Switch Mode Power Supply (240/480/960-W Models)

S8VK-WB

Even more compact three-phase 380 to 480 V input power supplies. Reduces wiring work with the Push-In Plus terminals. With a line-up that includes 24 VDC and 48 VDC models.

246437

- Can operate at an ambient temperature of -40 to +70°C ✻1
- Side-by-side Mounting enabled ✻1 ✻2
- Complies with SEMI F47-0706 standard ✻3
- Certification for 3,000 m altitude ✻3
- Coated PCBs for Better Resistance to Environment
- Equipped with signal output that indicates DC OK and the overload status

⚠ Refer to *Safety Precautions* on page 30.

✻1. For details, refer to *Derating Curves* on page 26.
✻2. Refer to the Front, Side-by-side mounting on page 30.
✻3. For details, refer to *Standard Compliance* on page 21.

Lineup

Output voltage	Power rating		
	240 W	480 W	960 W
24 V	•	•	•
48 V	•	•	•

Model Number Structure

Model Number Legend Not all combinations are possible. Refer to List of Models in Ordering Information, below.

S8VK-WB □□□ □□
Series name (1) (2) (3)

(1) Rated input voltage

Code	Rated input voltage
B	380 to 480

(2) Power rating

Code	Power rating
240	240 W
480	480 W
960	960 W

(3) Output voltage

Code	Output voltage (VDC)
24	24 V
48	48 V

Ordering Information

List of Models

Power rating	Rated input voltage	Rated output voltage (VDC)	Rated output current	Maximum boost current	Model
240 W	Three-phase / two-phase 380 to 480 VAC (Allowable range: Three-phase / two-phase 320 to 576 VAC, 450 to 810 VDC)	24 V	10 A	15 A	**S8VK-WB24024**
		48 V	5 A	7.5 A	**S8VK-WB24048**
480 W		24 V	20 A	30 A	**S8VK-WB48024**
		48 V	10 A	15 A	**S8VK-WB48048**
960 W		24 V	40 A	60 A	**S8VK-WB96024**
		48 V	20 A	30 A	**S8VK-WB96048**

Accessories (Order separately)

Refer to page 28 for S8VK-WA/S8VK-WB Common Accessories.

Ratings, Characteristics, and Functions

Item			Power rating	240W	480W	960W
			Output voltage	24V	24V	24V
Efficiency ✻1			Three-phase 400 VAC input	93% typ.	94% typ.	95% typ.
			Two-phase 400 VAC input	93% typ.	94% typ.	95% typ.
Input conditions	Input voltage range ✻2			Three-phase/two-phase 320 to 576 VAC, 450 to 810 VDC		
	Frequency ✻2			50/60 Hz (47 to 63 Hz)		
	Input current ✻1		Three-phase 400 VAC input	0.41 A typ.	0.79 A typ.	1.6 A typ.
			Two-phase 400 VAC input	0.75 A typ.	1.5 A typ.	3.0 A typ.
	Power factor ✻1		Three-phase 400 VAC input	0.9 min.		
	Leakage current ✻3		Three-phase 400 VAC input	3.5 mA max.		
	Inrush current ✻4		Three-phase 400 VAC input	1.9 A typ.	3.3 A typ.	10.6 A typ.
Output characteristics	Rated output current			10 A	20 A	40 A
	Power Boost Function			15 A	30 A	60 A
	Voltage adjustment range ✻5			24 to 29.5 V (with V.ADJ)		24 to 28 V (with V.ADJ)
	Ripple noise voltage ✻6		Three-phase 380 to 480 VAC input	100 mV p-p max. at 20 MHz of bandwidth	80 mV p-p max. at 20 MHz of bandwidth	50 mV p-p max. at 20 MHz of bandwidth
	Input variation influence ✻7			0.5% max.		
	Load variation influence ✻8			1.5% max.		
	Temperature variation influence		200 to 240 VAC input	0.05%/°C max.		
	Startup time ✻9		Three-phase 400 VAC input	1,000 ms max.		
	Output hold time ✻9		Three-phase 400 VAC input	30 ms typ.	25 ms typ.	20 ms typ.
Additional functions	Overload protection			Yes, automatic reset, intermittent operation type Refer to *Overload Protection* on page 22.		
	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 22.		
	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 34.		
	INPUT OK Indicator			Yes (LED: Green)		
	DC OK Indicator			Yes (LED: Green)		
	Iout > 100% Indicator			Yes (LED: Yellow)		
	DC OK Signal Output			Yes (MOS FET relay output 30 VDC max., 50 mA max.)		
	Iout > 100% signal output			Yes (MOS FET relay output 30 VDC max., 50 mA max.)		
Insulation	Withstand voltage			3.0 kVAC for 1 min. (between all input terminals and all output terminals, signal output terminals), cutoff current 20 mA		
				2.5 kVAC for 1 min. (between all input terminals and PE terminals), cutoff current 30 mA		
				1.0 kVAC for 1 min. (between all output terminals, signal output terminals and PE terminals), cutoff current 25 mA		
				0.5 kVAC for 1 min. (between all output terminals and all signal output terminals), cutoff current 10 mA		
	Insulation resistance			100 MΩ min. (between all output terminals, signal output terminals and all input terminals / PE terminals) at 500 VDC		
Environment	Ambient operating temperature ✻10			-40 to 70°C (Derating is required according to the temperature. Refer to *Engineering Data* on page 26.) (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 ✻11			10 to 55 Hz, maximum 5 G, 0.42 mm single amplitude for 2 h each in X, Y, and Z directions		
	Shock resistance ✻11			294 m/s^2, 3 times each in ±X, ±Y, ±Z directions		
Reliability	MTBF ✻12			170,000 hrs typ.	160,000 hrs typ.	140,000 hrs typ.
	Expected life ✻13			10 years min.		
Construction	Weight			890 g max.	1,200 g max.	1,800 g max.
	Cooling fan			No		
	Degree of protection			IP20 by EN/IEC 60529		

