Matsusada Precision

Compact / High Power DC Power Supply

RK Series

NEW

The option that sequence movement is without a PC is available.

Compact / High Power Programmable DC Power Supply

RK series

400W	6V to 650V / 0.6A to 65A
800W	6V to 800V / 1A to 130A
1200W	6V to 650V / 1.8A to 180A

www.matsusada.com

RK series

A 2.76-inch(70mm) wide, this 400W compact body-size

Low noise, multiple functions, and digital communication are highlights of this supply which can be used from R&D to a variety of applications. All this convenience in a small DC power supply.

RK series is a small, programmable desktop 400W, 800W, 1200W high output power supply. The system can also be installed quite safely. Our low noise switching method include several features such as a delay trigger, memory function, and a lock to prevent operator mistake. All this enables the user to operate the supply for a wide range of applications. Moreover, the sequence function enables the user to control the supply without a laptop. The digital interface is also standard, allowing either Ethernet*1, USB, RS-232C, RS-485, or GPIB control, allowing the operator to use the system in many different production environments.*2

*1 Ethernet is the registered mark of Xerox Corporation. *2 Adaptors or options will be needed additionally.

Compact and high power
400W, 800W, 1200W

Ideal for research and development with low noise switching method.

PFC circuit and universal input wound not select the place of operation.

Various operations by connecting multiple power supplies, such as master/slave, is possible.

Sink-current / Disable sink-current function contribute to high speed response, and also good for applications which need constant voltage.

Operability and safety are improved with new features of key-lock function and acceleration rotary encoder, which accelerate the output ramp up with the speed of rotating the encoder.

Lineup

★ They are the models which can correspond to CE marking with -LCe option. Please refer to P.10 “Options”.

Output Voltage (V)	Output Current (A)	MODEL	Ripple	
			(mVrms)	(mArms)*1
0 to 6	0 to 65	RK6-65	10	130
	0 to 130	RK6-130	10	260
	0 to 180	RK6-180	15	360
0 to 10	0 to 40	RK10-40	10	80
	0 to 80	RK10-80	10	160
	0 to 120	RK10-120	15	240
0 to 15	0 to 26	RK15-26	10	60
	0 to 54	RK15-54	10	110
	0 to 80	RK15-80	15	160
0 to 20	0 to 20	RK20-20	10	40
	0 to 40	RK20-40	10	80
	0 to 60	RK20-60	15	120
0 to 30	0 to 13	RK30-13	10	30
	0 to 27	RK30-27 ★	10	60
	0 to 40	RK30-40	15	80
0 to 36	0 to 11	RK36-11	10	20
	0 to 22	RK36-22 ★	10	60
	0 to 33	RK36-33	15	80
0 to 45	0 to 9	RK45-9	10	20
	0 to 18	RK45-18 ★	15	60
	0 to 27	RK45-27	18	80
0 to 60	0 to 6.6	RK60-6.6	10	15
	0 to 13.5	RK60-13.5 ★	12	45
	0 to 20	RK60-20	18	60

Output Voltage (V)	Output Current (A)	MODEL	Ripple	
			(mVrms)	(mArms)*1
0 to 80	0 to 5	RK80-5	10	15
	0 to 10	RK80-10	30	20
	0 to 15	RK80-15	30	20
0 to 120	0 to 3.3	RK120-3.3	30	10
	0 to 6.6	RK120-6.6	30	20
	0 to 10	RK120-10	30	25
0 to 160	0 to 2.5	RK160-2.5	30	5
	0 to 5	RK160-5	30	10
	0 to7.5	RK160-7.5	30	20
0 to 250	0 to 1.6	RK250-1.6	40	5
	0 to 3.2	RK250-3.2	50	10
	0 to 4.8	RK250-4.8	50	15
0 to 350 *2	0 to 1.1	RK350-1.1	30	5
	0 to 1.5	RK350-1.5*3	35	5
	0 to 2.2	RK350-2.2	40	5
	0 to 3.2	RK350-3.2	50	10
0 to 400 *2	0 to 2	RK400-2	40	5
0 to 500 *2	0 to 0.8	RK500-0.8	20	5
	0 to 0.9	RK500-0.9*3	20	5
	0 to 1.6	RK500-1.6	30	5
	0 to 2.4	RK500-2.4	40	10
0 to 650 *2	0 to 0.6	RK650-0.6	40	5
	0 to 0.8	RK650-0.8*3	50	5
	0 to 1.2	RK650-1.2	80	5
	0 to 1.8	RK650-1.8	100	5
0 to 800 *2	0 to 1	RK800-1*4	100	5

*1 : At 10% to 100% of rated output voltage and rated output current.

*2 : Models of 350V and up have no output monitor terminals on front panel. Contact us when you need them.

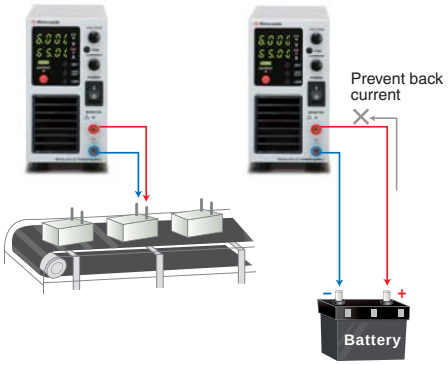
*3 : Dimensions are different from other 400W models. See page 9.

