SPECIFICATION

- 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
- [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.
- A value with the accuracy is the guaranteed value of the specification. However an accuracy noted as reference value shows the supplement data for reference when the product is used, and is not under the guarantee. A value without the accuracy is the nominal value or representative value (show as typ.).

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

AC/DC Mode, Signal Source

		AC/DCMode	Signal Source				
			INT	VCA	SYNC	EXT	ADD
single unit / 1P2W system		AC	yes	yes	yes	yes	yes
		ACHF	yes	yes	–	–	–
		ACDC	yes	–	yes	yes	yes
		DC	yes	yes	–	–	–
Polyphase system	1P3W	AC	yes	yes*2	yes		
		ACHF	yes	yes*2	–		
		ACDC	yes	–	yes		
		DC	yes	yes*2	–		
	3P4W	AC	yes	yes*2	yes		
		ACHF	yes	yes*2	–		
		ACDC*1	yes	–	yes		

*1 Valid for only AC output *2 Common for all phases

DP020AS is equipped with system master/phase master/booster switching function

System master unit		Master unit of the entire system (L1 phase master unit)
Slave	Phase master	Operates with control signals from the system master unit (L2 / L3 phase master unit)
	Booster	Expands the output power capacity of the master unit

- Add one phase master unit to system master unit to configure 1P3W, or add two units to configure 3P4W.
- Up to two boosters can be connected to each system master unit / phase master unit.
- 1P2W systems (up to 18 kVA) configured with each phase in the same phase.
- N and B represent the following.
  N : Total number of units (N = 2, 3, 4, 6, 9)
  B : Number of booster units for each phase (B = 0, 1, 2)

See page 1 for details.

Power Output

System configuration		Single unit	1P2W system	Polyphase system	
		1P2W		1P3W	3P4W
		2 kVA	4 kVA, 6 kVA, 8 kVA, 12 kVA, 18 kVA	4 kVA, 8 kVA, 12 kVA	6 kVA, 12 kVA, 18 kVA
Mode		–		Balanced	
AC output [V] = Vrms, [A] = Arms, unless otherwise specified.					
Rated output voltage		100 V / 200 V			
Voltage setting*3	range	AC : 0.0 V to 175.0 V / 0.0 V to 350.0 V, ACHF, ACDC : 0.0 V to 160.0 V / 0.0 V to 320.0 V, Arbitrary waveform : 0.0 Vp-p to 454.0 Vp-p / 0.0 Vp-p to 908.0 Vp-p			
	Resolution	0.1 V			
	Accuracy*4	± (0.3 % of set + 0.3 V / 0.6 V)			
Line voltage*5	range	–		AC : 0.0 V to 350.0 V / 0.0 V to 700.0 V ACHF, ACDC : 0.0 V to 320.0 V / 0.0 V to 640.0 V	AC : 0.0 V to 303.0 V / 0.0 V to 606.0 V ACHF, ACDC : 0.0 V to 277.2 V / 0.0 V to 554.2 V
	Resolution	–		0.2 V	
Max. current*6		20 A / 10 A	20 A × N / 10 A × N	20 A × (1+B) / 10 A × (1+B)	
Max. peak current*7		4 times value of maximum current.	3.5 times value of maximum current.		
Output power		2 kVA	2 kVA × N	4 kVA × (1+B)	6 kVA × (1+B)
Load power factor range		Lead or lag, at 45 Hz to 65 Hz			
Frequency setting	Range	AC : 40.00 Hz to 1500 Hz, ACHF : 40.00 Hz to 5000 Hz, ACDC : 1.00 Hz to 1500 Hz			
	Resolution	0.01 Hz(set < 100 Hz), 0.1 Hz(set < 1000 Hz), 1 Hz(set ≤ 5000 Hz)			
	Accuracy	±0.01% of set (23 °C ± 5 °C)			
Frequency stability*8		±0.005 %			
Voltage frequency response*9		45 Hz to 65 Hz : ±0.3 %, 40 Hz to 999.9 Hz : ±0.5 %, 1000 Hz to 5000 Hz : ± (2.0×fo)% fo : output frequency [kHz]			
Voltage distortion factor*10		40 Hz to 550 Hz : 0.3 %, 550.1 Hz to 1500 Hz : 0.6×fo %, fo : output frequency [kHz]			
Output waveform		Sine, arbitrary (16 types), clipped sine (3 types)			
DC offset*11		±20 mV (typ., fine adjustment available)			
Output on phase*12 *13		0.0° to 359.9°Variable Resolution : 0.1°			
Output off phase*12 *13		0.0° to 359.9°Variable (selectable between active or inactive) Resolution : 0.1°			
Phase angle setting (unbalanced mode)	Range	–		L1 and L2 phase : 0.0° to 359.9°	L1, L2 and L3 phase : 0.0° to 359.9°
	Resolution	–		0.1°	
Phase angle accuracy*14		–		45 Hz to 65 Hz : ±0.5° 65 Hz to 5000 Hz : ± (0.44+0.9×fo)° fo : output frequency [kHz]	
DC output [V] = Vdc, [A] = Adc, unless otherwise specified.					
Rated		100 V / 200 V			–
Output setting*15		-227.0 V to +227.0 V / -454.0 V to +454.0 V Resolution : 0.1 V			
Voltage accuracy*16		± (I 0.05 % of set I + 0.1 V / 0.2 V)			
Max. current*17		20 A / 10 A	20 A × N / 10 A × N	20 A×(1+B) / 10 A×(1+B)	
Max. instantaneous current*18		4 times value of maximum current.	3.5 times value of maximum current.		
Output power		2 kW	2 kW × N	4 kW×(1+B)	

