



PNS330i Series Digital Protection Relay Test Set

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





PNS330i Series Digital Protection Relay Test Set

PNS330i Series Digital Protection Relay Test Set is a handheld testing product launched by PONOVO. It includes 3 models, PNS330i-3, PNS330i-6 and PNS330i-6A. The weight of the whole machine is approximately 3kg. It has high-precision analog voltage and current output and multi-channel optical digital interface, also can output of analog and digital quantities at the same time, fully satisfied the requirements of

conventional secondary equipment testing and intelligent secondary equipment testing.

PNS330i Series adopts Linux operating system, supports multiple communication methods such as Wi-Fi and Bluetooth, and can connect with mobile terminals and cloud servers.

PNS330i Series is a new generation of testing tools for the operation and maintenance of secondary equipment in substations.

3 Models

- PNS330i-3: 4*120V, 3*10A, 4 pairs of optical Ethernet ports.
- PNS330i-6: 6*120V, 6*10A; 4 pairs of optical Ethernet ports.
- PNS330i-6A: 6*120V, 6*10A.

Features

- 10.4-inch full touch LCD screen for operation
- Powered by a built-in lithium battery, the battery can be removable and replaceable
- Optical IRIG-B time synchronization interface, IEEE1588 time synchronization interface, GPS time synchronization interface
- Wi-Fi and Bluetooth communication interface

Applications

- Support quick test, state sequence, harmonic, ramp, differential protection, distance protection, the whole group transmission, zero sequence protection, overcurrent protection, reclose and post reclosing acceleration etc.
- SMV receiving analysis RMS, waveform, harmonic, vector diagram, sequence component, power, dual AD, phase check, polarity, packet statistics, message monitoring etc.
- GOOSE receiving analysis real-time value, variable bit list, packet statistics, message monitoring, GOOSE sending mechanism detection etc.
- Graphical SCD: realized graphical analysis of SCD, displaying virtual terminal wiring connection.
- Advanced application:
 - MMS communication function
 - Automatic test function

PNS330i Series Digital Protection Relay Test Set

➤ Protection relay & measurement and control devices in traditional and intelligent substation

PNS330i series support analog and SMV output, can test secondary devices such as traditional or intelligent substation protection relay and measurement and control devices. It can receive GOOSE and binary from intelligent devices.

GPS / IRIG-B / IEEE1588



PNS330i Series

Analog, IEC61850-9-2, IEC60044-7/8

GOOSE / Binary



Relay



PNS330i Series test traditional protective relay



PNS330i Series receive IEC61850-9-2 from PNS630 (SMV)



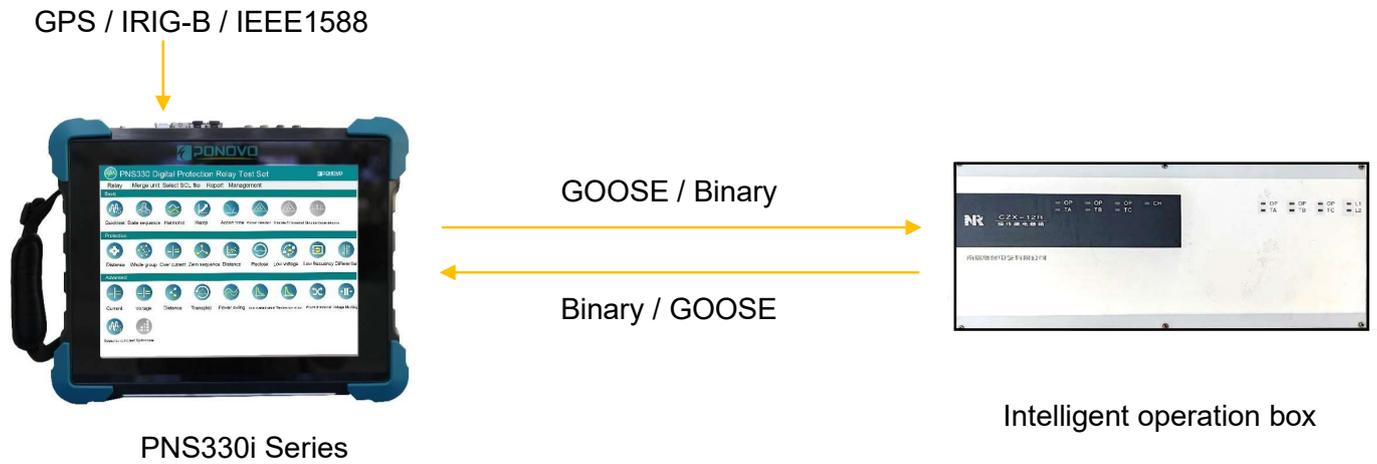
PNS330i Series test digital protective relay (SMV + GOOSE)



