

Specifications

Ratings, Characteristics, and Functions

		Power rating	120 W	240 W
Item		Output voltage	24 V	24 V
Efficiency		3-phase, 400 VAC input *11	89% typ.	89% typ.
Input	Voltage range *1		3-phase, 380 to 480 VAC (allowable range: 320 to 576 VAC) 2-phase, 380 to 480 VAC (allowable range: 340 to 576 VAC) 450 to 600 VDC (allowable range: 450 to 810 VDC) *8	
	Frequency *1		50/60 Hz (47 to 63 Hz)	
	Current	3-phase, 400 VAC input *11	0.38 A typ.	0.69 A typ.
	Power factor		-	-
	Leakage current	3-phase, 400 VAC input	3.5 mA max./1.3 mA typ.	3.5 mA max./1.4 mA typ.
	Inrush current (for a cold start at 25°C) *2	3-phase, 400 VAC input	28 A typ.	29 A typ.
Output	Rated output current		5 A	10 A
	Boost current		6 A	12 A
	Voltage adjustment range *3		22.5 to 29.5 VDC (with V.ADJ) (guaranteed)	
	Ripple & Noise voltage *4	3-phase, 400 VAC input *11	160 mV p-p max. at 20 MHz of bandwidth	190 mV p-p max. at 20 MHz of bandwidth
	Input variation influence *13		0.5% max.	
	Load variation influence *12		1.5% max.	
	Temperature variation influence	3-phase, 400 VAC input	0.05%/°C max.	
	Start up time *2	3-phase, 400 VAC input *11	700 ms typ.	600 ms typ.
	Hold time *2	3-phase, 400 VAC input *11	30 ms typ.	20 ms typ.
Additional functions	Overload protection		Yes, automatic reset	Yes, automatic reset
	Overvoltage protection		Yes, 130% or higher of rated output voltage, power shut off (shut off the input voltage and turn on the input again) *5	
	Series operation		Yes (For up to two Power Supplies, external diodes are required.)	
	Parallel operation		Yes (Refer to Engineering Data) (For up to two Power Supplies)	
	Output indicator		Yes (LED: Green), lighting from 80% to 90% or more of rated voltage	
Insulation	Withstand voltage		3.0 kVAC for 1 min. (between all input terminals and output terminals) cutoff current 20 mA 2.5 kVAC for 1 min. (between all input terminals and PE terminal) cutoff current 20 mA 1.0 kVAC for 1 min. (between all output terminals and PE terminal) cutoff current 30 mA	
	Insulation resistance		100 MΩ min. (between all output terminals and all input terminals / PE terminal) at 500 VDC	
Environment	Ambient operating temperature		-40 to 70°C (However, only startup is guaranteed for between -40°C to -25°C. (3-phase only)) (Derating is required according to the temperature.) (with no condensation or icing)	
	Storage temperature		-40 to 85°C (with no condensation or icing)	
	Ambient operating humidity		0% to 95% (Storage humidity: 0% to 95%)	
	Vibration resistance		10 to 55 Hz, 0.375-mm half amplitude for 2 h each in X, Y, and Z directions	
	Shock resistance		150 m/s ² , 3 times each in ±X, ±Y, and ±Z directions	
Reliability	MTBF		135,000 hrs min.	
	Life expectancy *10		10 years min.	
Construction	Weight		700 g max.	1,000 g max.
	Cooling fan		No	
	Degree of protection		IP20 by EN / IEC 60529	
Standards	Harmonic current emissions		Conforms to EN 61000-3-2	
	EMI	Conducted Emission	Conforms to EN 61204-3 Class B EN 55011 Class B	
		Radiated Emission	Conforms to EN 61204-3 Class B EN 55011 Class B	
	EMS		Conforms to EN 61204-3 high severity levels	
	Approved Standards *6		UL Listed: UL 508 *7 EN: EN 50178 Lloyd's standards *9 ANSI/ISA 12.12.01 *7	UL Listed: UL 508 *7 UL UR: UL 60950-1 (Recognition) cUR: CSA C22.2 No.60950-1 CSA: CSA C22.2 No.60950-1 EN: EN 50178, EN 60950-1 Lloyd's standards *9 ANSI/ISA 12.12.01 *7
	Conformed Standards		SELV (EN 50178), PELV(EN 60204-1, EN 50178) Safety of Power Transformers (EN 61558-2-16) EN 50274 for Terminal parts	SELV (EN 60950-1/EN 50178/UL 60950-1) PELV (EN 60204-1, EN 50178) Safety of Power Transformers (EN 61558-2-16) EN 50274 for Terminal parts
	SEMI		Conforms to F47-0706 (3-phase, 380 to 480 VAC input)	

Note: Refer to page 5 for notes 1 to 13.

