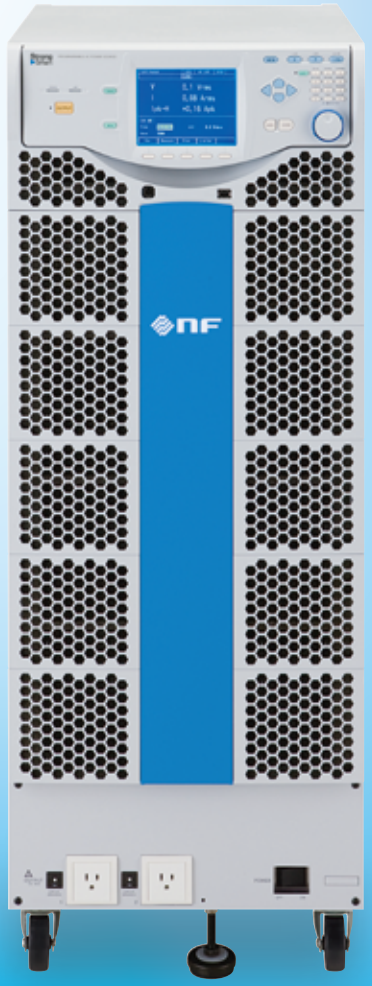
PROGRAMMABLE AC POWER SOURCE

DP series



Single-phase *1.5 kVA to*
Three-phase *144 kVA*

- Highly robust
- Low distortion
- Low noise
- Load protection

NF Corporation

DP series respond to Various testing needs

With the DP 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.

Line up

Abundant lineup that can be selected according to the application

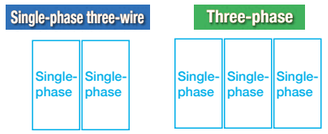
A variety of single-phase, single-phase three-wire, and three-phase power capacities are available.
Provides optimal power from single-phase 1.5kVA up to three-phase 144kVA.

- Single-phase / single-phase three-wire / three-phase switching is possible with one housing for multi-phase models
- Up to 12kVA, single-phase three-wire output and three-phase output are available in one housing
- Construct a single-phase three-wire / three-phase system by combining single-phase identical models (excluding Type K)
- Single-phase models 16kVA / 42kVA / 48kVA and multi-phase models 6kVA / 12kVA / 18kVA / 24kVA / 36kVA support short-time reverse power flow (20ms, 100%)

One housing

Single-phase	1.5 kVA to 48 kVA
Single-phase three-wire	3 kVA to 12 kVA
Three-phase	4.5 kVA to 9 kVA
Multi-phase	4.5 kVA to 36 kVA

Polyphase system by combining single-phase



3 kVA to 96 kVA　4.5 kVA to 144 kVA

Polyphase system in one housing

4.5 kVA

24 kVA

Output characteristics

The DP 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, ACDC, DC
- Output voltage/frequency

		100 V range	200 V range	Resolution
AC	Output voltage	0V to 160V	0V to 320V	0.1V
	Frequency	AC:40Hz to 550Hz	ACDC:1Hz to 550Hz	0.01Hz
DC	Output voltage	-227V to +227V	-454V to +454V	0.1V

- Load regulation
  within ±0.15 V (75 V to 150 V) /within ±0.30 V (150 V to 300 V)
  (DC, 45 Hz to 65 Hz when output current is varied from 0% to 100% of maximum current)
- Maximum peak current
  4 times or 3 times the maximum RMS current
  (corresponds to a capacitor input type rectified load with a crest factor of 4 or 3)
- Waveform harmonic distortion: 0.5% max.
- Efficiency　77% or more

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

●ACDC 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.

*only available with single-phase model, or single-phase output of multi-phase model

Full range of measurement functions

In addition to voltage, current and power, the DP series supports measurement of load power factor, crest factor, and up to 40th-order harmonic current. In addition, the series supports measures to control CO_2 by displaying CO_2 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*1 : up to 40th order
- Load power factor
- Crest factor
- Sync frequency
- CO_2 emissions*2

*1 Not conforming to IEC standards
*2 Up to 12kVA, excluding DP060LM / DP120LM

Simple operation

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

5.7-inch LCD

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*

*Not supported by chassis Type5, Type5L, Type6, Type6L

Remote controller　Option

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

DP008

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. When evaluating a prototype, this can provide protection in case there is an large current due to abnormal operation of the load. It is possible to continue output current after limit operation using a setting, or to turn output off after continuing the limited state for a specified time.

●Setting
Positive/negative current peak value and current RMS value

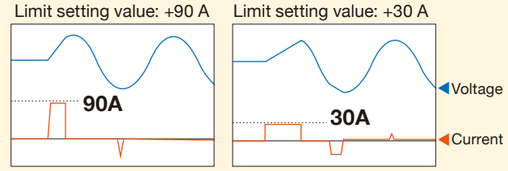
●Limiter operation
– Self-recovery (continuous) or output off
– Possible to designate the time to continue the limited state until output off (1 s to 10 s, resolution 1 s)

Peak value setting

Example of peak current limiting

Load : Simulated rectification load

Combination of diode bridge, electrolytic capacitor and resistive load



Effective at limiting inrush current of motors and large-capacity capacitors!

Protection function

The DP 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.

Remote sensing, AGC, Auto Cal

There are cases where a voltage drop occurs at the load end due to wiring. The DP Series is equipped with functions to always supply the set voltage.

Remote Sensing

Switches the voltage detection point used for measurement and output voltage correction to either output terminal or sensing input terminal.
Output is corrected by using this together with AGC and Auto Cal.

AGC (Automatic Gain Control)

This function performs continuous correction to ensure equality between the RMS values of the detection point voltage and the output voltage setting value. Even if the load fluctuates, correction is performed automatically to maintain the same value as the setting value.

Auto Cal (Auto Calibration)

Each time Auto Cal is turned on, this function measures the detection point voltage and performs correction to ensure that the output voltage RMS value is equal to the voltage setting value.

Other features

●Memory functions
Store/recall settings from nonvolatile memory
Basic settings (30), sequences (5), simulations (5), arbitrary waveforms (16), 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
EXT : amplifies external signal, used as power amplifier
ADD : adds external signal source to internal signal source

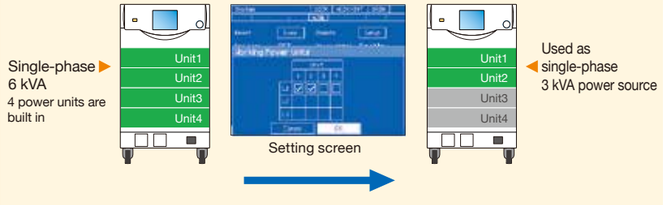
●Waveform monitor output (voltage or current)
●Output setting at power-on
●Output relay control
●Output on/off phase setting
●Beep　●Key lock and more.

Power unit energization setting

In the DP Series, the power section is modularized in 1.5 kVA or 2 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.

*For models exceeding 12kVA, the power capacity per unit differs.

Power units ON/OFF to suit the load capacity



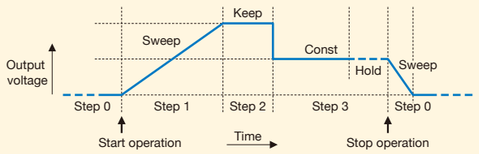
Sequences

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 and 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, and so on.
- Sequence control
  start, stop, hold, resume, branch 1, branch 2
- Number of memories : 5 (nonvolatile)

Example of output pattern



Simulation

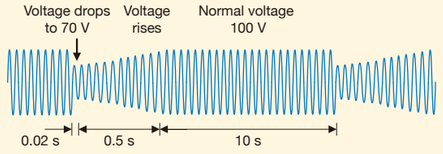
Simulates a problem in the power AC line such as blackout, voltage rise, voltage drop, abrupt phase changes, or abrupt frequency change, thereby enabling all types of AC line simulation such as prototype evaluation and product inspection. Settings are made with the panel, remote controller (sold separately)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

Note: This function does not support the main test of standard test such as IEC.

AC line simulation

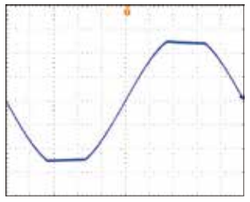
- Number of steps
  6 (Initial, Normal 1, Trans 1, Abnormal, Trans 2, Normal 2)
- Setting items
  step time, output range, AC voltage, frequency, start phase, stop phase, trigger output, and so on.
- Waveform : sine wave
- Number of memories : 5 (nonvolatile)

Example of AC line simulation



Clipped sine wave

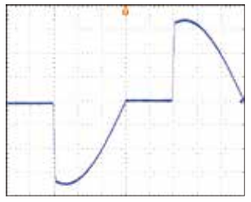
The peak clipped sine wave can be output. Setting can be done using the crest factor (CF) or clip rate (percent of the peak value).



- 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)

Arbitrary waveform

Arbitrary waveform output is possible. Waveforms can be easily created using the included control software, and can be saved in the internal memory via an external interface or USB memory.

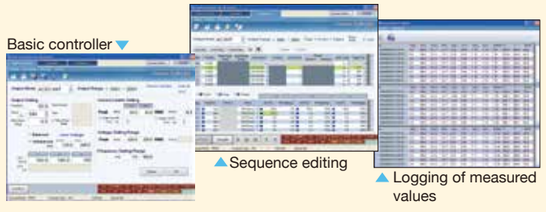


- Amplitude resolution
  16 bit
- Waveform length
  4096 words
- Number of memories
  16 (nonvolatile)

▶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, simulations and arbitrary waveforms.



Interface / external control I/O

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

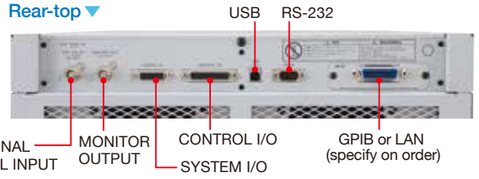
Interfaces : RS-232, USB, GPIB/LAN(LXI) (specify on order)

Note: LabVIEW driver comes with

External control I/O

- Enables control from a PLC, and other equipment.
- 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, and so on.