PNS330i Series send analog to MU, MU feedback SMV

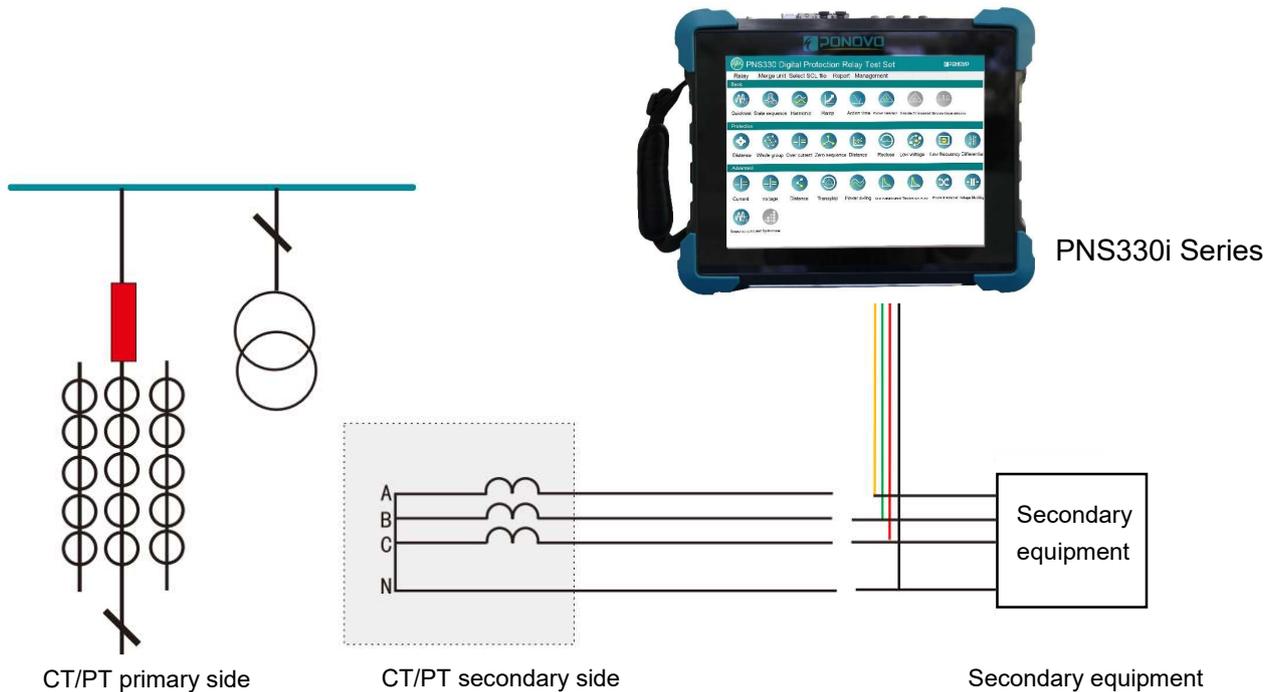
➤ Intelligent operation box

PNS330i Series can simulate the protection relay sending GOOSE and binary to the intelligent operation box, and can receive and verify the GOOSE and binary sent by the intelligent operation box.



