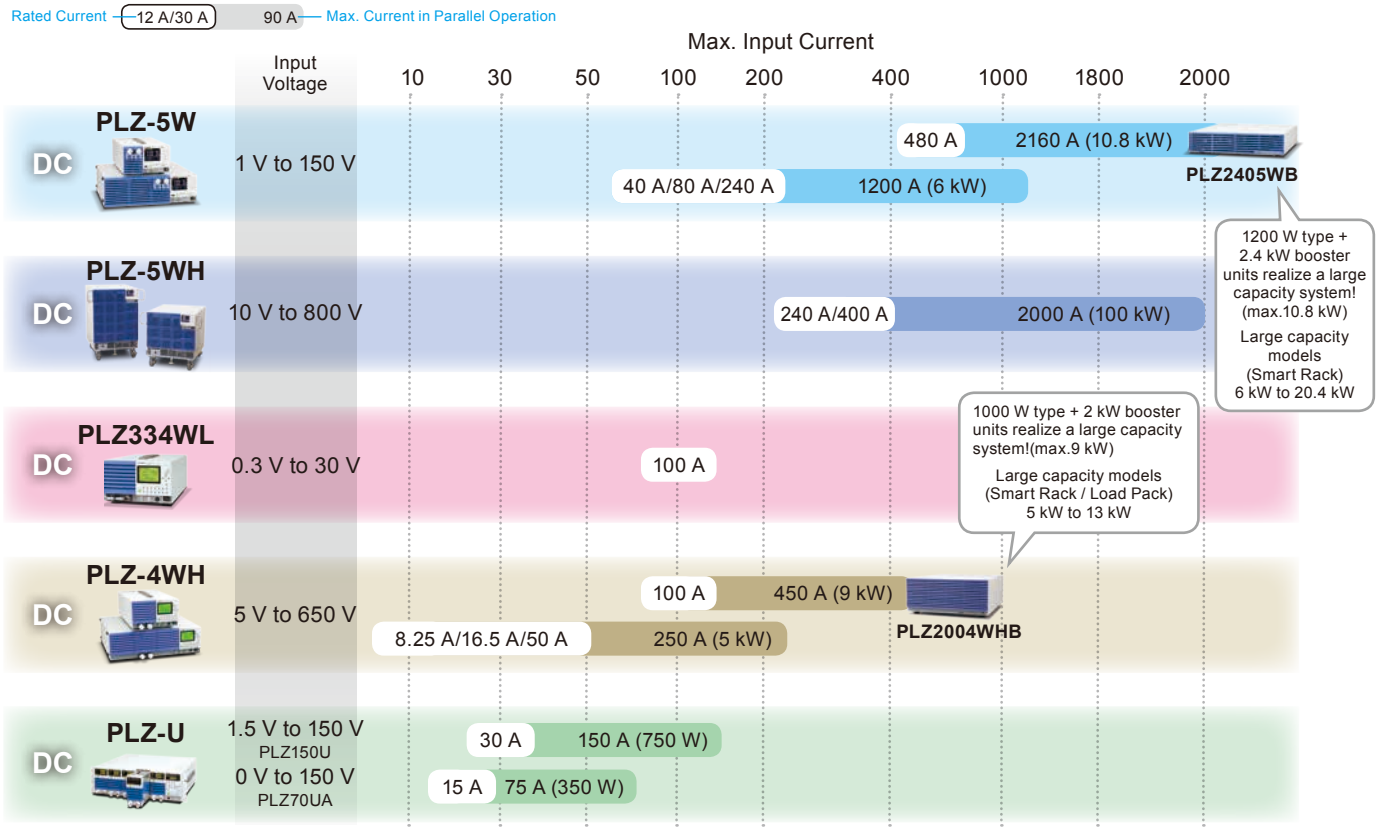
ELECTRONIC LOAD SELECTION GUIDE

Series		PLZ-5W	PLZ-5WH	PLZ-4WL	PLZ-4WH	PLZ-U
Line up		4 models	2 models	1 model	4 models	4 models
Features		Multi Functional	High Voltage	High Speed	High Voltage	Multi Channel
Input		DC	DC	DC	DC	DC
Mode	CC	✔	✔	✔	✔	✔
	CC+CV	✔	✔	✔	✔	✔
	CR	✔	✔	✔	✔	✔
	CR+CV	✔	✔	✔	✔	✔
	CV	✔	✔	✔	✔	✔
	CP	✔	✔	✔	✔	–
	ARB*	✔	✔	–	–	–
Input rating (Max.)		200 W/400 W/1.2 kW	12000 W/20000 W	330 W	165 W/330 W/1000 W	75 W/150 W
		150 V	800 V	30 V	650 V	150 V
		240 A	400 A	100 A	50 A	30 A
Zero Voltage Input		–	–	–	–	Available
GPIB		Option	Option	Standard	Standard	Standard
RS232C		Standard	Standard	Standard	Standard	Standard
USB		Standard	Standard	Standard	Standard	–
LAN		Standard	Standard	–	–	–

*Arbitrary I-V characteristics



Multifunctional Electronic Load (CC/CV/CR/CP)

PLZ-5W Series

LAN LXI USB GPIB (OPTION) RS232C DRIVERS CE

High-Speed Response, Advanced Communications, Large-Scale System Capability

The PLZ-5W Series high performance electronic load is the successor to the highly respected PLZ-4W series, whilst still retaining the same high specification and build quality. Advances include a high visibility color display, low voltage operation from a minimum of 1 V to a maximum of 150 V. Programmable profiles of voltage/current can be applied (using the new ARB function, as used in LED/solar testing) in addition to the inherited 6 modes of operation: Constant Current, Constant Resistance, Constant Voltage, Constant Power, Constant Current + Constant Voltage, Constant Resistance + Constant Voltage. Equipped with a high-speed response feature boasting a maximum slew rate of 60 A/µs (PLZ1205W) and a minimum setting resolution of 10 µA (PLZ205W). Additional features of the PLZ-5W series include: Soft-start function, variable slew rate, selectable response (CV/CR mode), switching function, ABC preset memory, 20 user-defined set-up configurations, and a sequence operation function. The advanced high-speed response makes the PLZ-5W ideal for the development and testing of today's modern power supplies that require variable high-speed current changes. This advantage extends to the testing of current clamps/transducers. The PLZ-5W Series is available in 4 standard models which can be incrementally extended by adding additional booster units (PLZ2405WB) to achieve a maximum of 10.8 kW/2160 A DC electronic load.

Dimensions

PLZ205W/405W: 214.5(8.45″)W × 124(4.88″)H × 400(15.75″)Dmm(inch)
PLZ1205W: 429.5(16.91″)W × 128(5.04″)H × 400(15.75″)Dmm(inch)

Accessories

Power cord (Cord length: Approx. 2.5 m), Rear-panel load input terminal cover, Load input terminal screw set (2 sets), Screws for the rear-panel load input terminal cover (2 pcs.), Front-panel load input terminal cover, Front-panel load input knob set, External control connector kit, Setup Guide, CD-ROM, Quick Reference(Japanese 1 sheet, English 1 sheet), Safety Information

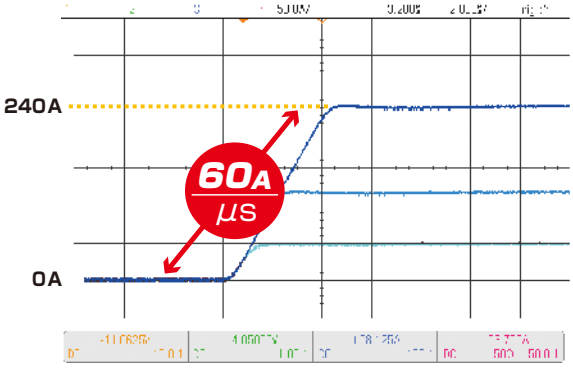
Features

- Operation voltage: 1 V to 150 V (from 0.05 V)
- High speed slew rate: 60 A/µs
- Arbitrary I-V characteristics: Installed “ARB mode”
- Parallel operation feature: The total current and power capacities can be increased to the maximum of 10.8 kW (2160 A) by connecting the booster units.
- New high visibilty color display.
- LAN(LXI compliant)/RS232C/USB are standard interface. External analog control. *GPIB is factory option.
- Improved sequence feature (Maximum 10000 steps)
- Setup memory can be saved to or loaded from a USB flash drive.

Functions

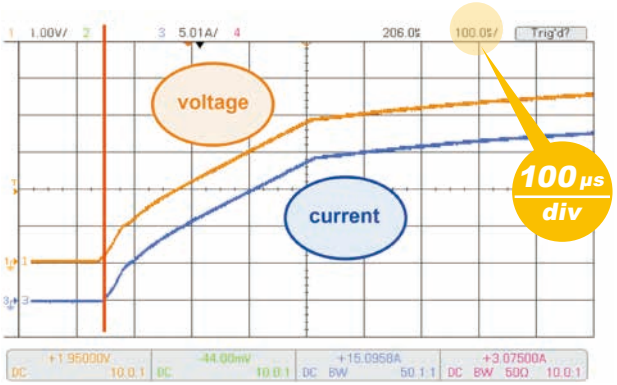
■ Maximum slew rate of 60 A/µs

Achieving a rise time of 4 µs to reach the rated current of the electronic load. Power supply evaluation demands a fast transient response which the PLZ-5W series achieves with ease.



■ High speed voltage tracking characteristics

High speed voltage tracking characteristic in CR mode is perfect for applications such as startup tests for power supplies.

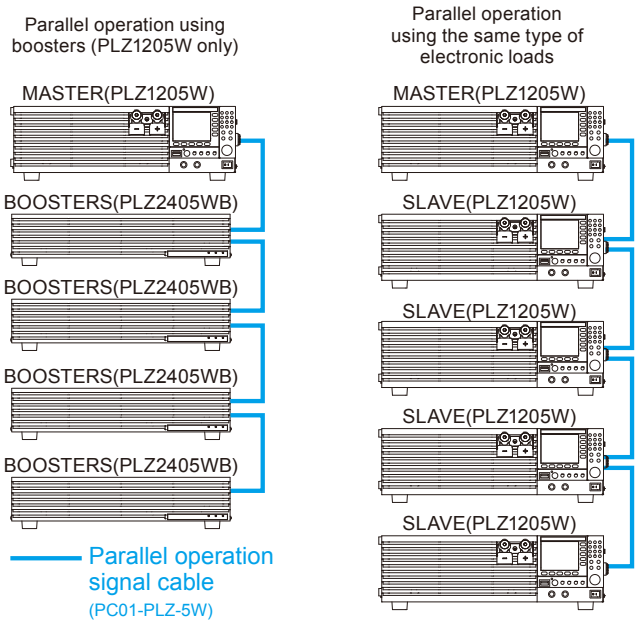


Functions

■ Parallel operation

Without using boosters, you can connect up to five units of the same model in parallel, including the master unit (max. 6 kW, 1200 A).
In the parallel connection configuration, one control master operates with one or more slave units, enabling you to control the entire system and view the sum of the combined data on the master unit's panel.
To connect the units requires the use of as many optional parallel cables (PC01-PLZ-5W) as the number of units to be connected.

*The PLZ2405WB (Booster) comes with 1 pc. of parallel operation cable (PC01-PLZ-5W).



* Do not stack three or more loads on top of each other.
You can stack loads (booster and master unit), but for safety reasons, only stack up to two units. If you want to use two or more boosters, we recommend you to rack mount them.

■ Booster unit PLZ2405WB*

Connecting up to 4 booster (PLZ2405WB) units with the master (PLZ1205W) increases the maximum system capability to 10.8 kW, 2160 A.
The optional parallel cable (PC01-PLZ-5W) is required to connect between the master and slave/booster units.

■ Specifications
Operating voltage ..... 1 Vdc to 150 Vdc
Current ..... 480 A
Power ..... 2400 W
Input voltage..... 100 Vac to 240 Vac (90 Vac to 250 Vac) single-phase
Power consumption ..... 95 VAmax
Dimensions ..... 430(16.93″)W × 86(3.39″)H × 450(17.72″)Dmm (inch)
Weight ..... approx. 15 kg (33.07 lb)

*PLZ2405WB is a dedicated booster for PLZ1205W.
It cannot be used with any other model.

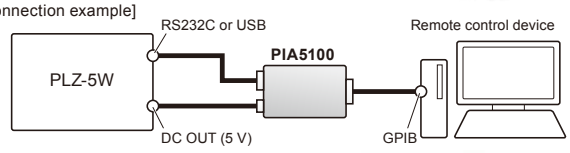
Options

■ GPIB converter

PIA5100

This converter converts RS232C or USB of the PLZ-5W to GPIB, enabling connection of a remote controller using GPIB.
[Accessories: Power cord set, Magnetic sheet]
*Not CE certified product

[Connection example]



■ Parallel operation signal cable kit

PC01-PLZ-5W (Cable length: Approx. 30 cm)

■ Sequence creation software

SD023-PLZ-5W (Wavy for PLZ-5W)

PLZ2405WB Specifications

Model		PLZ2405WB
Rating		
Operating voltage		1 Vdc to 150 Vdc
Power		2400 W
Current		480 A
Current range		
H range		0 A to 480 A
M range		0 A to 48 A
L range		0 A to 4.8 A
Setting accuracy		
CC mode	H, M range	±(0.4% of set + 0.8% of range)
	L range	±(0.4% of set + 5% of range)
CR mode	H, M range	±(0.5% of set + 1.5% of range)
	L range	±(0.5% of set + 5% of range)
CV mode		±(0.2% of set + 0.2% of range)
CP mode *1	H, M range	±(2% of range + 0.4% current range × Vin)
	L range	±(2% of range + 2.5% current range × Vin)

*1 Vin: Load input terminal voltage or sensing terminal voltage.