Rear-top ▼



Note: Some models have connectors for peripheral devices

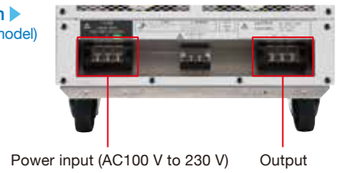
Power input (Specify on order)

Power input provides world wide compatibility.
Specify when ordering from single-phase, three-phase three-wire, and three-phase four-wire. The power input that can be specified differs depending on the model.

Output power	1.5 kVA	3 kVA	4.5 kVA to 12 kVA	16 kVA to 48 kVA
Single-phase 100 V to 230 V*	○	○	○	–
Three-phase three-wire 200 V to 220 V	–	–	○	○
Three-phase four-wire 380 V	–	–	○	○

*DP060LM and DP120LM single phase input is 200 V to 230 V

Rear-bottom ▶
(single-phase model)

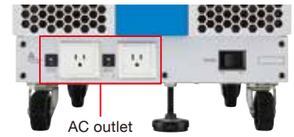


- Power input cable (sold separately) : Power input cables suitable for power input and power capacity.
- Cable holder (sold separately) : Holder for fixing power input cable / output cable. It depends on the model and the power input.

Power output

For 12kVA or lower, two AC outlets (NEMA 5-15: for Japan/ North America) are provided at the bottom of the front panel of the single-phase model. CEE7 (for Europe) is also available when ordering.

Front-bottom ▶
(single-phase model)



Stable output waveform of DP series — Measured data shows

Highly robustness, low distortion

Stability regardless of load

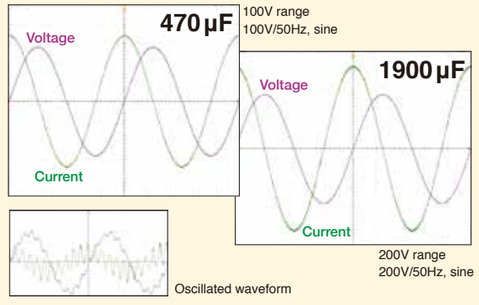
Switching of response characteristics is not required depending on load, and both capacitive and inductive loads are driven stably.

Protection for load

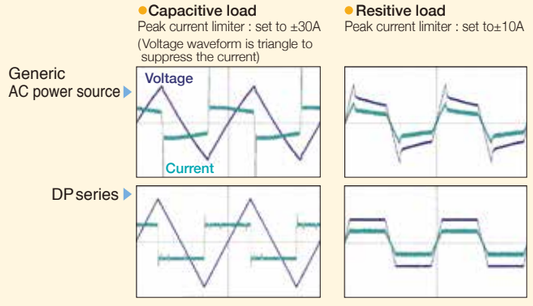
Variable peak current limiter function

This is effective for protecting the overcurrent caused by abnormal operation of the load in the evaluation of the developed prototype.

■Capacitive load output waveform



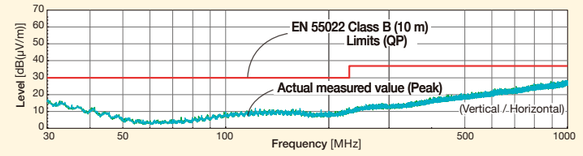
■Driving various loads using peak current limiters
Stable output waveform even during limiter operation



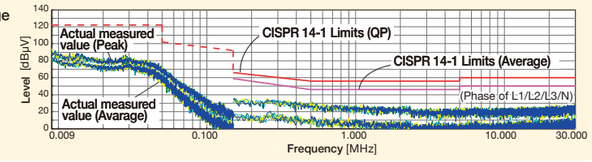
Low noise

Low noise for both conduction and radiation. It is the same level as the measured dark noise value only for the measurement system with the power supply stopped (data is overlapping).

■Radiated emissions
With noise filter, resistance load



■Noise terminal voltage
With noise filter and LISN, resistive load

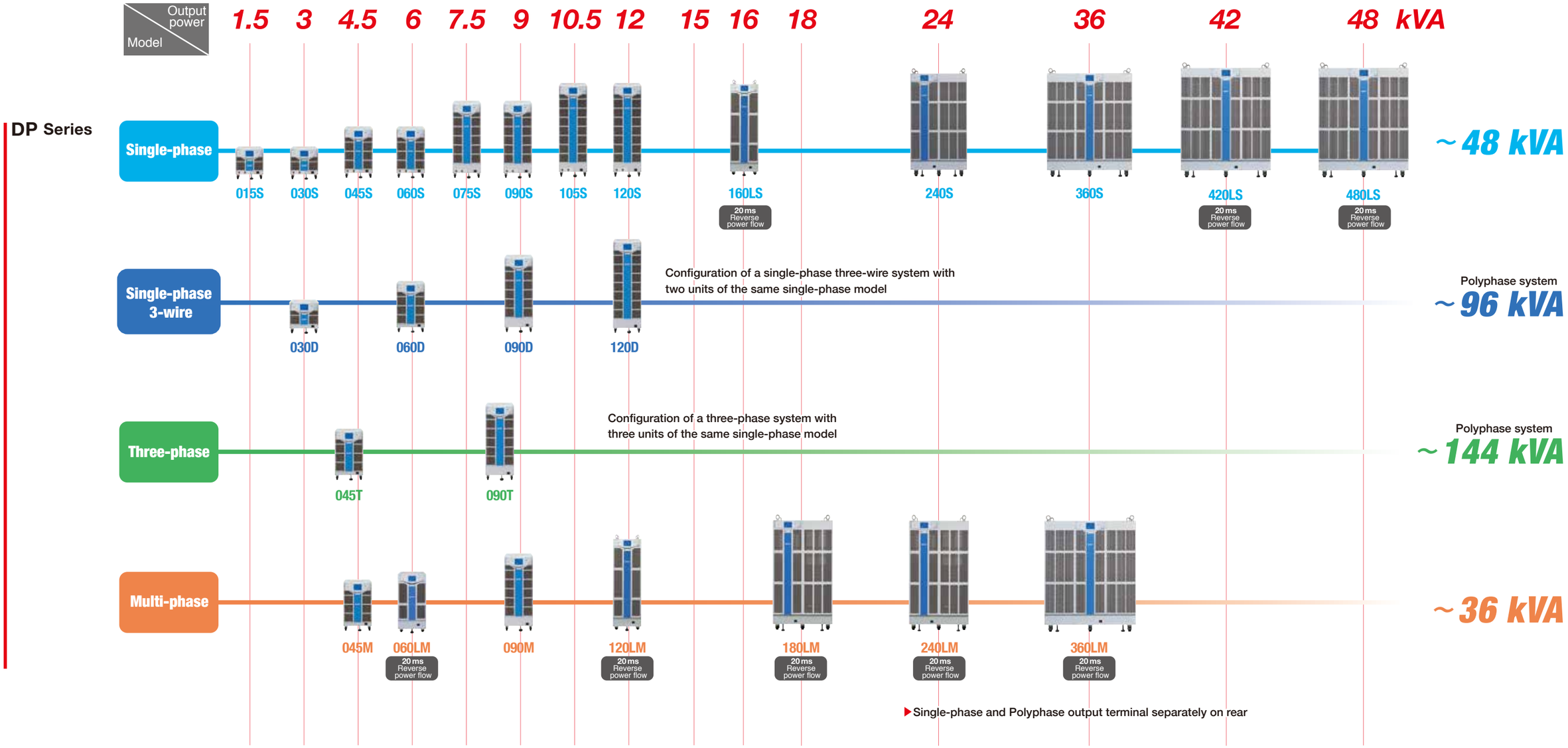


Peripherals

Peripheral devices and software for various standard tests are available. Contact us for detail.
—Reference impedance network, Voltage dips simulator, Immunity test program —

Lineup

An extensive lineup that meets various customer needs. Select the most suitable model according to your application, budget and operation.

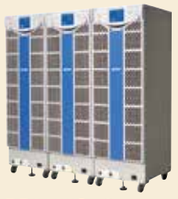


* Sigle-phaese use only model DP series Tyep K is available.
  Type K has the same specifications, except that a polyphase system cannot be built.

Polyphase System

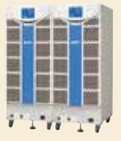
A single-phase 3 wire system can be built with combination of 2 same single-phase models. And a three-phase system can be bulit with combination of 3 same single-phase models. Multiple units can be connected by system connecting cables, and a single unit can be used as a single phase power supply as well.

DP060S×3
Three-phase 18 kVA



DP0120S×3
Three-phase 36 kVA

DP480LS×3
Three-phase 144 kVA



DP090S×2
Single-phase 3-wire
18 kVA

Customization

When power is needed between models of the line-up, we reduce power units to provide a solution.
Also, we support power increase by expansion of power units.
We provide solutions In accordance with budget and equipemnt expansion plan. Contact us for details.

Specifications

The following settings and conditions are provided unless otherwise noted.
• Load: resistance load for power factor 1
• Signal source: INT (internal signal source)
• Output voltage waveform: sine wave
• Remote sensing/AGC/Auto Cal: OFF
• Current limiter: factory default setting
• 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.

1P2W : Single-phase 2-wire
1P3W : Single-phase 3-wire
3P3W : Three-phase 3-wire
3P4W : Three-phase 4-wire

Single-phase models / polyphase models (1.5kVA to 36kVA)

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

Single-phase models	DP015S, DP030S, DP045S, DP060S, DP075S, DP090S, DP105S, DP120S, DP240S, DP360S
Single-phase three-wire models	DP030D, DP060D, DP090D, DP120D
Three-phase models	DP045T, DP090T
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. The system must be configured by same model and same firmware. Please inquire for details about specifications.