➤ Secondary circuit verification

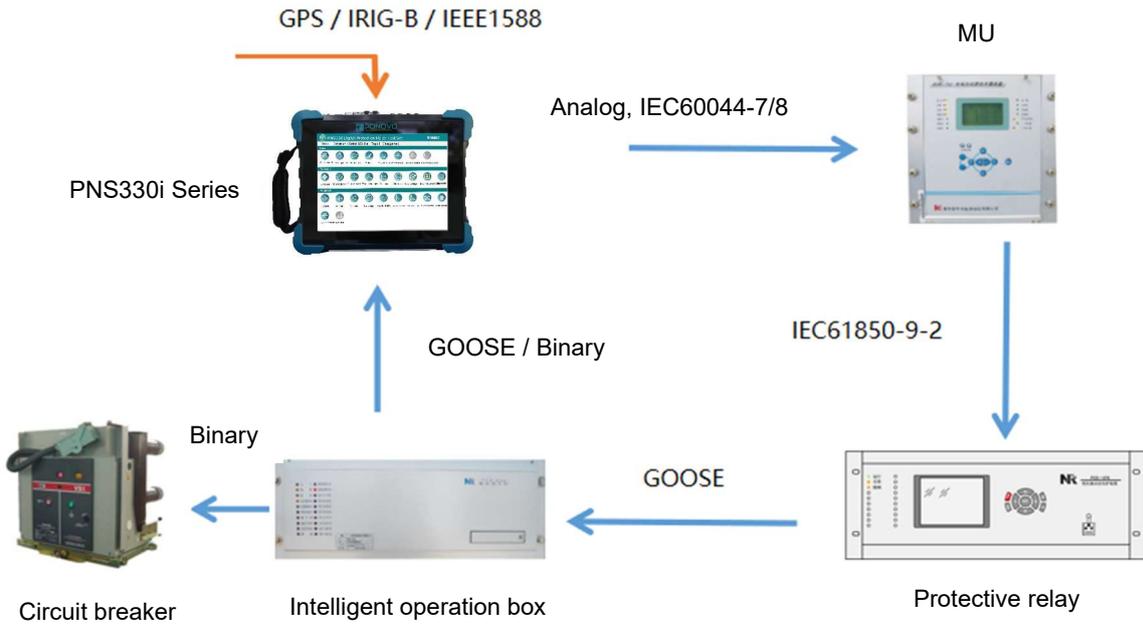
PNS330i Series can verify CT/PT secondary circuit.



➤ System test

PNS330i Series can debug the whole group in substation.

PNS330i Series Digital Protection Relay Test Set



PNS330i Series Panels

The front panel and right panel of 3 models are same, the top panel is different.



