KIKUSUI

Full-Load Current of 100 A at 0.3 V!

High Speed-Large Current DC Electronic Load (50 A/μs)

While the PLZ-4WL series succeeds to the superior operability of our conventional model of the PLZ-4W series, the PLZ-4WL series realizes the high speed 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.

Applications

- Test for the Low Voltage Power Supply of the CPU
- Discharge test for the large current rechargeable battery
- IV characteristic test of the solar battery
- Impedance test for the various type of rechargeable batteries, power supplies
- Test for the relays, switches
- Absorbing the surge of brushless motor
- Test for the prearcing time-current characteristic

Electronic Load
PLZ-4WL series

■ Lineup

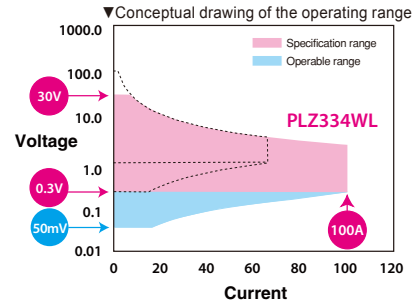
Model	Operation voltage	Current	Power
PLZ164WL	0.3 V to 30 V	50 A	165 W
PLZ334WL		100 A	330 W

■ Interface USB, GPIB, and RS232C are equipped as standard.

Feature/Function

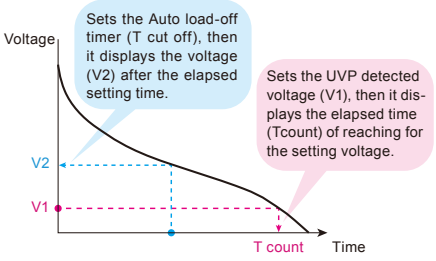
Realizing the low voltage operation

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.



Convenient feature for the discharge testing

The Auto load-off timer and the cut-off features can be applied to the discharge capacitance measurement of the rechargeable battery.



Accurate low-rate discharge by the Low-range (1/100)

Each operation mode of the CC, CR, and CP has 3 ranges (H, M, L). The "L "range employs the scale of 1/100 which covers the range from the small to the large scale of the current.

Current setting resolution of the PLZ334WL

H Range	5mA
M Range	0.5mA
L Range	0. 05mA

Sequence function

The sequence mode can be set in 2 operation modes (Normal and fast mode). The fast mode can be set for the minimum step time of 25 μs, and it can be synchronized with the external device by using the trigger input/output feature.

External analog control

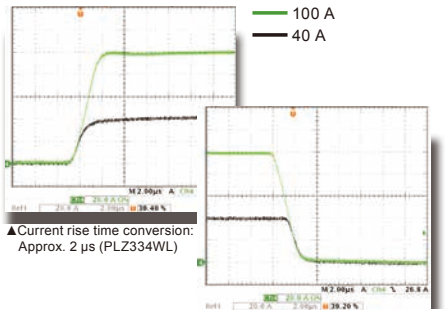
Not only the external control for the CC, CR, CP, and CV, but also it is capable to superimpose the current by the external input current on the present value of the CC setting. Moreover, it also can turn the LOAD ON/OFF.

Protection features

To ensure the safety, it equips the various protection features and activation of the alarm function. The alarm function can be output to the external source as an alarm output. The fuse is used to cut-off the output for the protection feature of the reverse connection.

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)

Other features

For the switching operation, set-up memories (100), CC soft-start, slew rate setting (CC), response setting (2 levels for each CV and CR), Current monitor output, remote sensing, and more.

*Master-Slave parallel operation can not be configured on this model.

