
# Multi-functional Electronic Load
# PLZ-4WH Series

Maximum operating voltage: 650V
165W, 330W, 1000W: 3 types
With connecting boosters (1000W type exclusive), maximum of 9kW/450A
Operating mode for constant current, constant resistance, constant voltage, constant power, constant current + constant voltage, and constant resistance + constant voltage
Sequence function (up to 1024 steps)
Voltage monitor terminal for monitoring high voltage
Equipped as standard with USB 2.0, GPIB, and RS-232C

KIKUSUI

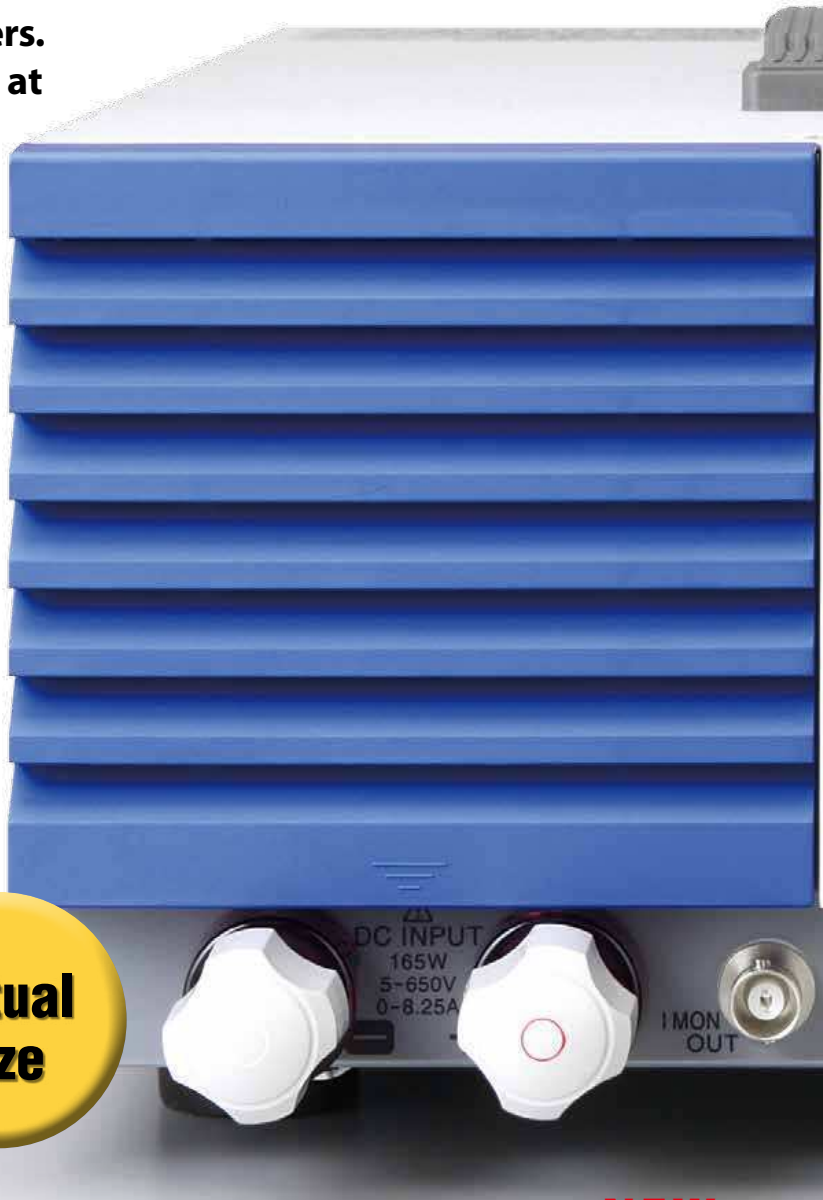
# High-Voltage Electronic Load 650V

## All new design with upgraded performance !

### 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 650V. Furthermore, when a booster unit (PLZ2004WHB) is connected, up to 9kW/450A can be realized with less space and at a low cost. The interface, USB, GPIB, and RS-232C functions comes as standard and supports automated testing applications.

| | |
|---|---|
| **Applications** | **EV and HEV high-voltage converter evaluation testing PV power generation, fuel cell, secondary batteries, and other evaluation testing High-voltage device evaluation testing** |




Actual size

DC ELECTRONIC LOAD **NEW**

## Multi-functional Electronic Load

# PLZ-4WH Series

4 model

■ Product line-up

| Model | Operating voltage | Current | Power |
|---|---|---|---|
| PLZ164WH | 5V ～ 650V | 8.25A | 165W |
| PLZ334WH | | 16.5A | 330W |
| PLZ1004WH | | 50A | 1000W |
| PLZ2004WHB | | 100A | 2000W |

[Other features]

● Parallel operation function ● Communication function ● Voltage monitor output ● Current monitor output ● Adjustable slew rate ● Switching operation ● Soft start ● Elapsed time display ● Auto load-off timer ● Remote sensing ● External load on/off control input ● External range switching input ● External trigger input ● External alarm input ● Alarm status output ● Load-on status output ● Range status output ● Short signal ● External voltage control (CC, CR, CV, and CP modes) ● External resistance control (CC, CR, CV, and CP modes) ● Overvoltage protection (OVP) ● Overcurrent protection (OCP) ● Overpower protection (OPP) ● Overheat protection (OHP) ● Undervoltage protection (UVP) ● Reverse connection protection (REV)

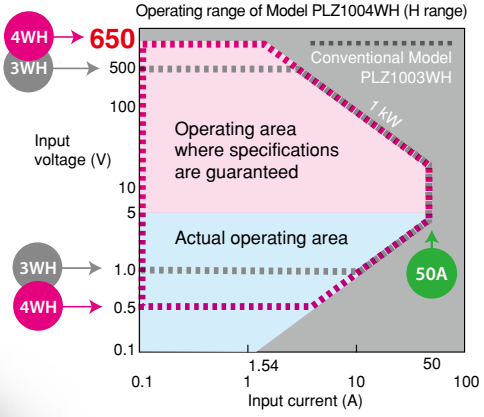

# Reliable testing supported by ease of use

The front panel is the common design in all of PLZ-4W Series. Since operability is uniform, tests can be set up quickly and easily.

# Operating range up to 650 V

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

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




# Easy measurement of voltage and current


In addition to an insulated-type current monitor terminal, an insulated-type voltage monitor terminal has been attached to the front panel. This makes it possible to measure voltage and current simply and with confidence.

| | |
|---|---|
| When set in 650V range | 100:1 |
| When set in 65V range | 10:1 |

# Full-featured interface communication function


The unit comes equipped as standard with USB, GPIB, and RS-232C functions, so it can easily be incorporated into a variety of inspection systems.

# Achieving up to 9kW/450A with less space and low cost

By connecting the maximum of four PLZ2004WHB boosters (sold separately) to the PLZ1004WH, it is possible to use the product as an Electronic Load unit for up to 9kW/450A. 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.

### ■ boosters PLZ2004WHB

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

● Example combination
3 kW system consisting of PLZ1004WH (top) and PLZ2004WHB booster (bottom)

### ● In comparison of the conventional model for the maximum 9kW system


Conventional Model
PLZ-3WH Series
PLZ1003WH×9

NEW
PLZ-4WH Series
PLZ1004WH + PLZ2004WHB×4

● Parallel operating units and capacity (maximum current and power)

| Slave Unit | 1 Unit | 2 Units | 3 Units | 4 Units |
|---|---|---|---|---|
| PLZ2004WHB | 150A<br>3000W | 250A<br>5000W | 350A<br>7000W | 450A<br>9000W |

