PONOVO

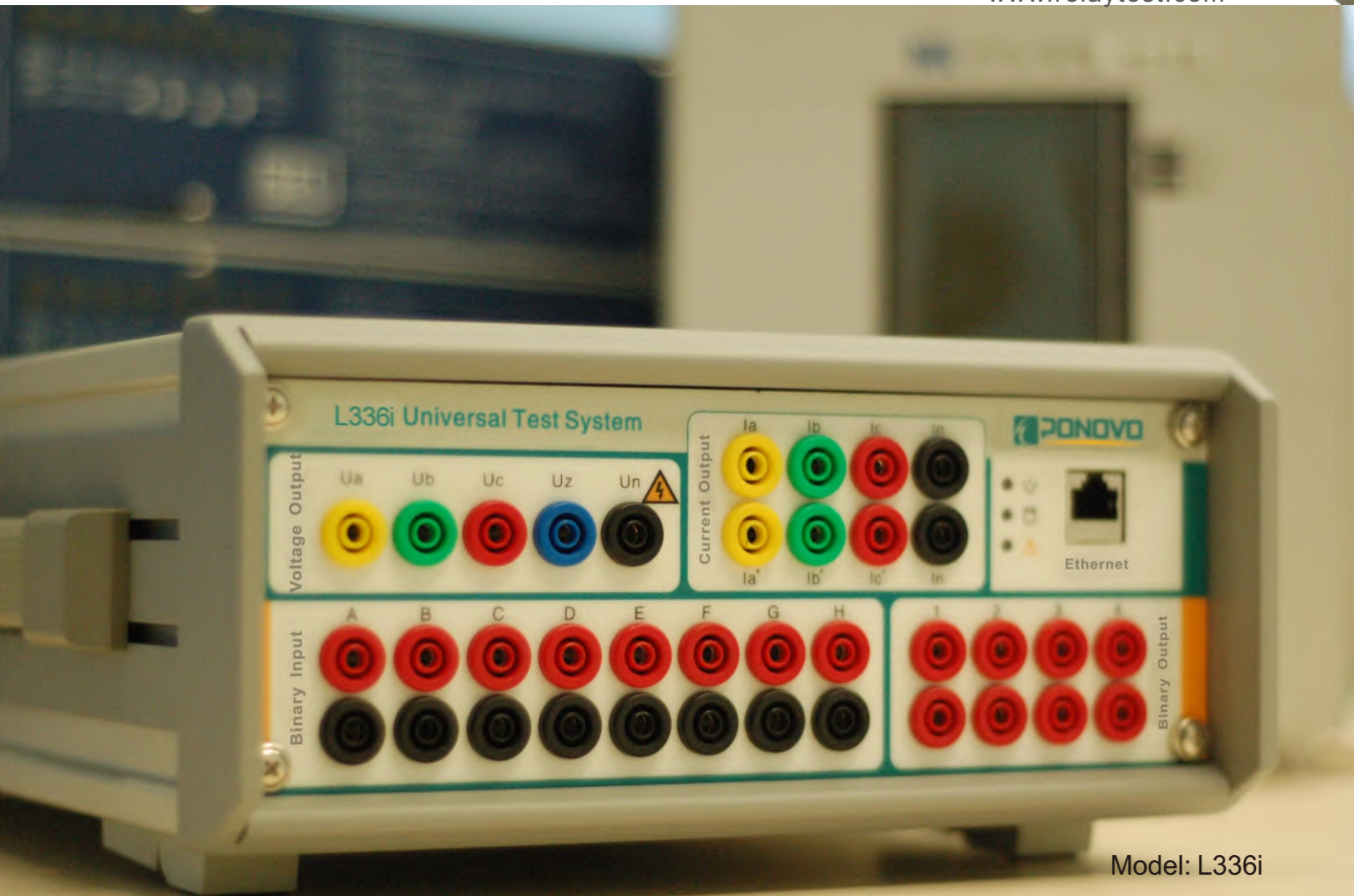# L336i SUPER-LIGHT
Protection Relay Test System

the smallest and lightest 6-phase protection relay test set in the world

www.relaytest.com

L336i Universal Test System

Voltage Output
Ua Ub Uc Uz Un

Current Output
Ia Ib Ic In
Ia' Ib' Ic' In

Ethernet

Binary Input
A B C D E F G H

Binary Output
1 2 3 4

Model: L336i

New light weight relay testing equipment

We are proud to announce the new L336i relay testing system which is the lightest in weight and the smallest in size in the word.