AC/DC Mode, Signal Source

	Single-phase models	Single-phase 3-wire models, Three-phase models
AC/DC mode	AC, ACDC, DC	AC, ACDC
Signal source	INT, VCA, SYNC, EXT, ADD	INT, VCA, SYNC

Power Output (Single-phase)

Model name		DP015S	DP030S	DP045S	DP060S	DP075S	DP090S	DP105S	DP120S	DP240S	DP360S
AC output *1	Output power *2	1.5 kVA	3 kVA	4. 5kVA	6 kVA	7.5 kVA	9 kVA	10.5 kVA	12 kVA	24 kVA	36 kVA
	Mode	Single-phase 2-wire Floating output, it can be used with grounding of Lo terminal.									
	Rated output voltage	100 V/200 V									
	Voltage setting range – Phase voltage	0.0 V to 160.0 V/0.0 V to 320.0 V, 0.0 Vp-p to 454.0 Vp-p/0.0 Vp-p to 908.0 Vp-p (Arbitrary waveform) For all phases in balanced mode and each phase in unbalanced mode									
	Voltage setting range – Line voltage	0.0 V to 320.0 V / 0.0 V to 640.0 V (1P3W), 0.0 V to 277.2 V / 0.0 V to 554.2 V (3P4W) Only for balanced mode for sine wave when polyphase system configured.									
	Voltage setting range – Resolution	Phase voltage setting : 0.1 V, line voltage setting : 0.2 V									
	Voltage setting range – Accuracy *3	± (0.5% of set + 0.6 V/1.2 V)									
	Max. current *4 *5	15 A/7.5 A	30 A/15 A	45 A/22.5 A	60 A/30 A	75A/37.5 A	90 A/45 A	105 A/52.5 A	120 A/60 A	240 A/120 A	360 A/180 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, ACDC mode : 1 Hz to 550 Hz									
	Frequency setting range – Resolution	0.01 Hz									
	Frequency setting range – Accuracy	±0.01% of setting (23˚C±5˚C)									
	Frequency stability *7	±0.005%									
	Output waveform	Sine, arbitrary (16 types), 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)	L2 phase : 0 deg. to 359.9 deg. (1P3W) L2 phase : 0 deg. to 359.9 deg., L3 phase : 0 deg. to 359.9 deg. (3P4W)									
	Phase angle setting range (unbalanced mode) – Resolution	0.1 deg.									
	Phase angle setting range (unbalanced mode) – Accuracy *9	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)									
DC output *11	Output power *2	1.5 kW	3 kW	4.5 kW	6 kW	7.5 kW	9 kW	10.5 kW	12 kW	24 kW	36 kW
	Rated output voltage	Floating output, it can be used with grounding of Lo terminal.									
	Mode	100 V/200 V									
	Rated output voltage	–227.0 V to +227.0 V/–454.0 V to +454.0 V									
	Rated output voltage – Resolution	0.1 V									
	Rated output voltage – Accuracy *12	± (I 0.5% of set I +0.6 V/1.2 V)									
	Max. current *13	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	240 A/120 A	360 A/180 A
	Max. instantaneous current *14	4 times value of maximum current.									
Output voltage stability (phase voltage)		Fluctuation with input voltage *15 : within ±0.15% (typ. for DP240S and DP360S) Fluctuation with output current *16 : within ±0.15 V/±0.30 V (DC), within ±0.15 V/±0.3 0V (45 Hz to 65 Hz), within ±0.5 V/±1.0 V (40 Hz to 550 Hz) Fluctuation with ambient temperature *17 : within ±0.01%/˚C (typ.)									
Output voltage distortion factor (phase voltage)		0.5% or lower (40 Hz to 550 Hz, 50% or higher of rated output voltage, maximum output current or lower, AC and ACDC modes, THD+N)									

Power Output (Single-phase 3-wire and Three-phase)

Model name			DP030D	DP060D	DP090D	DP120D	—	—
		Three-phase	—	—	—	—	DP045T	DP090T
AC output *1	Output power *2		3 kVA	6 kVA	9 kVA	12 kVA	4.5 kVA	9 kVA
	Mode		Single-phase 3-wire Floating output, it can be used with grounding of Lo terminal.				Three-phase	
	Rated output voltage		Phase voltage : 100 V/200 V					
	Setting mode		Balanced mode, unbalanced mode					
	Voltage setting range	Phase voltage	0.0 V to 160.0 V/0.0 V to 320.0 V, 0.0 Vp-p to 454.0 Vp-p/0.0 Vp-p to 908.0 Vp-p (Arbitrary waveform) For all phases in balanced mode and each phase in unbalanced mode					
	Voltage setting range	Line voltage	0.0 V to 320.0 V / 0.0 V to 640.0 V Only for balanced mode for sine wave when polyphase system cofigured.				0.0 V to 277.2 V / 0.0 V to 554.2 V	
	Voltage setting range	Resolution	Phase voltage setting : 0.1 V, line voltage setting : 0.2 V					
	Voltage setting range	Accuracy *3	± (0.5% of set + 0.6 V/1.2 V)					
	Max. current *4 *5		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, ACDC mode : 1 Hz to 550 Hz					
	Frequency setting range	Resolution	0.01 Hz					
	Frequency setting range	Accuracy	±0.01% of setting (23˚C±5˚C)					
	Frequency stability *7		±0.005%					
	Output waveform		Sine, arbitrary (16 types), 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)		L2 : 180 deg. ±35 deg				L2 : 120 deg. ±35 deg, L3 : 240 deg. ±35 deg	
	Phase angle setting range (unbalanced mode)	Resolution	0.1 deg.					
	Phase angle setting range (unbalanced mode)	Accuracy *9	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 voltage stability (phase voltage)			Fluctuation with input voltage *15 : within ±0.15% Fluctuation with output current *16 : within ±0.15 V/±0.3 0V (45 Hz to 65 Hz), within ±0.5 V/±1.0 V (40 Hz to 550 Hz) Fluctuation with ambient temperature *17 : within ±0.01%/˚C (typ.)					
Output voltage distortion factor (phase voltage)			0.5% or lower (40 Hz to 550 Hz, 50% or higher of rated output voltage, maximum output current or lower, AC and ACDC modes, THD+N)					

*1 : [V] = Vrms, [A] = Arms, unless otherwise specified.
*2 : In the case that the power input voltage is 1P 170 V or lower, models with 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 : [V]=Vdc, [A]=Adc, and the polarity is relative to Lo terminal, unless otherwise specified.
*12: 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.
*13: 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.
*14: Instantaneous = within 2 ms, at the rated output voltage
*15: In the case of single-phase input, 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 the 6 kVA or higher models, power input 200 V reference. In the case of three-phase three-wire input, for power input 170 V to 250 V, power input 200 V reference. In the case of three-phase four-wire input, for power input is 323 V to 433 V, power input 380 V reference. The resistance load at maximum current, the rated output voltage, DC or 45 Hz to 65 Hz.
Transition state immediately after a change of the input power supply voltage is not included.
*16: 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.
*17 : For power input 200 V or 380 V, no load, the rated output voltage, DC (only single-phase) or 45 Hz to 65 Hz.

Power Input

Model name		DP015S	DP030S	DP045S	DP060S	DP075S	DP090S	DP105S	DP120S	DP240S	DP360S
	Single-phase										
	Single-phase 3-wire	—	DP030D	—	DP060D	—	DP090D	—	DP120D	—	—
	Three-phase	—	—	DP045T	—	—	DP090T	—	—	—	—
Voltage/Phase*18 (Specify on order)		Overvoltage category II AC100 V to 230 V±10% (Max. voltage 250 V), 1P		AC100 V to 230 V±10% (Max. voltage 250 V), 1P2W or AC200 V to 220 V±15% (Max. voltage 250 V), 3P3W or AC380 V±15% (Max. voltage 433 V), 3P4W						AC200 V to 220 V±15% (Max. voltage 250 V), 3P3W or AC380 V±15% (Max. voltage 433 V), 3P4W	
Frequency		50 Hz ±2 Hz or 60 Hz ±2 Hz									
Power factor*19		0.95 or more (typ., at AC100 V input) , 0.90 or more (typ., at AC200 V input)								0.90 or more (typ.)	
Efficiency*19		77% or more (typ., at AC200 V input)								77% or more (typ.)	
Power consumption (Maximum)		2.25 kVA	4.5 kVA	6.75 kVA	9 kVA	11.25 kVA	13.5 kVA	15.75 kVA	18 kVA	36 kVA	54 kVA

*18: In the 6 kVA or higher models, the output capacity is limited to 4.5 kW for the 170 V or lower input.
*19: 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			DP015S	DP030S	DP045S	DP060S	DP075S	DP090S	DP105S	DP120S	DP240S	DP360S
	Single-phase 3-wire		DP030D	DP060D	DP090D	DP120D	—	—	—	—	—	—
	Three-phase		DP045T	DP090T	—	—	—	—	—	—	—	—
Display		Normal mode	Displays almost all measured and setting values (except harmonic current value)									
		Simple mode	Displays three measurement values (except harmonic current value) enlarged.									
Voltage *20	RMS value	Full scale	Phase voltage: 250.0 V/500.0 V; Line voltage: 500.0 V/1000.0 V (1P3W); 433.0 V/866.0 V (3P4W)									
		Resolution	0.1 V									
	DC average (avg) (only single phase)	Full scale	±250.0 V/±500.0 V									
		Resolution	0.1 V									
	Peak value (pk)	Full scale	±250.0 V/±500.0 V									
		Resolution	0.1 V									
Current *21	RMS value	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	320 A/160 A	480 A/240 A
		Resolution	0.01 A								0.1 A	
	DC average(avg) (only single phase)	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	±320 A/±160 A	±480 A/±240 A
		Resolution	0.01 A								0.1 A	
	Peak value (pk) Max./min. individual display	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	±1280 A/±640 A	±1920 A/±960 A
		Resolution	0.01 A								0.1 A	
		Hold	Hold the maximum values of I max I and I min I with the polarity (with the clear function)									
Power *22	Active (W)	Full scale	1800 W	3600 W	5400 W	7200 W	9000 W	10800 W	12600 W	14400 W	28800 W	43200 W
		Resolution	0.1 W/1 W (1000 W or higher)								1 W	
	Apparent (VA) *23	Full scale	2250 VA	4500 VA	6750 VA	9000 VA	11250 VA	13500 VA	15750 VA	18000 VA	36000 VA	54000 VA
		Resolution	0.1 VA/1 VA(1000 VA or higher)								1 VA	
	Reactive (var) *23	Full scale	2250 var	4500 var	6750 var	9000 var	11250 var	13500 var	15750 var	18000 var	36000 var	54000 var
		Resolution	0.1 var/1 var (1000 var or higher)								1 var	
Load power factor *23		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 *24		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	320 A/160 A	480 A/240 A
		Full scale (%)	100%									
		Resolution	0.01 A or 0.1%								0.1 A or 0.1%	
CO_2 emissions		Contents	Instantaneous (kg-CO_2/h), integration (t-CO_2) value for internal loss or output power. CO_2 emissions coefficient (t-CO_2/kWh): variable (resolution: 0.000001)								—	

*20 : For phase voltage in the polyphase model.
*21 : In the case that output current is 5% to 100% of maximum current.For phase current in the polyphase model.
*22 : In the case of sine wave, 50 V or higher output voltage, and that output current is 10% or higher of maximum current.
*23 : Excluding DC mode
*24 : 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			DP015S	DP030S	DP045S	DP060S	DP075S	DP090S	DP105S	DP120S	DP240S	DP360S
	Single-phase 3-wire		DP030D	DP060D	DP090D	DP120D	—	—	—	—	—	—
	Three-phase		DP045T	DP090T	—	—	—	—	—	—	—	—
Peak current limiter	Positive curren	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	+120.0A to +1008.0A/ +60.0A to +504.0A	+180.0A to +1512.0A/ +90.0A to +756.0A
	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	-1008.0A to -120.0A/ -504.0A to -60.0A	-1512.0A to -180.0A/ -756.0A to -90.0A
	Resolution		0.1A									
	Limiter operation		Automatic recovery (continuous) or output turn-off when the limited state continues over the specified time (1 s to 10 s, resolution 1 s)									
RMS current limiter	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	12.0A to 252.0A/ 12.0A to 126.0A	18.0A to 378.0A/ 18.0A to 189.0A
	Resolution		0.1A									
	Limiter operation		Automatic recovery (continuous) 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.

