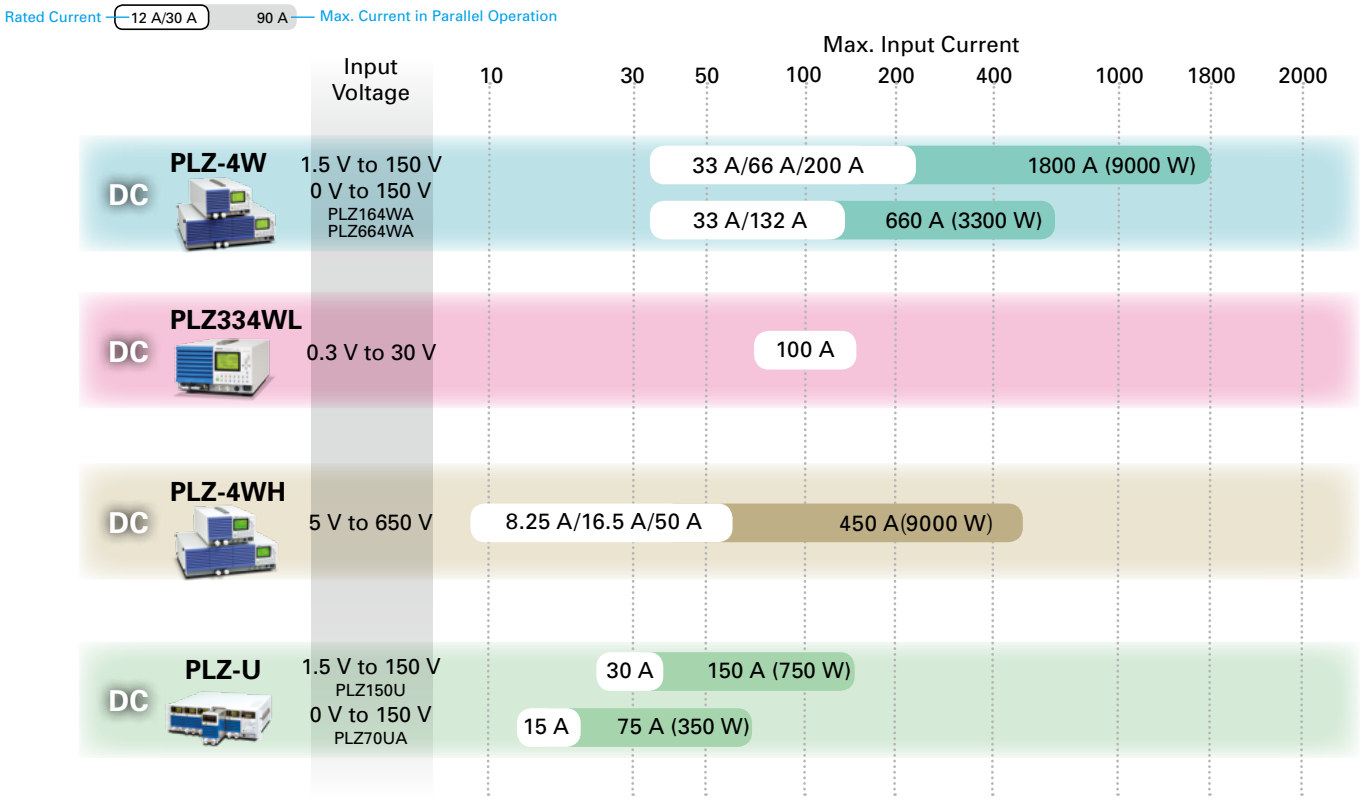
ELECTRONIC LOAD SELECTION GUIDE

Series		PLZ-4W	PLZ-4WL	PLZ-4WH	PLZ-U
Line up		6models	1 model	4 models	4 models
Features		Multi Functional	High Speed	High Voltage	Multi Channel
Input		DC	DC	DC	DC
Mode	CC	✔	✔	✔	✔
	CC+CV	✔	✔	✔	✔
	CR	✔	✔	✔	✔
	CR+CV	✔	✔	✔	✔
	CV	✔	✔	✔	✔
	CP	✔	✔	✔	
Input rating (Max.)		165 W/330 W/ 660 W/1000 W	330 W	165 W/330 W/1000 W	75 W/150 W
		150 V	30 V	650 V	150 V
		200 A	100 A	50 A	30 A
Zero Voltage Input		Available	–	–	Available
GPIB		Standard	Standard	Standard	Standard
RS-232C		Standard	Standard	Standard	Standard
USB		Standard	Standard	Standard	–



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

PLZ-4W Series

USB GPIB RS-232C DRIVERS CE

Suitable design for fuel cell, faster speed and lower voltage testing application of various devices!

