

High power of 5kW max.
Low profile and light weight design

NEW

Programmable DC-DC converter

Suitable for R&D of next-generation energy systems such as Solar cell and Smart house.

VDD series

Output

- ▶ 6V to 650V
- ▶ 1.5A to 600A
- ▶ 0.8kW to 5kW

Input voltage range

- ▶ DC90V to 420V
(depending on the models)



VDD series

Programmable DC-DC converter with
multi function and excellent operability

1kW to 2kW
models

3kW to 5kW
models



High power up to 5kW in 2U.

VDD series is a high power and variable output DC-DC converter which can be operated on DC.

Because the DC operation, VDD is most suitable for many applications.

For example, it is the best choice for R&D of next-generation energy systems and anti-disaster measure systems, such as Smart house in which electricity is supplied as DC mutually between home rechargeable batteries and EVs, and Voltage adjustment when driving DC electronic equipment by emergency large rechargeable batteries.

Furthermore, you can install VDD into your system easily, because it is equipped with various digital interface such as LAN and USB. *

* : Adaptors will be needed additionally. And, -LGob option will be needed if it will be used under specific condition. Please see page 9 for detail.



Compact and high power

1 kW to 5 kW



Wide input voltage range
DC90 V to 420 V
(depending on the models)



Ideal for research and
development with **low noise**
switching method.



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



VDD adopt **Large 4-digit monitor**
display for both voltage and
current, which contributes to
precise monitoring with
better recognition.



Operability and safety are
improved with new features of
key-lock function and acceleration
rotary encoder, that increment will
vary by speed of rotation.

Lineup

Output voltage [V]	Output current [A]	Output power [W]	Model	Ripple *1 *2		Input voltage [Vdc]	Dimensions (refer to P.8)
				[mVrms]	[mArms]		
0 to 6	0 to 133	800	VDD6-133	8	320	90 to 350	A
	0 to 266	1600	VDD6-266	8	1500	180 to 420	A
	0 to 500	3000	VDD6-500	10	900	250 to 350	D
0 to 8	0 to 240	1900	VDD8-240	8	3000	180 to 420	A
	0 to 600	4800	VDD8-600	10	3000	250 to 350	D
0 to 10	0 to 90	900	VDD10-90	8	300	90 to 350	A
	0 to 180	1800	VDD10-180	8	500	180 to 420	A
	0 to 300	3000	VDD10-300	10	900	250 to 350	D
	0 to 500	5000	VDD10-500	10	3000	250 to 350	D
0 to 15	0 to 60	900	VDD15-60	8	150	90 to 350	A
	0 to 100	1500	VDD15-100	8	250	180 to 420	A
	0 to 133	2000	VDD15-133	8	300	180 to 420	A
	0 to 200	3000	VDD15-200	10	500	250 to 350	D
	0 to 333	5000	VDD15-333	15	600	250 to 350	D
0 to 20	0 to 50	1000	VDD20-50	8	160	90 to 350	A
	0 to 100	2000	VDD20-100	8	250	180 to 420	A
	0 to 150	3000	VDD20-150	15	300	250 to 350	C
	0 to 250	5000	VDD20-250	15	400	250 to 350	C
0 to 30	0 to 33	1000	VDD30-33	8	100	90 to 350	A
	0 to 66	2000	VDD30-66	8	160	180 to 420	A
	0 to 100	3000	VDD30-100	20	200	250 to 350	C
	0 to 166	5000	VDD30-166	20	260	250 to 350	C
0 to 35	0 to 28	1000	VDD35-28	8	90	90 to 350	A
	0 to 57	2000	VDD35-57	8	150	180 to 420	A
	0 to 85	3000	VDD35-85	30	230	250 to 350	C
	0 to 142	5000	VDD35-142	30	280	250 to 350	C
0 to 45	0 to 22	1000	VDD45-22	8	70	90 to 350	A
	0 to 44	2000	VDD45-44	8	100	180 to 420	A
	0 to 66	3000	VDD45-66	30	130	250 to 350	C
	0 to 110	5000	VDD45-110	30	180	250 to 350	C
0 to 60	0 to 16.6	1000	VDD60-16.6	8	50	90 to 350	A
	0 to 33.3	2000	VDD60-33.3	8	80	180 to 420	A
	0 to 50	3000	VDD60-50	30	100	250 to 350	C
	0 to 83	5000	VDD60-83	30	135	250 to 350	C
0 to 80	0 to 12.5	1000	VDD80-12.5	8	40	90 to 350	A
	0 to 25	2000	VDD80-25	8	60	180 to 420	A
	0 to 37	3000	VDD80-37	30	80	250 to 350	C
	0 to 62	5000	VDD80-62	30	100	250 to 350	C
0 to 100	0 to 10	1000	VDD100-10	8	25	90 to 350	B
	0 to 20	2000	VDD100-20	8	50	180 to 420	B
	0 to 30	3000	VDD100-30	30	60	250 to 350	E
	0 to 50	5000	VDD100-50	30	80	250 to 350	E
0 to 150	0 to 6.6	1000	VDD150-6.6	10	20	90 to 350	B
	0 to 13.3	2000	VDD150-13.3	25	35	180 to 420	B
	0 to 20	3000	VDD150-20	30	40	250 to 350	E
	0 to 33	5000	VDD150-33	30	55	250 to 350	E
0 to 200	0 to 5	1000	VDD200-5	40	15	90 to 350	B
	0 to 10	2000	VDD200-10	40	25	180 to 420	B
	0 to 15	3000	VDD200-15	40	30	250 to 350	E
	0 to 25	5000	VDD200-25	40	40	250 to 350	E
0 to 300	0 to 3.3	1000	VDD300-3.3	25	10	90 to 350	B
	0 to 6.6	2000	VDD300-6.6	35	18	180 to 420	B
	0 to 10	3000	VDD300-10	50	20	250 to 350	E
	0 to 16.6	5000	VDD300-16.6	50	30	250 to 350	E
0 to 500	0 to 2	1000	VDD500-2	100	5	90 to 350	B
	0 to 4	2000	VDD500-4	100	12	180 to 420	B
	0 to 6	3000	VDD500-6	100	15	250 to 350	E
	0 to 10	5000	VDD500-10	100	20	250 to 350	E
0 to 600	0 to 1.66	1000	VDD600-1.66	60	5	90 to 350	B
	0 to 3.3	2000	VDD600-3.3	75	10	180 to 420	B
	0 to 5	3000	VDD600-5	150	15	250 to 350	E
	0 to 8.3	5000	VDD600-8.3	150	15	250 to 350	E
0 to 650	0 to 1.5	1000	VDD650-1.5	150	5	90 to 350	B
	0 to 3	2000	VDD650-3	150	10	180 to 420	B
	0 to 4.6	3000	VDD650-4.6	150	15	250 to 350	E
	0 to 7.6	4900	VDD650-7.6	150	15	250 to 350	E

