Matsusada Precision

Fast Response Bipolar Power Supply

DOPF series

NEW

Function Generator Integrated

Four-Quadrant and High-Speed Bipolar Power Supply

±5V to ±300V/150W to 2000W/DC to 30kHz (max)

DOPF series

- Waveform generation, sequence operation, various measurements on a single power supply
- All settings and operations are realized only by operation on the front panel
- Available for expanding to 6kW with master/slave connection

MADE IN JAPAN

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DOPF series

More user-friendly and convenient.
DOPF series with function generator is now available.

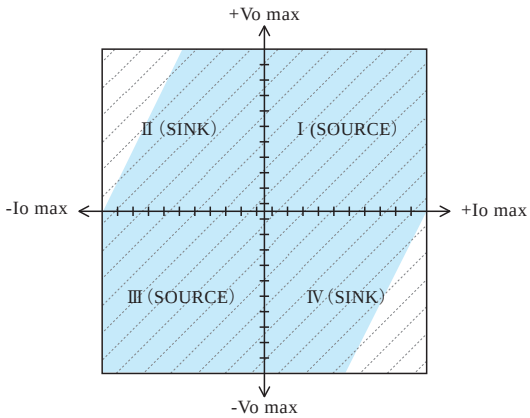
DOPF series is a four-quadrant and high-speed bipolar amplifier with a built-in function generator, which improves the operations.
Any waveform can be programmed easily on the front panel, and necessary functions are all available in term of sequence, measurement, memory setting, and protection besides waveform.
Moreover, equipped with the control signal output of parallel operation as standard, full synchronized operation is achieved even with high speed. DOPF series integrated with signal generator in four quadrants offers variations in experiments and evaluation tests.

Features

- DOPF series which is four-quadrant high speed bipolar power supply is now available with integrated function generator.
- Waveform with less distortion by DDS method (DC to 30 kHz sine wave, square wave, and triangular wave)
- DC and AC output can be programmed individually, making the unit user-friendly with its simple operation.
- External control is available with communication options (USB, LAN, RS-232C, and RS-485).
- LCD display uses high contrast white LED backlight for high visibility.

Four-quadrant operation

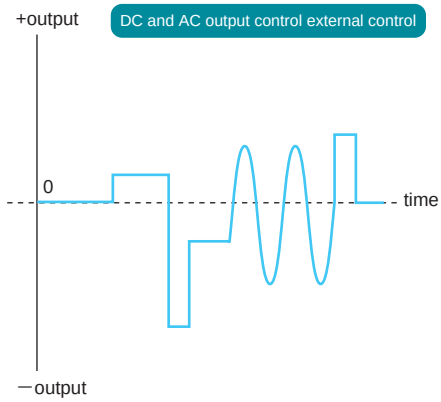
Vo max: rated output voltage
Io max : rated output current



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

DC operation range

DC and AC output control external control



Applications

Driving capacitive loads (capacitors), biasing inductive loads (coils, transformers, etc.), motor testing, power conditioners, evaluation test for solar panel related devices