# Capable of parallel operation with up to five units of the same model

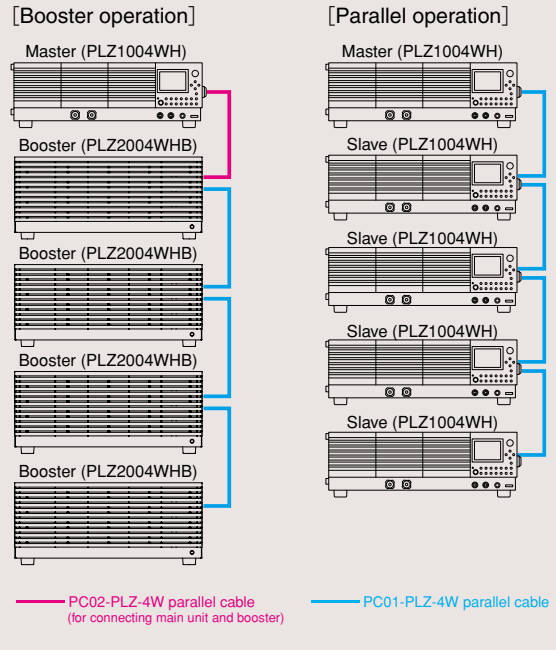
Parallel operation without the use of boosters is also possible up to five units of the same model, including the master unit, can be connected in parallel (5kW/250A maximum). In this case, the system operates under the master-slave configuration, and the master unit controls and displays the entire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

● Parallel operating units and capacity (maximum current and power)

| Slave Unit | 1 Unit | 2 Units | 3 Units | 4 Units |
|---|---|---|---|---|
| PLZ164WH | 16.5A<br>330W | 24.75A<br>495W | 33A<br>660W | 41.25A<br>825W |
| PLZ334WH | 33A<br>660W | 49.5A<br>990W | 66A<br>1320W | 82.5A<br>1650W |
| PLZ1004WH | 100A<br>2000W | 150A<br>3000W | 200A<br>4000W | 250A<br>5000W |

*The constant current mode setting accuracy and current measurement accuracy can be set to the same accuracy as that of the main unit by calibrating in parallel operation.

● Basic connection diagram




★ *Large capacity systems (9kW and above), rack systems and so on is also able to be supported. For details, please contact us.*

# 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 | 300µA | 1mA | 2mA |
| M | 30µA | 100µA | 200µA |
| L | 3µA | 10µA | 20µA |

# Ability to switch between a wide range of response speeds

The PLZ-4WH detects input current and voltage, and it operates by negative feedback control of those values. It secures and maintains stable operation by enabling the user to select the optimum speed of response by setting the negative feedback control response as shown below to counter operational instability that occurs in connection with the response characteristics of the test object, length of the load wiring, or size of the loop, for instance.

**CC, CR modes (4 stages)**

1/1: Normal response speed
1/2: Half the normal speed
1/5: One-fifth the normal speed
1/10: One-tenth the normal speed

**CV mode (5 stages)**

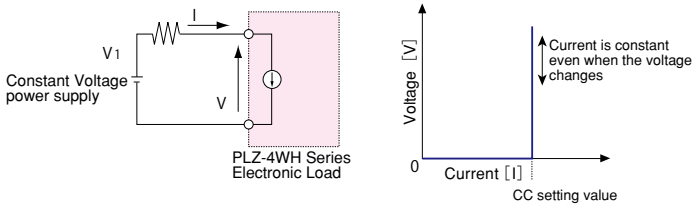
100: 100 times the normal speed
10: 10 times the normal speed
1/1: Normal response speed
1/10: One-tenth the normal speed
1/100: One-hundredth the normal speed

# Support for six operation modes

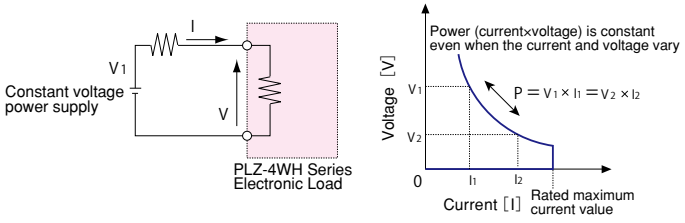
The PLZ-4WH is equipped with six operation modes: constant current, constant resistance, constant voltage, constant power, constant current + constant voltage, and constant resistance + constant voltage modes.

## Equivalent circuits and operation in each mode

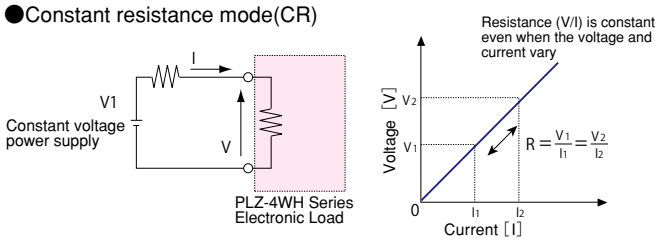
●Constant current mode(CC)



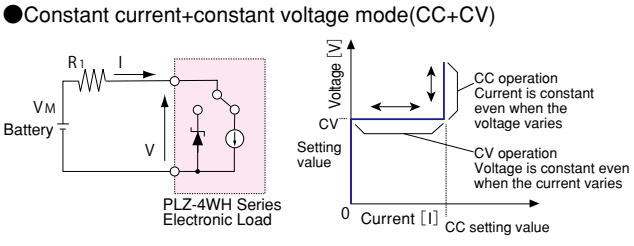

●Constant power mode(CP)



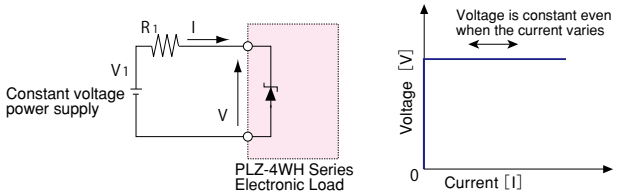

●Constant resistance mode(CR)



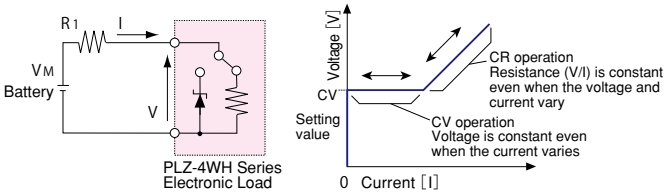

●Constant current+constant voltage mode(CC+CV)




●Constant voltage mode(CV)




●Constant resistance+constant voltage mode(CR+CV)



# Load-on/off operations

## ▶ Adopting the Load-on/off functions that flexibly apply to the system

With load-on/off operations, the following items can be selected in addition to standard operations:

- Start-up with load-on status when the power is turned on
- Display the elapsed time of the load-on period
- Load-off after a certain time has elapsed
- Load-on/off by the relay or other external signal

# Remote sensing function

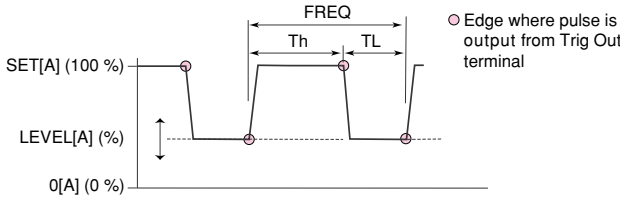
## ▶ Compensating the voltage drop of the wiring

Connecting a sensing terminal to the DUT makes it possible to set the combined resistance, including even the resistance of the wiring, from the panel in constant resistance mode. Also, points that connect the sensing function can be set to a certain power and certain voltage in constant power mode and constant voltage mode. Furthermore, since transient characteristics are improved in these constant voltage, constant power, and constant resistance modes, it also leads to operational stability. (Voltage that can be compensated: 2V one way)

# Switching function

## ▶ Transient response test conditions are also freely changeable on the spot

In constant current mode and constant resistance mode, switching operations of up to 4kHz are possible with the built-in oscillator. Also, the level, frequency, duty cycle (ratio), and other configuration parameters can be changed even during a load-on period.



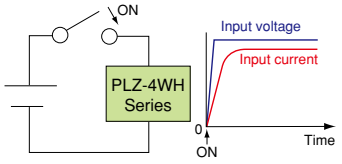

【Configuration parameters】

- Operation modes: CC and CR
- Duty cycle settings: 5% to 95%, in 0.1% steps
- Frequency setting range: 1Hz to 4kHz
- Frequency setting resolution:
  0.1Hz at 1Hz to 10Hz
  1Hz at 10Hz to 100Hz
  10Hz at 100Hz to 1kHz
  100Hz at 1kHz to 4kHz
- Frequency setting accuracy: ±0.5% of set
  *The minimum duration for a duty cycle is 50µs.

