

Specifications

Unless specified otherwise, the specifications are for the following settings and conditions.

- The warm-up time is 30 minutes (with current flowing). • TYP: These are typical values that are representative of situations where the product operates in an environment with an ambient temperature of 23°C. These values do not guarantee the performance of the PCR-WEA/WEA2.
- setting: Indicates a setting. • reading: Indicates the readout value. • f.s: Indicates full scale.

Input (AC rms)

Model		Single-phase output			Single-phase/three-phase switchable model					
		PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2
Nominal input voltage	1P2W input model	100 Vac to 120 Vac / 200 Vac to 240 Vac *1			—					
	3P3W input model	—			200 Vac to 240 Vac (3 phase line voltage)					
	3P4W input model	—			380 Vac to 480 Vac (3 phase line voltage)					
Phase		Single-phase			Three-phase					
Nominal input Frequency		50 Hz to 60 Hz								
Input frequency range		45 Hz to 65 Hz								
Apparent power		1.4 kVA and less	2.7 kVA and less	4 kVA and less	7.8 kVA and less	15.6 kVA and less	23.4 kVA and less	31.2 kVA and less	39 kVA and less	46.8 kVA and less
Power factor *2		0.95(TYP)			0.97(TYP) 3P3W input model / 0.95(TYP) 3P4W input model					
Maximum current *3	1P2W input model	17 A / 8.5 A	32 A / 16 A	48 A / 24 A	—					
	3P3W input model	—			27 A	53 A	80 A	106 A	133 A	159 A
	3P4W input model	—			14 A	28 A	42 A	56 A	70 A	84 A
Hold-up time for power interruption*2		10 ms								

*1 100 V/200 V input system (auto select) *2 At output voltage 100 V/200 V, rated output current, sine wave, load power factor 1, output frequency 40 Hz to 1 kHz

*3 Current at the minimum voltage (within the allowable variation range)

Output

Model		Single-phase output			Single-phase/three-phase switchable model					
		PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2
Maximum peak current *11		4 times the maximum output current								
Inrush current capacity *3		3 times the rated current (0.07 s) *12 1.4 times the rated current (0.5 s)			1.4 times the rated current (0.5 s)					
Efficiency *10		82 % (TYP)			85 % (TYP)					
AC voltage										
AC voltage *1	Rating	160 V / 320 V *2								
	Setting range	0 V to 161.0 V, 0 V to 322.0 V								
	Setting resolution	0.1 V								
	Setting accuracy (phase voltage) *3 *4	±(0.3 % of setting + 0.3 V), ±(0.3 % of setting + 0.6 V)								
	Setting accuracy (Line voltage) *3 *4	±(0.3 % of setting + 0.3 V), ±(0.3 % of setting + 0.6 V) *5								
Maximum current *1 *6	Single-phase output	10 A / 5 A	20 A / 10 A	30 A / 15 A	60 A / 30 A	120 A / 60 A	180 A / 90 A	240 A / 120 A	300 A / 150 A	360 A / 180 A
	Single-phase three-wire output, Three-phase output	—		10 A / 5 A	20 A / 10 A	40 A / 20 A	60 A / 30 A	80 A / 40 A	100 A / 50 A	120 A / 60 A
Phase		1P			1P2W, 1P3W, 3P4W switchable					
Power capacity	Single-phase output	1 kVA	2 kVA	3 kVA	6 kVA	12 kVA	18 kVA	24 kVA	30 kVA	36 kVA
	Three-phase output	—			2 kVA	4 kVA	8 kVA	12 kVA	16 kVA	20 kVA
Load power factor		0 to 1 (leading or lagging)								
Frequency	Setting range	1 Hz to 5 kHz *7 (5 kHz -3dB, <40 Hz derating required)								
	Resolution	0.01 Hz(1.00 Hz to 100.0 Hz), 0.1 Hz(100.0 Hz to 1000 Hz), 1 Hz(1000 Hz to 5000 Hz)								
	Accuracy *3	±0.01 %, Temperature coefficient : ±0.005 %/°C								
Phase	Resolution	—			0.01*13, 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 4 kHz), 2° (4 kHz or more)					
	Accuracy *3	—			Within ±(0.4° + fo×0.9°) *8 fo: frequency [kHz]					
DC voltage										
DC voltage	Rating *11	-226 V to +226 V, -452 V to +452 V *2								
	Setting range *11	-227.5 V to +227.5 V, -455.0 V to +455.0 V								
	Resolution	0.1 V								
	Accuracy *9	±(0.05 % of setting + 0.1 V)								
Maximum current *6		10 A / 5 A	20 A / 10 A	30 A / 15 A	60 A / 30 A	120 A / 60 A	180 A / 90 A	240 A / 120 A	300 A / 150 A	360 A / 180 A
Power capacity		1 kW	2 kW	3 kW	6 kW	12 kW	18 kW	24 kW	30 kW	36 kW