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

Lineup

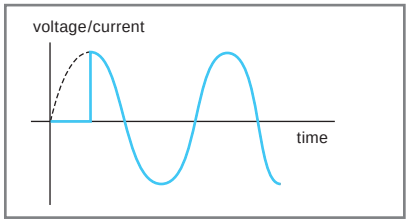
Model	Maximum outpuut voltage	Maximum output current	Maximum output power	Frequency response (-3 dB)	Weight [kg] approx.	Dimensions (See page 06 and 07.)
DOPF5-30	±5 V	±30 A	150 W	DC to 20 kHz	17	A
DOPF5-60		±60 A	300 W	DC to 20 kHz	23	B
DOPF6-120	±6 V	±120 A	720 W	DC to 20 kHz	47	C (Busbar Type)
DOPF10-15	±10 V	±15 A	150 W	DC to 20 kHz	11	A
DOPF10-30		±30 A	300 W	DC to 20 kHz	17	A
DOPF10-60		±60 A	600 W	DC to 20 kHz	23	B
DOPF20-7.5	±20 V	±7.5 A	150 W	DC to 20 kHz	11	A
DOPF20-15		±15 A	300 W	DC to 20 kHz	17	A
DOPF20-30		±30 A	600 W	DC to 20 kHz	23	A
DOPF20-60		±60 A	1200 W	DC to 20 kHz	40	C (Terminal Block Type)
DOPF20-100		±100 A	2000 W	DC to 20 kHz	47	C (Busbar Type)
DOPF25-6	±25 V	±6 A	150 W	DC to 30 kHz	11	A
DOPF25-12		±12 A	300 W	DC to 30 kHz	17	A
DOPF25-24		±24 A	600 W	DC to 30 kHz	23	A
DOPF25-48		±48 A	1200 W	DC to 20 kHz	40	C (Terminal Block Type)
DOPF25-80		±80 A	2000 W	DC to 20 kHz	47	C (Busbar Type)
DOPF30-40	±30 V	±40 A	1200 W	DC to 20 kHz	40	C (Terminal Block Type)
DOPF45-3.3	±45 V	±3.3 A	150 W	DC to 20 kHz	12	A
DOPF45-6.6		±6.6 A	300 W	DC to 20 kHz	17	A
DOPF45-13.3		±13.3 A	600 W	DC to 20 kHz	23	A
DOPF45-16		±16 A	720 W	DC to 20 kHz	23	A
DOPF45-26.7		±26.7 A	1200 W	DC to 20 kHz	40	C (Terminal Block Type)
DOPF45-44.4		±44.4 A	2000 W	DC to 20 kHz	47	C (Terminal Block Type)
DOPF60-2.5	±60 V	±2.5 A	150 W	DC to 20 kHz	12	A
DOPF60-5		±5 A	300 W	DC to 20 kHz	17	A
DOPF60-10		±10 A	600 W	DC to 20 kHz	23	A
DOPF60-20		±20 A	1200 W	DC to 20 kHz	40	C (Terminal Block Type)
DOPF60-33.3		±33.3 A	2000 W	DC to 20 kHz	47	C (Terminal Block Type)
DOPF70-17	±70 V	±17 A	1200 W	DC to 20 kHz	40	C (Terminal Block Type)
DOPF80-25	±80 V	±25 A	2000 W	DC to 20 kHz	47	C (Terminal Block Type)
DOPF120-2.5	±120 V	±2.5 A	300 W	DC to 20 kHz	18	A
DOPF120-5		±5 A	600 W	DC to 20 kHz	30	D
DOPF120-10		±10 A	1200 W	DC to 20 kHz	45	C (Terminal Block Type)
DOPF150-2	±150 V	±2 A	300 W	DC to 20 kHz	18	A
DOPF150-4		±4 A	600 W	DC to 20 kHz	30	D
DOPF150-8		±8 A	1200 W	DC to 20 kHz	45	C (Terminal Block Type)
DOPF200-1.5	±200 V	±1.5 A	300 W	DC to 20 kHz	18	A
DOPF200-1.75		±1.75 A	350 W	DC to 20 kHz	18	A
DOPF200-3		±3 A	600 W	DC to 20 kHz	30	D
DOPF200-3.5		±3.5 A	700 W	DC to 20 kHz	38	C (Terminal Block Type)
DOPF200-6		±6 A	1200 W	DC to 20 kHz	45	C (Terminal Block Type)
DOPF300-1	±300 V	±1 A	300 W	DC to 20 kHz	18	A
DOPF300-2		±2 A	600 W	DC to 20 kHz	30	D
DOPF300-4		±4 A	1200 W	DC to 20 kHz	45	C (Terminal Block Type)

Functions

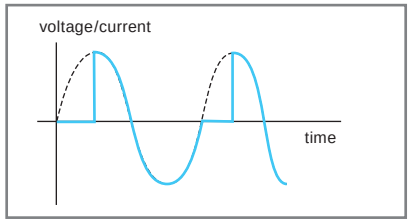
Fundamental wave generated function

The DOPF is equipped with a built in function generator that produces sine, rectangular, and triangle waves. Frequency range can be set between 0.01 Hz and 20 kHz (30 kHz is available for some models). In addition, the easy adjustments of amplitude, initial phase (sine wave), switching/cutoff phase setting (sine wave), and duty cycle (rectangular wave, triangular wave) are possible, making it very convenient for a variety of evaluation tests and applications.

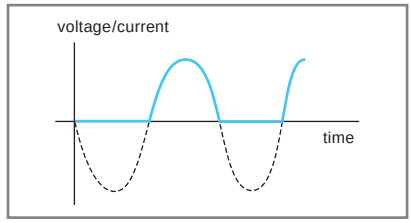
Initial phase



Switching phase



Cutoff phase



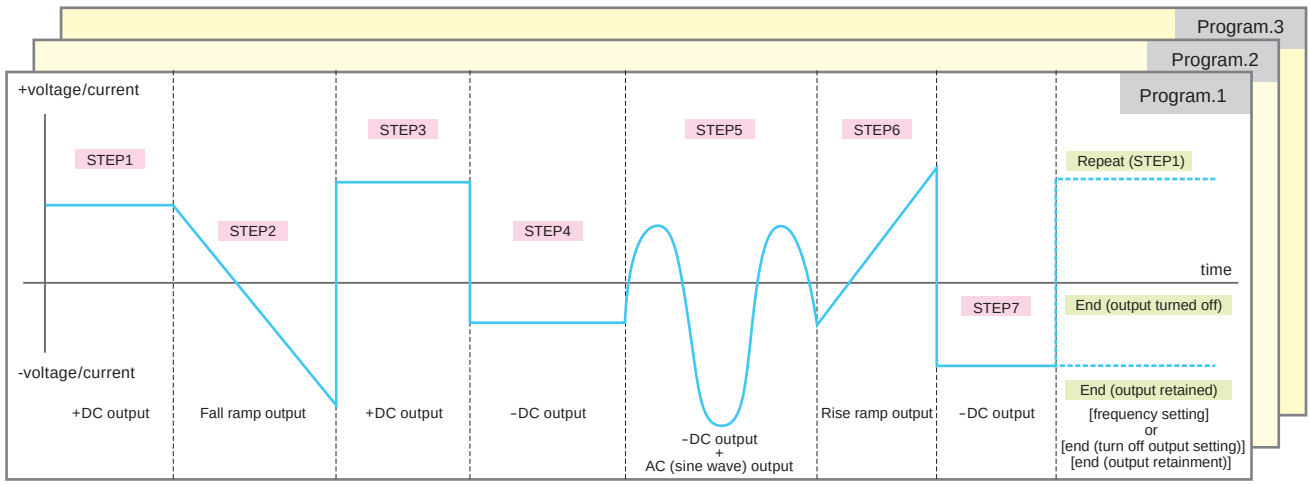
Applications Power-on test, rush current measurement, wave fluctuation test, etc.

