

NEW

Ultra Slim DC Power Supply

Width: Only 1.38"/Output Power: 80W

- ▶ Available for 80 W output while being ultra small size of only 1.4-inch in the width.
- ▶ There are models that can control the output current at 0.1mA increment.
- ▶ Excellent quietness is achieved by natural air-cooling system.

R4K-80 series

Max. output voltage: 16 to 320V

Max. output current: 0.5 to 10A

Max. output Power: 80W



Ultra Slim DC Power Supplies

R4K-80 series

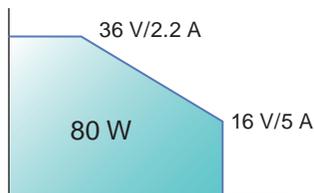


Ultra Slim Sophisticated Bench-top Power Supply

R4K-80 series is higher performance DC variable power supply. 4-digit digital meter and high resolution D/A, A/D converters are added newly for more precise setting and reading. Needless to say, the innovative compact size, variable range feature and high operability are remaining same as conventional RK-80 series. R4K-80 series is the best suitable DC power supply for a variety of applications from laboratory experiment to line productions.

New user-friendly functions

- Useful new feature of variable setting range



Set voltage/current value within 80 W, then turn on output

*Not automatic range change which can output 80 W all the time. Resetting is required.

New and useful functions and stylish front panel design!

Quick access to functions needed

- No.1** Preset setting is automatically displayed when output is off.
- No.2** OCP is added for more safety operation.
- No.3** Quick lock with one touch action. Two selectable lock options.

R4K-80 series

More useful !



Compact and light weight space saving design



Very quiet due to the adopting naturally-cooled system without cooling fan.



For wider output range
R4K-80L: 16 V/10 A
R4K-80: 36 V/5 A
R4K-80M: 110 V/1.3 A
R4K-80H: 320 V/0.5 A



Unique low noise power conversion technology for research application



Power factor correction and universal input



Multiple units operation with master/slave and digital interface

Useful NEW 5 Additional Functions

■ **4-digit digital meter** (output voltage and current)

■ **High resolution D/A, A/D converter integrated**

As 1 click of rotary encoder is 1 count, fine setting is possible

■ **Digital interface as standard function**

Digital interface shall make the data logging and automatic measurement easier.

★Conversion adapters suitable for RS-232C, RS-485 or GPIB is separately required.

■ **Various waveform with pulse and ramp sequence function at will**

With pulse/ramp sequence function (optional) various test pattern can be set without personal computer.

■ **Output voltage and output current can be set speedily.**

When setting output voltage and output current by rotary encoder on front panel, every time fine switch is pressed, setting digit on digital display will be switched. In case, setting small output value or change setting value widely, setting can be done speedily. (Fine switch cannot be used when output value is set by remotely.)

Lineup

*1 : Value at local control. More precise setting can be available with remote digital control. Please see P.5 "Various Digital Control Functions".
*2 : When 115 Vac maximum output

Output voltage (V)	Output current (A)	Output Power (W)	MODEL	Ripple		Minimum setting unit ^{*1}		AC Input			Weight (typ)	
				(mVrms)	(mA rms)	Output voltage	Output current	Input Voltage	Input Current (typ)			Power factor (typ)
0 to 16	0 to 10	80	R4K-80L	5	10	10 mV	10 mA	85 to 264 Vac 47 to 63 Hz Single phase	AC in		0.99 ^{*2}	1 kg
0 to 36	0 to 5		R4K-80	5	4				1 mA	115 V		
0 to 110	0 to 1.3		R4K-80M	10	2	100 mV	1 mA		1 A	0.5 A		
0 to 320	0 to 0.5		R4K-80H	20	1							

FUNCTIONS

Multi Setting Function

Function to memorize 3 different voltage and current settings in addition to standard preset function.

No need to adjust the output when different setting, and convenient function for production inspection process or testing which require frequent data taking.



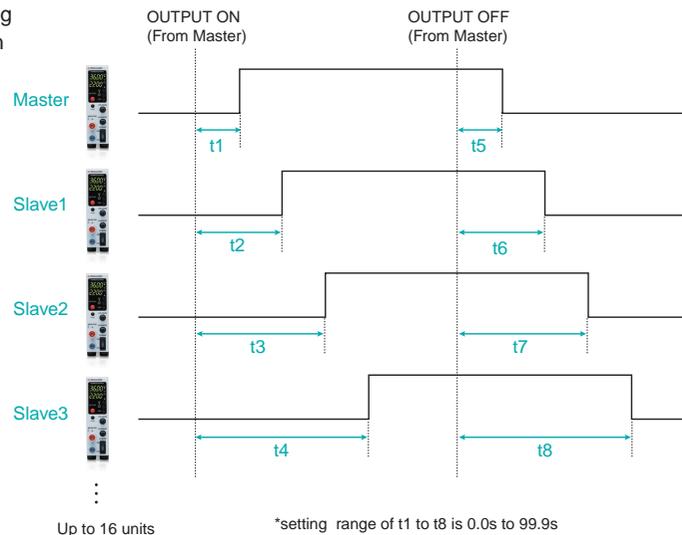
- ① Press down SET
- ② Select a memory with 3 buttons
- ③ Set voltage and current

Delay Trigger Function

In case -LUs1,-LGob or -LEt option is selected, only one unit of R4K-80 series can be used.