*1 output L range, output H range

*2 Specification guaranteed voltage range is 1 V to 160 V / 2 V to 320 V (AC) and 1.4 V to 226 V / 2.8 V to 452 V (DC)

*3 At ambient temperature of 23 °C±5 °C.

*4 No load, output frequency 45 Hz to 65 Hz

*5 When the phase angle of 120° of each phase.

*6 For output phase voltage of 100 Vac to 160 Vac/ 200 Vac to 320 Vac and output voltage of 100 Vdc to 226 Vdc/ 200 Vdc to 452 Vdc, output current is reduced with output voltage. When the output frequency is between 1 Hz and 40 Hz, the output current is reduced by the output frequency. The output current is 70 % at 1 Hz.

*7 On the 500 Hz limit model, the frequency is limited to 1 Hz to 500.0 Hz for three-phase output.

*8 Within ±(0.4° + 2.5 μs×360°×fo×10³). The following show the angles obtained by calculating the expression with the specified frequency within ± 0.5° (at 60 Hz output), within ± 0.8° (at 400 Hz output)

*9 With no load at 23°C±5°C.

*10 When the output voltage is 100 V or 200 V, the output current is the rated value, the load power factor is 1, and the output frequency is between 40 Hz and 1 kHz.

*11 Repeated output is possible when the crest factor is 4.

*12 125 Vac/ 250 Vac (output L range/ H range)

*13 Waveform bank 0, at 1 Hz to 500 Hz.

Regeneration Function

Only for three-phase, three-wire input models with R at the end of the model name. Single-phase output models and three-phase, four-wire input models do not have a regeneration function. For regeneration within the installation site only.

Model	Single-phase/three-phase switchable model						
	PCR 6000WEA2R	PCR 12000WEA2R	PCR 18000WEA2R	PCR 24000WEA2R	PCR 30000WEA2R	PCR 36000WEA2R	
Maximum regenerated power *1	6 kVA	12 kVA	18 kVA	24 kVA	30 kVA	36 kVA	
Maximum reverse power flow current *1 *2	1P2W	60 A / 30 A	120 A / 60 A	180 A / 90 A	240 A / 120 A	300 A / 150 A	360 A / 180 A
	1P3W 3P	20 A / 10 A	40 A / 20 A	60 A / 30 A	80 A / 40 A	100 A / 50 A	120 A / 60 A
Regeneration efficiency *3	85 % (TYP)						
Output current harmonic distortion	THD: 5 % and less, each harmonic: 3 % and less (2nd to 40th)						

*1 When the output phase voltage is between 100 Vac and 160 Vac or 200 Vac and 320 Vac, the output current is reduced by the output voltage.

When the output frequency is between 1 Hz and 40 Hz, the output current is reduced by the output frequency. The output current is 70 % at 1 Hz.