Power Unit Energization Setting

Model name		DP015S	DP030S	DP045S	DP060S	DP075S	DP090S	DP105S	DP120S	DP240S	DP360S
	Single-phase 3-wire	DP030D	DP060D	DP090D	DP120D	—	—	—	—	—	—
	Three-phase	DP045T	DP090T	—	—	—	—	—	—	—	—
Number of units		1	2	3	4	5	6	7	8	8	8
Energizing setting*25		No	Yes								

*25 : Can be set for only a model with more than one unit.

▶ Sequence function, simulation, control software and other functions (see P.17)

General Information

Model name		DP015S	DP030S	DP045S	DP060S	DP075S	DP090S	DP105S	DP120S	DP240S	DP360S
	Single-phase 3-wire	—	DP030D	—	DP060D	—	DP090D	—	DP120D	—	—
	Three-phase	—	—	DP045T	—	—	DP090T	—	—	—	—
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/m³, no condensation)									
Dimensions (W×H×D) mm (no protrusions)		430×398×562		430×665×562		430×1021×562		430×1287×562		860×1463×649	1290×1463×649
Chassis (P.18)		Type1		Type2		Type3		Type4		Type5	Type6
Weight (approx.)		38 kg	50 kg	70 kg	82 kg	110 kg	125 kg	140 kg	155 kg	345 kg	510 kg
Accesories		Instruction manual, control software, LabVIEW driver (version 8.6 or higher), power cable									

Single-phase models (for short reverse power flow) (1.6 kVA / 42 kVA / 48 kVA)

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

Single-phase models	DP160LS, DP420LS, DP480LS
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. The system must be configured by same model and same firmware. Please inquire for details about specifications.

AC/DC Mode, Signal Source

	Single-phase models	Polyphase system
AC/DC mode	AC, ACDC, DC	AC, ACDC
Signal source	INT, VCA, SYNC, EXT, ADD	INT, VCA, SYNC

Power Output

[V]=Vrms, [A]=Arms in AC output, [V]=Vdc, [A]=Adc in DC output

Model name		DP160LS		DP420LS		DP480LS	
		Single-phase	Polyphase	Single-phase	Polyphase	Single-phase	Polyphase
AC output	Output power	16 kVA	1P3W : 32 kVA 3P4W : 48 kVA	42 kVA	1P3W : 84 kVA 3P4W : 126 kVA	48 kVA	1P3W : 96 kVA 3P4W : 144 kVA
	Mode	1P2W Floating output, the Lo terminal can be grounded.	1P3W 3P4W (Y-connection) Floating output, the N-terminal can be grounded.	1P2W Floating output, the Lo terminal can be grounded.	1P3W 3P4W (Y-connection) Floating output, the N-terminal can be grounded.	1P2W Floating output, the Lo terminal can be grounded.	1P3W 3P4W (Y-connection) Floating output, the N-terminal can be grounded.
	Setting mode*1	—	Balanced, Unbalanced	—	Balanced, Unbalanced	—	Balanced, Unbalanced
	Rated output voltage	100 V / 200 V					
	Voltage setting range*2	0.0 V to 160.0 V / 0.0 V to 320.0 V, 0.0 Vp-p to 454.0 Vp-p / 0.0 Vp-p to 908.0 Vp-p(arbitrary), Setting resolution : 0.1 V					
	Voltage accuracy*3	± (0.5 % of set + 0.6 V / 1.2 V)					
	Line voltage setting range *4	—	1P3W : 0.0 V to 320.0 V / 0.0 V to 640.0 V 3P4W : 0.0 V to 277.2 V / 0.00 V to 554.2 V Setting resolution : 0.2 V	—	1P3W : 0.0 V to 320.0 V / 0.0 V to 640.0 V 3P4W : 0.0 V to 277.2 V / 0.00 V to 554.2 V Setting resolution : 0.2 V	—	1P3W : 0.0 V to 320.0 V / 0.0 V to 640.0 V 3P4W : 0.0 V to 277.2 V / 0.00 V to 554.2 V Setting resolution : 0.2 V
	Max. current *5	160 A / 80 A		420 A / 210 A		480 A / 240 A	
	Max. peak current *6	Peak value (Apk) which is four times of the maximum current		Peak value (Apk) which is three times of the maximum current			
	Short reverse power flow*7 *8	100 % or less of maximum current (RMS) (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)					
	Load power factor*8	0 to 1 (phase lead or phase lag, 45 Hz to 65 Hz)					
	Frequency setting range	40.00 Hz to 550.00 Hz (AC mode) , 1.00 Hz to 550.00 Hz (ACDC mode) , Setting resolution : 0.01 Hz					
	Frequency accuracy	±0.01 % of set (23°C ±5°C)					
	Frequency stability *9	±0.005%					
	Voltage frequency characteristic*10	±1%					
	Output waveform	Sine wave, arbitrary wave (16 types) , clipped sine wave (3 types)					
	Output on phase setting range*11	0.0° to 359.9° variable, Setting resolution : 0.1°					
	Output off phase setting range*11	0.0° to 359.9° variable (active/inactive selectable) , Setting resolution : 0.1°					
	Phase angle setting range *12	—	1P3W L2 phase : 0.0° to 359.9° 3P4W L2 phase : 0.0° to 359.9° L3 phase : 0.0° to 359.9° Setting resolution : 0.1°	—	1P3W L2 phase : 0.0° to 359.9° 3P4W L2 phase : 0.0° to 359.9° L3 phase : 0.0° to 359.9° Setting resolution : 0.1°	—	1P3W L2 phase : 0.0° to 359.9° 3P4W L2 phase : 0.0° to 359.9° L3 phase : 0.0° to 359.9° Setting resolution : 0.1°
	Phase angle accuracy *13	—	45 Hz to 65 Hz : ±1.0° 40 Hz to 550 Hz : ±2.0°	—	45 Hz to 65 Hz : ±1.0° 40 Hz to 550 Hz : ±2.0°	—	45 Hz to 65 Hz : ±1.0° 40 Hz to 550 Hz : ±2.0°
	DC offset *14	Within ± 20 mV (typ.), fine adjustment available					
DC output	Output power	16 kW	—	42 kW	—	48 kW	—
	Mode	Floating output, the Lo terminal can be grounded.	—	Floating output, the Lo terminal can be grounded.	—	Floating output, the Lo terminal can be grounded.	—
	Rated output voltage	100 V / 200 V	—	100 V / 200 V	—	100 V / 200 V	—
	Voltage setting range	−227.0 V to +227.0 V / −454.0 V to +454.0 V, Setting resolution : 0.1 V	—	−227.0 V to +227.0 V / −454.0 V to +454.0 V, Setting resolution : 0.1 V	—	−227.0 V to +227.0 V / −454.0 V to +454.0 V, Setting resolution : 0.1 V	—
	Voltage sccuracy *15	± (I 0.5% of set I + 0.6 V / 1.2 V)	—	± (I 0.5% of set I + 0.6 V / 1.2 V)	—	± (I 0.5% of set I + 0.6 V / 1.2 V)	—
	Maximum source current *16	160 A / 80 A	—	420 A / 210 A	—	480 A / 240 A	—
	Maximum instantaneous source current *17	Peak value (Apk) which is four times of the maximum current	—	Peak value (Apk) which is three times of the maximum current	—	Peak value (Apk) which is three times of the maximum current	—
	Short sink current *18	100 % or less of maximum source current (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)	—	100 % or less of maximum source current (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)	—	100 % or less of maximum source current (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)	—

Stability and Distortion

Model name	DP160LS		DP420LS		DP480LS	
Output voltage stability (phase voltage)	Fluctuation with input voltage *19 : Within ±0.15% (typ.)					
	Fluctuation with output current *20					
	±0.15 V / ±0.30 V(DC) ±0.15 V / ±0.30 V (45 Hz to 65 Hz) ±0.5 V / ±1.0 V (40 Hz to 550 Hz)	±0.15 V / ±0.30 V (45 Hz to 65 Hz) ±0.5 V / ±1.0 V (40 Hz to 550 Hz)	±0.15 V / ±0.30 V(DC) ±0.15 V / ±0.30 V (45 Hz to 65 Hz) ±0.5 V / ±1.0 V (40 Hz to 550 Hz)	±0.15 V / ±0.30 V (45 Hz to 65 Hz) ±0.5 V / ±1.0 V (40 Hz to 550 Hz)	±0.15 V / ±0.30 V(DC) ±0.15 V / ±0.30 V (45 Hz to 65 Hz) ±0.5 V / ±1.0 V (40 Hz to 550 Hz)	±0.15 V / ±0.30 V (45 Hz to 65 Hz) ±0.5 V / ±1.0 V (40 Hz to 550 Hz)
	Fluctuation with ambient temperature*21 : Within ±0.01 %/°C (typ.)					
Distortion of output voltage waveform*22	0.5 % or lower					