*3 Specifications for phase voltage settings for 1P3W and 3P4W. In balanced mode, set all phases at once, and in unbalanced mode, set each phase individually. See *15 for DC voltage settings for 1P3W and ACDC modes.
*4 10 V to 175 V / 20 V to 350 V, sine wave, no load, 45 Hz to 65 Hz, DC voltage setting. 0 V, 23 °C ± 5 °C : Specifications for phase voltage settings in multiphase systems. Accuracy of the system master unit or the phase master unit.
*5 Only 1P3W and 3P4W balanced mode and sine wave are possible.
*6 If the output voltage exceeds the rated output voltage, it will be limited (reduced) to below the power capacity. If there is DC superposition, the effective current value of AC + DC is within the maximum current. The maximum current may decrease at frequencies below 40 Hz or above 1500 Hz, and at ambient temperatures above 40 °C.
*7 Capacitor input type rectifier load, at rated output voltage, 45 Hz to 65 Hz.
*8 Rated output voltage, no load, and resistive load resulting in maximum current. 45 Hz to 65 Hz, over operating temperature range.
*9 Based on sine wave, rated output voltage, 55 Hz. At resistive load with maximum current.
*10 80% or more of rated output voltage, maximum current or less (resistive load), AC, ACHF and ACDC, THD. Specifications for phase voltage settings for 1P3W and 3P4W.
*11 AC and ACHF, 23 °C ± 5 °C.
*12 For 1P3W and 3P4W, set to L1 phase.
*13 Cannot be set if the soft start or the soft stop is enabled.
*14 50 V or more, sine wave, same load conditions for all phases, and same voltage settings for all phases.
*15 For 1P3W, the voltage is set to L1 phase. The L2 phase outputs the same voltage as the L1 phase with the opposite polarity based on the Lo terminal. For example, if the voltage setting is +100 V, +100 V is output between the Hi-Lo terminals of the L1 phase, -100 V is output between the Hi-Lo terminals of the L2 phase, and the line between the Hi terminals of L1 and L2 is output. +200 V is output based on the Hi terminal of the L2 phase.
*16 -227 V to -10 V, +10 V to +227 V / -454 V to -20 V, +20 V to +454 V, no load, When AC setting is 0 V, 23 °C ± 5 °C.
*17 If the output voltage exceeds the rated output voltage, it will be limited (reduced) to below the power capacity. If there is AC superimposition, the effective current value of DC + AC is within the maximum current. The maximum current may decrease if the ambient temperature is 40 °C or higher.
*18 Instantaneous means within 2ms, at rated output voltage.

Output voltage stability

	Single unit	1P2W system	1P3W system	3P4W system
Fluctuation with input voltage*19	±0.15% (typ.)			
Fluctuation with output current*20	DC, 10 Hz to 100 Hz : ±0.1 V / ±0.2 V, 100.1 Hz to 550 Hz : ±0.3 V / ±0.6 V, 550.1 Hz to 1500 Hz : ±1.0 V / ±2.0 V			
Fluctuation with ambient temperature*21	±0.01%/˚C (typ.)			