The specifications show the values at the rated output after two hours of warm up unless specifically indicated.

*1: The value is applied in the usage range of rated output from 10% to 100%.

*2: The value is for connecting the resistance load. As for values in connecting the nonlinear load (including semiconductor laser diode), contact our sales representatives.

Standard functions

Key Lock Function



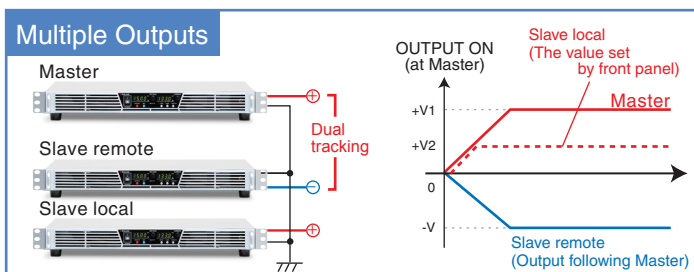
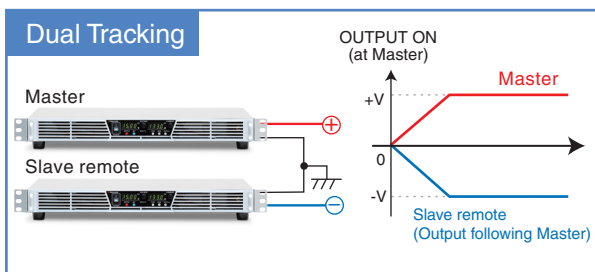
Lock all front panel operation to prevent erroneous operation.
(emergency stop by power switch is still valid.)

Lock all the function other than reset lock mode.
This mode is good for purpose to avoid mis-operation completely.

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 outputs simultaneously by turning on the master unit.

★ Please refer to P. 9 for detail connection.



