

NEW

DC to 200kHz

Ultra fast response Four-quadrant bi-polar power supply

Output voltage : $\pm 20\text{V}$ to $\pm 60\text{V}$
Output power : 150W to 1200W

DOS series



DOS series

Ultra fast response four-quadrant bi-polar power supply



DOS series is **four-quadrant bi-polar power supply with ultra high-speed response of DC to 200kHz(CV mode)**. It shall output various waveforms including sinusoidal, triangular, saw-tooth, rectangular and more with combination with a function generator. As DOS series amplifies any waveform, it is suitable for all sorts of simulation tests. **Sourcing and sinking of electrical power with four-quadrant operation as well as 2 operation modes of CV and CC is possible.** Compact size of only 3U or 4U height for such various function and ultra high-speed response power supply. In addition, the features of large meters with high visibility and superior operability make the DOS series versatile four quadrant bi-polar power supply which can be used a wide variety of occasion from in laboratory to production line.

Features

Ultra fast response

Suitable for transient response test because of its ultra high-speed response DC to 200kHz and high power, 1200W.

Four-quadrant action

DOS Series can be used both as a high speed response DC power supply and as an electronic load.

DC bias

10-turn potentiometer to be used as the output setting volume when used as the DC power supply and as the bias setting dial at outputting AC waveform is equipped.

Constant voltage (CV) / Constant current (CC)

A single switch selects between CV and CC modes.

Compact & light weight

For maximum compactness and light weight, DOS Series has been improved for small footprint and handiness.

DC output meter equipped

3-digit digital meter displays the DC value of the output voltage and current.
(The option of rms indication is available.)

Complete protective functions

Protective functions against over voltage/current and against output short-circuit are completely provided.

Master-slave

Master / Slave control(option) for more power requirement.

Applications

- Inductive load such as coil and transformer
- Various motor tests
- Evaluation test for solar panel related devices
- Ripple test of capacitors
- Voltage regulation tests for in-vehicle electrical component
- For surface treatment

Lineup

*Models with voltage, current or frequencies not listed here are also available. Please contact the nearest sales office.

Model	Output voltage V(rms)	Output current A(rms)	Output power W	Frequency response kHz(-3dB)		Size inch(mm) W x H x D	Weight kg(typ.)
				CV mode	CC mode		
DOS20-7.5	±20(14)	±7.5(5.3)	150	DC to 200	DC to 100	19×5.24×18.98 (483×133×482)	11
DOS20-15	±20(14)	±15(10.5)	300	DC to 200	DC to 100	19×5.24×21.65 (483×133×550)	17
DOS20-30	±20(14)	±30(21)	600	DC to 200	DC to 100	19×6.97×24.02 (483×177×610)	23
DOS20-60	±20(14)	±60(42)	1200	DC to 200	DC to 100	19×10.47×24.02 (483×266×610)	40
DOS25-6	±25(17.6)	±6(4.2)	150	DC to 200	DC to 100	19×5.24×18.98 (483×133×482)	11
DOS25-12	±25(17.6)	±12(8.6)	300	DC to 200	DC to 100	19×5.24×21.65 (483×133×550)	17
DOS25-24	±25(17.6)	±24(17.1)	600	DC to 200	DC to 100	19×6.97×24.02 (483×177×610)	23
DOS25-48	±25(17.6)	±48(34)	1200	DC to 200	DC to 100	19×10.47×24.02 (483×266×610)	40
DOS45-3.3	±45(32)	±3.3(2.4)	150	DC to 200	DC to 100	19×5.24×18.98 (483×133×482)	12
DOS45-6.6	±45(32)	±6.6(4.7)	300	DC to 200	DC to 100	19×5.24×21.65 (483×133×550)	17
DOS45-13.3	±45(32)	±13.3(9.5)	600	DC to 200	DC to 100	19×6.97×24.02 (483×177×610)	23
DOS45-16	±45(32)	±16(11.3)	720	DC to 200	DC to 100	19×6.97×24.02 (483×177×610)	23
DOS45-26.7	±45(32)	±26.7(18.9)	1200	DC to 200	DC to 100	19×10.47×24.02 (483×266×610)	40
DOS60-2.5	±60(42)	±2.5(1.75)	150	DC to 200	DC to 100	19×5.24×18.98 (483×133×482)	12
DOS60-5	±60(42)	±5(3.5)	300	DC to 200	DC to 100	19×5.24×21.65 (483×133×550)	17
DOS60-10	±60(42)	±10(7)	600	DC to 200	DC to 100	19×6.97×24.02 (483×177×610)	23
DOS60-20	±60(42)	±20(14)	1200	DC to 200	DC to 100	19×10.47×24.02 (483×266×610)	40