*19 Power input is 90 V to 250 V, based on power input of 200 V, rated output voltage, maximum current, DC or 45 Hz to 65 Hz, with resistive load. Does not include transient conditions immediately after input power supply voltage fluctuations. For 1P3W and 3P4W, these are specifications for phase voltage settings.

*20 When the output current is changed from 0% to 100% of the maximum current. Output voltage 50V to 160V/100V to 320V, standard at no load. However, when the output voltage is higher than the rated output voltage, the maximum current is limited by the power capacity. For 1P3W and 3P4W, these are specifications for phase voltage settings. From 10 Hz to 40 Hz, the peak value of the output current is within the maximum current.

*21 Power input 200 V, no load, rated output voltage, DC or 45 Hz to 65 Hz. For 1P3W and 3P4W, these are specifications for phase voltage settings.

Measurement Function

		Single unit	1P2W system	1P3W system	3P4W system
Voltage*22 (Full scale)					
RMS value		250.0 V / 500.0 V			
DC average		±250.0 V / ±500.0 V			
Peak value		±250.0 V / ±500.0 V			
Line Voltage RMS value*23		–		500.0 V / 1000.0 V	433.0 V / 866.0 V
Line Voltage DC average*24		–		500.0 V / 1000.0 V	–
Resolution		0.1 V			
Current*25 (Full scale)					
RMS value		24 A / 12 A	24 A×N / 12 A×N	24 A×(1+B) / 12 A×(1+B)	
	Resolution	0.01 A (rdg < 100 A), 0.1 A (rdg < 1000 A)			
DC average		±24 A / ±12 A	±24 A×N / ±12 A×N	±24 A×(1+B) / ±12 A×(1+B)	–
	Resolution	0.01 A (| rdg | < 100 A), 0.1 A (| rdg | < 1000 A)			
Peak value		±96 A / ±48 A	±96 A×N / ±48A× N	±96 A×(1+B) / ±48 A×(1+B)	
	Resolution	0.01 A (| rdg | < 100 A), 0.1 A (| rdg | < 1000 A)			
Hold		Hold the maximum values of | max | and | min | with the polarity (with the clear function)			
Power*26 *27 (Full scale)					
Active (W)		±2.4 kW	±2.4 kW×N		
	Resolution	1 W			
Apparent (VA)*28		3.0 kVA	3.0 kVA×N		
	Resolution	1 VA			
Load power factor*28		-1.00 to +1.00 Resolution : 0.01			
Load crest factor		0.00 to 50.00 Resolution : 0.01			
Synchronization frequency (SYNC only)	Resolution	38.0 Hz to 1575 Hz 0.1 Hz(38.0 Hz to 999.9 Hz), 1 Hz(1000 Hz to 1575 Hz)			
Harmonic analysis*29					
Measurement target		output current, output voltage and sensing voltage			
Measurement item		effective value and percentage of effective value to fundamental wave			
Frequency range(fundamental wave)		40 Hz to 1000 Hz			
Measurement range*30		1st to 50th order of fundamental wave			
Current (full scale)		24 A / 12A	24 A×N / 12A×N	24 A×(1+B) / 12 A×(1+B)	
	Resolution	0.01 A (rdg < 100 A), 0.1 A (rdg < 1000 A), 0.1 %			
Voltage (full scale)		250.0 V / 500.0 V			
	Resolution	0.1 V, 0.1%			

*22 Specifications for phase voltage for 1P3W and 3P4W. Measures the voltage of the system master unit or phase master unit.

*23 Displays the result calculated from the phase voltage measurement value and phase angle setting value assuming the output voltage waveform is a sine wave.

*24 Display calculated from phase voltage measurement results

*25 1P3W and 3P4W are phase current specifications.

*26 When sine wave, output voltage is 50 V or more, and output current is 10% or more of the maximum current. For multi phase systems, the power value is calculated from the voltage of the system master unit or phase master unit.

*27 For 1P3W and 3P4W, the total of all phases can be displayed.

*28 DC mode is not displayed.

*29 For phase voltage or phase current in AC-INT mode (measurement does not comply with IEC standards)

*30 The maximum frequency that can be analyzed is 5000 Hz. The upper limit of the analysis order changes depending on the frequency of the fundamental wave.

