Matsusada Precision

DIGITAL CONTROLLER
CO Series

NEW

Digital Controllers

—— for Matsusada's power supplies

Ehternet supported modules makes possible the construction of large-scale system

CO series

- USB
- LAN
- RS-232C
- RS-485
- GPIB

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Digital Controller

The CO series is a line of adapters used to digitally control Matsusada's High Voltage, DC, and AC power supplies via personal computer. In addition to enabling manufacturing line automation and speeding up R&D, the CO series is ideally suited to building safe, stable, varsatile and highly accurate automatic inspection and measurement systems, saving your time and cutting labor costs.

The addition of an ethernet supported module to our product lineup makes large-scale systems and remote location control possible.

The CO series utilizes fiber optic cables for the digital communication, assuring high quality communication in even the noisiest environments, such as in the factory floor. The fiber optic connection also secures electrical isolation, resulting in safer operation even when combined with power supplies of different potentials.

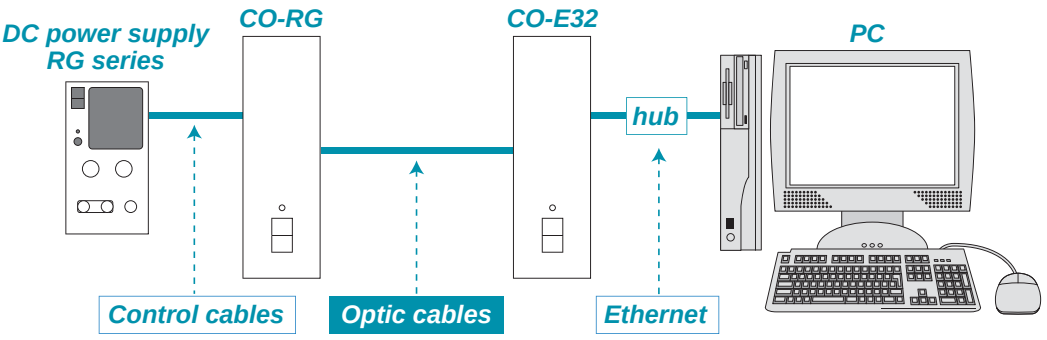
The CO series boasts a multitude of functions, including high resolution 16-bit(1 / 65535) control and read back or status output. This promises the CO series is ideal for Research & Development, quality control, and 24 / 7 production lines that require high accuracy. The CO series is also ultra-compact, allowing you to place them practically anywhere, saving valuable shelf and floor space.

Features

- USB, Ethernet, RS-232C, RS-485, and GPIB supported.
  (Ethernet is a registered trademark of Xerox Corporation.)
- **Resolution :** 16-bit(1 / 65535)
- **Isolation :** Fiber optic cable(optical link only)
- **Functions :** PC Control, Listener / Talker, Read Back or Status
- **Size :** 1.5"W × 4.9"H × 5.9"D
- **Enable to directly control from sequencer(PLC)***

* Require a RS-232 port for communication

Example of communication with optical fiber



- Stable communication is possible even in high noise environment.
- Extremely safe operation is possible due to no limit to voltage it can withstand.

Function

*Please contact near by sales office for AC power supplies, Electric Load, and the others which is not listed below.

