KEISOKU GIKEN Co., Ltd.

Just like a Resistor!

High-end multifunctional electronic load

Load Station Series

The ultimate DC electronic load!

1kW

300W

DC high-speed electronic load

300W : ￥Please contact us

1kW : ￥Please contact us

~10kW max.

CE

"3-minute guide" for "Load Station Series"
Now available on Youtube. *only Japanese

https://www.keisoku.co.jp/pw/support/movie-info/

No overshoot! High-end multifunction electronic load device

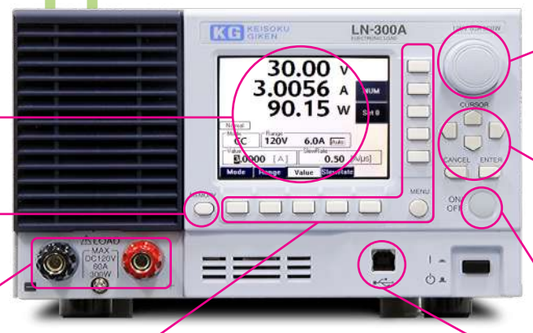
Load Station Series

- Oscilloscope-like electronic load is truly a "UI revolution
- Lineup of 4 models (120V / 500V each) in 300W and 1kW
- Equipped with a variety of load and operating modes
- Linear operation" with no concept of minimum operating voltage realizes "like electronic resistance"!
- Capable of ripple noise/high accuracy DC voltage measurement（※1）
- Significant weight reduction（300W type: 6.5kg 1kW type: 13kg）
- Independently configurable current rise/fall times from 1 μs minimum（※2）
- GP-IB and DIDO control available（※3）
- Remote control via LAN is possible（※4）
- CE marking compliant（Main unit only, optional RC-02A is not included）

※1：Factory option　※2：When CC in dynamic mode
※3：Option: LX-OP01　※4：Option: LX-OP12

Front

Eight front points for pursuing ease of use



Easy-to-read 3.5-inch large color LCD

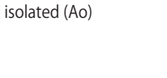
One-touch memory function for recalling set values

Convenient front load terminal

With safety terminal block cover

Large rotary knob for easy up/down of current

10-degree tilt on key tops for improved operability



Self-illuminated load ON/OFF button

Oscilloscope-like reverse array keys can also be used as a numeric keypad for numerical input

Front USB for connection to PC and immediate use

Side

The handle is placed on the side of the main unit for a cleaner top.

Rear

Ripple noise measurement input (option: RC-02A)

Main power switch

Supports worldwide power input for use around the world

Convenient rear load terminals for rack mounting (with safe terminal block cover)

GP-IB/DIDO and LAN interface (Optional)

Booster connector

Trigger output terminal

External control input (Ai)

Load remote sense input

Remote sense external/ internal toggle switch

Current monitor output/non-isolated (Ao)

■ Lineup of 4 models in 300W and 1kW

The Load Station series offers two types (120V, 150V) of 300W/1kW with different rated voltages.
Select the 120V type for applications with relatively high current and the 500V type for high voltage applications.
The booster function is provided as standard, so if the capacity of one unit is not sufficient, up to 10 units (10 kW in the case of the 1 kW type) can be easily connected (same voltage model).
(for the same voltage model) can be easily expanded.

type name	Rated voltage	Rated current	Rated power
LN-300A	120V	60A	300W
LN-300C	500V	12A	300W
LN-1000A	120V	180A	1kW
LN-1000C	500V	36A	1kW

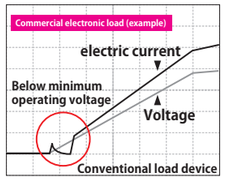
■ Combination of load and operating modes Support for 26 modes of testing

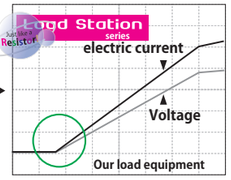
The Load Station series has 6 load modes (CC, CR, CV, CP, EXT, SHORT) and 6 operation modes (Normal, Dynamic, Sequence, Sweep, MPPT (optional), Current Limit). Sequence operation can be performed from a PC.
Sequence operation requires setting from a PC.