The PLZ-4W Series Electronic Load unit is a multifunctional system designed to offer the highest levels of reliability and safety with operation function of constant voltage, constant current, constant power and constant resistance mode. And its control unit comes with GPIB, RS232C and USB as standard interface. The PLZ-4W Series are available in 5 models and which a 0 V input operating voltage is available in 2 models (PLZ164WA, PLZ664WA) suited to meet with the testing demands for the Fuel Cell, DC/DC converter, SW Power Supply, and any other devices required for the lower operating voltage application. The PLZ664WA offers the 132 A at 0 V input as a largest current rating in its class. (33 A for model PLZ164WA) Furthermore, the PLZ-4W features high speed slew rate when switching, it can be used as simulating load for the characteristic, performance, life cycle, aging test in the field of application in Automobile electronics, SW Power Supply manufacturer, Secondary Battery.
To achieve large capacity for testing application at low cost, the PLZ1004W can be expanded up to 9 kW by using the 2 kW booster unit (PLZ2004WB).

Dimensions

Type I :214.5(8.44″)W × 124(4.88″)H × 400(15.75″)Dmm
Type II :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), Input power cable (with a SVT3 18 AWG 3 P plug, 2.4 m), Load input terminal cover, Lock plate (2 pcs.), Load input terminal bolt, nut and spring washer (2 sets)

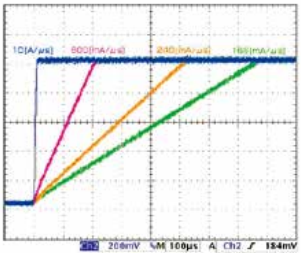
Features

- Equipped with 6 operation modes (CC, CR, CV, CP, CC+CV, CR + CV)
- 0 V input operating voltage type model is available (PLZ164WA, PLZ664WA)
- For transient switching operations, it is possible to set a slew rate (A/μs)
- 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

■ High-speed response and variable slew-rate

Lately the Electronic Load has been required to apply faster response to comply with such as DC/DC converters with high-speed performance.
With PLZ-4W Series, it realizes a faster response of rise/fall time as calculated conversion value with 10 μs, and enabling a transient response test for the direct current and accurate reproduction of a simulation waveform as a dummy load. In addition, instead of the conventional rise/fall time settings, it also can be set with a slew rate (A/μs). As for the setting value, it can be varied continuously, and be possible to optimize transient control for voltage drops due to wiring inductance, constant-voltage power supply, etc., when the load current is switched on.



▲ A current waveform shifting by variable slew-rate

* Adequate slew rate performance is guaranteed as long as the change in the current remains within the 2 %-to-100 % range of the rating.(M range 20 % to 100 %)
The rise time to the rated current takes approximately 10 μs. When the variation of the current value is small, the slew rate may not be achieved to the setting value.

■ 0 V input

The PLZ164WA and PLZ664WA permit a load input up to the rated current even when the Input Voltage is set for 0 V. This is an absolute required specification for single cell tests of the fuel cells. Also, because of the low power consumption and scaling down of semi-conductor processes, semi-conductor devices are experiencing further voltage reductions. The Load can meet with these applications of power evaluation test. Higher precision is offered for current settings. Resolutions in micro currents are ensured by 3-range configuration. (Resolving power 10 μA set with L range of PLZ164W and PLZ164WA is possible) Further, each display for the voltmeter, ammeter, and wattmeter now uses a 5-digit display.

■ Sequence function

Sequence patterns set as you requested can be saved in the built-in memory. In the sequence program, 10 normal sequences and 1 first sequence can be saved. 256 steps of normal sequences, and 1,024 steps of the first sequence can be saved in each program.
Simple editing is possible using the large liquid crystal display (LCD).

■ Convenient function for discharging test of cells

The PLZ4W can measure the time from load-on to load-off. When combined with under voltage protection (UVP) function, the time from when the battery discharge is started until the battery voltage falls to the cutoff voltage can be measured. Also, you can set the timer so it will load-off automatically after a specified time elapses from load-on mode. Once this timer is set, the input voltage value immediately before load-off is displayed, so it is possible to measure the closed circuit voltage after a specified time elapses from the start of discharging battery.

■ Booster unit PLZ2004WB*

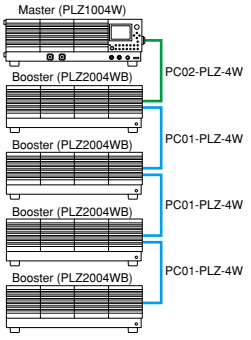
To achieve a large capacity system at low cost, the PLZ1004W has an expandable option PLZ2004WB as a booster unit.

Using one unit of PLZ1004W as a master unit, a maximum of 4 booster units can be parallel connected. (Max. 9 kW, 1800 A)

*PLZ2004WB(Booster unit) can be used for the PLZ1004W only. It cannot be connected and used with any other model.