# Soft start function

## ▶ Assures even with steep voltage application

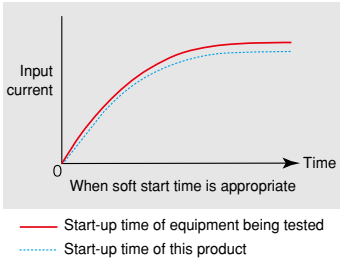
In constant current mode, the product can prevent the generation of overcurrent* even when voltage is steeply applied from the DUT in "Load On condition and with the current having been set." For example, in a battery discharge test, it can suppress the generation of overcurrent when for some reason voltage is suddenly applied to an Electronic Load used for discharge.




*There is electrostatic capacitance between the Electronic Load input terminals. Charging and discharging current flows to this capacitance.

## ▶ Ability to start up the power in CC mode

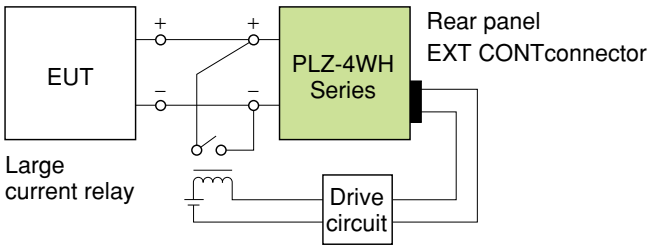
In many cases during constant voltage power supply tests, testing is conducted in constant resistance mode for start-up time measurements (during start-up), and in constant current mode during load change tests. If, however, the soft start time is set to a time corresponding to the start-up time of the constant voltage power supply, it is possible to perform start-up time measurements and load change tests in constant current mode, without changing the operation mode. (Either 1, 2, 5, 10, 20, 50, 100, or 200ms can be selected as the soft start time.)




# Short function

## ▶ Improved efficiency for the current limit evaluation with a single action

In tests such as the DC power supply "fold-back type drooping characteristics test of current limiting characteristics," the maximum current (in constant current mode) or the minimum resistance (in constant resistance mode) can be set with a single action and thus increase work efficiency. At the same time, since contact signals are output to an EXT CONT connector, it is possible to achieve even lower impedance shorting by driving exterior relays and shorting the output of the tested device.



# Sequence function

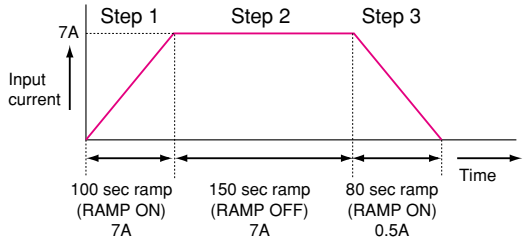
## ▶ Actual load simulation by programming current waveforms internally

Arbitrarily set sequence patterns can be saved in the built-in memory and executed. Ten normal sequence programs and one fast sequence program can be saved. Although sequence editing and execution can be performed from the panel, those tasks can also be performed easily by using the application software separately sold "Wavy"* sequence creation software.

*A personal computer will require one of the following interfaces: USB, RS232C, or GPIB.

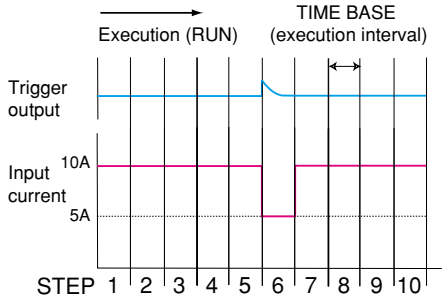
■ Normal sequence

The execution time and Load ON/OFF can be set for each step. The level can be changed not only in a stepped form but also in a ramped form. It is also possible to cancel pausing both by using the PAUSE function and by external trigger input, and to synchronize with trigger output and other external equipment.




■ Fast sequence

Each step is executed at high speed. Since the time resolution is high, fast simulation is possible. The execution time, level, and trigger output can be set.




● Sequence configuration parameters

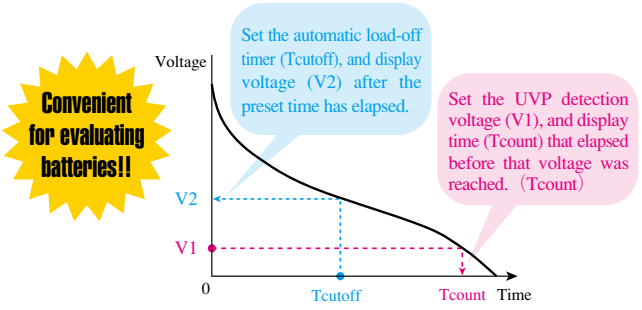
| | Normal Sequence | Fast Sequence |
|---|---|---|
| Operation mode | CC、CR、CV、CP | CC、CR |
| Maximum steps | 256 | 1024 |
| Step execution time | 1ms～999h59min | 100μs～100ms |
| Time resolution (setting range) | 1ms（1ms～1min）<br>100ms（1min～1h）<br>1s（1h～10h）<br>10s（10h～100h）<br>1min（100h～999h59min） | 100μs |

# Elapsed time display and automatic load-off timer

## ▶ Convenient battery discharge function

By combining four functions, namely, the elapsed time display, undervoltage protection (UVP), load-off voltage display, and automatic load-off timer, it is possible to perform two tests that are convenient for battery discharge testing, namely, the "measurement of time from discharge start to the final voltage" and "measurement from discharge start to the closed circuit voltage after a certain time has elapsed."


▲ Example of load-off voltage display




# ABC preset memory

## ▶ Instantaneous retrieval of settings

Settings can be saved in three memories (A, B, and C) that are available for each range of each mode. Saved settings can be freely retrieved and saved even during load-on periods. In constant current + constant voltage mode and constant resistance + constant voltage mode, the memories for the constant current and constant voltage, and for the constant resistance and constant voltage, can be retrieved and saved.

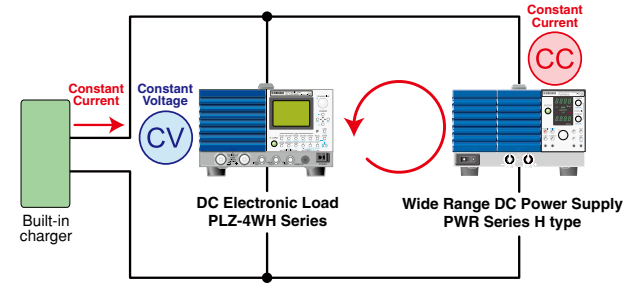
# Protective functions and other features

Overcurrent protection (OCP), overpower protection (OPP), overvoltage protection (OVP), undervoltage protection (UVP), overheat protection (OHP), reverse connection protection (REV), external alarm input detection, configuration setting, and setup memories (100)

# Evaluation Test on EV/HEV internal chargers and DC/DC converters

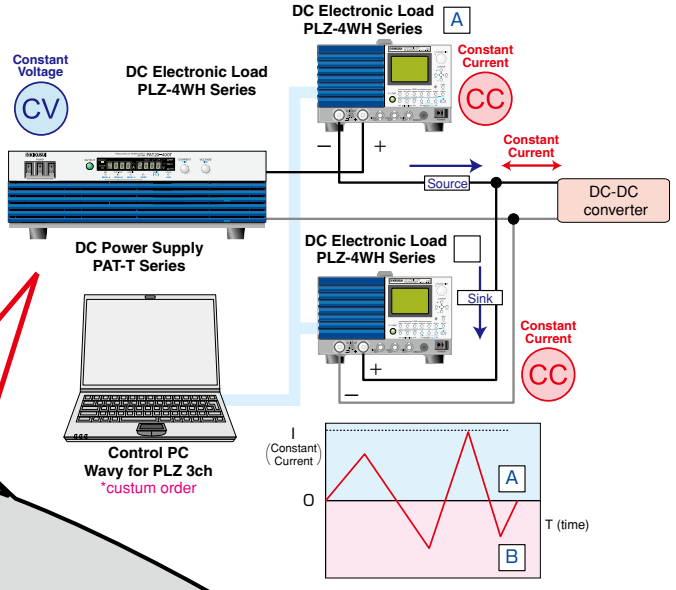
## ● Built-in charger characteristics test and battery simulation

