

# PROGRAMMABLE AC POWER SOURCE

## DP-G Series



NF Corporation

# A powerful and reliable AC power source — for customers.

AC power sources for supplying various types of power play a key role in improving performance, quality and productivity in R&D and production lines. As society strengthens its efforts to protect the environment, the AC power sources used at manufacturing sites must also be environmentally friendly.

AC power sources from NF meet both the diverse needs of our customers and the needs of society. Our products continue to evolve as we look into the future, one step ahead of the rest.

## PROGRAMMABLE AC POWER SOURCE

### Evolution of the ideal power source

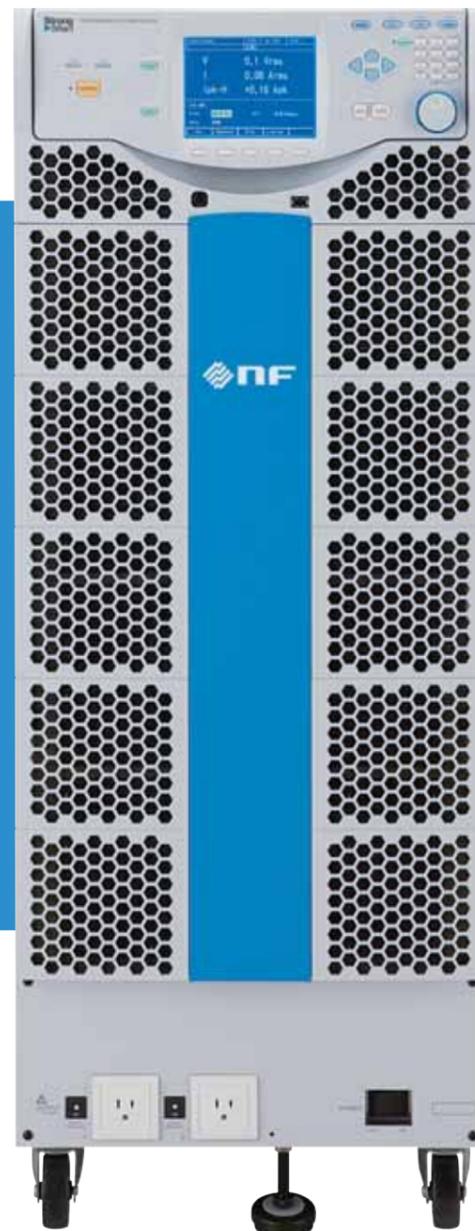
NF has knowledge and skill about AC power sources, and our DP-G series incorporates new ideas while pursuing the high-quality, stable supply of power that is the fundamental role of any AC power source.

Output control employing our unique hybrid power control technology

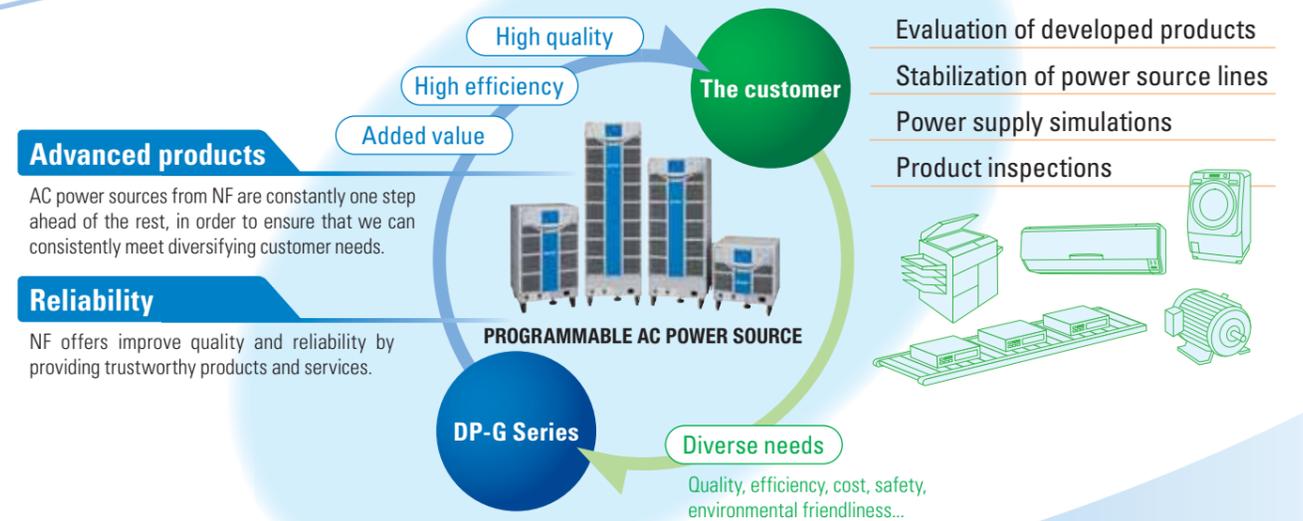
User interface designed to take into account how each customer uses the equipment

Energy-saving design to efficiently supply power and improve equipment operability

The DP-G series has the performance and functions required of a power source while meeting the unique needs of each customer. Strong and smart — it is an AC power source for the future.



To reduce environmental impact and ensure safety:  
**AC power sources to meet society's needs**



#### High Performance

A new standard in AC power sources, focused on basic performance

- Low distortion, low output noise
- High stability for a variety of loads, including capacitive and inductive types
- Power unit modularization for a wide range of capacity settings
- AC and DC output with various types of output power control

#### Multifunction

Multiple functions for bringing out maximal performance

- The high-performance current limiter can be set with peak value and RMS value
- Numerous measurement functions : voltage, current, power, crest factor, power factor, frequency, harmonic current
- Simulation functions for broader applications : sequence, simulation, clipped sine wave

#### High Usability

User interface designed for ease-of-use

- Easy-to-read display and easy-to-use operation keys
- Application software for testing and complex settings
- A wide range of interfaces to support automation and system building

#### Ecology

Energy-saving design to reduce environmental impact

- Higher efficiency
- Reduced noise
- Power unit energization settings
- Compact and lightweight
- Indication of CO<sub>2</sub> emissions

### Hybrid power control

Integration of analog and digital

Hybrid power control integrates analog control technology—NF's specialty—with intelligent digital control. Analog is used in areas requiring a wide band and high-speed response, and digital is used for control to suit communication and load conditions. The result is highly stable control that exploits the advantages of both analog and digital methods.