Sequence functions *

DOPF is equipped with a sequence function that can program step length, step amplitude, ramp, CV/CC mode, sequence-ending setting, AC superposition, step jump, number of jump, etc. Any desired waveform can be generated making it useful for various experiment, evaluation, and validation applications.

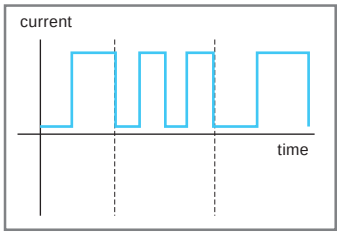
- Setting length: 10 ms to 1999 s 999 ms (resolution: 1 ms), Ramp and AC waveform is 50 ms
- Setting up to 16 steps per program, and saving the setting for three programs
- Can be set CV/CC mode per program
- Frequency: Infinite, 1 to 999

Program image

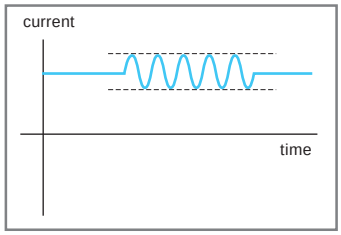


Complicated waveforms such as below can be easily generated just by using the sequence function.

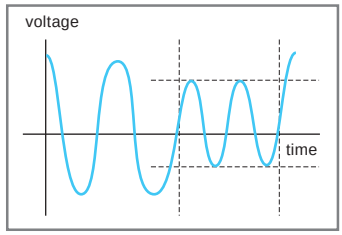
Pulse current variation



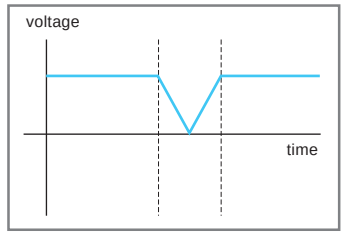
Ripple current superposition



AC voltage/frequency variation



DC voltage interruption

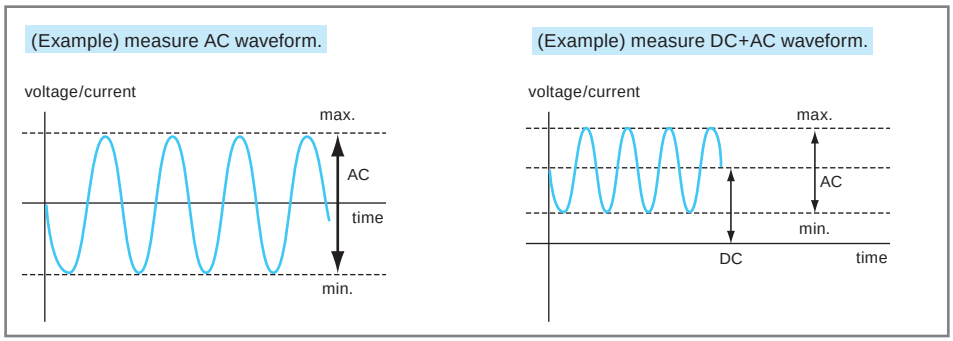


Applications Motor testing, pulse power supplies, or various evaluation equipment, etc.

* If amplifier's output cuts off while it is running a sequence program half-way-through, the leftover sequence will not run but it is re-activated from the beginning of the original sequence.

Measurement functions

DOPF is equipped with measurement functions that measure DC value, AC RMS value, Max value, and Min. value.
Thus wide frequency ranges, DC to 20 kHz, can be measured automatically, and it is easy to change the setting depending on application.
Besides, there is no need for choosing options, and it is easy to change the setting depening on the application.



Memory function

DOPF is equipped with both preset and set-up memory.
During fundamental wave operation, output voltage (at CV mode), Output current (at CC mode), CV/CC setting, and waveform setting can be saved to 10 set-up memories. Also, sequence programs can be saved in up to 3 programs, which is useful for operations regarding multiple waveforms more often-used or sequence function. Data changes can be saved and data called out very easily.

DOPF is also equipped with a
Protection function, Key-lock function, and CV/CC crossover as standard.

Operability

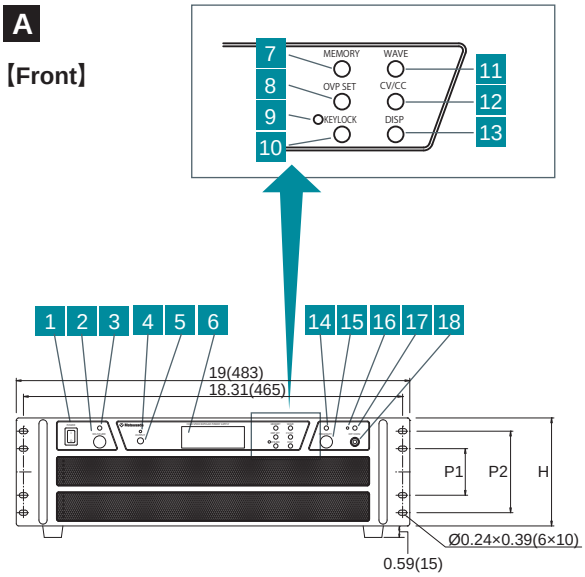
DOPF series has numerous functions, it is user-friendly, and will contribute to minimizing tact time as well as improving efficiency of operation.