Function to delay the OUTPUT ON/OFF time. It is possible to use in case single unit of R4K-80 series is used, and also when connecting several Matsusada power supplies (*1) using master-slave connection terminal (*2) and output voltage / output current are set individually, delay trigger function can be used. (*3)

- *1 : R4K-36 series, RK-80 series, RK series and REK series. Detail catalog for each model is available. Please contact nearby sales office.
- *2 : Can be connected up to 16 units.
- *3 : Only for slave-local. In case of slave remote control, exact same model of power supply need to be used. Also, in case of slave-local, each output voltage and current can be set individually. In case of slave-remote, output voltage and current can be set with one-control function which each slave unit follows the master unit setting.



Two Mode Lock Function

Function to select two different lock functions for two different purpose. "Full Lock" locks all the function on front panel, and "Normal Lock" locks all the function except for ON/OFF. "Full Lock" mode shall be good in case mis-operation have to be completely avoided, and "Normal Lock" mode shall be good in case to avoid mis-operation but secure the way for emergency stop of power supply. You can select the best mode according to your level of "Security", (in both modes, emergency stop is possible with Power Switch.)

Full LOCK

Lock all the function other than reset lock mode, and effective for purpose to avoid mis-operation when controlled.



Normal LOCK

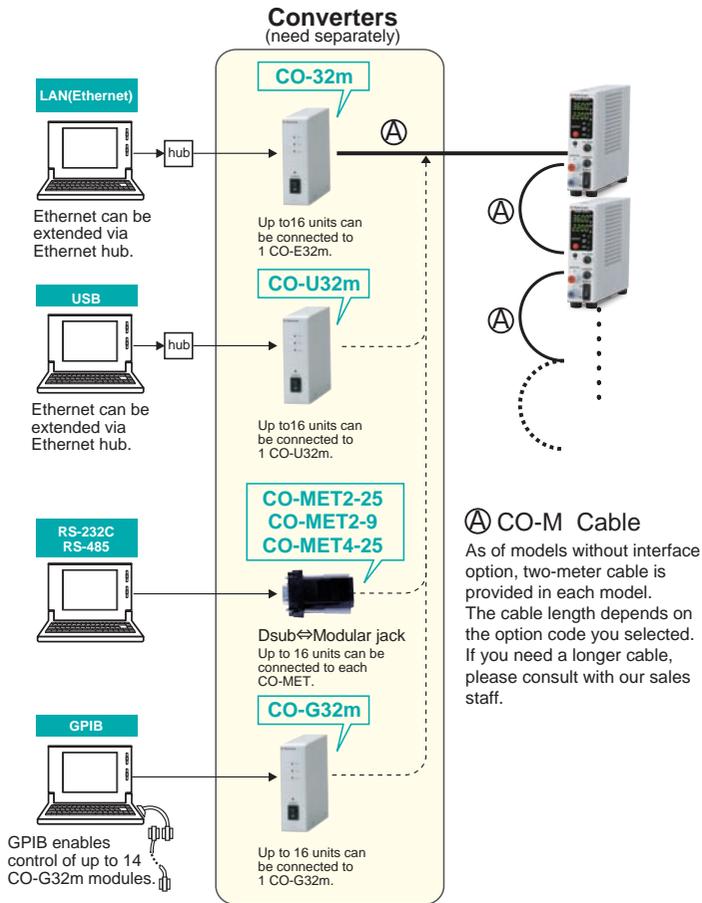
Lock voltage and current setting dial, and effective for purpose to avoid changing output setting by mistake or when easy emergency stop is required.



Digital Interface

Digital control of USB/Ethernet*/RS-232C/RS485/ GPIB and one-control on master slave operation.

*Ethernet is a registered trademark of Xerox Corporation.



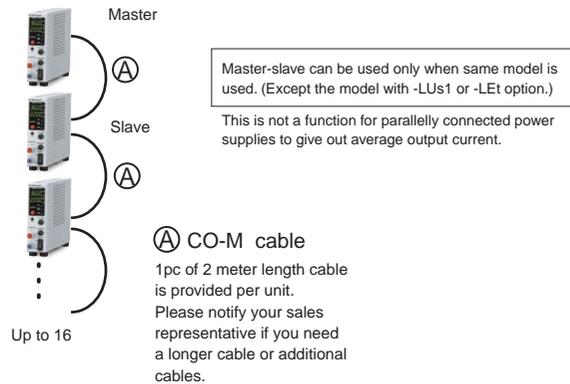
-LGob option will be needed if it will be used under specific condition. Please see P.8 for detail.