# The DP-G series provides optimal power to each customer.

With the DP-G series, we took into account the basic ways that AC power sources are used, and focused closely on basic performance, functions and ease-of-use.

## Lineup

You can select the optimal power source, from single-phase 1.5 kVA to a maximum of three-phase 36 kVA.

The lineup includes single-phase, single-phase three-wire, three-phase and multi-phase (switchable between single-phase, single-phase three-wire and three-phase) models

A polyphase system (single-phase three-wire/three-phase) can be configured by connecting multiple units of the same single-phase model.

Output capacity	1.5kVA	3kVA	4.5kVA	6kVA	7.5kVA	9kVA	10.5kVA	12kVA	Polyphase system
Single-phase	●	●	●	●	●	●	●	●	—
Single-phase three-wire	—	●	—	●	—	●	—	●	Max. 24 kVA
Three-phase	—	—	●	—	—	●	—	—	Max. 36 kVA
Multi-phase	—	—	●	—	—	●	—	—	—

Selection guide P. 7

## Output characteristics

The DP-G series achieves stable output with low harmonic distortion, and operates stably with large-capacity capacitor loads. Has a variety of output modes and a wide output range.

AC/DC modes: AC, AC + DC, DC

Output voltage/frequency		100 V range	200 V range	Resolution
AC	Output voltage	0V to 155V	0V to 310V	0.1V
	Frequency	AC : 40Hz to 550Hz	AC+DC : 1Hz to 550Hz	0.1Hz
DC	Output voltage	-220V to +220V	-440V to +440V	0.1V

Load regulation: within  $\pm 0.15$  V (75 V to 150 V)/within  $\pm 0.30$  V (150 V to 300 V)  
(DC, 45 Hz to 65 Hz if output current is varied from 0% to 100% of maximum current)

Maximum peak current: 4 times the maximum RMS current  
(corresponds to a capacitor input type rectified load with a crest factor of 4)

Waveform harmonic distortion: 0.5% max.

Detailed output specifications P. 8

## Full range of measurement functions

In addition to voltage, current and power, the DP-G series optionally supports measurement of load power factor, crest factor, and up to 40th-order harmonic current. In addition, the series supports measures to control CO<sub>2</sub> by displaying CO<sub>2</sub> emissions during operation.

Measured items:

- Voltage: RMS value, average DC value, peak value
- Current: RMS value, average DC value, peak value, peak hold value
- Power: active power, apparent power, reactive power
- Harmonic current: up to 40th order
- Load power factor
- Crest factor
- Sync frequency
- CO<sub>2</sub> emissions

Detailed measurement specifications P. 9

## Simple operation

Panel operation is a breeze using the large, easy-to-read display. The design stresses improved ease-of-use and work efficiency for users, with features such as a function for selecting three decided measurement items and displaying them enlarged, and remote operation using a remote controller.

Ease of operation P. 6



Enlarged display of measurement value



The DP-G series is equipped with a wide assortment of functions and interfaces to support a variety of approaches to using AC power.

- Current limiter
- Protection function
- Output voltage correction
- Sequence
- Simulation
- Clipped sine wave
- Memory function
- External control input/output
- USB memory
- Remote controller
- Power unit energization setting
- And more!

## Function

Unique functions you expect from NF — a company with unparalleled knowledge about AC power sources

### Current limiter function

Output current limits can be set with peak value and RMS value. With peak value setting, both positive and negative current values can be set. It is possible to continue output current limitation after limit operation using a setting, or to turn output off after continuing the limited state for a specified time. When evaluating a prototype, this is can provide protection in case there is an abnormal current due to abnormal operation of the load.

#### Setting

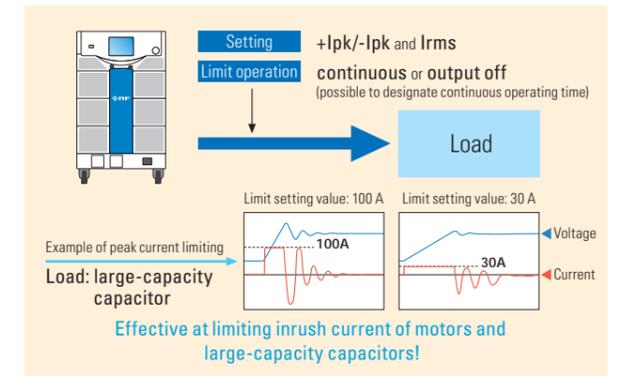
Positive/negative current peak value and current RMS value

#### Limiter operation

- Self-recovery (continuous) or output off
- Possible to designate the time to continue the limited state until output off (1 s to 10 s, resolution 1 s)



Peak value setting



### Protection function

The DP-G series has a built-in function for protecting the power source itself if a problem occurs due to issues such as output overvoltage or overcurrent, power unit trouble, internal control problems in areas such as the operation panel or communication, a rise in ambient temperature, or a drop in AC line voltage. If a problem occurs, it is displayed on the panel and output is turned off. This is used together with the current limiter function for protection against overcurrent, and it is possible to select either self-recovery after elimination of the problem, or output off after a designated time.

### Setting range limit function

This prevents load malfunction due to mis-operation or other problems by limiting the setting range for the output voltage upper limit and the frequency upper and lower limits.

### Other features

#### Memory functions

Store/recall settings from nonvolatile memory  
Basic settings (30), sequences (5), simulations (5), clipped sine waves (3)

Figures in parentheses indicate the number of memories

#### External signal input

SYNC: synchronizes the frequency of internal signal source with external signal

VCA: controls output voltage with DC signal

#### Waveform monitor output (voltage or current)

- Output setting at power-on
- Output relay control
- Output on/off phase setting
- Beep Key lock And more!

### AC and DC output for a broad range of applications

#### AC mode

Mode for outputting 40 Hz to 550 Hz AC. Because the DC component of the output is canceled, DP-G series can also handle transformer testing where the core causes magnetic saturation due to the DC component.

#### AC + DC mode

This mode is used to superimpose an AC component onto DC, superimpose (offset) a DC component onto AC, or amplify a signal containing DC when outputting 1 Hz to 40 Hz AC. This mode is used in AC line simulation where DC components, such as sudden voltage or phase changes, arise temporarily. Noise superimposition testing of DC-DC converters and ripple testing of capacitors are also possible.

