Ratings, Characteristics, and Functions

Item			Power rating	30 W	60 W	
			Rated output voltage	5 V	12 V	24 V
			Indication monitor	None	None	None
Efficiency ✻			115 VAC input	78% typ.	85% typ.	85% typ.
			230 VAC input	77% typ.	86% typ.	86% typ.
Input conditions	Voltage range ✻			Single-phase, 85 to 264 VAC, 90 to 350 VDC, 265 to 300 VAC (1 second)		
	Frequency ✻			50/60 Hz (47 to 450 Hz)		
	Input current ✻		115 VAC input	0.53 A typ.	0.99 A typ.	1.1 A typ.
			230 VAC input	0.32 A typ.	0.61 A typ.	0.67 A typ.
	Power factor			---		
	Leakage current ✻		115 VAC input	0.5 mA max.		
			230 VAC input	1 mA max.		
	Inrush current ✻		115 VAC input	16 A typ.		
			230 VAC input	32 A typ.		
Output characteristics	Rated output current			5 A	4.5 A	2.5 A
	Rated output power			25 W	54 W	60 W
	Maximum boost current			6 A	5.4 A	3 A
	Voltage adjustment range ✻			4.5 to 5.8V (with V. ADJ)	10.8 to 14 V (with V. ADJ)	21.6 to 28 V (with V. ADJ)
	Ripple noise voltage ✻		100 to 240 VAC input	130 mVp-p max. at 20 MHz of bandwidth	120 mVp-p max. at 20 MHz of bandwidth	110 mVp-p max. at 20 MHz of bandwidth
	Input variation influence ✻			0.5% max.		
	Load variation influence ✻			1.5% max.		
	Temperature variation influence		100 to 240 VAC input	0.05%/°C max.		
	Start up time ✻		115 VAC input	1000 ms max.	1000 ms max.	1000 ms max.
			230 VAC input	1000 ms max.	1000 ms max.	1000 ms max.
	Hold time ✻		115 VAC input	45 ms typ.	20 ms typ.	20 ms typ.
			230 VAC input	240 ms typ.	120 ms typ.	110 ms typ.
Additional functions	Overload protection			Yes, automatic reset, intermittent operation type, Refer to *Overload Protection* on page 8 for details.		
	Overvoltage protection			Yes, 130% or higher of rated output voltage, power shut off (shut off the input voltage and turn on the input again), Refer to *Overvoltage Protection* on page 8 for details.		
	Series operation			Yes (For up to two Power Supplies; external diodes required.)		
	Parallel operation			Yes (For up to two Power Supplies), Refer to *Parallel Operation* on page 22 for details.		
	Output indicator			Yes (LED: Green)		
	Alarm indicator			Yes (LED: Red)		
	Indication monitor		Measurement and display details	Refer to *Communication and Indication Items* on page 7 for details.		
			Main display	None		
	Ethernet communication		Measurement and display details	Refer to *Communication and Indication Items* on page 7 for details.		
			Communication protocol	EtherNet/IP, Modbus TCP		
			Physical layer	100BASE-TX		
			Communication specifications	Refer to *Communication Specifications* on page 8 for details.		
Insulation	Withstand voltage			3.0 kVAC for 1 min. (between all input terminals and output terminals, all EtherNet/IP ports), current cutoff 20 mA		
				2.0 kVAC for 1 min. (between all input terminals and PE terminals), current cutoff 20 mA		
				1.0 kVAC for 1 min. (between all output terminals and PE terminals), current cutoff 30 mA		
				0.5 kVAC for 1 min. (between all output terminals and all EtherNet/IP ports), current cutoff 30 mA		
	Insulation resistance			100 MΩ min. (between all output terminals and all input terminals/PE terminals) at 500 VDC		
				100 MΩ min. (between all EtherNet/IP ports and all input terminals) at 500 VDC		
Environment	Ambient operating temperature ✻			-40 to 70°C (Derating is required according to the temperature. Refer to *Engineering Data*) (with no condensation or icing)		
	Storage temperature			-40 to 85°C (with no condensation or icing)		
	Ambient operating humidity			95% max. (Storage humidity: 95% max.)		
	Vibration resistance			10 to 55 Hz, maximum 5 G, 0.42 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, ±Z directions		
Reliability	MTBF ✻			160,000 hrs typ.		
	Life expectancy ✻			10 years min.		
Construction	Weight			250 g max.	250 g max.	250 g max.
	Cooling fan			No		
	Degree of protection			IP20 by EN/IEC 60529		

✻ Refer to *Definitions of the Terms Under Ratings, Characteristics, and Functions* on page 6.