Various Digital Control Functions

Control function	Output ON/OFF setting	
	Status output (fault/output/OVP/OC/OTP/ACF/reversible sense connection)	
	Maximum 16 units (-LGob option models: 32 units) digital control	
One control function for multiple units		
Write function	Output voltage setting/ Output current setting	Percent mode (100.00%), *voltage current value mode (maximum rated voltage and current value)
	OVP setting/ OCP setting	Percent mode (100.0%), voltage current value mode (maximum over voltage/ over current protection value)
Reading function	Output voltage reading/ Output current reading	Percent mode (100.00%), *voltage current value mode (maximum rated voltage and current value)
	Output voltage setting/ Output current setting	Percent mode (100.00%), *voltage current value mode (maximum rated voltage and current value)
	OVP setting/ OCP setting	Percent mode (100.0%), voltage current value mode (maximum over voltage/ over current protection value)

* Minimum value of each model is same as minimum display of front panel meter.

Master/Slave Control

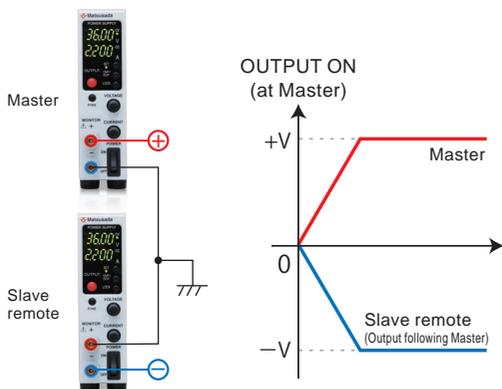


Dual Tracking, Multiple Outputs

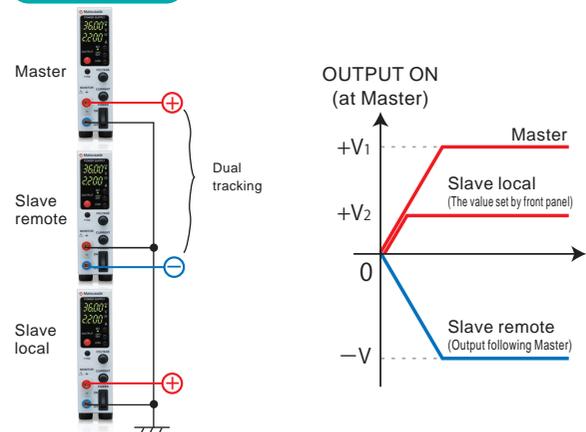
Dual tracking control, which enables both positive and negative outputs simultaneously in master slave operation, is possible. Multi outputs and various versatile operations are also possible by combining above dual tracking control and slave local mode. Positive and negative output (+V, -V) of dual tracking control and set output voltage of slave local mode can be output simultaneously by turning on the master unit.

*Please refer to P.10 for detail connection.

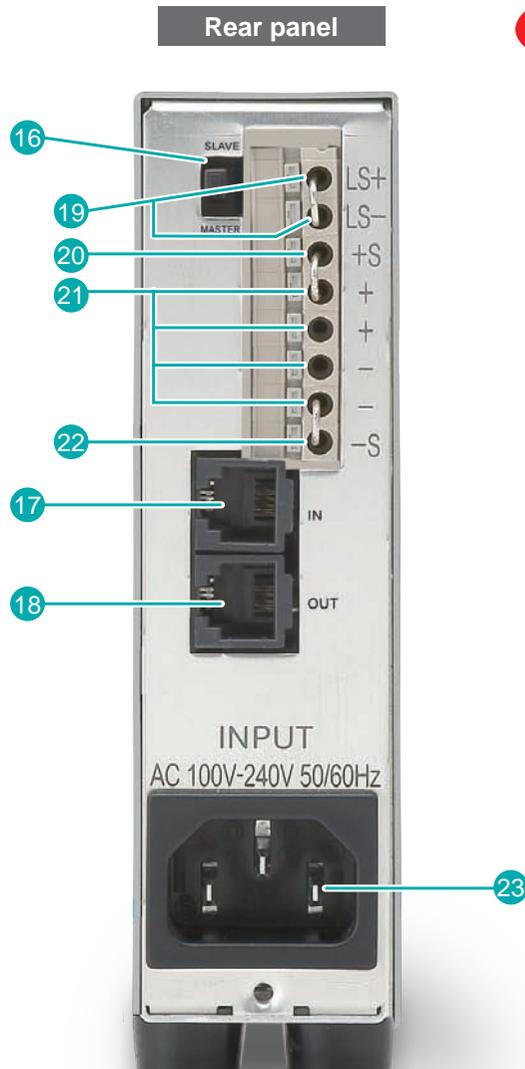
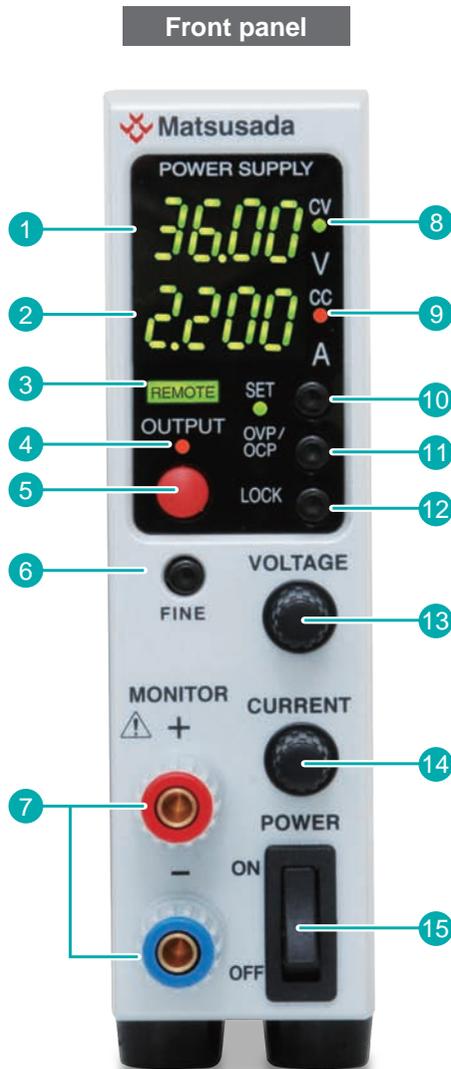
Dual Tracking



