L336EXi Series
SUPER-LIGHT Digital Protection Relay Test Set

The super-light universal relay test set

with digital-analog protection relay testing capabilities

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

Super-Light Digital Protection Relay Test System

L336EXi Series Super-Light Digital Protection Relay Test Set is new generation of L336i series portable relay testing equipment launched by PONOVO. The weight of the whole machine is approximately 9kg. It has 4 models, L336EXi, L336EXi-E, L336EXi-B and L336EXi-H. It is equipped with analog current and voltage output channels, and fiber digital output capability, which could be used for testing any type of relays from electromagnetic relays, numerical relays, microcomputer relays, and digital relays based on IEC61850. L336EXi Series adopts Linux operating system, supports multiple communication methods such as Wi-Fi and Bluetooth, and support both local control and external PC control.

4 Models

- L336EXi, 6*20A, 6*130V, 8 pairs of optical Ethernet ports, external power supply.
- L336EXi-H, 6*20A, 4*300V, 8 pairs of optical Ethernet ports, external power supply.
- L336EXi-E, 4*20A, 4*300V, 8 pairs of optical Ethernet ports, external power supply.
- L336EXi-B, 6*20A, 6*130V, 8 pairs of optical Ethernet ports, support both battery power supply and external power supply.

Features

- Super light design, only 9kg, 1/3 of the weight of traditional testing system.
- 4 models optional, equipped with multi current output and voltage output channels, high power output for different kinds of relay testing and stable signal output with high accuracy.
- Equipped with 8 fiber optic ports for different digital relay testing. Combined full IEC61850 function, support digital quantity include SV, FT3 can be sent and received, and GOOSE can be published and subscription.

- Embedded with 10.4inch touchscreen for local operation and also support external PC control by PowerTest Int V7.0 software.
- Internal digital recorder for monitoring and recording test process.
- Built-In WIFI for wireless connection to PC.
- Built-in GPS, support IRIG-B and IEEE1588(PTP) Synchronization.

Applications

SMV sending and receiving, GOOSE publish and subscription

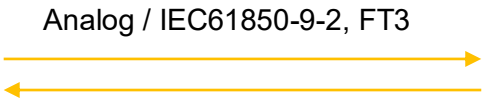
Binary input and binary output ↔  → Voltage and current output

L336EXi Series Digital Protection Relay Test Set

L336EXi Series supports analog voltage and analog current output, binary input and binary output, SMV sending and receiving and GOOSE publish and subscription, can test secondary devices such as traditional or intelligent substation protection relay and measurement and control devices.

No.	Signal type of test set
1	Analog output + Binary input (used for testing traditional relay)
2	SMV sending + GOOSE subscription (used for testing full digital relay)
3	Analog output + GOOSE subscription
4	SMV sending + Binary input
5	Analog output + Binary input + GOOSE subscription
6	SMV sending + Binary input + GOOSE subscription
7	Analog output + SMV receiving (used for testing merging unit)
8	SMV receiving + GOOSE subscrition (used for network analyzing)

L336EXi Series



Relay

L336EXi Series test traditional protective relay (analog output + binary input)

L336EXi series test full-digital protective relay (SMV sending + GOOSE subscription)

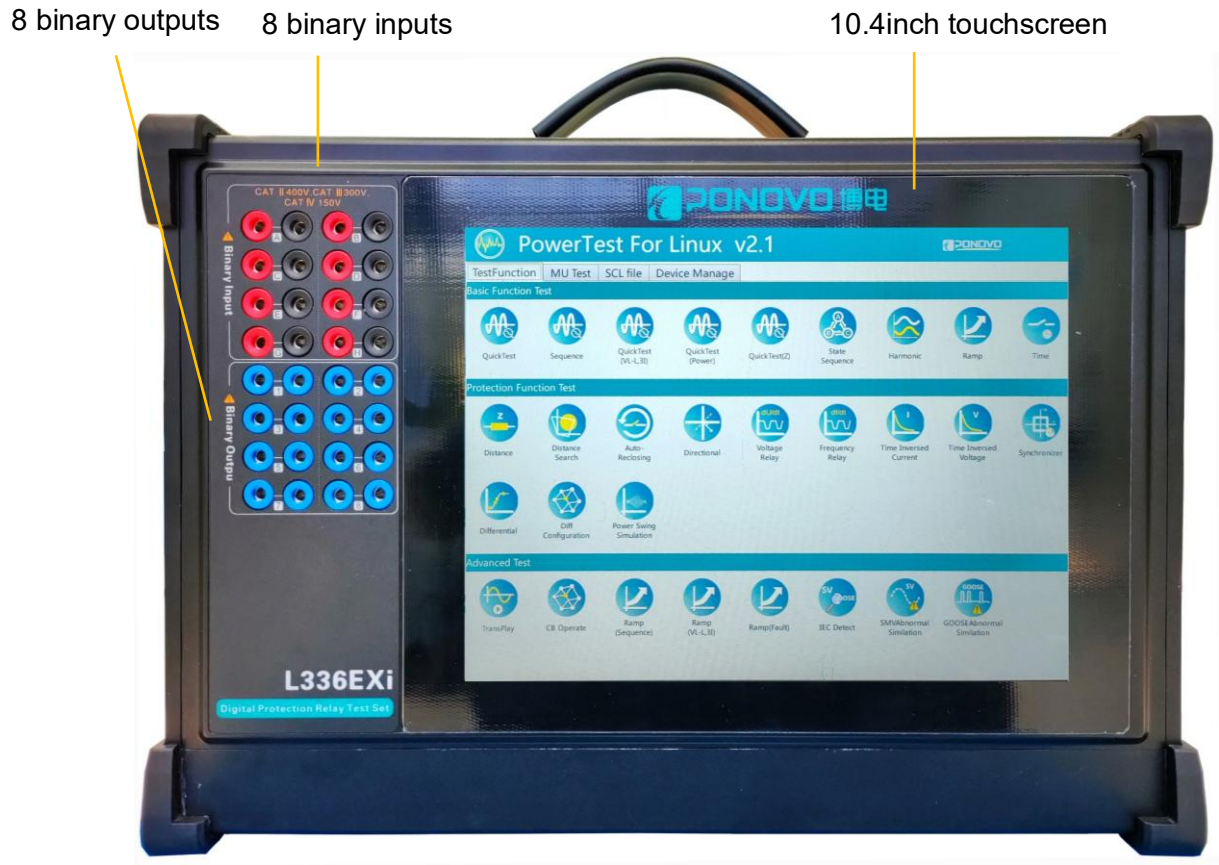
L336EXi Series receive SMV and GOOSE from PNS330i (SMV receiving + GOOSE subscription)