*4 : Dimensions are different from other 800W models. See page 9.

Features

SINK CURRENT / SINK CURRENT PREVENTION FUNCTION

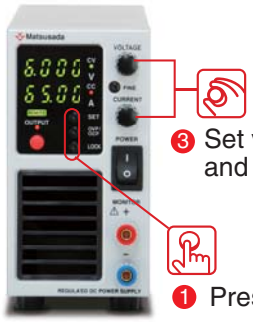
RK series features function to sink current, and enable to decrease the voltage quickly when turning off the output or when control the voltage down, which increase the safety of operation. In case that continuous aging test in short interval, quick voltage fall time increase the efficiency of process. 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.

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.



TWO MODE LOCK FUNCTION

Function to select two different lock functions for two different purpose."Full Lock" locks all the functions on front panel, and "Normal Lock" locks all the functions 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

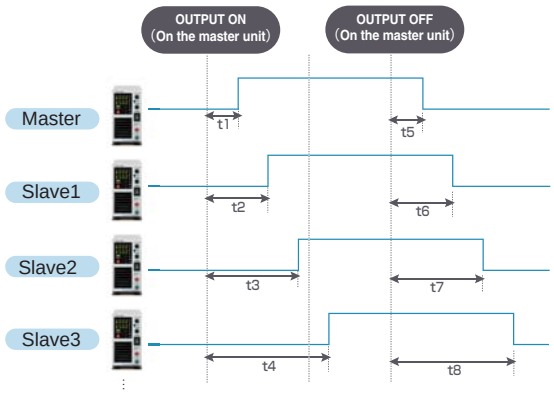
Lock all the function other than reset lock mode, and effective for purpose to avoid mis-operation when controlled

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.

DELAY TRIGGER FUNCTION

This function enables power supply to set to delay the output trigger timing. Either in case of single unit of RK series power supply or in case of multiple power supplies in Master / Slave connection (*1), it is possible to use this feature (*2) among multiple DC power supplies having individually different output voltage / current setting (*3)



Total 16 units * t1 to t8 can be set in the range 0.0s to 99.9s.

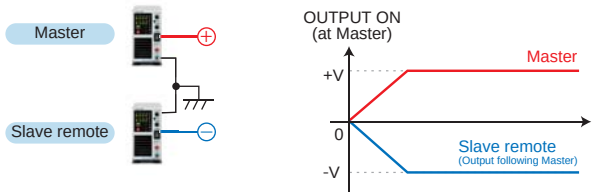
*1 : Can be connected up to 16pcs.
*2 : Only for slave-local. In case of slave remote control, exact same model of power supply need to be used. Also, in case of slave-local, each output voltage and current can be set individually. In case of slave-remote, output voltage and current can be set with one-control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

DUAL TRACKING, MULTIPLE OUTPUTS

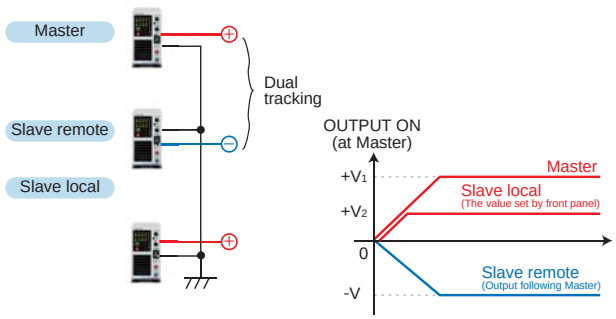
Dual tracking control, which enables both positive and negative outputs simultaneously in master slave operation, is possible. Multi outputs and various versatile operations are also possible by combining above dual tracking control and slave local mode. Positive and negative output (+V, -V) of dual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

(Please refer to P.10 for detail of connection.)

Dual Tracking



Multiple Outputs



New useful functions

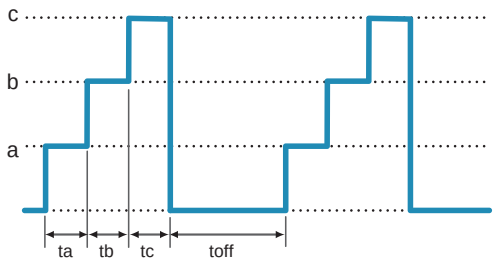
In addition to standard functions, these features offer many different usage and use in wide variety of applications.

Pulse / Ramp sequence, Master follow function(-LDe option)

above 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.

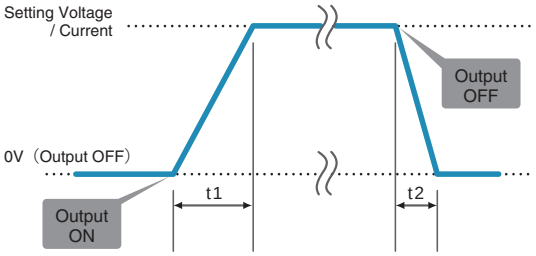


ta,tb,tc and toff can be set with range 1.0s to 99.9h respectively.