Multiple Outputs



Functions



Real size

- 1 Output voltage and OVP setting display
- 2 Output current and OCP setting display (mA for R4K-80H)
- 3 Remote programming display
Light up when output voltage/current control in remote mode.
- 4 Output display -Light up when output is on.
- 5 OUTPUT ON/OFF switch
To be used to turn output on/off when local mode as well resetting protection functions.
- 6 FINE switch
To alter the digit of a setting for setting up output voltage and current.
- 7 Monitor terminal (M6)
- 8 Constant voltage operation mode display
- 9 Constant current operation mode display
- 10 PRESET switch
- 11 OVP/OCP switch
- 12 LOCK switch

- 13 OUTPUT voltage · OVP setting dial
- 14 OUTPUT current · OCP setting dial
- 15 Power ON/OFF switch
This has priority over all operations for safety reason.
- 16 Master/Slave change switch
- 17 Digital interface IN For Master/Slave function too
- 18 Digital interface OUT For Master/Slave function too
- 19 Remote output ON/OFF switch
- 20 +Sense
- 21 OUTPUT terminal
- 22 -Sense
- 23 AC inlet

Specifications

Output Control	CV Mode: By rotary encoder on front panel CC Mode: By rotary encoder on front panel
Output Function	Wide output range, automatic limit setting at 80 W for voltage and current In CV mode output current drop down when output power is more than 84.05 W In CC mode output voltage drop down when output power is more than 84.05 W
Lock Function	Lock function locks the output voltage and current setting
Output Display *1	Voltage: 4-digit digital meter. Accuracy is $\pm 0.2\% \text{rdg} \pm 4$ digits Accuracy of preset setting is $\pm 0.2\% \text{Setting} \pm 40 \text{ mV}^{*2}$ Current: 4-digit digital meter. Accuracy is $\pm 0.4\% \text{rdg} \pm 5$ digits Accuracy of preset setting is $\pm 0.4\% \text{Setting} \pm 5 \text{ mA}^{*2}$
Temp. coeff.	$\pm 0.01\% / ^\circ\text{C}$ (CV mode), $\pm 0.02\% / ^\circ\text{C}$ (CC mode)
Protections	Over voltage protection (OVP): Cut off the output at set value Setting range : appx. 5% to 110% of rated maximum voltage Setting: By front panel rotary encoder Reset: By output ON/OFF switch or remote switch (manual control) Over current protection (OCP): Cut off the output at set value Setting range: appx. 5% to 110% of rated maximum current Setting: By front panel rotary encoder Reset: By output ON/OFF switch or remote switch (manual control) Over temperature protection. (OTP): Cut off output at abnormal inside temperature. Reset (after temperature get down to normal temperature): Output ON/OFF switch or Remote switch (manual control) Input brownout (ACF)-Blackout protection Output is cut off when input voltage decreased. Reset (when normal voltage value or recovery from blackout) Manual recovery by OUTPUT switch or remote switch for blackout protection (re-output protection function). Automatic recovery when blackout protection is canceled. Sense reverse connection
Other Functions	Remote switch ON/OFF (TTL or external relay), Remotesensing Delay trigger: Individual setting of ON delay and OFF delay (0.0 to 99.9 sec) Multi setting function: Voltage and current memory "a", "b" and "c" setting in addition to standard voltage and current preset
OperationTemp.	0°C to +40°C
Storage Temp.	-20°C to +70°C
Relative humidity	20% to 80%, no condensing
Isolation voltage	16 V, 36 V output models: $\pm 250 \text{ Vdc}$ (Positive or Negative terminal grounding) 110 V, 320 V output models: $\pm 500 \text{ Vdc}$ (Positive or Negative terminal grounding)
Leakage current	0.5/1 mA typ (ACIN 100 V/200 V 60 Hz)
Dielectric voltage	Between input power supply and output terminal: AC1500 V 1 min. Between input power supply and chassis: AC1500 V 1 min. Between output terminal and chassis: DC500 V 1 min.
Accessories	AC Input cable 2.5 m single phase 3-pin type (1), Instruction manual (1), Ground plate (1)



