

NEW

Four-quadrant Fast Response Bipolar Power Supply

- ▶ Output voltage: 0V to $\pm 45V$
- ▶ Maximum output power: 240W
- ▶ Frequency bandwidth: DC to 100kHz

DHOP series

Weight: approx. 7kg



DHOPseries



Four-quadrant fast response bipolar power supply

DHOP series is **four-quadrant bipolar power supply which source and sink electric power**. They can be used in 2-mode of a constant voltage (CV) or a constant current (CC). Thanks to the original design, phenomenal light weight and compact size power supply, which is 8.3" (210 mm) width, and weigh 7 kg has been achieved. They are ultra compact and high speed, driving output proportional to the input waveform such as a sine wave, triangular wave, saw wave, and square wave.

DHOP series is most appropriate for evaluation test such as solar panels, the instruments driven by battery and the IC which control battery.

Even faster model, DOS series, amplifier with function generator, DOPF series, or more high power model, DOP series, are available. Contact to local sales office for details.

Applications

- ▶ **Suitable to evaluate battery driven equipment to use as a simulated battery**
- ▶ Inductive load such as coil and transformer
- ▶ Voltage regulation tests for in-vehicle electrical component
- ▶ Capacitive load like capacitor
- ▶ Evaluation test for solar panel related devices
- ▶ Various motor tests
- ▶ For surface treatment

This product is not designed for charge and discharge of battery.
Please contact nearby sales if unit is used for charge and discharge application.

Features

1 Response speed

Newly developed DHOP series is the most appropriate for transient response test with such high power and broad bandwidth.

2 DC bias

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

3 DC output meter

3-digit digital meter displays the DC value of the output voltage and current.

4 Compact & light weight

For maximum compactness and light weight, DHOP Series has been improved for small footprint and easy carry.

5 Constant voltage (CV)/Constant current (CC)

A single switch selects between CV and CC modes.

6 Four-quadrant action

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

7 Complete protective function

Protective function against over voltage / current and protective measures against output short-circuit are completely provided.

Lineup

★ Please consult with our sales office about the specifications except the following list.

Model	Maximum output voltage V	Maximum output current A	Maximum output power W	Frequency bandwidth kHz (-3 dB)	Weight kg approx.
DHOP20-12	±20	±12	240	CV mode: DC to 100 kHz	7
DHOP45-5	±45	±5	225	CC mode: DC to 10 kHz	

Specifications

Input voltage	85 V to 264 Vac 50/60 Hz single phase
Input current	6 A max @115 Vac input
External control voltage (Vcon-in)	-10 V to +10 V (input impedance: more than 10 kΩ)
Output voltage limit	Variable from 0% to approx. 110% with frontpanel VR
Output current limit	Variable from 0% to approx. 110% with frontpanel VR
Output display (DC value)	Voltage: 3-digit digital meter ±999 Current: 3-digit digital meter ±999
DC bias	-100% to +100% by 10-turn potentiometer
Ripple	<CV mode> less than 0.1% rms <CC mode> less than 0.4% rms
Stability	0.016%/Hr typ.
Setting accuracy	±0.5% F.S.
Distortion	<CV mode> 0.05% <CC mode> 0.5% (at rated output or resistor load)
Regulation	Input: 0.05% (for ±10% input change) Load: 0.05% (for 10% to 100% load change)
Temperature coef.	0.02%/°C
Output monitor	Output voltage : -10 V to +10 V ±1% F.S. Output current : -10 V to +10 V ±1% F.S. Output impedance: 1 kΩ
Protections	Over voltage protection, over current protection, against short-circuit and blackout protection (can be canceled with -LN option)
Operating temp.	0°C to +40°C
Storage temp.	-20°C to +70°C
Relative humidity	-20% to 80%, non condensing
Accessories	AC input cable 2.5 m (1) Instruction manual (1)

Protections

Over voltage protection (O.V.P)

DHOP series is equipped with over voltage protection, which protects load by limiting voltage up to approx. 110% of the rated output voltage even at abnormal conditions.

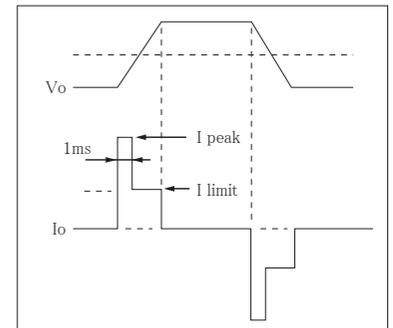
Over current protection (O.C.P)

DHOP series is also equipped with over current protection, which protects power supplies and load by limiting current up to approx. 110% of the rated output current.

High speed over current protection

DHOP 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 1 ms. Additional high speed over current protection can limit pulse current of square waveforms or from capacitor at approx. 2 times more current of rating.



Output range

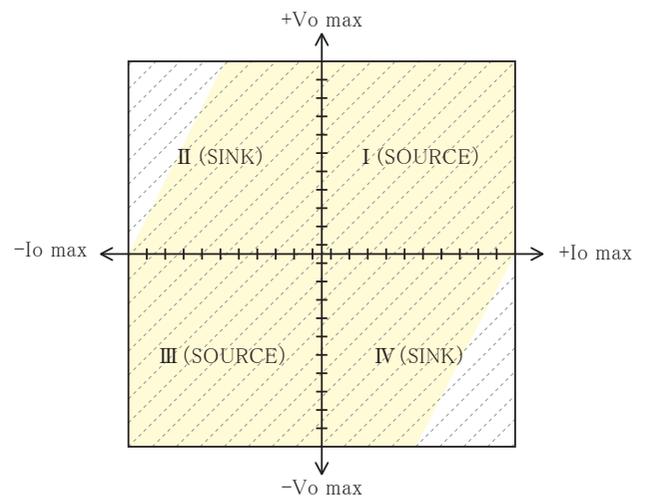
DHOP series is a bipolar power supply which can perform four-quadrant operation. They can supply (source) and absorb (sink) current in the field of the drawing on the right.

