PW636i

Protection Relay Test Set

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

PW636i Protection Relay Test Set

Universal testing system PW636i (6x32A, 4x300V) can test all types of protective relays, including modern IEC61850 based relays. Other test works, such as transducer, energy meter, indication meter, etc., can also be done easily. It's the ideal test device for all power utilities, power plants, relay manufactures, panel manufactures, research institutes, universalities, testing companies, etc.

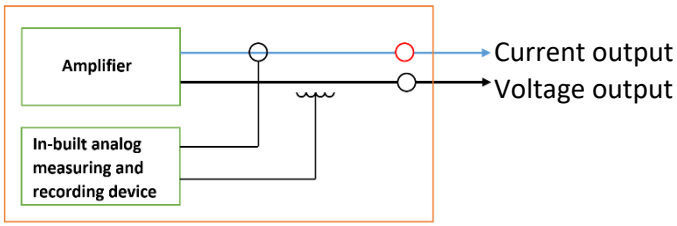
Product Features

- In-built monitoring and recording
- Large output power
- High accuracy
- Support IEC61850 based test
- Current booster interface for testing high burden relay
- Support importing setting value of relays via XRIO/RIO/PONOVO's Powertest default set files automatically

➢ In-Built Analog Monitoring & Recording Unit

❖ This in-built analog monitoring and recording unit samples the actual current/voltage outputs and real-time output waveform can be displayed in the software.

❖ This makes it easy to check the correctness of wiring before the test and observe the output during the test process.

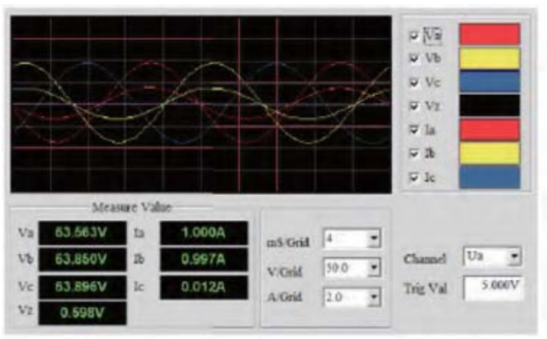


Principle

➢ Real-Time Outputs Display

❖ Real-time output waveform display helps the fast troubleshooting of wiring and test circuitry before test actual started.

❖ User can also use this provision to analyze the external signals, such as phase angle, power, harmonic, etc.



➢ IEC 61850 Function

❖ PW636i provides analog voltage/current signal to relay and the GOOSE message from relay is received and analyzed by relay test set.

Application

- **Relay test**

  Distance protection
  Differential protection
  Directional relay
  Time-inversed current relay
  Auto-reclosing, etc.

- **Measuring and control device**

  Synchronizer
  Transducer
  Energy meter
  df/dt, etc.

- **System simulation**

  Transient, steady-state fault simulation
  Playback of COMTRADE format file

- **Calibration**

  0.5 Class energy meter
  Disturbance recorder
  Indicating meters, etc.

Test functions according to IEEE relay code

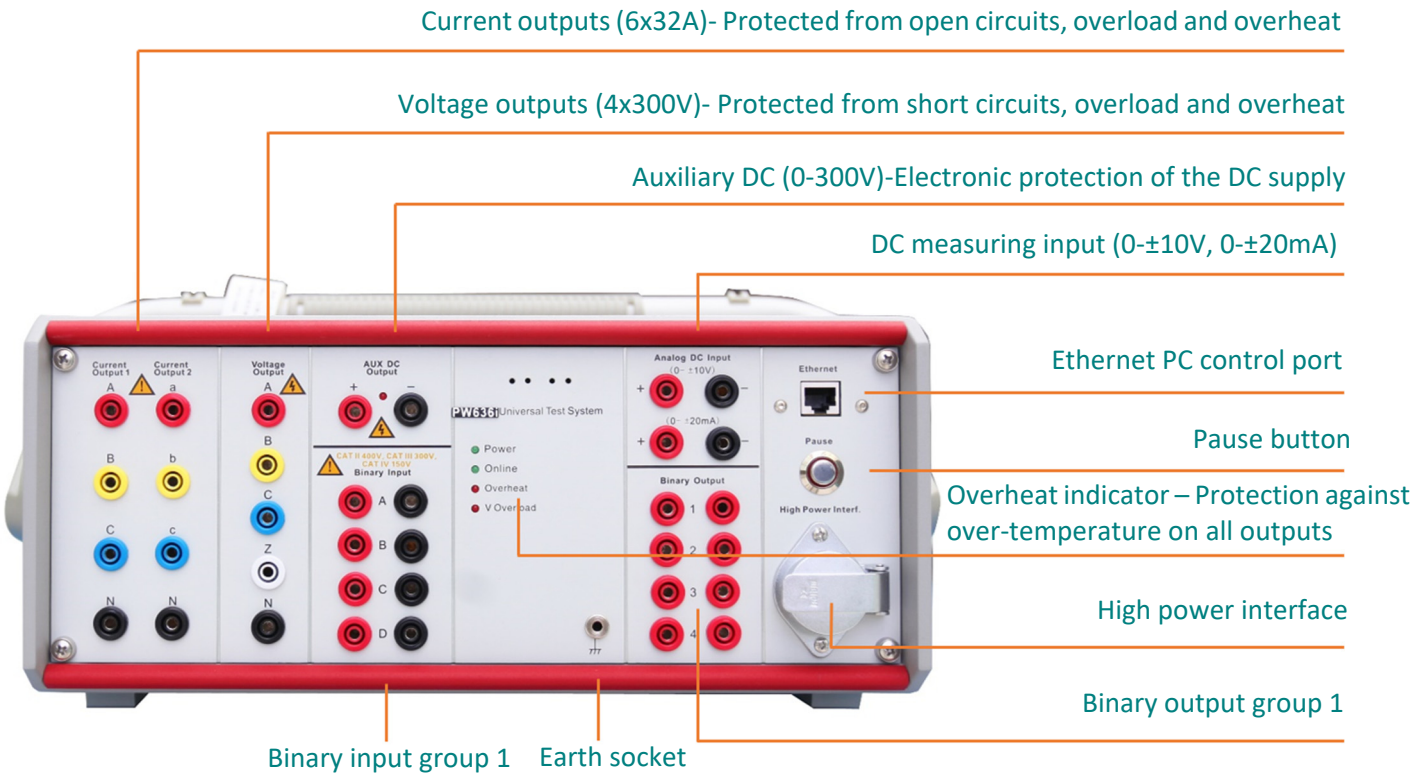
IEEE. NO.	DEVICE
2	Time Delay Starting or Closing Relay
21	Distance Relay
24	Volts per Hertz Relay
25	Synchronizing or Synchronism-Check Device
27/27N	Undervoltage Relay
30	Annunciator Relay
32	Directional Power Relay
36	Polarity or Polarizing Voltage Devices
37	Undercurrent or Underpower Relay
40	Field (over/under excitation) Relay
46	Reverse phase or Phase-Balance Current Relay
47	Phase-sequence or phase-balance voltage relay
50/50N	Instantaneous Overcurrent Relay
51/51N	AC Time Overcurrent Relay
52	AC Circuit Breaker
53	Field Excitation Relay
55	Power Factor Relay
56	Field Application Relay
58	Rectification failure relay
59/59N	Overvoltage Relay
60	Voltage or Current Balance Relay

IEEE. NO.	DEVICE
61	Density switch or sensor
62	Time-Delay Stopping or Opening Relay
64	Ground Detector Relay
67/67N	AC Directional Overcurrent Relay
68	Blocking or "out of step" Relay
74	Alarm Relay
76	DC Overcurrent Relay
78	Phase-Angle Measuring Relay
79	AC-Reclosing Relay
81/81U/O/R	Frequency Relay
82	DC load-measuring reclosing relay
85	Carrier or pilot-receiver relay
86	Lock-out relay
87	Differential Protective Relay
91	Voltage Directional Relay
92	Voltage and Power Directional Relay
94	Trip Relay
Other Functions (Optional)	IEC61850 High burden relay Lower Level outputs Transducer Energy meter

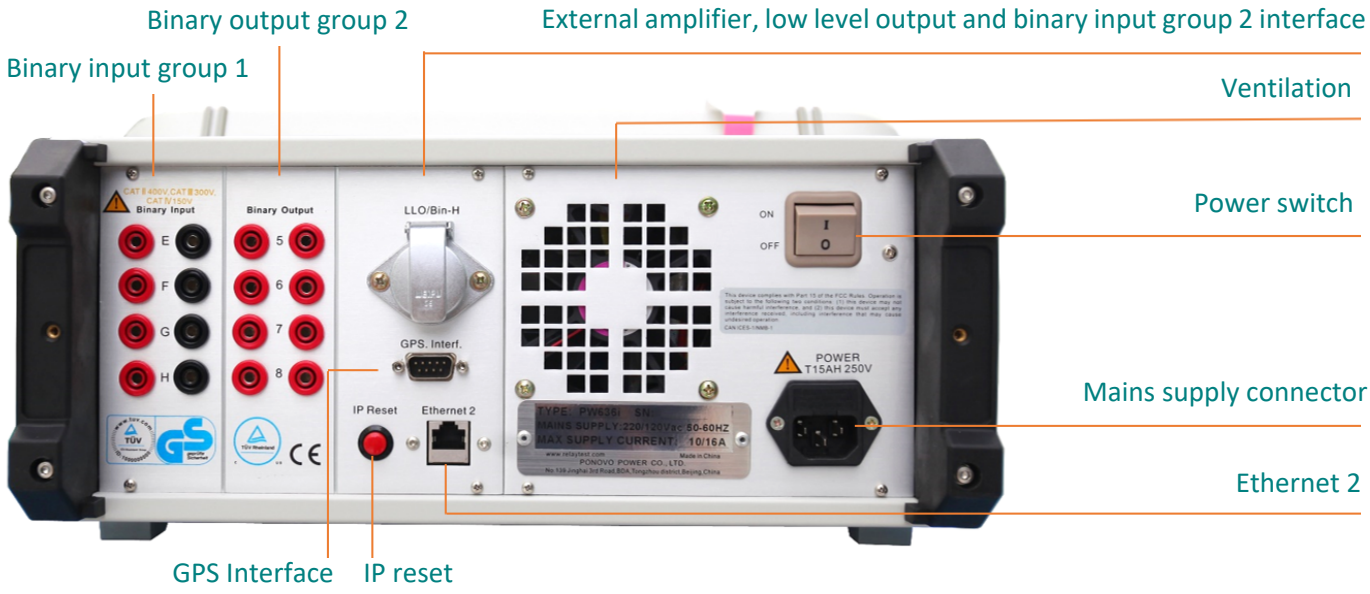
PW636i Panels

PW636i is designed with fuse on the mains supply and electronic protection for overload on the current (open circuit) or voltage outputs (short circuit), with immediate isolation of the output and alarm indication. Also diagnostic message for the setting of wrong data, mistakes on the input etc. There's also electronic protection in case of counter-feed of voltage output, if any incorrectness happens, the alarm light shall flash. And Overheat LED indicator shall flash for protection against over-temperature, on all outputs.