Note: For ✻1 to ✻13, refer to page 21.

Item			Power rating	240W	480W	960W
			Output voltage	48V	48V	48V
Efficiency ✻1			Three-phase 400 VAC input	93% typ.	94% typ.	96% typ.
			Two-phase 400 VAC input	93% typ.	94% typ.	95% typ.
Input conditions	Input voltage range ✻2			Three-phase/two-phase 320 to 576 VAC, 450 to 810 VDC		
	Frequency ✻2			50/60 Hz (47 to 63 Hz)		
	Input current ✻1		Three-phase 400 VAC input	0.41 A typ.	0.78 A typ.	1.6 A typ.
			Two-phase 400 VAC input	0.75 A typ.	1.5 A typ.	2.9 A typ.
	Power factor ✻1		Three-phase 400 VAC input	0.9 min.		
	Leakage current ✻3		Three-phase 400 VAC input	3.5 mA max.		
	Inrush current ✻4		Three-phase 400 VAC input	1.7 A typ.	3.0 A typ.	10.5 A typ.
Output characteristics	Rated output current			5 A	10 A	20 A
	Power Boost Function			7.5 A	15 A	30 A
	Voltage adjustment range ✻5			48 to 56 V (with V.ADJ)		
	Ripple noise voltage ✻6		Three-phase 380 to 480 VAC input	50 m V p-p max. at 20 MHz of bandwidth	60 mV p-p max. at 20 MHz of bandwidth	60 mV p-p max. at 20 MHz of bandwidth
	Input variation influence ✻7			0.5% max.		
	Load variation influence ✻8			1.5% max.		
	Temperature variation influence		380 to 480 VAC input	0.05%/°C max.		
	Startup time ✻9		Three-phase 400 VAC input	1,000 ms max.		
	Output hold time ✻9		Three-phase 400 VAC input	30 ms typ.	25 ms typ.	20 ms typ.
Additional functions	Overload protection			Yes, automatic reset, intermittent operation type Refer to *Overload Protection* on page 22.		
	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 22.		
	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 34.		
	INPUT OK Indicator			Yes (LED: Green)		
	DC OK Indicator			Yes (LED: Green)		
	Iout > 100% Indicator			Yes (LED: Yellow)		
	DC OK Signal Output			Yes (MOS FET relay output 30 VDC max., 50 mA max.)		
	Iout > 100% signal output			Yes (MOS FET relay output 30 VDC max., 50 mA max.)		
Insulation	Withstand voltage			3.0 kVAC for 1 min. (between all input terminals and all output terminals, signal output terminals), cutoff current 20 mA		
				2.5 kVAC for 1 min. (between all input terminals and PE terminals), cutoff current 20 mA		
				1.0 kVAC for 1 min. (between all output terminals, signal output terminals and PE terminals), cutoff current 30 mA		
				0.5 kVAC for 1 min. (between all output terminals and all signal output terminals), cutoff current 10 mA		
	Insulation resistance			100 MΩ min. (between all output terminals, signal output terminals and all input terminals / PE terminals) at 500 VDC		
Environment	Ambient operating temperature ✻10			-40 to 70°C (Derating is required according to the temperature. Refer to *Engineering Data* on page 26.) (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 ✻11			10 to 55 Hz, maximum 5 G, 0.42 mm single amplitude for 2 h each in X, Y, and Z directions		
	Shock resistance ✻11			294 m/s^2, 3 times each in ±X, ±Y, ±Z directions		
Reliability	MTBF ✻12			170,000 hrs typ.	160,000 hrs typ.	140,000 hrs typ.
	Expected life ✻13			10 years min.		
Construction	Weight			890 g max.	1,200 g max.	1,800 g max.
	Cooling fan			No		
	Degree of protection			IP20 by EN/IEC 60529		

Note: For ✻1 to ✻13, refer to page 21.