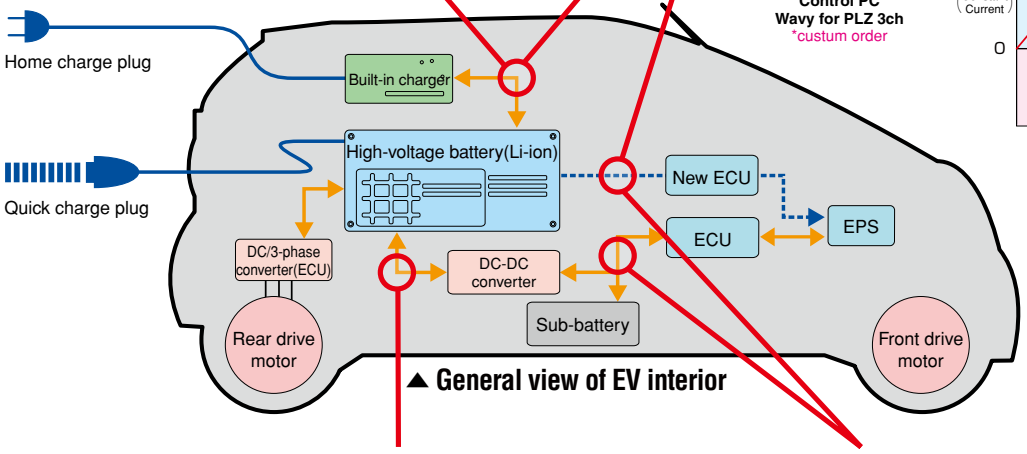
By connecting a DC Electronic Load unit and high-voltage DC power supply in parallel, the PLZ-4WH is used as a simulated battery for an EV in-vehicle charger. Start-up tests and load change tests are performed in Electronic Load CV mode.




## ● Use as a high-speed constant-current power supply

The unit can be used as a high-speed constant-current power source by controlling high-speed positive current at A and negative current at B. A simulation of the regenerative current of brushless motor with regards to the interactive converter is performed.

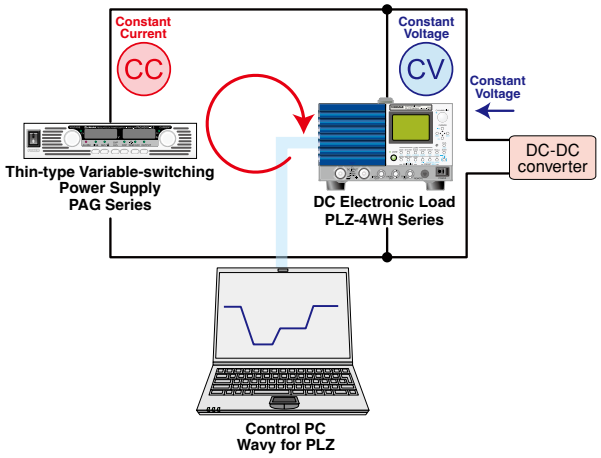



▲ General view of EV interior

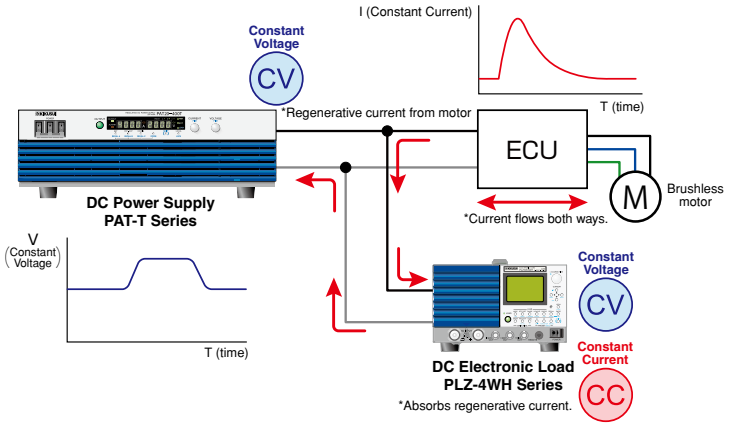
## ● For power supply variation tests

By connecting a DC Electronic Load unit and high-voltage DC power supply in parallel, the PLZ-4WH is used as a simulated battery to simulate medium speed power supply variations.Variation waveforms can be created and executed with Wavy sequence creation software.




## ● For motor surge absorption measurement

During a brushless motor performance evaluation, the regenerative current from the brushless motor is absorbed, protecting the power supply and ECU.

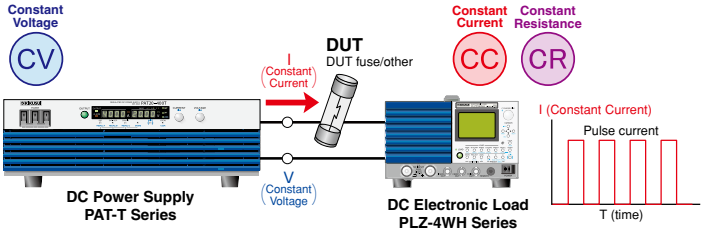



★ *Select a PLZ-4W, 4WL, or 4WA Series unit according to the purpose of use. See the series lineup at the end of this catalogue.*

# For evaluation test on parts

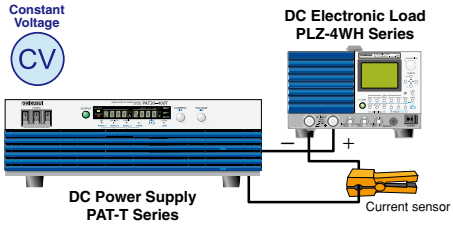
### ●For life performance acceleration tests

The PLZ-4WH can be used not only for temperature rise tests, long-term durability tests, pulse interrupt characteristics tests, and other high-accuracy constant current tests but also for pulse current evaluations.




### ●As high-accuracy constant current power supply

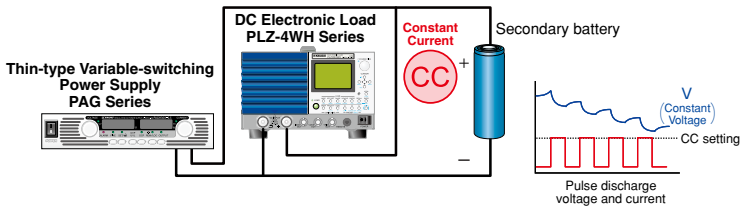
By connecting a constant voltage power supply and a DC Electronic Load unit in series, the product achieves constant current at the DC Electronic Load unit's constant current accuracy.




# For evaluation test on secondary batteries

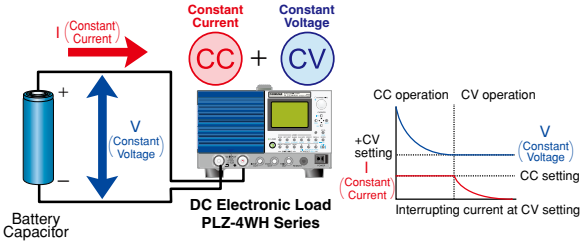
### ●For battery charge-discharge tests

The PLZ-4WH can be used to evaluate impedance and residual capacity by discharging electricity not only at a normal constant current but also at a pulse current corresponding to the actual load. Waveform patterns can be created with Wavy for PLZ, too.




### ●Battery capacitor

During a secondary cell performance evaluation, it is necessary to perform a capacity test based on the battery's rating. Using the Electronic Load unit's +CV function, a capacity evaluation is performed by discharging the CV when the prescribed voltage is reached.




## OPTION

"Wavy" sequence creation and control software

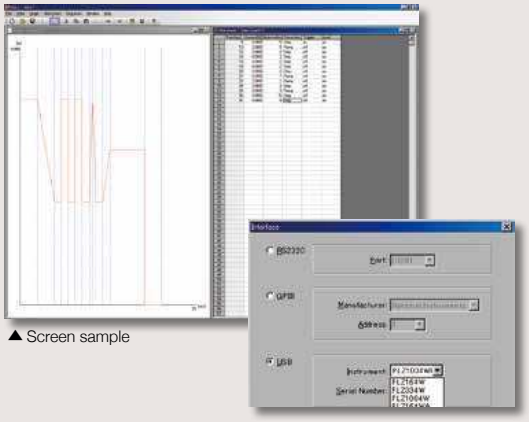
# Wavy series

**Download !**

**A Wavy trial version is available!**

You can try it out for three weeks without functional limitations.
http://www.kikusui.co.jp/download/index_j.html

*This is software that further enhances the waveform generation and sequence functions of the PLZ-4WH Series.*
*Using a mouse, it is possible to create and edit with the sensation of using a spreadsheet and drawing.*



▲ Screen sample

## ■ Sequence creation software Wavy for PLZ-4W

Operating environment : Windows 2000 ／ Windows XP ／ Windows Vista ／ Windows 7
*See our home page for details.