B. Ramp

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

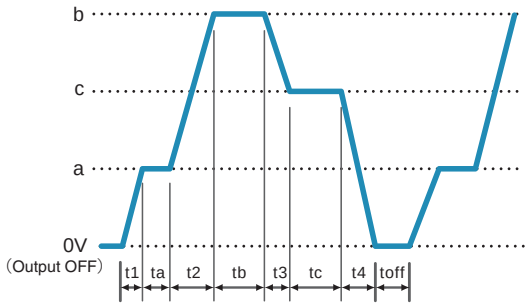
*The Ramp sequence can be selected from [both set voltage and current], [only set voltage], and [only set current].



t1 and t2 can be set with range 0 to 999s respectively.

C. Combination of Pulse and Ramp Sequence

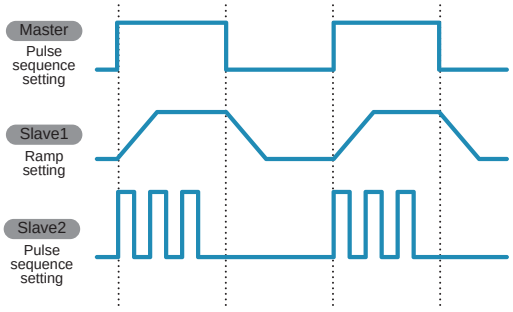
Features of pulse sequence operation and ramp sequence operation can be combined for more convenient operation. In addition, by adding multi set function, sequence operation can be operated using stored voltage and current settings in each memory. The setting of repetition to say nothing of a continuous 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.



t1, t2, t3 and t4 can be set with range 0 to 999s respectively.
ta, tb, tc and toff can be set with range 0.0s,1.0s to 99.9h respectively.

D. Master follow

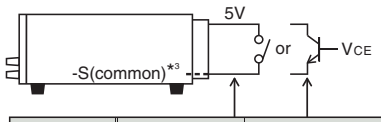
When the pulse sequence operation and the ramp work master-slave, the output signal to the slave unit is transmitted. The slave unit can be output in an output status different from the master unit.



Note The operation accuracy of the timer when sequensing is 0.5%. Be careful when you use it by the long-term running operation.

Standard functions

Remote switch ON / OFF



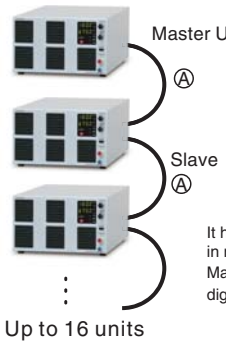
Output	Relay	Open collector
ON	SHORT	VCE ≦ 0.4V
OFF	OPEN	VCE ≧ 2V

Sink Current 1mA
Logic of output can be reversed.

Master / Slave Control

Master unit can control multiple units connected as slave.
Please refer to P.4 “Delayed Trigger Function” and “Dual Tracking and Multi-Output”, P.5 “D. Master Follow”.

* This is not a function for parallelly connected power supplies to give out average output current.

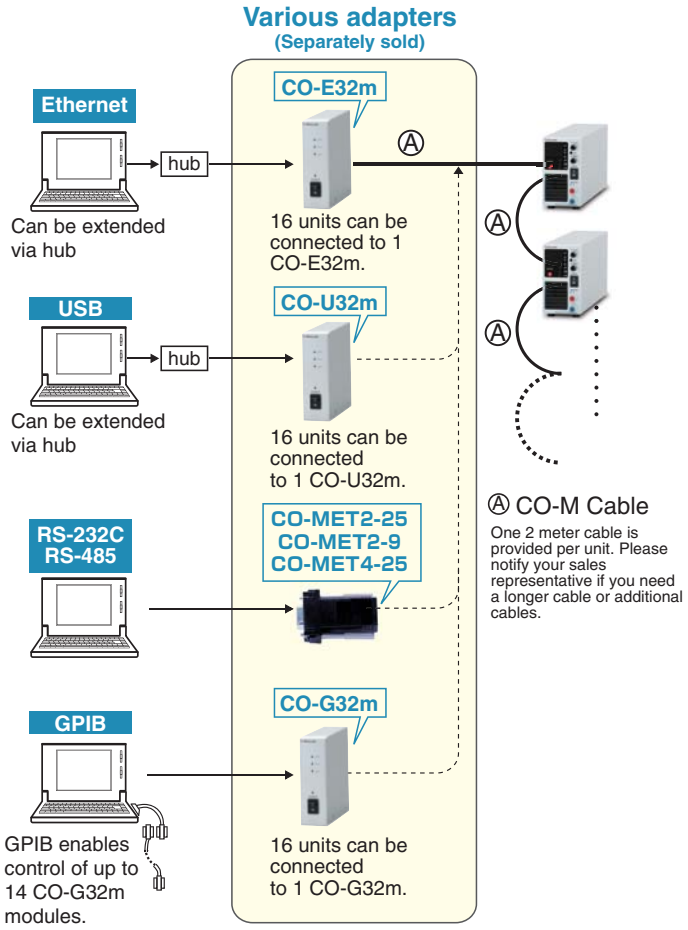


Ⓐ CO-M cable
One piece(2m L) is included per a unit.
Please consult our sales staff, if much more extension required.