Power Supply / type / Combination of adapters / Functions		RE series EPR series*3		R4G series			RG series	AU, AF / AE, AK, *9 ES, EQ, EJ, W, K12-R, XR series
		Power supply integrated interface	Optical communication	Modular cable	Power supply integrated interface	Optical communication	Optical communication	Optical communication
Combination of adapters	Adapters1 with Ethernet	-LEt option	CO-E32	CO-E32m	———	CO-E32	CO-E32	CO-E32
	Adapters1 with USB	-LUs1 option	CO-U32	CO-U32m	-LUs1 option	CO-U32	CO-U32	CO-U32
	Adapters1 with RS-232C	———	CO-OPT2-25 CO-OPT2-9	CO-MET2-25 CO-MET2-9	-LRs option	CO-OPT2-25 CO-OPT2-9	CO-OPT2-25 CO-OPT2-9	CO-OPT2-25 CO-OPT2-9
	Adapters1 with RS-485	———	CO-OPT4-25	CO-MET4-25	———	CO-OPT4-25	CO-OPT4-25	CO-OPT4-25
	Adapters1 with GPIB	-LGb option	CO-G32	CO-G32m	———	CO-G32	CO-G32	CO-G32
Functions	Adapters2 Combine with Adapters 1	———	-LGob option	-LGmb option	———	-LGob option	CO-RG, CO-RG-LH	CO-HV
Output Voltage control and setting checking		16-bit or 100.00% *4		100.00% or voltage value			16-bit or 100.00%	16-bit or 100.00%
Output Current control and setting checking		16-bit or 100.00% *5		100.00% or current value			16-bit or 100.00%	16-bit or 100.00%*10
Output voltage monitor		12-bit or 100.00% *4		100.00% or voltage value			12-bit or 100.00%	12-bit or 100.00%
Output current monitor		12-bit or 100.00% *5		100.00% or current value			12-bit or 100.00%	12-bit or 100.00%
Remote ON / OFF		○		○			○	○
OVP control		16-bit or 100.00% *6		100.00% or voltage value			—	—
OCP control		—		100.00% or current value			—	—
CV / CC mode status		CV / CC		CV / CC			—	—
OVP status		○ *6		○			—	—
OCP status		—		○			—	—
OTP status		○ *6		—			—	—
ACF status		○ *6		—			—	—
LD(Interlock) status		—		○			—	—
UV status *1		O (UV setting : 16-bit or 100.00%)		—			—	—
UC status *2		O (UC setting : 16-bit or 100.00%)		—			—	—
Output status		ON or stop by FLT *6		○			OUTPUT switch position	ON or OFF *11
Output reset		○ *7		○ *8			—	○ *12
Polarity change		—		—			—	○ *13

Power Supply / type / Combination of adapters / Functions		RK-80 series			R4K-80, R4K-36 series			RK, RKT, REKJ, REK series		
		Modular cable	Power supply integrated interface	Optical communication	Modular cable	Power supply integrated interface	Optical *16 communication	Modular cable	Power supply integrated interface	Optical communication
Combination of adapters	Adapters1 with Ethernet	CO-E32m	———	CO-E32	CO-E32m	———	CO-E32	CO-E32m	-LEt option*14	CO-E32
	Adapters1 with USB	CO-U32m	-LUs1 option	CO-U32	CO-U32m	-LUs1 option*14	CO-U32	CO-U32m	-LUs1 option*14	CO-U32
	Adapters1 with RS-232C	CO-MET2-25 CO-MET2-9	———	CO-OPT2-25 CO-OPT2-9	CO-MET2-25 CO-MET2-9	———	CO-OPT2-25 CO-OPT2-9	CO-MET2-25 CO-MET2-9	———	CO-OPT2-25 CO-OPT2-9
	Adapters1 with RS-485	CO-MET4-25	———	CO-OPT4-25	CO-MET4-25	———	CO-OPT4-25	CO-MET4-25	———	CO-OPT4-25
	Adapters1 with GPIB	CO-G32m	———	CO-G32	CO-G32m	———	CO-G32	CO-G32m	———	CO-G32
Functions	Adapters2 Combine with Adapters 1	-LGmb option	———	-LGob option	*14 Standard	———	*14*16 -LGob option	*14 Standard	———	*14 -LGob option
Output Voltage control and setting checking		100.0% or voltage value			100.00% or voltage value			100.00% or voltage value		
Output Current control and setting checking		100.0% or current value			100.00% or current value			100.00% or current value		
Output voltage monitor		100.0% or voltage value			100.00% or voltage value			100.00% or voltage value		
Output current monitor		100.0% or current value			100.00% or current value			100.00% or current value		
OVP control		100.0% or voltage value			100.00% or voltage value			100.0% or voltage value		
OCP control		100.0% or current value			100.00% or current value			100.0% or current value		
Remote ON / OFF		○			○			○		
CV / CC mode status		CV / CC			CV / CC			CV / CC		
OVP status		○			○			○		
OCP status		○			○			○		
OTP status		○			○			○		
OPP status		○			○		*16	—		
ACF status		○			○			○		
RS(Reverse connection of sensing) status		○			○			○		
LD(Interlock) status		—			—			○		
Output status		○			○			○		
Output reset		○		*15	○		*15	○		*17