Measurement accuracy		
Voltmeter accuracy		±(0.1% of reading + 0.1% of range)
Ammeter accuracy	H, M range	±(0.4% of set + 0.8% of range)
	L range	±(0.4% of set + 5% of range)
Protection functions		
Protection functions other than those below are detected and activated on the PLZ1205W. For details, see the PLZ-5W user's manual.		
Over temperature protection (OTP)		Turns off the load when the heatsink temperature reaches 100 °C
General specifications		
Input power supply voltage range		100 Vac to 240 Vac (90 Vac to 250 Vac) single-phase, continuous
Input frequency range		47 Hz to 63 Hz
Power consumption		95 VAmax
Inrush current (peak value)		45 Apeak

Model		PLZ2405WB
General specifications		
Environment	Operating temperature range	0 °C to 40 °C (32 °F to 104 °F)
	Operating humidity range	20%rh to 85%rh (no condensation)
	Storage temperature range	-20°C to 70°C (-4 °F to 158 °F)
	Storage humidity range	90%rh or less (no condensation)
	Installation location	Indoor use, altitude of up to 2000 m, overvoltage category II
Isolation voltage		±500 V
Insulation resistance	Between primary and input terminals, between primary and chassis, between input terminals and chassis	500 Vdc 30 MΩ or greater (at 70%rh humidity or less)
Withstanding voltage	Between primary and input terminals	No abnormalities at 1500 Vac for 1 minute
	Between primary and chassis	No abnormalities at 1500 Vac for 1 minute
	Between input terminals and chassis	No abnormalities at 750 Vdc for 1 minute
Electromagnetic compatibility (EMC) *1 *2		Complies with the requirements of the following directive and standards. EMC Directive 2014/30/EU, EN 61326-1 (Class A *3), EN 55011 (Class A *3, Group1 *4) EN 61000-3-2, EN 61000-3-3 Applicable under the following conditions. The maximum length of all cabling and wiring connected to the product must be less than 3 m.
Safety *1		Complies with the requirements of the following directive and standards. Low Voltage Directive 2014/35/EU *2 EN 61010-1 (Class I *5, Pollution Degree 2 *6)

*1 Does not apply to specially made or modified products. *2 Limited to products that have the CE mark on their panel. *3 This is a Class A equipment. This product is intended for use in an industrial environment. This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts. *4 This is a Group 1 equipment. This product does not generate and/or use intentionally radio-frequency energy, in the from of electromagnetic radiation, inductive and/or capacitive coupling, for the treatment of material or inspection/analysis purpose. *5 This is a Class I equipment. Be sure to ground the this product protective conductor terminal. The safety of this product is only guaranteed when the product is properly grounded. *6 Pollution is addition of foreign matter (solid, liquid or gaseous) that may produce a reduction of dielectric strength or surface resistivity. Pollution Degree 2 assumes that only non-conductive pollution will occur except for an occasional temporary conductivity caused by condensation.

PLZ-5W Series Specifications

Unless specified otherwise, the specifications are for the following settings and conditions.
- The product is warmed up for at least 30 minutes (with current flowing).
- TYP: These are typical values that are representative of situations where the product operates in an environment with an ambient temperature of 23 °C. They are not guaranteed performance values.
- set: Indicates a setting. ● range: Indicates the rated value of each range. ● reading: Indicates a reading.
- The specifications of the PLZ-5W are for the load input terminals on the rear panel.

Model	PLZ205W	PLZ405W	PLZ1205W
Rating			
Operating voltage (DC) *1	1 V to 150 V *2		
Current	40 A	80 A	240 A (80 A *3 for the load input terminals on the front panel)
Power	200 W	400 W	1200 W
Input resistance when the load is off	Approx. 660 kΩ *4		
Load input terminal's isolation voltage	±500 V		

*1 The minimum operating voltage at which current begins to flow through the PLZ-5W is approximately 0.05 V. At the load input terminals on the rear panel.
*2 In switching mode, for every slew rate setting of 1 A/µs, the minimum operating voltage (including the voltage drop due to the wiring inductance component) increases by approximately 150 mV for the PLZ205W, 125 mV for the PLZ405W, and 75 mV for the PLZ1205W.
*3 The specifications of the PLZ-5W are for the load input terminals on the rear panel and the load input terminals on the front panel may not meet the specifications.
*4 In the case of parallel operation using the same models, approx. 660/number of units kΩ.

Model		PLZ205W	PLZ405W	PLZ1205W
CC mode				
Operating range	H range	0 A to 40 A	0 A to 80 A	0 A to 240 A
	M range	0 A to 4 A	0 A to 8 A	0 A to 24 A
	L range	0 A to 0.4 A	0 A to 0.8 A	0 A to 2.4 A
Setting range	H range	0 A to 42 A	0 A to 84 A	0 A to 252 A
	M range	0 A to 4.2 A	0 A to 8.4 A	0 A to 25.2 A
	L range	0 A to 0.42 A	0 A to 0.84 A	0 A to 2.52 A
Resolution	H range	1 mA	2 mA	5 mA
	M range	0.1 mA	0.2 mA	0.5 mA
	L range	0.01 mA	0.02 mA	0.05 mA
Setting accuracy	H range	±(0.2% of set + 0.1% of range)		
	M range	±(0.2% of set + 0.3% of range)		
	L range	±(0.2% of set + 1% of range)		
Parallel operation	H, M range	±(0.4% of set + 0.8% of range)		
	L range	±(0.4% of set + 5% of range)		
Input line regulation *1		4 mA	8 mA	24 mA
Ripple	rms *2	4 mA	8 mA	24 mA
	p-p *3	40 mA	80 mA	200 mA

*1 When the input voltage is changed from 1 V to 150 V at a current of rated power/150 V.
*2 Measurement frequency bandwidth: 10 Hz to 1 MHz
*3 Measurement frequency bandwidth: 10 Hz to 20 MHz

Model		PLZ205W	PLZ405W	PLZ1205W
CR mode				
Operating range *1	H range	40 S to 0.002 S (0.025 Ω to 500 Ω)	80 S to 0.004 S (0.0125 Ω to 250 Ω)	240 S to 0.012 S (0.0042 Ω to 83.333 Ω)
	M range	4 S to 0.0002 S (0.25 Ω to 5000 Ω)	8 S to 0.0004 S (0.125 Ω to 2500 Ω)	24 S to 0.0012 S (0.042 Ω to 833.33Ω)
	L range	400 mS to 0.02 mS (2.5 Ω to 50000 Ω)	800 mS to 0.04 mS (1.25 Ω to 25000 Ω)	2400 mS to 0.12 mS (0.42 Ω to 8333.3Ω)
Setting range	H range	42 S to 0 S (0.0238 Ω to Open)	84 S to 0 S (0.0119 Ω to Open)	252 S to 0 S (0.00397 Ω to Open)
	M range	4.2 S to 0 S (0.238 Ω to Open)	8.4 S to 0 S (0.119 Ω to Open)	25.2 S to 0 S (0.0397 Ω to Open)
	L range	420 mS to 0 S (2.38 Ω to Open)	840 mS to 0 S (1.19 Ω to Open)	2520 mS to 0 S (0.397 Ω to Open)
Resolution	H range	1 mS	2 mS	5 mS
	M range	0.1 mS	0.2 mS	0.5 mS
	L range	0.01 mS	0.02 mS	0.05 mS
Setting accuracy *2	H, M range	±(0.5% of set + 0.5% of range)		
	L range	±(0.5% of set + 1.5% of range)		
Parallel operation	H, M range	±(0.5% of set + 1.5% of range)		
	L range	±(0.5% of set + 5% of range)		

*1 Conductance [S] = input current [A]/input voltage [V] = 1/resistance [Ω]
*2 Converted value at the input current. At the connectors.

Model		PLZ205W	PLZ405W	PLZ1205W
CV mode				
Operating range	H range	1 V to 150 V		
	L range	1 V to 15 V		
Setting range	H range	0 V to 157.5 V		
	L range	0 V to 15.75 V		
Resolution	H range	5 mV		
	L range	0.5 mV		
Setting accuracy *1		±(0.1 % of set + 0.1% of range)		
	Parallel operation	±(0.2 % of set + 0.2% of range)		
Input current variation *2		12 mV		

*1 With the input voltage within the operating range, and at the connector during remote sensing.
*2 For a current change in the range of 10% to 100% of the rating at an input voltage of 5 V (during remote sensing).

Model		PLZ205W	PLZ405W	PLZ1205W
CP mode				
Operating range	H range	20 W to 200 W	40 W to 400 W	120 W to 1200 W
	M range	2 W to 20 W	4 W to 40 W	12 W to 120 W
	L range	0.2 W to 2 W	0.4 W to 4 W	1.2 W to 12 W
Setting range	H range	0 W to 210 W	0 W to 420 W	0 W to 1260 W
	M range	0 W to 21 W	0 W to 42 W	0 W to 126 W
	L range	0 W to 2.1 W	0 W to 4.2 W	0 W to 12.6 W
Resolution	H range	0.005 W	0.01 W	0.05 W
	M range	0.0005 W	0.001 W	0.005 W
	L range	0.00005 W	0.0001 W	0.0005 W
Setting accuracy *1	H range	±(0.5% of range + 0.04 A × Vin)	±(0.5% of range + 0.08 A × Vin)	±(0.5% of range + 0.24 A × Vin)
	M range	±(0.5% of range + 0.008 A × Vin)	±(0.5% of range + 0.016 A × Vin)	±(0.5% of range + 0.048 A × Vin)
	L range	±(1% of range + 0.004 A × Vin)	±(1% of range + 0.008 A × Vin)	±(1% of range + 0.024 A × Vin)
Parallel operation	H, M range	±(2% of range + 0.4% current range × Vin)		
	L range	±(2% of range + 2.5% current range × Vin)		

*1 Vin: The voltage at the load input terminals on the rear panel or sensing connectors.

Model		PLZ205W	PLZ405W	PLZ1205W
ARB mode				
Operating range		Three to 100 points of current values can be set for the input voltage. The space between two points is linearly interpolated.		
Response speed		Response for input voltage max 50 us.		
Voltmeter				
Display	H range	0.00 V to 150.00 V		
	L range	0.000 V to 15.000 V		
Accuracy		±(0.1% of reading + 0.1% of range)		
	Parallel operation (TYP)	±(0.1% of reading + 0.1% of range)		
Ammeter				
Display	H range	0.000 A to 40.000 A	0.000 A to 80.000 A	0.00 A to 240.00 A
	M range	0.0000 A to 4.0000 A	0.0000 A to 8.0000 A	0.000 A to 24.000 A
	L range	0.00 mA to 400.00 mA	0.00 mA to 800.00 mA	0.0000 A to 2.4000 A
Accuracy	H, M range	±(0.2% of reading + 0.3% of range)		
	L range	±(0.2% of reading + 1% of range)		
Parallel operation (TYP)	H, M range	±(0.4% of reading + 0.8% of range)		
	L range	±(0.4% of reading + 5% of range)		
Power display				
Display		Displays the product of the voltmeter reading and ammeter reading.		
Switching function				
Operation mode		CC and CR		
Frequency setting range		1.0 Hz to 100.0 kHz		
Frequency setting resolution	1 Hz to 10 Hz	0.1 Hz		
	11 Hz to 100 Hz	1 Hz		
	110 Hz to 1000 Hz	10 Hz		
	1.1 kHz to 10.0 kHz	0.1 kHz		
	10 kHz to 100 kHz	20 kHz, 50 kHz, 100 kHz		
Frequency setting accuracy		±(0.5% of set)		
Duty cycle setting range, step *1	1 Hz to 10 Hz	5.0% to 95.0%, 0.1% steps		
	11 Hz to 100 Hz			
	110 Hz to 1000 Hz			
	1.1 kHz to 10.0 kHz	5% to 95%, 1% steps		
	10 kHz to 100 kHz	10% to 90%, 10% steps		

*1 The minimum time span is 5us. The minimum duty cycle is limited by the minimum time span.

Model		PLZ205W	PLZ405W	PLZ1205W
Slew rate				
Operation mode		CC		
Setting range	H range	0.01 A/µs to 10 A/µs	0.02 A/µs to 20 A/µs	0.06 A/µs to 60 A/µs
	M range	0.001 A/µs to 1 A/µs	0.002 A/µs to 2 A/µs	0.006 A/µs to 6 A/µs
	L range	0.1 mA/µs to 100 mA/µs	0.2 mA/µs to 200 mA/µs	0.6 mA/µs to 600 mA/µs
Resolution	H range	0.01 A/µs	0.02 A/µs	0.06 A/µs
	M range	0.001 A/µs	0.002 A/µs	0.006 A/µs
	L range	0.1 mA/µs	0.2 mA/µs	0.6 mA/µs
Setting accuracy *1	H, M range	±(10% of set +1.25 µs)		
	L range	±(12% of set +5 µs)		

*1 The time it takes to shift from 10% to 90% when the current is varied from 0% to 100% of the rated current.

Model	PLZ205W	PLZ405W	PLZ1205W
Soft start			
Operation mode	CC		
Time setting range	100 µs, 200 µs, 500 µs, 1 ms, 2 ms, 5 ms, 10 ms, 20 ms, or off		
Time setting accuracy	±(30% of set +10 µs)		

PLZ-5W Series Specifications

Model		PLZ205W	PLZ405W	PLZ1205W
Possible remote sensing compensation voltage				
approx. 7 V (Total potential difference between the input terminals and sensing connectors)				
Protective function				
Overcurrent protection (OCP)	Setting range	0.0 A to 44.0 A	0.0 A to 88.0 A	0.0 A to 264.0 A
	Resolution	0.1 A	0.2 A	0.5 A
	Protection operation	Either load off or limitation can be selected.		
Overpower protection (OPP)	Setting range	0 W to 220 W	0 W to 440 W	0 W to 1320 W
	Resolution	1 W	2 W	5 W
	Protection operation	Either load off or limitation can be selected.		
Undervoltage protection (UVP)	Setting range	0.00 V to 150.00 V, or off		
	Resolution	0.01 V		
	Protection operation	Load off		
Watchdog protection (WDP)	Setting range	60s to 3600s, or off		
	Protection operation	Load off		

Model		PLZ205W	PLZ405W	PLZ1205W
Sequence function				
Operation mode		CC, CR, CV, CP		
Maximum number of programs		30		
Maximum number of steps		10000		
Step execution time		25 µs to 1000 h		
Time resolution		25 µs		
Other functions				
Elapsed time display		Displays the time from load on to load off.		
	Range	1s to 999h 59min 59s.		
Integrated current display		Displays integrated current from load on to load off.		
Integrated power display		Displays integrated power from load on to load off.		
Auto load off timer		Automatically turns off the load after the specified time elapses.		
	Setting range	1s to 3599999s, or off		