Option

■Low inductance cable
[TL01-PLZ(50cm)]
[TL02-PLZ(1m)]
[TL03-PLZ(2m)]

■Rack mount accessories
[KRA150(millimeter size)]
[KRA3(inch size)]

■Analog remote control connector kit
[OP01-PLZ-4WL]

■Aplication Software

CALRIGHT INSTRUMENTS
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Specifications

Model			PLZ164WL	PLZ334WL
Ratings	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		50 A	100 A
	Power		165 W	330 W
	Minimum start voltage *1		50 mV (typ)	
Constant current (CC) mode	Operating range	H	0 A to 50 A	0 A to 100 A
		M	0 A to 5 A	0 A to 10 A
		L	0 A to 500 mA	0 A to 1 A
	Setting range	H	0 A to 52.5 A	0 A to 105 A
		M	0 A to 5.25 A	0 A to 10.5 A
		L	0 A to 525 mA	0 A to 1.05 A
	Resolution	H	2 mA	5 mA
		M	0.2 mA	0.5 mA
		L	0.02 mA	0.05 mA
	Accuracy of setting		±(0.2 % of set + 0.1 % of f.s.*2) + Vin/150 kΩ *3	
	Input voltage variation *4		±(0.1 % of set + 0.02 % of f.s.*2)	
	Ripple	rms *5	4 mA	8 mA
		p-p *6	40 mA	80 mA
Constant resistance (CR) mode	Operating range	H	165 S to 3 mS (6.06 mΩ to 333 Ω)	330 S to 6 mS (3.03 mΩ to 166.7 Ω)
		M	16.5 S to 300 µS (60.6 mΩ to 3.33 kΩ)	33.3 S to 600 µS (30.3 mΩ to 1.667 kΩ)
		L	1.65 S to 30 µS (606 mΩ to 33.3 kΩ)	3.3 S to 60 µS (303 mΩ to 16.67 kΩ)
	Setting range	H	173.25 S to 0 S (5.77 mΩ to OPEN)	346.5 S to 0 S (2.886 mΩ to OPEN)
		M	17.325 S to 0 S (57.7 mΩ to OPEN)	34.65 S to 0 S (28.86 mΩ to OPEN)
		L	1.7325 S to 0 S (577 mΩ to OPEN)	3.465 S to 0 S (288.6 mΩ to OPEN)
	Resolution	H	3 mS	6 mS
		M	300 µS	600 µS
		L	30 µS	60 µS
	Accuracy of setting *7		±(0.5 % of set *8 + 0.5 % of f.s.*2) + Vin/150kΩ	
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	16.5 W to 165 W	33 W to 330 W
		M	1.65 W to 16.5 W	3.3 W to 33 W
		L	0.165 W to 1.65 W	0.33 W to 3.3 W
	Setting range	H	0 W to 173.25 W	0 W to 346.5 W
		M	0 W to 17.325 W	0 W to 34.65 W
		L	0 W to 1.7325 W	0 W to 3.465 W
	Resolution	H	10 mW	20 mW
		M	1 mW	2 mW
		L	0.1 mW	0.2 mW
	Accuracy of setting		±(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 reading + 0.1 % of f.s)	
Ammeter	Display	H	0.000 A to 50.000 A	0.00 A to 100.00 A
		M	0.000 A to 5.000 A	0.000 A to 10.000 A
		L	0.00 mA to 500.00 mA	0.0000 A to 1.0000 A
	Accuracy		±(0.2 % of reading + 0.3 % of f.s)	
Wattmeter	Display	H,M	0.00 W to 165.00 W	0.00 W to 330.00 W
		L *15	0.000 W to 15.000 W	0.000 W to 30.000 W
		L *16	0.0000 W to 1.6500 W	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 % in 1 % steps *10	
	Accuracy of frequency setting		±(0.5 % of set)	
Slew rate	Selectable range (CC)	H	2.5 mA/µs to 25 A/µs	5 mA/µs to 50 A/µs
		M	250 µA/µs to 2.5 A/µs	500 µA/µs to 5 A/µs
		L	25 µA/µs to 250 mA/µs	50 µA/µs to 500 mA/µs
	Accuracy of setting *11		±(10 % of set + 0.8 µs)	
Soft start	Operation mode		CC mode	
	Selectable times *12		OFF, 100 µs, 200 µs, 500 µs, 1 ms, 2 ms, 5 ms, 10 ms, or 20 ms	
	Time accuracy		±(30 % of set +10 µs)	
Response	Response speed		NORMAL, FAST	
Remote 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			PLZ164WL	PLZ334WL
Sequence function	Normal sequence	Operation modes	CC, CR, CV, and CP	
		Maximum number of steps	256	
		Step execution time	1 ms to 999 h 59 min	
		Time resolution	1 ms for 1 ms to 1 min, 100 ms for 1 min to 1 h, 1 s for 1 h to 10 h 10 s for 10 h to 100 h, 1 min for 100 h to 999 h 59 min	
	Fast sequence	Operation modes	CC and CR	
		Maximum number of steps	1024	
		Step execution time	25 µs to 100 ms	
		Time resolution	25 µs for 25 µs to 100 µs, 100 µs for 100 µs to 100 ms	
Other functions	Elapsed time display		Measures the time from load on to load off. Can be turned on and off. 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. an be set to off or a time within the range of 1 s to 999 h 59 min 59 s	