L336EXi send analog to MU, MU feedback SMV (Analog output+ SMV receiving)

L336EXi Series Panels

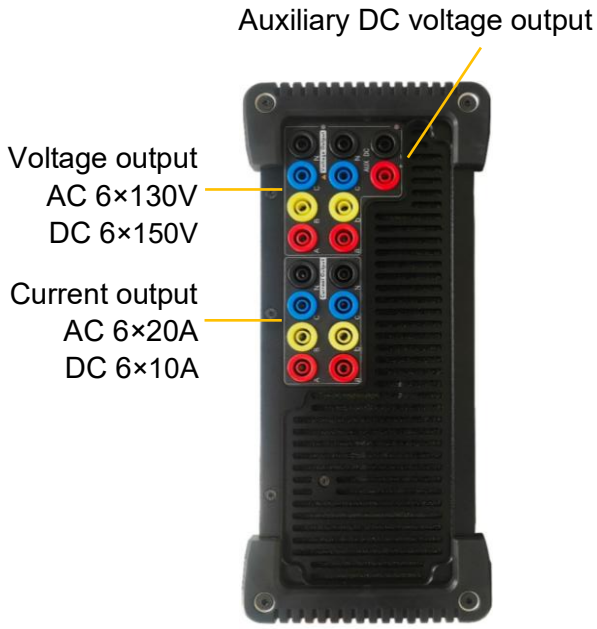
The front panel and left panel of 4 models are same, the right panel and top panel are different.

▪ Front Panel of L336EXi, L336EXi-H, L336EXi-E, L336EXi-B



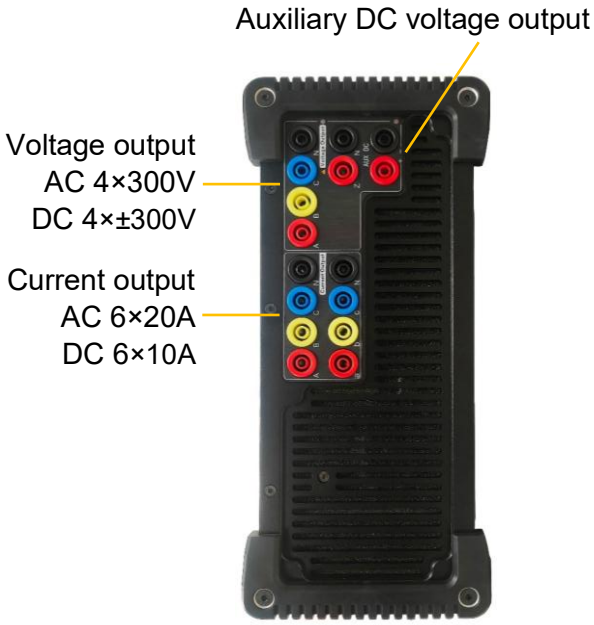
▪ Left Panel of L336EXi, L336EXi-H, L336EXi-E, L336EXi-B