Specifications

Input voltage Input current

Model	Input voltage ±10% · AC50/60Hz	Input current	Recommended breaker
150W	115V	4A	115VAC/15A
300W		7A	
600W	230V	7A	230VAC/15A
1.2kW		13A	230VAC/20A

External control voltage(Vcon-in) -10V to +10V
(Input impedance is 10 kΩ or more.)

Output indication (DC value indication) Output voltage 3- digit digital meter ±999
Output current 3-digit digital meter ±999

DC bias 10-turn potentiometer enables setting between -100% and +100%.

Ripple Less than 0.02%rms

Stability 0.016 % /Hr typ.

Setting accuracy ±0.5 % F.S

Distortion factor

CV: 0.05 % CC: 0.5 %

Regulation

Line : 0.05 % (for ±10 % input change)
Load : 0.05 % (for 0 to 100 % load change)

Temperature coefficient

200ppm/°C

Output monitor

Output voltage -10V to +10V±1%F.S
Output current -10V to +10V±1%F.S
Output impedance 1kΩ

Protective function

Protection against output short-circuit, overvoltage, overcurrent
Blackout protection(can be canceled with -LN option)

Operating temp.

0°C to 40°C

Storage temp.

-40°C to +85°C

Humidity

20% to 80%RH(no condensation)

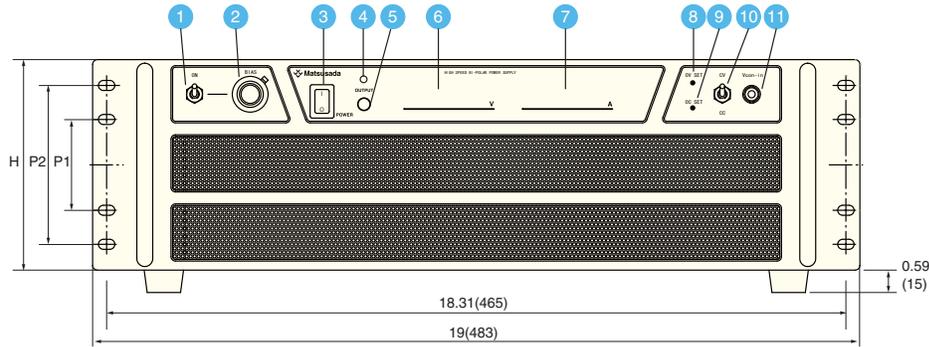
Accessories

Input cable ... 2.5 m(1)
(3-pin connector for 115V model Flying lead for 230V model)
Instruction manual(1)

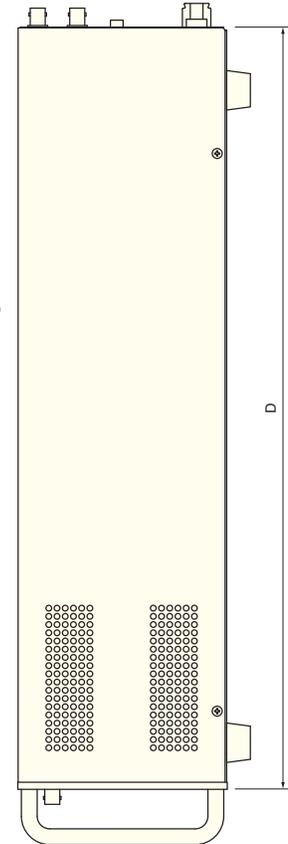
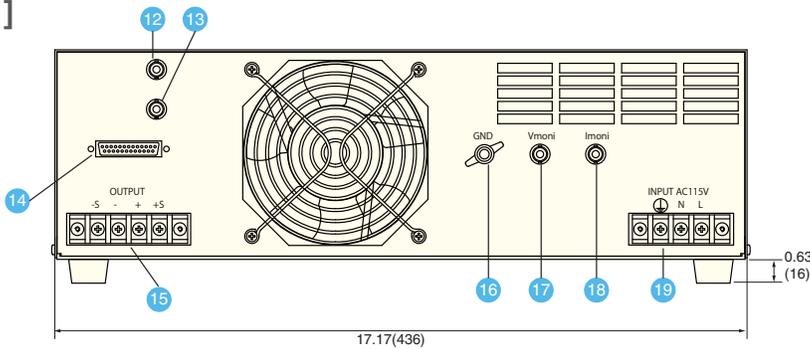
Functions / Dimensions inch(mm)