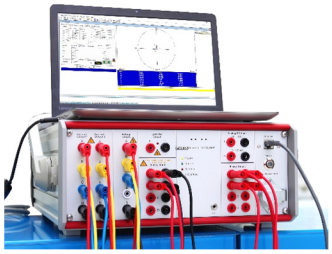
Front Panel



Rear Panel



PowerTest - Relay Test Set Software



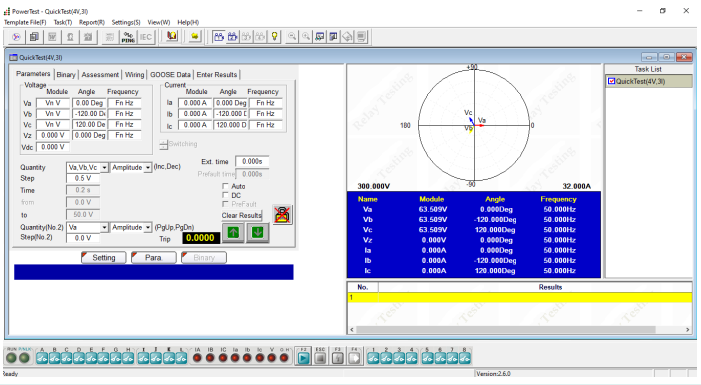
For all the three phase or six phase relay testers of PONOVO, one universal software can be used, the name is **PowerTest** software. PowerTest is a relay test software that includes different test packages, the **Basic** package, **Protection** package, **Advanced** package, **Special** package, **New Modules**, which packages includes different testing module, that can be used for all kinds of relay testing, and it also has the special package for more testing application, such as transducer, energy meter, etc.

➢ Basic Package

In the **Basic** package, there are different Quick Test modules, Time module, State Sequence, Ramp, Harmonic, CB Operation, Non-electricity Check, and TransPlay for playing back the comtrade file.

QuickTest (4V. 3I)

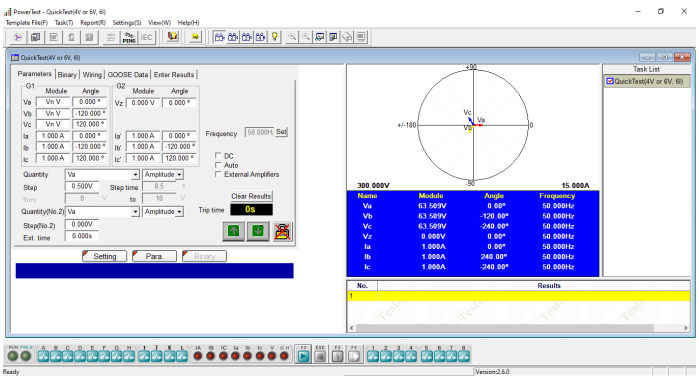
- ❖ 4 voltage and 3 current sources available for test relay
- ❖ Amplitude, phase angle and frequency of voltage and current sources can be controlled independently
- ❖ Test can be in manual or auto mode



PowerTest - Relay Test Set Software

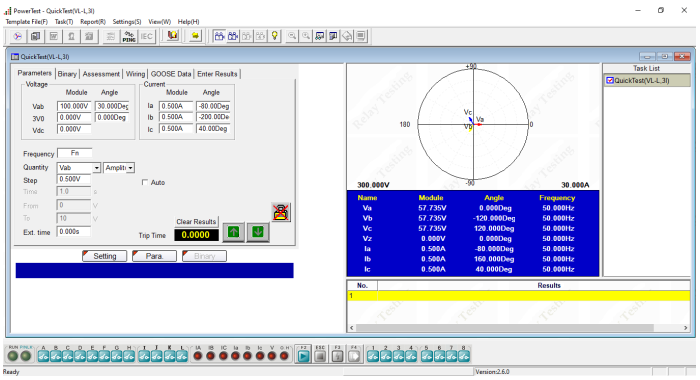
QuickTest (4V,6I)

- ❖ 4 voltage and 6 current sources available for test relay
- ❖ Amplitude, phase angle and frequency of voltage and current sources can be controlled independently
- ❖ Test can be in manual or auto mode



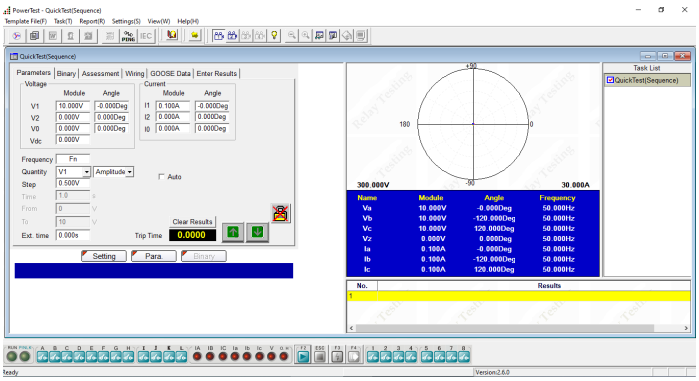
QuickTest (VL-L, 3I)

- ❖ Easy to control the phase-phase voltage, 3V0 (zero sequence voltage) and 3 currents
- ❖ Amplitude, phase angle and frequency of current sources and phase-phase voltage, zero sequence voltage can be controlled independently
- ❖ Test can be in manual or auto mode



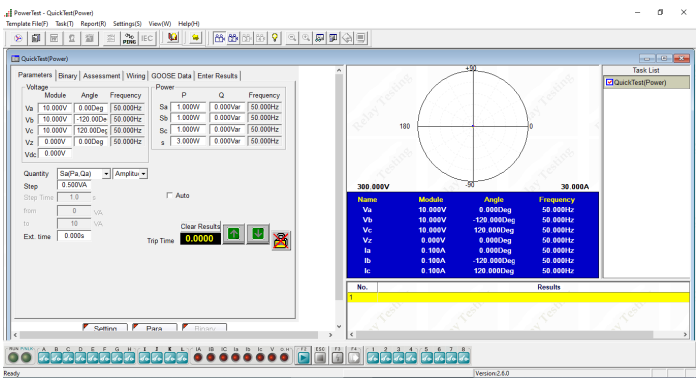
QuickTest (Sequence)

- ❖ Easy to control the sequence components (positive sequence, negative sequence and zero sequence) for voltage and current
- ❖ Amplitude and phase angle of the sequence components of voltage and current can be controlled independently
- ❖ Test can be in manual or auto mode



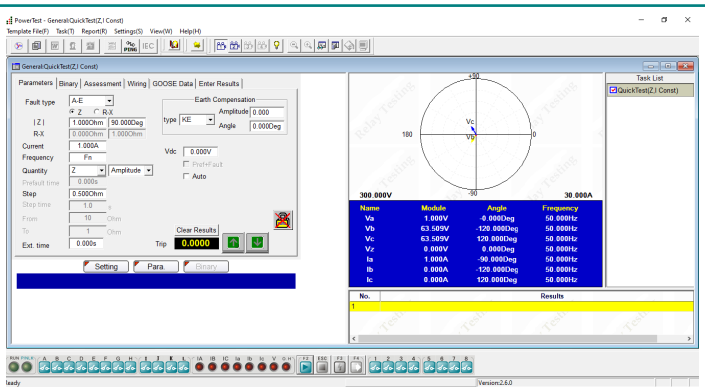
QuickTest (Power)

- ❖ Easy to control the output of power, including active power, reactive power and apparent power
- ❖ Amplitude of active power, reactive power and apparent power can be controlled independently
- ❖ Test can be in manual or auto mode



QuickTest (Z, I Const)

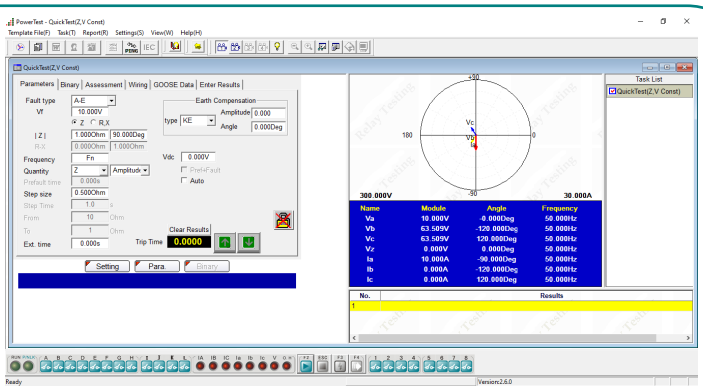
- ❖ Easy to test impedance relay with constant current
- ❖ Set the fault impedance and fault current, obtain the amplitude and phase angle of each phase voltage and current according to the fault type
- ❖ Can manually or automatic search the relay operation value