More Options for different Testing Requirement:

➤ Standard Version-L336i：6∗15A, 4∗300V
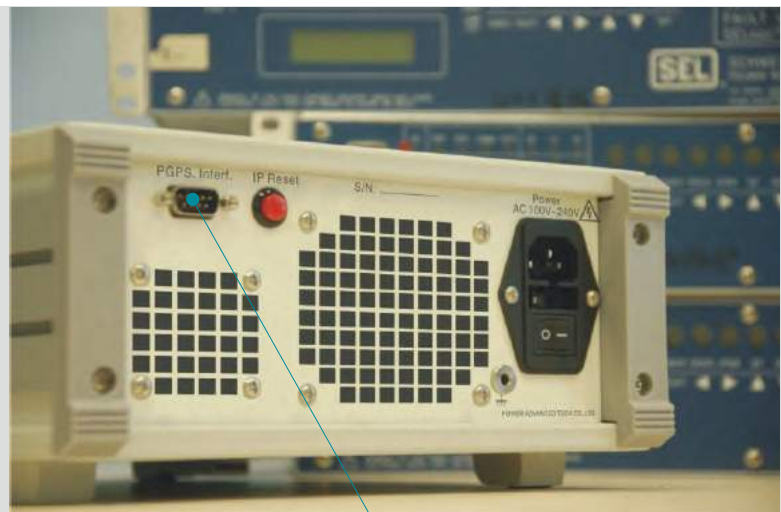➤ Economic Version-L336i-E：3∗20A, 4∗300V

Features

➤ Light weight with only 8.6kg, 1/3 of the weight of traditional testing system
➤ Tracing the signal generation with digital technology
➤ Stable signal output with high accuracy
➤ Binary inputs with adjustable threshold
➤ Use LAN port for connecting to external PC
➤ Internal digital recorder for monitoring and recording test process
➤ Use powerful PowerTest software with ready test modules, realizing the maximum control flexibility over test process
➤ Can be upgraded to support the test of IEC61850 compatible relay
➤ Can support wireless control by smart phone APP for testing relays