Model		PLZ205W	PLZ405W	PLZ1205W
EXT CONT connector				
Load on/off control input		Logic level switchable. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 3.5 V to 5 V, LOW: 0 V to 1.5 V.		
Range control input		The range can be switched between L, M, and H using a 2 bit signal. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 3.5 V to 5 V, LOW: 0 V to 1.5 V.		
Alarm input		An alarm is activated with a voltage between 0 V and 1.5 V. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 3.5 V to 5 V, LOW: 0 V to 1.5 V.		
Alarm clearing input		After an alarm occurs, eliminate the root cause of the alarm, and change the input to pin 5 of the EXT CONT connector from a low level signal to a high level signal. The alarm will be cleared on the rising edge of this signal. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 3.5 V to 5.0 V, LOW: 0 V to 1.5 V.		
Trigger input		Paused sequence operation resumes when a voltage between 0 V and 0.8 V is received. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 2 V to 5 V, LOW: 0 V to 0.8 V.		
External voltage control input (CC, CR, CP mode)		Controls the load settings of CC, CR, CP mode through external voltage input. The input impedance is approx. 10 kΩ. CC: The setting can be controlled in the range of 0% to 100% of the rated current through external voltage input of 0 V to 10 V. CR: The setting can be controlled in the range of 0% to 100% of the conductance setting through external voltage input of 0 V to 10 V. CP: The setting can be controlled in the range of 0% to 100% of the rated power through external voltage input of 0 V to 10 V.		
	Setting accuracy	±(1% of range) (TYP value of H range in CC mode)		
External voltage control input (CV mode)		The load setting of CV mode can be controlled through external voltage input. The rated voltage can be controlled in the range of 0% to 100% with 0 V to 10 V. The input impedance is approx. 10 kΩ.		
	Setting accuracy	±(1% of range) (TYP value)		
External voltage control input (superimposing in CC mode)		Controls the load setting of CC mode by adding current through external voltage input. Adds current in the range of -100% to 100% of the rated current for -10 V to 10 V. The input impedance is approx. 10 kΩ.		
	Setting accuracy	±(1% of range) (TYP value of H range)		
Load-on status output		On when load is on. Open-collector output from a photocoupler. *1		
Range status output		Outputs current range state L, M, and H using 2 bits. Open-collector output from a photocoupler. *1		
ALARM 1 output		ON when overvoltage detection, reverse-connection detection, overheat detection, alarm input detection, front-panel load terminal overcurrent detection or parallel operation anomaly detection is activated. Open-collector output from a photocoupler. *1		
ALARM 2 output		On when OCP, OPP, UVP, or WDP is operating.		
DIGITAL 0 / DIGITAL 1 output		Logic signal output during a step of a sequence. Output impedance: approx. 330 Ω, output voltage: approx. 3.3 VEMF		
DIGITAL 2 output		Can be switched between input and output. Output: Logic signal output during a step of a sequence. The output impedance is 330 Ω. Input: This signal is the trigger input signal for the sequence and the measurement functions. The thresholds are HIGH: 2 V to 5 V, LOW: 0 V to 0.8 V.		
Current monitor output		Outputs 0 V to 10 V for 0% to 100% of the rated current of each range.		
	Accuracy	±(1% of range) (TYP value of H range)		
Short signal output		Relay contact on when the short function is turned on (30 Vdc/1 A).		
Front-panel BNC terminal				
Trigger output		Transmits 10 µs pulses when trigger output is ON during sequence operation and during step execution. Transmits 1 µs pulses during switching operation. Output impedance: 200 Ω, output voltage: approx. 5 VEMF		
Current monitor output		Outputs 0 V to 2 V for 0% to 100% of the rated current of each range.		
	Accuracy	±(1% of range) (TYP value of H range)		
Isolation voltage		±30 V		
Communication function				
RS232C		D-SUB 9-pin connector Baud rate: 9600, 19200, 38400, 115200 bps Data length: 8 bits, Stop bits: 1 bit, Parity bit: None, Flow control: None, CTS-RTS		
USB		Complies with the USB 2.0 specification. Data rate: 480 Mbps (High speed) Complies with the USBTMC-USB488 device class specifications.		
LAN		IEEE 802,3 100Base-TX/10Base-T Ethernet IPv4, RJ-45 connector		
General specifications				
Input voltage range / Input frequency range		100 Vac to 240 Vac (90 Vac to 250 Vac) single phase, continuous / 47 Hz to 63 Hz		
Power consumption		50 VAmax	50 VAmax	85 VAmax
Inrush current (peak value)		45 A		
Environ-mental conditions	Operating temperature range	0 °C to 40 °C (32 °F to 104°F)		
	Operating humidity range	20%rh to 85%rh (no condensation)		
	Storage temperature range	-20 °C to 70 °C (-4 °F to 158°F)		
	Storage humidity range	90%rh or less (no condensation)		
	Installation location	Indoor use, altitude of up to 2000 m, overvoltage category II.		
Insulation resistance	Between primary and input terminals	500 Vdc, 30 MΩ or more (70%rh or less)		
	Between primary and chassis			
	Between input terminals and chassis			
Withstanding voltage	Between primary and input terminals	No abnormalities at 1500 Vac for 1 minute.		
	Between primary and chassis	No abnormalities at 1500 Vac for 1 minute.		
	Between input terminals and chassis	No abnormalities at 750 Vac for 1 minute.		
Weight		Approx. 7 kg (15.4 lb.)	Approx. 7.5 kg (16.5 lb.)	Approx. 14 kg (30.9 lb.)
Electromagnetic compatibility (EMC) *2 *3		Complies with the requirements of the following directive and standards. EMC Directive 2014/30/EU, EN 61326-1 (Class A *4), EN 55011 (Class A *4, Group 1 *5) EN 61000-3-2, EN 61000-3-3 Applicable under the following conditions. The maximum length of all cabling and wiring connected to the PLZ-5W must be less than 3 m.		
Safety *2		Complies with the requirements of the following directive and standards. Low Voltage Directive 2014/35/EU *3, EN 61010-1 (Class I *6, Pollution Degree 2 *7)		

*1 The maximum voltage that can be applied to the photocoupler is 30 V. The maximum current is 4 mA. *2 Does not apply to specially ordered or modified PLZ-5Ws. *3 Limited to products that have the CE mark on their panels. *4 This is a Class A equipment. This product is intended for use in an industrial environment. This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts. *5 This is a Group 1 equipment. This product does not generate and/or use intentionally radiofrequency energy, in the form of electromagnetic radiation, inductive and/or capacitive coupling, for the treatment of material or inspection/analysis purpose. *6 This is a Class I equipment. Be sure to ground this product's protective conductor terminal. The safety of this product is only guaranteed when the product is properly grounded. *7 Pollution is addition of foreign matter (solid, liquid or gaseous) that may produce a reduction of dielectric strength or surface resistivity. Pollution Degree 2 assumes that only non-conductive pollution will occur except for an occasional temporary conductivity caused by condensation.

Multifunctional Electronic Load (CC/CV/CR/CP)

PLZ-5WH Series

LAN LXI USB GPIB OPTION RS232C DRIVERS CE

PLZ20005WH

PLZ12005WH

Maximum Operating Voltage 800 V. Ideal for high capacity power supply and rechargeable battery evaluation!

The PLZ-5WH high power DC electronic load series is where durable, reliable ingenuity meets multifunctional, high power design. The highly compact, power dense design of the PLZ-5WH series allows for up to 20 kW in a single unit. Load simulation can be achieved fast and efficiently with the PLZ-5WH high speed current control circuits. Accurate current measures can be made with extremely high setting resolution, with a color LCD interface for maximum visibility. LAN (LXI), USB, and RS232C digital interfaces have been included for simple integration into any system.

Dimensions

PLZ12005WH: 429.8(16.9″)W×396.2(15.6″)H×550(21.7″)Dmm(inch)
PLZ20005WH: 429.8(16.9″)W×573.5(22.6″)H×550(21.7″)Dmm(inch)

Accessories

Power cord (length:2.5 m), Load input terminal cover, Load input terminal screw set (2 sets), Screws for the load input terminal cover (2 pcs.), External control connector kit, Safety terminal adapter TL41 (red 1 set, black 1set), Parallel operation signal cable kit (Cable length:Approx. 1 m), Heavy object warning label, Safety Information, Setup Guide, Quick Reference (English/Japanese, 1 sheet each), CD-ROM

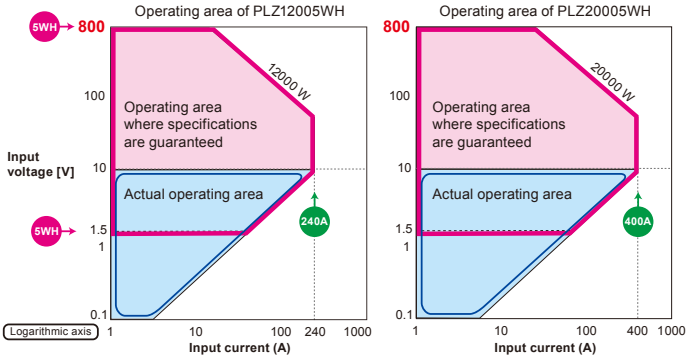
Features

- Operating voltage from 10 V - 800 V. Minimum operating voltage required for current output is 1.5 V.
- 20 kW capacity in a single, compact unit (PLZ20005WH)
- Parallel operation up to five units (Maximum 100 kW, 2000 A)
- Synchronization: Load on/off control and sequence execution can be synchronized among multiple units.
- Data logging function:
  The most recent measurements (current, voltage, power) are shown on display and can be stored in internal memory.
- Cutoff function: The load cutoff can be set once the specified time, voltage drop, integrated current, or integrated power has been reached.
- LAN (LXI Compliant)/USB/RS232C standard interface
  *GPIB factory option available

Functions

■ Operating range up to 800 V

The rated power, current, voltage and minimum voltage can be seen in the following figure. Specifications are guaranteed at input voltages of 10 V and greater, but actual operation is available for input voltages as low as 1.5 V. However, this is outside of the operation area where specifications are not guaranteed.



■ Parallel operation

The PLZ12005WH/PLZ20005WH can be connected in master-slave paralel to increase the total current and power capacity. During parallel operation, one unit is selected as the master unit that controls all other PLZ12005WH/PLZ20005WH (slave) units connected in parallel. The master unit displays the total current and total power for all electronic loads connected in the system. The parallel operation signal cable is included with the device and is available upon request. Up to 4 slave units can be connected to the master unit with parallel operation signal cables that automatically select the master/slave status depending on the cable configuration. Standalone settings will return to normal when cables are removed and power is turned on, with no further configuration required.

Maximum current and power during parallel operation using the same model

Number of slaves	Maximum current / Maximum power	
	PLZ12005WH	PLZ20005WH
2	480 A / 24 kW	800 A / 40 kW
3	720 A / 36 kW	1200 A / 60 kW
4	960 A / 48 kW	1600 A / 80 kW
5	1200 A / 60 kW	2000 A / 100 kW

Options

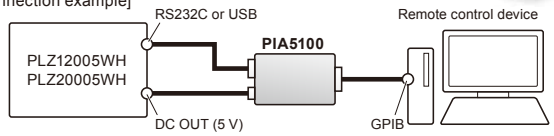
■ GPIB converter

PIA5100

This converter converts RS232C or USB connection into GPIB, enabling remote control connection using GPIB as seen below.
[Accessories: Power cord set, Magnetic sheet]

*Not CE certified product

[Connection example]



■ Parallel operation signal cable kit

PC02-PLZ-5W

This kit contains a signal cable for performing parallel operation on the PLZ12005WH/PLZ20005WH. Cable length: Approx. 1 m

PLZ-5WH Series Specifications

Unless specified otherwise, the specifications are for the following settings and conditions.
- The product is warmed up for at least 30 minutes.
- TYP: These are typical values that are representative of situations where the product operates in an environment with an ambient temperature of 23 °C. These values do not guarantee the performance of the PLZ12005WH/PLZ20005WH.
- set: Indicates a setting. ● range: Indicates the rated value of each range. ● reading: Indicates a readout value. ● rating: Indicates a rated value.
- Open: Indicates equivalence to the state in which the load input terminals are opened. ● Using DC INPUT

Model		PLZ12005WH	PLZ20005WH
Rating			
Operating voltage (DC)		10 V to 800 V	
Current		240 A	400 A
Power		12000 W	20000 W
Load input terminal's isolation voltage		±800 V	
CC mode			
Operating range		0 A to 240 A	0 A to 400 A
Setting range		0 A to 242.400 A	0 A to 404.00 A
Resolution		5 mA	10 mA
Setting accuracy		±(0.2 % of set + 0.1 % of rating)	
	Parallel operation	±(0.4 % of set + 0.2 % of rating)	
CR mode			
Operating range *1	H range	6000 mS to 0 S	10 S to 0 S
	L range	60 mS to 0 S	100 mS to 0 S
Setting range	H range	6060.0 mS to 0 S	10.1000 S to 0 S
	L range	60.600 mS to 0 S	101.000 mS to 0 S
Resolution	H range	0.2 mS	
	L range	0.002 mS	
Setting accuracy *2	H range	±(0.5 % of set + 0.5 % of rating)	
	L range	±(0.5 % of set + 0.2 % of rating)	
Parallel operation	H range	±(1.0 % of set + 1.0 % of range)	
	L range	±(1.0 % of set + 1.0 % of range)	
CV mode			
Operating range		10 V to 800 V	
Setting range		0 V to 808.00 V	
Resolution		20 mV	
Setting accuracy *3		±(0.05 % of set + 0.05 % of rating)	
	Parallel operation	±(0.1 % of set + 0.1 % of rating)	
CP mode			
Operating range		0 W to 12000 W	0 W to 20000 W
Setting range		0 W to 12120 W	0 W to 20200 W
Resolution		0.5 W	
Setting accuracy *4		±(0.5 % of rating + 0.2 A × Vin)	±(0.5 % of rating + 0.4 A × Vin)
	Parallel operation	±(1 % of range + 0.1 % current rating × Vin)	
ARB mode			
Operating range		Three to 100 points of current values can be specified for the input voltage. Linear interpolation is applied between specified points.	
Response speed		500 µs, 1 ms, 2 ms, 5 ms, 10 ms, 20 ms, 50 ms, 100 ms, or off	

*1 Conductance [S] = input current [A]/input voltage [V] = 1/resistance [Ω]
*2 Converted value at the input current. At the sensing terminals during remote sensing.
*3 With the input voltage within the operating range, and at the sensing terminals during remote sensing.
*4 Vin: Load input terminal voltage or SENSING terminal voltage.

Model		PLZ12005WH	PLZ20005WH
Voltmeter			
Display		0.00 V to 800.00 V	
Resolution		10 mV	
Accuracy		±(0.05 % of reading + 0.05 % of range)	
	Parallel operation (TYP)	±(0.1 % of reading + 0.1 % of range)	
Ammeter			
Display		0.00 A to 240.00 A	0.00 A to 400.00 A
Resolution		10 mA	
Accuracy		±(0.2 % of reading + 0.1 % of range)	
	Parallel operation (TYP)	±(0.4 % of reading + 0.2 % of range)	
Power display			
Display		Displays the product of the voltmeter reading and ammeter reading	

Model		PLZ12005WH	PLZ20005WH
Pulse function			
Operation mode		CC and CR	
Frequency setting range		1.0 Hz to 10.0 kHz	
Frequency setting resolution *1	1 Hz to 10 Hz	0.1 Hz	
	11 Hz to 100 Hz	1 Hz	
	110Hz to 1000Hz	10 Hz	
	1.1 kHz to 10.0 kH	0.1 kHz	
Frequency setting accuracy	1 Hz to 5.0 kHz	±(0.5 % of set)	
	5.1 Hz to 10.0 kHz	±(1.0 % of set)	
Duty cycle setting range, step	1 Hz to 10 Hz	5.0 % to 95.0 %, 0.1 % steps	
	11 Hz to 100 Hz		
	110Hz to 1000Hz		
	1.1 kHz to 10.0 kHz	5 % to 95 %*2, 1 % steps	
Switch value (Depth) *3	CC mode	0 A to 242.40 A	0 A to 404.00 A
	CR mode H range	6.0600 S to 0 S	10.1000 S to 0 S
	CR mode L range	60.600 mS to 0 S	60.600 mS to 0 S
Sine function			
Operation mode		CC	
Frequency setting range		1.0 Hz to 1 kHz, 2 kHz, 5 kHz, 10 kHz	
Frequency setting resolution *4	1 Hz to 10 Hz	1 Hz	
	20 Hz to 100 Hz	10 Hz	
	200 Hz to 1000 Hz	100 Hz	
Frequency setting accuracy	300 Hz to 900 Hz	±(1.0 % of set)	
	Other than above frequency	±(0.5 % of set)	
Slew rate			
Operation mode		CC	
Operation range		0.01 A/µs to 12 A/µs	0.02 A/µs to 20 A/µs
Resolution		0.2 mA/µs	0.5 mA/µs
Setting accuracy *5		±(10 % of set +20 µs)	
Soft start			
Operation mode		CC	
Time setting range		500 µs, 1 ms, 2 ms, 5 ms, 10 ms, 20 ms, 50 ms, 100 ms, or off	
Sequence function			
Operation mode		CC, CR, CV, CP	
Maximum number of programs		30	
Maximum number of steps		10000	
Step execution time		50 µs to 3600000 s (50 µs to 1000 h)	
Time resolution		1 µs	

*1 (Reference) The resolution actually set in the device is period resolution ΔT = 1 µs, as shown in the equation below. For example, if you specify 9300 Hz, the period set in the device will be n × ΔT = 108 × 1 µs = 108 µs (where n is a number set in the device). Converted to frequency, this becomes 1/108 µs = 9259 Hz.
*2 The minimum time span is 20 µs. The minimum duty cycle is limited by the minimum time span.
*3 The switch value is limited to the set current or set conductance or less.
*4 (Reference) The resolution actually set in the device is period resolution ΔT = 20 µs, as shown in the equation below. For example, if you specify 900 Hz, the period set in the device will be n × ΔT = 56 × 20 µs = 1120 µs (where n is a number set in the device). Converted to frequency, this becomes 1/1120 µs ≈ 893 Hz.
*5 Time to change from 10 % to 90 % when the current is changed from 0 % to 100 % of the rated current.