Power Input

Model name	DP160LS		DP420LS		DP480LS	
	Single-phase	Polyphase	Single-phase	Polyphase	Single-phase	Polyphase
Voltage/Phase (Specify when ordering)	Overvoltage Category II 3P3W input : 200 V to 220 V ±15 %, with limited to 250 V or lower 3P4W input : 380 V (phase voltage : 220 V) ±15 %, with limited to 433 V (phase voltage : 250 V) or lower.					
Frequency	50 Hz ±2 Hz or 60 Hz ±2 Hz					
Power factor*23	0.90 or higher (typ.)					
Efficiency*23	77% or higher (typ.)					
Maximum power consumption	24 kVA or lower	3P3W : 48 kVA or lower 3P4W : 72 kVA or lower	63 kVA or lower	3P3W : 126 kVA or lower 3P4W : 189 kVA or lower	72 kVA or lower	3P3W : 144 kVA or lower 3P4W : 216 kVA or lower

Measurement Function

Model name			DP160LS		DP420LS		DP480LS	
			Single-phase	Polyphase	Single-phase	Polyphase	Single-phase	Polyphase
Display		Normal mode	Displays almost all measured and setting values (except harmonic current value)					
		Simple mode	Displays three measurement values (except harmonic current value) enlarged.					
Voltage *24	RMS value	Full scale	250.0 V / 500.0 V	Line voltage (sine only) 1P3W : 500.0 V / 1000.0 V 3P4W : 433.0 V / 866.0 V	250.0 V / 500.0 V	Line voltage (sine only) 1P3W : 500.0 V / 1000.0 V 3P4W : 433.0 V / 866.0 V	250.0 V / 500.0 V	Line voltage (sine only) 1P3W : 500.0 V / 1000.0 V 3P4W : 433.0 V / 866.0 V
		Resolution	0.1 V					
	DC average (avg)	Full scale	±250.0 V / ±500.0 V	—	±250.0 V / ±500.0 V	—	±250.0 V / ±500.0 V	—
		Resolution	0.1 V	—	0.1 V	—	0.1 V	—
	Peak value (pk) each of max./min.	Full scale	±250.0 V / ±500.0 V					
		Resolution	0.1 V					
Current *25	RMS Value	Full scale	213.3 A / 106.7 A		560 A / 280 A		640 A / 320 A	
		Resolution	0.1 A					
	DC average (avg)	Full scale	±213.3 A / ±106.7 A	—	±560 A / ±280 A	—	±640 A / ±320 A	—
		Resolution	0.1 A	—	0.1 A	—	0.1 A	—
	Peak value (pk) each of max./min.	Full scale	±853.3 A / ±426.7 A		±2240 A / ±1120 A		±2560 A / ±1280 A	
		Resolution	0.1 A					
		Hold	Hold the maximum values of l max l and l min l with the polarity (with the clear function)					
Power *26	Active (W)	Full scale	19200 W		50400 W		57600 W	
		Resolution	1 W					
	Apparent (VA) *27	Full scale	24000 VA		63000 VA		72000 VA	
		Resolution	1 VA					
	Reactive (var) *27	Full scale	24000 var		63000 var		72000 var	
		Resolution	1 var					
Load power factor *27		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 *28		Range	Up to 40th order.					
		Full scale	213.3 A / 106.7 A, 100%		560 A / 280 A, 100%		640 A / 320 A, 100%	
		Resolution	0.1 A or 0.1%					

*1 : Can be set only when the polyphase system is configured.
*2 : For phase voltage setting in the polyphase output. In balanced mode all phases are collectively set and in unbalanced mode each phase is individually set .
*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±5C. For phase voltage setting in the polyphase output.
*4 : Line voltage can be set only in balanced mode and with sine wave.
*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 active current of AC+DC satisfies the maximum current. In the case of 40 Hz or lower or 400 Hz or higher, and that the ambient temperature is 40°C or higher, the maximum current may decrease.
For phase current setting in the polyphase output.
*6 : For the capacitor input type rectified load (crest factor=4 or 3), the rated output voltage, and 45 Hz to 65 Hz.
*7 : In the case rated output voltage, 50 Hz or 60 Hz. If the output voltage is higher than the rated value, this is limited to satisfy the power capacity. It may reduce short reverse power flow if ambient temperature is 40°C or higher or repeated interval of reverse power flow is 15 minutes or less.
*8 : External power injection or regeneration which is over short reverse power flow capacity is not available.
*9 : For 45 Hz to 65 Hz, the rated output voltage, no load and the resistance load for the maximum current, and the operating temperature.
*10 : For 40 Hz to 550 Hz, sine wave, the rated output voltage, the resistance load for the maximum current at 55 Hz, and 55 Hz reference.
*11 : Setting for the L1 phase in the polyphase ouput. The component of the phase angle setting is added for the other phases.
*12 : Can be set only with unbalance mode in the polyphase output.
*13 : In the case of 50 V or higher, sine wave, and same load condition and voltage setting for all phases.
*14 : In the case of the AC mode and 23°C±5°C.
*15 : 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.
*16 : 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 active 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.
*17 : Instantaneous = within 2 ms, at the rated output voltage.
*18 : In the case rated output voltage. If the output voltage is higher than the rated value, this is limited to satisfy the power capacity. It may reduce short reverse power flow if ambient temperature is 40°C or higher or repeated interval of reverse power flow is 15 minutes or less.
*19 : For power input 170 V to 250 V (3P3W) or 323 V to 433 V (3P4W), power input 200 V reference (3P3W) or 380 V reference (3P4W), the resistance load at the maximum current, the rated output voltage, DC (only single-phase output) or 45 Hz to 65 Hz. Transition state immediately after a change of the input power-supply voltage is not included.
*20 : In the case that the output current is changed from 0% to 100% of the maximum 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.
*21 : For power input 200 V (3P3W) or 380 V (3P4W), no load, the rated output voltage, DC or 45 Hz to 65 Hz.
*22 : 40 Hz to 550 Hz, 50 % or higher of the rated output voltage, the maximum current or lower, AC and ACDC modes, THD+N.
*23 : In the case of AC-INT, the rated output voltage, the resistance load at the maximum current, 45 Hz to 65 Hz output.
*24 : For the polyphase system, this specification is for the phase voltage and the DC average value display cannot be selected.
*25 : In the case that output current is 5% to 100% of maximum current.
For the polyphase system, these are the specifications for the phase current. The DC average value display cannot be selected.
*26 : In the case of sine wave, 50 V or higher output voltage, and that output current is 10% or higher of maximum current.
*27 : Excluding DC mode
*28 : AC-INT mode, fundamental wave 50 Hz/60 Hz only, phase current.
This measurement does not conform to IEC or other standards.

Power Unit Energization Setting

Model name	DP160LS		DP420LS		DP480LS	
	Single-phase	Polyphase	Single-phase	Polyphase	Single-phase	Polyphase
Maximum output power per unit	2 kVA		6 kVA			
Number of units	8		7		8	

Current Limiter

Model name			DP160LS	DP420LS	DP480LS
Peak current limiter	Positive current	Setting range (peak value)	+80.0 A to +672.0 A / +40.0 A to +336.0 A	+210.0 A to +1323.0 A / +105.0 A to +661.5 A	+240.0 A to +1512.0 A / +120.0 A to +756.0 A
	Negative current	Setting range (peak value)	-672.0 A to -80.0 A / -336.0 A to -40.0 A	-1323.0 A to -210.0 A / -661.5 A to -105.0 A	-1512.0 A to -240.0 A / -756.0 A to -120.0 A
	Resolution		0.1A		
	Limiter operation		Automatic recovery (continuous) or output turn-off when the limited state continues over the specified time (1 s to 10 s, resolution 1 s)		
RMS current limiter	Setting range (RMS)		8.0 A to 168.0 A / 8.0 A to 84.0 A	21.0 A to 441.0 A / 21.0 A to 220.5 A	24.0 A to 504.0 A / 24.0 A to 252.0 A
	Resolution		0.1A		
	Limiter operation		Automatic recovery (continuous) 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, simulation, control software and other functions (see P.17)

General Information

Model name	DP160LS	DP420LS	DP480LS
Withstanding voltage	AC 1500 V or DC 2130 V 1 minute		
Insulation resistance	30 MΩ or higher (DC 500 V), (inputs vs. outputs/chassis, inputs/chassis vs. outputs)		
Operating temperature / humidity	0°C to +50°C, 5% to 85%RH (absolute humidity : 1 to 25 g/m³, without condensation) Some specifications are limited by the temperature range		
Dimensions (W×H×D) mm(no protrusions)	455×1407×803	1365×1580×803	
Chassis (P.18)	Type4L	Type6L	
Weight (approx.)	Approx. 230 kg	Approx. 600 kg	Approx. 650 kg
Power input terminal (rear)	M8 upset bolt (3P3W), M6 screw (3P4W)	M10 upset bolt	
Output terminal	M8 upset bolt	M16 upset bolt	
Sensing input terminal (rear)	M4 screw		
Accesories	Instruction Manual, CD-ROM (Control Software, LabVIEW Driver, Instruction Manual for Remote Control and Control Software) Control cable (D-sub 25 pin connector), Stabilizer (DP160LS only)		

Multi-phase models (4.5kVA to 36kVA)

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

Multi-phase model	DP045M, DP060LM, DP090M, DP120LM, DP180LM, DP240LM, DP360LM

AC/DC Mode, Signal Source

	Single-phase output	Polyphase output
AC/DC mode	AC, ACDC, DC	AC, ACDC
Signal source	INT, VCA, SYNC, EXT, ADD	INT, VCA, SYNC

Power Output (Single-phase)