1 Power switch : This has priority over all operations for safety reason.
2 Amplitude setting switch : DC and AC amplitude changeover (voltage or current)
3 Amplitude adjustment rotary encoder : It is used as amplitude setting, each setting change, sequence editing
4 Output switch : Turn output ON/OFF
5 Display : Display each setting, monitor value
6 Memory switch : Call up and save set-up memory
7 Wave switch : Fundamental wave changeover
8 OVP setting switch : Set OVP, OCP protection function setting and measurement setting
9 CV/CC changeover switch : CV/CC changeover
10 Key-lock switch : Set key-lock
11 Display switch : Change display
12 Frequency setting switch : Change waveform setting (frequency, phase, and duty cycle)
13 Frequency adjustment rotary encoder : Set waveform setting value
14 External control voltage effective switch: Integrated function generator and external voltage operation changeover

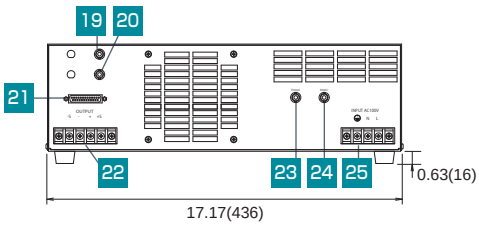
Dimensions inch (mm)/Appearance

A

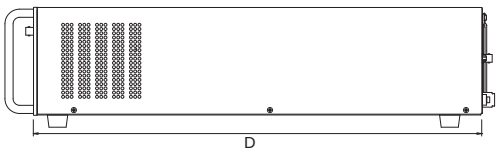
【Front】



【Rear】

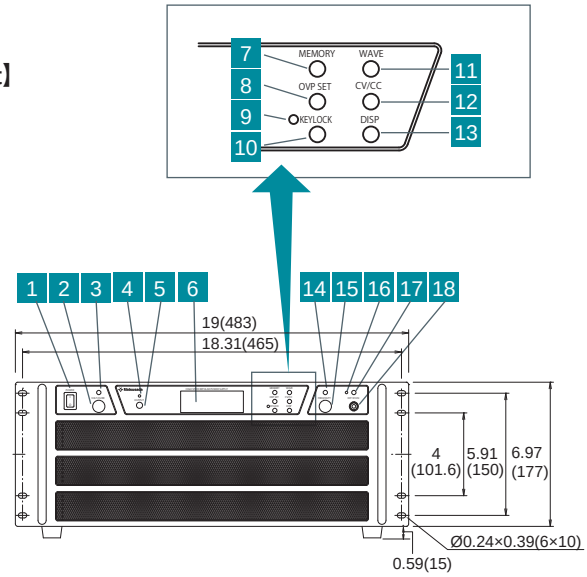


【Side】

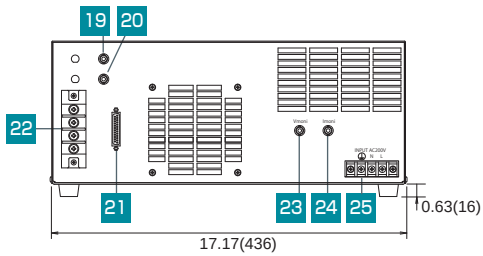


B

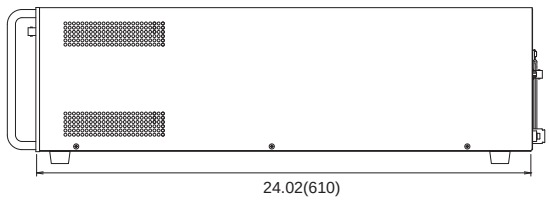
【Front】



【Rear】



【Side】

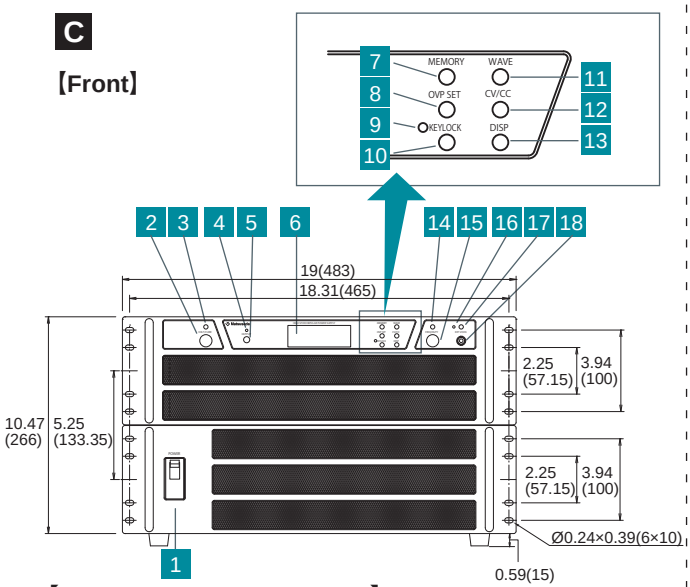


Model	H	P1	P2	D
150 W (except DOPF5-30)	5.24 (133)	2.25 (57.15)	3.94 (100)	18.98 (482)
DOPF5-30, 300 W	5.24 (133)	2.25 (57.15)	3.94 (100)	21.65 (550)
more than 600 W	6.97 (177)	4 (101.6)	5.91 (150)	24.02 (610)