It has to hook with each same model in the same series in master-slave.
Master-slave function can only be effective with standard digital interface.

Digital interface

Able to one control master-slave operation in addition to digital control by USB / LAN(Ethernet) / RS-232C / RS-485 / GPIB

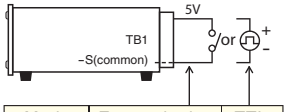


Ⓐ CO-M Cable
One 2 meter cable is provided per unit. Please notify your sales representative if you need a longer cable or additional cables.

-LGob option will be needed if it will be used under noisy condition. Please see P.10 for detail.

Remote Control

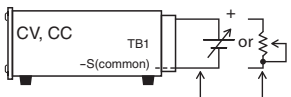
Remote / Local change



Mode	External relay	TTL
Remote	Short	Low
Local	Open	High

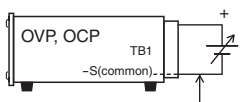
Each mode of voltage, current, OVP, OCP can be switched by relay or TTL signal.

Output control



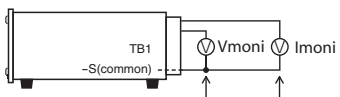
Vout·Iout	Control voltage	R★
0 to MAX	0 to approx.10Vdc input imp.500kΩ	0 to approx. 10kΩ

★Possible to change 10kΩ to 0Ω for fail safe



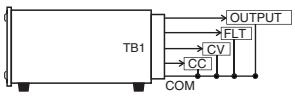
Vout·Iout	Control voltage
Max ×5 to 110%	0 to approx.10Vdc input imp.20kΩ

Output Monitor



Output 0 to MAX	0 to approx.10Vdc Output imp.1kΩ	0 to approx.10Vdc Output imp.1kΩ

Status Output



OUTPUT ON when OUTPUT
FLT ON when fault *
CV CC ON when each mode

*On when OVP, OCP, OTP, ACF, reverse connection of sensing or interlock(LD) status.

Common is floating in open collector output of common. Withstand voltage 30Vdc, sink current 5mA or less.

Please have the remote connector(TB1) isolated in order to prevent the damages to power supply in case it is connected to an electrical load which gives out high energy pulsive output.

Specifications

Input Voltage	85 to 264VAC 50Hz / 60Hz Single Phase (Rated input voltage range is between 100V to 240VAC (50Hz / 60HZ) while applying CE marking.
Input Current (at 115VAC)	400W Models : 5.2A max 800W Models : 11A max 1200W Models : 16A max Power factor at max. output : 0.99 typ.
Output control	Local : Constant voltage : rotary encoder on front panel Constant current : rotary encoder on front panel Remote : Constant voltage : external control voltage 0Vdc to 10Vdc or external variable resistor 0Ω to approx.10kΩ Constant current : external control voltage 0Vdc to 10Vdc or external variable resistor 0Ω to approx.10kΩ
Voltage regulation	Line : 0.05% of maximum output (for AC±10% input change) Load : 0.1% of maximum output (for 10% to 100% load change)
Current regulation	Line : 0.05% of maximum output (for AC±10% input change) Load : 0.1% of maximum output (for 10% to 100% load change)
Stability	0.05%/8H of maximum output voltage
Temperature coefficient	0.01% / °C of maximum output voltage 0.02% / °C of maximum output current
Output display	Output voltage : 4-digit digital meter (±0.5%rdg±5digit at 23°C±5°C) Output current : 4-digit digital meter (±0.5%rdg±5digit at 23°C±5°C)
Monitor output	Output voltage monitor : 10V / maximum output voltage Output current monitor : 10V / maximum output current
Protection	Over voltage protection (OVP) : Output is cut off at a set value. Over current protection(OCP) : Output is cut off at a set value. Setting range : approx.5% to 110% of rated output Local setting : Rotary encoder on front panel Reset: Manual recovery by OUTPUT switch or remote switch. Over temperature protection (OTP) Output is cut off when internal part is heated abnormally. Reset (after the temperature has gone down to normal) : Manual recovery by OUTPUT switch or remote switch. 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 Interlock(LD) Fail-safe system