		load mode					
		CC	CR	CV	CP	EXT	SHORT
Operation Mode	Normal	○	○	○	○	○	○
	Dynamic	○	○	○	○	—	—
	Sequence	○	○	○	○	—	—
	Sweep	○	○	—	○	—	—
	MPPT	○	○	○	—	—	—
	Current Limit	○	○	○	○	○	○

■ Linear operation "like electronic resistance"

The restriction of electronic load devices that "no current flows below the minimum operating voltage" has become a common sense of the past; the Load Station series has "electronic resistance characteristics" in which the current changes linearly from zero V, eliminating the need to worry about the minimum operating voltage. In addition, since there is no need for soft-start operation, as is generally the case with electronic load devices, there is no current delay, resulting in an ideal start-up.





■ Fast response also in constant voltage (CV) mode

In analog circuits, the constant voltage (CV) mode, which makes a particularly large difference, can also respond at high speed, as well as in the constant current (CC) mode.

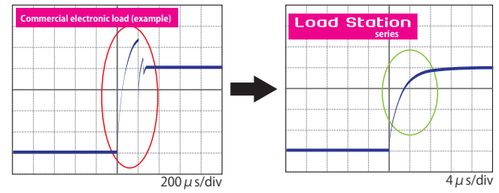
type name	Response time * Fast/Slow switching	Response start time*.
LN-300A	Fast　45 ms	2 ms
LN-300C	Fast　280 ms	7 ms
LN-1000A	Fast　550 μs	20 μs
LN-1000C	Fast　110 ms	4 ms

*typ. 値

Here's the difference

■ High-speed current control technology

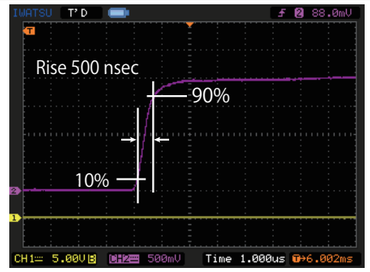
Electronic load devices may experience current overshoot or ringing depending on operating conditions; the Load Station series eliminates such currents with its high-speed current feedback control technology to achieve ideal current waveforms.



■ High-speed response Slew rate max. 30A/μs

The Load Station series offers a fast response time of up to 30 A/μs (LN-1000A) thanks to high-speed current control technology. The minimum response time is 500ns for all models, realizing fast start-up even when the set current value is small.
The settable response time varies depending on the range and other conditions.
*High-speed electronic loads are required for testing power supplies supplied to high-speed devices!

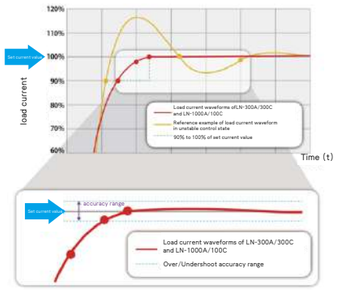
type namec	Maximum slew rate
LN-300A	20 A/ μs
LN-300C	1 A/ μs
LN-1000A	30 A/ μs
LN-1000C	3 A/ μs



Minimum Response Time

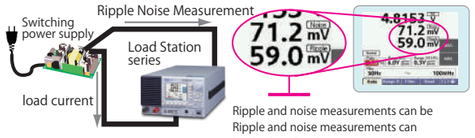
■ Rising current over/Guaranteed undershoot range specifications

High-speed current control ensures that over/undershoot against the set current is extremely small and smooth, and protects the DUT from damage without stressing it.



■ Ripple Noise/High Accuracy DC Voltage Measurement

The Load Station series can be equipped with an optional ripple noise measurement board (RC-02A), which is also capable of high-precision DC voltage measurement. The RC-02A can also measure high-precision DC voltage, making it ideal for measuring various battery voltages.

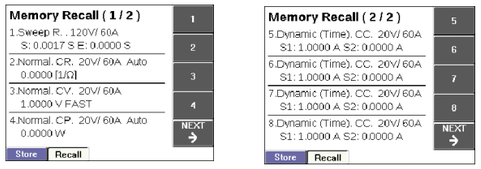


Ripple and noise measurements can be
Ripple and noise measurements can
be displayed at the same time.
No troublesome switching operation is required!