Applications

➤ **Relay test:** line protection, differential protection, generator protection, line differential, directional relay Time-inversed current relay, auto-reclosing, etc
➤ **Measuring and control device:** synchronizer , df/dt, etc
➤ **System simulation:** playback of COMTRADE format file
➤ **Calibration:** 0.5 Class energy meter, disturbance recorder, indicating meters, etc
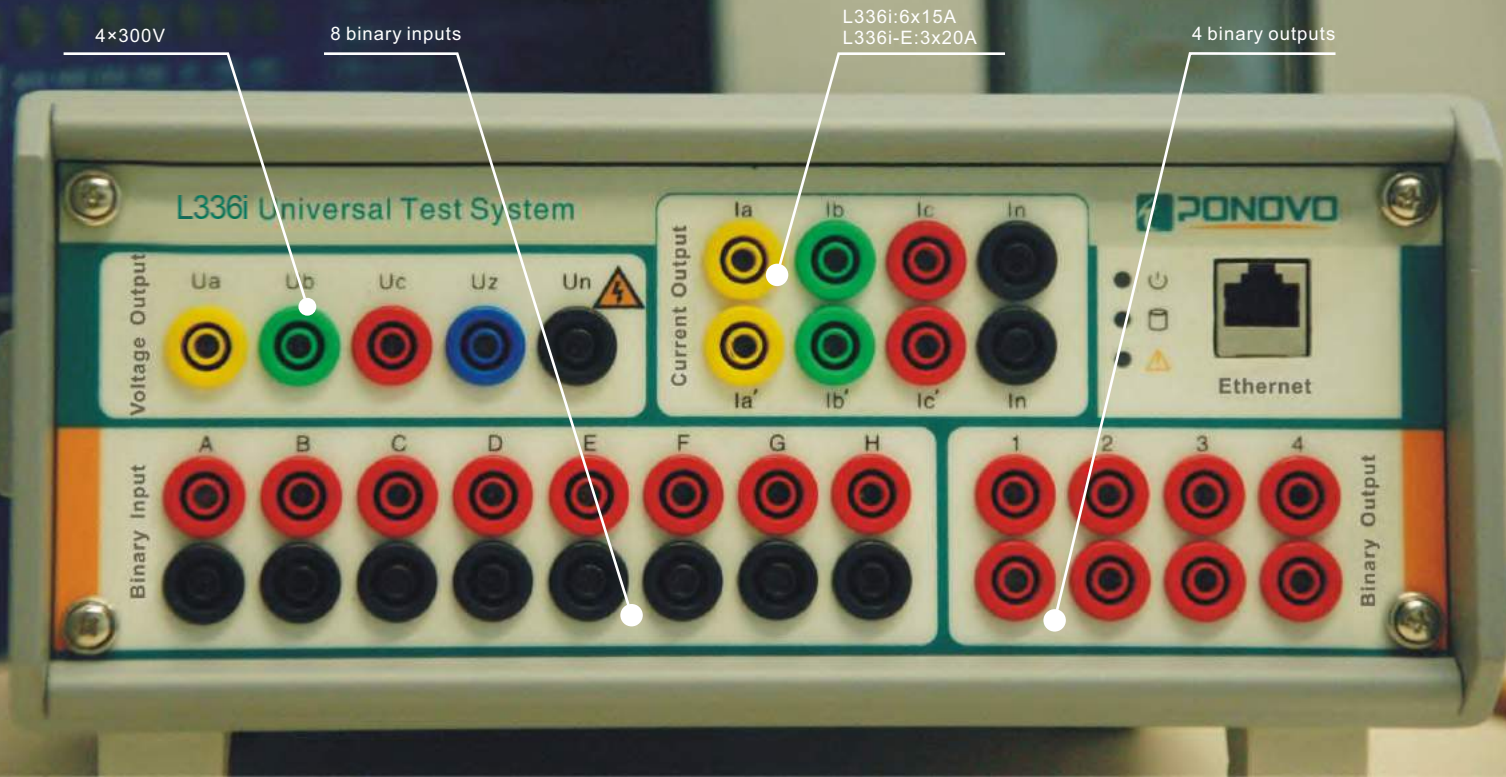
Rear side

Connecting GPS or IRIG−B

Front panel (actual size image)

4×300V

8 binary inputs

L336i:6x15A
L336i-E:3x20A

4 binary outputs

L336i Universal Test System

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Ua   Ub   Uc   Uz   Un

Current Output
Ia   Ib   Ic   In
Ia'   Ib'   Ic'   In

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Ethernet

Binary Input
A   B   C   D   E   F   G   H

1   2   3   4
Binary Output

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Ethernet

Binary Input
A   B   C   D   E   F   G   H

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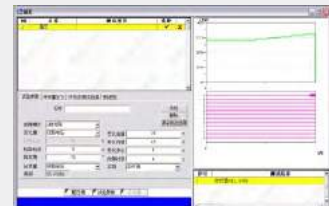Binary Output

PowerTest software

Quick Test
Manual or auto control over all voltage and current sources. All test parameters, such as amplitude, phase, frequency, etc can be set separately.
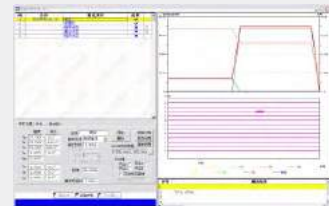
Ramp
Linear or pulse ramp can be used for different test applications, such as directional relay, current relay, voltage relay, frequency, etc.