PLZ-5WH Series Specifications

Model		PLZ12005WH	PLZ20005WH
Other functions			
Remote sensing	Input voltage rating *1	800 V *2	
	Isolation voltage	±800 V	
Number of units in parallel operation *3		5 units	
Mutual synchronized operation		Load on/off	
		Synchronization of sequence execution, and sequence resumption	
		Recording timing of measured values	
Elapsed time display		Displays the time from load on to load off.	
	Range	0 s to 3600000 s (1000 h 0 min 0 s)	
Ampere-hour meter display		Displays integrated current	
	Range	0.000 mAh to 800.000 kAh	
Watt-hour meter display		Displays integrated power	
	Range	0.000 Wh to 400.000 MWh	

Model		PLZ12005WH	PLZ20005WH
Other functions			
Cutoff *4	Elapsed time	The load turns off when the elapsed time value reaches the specified value.	
	Setting range	0 s to 3600000 s (1000 h 0 min 0 s)	
	Voltage drop	The load turns off when the voltmeter value reaches the specified value.	
	Setting range	0.00 V to 800.00 V	
	Integrated current	The load turns off when the ampere-hour meter value reaches the specified value.	
	Setting range	0.000 mAh to 800.000 kAh	
	Integrated power	The load turns off when the watt-hour meter value reaches the specified value.	
	Setting range	0.000 Wh to 400.000 MWh	

*1 There are limitations depending on the actual power that the load consumes.
*2 A value obtained by adding the voltage between the load input terminals to the total potential difference between the positive and negative load input terminal and the SENSING terminals.
*3 The parallel operation terminal operates at the electric potential of the negative load terminal.
*4 Multiple cutoff causes selectable.

Model		PLZ12005WH	PLZ20005WH
EXT CONT connector			
Load on/off control input		Logic level switchable. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 3.5 V to 5 V, LOW: 0 V to 1.5 V.	
Alarm input		An alarm is activated with a voltage between 0 V and 1.5 V. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 3.5 V to 5 V, LOW: 0 V to 1.5 V.	
Alarm clearing input		After an alarm occurs, eliminate the root cause of the alarm, and change the input to pin 5 of the EXT CONT connector from a low level signal to a high level signal. The alarm will be cleared on the rising edge of this signal. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 3.5 V to 5.0 V, LOW: 0 V to 1.5 V.	
Trigger input		Paused sequence operation resumes when a voltage between 0 V and 0.8 V is received. Pulled up to 5 V by a 10 kΩ resistor. The thresholds are HIGH: 2 V to 5 V, LOW: 0 V to 0.8 V.	
External voltage control input (CC, CR, CP mode)		Controls the load settings of CC, CR, CP mode through external voltage input. The input impedance is approx. 10 kΩ. CC: The setting can be controlled in the range of 0 % to 100 % of the rated current through external voltage input of 0 V to 10 V. CR: The setting can be controlled in the range of 0 % to 100 % of the conductance setting through external voltage input of 0 V to 10 V. CP: The setting can be controlled in the range of 0 % to 100 % of the rated power through external voltage input of 0 V to 10 V.	
	Setting accuracy	±(1 % of range) (TYP value in CC mode)	
External voltage control input (CV mode)		The load setting of CV mode can be controlled through external voltage input. The rated voltage can be controlled in the range of 0 % to 100 % with 0 V to 10 V. Input impedance: approx. 10 kΩ.	
	Setting accuracy	±(1 % of range) (TYP)	
External voltage control input (superimposing in CC mode)		Controls the load setting of CC mode by adding current through external voltage input. Adds current in the range of -100 % to 100 % of the rated current for -10 V to 10 V. Input impedance: approx. 10 kΩ.	
	Setting accuracy	±(1 % of range) (TYP)	
Load-on status output		On when load is on. Open-collector output from a photocoupler. *1	
ALARM 1 output		ON when overvoltage detection, reverse-connection detection, overheat detection, alarm input detection, or parallel operation anomaly detection is activated. Open-collector output from a photocoupler. *1	
ALARM 2 output		Turns on when OCP, OPP, UVP, or WDP is activated. Open-collector output from a photocoupler. *1	
DIGITAL 0 output / DIGITAL 1 output		Logic signal output during a step of a sequence. Output impedance: approx. 330 Ω. The thresholds are HIGH: 2.3 V to 3.3 V, LOW: 0 V to 1.0 V.	
DIGITAL 2 input/output		Input/output switchable. Output: Logic signal output during a step of a sequence. Output impedance: 330 Ω. Input: Trigger input signal for the sequence and the measurement functions. The thresholds are HIGH: 2 V to 5 V, LOW: 0 V to 1.0 V.	
Current monitor output		Outputs 0 V to 10 V for 0 % to 100 % of the rated current. Output impedance: 1 kΩ (TYP)	
	Accuracy	±(1 % of range) (TYP)	
All pins		800 V reinforced insulation between each pin and load terminals	
BNC connector			
Trigger output		Transmits 10 µs pulses during step execution when trigger output is set in a sequence. Transmits 10 µs pulses during pulse operation. Output impedance 200 Ω, output voltage HIGH: 2 V to 5 V, LOW: 0 V to 0.8 V.	
Current monitor output	Output voltage	0 V to 10 V for 0 % to 100 % of the rated current	
	Output impedance	50 Ω (TYP)	
	Accuracy	±(1 % of range)	
Voltage monitor output	Output voltage	1/100 of the measured voltage from 0 V to 8 V	
	Output impedance	50 Ω (TYP)	
	Accuracy	±(1 % of range)	
Isolation voltage		±30 V	
Communication function			
RS232C		D-SUB 9-pin connector. Baud rate: 9600, 19200, 38400, 115200 bps. Data length: 8 bits, Stop bits: 1 bit, Parity bit: None, Flow control: No, CTS-RTS	
USB (device)		Standard type B socket. Complies with the USB 2.0 specification. Data rate: 480 Mbps (High Speed). Complies with the USBTMC-USB488 device class specifications.	
USB (host)		Standard type A socket, Complies with the USB 2.0 specifications. Data rate: 480 Mbps (High Speed).	
LAN		IEEE 802,3 100Base-TX/10Base-T Ethernet, IPv4, RJ-45 connector.	
General specifications			
Input voltage range / Input frequency range		100 Vac to 240 Vac (90 Vac to 250 Vac) single phase / 47 Hz to 63 Hz	
Power consumption		740 VAmax	
Inrush current (peak value)		100 A or less (at cold start)	
Noise level		80 dB max. (standalone)	
Environmental conditions	Operating temperature range	0 °C to 40 °C	
	Operating humidity range	20 %rh to 85 %rh (no condensation)	
	Storage temperature range	-20 °C to 70 °C	
	Storage humidity range	90 %rh or less (no condensation)	
	Installation location	Indoor use, altitude of up to 2 000 m, overvoltage category II	
Insulation resistance	Primary ⇔ chassis, input terminals, monitor terminals	1000 Vdc, 30 MΩ or more (70 %rh or less)	
	Input terminals ⇔ chassis, monitor terminals		
	Monitor terminals ⇔ chassis	500 Vdc, 30 MΩ or more (70 %rh or less)	
Withstanding voltage	Primary ⇔ chassis, input terminals, monitor terminals	No abnormalities at 1500 Vac for 2 s.	
	Input terminals ⇔ chassis, monitor terminals		
	Monitor terminals ⇔ chassis	No abnormalities at 350 Vac for 2 s	
Electromagnetic compatibility *2*3		Complies with the requirements of the following directive and standards. EMC Directive 2014/30/EU EN 61326-1 (Class A*4) EN 55011 (Class A*4, Group 1*5) EN 61000-3-2 EN 61000-3-3 Applicable under the following conditions. The maximum length of all cabling and wiring connected to the product must be less than 3 m.	
Safety *2		Complies with the requirements of the following directive and standards. EMC Directive 2014/35/EU*3 EN 61010-1 (Class I*6, Pollution Degree 2*7)	

*1 The maximum voltage that can be applied to the photocoupler is 30 V. The maximum current is 4 mA. *2 Does not apply to specially ordered or modified products. *3 Only on models that have the CE marking on the panel. *4 This product confirms to Class A. This product is intended for use in an industrial environment. This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts. *5 This is a Group 1 instrument. This product does not generate and/or use intentionally radio-frequency energy, in the form of electromagnetic radiation, inductive and/or capacitive coupling, for the treatment of material or inspection/analysis purpose. *6 This product confirms to Class I. Be sure to ground the protective conductor terminal of this product. If not grounded properly, safety is not guaranteed. *7 Pollution is addition of foreign matter (solid, liquid or gaseous) that may produce a reduction of dielectric strength or surface resistivity. Pollution Degree 2 assumes that only non-conductive pollution will occur except for an occasional temporary conductivity caused by condensation.

Multifunctional Electronic Load (CC/CV/CR/CP)

PLZ334WL

GPIB RS232C USB DRIVERS CE

Dimensions

214.5(8.44")W × 124(4.88")H × 400(15.75")Dmm

Accessories

Setup guide, Quick reference (1 each for English and Japanese), CD-R (Contains the user's manual and the communication interface manual), Power cord, Set of screws for the load input terminal (2 sets.), Load input terminal cover, Screws for the Input terminal cover (2 pcs.), Protection dummy plug for J1 terminal, Connecting cable to the chassis

Options

■ Low inductance cable

TL01-PLZ (50 cm)	TL02-PLZ (1 m)	TL03-PLZ (2 m)
		
Inductance value(Typ value)		
140 nH	150 nH	200 nH

■ Sequence creation software
Wavy for PLZ-4W

Large Current DC Electronic Load with Fast Slew Rate(50 A/μs)

While the PLZ334WL succeeds to the superior operability of our conventional model of the PLZ-4W series, the PLZ-4WL series realizes the fast rise and fall time (slew rate of 50 A/μs.) in the range of low voltage with large current. The PLZ-4WL offers six operation modes, and equips with various features such as sequence operation, switching operation, soft-start function, and time and voltage measurement. The PLZ-4WL applies not only for the conventional load test of the CPU power supply, but also it can be applied to even faster current response test. In addition, the PLZ-4WL is a space-saving design (about 50 % less volume of the conventional model) that can save the facility space of the testing site, and it can be applied for single cell testing of large scale rechargeable batteries.

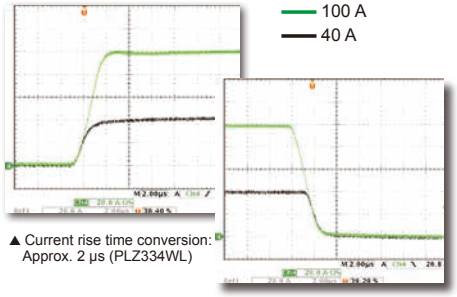
Features

- Full-load current of 100 A at 0.3 V!
  Possible to operate as low as 50 mV of the input voltage
- Realize the fast slew rate of 50 A/μs at 2.3 V of the load input terminal voltage. (Rise/Fall time conversion: Approx. 2 μs)
- Current setting resolution: 50 μA (L range)
- 6 operation modes (CC, CR, CV, CP, CC+CV, CR + CV)
- Equipped with sequence function and switching function
- Elapsed time display function and auto load-off timer function are convenient for the discharge tests of batteries.
- GPIB/RS232C/USB are standard interface
- Available for input voltage range AC100 V to 120 V/200 V to 240 V
- Equipped with various protection functions
  (OVP, OCP, OPP, OHP, UVP, REV)
- Optional low inductance cables are available exclusively for PLZ-4WL series.
- Optional sequence creation software (Wavy for PLZ-4W) is available

Functions

■ Fast slew rate

Realize the slew rate of 50 A/μs at 2.3 V of the load input terminal voltage.

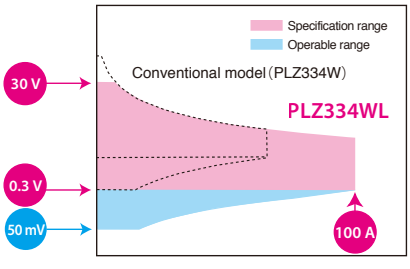


▲ Current rise time conversion: Approx. 2 μs (PLZ334WL)

▲ Current fall time conversion: Approx. 2 μs (PLZ334WL)

■ Realizing the low voltage operation

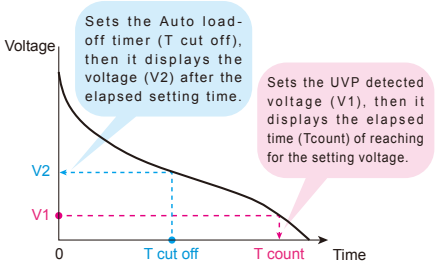
Possible to operate as low as 50 mV by the input voltage. Even below the input voltage of 0.3 V, this product can be used by reducing the current.