V_o max: rated output voltage

I_o max : rated output current

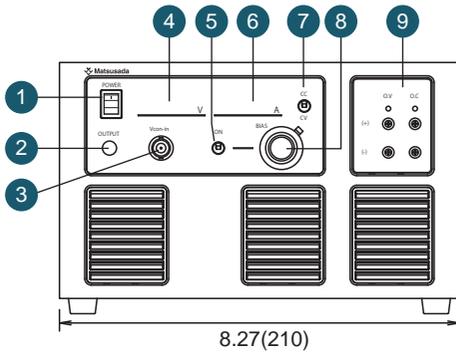
 AC operation range (with 50 Hz or more frequency , 50% of duty cycle and without any DC bias)

 DC operation range

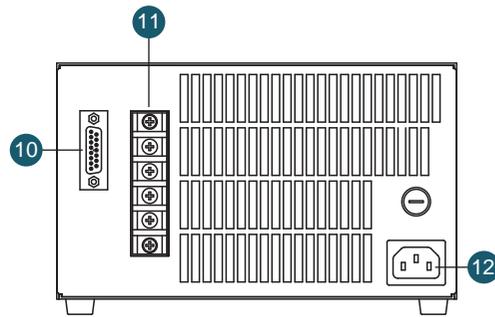


Dimensions inch (mm)/Functions

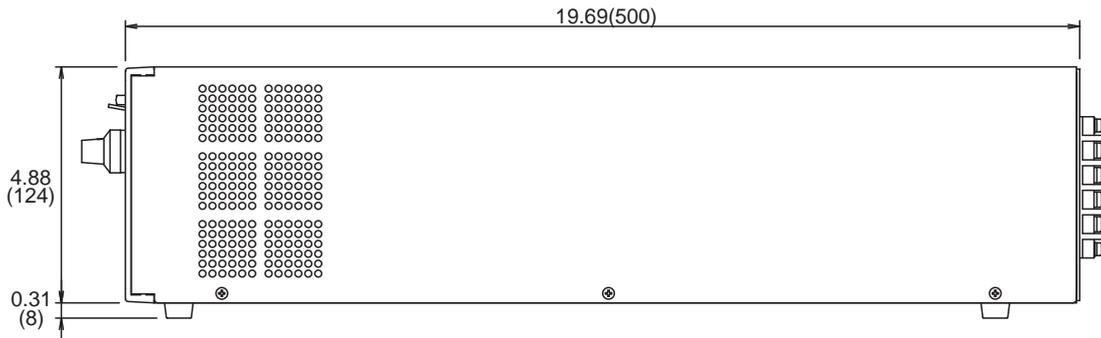
Front



Rear



Side



- | | |
|------------------------|---|
| ① POWER ON/OFF switch | ⑦ CV/CC select switch |
| ② OUTPUT ON/OFF switch | ⑧ Bias setting dial |
| ③ Vcon-in terminal | ⑨ Voltage/Current limitation setting VR |
| ④ Output voltage meter | ⑩ Control connector |
| ⑤ Bias ON/OFF switch | ⑪ Output terminal |
| ⑥ Output current meter | ⑫ AC input terminal |

CV/CC setting selection

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

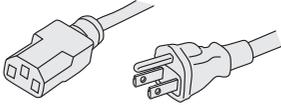
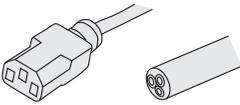
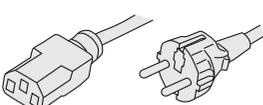
Vcon	In CV mode		In CC mode
	Output voltage	Output current	Output current
-10 V	-Rating	-Rating	
0 V	0 V	0 A	
+10 V	+Rating	+Rating	

Use of BIAS

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

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

AC input cable

CABLE TYPE 1	CABLE TYPE 3	CABLE TYPE 4
125 V/10 A (Standard)	250 V/10 A (Sold separately)	250 V/10 A (Sold separately)
		

Options

- LD** Interlock
- LN** No protection against blackout
- LS** Remote switch (Output ON/OFF)

When ordering, suffix the following option mark to the model number.

<Example> DHOP45-5-LDNS (Alphabetical order)

Characteristic of amplifier

Rise time

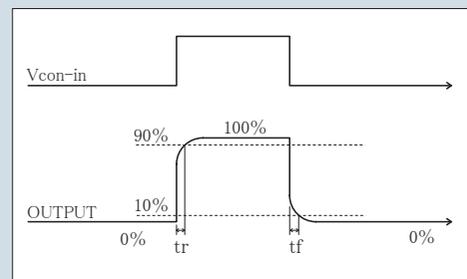
(Stepping time): The response time is sometimes described by the rise time (as shown in the drawing on the right).

The rise time of an amplifier at a response speed of (= frequency bandwidth) F_c (Hz) is generally acquired by " $t_r \cong 0.35/f_c$."

Fall time t_f is the same as t_r .

Frequency bandwidth

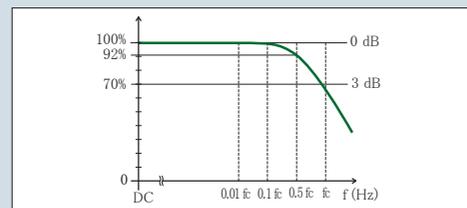
: at 100 kHz or lower, $t_r = t_f =$ around 3.5 μ s



Response speed

When accurate output waveforms are required, select an amplifier with a frequency bandwidth higher enough 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, placed a power resistance 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.