▪ Right Panel of L336EXi, L336EXi-B

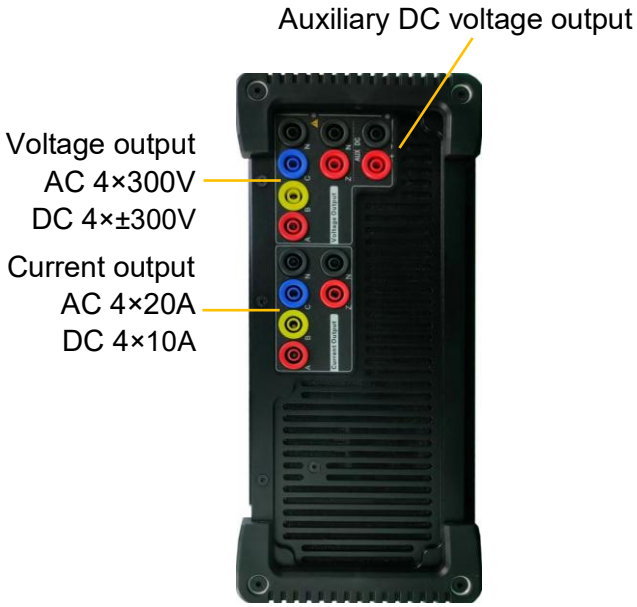


L336EXi Series Digital Protection Relay Test Set

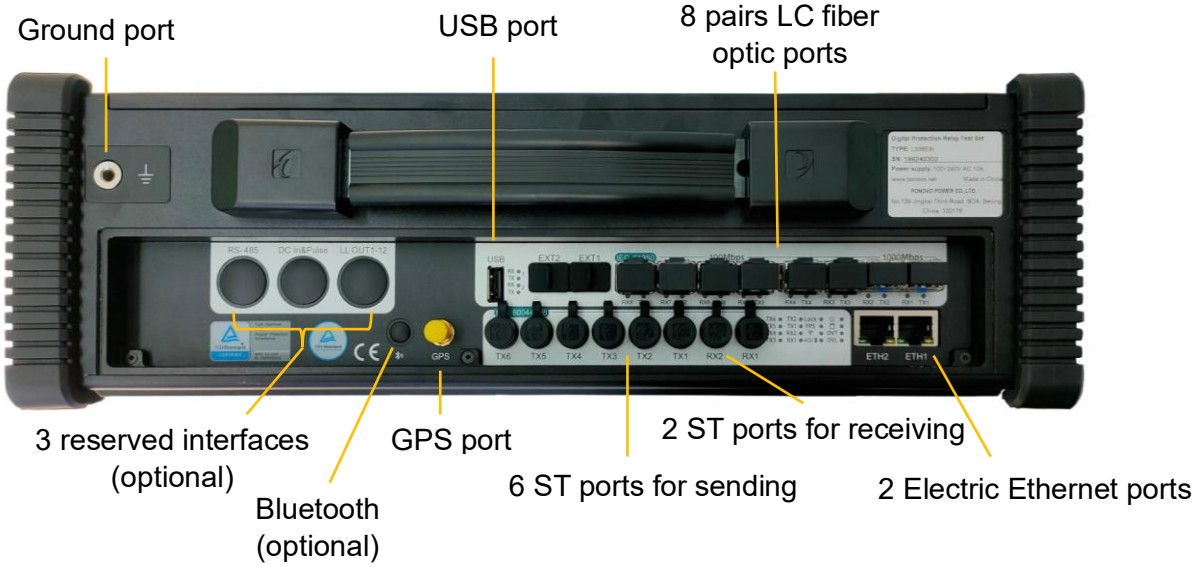
▪ Right Panel of L336EXi-H



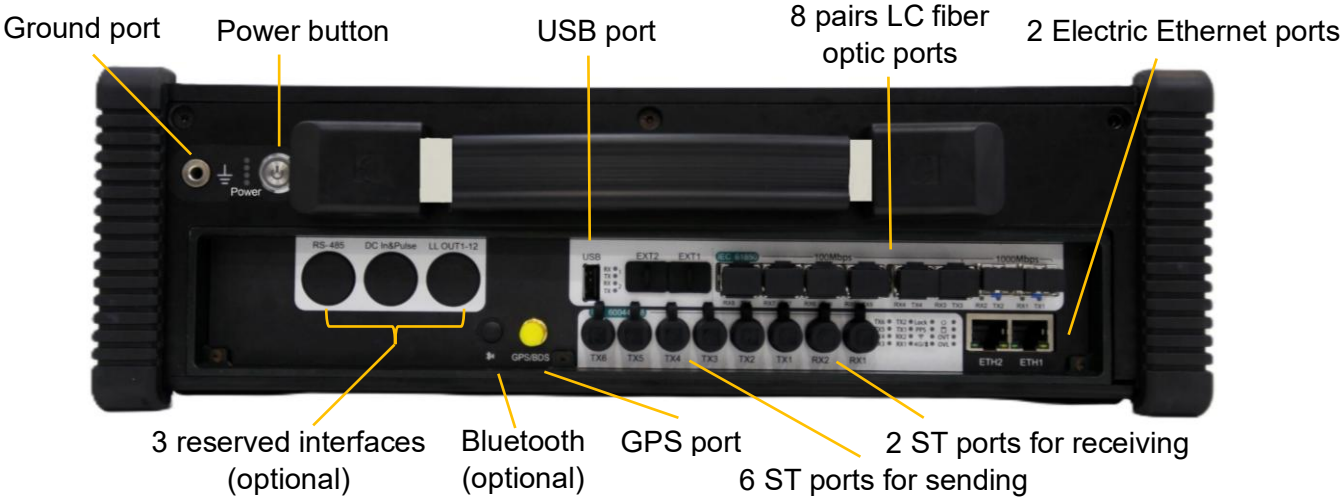
▪ Right Panel of L336EXi-E



▪ Top Panel of L336EXi, L336EXi-H, L336EXi-E



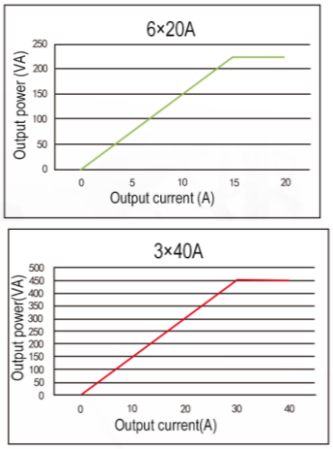
▪ Top Panel of L336EXi-B



L336EXi
Digital Protection Relay Test Set

Specifications

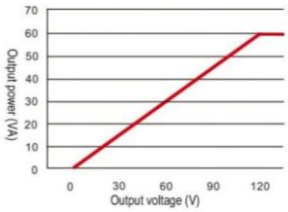
AC Current outputs

Control	Independent control of amplitude, frequency and phase angle
Range	6×20A/3×40A
Accuracy	error < 0.08% rd. + 0.02% rg. guar. error < 0.03% rd. + 0.02% rg. typ.
Resolution	1mA(≤10A), 5mA(10A~40A)
Max output power	6×225VA (20A/phase), 3×450VA (30~40A/phase)
Output power characteristic curve	
Current rise/drop time	<100μs
Harmonic distortion (THD%)	≤0.2%
Frequency	10Hz~1kHz
Output time	continuous (<10A/channel) >30s (10~20A/channel) >15s (20~30A/channel) >10s (30~40A/channel)
Operation indication	Automatic detection and alarm when overload, distortion and open circuit