PowerTest - Relay Test Set Software

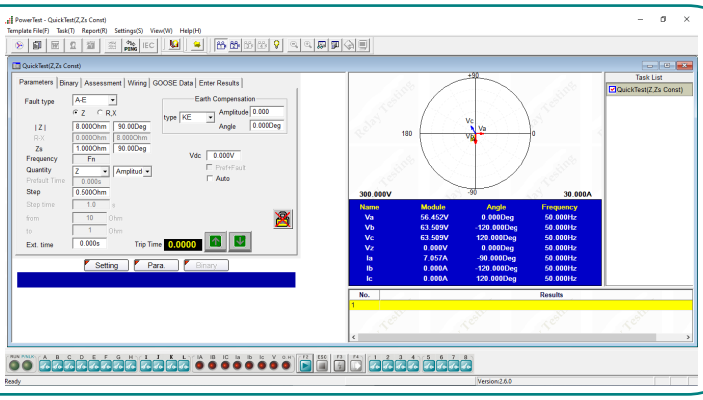
QuickTest (Z, V Const)

- ❖ Easy to test impedance relay with constant voltage
- ❖ Set the fault impedance and fault voltage, obtain the amplitude and phase angle of each phase voltage and current according to the fault type
- ❖ Can manually or automatic search the relay operation value



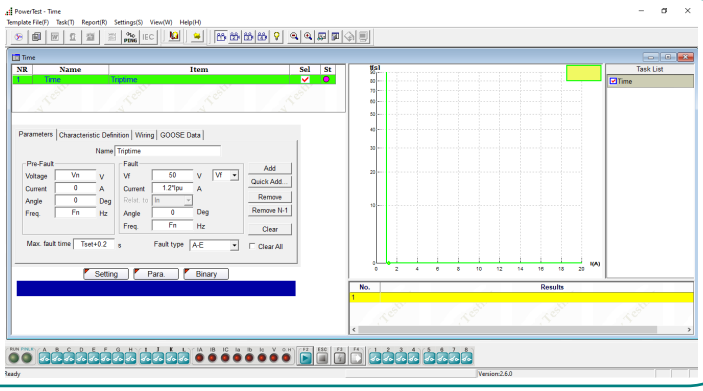
QuickTest (Z, Zs Const)

- ❖ Easy to test impedance relay with constant system impedance
- ❖ Set the fault impedance and system impedance, obtain the amplitude and phase angle of each phase voltage and current according to the fault type
- ❖ Can manually or automatic search the relay operation value



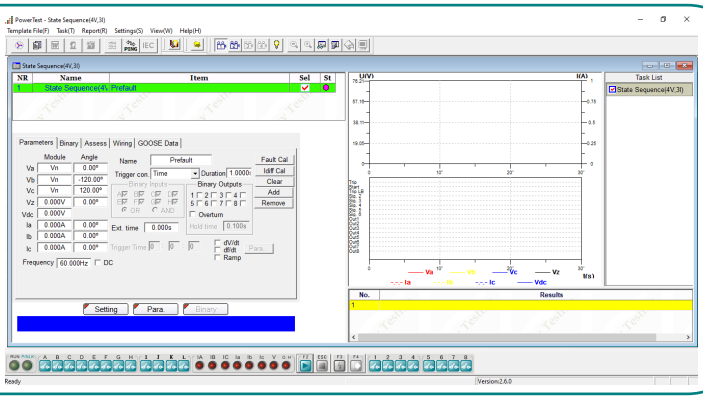
Time

- ❖ Time module is used to test trip delay time of protection relay
- ❖ Various value can be set separately, such as pick up value, delay time, pre-fault time, post-fault time, binary input/output, the voltage and current at pre-fault and fault state, characteristic definition, etc.



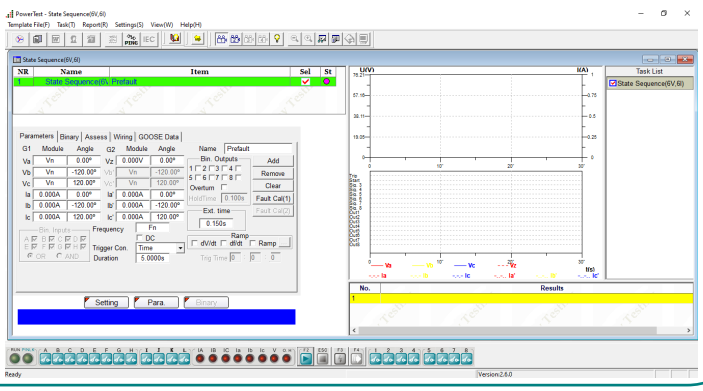
State Sequence (4V, 3I)

- ❖ Used to define multiple continuous state sequences for special test applications, such as generate a series of states to test the tripping time and close time
- ❖ 4 voltage and 3 current sources available for each state
- ❖ Trigger condition in each state can be set separately



State Sequence (4V, 6I)

- ❖ Used to define multiple continuous state sequences for special test applications, such as generate a series of states to test the tripping time and close time
- ❖ 4 voltage and 6 current sources available for each state
- ❖ Trigger condition in each state can be set separately

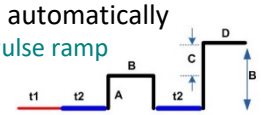


PowerTest - Relay Test Set Software

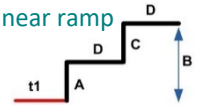
Ramp (3I)

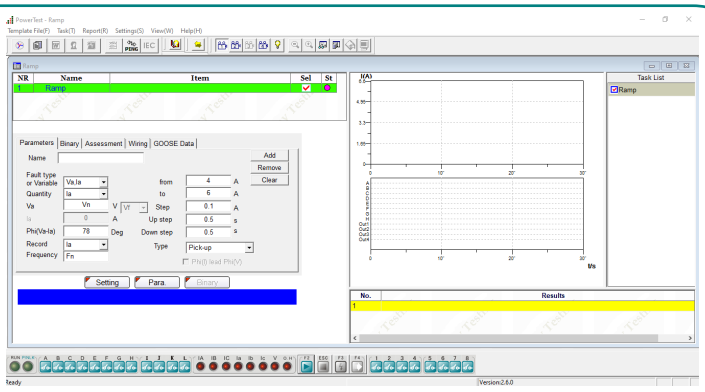
- Specially designed to realize RAMP for different test applications, such as pick up/drop off value checking, directional relay testing, maximum torque angle checking etc.
- Both pulse ramp and linear ramp available
- Can search the relay operation value automatically

Pulse ramp



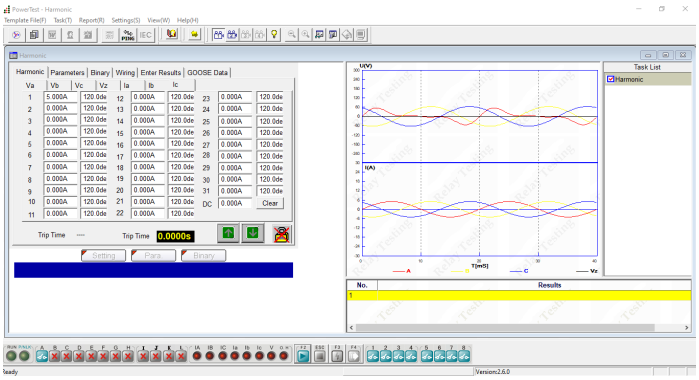
Linear ramp





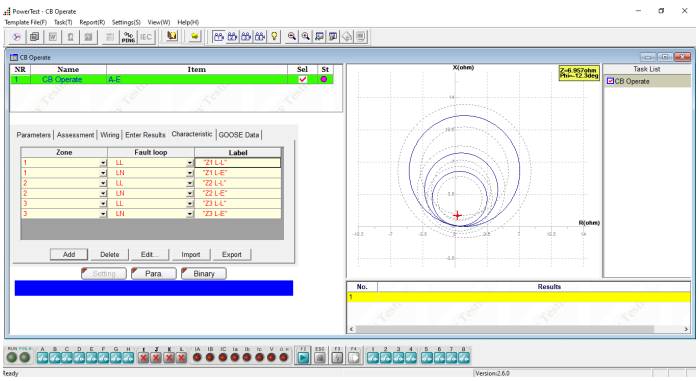
Harmonic

- Can generate harmonics for all voltage and current outputs
- Can check the 2nd /3rd / 4th /5th harmonic restraint of current differential
- Can check the harmonic measurement of the relay up to 31st harmonic
- Can set the harmonic for each channel separately



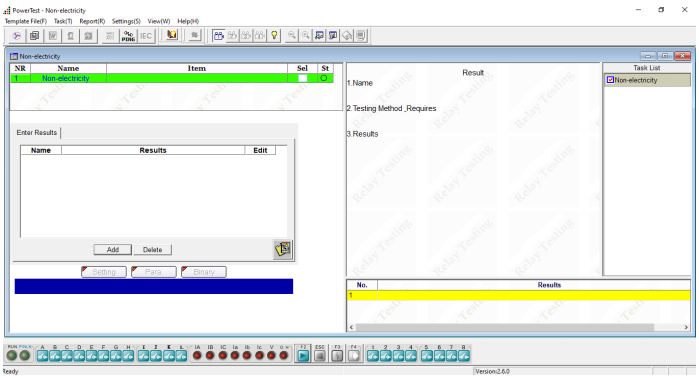
CB Operate

- Can check different types of line protection system, including over current, distance, etc.
- Can check the whole relay system, including auto-reclosing and circuit breaker simulate
- Can set different fault type
- Can do end-to-end test with GPS control mode



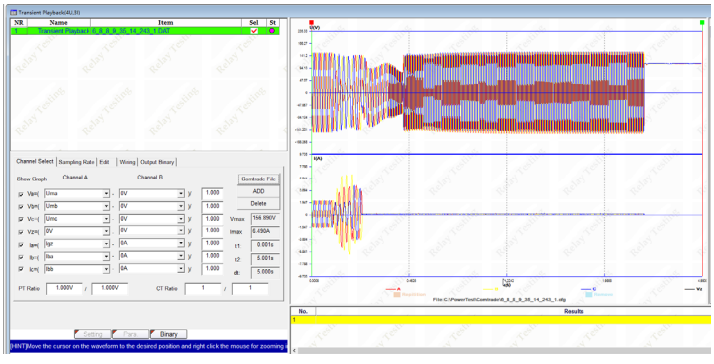
Non-electricity

- Give tips before and after testings to have test scheme prepared well and finished well
- Neither has any output value nor judge the binary input. It only generates a complete report for project check from appearance and safety.



