# 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

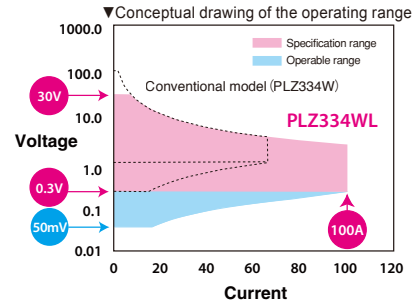
| Model | Operation voltage | Current | Power |
|---|---|---|---|
| PLZ164WL | 0.3 V to 30 V | 50 A | 165 W |
| PLZ334WL | | 100 A | 330 W |

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

## Feature/Function

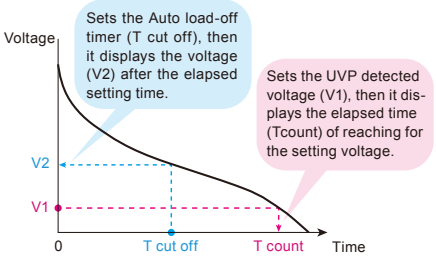
### Realizing the low voltage operation

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.




### Operation mode

Applied to the 6 operating modes (Constant current, Constant resistance, Constant voltage, Constant power, Constant current + Constant voltage, Constant resistance + Constant voltage)

### 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

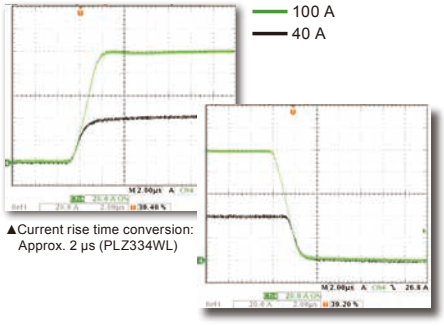
Not only the external control for the CC, CR, CP, and CV, but also it is capable to superimpose the current by the external input current on the present value of the CC setting. Moreover, it also can turn the LOAD ON/OFF.

### 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)]

▲TL03-PLZ

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

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

■Aplication Software
[Wavy for PLZ-4W]
The current waveform can be easily simulated by the PC. The measuring feature enables data logging.

# 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


**KIKUSUI AMERICA, INC.** 1-310-214-0000 | www.kikusuiamerica.com

3625 Del Amo Blvd, Suite 160, Torrance, CA 90503
Phone : 310-214-0000 Facsimile : 310-214-0014

**KIKUSUI TRADING (SHANGHAI) Co., Ltd.** | www.kikusui.cn

Room 305,Shenggao Building , No.137,Xianxia Road, Shanghai City, China
Phone : 021-5887-9067 Facsimile : 021-5887-9069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Printed in Japan

Issue: Oct.2019 201910PDFEC51a