DC Current outputs

Range	6×10A
Accuracy	±5mA (0.2A~1A) ±0.5% (1A~10A)
Resolution	2mA (0.2A~10A)
Max output power	100W (10A)
Operation indication	Overload protection automatically

AC Voltage outputs

Control	Independent control of amplitude, frequency and phase angle
Range	6×130V
Fourth voltage (Uz)	Can be set as zero sequence voltage, line extraction voltage, or any value
Accuracy	error < 0.08% rd. + 0.02% rg. guar. error < 0.03% rd. + 0.02% rg. typ.
Resolution	5mV (≤2V); 10mV (2V~130V)
Output power	3x60VA (120V/phase) 6x30VA (120V/phase)
Output power characteristic curve	
Voltage rise/drop time	<100μs
Harmonic distortion (THD%)	≤0.2%
Frequency	10Hz~1kHz
Output time	continuous output rated voltage
Operation indication	Automatic detection and alarm when overload, distortion and short circuit
Synchronization error between current and voltage	≤10μs

DC Voltage outputs

Range	6×±150V/1×±300V
Accuracy	±25mV (0.5V~5V); ±0.5% (5V~150V)
Resolution	1mV (0.5V~5V); 10mV(5V~150V)
Max output power	60W (150V)

General

Frequency	
Range(Sine signal)	10Hz~1kHz
Accuracy	<0.5mHz①
Resolution	0.001Hz
Output characteristic	Can add harmonic (2nd ~ 31st) and DC
Phase	
Range	0~359.9°
Accuracy	±0.1°
Resolution	0.1°

Auxiliary DC supply

Voltage range	48V~264V
Power	88W at 110V; 110W at 220V
Accuracy	<2%rg. typ. <5%rg. guar

Note: ① test at 50Hz/60Hz condition.

L336EXi Digital Protection Relay Test Set

Binary inputs(A~H)	
Number	8
Trigger criteria	Potential-free contacts or DC voltage compared to threshold voltage
Input characteristics	Potential-free or 18VDC threshold
Max input	300Vpeak
Sample rate	20kHz
Resolution	50μs
Max. measuring time	Infinite
Counting function	<3kHz at pulse, width 150μs
Max. input voltage	CAT II / 400V, CAT III / 300V, CAT IV / 150V
Debounce/Deglitch time	0-25ms
Galvanic isolation	8 galvanically isolated
Connection	4 mm banana sockets
Counter inputs(optional)	
Number	2
Max. counting frequency	100kHz
Pulse width	>3μs
Threshold voltage	5V (2V hysteresis)
Max. input voltage	±8V
Connection	10 pin combination socket (top panel)
Binary outputs, relays (1~4)	
Type	Potential-free relay contacts, software controlled
Number	4
Break capacity AC	Vmax: 300VAC / Imax: 8A / Pmax: 2000VA
Break capacity DC	Vmax: 300VDC / Imax: 8A / Pmax: 150 W
Connection	4 mm banana sockets (front side)
Binary outputs, transistor (5~8)	
Type	open collector transistor outputs
Number	4
Update rate	10kHz
Break capacity DC	±30mA/±300V DC
Connection	4 mm banana sockets (front side)
DC voltage measuring input(optional)	
Measuring range	0~±10V
Accuracy	<0.02%rg. Typ.; 0.05%rg. Guar.
Input impedance	100kΩ
DC current measuring input(optional)	
Measuring range	0~±1mA, 0~±20mA
Accuracy	<0.02%rg. Typ.; 0.05%rg. Guar.
Input impedance	50Ω

IEC61850 SV, GOOSE (optional) (designed based on FPGA)	
Number	8 fiber optic ports/Ethernet ports (100/1000MB), changeable
Interface type	LC/RJ45
Fiber-optic type	62.5/125μm (multimode fiber, orange)
GOOSE publishing and subscription	①Mapping of binary outputs to data attributes in published GOOSE message, and mapping of data attributes from subscribed GOOSE messages to binary inputs. ②Number of virtual binary outputs/inputs: ≥360 ③Number of GOOSEs to be published /subscribed: ≥128
SV sending and receiving 288 samples per nominal period	
VLAN support	selectable priority and VLAN-ID
Status indication	LINK green (light): An effective link RX\TX green (flashing): Data exchange
FT3(optional) (designed based on FPGA)	
Number	Total 8, 6 ports for sending, 2 ports for receiving
Standard	IEC60044-7/8
Interface type	ST
Fiber-optic type	62.5/125μm (multimode fiber, orange)
Status indication	HD green (light): An effective link
Synchronization-GPS interface (Built-in)	
Timing accuracy	10us
Interface type	SMA
Synchronization-IRIG-B interface (Built-in)	
Timing accuracy	10us
Interface type	ST
Synchronization-PTP (Precision Time Protocol, IEEE1588) interface (Built-in)	
Power supply	
Nominal input voltage 100~240V AC	
Permissible input voltage 85~264VAC	
Nominal frequency	50/60Hz
Permissible frequency range 45~65Hz	
Current	10A max
Protection	Over voltage protection and unsafe grounding alarming
Connection	Standard AC socket (IEC 60320)
Others	
Weight	9kg
Dimensions	374×261×116mm(W×H×D)
Control mode	Local control and PC control
PC connection	2 Ethernet ports / WIFI (802.11 b/g/n)
Local display	TFT LCD, 10.4inch touch screen