Charging port

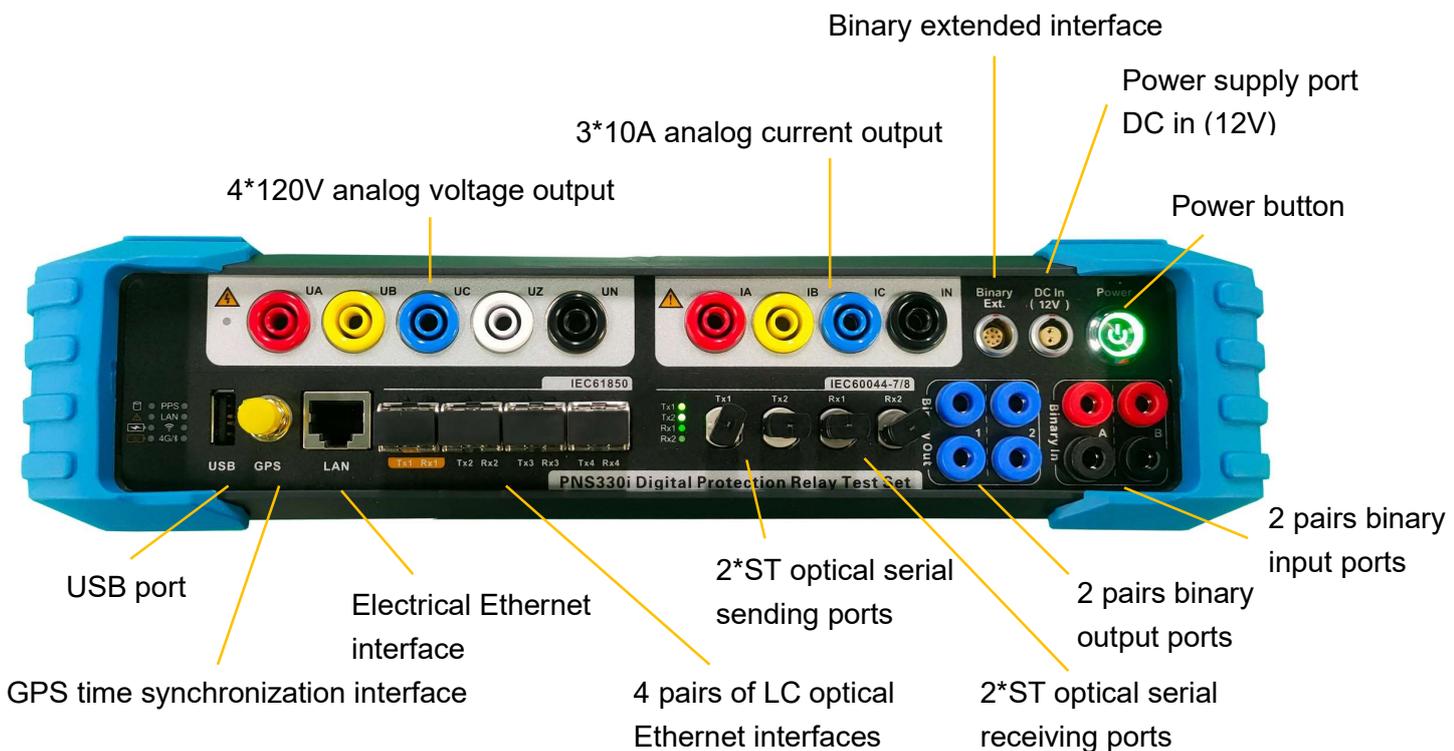
PNS330i Series Digital Protection Relay Test Set



