" to test Pickup and drop-off, and calculate the return factor
- Select DC -U2,

- Set variable, start value, stop value, step and step time.
- Press the Run button to start output, shown as figure. The variable will gradually increase on the step from the start value to the stop value. When the tester receives the binary input of protection acting signal and finish recording the action time, the test will stop.
- Choose "Shot" to test Delay Time
- Select DC -U2,

- Set the start value and duration time of variables.
- Press the Run button to output. When the tester receives the binary input of protection acting signal and finish recording the action time, the test will stop.

T200A
Universal Single
Phase Test Set

Specifications

High power AC current output (I1)

Range	0.5A~20A		10~250A
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	10~500V
Accuracy	±0.5%
Power	1200VA(400V)
Load time <1A :	continuous
1~3A :	Max 60min

High power DC voltage output (Udc)

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

Auxiliary DC voltage output (Aux Udc)

Range	20~240V
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	20~100Hz	—
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%	

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	20~100Hz	—
Phase angle	0~360°	—
Phase angle accuracy	0.5 °	—
Distortion 5V~120V	<0.5%	—
Transient response	500 μ s	500 μ s

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	20~100Hz	—

Binary inputs

Number	2
Input characteristics	30~250V 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%

Certificates

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

Others

Operation temperatur	−5 ~ +45°C
Operation humidity	5 ~95 %, non-condensing
Weight	23kg
Dimensions (W x H x D)	440 mm×255mm×255 mm
PC connection	USB
Ground Socket (earth)	4 mm banana socket; front side

Sales network
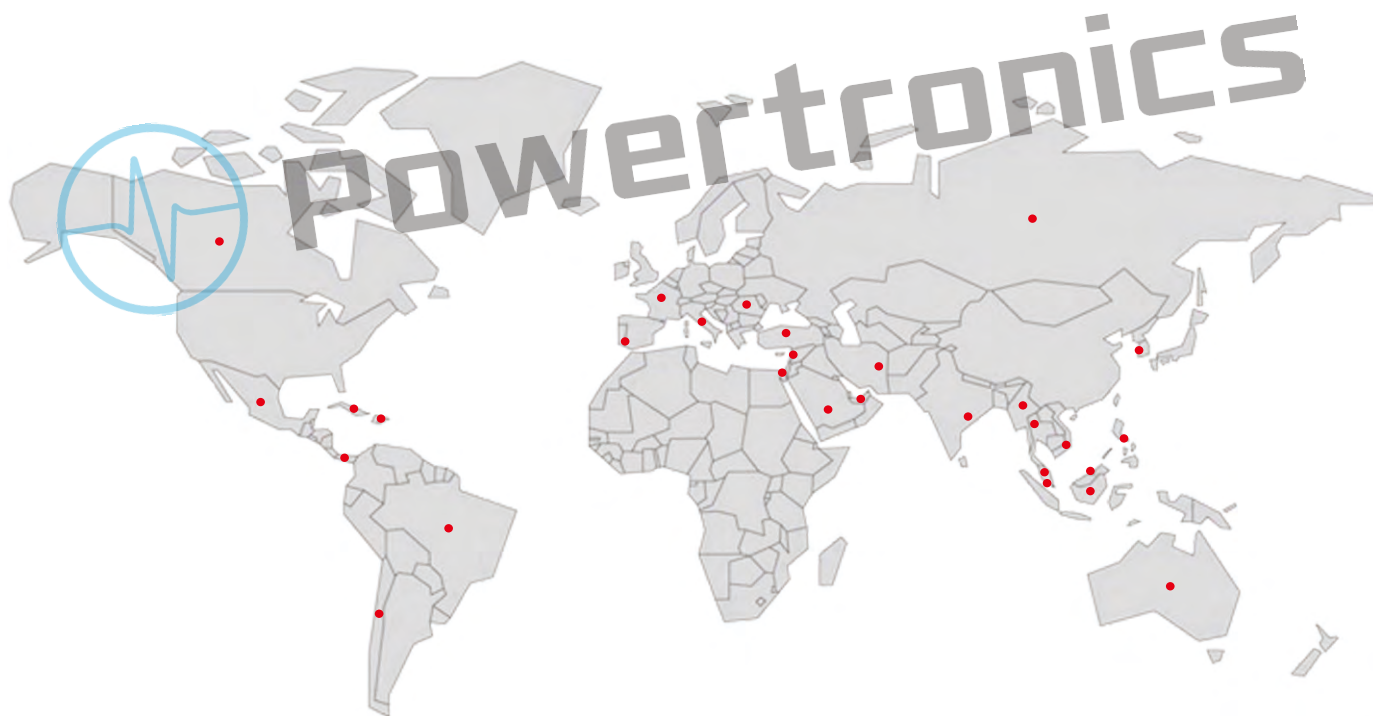
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