Hardware self-check	Self-check after power on
Galvanic separated groups	The following groups are galvanically separated from each other: mains, voltage amplifier output, current amplifier group A/B, auxiliary DC supply, binary/analog input.
Protection	All current and voltage outputs are fully overload and short circuit proof and protected against external high-voltage transient signals and over temperature.
Environmental conditions	
Operation temperature	0~50ºC
Storage temperature	-25~+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
Safety	EN/IEC 61010-1/1-12/2-030; EN/IEC 60255-25/27; FCC Part 15: Sub B
Others	ECS-001:2006 LVD EU
Developed and manufactured under an ISO9001:2015 registered system	

Specifications are subject to modification without notice.

L336EXi-H
Digital Protection Relay Test Set

Specifications

AC Current outputs	
Control	Independent control of amplitude, frequency and phase angle
Range	6×20A/3×40A
Accuracy	error < 0.08% rd. + 0.02% rg. guar. error < 0.03% rd. + 0.02% rg. typ.
Resolution	1mA(≤10A), 5mA(10A~40A)
Max output power	6×225VA (20A/phase), 3×450VA (30~40A/phase)
Current rise/drop time	<100μs
Harmonic distortion (THD%)	≤0.2%
Frequency	10Hz~1kHz
Output time	continuous (<10A/channel) >30s (10~20A/channel) >15s (20~30A/channel) >10s (30~40A/channel)
Operation indication	Automatic detection and alarm when overload, distortion and open circuit

DC Current outputs	
Range	6×10A
Accuracy	±5mA (0.2A~1A) ±0.5% (1A~10A)
Resolution	2mA (0.2A~10A)
Max output power	100W (10A)
Operation indication	Overload protection automatically

AC Voltage outputs	
Control	Independent control of amplitude, frequency and phase angle
4-phase ac(L-N)	4×0~300V
1-phase ac(L-L)	1×0~600V
Fourth voltage (Uz)	Can be set as zero sequence voltage, line extraction voltage, or any value
Accuracy	error < 0.08% rd. + 0.02% rg. guar. error < 0.03% rd. + 0.02% rg. typ.
Resolution	1mV(<30V), 10mV(30V~300V)

Max output 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
Voltage rise/drop time	<100μs
Harmonic distortion (THD%)	<0.05% type., <0.1% guar., at 30V~300V
Frequency	10Hz~1kHz
Output time	continuous output rated voltage
Operation indication	Automatic detection and alarm when overload, distortion and short circuit
Synchronization error between current and voltage	≤10μs

DC Voltage outputs	
Range	4×±300V/ 1×±600V
Accuracy	±50mV (2V ~10V), ±0.5% (10 ~300V)
Resolution	10mV
Max output power	100W (300V)

General	
Frequency	
Range(sine signal)	10Hz~1kHz
Accuracy	<0.5mHz①
Resolution	0.001Hz
Output characteristic	Can add harmonic (2nd ~ 31st) and DC
Phase	
Range	0~359.9°
Accuracy	±0.1°
Resolution	0.1°

Auxiliary DC supply	
Voltage range	48V~264V
Power	88W at 110V; 110W at 220V
Accuracy	<2%rg. typ. <5%rg. guar

Binary inputs (A~H)	
Number	8
Trigger criteria	Potential-free contacts or DC voltage compared to threshold voltage
Input characteristics	Potential-free or 18VDC threshold
Max input	300Vpeak
Sample rate	20kHz
Resolution	50μs

Note: ① test at 50Hz/60Hz condition.