*2 When the output voltage is 100 V or 200 V and the output frequency is between 40 Hz and 1 kHz (when the current phase is -90 deg to -180 deg or 90 deg to 180 deg relative to the output voltage)

*3 When the output voltage is 100 V or 200 V, the output current is the rated value, sine wave, the load power factor is 1, and the output frequency is between 45 Hz to 65 Hz.

Output Voltage Stability (Phase Voltage)

Model	Single-phase output			Single-phase/three-phase switchable model					
	PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2
Line regulation *1	Within ±0.1 %								
Load regulation *2	Within ±0.1 V / ±0.2 V (1 Hz to 100 Hz) Within ±0.3 V / ±0.6 V (100.1 Hz to 500 Hz) Within ±1 V / ±2 V (500.1 Hz to 1 kHz)			Within ±0.2 V / ±0.4 V (1 Hz to 100 Hz) Within ±0.3 V / ±0.6 V (100.1 Hz to 500 Hz) Within ±1 V / ±2 V (500.1 Hz to 1 kHz)					
Output frequency variation *3	When the output voltage correction function is enabled : Within ±0.3 % (1 Hz to 1 kHz), Within ±10 % (1001 Hz to 5 kHz) When the output voltage correction function is disabled : Within -3 dB (5 kHz)								
Ripple noise *4	≤ 0.25 Vrms								
Ambient temperature variation *5	±100 ppm/ °C (TYP)								
Total harmonic distortion *6	0.3 % and less (1 Hz to 100 Hz), 0.5 % and less (100.1 Hz to 330 Hz), 1.5 %/kHz and less (330.1 Hz to 5 kHz)								
Transient response *7	Response FAST : 40 μs (TYP)								
Response speed Tr/Tf *8	Response FAST : 40 μs (TYP)			Response MEDIUM : 100 μs (TYP)			Response SLOW : 300 μs (TYP)		

*1 With respect to changes in the rated range of input voltage.

*2 With respect to 0 % to 100 % changes in the rating of output current.

When the output phase voltage is between 80 V and 160 V (L range) or 160 V and 320 V (H range) and the load power factor is 1, and the response is FAST.

At the output terminal block, when the compensation function is not used.

*3 Voltage variation over 40 Hz to 5 kHz in AC mode with 55 Hz as the reference.

When the output phase voltage is between 80 V and 160 V or 160 V and 320 V and the load power factor is 1, and the response is FAST, at the output terminal block.

*4 5 Hz to 1 MHz components in DC mode.

*5 With respect to changes in the operating temperature range. When the output phase voltage is 100 V or 200 V, with no load.

*6 When the output phase voltage is between 80 V and 160 V or 160 V and 320 V and the load power factor is 1, and the response is FAST, at the output terminal block.

*7 When the output voltage is 100 V or 200 V, the load power factor is 1, and the output current changes from 0 A to the rated value and from the rated value to 0 A.

*8 At 10 % to 90 % of the output voltage.

Measurement

Model	Single-phase output			Single-phase/three-phase switchable model						
	PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2	
Voltage Rms value	Resolution	0.1 V								
	Accuracy *1	DC, 40 Hz to 999.9 Hz : ±(0.3 % of reading +1 V)			1 kHz to 5 kHz : ±(0.5 % of reading +1 V)					
Current Rms value	Resolution	0.01 A			0.1 A					
	Accuracy *1 *2	45 Hz to 65 Hz : ±(0.3 % of reading +0.3 % of f.s)			DC, 40 Hz to 999.9 Hz : ±(0.6 % of reading +0.6 % of f.s) 1 kHz to 5 kHz : ±(1.2 % of reading +1.2 % of f.s)					
Current peak value	Resolution	0.01 A			0.1 A			1 A		
	Accuracy *1 *3	4 % of f.s								
Active power	Resolution	1 W			10 W					
	Accuracy *1 *2 *4	45 Hz to 65 Hz : ±(0.3 % of reading +0.3 % of f.s)								
Apparent power	Resolution	1 VA			10 VA					
Power factor	Resolution	0.01								
Phase difference	Resolution	0.1°								
Harmonic measurement	Frequency range (fundamental wave)	10 Hz to 1 kHz								
	Upper limit of harmonic analysis	5th to 50th								
	FFT data length	4096								
	Measurement items	Rms voltage and current, phase angle, THD								
Recommended calibration period	1 year									

*1 At ambient temperature of 23 °C±5 °C.