Digital interface

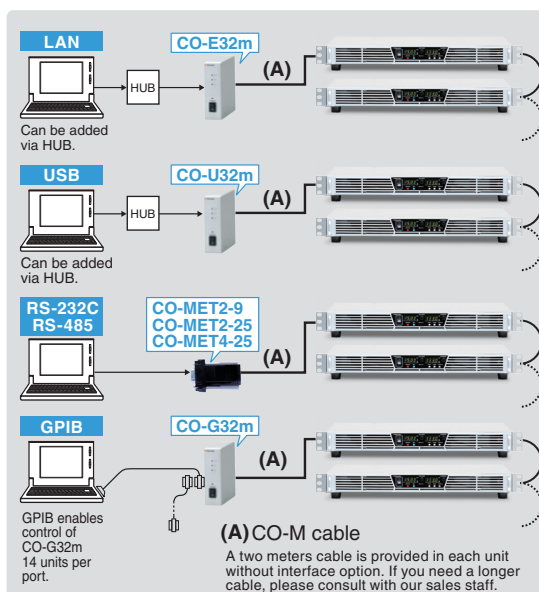
Enable digit control via LAN/USB/RS-232C/RS-485/GPIB as well as one control with Master/Slave.

Adapters (separately sold)

To use the digital interface, you need to prepare an digital interface adapter separately.
The following interface adapters are available according to the communication method of your controller port.

- **CO-E32m**: Adapter for LAN
Total 16 units can be connected to one CO-E32m. LAN cable is not provided.
- **CO-U32m**: Adapter for USB
Total 16 units can be connected to one CO-U32m. USB cable is not provided.
- **CO-MET2-9**: Adapter for RS-232C (9 pin)
D-sub ⇄ Modular jack Total 16 units can be connected to each CO-MET2-9.
- **CO-MET2-25**: Adapter for RS-232C (25 pin)
D-sub ⇄ Modular jack Total 16 units can be connected to each CO-MET2-25.
- **CO-MET4-25**: Adapter for RS-485 (25 pin)
D-sub ⇄ Modular jack Total 16 units can be connected to each CO-MET4-25.
- **CO-G32m**: Adapter for GPIB
Total 16 units can be connected to one CO-G32m. GPIB cable is not provided.

For details, refer to CO/USB series catalogue.



Master/slave

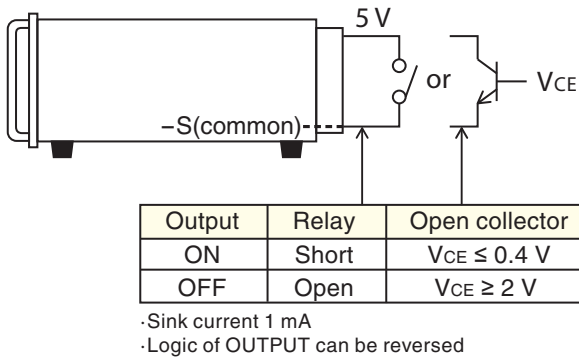
One-control on local in parallel is enabled up to 16 units with master/slave operation

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

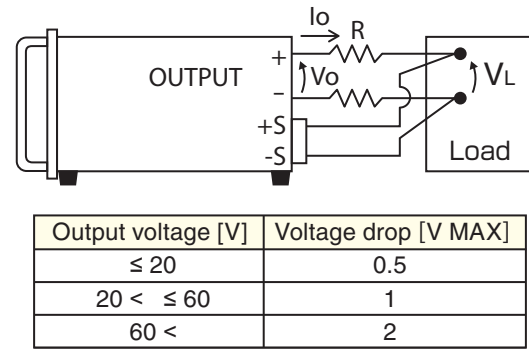


When noisy environment is presumed, the following -LGob option (optical interface) is required.

Remote Switch ON/OFF



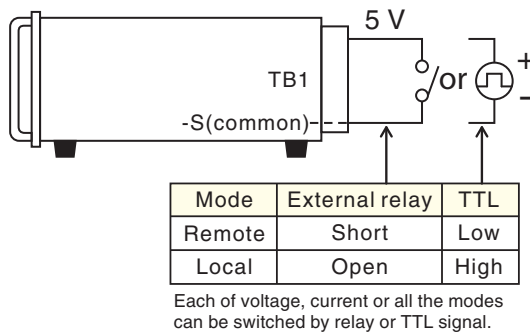
Remote sensing



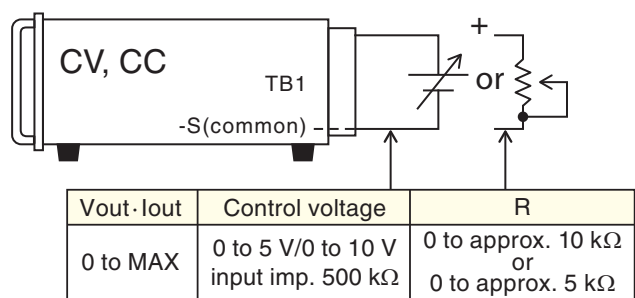
Prevents voltage drop down ($V_O - V_L$) due to resistance (R) or deterioration of stability by contact resistance.