L336EXi-H Digital Protection Relay Test Set

Max. measuring time	Infinite
Counting function	<3kHz at pulse, width 150μs
Max. input voltage	CAT II / 400V, CAT III / 300V, CAT IV / 150V
Debounce/Deglitch time	0~25ms
Galvanic isolation	8 galvanically isolated
Connection	4mm banana sockets
Counter inputs(optional)	
Number	2
Max. counting frequency	100kHz
Pulse width	>3μs
Threshold voltage	5V (2V hysteresis)
Max. input voltage	±8V
Connection	10pin combination socket (top panel)
Binary outputs, relays (1~4)	
Type	Potential-free relay contacts, software controlled
Number	4
Break capacity AC	Vmax: 300VAC / Imax: 8A / Pmax: 2000VA
Break capacity DC	Vmax: 300VDC / Imax: 8A / Pmax: 150 W
Connection	4mm banana sockets (front side)
Binary outputs, transistor (5~8)	
Type	open collector transistor outputs
Number	4
Update rate	10kHz
Break capacity DC	±30mA/±300V DC
Connection	4mm banana sockets (front side)
DC voltage measuring input(optional)	
Measuring range	0~±10V
Accuracy	<0.02%rg. Typ.; 0.05%rg. Guar.
Input impedance	100kΩ
DC current measuring input(optional)	
Measuring range	0~±1mA, 0~±20mA
Accuracy	<0.02%rg. Typ.; 0.05%rg. Guar.
Input impedance	50Ω
IEC61850 SV, GOOSE (optional) (designed based on FPGA)	
Number	8 fiber optic ports/Ethernet ports (100/1000MB), changeable
Interface type	LC/RJ45
Fiber-optic type	62.5/125μm(multimode fiber, orange)
GOOSE publishing and subscription	①Mapping of binary outputs to data attributes in published GOOSE message, and mapping of data attributes from subscribed GOOSE messages to binary inputs. ②Number of virtual binary outputs/inputs: ≥360 ③Number of GOOSEs to be published /subscribed: ≥128
SV sending and receiving 288 samples per nominal period	
VLAN support	selectable priority and VLAN-ID
Status indication	LINK green (light): An effective link RX\TX green (flashing): Data exchange
FT3(optional) (designed based on FPGA)	
Number	Total 8, 6 ports for sending, 2 ports for receiving
Standard	IEC60044-7/8
Interface type	ST
Fiber-optic type	62.5/125μm (multimode fiber, orange)
Status indication	HD green (light): An effective link
Synchronization-GPS interface (Built-in)	
Timing accuracy	10us
Interface type	SMA
Synchronization-IRIG-B interface (Built-in)	
Timing accuracy	10us
Interface type	ST
Synchronization-PTP (Precision Time Protocol, IEEE1588) interface (Built-in)	
Power supply	
Nominal input voltage 100~240V AC	
Permissible input voltage 85~264VAC	
Nominal frequency 50/60Hz	
Permissible frequency range 45~65Hz	
Current	10A max
Protection	Over voltage protection and unsafe grounding alarming
Connection	Standard AC socket (IEC 60320)
Others	
Weight	9kg
Dimensions	374×261×116mm(W×H×D)
Control mode	Local control and PC control
PC connection	2 Ethernet ports / WIFI (802.11 b/g/n)
Local display	TFT LCD, 10.4inch touch screen
Hardware self-check Self-check after power on	
Galvanic separated groups The following groups are galvanically separated from each other: mains, voltage amplifier output, current amplifier group A/B, auxiliary DC supply, binary/analog input.	

Protection	All current and voltage outputs are fully overload and short circuit proof and protected against external high-voltage transient signals and over temperature.
Environmental conditions	
Operation temperature	0~50ºC
Storage temperature	-25~+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
Safety	EN/IEC 61010-1/1-12/2-030 EN/IEC 60255-25/27 FCC Part 15: Sub B
Others	ECS-001:2006 LVD EU
Developed and manufactured under an ISO9001:2015 registered system	

Specifications are subject to modification without notice.

L336EXi-E
Digital Protection Relay Test Set

Specifications

AC Current outputs	
Control	Independent control of amplitude, frequency and phase angle
Range	4×20A/1×80A
Accuracy	error < 0.08% rd. + 0.02% rg. guar. error < 0.03% rd. + 0.02% rg. typ.
Resolution	1mA(≤10A), 5mA(10~40A)
Max output power	4×225VA (20A/phase) 1×450VA (50A)
Current rise/drop time	<100μs
Harmonic distortion (THD%)	≤0.2%
Frequency	10Hz~1kHz
Output time	continuous (<10A/channel) >30s (10~20A/channel) >15s (20~30A/channel) >10s (30~40A/channel)
Operation indication	Automatic detection and alarm when overload, distortion and open circuit

DC Current outputs	
Range	4×10A
Accuracy	±5mA (0.2A~1A) ±0.5% (1A~10A)
Resolution	2mA (0.2A~10A)
Max output power	100W (10A)
Operation indication	Overload protection automatically

AC Voltage outputs	
Control	Independent control of amplitude, frequency and phase angle
4-phase ac(L-N)	4×0~300V
1-phase ac(L-L)	1×0~600V
Fourth voltage (Uz)	Can be set as zero sequence voltage, line extraction voltage, or any value
Accuracy	error < 0.08% rd. + 0.02% rg. guar. error < 0.03% rd. + 0.02% rg. typ.
Resolution	1mV(<30V), 10mV(30V~300V)

Max Output 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
Voltage rise/drop time	<100μs
Harmonic distortion (THD%)	<0.05% type., <0.1% guar., at 30V~300V
Frequency	10Hz~1KHz
Output time	continuous output rated voltage
Operation indication	Automatic detection and alarm when overload, distortion and short circuit
Synchronization error between current and voltage	≤10μs

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

General	
Frequency	
Range(sine signal)	10Hz~1KHz
Accuracy	<0.5mHz①
Resolution	0.001Hz
Output characteristic	Can add harmonic (2nd ~ 31st) and DC
Phase	
Range	0~359.9°
Accuracy	±0.1°
Resolution	0.1°

Auxiliary DC supply	
Voltage range	48V~264V
Power	88W at 110V; 110W at 220V
Accuracy	<2%rg. typ. <5%rg. guar

Binary inputs (A~H)	
Number	8
Trigger criteria	Potential-free contacts or DC voltage compared to threshold voltage
Input characteristics	Potential-free or 18VDC threshold
Max input	300Vpeak
Sample rate	20kHz
Resolution	50μs

Note: ① test at 50Hz/60Hz condition.