Electronic load function + instrument function (optional configuration)

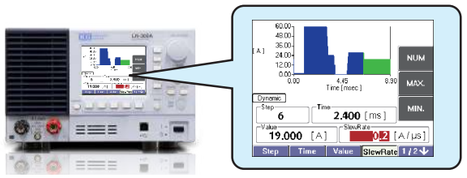
■ 8 memory functions

Up to 8 different load modes, load set values, and other conditions can be stored/read out. For example, load values for various conditions can be stored in addition to minimum/rated/maximum load conditions.



■ 16-step dynamic (switching) mode MAX 500kHz

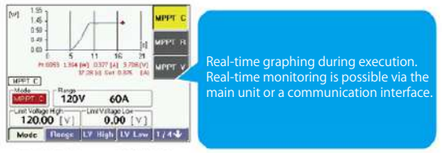
In addition to the general 2-step (HIGH/LOW, binary) dynamic mode, 16-step dynamic operation is available. This enables testing with more detailed current waveforms. The current waveform can be set graphically on the color LCD. Operation can be set in either time or period (frequency display).



■ MPPT (Maximum Power Point Tracking) function(Option: LX-OP11)

MPPT function (mountain climbing method) required for testing solar panels (PV), etc., is prepared as an option.
This is a control method that continuously adjusts the operating voltage and current using CC, CR, or CV mode until maximum power is obtained.
During operation, a real-time chart (graph) is displayed on the LCD panel, allowing the user to monitor the operating status during operation.

Setting items	Contents
MPPT operation mode	CC,CR,CV
Step time interval for MPPT operation	200ms or 1000ms
Step time interval for overall scan	200ms or 1000ms
Overall scan execution interval	10s ～ 999h59m59s



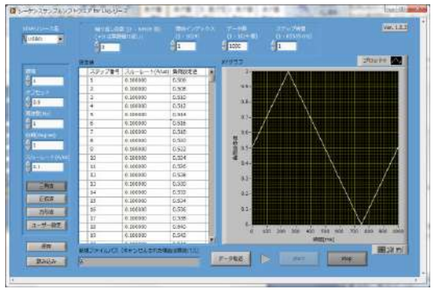
Real-time graphing during execution.
Real-time monitoring is possible via the main unit or a communication interface.

Example of MPTT CC mode execution

■ Sequence mode with 1,024 memories

The Load Station series has 1,024 words of built-in memory for sequence operation, enabling reproduction of various current waveforms by transferring data created by a PC to the built-in memory.
The increment time for each step is common and can be programmed in the range from a minimum of 1 ms to a maximum of 1 min.

*Sample software for sequence settings can be downloaded from our web site.
https://www.keisoku.co.jp/pw/support/download-doc/



Sequence Sample Software Setup Screen

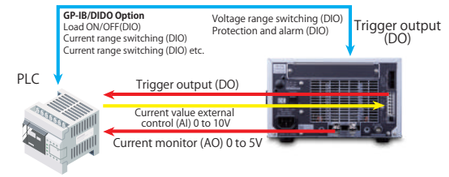
■ Equipped with load mode automatic switching function

The automatic load mode switching function is a function that monitors the output voltage of a battery and switches the load mode when it reaches a set voltage (e.g., CC+CV) or turns the load off (e.g., CC+OFF) when conducting discharge tests on rechargeable batteries or other devices.
As shown in the table on the right, it is possible to switch from any mode except EXT (external control) and SHORT to other modes.
* Switching to CC mode is not possible.

		start load mode					
		CC	CR	CV	CP	EXT	SHORT
changeover mode	OFF	○	○	○	○	×	×
	CC	—	×	×	×	×	×
	CR	○	—	○	○	×	×
	CV	○	○	—	○	×	×
	CP	○	○	○	—	×	×

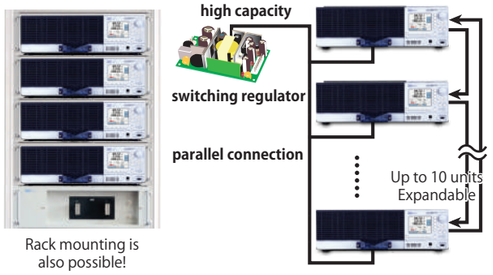
■ Interface/External Control

The Load Station series is equipped with a USB interface as standard and can be connected from the front panel. When the optional GP-IB/DIDO board (LX-OP01) is built in, in addition to the GP-IB interface, which is widely used for measuring instruments, it can also be connected to a PLC as shown on the right. Also, by installing a LAN interface (LX-OP12), direct control with a PC is possible.