#### DC mode

Mode for outputting DC only. A high SN ratio is attained even with comparatively low voltage. When used together with the current limiter function, this mode provides superior performance as a DC power supply.  
Note: only available with single-phase model, or single-phase output of multi-phase type



**Function** Numerous functions for a wide range of AC power source usages

**Sequences**

Options P. 7

Parameters such as frequency, voltage and time can be programmed and sequentially output. Settings are made using the panel, remote controller (sold separately) or included control software. Long, complex output patterns can be easily programmed using this software.



Sequence setting

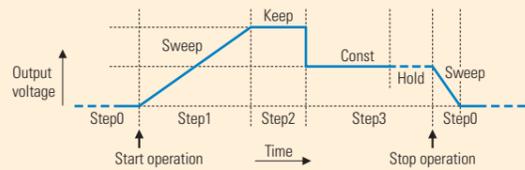
**Number of steps:** max. 255 (in 1 sequence)

**Setting items:** step time, output range, AC/DC mode, DC voltage, AC voltage, frequency, waveform, start phase, stop phase, phase angle, step termination, jump count, etc.

**Sequence control:** start, stop, hold, resume, branch 1, branch 2

**Number of memories:** 5 (nonvolatile)

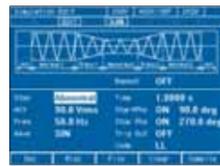
**Example of output pattern**



**Simulation**

Options P. 7

Simulates a problem in the power AC line such as blackout, voltage rise, voltage drop, abrupt phase changes, or abrupt frequency change, thereby enabling all types of AC line simulation such as prototype evaluation and product inspection. Settings are made with the panel, remote controller (sold separately) or included control software.



AC line simulation

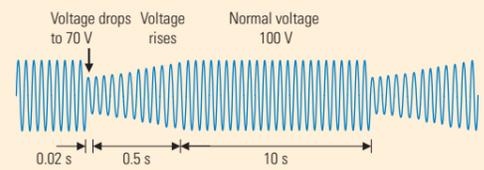
**Number of steps:** 6 (Initial, Normal 1, Trans 1, Abnormal, Trans 2, Normal 2)

**Setting items:** step time, output range, AC voltage, frequency, start phase, stop phase, trigger output, etc.

**Waveform:** sine wave

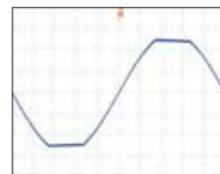
**Number of memories:** 5 (nonvolatile)

**Example of AC line simulation**



**Clipped sine wave**

The peak clipped sine wave can be output. Setting can be done using the crest factor (CF) or clip rate (percent of the peak value).



**CF setting range:** 1.10 to 1.41 (with RMS correction)

**Clip rate setting range:** 40.0% to 100.0%

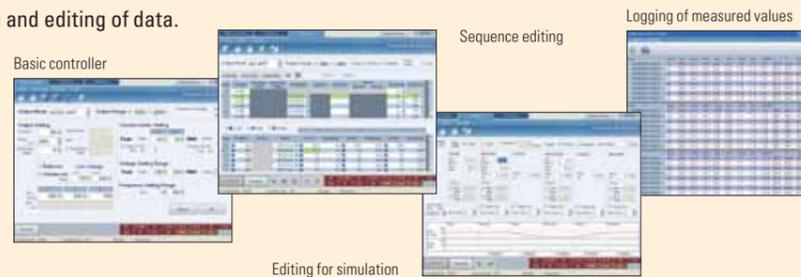
**Number of memories:** 3 (nonvolatile)

Software is included for easy creation and editing of data.

**Control software**

Enables control of basic parameters for output via a PC, including data logging, creating/editing of sequences\* and simulations\*.

\*Optional



**Interface / external control I/O**

Interfaces and an external control I/O provide support for system integration and automation.

**Interfaces:** RS-232, USB, GPIB (optional)

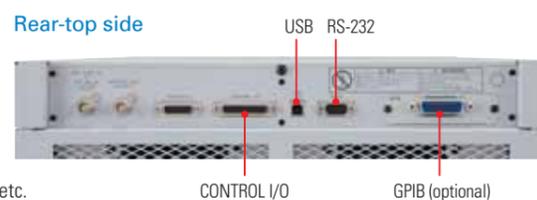
Note: LabVIEW driver comes standard

**External control I/O**

Enables control from a PLC, etc.

**Control input:** output on/off, sequence control, memory recall (basic setting memory, sequence, simulation)

**Status output:** power on/off, output on/off, protection operation, limiter operation, output range, step synchronization output of sequence and simulation, etc.



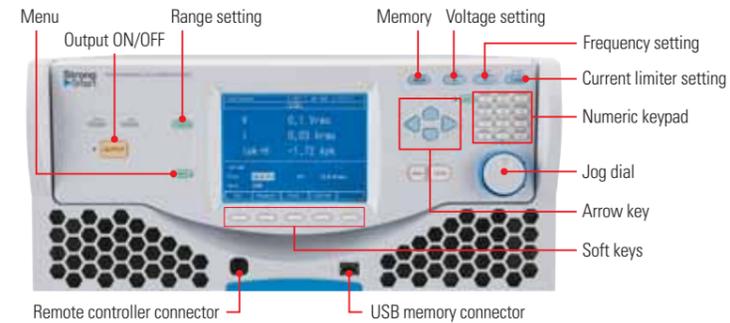
**Usability**

The DP-G series is designed not only for performance and functionality, but ease-of-use



**Operability**

Our user interface, designed to have a wealth of functions without being too complex, enables simple and smooth operations.



**Remote controller**

DP008 Option

Performs the same operations as the operation panel on the main unit  
Cable length: approx. 3.5 m

**Operation panel**

Enables everything from basic setting to sequence setting  
5.7-inch LCD

Voltage, frequency and other values can be called up to the screen using a single key  
Quick and sure setting of numeric values using the keypad, arrow key and jog dial.  
Angle can be toggled between 2 levels

**USB memory**

Data can be written into and read from memory without connecting a PC. This is convenient when sharing basic parameter settings among multiple units, or when reading data created with control software.

**Power input/output**

Power input ranging from AC90 V to 250 V provides worldwide compatibility. Two AC outlets (NEMA 5-15: for Japan/North America) are provided at the bottom of the front panel of the single-phase model. C type (for China) is also available when ordering.