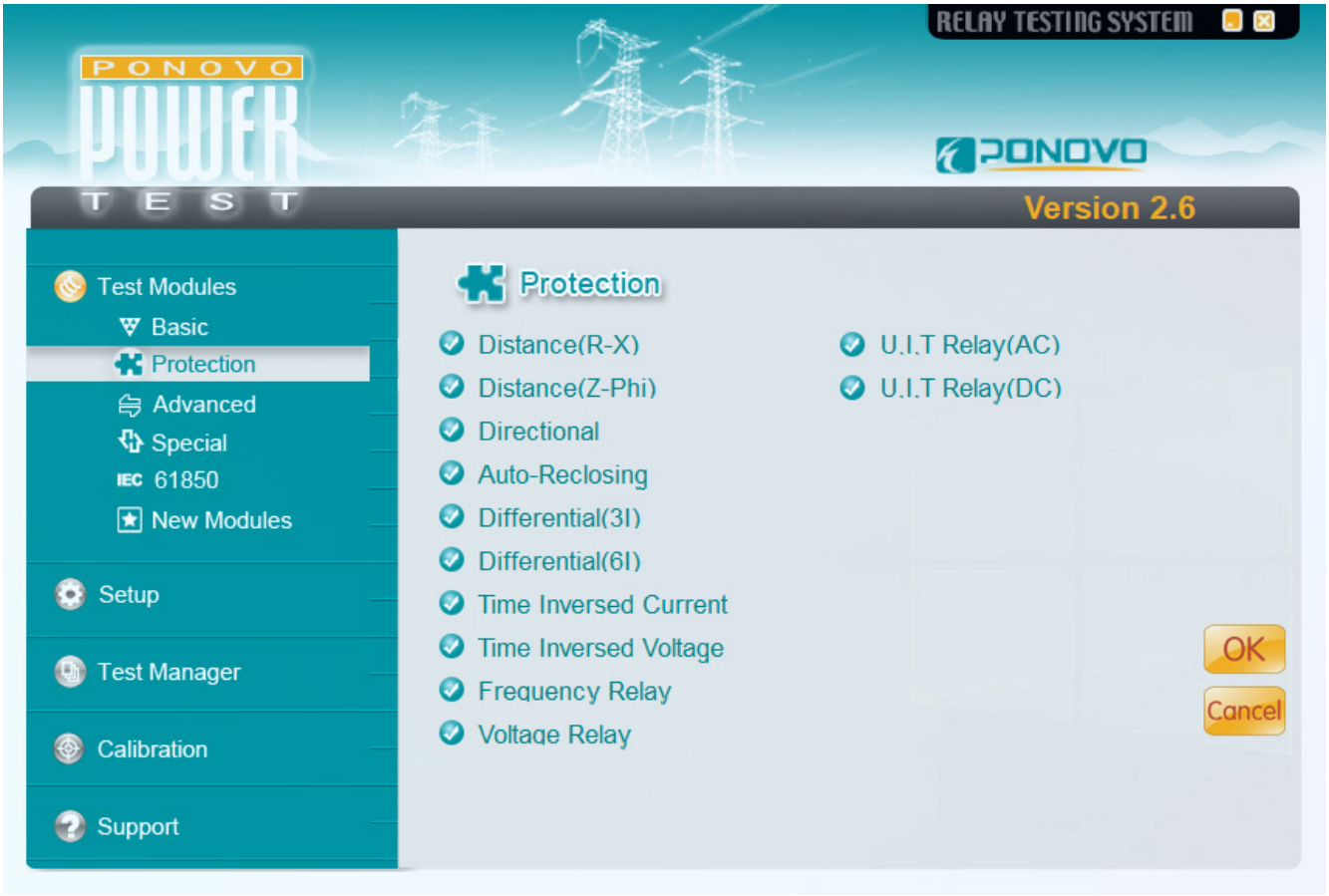
Transient Playback (4V,3I)

- Can play back the COMTRADE format file which records 4 voltage channels and 3 current channels
- Display the waveform and data of the imported COMTRADE file



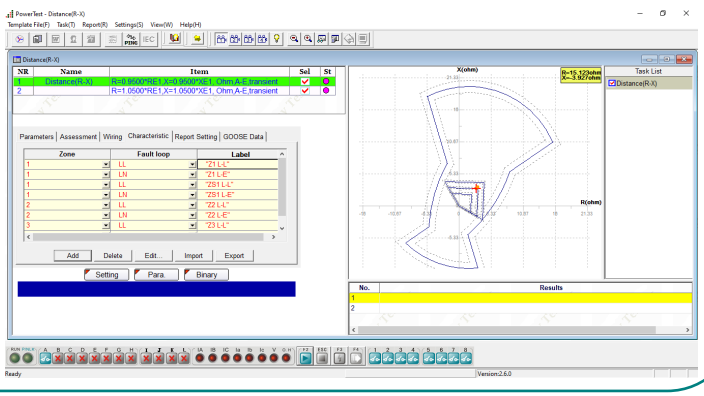
➢ Protection Package

In protection package, there are more testing modules for relay's characteristics testings, such as Distance, Differential, Directional, Time Inversed Current, Time Inversed Voltage, Frequency, Auto-Reclosing etc.



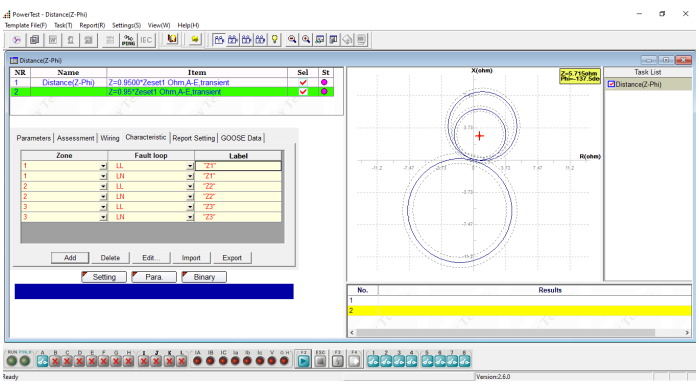
Distance (R-X)

- ❖ Can test impedance relay with R-X setting in different ways
- ❖ Input impedance characteristic to Z plain
- ❖ Associate the characteristic with relay settings
- ❖ Select test point/ items directly on Z plain or in setting box
- ❖ Zone verification
- ❖ Z-T test
- ❖ Edit new characteristic



Distance (Z-Phi)

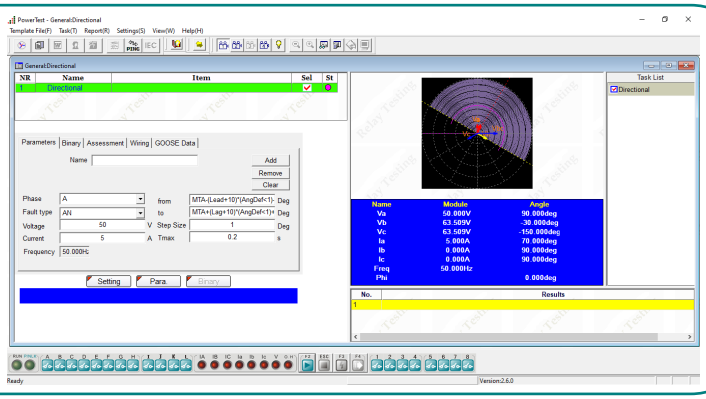
- ❖ Can test impedance relay with Z-Phi setting in different ways
- ❖ Input impedance characteristic to Z plain
- ❖ Associate the characteristic with relay settings
- ❖ Select test point/ items directly on Z plain or in setting box
- ❖ Zone verification
- ❖ Z-T test
- ❖ Edit new characteristic



PowerTest - Relay Test Set Software

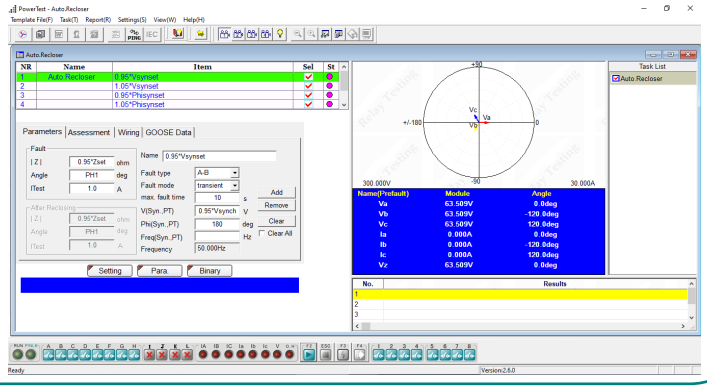
Directional

- Can search maximum torque angle and two boundary angles (Lead and lag angles)
- Can set angle define, V lead I or I lead V
- Can set fault type, singe phase, phase-phase or three phase fault



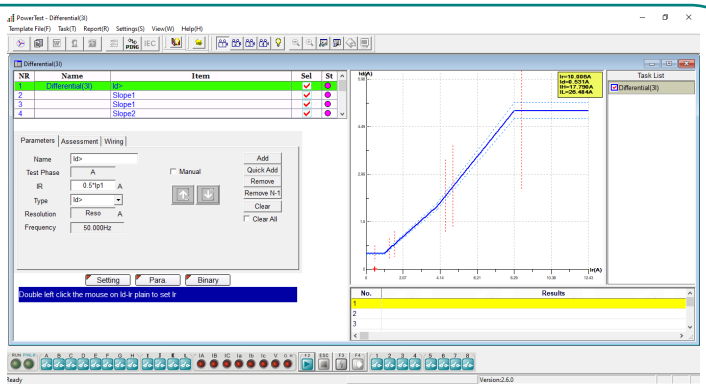
Auto-Reclosing

- Can test the reclose function
- Realize relay automatic reclosing with checking the difference between two systems, checking the synchronization setting, reclose set time checking and automatic evaluating of testing results.