Model name		DP045M	DP060LM	DP090M	DP120LM	DP180LM	DP240LM	DP360LM
AC output *1	Output power	4.5 kVA	6 kVA	9 kVA	12 kVA	18 kVA	24 kVA	36 kVA
	Mode	Single-phase two-wire Floating output, the Lo terminal can be grounded.						
	Rated output voltage	100 V/200 V						
	Voltage setting range	0.0 V to 160.0 V / 0.0 V to 320.0 V, 0.0 Vp-p to 454.0 Vp-p / 0.0 Vp-p to 908.0 Vp-p (arbitrary wave)						
	Setting resolution	0.1 V						
	Voltage accuracy *2	± (0.5% of set + 0.6 V/1.2 V)						
	Max. current *3	45A / 22.5 A	60 A / 30 A	90 A / 45 A	120 A / 60 A	180 A / 90 A	240 A / 120 A	360 A / 180 A
	Max. peak current *4	Peak value (Apk) which is four times of the Max. current				Peak value (Apk) which is three times of the Max. current		
	Short reverse power flow *5	———	100% or less of Max. current (RMS) (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)	———	100% or less of Max. current (RMS) (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)			
	Load power factor	0 to 1 (phase lead or phase lag, 45 Hz to 65 Hz)						
	Frequency setting range	40.00 Hz to 550.00 Hz (AC mode), 1.00 Hz to 550.00 Hz (ACDC mode)						
	Setting resolution	0.01 Hz						
	Frequency accuracy	± 0.01% of set (23°C ± 5°C)						
	Frequency stability *6	± 0.005%						
	Voltage frequency characteristic *7	± 1%						
	Output waveform	Sine wave, arbitrary wave (16 types), clipped sine wave (3 types)						
	Output on phase setting range	0.0° to 359.9° variable, setting resolution: 0.1°						
	Output off phase setting range	0.0° to 359.9° variable (active/inactive selectable), setting resolution: 0.1°						
	DC offset *8	Within ± 20 mV (typ. fine adjustment available)						
DC output *9	Output power	4.5 kW	6 kW	9 kW	12 kW	18 kW	24 kVA	36 kVA
	Mode	Floating output, the Lo terminal can be grounded.						
	Rated output voltage	100 V/200 V						
	Voltage setting range	−227.0 V to +227.0 V / −454.0 V to +454.0 V						
	Setting resolution	0.1 V						
	Voltage accuracy *10	± (10.5% of set I + 0.6 V/1.2 V)						
	Max. source current *11	45A / 22.5 A	60 A / 30 A	90 A / 45 A	120 A / 60 A	180 A / 90 A	240 A / 120 A	360 A / 180 A
	Max. instantaneous source current *12	Peak value (Apk) which is four times of the Max. current				Peak value (Apk) which is three times of the Max. current		
	Short sink current *13	———	100% or less of Max. source current (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)	———	100% or less of Max. source current (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)			

*1 : [V]=Vrms, [A]=Arms, unless otherwise specified.

*2 : 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.

*3 : 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 active current of AC+DC satisfies the maximum current.
In the case of 40 Hz or lower or 400 Hz or higher, and that the ambient temperature is 40°C or higher, the maximum current may decrease.

*4 : For the capacitor input type rectified load (crest factor=4 or 3), the rated output voltage, and 45 Hz to 65 Hz.

*5 : In the case rated output voltage, 50 Hz or 60 Hz.
If the output voltage is higher than the rated value, this is limited to satisfy the power capacity.
It may reduce short reverse power flow if ambient temperature is 40°C or higher or repeated interval of reverse power flow is 15 minutes or less.
External power injection or regeneration which is over short reverse power flow capacity is not available.

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

*7 : For 40 Hz to 550 Hz, sine wave, the rated output voltage, the resistance load for the maximum current at 55 Hz, and 55 Hz reference.

*8 : In the case of the AC mode and 23°C±5°C.

*9 : [V]=Vdc, [A]=Adc, unless otherwise noted. The polarity is relative to the Lo terminal.

*10: 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.

*11 : 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 active 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.

*12: Instantaneous=within 2 ms, at the rated output voltage.

*13: In the case rated output voltage. If the output voltage is higher than the rated value, this is limited to satisfy the power capacity.
It may reduce short reverse power flow if ambient temperature is 40°C orhigher or repeated interval of reverse power flow is 15 minutes or less.

Power Output (Polyphase)

Model name			DP045M	DP060LM	DP090M	DP120LM	DP180LM	DP240LM	DP360LM
AC output *1	Output power	1P3W	3 kVA	4 kVA	6 kVA	8 kVA	12 kVA	16 kVA	24 kVA
		3P4W	4.5 kVA	6 kVA	9 kVA	12 kVA	18 kVA	24 kVA	36 kVA
	Mode		Single-phase three-wire (1P3W), three-phase four-wire (Y-connection) (3P4W) Floating output, the N-terminal can be grounded.						
	Setting mode *14		Balanced mode, unbalanced mode						
	Rated output voltage		100 V/200 V (phase voltage)						
	Voltage setting range	Phase voltage setting	0.0 V to 160.0 V / 0.0 V to 320.0 V, 0.0 Vp-p to 454.0 Vp-p / 0.0 Vp-p to 908.0 Vp-p (arbitrary wave)						
			Collective for all phases in balanced mode and each phase in unbalanced mode						
		Line voltage setting	1P3W: 0.0 V to 320.0 V / 0.0 V to 640.0 V, 3P4W: 0.0 V to 277.2 V /0.0 V to 554.2 V						
			Balanced mode and sine wave only						
		Setting resolution	Phase voltage setting: 0.1 V, Line voltage setting: 0.2 V						
	Voltage accuracy *2		± (0.5% of set + 0.6 V/1.2 V)						
	Max. current *3		15A / 7.5 A	20 A / 10 A	30 A / 15 A	40 A / 20 A	60 A / 30 A	80 A / 40 A	120 A / 60 A
	Max. peak current *4		Peak value (Apk) which is four times of the Max. current				Peak value (Apk) which is three times of the Max. current		
	Short reverse power flow *5		———	100% or less of Max. current (RMS) (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)	———	100% or less of Max. current (RMS) (reverse power flow time ≤ 20 ms, discontinuous, 40°C or lower)			
	Load power factor		0 to 1 (phase lead or phase lag, 45 Hz to 65 Hz)						
	Frequency setting range		40.00 Hz to 550.00 Hz (AC mode), 1.00 Hz to 550.00 Hz (ACDC mode)						
	Setting resolution		0.01 Hz						
	Frequency accuracy		± 0.01% of set (23°C ± 5°C)						
	Frequency stability *6		± 0.005%						
	Voltage frequency characteristic *7		± 1%						
	Output waveform		Sine wave, arbitrary wave (16 types), clipped sine wave (3 types)						
	Output on phase setting range *15		0.0° to 359.9° variable, setting resolution: 0.1°						
	Output off phase setting range *15		0.0° to 359.9° variable (active/inactive selectable), setting resolution: 0.1°						
	Setting range of the phase angle (unbalanced mode)		L2 phase: 180.0° ± 35.0° (1P3W), L2 phase: 120.0° ± 35.0°, L3 phase: 240.0° ± 35.0° (3P4W)						
	Setting resolution		0.1°						
	Phase angle accuracy *16		45 Hz to 65 Hz: ±1.0°, 40 Hz to 550 Hz: ±2.0°						
	DC offset *8		Within ± 20 mV (typ. fine adjustment available)						

*14: Can be set only in the polyphase output.

*15: Set for the L1 phase. The component of the phase angle setting is added for the other phases.

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

Stability and Distortion

Output voltage stability (phase voltage)	Fluctuation with input voltage *17 : within ±0.15% (typ.) Fluctuation with output current *18 : DC (only single-phase output) within ±0.15 V/±0.30 V, 45 Hz to 65 Hz within ±0.15 V/±0.30 V, 40 Hz to 550 Hz within ±0.5 V/±1.0 V Fluctuation with ambient temperature *19 : within ±0.01%/°C (typ.)
Distortion of output voltage waveform (phase voltage) *20	0.5 % or lower

*17: For 4.5 kVA model only, for power input 90 V to 250 V (single-phase), power input 200 V reference. In the case of single-phase and three-phase three-wire input, for power input 170 V to 250 V, power input 200 V reference. In the case of three-phase four-wire input, for power input 323 V to 433 V, power input 380 V reference. For the resistance load at the maximum current, the rated output voltage, DC (only single-phase output) or 45 Hz to 65 Hz. Transition state immediately after a change of the input power-supply voltage is not included.

*18: In the case that the output current is changed from 0% to 100% of the maximum 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.

*19: For power input 200 V (single-phase, three-phase three-wire input) or 380 V (three-phase four-wire input), no load, the rated output voltage, DC (only single-phase output) or 45 Hz to 65 Hz.

*20: 40 Hz to 550 Hz, 50% or higher of the rated output voltage, the maximum current or lower, AC and ACDC modes, THD+N.

Power Intput

Model name		DP045M	DP060LM	DP090M	DP120LM	DP180LM	DP240LM	DP360LM
Voltage *21		Overvoltage category II						
	1P2W input	100 V to 230 V ±10%, with limited to 250 V or lower	200 V to 230 V ±15%, with limited to 250 V or lower	100 V to 230 V ±10%, with limited to 250 V or lower	200 V to 230 V ±15%, with limited to 250 V or lower	———		
	3P3W input	200 V to 220 V ±15%, with limited to 250 V or lower						
	3P4W input	380 V (phase voltage: 220 V) ±15%, with limited to 433 V (phase voltage: 250 V) or lower						
Frequency		50 Hz ±2 Hz or 60 Hz ±2 Hz						
Power factor *22	at AC100 V input	0.95 or higher (typ.)	———	0.95 or higher (typ.)	———			
	at AC200 V input	0.90 or higher (typ.)						
Efficiency *22		77% or higher (typ.)						
Maximum power consumption		6.75 kVA or lower	9 kVA or lower	13.5. kVA or lower	18 kVA or lower	27 kVA or lower	36 kVA or lower	54 kVA or lower

*21: Specify on order.