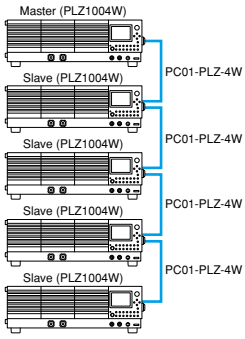
■ Specifications

Operating voltage	1.5 V to 150 V
Current	400 A
Power	2000 W
Input voltage	AC100 V to 240 V (AC90 V to 250 V) single phase, continuous
Power consumption	200 VA(max)
Dimensions	Type II (The depth is 550(21.65") (600(23.62")) mm(inch))
Weight	approx.23 kg (50.71 lbs)



■ Parallel operation

Under parallel operation, the same model can be parallel connected to a maximum of 5 units when booster unit is not used. (Max. 5 kW, 1000 A)



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

■ GPIB, RS-232C, USB as standard equipment

The system comes with interfaces GPIB, RS-232C and USB as standard equipment. All the interfaces comply with SCPI (standard commands for programmable instruments) as well as IEEE488.2

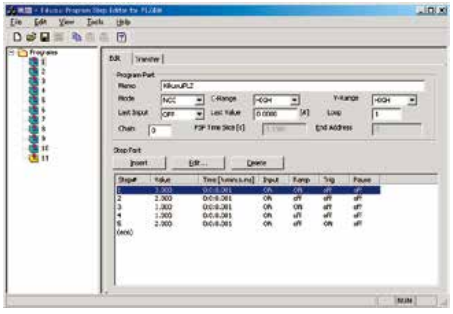
■ Other functions

The PLZ-4W Series has equipped with all the same functions of its former type of the PLZ-3W Series, such as the Soft-start Function, Lock Function, Short Function, ABC Memory Function, Set-up Memory Function, Switching Functions, etc.

■ Sample program

We have prepared sample programs for the PLZ-4W Series at our website. (Free download service). These include the Utility software [MEMcopy] to read, or save the set-up memory content from media such as floppy disc, the Sequence Editing software [StepEdit], and Visual Basic applications such as measured data collection and GUI remote control, and their source code [VB Sample].

Even if you don't have the expensive GPIB card or the programming skills, you can start measuring easily by installing these software and USB drivers in a Windows PC (compatible with Windows 98 or later) with USB mounted, and link the PLZ-4W Series via a USB cable.



▲ Application Software

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

[NOTICE] PLZ-164WA and PLZ664WA

● Operating voltage is secured by the input node of the load device. Please select load wiring that does not make input node voltage of the load device become 0 V or less. In addition, this equipment detects non-input. It detects non-input and stops electric current when the input node voltage of the load device is 0.3 V or less and input current is approximately 1 % of the current rating or less.

● PLZ164WA and PLZ664WA are equipped with bias supply inside. In the case of supply for which diode is arranged from minus output to plus output, such as switching supply, an electric current flows from the bias supply to the diode and an alarm for reverse connection occurs when turning off the output of the supply under test while this equipment is loaded on.

● Because a noise filter is used for the primary input for PLZ164WA and PLZ664WA, the leakage breaker, etc. may be activated, depending on the environment of the input power, when using multiple quantities of them at the same time. Therefore, we provide models for customers who are planning to use multiple devices at the same time. If you have any other questions, please contact our sales department for details.

PLZ-4W Series Specifications

Unless specified otherwise, the specifications are for the following settings and conditions.
- The warm-up time is 30 minutes (with current flowing).
- After warm-up is complete, the PLZ-4W must be calibrated correctly according to the procedures given in the operation manual in a 23 °C±5 °C environment.
- ** % of set denotes ** % of the input voltage, input current, or input power setting.
- ** % of f.s denotes ** % of the rated input voltage, rated input current, or rated input power.
- **% of rdg represents denotes ** % of the input voltage, input current, or input power reading.