*2 At 10 % to 100 % of maximum rated current, sine wave.

*3 Pulse height of sine wave

*4 At a power factor of 1.

Specifications

General

Model		Single-phase output			Single-phase/three-phase switchable model					
		PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2
Insulation resistance	Between input and chassis, output and chassis, and input and output	500 Vdc, 10 MΩ or more								
Withstand voltage	Between input and chassis, output and chassis, and input and output	1500 Vac / 2150 Vdc, 1 minute								
Electromagnetic compatibility (EMC) *1 *2		Complies with the requirements of the following directive and standards. EMC Directive 2014/30/EU EN 61326-1 (Class A*3), EN 55011 (Class A*3, Group 1*4), EN 61000-3-2*5, EN 61000-3-3*5 Applicable under the following conditions The maximum length of all cabling and wiring connected to the product must be less than 3 m.			Complies with the requirements of the following directive and standards. EMC Directive 2014/30/EU EN 61326-1 (Class A*3) EN 55011 (Class A*3, Group 1*4) Applicable under the following conditions The maximum length of all cabling and wiring connected to the product must be less than 3 m.					
Safety *1		Complies with the requirements of the following directive and standards. Low Voltage Directive 2014/35/EU*2 EN 61010-1 (Class I*6, Pollution Degree2*7)								
Environmental conditions	Operating environment	Indoor use, overvoltage category II								
	Operating temperature range	0 °C to +50 °C (32 °F to +122 °F)								
	Storage temperature range	-10 °C to +60 °C (14 °F to +140 °F)								
	Operating humidity range	20 %rh to 80 %rh (no condensation)								
	Storage humidity range	90 %rh and less (no condensation)								
Altitude		Up to 2000 m								
Dimensions		See page 17								
Weight		16 kg (35.3 lb)	20 kg (44.1 lb)	23 kg (50.7 lb)	43 kg(94.8 lb) 42 kg(92.6 lb)	65 kg(143.3 lb) 66 kg(145.5 lb)	120 kg (264.6 lb)	130 kg (286.6 lb)	160 kg (352.7 lb)	170 kg(374.8 lb) 180 kg(396.8 lb)
Input terminal		M6			M5		200 V input model : M8 400 V input model : M5			
Output terminal		M6			M5		M6		M8	
Accessories		Cable tie (4 pcs.), External control(DIGITAL I/O) connector (1 pc.), Heavy object warning label (1 pc.)*Excludes PCR1000WEA, Read This First! (1 copy), Quick Reference(1 sheet), CD-ROM (1 disc), Safety Information (1 copy)								

*1 Does not apply to specially ordered or modified products.

*2 Only on models that have the CE marking on the panel.

*3 This is Class A equipment. This product is intended for use in an industrial environment. This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

*4 This is Group 1 equipment. This product does not generate and/or use intentionally radio-frequency energy, in the form of electromagnetic radiation, inductive and/or capacitive coupling, for the treatment of material or inspection/analysis purpose.

*5 This does not apply to the PCR6000WEA2R.

*6 This is Class I equipment. Be sure to ground this product's protective conductor terminal. The safety of this product is only guaranteed when the product is properly grounded.

*7 Pollution is addition of foreign matter (solid, liquid or gaseous) that may produce a reduction of dielectric strength or surface resistivity. Pollution Degree 2 assumes that only non-conductive pollution will occur except for an occasional temporary conductivity caused by condensation.