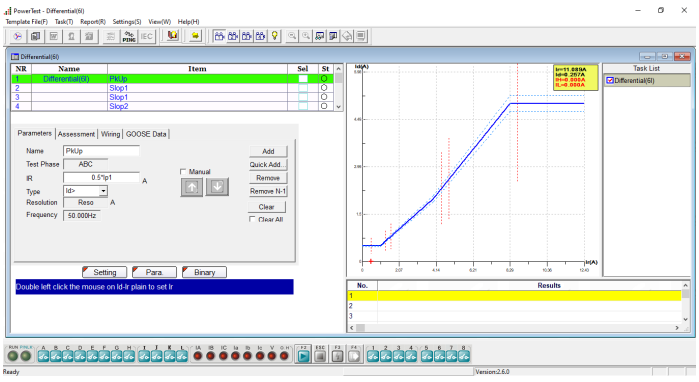
Differential (3I)

- Can search out the percentage restraint curve, harmonic restraint, trip time for single phase fault
- Can search the percentage restraint curve
- Can check 2nd harmonic restraint
- Can check 3rd harmonic restraint
- Can check 5th harmonic restraint
- Can check tripping time of set points



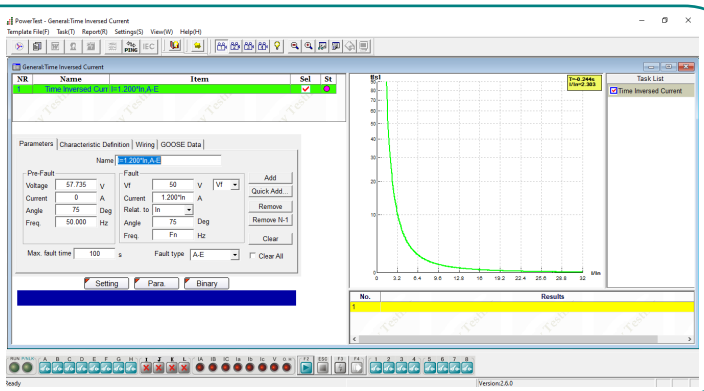
Differential (6I)

- Suitable for 6 output current channels' relay tester, such as transformer, generator and bus bar etc. differential protection equipment test
- Realize the two sides 3 phase/phase-phase/single phase test between relay tester and relay equipment.
- Can search the percentage restraint curve, harmonic restraint, trip time



Time Inversed Current

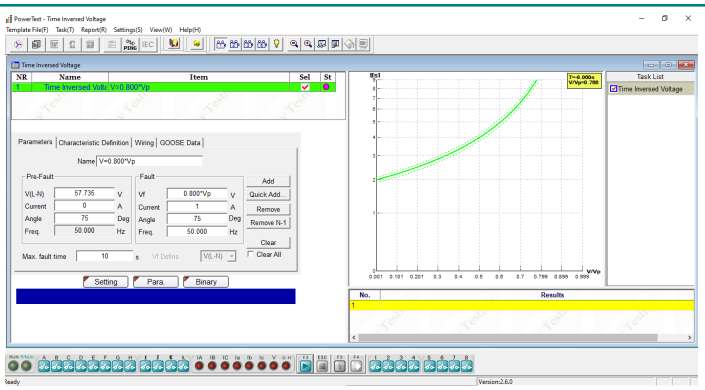
- Realize the directional over-current test and non-directional over-current test
- Include testing positive sequence, negative sequence and zero sequence inverse-time over-current, definite-time over-current, over-heat protection.
- Can import the IEC and IEEE standard curve or user defined curve



PowerTest - Relay Test Set Software

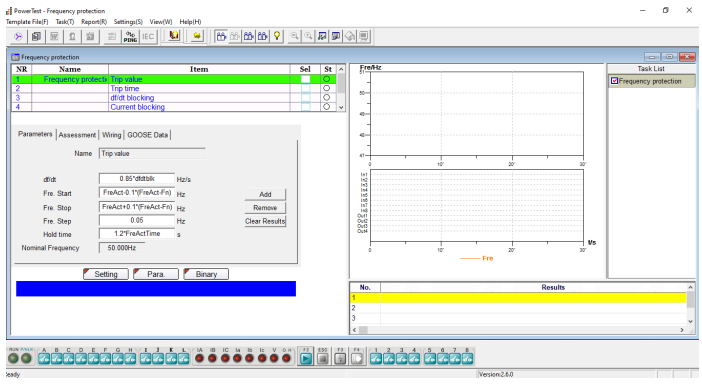
Time Inversed Voltage

- ❖ Can test time inversed over voltage and time inverse under voltage relay
- ❖ Include testing directional, time definite and with time delay voltage relay
- ❖ Can simulate three phase, phase-earth fault, and phase-phase fault



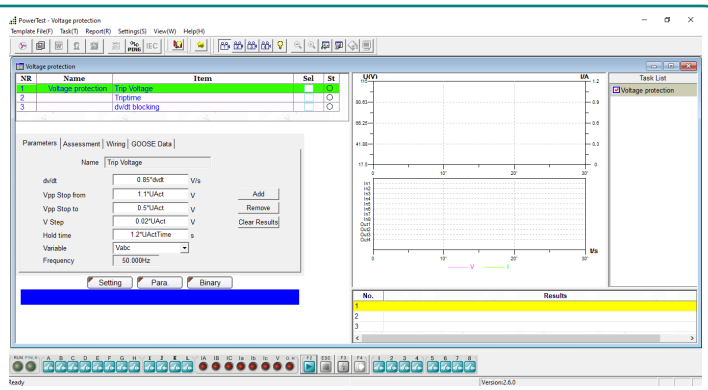
Frequency Relay

- ❖ Can test frequency protection relay, such as over frequency, under frequency, df/dt trip, df/dt blocking
- ❖ Including pick up frequency, trip time, df/dt setting value, voltage blocking value and current blocking value test



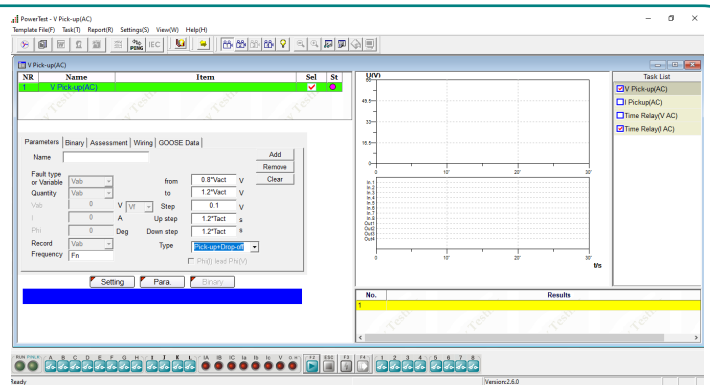
Voltage Relay

- ❖ Can test voltage protection relay including under voltage and over voltage
- ❖ Can test pick up voltage, trip time and dv/dt setting value



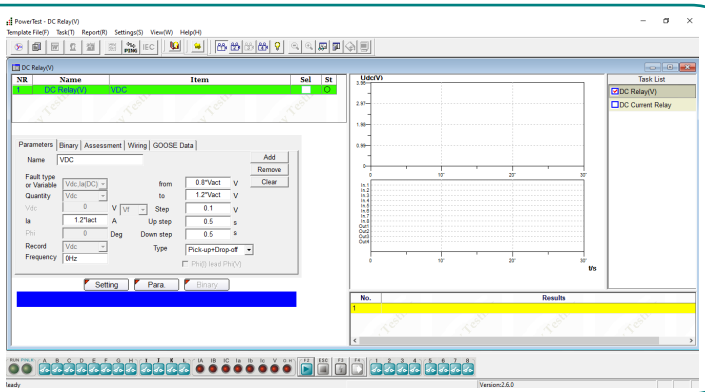
U. I. T Relay (AC)

- ❖ Can test AC type auxiliary/intermediate relay and AC type time relay
- ❖ Can test AC voltage type electromagnetic relay
- ❖ Can test AC current type electromagnetic relay
- ❖ Can test electromagnetic time relay picked-up by AC voltage
- ❖ Can test electromagnetic time relay picked-up by AC current



U. I. T Relay (DC)

- ❖ Can test DC type voltage relay. Auxiliary DC source Vdc is used for this test. Also DC current can be generated for some relays when it is required.
- ❖ Can test DC type current relay. Current source is used for this test. DC voltage can be generated for some relays when it is required.

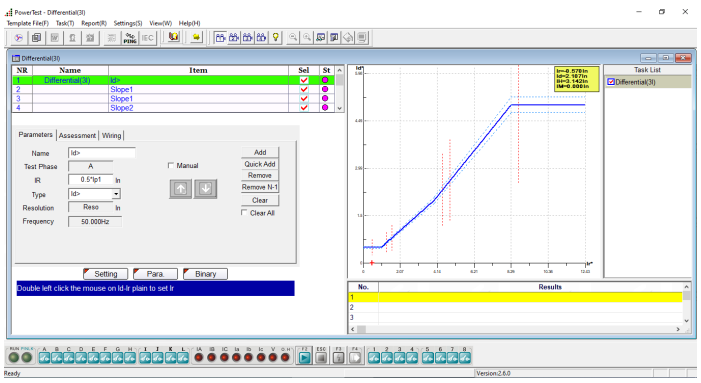


➢ Advanced Package

In the advanced package, the centralization testing the RX Characteristic Sweep, testing for distance relay, Advanced Differential, Advanced Transplay, Synchronization, etc.