- Creating and editing data of test conditions required so that the sequence operation can be done easily.
- Using the save function for data files of test conditions makes routine test condition control easy.
- The progress of executed sequences is displayed by the cursor and settings on an "execution graph."
- It is possible to observe actual output intuitively, using a "monitor graph" that plots monitored values while an execution is in progress.
- Acquired monitor data can be saved as test results.
- A "waveform image" window was newly added, making it easy to see the waveforms of alternating current (AC) signals.
- Arbitrary new waveforms can be easily created and edited. Also, arbitrary waveforms that are created can be quickly written and output.
- The product supports the selection and nonselection of sequence step items. Functions such as the pause function, trigger function, and AC waveform can be selected as needed.

## ■ PLZ164WH / PLZ334WH / PLZ1004WH specifications

| Ratings | | | |
|---|---|---|---|
| Model | PLZ164WH | PLZ334WH | PLZ1004WH |
| Operating voltage | 5V to 650V | | |
| Current | 8.25A | 16.5A | 50A |
| Power | 165W | 330W | 1000W |
| Minimum operating voltage*1 | 0.5V | | |
| 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].

| Constant Current (CC) mode | | | | | |
|---|---|---|---|---|---|
| Model | | | PLZ164WH | PLZ334WH | PLZ1004WH |
| Operating range | H range | | 0 to 8.25A | 0 to 16.5A | 0 to 50A |
| | M range | | 0 to 825mA | 0 to 1.65A | 0 to 5A |
| | L range | | 0 to 82.5mA | 0 to 165mA | 0 to 500mA |
| Setting range | H range | | 0 to 8.6625A | 0 to 17.325A | 0 to 52.5A |
| | M range | | 0 to 866.25mA | 0 to 1.7325A | 0 to 5.25A |
| | L range | | 0 to 86.625mA | 0 to 173.25mA | 0 to 525mA |
| Resolution | H range | | 300μA | 1mA | 2mA |
| | M range | | 30μA | 100μA | 200μA |
| | L range | | 3μA | 10μA | 20μA |
| Setting accuracy | H, M range | | ±(0.2 % of set + 0.1 % of f.s*1) | | |
| | L range | At least 300μA | ±(0.2 % of set + 0.1 % of f.s) | | |
| | | Less than 300μA | ±(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 | | 20mA | | |
| | L range | | 2mA | | |
| Ripple | rms*4 | | 2mA | 4mA | 12mA |
| | p-p*5 | | 20mA | 40mA | 120mA |
| | 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 5V to 650V at a current equal to the rated power/650V
*4 Measurement frequency bandwidth: 10Hz to 1MHz
*5 Measurement frequency bandwidth: 10Hz to 20MHz

| Constant Resistance (CR) mode | | | | |
|---|---|---|---|---|
| Model | | PLZ164WH | PLZ334WH | PLZ1004WH |
| Operating range*1 | H range | 1.655 to 30μS | 3.3S to 60μS | 10S to 200μS |
| | | (606.06mΩ to 33.333kΩ) | (303.03mΩ to 16.666kΩ) | (100mΩ to 5kΩ) |
| | M range | 165mS to 3μS | 330mS to 6μS | 1S to 20μS |
| | | (6.06Ω to 333.333kΩ) | (3.03Ω to 166.666kΩ) | (1Ω to 49.999kΩ) |
| | L range | 16.5mS to 0.3μS | 33mS to 0.6μS | 100mS to 2μS |
| | | (60.606Ω to 3.333MΩ) | (30.303Ω to 1.666MΩ) | (10Ω to 500kΩ) |
| Setting range | H range | 1.7325S to 0 S | 3.465S to 0 S | 10.5S to 0 S |
| | | (577.2mΩ to OPEN) | (288.6mS to OPEN) | (95.23mΩ to OPEN) |
| | M range | 173.25mS to 0 S | 346.5mS to 0 S | 1.05S to 0 S |
| | | (5.772Ω to OPEN) | (2.886Ω to OPEN) | (952.3mΩ to OPEN) |
| | L range | 17.325mS to 0 S | 34.65mS to 0 S | 105mS to 0 S |
| | | (57.72Ω to OPEN) | (28.86Ω to OPEN) | (9.523Ω to OPEN) |
| Resolution | H range | 30μS | 60μS | 200μS |
| | M range | 3μS | 6μS | 20μS |
| | L range | 0.3μS | 0.6μS | 2μS |
| 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

| Constant Voltage (CV) mode | | | | |
|---|---|---|---|---|
| Model | | PLZ164WH | PLZ334WH | PLZ1004WH |
| Operating range | H range | 5V to 650V | | |
| | L range | 5V to 65V | | |
| Setting range | H range | 0V to 682.5V | | |
| | L range | 0V to 68.25V | | |
| Resolution | H range | 20mV | | |
| | L range | 2mV | | |
| 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 | | 65mV | | |

*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 5V (during remote sensing).

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

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

| Voltmeter | | | | |
|---|---|---|---|---|
| Model | | PLZ164WH | PLZ334WH | PLZ1004WH |
| Display | H range | 0.00V to 650..00V | | |
| | L range | 0.000V to 65.000V | | |
| Accuracy | Parallel operation (TYP) | ±(0.1 % of rdng + 0.1 % of f.s) | | |

| Ammeter | | | | |
|---|---|---|---|---|
| Model | | PLZ164WH | PLZ334WH | PLZ1004WH |
| Display | H, M range | 0.0000A to 8.2500A | 0.000A to 16.500A | 0.00A to 50.000A |
| | L range | 0.000mA to 82.500mA | 0.00mA to 165.00mA | 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

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

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

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

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

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

*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.

| Soft start | | | | |
|---|---|---|---|---|
| Model | | PLZ164WH | PLZ334WH | PLZ1004WH |
| Operating mode | | CC mode | | |
| Time setting range*1 | | 1,2,5,10,20,50,100,200ms | | *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 | 2V | | |
| **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, 5V to 650V | | |
| 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 | 1ms - 999h59min | | |
| | Time resolution (setting range) | 1ms(1ms to 1min)、100ms(1min to 1h)、1s(1h to 10h)、10s(10h to 100h)、1min(100h to 999h59min) | | |
| Fast sequence | Operating mode | CC,CR | | |
| | Maximum steps | 1024 | | |
| | Step execution time | 100 μs to 100ms | | |
| | 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 5V at 10kΩ (CMOS level signal) | | |
| External range switching input*1 | | 2 bit, pull-up to 5V at 10kΩ (CMOS level signal) | | |
| Trigger input | | Clear the sequence operation pause when at least 10 μs are input for H (CMOS level signal for 5V system), pull-down to common by 100kΩ resister | | |
| External alarm input | | Alarm operation with L, pull-up to 5V at 10kΩ (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 (30Vdc/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).<br>Maximum to minimum resistance at 0 to 10V (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 10kΩ (CC, CV, CP).<br>Maximum to minimum resistance or minimum to maximum resistance at 0 to 10kΩ (CR). | | |
| External CV voltage control input | | 0 to 10% of rated voltage at 0 to 10V | | |
| Current monitor output | | 10V f.s. (H/L range), 1V f.s. (M range), output impedance of 1kΩ | | |
| Voltage monitor output | | 10V for each range f.s., output impedance of 1kΩ | | |
| **Front BNC terminal** | | | | |
| Trigger output | | Output of pulse during sequence operation, switching operation, or GPIB GET command input | | |
| Current monitor output | | 10V for full scale (H/L range), 1V for full scale (M range) | | |
| Voltage monitor output | | 6.5V 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;<br>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 30V and maximum current is 8mA.
*3 External CV voltage control input cannot be used in CP or CV mode.