*1 Indicate the status of voltage drop due to the cases as short circuit. (RE series only)
*2 Indicate the status of current drop due to the case such as wire disconnection. (RE series only)
*3 As for EPR series, only optical communication is available.
*4 As for EPR series, output voltage value is also available.
*5 As for EPR series, output current value is also available.
*6 Only RE series.
*7 Reset the output cut off status due to OVP. (RE series only)
*8 Reset output cut-off status due to OVP, OCP and interlock function.
*9 AF, AE, ES and EQ series need -LG option to connect to CO series adapters.
*10 Except AF, AE, ES, EQ, and K12-R series.
For AU series, this becomes overload trip control and setting checking.
*11 Except EJ and XR series.
*12 Unit with OCP option only.
*13 K12-R and EJ series only.
*14 If you select -LUs1, -LGob or -LEt options, standard digital interface will not be equipped.
*15 Reset output cut-off status due to OVP, OCP, OTP, OPP and reverse connection of sensing function.
*16 Except R4K-36 series.
*17 Reset output cut-off status due to OVP, OCP, OTP, OPP, reverse connection of sensing and interlock function.

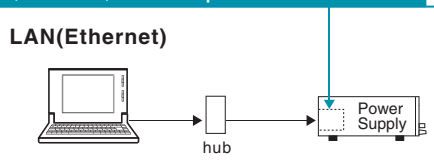
Constitution

Combination with power supplies

Refer to P.7 “Accessories” for the cable of Ⓐ to Ⓓ

Configuration example of
DC power supplies(R4G, RK-80, R4K-80, R4K-36, RK, RKT, REKJ, REK) and HV power supply(EPR)

RK, RKT, REKJ, REK option -LEt



Application System when controls with Ethernet.

Connection A hub will be required between computer and power supply when control several power supply.

Features Full-controll type with control features and status features. It enables you to configure the system with many units at low cost.

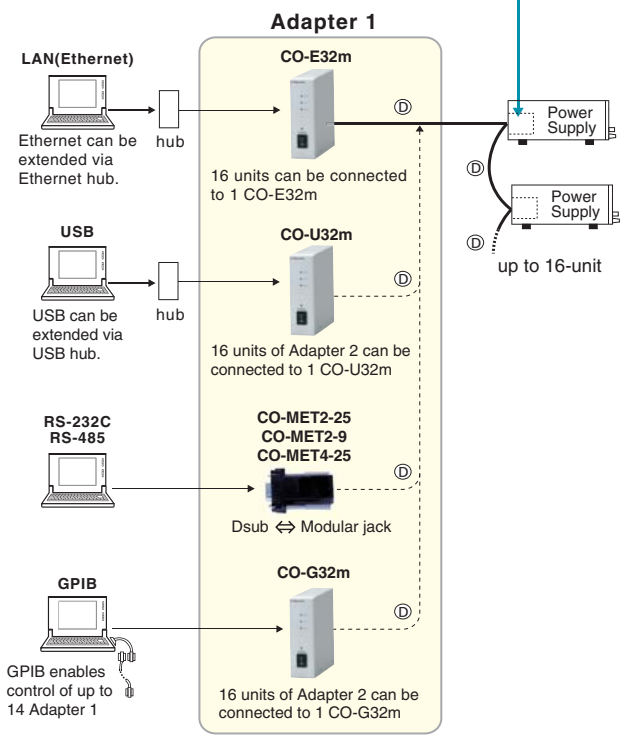
R4G, RK-80, R4K-80, R4K-36, RK, RKT, REKJ, REK option -LUs1

Application System when control with USB.

Connection USB hub will be required between computer and power supply when control several power supply. Number of unit is to be determined by hub to be used.

Features Full control type with various control functions and status functions. An system of lot of units can be built with low cost.

R4G, RK-80 option
R4K-80, R4K-36, RK, RKT, REKJ, REK : Standard -LGmb



Application System when control one or several power supplies with Ethernet, USB,GPIB, RS-232C or RS-485.