Model			PLZ164W	PLZ334W	PLZ1004W	PLZ164WA	PLZ664WA
Rating							
Operating voltage (DC)			1.5 V to 150 V *1			0 V to 150 V *2	
Current			33 A	66 A	200 A	33 A	132 A
Power			165 W	330 W	1000 W	165 W	660 W
Minimum start voltage *3			0.3 V or greater				
CC mode							
Operating range	Range	H	0 A to 33 A	0 A to 66 A	0 A to 200 A	0 A to 33 A	0 A to 132 A
		M	0 A to 3.3 A	0 A to 6.6 A	0 A to 20 A	0 A to 3.3 A	0 A to 13.2 A
		L	0 A to 330 mA	0 A to 660 mA	0 A to 2 A	0 A to 330 mA	0 A to 1.32 A
Setting range	Range	H	0 A to 34.65 A	0 A to 69.3 A	0 A to 210 A	0 A to 34.65 A	0 A to 138.6 A
		M	0 A to 3.465 A	0 A to 6.93 A	0 A to 21 A	0 A to 3.465 A	0 A to 13.86 A
		L	0 A to 346.5 mA	0 A to 693 mA	0 A to 2.1 A	0 A to 346.5 mA	0 A to 1.386 A
Resolution	Range	H	1 mA	2 mA	10 mA	1 mA	10 mA
		M	0.1 mA	0.2 mA	1 mA	0.1 mA	1 mA
		L	0.01 mA	0.02 mA	0.1 mA	0.01 mA	0.1 mA
Accuracy of setting	Range	H, M	±(0.2 % of set + 0.1 % of f.s *1) + Vin *2/500 kΩ				
		L	±(0.2 % of set + 0.1 % of f.s)				
Input voltage variation*3	Range	H	2 mA	4 mA	10 mA	2 mA	8 mA
		M	2 mA	4 mA	10 mA	2 mA	8 mA
		L	0.1 mA	0.2 mA	0.6 mA	0.1 mA	0.4 mA
Ripple		rms *4	3 mA	5 mA	20 mA *6	7.5 mA	30 mA*6
		p-p *5	30 mA	50 mA	100 mA*6	50 mA	200 mA*6
CR mode							
Operating range *1	Range	H	22 S to 400 µS (45.455 mΩ to 2.5 kΩ)	44 S to 800 µS (22.727 mΩ to 1.25 kΩ)	133.332 S to 2.4 mS (7.5 mΩ to 416.666 Ω)	22 S to 400 µS (45.455 mΩ to 2.5 kΩ)	88 S to 1.6 mS (11.363 mΩ to 625 Ω)
		M	2.2 S to 40 µS (454.55 mΩ to 25 kΩ)	4.4 S to 80 µS (227.27 mΩ to 12.5 kΩ)	13.3332 S to 2420 µS (75 mΩ to 4.1666 kΩ)	2.2 S to 40 µS (454.55 mΩ to 25 kΩ)	8.8 S to 160 µS (113.63 mΩ to 6.25 kΩ)
		L	0.22 S to 4 µS (4.545 5 Ω to 250 kΩ)	0.44 S to 8 µS (2.272 7 Ω to 125 kΩ)	1.33332 S to 24 µS (750 mΩ to 41.666 kΩ)	0.22 S to 4 µS (4.545 5 Ω to 250 kΩ)	0.88 S to 16 µS (1.136 3 mΩ to 62.5 kΩ)
Setting range	Range	H	23.1 S to 0 S (43.290 mΩ to OPEN)	46.1 S to 0 S (21.692 mΩ to OPEN)	139.9968 S to 0 S (7.1430 mΩ to OPEN)	23.1 S to 0 S (43.290 mΩ to OPEN)	92.4 S to 0 S (10.822 mΩ to OPEN)
		M	2.31 S to 0 S (432.9 mΩ to OPEN)	4.61 S to 0 S (216.92 mΩ to OPEN)	13.99968 S to 0 S (71.430 mΩ to OPEN)	2.31 S to 0 S (432.9 mΩ to OPEN)	9.24 S to 0 S (108.22 mΩ to OPEN)
		L	0.231 S to 0 S (4.329 Ω to OPEN)	0.461 S to 0 S (2.1692 Ω to OPEN)	1.399968 S to 0 S (714.30 mΩ to OPEN)	0.231 S to 0 S (4.329 Ω to OPEN)	0.924 S to 0 S (1.0822 Ω to OPEN)
Resolution	Range	H	400 µS	800 µS	2.424 mS	400 µS	1.6 mS
		M	40 µS	80 µS	242.4 µS	40 µS	160 µS
		L	4 µS	8 µS	24.24 µS	4 µS	16 µS
Accuracy of setting *2	Range	H, M	±(0.5 % of set *3 + 0.5 % of f.s *4) + Vin/500 kΩ				
		L	±(0.5 % of set *3 + 0.5 % of f.s)				
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	
Setting range	Range	H	0 V to 157.5 V				
		L	0 V to 15.75 V				
Resolution	Range	H	10 mV				
		L	q				
Accuracy of setting	Range	H, L	±(0.1 % of set + 0.1 % of f.s)				
Input current variation*1			12 mV				
CP mode							
Operating range	Range	H	16.5 W to 165 W	33 W to 330 W	100 W to 1000 W	16.5 W to 165 W	66 W to 660 W
		M	1.65 W to 16.5 W	3.3 W to 33 W	10 W to 100 W	1.65 W to 16.5 W	6.6 W to 66 W
		L	0.165 W to 1.65 W	0.33 W to 3.3 W	1 W to 10 W	0.165 W to 1.65 W	0.66 W to 6.6 W
Setting range	Range	H	0 W to 173.25 W	0 W to 346.5 W	0 W to 1050 W	0 W to 173.25 W	0 W to 693 W
		M	0 W to 17.325 W	0 W to 34.65 W	0 W to 105 W	0 W to 17.325 W	0 W to 69.3 W
		L	0 W to 1.7325 W	0 W to 3.465 W	0 W to 10.5 W	0 W to 1.732 5 W	0 W to 6.93 W
Resolution	Range	H	10 mW	10 mW	100 mW	10 mW	20 mW
		M	1 mW	1 mW	10 mW	1 mW	2 mW
		L	0.1 mW	0.1 mW	1 mW	0.1 mW	0.2 mW
Accuracy of setting	Range	H, M	±(0.6 % of set + 1.4 % of f.s*1)				
		L	±(0.6 % of set + 1.4 % of f.s)				

[rating]
*1 The minimum operating voltage (including the voltage drop due to the wire inductance component) in switching mode increases by 0.15 V per 1 A/µs at slew rate settings greater than 5 A/µs.
*2 The minimum operating voltage (including the voltage drop due to the wire inductance component) in switching mode increases by 0.3 V per 1 A/µs at slew rate settings greater than 5 A/µs.
*3 Minimum voltage at which the current starts flowing to the PLZ-4W. (The PLZ-4W 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. Once 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.)