▲ Conceptual drawingof the operating range

■ Convenient feature for the discharge testing

The Auto load-off timer and the Cut-off features can be applied to the discharge capacity measurement of the rechargeable battery



PLZ334WL Specifications

model			PLZ334WL
Rating	Operating voltage (DC)		0.3 V to 30 V
			Minimum operating voltage for the Switching mode(includes the value of voltage drop generated by the inductance component of wirings)increases approximately 40 mV per 1 A/µs of the slew rate setting.
	Current		100 A
	Power		330 W
	Minimum start voltage *1		50 mV (typ)
Constant Current (CC) mode	Operating range	H	0 A to 100 A
		M	0 A to 10 A
		L	0 A to 1 A
	Setting range	H	0 A to 105 A
		M	0 A to 10.5 A
		L	0 A to 1.05 A
	Resolution	H	5 mA
		M	0.5 mA
		L	0.05 mA
	Accuracy of setting	H, M, L	±(0.2 % of set + 0.1 % of f.s.*2) + Vin/150 k *3
	Input voltage variation *4	H, M, L	±(0.1 % of set + 0.02 % of f.s.*2)
	Ripple	rms *5	8 mA
		p-p *6	80 mA
Constant Resistance (CR) mode	Operating range	H	330 S to 6 mS
			(3.03 mΩ to 166.7 Ω)
		M	33.3 S to 600 µS
			(30.3 mΩ to 1.667 kΩ)
		L	3.3 S to 60 µS
			(303 mΩ to 16.67 kΩ)
	Setting range	H	346.5 S to 0 S
			(2.886 mΩ to OPEN)
		M	34.65 S to 0 S
			(28.86 mΩ to OPEN)
		L	3.465 S to 0 S
			(288.6 mΩ to OPEN)
	Resolution	H	6 mS
		M	600 µS
		L	60 µS
	Accuracy of setting *7	H, M, L	±(0.5 % of set *8 + 0.5 % of f.s.*2) + Vin/150 k
Constant Voltage (CV) mode	Operating range	H	0.3 V to 30 V
		L	0.3 V to 4 V
	Setting range	H	0 V to 31.5 V
		L	0 V to 4.2 V
	Resolution	H	2 mS
		L	200 µS
	Accuracy of setting		±(0.1 % of set + 0.1 % of f.s.)
	Input current variation *9		12 mV
Constant Power (CP) mode	Operating range	H	33 W to 330 W
		M	3.3 W to 33 W
		L	0.33 W to 3.3 W
	Setting range	H	0 W to 346.5 W
		M	0 W to 34.65 W
		L	0 W to 3.465 W
	Resolution	H	20 mW
		M	2 mW
		L	0.2 mW
	Accuracy of setting	H, M, L	±(2.5 % of f.s. *2)
Voltmeter	Display	H	0.000 V to 30.000 V
		L	0.0000 V to 4.0000 V
	Accuracy		±(0.1 % of rdg + 0.1 % of f.s.)
Ammeter	Display	H, M	0.00 A to 100.00 A
		L	0.0000 A to 1.0000 A
	Accuracy		±(0.2 % of rdg + 0.3 % of f.s.)
Watt-meter	Display	H, M	0.00 W to 330.00 W
		L *15	0.000 W to 30.000 W
		L *16	0.0000 W to 3.3000 W
Switching mode	Operation mode		CC/CR mode
	Selectable frequency range		1 Hz to 50 kHz
	Duty cycle setting		5 % to 95 % 1 % step *10
	Accuracy of frequency setting		±(0.5 % of set)
Slew rate	Selectable range (CC)	H	5 mA/µs to 50 A/µs
		M	500 µA/µs to 5 A/µs
		L	50 µA/µs to 500 mA/µs
	Accuracy of setting *11		±(10 % of set + 0.8 µs)
Soft start	Operation mode		CC mode
	Selectable time range *12		Off, 100 µs, 200 µs, 500 µs, 1000 µs, 2 ms, 5 ms,10 ms,20 ms
	Accuracy of setting		±(30 % of set + 10 µs)
Response	Response speed		NORMAL, FAST
Remote sensing	Sensing voltage that can be compensated		3 V for a single line
Protection function	Overvoltage protection (OVP)		Turns off the load at 115 % of the rated voltage
	Overcurrent protection (OCP)		Setting range 10 % to 110 % of the rated current Load off or limit selectable
	Overpower protection (OPP)		Setting range 10 % to 110 % of the rated power Load off or limit selectable
	Overheat protection (OHP)		Turns off the load when the heat sink temperature reaches 90 °C
	Undervoltage protection (UVP)		Turns off the load when detected. Can be set in the range of 0.3 V to 30 V
	Reverse connection protection (REV)		By diode and fuse. Turns off the load when an alarm occurs.

model				PLZ334WL
Sequence function	Normal sequence			
	Operation mode			CC, CR, CV, CP
	Maximum number of steps			256
	Step execution time			1 ms to 999 h 59 min
	Resolution			1 ms, 100 ms, 1 s, 10 s, 1 min
	Fast sequence			
	Operation mode			CC, CR
	Maximum number of steps			1024
	Step execution time			25 µs to 100 ms
	Resolution			25 µs (25 µs to 100 µs)
				100 µs(100 µs to 100 ms)
Other functions	Elapsed time display			Measures the time from load on to load off. On/Off selectable. Measures from 1 s up to 999 h 59 min 59 s.
	Auto load off timer			Measures the time from load on to load off. Can be set in the range of 1 s to 999 h 59 min 59 s or off.
Input / Output signal	J1 connector			26-pin MIL connector
			EXT cont MODE	CC/CR/CP External Voltage Control, 0 to 100 % of the rating of Range by 0 to 10V
			EXT cont ADD	CC mode External Voltage Control, 0 to 100 % of the Local setting value of the rating Range by 0 to ±10 V, Adding up the value to the setting value of ExtCont.
			EXT cont CV	CV mode External Voltage Control, 0 to 100 % of the rating of Range by 0 to 10V
			IMON	Current monitor output, 10 Vf.s. (H/L range), 1 Vf.s. (M range)
			LOAD CONT INPUT	CMOS signal L level (or H level) Load On, Switchable to the logic level
			RANGE CONT	External range switch input, 2 bit
			ALARM INPUT	The alarm activates when the L level of CMO signal is applied for more than 10 µs. The internal circuit pulls up to 5 V by 10 kΩ
			TRIG INPUT	When it is in the pause condition, the pause can be cancelled when the L level of CMOS signal is applied for more than 10 µs. The internal circuit pulls up to 5 V by 10 kΩ
			ALARM CLEAR INPUT	The alarm can be cleared when the L level of CMOS signal is applied for more than 100 ms. The internal circuit pulls up to 5 V by 10 kΩ
			LOAD ON STATUS	On when the load is on. Open collector by the photo coupler
			RANGE STATUS	Range status output. 2 bit
			ALARM STATUS	On when the alarm is on(OVP, OCP, OPP, OHP, REV, UVP) or Turns on when the external alarm is applied
			SHORT SIGNAL OUT	Relay contact output (DC30 V/1 A)
	Front panel BNC connector			
			TRIG OUT	Outputs a pulse during sequence operation and switching operation.
			IMON OUT	1 V f.s(H/L range), 0.1 V f.s(M range)Isolated to the internal common(connected to the chassis potential)
Communication function	GPIB, RS232C, and USB interfaces are equipped as standard.			
General Specifications	Input voltage range			100 V AC to 240 V AC (90 V AC to 250 V AC), Single phase
	Input frequency range			47 Hz to 63 Hz
	Power consumption			95 VAmax
	Inrush current *13			65 Amax
	Operating temperature range			0 °C to 40 °C
	Operating humidity range			20 % to 85 % RH (without condensation)
	Storage temperature range			-20 °C to 70 °C
	Storage humidity range			90 % RH or less (without condensation)
	Isolation voltage			±500 V
	Insulation resistance	Primary - input terminal		500 VDC, 30 M or more (ambient humidity of 70 % RH or less)
		Primary - chassis		500 VDC, 30 M or more (ambient humidity of 70 % RH or less)
		Input terminal - chassis		500 VDC, 30 M or more(ambient humidity of 70 % RH or less)
	Withstand voltage	Primary - input terminal		No abnormalities at 1500 VAC for 1 minute.
		Primary - chassis		No abnormalities at 1500 VAC for 1 minute.
	Accessories			Setup Guide, Quick Reference (1 each for English and Japanese), CD-R (Contains the User's Manual and the Communication Interface Manual), Power cord, Set of screws for the load input terminal (2 sets.), Load input terminal cover, Screws for the Input terminal cover (2 pcs.), Protection dummy plug for J1 terminal, Connecting cable to the chassis
	Safety *14			Conforms to the requirements of the following directive and standard. Low Voltage Directive 2014/35/EU, EN61010-1 Class I, Pollution degree 2
	Electromagnetic compatibility (EMC)			Conforms to the requirements of the following directive and standard. EMC Directive 2014/30/EU, EN 61326-1, EN 55011 Emissions: Class A, Group 1 Immunity: Minimum immunity test requirements EN61000-3-2, EN61000-3-3
	Weight			Approx. 8.0 kg(17.64 lbs)
	Dimensions (mm(inch)(maximum)			214.5(8.44")W×124(4.88")(155(6.1"))H×400(15.75")(455(17.91"))D

*1 Minimum voltage at which the current starts flowing to the electronic load. At the load input terminal.
*2 In the M range, it applies for the full scale of the H range
*3 Vin: Input terminal voltage or the sensing voltage of the electronic load.
*4 When the input voltage is varied from 0.3 V to 30V at a current of the rated power/30 V
*5 Measurement frequency bandwidth : 10 Hz to 1 MHz
*6 Measurement frequency bandwidth : 10 Hz to 20 MHz
*7 Conversion rate of the input current. At the sensing terminal.
*8 set=Vin/Rset
*9 With respect to a change in the current of 10 % to 100 % of the rating at an input voltage of 0.3 V (during remote sensing)
*10 The minimum time width is 10 µs. Between 5 kHz to 50 kHz, the maximum duty cycle is limited by the minimum time width.
*11 Time to reach from 10 % to 90 % when the current is varied from 2 % to 100 % (20 % to 100 % in M range)
*12 Time to reach from 10 % to 90 % of the input current
*13 Approximately 35 A for the input voltage of AC100 V
*14 This product is categorized in the "Class I". The protective conductor terminal of this product must be connected to the ground. The safety can not be guaranteed when it is not connected to the ground properly.
*15 In a mode other than CP mode
*16 In CP mode

Multifunctional Electronic Load (CC/CV/CR/CP)

PLZ-4WH Series

USB GPIB RS232C DRIVERS CE

High-Voltage Electronic Load 650 V! For EV and HEV high-voltage converters. With the booster, extended capacity at a low cost can be realized!

In recent years, the market trend of various devices that compose in the automotive electronics such as EV, HEV, and the new energy market for PV power generation, fuel cells, secondary batteries have been moved to higher voltage and larger capacities. At the same time, it has increased the demand for the Electronic Load evaluation equipment to meet these new requirement. The PLZ-4WH Series continues to provide excellent operability of the conventional model (PLZ-4W Series) while extending the maximum operating voltage to 650 V. Furthermore, when the booster unit (PLZ2004WHB) is connected, it can be realized up to 9 kW/450 A with less space and at a low cost. The USB, GPIB, and RS232C comes as standard interface that supports automated testing applications.

Dimensions

PLZ164WH: 214.5(8.44″)W × 124(4.88″)H × 400(15.75″)Dmm
PLZ334WH: 214.5(8.44″)W × 124(4.88″)H × 400(15.75″)Dmm
PLZ1004WH: 429.5(16.91″)W × 128(5.04″)H × 400(15.75″)Dmm

Accessories

Setup guide, Quick reference (1 each for English and Japanese), CD-R(Contains the user's manual and the communication interface manual), Power cord (with plug, length: 2.4 m), Load input terminal cover, Lockplate for the load input terminal cover (2 pcs.), Set of screws for the load input terminal (2 sets.)

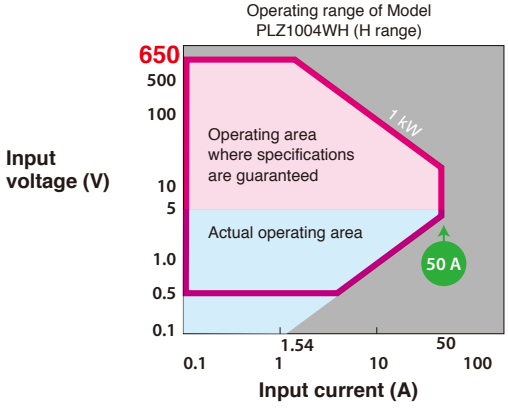
Features

- Maximum operating voltage: 650 V
- With connecting boosters, maximum of 9 kW/450 A
- 6 operation modes (CC, CR, CV, CP, CC+CV, CR + CV)
- Voltage monitor terminal for monitoring high voltage
- Sequence function (up to 1024 steps)
- Remote sensing function
- Soft start function
- Equipped with various types of protection circuits:
  Over Voltage Protection(OVP), Over Current Protection(OCP), Over Power Protection(OPP), Over Heat Protection(OHP), Under Voltage Protection(UVP), And Reverse Connection Protection(REV)
- GPIB/RS232C/USB are standard interface

Functions

■ Operating range up to 650 V

The PLZ-4WH supports input voltages up to 650 V, and it can be used to evaluate EV and HEV in-vehicle chargers, DC/DC converters, and battery cells; power supplies for high-voltage DC electric supply systems; and it also performs PFC tests on European and other three-phase 400 V system input power supplies; and evaluation test of high-voltage parts related to such equipment. Moreover, it achieves to enlarge further operating range. (See the figure below.) It can operate from 5 V, and even the current range is more than 0.5 V and less than 5 V, it can be used with reduced current.



▲ Comparison with our conventional PLZ-3WH (PLZ1003WH) model

■ Booster unit PLZ2004WHB*

By connecting up to 4 units of PLZ2004WHB boosters (sold separately) combined with the PLZ1004WH, it is possible to configure the system as an Electronic Load unit for up to 9 kW/450 A. Compared to parallel operation of the same model, size (space) reductions of up to about 30 %, can be achieved. Incidentally, optional PC01-PLZ-4W and PC02-PLZ-4W parallel operation cables will be required for connections depend on the number of units to be connected.

■ Specifications

Operating voltage	5 V to 650 V
Current	100 A
Power	2000 W
Input voltage	100 VAC to 240 VAC (90 VAC to 250 VAC) single phase
Power consumption	200 VA(max)
Dimensions	Type II (The depth is 550(21.65")(600(23.62")) mm(inch))
Weight	approx. 24 kg(52.91 lbs)

*Exclusively used for the PLZ1004WH.
It can not be used to connect any other model.

