Matsusada Precision

Ultra Slim DC Power Supplies

RK-80 Series

NEW

Overwhelming compact size and light weight design

Ultra compact DC programmable power supplies

RK-80 series

RK-80L : 16 Vmax / 10 Amax / 80 W
RK-80 : 36 Vmax / 5 Amax / 80 W
RK-80M : 110 Vmax / 1.3 Amax / 80 W
RK-80H : 320 Vmax / 0.5 Amax / 80 W

- Slim design of 1.4-inch in width
- Double output voltage / current range
- Available for the commercial AC voltage all over the world

www.matsusada.com

Ultra Slim DC Power Supply

RK-80 series

"Ultra compact and light weight"
"Versatile and user-friendly design"

Ultra Slim Sophisticated Bench-top DC Power Supply

RK-80 series is a high performance DC programmable power supply. 3-digit digital meter is added newly . Needless to say, the innovative compact size, variable range feature and high operability are realized. RK-80 series is the suitable DC power supply for a variety of applications from laboratory experiment to line productions.

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

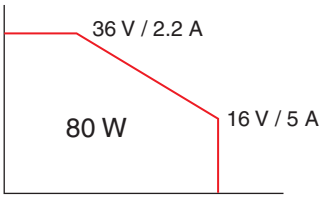
World Wide
Power factor correction and universal input

Multiple units operation with master / slave and digital interface

New user-friendly functions

New and useful functions and stylish front panel design!

NEW RK-80



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.

Useful NEW 3 Additional Functions

NEW **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 cannnot be used when output value is set by remotely.)

When output is OFF, the preset value can be displayed automatically by operating rotary encoder on the front panel.

Various protections such as over voltage / current protection (OVP, OCP) are equipped as standard functions.

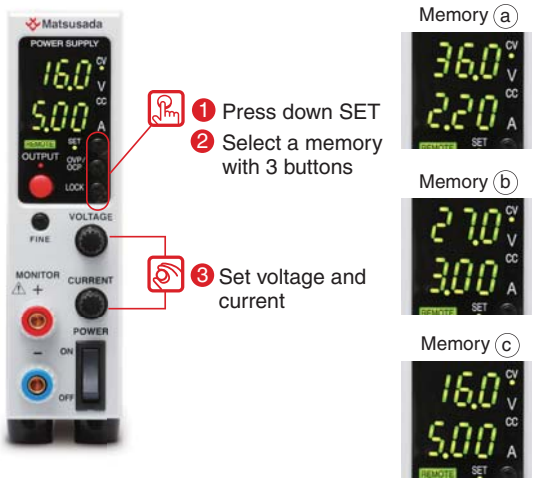
Lineup

Output voltage (V)	Output current (A)	Output Power(W)	MODEL	Ripple		Resolution *1		AC Input				Weight (approx.)
				(mVrms)	(mArms)	Output volt.	Output cur.	Voltage	Current (typ)		Power factor (typ)	
0 to 16	0 to 10	80	RK-80L	5	10	0.1 V	0.01 A	85 to 264VAC 50 / 60Hz single phase	AC in 115 V	AC in 230 V	0.99 *2	950g
0 to 36	0 to 5		RK-80	5	4				1 A	0.5 A		
0 to 110	0 to 1.3		RK-80M	10	2	1 V						
0 to 320	0 to 0.5		RK-80H	20	1		1 mA					

*1 : Specification under the Local control mode.
*2 : Maximum output @115 VAC input.

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.



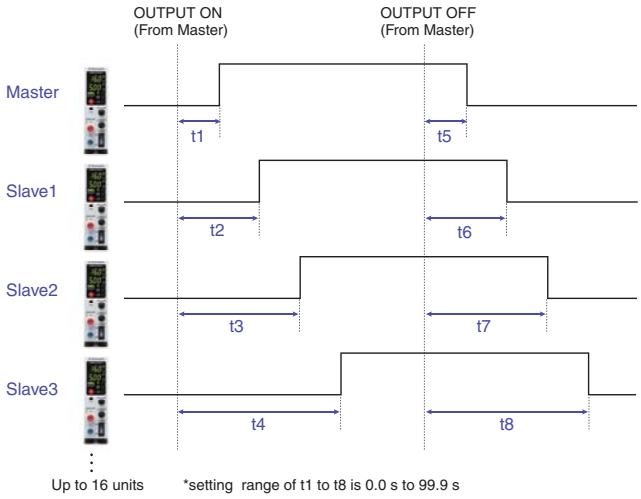
DELAY TRIGGER FUNCTION

(It is available only for one RK-80 when -LUs1, -LGob or -LRmf option is selected.)