Remote Control

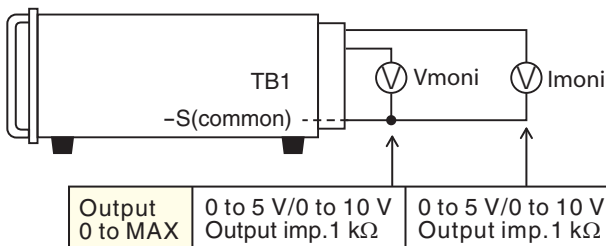
Remote/Local change



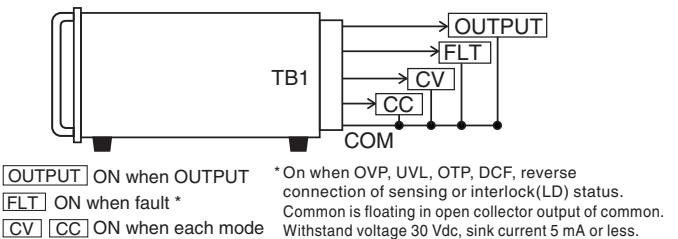
Output control



Output Monitor



Status Output



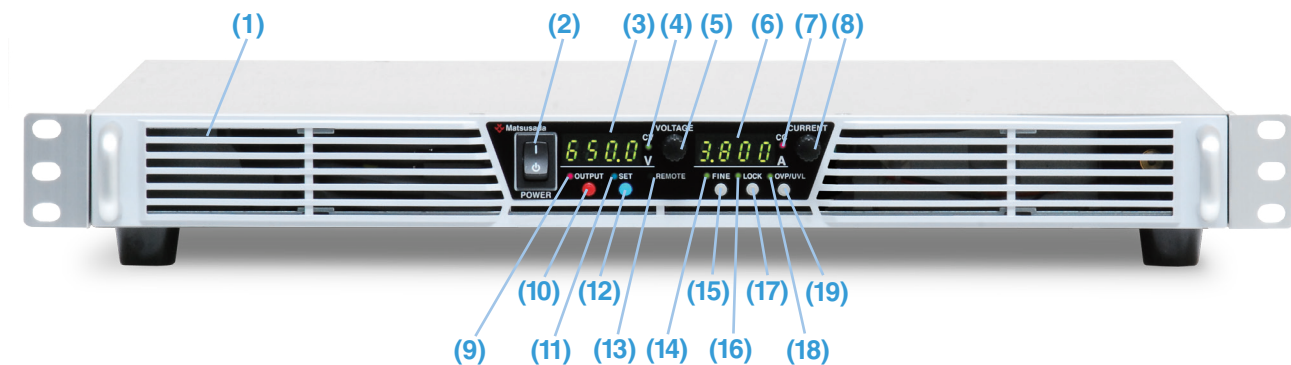
Various Digital Control Functions

Control function	Output ON/OFF setting
	Status output (fault/output/OVP/UVL/OTP/DCF/sense connection reversely/interlock)
	Maximum 16 units (-LGob models: 32 units) digital control
	One control function for multiple units
Write function	Output voltage setting/Output current setting, Percent mode, Voltage Current Value mode
	OVP setting/UVL setting, Percent mode, Voltage Current Value mode
Reading function	Output voltage reading/Output current reading, Percent mode, Voltage Current Value mode
	Output voltage setting/Output current setting, Percent mode, Voltage Current Value mode
	OVP setting/UVL setting, Percent mode, Voltage Current Value mode

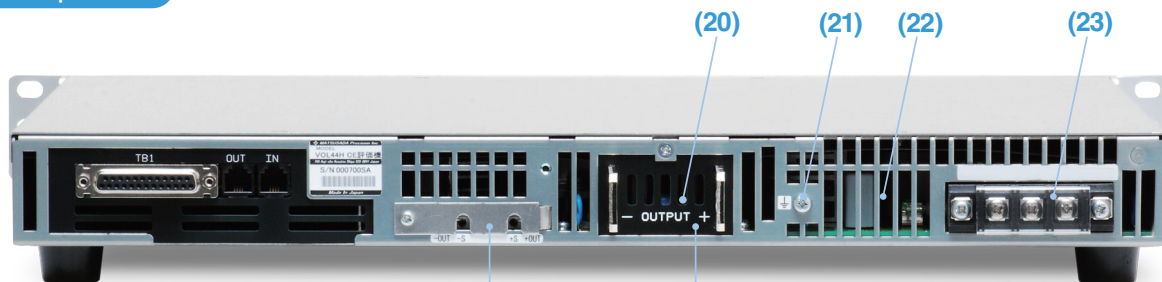
* Minimum value of each model is same as minimum display of front panel meter.