10.4-inch touch screen

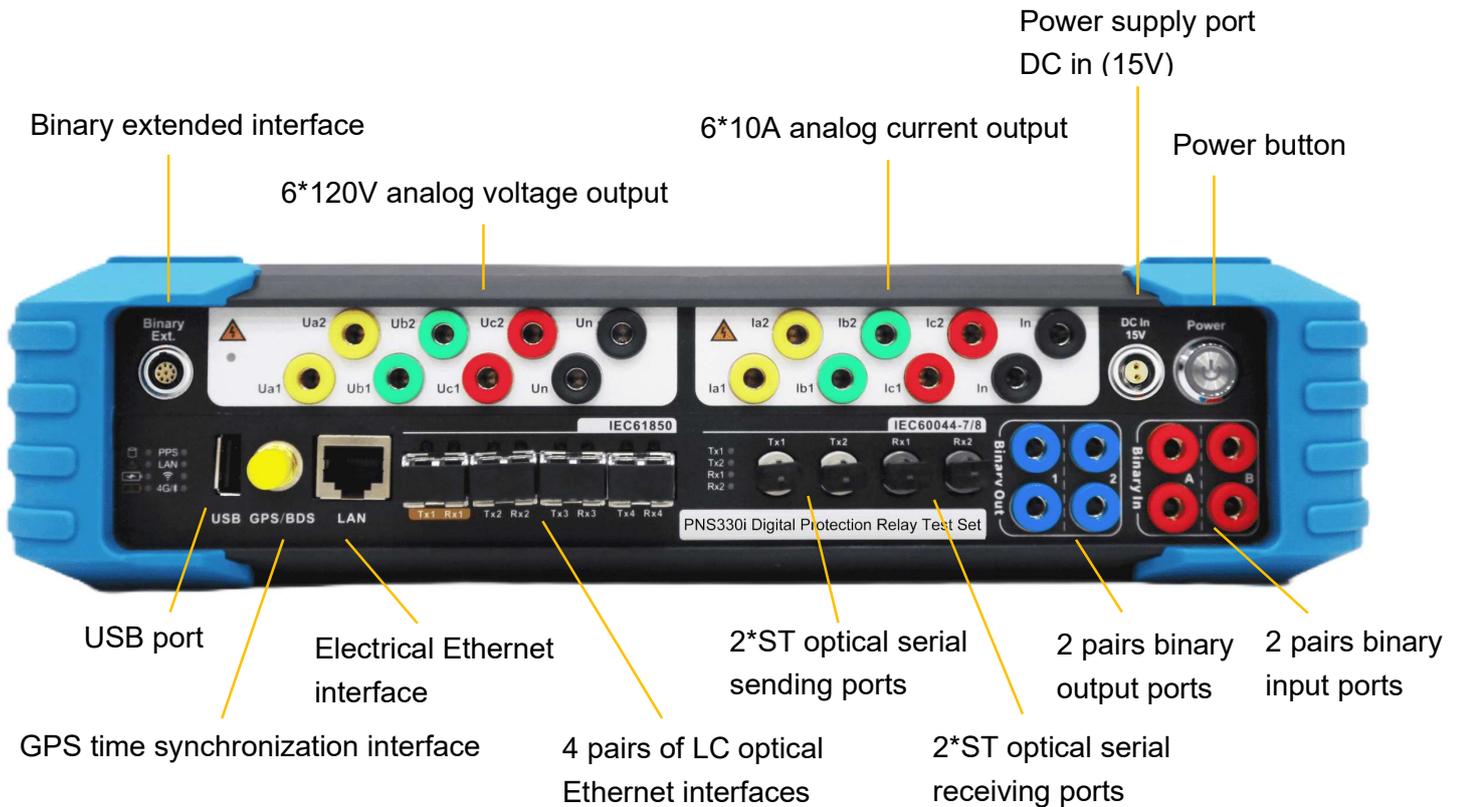
Front panel

▪ PNS330i-3 Front Panel

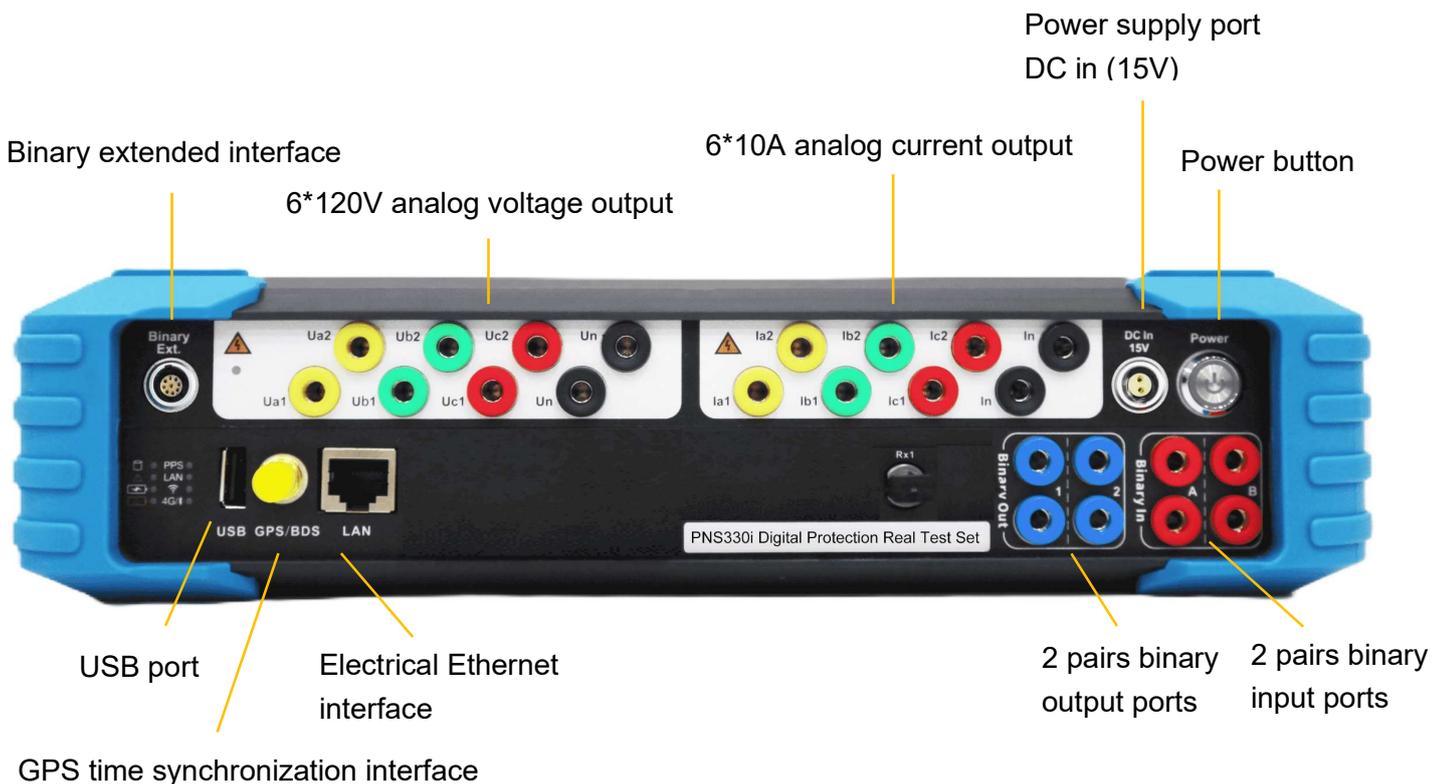


PNS330i Series Digital Protection Relay Test Set

▪ PNS330i-6 Front Panel



▪ PNS330i-6A Front Panel



PNS330i-3 Digital Protection Relay Test Set



Specifications

AC Current outputs

| | |
|----------------------------|--|
| Control | Independent control of amplitude, frequency and phase angle |
| Range | 3×10A |
| Accuracy | ±0.1% |
| Rising/drop off time | <100us |
| Power | ≥20VA (10A/phase output) |
| Harmonic distortion (THD%) | ≤0.2% |
| Operation indication | Overload, distortion, open circuit automatic detection and alarm |

AC voltage outputs

| | |
|----------------------------|--|
| Control | Independent control of amplitude, frequency and phase angle |
| Range | 4×120V |
| Fourth voltage (Uz) | Can be set as zero sequence voltage, line extraction voltage, or any value |
| Accuracy | ±0.1% |
| Rising / drop off time | <100us |
| Harmonic distortion (THD%) | ≤0.2% |
| Max power | ≥30VA |
| Output time | Continuous at rated output condition |
| Operation indication | Overload, distortion, short circuit automatic detection and alarm |

General

| | |
|---|--|
| Frequency | 10Hz~1000Hz |
| Amplitude-frequency characteristic | ≤ ±0.5% (10Hz~450Hz) ≤ ±1% (450Hz~1000Hz) |
| Phase error | 0.2° |
| Voltage and current synchronization error | ≤10us |

DC Current outputs

| | |
|---------------|-------------------------|
| Range | 3×5A |
| Accuracy | ±0.5% |
| Load capacity | ≥0.6Ω (5A/phase output) |

DC voltage outputs

| | |
|-------|--------|
| Range | 4×169V |
|-------|--------|

| | |
|----------|--------------------------|
| Accuracy | ±0.5% |
| Power | ≥30W (169V/phase output) |

Digital interface

4×optical serial ports

1 receiving port for FT3 (expand) message;
1 receiving port for IRIG-B synchronization;
2 sending ports for FT3(extend) message.
ST type

4 pairs optical ethernet ports

Receiving/sending IEC61850-9-2 message, GOOSE message, the forth pair can be used as 1588 network synchronization time port.