Other functions	Keylock to avoid misoperation. Digital master slave operation. (Up to 250V for series operation.) (Max 16 units for parallel or series connection.) (Combination of parallel and series is not possible.) Setting memory function Quiet forced air cooling Remote sensing Remote switch ON / OFF (TTL or external relay) Status signal output (CV, CC, FLT, OUTPUT) Delay trigger : Individual setting of ON delay and OFF delay (0.0 to 99.9sec) Multi setting function : Voltage and current memory "a" "b" and "c" setting in addition to standard voltage and current preset
Transient response time	Recovery time 1ms (the time before returning to less than 10% of the setting voltage for 70% to 100% load change at the time of CV operating)
Operation temperature	0°C to +50°C (when the input voltage is below 100VAC, the output power is to be derated at 10%.)
Storage temperature	-20°C to +70°C
Storage humidity	20% to 80% RH (no condensation)
Isolation Voltage	±250VDC (Positive or Negative grounding)
Dielectric voltage	Between input power supply and output terminal, and between input terminal and chassis is AC1000V : 1 minute
Accessories	·Instruction manual (1) ·Output terminal cover (1) only 800W,1200W Models (up to 80V) ·Remote connector cover (1) ·CO-M cable 2m (1) ·Input AC cable 2.5m (1) (See page.10)

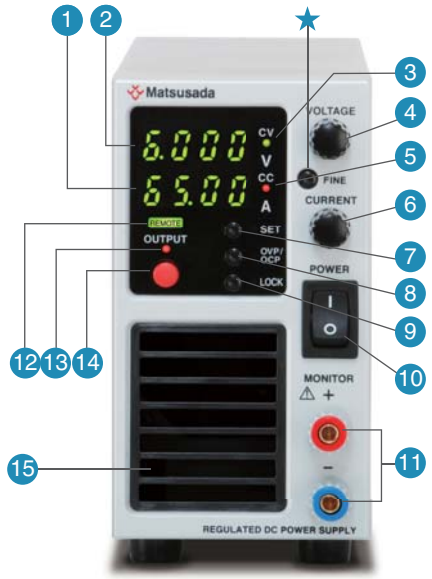
Various Digital Control Functions

Control function	Output ON / OFF setting	
	Status output (fault / output / OVP / OCP / OTP / ACF / reversible sense connection / interlock)	
	Maximum 16 units(-LGob option models : 32nits) 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.

Functions

Front Panel

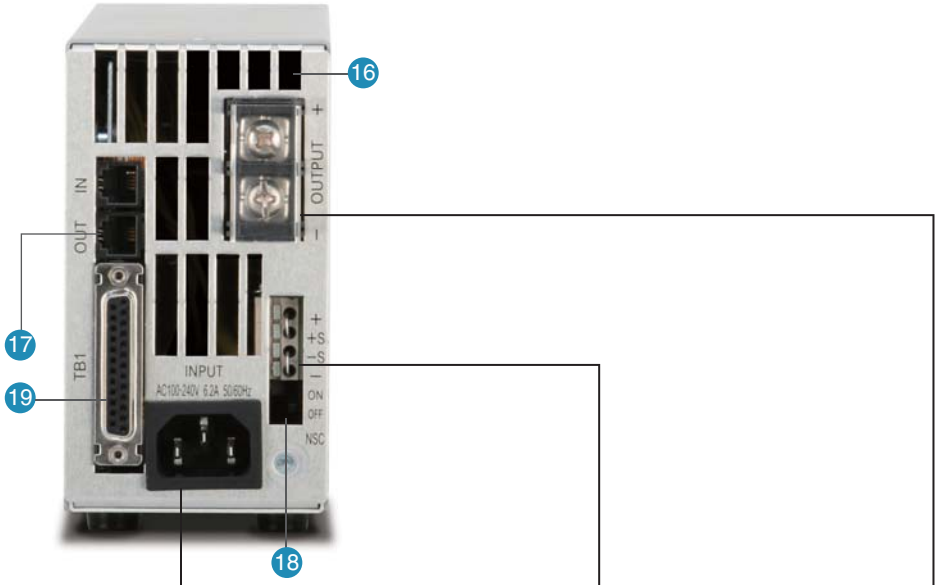


1. Output voltage, OVP setting display
2. Output current, OCP setting display
3. OVP / OCP setting switch
4. Keylock setting switch
5. Power ON / OFF switch
   (This has priority over all operations for safety reason.)
6. Monitor terminal (20Amax)
7. Constant voltage mode
8. Output voltage, OVP setting dial
9. Constant current mode
10. Output current, OCP setting dial
11. Output preset switch
12. Remote programming display
    (Light on when voltage/current remote control.)
13. OUTPUT (Light on when output is ON.)
14. Output ON / OFF switch (To be used to turn output on / off when local mode as well resetting protection functions.)
15. Air intake (Temperature-sensitive fan.)
16. Exhaust hole
17. Digital interface (Master Slave connect on)
18. Not Sink Current switch
19. Connector for remote control (TB1)

★ FINE switch only 400W models except RK350-1.5, RK500-0.9 and RK650-0.8

Switching setting digit when setting output voltage or current.

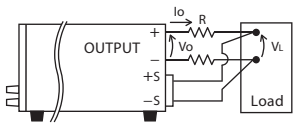
Rear Panel



Input Terminal

·AC Inlet for 400W,800W models.
·Terminal board for 1200W models.