Function to output ON / OFF of total 16 units from one master unit. (when master / slave)
It is possible to delay the ON / OFF time, and simultaneous ON / OFF setting is possible as well.
Ideal function for application which require time delay for ON / OFF setting.

Master / slave is available only for the models with -LGmb option.

*1 : R4K-36 series, R4K-80 series, TB 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

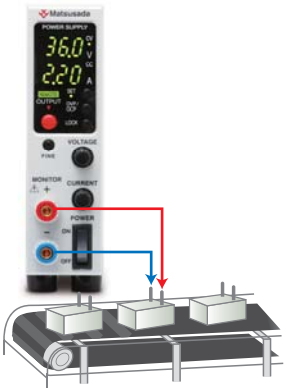
Lock all the function other than reset lock mode, and effective for purpose to avoid mis-operation when controlled.

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.

Sink Current / Sink Current Prevention Function

RK-80 series features function to sink current, and enable to decrease the voltage quickly when turning off the output or when control the voltage down, which increase the safety of operation.
In case that continuous aging test in short interval, quick voltage fall time increase the efficiency of process. On the contrary by using sink current prevention function, it is possible to prevent voltage drop on the load by decreasing the current flow from load to power supply when turning off the power supply or when decrease the output voltage.



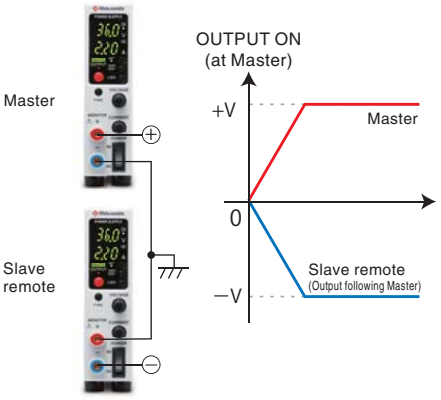
<NOTE> It is not possible to stabilize the output by controlling back current. In case of load which has inverse voltage or over rated voltage, such as inductive load or regenerative motor, protect the power supply by adding dummy resister or diode to prevent back current.

Dual Tracking, Multiple Outputs

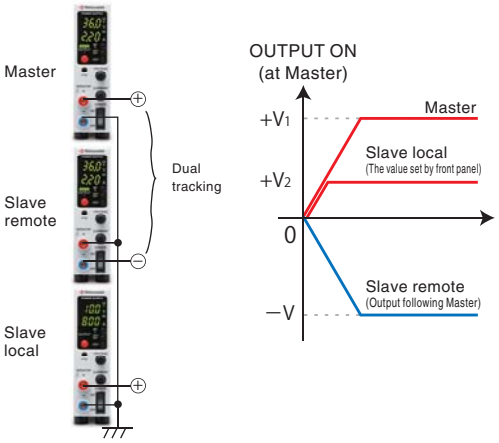
Dual tracking control, which enables both positive and negative outputs simultaneously in master slave operation, is possible. Multi outputs and various versatile operations are also possible by combining above dual tracking control and slave local mode. Positive and negative output (+V,-V) of dual tracking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

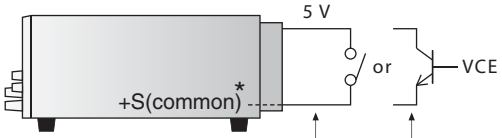


Multiple Outputs



REMOTE FUNCTIONS

Remote switch ON / OFF



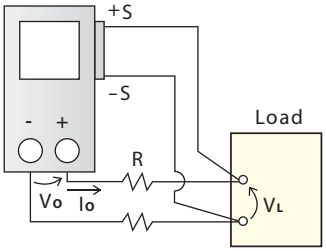
Output	Relay	Open collector
ON	SHORT	$V_{CE} \leqq 0.4$ V
OFF	OPEN	$V_{CE} \geqq 2$ V