**Ecology**

An eco-friendly AC power source designed to protect the environment by saving energy

**Power unit energization setting**

In the DP-G series, the power section is modularized in 1.5 kVA units. Power units can be set ON or OFF to suit the load capacity. This enables efficient operation while reducing power consumption. Even if a unit encounters a malfunction or other problem, that unit can be turned off using the "power unit energization setting," while operation of the other units continues.

**High efficiency of 77%**

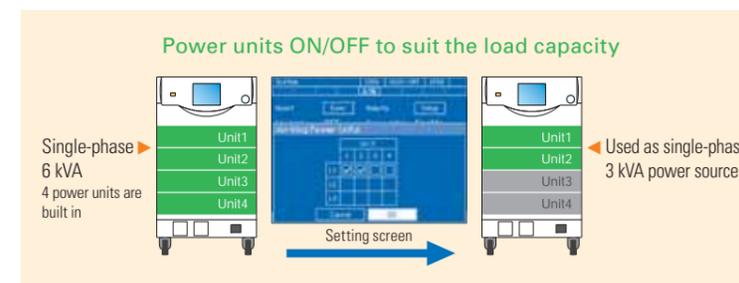
High efficiency is achieved together with multifunctionality by using power control technology.

**Compact and lightweight**

This reduces resources used in manufacturing and helps to reduce CO<sub>2</sub> emissions from transport.

**Display of CO<sub>2</sub> emissions**

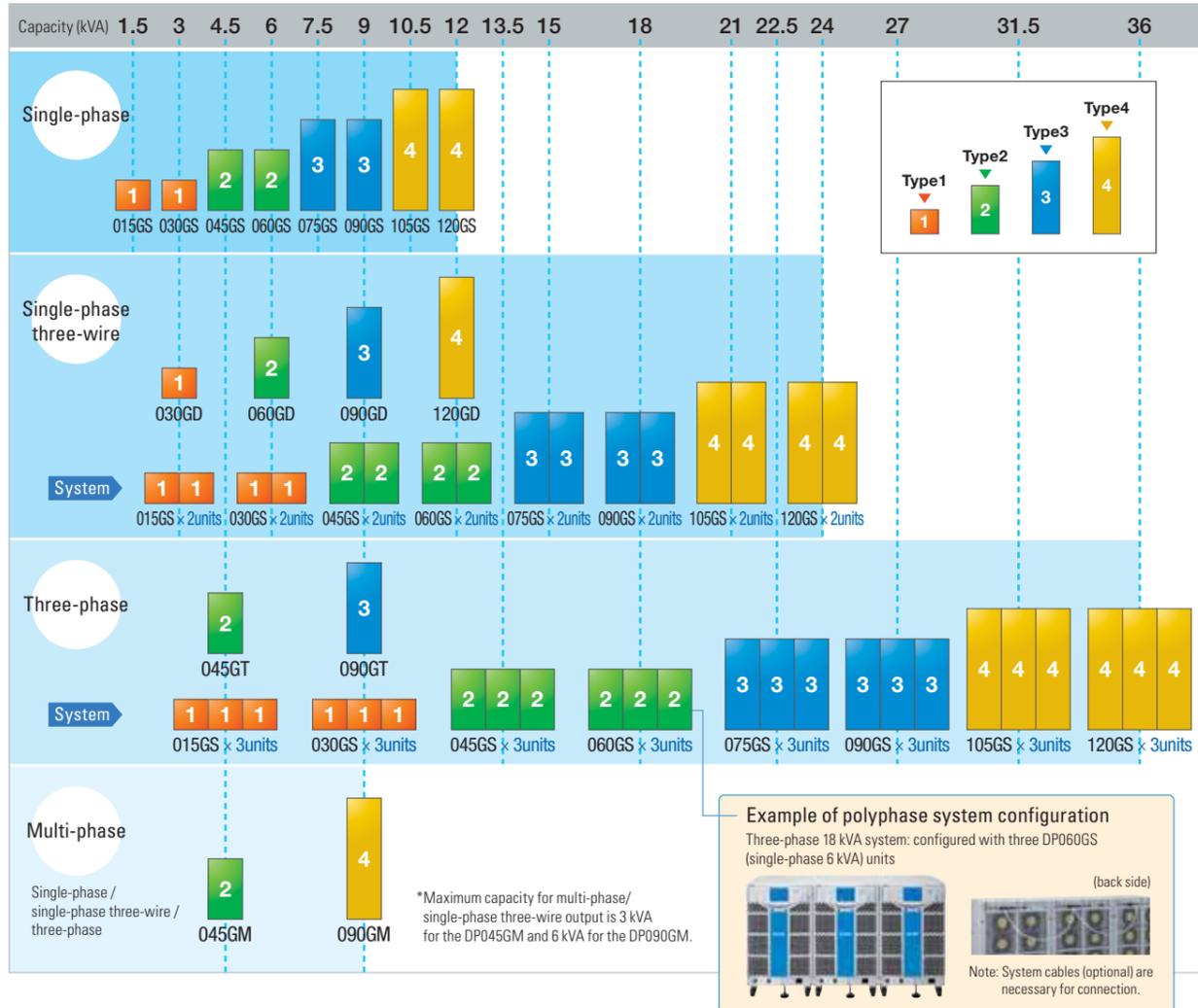
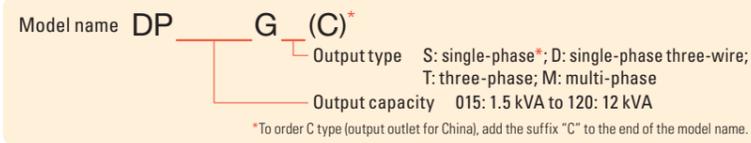
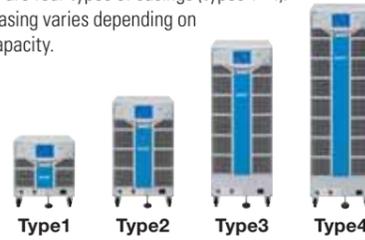
The measurement function (P. 3) is equipped with a CO<sub>2</sub> emissions display function to support customer efforts to control CO<sub>2</sub> emissions.