■ Booster connection(Capacity up to 10 kW)

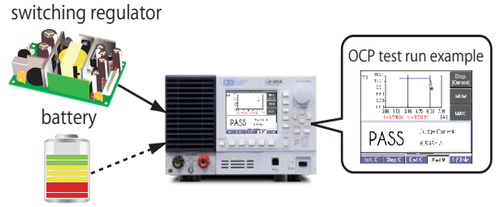
The Load Station series comes standard with a master/slave booster function that can be used as needed. For example, multiple electronic loads are normally used separately, and only when there is insufficient capacity can they be used as one large capacity load by connecting a booster and setting one as the master and the others as slaves.



Rack mounting is also possible!

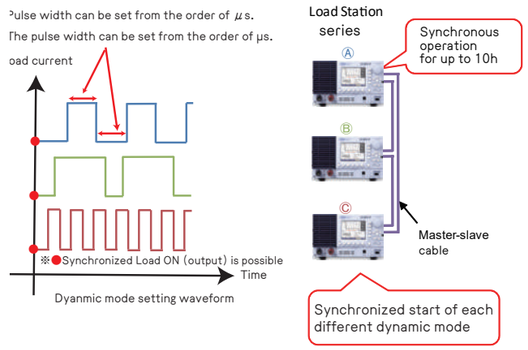
■ Sweep mode (built-in test function)

Sweep mode is a function that allows voltage and current measurements to be made while the load current is finely varied (swept) in three different load modes (CC, CR, and CP), and the results plotted on a color LCD for real-time graphing. For example, the OCP (overcurrent protection characteristic) of a switching power supply or the I-V characteristic of a rechargeable battery can be performed with a single electronic load, eliminating the need for a PC or dedicated program.



■ Multi-channel synchronous operation

It can be used to synchronously change the load current in switching power supplies with multi-channel outputs, etc. Load ON/OFF and step execution in dynamic mode can be synchronized with the master machine.



■ Software E-Load Player (free of charge)

E-Load Player is a software package containing 6 functions such as various settings and I-V characteristic tests for the Load Station series, which can be downloaded free of charge from our website.

basic setting
Measured value expansion
Dynamic setting (1)
Dynamic settings (2)
measurement log
I-V Characteristics

Download Site https://www.keisoku.co.jp/pw/support/download-doc/

Application Examples

Various characteristic tests of switching power supplies

■ Output characteristic test of switching power supplies

The ripple noise measurement function (factory option: RC-02A), which can incorporate an electronic load, makes it possible to complete output testing of switching power supplies with only an electronic load.

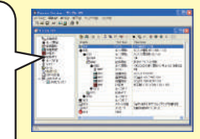
■ Switching power supply protection function test

Sweep mode enables graphing and good/fail judgment of OCP (overcurrent protection) tests with a stand-alone electronic load (without PC).

Switching power supply

■ Automatic evaluation of switching power supplies

Automatic evaluation software TP (sold separately) can automatically measure various characteristics of switching power supplies and output them as evaluation reports.

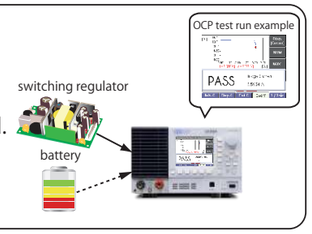


Automatic inspection of switching power supplies

The PTSmini automatic testing software (sold separately) automates various characteristic tests of switching power supplies and provides a good/fail judgment.

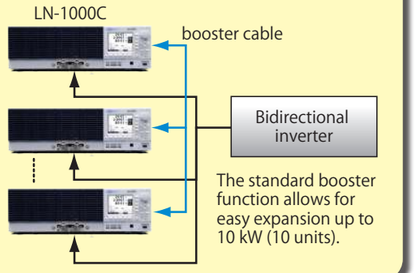
For I-V characteristics of various batteries, OCP testing of switching power supplies, etc.