| General specifications | | | | |
|---|---|---|---|---|
| Model | | PLZ164WH | PLZ334WH | PLZ1004WH |
| Input voltage range / input frequency range | | 100 to 240Vac (90 to 250Vac) single phase, continuous: 47-63Hz | | |
| Power consumption | | 80VAmax | 90VAmax | 160VAmax |
| Inrush current*1 | | 140Amax | | |
| Protective conductor current (when at 100V, 50Hz: typical value) | | 600 μA | | |
| Operating temperature range/humidity range | | 0° to 40°C, 20% to 85% rh (no condensation) | | |
| Storage temperature range/humidity range | | -20° to 70°C, 90% rh or less (no condensation) | | |
| Ground voltage | | ±750Vdc | | |
| Insulation resistance | Primary to input terminal | 1000Vdc, 30MΩ or more (ambient temperature with 70% rh or less) | | |
| | Primary to chassis | 1000Vdc, 30MΩ or more (ambient temperature with 70% rh or less) | | |
| | Input terminal to chassis | 1000Vdc, 30MΩ or more (ambient temperature with 70% rh or less) | | |
| Withstand voltage | Primary to input terminal | 1500V Vac no abnormality for one minute | | |
| | Primary to chassis | 1500V Vac no abnormality for one minute | | |
| | Input terminal to chassis | 1000V Vdc no abnormality for one minute | | |
| Dimensions (mm) | | See the outline drawing. | | |
| Weight | | Approx. 7 kg (15.4 lb.) | Approx. 8kg (17.6 lb.) | Approx. 16kg (35.3 lb.) |
| Battery backup | | Backs up configuration (setting) information | | |
| Accessories | | Power cord (2.4m length with SVT3 18AWG 3P plug) : 1pc., Load input terminal cover : 1pc., Lock plates for load input terminal cover : 2pc.,<br>Screw sets for load input terminal : 2pc., CD-R*2 : 1pc., Setup guide (Japanese/English) : 1pc., Quick reference in Japanese : 1pc., Quick reference in English : 1pc. | | |
| Electromagnetic ompatibility*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 70A with 100Vac 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.

## PLZ2004WHB specifications

| Ratings | |
|---|---|
| Model | PLZ2004WHB |
| Operating voltage | 5V to 650V |
| Current | 100A |
| Power | 2000W |
| Minimum operating voltage*1 | 0.5V |
| Input resistance when load-off | 2.21 [MΩ] *2 |

*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.

| Constant Current (CC) mode | | |
|---|---|---|
| Operating range | H range | 0 to 100A |
| | M range | 0 to 10A |
| | L range | 0 to 1A |
| Setting range | H range | 0 to 105A |
| | M range | 0 to 10.5A |
| | L range | 0 to 1.05A |
| Resolution*1 | H range | 10mA |
| | M range | 1mA |
| | L range | 0.1mA |
| 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) |

*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

| 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℃±5℃ (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 |

*1 M range: full scale of H range

| 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 |

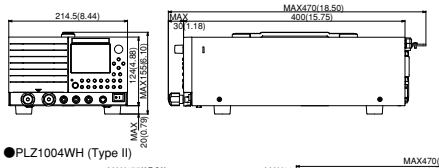
*1 Other protective functions detect and operate with the PLZ1004WH.

| General specifications | | |
|---|---|---|
| Model | | PLZ2004WHB |
| Input voltage range | | 100Vac to 240Vac (90Vac to 250Vac) single phase, continuous |
| Input frequency range | | 47Hz to 63Hz |
| Power consumption | | 200VAmax |
| Inrush current*1 | | 120Amax |
| Protective conductor current | | 600 μA (typical: 100V, 50Hz) |
| Operating temperature range | | 0℃ to 40℃ |
| Operating humidity range | | 20% to 85% rh (no condensation) |
| Storage temperature range | | -20℃ to 70℃ |
| Storage humidity range | | 90% rh or less (no condensation) |
| Ground voltage | | ±750Vdc |
| 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 | 1500V Vac, no abnormality for one minute |
| | Primary to chassis | 1500V Vac, no abnormality for one minute |
| | Input terminal to chassis | 1000V Vdc, no abnormality for one minute |
| Dimensions (mm) / weight | | See the outline drawing. ／Approx. 24kg (52.91 lb.) |
| Accessories | | One power cord (2.4m 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:<br>Immunity IEC61326-1:2006 Class A<br>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 |

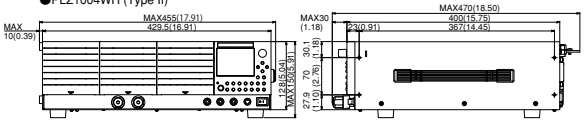
*1 Approximately 60A with 100Vac input
*2 Applies only to models that display CE marking on panel. Does not apply to specially ordered or modified items.
*3 This product is a Class 1 instrument. Be sure to ground this product's protective conductor terminal. If it is not properly grounded, safety cannot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

## Dimensions unit:mm(inches)

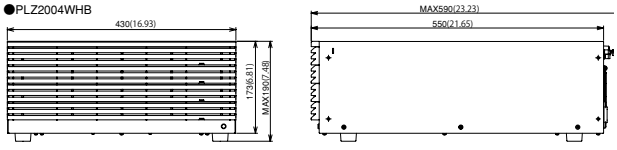
●PLZ164WH, PLZ334WH (Type I)



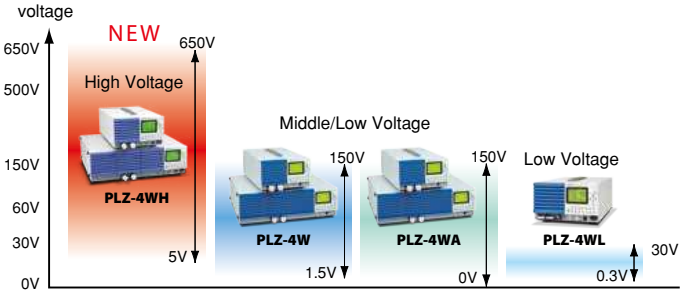

●PLZ1004WH (Type II)




●PLZ2004WHB




## Series Selection





KIKUSUI ELECTRONICS CORPORATION
1-1-3, Higashiyamata, Tsuzuki-ku, Yokohama, 224-0023, Japan
Phone: (+81) 45-593-7570, Facsimile: (+81) 45-593-7571, www.kikusui.co.jp

KIKUSUI AMERICA, INC. 1-877-876-2807 www.kikusuiamerica.com
2975 Bowers Avenue, Suite 307, Santa Clara, CA 95051
Phone : 408-980-9433 Facsimile : 408-980-9409

KIKUSUI TRADING (SHANGHAI) Co., Ltd. www.kikusui.cn
Room 216,Building 4, No.641,Tianshan Road, Shanghai City, China
Phone : 021-5887-9067 Facsimile : 021-5887-9069

For our local sales distributors and representatives, please refer to "sales network" of our website.


●Distributor/Representative




Issue:Jun.2011 2011062KSOHEC21a

Large-Capacity DC Electronic Load System
PLZ-4W, 4WH SR/LP Series

KIKUSUI

# *Sink High Power. Here is a Turnkey Solution.*

## Large - Capacity DC Electronic Load System

### PLZ-4W, 4WH SR/LP SERIES

* Definition of Series Name: SR (Smart Rack), LP (Load Pack)

**Large Current**
Maximum **2600 A**
5 kW to 13 kW

PLZ-4W SR/LP SERIES

| | |
|---|---|
| PLZ5004W SR | PLZ9004W LP |
| PLZ7004W SR | PLZ11004W LP |
| PLZ9004W SR | PLZ13004W LP |

**High Voltage**
Maximum **650 V**
5 kW to 13 kW

PLZ-4WH SR/LP SERIES

| | |
|---|---|
| PLZ5004WH SR | PLZ9004WH LP |
| PLZ7004WH SR | PLZ11004WH LP |
| PLZ9004WH SR | PLZ13004WH LP |

# Large-Capacity DC Electronic Load System

## PLZ-4W SR/LP Series

● The PLZ-4W SR/LP Series offers wide range of the "Large-Capacity DC Electronic Load System" that consists of the conventional electronic load model PLZ1004W and PLZ2004WB applying to the large current (maximum 2600 A) installed in the exclusive rack mount system.

## PLZ-4WH SR/LP Series

● The PLZ-4WH SR/LP Series offers wide range of the "Large-Capacity DC Electronic Load System" that consists of the conventional electronic load model PLZ1004WH and PLZ2004WHB applying to the high voltage (maximum 650 V) installed in the exclusive rack mount system.