Selection Guide

Please select required capacity for the each model (single-phase, single-phase three-wire, three-phase, or multi-phase).  
A polyphase system can be configured by combining multiple units of the same single-phase model.

There are four types of casings (types 1-4).  
The casing varies depending on the capacity.



Option

The **mark** indicates a factory option. The **mark** indicates an item that can be added after purchase.

Sequence and Simulation PA-001-1723

Adds sequence function and simulation.

GPIB PA-001-1725

Remote Controller DP008



DP008

System Cable (for single-phase three-wire) PA-001-1720

System Cable (for 3-phase) PA-001-1721

Rack Mount Adapter

Select either EIA (inch) or JIS (millimeter) to suit your model.  
Please inquire for details.

Replacement Air Filter

Select the type that suits your model.  
Please inquire for details.

Specifications

Models/systems  
Each item applies to all models unless indicated otherwise.

Single-phase models	DP015GS, DP030GS, DP045GS, DP060GS, DP075GS, DP090GS, DP105GS, DP120GS
Single-phase three-wire models	DP030GD, DP060GD, DP090GD, DP120GD
Three-phase models	DP045GT, DP090GT
Multi-phase models (switchable between single-phase, single-phase three-wire and three-phase)	DP045GM, DP090GM *Specifications may vary in the case of single-phase output or polyphase output (single-phase three-wire, three-phase).
Polyphase systems	Configuration of a single-phase three-wire system with two units of the same single-phase model, or configuration of a three-phase system with three units (connected with system cable). Note: In a polyphase system, the specifications of the constituent single-phase models are the specifications for each phase. Please inquire for details about specifications.

**mark** indicates an option. Refer to P. 7 for a list of options.  
The following settings and conditions are provided unless otherwise noted.

- Load: resistance load for power factor 1
- AGC/Auto Cal: OFF
- Signal source: INT (internal signal source)
- Current limiter: factory default setting
- Output voltage waveform: sine wave
- Output terminal: rear panel output terminal block [set] indicates a setting value.

When two values are indicated with a slash, this means that specifications vary depending on the output range. The value before the slash is for 100 V specifications, and the value after the slash is for 200 V specifications.

AC/DC Mode, Signal Source

AC/DC Mode	Single-phase models: AC, AC+DC, DC	Multi-phase models: AC, AC+DC	Single-phase 3-wire models: AC, AC+DC	Three-phase models: AC, AC+DC
Signal Source	INT, VCA, SYNC		INT, VCA, SYNC	

Power Output

Note: When two values are indicated with a slash [ / ], the value before the slash is specification for 100 V range, the value after the slash is specification for 200 V range.

Output Mode	Single-phase								Single-phase 3-wire				Three-phase		
	Model Name	DP015GS	DP030GD DP045GM	DP045GS	DP060GS	DP075GS	DP090GS DP090GM	DP105GS	DP120GS	DP030GD DP045GM	DP060GD DP090GM	DP090GD	DP120GD	DP045GT DP045GM	DP090GT DP090GM
Output Power *2	1.5 kVA	3 kVA	4.5 kVA	6 kVA	7.5 kVA	9 kVA	10.5 kVA	12 kVA	3 kVA	6 kVA	9 kVA	12 kVA	4.5 kVA	9 kVA	
Output Mode	1P2W Floating output, it can be used with grounding of Lo terminal.								1P3W Floating output, it can be used with grounding of N terminal.				3P4W		
Rated Output Voltage	100 V/200 V								100 V/200 V				100 V/200 V		
Output Range	100 V range/200 V range														
Voltage Setting Mode	Balanced mode, unbalanced mode														
Voltage Setting Range	Phase Voltage	0.0 V to 155.0 V/0.0 V to 310.0 V, 0.0 Vp-p to 440.0 Vp-p													
	Line Voltage	All-phase common setting for balanced mode. Each phase setting for unbalanced mode.												0.0 V to 268.4 V/ 0.0 V to 536.8 V	
Resolution	Phase voltage setting: 0.1 V, line voltage setting: 0.2 V														
Accuracy *3	±(1% of set + 0.6 V/1.2 V) (only for phase voltage setting)														
Max. Current *4 *5	15 A/7.5 A	30 A/15 A	45 A/22.5 A	60 A/30 A	75 A/37.5 A	90 A/45 A	105 A/52.5 A	120 A/60 A	15 A/7.5 A	30 A/15 A	45 A/22.5 A	60 A/30 A	15 A/7.5 A	30 A/15 A	
Max. Peak Current *4 *6	4 times value of maximum current.														
Load Power Factor Range	0 to 1 (lead or lag, at 45 Hz to 65 Hz, external power injection and regeneration are not available.)														
Frequency Setting Range	AC mode: 40 Hz to 550 Hz, AC+DC mode: 1 Hz to 550 Hz														
Resolution	0.1 Hz														
	Accuracy *3	±0.01% of setting (23°C ±5°C)													
Frequency Stability *7	±0.005%														
Output Waveform	Sine, clipped sine (3 types)														
Output On Phase *8	0.0 deg. to 359.9 deg. variable (resolution 0.1 deg.)														
Output Off Phase *8	0.0 deg. to 359.9 deg. variable (resolution 0.1 deg. selectable between active or inactive)														
Phase Angle Setting Range (unbalanced mode only)	-												L2: 180 deg. ±35 deg.		L2: 120 deg. ±35 deg. L3: 240 deg. ±35 deg.
	Resolution	-													
Accuracy *9	-												0.1 deg.		45 Hz to 65 Hz: ±1.0 deg., 40 Hz to 550 Hz: ±2.0 deg.
DC Offset *10	Within ±20 mV (typ., fine adjustment available)														
Output Power *12	1.5 kW	3 kW	4.5 kW	6 kW	7.5 kW	9 kW	10.5 kW	12 kW	-						
Mode	Floating output, it can be used with grounding of Lo terminal.														
Rated Output Voltage	100 V/200 V														
Voltage Setting Range	-220 V to +220 V/-440 V to +440 V														
	Resolution	0.1 V													
Accuracy *13	±(  1% of set   + 0.6 V/1.2 V)														
Max. Current *14	15 A/7.5 A	30 A/15 A	45 A/22.5 A	60 A/30 A	75 A/37.5 A	90 A/45 A	105 A/52.5 A	120 A/60 A	-						
Max. Instantaneous Current *15	4 times value of maximum current.														
Output Voltage Stability (phase voltage)	Fluctuation with input voltage *16: within ±0.15%														
	Fluctuation with output current *17: within ±0.15 V/±0.30 V (DC), within ±0.15 V/±0.30 V (45 Hz to 65 Hz), within ±0.5 V/±1.0 V (40 Hz to 550 Hz)														
Output Voltage Distortion Factor (phase voltage)	Fluctuation with ambient temperature *18: within ±0.01%/°C														
	0.5% or lower (40 Hz to 550 Hz, 50% or more of rated output voltage, maximum output current or below, AC and AC+DC modes, THD+N)														

\*1: [V] = Vrms, [A] = Arms, and power supply input voltage is 200 V, unless otherwise specified.