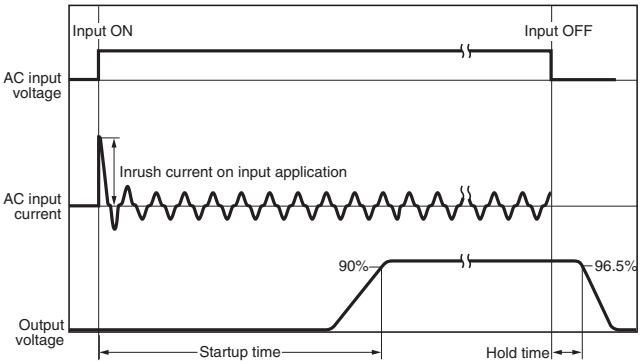
Item			Power rating / Output voltage (VDC)	240 W 24 V/48 V	480 W 24 V/48 V	960 W 24 V/48 V
Standards ✻15	Harmonic current emissions			Conforms to EN 61000-3-2 (three-phase/two-phase) ✻14		
	EMI	Conducted emissions		Conforms to EN 61204-3 Class B, EN 55011 Class B (three-phase) Conforms to EN 61204-3 Class A, EN 55011 Class A (two-phase)		
		Radiated emissions				
	EMS			Conforms to EN 61204-3 high severity levels		
	Safety standards			UL 508 Listing UL 62368-1 (Recognition) OVC II (≤ 3000 m) Pol2 CSA C22.2 No.62368-1 OVC II (≤ 3000 m) Pol2 EN/IEC 62477-1 OVC III (≤ 2000 m) OVC II (2000 m < and ≤ 3000 m) Pol2 EN/IEC 62368-1 OVC II (≤ 3000 m) Pol2 RCM (EN61000-6-4) Complies with PELV (EN/IEC 60204-1) Complies with EN/IEC 61558-2-16 BIS: IS 13252 (Part1) (480 W at 24 V output and 960 W at 24 V output only)		
	SEMI			Complies with SEMI F47-0706 (three-phase 380 to 480 VAC input)		

✻1. The value is when both rated output voltage and rated output current are satisfied.
✻2. Do not use an inverter output for the product. Inverters with an output frequency of 50/60 Hz are available, but the rise in the internal temperature of the product may result in ignition or burning. If the input is connected to a UPS, do not connect a UPS with a square-wave output. Doing so will cause the internal temperature of the product to increase, possibly causing smoking or burning.
✻3. The value is determined according to the Electrical Appliances and Material Safety Act.
✻4. Values for a cold start at 25°C. Refer to *Inrush Current, Startup Time, and Output Hold Time* on page 22.
✻5. If the output voltage adjuster (V. ADJ) is turned, the voltage will increase by more than the voltage adjustment range. When adjusting the output voltage, confirm the actual output voltage from the product and be sure that the load is not damaged.
✻6. The value is when both rated output voltage and rated output current are satisfied. A characteristic when the ambient operating temperature is 25°C.
✻7. 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.
✻8. 380 to 480 VAC input, in the range of 0 A to the rated output current.
✻9. This is the value when both rated output voltage and rated output current are satisfied and at room temperature (25◦C). Refer to *Inrush Current, Startup Time, and Output Hold Time* on page 22 for details.
✻10. At -40 to -25°C, time will be required before the rated output voltage is output after the input voltage is input.
✻11. If there is a possibility that the Unit will be subject to vibration or shock, use a steel DIN Rail.
✻12. MTBF is calculated according to JEITA RCR-9102.
✻13. Refer to *Recommended Replacement Periods and Periodic Replacement for Preventive Maintenance* on page 39 for details.
✻14. When using 2-phase input, conforms to EN 61000-3-2 under the following condition.
960W: At the rated output voltage, and 80% or less than the rated output current
✻15. Refer to *Standard Compliance* below for details.

Standard Compliance

- To comply with PELV output requirements for EN/IEC 60204-1, ground the negative side of the output (-V) to a protective earth (PE).
- EN/IEC 61558-2-16
  The S8VK-WA was designed based on EN/IEC 61558-2-16.
  Currently, IEC 61558-2-17 has been replaced by IEC 61558-2-16.
  When certification was received for EN/IEC 60204-1 (Machinery Safety), it was necessary to go through a control transformer to the control circuits. However, a control transformer is not always necessary for product that have been certified for the safety standard for OVCIII or for product that use a transformer that complies with EN/IEC 61558-2-16.
- For the S8VK-WB, the DC input is not compliant with Safety standards.
- Only 480 W and 960 W models are compliant with BIS (IS 13252 (Part 1)).
- This BIS Standard is an Indian standard that has been in effect for this product since April 2021, and certification has been acquired for some models to enable individual product export to India. (480 W at 24 V output and 960 W at 24 V output only)

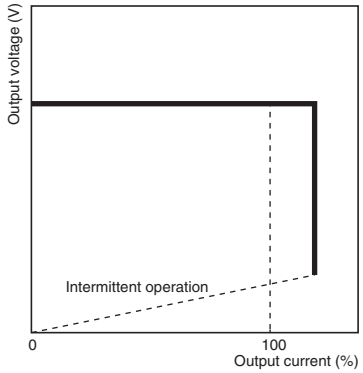
Inrush Current, Startup Time, and Output Hold Time



Note: Twice the normal inrush current will flow during parallel operation or for backup operation. Therefore, check the fusing characteristics of fuses and operating characteristics of breakers making sure that the external fuses will not burn out and the circuit breakers will not be activated by the inrush current.

Overload Protection

The product is automatically protected from short-circuit current and overcurrent damages when the load current is in the range of 151 to 175% of the rated current.
When the output current falls within the rated range, the overload protection function is automatically cleared.