LC type

3 pairs of 100Base-FX (100Mbit, fiber optic, full duplex);
1 pair of 1000Base-FX (1000Mbit, fiber optic, full duplex)

Binary

| | |
|-----------------------|---|
| Binary input | 4 pairs (A-D), electrical isolation |
| Input characteristics | 15V~250V(DC) or potential free automatic identification |
| Timing error | ±0.1ms (0.001s~1s) ±0.1% (1s~1.50×10 ⁵ s) |
| Binary output | 4 pairs (1-4), electrical isolation |
| Type | Potential free has no polarity, 4 pairs binary output are semiconductor type (100us) |

Others

Synchronization IRIG-B and IEEE1588,
GPS time synchronization function (optional)

Wireless communication

Wi-Fi(optional) and Bluetooth(optional)

| | |
|--------------------|--|
| Control interface | RJ45 Ethernet (1000Mbit) |
| USB | Connect with U disk, keyboard ect. |
| Display screen | 10.4-inch touch screen |
| Battery | 11.1V/8800mAh, 97.68Wh lithium battery, can be removable |
| Dimensions (LxWxH) | 295mm×235mm×71mm |
| Weight | <3kg |

Specifications are subject to modification without notice

PNS330i-6 Digital Protection Relay Test Set



Specifications

AC Current outputs

| | |
|----------------------------|--|
| Control | Independent control of amplitude, frequency and phase angle |
| Range | 6×10A |
| Accuracy | ±0.1% |
| Rising/drop off time | <100us |
| Power | ≥30VA (10A/phase output) ≥50VA (20A/phase output) |
| Harmonic distortion (THD%) | ≤0.2% |
| Operation indication | Overload, distortion, open circuit automatic detection and alarm |

AC voltage outputs

| | |
|----------------------------|--|
| Control | Independent control of amplitude, frequency and phase angle |
| Range | 6×120V |
| Fourth voltage (Uz) | Can be set as zero sequence voltage, line extraction voltage, or any value |
| Accuracy | ±0.1% |
| Rising / drop off time | <100us |
| Harmonic distortion (THD%) | ≤0.2% |
| Max power | ≥30VA |
| Output time | Continuous at rated output condition |
| Operation indication | Overload, distortion, short circuit automatic detection and alarm |

General

| | |
|---|--|
| Frequency | 10Hz~1000Hz |
| Amplitude-frequency characteristic | ≤ ±0.5% (10Hz~450Hz) ≤ ±1% (450Hz~1000Hz) |
| Phase error | 0.2° |
| Voltage and current synchronization error | ≤10us |

DC Current outputs

| | |
|---------------|-------------------------|
| Range | 6×5A |
| Accuracy | ±0.5% |
| Load capacity | ≥0.8Ω (5A/phase output) |

DC voltage outputs

| | |
|----------|--------|
| Range | 6×169V |
| Accuracy | ±0.5% |

| | |
|-------|--------------------------|
| Power | ≥30W (169V/phase output) |
|-------|--------------------------|

Digital interface

4×optical serial ports
1 receiving port for FT3 (expand) message;
1 receiving port for IRIG-B synchronization;
2 sending ports for FT3(extend) message.
ST type

4 pairs optical ethernet ports

Receiving/sending IEC61850-9-2 message, GOOSE message, the forth pair can be used as 1588 network synchronization time port.
LC type
3 pairs of 100Base-FX (100Mbit, fiber optic, full duplex);
1 pair of 1000Base-FX (1000Mbit, fiber optic, full duplex)