\*2: In the case that the power input voltage is 170 V or lower, models of 6 kVA or higher have the limit on the power capacity

\*3: In the case of 10 V to 150 V/20 V to 300 V, sine wave, no load, 45 Hz to 65 Hz, DC voltage setting 0 V, 23°C ±5°C

\*4: For single-phase 3-wire and three-phase, value is phase current.

\*5: If the output voltage is higher than the rated value, this is limited (lowered) to satisfy the power capacity. If there is the DC superimposition, the RMS current of AC+DC satisfies the maximum current. In the case of 40 Hz or lower or 400 Hz or higher, and the ambient temperature is 40°C or higher, the maximum current may decrease.

\*6: For the capacitor input type rectified load (crest factor=4), the rated output voltage, and 45 Hz to 65 Hz

\*7: For 45 Hz to 65 Hz, the rated output voltage, no load and the resistance load for the maximum current, and the operating temperature.

\*8: Set for L1 phase, the component of the phase angle setting is added for the other phases.

\*9: In the case of 50 V or higher, sine wave, and same load conditions and voltage setting for all phases.

\*10: In the case of AC mode and 23°C ±5°C

\*11: Only single-phase model and single-phase output of multi-phase model.

[V]=Vdc, [A]=Adc, the power input voltage is 200 V, and the polarity is relative to Lo terminal, unless otherwise specified.

\*12: In the case that the power input is 170 V or lower, models with 6 kVA (6 kW) or higher have the limit on the power capacity.

\*13: In the case of -212 V to -10 V, +10 V to +212 V/-424 V to -20 V, +20 V to +424 V, no load, AC setting 0 V, 23°C ±5°C.

\*14: If the output voltage is higher than the rated value, this is limited (lowered) to satisfy the power capacity. If there is the AC superimposition, the RMS current of DC+AC satisfies the maximum current. In the case that the ambient temperature is 40°C or higher, the maximum current may decrease.

\*15: Instantaneous = within 2 ms, at the rated output voltage

\*16: For power input 90 V to 250 V for 1.5 kVA, 3 kVA and 4.5 kVA models, power input 170 V to 250 V for 6 kVA or higher models, power input 200 V reference, the resistance load at maximum current, the rated output voltage, DC (only single-phase model and single-phase output of the multi-phase model) or 45 Hz to 65 Hz. Transition state immediately after a change of the input power supply voltage is not included.

\*17: In the case that the output current is changed from 0% to 100% of maximum output current. For output voltage 75 V to 150 V/150 V to 300 V, no load reference.

However, if the output voltage is higher than the rated value, the maximum current is limited to satisfy the power capacity.

\*18: For power input 200 V, no load, the rated output voltage, DC (only single-phase and single-phase output of the multi-phase model) or 45 Hz to 65 Hz.

Specifications

Power Input

Model Name	DP015GS	DP030GS DP030GD	DP045GS, DP045GM DP045GT	DP060GS DP060GD	DP075GS	DP090GS, DP090GD DP090GT, DP090GM	DP105GS	DP120GS DP120GD
Voltage/Phase *19	AC100 V to 230 V±10% (Maximum voltage 250 V), single-phase							
Frequency	50 Hz ±2 Hz or 60 Hz ±2 Hz							
Power Factor *20	0.95 or more (typ., at AC100 V input), 0.90 or more (typ., at AC200 V input)							
Efficiency *20	77% or more (typ., at AC200 V input)							
Power Consumption (Maximum)	2.25 kVA	4.5 kVA	6.75 kVA	9 kVA	11.25 kVA	13.5 kVA	15.8 kVA	18 kVA

\*19: In the 6 kVA or higher models, the output capacity is limited to 4.5 kW for the 170 V or lower input.  
 \*20: In the case of AC-INT, the rated output voltage, the resistance load at the maximum current, 45 Hz to 65 Hz output.

Measurement Function

Model Name	Single-phase	DP015GS	DP030GS	DP045GS	DP060GS	DP075GS	DP090GS	DP105GS	DP120GS	
Display	Single-phase three-wire	DP030GD	DP060GD	DP090GD	DP120GD	-	-	-	-	
	Three-phase	DP045GT	DP090GT	-	-	-	-	-	-	
	Multi-phase	DP045GM	DP090GM	DP045GM	-	-	DP090GM	-	-	
Voltage *21	Normal Mode	Displays almost all measured and setting values (except harmonic current value)								
	Simple Mode	Displays three measurement values (except harmonic current value) enlarged.								
	RMS Value	Full scale	Phase voltage: 250 V/500 V; Line voltage: 500 V/1000 V (single-phase three-wire); 433 V/866 V (three-phase)							
	Resolution	0.1 V								
DC Average (avg) (only single phase)	Full scale	±250 V/±500 V								
	Resolution	0.1 V								
Peak Value (pk)	Full scale	±250 V/±500 V								
	Resolution	0.1 V								
Current *22	RMS Value	Full scale	20 A/10A	40 A/20 A	60 A/30 A	80 A/40 A	100 A/50 A	120 A/60 A	140 A/70 A	160 A/80 A
	Resolution	0.01 A								
	DC Average (avg)	Full scale	±20 A/±10 A	±40 A/±20 A	±60 A/±30 A	±80 A/±40 A	±100 A/±50 A	±120 A/±60 A	±140 A/±70 A	±160 A/±80 A
	Resolution	0.01 A								
Peak Value (pk)	Full scale	±80 A/±40 A	±160 A/±80 A	±240 A/±120 A	±320 A/±160 A	±400 A/±200 A	±480 A/±240 A	±560 A/±280 A	±640 A/±320 A	
	Resolution	0.01 A								
Max/Min Individual Display	Hold	Hold the maximum values of  max  and  min  with the polarity (with the clear function)								
Power *23	Active (W) *24	Full scale	1800 W	3600 W	5400 W	7200 W	9000 W	10800 W	12600 W	14400 W
	Resolution	0.1 W/1 W (1000 W or higher)								
	Apparent (VA) *25	Full scale	2250 VA	4500 VA	6750 VA	9000 VA	11250 VA	13500 VA	15750 VA	18000 VA
	Resolution	0.1 VA/1 VA								
Reactive (var) *25 *26	Full scale	2250 var	4500 var	6750 var	9000 var	11250 var	13500 var	15750 var	18000 var	
	Resolution	0.1 var/1 var (1000 var or higher)								
Load Power Factor *25	Range	0.00 to 1.00								
	Resolution	0.01								
Load Crest Factor	Range	0.00 to 50.00								
	Resolution	0.01								
Synchronization Frequency	Range	38.0 Hz to 525.0 Hz								
	Resolution	0.1 Hz								
Harmonic Current *27	Range	Up to 40th order.								
	Full scale (RMS)	20 A/10 A	40 A/20 A	60 A/30 A	80 A/40 A	100 A/50 A	120 A/60 A	140 A/70 A	160 A/80 A	
	Full scale (%)	100%								
	Resolution	0.01 A or 0.1%								
CO <sub>2</sub> Emissions Display	Contents	Instantaneous (kg-CO <sub>2</sub> /h), integration (t-CO <sub>2</sub> ) value for internal loss or output power. CO <sub>2</sub> emissions coefficient (t-CO <sub>2</sub> /kWh): variable (resolution: 0.000001)								