L336EXi-E Digital Protection Relay Test Set

Max. measuring time	Infinite
Counting function	<3kHz at pulse, width 150μs
Max. input voltage	CAT II / 400V, CAT III / 300V, CAT IV / 150V
Debounce/Deglitch time	0~25ms
Galvanic isolation	8 galvanically isolated
Connection	4mm banana sockets
Counter inputs(optional)	
Number	2
Max. counting frequency	100kHz
Pulse width	>3μs
Threshold voltage	5V (2V hysteresis)
Max. input voltage	±8V
Connection	10pin combination socket (top panel)
Binary outputs, relays (1~4)	
Type	Potential-free relay contacts, software controlled
Number	4
Break capacity AC	Vmax: 300VAC / Imax: 8A / Pmax: 2000VA
Break capacity DC	Vmax: 300VDC / Imax: 8A / Pmax: 150 W
Connection	4mm banana sockets (front side)
Binary outputs, transistor (5~8)	
Type	open collector transistor outputs
Number	4
Update rate	10kHz
Break capacity DC	±30mA/±300V DC
Connection	4mm banana sockets (front side)
DC voltage measuring input(optional)	
Measuring range	0~±10V
Accuracy	<0.02%rg. Typ.; 0.05%rg. Guar.
Input impedance	100kΩ
DC current measuring input(optional)	
Measuring range	0~±1mA, 0~±20mA
Accuracy	<0.02%rg. Typ.; 0.05%rg. Guar.
Input impedance	50Ω
IEC61850 SV, GOOSE (optional) (designed based on FPGA)	
Number	8 fiber optic ports/Ethernet ports (100/1000MB), changeable
Interface type	LC/RJ45
Fiber-optic type	62.5/125μm(multimode fiber, orange)
GOOSE publishing and subscription	①Mapping of binary outputs to data attributes in published GOOSE message, and mapping of data attributes from subscribed GOOSE messages to binary inputs. ②Number of virtual binary outputs/inputs: ≥360 ③Number of GOOSEs to be published /subscribed: ≥128
SV sending and receiving 288 samples per nominal period	
VLAN support	selectable priority and VLAN-ID
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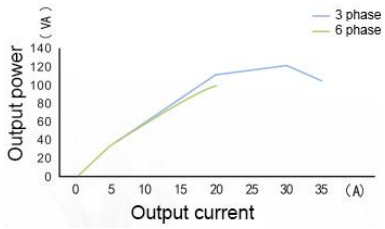
FT3(optional) (designed based on FPGA)	
Number	Total 8, 6 ports for sending, 2 ports for receiving
Standard	IEC60044-7/8
Interface type	ST
Fiber-optic type	62.5/125μm (multimode fiber, orange)
Status indication	HD green (light): An effective link
Synchronization-GPS interface (Built-in)	
Timing accuracy	10us
Interface type	SMA
Synchronization-IRIG-B interface (Built-in)	
Timing accuracy	10us
Interface type	ST
Synchronization-PTP (Precision Time Protocol, IEEE1588) interface (Built-in)	
Power supply	
Nominal input voltage 100~240V AC	
Permissible input voltage 85~264VAC	
Nominal frequency 50/60Hz	
Permissible frequency range 45~65Hz	
Current	10A max
Protection	Over voltage protection and unsafe grounding alarming
Connection	Standard AC socket (IEC 60320)
Others	
Weight	9kg
Dimensions	374×261×116mm(W×H×D)
Control mode	Local control and PC control
PC connection	2 Ethernet ports / WIFI (802.11 b/g/n)
Local display	TFT LCD, 10.4inch touch screen
Hardware self-check Self-check after power on	
Galvanic separated groups The following groups are galvanically separated from each other: mains, voltage amplifier output, current amplifier group A/B, auxiliary DC supply, binary/analog input.	

Protection	All current and voltage outputs are fully overload and short circuit proof and protected against external high-voltage transient signals and over temperature.
Environmental conditions	
Operation temperature	0~50ºC
Storage temperature	-25~+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
Safety	EN/IEC 61010-1/1-12/2-030 EN/IEC 60255-25/27 FCC Part 15: Sub B
Others	ECS-001:2006 LVD EU
Developed and manufactured under an ISO9001:2015 registered system	

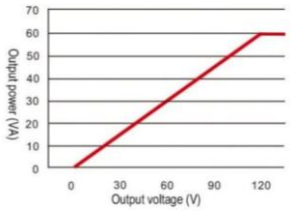
Specifications are subject to modification without notice.

L336EXi-B
Digital Protection Relay Test Set

Specifications

AC Current outputs	
Control	Independent control of amplitude, frequency and phase angle
Range	6×20A/3×40A
Accuracy	error < 0.08% rd. + 0.02% rg. guar. error < 0.03% rd. + 0.02% rg. typ.
Resolution	1mA(≤10A), 5mA(10A~40A)
Max output power	6×100VA (20A/phase), 3×120VA (30A/phase)
Output power characteristic curve	
Current rise/drop time	<100μs
Harmonic distortion (THD%)	≤0.2%
Frequency	10Hz~1kHz
Output time	continuous (<10A/channel) >30s (10~20A/channel) >15s (20~30A/channel) >10s (30~40A/channel)
Operation indication	Automatic detection and alarm when overload, distortion and open circuit

DC Current outputs	
Range	6×10A
Accuracy	±5mA (0.2A~1A) ±0.5% (1A~10A)
Resolution	2mA (0.2A~10A)
Max output power	90W (10A)
Operation indication	Overload protection automatically