[CC mode]
*1 Full scale of H range
*2 Vin: Input terminal voltage of Electronic Load
*3 When the input voltage is varied from 1.5 V to 150 V at a current of rated power/150 V.
*4 Measurement frequency bandwidth: 10 Hz to 1 MHz
*5 Measurement frequency bandwidth: 10 Hz to 20 MHz
*6 At measurement current of 100 A

[CR mode]
*1 Conductance [S] = Input current [A] / input voltage [V] = 1/resistance [Ω]
*2 Converted value at the input current. At the sensing point.
*3 set = Vin/Rset
*4 Full scale of H range

[CV mode]
*1 With respect to a change in the current of 10 % to 100 % of the rating at an input voltage of 1.5 V (during remote sensing).

[CP mode]
*1 Full scale of H range

PLZ-4W Series Specifications

Model			PLZ164W	PLZ334W	PLZ1004W	PLZ164WA	PLZ664WA
Meters							
Voltmeter	Range	H, M	0.00 V to 150.00 V				
		L	0.000 V to 15.000 V				
	Accuracy		±(0.1 % of rdg + 0.1 % of f.s)				
Ammeter	Range	H, M	0.000 A to 33.000 A	0.000 A to 66.000 A	0.00 A to 200.00 A	0.000 A to 33.000 A	0.00 A to 132.00 A
		L	0.00 A to 330.00 mA	0.00 A to 660.00 mA	0.0000 A to 2.0000 A	0.00 A to 330.00 mA	0.000 A to 1.3200 A
	Accuracy		±(0.2 % of rdg + 0.3 % of f.s)				
Wattmeter*1	Range	H, M	0.00 W to 165.00 W	0.00 W to 330.00 W	0.0 W to 1000.0 W	0.00 W to 165.00 W	0.00 W to 660.00 W
		L*2	0.000 W to 49.500 W	0.000 W to 99.000 W	0.00 W to 300.00 W	0.000 W to 49.500 W	0.000 W to 198.00 W
		L*3	0.0000 W to 1.6500 W	0.0000 W to 3.3000 W	0.000 W to 10.000 W	0.0000 W to 1.6500 W	0.0000 W to 6.6000 W
Switching mode							
Operation mode			CC and CR				
Duty cycle setting			5 % to 95 %*1, 0.1 % step				
Selectable frequency range			1 Hz to 20 kHz				
Frequency 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 20 kHz		100 Hz				
Frequency accuracy of setting			±(0.5 % of set)				
Slew rate							
Setting range *1	Range	H	2.5 mA/µs to 2.5 A/µs	5 mA/µs to 5 A/µs	16 mA/µs to 16 A/µs	2.5 mA/µs to 2.5 A/µs	10 mA/µs to 10 A/µs
		M	250 µA/µs to 250 mA/µs	500 µA/µs to 500 mA/µs	1.6 mA/µs to 1.6 A/µs	250 µA/µs to 250 mA/µs	1 mA/µs to 1 A/µs
		L	25 µA/µs to 25 mA/µs	50 µA/µs to 50 mA/µs	160 µA/µs to 160 mA/µs	25 µA/µs to 25 mA/µs	100 µA/µs to 100 mA/µs
Resolution			See below.				
Accuracy of setting*2			±(10 % of set + 5 µs)				
Slew rate resolution							
PLZ164W PLZ164WA	Setting		25 µA/µs to 250 µA/µs	250 µA/µs to 2.5 mA/µs	2.5 mA/µs to 25 mA/µs	25 mA/µs to 250 mA/µs	250 mA/µs to 2.5 A/µs
	Resolution		100 nA	1 µA	10 µA	100 µA	1 mA
PLZ334W	Setting		50 µA/µs to 500 µA/µs	500 µA/µs to 5 mA/µs	5 mA/µs to 50 mA/µs	50 mA/µs to 500 mA/µs	500 mA/µs to 5 A/µs
	Resolution		200 nA	2 µA	20 µA	200 µA	2 mA
PLZ664WA	Setting		100 µA/µs to 1 mA/µs	1 mA/µs to 10 mA/µs	10 mA/µs to 100 mA/µs	100 mA/µs to 1 A/µs	1 A/µs to 10 A/µs
	Resolution		400 nA	4 µA	40 µA	400 µA	4 mA
PLZ1004W	Setting		160 µA/µs to 1.6 mA/µs	1.6 mA/µs to 16 mA/µs	16 mA/µs to 160 mA/µs	160 mA/µs to 1.6 A/µs	1.6 A/µs to 16 A/µs
	Resolution		600 nA	6 µA	60 µA	600 µA	6 mA
Soft start							
Operation mode			CC and CR				
Selectable time range			1, 2, 5, 10, 20, 50, 100, or 200 ms				
Time accuracy			±(30 % of set +100 µs)				
Remote sensing							
Voltage that can be compensated			2 V for a single line				
Protection function							
Overvoltage protection (OVP)			Turns off the load at 110 % of the rated voltage				
Overcurrent protection (OCP)			0.03 A to 36.3 A	0.06 A to 72.6 A	0.2 A to 220 A	0.03 A to 36.3 A	0.13 A to 145.2 A
			Or 110 % of the maximum current of each range				
Overpower protection (OPP)			0.1 W to 181.5 W	0.3 W to 363 W	1 W to 1 100 W	0.1 W to 181.5 W	0.6 W to 726 W
			Or 110 % of the maximum power of each range Load off or limit selectable				
Overheat protection (OHP)			Turns off the load when the heat sink temperature reaches 95 °C				
Undervoltage protection (UVP)			Turns off the load when detected.				
			Can be set in the range of 0 V to 150 V or Off.				
Reverse connection protection (REV)			By diode and fuse. Turns off the load when an alarm occurs.				