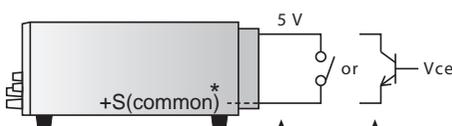
For safer operation, connect ground plate to output terminal.

*1 : At 1% to 100% of rated output.
*2 : The accuracy of the preset value varies according to rated output value of each product.
Refer to the following table.

Voltage	Accuracy of preset value	Current	Accuracy of preset value
up to 9 V	$\pm 0.2\% \text{setting} \pm 4 \text{ mV}$	up to 999 mA	$\pm 0.4\% \text{setting} \pm 0.5 \text{ mA}$
10 to 99 V	$\pm 0.2\% \text{setting} \pm 40 \text{ mV}$	1 A to 9 A	$\pm 0.4\% \text{setting} \pm 5 \text{ mA}$
more than 100 V	$\pm 0.2\% \text{setting} \pm 400 \text{ mV}$	10 A to 99 A	$\pm 0.4\% \text{setting} \pm 50 \text{ mA}$

Remote Functions

Remote switch ON/OFF

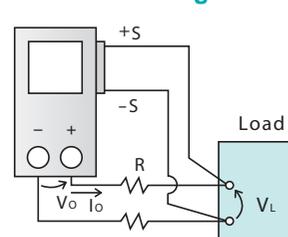


**+S is common. So external control voltage shall be input with +S as reference. Otherwise it can cause failure.

Output	Relay	Open collector
ON	SHORT	$V_{ce} \leq 0.4 \text{ V}$
OFF	OPEN	$V_{ce} \geq 2 \text{ V}$

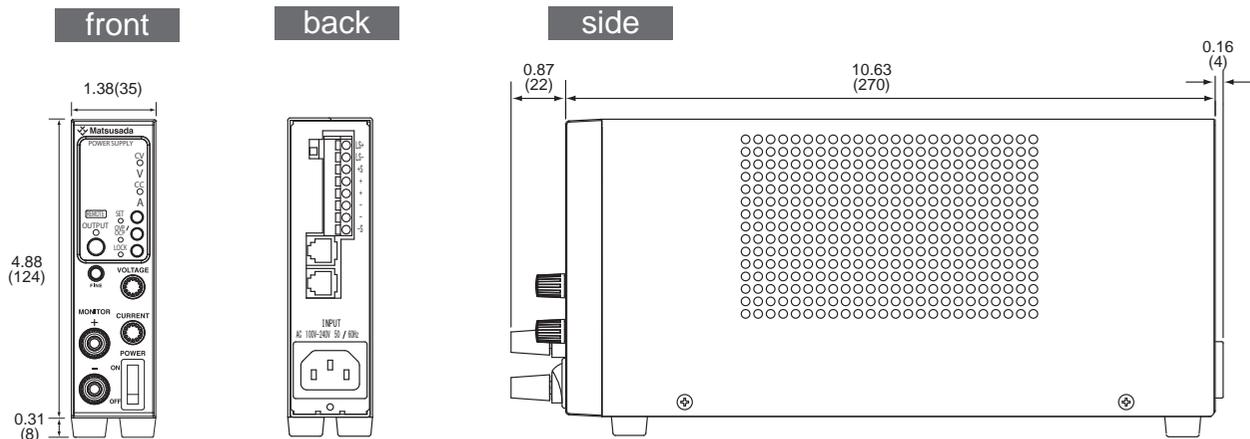
Sink current 1 mA

Remote sensing



Compensate the voltage drop ($V_O - V_L$) due to resistance of output lead or drop of stability by contact resistance. (maximum 0.5 V)

Dimensions inch(mm)