Using the newly developed sweep mode (PC-less test function), I-V characteristics of various batteries can be graphed with electronic loads alone, and OCP characteristics of switching power supplies can be acquired. The acquired data can also be transferred to a PC via USB, which is a standard feature.



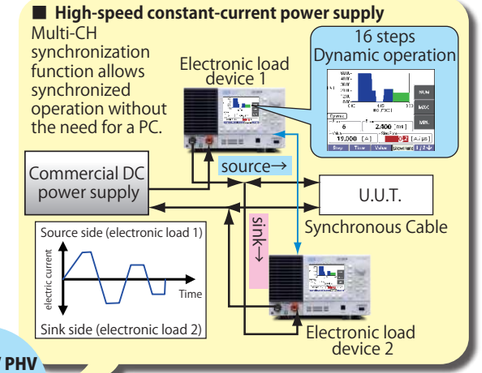
EV, HEV, and PHV charger and DC/DC converter evaluation testing

■ Discharge Evaluation of Bidirectional Inverters



■ High-speed constant-current power supply

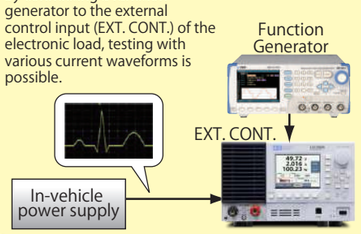
Multi-CH synchronization function allows synchronized operation without the need for a PC.



EV / HEV / PHV

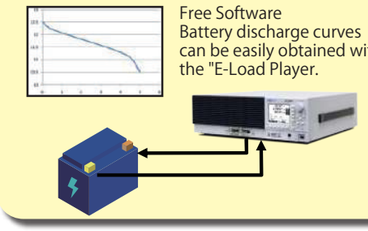
■ High-precision emulation of current waveforms

By connecting a function generator to the external control input (EXT. CONT.) of the electronic load, testing with various current waveforms is possible.

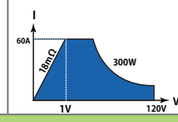
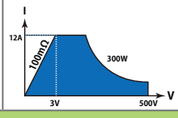
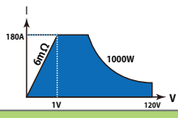
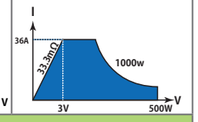


■ Battery Discharge Testing

Free Software
Battery discharge curves can be easily obtained with the "E-Load Player.