Sink current 1 mA

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

Remote sensing

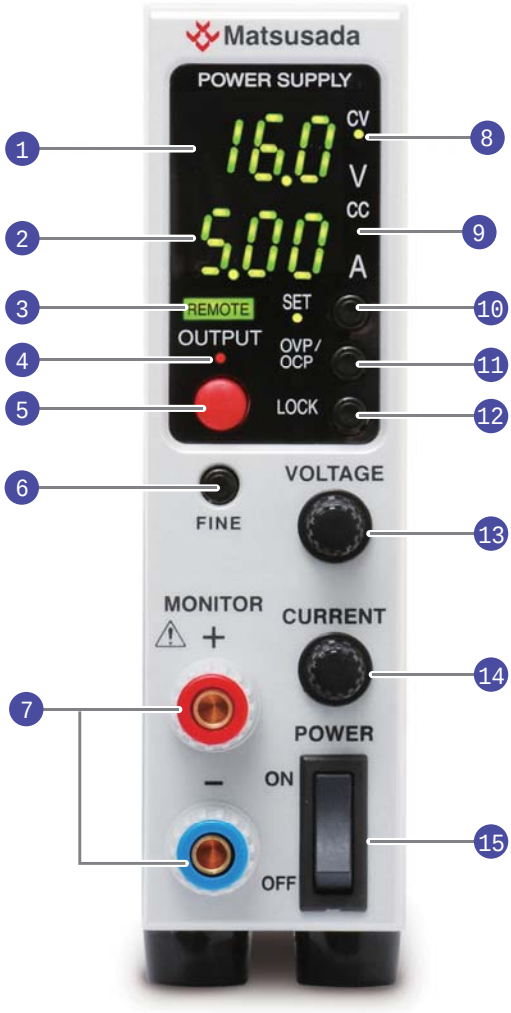
Compensate the voltage drop (V_O-V_L) due to resistance of output lead or drop of stability by contact resistance. (maximum 0.5 V)



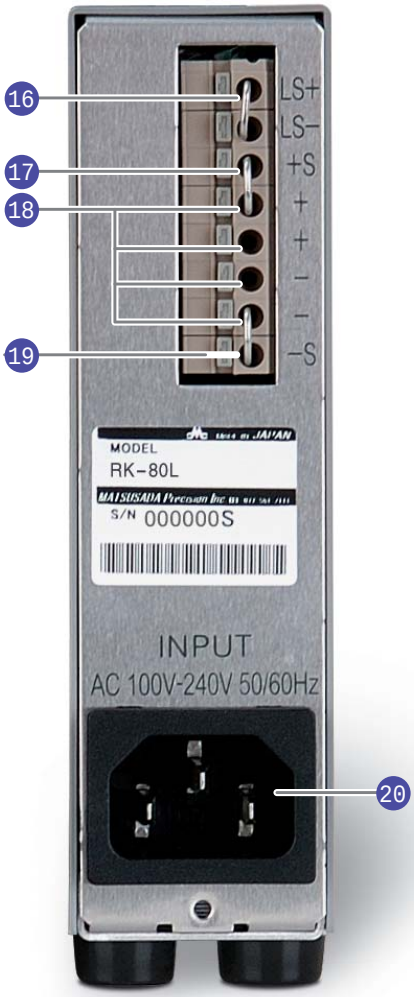
FUNCTIONS

Actual size

Front panel



Rear panel



1. Output voltage and OVP setting display
2. Output current and OCP setting display
   [RK-80H : mA display]
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 shift the digit of a setting value of output voltage / current.
7. Monitor terminal
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. LS switch (remote switch)
17. +Sense
18. Output terminal
19. −Sense
20. AC input terminal

SPECIFICATION

Output Control
CV Mode : By rotary encoder on front panel
Setting resolution of output voltage is 1 / 256 of rated maximum voltage
CC Mode : By rotary encoder on front panel
Output current setting accuracy is 1 / 256 of rated maximum output current.
Remote control is option. See OPTION for remote control function.

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 : 3-digit digital meter. Accuracy is ±0.2 % FS ±4-digits
(Accuracy of preset setting is ±0.2 %Setting ±400 mV) *2
Current : 3-digit digital meter. Accuracy is ±0.4 % FS ±5 digits
(Accuracy of preset setting is ±0.4 %Setting ±50 mA) *2

Temp.coefficiency
±0.01 % / °C (at CV mode), ±0.02 % / °C (at CC mode)

Protection
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 (TLL or external relay), Remote sensing
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

Operation Temp.
0 °C to 40 °C

Storage Temp.
−20 °C to +70 °C

Storage humidity
20 % to 80 % (no condensation)

Isolation voltage
16 V and 36 V models : ±250 V-DC (Positive or Negative terminal grounding)
110 V and 320 V models : ±500 V-DC (Positive or Negative terminal grounding)

Leak 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.