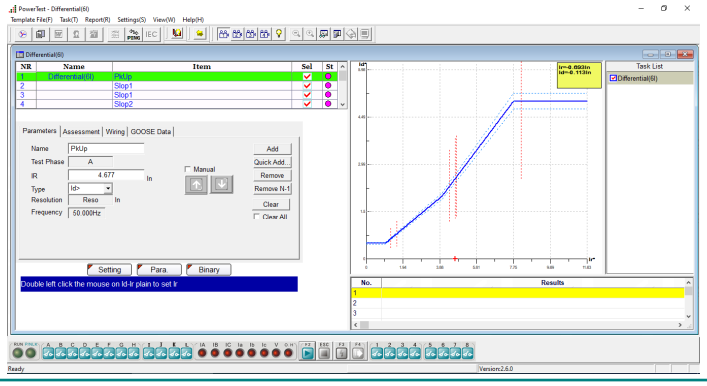
Advanced Differential (3I)

- ❖ Can search the percentage restraint curve, harmonic restraint, trip time for single phase fault
- ❖ Can automatic to calculate the matching factor via the transformer parameter and CT/PT parameter
- ❖ Only check single phase fault



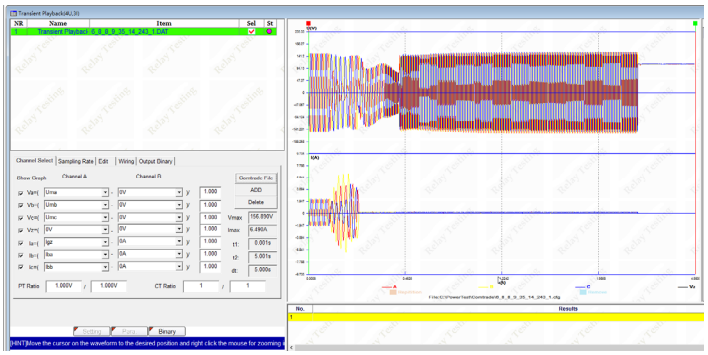
Advanced Differential (6I)

- ❖ Can search the percentage restraint curve, harmonic restraint, trip time
- ❖ Can automatic to calculate the matching factor via the transformer parameter and CT/PT parameter
- ❖ Can test single phase, phase-phase， three-phase fault



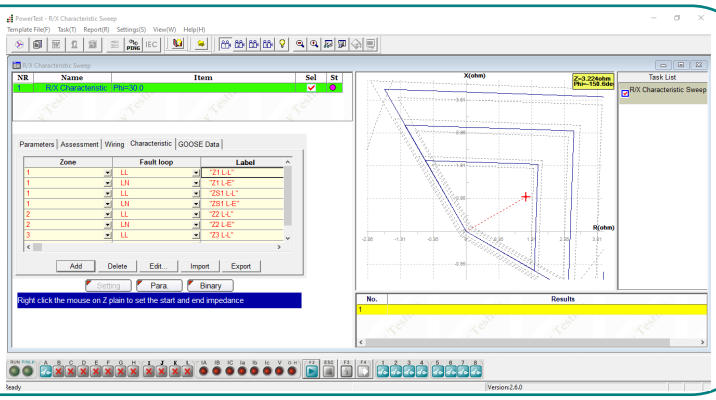
Advanced TransPlay(4V,3I)

- ❖ Can play back the COMTRADE format file, including CFG, which describe signal names, sampling frequencies, etc. and DAT which contains the sampling values for each channel.
- ❖ Can edit the COMTRADE data



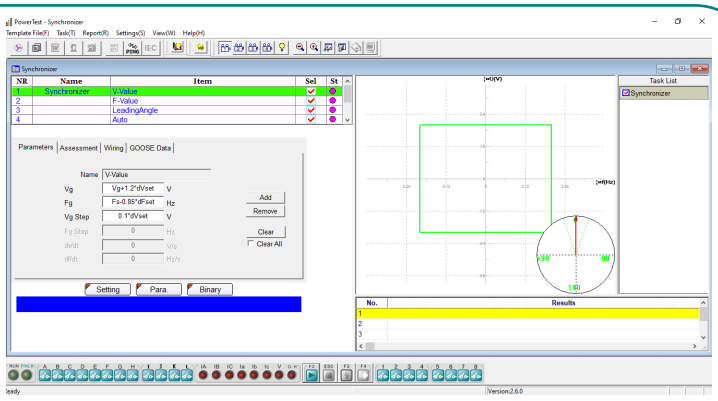
RX Characteristic Sweep

- ❖ Can search the characteristic boundary of the impedance relay
- ❖ Can find the boundary at different angles



Synchronizer

- ❖ Can check synchronizing relay
- ❖ Can check voltage difference
- ❖ Can check frequency difference
- ❖ Can check leading time and leading angle
- ❖ Can check pulse width for frequency adjustment
- ❖ Can check pulse width for voltage adjustment
- ❖ Can check auto-adjusting function with both voltage and frequency varying

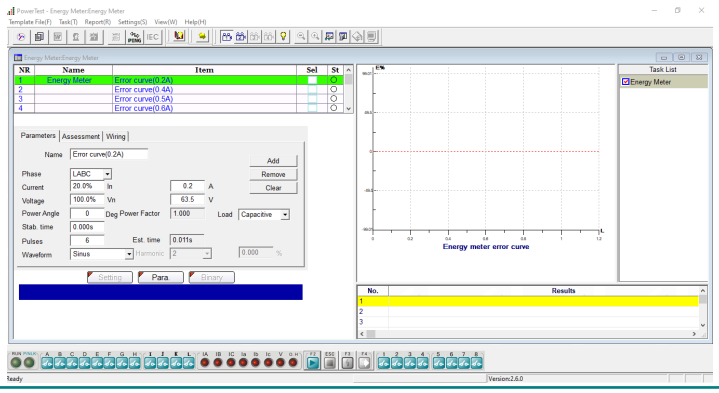


➢ Special Package

In the special package, there are Energy Meter, High Burden Relay, Power Swing Simulation, Transducer and Time Inversed Current (Sp) modules.

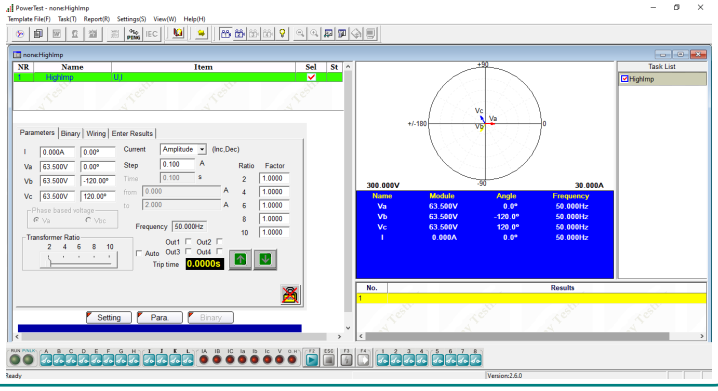
Energy Meter

- ❖ Can check the functionality and accuracy of energy meter with or without optional accessory PACB108
- ❖ 1-phase or 3-phase energy meters can be checked
- ❖ Active power meter, reactive power meter, and apparent power meter can be checked



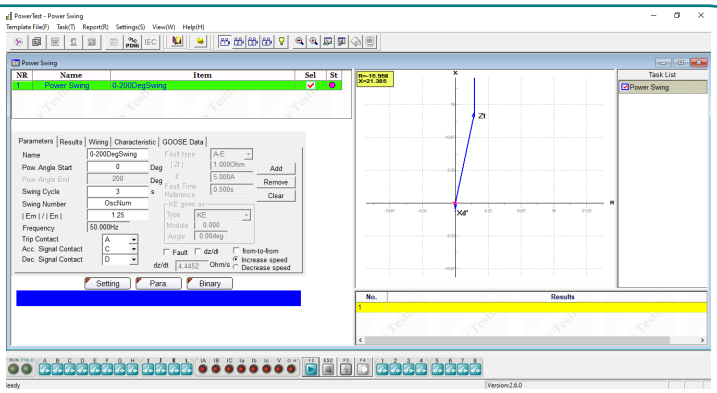
High Burden Relay (Optional)

- ❖ Can test trip current, time and direction of high burden relay, with PONOVO tester and accessory PHPC01
- ❖ Both manual and auto methods can be applied



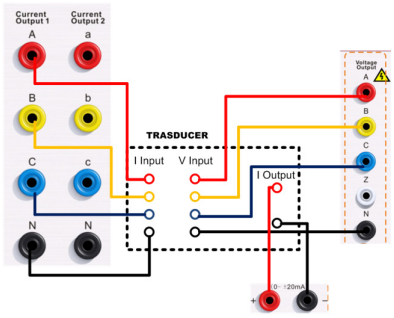
Power Swing Simulation

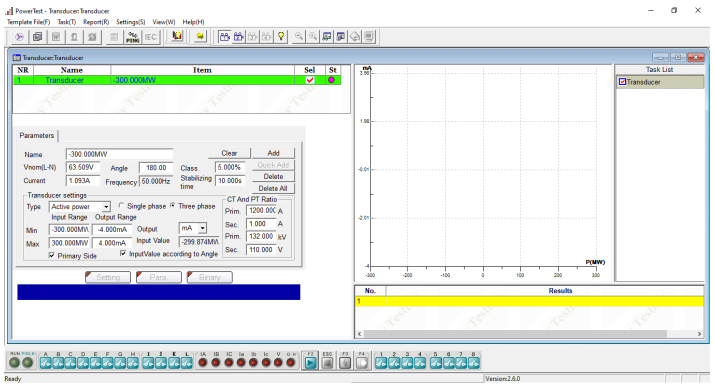
- ❖ Can really simulate the oscillations in power flow reference the power parameter
- ❖ Can simulate Out-of-Step and Stable swing
- ❖ Can simulate increase and decrease swing
- ❖ Can be a tool for relay test engineer to observe the relay behavior during dynamic power swing process.