*22: 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			DP045M	DP060LM	DP090M	DP120LM	DP180LM	DP240LM	DP360LM
View		Normal	Displays almost all the measured and setting values excluding the harmonic current measurement on one screen.						
		Simple	Enlarges and displays three items among all the measured values except the harmonic current measurement.						
Voltage *23	Effective value (rms)	Full scale	Single-phase output	250.0 V / 500.0 V					
			Polyphase output	Line voltage of polyphase output, only with sine waveform output. 1P3W: 500.0 V / 1000.0 V, 3P4W: 433.0 V / 866.0 V					
		Resolution		0.1 V					
	DC average value (avg)	Full scale	Single-phase output	±250.0 V / ±500.0 V					
			Polyphase output	———					
		Resolution	Single-phase output	0.1 V					
			Polyphase output	———					
	Peak value (pk) (each of max. and min.)	Full scale		±250.0 V / ±500.0 V					
		Resolution		0.1 V					
Current *24	Effective value (rms)	Full scale	Single-phase output	60 A / 30 A	80 A / 40 A	120 A / 60 A	160 A / 80 A	240 A / 120 A	320 A / 160 A	480 A / 240 A
			Polyphase output	20 A / 10 A	26.67 A / 13.33 A	40 A / 20 A	53.33 A / 26.67 A	80 A / 40 A	106.7 A / 53.3 A	160 A / 80 A
		Resolution		0.01 A				0.1 A		
	DC average value (avg)	Full scale	Single-phase output	±60 A / ±30 A	±80 A / ±40 A	±120 A / ±60 A	±160 A / ±80 A	±240 A / ±120 A	±320 A / ±160 A	±480 A / ±240 A
			Polyphase output	———						
		Resolution	Single-phase output	0.01 A				0.1 A		
			Polyphase output	———						
	Peak value (pk) (each of max. and min.)	Full scale	Single-phase output	±240 A / ±120 A	±320 A / ±160 A	±480 A / ±240 A	±640 A / ±320 A	±960 A / ±480 A	±1280 A / ±640 A	±1920 A / ±960 A
			Polyphase output	±80 A / ±40 A	±106.67 A / ±53.33 A	±160 A / ±80 A	±213.32 A / ±106.67 A	±320 A / ±160 A	±426.7 A / ±213.3 A	±640 A / ±320 A
		Resolution		0.01 A				0.1 A		
		Hold		Holds the maximum values of Imax and Imin with the polarity (with the clear function)						
Power *25	Active (W)	Full scale	Single-phase output	5400 W	7200 W	10800 W	14400 W	21600 W	28800 W	43200 W
			Polyphase output	1800 W	2400 W	3600 W	4800 W	7200 W	9600 W	14400 W
		Resolution		0.1 W / 1 W (1000 W or higher)				1 W		
	Apparent *26 (VA)	Full scale	Single-phase output	6750 VA	9000 VA	13500 VA	18000 VA	27000 VA	36000 VA	54000 VA
			Polyphase output	2250 VA	3000 VA	4500 VA	6000 VA	9000 VA	12000 VA	18000 VA
		Resolution		0.1 VA / 1 VA (1000 VA or higher)				1 VA		
	Reactive *26 (var)	Full scale	Single-phase output	6750 var	9000 var	13500 var	18000 var	27000 var	36000 var	54000 var
			Polyphase output	2250 var	3000 var	4500 var	6000 var	9000 var	12000 var	18000 var
		Resolution		0.1 var / 1 var (1000 var or higher)				1 var		
Load power factor *26		Measurement range		0.00 to 1.00						
		Resolution		0.01						
Load crest factor		Measurement range		0.00 to 50.00						
		Resolution		0.01						
Synchronization frequency (only SYNC)		Display range		38.0 Hz to 525.0 Hz						
		Resolution		0.1 Hz						
Harmonic current *27		Measurement range		Up to 40th order of the fundamental wave						
		Full scale	Single-phase output	60 A / 30 A, 100%	80 A / 40 A, 100%	120 A / 60 A, 100%	160 A / 80 A, 100%	240 A / 120 A, 100%	320 A / 160 A, 100%	480 A / 240 A, 100%
			Polyphase output	20 A / 10 A, 100%	26.67 A / 13.33 A, 100%	40 A / 20 A, 100%	53.33 A / 26.67 A, 100%	80 A / 40 A, 100%	106.7 A / 53.3 A, 100%	160 A / 80 A, 100%
		Resolution		0.01 A, 0.1%				0.1 A, 0.1%		
CO_2 emissions (only DP045M, DP090M)		Contents		Instantaneous (kg CO_2/h), integration (t-CO_2) value for internal loss or output power. CO_2 emissions coefficient (t-CO_2/kWh): variable (resolution: 0.000001)						

*23: In the polyphase output, it is a specification for phase voltage, and the DC average value display cannot be selected.

*24: The output current is 5% to 100% of the maximum current.

*25: All in the case of sine wave, 50 V or higher output voltage, and that the output current is 10% or higher of the maximum current. In the polyphase output, these are the specifications for each phase. In the polyphase output, the all-phase total display is available.

*26: Excluding DC mode

*27: AC - INT, fundamental wave 50 Hz/60 Hz only, phase current. The measurement does not conform to the IEC or other standard.

Power Unit Energization Setting

Model name		DP045M	DP060LM	DP090M	DP120LM	DP180LM	DP240LM	DP360LM
Maximum output power per unit		1.5 kVA	2 kVA	1.5 kVA	2 kVA	6 kVA	4 kVA	6 kVA
Number of units	Single-phase output	3	3	6	6	3	6	6
	Polyphase output*	———	———	2	2	———	2	2

*Per each phase

Current Limiter

Model name				DP045M	DP060LM	DP090M	DP120LM
Peak current limiter	Positive current	Setting range (peak value)	Single-phase output	+22.5 A to +189.0 A / +11.2 A to +94.5 A	+30.0 A to +252.0 A / +15.0 A to +126.0 A	+45.0 A to +378.0 A / +22.5 A to +189.0 A	+60.0 A to +504.0 A / +30.0 A to +252.2 A
			Polyphase output	+7.5 A to +63.0 A / +3.7 A to +31.5 A	+10.0 A to +84.0 A / +5.0 A to +42.0 A	+15.0 A to +126.0 A / +7.5 A to +63.0 A	+20.0 A to +168.0 A / +10.0 A to +84.0 A
	Negative current	Setting range (peak value)	Single-phase output	−189.0 A to −22.5 A / −94.5 A to −11.2 A	−252.0 A to −30.0 A / −126.0 A to −15.0 A	−378.0 A to −45.0 A / −189.0 A to −22.5 A	−504.0 A to −60.0 A / −252.0 A to −30.0 A
			Polyphase output	−63.0 A to −7.5 A / −31.5 A to −3.7 A	−84.0 A to −10.0 A / −42.0 A to −5.0 A	−126.0 A to −15.0 A / −63.0 A to −7.5 A	−168.0 A to −20.0 A / −84.0 A to −10.0 A
	Resolution			0.1 A			
	Limiter operation			Select whether to recover automatically (continuous) or turn the output off when the limited state continues over the specified time (1 s to 10 s, resolution 1 s).			
RMS current limiter	Setting range (RMS)		Single-phase output	2.3 A to 47.3 A / 2.3 A to 23.7 A	3.0 A to 63.0 A / 3.0 A to 31.5 A	4.5 A to 94.5A / 4.5 A to 47.3 A	6.0 A to 126.0A / 6.0 A to 63.0 A
			Polyphase output	0.8 A to 15.8 A / 0.8 A to 7.9 A	1.0 A to 21.0 A / 1.0 A to 10.5 A	1.5 A to 31.5 A / 1.5 A to 15.8 A	2.0 A to 42.0 A / 2.0 A to 21.0 A
	Resolution			0.1 A			
	Limiter operation			Select whether to recover automatically (continuous) or turn the output off when the limited state continues over the specified time (1 s to 10 s, resolution 1 s).			

Model name				DP180LM	DP240LM	DP360LM
Peak current limiter	Positive current	Setting range (peak value)	Single-phase output	+90.0 A to +567.0 A / +45.0 A to +283.5 A	+120.0 A to +756.0 A / +60.0 A to +378.0 A	+180.0 A to +1134.0 A / +90.0 A to +567.0 A
			Polyphase output	+30.0 A to +189.0 A / +15.0 A to +94.5 A	+40.0 A to +252.0 A / +20.0 A to +126.0 A	+60.0 A to +378.0 A / +30.0 A to +189.0 A
	Negative current	Setting range (peak value)	Single-phase output	−567.0 A to −90.0 A / −283.5 A to −45.0 A	−756.0 A to −120.0 A / −378.0 A to −60.0 A	−1134.0 A to −189.0 A / −567.0 A to −90.0 A
			Polyphase output	−189.0 A to −30.0 A / −94.5 A to −15.0 A	−252.0 A to −40.0 A / −126.0 A to −20.0 A	−378.0 A to −60.0 A / −189.0 A to −30.0 A
	Resolution			0.1 A		
	Limiter operation			Select whether to recover automatically (continuous) or turn the output off when the limited state continues over the specified time (1 s to 10 s, resolution 1 s).		
RMS current limiter	Setting range (RMS)		Single-phase output	9.0 A to 189.0 A / 9.0 A to 94.5 A	12.0 A to 252.0 A / 12.0 A to 126.0 A	18.0 A to 378.0 A / 18.0 A to 189.0 A
			Polyphase output	3.0 A to 63.0 A / 3.0 A to 31.5 A	4.0 A to 84.0 A / 4.0 A to 42.0 A	6.0 A to 126.0 A / 6.0 A to 63.0 A
	Resolution			0.1 A		
	Limiter operation			Select whether to recover automatically (continuous) or turn the output off when the limited state continues over the specified time (1 s to 10 s, resolution 1 s).		

▶ Sequence function, simulation, control software and other functions (see P.17)

General Information

Model name		DP045M	DP060LM	DP090M	DP120LM	DP180LM	DP240LM	DP360LM
Withstanding voltage		AC 1500 V or DC 2130 V 1 minute, (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/m³, no condensation)						
Dimensions (W×H×D) mm (no protrusions)		430 × 665 × 562	455 × 887 × 803	455 × 1287 × 562	455 × 1407 × 803	910 × 1580 × 803		1365 × 1580 × 803
Chassis (P.18)		Type2	Type2L	Type4	Type4L	Type5L		Type6L
Weight (approx.)		75 kg	125 kg	130 kg	200 kg	350 kg	400 kg	570 kg
Power input terminal (rear)	Single-phase	M6 screw		M8 upset bolt	M8 upset bolt	———		
	Three-phase 3-wire			M6 screw	M8 upset bolt	M10 upset bolt		
	Three-phase 4-wire			M6 screw	M6 screw	M10 upset bolt		
Single-phase output terminal (rear)		M6 screw		M8 upset bolt		M10 upset bolt		M12 upset bolt
Polyphase output terminal (rear)		M6 screw						M8 upset bolt
Sensing input terminal (rear)		M4 screw						
Accesories		Instruction manual, CD-ROM (control software, LabVIEW driver, instruction manual for remote control and control software), control cable (D-sub 25 pin connector), stabilizer (DP120LM only)						
	DP045M, DP090M	Instruction manual, CD-ROM (control software, LabVIEW driver, instruction manual for remote control and control software), ferrite core (large), ferrite core (small), cable tie, tabilizer (DP90M only)						

DP series

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, ACDC-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 system. 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 output (2 bit), trigger output, repeat count (1-9999 times or infinite).
Simulation control	Start, stop
Others	In simulation function, only AC and sine wave, only for ACDC-INT.

