

# Specifications

## Ratings, Characteristics, and Functions

Item	Power rating Output voltage	15 W			30 W			
		5 V	12 V	24 V	5 V	12 V	24 V	
Efficiency	230 VAC input *6	77% typ.	77% typ.	80% typ.	79% typ.	82% typ.	86% typ.	
Input	Voltage range *1	Single-phase, 85 to 264 VAC, 90 to 350 VDC *10						
	Frequency *1	50/60 Hz (47 to 450 Hz)						
	Current	115 VAC input *6	0.32 A typ.	0.3 A typ.	0.31 A typ.	0.5 A typ.	0.57 A typ.	0.58 A typ.
		230 VAC input *6	0.2 A typ.	0.21 A typ.	0.2 A typ.	0.32 A typ.	0.37 A typ.	0.36 A typ.
	Power factor	230 VAC input, 100% load		0.42 min.	0.43 min.		0.42 min.	0.43 min.
	Leakage current	115 VAC input	0.14 mA typ.			0.13 mA typ.		
		230 VAC input	0.25 mA typ.			0.24 mA typ.		
Inrush current *2 (for a cold start at 25°C)	115 VAC input	16 A typ.			16 A typ.			
	230 VAC input	32 A typ.			32 A typ.			
Output	Rated output current	3 A	1.2 A	0.65 A	5 A	2.5 A	1.3 A	
	Boost current	3.6 A	1.44 A	0.78 A	6 A	3 A	1.56 A	
	Voltage adjustment range *3	-10% to 15% (with V.ADJ) (guaranteed)						
	Ripple & Noise voltage *4	100 to 240 VAC input, 100% load *6	60 mVp-p max. at 20 MHz of bandwidth	50 mVp-p max. at 20 MHz of bandwidth	30 mVp-p max. at 20 MHz of bandwidth	30 mVp-p max. at 20 MHz of bandwidth	30 mVp-p max. at 20 MHz of bandwidth	30 mVp-p max. at 20 MHz of bandwidth
		Input variation influence *8	0.4% max.			0.4% max.		
	Load variation influence *7	0.8% max.			0.8% max.			
	Temperature variation influence	115 to 230 VAC input	0.05%/°C max.			0.05%/°C max.		
	Start up time *2	115 VAC input *6	530 ms typ.	520 ms typ.	580 ms typ.	550 ms typ.	550 ms typ.	600 ms typ.
		230 VAC input *6	330 ms typ.	400 ms typ.	400 ms typ.	430 ms typ.	490 ms typ.	480 ms typ.
	Hold time *2	115 VAC input *6	28 ms typ.	29 ms typ.	32 ms typ.	33 ms typ.	36 ms typ.	23 ms typ.
		230 VAC input *6	134 ms typ.	138 ms typ.	134 ms typ.	177 ms typ.	170 ms typ.	154 ms typ.
Additional functions	Overload protection	Yes, automatic reset			Yes, automatic reset			
	Overvoltage protection *5	Yes, 130% or higher of rated output voltage, power shut off (shut off the input voltage and turn on the input again)						
	Series operation	Yes (For up to two Power Supplies, external diodes are required.)						
	Parallel operation	Yes (Refer to <i>Safety Precautions</i> ) (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), 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 20 mA			100 MΩ min. (between all output terminals and all input terminals/PE terminals) at 500 VDC			
		100 MΩ min. (between all output terminals and all input terminals/PE terminals) at 500 VDC						
Environment	Ambient operating temperature *12	-40 to 70°C (Derating is required according to the temperature. Refer to <i>Engineering Data</i> ) (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 <sup>2</sup> , 3 times each in ±X, ±Y, and ±Z directions						
Reliability	MTBF	135,000 hrs min.						
	Life expectancy *9	10 years min.						
Construction	Weight	150 g max.			195 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 Emissions	Conforms to EN 61204-3 Class B, EN 55011 Class B					
		Radiated Emissions	Conforms to EN 61204-3 Class B, EN 55011 Class B					
	EMS		Conforms to EN 61204-3 high severity levels					
	Approved Standards	UL Listed: UL 508 (Listing, Class2 Output: Per UL 1310)						
		UL UR: UL 60950-1 (Recognition)						
		cUL: CSA C22.2 No. 107.1 (Class2 Output: Per CSA C22.2 No.223) cUR: CSA C22.2 No. 60950-1 EN/VDE: EN 50178, EN 60950-1 ANSI/ISA 12.12.01						
	Conformed Standards		PELV (EN 60204-1, EN 50178) EN 61558-2-16					
Marine Standards		Lloyd's register *10 *11						
SEMI		Conforms to F47-0706 ( 200 to 240 VAC input)						