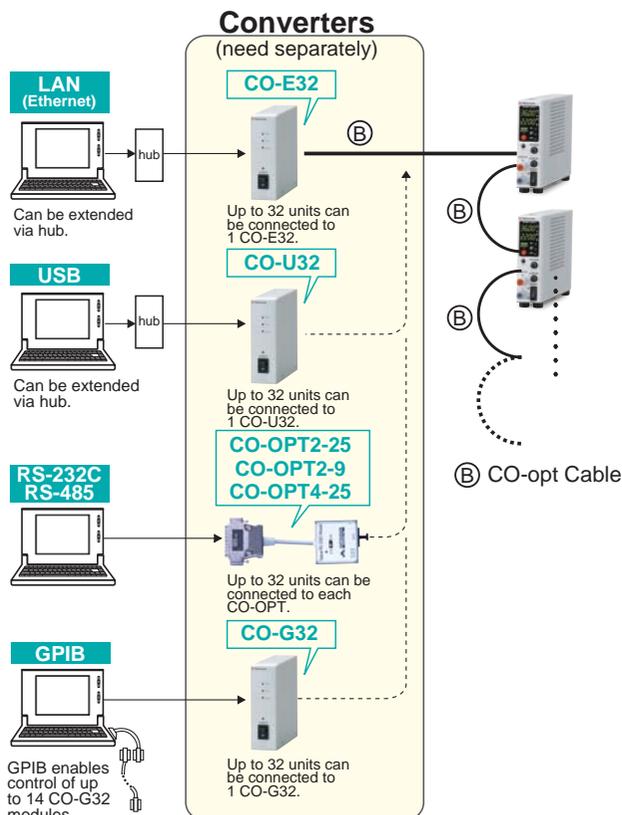


Options

-LGoB: Optical Interface Board *1 *2

- LGoB: Optical interface board + optical cable 2 m
- LGoB(Fc5): Optical interface board + optical cable 5 m
- LGoB(Fc10): Optical interface board + optical cable 10 m
- LGoB(Fc20): Optical interface board + optical cable 20 m
- LGoB(Fc40): Optical interface board + optical cable 40 m

Optical communication offers insulation control. It is to prevent malfunction such as transient phenomenon by surge, lightning induction, and exogenous noise.



Select the -LGoB option when using power supply following environmental condition
Factories which has a lot of noise
(ex.) in case of using power supplies and loads near motors and coils.
In case using power supply with high voltage floating (more than 250 V)
The length between power supply and controller unit (PC or PLC) is more than 2-meter

-LIc: Output current accumulation function *3

Accumulate the output current and display its value (up to 100 Ah).
Accumulated value is stored even when output is off.
Also, accumulated value which stop the output can be set preliminarily,
it is very suitable to the application such as controlling plating solution.

-LU1: USB Interface Board *1 *2 *4

When controlling several R4K-80 power supplies
via USB, a USB hub will be required between
the PC and R4K-80 power supplies.



-LEt: LAN (Ethernet) Interface Board *1 *2 *4

When controlling several R4K-80 power supplies
via Ethernet, a hub will be required between
the PC and R4K-80 power supplies.



(Ethernet is a registered trademark of Xerox Corporation.)

-L(Mc0.5), -L(Mc0.15): Communication cable length change *1 *2 *5

Change length of CO-M cable to 0.5-meter long or 0.15-meter long.

-LH: Higher isolation voltage

This option make the isolation voltage to be ± 1 kV, which enable extended
capability of series operation.

*1 These options cannot be selected together. Only one of each can be selected.

*2 If you select these options, standard digital interface will not be equipped.
Also, please see the CO series catalog for detail of function of digital interface
function.

*3 Please consider the location of usage. High humidity environment can be the
cause of failure and corrosion.

*4 Master/slave function is not available.

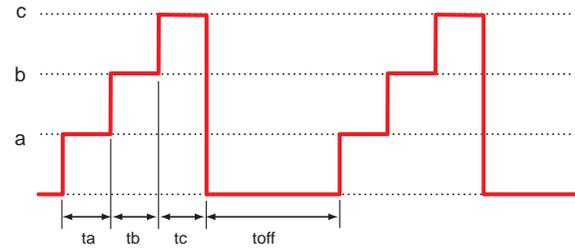
*5 -L(Mc0.5) or -L(Mc0.15) option cannot be selected with -LGoB, -LU1 or
-LEt option.

-LDe: Pulse Ramp Sequence

Below output control, between A to D is available

A. PULSE SEQUENCE

Using the stored voltage and current setting in each memory of a, b and c and multi set function, sequence operation is possible. The setting of repetition to say nothing of a continuous driving can be set. Various different operations, such as repetition of memory a and b or b, c and off, are possible by setting the set time of memory a, b, c, and/or off to be 0.0. Thus, it makes this model suitable for evaluation test or other applications.