Functions

■ Low range (1/100) feature

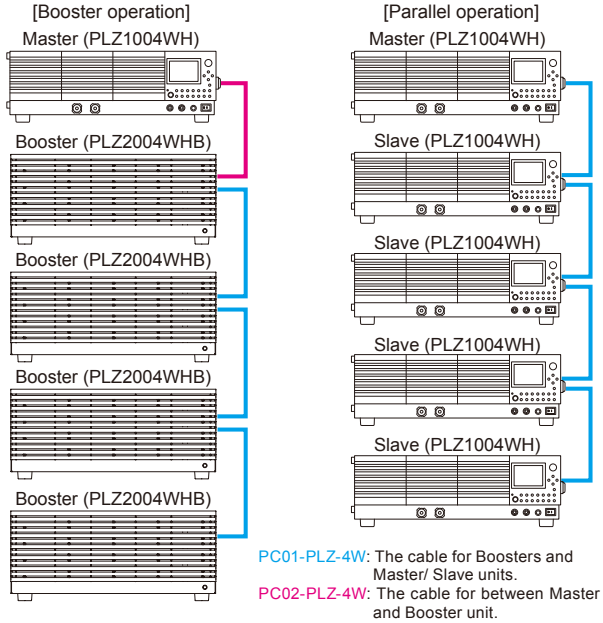
In CC, CR, and CP modes, three ranges are available: H, M, and L.
The L range is 1/100, enabling coverage from low to high power with a single unit.

● Current setting resolution

	PLZ164WH	PLZ334WH	PLZ1004WH
H	300 µA	1 mA	2 mA
M	30 µA	100 µA	200 µA
L	3 µA	10 µA	20 µA

■ Parallel operation

Parallel operation without the use of boosters is also possible up to five units of the same model, including the master unit, can be connected in parallel (5 kW/250 A maximum). In this case, the system operates under the master-slave configuration, and the master unit controls and displays the entire system. Note that optional PC01-PLZ-4W parallel operation cables will be required for connections depend on the number of units to be connected.

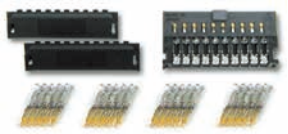


PC01-PLZ-4W: The cable for Boosters and Master/ Slave units.
PC02-PLZ-4W: The cable for between Master unit and Booster unit.

Options

■ Accessory kit

OP01-PLZ-4W
(used for the connection of J1 connector on the rear panel when operating by external control)
● Connector, Semi-cover, Pin 20 pcs.



■ Parallel operation cable

PC01-PLZ-4W
(for boosters and master/slave units, 300 mm)

PC02-PLZ-4W
(for between master unit and booster unit, 550 mm)

■ Sequence creation software

Wavy for PLZ-4W

PLZ2004WHB Specifications

Model		PLZ2004WHB
Ratings		
Operating voltage		5 V to 650 V
Current		100 A
Power		2000 W
Minimum operating voltage *1		0.5 V
Input resistance when load-off		2.21[MΩ] *2
Constant Current (CC) mode		
Operating range	H range	0 to 100 A
	M range	0 to 10 A
	L range	0 to 1 A
Setting range	H range	0 to 105 A
	M range	0 to 10.5 A
	L range	0 to 1.05 A
Resolution *1	H range	10 mA
	M range	1 mA
	L range	0.1 mA
Setting accuracy *2	H, M, L range	±(1.2 % of set + 1.1 % of f.s *3)
Ripple *2	H, M, L range	PLZ1004WH unit specifications × (Total power capacity/kW) (typ)
Constant resistance (CR), constant voltage (CV), and constant power (CP) mode setting accuracy		
CR mode	H, M, L range	±(1.2 % of set + 1.1 % of f.s*1)(TYP)
CV mode	H, L range	±(0.2 % of set + 0.2 % of f.s)(TYP)
CP mode	H, M, L range	±(5 % of f.s*1) 23 °C ±5 °C(TYP)
Measurement functions		
Voltmeter	Accuracy H, L range	±(0.1 % of rdng + 0.1 % of f.s)(TYP)
Ammeter	Accuracy H, M, L range	±(1.2 % of rdng + 1.1 % of f.s*1)(TYP)
Wattmeter		Displays the product of the values indicated by the voltmeter and ammeter
Protective functions *1		
Overheat protection (OHP)		Load-off when heat sink temperature reaches 90 cLoad-off at time of detection
Reverse connection protection (REV)		Protection by fuse

*1 When one PLZ2004WHB unit is connected.
*2 When connected to master unit.
*3 Full scale of range, with M range being full scale of H range.

*1 M range: full scale of H range

*1 Other protective functions detect and operate with the PLZ1004WH.

Model		PLZ2004WHB
General specifications		
Input voltage range		100 Vac to 240 Vac (90 Vac to 250 Vac) single phase, continuous
Input frequency range		47 Hz to 63 Hz
Power consumption		200 VAmax
Inrush current *1		120 Amax
Protective conductor current		600 µA (typical: 100 V, 50 Hz)
Operating temperature range		0 °C to 40 °C
Operating humidity range		20 % to 85 % rh (no condensation)
Storage temperature range		-20 °C to 70 °C
Storage humidity range		90 % rh or less (no condensation)
Ground voltage		±750 Vdc
Insulation resistance	Primary to input terminal	1000Vdc, 30 MΩ or more (ambient temperature with 70 % rh or less)
	Primary to chassis	1000Vdc, 30 MΩ or more (ambient temperature with 70 % rh or less)
	Input terminal to chassis	1000Vdc, 30 MΩ or more (ambient temperature with 70 % rh or less)
Withstand voltage	Primary to input terminal	1500 V Vac, no abnormality for one minute
	Primary to chassis	1500 V Vac, no abnormality for one minute
	Input terminal to chassis	1000 V Vdc, no abnormality for one minute
Dimensions (mm(inch))(maximum) / weight		430(16.93") W × 173(6.81")(190(7.48") H × 550(21.65")(590(23.23") D /Approx. 24 kg (52.91 lbs)
Accessories		One power cord (2.4 m length with SVT3 18AWG 3P plug), one load input terminal cover, two lock plates for load input terminal cover, two screw sets for load input terminal, and one instruction manual
Electromagnetic compatibility *2		Conforms to the requirements of the following directive and standard. EMC Directive 2014/30/EU EN 61326-1 EN 61000-3-2 EN 61000-3-3
Safety *3		Conforms to the requirements of the following directive and standard. Low Voltage Directive 2014/35/EU EN 61010-1 (Class I, Pollution degree 2)

*1 Approximately 60 A with 100 Vac input
*2 Applies only to models that display CE marking on panel. Does not apply to specially ordered or modified items.
*3 This product is a Class 1 instrument. Be sure to ground this product's protective conductor terminal. If it is not properly grounded, safety cannot be guaranteed.

PLZ164WH / PLZ334WH / PLZ1004WH Specifications

Model			PLZ164WH	PLZ334WH	PLZ1004WH
Ratings					
Operating voltage			5 V to 650 V		
Current			8.25 A	16.5 A	50 A
Power			165 W	330 W	1000 W
Minimum operating voltage*1			0.5 V		
Load-off input resistance			2.21(MΩ)*2		

*1 Minimum voltage when current starts to flow through the unit. Occurs at the load input terminal.
*2 When doing parallel operation with same model: 2.21/number of units [MΩ]. When doing parallel operation with PLZ2004WHB: 2.21 [MΩ].

Model			PLZ164WH	PLZ334WH	PLZ1004WH
Constant Current (CC) mode					
Operating range	H range		0 to 8.25 A	0 to 16.5 A	0 to 50 A
	M range		0 to 825 mA	0 to 1.65 A	0 to 5 A
	L range		0 to 82.5 mA	0 to 165 mA	0 to 500 mA
Setting range	H range		0 to 8.6625 A	0 to 17.325 A	0 to 52.5 A
	M range		0 to 866.25 mA	0 to 1.7325 A	0 to 5.25 A
	L range		0 to 86.625 mA	0 to 173.25 mA	0 to 525 mA
Resolution	H range		300 µA	1 mA	2 mA
	M range		30 µA	100 µA	200 µA
	L range		3 µA	10 µA	20 µA
Setting accuracy	H, M range		±(0.2 % of set + 0.1 % of f.s*1)		
	L range	At least 300 µA	±(0.2 % of set + 0.1 % of f.s)		
		Less than 300 µA	±(0.2 % of set + 0.1 % of f.s) + Vin*2/2.21 [MΩ]		
	Parallel operation		±(1.2 % of set + 1.1 % of f.s*1)		
Input voltage variation*3	H, M range		20 mA		
	L range		2 mA		
Ripple	rms*4		2 mA	4 mA	12 mA
	p-p*5		20 mA	40 mA	120 mA
	Parallel operation (typ)	rms*4	When doing parallel operation with same model: Single unit specifications x Number of units. When doing parallel operation with PLZ2004WHB: PLZ1004WH single unit specifications x (Total power capacity/kW)		
		p-p*5			

*1 Full scale of range, with M range being full scale of H range
*2 Vin: The voltage at the load input or sensing terminals
*3 When the input voltage is changed from 5 V to 650 V at a current equal to the rated power/650 V
*4 Measurement frequency bandwidth: 10 Hz to 1 MHz
*5 Measurement frequency bandwidth: 10 Hz to 20 MHz

Model		PLZ164WH	PLZ334WH	PLZ1004WH
Constant Resistance (CR) mode				
Operating range*1	H range	1.65 S to 30 µS	3.3 S to 60 µS	10 S to 200 µS
		(606.06 mΩ to 33.333 kΩ)	(303.03 mΩ to 16.666 kΩ)	(100 mΩ to 5 kΩ)
	M range	165 mS to 3 µS	330 mS to 6 µS	1 S to 20 µS
		(6.06 Ω to 333.333 kΩ)	(3.03 Ω to 166.666 kΩ)	(1 Ω to 49.999 kΩ)
	L range	16.5 mS to 0.3 µS	33 mS to 0.6 µS	100 mS to 2 µS
		(60.606 Ω to 3.333 MΩ)	(30.303 Ω to 1.666 MΩ)	(10 Ω to 500 kΩ)
Setting range	H range	1.7325 S to 0 S	3.465 S to 0 S	10.5 S to 0 S
		(577.2 mΩ to OPEN)	(288.6 mS to OPEN)	(95.23 mΩ to OPEN)
	M range	173.25 mS to 0 S	346.5 mS to 0 S	1.05 S to 0 S
		(5.772 Ω to OPEN)	(2.886 Ω to OPEN)	(952.3 mΩ to OPEN)
	L range	17.325 mS to 0 S	34.65 mS to 0 S	105 mS to 0 S
		(57.72 Ω to OPEN)	(28.86 Ω to OPEN)	(9.523 Ω to OPEN)
Resolution	H range	30 µS	60 µS	200 µS
	M range	3 µS	6 µS	20 µS
	L range	0.3 µS	0.6 µS	2 µS
Setting accuracy*2	H, M range	±(0.5 % of set*3 + 0.5 % of f.s*4)		
	L range	±(0.5 % of set*3 +0.5 % of f.s) + Vin*5/2.21 [MΩ]		
	Parallel operation (typ)	±(1.2 % of set +1.1 % of f.s*4)		

*1 Conductance [S] = Input current [A]/Input voltage [V] = 1/Resistance [Ω]
*2 Converted value with input current; at sensing terminal
*3 set=Vin/Rset
*4 When M range: Full scale of H range
*5 Vin: Rear load input terminal voltage or sensing terminal voltage

Model			PLZ164WH	PLZ334WH	PLZ1004WH
Constant Voltage (CV) mode					
Operating range	H range		5 V to 650 V		
	L range		5 V to 65 V		
Setting range	H range		0 V to 682.5 V		
	L range		0 V to 68.25 V		
Resolution	H range		20 mV		
	L range		2 mV		
Setting accuracy*1			±(0.2 % of set + 0.2 % of f.s)		
	Parallel operation (typ)		±(0.2 % of set + 0.2 % of f.s)		
Input current fluctuation*2			65 mV		

*1 At sensing terminal during remote sensing when input voltage is within operating range. Same with parallel operation, too.
*2 With respect to change in current at 10 % to 100 % of rated voltage with input voltage of 5 V (during remote sensing).

Model			PLZ164WH	PLZ334WH	PLZ1004WH
Constant Power (CP) mode					
Operating range	H range		16.5 W to 165 W	33 W to 330 W	100 W to 1000 W
	M range		1.65 W to 16.5 W	3.3 W to 33 W	10 W to 100 W
	L range		0.165 W to 1.65 W	0.33 W to 3.3 W	1 W to 10 W
Setting range	H range		0 W to 173.25 W	0 W to 346.5 W	0 W to 1050 W
	M range		0 W to 17.325 W	0 W to 34.65 W	0 W to 105 W
	L range		0 W to 1.7325 W	0 W to 3.465 W	0 W to 10.5 W
Resolution	H range		10 mW	20 mW	100 mW
	M range		1 mW	2 mW	10 mW
	L range		0.1 mW	0.2 mW	1 mW
Setting accuracy	H, M range		±(3 % of f.s*1)		
	L range	At least 0.25 W	±(3 % of f.s)		
		Less than 0.25 W	±(3 % of f.s + Vin*2/2.21 [MΩ])		
	Parallel operation(TYP)		±(5 % of f.s*1) (at 23 °C ±5 °C)		

*1 When M range: Full scale of H range
*2 Vin: Rear load input terminal voltage or sensing terminal voltage

Model		PLZ164WH	PLZ334WH	PLZ1004WH
Voltmeter				
Display	H range	0.00 V to 650.00 V		
	L range	0.000 V to 65.000 V		
Accuracy	Parallel operation(TYP)	±(0.1 % of rdng + 0.1 % of f.s)		

Model		PLZ164WH	PLZ334WH	PLZ1004WH
Ammeter				
Display	H, M range	0.0000 A to 8.2500 A	0.000 A to 16.500 A	0.00A to 50.000A
	L range	0.000 mA to 82.500 mA	0.00m A to 165.00 mA	0.00 mA to 500.00mA
Accuracy	H, M, L range	±(0.2 % of rdng + 0.3 % of f.s*1)		
	Parallel operation	±(1.2 % of rdng + 1.1 % of f.s*1)		

*1 When M range: Full scale of H range

Model			PLZ164WH	PLZ334WH	PLZ1004WH
Wattmeter					
Display *1	H, M range		0.00 W to 165.00 W	0.00 W to 330.00 W	0.0 W to 1000.0 W
	L range	Other than CP mode	0.000 W to 53.625 W	0.00 W to 107.25 W	0.0 W to 325.00 W
		CP mode	0.0000 W to 1.6500 W	0.0000 W to 3.3000 W	0.000 W to 10.000 W

*1 Displays the product of the voltage and current display values

Model	PLZ164WH	PLZ334WH	PLZ1004WH
Switching mode			
Operating mode	CC and CR		
Duty cycle settings	5 % to 95 %*1 0.1% steps		
Frequency setting range	1 Hz to 4 kHz		
Frequency setting resolution	1 Hz to 10 Hz	0.1 Hz	
	10 Hz to 100 Hz	1 Hz	
	100 Hz to 1 kHz	10 Hz	
	1 kHz to 4 kHz	100 Hz	
Frequency setting accuracy	±(0.5 % of set)		

*1 The minimum time duration is 50 µs. From 1 to 4 kHz, the maximum duty cycle is limited by it.