Note: 1. Internal parts may occasionally deteriorate or be damaged if a short-circuited or overcurrent state continues during operation. Be sure to check that the Iout > 100% indicator is not lit or the Iout > 100% signal output is turned OFF before using.
2. Internal parts may possibly deteriorate or be damaged if the Power Supply is used for applications with inrush current or overloading at the load end. Do not use the Power Supply for such applications.

Overvoltage Protection

Overvoltage will be detected to prevent the load from being subjected to excessive voltage when the feedback circuit in the Power Supply fails, etc.
When an excessive voltage that is approximately 130% of the rated output voltage or more is output, the output voltage is cut OFF, preventing damage to the load due to overvoltage.
Reset the input power by turning it OFF for at least three minutes and then turning it back ON again.
Note: Do not turn ON the power again until the cause of the overvoltage has been removed.

INPUT OK Indicator

The INPUT OK indicator will light when the input voltage exceeds the lower limit value of the permissible range.
Note: The voltage may be applied even if the indicator does not light. Be sure to check the input voltage when performing wiring.

DC OK Indicator/Signal Output

The DC OK indicator will light when the output voltage is more than 90% of the rated output voltage, and the internal MOS FET relay is conducted (turned ON).
Note: 1. The output voltage may be generated even if the indicator does not light. Be sure to check the output voltage when connecting to the load.
2. This function monitors the voltage at the power output terminals.
To check the voltage accurately, measure the voltage at the load end.
3. If the output voltage is set to less than 90% of the rated output voltage, the indicator may go off and the signal output may be turned OFF.

Iout > 100% Indicator/Signal Output

The Iout > 100% indicator lights up when the output current exceeds the rated output current, and the internal MOS FET relay is conducted (turned ON).
Note: 1. The Iout > 100% Indicator may light up, and the Iout > 100% Signal Output may turn ON during peak current operation, however, the Power Supply can be used as long as the operating conditions specified in *Peak current* (P.33) are satisfied.
2. Even when the operating conditions for parallel operation are satisfied, the Iout>100% Indicator / Signal Output may operate, so do not use the Iout>100% Indicator / Signal Output.
3. During a short-circuit, the indicator will operate intermittently due to the overload protection function. When this happens, the indicator will blink in accordance with the intermittent operation, and the Iout > 100% signal output will repeated turn ON and OFF.
The shortest ON time of the Iout > 100% signal output during intermittent operation is 5 ms.

Specifications of the Signal Output Terminals (between DC OK Signal Output Terminal and COM Terminal, and between Iout > 100% Signal Output Terminal and COM Terminal)

Since the Signal Output is composed of the MOS FET relay, it does not have any polarity.
30 VDC max., 50 mA max.
Residual voltage when the function is ON: 2 V max.
Leakage current when the function is OFF: 0.1 mA max.
Note: 1. Internal current control circuits are not provided internally for output signals. Do not allow the output current to exceed 50 mA.
2. After completing wiring, confirm that the circuits operate correctly.

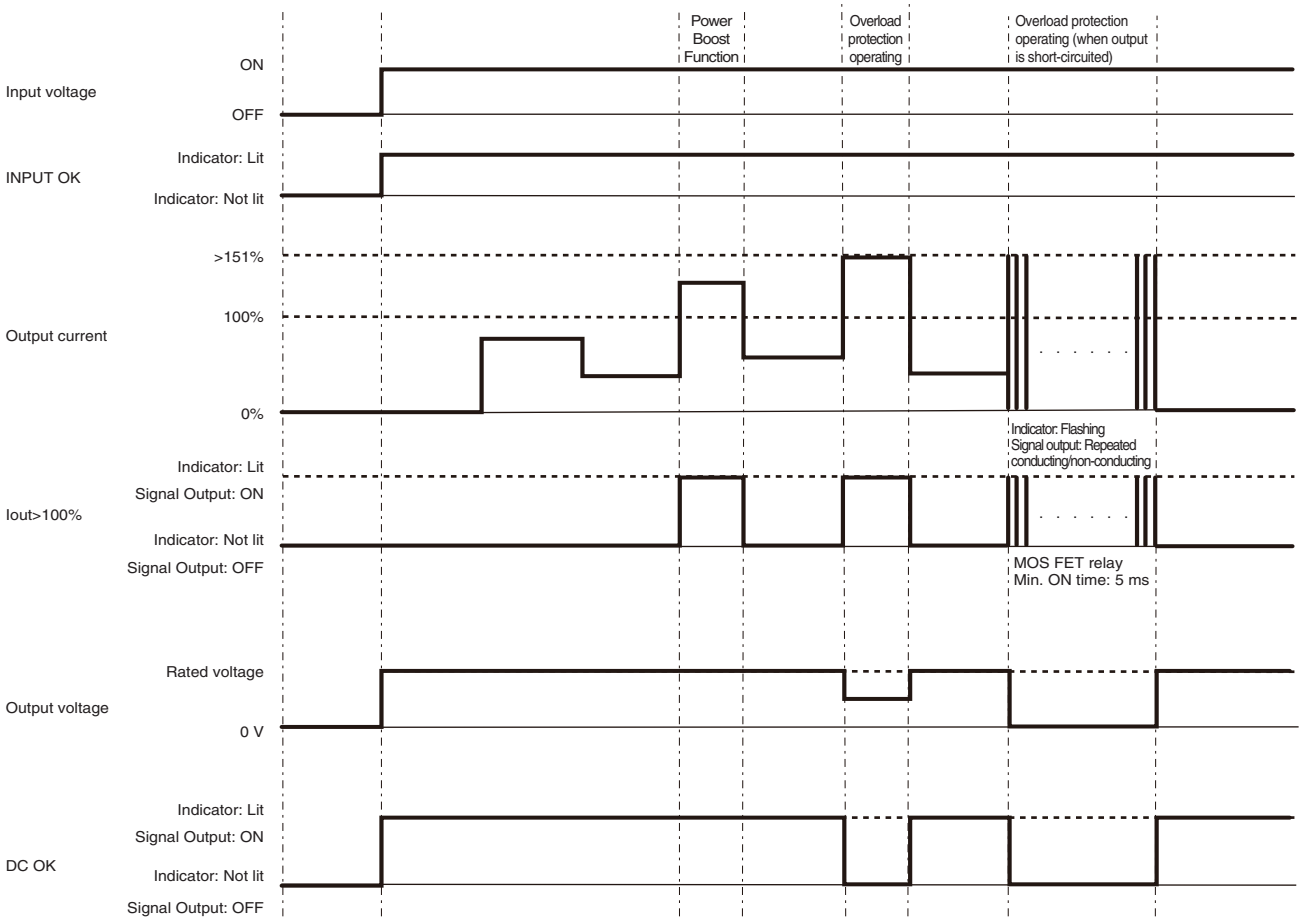
Identification of error locations at the input, product, and load side by the Indicator or Signal Output, and troubleshooting for the same (Maintenance point indicator)