Item			Power rating	90 W		120 W	
			Rated output voltage	24 V		24 V	
			Indication monitor	Included	None	Included	None
Efficiency ✻		115 VAC input		86% typ.	87% typ.	90% typ.	90% typ.
		230 VAC input		87% typ.	88% typ.	92% typ.	92% typ.
Input conditions	Voltage range ✻			Single-phase, 85 to 264 VAC, 90 to 350 VDC, 265 to 300 VAC (1 second)			
	Frequency ✻			50/60 Hz (47 to 450 Hz)		50/60 Hz (47 to 63 Hz)	
	Input current ✻	115 VAC input		1.7 A typ.	1.7 A typ.	1.2 A typ.	1.2 A typ.
		230 VAC input		1.0 A typ.	1.0 A typ.	0.63 A typ.	0.63 A typ.
	Power factor			---		0.9 min.	
	Leakage current ✻	115 VAC input		0.5 mA max.			
		230 VAC input		1 mA max.			
	Inrush current ✻	115 VAC input		16 A typ.			
		230 VAC input		32 A typ.			
Output characteristics	Rated output current			3.75 A		5 A	
	Rated output power			90 W		120 W	
	Maximum boost current			---		6 A	
	Voltage adjustment range ✻			23.0 to 24.1 V		21.6 to 28 V (with V. ADJ)	
	Ripple noise voltage ✻	100 to 240 VAC input		300 mVp-p max. at 20 MHz of bandwidth		150 mVp-p max. at 20 MHz of bandwidth	
	Input variation influence ✻			0.5% max.			
	Load variation influence ✻			1.5% max.			
	Temperature variation influence	100 to 240 VAC input		0.05%/°C max.			
	Start up time ✻	115 VAC input		1000 ms max.		1000 ms max.	
		230 VAC input		1000 ms max.		1000 ms max.	
	Hold time ✻	115 VAC input		25 ms typ.		35 ms typ.	
		230 VAC input		130 ms typ.		35 ms typ.	
Additional functions	Overload protection			Yes, automatic reset, intermittent operation type, Refer to *Overload Protection* on page 8 for details.			
	Overvoltage protection			Yes, 110% or higher of rated output voltage (90 W), 130% or higher of rated output voltage (120 W), power shut off (shut off the input voltage and turn on the input again, Refer to *Overvoltage Protection* on page 8 for details.			
	Series operation			Yes (For up to two Power Supplies, external diodes are required.)			
	Parallel operation			Yes (For up to two Power Supplies), Refer to *Parallel Operation* on page 22 for details.			
	Output indicator			Yes (LED: Green)			
	Alarm indicator			Yes (LED: Red)			
	Indication monitor	Measurement and display details		Refer to *Communication and Indication Items* on page 7 for details.			
		Main display		7-segment LED (White)	None	7-segment LED (White)	None
	Ethernet communication	Measurement and display details		Refer to *Communication and Indication Items* on page 7 for details.			
		Communication protocol		EtherNet/IP, Modbus TCP			
		Physical layer		100BASE-TX			
		Communication specifications		Refer to *Communication Specifications* on page 8 for details.			
Insulation	Withstand voltage			3.0 kVAC for 1 min. (between all input terminals and output terminals, all EtherNet/IP ports), current cutoff 20 mA			
				2.0 kVAC for 1 min. (between all input terminals and PE terminals), current cutoff 20 mA			
				1.0 kVAC for 1 min. (between all output terminals and PE terminals), current cutoff 30 mA			
				0.5 kVAC for 1 min. (between all output terminals and all EtherNet/IP ports), current cutoff 30 mA			
	Insulation resistance			100 MΩ min. (between all output terminals and all input terminals/PE terminals) at 500 VDC			
				100 MΩ min. (between all EtherNet/IP ports and all input terminals) at 500 VDC			
Environment	Ambient operating temperature ✻			-40 to 70°C (Derating is required according to the temperature. Refer to *Engineering Data*) (with no condensation or icing)			
	Storage temperature			-40 to 85°C (with no condensation or icing)			
	Ambient operating humidity			95% max. (Storage humidity: 95% max.)			
	Vibration resistance			10 to 55 Hz, maximum 5 G, 0.42 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, ±Z directions			
Reliability	MTBF ✻			110,000 hrs typ.	150,000 hrs typ.	110,000 hrs typ.	140,000 hrs typ.
	Life expectancy ✻			10 years min.			
Construction	Weight			350 g max.		400 g max.	
	Cooling fan			No			
	Degree of protection			IP20 by EN/IEC 60529			

✻ Refer to *Definitions of the Terms Under Ratings, Characteristics, and Functions* on page 6.