State sequence
Here we can a sequence of states for special test application. A fault calculation tool is provided to set fault settings easily for each sequence.
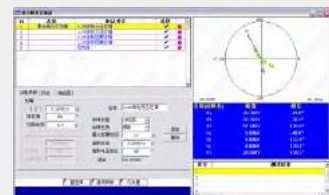
Distance
The impedance characteristic can be uploaded on to the Z-plane and any points on Z-plain can be checked. Z-T diagram can also be got after test is over.
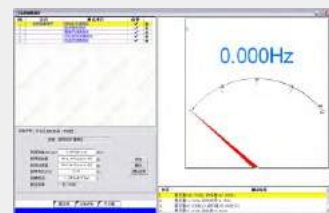
Auto-recloser
This module makes the check of autoreclosure very easy. The tripping after the second fault can also be checked.
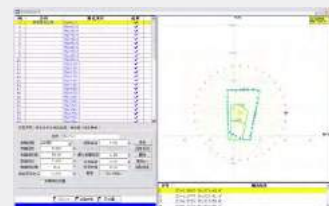
Underfrequency
Different tests can be done for df/dt relay, including pick up , trip time, df/dt setting, under-voltage or under-current blocking.
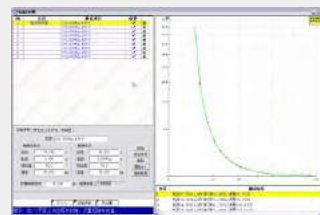
R/X characteristic sweep
This module is used to map out the characteristic boundary of impedance relay and compare it with the principle characteristic.
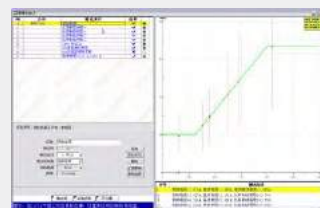
www.relaytest.com

Inverse time overcurrent

Test can be done based on actual over current characteristic. Assessment will be done automatically after test is over.
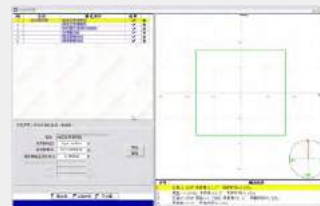
Differential

This module allows user to test differential relay with 6 currents. Ir/Id curve can be defined easily based on relay setting. Harmonic restraint can also be checked.

Synchronizer

This module is used to check the synchronizer relay, including voltage and frequency difference check, leading time and leading angle check, auto-adjusting function, etc.

Power swing

This module provides the tool to observe the relay behavior during dynamic power swing process. Power swing with fault can also be simulated.
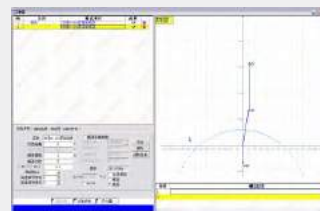
Cellphone APP control (optional)

L336i support wireless control for doing testings by smartphone APP, in IOS and Android system. Quick Test and State Sequence modules are available in the APP.
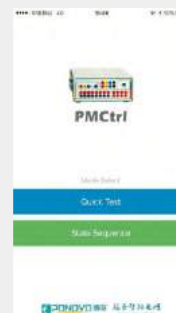
Support Both Android and IOS System

Test of IEC61850 compatible relay (optional)

Relay test equipment supplies analog voltage/current signal to relay and the GOOSE message from relay is received and interpreted by relay test equipment.