Error locations at the input, product, and load side can be identified by the INPUT OK, DC OK, Iout > 100% Indicator / Signal Output.

INPUT OK Indicator	DC OK Indicator/Signal Output	Iout > 100% Indicator/Signal Output	Product operating status	Troubleshooting methods
●	●	○	---	(Normal)
●	●	●	Operation is being performed in excess of the rated output current of the product.	Change to a product with less load or larger output capacity. However, the Power Supply can be used as long as the operating conditions specified in Peak current (P.33) are satisfied.
●	○	●	Overload protection is activated for the product, and the output voltage drops.	Make sure the output line and the load are not short-circuited. If there is no short-circuiting, change to a product with less load or larger output capacity.
●	○	✳		
●	○	○	The product may have failed, or the overvoltage protection may have been activated for the product.	To check for overvoltage protection, turn the input power OFF, and then turn it ON again after 3 minutes or more has elapsed. If no output voltage is output, the product may have failed. Replace the product.
○	○	○	No input voltage is being supplied.	Make sure the circuit breaker connected to the input side has not tripped, or the fuse connected to the input side has not blown. Turn ON the circuit breaker or replace the fuse. Turn the input power ON again, and if no output voltage is output, the product may have failed. Replace the product.

●: Lit / ON ○: Not lit / OFF ✳: Flashing / ON · OFF

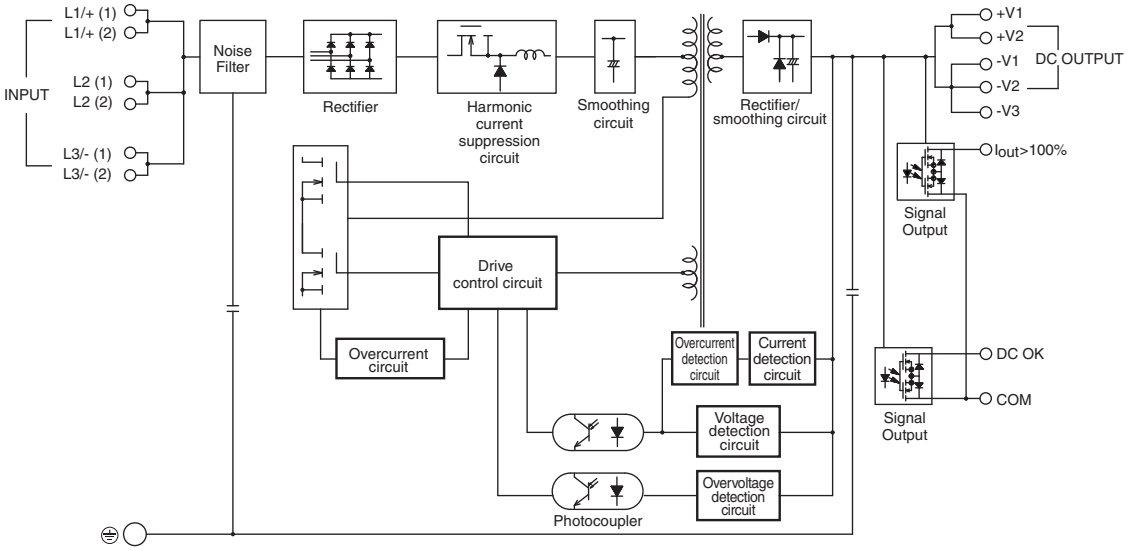
Time chart (Operation of the Indicator/Signal Output according to the product status)