Model		PLZ164WH	PLZ334WH	PLZ1004WH
Slew rate				
Setting range*1	H range	0.132 mA/µs to 0.132 A/µs	0.264 mA/µs to 0.264 A/µs	0.8 mA/µs to 0.8 A/µs
	M range	13.2 µA/µs to 13.2 mA/µs	26.4 µA/µs to 26.4 mA/µs	80 µA/µs to 80 mA/µs
	L range	1.32 µA/µs to 1.32 mA/µs	2.64 µA/µs to 2.64 mA/µs	8 µA/µs to 8 mA/µs
Resolution (Setting range)	H range	50 µA(13.2 to 132 [mA/µs])	100 µA(26.4 to 264 [mA/µs])	300 µA(80 to 800 [mA/µs])
		5 µA(1.32 to 13.2 [mA/µs])	10 µA(2.64 to 26.4 [mA/µs])	30 µA(8 to 80 [mA/µs])
		0.5 µA(0.132 to 1.32 [mA/µs])	1 µA(0.264 to 2.64 [mA/µs])	3 µA(0.8 to 8 [mA/µs])
	M range	5 µA(1.32 to 13.2 [mA/µs])	10 µA(2.64 to 26.4 [mA/µs])	30 µA(8 to 80 [mA/µs])
		0.5 µA(0.132 to 1.32 [mA/µs])	1 µA(0.264 to 2.64 [mA/µs])	3 µA(0.8 to 8 [mA/µs])
		0.05 µA(13.2 to 132 [µA/µs])	0.1 µA(26.4 to 264 [µA/µs])	0.3 µA(80 to 800 [µA/µs])
	L range	0.5 µA(0.132 to 1.32 [mA/µs])	1 µA(0.264 to 2.64 [mA/µs])	3 µA(0.8 to 8 [mA/µs])
		0.05 µA(13.2 to 132 [µA/µs])	0.1 µA(26.4 to 264 [µA/µs])	0.3 µA(80 to 800 [µA/µs])
		0.005 µA(1.32 to 13.2 [µA/µs])	0.01 µA(2.64 to 26.4 [µA/µs])	0.03 µA(8 to 80 [µA/µs])
Setting accuracy*2		±(10 % of set + 25 µs)		

*1 In constant current mode. In constant resistance mode, the maximum slew rate in each range is 1/10.
*2 Time to reach 10 % to 90 % with respect to a 2 % to 100 % (or for M range a 20 % to 100 %) change from the rated current.

PLZ164WH / PLZ334WH / PLZ1004WH Specifications

Model		PLZ164WH	PLZ334WH	PLZ1004WH
Soft start				
Operating mode		CC mode		
Time setting range *1		1, 2, 5, 10, 20, 50, 100, 200 ms		*1 Time for input current to reach 10 % to 90 %
Time setting accuracy		±(30 % of set + 100 µs)		
Response				
Response speed	CC/CR mode	Switchable in 4 stages (1/1, 1/2, 1/5, 1/10)		
	CV mode	Switchable in 5 stages (100, 10, 1, 1/10, 1/100)		
Remote sensing				
Voltage that can be compensated	One way	2 V		
Protective functions				
Overvoltage protection (OVP)		110 % of rated voltage for the range		
Overcurrent protection (OCP)		110 % of 0.01 A rated current or 110 % of the maximum current for each range: Load-off or limit selectable		
Overpower protection (OPP)		From 0.1 % to 110 % of rated power or 110 % of the maximum power of each range: Load-off or limit selectable		
Overheat protection (OHP)		Load-off when heat sink temperature reaches 90 °C		
Undervoltage detection (UVP)		Can set to Off, 5 V to 650 V		
Reverse connection protection (REV)		By fuse. Load-off when ALM occurs.		
Sequence functions				
Normal sequence	Operating modes	CC, CR, CV, CP		
	Maximum steps	256		
	Step execution time	1 ms to 999 h 59 min		
	Time resolution (setting range)	1 ms (1 ms to 1 min), 100 ms (1 min to 1 h), 1 s (1 h to 10 h), 10 s (10 h to 100 h), 1 min (100 h to 999 h 59 min)		
Fast sequence	Operating mode	CC, CR		
	Maximum steps	1024		
	Step execution time	100 µs to 100 ms		
	Time resolution	100 µs		
Other				
Elapsed time display		Measurement of time from load-on to load-off, On/Off capable 1 s to 999 h 59 min 59 s		
Auto load-off timer		Automatic load-off after elapse of preset time. Can set from 1 s to 999 h 59 min 59 s or to Off.		
Analog external control (EXT CONT connector)				
Load-on/off control input		Switchable logic level, pull-up to 5 V at 10 kΩ (CMOS level signal)		
External range switching input *1		2 bit, pull-up to 5 V at 10 kΩ (CMOS level signal)		
Trigger input		Clear the sequence operation pause when at least 10 µs are input for H (CMOS level signal for 5 V system), pull-down to common by 100 kΩ resister		
External alarm input		Alarm operation with L, pull-up to 5 V at 10 kΩ (CMOS level signal)		
Alarm status output		During alarm (OVP, OCP, OPP, OHP, REV) operation and external alarm input: On, open collector (photocoupler) *2		
Load-on status output		During load-on: On, open collector (photocoupler) *2		
Range status output		2 bit, open collector (photocoupler) *2		
Short signal		Relay contact output (30 Vdc/1 A)		
External voltage control input (CC, CR, CV, CP modes)		CC, CR, CV, and CP modes. 0 to 100 % of rated current, voltage, and power at 0 to 10V (CC, CV, CP). Maximum to minimum resistance at 0 to 10 V (CR).		
External resistance control input (CC, CR, CV, CP modes)		0 to 100 % or 100 to 0 % of rated current, voltage, and power at 0 to 10 kΩ (CC, CV, CP). Maximum to minimum resistance or minimum to maximum resistance at 0 to 10 kΩ (CR).		
External CV voltage control input		0 to 10 % of rated voltage at 0 to 10 V		
Current monitor output		10 V f.s. (H/L range), 1 V f.s. (M range), output impedance of 1 kΩ		
Voltage monitor output		10 V for each range f.s., output impedance of 1 kΩ		
Front BNC terminal				
Trigger output		Output of pulse during sequence operation, switching operation, or GPIB GET command input		
Current monitor output		10 V for full scale (H/L range), 1 V for full scale (M range)		
Voltage monitor output		6.5 V for full scale in each range		
Communication functions				
GPIB		IEEE std. 488.1-1987 SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, E1 Supports SCPI and IEEE std. 488.2-1992 specification command set.		
RS232C		D-SUB 9pin (EIA-232-D)Baud rate: 2400/4800/9600/19200 bps; Data bit: 8; Stop bit: 1/2; Parity: none; Flow control: Xon/Xoff. Supports SCPI and IEEE std. 488.2-1992 specification command set.		
USB		USB 2.0, 12 Mbps. Conforms to USBTMC-USB488 device class.		

*1 Front panel settings are only effective in the H range. *2 Photocoupler's maximum applied voltage is 30 V and maximum current is 8 mA. *3 External CV voltage control input cannot be used in CP or CV mode.

Model		PLZ164WH	PLZ334WH	PLZ1004WH
General specifications				
Input voltage range/input frequency range		100 Vac to 240 Vac (90 Vac to 250 Vac) single phase, continuous: 47 Hz to 63 Hz		
Power consumption		80 VAmax	90 VAmax	160 VAmax
Inrush current *1		140 Amax		
Protective conductor current (when at 100 V, 50 Hz: typical value)		600 µA		
Operating temperature range/humidity range		0 °C to 40 °C, 20 % to 85 % rh (no condensation)		
Storage temperature range/humidity range		-20 °C to 70 °C, 90 % rh or less (no condensation)		
Ground voltage		±750 Vdc		
Insulation resistance	Primary to input terminal	1000 Vdc, 30 MΩ or more (ambient temperature with 70 % rh or less)		
	Primary to chassis	1000 Vdc, 30 MΩ or more (ambient temperature with 70 % rh or less)		
	Input terminal to chassis	1000 Vdc, 30 MΩ or more (ambient temperature with 70 % rh or less)		
Withstand voltage	Primary to input terminal	1500 V Vac no abnormality for one minute		
	Primary to chassis	1500 V Vac no abnormality for one minute		
	Input terminal to chassis	1000 V Vdc no abnormality for one minute		
Dimensions (mm(inch))(maximum)		214.5(8.44") W × 124(4.88")(155(6.10") H × 400(15.75")(470(18.50") D		429.5(16.91") W × 128(5.04")(150(5.91") H × 400(15.75")(470(18.50") D
Weight		Approx. 7 kg (15.4 lb.)	Approx. 8 kg (17.6 lbs)	Approx. 16 kg (35.3 lbs)
Battery backup		Backs up configuration (setting) information		
Accessories		Power cord (2.4 m length with SVT3 18AWG 3 P plug): 1 pc., Load input terminal cover: 1pc., Lock plates for load input terminal cover: 2 pc., Screw sets for load input terminal: 2 pc., CD-R *2: 1 pc., Setup guide (Japanese/English): 1 pc., Quick reference in Japanese: 1 pc., Quick reference in English: 1 pc.		
Electromagnetic compatibility *3		Complies with the requirements of the following directive and standards. EMC Directive 2014/30/EU, EN 61326-1 (Class A), EN55011 (Class A, Group 1), EN 61000-3-2, EN 61000-3-3		
Safety *4		Complies with the requirements of the following directive and standards. Low Voltage Directive 2014/35/EU, EN 61010-1 (Class I, Pollution degree 2)		

*1 Approximately 70 A with 100 Vac input *2 CD-R contains application and sample, user's manual, communication interface manual, and VISA library (KI-VISA).
*3 Applies only to models that display CE marking on panel. Does not apply to specially ordered or modified items.
*4 This product is a Class 1 instrument. Be sure to ground this product's protective conductor terminal. If it is not properly grounded, safety cannot be guaranteed.

Multifunctional Electronic Load (CC/CV/CR/CC+CV/CR+CV)

PLZ-U Series

GPIB RS232C DRIVERS CE

This photo shows a 5-channel frame housing 5 units.
The rack mount bracket is optional.

*Multi-Channel Load Systems Can Be Built Easily! Operating Multiple Units in Parallel Offers Large Capacity!**

The PLZ-U Series provides a set of compact, high-performance multi-channel electronic load systems capable of operating in five modes - constant current, constant resistance, constant voltage, constant current+constant voltage and constant resistance+constant voltage. Adopting the modular (plug-in) design, the Series consists of four models - two frame models and two load unit models. The PLZ-30F frame can configure the load units up to three channels, and the PLZ-50F frame can configure up to five channels. Two load unit models are available, the PLZ-70UA (75-watt load that operates even at 0 V) and PLZ-150U (150-watt load that operates from 1.5 V up). Load units can be operated in parallel to increase the current capacity or power capacity. By combining different models of load units and frame, the power capacity can be changed from 75 W to 750 W (when five PLZ150U units are mounted in a PLZ-50F frame). Supporting the GPIB and RS232C interfaces as standard, the electronic load can be built into various types of test systems, making it useful in testing fuel cells, secondary cells, DC/DC converters, switching power supplies, multiple-output power supplies, and more.

*Only load units of the same model can be operated in parallel.

Dimensions

PLZ-30F: 292(11.5″)W × 128(5.04″)H × 400(15.75″)Dmm
PLZ-50F: 435(17.13″)W × 128(5.04″)H × 400(15.75″)Dmm

Features

- Slew rate of 2.4 A/μs in the rising and falling edges in CC mode (PLZ150U)
- Built-in three ranges; voltmeter, ammeter, and wattmeter functions that provide readings of up to five digits
- The current slew rate can be changed continuously in constant current and constant resistance modes.
- Supports 0-V input - an indispensable feature for testing single-cell fuel cells.
- Individual units (channels) can operate either independently or in synchronization.
- Up to five load units of the same model can be operated in parallel.
- Up to three values can be stored in memory for each most frequently used operation mode and range.
- Equipped with various types of protection circuits (over voltage protection, over current protection, over power protection, over heat protection, under voltage protection, and reverse connection protection).
- Supports the GPIB and RS232C interfaces as standard.
- External control is available to turn on or off the output.

Accessories

Load unit: Operation manual, Rear load input terminal cover, Load input connector screw set (2 sets/M6 bolt, M6 nut, M6 spring washer and M4 screw), Load unit attachment screw (2 pcs./M3-10 screw), Sensing terminal screw (2 pcs./M3-6 screw, attached to the unit)
Frame: Operation manual, Power cord (with SVT3 18AWG 3-prong plug, cable length of 2.4 m), Front/Rear blank panel (2 pcs./PLZ-30F or 4 pcs./PLZ-50F), Protection dummy plug (2 pcs./for the FRAME CONT connector, attached to the unit)

Application Software (downloadable free of charge)

Application software for controlling this system from a PC is available from our website.

[NOTICE]PLZ-70UA

The operating voltage is guaranteed by the input terminal of the load unit. Be sure to select a load cable that never inputs a voltage of 0 V or less to the load unit input terminal. This system detects the no-signal condition. The no-signal condition is detected when the voltage at the load unit input terminal is 0.3 V or less and when the input current is equal to or less than about 1 % of the rating, in which case the current will stop flowing.

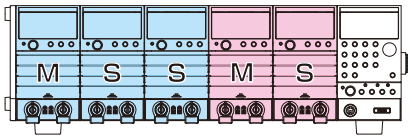
Options

■ Control flat cable
PC01-PLZ-4W (300 mm)
PC02-PLZ-4W (550 mm)
(for connection between frames)

■ Sequence creation software
Wavy for PLZ-U

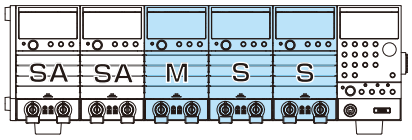
Parallel Operation for Larger Capacity

Up to five adjacent load units of the same models can be operated in parallel. For example, you can build a 375-watt load system by operating five PLZ70UA load units in parallel in the PLZ-50F frame or a 750-watt load system by operating five PLZ150U load units in parallel.



M: Master
S: Slave

When three load units of one model and two load units of another model are operated in parallel in the PLZ-50F frame



M: Master
S: Slave
SA: Standalone load unit

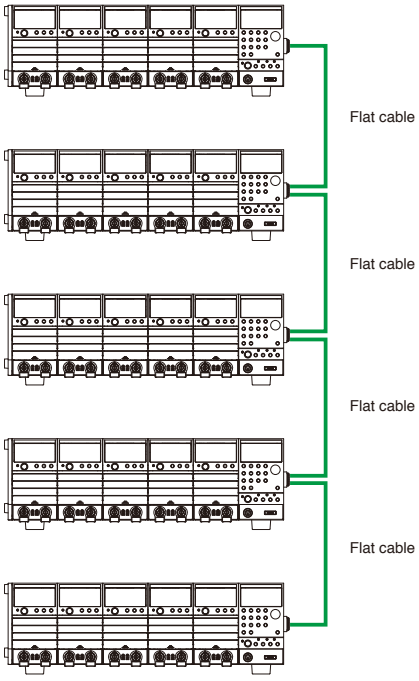
When three load units of the same model are operated in parallel and two standalone load units are operated independently in the PLZ-50F frame

Number of Modules and Capacities

Number of parallel operated load modules	PLZ70UA	PLZ150U
2	30 A/150 W	60 A/300 W
3	45 A/225 W	90 A/450 W
4	60 A/300 W	120 A/600 W
5	75 A/375 W	150 A/750 W

Frame Control

By connecting two or more frames, you can use one frame to control the other frames (up to five frames can be connected at a time). Operations such as load on/off and preset memory call can be performed.