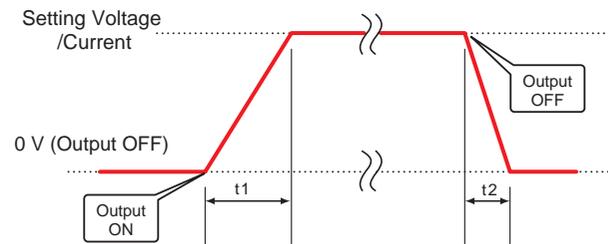


t_a , t_b , t_c and t_{off} can be set with range 0.0 s, 1.0 s to 99.9 h respectively.

B. RAMP SEQUENCE

This function controls the ramping up and down the voltage and current to the set value (or from set voltage and current value to 0 V/0 A). It is convenient to increase (decrease) the voltage and current value slowly.

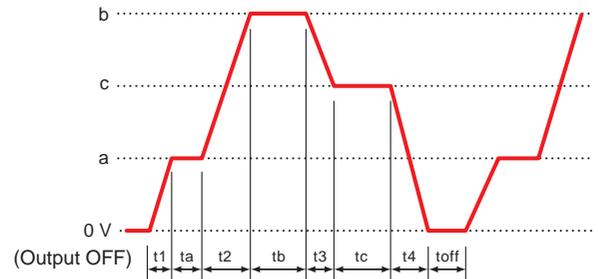
*The Ramp sequence can be selected from [both set voltage and current], [only set voltage], and [only set current].



t_1 and t_2 can be set with range 0 s to 999 s respectively.

C. COMBINATION OF PULSE and RAMP SEQUENCE

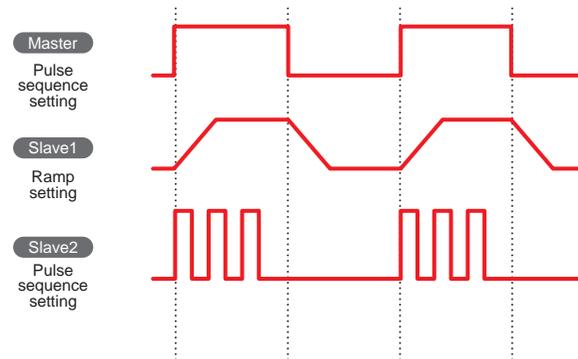
Features of pulse sequence operation and ramp sequence operation can be combined for more convenient operation. In addition, by adding multi set function, sequence operation can be operated using stored voltage and current settings in each memory. The setting of repetition to say nothing of a continuous driving can be set. For example it is possible to slowly ramp up and down the voltage and current to the three different settings, and so, it is useful on various scenes.



t_1 , t_2 , t_3 and t_4 can be set with range 0 s to 999 s respectively.
 t_a , t_b , t_c and t_{off} can be set with range 0.0 s, 1.0 s to 99.9 h respectively.

D. MASTER FOLLOW

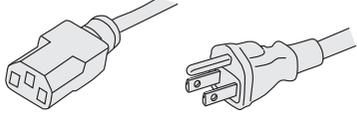
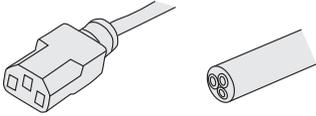
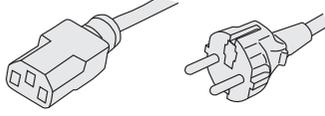
When the pulse sequence operation and the ramp work master-slave, the output signal to the slave unit is transmitted. The slave unit can be output in an output status different from the master unit.
 (Master follow function cannot be used with -LUs1 or -LEt option.)



Note: The operation accuracy of the timer when sequencing is $\pm 0.5\%$. Be careful when you use it by the long-term running operation.

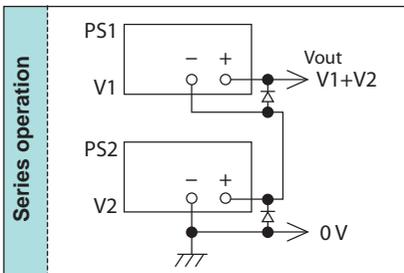
When ordering, suffix the above option number to the model number. <e.g.> R4K-80-LDeGobHic, R4K-80L-LDeHicUs1

AC Input Cable

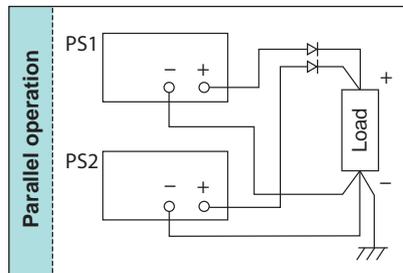
CABLE TYPE 1 (standard)	CABLE TYPE 3 (sold separately)	CABLE TYPE 4 (sold separately)
125 V/10 A	250 V/10 A	250 V/10 A
		

Series Operation - Parallel Operation

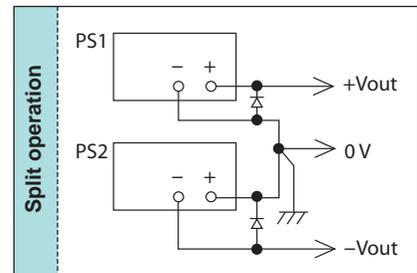
R4K-80 power supply of same model number can be connected in series or parallel to increase output voltage or current. In that case, local control or the control in the digital master slave is recommended. The common of the Remote out ON, OFF switch and the common of the outside input control connector are connected with positive output. So, please do not share the common with any more than two.