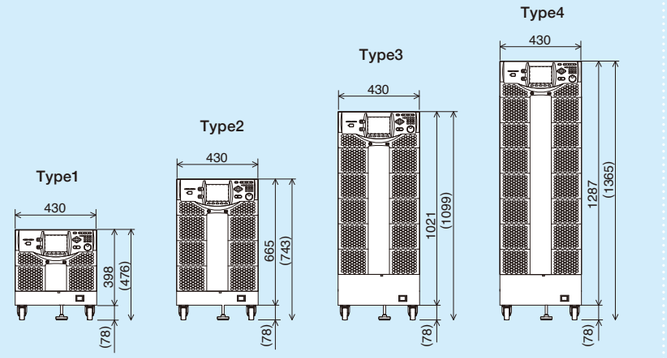
Control Software

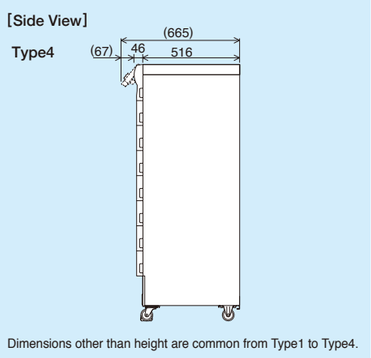
Functions	Remote control	Parameter setting, saving, loading, and others.
	Status monitor	Monitors and displays status of connected equipment.
	Logging	Reads and saves measured values.
	Arbitrary waveform	Waveform creation and edit, transfer, display and file operations
	Sequence / simulation	Sequence data creation, edit, save, transfer, preview, execution control, monitor/display during execution, and others.
Operating environment	CPU	300 MHz min. (1.6 GHz min. recommended)
	Memory	128 MB or more. (512 MB min. recommended)
	Free hard disk space	64 MB or more.
	Display	Can display 1024 × 768 pixels or more, and 256 colors or more
	OS	Windows 7 / 8.1 / 10 (32bit / 64bit)
	Disk drive	CD-ROM drive
	Interface	USB 1.1 full-speed
	Softwave component	Microsoft .NET Framework 4.0

Other Functions

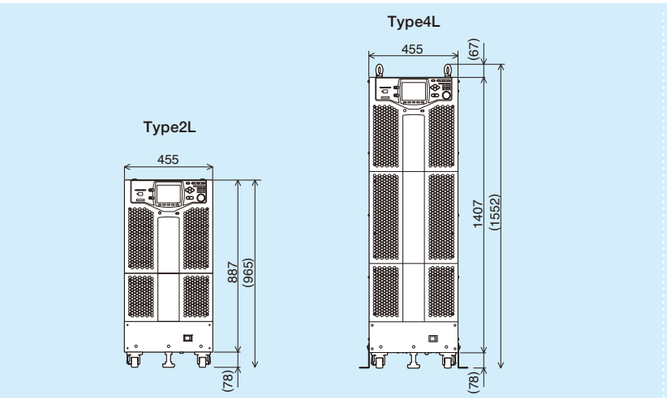
Setting limitation	Voltage (RMS)	Phase voltage, line to line voltage (1P3W, 3P4W)
	Frequency	Upper limit or lower limit.
Remote sensing		Voltage detection point is output terminal or sensing input terminal. (switchable)
AGC		Function for continuously performing automatic correction so that the RMS value 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	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
Arbitrary wave	Number of memories	16 (nonvolatile)
	Waveform length	4096 words
	Amplitude resolution	16-bit
External signal input	External sync input	Sync signal source switching: external sync signal (EXT) or power input (LINE), 40 Hz to 500 Hz
	VCA input	Gain setting range: 0.0 to 227.0 times/0.0 to 454.0 times Resolution: 0.1
	External signal input (EXT / ADD)	Gain setting range: 0.0 to 227.0 times/0.0 to 454.0 times, Resolution: 0.1 Input frequency range: DC to 550 Hz (sine wave), DC to 100 Hz (not sine wave).
Memory function		Store and recall settings from nonvolatile memory
	Number of memories	Basic settings: 30; sequences: 5; simulations: 5; clipped sine waves: 3; arbitrary waves: 16
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 (GPIB / LAN select on order)		USB interface [USB1.1, USBTMC] RS-232 interface (not capable of binary transfer) GPIB interface (IEEE 488.1 std 1987) (not capable of binary transfer or serial polling) LAN interface (LXI 1.4)
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.

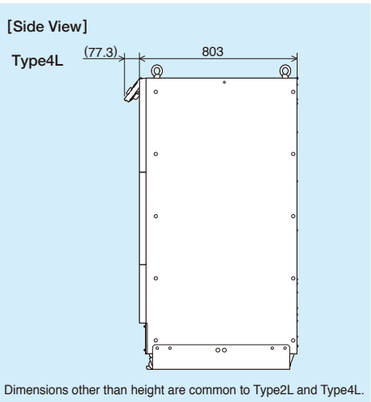
Chassis (Dimension drawings Units : mm)



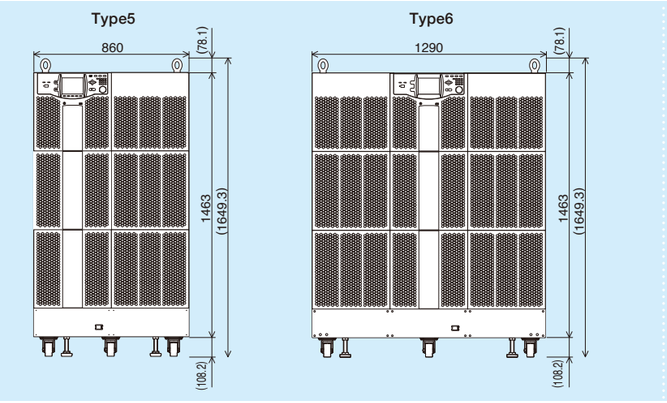


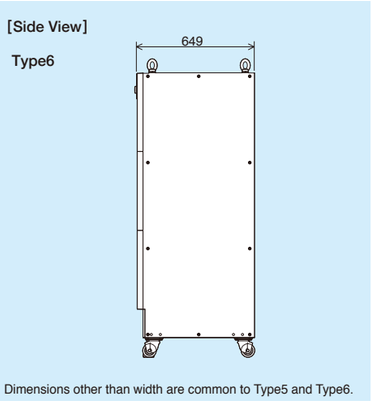
Dimensions other than height are common from Type1 to Type4.



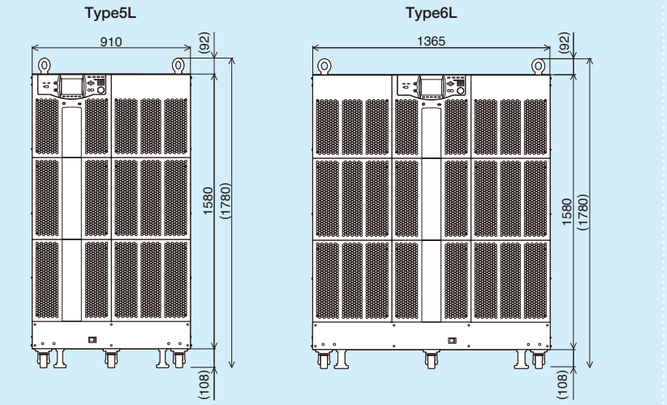


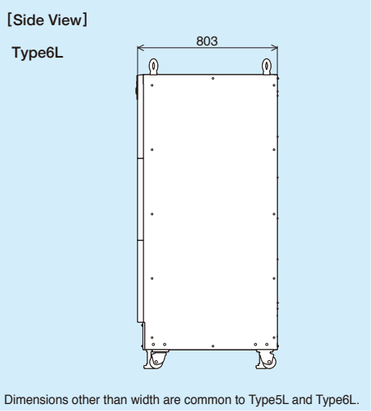
Dimensions other than height are common to Type2L and Type4L.





Dimensions other than width are common to Type5 and Type6.





Dimensions other than width are common to Type5L and Type6L.

Ordering Information

Model name

DP□□□ □ □ (□)

- Outlet type (only for single-phase model of 12kVA or less)
  - Non: NEMA 5-15 (for Japan / North America)
  - E : CEE7 (for Europe)
  - C : CPCS-CCC (for China, standard on Type K)
- Output type ▶ S: single-phase, D: single-phase three-wire, T: three-phase, M: multi-phase
- Type ▶ Non: no reverse power flow
  - L : reverse power flow(20ms)
  - K : Type K, single-phase only model
- Output capacity ▶ 015: 1.5kVA to 480: 48kVA

Specify on order

Specify the following three points.

- Interface : GPIB or LAN(LXI)
- Power input : Single-phase 100V to 230V
  Three-phase 3-wire 200V to 220V
  Three-phase 4-wire 380V
  - Single-phase only for 1.5kVA and 3kVA model
  - 3P3W or 3P4W for models of 18kVA or more
  - Single-phase input for DP060LM and DP120LM is 200V to 230V.
- Power outlet* (equipped for single-phase models of 12kVA or less) :
  For Japan / North america (NEMA 5-15) or for Europe (CEE 7)

*Outlet for China (CPCS-CCC) is standard on Type K.

Option

Remote controller DP008

System cable (1P3W)
PA-001-1720
PA-001-2715(for DP420LS / DP480LS)

System cable (3P4W)
PA-001-1721
PA-001-2717(for DP420LS / DP480LS)

Power cable(approx.3m)
Power input / output cable. Select according to the model. Contact us for details.

Cable holder
Attach it to the main unit and fix the cables connected to the power input terminal and output terminal. Contact us for details.

Replacement air filter
Select according to the model. Contact us for details.

Rack mount adapter
Select either EIA(in.) or JIS(mm) to suit your model. Contact us for detail.

*Note: The contents of this catalog are current as of May 11, 2020.
Product appearance and specifications are subject to change without notice.
Before purchase, contact us to confirm the latest specifications, price and delivery date.

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