Connections

Block Diagrams

S8VK-WB□□□□

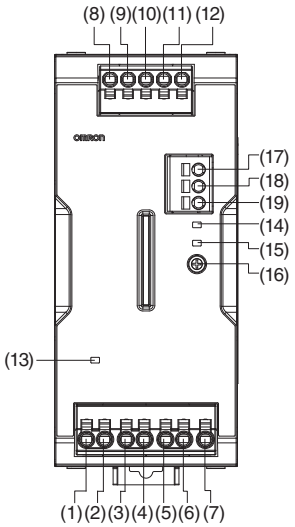


Construction and Nomenclature

Nomenclature

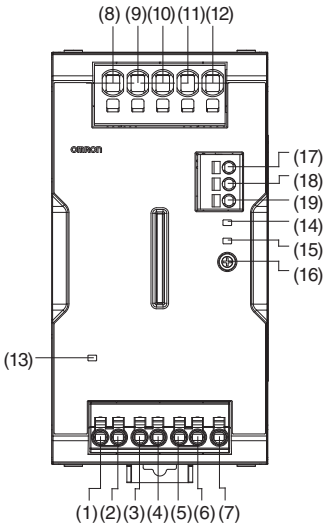
240 W

S8VK-WB240□□



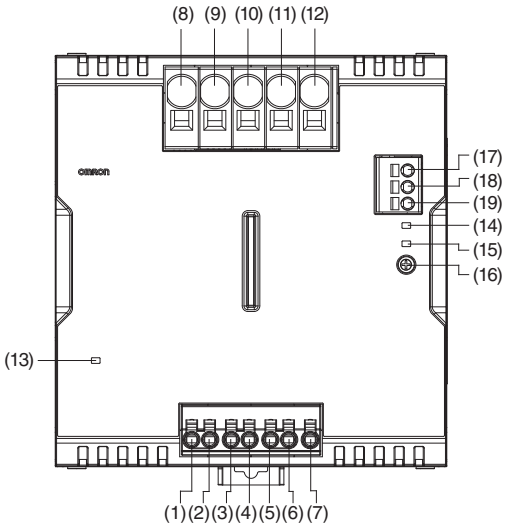
480 W

S8VK-WB480□□



960 W

S8VK-WB960□□



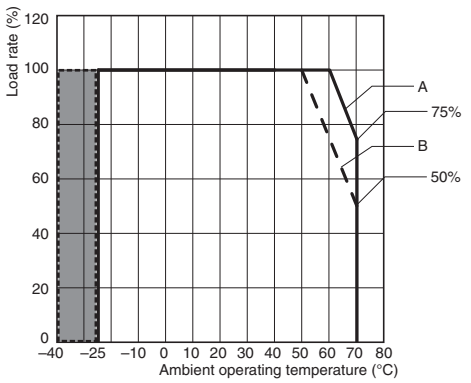
No.	Terminal name	Name	Function
(1)	L1/+ (1)	Input terminals	Connect the input lines to these terminals. ✻1
(2)	L1/+ (2)		
(3)	L2 (1)		
(4)	L2 (2)		
(5)	L3/- (1)		
(6)	L3/- (2)		
(7)	PE	Protective Earth terminal (⏚)	Connect the ground line to this terminal. ✻2
(8)	+V1	DC Output terminals	Connect the load lines to these terminals.
(9)	+V2		
(10)	-V1		
(11)	-V2		
(12)	-V3		
(13)	---	INPUT OK Indicator (INPUT OK: Green)	Lights up when the input voltage exceeds the lower limit value of the permissible range.
(14)	---	Iout > 100% Indicator (Iout > 100%: Yellow)	The Iout > 100% Indicator lights up when the output current exceeds the rated output current.
(15)	---	DC OK Indicator (DC OK: Green)	Lights up when the output voltage is more than 90% of the rated output voltage.
(16)	---	Output voltage adjuster (V.ADJ)	Use to adjust the output voltage.
(17)	Iout > 100%	Iout > 100% Signal Output Terminal	The Iout > 100% Signal Output is output when the output current exceeds the rated output current.
(18)	DC OK	DC OK Signal Output Terminal	Outputs when the output voltage is more than 90% of the rated output voltage.
(19)	COM	COM Terminal	Common terminal for Signal Output (17) and (18).

✻1. For a two-phase power input, connect to (L1/+) and (L3/-).
For a DC power input, connect (L1/+) to (+), and (L3/-) to (-).
(Refer to the wiring diagrams illustrated in *Recommended circuit breakers and fuses* on page 31.)
✻2. This is the protective earth terminal specified in the safety standards. Always ground this terminal.

Engineering Data

Derating Curves

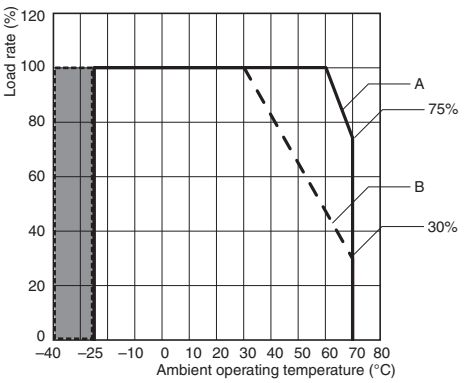
240 W <Horizontal separation: 15 mm or more>



Note: 1. At more than 528 VAC three-phase, derate the load at 0.5%/V.
2. At less than 380 VAC two-phase or at more than 528 VAC two-phase, derate the load at 0.5%/V.
3. At more than 746 VDC, derate the load at 0.5%/V.
4. In the shaded area, time is required to reach the rated output voltage after the input voltage is applied.