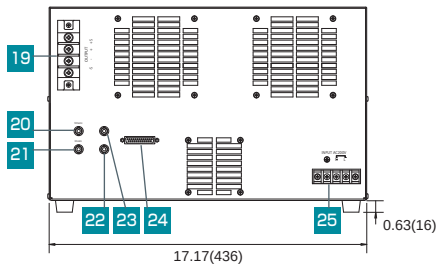
1 Power ON/OFF switch
2 Amp./Bias setting encoder
3 Amp./Bias change switch
4 OUTPUT indication LED
5 OUTPUT ON/OFF switch
6 Display
7 Memory setting switch
8 OVP setting switch
9 Key lock indicate LED
10 Key lock switch
11 Waveform change switch
12 CV/CC change switch
13 Display change switch
14 Frequency/Duty change switch
15 Frequency/Duty setting encoder
16 External control voltage indicate LED
17 External control voltage switch
18 External control voltage input terminal
19 Interlock (Option)
20 Remote switch ON/OFF (Option)
21 Connector for master/slave (Option)
22 Output terminal
23 Output voltage monitor terminal
24 Output current monitor terminal
25 AC Input terminal

C

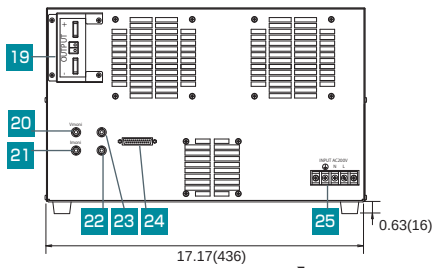
【Front】



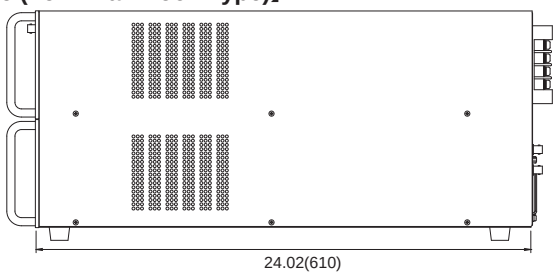
【Rear (Terminal Block Type)】



【Rear (Busbar Type)】

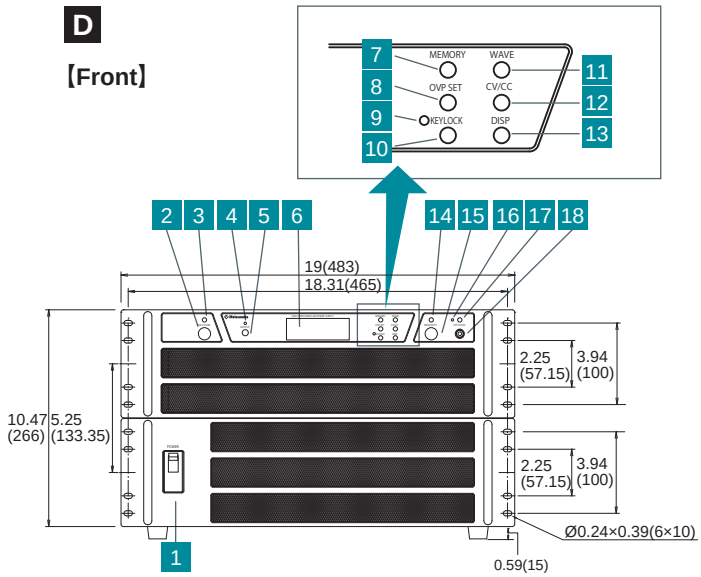


【Side (Terminal Block Type)】

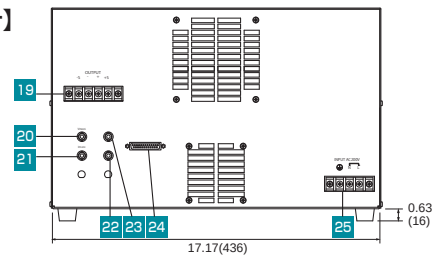


D

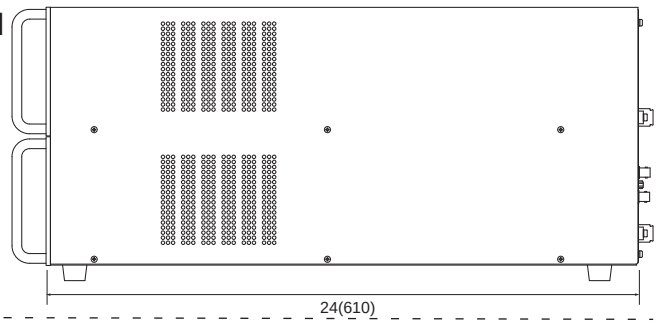
【Front】



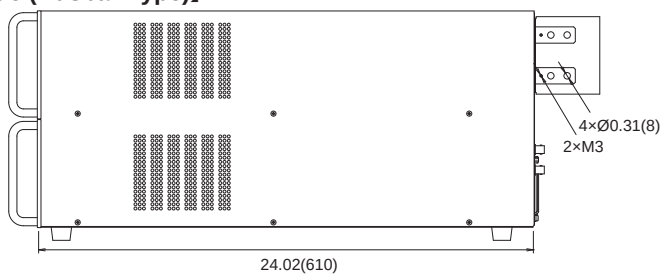
【Rear】



【Side】



【Side (Busbar Type)】



1 Power ON/OFF switch
2 Amp./Bias setting encoder
3 Amp./Bias change switch
4 OUTPUT indication LED
5 OUTPUT ON/OFF switch
6 Display
7 Memory setting switch
8 OVP setting switch
9 Key lock indicate LED
10 Key lock switch
11 Waveform change switch
12 CV/CC change switch
13 Display change switch
14 Frequency/Duty change switch
15 Frequency/Duty setting encoder
16 External control voltage indicate LED
17 External control voltage switch
18 External control voltage input terminal
19 Output terminal
20 Output voltage monitor terminal
21 Output current monitor terminal
22 Remote switch ON/OFF (Option)
23 Interlock (Option)
24 Connector for master/slave (Option)
25 AC Input terminal

Specifications

Input voltage/Input current

Target Model	Rated Input voltage (AC50/60Hz)	Rated Input current	Recommended breaker
150 W model *1	AC100 V to 120 V ±10% single phase	4 A	100 Vac/15 A
DOPF5-30 model		5 A	
300 W, 350 W model *2		7 A	
DOPF5-60 model		10 A	
600 W model	AC200 V to 240 V ±10% single phase	7 A	200 Vac/15 A
700 W, 720 W model		8 A	
1.2 kW model		13 A	200 Vac/20 A
2 kW model		20 A	200 Vac/30 A

*1. except for DOPF5-30 *2. except for DOPF5-60

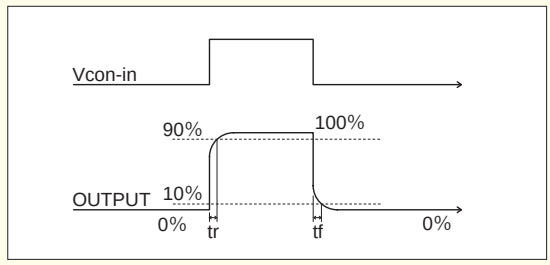
Waveform generation function	Sine wave, Rectangular wave, phase setting (sine wave), duty setting (square wave and triangular wave)