\*1. Do not use an inverter output for the Power Supply. Inverters with an output frequency of 50/60 Hz are available, but the rise in the internal temperature of the Power Supply may result in ignition or burning.

\*2. For a cold start at 25°C. Refer to *Engineering Data* on page 9 to 11 for details.

\*3. If the output voltage adjuster (V. ADJ) is turned, the voltage will increase by more than +15% of the voltage adjustment range. When adjusting the output voltage, confirm the actual output voltage from the Power Supply and be sure that the load is not damaged.

\*4. A characteristic when the ambient operating temperature is between -25 to 70°C.

\*5. Refer to *Overvoltage Protection* on page 10 for the time when input voltage shuts off and input turns on again.

\*6. The value is when both rated output voltage and rated output current are satisfied.

\*7. 100 to 240 VAC input, in the range of 0 A to the rated output current

\*8. This is the maximum variation in the output voltage when the input voltage is gradually changed within the allowable input voltage range at the rated output voltage and rated output current.

\*9. Refer to *Recommended Replacement Periods and Periodic Replacement for Preventive Maintenance* on page 22 for details.

\*10. Safety Standards for a DC Input

The following safety standards apply to a DC input: UL 60950-1, cUR (CSA C22.2 No. 60950-1), EN 50178, EN 60950-1, and Lloyd's.

For a DC input, safety is ensured by an external fuse.

Select an external fuse that meets the following conditions.

S8VK-G015□□: 350 VDC min, 3 A

S8VK-G030□□: 350 VDC min, 4 A

\*11. Clamp filter "ZCAT2035-0930" manufactured by TDK Corporation. or equivalent should be installed in the cable connected to the input - output terminals of S8VK-G series. Noise filter "FN2080-10-06" manufactured by SCHAFFNER Corporation. or equivalent should be connected to the Input terminals of S8VK-G series.

\*12. At -40 to -25°C, time will be required before the rated output voltage is output after the input voltage is input.

Also, the ripple noise value may exceed the value shown in the above table.