Output Impedance Setting

Resistance component

Model		Single-phase output			Single-phase/three-phase switchable model					
		PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2
L range	1P	0 Ω to 2000 mΩ	0 Ω to 1000 mΩ	0 Ω to 667 mΩ	0 Ω to 333 mΩ	0 Ω to 167 mΩ	0 Ω to 111 mΩ	0 Ω to 83 mΩ	0 Ω to 67 mΩ	0 Ω to 56 mΩ
	1P3W 3P	—	—	0 Ω to 2000 mΩ	0 Ω to 1000 mΩ	0 Ω to 500 mΩ	0 Ω to 333 mΩ	0 Ω to 250 mΩ	0 Ω to 200 mΩ	0 Ω to 167 mΩ
H range	1P	0 Ω to 8000 mΩ	0 Ω to 4000 mΩ	0 Ω to 2667 mΩ	0 Ω to 1333 mΩ	0 Ω to 667 mΩ	0 Ω to 444 mΩ	0 Ω to 333 mΩ	0 Ω to 267 mΩ	0 Ω to 222 mΩ
	1P3W 3P	—	—	0 Ω to 8000 mΩ	0 Ω to 4000 mΩ	0 Ω to 2000 mΩ	0 Ω to 1333 mΩ	0 Ω to 1000 mΩ	0 Ω to 800 mΩ	0 Ω to 667 mΩ

Reactance component

■ Response: FAST

Model		Single-phase output			Single-phase/three-phase switchable model					
		PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2
L range	1P	40 μH to 2000 μH	20 μH to 1000 μH	13 μH to 667 μH	7 μH to 333 μH	3 μH to 167 μH	2 μH to 111 μH	2 μH to 83 μH	1 μH to 67 μH	1 μH to 56 μH
	1P3W 3P	—	—	40 μH to 2000 μH	20 μH to 1000 μH	10 μH to 500 μH	7 μH to 333 μH	5 μH to 250 μH	4 μH to 200 μH	3 μH to 167 μH
H range	1P	160 μH to 8000 μH	80 μH to 4000 μH	53 μH to 2667 μH	27 μH to 1333 μH	13 μH to 667 μH	9 μH to 444 μH	7 μH to 333 μH	5 μH to 267 μH	4 μH to 222 μH
	1P3W 3P	—	—	160 μH to 8000 μH	80 μH to 4000 μH	40 μH to 2000 μH	27 μH to 1333 μH	20 μH to 1000 μH	16 μH to 800 μH	13 μH to 667 μH

■ Response: MED

Model		Single-phase output			Single-phase/three-phase switchable model					
		PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2
					PCR 6000WEA2R	PCR 12000WEA2R	PCR 18000WEA2R	PCR 24000WEA2R	PCR 30000WEA2R	PCR 36000WEA2R
L range	1P	80 μH to 2000 μH	40 μH to 1000 μH	27 μH to 667 μH	13 μH to 333 μH	7 μH to 167 μH	4 μH to 111 μH	3 μH to 83 μH	3 μH to 67 μH	2 μH to 56 μH
	1P3W 3P	—	—	80 μH to 2000 μH	40 μH to 1000 μH	20 μH to 500 μH	13 μH to 333 μH	10 μH to 250 μH	8 μH to 200 μH	7 μH to 167 μH
H range	1P	320 μH to 8000 μH	160 μH to 4000 μH	107 μH to 2667 μH	53 μH to 1333 μH	27 μH to 667 μH	18 μH to 444 μH	13 μH to 333 μH	11 μH to 267 μH	9 μH to 222 μH
	1P3W 3P	—	—	320 μH to 8000 μH	160 μH to 4000 μH	80 μH to 2000 μH	53 μH to 1333 μH	40 μH to 1000 μH	32 μH to 800 μH	27 μH to 667 μH