Functions (All the displays are made to turn on for explanation.)

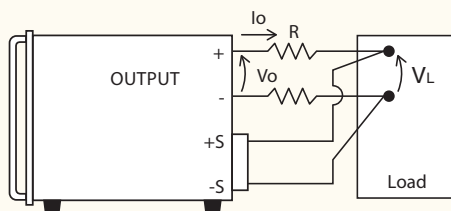
Front panel



Rear panel



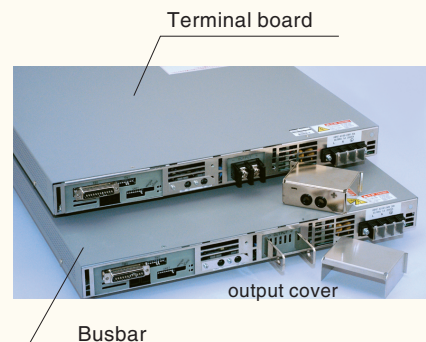
Remote sensing



Prevents voltage drop down ($V_o - V_L$) due to resistance (R) or deterioration of stability by contact resistance.

Output voltage(V)	Voltage drop(V MAX)
≤ 20	0.5
$20 < \leq 60$	1
$60 <$	2

Output terminal



(1) Air intake

(2) Power ON/OFF switch
This has priority over all operations for safety reason.

(3) Output voltage, OVP setting display

(4) Constant voltage mode

(5) Output voltage, OVP setting dial

(6) Output current, UVL setting display

(7) Constant current mode

(8) Output current, UVL setting dial

(9) OUTPUT display
Light on when output is ON.

(10) Output ON/OFF switch
To be used to turn output ON/OFF when local mode as well resetting protection functions.

(11) Output preset display

(12) Output preset switch

(13) Remote programming display
Light on when voltage/current remote control.

(14) FINE display
Light on when FINE condition.

(15) FINE setting switch

(16) Keylock display

(17) Keylock setting switch

(18) OVP/UVL setting display

(19) OVP/UVL setting switch

(20) Output terminal

(21) Functional earthing terminal

(22) Exhaust hole

(23) DC input terminal (M4)

Specifications

These specifications, unless otherwise specified, at maximum rated output after two hours of warm up, and scope of application is between 10% and 100% of maximum rated output. Avoid the continuous operation under a short circuit condition in the rated output voltage less than 10%, which could activate the protection.

Input		Input voltage *1	Model
	0.8 kW to 1 kW	90 Vdc to 350 Vdc	Standard
	1.5 kW to 2 kW	180 Vdc to 420 Vdc	Standard
	3 kW to 5 kW	250 Vdc to 350 Vdc	Standard
		350 Vdc to 420 Vdc	-L (400V) option

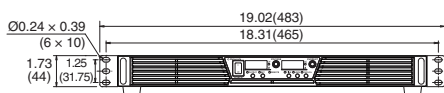
*1: The ripple of the input voltage must be 3% or less. The voltage indicates from the minimum to maximum including the ripple.

Output control	[Local] Constant voltage: rotary encoder on front panel Constant current: rotary encoder on front panel [Remote] Constant voltage: external control voltage 0 to 5 Vdc or 10 Vdc, or external variable resistor 0 to approx. 5 kΩ or 10 kΩ Constant current: external control voltage 0 to 5 Vdc or 10 Vdc, or external variable resistor 0 to approx. 5 kΩ or 10 kΩ		
Voltage regulation	Line: 0.01% of maximum output (for ±10% DC input change) Load: 0.1%+2 mV of maximum output (for 10% to 100% load change)		
Current regulation	Line: 0.01% of maximum output (for ±10% DC input change) Load: 0.2% +5 mA of maximum output (for 10% to 100% load change)		
Stability	0.05%/8 Hr of maximum output voltage		
Temperature coefficient	0.01%/°C of maximum output voltage 0.04%/°C of maximum output current		
Output display	Output voltage: 4-digit digital meter (±0.5% Full Scale±1 digit, 23°C ± 5°C in the rated output voltage from 10% to 100%) Output current: 4-digit digital meter (±0.5% Full Scale±1 digit, 23°C ± 5°C in the rated output current from 10% to 100%)		
Monitor output	Output voltage monitor: 5 V or 10 V/maximum output voltage Output current monitor: 5 V or 10 V/maximum output current		
Protections	<ul style="list-style-type: none"> - Over voltage protection (OVP): Output is cut off at a set value. - Under voltage limitation (UVL): 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 (DCF) - 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 		
Other functions	<ul style="list-style-type: none"> - Keylock to avoid misoperation. - Digital master slave operation. (up to 250 V 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) 		
Transient response time	Recovery time 1 ms (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 to +50°C		
Storage temperature	-20°C to +70°C		
Relative humidity	20% to 80%, non condensing		
Dielectric voltage	Between input power supply and output terminal: DC1000 V 1 minute Between input power supply and chassis: DC1000 V 1 minute Between output terminal and chassis: DC1000 V 1 minute		
Accessories	<ul style="list-style-type: none"> - Instruction manual × 1 - Output terminal cover × 1 - Remote connector cover × 1 - CO-M cable 2 meter × 1 		