A. Standard mounting, B. Face-up mounting

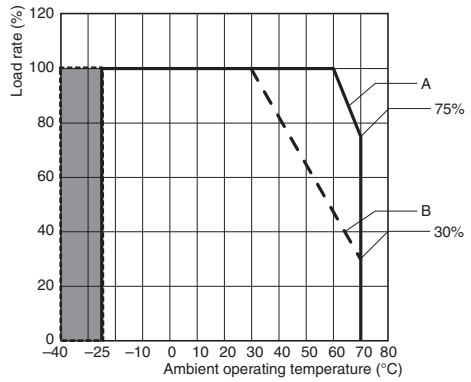
480 W <Horizontal separation: 15 mm or more>



Note: 1. At more than 528 VAC three-phase, derate the load at 0.5%/V.
2. At less than 380 VAC two-phase or at more than 528 VAC two-phase, derate the load at 0.5%/V.
3. At more than 746 VDC, derate the load at 0.5%/V.
4. In the shaded area, time is required to reach the rated output voltage after the input voltage is applied.

A. Standard mounting, B. Face-up mounting

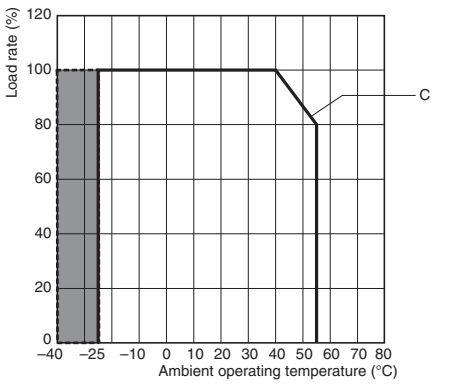
960 W <Horizontal separation: 15 mm or more>



Note: 1. At more than 528 VAC three-phase, derate the load at 0.5%/V.
2. At less than 380 VAC two-phase or at more than 528 VAC two-phase, derate the load at 0.5%/V.
3. At more than 746 VDC, derate the load at 0.5%/V.
4. In the shaded area, time is required to reach the rated output voltage after the input voltage is applied.

A. Standard mounting, B. Face-up mounting

240 W/480 W/960 W <Horizontal separation: less than 15 mm>

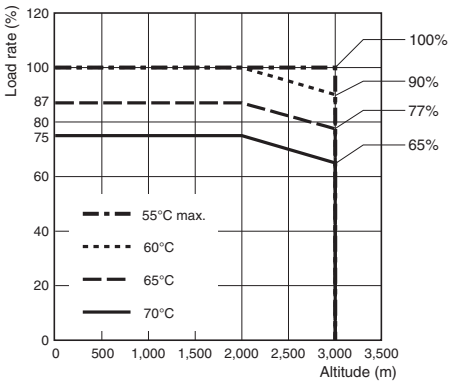


Note: 1. Apply the rated input voltage for both three-phase and two-phase.
2. In the shaded area, time is required to reach the rated output voltage after the input voltage is applied.

C. Front, side-by-side mounting

This Power Supply can be used at an altitude of up to 3,000 m.
Between 2,000 and 3,000 m, derate the load according to the following derating curve.

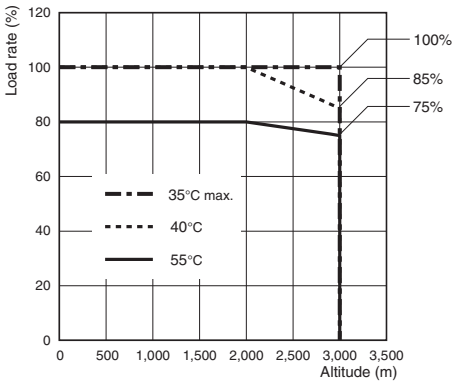
240 W/480 W/960 W <Horizontal separation: 15 mm or more>



Note: 1. At more than 528 VAC three-phase, derate the load at 0.5%/V.
2. At less than 380 VAC two-phase or at more than 528 VAC two-phase, derate the load at 0.5%/V.
3. At more than 746 VDC, derate the load at 0.5%/V.

