



T200A Universal Tester

PONOVO POWER CO., LTD.

www.relaytest.com



Examples of what T200A can test 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

ANSI/IEEE

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 introduction

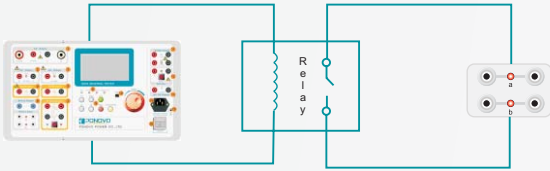


1. High power output (I1): it's mainly applied for CT test and primary side injection.
2. High power output(UDC): 10~300V, it's mainly applied for DC act time testing and low voltage operation test to the tripping coil on intermedia/high voltage breaker.
3. High power output (U1): it's mainly applied 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°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 .
9. Menu selection, parameter setting and adjustment's output control areas.
10. USB port: it is applied for reading report and debugging the computer in high level.
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	

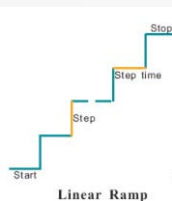
Test procedure

- 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

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		

Pulse ramp



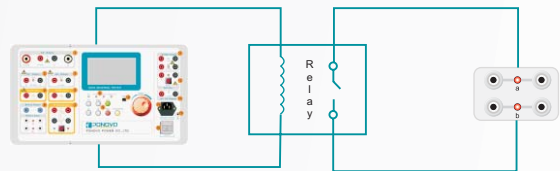
Pulse Ramp		F1 ↑
Source AC-I2	Trip	
Start 000.00A	No Action	
Stop 005.00A		
Step 01.00A		
Step time 01.00s		
Interval 01.00s		



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	

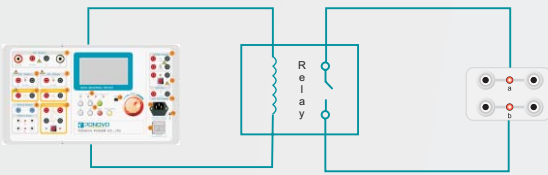
This function can be realized in the AC test of Pick Up. This unit can make the boundary for power direction relay.

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

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

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

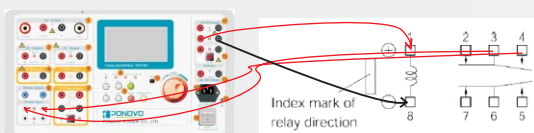
- Voltage amplitude: it should be larger than the voltage blocking value of the relay, unless the voltage blocking value of the protection is under test.
- Current amplitude: it should be larger than the current blocking value of the relay, unless the current blocking value of the protection is under 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 pickup test by using T200A

1)Wiring method



2)Software interface

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

3)Test procedure

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

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

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

- Select DC -U2,

Liner ramp		F1 ↑
Source	DC-U2	Pick up
Start	000.00V	Drop off
Stop	050.00V	Ratio
Step	01.00V	No Space
Step time	01.00s	
I2	000.00A	

- 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,

Shot		F1 ↑
Shot	DC-U2	
Start	050.00V	
Duration	01.00s	

- 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 Tester



Specifications

High power AC current output (I1)

Range	0.2A~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



PONOVO POWER CO., LTD.

No.139 Jinghai Third Road, BDA, Beijing, China. 100176

Tel : +86 (10) 59089666

Fax : +86 (10) 59089999

www.relaytest.com