*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.

Rated output voltage	Model	Accuracy of preset value
up to 9 V	————	±0.2 %setting±40 mV
10 V to 99 V	RK-80L, RK-80	±0.2 %setting±400 mV
more than100 V	RK-80M, RK-80H	±0.2 %setting±4 V

Rated output current	Model	Accuracy of preset value
up to 900 mA	RK-80H	±0.4 %setting±5 mA
901 mA to 9 A	RK-80, RK-80M	±0.4 %setting±50 mA
10 A to 99 A	RK-80L	±0.4 %setting±500 mA

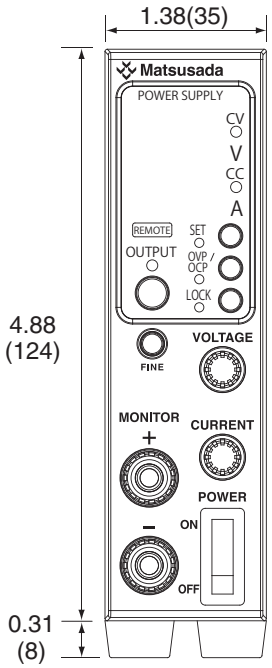
ACCESSORIES

·Input AC cable 2.5 m
single phase 3-pin type(1)
(⇒refer to “AC input cable” in page 10.)
·Instruction manual(1)
·Ground plate(1)

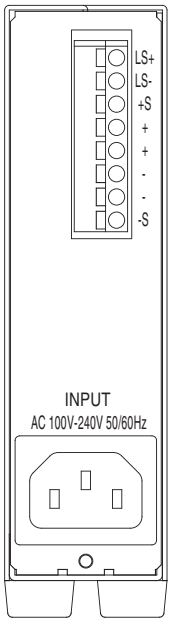
*For safer operation, connect ground plate and output terminal.

Dimensions inch(mm)