Applications (example)
●Charge/Discharge test on the large capacity secondary battery ●Converter evaluation ●Alternator evaluation ●FC stack cell evaluation ●PV panel evaluation ●EV charger evaluation ●Heat generation evaluation by the harness electric conduction ●Capacitor endurance test ●Evaluation on the industrial larage capacity DC power suppy system

High Voltage
Maximum 650 V
5 kW to 13 kW

PLZ-4WH LP Series

PLZ-4WH SR Series

Large Current
Maximum 2600 A
5 kW to 13 kW

PLZ-4W LP Series

PLZ-4W SR Series

- The system offers from 5 kW to 13 kW with two types of rack system (SR/LP type), 12 models are available.
- Assembled with exclusive components based on optimization design concept. Delivers the system with fully assembled and tested, so immediate operation is possible.
- The industry's smallest in its class for the multi-functional high-speed response DC electronic load.
- Expandable by installing additional booster units after purchase*.
  *For the installation, adjustment, please contact your nearest distributor.
- AC Input 90 to 250 Vac Auto select, less than 15 A. No special wiring is required.
- Range switching function allows to guarantee the specificatiosn even for the samller capacity input. (Perfromance test Data is included with the system as standard document)
- Equipped USB/RS232C/GPIB interface as standard features.
- Capable of operation using the Sequence Creation software "Wavy".
- The Load input terminal is designed on the Safety-Comes-First concept. (protection against electric shocks)
- Load cable for large current is available as option.
  (50 A/100 A/200 A/500 A/1000 A, 3 m, the cable equipped with solderless terminals on both ends)
- The base hold angle for fixing the anchor bolt (OP03-KRC) is available as a rack mount option.

## ■ Rear Panel (DC INPUT)

PLZ-4W SR/LP Series

SR Series

LP Series

Input terminals applying to the large current

Input terminals applying to the high voltage

**Equipped with the boxed type of safety cover on all models**

Maximizing the Safe and Secure design of the load input terminal based on the safety features (protecting from electric shocks), but also from usability perspectives such as an easy-to-connect operation by opening the terminal cover, and capable of visual check.

PLZ-4WH SR/LP Series

SR Series

LP Series

## PLZ-4W SR/LP Series Lineup　Operating voltage : 1.5 V to 150 V

| Maximum input rating | 5 kW<br>1000 A | 7 kW<br>1400 A | 9 kW<br>1800 A | 9 kW<br>1800 A | 11 kW<br>2200 A | 13 kW<br>2600 A |
|---|---|---|---|---|---|---|
| | PLZ-4W Smart Rack | | | PLZ-4W Load Rack | | |
| |  |  |  |  |  |  |
| | PLZ5004W SR | PLZ7004W SR | PLZ9004W SR | PLZ9004W LP | PLZ9004W LP | PLZ13004W LP |

## PLZ-4WH SR/LP Series Lineup　Operating voltage : 5 V to 650 V

| Maximum input rating | 5 kW<br>250 A | 7 kW<br>350 A | 9 kW<br>450 A | 9 kW<br>450 A | 11 kW<br>550 A | 13 kW<br>650 A |
|---|---|---|---|---|---|---|
| | PLZ-4WH Smart Rack | | | PLZ-4WH Load Rack | | |
| |  |  |  |  |  |  |
| | PLZ5004WH SR | PLZ7004WH SR | PLZ9004WH SR | PLZ9004WH LP | PLZ9004WH LP | PLZ13004WH LP |

# OPTION

## ■ High Current Load Wire

*Solderless terminals on both ends.

| Model | DC14-2P3M-M12M8 | DC38-2P3M-M12M8 | DC80-2P3M-M12M8 | DC80-2P3M-M12M12 | DC150-2P3M-M12M12 | DC150-4P3M-M12M12 | DC600-2P3M-M12M12 |
|---|---|---|---|---|---|---|---|
| Maximum Allowable voltage | 650 V | | | | | | 150 V |
| Maximum Allowable current | 50 A | 100 A | 200 A | 200 A | 300 A | 500 A | 1000 A |
| Terminal | M12/M8 | M12/M8 | M12/M8 | M12/M12 | M12/M12 | M12/M12 | M12/M12 |
| Nominal Cross-Sectional Area | 14 $mm^2$ (Equivalent of AWG 5) | 38 $mm^2$ (Equivalent of AWG 1) | 80 $mm^2$ (Equivalent of AWG 3/0) | 80 $mm^2$ (Equivalent of AWG 3/0) | 150 $mm^2$ (Equivalent of AWG 6/0) | 150 $mm^2$ (Equivalent of AWG 6/0) | 600 $mm^2$ |
| Length / Weight *Per cable | Approx.3 m / Approx.1 kg | Approx.3 m / Approx.2.7 kg | Approx.3 m / Approx.5.6 kg | Approx.3 m / Approx.5.6 kg | Approx.3 m/ Approx.10 kg | Approx.3 m/ Approx.20 kg | Approx.3 m / Approx.40 kg |
| Exterior design | A TYPE（2 pc） | A TYPE（2 pc） | A TYPE（2 pc） | A TYPE（2 pc） | A TYPE（2 pc） | A TYPE（4 pc） | B TYPE（2 pc） |
| |  |  |  |  |  |  |  |

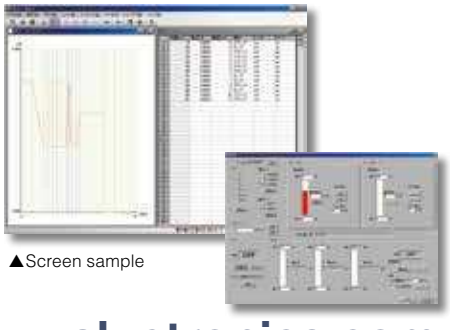
Sequence creation software

# Wavy series

## ■Sequence creation software **Wavy for the PLZ-4W**

[Operating environment]
Windows 2000/Windows XP/Windows Vista/Windows 7
*For details, please refer to our web site.

*The software that further enhances the waveform generation and sequence functions.*
*Using a mouse, you can create and edit feel like drawing and filling out the spreadsheet.*



▲Screen sample

- ■ Creating and editing data of test conditions required so that the sequence operation can be done easily.
- ■ Using the save function for data files of test conditions makes routine test condition control easy.
- ■ The progress of executed sequences is displayed by the cursor and settings on an “execution graph.”
- ■ It is possible to observe actual output intuitively, using a “monitor graph” that plots monitored values while an execution is in progress.
- ■ Acquired monitor data can be saved as test results.
- ■ A “waveform image” window was newly added, making it easy to see the waveforms of alternating current (AC) signals.
- ■ Arbitrary new waveforms can be easily created and edited. Also, arbitrary waveforms that are created can be quickly written and output.
- ■ The product supports the selection and nonselection of sequence step items. Functions such as the pause function, trigger function, and AC waveform can be selected as needed.

**Download !**

Trial version is available on our web !!
**http://www.kikusui.co.jp/en/download/index.html**

## PLZ-4W SR Series

| Specifications | Rating | | | Constant current mode (CC) | | | | Constant voltage mode (CV) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Operating voltage | Current | Power | Operating range | | | Ripple | Operating range | | Resolution | |
| | V | A | W | H range (A) | M range (A) | L range (A) | mArms *1 | H range (V) | L range (V) | H range (mV) | L range (mV) |
| PLZ5004W SR | 1.5 to 150 | 1000 | 5000 | 0 to 1100 | 0 to 110 | 0 to 11 | 100 | 0 to 157.5 | 0 to 15.75 | 10 | 1 |
| PLZ7004W SR | | 1400 | 7000 | 0 to 1540 | 0 to 154 | 0 to 15.4 | 140 | | | | |
| PLZ9004W SR | | 1800 | 9000 | 0 to 1980 | 0 to 198 | 0 to 19.8 | 180 | | | | |

| Specifications | Constant resistance mode (CR) | | | Constant power mode (CP) | | | Weight | Power consumption |
|---|---|---|---|---|---|---|---|---|
| Model | Operating range | | | Operating range | | | Approx. | Approx. |
| | H range (s) | M range (s) | L range (s) | H range (W) | M range (W) | L range (W) | kg | VA |
| PLZ5004W SR | 699.0 to 0 | 69.90 to 0 | 6.990 to 0 | 0 to 5250 | 0 to 525 | 0 to 52.5 | 110 | 560 |
| PLZ7004W SR | 980.0 to 0 | 98.00 to 0 | 9.800 to 0 | 0 to 7350 | 0 to 735 | 0 to 73.5 | 140 | 760 |
| PLZ9004W SR | 1260.0 to 0 | 126.0 to 0 | 12.60 to 0 | 0 to 9450 | 0 to 945 | 0 to 94.5 | 170 | 960 |