(technical) specification

type name		LN-300A	LN-300C	LN-1000A	LN-1000C
Load section rating					
electric current		60A	12A	180A	36A
Voltage		120V	500V	120V	500V
electric power（※ 1）		300W		1kW	
Internal Minimum Resistance（※ 2）		18m Ω or less	100m Ω or less	6m Ω or less	33.3m Ω or less
Load range（※ 2, 3）					
Operation Mode					
steady-state load		Constant current (CC), constant resistance (CR), constant voltage (CV), constant power (CP), external control (EXT), short circuit (SHORT)			
variable load		Switching operation (up to 16 steps), CC/CR/CV/CP modes supported, single/repeat operation			
sweep		Sweep R (CR mode), Sweep C (CC mode), Sweep P (CP mode)			
sequence		CC/CR/CV/CP modes supported, up to 1,024 steps			
MPPT (Option: LX-OP11)		MPPT CC、MPPT CR、MPPT CV			
Constant current (CC) mode					
Current setting range Resolution	Current range: H	0A ～ 60A / 5mA	0A ～ 12A / 1mA	0A ～ 180A / 15mA	0A ～ 36A / 3mA
	Current range: M	0A ～ 6A / 0.5mA	0A ～ 1.2A / 0.1mA	0A ～ 18A / 1.5mA	0A ～ 3.6A / 0.3mA
	Current range: L	0A ～ 0.6A / 0.1mA	0A ～ 0.12A / 0.02mA	0A ～ 1.8A / 0.3mA	0A ～ 0.36A / 0.06mA
Constant resistance (CR) mode					
Voltage range		20V	85V	20V	85V
Resistance setting range Resolution	Current range: H	40.000 S ～ 0.005 S (0.025 Ω～ 200 Ω) /4mS	3.3333 S ～ 0.0004 S (0.3 Ω～ 2.5 k Ω) /333 μ S	120.00 S ～ 0.01 S (0.0083 Ω～ 66.667 Ω) /12mS	10.000 S ～ 0.001 S (0.1 Ω～ 833.33 Ω) /1mS
	Current range: M	4.0000 S ～ 0.0005 S (0.25 Ω～ 2 k Ω) /400 μ S	0.33333 S ～ 0.00004S (3 Ω～ 25 k Ω) /33 μ S	12.000 S ～ 0.001 S (0.0833 Ω～ 666.67 Ω) /1.2mS	1.0000 S ～ 0.0001S (1 Ω～ 8333.3 Ω) /0.1mS
Voltage range		120V	500V	120V	500V
Resistance setting range Resolution	Current range: H	13.333 S ～ 0.0016S (0.075 Ω～ 600 Ω) /1.33mS	1.1111 S ～ 0.0001 S (0.9 Ω～ 7 k Ω) /111 μ S	40.000 S ～ 0.005S (0.025 Ω～ 200 Ω) /3.99mS	3.3333 S ～ 0.0004 S (0.3 Ω～ 2.3333 k Ω) /333 μ S
	Current range: M	1.3333 S ～ 0.00016S (0.75 Ω～ 6 k Ω) /133 μ S	0.11111 S ～ 0.00001S (9 Ω～ 70 k Ω) /11 μ S	4.0000 S ～ 0.0005 S (0.25 Ω～ 2 k Ω) /399 μ S	0.33330 S ～ 0.00004S (3 Ω～ 23.333 k Ω) /33 μ S
Constant voltage (CV) mode					
Voltage setting range Resolution	Voltage range: H	0 V ～ 120V / 10mV	0 V ～ 500V / 50mV	0 V ～ 120V / 10mV	0 V ～ 500V / 50mV
	Voltage range: L	0 V ～ 20V / 2mV	0 V ～ 85V / 10mV	0 V ～ 20V / 2mV	0 V ～ 85V / 10mV
Constant voltage (CP) mode					
Power setting range	Current range: H	0 W ～ 300W / 50mW		0 W ～ 1000W / 167mW	
	Current range: H	0 W ～ 40W / 5mW		0 W ～ 120W / 16.7mW	
DC voltage measurement					
Voltage measurement range Resolution	Current range: H	0 ～ 120.00V / 10mV	0 ～ 500.00V / 10mV	0 ～ 120.00V / 10mV	0 ～ 500.00V / 10mV
	Current range: M	0 ～ 20.000V / 1mV	0 ～ 85.000V / 1mV	0 ～ 20.000V / 1mV	0 ～ 85.000V / 1mV
DC current measurement					
Current measurement range Resolution	Current range: H	0 ～ 60A / 0.5mA	0 ～ 12A / 0.5mA	0 ～ 180A / 1.5mA	0 ～ 36A / 1.5mA
	Current range: M	0 ～ 6A / 0.1mA	0 ～ 1.2A / 0.1mA	0 ～ 18A / 0.3mA	0 ～ 3.6A / 0.3mA
	Current range: L	0 ～ 0.6A / 0.1mA	0 ～ 0.12A / 0.1mA	0 ～ 1.8A / 0.3mA	0 ～ 0.36A / 0.3mA
Power measurement					
measurement method		Calculation method [voltage measured value x current measured value].		Calculation method [voltage measured value x current measured value].	
interface					
PC Interface		Standard equipment: USB Option: GP-IB/DIDO: LX-OP01, LAN: LX-OP12			
Other		Trigger output, current monitor output (non-isolated)			
Protection, alarm function					
overcurrent protection		Load-off or current limit function (selectable)			
overpower protection		Load-off or power limit function (selectable)			
Overheat Protection		Load-off upon detection of temperature rise in equipment			
Overvoltage alarm（※ 4）		Load off, alarm occurs			
Reverse connection alarm（※ 4）		Alarm occurs when reverse connection is detected			
Power input					
Supply voltage/frequency range		AC85V to 264V / 50 Hz ± 2 Hz or 60 Hz ± 2 Hz overvoltage category II			
Power consumption		60VA or less		65VA or less	
Dimensions, weight and load terminal shape					
Load terminal shape	front	binding post		M8 terminal	
	rear	M6 terminal		M8 terminal	
Dimensions (W x H x D) / Weight		215 x 128.6 x 420 mm / approx. 6.5 kg		430 x 128.6 x 450 mm / approx. 13 kg	