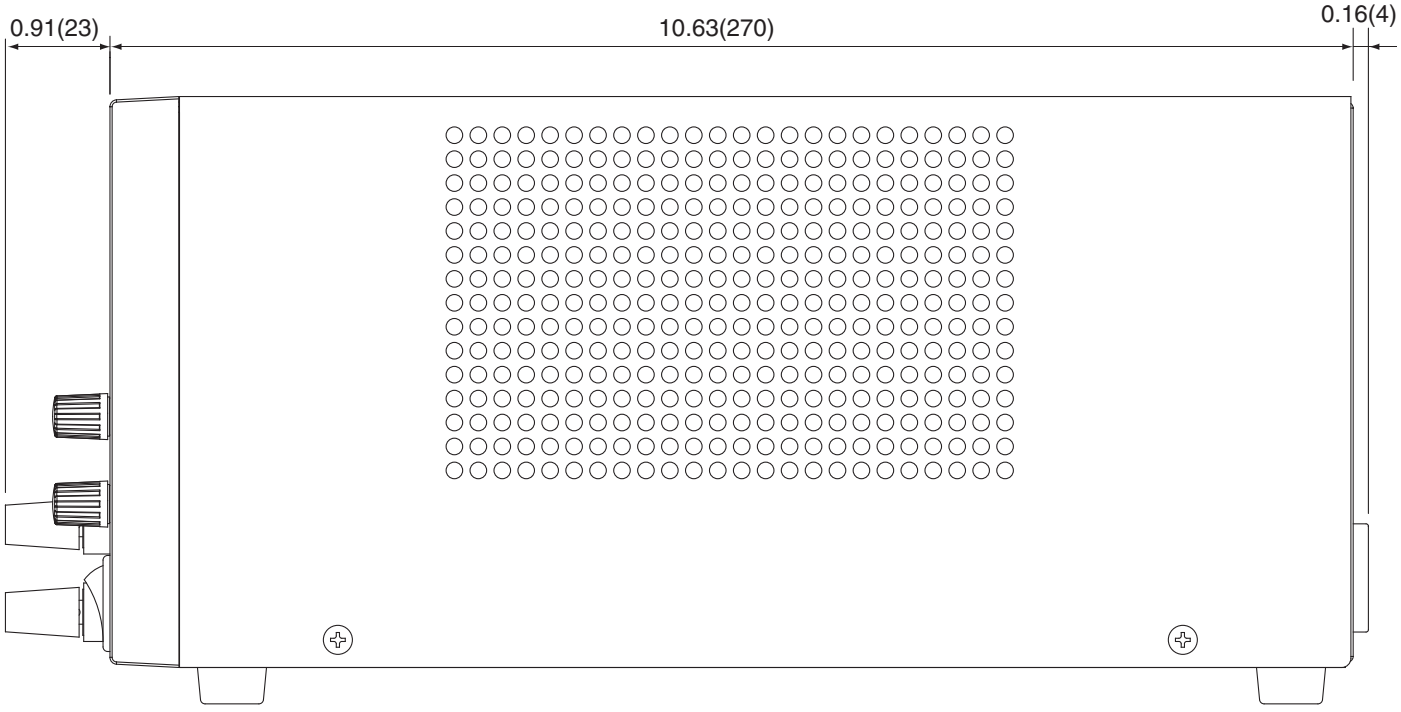
Front



Rear



side

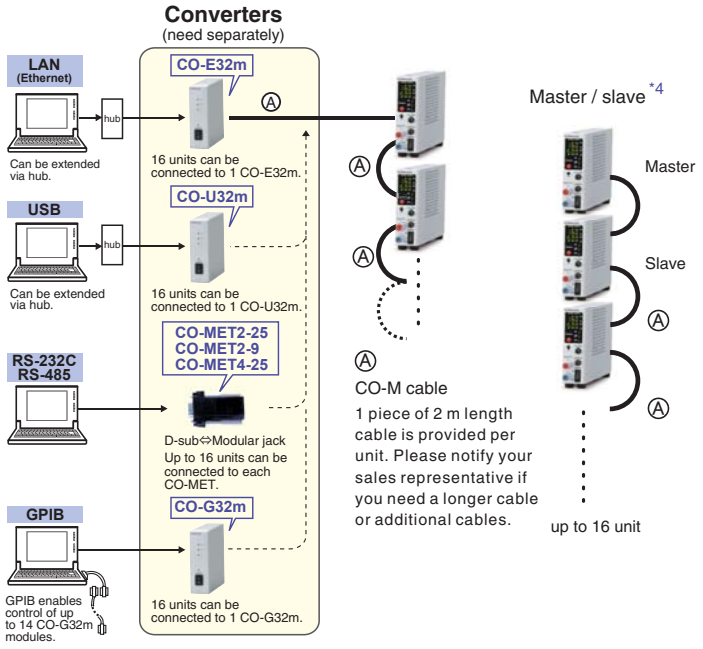


Options

-LGmb Digital interface board *1 *2

-LGmb : Digital interface + modular cable 2 m length
-LGmb(Mc0.15) : Digital interface + modular cable 0.15 m length
-LGmb(Mc0.5) : Digital interface + modular cable 0.5 m length

Enable digit control via LAN(Ehternet *3) / USB / RS-232C / RS-485 / GPIB as well as one control with Master / Slave.

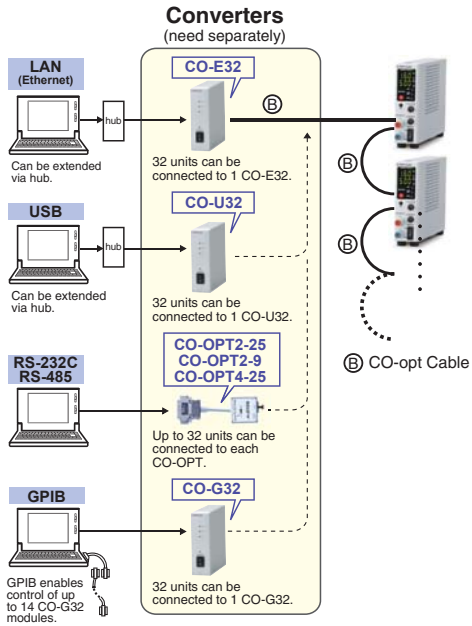


When noisy environment is presumed, the following -LGob option(optical interface) is required.

-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.