Remote sensing



Prevents voltage drop down (V_O-V_L) due to resistance (R) or deterioration of stability by contact resistance (Max compensation 0.5V)

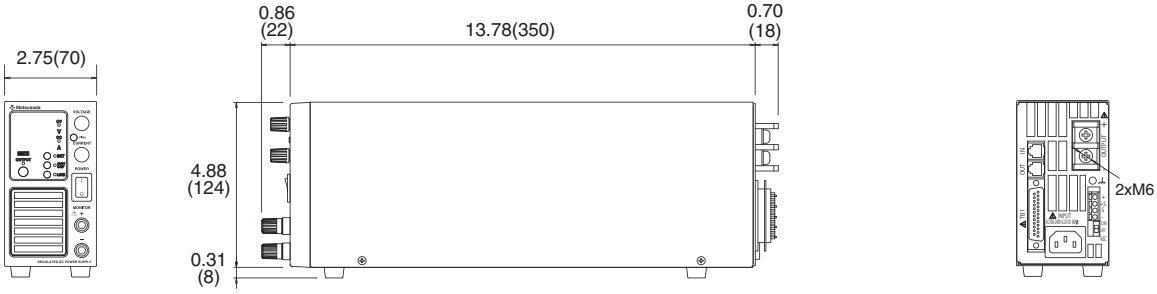
Output Terminal

·Terminal board for 400W models.
·Busbars for 800W, 1200W models.

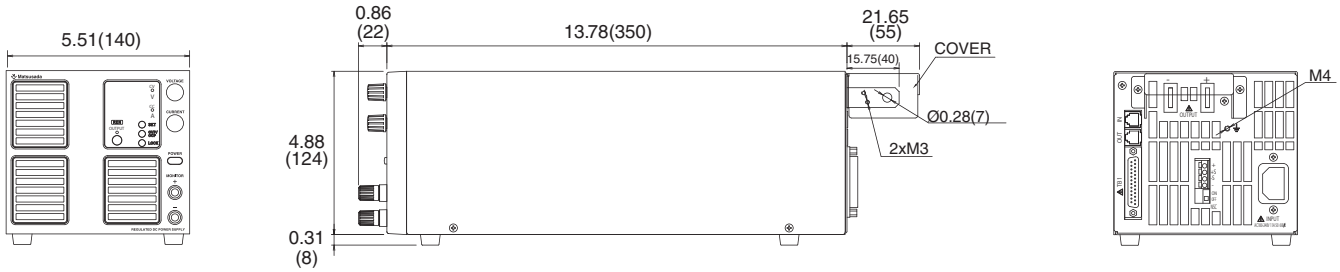
** Output terminal for high voltage models (≧120V) of RK800W and RK1200W (except RK800-1) and the model correspondeing to CE marking.*

Dimensions inch(mm)

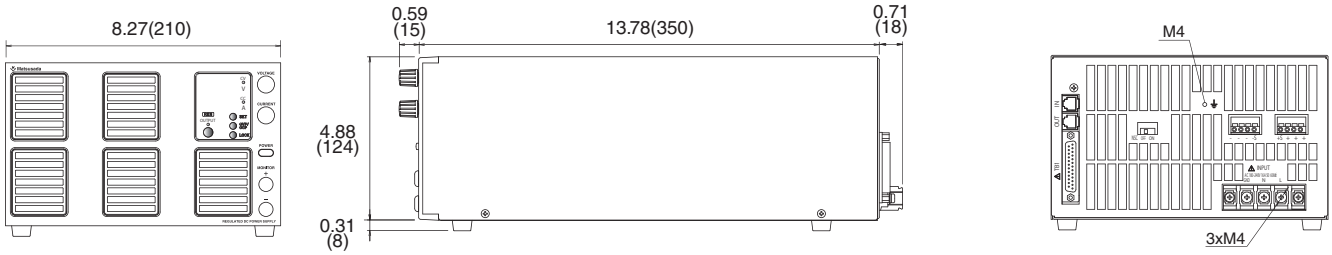
400W models (except RK350-1.5, RK500-0.9 and RK650-0.8) Weight : 3kg approx.



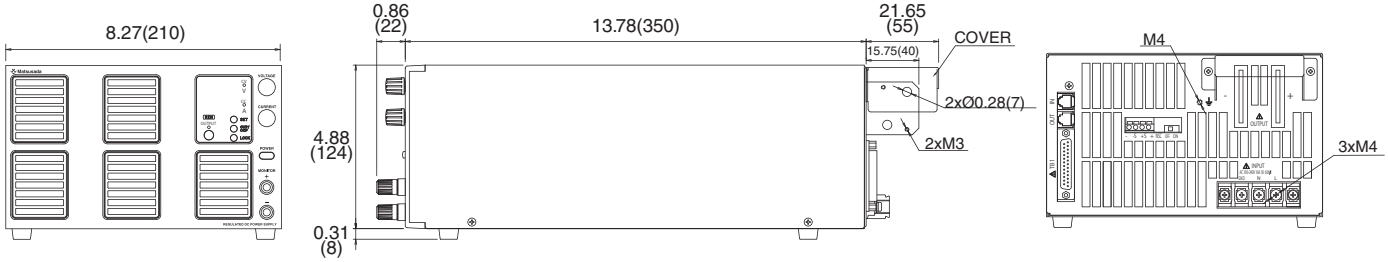
400W models (only RK350-1.5, RK500-0.9 and RK650-0.8), 800W models (except RK800-1) Weight : 5kg approx.