[Meters]

*1 Displays the product of the voltmeter reading and ammeter reading.

*2 In a mode other the CP mode

*3 In CP mode

[Switching mode]

*1 The minimum time width is 10 µs. Between 5 kHz and 20 kHz, the maximum duty cycle is limited by the mini-mum time width.

[Slew rate]

*1 In CC mode. The maximum slew rate of each range is 1/10th the value in CR mode.

*2 Time to reach from 10 % to 90 % when the current is varied from 2 % to 100 % of the rated current.

PLZ-4W Series Specifications

Model		PLZ164W	PLZ334W	PLZ1004W	PLZ164WA	PLZ664WA
Sequence function						
Normal sequence	Operation mode	CC, CR, CV, or CP				
	Maximum number of steps	256				
	Step execution time	1 ms to 999 h 59 min				
	Time resolution	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	Operation mode	CC or CR				
	Maximum number of steps	1024				
	Step execution time	25 µs to 100 ms				
	Time resolution	25 µs (25 µs to 100 µs)/100 µs (100 µs to 100 ms)				
Others, Common specifications70						
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		Automatically turns off the load after a specified time elapses. Can be set in the range of 1 s to 999 h 59 min 59 s or off				
Front panel BNC connector	TRIG OUT	Trigger output: Approx. 4.5 V, pulse width: Approx. 2 µs, output impedance: Approx. 500 Ω Outputs a pulse during sequence operation and switching operation.				
	I MON OUT	Current monitor output 1 V f.s (H or L range) and 0.1 V f.s (M range)				
Communication function	GPIB	IEEE std. 488.1-1978 SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, E1				
		Supports the SCPI and IEEE std. 488.2-1992 command set Sets panel functions except the power switch and reads measured values				
	RS-232C	D-SUB 9-pin connector (conforms to EIA-232-D)				
		Sets panel functions except the power switch and reads measured values Supports the SCPI and IEEE std. 488.2-1992 command set Baud rate: 2400, 4800, 9600, 19200 bps Data length: 8-bit, Stop bit: 1, 2-bit, Parity bit: None, Flow control: Xon/Xoff				
	USB	Conforms to USB 2.0 Specifications and USBTMC-USB488 Device Class Specifications				
		Sets panel functions except the power switch and reads measured values Communication speed 12 Mbps (Full speed)				
General Specifications						
Input voltage range		100 VAC to 240 VAC (90 VAC to 250 VAC) Single phase, continuous			100 VAC to 120 VAC/200 VAC to 240 VAC (90 VAC to 132 VAC/180 VAC to 250 VAC) Single phase	
Input frequency range		47 Hz to 63 Hz				
Power consumption		80 VAmax	90 VAmax	160 VAmax	450 VAmax	1500 VAmax
Inrush current		45 A			80 A	
Operating temperature range		0 °C to 40 °C				
Operating humidity range		20 % – 85 % RH (without condensation)				
Storage temperature range		–25 °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 Ω or more (ambient humidity of 70 % RH or less)				
	Primary - chassis	500 VDC, 30 M Ω 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.				
Dimensions (mm(inch))		214.5(8.44˝)W × 124(4.88˝)H × 400(15.75˝)D		429.5(16.91˝)W × 128(5.04˝)H × 400(15.75˝)D	214.5(8.44˝)W × 124(4.88˝)H × 400(15.75˝)D	429.5(16.91˝)W × 128(5.04˝)H × 400(15.75˝)D
Weight		Approx. 7 kg (15.43 lbs)	Approx. 8 kg (17.64 lbs)	Approx. 15 kg (33.07 lbs)	Approx. 7.5 kg (16.53 lbs)	Approx. 16 kg (35.27 lbs)
Battery backup		Backs up setup information				
Accessories		Power cord × 1 pc. (with SVT3, 18AWG, 3-pin plug, cable length of 2.4 m), Load input terminal cover × 1 piece (2 lock plates provided), Set of screws for the load input terminal × 2 sets (bolts, nuts, and spring washers), Operation manual × 1 copy, Setup Guide, Quick Reference (1 each for English and Japanese), CD-R(Contains the User's Manual and the Communication Interface Manual)				
Electromagnetic compatibility (EMC) *1		Conforms to the requirements of the following directive and standard. EMC Directive 89/336/EEC EN61326:1997/A2:2001 Emissions: Class A Immunity: Minimum immunity test requirements EN61000-3-2:2000 EN61000-3-3:1995/A1:2001				
Safety *1 *2		Conforms to the requirements of the following directive and standard. Low Voltage Directive 73/23/EEC EN61010-1:2001 Class I Pollution degree 2				