Item		Power rating	480 W	960 W (768 W *18)
		Output voltage	24 V	24 V
Efficiency		3-phase, 400 VAC input *11	91% typ.	92% typ.
Input	Voltage range *1		3-phase, 380 to 480 VAC (allowable range: 320 to 576 VAC) 2-phase, 380 to 480 VAC (allowable range: 340 to 576 VAC) 450 to 600 VDC (allowable range: 450 to 810 VDC) *8	3-phase, 380 to 480 VAC (allowable range: 320 to 576 VAC) 2-phase, 380 to 480 VAC (allowable range: 340 to 576 VAC)
	Frequency *1		50/60 Hz (47 to 63 Hz)	
	Current	3-phase, 400 VAC input *11	1.2 A typ.	2.1 A typ.
	Power factor		-	-
	Leakage current	3-phase, 400 VAC input	3.5 mA max./1.0 mA typ.	3.5 mA max./1.2 mA typ.
Output	Inrush current (for a cold start at 25°C) *2	3-phase, 400 VAC input	28 A typ.	
	Rated output current		20 A	40 A at 3-phase (32 A at 2-phase)
	Boost current		24 A	48 A at 3-phase (Not possible at 2-phase)
	Voltage adjustment range *3		22.5 to 29.5 VDC (with V.ADJ) (guaranteed)	22.5 to 29.5 VDC (with V.ADJ) (guaranteed) *14
	Ripple & Noise voltage *4	3-phase, 400 VAC input *11	130 mV p-p max. at 20 MHz of bandwidth	90 mV p-p max. at 20 MHz of bandwidth
	Input variation influence *13		0.5% max.	
	Load variation influence *12		1.5% max.	
	Temperature variation influence	3-phase, 400 VAC input	0.05%/°C max.	
	Start up time *2	3-phase, 400 VAC input *11	500 ms typ.	700 ms typ.
Additional functions	Hold time *2	3-phase, 400 VAC input *11	20 ms typ.	20 ms typ.
	Overload protection		Yes, automatic reset	
	Overvoltage protection		Yes, 130% or higher of rated output voltage, power shut off (shut off the input voltage and turn on the input again) *5	
	Series operation		Yes (For up to two Power Supplies, external diodes are required.)	
	Parallel operation		Yes (Refer to Engineering Data) (For up to two Power Supplies)	
Insulation	Output indicator		Yes (LED: Green), lighting from 80% to 90% or more of rated voltage	
	Withstand voltage		3.0 kVAC for 1 min. (between all input terminals and output terminals) cutoff current 20 mA 2.5 kVAC for 1 min. (between all input terminals and PE terminal) cutoff current 20 mA 1.0 kVAC for 1 min. (between all output terminals and PE terminal) cutoff current 30 mA	
	Insulation resistance		100 MΩ min. (between all output terminals and all input terminals / PE terminal) at 500 VDC	
Environment	Ambient operating temperature		-40 to 70°C (However, only startup is guaranteed for between -40°C to -25°C. (3-phase only)) (Derating is required according to the temperature.) (with no condensation or icing)	
	Storage temperature		-40 to 85°C (with no condensation or icing)	
	Ambient operating humidity		0% to 95% (Storage humidity: 0% to 95%)	
	Vibration resistance		10 to 55 Hz, 0.375-mm half amplitude for 2 h each in X, Y, and Z directions	
	Shock resistance		150 m/s ² , 3 times each in ±X, ±Y, and ±Z directions	
Reliability	MTBF		135,000 hrs min.	
	Life expectancy *10		10 years min.	
Construction	Weight		1,600 g max.	2,700 g max.
	Cooling fan		No	
	Degree of protection		IP20 by EN / IEC 60529	
Standards	Harmonic current emissions		Conforms to EN 61000-3-2 *15	
	EMI	Conducted Emission	Conforms to EN 61204-3 Class B EN 55011 Class B *16	
		Radiated Emission	Conforms to EN 61204-3 Class B EN 55011 Class B *16	
	EMS		Conforms to EN 61204-3 high severity levels	
	Approved Standards *6		UL Listed: UL 508 *7 UL UR: UL 60950-1 (Recognition) cUR: CSA C22.2 No.60950-1 CSA: CSA C22.2 No.60950-1 EN: EN 50178, EN 60950-1 Lloyd's standards ANSI/ISA 12.12.01 *7	
	Conformed Standards		SELV (EN 60950-1/EN 50178/UL 60950-1) PELV (EN 60204-1, EN 50178) Safety of Power Transformers (EN 61558-2-16) EN 50274 for Terminal parts	
	SEMI		Conforms to F47-0706 (3-phase, 380 to 480 VAC input) *17	

Note: Refer to page 5 for notes 1 to 18.