Input /Output signal	J1 connector		26-pin MIL connector	
		Load on/off control input	Turn on the load with a high (or low) CMOS level signal	
		Load on status output	On when the load is on (open collector output from a photocoupler)	
		Range switch input	Switch ranges L, M, and H using a 2-bit signal	
		Range status output	Outputs range L, M, or H using a 2-bit signal (open collector output from a photocoupler)	
		Trigger input	Clear the sequence operation pause with a high CMOS level signal whose duration is 10 µs or longer	
		Alarm input	Activate the alarm with a low CMOS level signal	
		Alarm release input	Release the alarm with a low CMOS level signal	
		Alarm status output	On when OVP, OCP, OPP, OHP, UVP, or REV is activated or when an external alarm input is applied (open collector output from a photocoupler)	
		Short signal output	Relay contact output (30 Vdc/1 A)	
		External voltage control (CC, CR, and CP mode)	Voltages in the range of 0 V to 10 V correspond to 0 % to 100 % of the rated current (CC mode) or rated power (CP mode). Voltages in the range of 0 V to 10 V correspond to the range of resistance values from the maximum resistance value to the minimum resistance value (CR mode).	
		External voltage control (CV mode)	Voltages in the range of 0 V to 10 V correspond to the range of voltages from 0 % of the rated voltage to 100 % of the rated voltage.	
		External voltage control (superimposing in CC mode)	Superimpose the current on the CC mode panel/remote setting by applying an external voltage of -10 V to 10 V (CC mode). 0 V corresponds to 0 % of the current setting and 10 V corresponds to 100 % of the current setting.	
		Current monitor output	10 V for f.s (H or L range), 1 V for f.s (M range)	
	Front panel BNC connector			
		TRIG OUT	Trigger output: Approx. 4.5 V, pulse width: Approx. 2 µs, output impedance: Approx. 500 Ω Outputs a (low level) pulse during sequence operation and switching operation.	
		IMON OUT	Current monitor output. 1 V for f.s (H or L range), 0.1 V for f.s (M range)	
Communication function	GPIB, RS232C, and USB interfaces are equipped as standard.			
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		95 VA max	
	Inrush current *13		65 Amax	
	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)	
	Isolation voltage		±500 V	
	Insulation resistance	Primary - input terminal	500 Vdc, 30 MΩ or more (ambient humidity of 70 %rh or less)	
		Primary - chassis	500 Vdc, 30 MΩ or more (ambient humidity of 70 %rh or less)	
		Input terminal- chassis	500 Vdc, 30 MΩ 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		Power cord(1 pc.(with plug, length: 2.4 m)), Load input terminal cover(1 pc.), Set of screws for the load input terminal cover(2 sets), Set of screws for the load input terminal(2 sets), Chassis connection wire(1 pc.), CD-R(1 pc.), Setup Guide(1 pc.(Japanese, English), Quick Reference(English:1pc., Japanese:1pc.)	
	Safety *14		Complies with the requirements of the following standard. IEC 61010-1:2001 (Class I, Pollution degree 2)	Complies with the requirements of the following directive and standards. Low Voltage Directive 2014/35/EU, EN 61010-1 (Class I, Pollution degree 2)
	Weight		Approx. 6.5 kg (14.3 lb.)	Approx. 8 kg (17.6 lb.)
	Dimensions (Max.)		214.5(8.45")W×124(155)(4.88")H×400(455)(15.75")Dmm	

▲ Rear panel
(Not available for the load input terminal on the rear panel)

*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 30 V 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

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