※ 1：It varies depending on the temperature at which this product is used (temperature inside the enclosure) and the operating time.
※ 2：At rear panel load terminals; not the CR mode setting value.
※ 3：The minimum operating voltage varies depending on the current value.
※ 4：The overvoltage and reverse connection alarm function will turn off the load, but the voltage that caused the problem will remain applied. Remove the cause of the problem as soon as possible.

Order Information

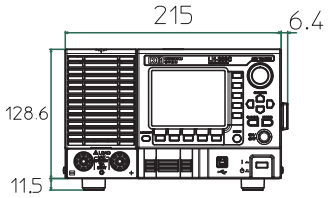
type name	Contents	Price
LN-300A	120V, 60A, 300W, 20A/ μ s	Please contact us
LN-300C	500V, 12A, 300W, 1A/ μ s	
LN-1000A	120V, 180A, 1kW, 30A/ μ s	
LN-1000C	500V, 36A, 1kW, 3A/ μ s	
inspection report		
LN-XXX/REC	Electronic Load Body Inspection Report (XXX is the model name)	Please contact us
RC-02A/REC	RC-02A Inspection Report	
TCP	Traceability by Product (Inspection report (Japanese version only) must be ordered) (Two copies are required for those with RC-02A)	
SCI	Standard Instrument Test Report (Test report (Japanese version only) must be ordered) (Two copies are required for those with RC-02A)	
Shipping Options		
RC-02A	Ripple Noise Measurement Module	Please contact us
LX-OP11	MPPT mode added	
Interface Accessories		
LX-OP01*2	GP-IB/DIDO Option	Please contact us
LX-OP12*2	LAN interface option	
Cable Accessories		
LX-OP03*1	Master/slave connection cable	Please contact us
Rack Mount Accessories		
LX-RK-JIS	Rack Mount Kit JIS Type	Please contact us
LX-RK-EIA	Rackmount Kit EIA Type	
LX-BP	Rack Mount Kit Blank Panel	

*1 The master/slave connection cable option is required for the number of units to be connected. *2 The optional interfaces (LX-OP01 and LX-OP12) cannot be installed at the same time, so you must select one of them.

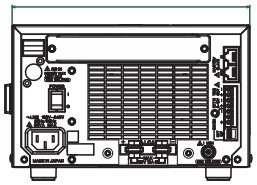
Dimensions

LN-300A / LN-300C

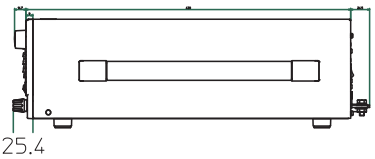
Front



Rear

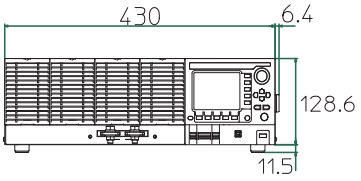


Side

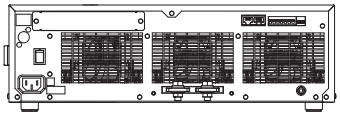


LN-1000A / LN-1000C

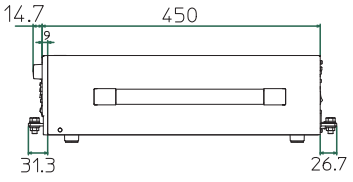
Front



Rear



Side



●The information in this catalog is current as of June 2023. ●For purchase, please confirm the latest specifications, price and delivery date. ●All company and product names mentioned herein are trademarks or registered trademarks of their respective companies. ●Specifications and shapes are subject to change without notice. ●While every effort has been made to ensure that the information provided is accurate, please contact us if you notice any errors.

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