\*21: For phase voltage in the polyphase model and polyphase output of the multi-phase model.  
 \*22: In the case that output current is 5% to 100% of maximum current.  
 For phase current in the polyphase model and polyphase output of the multi-phase.  
 \*23: In the case of sine wave, 50 V or higher output voltage, and that output current is 10% or higher of maximum current.  
 \*24: For the load with power factor 1  
 \*25: Excluding DC mode  
 \*26: For the load with power factor 0.5 or lower  
 \*27: AC-INT mode, fundamental wave 50 Hz/60 Hz only, phase current.  
 This measurement does not conform to IEC or other standards.

Current Limiter

Model Name	Single-phase	DP015GS	DP030GS	DP045GS	DP060GS	DP075GS	DP090GS	DP105GS	DP120GS	
Peak current limiter	Single-phase three-wire	DP030GD	DP060GD	DP090GD	DP120GD	-	-	-	-	
	Three-phase	DP045GT	DP090GT	-	-	-	-	-	-	
	Multi-phase	DP045GM	DP090GM	DP045GM	-	-	DP090GM	-	-	
RMS current limiter	Positive current	Setting range (peak value)	+7.5A to +63.0A/ +3.7A to +31.5A	+15.0A to +126.0A/ +7.5A to +63.0A	+22.5A to +189.0A/ +11.2A to +94.5A	+30.0A to +252.0A/ +15.0A to +126.0A	+37.5A to +315.0A/ +18.7A to +157.5A	+45.0A to +378.0A/ +22.5A to +189.0A	+52.5A to +441.0A/ +26.2A to +220.5A	+60.0A to +504.0A/ +30.0A to +252.0A
	Negative current	Setting range (peak value)	-63.0A to -7.5A/ -31.5A to -3.7A	-126.0A to -15.0A/ -63.0A to -7.5A	-189.0A to -22.5A/ -94.5A to -11.2A	-252.0A to -30.0A/ -126.0A to -15.0A	-315.0A to -37.5A/ -157.5A to -18.7A	-378.0A to -45.0A/ -189.0A to -22.5A	-441.0A to -52.5A/ -220.5A to -26.2A	-504.0A to -60.0A/ -252.0A to -30.0A
	Resolution	0.1A								
	Limit operation	Automatic recovery (continuous, factory default) or output turn-off when the limited state continues over the specified time (1 s to 10 s, resolution 1 s)								
Setting range (RMS)	0.8A to 15.8A/ 0.8A to 7.9A	1.5A to 31.5A/ 1.5A to 15.8A	2.3A to 47.3A/ 2.3A to 23.7A	3.0A to 63.0A/ 3.0A to 31.5A	3.8A to 78.8A/ 3.8A to 39.4A	4.5A to 94.5A/ 4.5A to 47.3A	5.3A to 110.3A/ 5.3A to 55.2A	6.0A to 126.0A/ 6.0A to 63.0A		
	Resolution	0.1A								
Limit operation	Automatic recovery (continuous, factory default) or output turn-off when the limited state continues over the specified time (1 s to 10 s, resolution 1 s)									

Note: If you increased or decreased the number of units by the power unit energization setting, the factory default setting corresponding to the capacity is used.

Sequence Function 

Number of Memories	5 (nonvolatile)
Number of Steps	255 max. (for each sequence)
Setting Range of Step Time	0.0010 s to 999.9999 s
Operation within Step	Constant, keep, linear sweep
Parameters	Output range, AC/DC mode, AC phase voltage, frequency, waveform, DC voltage, start phase, stop phase, phase angle, step termination, jump count (1 to 9999, or infinite), specification of the jump-to step, synchronous step output (2 bit), specification of the branch step, trigger output
Sequence Control	Start, stop, hold, resume, branch 1, branch 2
Others	1) Sequence function works with AC-INT, AC+DC-INT and DC-INT. 2) AC voltage, frequency, waveform, start phase and stop phase cannot be set with DC-INT. 3) Phase angle setting is only for the polyphase model and polyphase output of the multi-phase model. 4) Also, the start phase and the stop phase are set for L1 phase and the setting value is added to each phase angle of L2 and L3 phase.

Simulation 

Number of Memories	5 (nonvolatile).
Number of Steps	6 (initial, normal 1, transition 1, abnormal, transition 2, normal 2).
Step Time Setting Range	0.0010 s to 999.9999 s (0 s can be set for transition steps only).
Parameters	Output range, AC voltage, frequency, waveform (sine wave only), start phase (excluding transition steps), stop phase (excluding transition steps), synchronous step (2 bit), trigger output, repeat count (1-9999 times or infinite).
Simulation Control	Start, stop.
Others	In simulation function, only AC and sine wave, fixed for AC+DC-INT.