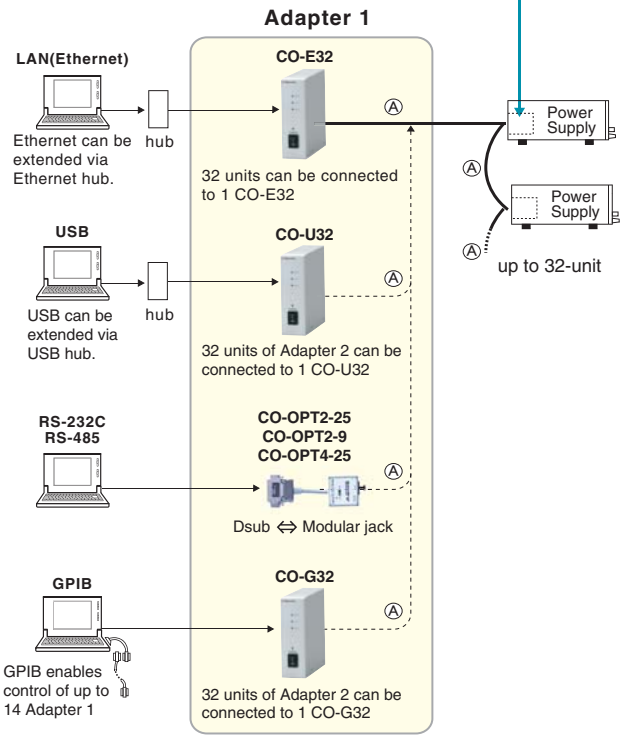
Connection Adapter 1 is to be connected to power supplies with modular cable.

Number of unit 16 units of power supplies can be connected to 1 Adapter 1.
In case of GPIB maximum 224 units (14 address × 16 units) can be connected using address.

Features Full control type with various control functions and status functions. An system of lot of units can be built with low cost.

When computer control is not in use, master-slave control by local control is available. (Adapter1 is not necessary.)
When increasing output current by connecting multiple power supplies in parallel it is possible to control them as if controlling one power supply.

R4G, RK-80, R4K-80, RK, RKT, REKJ, REK, EPR option -LGob



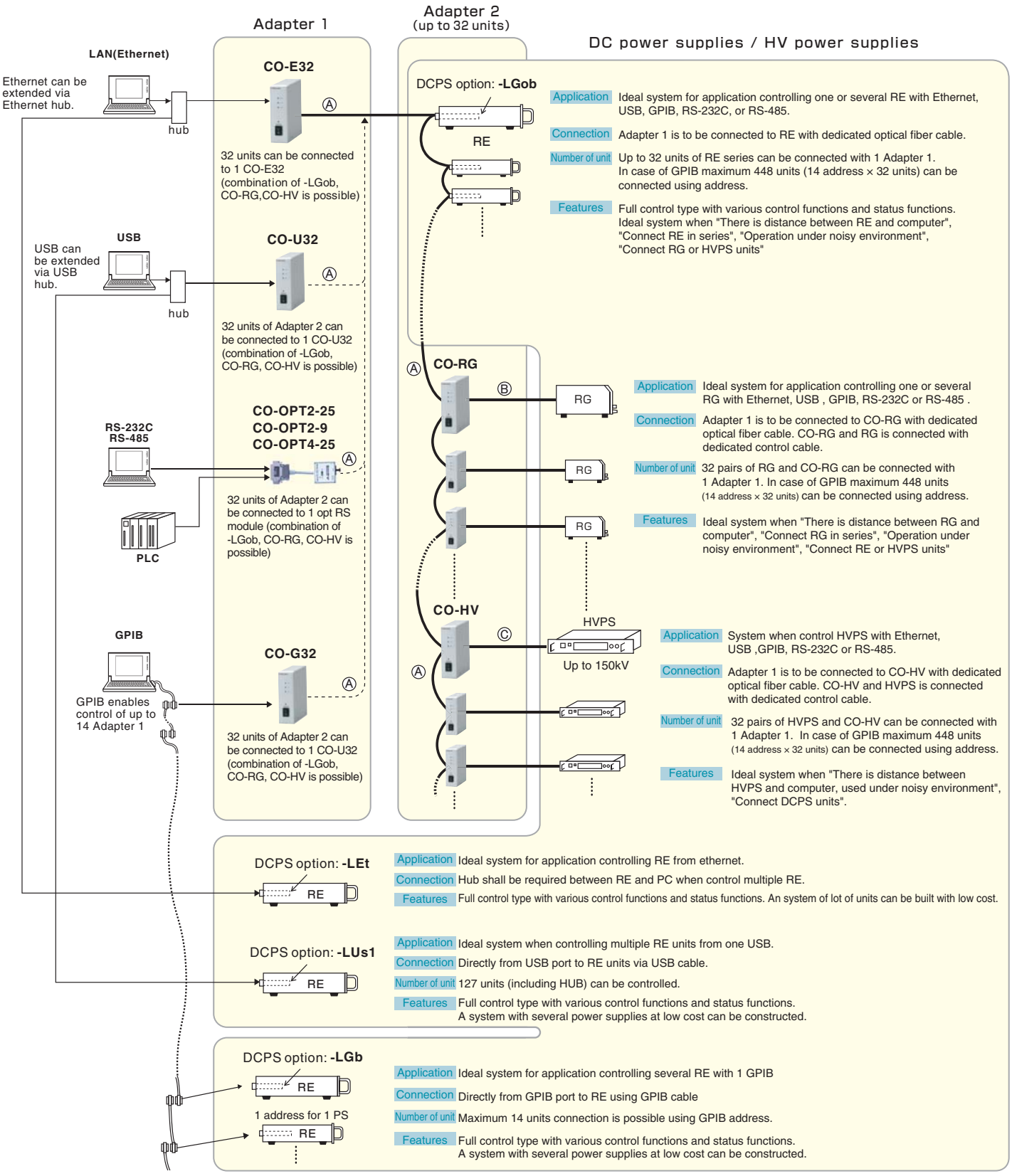
Application System when control one or several power supplies with Ethernet, USB, GPIB, RS-232C or RS-485.