Current Limiter

		Single unit	1P2W system	1P3W system	3P4W system
Peak current limiter					
Positive current	Setting range (peak value)	+10.0 A to +84.0 A / +5.0 A to +42.0 A	+10.0 A×N to +84.0 A×N / +5.0 A×N to +42.0 A×N	+10.0 A×(1+B) to +84.0 A×(1+B) / +5.0 A×(1+B) to +42.0 A×(1+B)	
Negative current	Setting range (peak value)	-84.0 A to -10.0 A / -42.0 A to -5.0 A	-84.0 A×N to -10.0 A×N / -42.0 A×N to -5.0 A×N	–84.0 A×(1+B) to –10.0 A×(1+B) / –42.0 A×(1+B) to –5.0 A×(1+B)	
Resolution*31		0.1 A(| set | < 100 A), 1 A(| set | < 1000 A)			
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)		1.0 A to 21.0 A / 1.0 A to 10.5 A	1.0 A×N to 21.0 A×N / 1.0 A×N to 10.5 A×N	1.0 A×(1+B) to 21.0 A×(1+B) / 1.0 A×(1+B) to 10.5 A×(1+B)	
Resolution*31		0.1 A (set < 100 A), 1 A (set < 1000 A)			
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)			

*31 When configuring 1P2W system and polyphase systems, the output resolution is N times or (1+B) times the setting resolution.

SPECIFICATION (continued)

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.

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.
Environment	OS	Windows 10 / 11 (64bit)
	Interface	USB 2.0
	Software component	Microsoft .NET Framework 4.8

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	16K words
	Amplitude resolution	16-bit

(Continued)

External signal input	External sync input	Sync signal source switching: external sync signal (EXT) or power input (LINE), 40 Hz to 1500 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 1500 Hz (sine wave), DC to 550 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 over voltage, 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 [USB2.0, USBTMC-USB488] RS232 (not capable of binary transfer) GPIB (IEEE 488.1 std 1987, IEEE std.488.2-1992) LAN (IEEE 802.3, not capable of binary transfer)
USB memory		Usable memory: conforms to USB 2.0 Connector: USB-A (front panel) Readable/writable content: basic setting memory, sequence, AC line simulation, and arbitrary wave.
Soft start / soft stop		Gradually increase and decrease the output over a set time (0.1s to 30s).
High-impedance output off function		Turn off the output in high-impedance mode. Only applicable output relay control disabled
Output relay control		Selects either ON/OFF using output relay, or high-impedance without using output relay.
SHUTDOWN input		Forcefully turn off the output and initiate a shutdown through an external signal or contact
Output waveform monitor		Monitors waveform of output voltage or output current. (switchable)
LCD display		Contrast 0 to 99.
Others		Beep, key lock, output setting at power-on, trigger output setting, time unit setting (for sequence and simulation), reset function.

General

Power Input	Voltage	AC100 V to 230 V±10% (Max. voltage 250 V), 1P2W Overvoltage category II
	Frquency	50 Hz ±2 Hz or 60 Hz ±2 Hz
	Power factor*32	0.95 or more (typ.)
	Efficiency*32	80% or more (typ.)
	Power consumption	2.65 kVA or less
Withstanding voltage		AC 1500 V or DC 2130 V
Insulation resistance		30 MΩ or more (DC 500 V)
Operating environment		Indoor use, pollution 2
Altitude		2000 m or less
Operating conditions		0˚C to + 50˚C, 5% to 85% RH, (Absolute humidity 1 to 25 g/m³, no condensation)
Storage conditions		-10˚C to + 60˚C , 5% to 95% RH, (Absolute humidity 1 to 29 g/m³, no condensation)
Dimensions (mm)		430 (W) × 130 (H) × 650 (D), no protrusion
Weight		approx. 20 kg
Input / output terminal		Power input (M5), Output (M5), Sensing input (AWG 24 to 16)
Accessories		Instruction Manual, ferrite core, Cable tie, SHUT DOWN connector

***32 AC-INT, rated output voltage, resistive load at max. current, 45 Hz to 65 Hz output**

Option

- System Cable (Approx. 0.5 m)
- System Cable (Approx. 1 m)
- System Cable (Approx. 2 m)
- Rack Mount Adapter (inch)
- Rack Mount Adapter (mm)
- Replacement Air Filter
- Power cable (Approx. 3 m)

*Note: The contents of this catalog are current as of December 8th, 2023.
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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