Frequency setting accuracy	≤ 0.03%
Step length	10 ms to 1999 s 999 ms (but ramp and AC wave form is 50 ms)
Step resolution	1 ms
Frequency for waveform	DC, 10 mHz to 20 kHz (30 kHz)
External control voltage	-10 V to +10 V input impedance > 10 kΩ, switchable of the external control
Output setting range	DC: -100% to +100% AC : 0% to +100%
Ripple	0.02% rms
Stability	0.016%/Hr typ
Setting accuracy	±0.5% FS

Distortion factor	CV: 0.05%, CC: 0.5%
Voltage regulation	Line : 0.05% (for ±10% input change) Load: 0.05% (for 10% to 100% load change)
Protections	Against output short-circuit,overvoltage and overcurrent (variable OVP/OCP limit)
Temperature coef.	0.02%/°C (CV Mode), 0.04%/°C (CC Mode)
Control voltage output	-10 V to +10 V (output impedance 50 Ω)
Output display	LCD on front panel Three-digit output voltage monitor Three-digit output current monitor (AC (rms), DC, MAX, MIN)
Output display accuracy	DC: ±1% F.S ±1 dgt, AC: ±1% F.S ±1 dgt (at sine wave, freguency 10 Hz to 1 kHz)
Output monitor	CV: -10 V to +10 V ±1% FS (output impedance 1 kΩ) CC: -10 V to +10 V ±1% FS (output impedance 1 kΩ)
Remote sensing	Compensate the voltage drop to up to 0.5 V (Effective only at CV mode and DC output)
Preset function	10 memories Sequence program: 3 memories Sequence step: 16 steps/program
Operation temp.	0°C to +40°C
Storage temp.	-20°C to +70°C
Relative humidity	20% to 80%, non condensing
Accessories	Input cable 2.5 m length x 1 (3-pin connector for 115 V models, Flying lead for 230 V models) Instruction manual x 1

Characteristic of amplifier

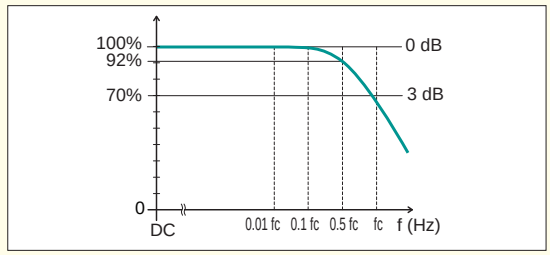
Rise time

(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) Fc (Hz) is generally acquired by "tr ≒ 0.3/fc."
Fall time tf is the same as tr.
Frequency bandwidth
: at 30 kHz or lower, tr = tf = around 12 µs
: at 20 kHz or lower, tr = tf = around 18 µs



Response speed

When accurate output waveforms are required, select an amplifier with a frequency bandwidth, which is higher than the required operating frequency. In the case of using sine waves, 3 to 5 times more frequency bandwidth is required, whereas with square waves, around 10 times more frequency bandwidth is needed. Inadequate bandwidth can cause a decrease in output amplitude and a difference between input and output phases. Operating the product (load) while monitoring the actual output waveforms is recommended.