## PLZ-4W LP Series

| Specifications | Rating | | | Constant current mode (CC) | | | | Constant voltage mode (CV) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Operating voltage | Current | Power | Operating range | | | Ripple | Operating range | | Resolution | |
| | V | A | W | H range (A) | M range (A) | L range (A) | mArms *1 | H range (V) | L range (V) | H range (mV) | L range (mV) |
| PLZ9004W LP | 1.5 to 150 | 1800 | 9000 | 0 to 1980 | 0 to 198 | 0 to 19.8 | 180 | 0 to 157.5 | 0 to 15.75 | 10 | 1 |
| PLZ11004W LP | | 2200 | 11000 | 0 to 2420 | 0 to 242 | 0 to 24.2 | 220 | | | | |
| PLZ13004W LP | | 2600 | 13000 | 0 to 2860 | 0 to 286 | 0 to 28.6 | 260 | | | | |

| Specifications | Constant resistance mode (CR) | | | Constant power mode (CP) | | | Weight | Power consumption |
|---|---|---|---|---|---|---|---|---|
| Model | Operating range | | | Operating range | | | Approx. | Approx. |
| | H range (s) | M range (s) | L range (s) | H range (W) | M range (W) | L range (W) | kg | VA |
| PLZ9004W LP | 1260.0 to 0 | 126.0 to 0 | 12.60 to 0 | 0 to 9450 | 0 to 945 | 0 to 94.5 | 250 | 960 |
| PLZ11004W LP | 1540.0 to 0 | 154.0 to 0 | 15.40 to 0 | 0 to 11550 | 0 to1155 | 0 to115.5 | 275 | 1160 |
| PLZ13004W LP | 1820.0 to 0 | 182.0 to 0 | 18.20 to 0 | 0 to 13650 | 0 to 1365 | 0 to 136.5 | 300 | 1360 |

## PLZ-4WH SR Series

| Specifications | Rating | | | Constant current mode (CC) | | | | Constant voltage mode (CV) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Operating range | Current | Power | Operating range | | | Ripple | Operating range | | Resolution | |
| | V | A | W | H range (A) | M range (A) | L range (A) | mArms *1 | H range (V) | L range (V) | H range (mV) | L range (mV) |
| PLZ5004WH SR | 5 to 650 | 250 | 5000 | 0 to 262.5 | 0 to 26.25 | 0 to 2.625 | 60 | 0 to 682.5 | 0 to 68.25 | 20 | 2 |
| PLZ7004WH SR | | 350 | 7000 | 0 to 367.5 | 0 to 36.75 | 0 to 3.675 | 84 | | | | |
| PLZ9004WH SR | | 450 | 9000 | 0 to 472.5 | 0 to 47.25 | 0 to 4.725 | 108 | | | | |

| Specifications | Constant resistance mode (CR) | | | Constant power mode (CP) | | | Weight | Power consumption |
|---|---|---|---|---|---|---|---|---|
| Model | Operating range | | | Operating range | | | Approx. | Approx. |
| | H range (s) | M range (s) | L range (s) | H range (W) | M range (W) | L range (W) | kg | VA |
| PLZ5004WH SR | 52.5 to 0 | 5.25 to 0 | 525 m to 0 | 0 to 5250 | 0 to 525 | 0 to 52.5 | 110 | 560 |
| PLZ7004WH SR | 73.5 to 0 | 7.35 to 0 | 735 m to 0 | 0 to 7350 | 0 to 735 | 0 to 73.5 | 140 | 760 |
| PLZ9004WH SR | 94.5 to 0 | 9.45 to 0 | 945 m to 0 | 0 to 9450 | 0 to 945 | 0 to 94.5 | 170 | 960 |

## PLZ-4WH LP Series

| Specifications | Rating | | | Constant current mode (CC) | | | | Constant voltage mode (CV) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Operating voltage | Current | Power | Operating range | | | Ripple | Operating range | | Resolution | |
| | V | A | W | H range (A) | M range (A) | L range (A) | mArms *1 | H range (V) | L range (V) | H range (mV) | L range (mV) |
| PLZ9004WH LP | 5 to 650 | 450 | 9000 | 0 to 472.5 | 0 to 47.25 | 0 to 4.725 | 108 | 0 to 682.5 | 0 to 68.25 | 20 | 2 |
| PLZ11004WH LP | | 550 | 11000 | 0 to 577.5 | 0 to 57.75 | 0 to 5.775 | 140 | | | | |
| PLZ13004WH LP | | 650 | 13000 | 0 to 682.5 | 0 to 68.25 | 0 to 6.825 | 156 | | | | |

| Specifications | Constant resistance mode (CR) | | | Constant power mode (CP) | | | Weight | Power consumption |
|---|---|---|---|---|---|---|---|---|
| Model | Operating range | | | Operating range | | | Approx. | Approx. |
| | H range (s) | M range (s) | L range (s) | H range (W) | M range (W) | L range (W) | kg | VA |
| PLZ9004WH LP | 94.5 to 0 | 9.45 to 0 | 945 m to 0 | 0 to 9450 | 0 to 945 | 0 to 94.5 | 235 | 960 |
| PLZ11004WH LP | 115.5 to 0 | 11.55 to 0 | 1.155 to 0 | 0 to 11550 | 0 to 1155 | 0 to 115.5 | 260 | 1160 |
| PLZ13004WH LP | 136.5 to 0 | 13.65 to 0 | 1.365 to 0 | 0 to 13650 | 0 to 1365 | 0 to 136.5 | 285 | 1360 |

*1 Measurement frequency bandwidth: 10 Hz to 20 MHz At measurement current of 100 A

### ■ Dimensions (mm)

| | |
|---|---|
| PLZ5004W SR | 432.6 W (545) × 469.6 H (570) × 764.7 D (955) |
| PLZ7004W SR | 432.6 W (545) × 602.3 H (705) × 764.7 D (955) |
| PLZ9004W SR | 432.6 W (545) × 735 H (835) × 764.7 D (955) |
| PLZ9004W LP | 570 W × 1350 H (1435) × 950 D (1020) |
| PLZ11004W LP | |
| PLZ13004W LP | |
| PLZ5004WH SR | 432.6 W (545) × 559.6 H (660) × 764.7 D (955) |
| PLZ7004WH SR | 432.6 W (545) × 737.3 H (840) × 764.7 D (955) |
| PLZ9004WH SR | 432.6 W (545) × 915 H (1015) × 764.7 D (955) |
| PLZ9004WH LP | 570 W × 1350 H (1435) × 950 D (1020) |
| PLZ11004WH LP | |
| PLZ13004WH LP | |

### ■ Common Specifications

Input voltage range .....100 V AC to 240 V AC (90 V AC to 250 V AC), single phase, continuous
Input frequency range.....47 Hz to 63 Hz
Operating temperature range .....0 to 40
Operating humidity range .....20 %rh to 85 %rh (without condensation)
Storage temperature range.....-25 to 70
Storage humidity range.....90 %rh or less (without condensation)

For details of the Large-Capacity DC Electronic Load System PLZ4W SR/LP Series, please refer to our web site.

www.kikusui.co.jp



KIKUSUI ELECTRONICS CORPORATION www.kikusui.co.jp
KIKUSUI 1-1-3,Higashiyamata,Tsuzuki-ku,Yokohama,224-0023, Japan
Phone : (+81)45-593-7570, Facsimile : (+81)45-593-7571

KIKUSUI AMERICA, INC. 1-877-876-2807 www.kikusuiamerica.com
2975 Bowers Avenue, Suite 307, Santa Clara, CA 95051
Phone : 408-980-9433 Facsimile : 408-980-9409

Printed in Japan
Issue: Feb. 2014 2014021KPRIEC21