Protection
Relay

Analog Signal
Hard-wried

GOOSE,IEC61850-8-1

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Technical specifications

AC Current outputs

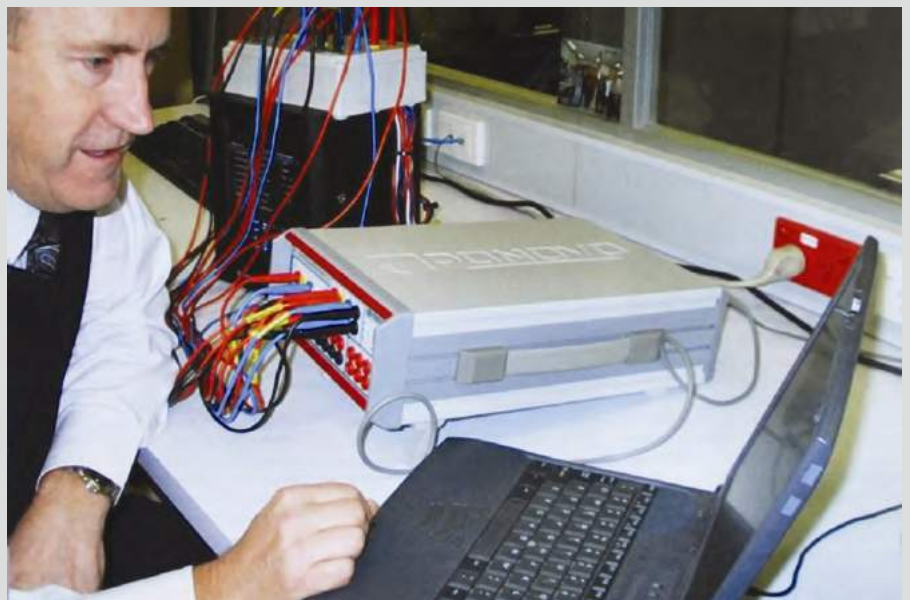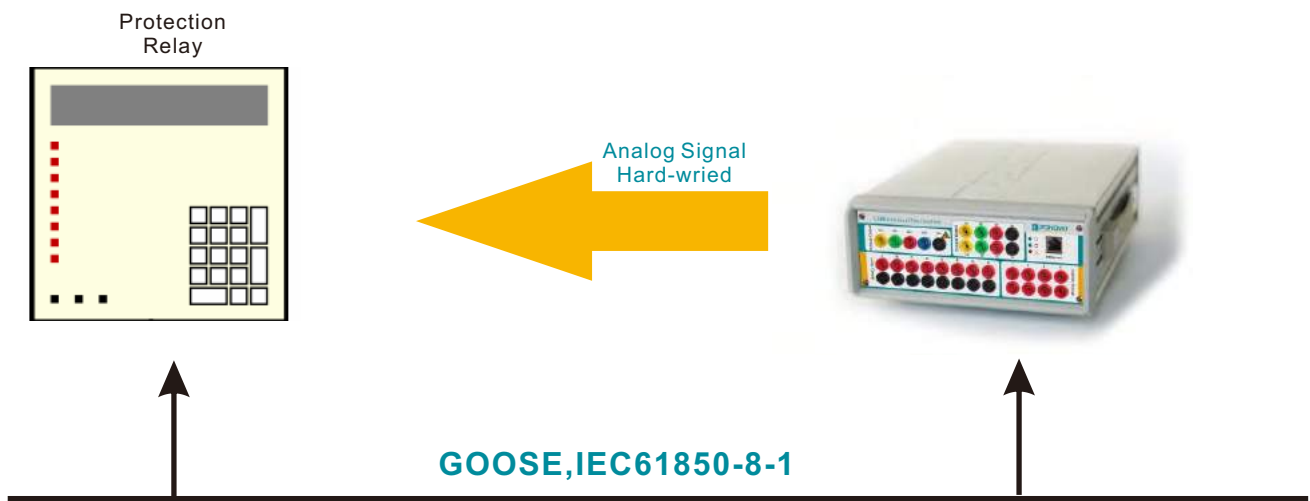|	
Control	Independent control of amplitude, frequency and phase angle
Range	Standard version: 6×15A / 3×30A / 1×60A
	Economic version:3×20A / 1×60A*
Accuracy	error < 0.08 % rd. + 0.02 % rg.guar.
	error < 0.03% rd. + 0.02 % rg. typ.
Resolution	1mA
Output power	Standard version: ≥210VA(at 30A, LN)
	Standard version: ≥105VA(at 15A, LN)
	Economic version: ≥140VA(at 20A, LN)*
Output response time	<100µs
Distortion (THD%)	<0.05%type.,<0.1%guar., at >0.5A
Frequency- Amplitude chacteristic	≤± 0.1%~± 0.5% (1Hz~1kHz)
Output time	continuous (<10A/channel)
	>70s (<10~20A/channel)
	>15s (≥20/channel)
Operation indication	Overload, distortion, open circuit,over heat