Capacitive load

Capacitive load may cause oscillation.
In such cases, place a resistor in series with the output.
Be careful to not limit the frequency bandwidth by using a resistor in series that is too large.

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.

Options

* These options cannot be selected together.

-LD Interlock

-LEt LAN interface board *

Digital control via LAN

[Control items]
Output ON/OFF, Voltage/Current setting (AC and DC), Switch of Constant Voltage/Constant Current, Frequency setting, Waveform setting (sine wave, square wave, and triangular wave), phase setting (sine wave), Duty setting (square wave and triangular wave)

-LF Floating ground (withstanding voltage of 200 Vdc)

The negative terminal of the output can be floatable up to 200 V. However, please take note that external control signal source (such as function wave generator) and the common for the measuring device that connects to amplifier's monitor terminal will also become floating potential in this case.

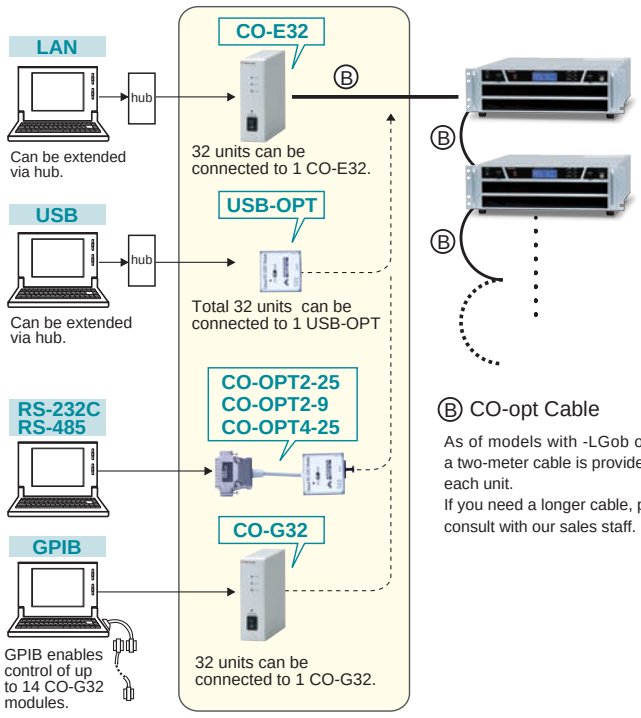
-LGob Optical interface board *

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

Optical communication offers insulation control. It is to prevent malfunction such as transient phenomenon by surge, lightning induction, and external noise.

[Control items]
Output ON/OFF, Voltage/Current setting (AC and DC), Switch of Constant Voltage/Constant Current, Frequency setting, Waveform setting (sine wave, square wave, and triangular wave), phase setting (sine wave), Duty setting (square wave and triangular wave)
(The converters are required sold separately. Please contact our sales staff for details.)

Converters (Sold separately)



Ⓑ CO-opt Cable

As of models with -LGob option, a two-meter cable is provided in each unit.
If you need a longer cable, please consult with our sales staff.

Select the -LGob option when using power supply following environmental condition
-Factories which has a lot of noise
<Example> In case of using power supplies and loads near motors and coils.
-In case using power supply with high voltage floating (more than 250 V)
-The installation distance between power supply and controller (PL or PLC) produced by Matsusada Precision is more than two meters.

-LMsm, -LMss Master/slave control

"-LMsm" for Master unit, or "-LMss" for slave unit
Maximum 2 slave units can be connected to the master unit.
As the master and slave units individually adopt the dedicated settings, the switching of the two units is not allowed.
When you control the master/slave operation via the USB communication while using the option in combination with -LUs1option, make sure that the master unit should select -LUs1 option only.
As for the slave unit, -LUs1 option is unnecessary.
On the other hand, however, if you use USB communication to control the slave unit only, -LUs1 option is required in the slave unit.

-LS Remote switch/output ON/OFF

-LUs1 USB interface board *

Digital control via USB

[Control items]
Output ON/OFF, Voltage/Current setting (AC and DC),
Switch of Constant Voltage/Constant Current, Frequency setting,
Waveform setting (sine wave, square wave, and triangular wave),
phase setting (sine wave),
Duty setting (square wave and triangular wave)

-L(220V) Change of input voltage

200 Vac to 240 Vac ±10% single phase, 50/60 Hz input
(150 W, 300 W, and 350 W models only)

When ordering, add option No. to the Model No.
(Alphabetical and input voltage order)
<Example> DOPF60-20-LDFMs(m)SUs1
DOPF20-15-LDFGob(Fc10)Ms(s)S(220V)

Corresponding to "Equipment Utilizing High Frequency."