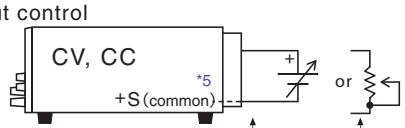
Select the -LGob option when using power supply following environmental condition
・Factories which has a lot of noise
(ex.)in case of using power supplies and loads near motors and coils.
・In case using power supply with high voltage floating(more than 250V)
・The length between power supply and controller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

-LUs1 USB Interface Board *1 *2 *4

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

-LRmf Remote multi function *1

Output control



Vout・Iout	Vcon・Icon	R
0 to MAX	0 to 10 Vdc approx.	0 to 10 kΩ approx.

At the time of the remote control, it performs "operation to change 3 ranges" as follows.

model	Switch number	Range	Rated output voltage	Rated output current
RK-80L	1	High	16 V	5 A
	2	Middle	10 V	8 A
	3	Low	8 V	10 A
RK-80	1	High	36 V	2.2 A
	2	Middle	27 V	3 A
	3	Low	16 V	5 A
RK-80M	1	High	110 V	0.7 A
	2	Middle	80 V	1 A
	3	Low	60 V	1.3 A
RK-80H	1	High	320 V	200 mA
	2	Middle	250 V	300 mA
	3	Low	160 V	500 mA

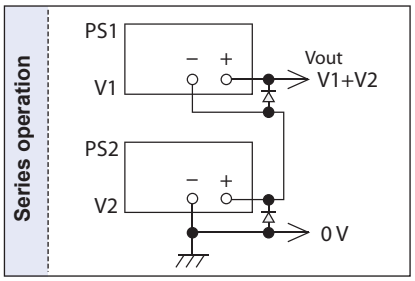
*1) These options can be chosen only one either.
*2) For detailed specification of USB and digital interface, please refer date sheet of CO series.
*3) Ethernet is the registered trademark of Xerox corporation.
*4) Delay triger function can be set individually at the time of master-slave. Furthermore, all functions (except OUTPUT) of master-slave can be also canceled by the change of Remote / Local, and the preset value of output voltage / current can be set individually.
*5) +S is common. So external control voltage shall be input with +S as reference. Otherwise it can cause failure.

How to order

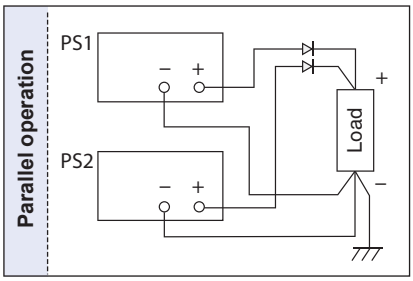
Add above -L mark to the model number when ordering
{e.g} RK-80-LGmb(Mc0.5), RK-80L-LGob(Fc20)
alphabetical order

Series Operation · Parallel Operation

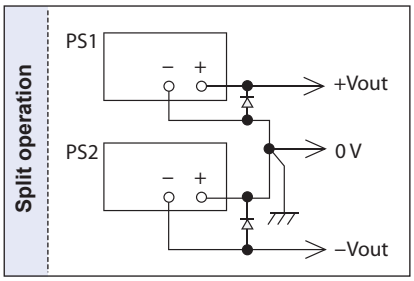
RK-80 power supply of same model number can be connected in series or parallel to increase output voltage or current.
In that case, local control or the control in the digital master slave is recommended.
Because the common of the outside input / output control connector (TB1) is connected to the positive output, please do not connect common 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.

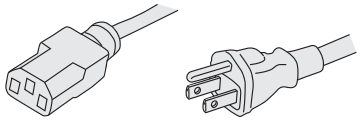
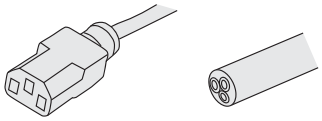
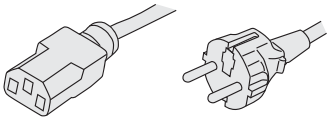


Please keep all the settings of voltage the same. Output current will be the summation of each current. Please keep OVP level of power supply maximum to prevent any damage.



+output and –output are available.

AC Input Cable

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

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.

Connection · Operation

Connection of load

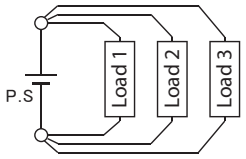
· Please use a short lead wire that is sufficiently thick for the connection.