■ Response: SLOW

Model		Single-phase output			Single-phase/three-phase switchable model					
		PCR 1000WEA	PCR 2000WEA	PCR 3000WEA2	PCR 6000WEA2	PCR 12000WEA2	PCR 18000WEA2	PCR 24000WEA2	PCR 30000WEA2	PCR 36000WEA2
					PCR 6000WEA2R	PCR 12000WEA2R	PCR 18000WEA2R	PCR 24000WEA2R	PCR 30000WEA2R	PCR 36000WEA2R
L range	1P	240 μH to 2000 μH	120 μH to 1000 μH	80 μH to 667 μH	40 μH to 333 μH	20 μH to 167 μH	13 μH to 111 μH	10 μH to 83 μH	8 μH to 67 μH	7 μH to 56 μH
	1P3W 3P	—	—	240 μH to 2000 μH	120 μH to 1000 μH	60 μH to 500 μH	40 μH to 333 μH	30 μH to 250 μH	24 μH to 200 μH	20 μH to 167 μH
H range	1P	960 μH to 8000 μH	480 μH to 4000 μH	320 μH to 2667 μH	160 μH to 1333 μH	80 μH to 667 μH	53 μH to 444 μH	40 μH to 333 μH	32 μH to 267 μH	27 μH to 222 μH
	1P3W 3P	—	—	960 μH to 8000 μH	480 μH to 4000 μH	240 μH to 2000 μH	160 μH to 1333 μH	120 μH to 1000 μH	96 μH to 800 μH	80 μH to 667 μH

Limit Values and Protection Functions (Common Specification)

		Setting range	Setting resolution	
Voltage protection	AC voltage upper limit	0.0 V to 322.0 V	0.1 V	
	AC voltage lower limit			
	DC voltage upper limit	-455 V to 455 V	0.1 V	
	DC voltage lower limit			
	Output overvoltage protection (OVP)	Rms value	14.0 V to 500.5 V	0.1 V
		Positive peak value	14.0 V to 500.5 V	0.1 V
Negative peak value		-500.5 V to -14.0 V	0.1 V	
Power module overvoltage protection		Fixed	—	
Output undervoltage protection (UVP)		0.0 V to 500.5 V	0.1 V	
Frequency protection	Frequency upper limit	1 Hz to 5000 Hz 500 Hz LMT model: 1 Hz to 500 Hz (Three-phase output)	0.01 Hz (1.00 Hz to 100.0 Hz)	
	Frequency lower limit		0.1 Hz (100.0 Hz to 1000 Hz), 1 Hz (1000 Hz to 5000 Hz)	
Current protection	Current limit *1	Maximum output current × 0.1 to maximum output current × 1.1	0.01 A (0.35 A to 100.0 A), 0.1 A (100.0 A to 1000 A)	
	Positive peak current limit Negative peak current limit *2			
Overheat protection	Power module overheat protection	Fixed	—	
	Fan error	Fixed	—	
Overload protection		Rated current or current limit	Current limit resolution	
Independent operation detection		Fixed	—	
Sensing error detection		±(10 % +10 V) with respect to the output terminal voltage	—	

*1 The current that can actually be supplied is 1.1 times the rated current or the current limit, whichever is less.

*2 The current that can actually be supplied is the maximum peak current or the current limit, whichever is less.

Communication Interface (Common Specification)

USB	Complies with the USB 2.0 specifications; data rate: 480 Mbps (high speed), socket B type, self-powered, Complies with the USBTMC-USB488 device class specifications.
LAN	IEEE802.3, 100Base-TX Ethernet LXI Rev.1.5 2016 (extended functions: VXI-11, HiSLIP, IPv6), data rate: 100 Mbps (auto negotiation, full speed) AUTO MDIX function IPv4, RJ45 connector, category 5, straight cable Complies with SCPI Specification 1999.0
RS232C	Complies with the EIA232D specifications, asynchronous full duplex, D-SUB 9-pin connector (male), crossover cable (null modem), 9600bps/19200bps/38400bps/57600bps/115200bps
GPIO (option)	Complies with IEEE Std 488.1-1987 SH1, AH1, T8, L4, SR0, RL0, PP0, DC0, DT0, C0, E1 24-pin connector (receptacle)