DOPF series is applied to "Equipment Utilizing High Frequency" which shall accept the permission from the Minister of Internal Affairs and Communications under Article 100 of the Radio Law. (It is necessary if the output power of the product operation exceeds 500 W with a frequency of 10 kHz.)
For details regarding the application of the permission, please contact general telecommunication bureaus in charge.

Low voltage type High-speed bipolar power supplies

Function generator built-in type

DOPF series

Output voltage : ±5 V to ±300 V
Output power : 150 W to 2 kW
Frequency bandwidth: DC to maximum 30 kHz

- DOPF series can be used for various applications by fast response and built-in function generator.

Wide lineup type

DOP series

Output voltage : ±5 V to ±300 V
Output power : 150 W to 2 kW
Frequency bandwidth: DC to maximum 30 kHz

- The model which is most suitable for your application can be selected from wide lineup.

Ultra-fast response type

DOS series

Output voltage : ±20 V to ±60 V
Output power : 150 W to 2 kW
Frequency bandwidth: DC to maximum 200 kHz

- Ultra-fast response is achieved in compact size.

High voltage type

DOC series

Output voltage : ±500 V, ±1000 V
Output power : 50 W, 100 W
Frequency bandwidth: DC to maximum 10 kHz

- High voltage output (maximum ±1 kV) and fast response.

Function generator built-in type

DJOPF series

Output voltage : ±10 V to ±60 V
Output power : 50 W, 60 W
Frequency bandwidth: DC to maximum 30 kHz

- DJOPF series has a built-in function generator in its light and compact size of only 140 mm width.

Compact and high power type

DHOP series

Output voltage : ±20 V, ±45 V
Output power : 240 W
Frequency bandwidth: DC to maximum 100 kHz

- High power and fast response are achieved in compact half-rack size.

High voltage type High-speed Amplifier

Ultra-high speed type

AMP series

Output voltage: ±600 V to ±40 kV
Output power : 100 W to 1.2 kW
Slew rate : 700 V/µs, 360 V/µs, 300 V/µs

- Slew rate with actual load is as high as 700 V/µs.
- Peak current output of 3 times of rated output current is available.
- Various protections such as over current/voltage protection and output short circuit are available.
- Suitable for Solar battery panel evaluations, Beam deflection, Corona discharge, and so on.

Large current/high speed type

AMPS series

Output voltage: ±400 V to ±20 kV
Output power : 400 W to 1.2 kW
Slew rate : 400 V/µs to 1200 V/µs

- Maximum peak current is 4 A. (±600 V model)
- Frequency bandwidth with actual load is as high as 100 kHz.
- Various protections such as over current protection and output short circuit are available.
- Suitable for laser modulation and Ion/Electon beam deflection.

High speed type

AMS/AMT series

Output voltage: ±600 V to ±20 kV
Output power : 20 to 200 W
Slew rate : 30 V/µs (AMS) 250 V/µs or 360 V/µs (AMT)

- Wide lineup of output voltage.
- Quick response as fast as 100 kHz enables to output according to input wave forms.
- Various protections such as over current protection, arc and output short circuit are available.
- Suitable for Beam deflection, Corona discharge, Electrophotography process, and so on.

Ultra compact type

AMJ series

Output voltage : ±500 V to ±4 kV
Output power : 20 W, 40 W
Slew rate : 150 V/µs

- Ultra compact size and fast response.
- Output of any wave forms according to input wave forms is available.
- Various protections such as over current protection, arc and output short circuit are available.
- Suitable for Beam deflection, Corona discharge, Electrophotography process, and so on.

Contact us for various kinds of Power supplies

**As a pioneer of power supply manufacturing,
Matsusada Precision offers solutions to meet various
needs with its expertise through direct sales.
Please visit our website and contact us for more information.**

Contact Us **www.matsusada.com**

Contact with phone or fax

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North Carolina office	International office in Japan
TEL(704)496-2644	**TEL+81-6-6150-5088**
FAX(704)496-2643	FAX+81-6-6150-5089

Manufacturer warranty

We warrant the specification, unless otherwise specified, at max. rated output after warm up, and scope of application is between 10% and 100% of max. rated output. 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. We will not inspect, adjust or repair any of our power supply products in the field or at any customer site. If you suspect that there has been a power supply failure in the field, please inspect your whole unit by yourself in an effort to determine that the problem is, in fact, arising out of our power supply products. If it is found that the problem is arising out of such power supply product after inspection, please contact your local sales office for additional troubleshooting. A “Return Merchandise Authorization” is required in case the power supply must be sent back to the factory in Japan for inspection and repair. 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. No modification or supplement of this warranty shall be binding unless in writing and signed by a duly authorized officer of Matsusada. Matsusada reserves the right to make any changes in the contents of catalogs or specifications at any time without advance notice. Due to compelling reason such as unavailability of components used, products might be un available or unable to repair. The products specified in catalogs or specifications are designed for use by the person who has enough expertise or under the control of such person, and not for general consumers. Schematics of products shall not be submitted to users. Test result or test data for the products shall be available upon request with charge.
Make sure you read the specification in the latest catalog before you order. Contact nearby sales office for the latest catalog.
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https://www.matsusada.com/support/manufacturer_warranty.html

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