Transducer

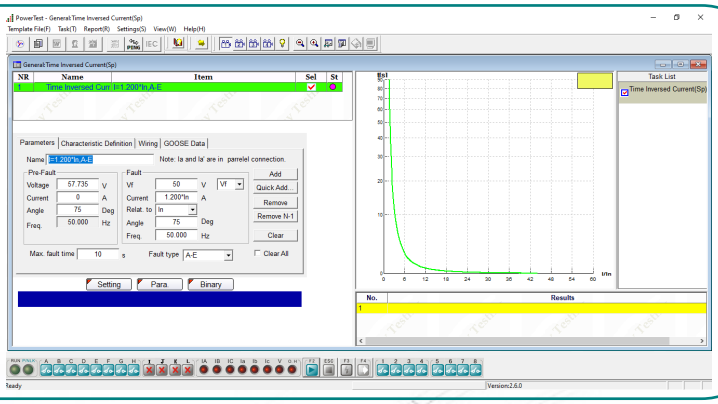
- ❖ Can check accuracy of transducer





Time Inversed Current (Sp) (optional)

- ❖ Realize the directional over-current test and non-directional over-current test
- ❖ Include testing positive sequence, negative sequence and zero sequence inverse-time over-current, definite- time over-current, over-heat protection or the customized "Current/Time" operation characteristics

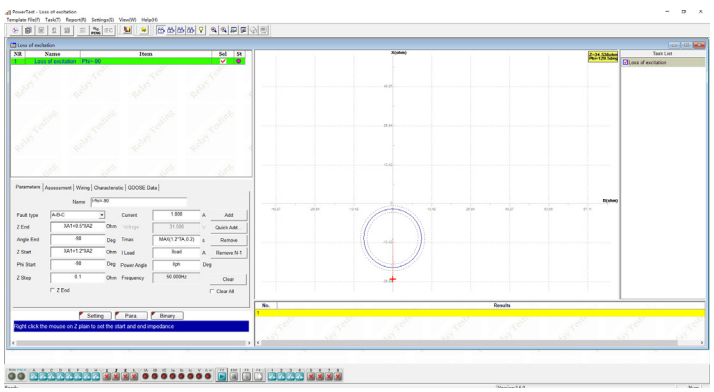


➢ New Modules Package

In the New Modules package, there are loss of excitation, QuickTest(harmonic), Transplay(6V, 6I) and QuickTest(Low Level) modules.

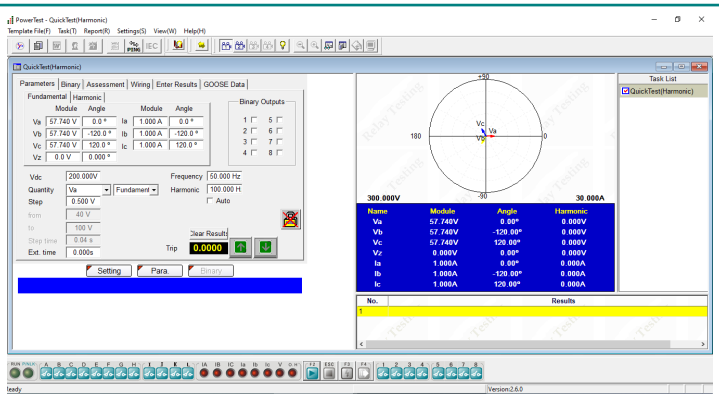
Loss of excitation

- Can search for two different excitation loss characteristics
- During the test process a series of shots will be generated to search out the boundary along this shot line. Then next shot at a different angle will be generated. In this way we can then find out the boundary at different angles.



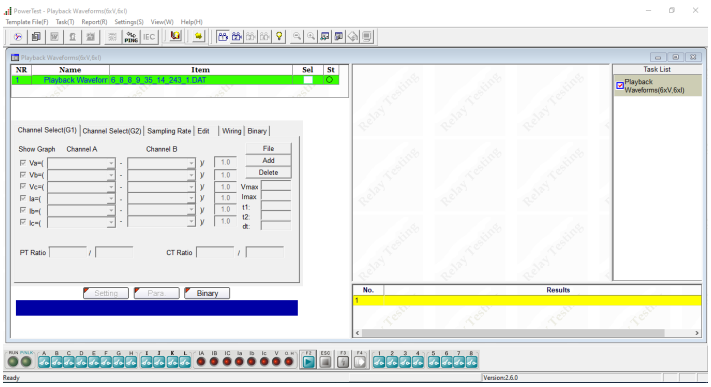
QuickTest (Harmonic)

- Can automatically and manually superposition harmonics with user-defined frequency
- The fundamental and harmonic of voltage and current sources can be controlled independently



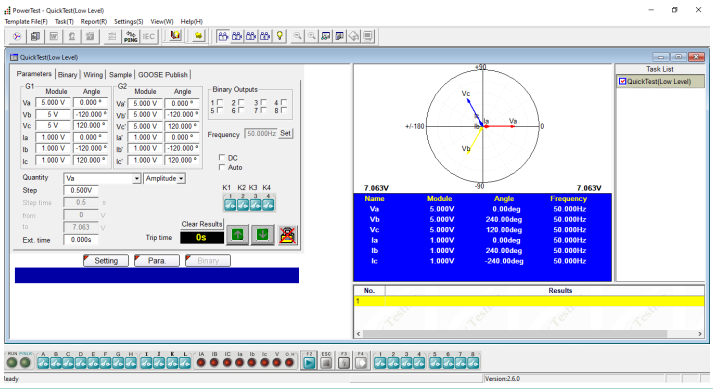
Transplay (6V, 6I)

- ❖ Can play back the COMTRADE format file which records 4 voltage channels and 6 current channels
- ❖ Display the waveform and data of the imported COMTRADE file



QuickTest (Low Level) (Optional)

- ❖ 12 low level voltage sources available for test purpose

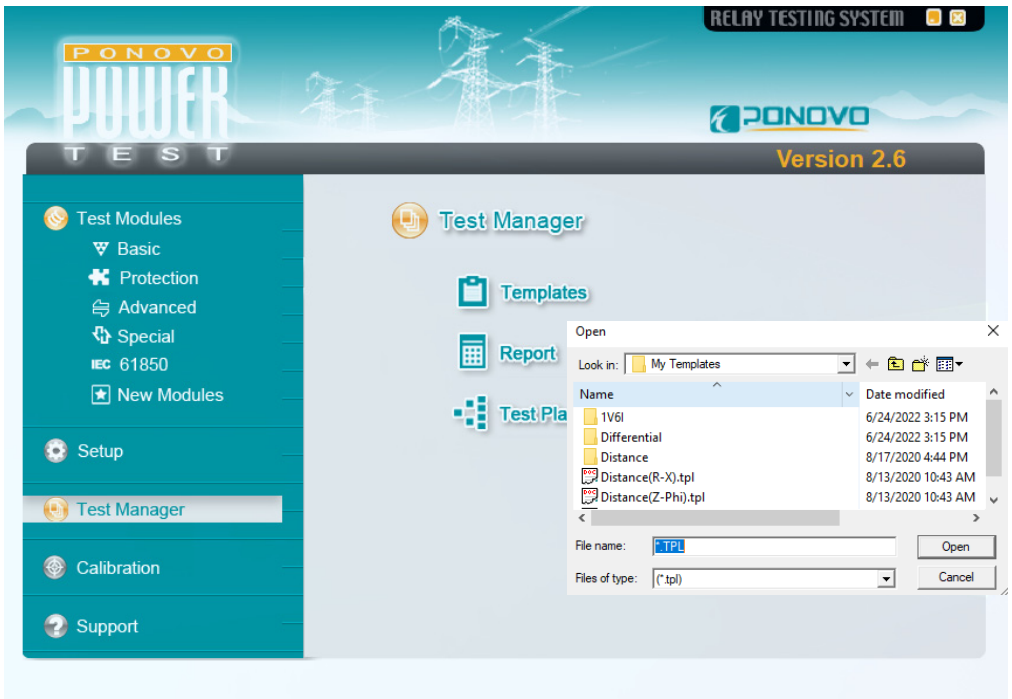


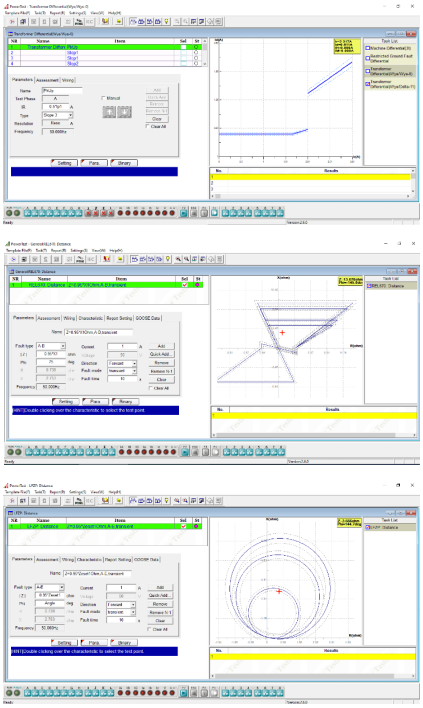
PONOVO Template Service

Besides the above standard test modules, the relay templates are provided for the automatic testing purposes. Every relay template is created based on each relay model and its function from different relay manufacturers, and the setting names in the templates are the same as what they are in the relay, so it is easy for the engineer to conduct the site testing and simplify the works greatly. There are more than 500 different relay templates available for customers to download from the website for free.

The CSV/RIO/XIRO files can be imported into the templates by PowerTest.

The optional service such as offering the customized templates and reports is provided by PONOVO.