800W models (only RK800-1) Weight : 6kg approx.



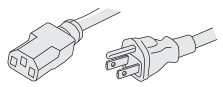
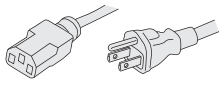
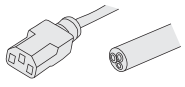
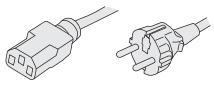
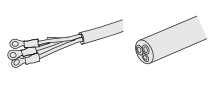
1200W models Weight : 6kg approx.



* Output terminal for the model corresponding to CE marking and high voltage models (≧120V) of RK800W and RK1200W are the same terminal board used for RK400W.

AC Input Cables

When you use RK series in Europe, please contact our sales office.

CABLE TYPE 1 (RK400W standard)	CABLE TYPE 8 (RK800W standard)	CABLE TYPE 3 (RK400W, RK800W)	CABLE TYPE 4 (RK400W, RK800W)	CABLE TYPE 5 (RK1200W standard)
125V / 10A	125V / 15A	250V / 10A	250V / 10A	250V / 25A
				

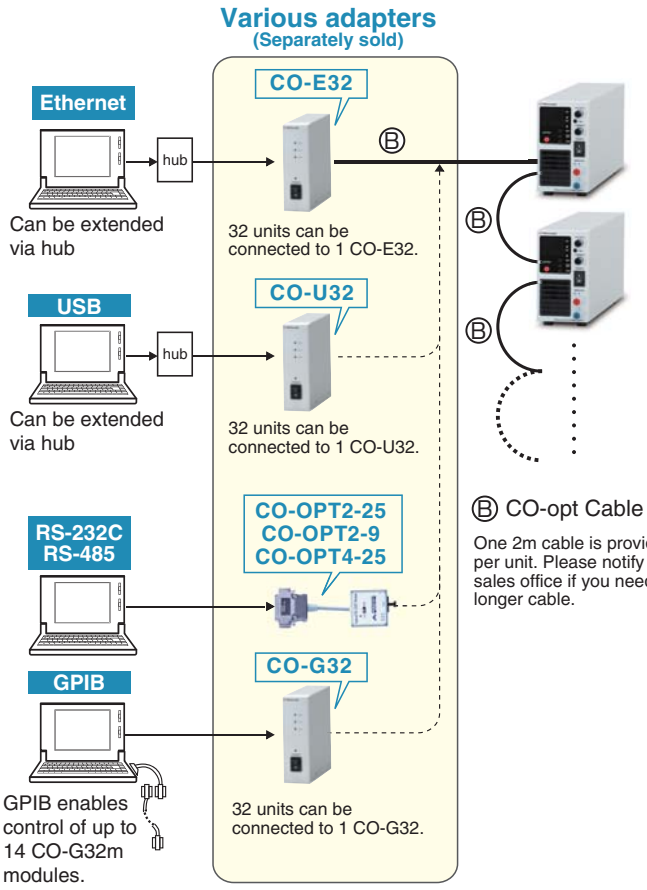
Please use the AC cable suitable for use environment and the area. CABLE TYPE3 and 4 correspond to CE marking.

Options

-LGob : Optical Interface Board *1 *2

-LGob	Optical Interface Board + 2 meters long optical cable
-LGob (Fc5)	Optical Interface Board + 5 meters long optical cable
-LGob (Fc10)	Optical Interface Board + 10 meters long optical cable
-LGob (Fc20)	Optical Interface Board + 20 meters long optical cable
-LGob (Fc40)	Optical Interface Board + 40 meters long optical cable

It is isolated by optical communication. It makes it possible to prevent malfunction caused by transient phenomenon such as surge, lightning, induction, and external noise due to perfectly isolated by optical fiber.



In case power supply will be use following condition, make sure this options selected.
- Noisy environment such as factories.
  (ex. usage of motor and coil around load or power supply)
- Usage on high voltage floating (more than 250V)
- In case the distance between power supply and controller (PC or PLC) is longer than 2-meter long.

-LDe : Pulse / Ramp sequence, Master follow function

Please see page 5.

-L(SCPI) : SCPI command

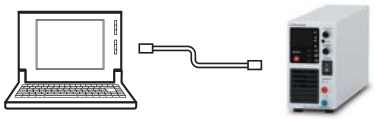
Enable control via SCPI command.

-LCe : Corresponding to CE marking *3

Object : Models with ★ mark on P.3 "Lineup".

-LUs1 : USB Interface Board *1 *2

Enable digital control via USB

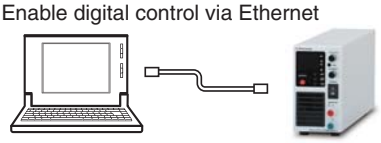


When controlling several RK power supplies via USB, a USB hub will be required between the PC and RK power supplies.

Corresponding OS : Microsoft Windows XP / Vista / 7 / 8
(All can correspond to both the 32-bit version and the 64-bit version.)
(Microsoft and Windows are registered trademarks of Microsoft Corporation.)