· 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.

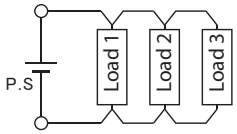
AWG	mm2	Max current(A)
18	1.1	2
16	1.3	7
14	2.1	11
12	3.3	18
10	5.3	23
8	8.4	39
6	13	67

Parallel connection of load

○ *Good example*



× *Bad example*

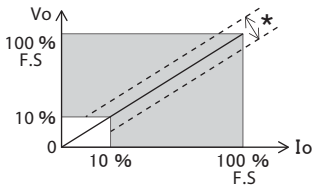


Definition of specifications

Specifications in this catalog, except otherwise specified, refer to values when maximum rating output (full scale∗) after 2-hour warm up.

Applicable scope of specifications

"F.S × catalog value(∗)" is applied for ripple, stability, regulations and temperature coefficient, and "value if F.S × ±0.5 %(∗)" is applied for high-voltage output linearity, monitor linearity and display linearity, both in the range of 10 % to 100 % of maximum rating output.



Ripple

Indication is in rms that includes high-frequency noise.

Preset

Preset value does not show the actual output status accurately. If you need an accurate setting, conduct actual output without load and set a voltage. Also for setting current, conduct output after shorting the output terminal and gradually raise current before setting at a desired value.

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.

FAX

USA/Canada : +1-888-652-8651
other countries : +81-6-6150-5089

Customer Inquiry Sheet (RK-80 series)

Please copy this page and above fax number after filling out form below.

■ I would like

☐ A quotation ☐ An explanation of product ☐ A demonstration ☐ To purchase

☐ Other ( )

■ Give us your requirement / comment

■ Please fill in below.

Address:	
Company:	
Dept.:	Title:
Name:	
Tel:	Fax:
E-mail:	

Manufacturer warranty

We warrant the specification, unless otherwise specified, at max. rated output after warm up, and scope of application is between 10% and 100% of max. rated output. We warrant that products contained in this catalog (hereinafter, the "Products") are free from defects in material and workmanship under normal use for a period of one (1) year from the date of shipment thereof. However, the warranty period for X-ray detectors and X-ray source shall be either one (1) year from the date of shipment or 1,000 hours, whichever shorter. The above warranty shall not apply to any Product which, at our sole judgment, has been: i) Repaired or altered by persons unauthorized by us; or ii) Connected, installed, adjusted or used otherwise than in accordance with the instructions furnished by us (including being used in an inappropriate installation environment, such as in corrosive gas, high temperature and humidity). We are not liable for any loss, damage or failure of the Products after the shipment thereof caused by external factors such as disasters. We will not inspect, adjust or repair any of our power supply products in the field or at any customer site. If you suspect that there has been a power supply failure in the field, please inspect your whole unit by yourself in an effort to determine that the problem is, in fact, arising out of our power supply products. If it is found that the problem is arising out of such power supply product after inspection, please contact your local sales office for additional troubleshooting. A "Return Merchandise Authorization" is required in case the power supply must be sent back to the factory in Japan for inspection and repair. We, at our sole discretion repair or replace such defective products at no cost to the purchaser. We assume no liability to the purchaser or any third party for special, incidental, consequential, or other damages resulting from a breach of the foregoing warranty. This warranty excludes any and all other warranties not set forth herein, express or implied, including without limitation the implied warranties of merchantability or fitness for a particular purpose. The Products are not designed and produced for such applications as requiring extremely high reliability and safety, or involving human lives (such as nuclear power, aerospace, social infrastructure facility, medical equipment, etc.). The use under such environment is not covered by this warranty and may require additional design and manufacturing processes. No modification or supplement of this warranty shall be binding unless in writing and signed by a duly authorized officer of Matsusada. Matsusada reserves the right to make any changes in the contents of catalogs or specifications at any time without advance notice. Due to compelling reason such as unavailability of components used, products might be un available or unable to repair. The products specified in catalogs or specifications are designed for use by the person who has enough expertise or under the control of such person, and not for general consumers. Schematics of products shall not be submitted to users. Test result or test data for the products shall be available upon request with charge.
Make sure you read the specification in the latest catalog before you order. Contact nearby sales office for the latest catalog.
PLEASE SEE THE LINK BELOW FOR THE COMPLETE WARRANTY TERMS
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