[General Specifications]

*1 Only on models that have CE marking on the panel. Not applicable to custom order models.

*2 This instrument is a Class I equipment. Be sure to ground the protective conductor terminal of the instrument. The safety of the instrument is not guaranteed unless the instrument is grounded properly.

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

PLZ334WL

GPIB RS-232C 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)

■ 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 the single cell testing of the large scale rechargeable battery.

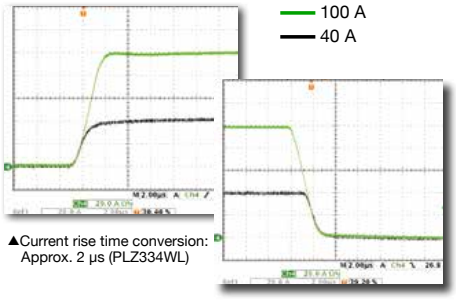
Features

- 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.

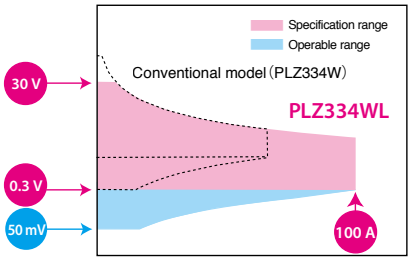


▲Current rise time conversion: Approx. 2 μs (PLZ334WL)

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

■ Realizing the low voltage operation

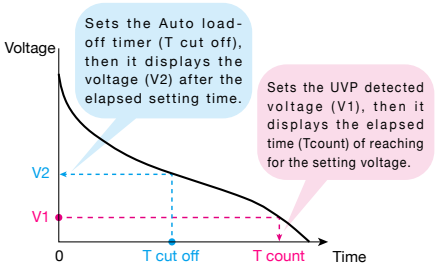
Possible to operate as low as 50 mV by the input voltage. Even below the input voltage of 0.3 V, this product can be used by reducing the current.



▲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 mV
		L	200 µV
	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.)
Wattmeter	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, RS-232C, 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 2006/96/EC, EN61010-1:2001 Class I Pollution degree 2
	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 2 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 RS-232C 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 RS-232C comes as standard interface that supports automated testing applications.

Dimensions

Type I : 214.5(8.44″)W × 124(4.88″)H × 400(15.75″)Dmm
Type II: 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.)

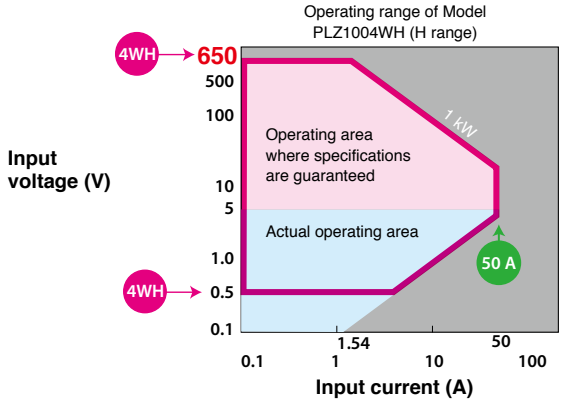
Features

- 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, continuous
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

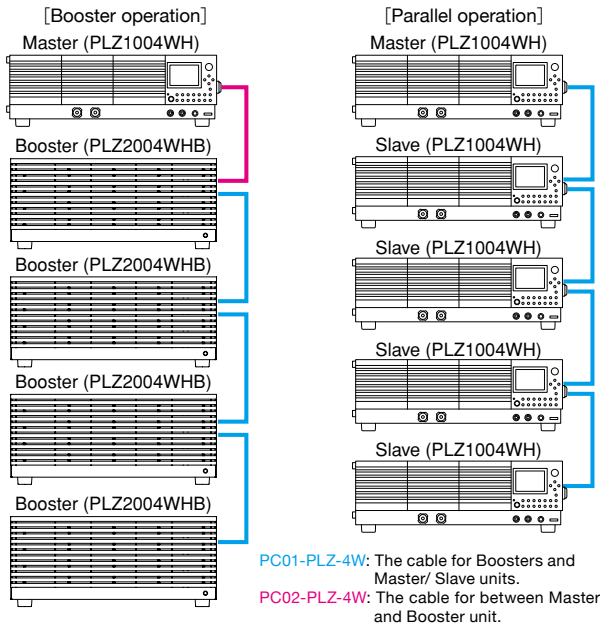
In CC, CR, and CP modes, three ranges are available: H, M, and L.
The L range is 1/100, enabling coverage from low to high power with a single unit.