-LEt : Ethernet Interface Board *1 *2

Enable digital control via Ethernet



Hab shall be required between RK and personal computer when control multiple RK via Ethernet.

If this option is taken, CE certification becomes void.

-L(Mc0.5), -L(Mc0.15) Communication cable extension

The length of CO-M cable will be 0.5-meter long 0.15-meter long.
(You can choose only either.)

-LZ : The handle for carrying

It can attach with all the models. (Height rises by 8mm.)

If this option is taken, CE certification becomes void.

*1 : These options cannot be selected together. Only one of each can be selected.
*2 : Please see the CO series catalog for detail of digital interface function.
*3 : Please ask to our sales office about the update status of the CE marking acquisition.
-LCe option can not be selected with -LEt or -LZ option.

When ordering, suffix the above option number to the model number.
<e.g.> RK30-27-LCeDeGob(Fc5)(SCPI), RK650-1.8-LDe(Mc0.5)(SCPI)Z

Coming soon **Please contact our sales office for detail.**

Output current accumulation function

Accumulate the output current and display its value.

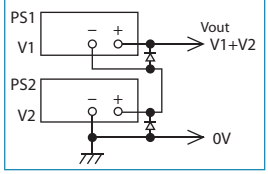
Multi-digital interface

Digital control by LAN(Ethernet), USB(USBTMC) and RS-485 (Multidrop) is available.
This option attaches IVI driver corresponding to SCPI command.
It makes it easy for control program development with various programming languages such as LabView, VisualBasic and C# etc. by using IVI driver.

Operation example

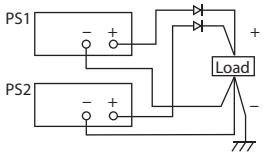
With RK series of the same model, output voltage and current can be increased by connecting power supplies in series or parallel. Control must be set on each individual unit. Do not connect together COMMON of 2 units or more as the COMMON of connector for external input and output control (TB1) is connected with output.

Series operation



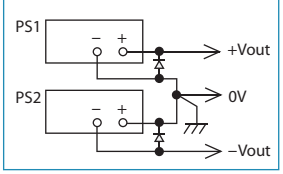
Sum of output is up to 250V. It is impossible to series operation for one exceeds 250V in output volt. Output current is of the min. one of power supply among them.

Parallel operation



Make all setting voltage same value. Output current is sum of each current. In addition, make OVP level for all power supplies maximum to prevent damage.

Split operation



Possible to output on positive(+) or negative (-).

TECHNICAL NOTE

Connection · Operation

Connection of load

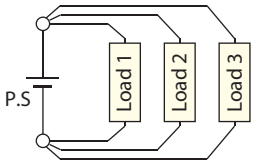
- Please use a short lead wire that is sufficiently thick for the connection.
- Please use PVC electric cable (105°C) that can fully tolerate the voltage used. It is necessary to consider current capacity, length limit of output wire by sensing (0.5V / lead) and so on for wiring with load. Please refer 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
4	21	106
2	33	170
1	42	209
1/0	53	270
2/0	67	330
3/0	85	350

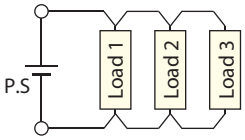
Use several cables or copper bar for model over 350A.

Parallel connection of load

Good example



Bad example

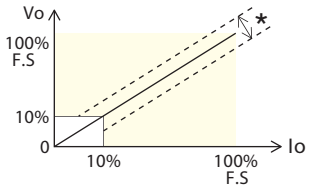


Definition of specifications

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 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:	

Warranty

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.If any Product is showed to be defective as satisfactory to us, 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. Regarding RoHS compliance, Matsusada Precision Inc. does not intentionally use objectionable substances in the products listed within this catalog. Matsusada Precision Inc. manufactures products using components which, according to our suppliers, are “RoHS compliant parts”. However, Matsusada Precision does not analyze each and every unit to confirm. Therefore, there may be some customized products which do not comply to RoHS. Please contact your nearby sales office for confirmation.

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For products www.matsusada.com/product For contact www.matsusada.com/contact

San Jose Office : 2570 N.First Street Suite 200 San Jose, CA 95131
Tel: +1-408-273-4573 Fax: +1-408-273-4673

New York Office : 80 Orville Drive Suite 100 Bohemia, NY 11716
Tel: +1-631-244-1407 Fax: +1-631-244-1496

Dallas Office : 5430 LBJ Freeway, Suite 1200 Dallas, TX 75240
Tel: +1-972-663-9336 Fax: +1-972-663-9337

Boston Office : 859 Willard St. One Adams Place, Suite 418 Quincy, MA 02169
Tel: +1-617-663-5711 Fax: +1-617-663-5331

International Office : Osaka-City, Osaka Japan
Tel: +81-6-6150-5088 Fax: +81-6-6150-5089

Headquarters : 745 Aoji-cho Kusatsu Shiga 525-0041 Japan
Tel: +81-77-561-2111 Fax: +81-77-561-2112