Dimensions [inch (mm)]

There are exhaust holes on rear panel for forced air cooling.
In case placed in a closed cabinet without extra room more than 0.3 meters, apply additional forced cooling.

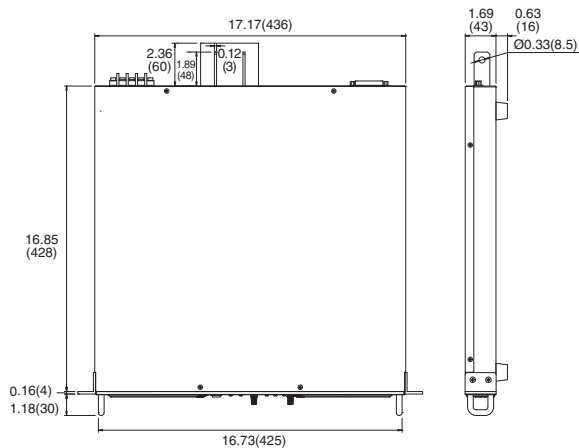
1 kW, 2 kW models



A

Busbar output type

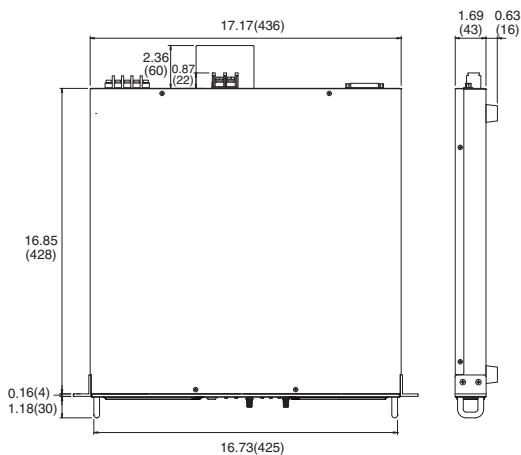
Weight: 8 kg approx.



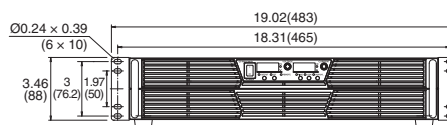
B

Terminal board output type

Weight: 8 kg approx.



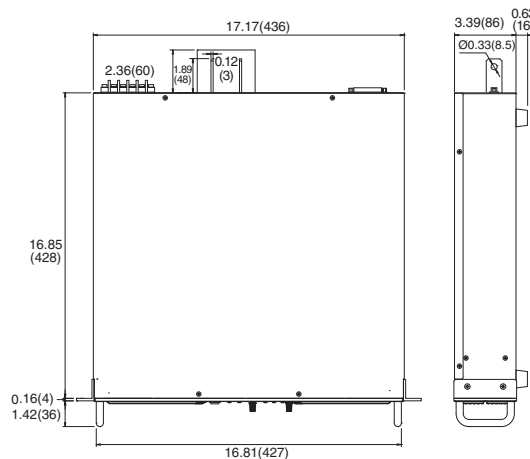
3 kW, 5 kW models



C

Small busbar output type

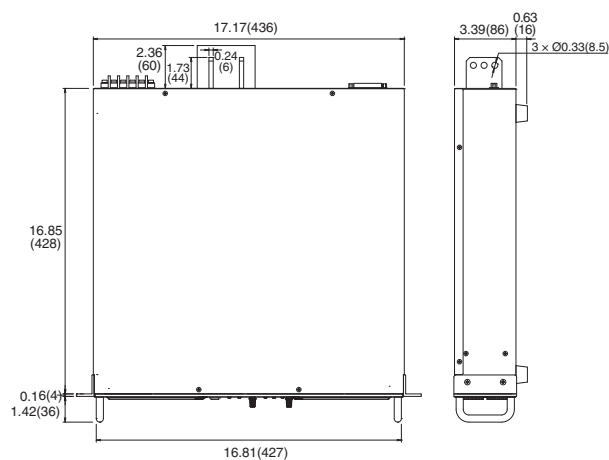
Weight: 14 kg approx.