150W, 300W, 600W output models

[Front]



[Rear]



- | | |
|----------------------------------|----------------------------------|
| 1 Bias ON/OFF switch | 11 Vcon-in terminal |
| 2 Bias setting dial | 12 Door switch(option) |
| 3 POWER ON/OFF switch | 13 REMOTE switch ON/OFF (option) |
| 4 OUTPUT indication LED | 14 Connector for Master-slave |
| 5 OUTPUT ON/OFF switch | 15 OUTPUT terminal |
| 6 Voltage meter | 16 GROUND internal |
| 7 Current meter | 17 Voltage monitor terminal |
| 8 Output voltage limiter(option) | 18 Current monitor terminal |
| 9 Output current limiter(option) | 19 AC input terminal |
| 10 CV/CC select switch | |

Model	H	P1	P2
150W-300W	5.24 (133)	2.25 (57.15)	3.94 (100)
600W (up to 60V)	6.97 (177)	4 (101.6)	5.91 (150)

*See P.3 for depth(D).

Use of BIAS

When the "BIAS ON/OFF switch" is flipped to ON, bias output can be changed with the "BIAS setting dial." Bias voltage can be set when CV control mode, and Bias current can be set when CC control mode.

Scale	In CV mode		In CC mode	
	Output voltage	Output current	Output voltage	Output current
000(ccw)	Max(-)	Max(-)		
500	0V	0A		
1000(cw)	Max(+)	Max(+)		

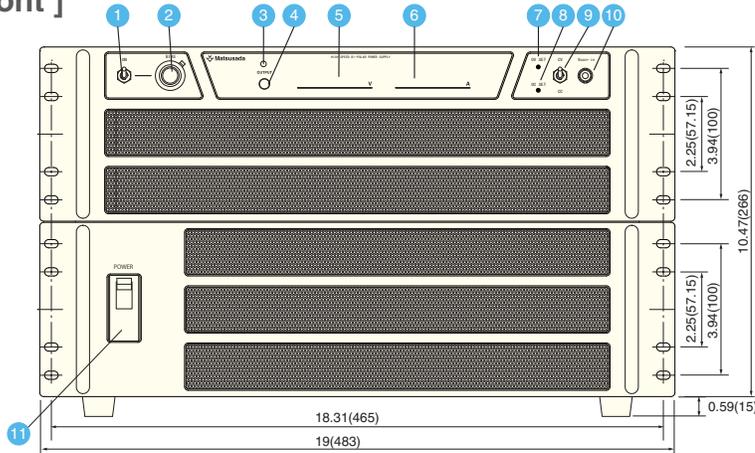
CV/CC setting selection

Inputting voltage via Vcon-in enables the control of output voltage V when CV control mode and output current A when CC control mode.