● 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 °C Load-off at time of detection
Reverse connection protection (REV)		Protection by fuse

*1 Minimum voltage when current starts to flow to the unit. Occurs at the load input terminal.
*2 In a condition in which the master unit (PLZ1004WH) is connected.

*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		Compatibility with these standards: Immunity IEC61326-1:2006 Class A Emission IEC61326-1:2006 Class A IEC61000-3-2:2006+A1:2009+A1:2009 IEC61000-3-3:2008
Safety*3		Compatibility with these standards: Low Voltage Directive 2006/95/EC EN61010-1:2001

*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
Voltmeter				
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		Compatibility with these standards: Immunity IEC61326-1:2006 Class A Emission IEC61326-1:2006 Class A IEC61000-3-2:2006+A1:2009+A1:2009 IEC61000-3-3:2008		
Safety *4		Compatibility with these standards: Low Voltage Directive 2006/95/EC EN61010-1 2001		

*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 RS-232C 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 three modes - constant current, constant resistance, and 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 house load units to support up to three channels, and the PLZ-50F frame up to five channels. The available two load unit models are 70UA (75-watt load that operates even at 0 V) and 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 RS-232C 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 RS-232C 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.

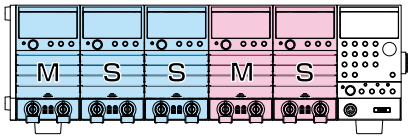
Options

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

■ Sequence Creation Software
Wavy for PLZ-U

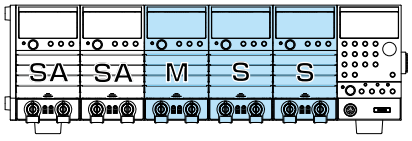
Parallel Operation for Larger Capacity

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

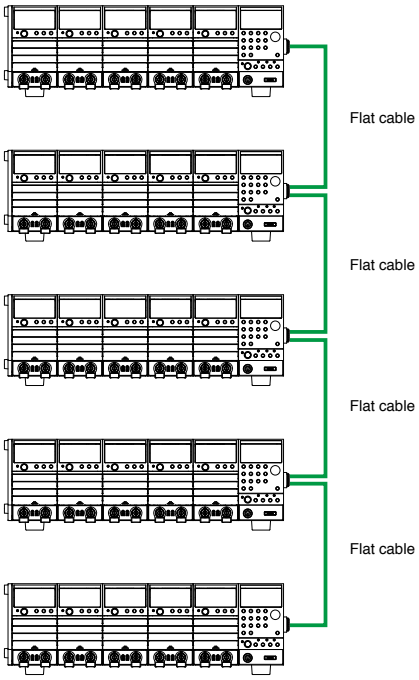
When three load units of the same model are operated in parallel and two standalone load units are operated independently in the PLZ-50F frame

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*1/500 kΩ	
Input voltage variation*2	Range	H	2 mA	
		M	1 mA	
		L	0.1 mA	
Ripple		rms*3	3 mA	7.5 mA
		p-p*4	30 mA	50 mA
CR mode				
Operating range The value inside parentheses is the conductance. *1	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 *2	
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*3	Range	H, M, and L	±(0.5 % of set*4 + 0.5 % of f.s*5) + 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*1			12 mV	

[Rating]
*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.)

[CC mode]
*1 Vin: Load input terminal voltage
*2 At a current greater than or equal to (Vin/500 kΩ)
*3 Measurement frequency bandwidth: 10 Hz to 1 MHz
*4 Measurement frequency bandwidth: 10 Hz to 20 MHz

[CR mode]
*1 Conductance [S] = (Input current [A]/input voltage [V]) = (1/resistance [Ω])
*2 Conductance f.s
*3 Converted value in terms of the input current, during remote sensing
*4 set = input voltage × specified conductance = (input voltage/specified resistance)
*5 f.s = Rated current of the specified range

[CV mode]
*1 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*1	12 mA/µs*1
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*1	12 mA/µs*1
		L	2.4 mA/µs*1	1.2 mA/µs*1
Resolution			0.01 A/µs	
Accuracy of setting*2			±(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)	

[Wattmeter]
*1 Product of the measured voltage and measured current

[Slew rate]
*1 Fixed value
*2 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	
RS-232C		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.	
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.	

Model		PLZ150U	PLZ70UA
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 89/336/EEC EN61326:1997/A2:2001 Emission: Class A Immunity: Minimum immunity test requirement EN61000-3-2:2000 EN61000-3-3:1995/A1:2001	
Safety *3, *4		Conforms to the requirements of the following directives and standards Low Voltage Directive 73/23/EEC EN61010-1:2001 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 1 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.