D

Large busbar output type

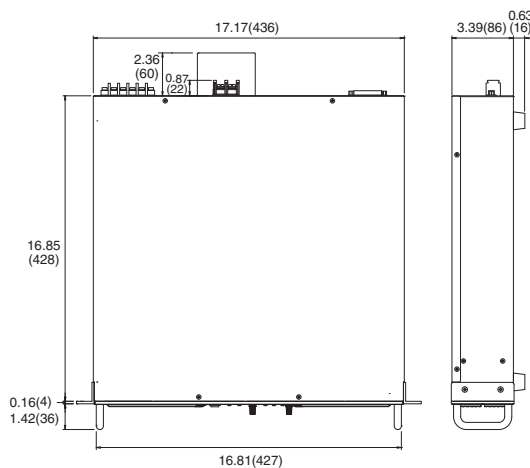
Weight: 14 kg approx.



E

Terminal board output type

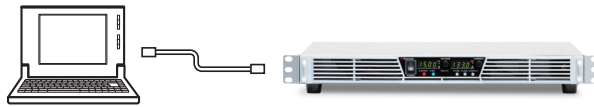
Weight: 14 kg approx.



Options

-LEt: LAN Interface Board *1*2

Enable digital control via LAN



Hub shall be required between VDD and PC when control multiple VDD.

-LGob: Optical interface Board *1*2

With optical communication, isolation control is performed. As complete isolation is performed by means of optical fiber, this enables advance prevention of erroneous operation involved with transient phenomenon caused by surges, inductive lightning, external noise, etc.

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

Select the optional optical interface board (-LGob) when using this DC power supply under the following conditions.

- Noisy environment including factories (Example: Motors or coils are used near power supplies and loads).
- Using with high voltage floating (more than 250 V).
- Installation distance of 2 meters or more between the DC power supply and a controller such as a computer, laptop, or Programmable Logic Controller (PLC).

Adapters (separately sold)

To use the optical interface, you need to prepare an optical interface adapter separately. The following interface adapters are available according to the communication method of your controller port.

- CO-E32: Adapter for LAN

Total 32 units can be connected to one CO-E32. LAN cable is not provided.



- USB-OPT: Adapter for USB

Total 32 units can be connected to one USB-OPT. USB cable is not provided.



- CO-OPT2-9: Adapter for RS-232C (9 pin)

Total 32 units can be connected to each CO-OPT2-9.



- CO-OPT2-25: Adapter for RS-232C (25 pin)

Total 32 units can be connected to each CO-OPT2-25.



- CO-OPT4-25: Adapter for RS-485 (25 pin)

Total 32 units can be connected to each CO-OPT4-25.

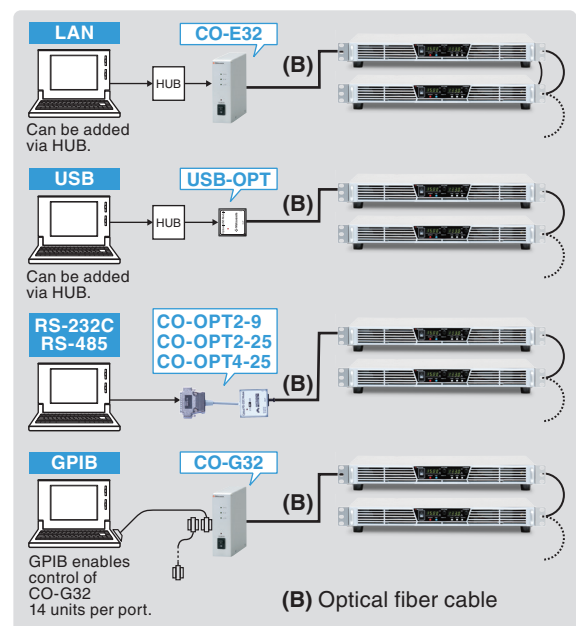


- CO-G32: Adapter for GPIB

Total 32 units can be connected to one CO-G32. GPIB cable is not provided.

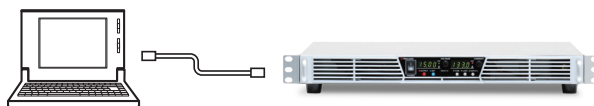


For details, refer to CO/USB series datasheet.



-LU1: USB Interface Board *1*2

Enable digital control via USB



USB hub shall be required between VDD and PC when control multiple VDD.

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

Change length of CO-M cable to 0.5 meters and 0.15 meters long. (Only either can be selected.)

-L(400V): Input voltage 400V

Please see page 7.