Connection Adapter 1 will be connected to power supplies by dedicated optical fiber.

Number of unit 32 units of power supplies can be connected to 1 Adapter 1.
In case of GPIB maximum 448 units (14 address × 32 units) can be connected using address.

Features Full control type with various control functions and status functions. Ideal system when "There is distance between power supplies and computer, used under noisy environment", "Connect HVPS units".

Connection with DC power supplies / HV power supplies



Specifications

CO-G32, CO-U32, CO-E32, CO-G32m, CO-U32m, CO-E32m, CO-RG, CO-HV

Input voltage : 100V to 240VAC, 47 to 63Hz, single phase
Isolation voltage : AC1.5kV for 1 min between primary-secondary
AC input cable : 1.8m

CO-OPT2-25, CO-OPT2-9, CO-OPT4-25, CO-MET4-25

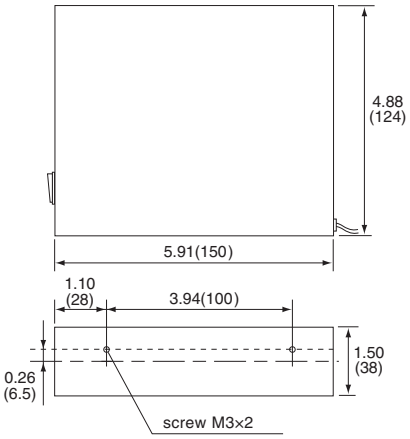
Input voltage : 100V to 240VAC, 47 to 63Hz, single phase
AC input cable : 1.8m

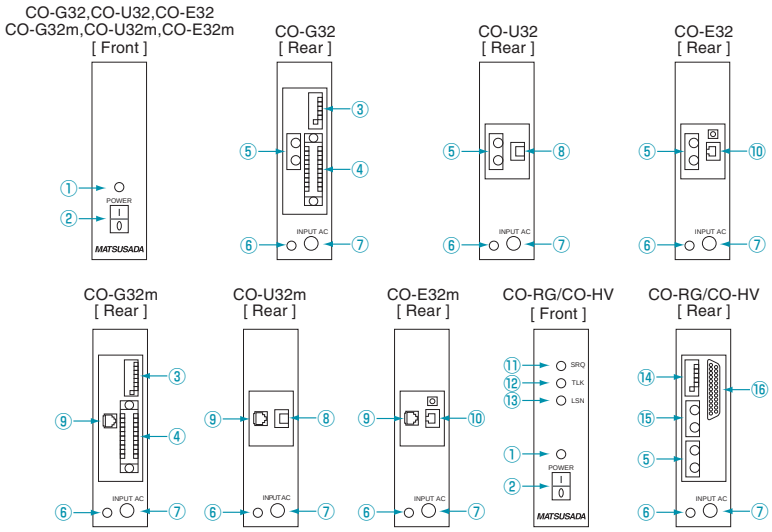
CO-MET2-25, CO-MET2-9

Input power is not required.