More Templates can be download from our website www.ponovo.net

AREVA

- CAG17
- CTIG
- CTIGM
- CTMFM
- CTMM
- CTNM
- CTT
- CTTM
- CTU
- DIFB
- MFVUM
- Micromho
- MVAPM
- MWTU
- Optimho
- P111
- P115
- P120
- P121
- P122
- P123
- P124
- P127
- P141
- P142
- P143
- P144
- P145
- P241
- P242
- P243
- P342
- P343
- P344
- P345
- P430
- P433
- P435
- P436
- P437
- P438
- P441
- P442
- P443
- P921
- P922
- P923
- P940
- P941
- P942
- P943
- PPX
- PVMM
- Quadromho
- SKE
- SKD
- VAGM22
- VAPM
- P632
- P633
- P634
- P642
- P643
- P645
- •••

SEL

- SEL300
- SEL351
- SEL587
- SEL311B
- SEL487B
- SEL487E
- SEL167
- SEL411
- SEL311C
- SEL311L
- SEL321
- SEL421
- SEL501
- SEL587
- •••

SIEMENS

- 7RW600
- 7SA6XX
- 7SA511
- 7SA513
- 7SA518
- 7SA519
- 7SA522
- 7SD5
- 7SD52
- 7SD63
- 7SJ61
- 7SJ63
- 7SJ80
- 7SS52
- 7ST6
- 7UM61
- 7UM62
- 7UM512
- 7UM515
- •••

ABB

- LZ96
- REG100
- REL511
- REL531
- MSOC
- RAZFE
- REB670
- REC670
- REF542
- REG216
- REL300
- REL316
- REL350
- REL352
- REL356
- REL511
- REL512
- REL521
- REL531
- REL561
- REL650
- REL670
- •••

NR

- PCS-902
- RCS-915
- RCS-931
- RCS-993
- RCS-902
- PCS-9611
- PCS-902H
- PCS-931D
- PCS-9611C
- •••

GE

- SR489
- SR745
- F650
- SR750
- GT60
- D60
- DLPD
- G30
- L90
- GE345
- •••

Schneider Electric

- SEPAM 10
- SEPAM 80
- SEPAM 2000
- SEPAM S42
- T20
- •••

WOODWARD

- MRA4
- MRDT4
- MRI4
- MRM
- MRN
- •••

TOSHIBA

- GRB100
- GRD110
- GRD140
- GRD150
- GRF100
- GRL100
- •••

ERL

- F _PRO
- L _PRO
- T_ PRO
- •••

VAMP

- VAMP 255
- VAMP 265
- •••

SIFANG

- 326GD
- •••

www.adv-cs.com

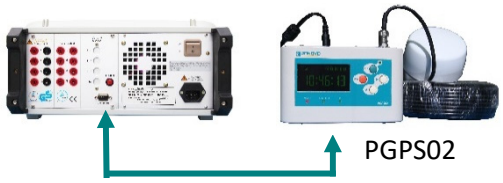
- PCT210
- •••

Optional Accessories

- **PW-VP50 CT Polarity checker**

2 units. Master machine injects pulse current to primary side of CT, slave machine receives and analysis the waveform of induced pulse current at the secondary side so as to judge the polarity is positive or negative automatically by the LED indicator on the kits.

- **GPS synchronization (PGPS02/PGPS04i)**



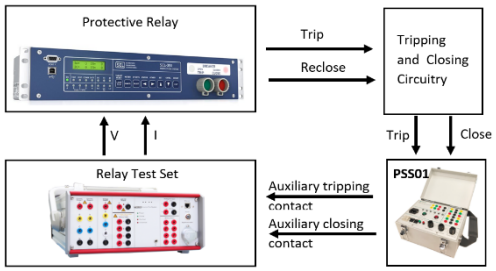
PGPS02

PGPS04i

PGPS02: It provides GPS synchronization signal in PPS (pulse per second) or PPM (pulse per minute) for synchronized test. Trigger time can be set for end- to-end test application.

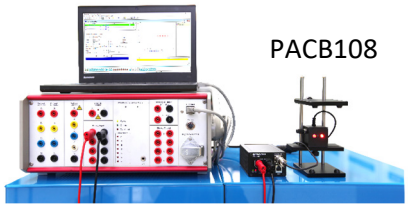
PGPS04i: The PGPS04i is a multi-functional time synchronization device that integrates with GPS time synchronization, IRIG-B (DC-TTL/DC-RS422/optical) outputs, IRIG-B (DC-TTL/DC-RS422/fiber) pulse input, 1PPS/1PPM (DC-TTL/DC-RS232 /fiber) pulse output, timing set of whole trigger points, real-time clock auto-generating and other relevant functions.

- **Circuit breaker simulator (PSS01)**



Working together with PONOVO relay testing device, PSS01 is to be used to simulate the circuit breaker operation for checking the relay scheme performance. Complicated software settings can be avoided by using this simple accessory.

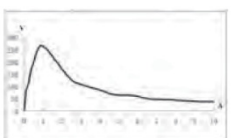
- **Scanning Head (PACB108)**



PACB108

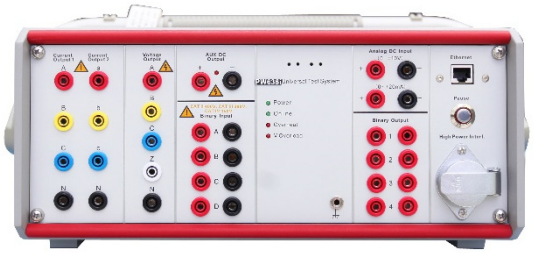
The passive optical scanning head PACB108 detects the status of an LED, that is either an optical pulse output from an energy meter or the binary status of a protective relay or other similar optical source.

- **Current Booster (Phpc01)**



Phpc01 current booster is designed to supply high compliance voltage even at small current range, suitable for testing high burden electromagnetic current relays.

PW636i
Protection Relay Test Set



Specifications

Voltage generators

Setting range

4-phase ac(L-N)	4×0~300V
1-phase ac(L-L)	1×0~600V
dc (L-N)	4×±0~300V
dc (L-L)	1×±0~600V

Power

4-phase ac(L-N)	4×75VA typ., at 300V 4×50VA guar., at 300V
3-phase ac(L-N)	3×100VA typ., at 300V 3×85VA guar., at 300V
1-phase ac(L-L)	1×200VA typ., at 600V 1×170VA guar., at 600V
dc (L-N)	4×100W at 300 V
Accuracy	error<0.08% rd.+0.02% rg. guar. at 0~300V error<0.03% rd.+0.01% rg. typ. at 0~300V
Ranges	300V
Resolution	10mV for 300Vac
Distortion	<0.05% typ., <0.1% guar.

Current generators

Setting range

6-phase ac(L-N)	6×0~32A
3-phase ac(2L-N)	3×0~64A
1-phase ac(6L-N)	1×0~180A
dc (6L-N)	1×±0~180A

Power

6-phase ac(L-N)	6×450VA typ. at 32A 6×400VA guar. at 32A
3-phase ac(2L-N)	3×800VA typ. at 64A 3×700VA guar. at 64A
1-phase ac(6L-N)	1×1200VA typ. at 180A 1×1000VA guar. at 180A
1-phase dc(6L-N)	1×1400W typ. at 180A 1×1000W guar. at 180A
Max compliance voltage(L-N)(L-L)	21Vpk/42Vpk
Accuracy	error 0.15% rd.+0.05% rg. guar., at 0~32A error<0.05% rd.+0.02% rg. typ., at 0~32A
Ranges	32A
Resolution	1mA
Distortion	< 0.05% typ. (< 0.1% guar.)

General

Frequency

Sine signal	DC, 0.001Hz~1000Hz
Transient signal	DC~10.0 kHz
Accuracy	±0.3ppm
Resolution	0.001Hz

Phase

Angle range	-360°~+360°
Accuracy	<0.05° typ., <0.1° guar. at 50/60Hz
Resolution	±0.001°

Auxiliary dc supply

Voltage range	0~300V
Power	88W at 110V, 176W at 220V, 90W at 300V
Accuracy	error < 0.1 % rg. typ. <0.5 % rg. guar.

Power supply

Nominal input voltage	110~240Vac
Permissible tolerance	90~260Vac
Nominal frequency	50/60Hz
Permissible frequency	45~65Hz

Binary inputs group 1

Number	8
Input characteristics	0~400Vdc/ac peak threshold or potential free
Sample rate	20kHz
Time resolution	50µs
Max. measuring time	Infinite
Debounce/Deglitch time	0~25ms
Counting function	<3kHz at pulse width>150µs
Galvanic isolation	8 galvanically isolated

Binary inputs group 2

Number	4
Input characteristics	0~+5Vdc or dry contact
Sample rate	25kHz
Time resolution	40µs
Max. measuring time	Infinite
Debounce/Deglitch time	0~25ms
Max. counting frequency	25kHz
Pulse width	>3µs
Threshold voltage	2V
Voltage hysteresis	0.8V
Max. input voltage	+5V
Galvanic isolation	1 galvanically isolated

Binary outputs, relay

Number	4 (front side)
Type	Potential free relay contacts, software controlled
Break capacity ac	Vmax: 300Vac /Imax: 8A /Pmax: 2000VA
Break capacity dc	Vmax: 300Vdc /Imax:8A /Pmax: 150W

Binary outputs, semiconductor

Number	4 (rear side)
Type	semiconductor
Break capacity dc	Vmax: 300Vdc /Imax:0.5A /Pmax: 150W
Update rate	100µs
Imax	0.5A

DC voltage measuring inputs

Measuring range	0~±10V
Accuracy	error <0.02% rg.typ. <0.05% rg. guar.
Input impedance	100KΩ

DC current measuring input

Measuring range	0~±20mA
Accuracy	error <0.02% rg. typ. <0.05% rg. guar.
Input impedance	50Ω

In-built monitoring and recording

Monitoring	currents and voltage outputs
Recording	analog outputs, binary inputs/outputs status
Mode	real time monitoring, no external wiring is required
Recording length	16s

Low level outputs

Setting range	12×0~10Vpk
Max. output current	1mA
Accuracy	error < 0.025% typ. < 0.07% guar. at 1~10Vpk
Resolution	250µV
Distortion(THD+N)	< 0.05% typ. (< 0.1% guar.)
Connection	19 pin combination socket (rear side)

IEC61850 Goose function (Optional)

Interpretation hardware is in-built. Please contact the supplier for options to activate the IEC61850 software support Goose function

Environmental conditions

Operation temperature	0~+50°C
Storage temperature	-25~+70°C
Relative humidity	5~95% non-condensing
EMC(E&I)	EN/IEC 61326-1 EN/IEC 61000-3-2/3 EN/IEC61000-4-2/3/4/5/6/8/11/18
Environment	EN/IEC 60068-2-1/2/3/6/27
Safety	EN/IEC 61010-1/1-12/2-030 EN/IEC 60255-25/27
Others	FCC Part 15:Sub B ECS-001:2006 LVD EU

Developed and manufactured under an ISO 9001: 2015 registered system

Others

PC connection	Ethernet,10M/100M
External amplifier interface	Circular connector
Current booster interface	Circular connector
GPS interface	DB9/TTL
Ground Socket(earth)	4mm banana socket, front side
Weight	20kg
Dimensions (W x H x D)	360mm ×157mm×427mm

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 aboard*

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