*1: If you select this option, standard digital interface and master-slave function will not be equipped. Also, please see the CO series catalog for detail of function of digital interface function.

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

How to order When ordering, add Option No. in the following order by alphabet, number, and input voltage to Model No.

<Example> VDD6-133-L(Mc0.5), VDD350-18-LGob(Fc20), VDD650-7.6-LU1(400V)

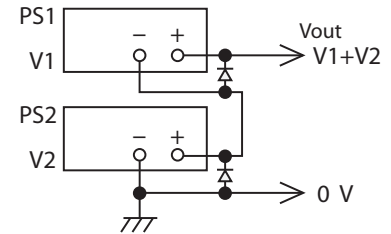
Operation example

VDD series 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 negative output, please do not connect common more than two.

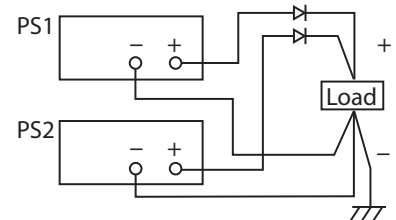
Series operation

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.



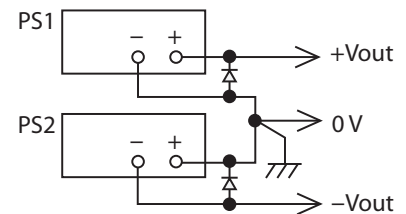
Parallel operation

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.



Split operation

+output and -output are available.





TECHNICAL NOTE

Connection and Operation

■ Connection of load

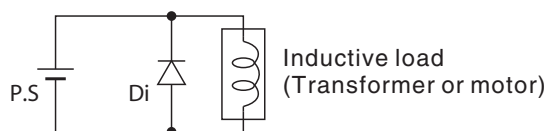
- Connect a short wire of sufficient thickness for the maximum current.
- Use an electric wire that can withstand the working voltage.
- The following table is a guide for a single wire. The maximum current varies greatly depending on the ambient temperature, arrangement, number of strands, and method of installation.
- Please check the specifications of the electric wire before use.

AWG	mm ²	Maxcurrent [A]	AWG	mm ²	Maxcurrent [A]
18	0.823	2.3	4	21.1	60
16	1.31	3.7	2	33.6	94
14	2.08	5.9	1	42.4	119
12	3.31	9.3	0	53.5	150
10	5.26	15	00	67.4	190
8	8.37	24	000	85.0	239
6	13.3	37	0000	107	302

In case of exceeding 302 A, please use multiple wires or connect with busbar.

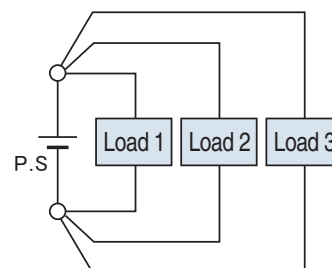
■ Connection of load

Please insert a diode of which rating is bigger than output voltage and current of power supply to protect the power supply from kick back of load.

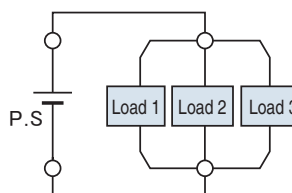
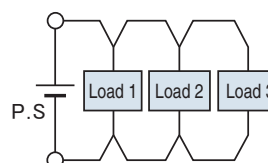


■ Parallel connection of load

Good



Not Good



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

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.

Who We Are

Matsusada Precision Inc. has manufactured High voltage power supplies for more than 50 years in Japan. Recognized by Japanese customers who demand high-quality levels, we have become a high voltage power supply manufacturer which has the highest market share in Japan. Currently, we are developing products not only for high-voltage power supplies, but also for DC power supplies, AC power supplies, electronic loads, high-voltage amplifiers, bipolar power supplies, and X-ray inspection equipment.

We have contributed to customers in various industries such as Semiconductor Production Equipment, Photomultiplier, IGBT, Electrostatic Chuck, Electron Beam, Electrospinning, Plasma, Motor for Electric vehicles, etc.

In addition, we have a direct sales system to respond promptly to customers. Our technical support team with many years of experience will respond promptly from Japan.

Our mission is to deliver products that meet Japan's strict quality standards to customers all over the world. We believe that if you contact us, you will surely find the power supply you need

Matsusada Precision



Matsusada Precision Inc.

Sales office

USA

North Carolina office

TEL(704)496-2644

FAX(704)496-2643

North Carolina office 9:00-17:00

Other country or region

International office in Japan

TEL+81-6-6150-5088

FAX+81-6-6150-5089

International office in Japan 9:00-17:00

We follow-up customers from japan



Contact Us

<https://www.matsusada.com/>