A. Standard mounting

240 W/480 W/960 W <Horizontal separation: less than 15 mm>



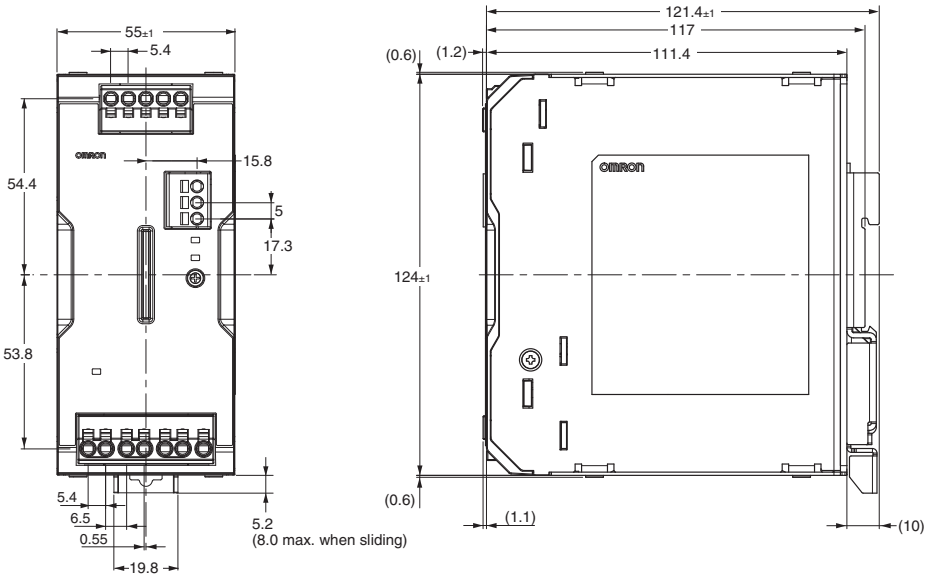
Note: Apply the rated input voltage for both three-phase and two-phase.

C. Front, side-by-side mounting

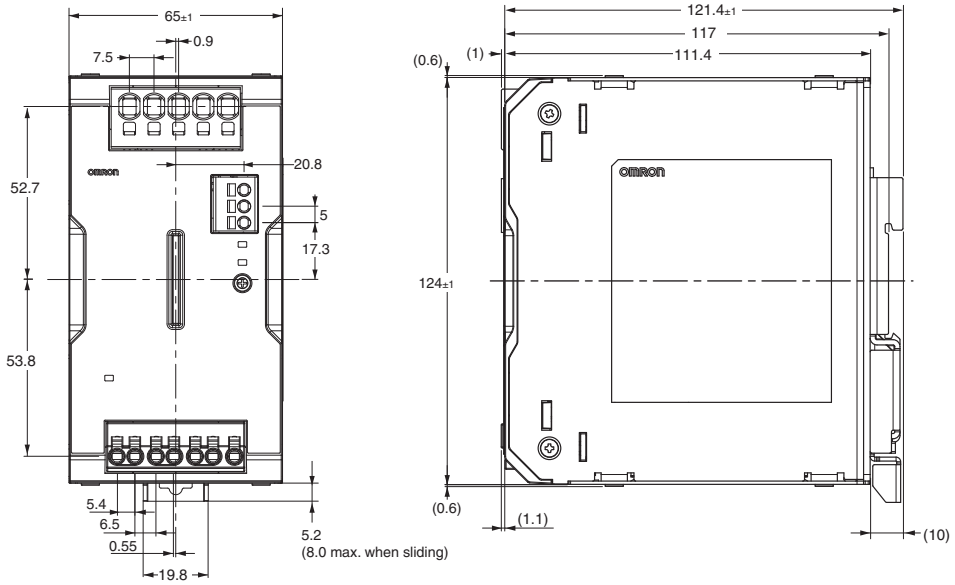
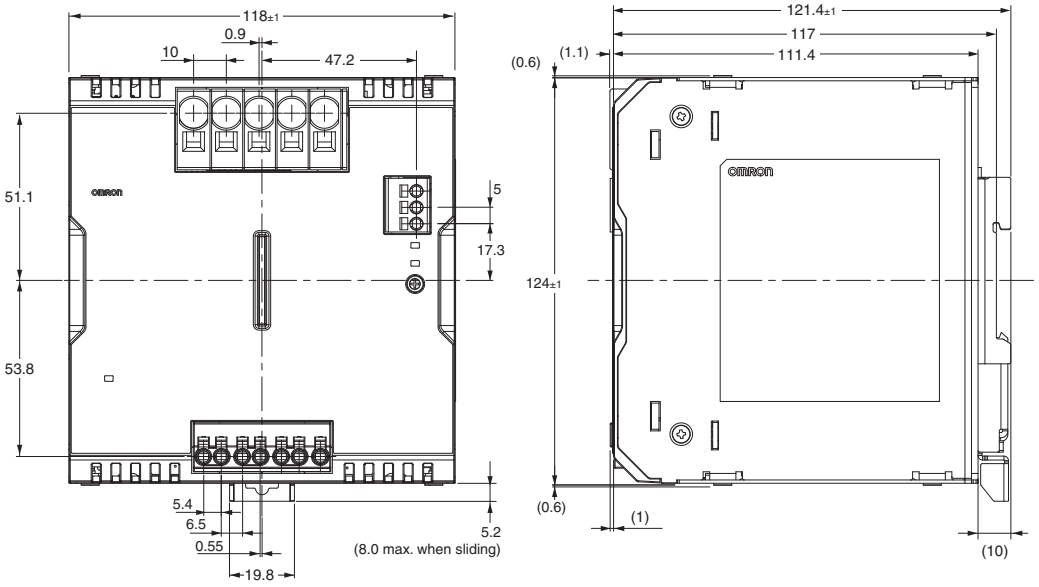
Dimensions

(Unit: mm)

S8VK-WB240□□



S8VK-WB480□□



S8VK-WB960□□