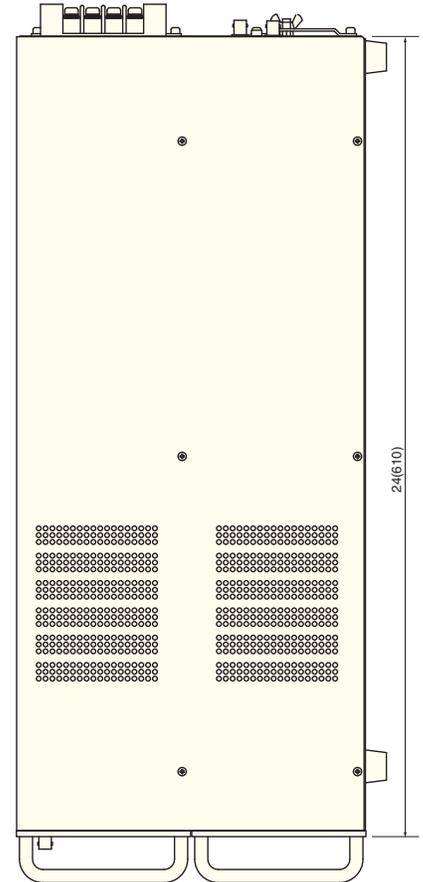
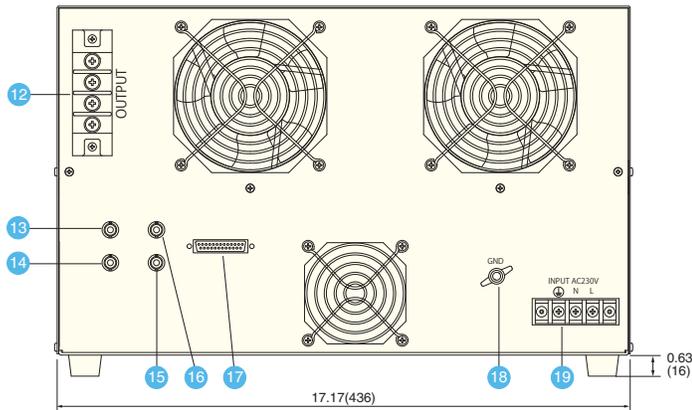
Vcon	In CV mode		In CC mode	
	Output voltage	Output current	Output voltage	Output current
-10V	Max(-)	Max(-)		
0V	0V	0A		
+10V	Max(+)	Max(+)		

1200W output models

[Front]



[Rear]



- ① Bias ON/OFF switch
- ② Bias setting dial
- ③ OUTPUT indication LED
- ④ OUTPUT ON/OFF switch
- ⑤ Voltage meter
- ⑥ Current meter
- ⑦ Output voltage limiter(option)
- ⑧ Output current limiter(option)
- ⑨ CV/CC select switch
- ⑩ Vcon-in terminal
- ⑪ POWER ON/OFF switch
- ⑫ OUTPUT terminal
- ⑬ Voltage monitor terminal
- ⑭ Current monitor terminal
- ⑮ REMOTE switch ON/OFF (option)
- ⑯ Door switch(option)
- ⑰ Connector for Master-slave
- ⑱ GROUND internal
- ⑲ AC input terminal

Use of BIAS

When the "BIAS ON/OFF switch" is flipped to ON, bias output can be changed with the "BIAS setting dial." Bias voltage can be set when CV control mode, and Bias current can be set when CC control mode.

Scale	In CV mode		In CC mode	
	Output voltage	Output current	Output voltage	Output current
000(ccw)	Max(-)	Max(-)	Max(-)	Max(-)
500	0V	0A		
1000(cw)	Max(+)	Max(+)		

CV/CC setting selection

Inputting voltage via Vcon-in enables the control of output voltage V when CV control mode and output current A when CC control mode.

Vcon	In CV mode		In CC mode	
	Output voltage	Output current	Output voltage	Output current
-10V	Max(-)	Max(-)		
0V	0V	0A		
+10V	Max(+)	Max(+)		

Protective functions

Over voltage protection (O.V.P)

DOS series is equipped with over voltage protection, which protects load by limiting voltage up to 120 % of the rated output voltage even at abnormal conditions.

Over current protection (O.C.P)

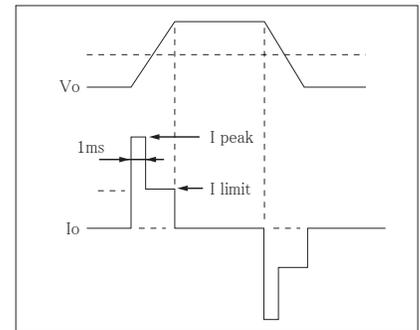
DOS series is also equipped with over current protection, which protects power supplies and load by limiting current up to 120 % of the rated output current.

High speed over current protection

DOS series is provided with 2 types of over current protections, high speed over current protection to limit the pulse current, and standard over current protection to limit the static current.

The standard over current protection limits the static current, responding at around 1m sec.

Additional high speed over current protection can limit pulse current of square waveforms or from capacitor at approximately 2 times more current of rating.