AC Voltage outputs	
Control	Independent control of amplitude, frequency and phase angle
Range	6×130V
Fourth voltage (Uz)	Can be set as zero sequence voltage, line extraction voltage, or any value
Accuracy	error < 0.08% rd. + 0.02% rg. guar. error < 0.03% rd. + 0.02% rg. typ.
Resolution	5mV (≤2V) /10mV (2V~130V)
Output power	3x60VA (120V/phase) 6x30VA (120V/phase)
Output power characteristic curve	
Voltage rise/drop time	<100μs
Harmonic distortion (THD%)	≤0.2%
Frequency	10Hz~1kHz
Output time	continuous output rated voltage
Operation indication	Automatic detection and alarm when overload, distortion and short circuit
Synchronization error between current and voltage	≤10μs

DC Voltage outputs	
Range	6×150V/1*300V
Accuracy	±25mV (0.5V~5V); ±0.5% (5V~150V)
Resolution	1mV (0.5V~5V); 10mV(5V~150V)
Max output power	60W (150V)

General	
Frequency	
Range(sine signal)	10Hz~1kHz
Accuracy	<0.5mHz①
Resolution	0.001Hz
Output characteristic	Can add harmonic (2nd ~ 31st) and DC
Phase	
Range	0~359.9°
Accuracy	±0.1°
Resolution	0.1°

Auxiliary DC supply	
Voltage range	48V~264V
Power	88W at 110V; 110W at 220V
Accuracy	<2%rg. typ. <5%rg. guar

Note: ① test at 50Hz/60Hz condition.

L336EXi-B Digital Protection Relay Test Set

Binary inputs (A~H)	
Number	8
Trigger criteria	Potential-free contacts or DC voltage compared to threshold voltage
Input characteristics	Potential-free or 18VDC threshold
Max input	300Vpeak
Sample rate	20kHz
Resolution	50μs
Max. measuring time	Infinite
Counting function	<3kHz at pulse, width 150μs
Max. input voltage	CAT II / 400V, CAT III / 300V, CAT IV / 150V
Debounce/Deglitch time	0-25ms
Galvanic isolation	8 galvanically isolated
Connection	4 mm banana sockets

Counter inputs (optional)	
Number	2
Max. counting frequency	100kHz
Pulse width	>3μs
Threshold voltage	5V (2V hysteresis)
Max. input voltage	±8V
Connection	10 pin combination socket (top panel)

Binary outputs, relays (1~4)	
Type	Potential-free relay contacts, software controlled
Number	4
Break capacity AC	Vmax: 300VAC / Imax: 8A / Pmax: 2000 VA
Break capacity DC	Vmax: 300VDC / Imax: 8A / Pmax: 150 W
Connection	4 mm banana sockets (front side)

Binary outputs, transistor (5~8)	
Type	open collector transistor outputs
Number	4
Update rate	10kHz
Break capacity DC	±30mA/±300V DC
Connection	4 mm banana sockets (front side)

DC voltage measuring input(optional)	
Measuring range	0~±10V
Accuracy	<0.02%rg. Typ.; 0.05%rg. Guar.
Input impedance	100kΩ

DC current measuring input(optional)	
Measuring range	0~±1mA, 0~±20mA
Accuracy	<0.02%rg. Typ.; 0.05%rg. Guar.
Input impedance	50Ω

IEC61850 SV, GOOSE (optional) (designed based on FPGA)	
Number	8 fiber optic ports/Ethernet ports (100/1000MB), changeable
Interface type	LC/RJ45
Fiber-optic type	62.5/125μm(multimode fiber, orange)
GOOSE publishing and subscription	①Mapping of binary outputs to data attributes in published GOOSE message, and mapping of data attributes from subscribed GOOSE messages to binary inputs. ②Number of virtual binary outputs/inputs: ≥360 ③Number of GOOSEs to be published /subscribed: ≥128
SV sending and receiving	288 samples per nominal period
VLAN support	selectable priority and VLAN-ID
Status indication	LINK green (light): An effective link RX\TX green (flashing): Data exchange

FT3(optional) (designed based on FPGA)	
Number	Total 8, 6 ports for sending, 2 ports for receiving
Standard	IEC60044-7/8
Interface type	ST
Fiber-optic type	62.5/125μm (multimode fiber, orange)
Status indication	HD green (light): An effective link

Synchronization-GPS interface (Built-in)	
Timing accuracy	10us
Interface type	SMA

Synchronization-IRIG-B interface (Built-in)	
Timing accuracy	10us
Interface type	ST

Synchronization-PTP (Precision Time Protocol, IEEE1588) interface (Built-in)

Power supply	
Nominal input voltage	100~240V AC， 200~340V DC
Permissible input voltage	85~264VAC， 200~360V DC
Nominal frequency	50/60Hz
Permissible frequency range	45~65Hz
Current	6A max
Battery	7.4V/32Ah, 236.8Wh lithium battery, can be removable
Protection	Over voltage protection and unsafe grounding alarming
Connection	Standard AC socket (IEC 60320)

Others	
Weight	9.5kg
Dimensions	374×261×116mm(W×H×D)
Control mode	Local control and PC control
PC connection	2 Ethernet ports / WIFI (802.11 b/g/n)
Local display	TFT LCD, 10.4inch touch screen

Hardware self-check	Self-check after power on
Galvanic separated groups	The following groups are galvanically separated from each other: mains, voltage amplifier output, current amplifier group A/B, auxiliary DC supply, binary/analog input.
Protection	All current and voltage outputs are fully overload and short circuit proof and protected against external high-voltage transient signals and over temperature.
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Environment	EN/IEC 60068-2-1/2/3/6/27
Safety	EN/IEC 61010-1/1-12/2-030; EN/IEC 60255-25/27; FCC Part 15: Sub B
Others	ECS-001:2006 LVD EU
Developed and manufactured under an ISO9001:2015 registered system	

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