# S8VK-G

Item	Power rating		60 W		120 W
	Output voltage		12 V	24 V	24 V
Efficiency	230 VAC input *6		85% typ.	88% typ.	89% typ.
Input	Voltage range *1		Single-phase, 85 to 264 VAC, 90 to 350 VDC *10		
	Frequency *1		50/60 Hz (47 to 450 Hz)		50/60 Hz (47 to 63 Hz)
	Current	115 VAC input *6	1.0 A typ.	1.1 A typ.	1.3 A typ.
		230 VAC input *6	0.6 A typ.	0.7 A typ.	0.7 A typ.
	Power factor	230 VAC input, 100% load	0.46 min.	0.45 min.	0.94 min.
	Leakage current	115 VAC input	0.16 mA typ.		0.24 mA typ.
		230 VAC input	0.30 mA typ.		0.38 mA typ.
Inrush current *2 (for a cold start at 25°C)	115 VAC input	16 A typ.		16 A typ.	
	230 VAC input	32 A typ.		32 A typ.	
Output	Rated output current		4.5 A	2.5 A	5 A
	Boost current		5.4 A	3 A	6 A
	Voltage adjustment range *3		-10% to 15% (with V. ADJ) (guaranteed)		
	Ripple & Noise	100 to 240 VAC input, 100% load *6	150 mVp-p max. at 20 MHz of bandwidth	50 mVp-p max. at 20 MHz of bandwidth	150 mVp-p max. at 20 MHz of bandwidth
	Input variation influence *8		0.4% max.		0.4% max.
	Load variation influence *7		0.8% max.		0.8% max.
	Temperature variation influence	115 to 230 VAC input	0.05%/°C max.		0.05%/°C max.
		115 VAC input *6	570 ms typ.	650 ms typ.	790 ms typ.
	Start up time *2	230 VAC input *6	430 ms typ.	500 ms typ.	750 ms typ.
		115 VAC input *6	26 ms typ.	25 ms typ.	42 ms typ.
Hold time *2	230 VAC input *6	139 ms typ.	129 ms typ.	42 ms typ.	
	115 VAC input *6	26 ms typ.	25 ms typ.	42 ms typ.	
Additional functions	Overload protection		Yes, automatic reset		Yes, automatic reset
	Overvoltage protection *5		Yes, 130% or higher of rated output voltage, power shut off (shut off the input voltage and turn on the input again)		
	Series operation		Yes (For up to two Power Supplies, external diodes are required.)		
	Parallel operation		Yes (Refer to <i>Safety Precautions</i> ) (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), 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 20 mA		
Insulation resistance		100 MΩ min. (between all output terminals and all input terminals/PE terminals) at 500 VDC			
Environment	Ambient operating temperature *12		-40 to 70°C (Derating is required according to the temperature. Refer to <i>Engineering Data</i> ) (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 <sup>2</sup> , 3 times each in ±X, ±Y, ±Z directions		
Reliability	MTBF		135,000 hrs min.		
	Life expectancy *9		10 years min.		
Construction	Weight		260 g max.	620 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 Emissions	Conforms to EN 61204-3 Class B, EN 55011 Class B		
		Radiated Emissions	Conforms to EN 61204-3 Class B, EN 55011 Class B		
	EMS		Conforms to EN 61204-3 high severity levels		
	Approved Standards	UL Listed: UL 508 (Listing, For 60 W only Class2 Output: Per UL 1310 )		UL UR: UL 60950-1 (Recognition)	
		cUL: CSA C22.2 No.107.1 (For 60 W only Class2 Output: Per CSA C22.2 No.223)		cUR: CSA C22.2 No.60950-1	
		EN/VDE: EN 50178, EN 60950-1		ANSI/ISA 12.12.01	
	Conformed Standards		PELV (EN 60204-1, EN 50178)		
	Marine Standards		Lloyd's register *10 *11		
	SEMI		Conforms to F47-0706 (200 to 240 VAC input)		

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- \*2. For a cold start at 25°C. Refer to *Engineering Data* on page 9 to 11 for details.
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- \*4. A characteristic when the ambient operating temperature is between -25 to 70°C.
- \*5. Refer to *Overvoltage Protection* on page 10 for the time when input voltage shuts off and input turns on again.
- \*6. The value is when both rated output voltage and rated output current are satisfied.
- \*7. 100 to 240 VAC input, in the range of 0 A to the rated output current
- \*8. This is the maximum variation in the output voltage when the input voltage is gradually changed within the allowable input voltage range at the rated output voltage and rated output current.
- \*9. Refer to *Recommended Replacement Periods and Periodic Replacement for Preventive Maintenance* on page 22 for details.
- \*10. Safety Standards for a DC Input  
The following safety standards apply to a DC input: UL 60950-1, cUR (CSA C22.2 No. 60950-1), EN 50178, EN 60950-1, and Lloyd's.  
For a DC input, safety is ensured by an external fuse.  
Select an external fuse that meets the following conditions.  
S8VK-G060□□: 350 VDC min, 6 A  
S8VK-G12024: 350 VDC min, 5 A
- \*11. Clamp filter "ZCAT2035-0930" manufactured by TDK Corporation. or equivalent should be installed in the cable connected to the input - output terminals of S8VK-G series.  
Noise filter "FN2080-10-06" manufactured by SCHAFFNER Corporation. or equivalent should be connected to the Input terminals of S8VK-G series.
- \*12. At -40 to -25°C, time will be required before the rated output voltage is output after the input voltage is input.  
Also, the ripple noise value may exceed the value shown in the above table.