AC Voltage outputs

Control	Independent control of amplitude, frequency and phase angle
Fourth voltage (Uz)	Can be set as zero sequence voltage, line voltage, or any value
Setting range	
4-phase ac(L-N)	4×0 ~ 300V
1-phase ac(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
Accuracy	error < 0.08 % rd. + 0.02 % rg.guar.,
	error < 0.03% rd. + 0.02 % rg. typ.,
Resolution	1mV(<30V), 10mV(30V~300V)
Output response time	<100µs
Distortion (THD%)	<0.05%type.,<0.1%guar.,at30V-300V
Frequency- Amplitudechacteristic	
	≤± 0.1%~± 0.5% (1Hz~1kHz)
Output time	Continuous at rated output condition
Operation indication	Overload, distortion, short circuit, over heat

Frequency

Sine signal	DC, 0.001Hz~1000Hz
Accuracy	0.3ppm
Resolution	0.001Hz
Output characteristic	Can simulate 2°-20° harmonic or DC

Phase angle

Range	-360°~+360°
Accuracy	±0.05°type.,±0.1°guar.
Resolution	0.001°

Synchronization time between current and voltage outputs

≤10µs

DC current outputs

Range	3×±0~10A / 1×±0~30A
Accuracy	± 5mA (0.2A~1A)
	± 0.5% (1A~10A)
Resolution	1mA
Output power	3×100W at 10A / 1×300W at (30A 10V)
Operation indication	Overload, distortion, open circuit, over heat

DC Voltage outputs

Range	4×±0~300V / 1×±0~600V
Accuracy	±50mV (2V ~ 10V), ±0.5% (10 ~ 300V)
Resolution	10mV
Output power	100W at 300V

Binary inputs

Number	8
Input characteristics	0~400Vdc/400Vac Pek threshold or potential free
Time resolution	50µs
Max. measuring time	infinite
Debounce/Deglitch time	0~25ms
Counting function	< 3kHz at pulse width>150µs

Binary output

Number	4
Characteristic	Potential free relay contact (auto detection)
Break capacity ac	Vmax：250V(AC)/Imax：0.5A
Break capacity dc	Vmax：250V(DC)/Imax：0.5A

DC voltage measuring input (Only available on L336i-E)*

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

DC current measuring input (Only available on L336i-E)*

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

IEC61850 upgrade (Optional)

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

Power Supply

Input	110-240Vac
Frequency	50/60Hz
Max. current	6.3A

Environmental conditions

Operation temperature	0~+50ºC
Storage temperature	-25º~+70ºC
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
Safty	EN/IEC 61010-1/1-12/2-030 EN/IEC 60255-25/27
Others	FCC Part 15:Sub B ECS-001:2006 LVD EU

Others

PC connection	Ethernet，10M/100M
Wireless control	Cellphone APP(optional)
GPS interface	DB9
Ground Socket (earth)	4 mm banana socket; front side
Dimension(W×H×D)	256mm×110mm×395 mm
Weight	8.6 kg

Use smart phone to control the device to output current

Sales network

TÜV
www.tuv.com
ID:1000000000

GS
geprüfte
Sicherheit

C E

TÜV Rheinland

ISO 9001 QMS
ISO 14001 EMS
OHSAS 18001