Output range

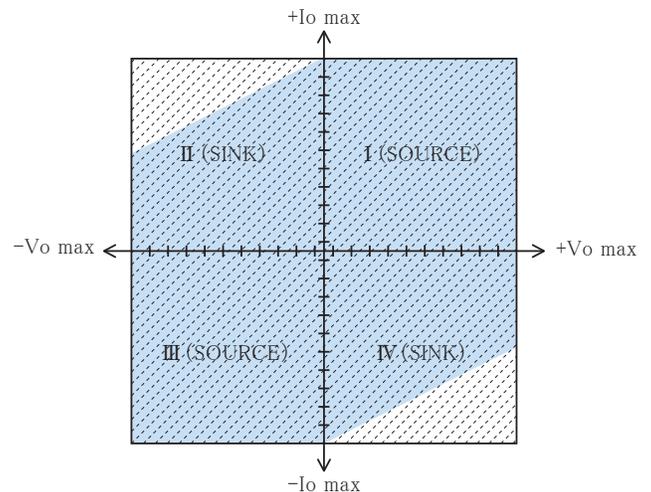
DOS series is a bi-polar power supply which can perform four-quadrant operation. They can supply (source) and absorb (sink) current in the field of the drawing on the right.

$V_o \text{ max}$: rated output voltage

$I_o \text{ max}$: rated output current

 Range of AC operation (with 50 Hz or more frequency and 50 % of duty and without any DC bias)

 Range of DC operation



Options

-LD	...Door switch
-LS	...Remote switch
-LN	...No protection against blackout
-LF	...Floating ground (Resistant to pressure 200 Vdc)
-LMs()	...Master-slave control*
-LPr	...rms display
-LVI	...Output voltage limit Variable from 0 to approx. 110% with front panel dial
-LII	...Output current limit Variable from 0 to approx. 110% with front panel dial

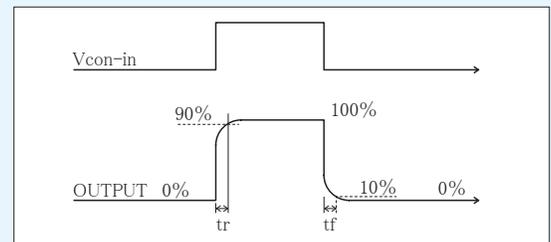
When ordering, suffix the following option mark to the model number.
<e.g> DOS25-48-LDFIIsmNPrSVI (Alphabetical order)

*() shall be "m" for Master unit, or "s" for Slave unit.
 -LMsm for Master, LMss for Slave.

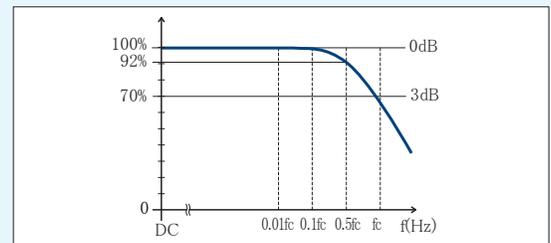
Order required quantity for each unit. Master unit or slave unit are to be set at the factory, and if master to slave change is required after shipment, adjustment at the factory will be needed. Slave unit will not operate by itself. Maximum 3 units including master unit can be connected.

Characteristic of amplifier

Rise time (Stepping time): The response time is sometimes described by the rise time (as shown in the drawing on the right).
 The rise time of an amplifier at a response speed of (= frequency bandwidth) F_c (Hz) is generally acquired by " $tr \cong 0.35/f_c$."
 Fall time tf is the same as tr .
 Frequency bandwidth
 : at 200 kHz or lower, $tr = tf =$ around 1.8 μs
 : at 100 kHz or lower, $tr = tf =$ around 3.5 μs



Response speed When accurate output waveforms are required, select an amplifier with a frequency bandwidth higher than the operating frequency. In case of using sine waves, 3 to 5 times more frequency bandwidth is required, and around 10-times more in case of square waves in general. Inadequate bandwidth causes not only decrease in the output amplitude but much difference between the input and output phases. Therefore operating the product while monitoring the actual output waveforms is recommended.



Capacitive load Capacitive load may cause oscillation. In such cases, place a power resistor in series with the output. Be careful that the frequency bandwidth is limited depending on the resistance and capacitance placed in series when capacitive load.

Inductive load Some inductance of inductive load may cause resonance in CC mode. In such cases, connect a C-R series circuit between output terminals to prevent resonance.