Note: The  mark indicates an option. Refer to a list of options.

Control Software

Functions	Remote Control	Parameter setting, saving, loading, and others.
	Status Monitor	Monitors and displays status of connected equipment.
	Logging	Reads and saves measured values.
	Sequence	Sequence data creation, edit, save, transfer, preview, execution control, monitor/display during execution, and others.
	Simulation	
Operating Environment	CPU	300 MHz min. (1 GHz min. recommended)
	Memory	256 MB min. (512 MB min. recommended)
	Free Hard Disk Space	50 MB min.
	Display	Can display 1024 x 768 pixels or more, and 256 colors or more
	OS	Windows 2000/XP/Vista (made by Microsoft)
	Disk Drive	CD-ROM drive
Interface	USB 1.1 or higher	

Other Functions

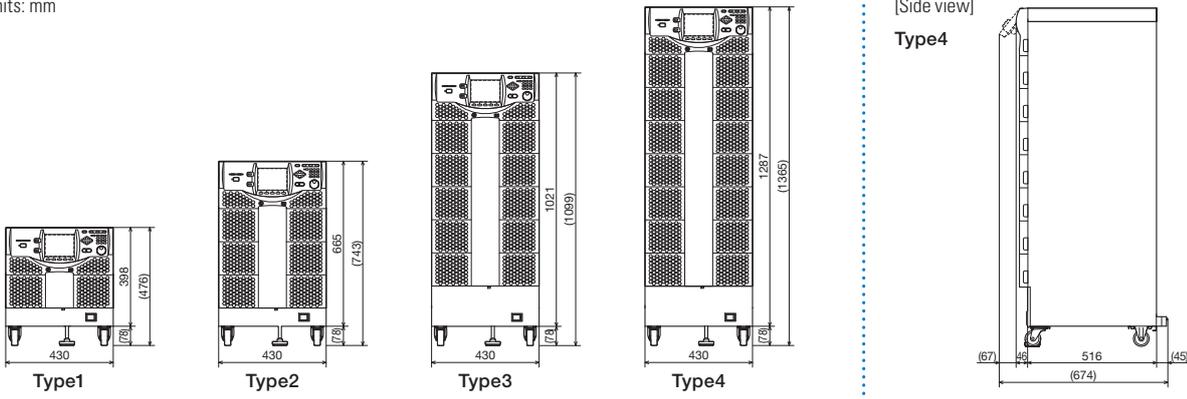
Power Unit Energization Setting	Each power unit can be enabled (energized) / disenable (not energized) separately. (1.5 kVA or 1.5 kW per power unit). The power consumption can be decreased by decreasing the number of the power units in operation according to the load capacity. (only a model with more than one unit)	
Setting Limitation	Voltage (RMS)	Phase voltage, line to line voltage (single-phase 3-wire, three-phase 4-wire)
	Frequency	Upper limit or lower limit.
Remote Sensing	Voltage detection point is output terminal or sensing input terminal. (switchable)	
AGC	Function for continuously performing automatic correction so that the RMS value of the detection point is equal to the voltage setting value. Response time less than 100 ms (typ.) (At DC/50 Hz/60 Hz, rated output voltage)	
Autocal (Automatic Calibration)	When the Autocal is on, the detection point is always measured, and the output voltage is continuously corrected so that its RMS value is equal to the output setting value.	
Clipped Sine Wave	Number of Memories	Number of memories: 3 (nonvolatile)
	CF	Variable range: 1.10 to 1.41; setting resolution: 0.01; RMS value correction: yes
	Clipping Rate	Variable range 40.0% to 100.0%; setting resolution: 0.1%; RMS value correction: no
External Signal Input	External Sync Input	Sync signal source switching: external sync signal (EXT) or power input (LINE)
	VCA Input	Gain setting range: 0.0 to 220.0 times/ 0.0 to 440.0 times Resolution: 0.1
Memory Function	Number of Memories	Store and recall settings from nonvolatile memory Basic settings: 30; sequences: 5; simulations: 5; clipped sine waves: 3
Protections		Protective operation for abnormal output (output overvoltage, output over current, etc.), power unit error, and internal control error (internal communication error, etc.)
External Control I/O		Enables control of the system using external signals (or no-voltage contacts) and state output.
Interface	USB interface [USB1.1, USBTMC] RS-232 interface (not capable of binary transfer)	
	GPIO interface (IEEE 488.1 std 1987)  (not capable of binary transfer or serial polling)	
USB Memory		Usable memory: conforms to USB 1.1 or USB 2.0, Connector: USB-A (front panel) Readable/writable content: basic setting memory, sequence, AC line simulation, arbitrary wave.
Output Relay Control		Selects either ON/OFF using output relay, or high-impedance without using output relay.
Output Waveform Monitor		Monitors waveform of output voltage or output current. (switchable)
LCD Display		5.7 inch, contrast 0 to 99, blue or white base color.
Others		Beep, key lock, output setting at power-on, trigger output setting, time unit setting (for sequence and simulation), reset function.

General Information

Model Name	DP015GS	DP030GS DP030GD	DP045GS DP045GT	DP045GM	DP060GS DP060GD	DP075GS	DP090GS, DP090GD, DP090GT	DP090GM	DP105GS	DP120GS DP120GD
Withstanding Voltage	AC 1500 V or DC 2130 V (inputs vs. outputs/chassis, inputs/chassis vs. outputs)									
Insulation Resistance	30 MΩ or higher (DC 500 V), (inputs vs. outputs/chassis, inputs/chassis vs. outputs)									
Operating Temperature	0°C to +50°C									
Operating Humidity	5% to 85% RH, Absolute humidity 1 to 25 g/m <sup>3</sup> , no condensation)									
Dimensions (W×H×D) mm	430×398×562			430×665×562			430×1021×562		430×1287×562	
Weight (approx.)	38 kg	50 kg	70 kg	82 kg	81 kg	110 kg	125 kg	130 kg	140 kg	155 kg
Accessories	Instruction manual, control software, LabVIEW driver (version 8.6 or higher), power cable									
Options	Refer to a list of options (P.7).									

## Dimension drawings

Units: mm



\*Dimensions other than height are the same for all types.

## PROGRAMMABLE AC POWER SOURCE DP-G Series



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