Total output voltage is to be up to 250 V. Therefore for models with output voltage of over 250 V, series operation cannot be conducted. Output current is to be the smallest current of those.



Please keep all the settings of voltage the same. Output current will be the summation of each current. Please keep OVP level of power supply maximum to prevent any damage.

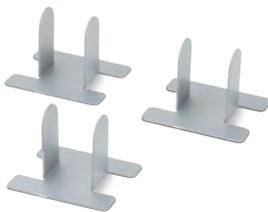


+output and -output are available.

Accessory Kit

Various accessories are available for convenient use of the unit.

Stand



For one unit operation...



Binder



For the applications which require 2 to 6 units combination. Dual, triple and quad multiple operation is possible.

*Cooling fan is needed for more than 3 units combination.



Rack mount holder [RMO series]



- 10 Units/1 rack holder, and can be placed in a cabinet. Easy to take one unit out.
- Best suitable for a system operation.
- With fan unit.

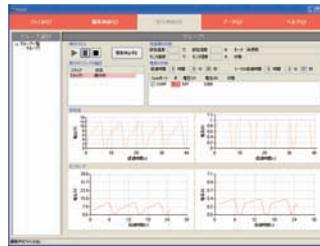
*Power supply is not included in the accessories.

“PSS2”, sequence software for our power supplies



PSS2 is a dedicated software that allows for sequential operation with simple settings as of various types of power supplies, electronic loads, and power supply digital controllers manufactured by Matsusada Precision. It is ideal for durability testing of electronic parts, electrical equipment, and automotive electrical equipment, and for all types of simulation testing.

Test Execution



The software provides an operation display on the single screen to monitor necessary information including sequence, thermostatic chamber, the status of the power supply, the voltage or current at testing.

Confirmation of Measurement data



You can confirm the result data of measurement. If necessary, the measurement data is outputted in CSV format.

TECHNICAL NOTE

Connection Operation

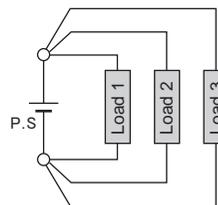
■ Connection of load

- Please use a short lead wire that is sufficiently thick for the connection.
- Please use PVC electric cable (105°C) that can fully tolerate the voltage used. It is necessary to consider current capacity, length limit of output wire by sensing (0.5 V/lead) and so on for wiring with load. Please refer to the following diagram to determine the thickness of cable.

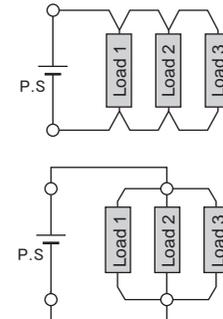
AWG	mm ²	Max current (A)
18	1.1	2
16	1.3	7
14	2.1	11
12	3.3	18
10	5.3	23
8	8.4	39
6	13	67

■ Parallel connection of load

○ Good example



✗ Bad example



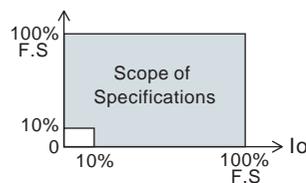
A power supply has no direct branching, but the load is branched using cables.

Specifications Definitions

The following definitions shall basically take precedence. In case there is any specific definition described in other parts of the brochure, the definition has higher priority than the following ones. The specification in this brochure indicates the value at rated power output (full scale) shown after a two-hour warm up.

Scope of Specifications

The following specifications are applied within a range of 10 to 100% of the rated output.
(●Ripple ●Stability ●Variations)
(●Temperature coefficient)



Ripple

Displays rms including high-frequency noise

Preset

The preset value does not accurately show the actual status of output. When accurate setting is required, actually output with no load and set the voltage. Also, set the current setting to the desired value by outputting with the output terminal shorted and gradually increasing current.

When selecting DC power supply

▶ Important Notice

- Products on this catalog have been manufactured with consideration of safety as DC power supply, however please follow instruction manual for operation and make sure to ground the ground terminal for your safety.
- Products on this catalog have been manufactured on the precondition that they are used in ground electric potential or within the range of the above series operation. Please contact our sales staff when using the product for floating of high electric potential, etc.
- Products on this catalog are manufactured with consideration for protection against load discharge. However for specific experiment or continuous discharge such as sputtering, product may need discharge resistance between power supply and load or could not be used at all. Please consult with our sales staff in advance.
- We recommend that you contact our sales staff with your requirement before choosing a product so that you can get the best product and the safety as high-voltage equipment is assured.