Dimensions inch(mm)

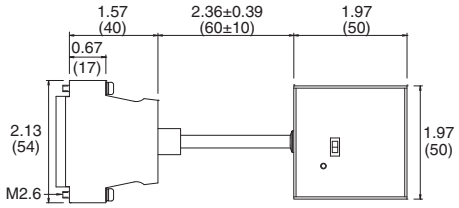
CO-G32.CO-U32,CO-E32,CO-G32m,CO-U32m,CO-E32m,CO-RG,CO-HV



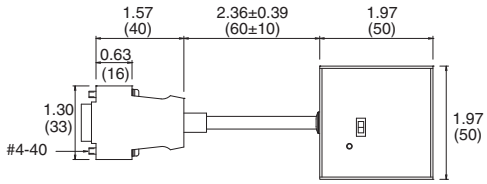


① POWER LED
② POWER ON/OFF switch
③ ADDRESS switch
④ IEEE-488 connector
⑤ Opt fiber connector(OUT)
⑥ GROUND terminal
⑦ AC input
⑧ USB connector
⑨ Module cable connector(OUT)
⑩ Ethernet cable connector
⑪ SRQ LED
⑫ TLK LED
⑬ LSN LED
⑭ Unit # / Upper connection unit setting switch
⑮ Opt fiber cable connection(IN)
⑯ Control cable connector(Dsub25 socket)

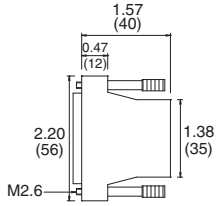
CO-OPT2-25



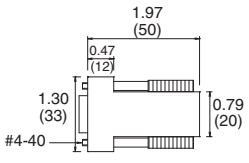
CO-OPT2-9



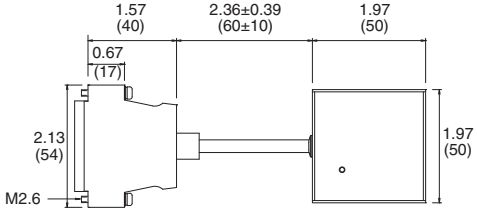
CO-MET2-25



CO-MET2-9



CO-OPT4-25 / CO-MET4-25



Accessories / Interface specifications / Options

Accessories

CO-G32,CO-G32m,CO-RG,CO-HV CO-U32,CO-U32m,CO-E32,CO-E32m	Instruction Manual (1), Rubber feet (4) (Ruber foot will be glued on depending on installation method.)
-LGmb	Modular cable(Case Ⓓ) CO-M cable (1) Standard : CO-M cable 1 (2m length) -L(Mc#) option : CO-M cable 1 (#m length)…See “Options”
CO-RG	Opt cable(Case Ⓐ) Standard : CO-OPT cable 1 (2m length) -L(Fc#) option : CO-OPT cable 1 (#m length)…See “Options” --- Control cable(Case Ⓑ) Standard: CO-RG cable (1) / -LH option : CO-RGH cable (1) (-LH option is required for CO-RG unit when combined with RG series of over 120V voltage. When ordering cable alone, specify CO-RG cable or CO-RGH cable.)
-LGob	Opt cable(Case Ⓐ) Standard : CO-OPT cable 1 (2m length) -L(Fc#) option : CO-OPT cable 1 (#m length)…See “Options”
CO-HV	Opt cable(Case Ⓐ) Standard : CO-OPT cable 1 (2m length) -L(Fc#) option : CO-OPT cable 1 (#m length)…See “Options” --- Control cable(Case Ⓒ) Either CO-AU cable, CO-AF cable, CO-W cable, CO-K12 cable or CO-XR cable (Both cables' length are 2m.) > CO-AU cable is required when combined with AU series. > CO-AF cable is required when combined with AE, AF, ES or EQ series. > CO-W cable is required when combined with W series. > CO-K12 cable is required when combined with K12-R series. > CO-XR cable is required when combined with XR series. > When order only CO-HV or cable, specify the cable part number.