Ordering Code * Please inquire by following code

Model name	Frame model	PLZ70UA	PLZ150U	Total number of unit
PLZ30F-70UA0-150U1	PLZ-30F	0	1	1
PLZ30F-70UA0-150U2		0	2	2
PLZ30F-70UA0-150U3		0	3	3
PLZ30F-70UA1-150U0		1	0	1
PLZ30F-70UA1-150U1		1	1	2
PLZ30F-70UA1-150U2		1	2	3
PLZ30F-70UA2-150U0		2	0	2
PLZ30F-70UA2-150U1		2	1	3
PLZ30F-70UA3-150U0		3	0	3

Model name	Frame model	PLZ70UA	PLZ150U	Total number of unit
PLZ50F-70UA0-150U1	PLZ-50F	0	1	1
PLZ50F-70UA0-150U2		0	2	2
PLZ50F-70UA0-150U3		0	3	3
PLZ50F-70UA0-150U4		0	4	4
PLZ50F-70UA0-150U5		0	5	5
PLZ50F-70UA1-150U0		1	0	1
PLZ50F-70UA1-150U1		1	1	2
PLZ50F-70UA1-150U2		1	2	3
PLZ50F-70UA1-150U3		1	3	4
PLZ50F-70UA1-150U4		1	4	5
PLZ50F-70UA2-150U0		2	0	2
PLZ50F-70UA2-150U1		2	1	3
PLZ50F-70UA2-150U2		2	2	4
PLZ50F-70UA2-150U3		2	3	5
PLZ50F-70UA3-150U0		3	0	3
PLZ50F-70UA3-150U1		3	1	4
PLZ50F-70UA3-150U2		3	2	5
PLZ50F-70UA4-150U0		4	0	4
PLZ50F-70UA4-150U1		4	1	5
PLZ50F-70UA5-150U0		5	0	5

PLZ-U Series Specifications

Model			PLZ150U	PLZ70UA
Rating				
Operating voltage (DC)			1.5 V to 150 V	0 V to 150 V
Current/power	Range	H	30 A/150 W	15 A/75 W
		M	3 A/150 W	1.5 A/75 W
		L	300 mA/45 W	150 mA/22.5 W
Isolation voltage of the load input terminal			500 VDC	
Withstand voltage between load input terminal channels			500 VDC	
Minimum start voltage*1			0.3 V or greater	
CC mode				
Operating range	Range	H	0 A to 30 A	0 A to 15 A
		M	0 A to 3 A	0 A to 1.5 A
		L	0 A to 300 mA	0 A to 150 mA
Selectable range			0 % to 105 % of f.s	
Resolution	Range	H	2 mA	1 mA
		M	0.2 mA	0.1 mA
		L	0.02 mA	0.01 mA
Accuracy of setting	Range	H, M, and L	±(0.2 % of set + 0.2 % of f.s) + Vin*2/500 kΩ	
Input voltage variation*3	Range	H	2 mA	
		M	1 mA	
		L	0.1 mA	
Ripple		rms*4	3 mA	7.5 mA
		p-p*5	30 mA	50 mA
CR mode				
Operating range The value inside parentheses is the conductance. *6	Range	H	PLZ150U OPEN to 50 mΩ (0 S to 20 S)	OPEN to 100 mΩ (0 S to 10 S)
		M	OPEN to 500 mΩ (0 S to 2 S)	OPEN to 1 Ω (0 S to 1 S)
		L	OPEN to 5 Ω (0 S to 200 mS)	OPEN to 10 Ω (0 S to 100 mS)
Selectable range			0 % to 105 % of f.s *7	
Resolution The value inside parentheses is the operating range.	Range	H	0.2 mS (0 S to 2 S)	0.1 mS (0 S to 1 S)
			2 mS (2 S to 20 S)	1 mS (1 S to 10 S)
		M	20 µS (0 S to 200 mS)	10 µS (0 S to 100 mS)
			0.2 mS (200 mS to 2 S)	0.1 mS (100 mS to 1 S)
		L	2 µS (0 S to 20 mS)	1 µS (0 S to 10 mS)
			20 µS (20 mS to 200 mS)	10 µS (10 mS to 100 mS)
Accuracy of setting*8	Range	H, M, and L	±(0.5 % of set*9 + 0.5 % of f.s*10) + Vin/500 kΩ	
CV mode				
Operating range	Range	H	1.5 V to 150 V	0 V to 150 V
		L	1.5 V to 15 V	0 V to 15 V
Selectable range			0 % to 105 % of f.s	
Resolution	Range	H	10 mV	
		L	1 mV	
Accuracy of setting	Range	H and L	±(0.1 % of set + 0.1 % of f.s)	
Input current variation *11			12 mV	

*1 Minimum voltage at which the current starts flowing to the PLZ-U.
(The PLZ-U detects no signal at an input voltage less than or equal to approximately 0.3 V and an input current less than or equal to approximately 1 % of the range rating. Therefore, if the input voltage is gradually increased from 0 V, no current will flow until 0.3 V is exceeded. If a current greater than or equal to 1% of the range rating starts flowing, the current can flow at voltages less than equal to 0.3 V.)
*2 Vin: Load input terminal voltage
*3 At a current greater than or equal to (Vin/500 kΩ)
*4 Measurement frequency bandwidth: 10 Hz to 1 MHz
*5 Measurement frequency bandwidth: 10 Hz to 20 MHz
*6 Conductance [S] = (Input current [A]/input voltage [V]) = (1/resistance [Ω])
*7 Conductance f.s
*8 Converted value in terms of the input current, during remote sensing
*9 set = input voltage × specified conductance = (input voltage/specified resistance)
*10 f.s = Rated current of the specified range
*11 During remote sensing

Model			PLZ150U	PLZ70UA
Voltmeter				
Measurement range			0 V to 150.0 V	
Resolution	15.75 V to 150 V		0.01 V	
	0 V to 15.75 V		0.001 V	
Measurement accuracy			±(0.1 % of rdg + 15 digits)	
Ammeter				
Measurement range	Range	H	0 A to 30 A	0 A to 15 A
		M	0 A to 3 A	0 A to 1.5 A
		L	0 mA to 300 mA	0 mA to 150 mA
Resolution	Range	H	0.001 A	
		M	0.0001 A	
		L	0.01 mA	
Measurement accuracy			±(0.2 % of rdg + 0.3 % of f.s)	
Wattmeter *1				
Measurement range			0 W to 150 W	0 W to 150 W
Resolution	100 W minimum		0.01 W	
	100 W or greater		0.1 W	
Switching mode				
Operation mode			CC and CR	
Selectable frequency range			1 Hz to 20 kHz	
Duty cycle setting			2 % to 98 %, 0.1 % steps	
Frequency resolution	1 Hz to less than 1 kHz		1 Hz	
	1 kHz to less than 10 kHz		10 Hz	
	10 kHz to 20 kHz		100 Hz	
Accuracy of frequency setting			±(0.5 % of set)	
Slew rate				
Operation mode			CC and CR	
Selectable range (CC)	Range	H	0.10 A/µs to 2.40 A/µs	0.05 A/µ to 1.20 A/µs
		M	0.10 A/µs to 0.24 A/µs	0.05 A/µ to 0.12 A/µs
		L	24 mA/µs*2	12 mA/µs*2
Selectable range (CR)	Range	H	0.10 A/µs to 0.24 A/µs	0.05 A/µ to 0.12 A/µs
		M	24 mA/µs*2	12 mA/µs*2
		L	2.4 mA/µs*2	1.2 mA/µs*2
Resolution			0.01 A/µs	
Accuracy of setting*3			±(10 % of set + 5 µs)	
Soft start				
Operation mode			CC	
Selectable time range			0.1, 1, 3, 10, 30, 100, or 300 ms	
Time accuracy			±(30 % of set +100 µs)	
Sequence function				
Sequence	Operation mode		CC and CR	
	Maximum number of steps		255	
	Step execution time		1 ms to 9 999 s	
	Number of loops		1 to 9999 (9999 is infinite loop)	

*1 Product of the measured voltage and measured current
*2 Fixed value
*3 Time to reach from 10 % to 90 % when the current is changed from 2 % to 100 % of the rated current of H range.

Model	PLZ150U	PLZ70UA
Protection function		
Overvoltage protection (OVP)	Turns off the load at 110 % of the rated voltage	
Overcurrent protection (OCP)	Set the value in the range of 0 % to 110 % of the rated current of H range. Trips at the value or 110 % of the rated current of the range, whichever is less. The action taken when the OCP trips can be set to load off or limit.	
Overpower protection (OPP)	Set the value in the range of 0 % to 110 % of the rated power of H range. Trips at the value or 110 % of the rated power of the range, whichever is less. The action taken when the OPP trips can be set to load off or limit.	
Overheat protection (OHP)	Trips when the heat sink temperature reaches 95 °C. The action taken when the OHP trips is to turn the load off.	
Reverse connection protection (RVP)	Short-term protection provided by a short-circuit system using a protection diode. The action taken when the OHP trips is to turn the load off.	
Undervoltage protection (UVP)	Set the value to off or in the range of 0 % to 100 % of the rated voltage. The action taken when the OHP trips is to turn the load off.	
Communication function		
GPIB	IEEE std. 488.2-1994 SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, and E1	
	Supports the SCPI command set Sets panel functions except the POWER switch and key lock and reads measured values	
RS232C	D-SUB 9-pin connector (conforms to EIA-232-D)	
	Sets panel functions except the POWER switch and key lock and reads measured values Baud rate: 2400, 4800, 9600, or 19200 bps; stop bit: 1; data length: 8 bits; parity: NONE; and flow control: XON/OFF.	

PLZ-U Series Specifications

Model		PLZ150U	PLZ70UA
Inter-frame control and external control			
Inter-frame control		Controls up to four slave frames from the master frame.	
		Enables you to turn on/off the load, recall presets ABC on all channels simultaneously, and recall setup memories 0 to 3.	
External control	Recall input of preset mem-ories A, B, and C	Recalls preset memories A, B, and C on all channels simultaneously	
	Setup memory recall input	Recalls the setup memory 0 to 3	
	Enable input	Enables the turning on/off of the load, recalling of presets ABC on all channels simultaneously, and recalling of setup memories 0 to 3.	
	Load-on input	Turns on the load on all channels simultaneously.	
	Load on status output	On when the load is on (open collector output)	
	Alarm status output	On when the alarm is on (open collector output)	
	Internal power output	5 V and maximum output current of 100 mA	
Input signal		Low active, pull up to 5 V using 10 kΩ. Low level input voltage: 0 V to 1 V, high level input voltage: 4 V to 5 V	
Output signal		Open collector, output withstand voltage of 30 VDC, output saturation voltage of approximately 1.1 V, and maximum output current of 100 mA.	
Remote sensing			
Sensing voltage that can be compensated		2 V for a single line	
Miscellaneous			
ABC preset memories		Saves settings (A, B, and C) for each operation mode of each range	
Setup memories		Saves four sets of setup parameters	
Elapsed time display		Measures the time from when the load is turned on to when the load is turned off (0.1 s to 99999 s)	
Auto load off timer		Turns off the load after the specified time elapses (off or 1 s to 99999 s)	
Delayed load-on		Turns on the load after the specified time elapses (0 ms to 1 s, 10 ms steps)	
Parallel operation		Possible between adjacent load units (same model) in the frame.	
External analog control			
Power output		12 V and maximum output current of 50 mA.	
External voltage control input *1		Operates in CC, CR, and CV modes. 0 % to 100 % of f.s in the range of 0 V to 10 V.	
Load-on input		Low active (or high active), pull up to 5 V using 10 kΩ. Low level input voltage: 0 V to 1 V, high level input voltage: 4 V to 5 V	
Current monitor output		0 % to 100 % of the rated current in the range of 0 V to 10 V	
Common		Negative pin electric potential of the load input terminal	
General Specifications			
Weight		Approx. 2 kg (4.41 lbs)	
Accessories	Rear load input terminal cover	1 pc.	
	Set of screws for the load input connector	2 sets (M6 bolt, M6 nut, M6 spring washer, M4 screw)	
	Load unit attachment screws	2 pcs. (M3-10 screws, attached to the unit)	
	Sensing terminal screw on the rear panel	2 pcs. (M3-6 screws, attached to the unit)	

*1 The time for updating the setting in CR or CV mode is approximately 100 ms.

Model		PLZ30F	PLZ50F
Rated supply voltage		100 VAC to 240 VAC (90 VAC to 250 V) single phase	
Rated frequency		50 Hz or 60 Hz (47 Hz to 63 Hz)	
Power consumption	Frame alone	33 VA or less	40 VA or less
	When load units are installed in all channels	300 VAmax	500 VAmax
Cooling system		Forced air cooling using a heat sensing variable speed fan.	
Operating temperature range		0 °C to 40 °C	
Operating humidity range		20 % to 85 % RH (without condensation)	
Storage temperature range		–20 °C to 70 °C	
Storage humidity range		90 % RH or less (without condensation)	
Insulation resistance	Primary - chassis	500 VDC, 30 MΩ or more (ambient humidity of 70 % RH or less)	
Withstand voltage	Primary - chassis	No abnormalities at 1500 VAC for 1 minute.	
Ground continuity		25 Aac, 0.1 Ω or less	
Battery backup		Backs up the setup data immediately before the power is turned off Battery life: 3 years or longer (at 25 °C)	
Number of installable load modules		3	5
Dimensions (mm)		See outline drawing.	
Weight	Frame alone	Approx. 5 kg (11.02 lbs)	Approx. 7 kg (15.43 lbs)
Accessories	Power cord	1 pc. (with SVT3, 18AWG, 3-prong plug, cable length of 2.4 m)	
	Blank panel (front panel)	2 pcs. maximum *1	4 pcs. maximum *1
	Protection dummy plug	2 pcs. (for the FRAME CONT connector, attached to the unit)	
	Operation manual	1 pc.	
Electromagnetic compatibility *1, *2		Conforms to the requirements of the following directives and standards EMC Directive 2014/30/EU EN 61326-1 EN 55011 Emission: Class A, Group 1 Immunity: Minimum immunity test requirement EN61000-3-2, EN61000-3-3	
Safety *3, *4		Conforms to the requirements of the following directives and standards Low Voltage Directive 2014/35/EU EN61010-1 Class I Pollution degree 2	

*1 In products that have load units installed, blank panels are installed in the empty slots. In products that contain the frame alone, the maximum number of blank panels are installed.
*2 Only on models that have CE marking on the panel.
*3 Not applicable to custom order models.
*4 This unit is a Class I device. Be sure to ground the protective conductor terminal of the unit. The safety of the unit is not guaranteed unless the unit is grounded properly.