Binary

Binary input 4 pairs (A-D), electrical isolation

Input characteristics 15V~250V(DC) or potential free automatic identification

Timing error ±0.1ms (0.001s~1s)
±0.1% (1s~1.50×10⁵ s)

Binary output 4 pairs (1-4), electrical isolation

Type Potential free has no polarity,
4 pairs binary output are semiconductor type (100us)

Others

Synchronization IRIG-B and IEEE1588,
GPS time synchronization function (optional)

Wireless communication

Wi-Fi(optional) and Bluetooth(optional)

Control interface RJ45 Ethernet (1000Mbit)

USB Connect with U disk, keyboard ect.

Display screen 10.4-inch touch screen

Battery 7.4V/19.2Ah, 142.08Wh lithium battery, can be removable

Charger 19V/4.7A

Dimensions (LxWxH) 295mm×235mm×71mm

Weight <3.5kg

Specifications are subject to modification without notice

PNS330i-6A Digital Protection Relay Test Set



Specifications

AC Current outputs

| | |
|----------------------------|--|
| Control | Independent control of amplitude, frequency and phase angle |
| Range | 6×10A |
| Accuracy | ±0.1% |
| Rising/drop off time | <100us |
| Power | ≥30VA (10A/phase output) ≥50VA (20A/phase output) |
| Harmonic distortion (THD%) | ≤0.2% |
| Operation indication | Overload, distortion, open circuit automatic detection and alarm |

AC voltage outputs

| | |
|----------------------------|--|
| Control | Independent control of amplitude, frequency and phase angle |
| Range | 6×120V |
| Fourth voltage (Uz) | Can be set as zero sequence voltage, line extraction voltage, or any value |
| Accuracy | ±0.1% |
| Rising / drop off time | <100us |
| Harmonic distortion (THD%) | ≤0.2% |
| Max power | ≥30VA |
| Output time | Continuous at rated output condition |
| Operation indication | Overload, distortion, short circuit automatic detection and alarm |

General

| | |
|---|--|
| Frequency | 10Hz~1000Hz |
| Amplitude-frequency characteristic | ≤ ±0.5% (10Hz~450Hz) ≤ ±1% (450Hz~1000Hz) |
| Phase error | 0.2° |
| Voltage and current synchronization error | ≤10us |

DC Current outputs

| | |
|-------|------|
| Range | 6×5A |
|-------|------|

| | |
|---------------|-------------------------|
| Accuracy | ±0.5% |
| Load capacity | ≥0.8Ω (5A/phase output) |

DC voltage outputs

| | |
|----------|--------------------------|
| Range | 6×169V |
| Accuracy | ±0.5% |
| Power | ≥30W (169V/phase output) |

Binary

| | |
|-----------------------|---|
| Binary input | 4 pairs (A-D), electrical isolation |
| Input characteristics | 15V~250V(DC) or potential free automatic identification |
| Timing error | ±0.1ms (0.001s~1s) ±0.1% (1s~1.50×10 ⁵ s) |
| Binary output | 4 pairs (1-4), electrical isolation |
| Type | Potential free has no polarity, 4 pairs binary output are semiconductor type (100us) |

Others

| | |
|------------------------|--|
| Synchronization | IRIG-B and IEEE1588, GPS time synchronization function (optional) |
| Wireless communication | Wi-Fi(optional) and Bluetooth(optional) |
| Control interface | RJ45 Ethernet (1000Mbit) |
| USB | Connect with U disk, keyboard ect. |
| Display screen | 10.4-inch touch screen |
| Battery | 7.4V/19.2Ah, 142.08Wh lithium battery, can be removable |
| Charger | 19V/4.7A |
| Dimensions (LxWxH) | 295mm×235mm×71mm |
| Weight | <3kg |

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 aboard



 **PONOVO POWER CO., LTD.**

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

Tel : +86 (10) 59089666

Fax: +86 (10) 59089999

www.ponovo.net

info@relaytest.com

support@relaytest.com