Interface specifications

Digital specifications

[USB] USB1.1 conformable (attach Windows driver)

[Ethernet] IEEE802.3 version 2.0 compliant
Network interface : 10BASE-T/100BASE-TX
Protocol : TCP/IP, Telnet, DHCP, BOOTP, Auto IP, HTTP

[RS-232C / RS-485]

Speed	Asynchronous 9600bps(fixed)
Data Length	8bit
Parity	None
Stop Bit	1bit
Flow control	None
Dsub connector	25pin(Male) :CO-OPT2-25/CO-OPT4-25/CO-MET2-25/CO-MET4-25 9pin(Female):CO-OPT2-9/CO-MET2-9

RS-232C 25pin:	Data input	PinNo.2	Data output	PinNo.3	GND PinNo.7
RS-232C 9pin:	Data input	PinNo.3	Data output	PinNo.2	GND PinNo.5
RS-485	:Data input+	PinNo.16	Data input−	PinNo.19	
	Data output+	PinNo.13	Data output−	PinNo.14	GND PinNo.7

*Cable to connect optical RS-232C module, optical RS-485 module and port is not enclosed.

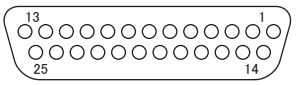
[GPIB]

Electrical specification	IEEE488-1978 conformable
Mechanical specification	IEEE488-1978 conformable
Interface function	SH1, AH1, L4, T6, SR1, RL0, PP0, DC1, DT0, C0
Address setting	Desired address can be assigned from 0 to 30 with address switch.
Delimiter	Combination of EOI, CR and LF
Service Request Function	Indication of output status and shut off status of controlled power supply

Analog specifications (CO-RG,CO-HV)

● **Control section**	**Setting accuracy**	+0.1%
	Temp. Coeff.	100ppm/°C
● **Monitor section**	**Reading accuracy**	±0.2%±2digit
	Temp. Coeff.	200ppm/°C

Dsub25 socket



Pin No.	Function	command
1	Output voltage setting(0V to 10V)	CH0,VCN
2	Output current setting(0V to 10V)	CH1,ICN
18	Over voltage protection setting(0V to 10V)	CH2,OVP
15	Voltage monitor(0V to 10V)	MN1,VM
3	Current monitor(0V to 10V)	MN2,IM
4, 21	Output ON/OFF signal	SW
8	Cut off reset signal	RST
20	Remote/Local setting	REN/GLT
16	SRQ	SRQ
11	Fault status	SRQ
12	CV mode status	STS
13	CC mode status	STS
5, 6, 10	COMMON	—

Options

-LH : High voltage isolation only for CO-RG
＊Needed when combined with RG of over 120V output.
-L(Fc0.5): When CO-OPT cable of 0.5m is required.(＊1)
-L(Fc5) : When CO-OPT cable of 5m is required.(＊1)
-L(Fc10) : When CO-OPT cable of 10m is required.(＊1)
-L(Fc20) : When CO-OPT cable of 20m is required.(＊1)
-L(Fc40) : When CO-OPT cable of 40m is required.(＊1)

-L(#4) : inch screws for D-sub fixing screws. (#4)
＊For CO-OPT2-25, CO-OPT4-25, CO-MET4-25
-L(Mc0.15) : When CO-M cable of 0.15m is required.(＊2)
-L(Mc0.5) : When CO-M cable of 0.5m is required.(＊2)

(＊1) For CO-HV, CO-RG and -LGob option models.
(＊2) For the standard models of R4K-80, R4K-36, RK, RKT, REKJ and REK, or -LGmb option models.

When ordering, please suffix the above option number to the model number. <e.g.>CO-RG-L(Fc5)H alphabetical order
When ordering CO-HV, please specify control cable. <e.g.>CO-HV(with CO-AU cable)

FAX

USA/canada : +1-888-652-8651

other countries : +81-6-6150-5089

Customer Inquiry Sheet (CO 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 merchant-ability 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 manufac-turing 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.

Matsusada Precision Inc.

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