OMRON

Switch Mode Power Supply
S8VK-X (240/480-W Models)

Monitoring the power supply status with the 7-segment display and signal output monitor contributes to reducing the work hours for maintenance

- Large, white 7-segment LED offers good visibility.
- Output voltage and output current values can be checked without the need of a tester.
- Undervoltage status and replacement time are notified by signal outputs.



⚠ Refer to *Safety Precautions* on page 13.

Model Number Structure

Model Number Legend

Note: Not all combinations are possible. Refer to *List of Models* in *Ordering Information*, below.

S8VK- X□□□□□A-SGN
1 2 3

1. Power Ratings
240: 240 W
480: 480 W

2. Output voltage (DC)
24: 24 V

3. Indication monitor
A: With indication monitor

Ordering Information

Note: For details on normal stock models, contact your nearest OMRON representative.

With Indication Monitor

Power rating	Rated input voltage	Rated output voltage (DC)	Rated output current	Maximum boost current	Model number
240 W	100 to 240 VAC (allowable range: 85 to 264 VAC, 90 to 350 VDC)	24 V	10 A	15 A	**S8VK-X24024A-SGN**
480 W		24 V	20 A	30 A	**S8VK-X48024A-SGN**

Mounting Brackets (Order Separately)

Name	Model number
Front-mounting bracket (For 240 W and 480 W models)	**S82Y-VK10F**

DIN Rail Mounting (Order Separately)

Part name	Model number
Mounting Rail (Material: Aluminum)	**PFP-100N**
	PFP-50N
	PFP-100N2
End Plate	**PFP-M**

Ratings, Characteristics, and Functions

Item			Power rating	240 W	480 W
			Rated output voltage (DC)	24 V	24 V
			Indication monitor	Included	Included
Efficiency ✻			115 VAC input	91% typ.	92% typ.
			230 VAC input	93% typ.	94% 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 63 Hz)	50/60 Hz (47 to 63 Hz)
	Input current ✻		115 VAC input	2.4 A typ.	4.6 A typ.
			230 VAC input	1.2 A typ.	2.3 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			10 A	20 A
	Rated output power			240 W	480 W
	Maximum boost current			15 A	30 A
	Voltage adjustment range ✻			21.6 to 28 V (with V. ADJ)	
	Ripple noise voltage ✻		100 to 240 VAC input	140 mVp-p max. at 20 MHz of bandwidth	130 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.	
			230 VAC input	1000 ms max.	
	Hold time ✻		115 VAC input	35ms typ.	25ms typ.
			230 VAC input	35ms typ.	25ms typ.
Additional functions	Overload protection			Yes, automatic reset, intermittent operation type, Refer to *Overload Protection* on page 4 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 4 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 16 for details.	
	Output indicator			Yes (LED: Green)	
	Output voltage indicator ✻			Yes (Switching)	
	Output current indicator ✻			Yes (Switching)	
	Peak hold current indication ✻			Yes (Switching)	
	Maintenance forecast monitor			Yes (Switching)	
	Maintenance forecast monitor signal output			Yes (MOS FET relay output) 30 VDC max. 50mA max.	
	Undervoltage alarm indication			Yes (Switching)	
	Undervoltage signal output			Yes (MOS FET relay output) 30 VDC max. 50mA max.	
Insulation	Withstand voltage			3.0 kVAC for 1 min. (between all input terminals and output terminals, signal 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 30 mA	
				0.5 kVAC for 1 min. (between all output terminals and all signal output terminals), current cutoff 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 ✻			-40 to 70°C (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			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 ✻			60,000 hrs typ.	
	Life expectancy ✻			10 years min.	
Construction	Weight			700 g max.	1,100 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 3.

Standards

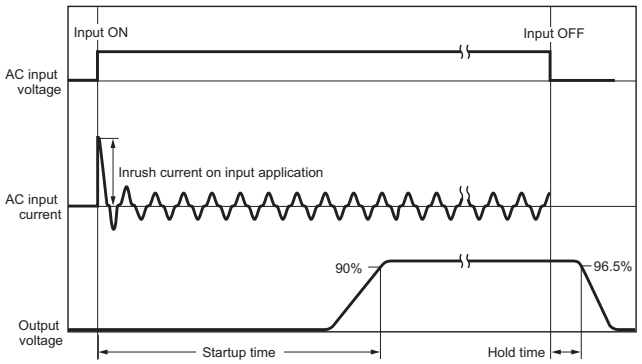
Standards	Harmonic current emissions		Conforms to EN 61000-3-2
	EMI	Conducted emissions	Conforms to EN 61204-3 Class B, EN 55011 Class B
		Radiated emissions	Conforms to EN 61204-3 Class B, EN 55011 Class B
	EMS		Conforms to EN 61204-3 high severity levels
	Safety standards		UL 508 (Listing) CSA C22.2 No. 107.1 UL 62368-1 (Recognition) OVC II (≤3000 m) Pol2 CSA C22.2, No. 62368-1 (cUR) OVC II (≤3000 m) Pol2 EN 62477-1 OVC III (≤2000 m) OVC II (2000 m < and ≤ 3000 m) Pol2 EN 62368-1 OVC II (≤3000 m) Pol2 RCM (EN61000-6-4) Conforms to PELV (EN/IEC 60204-1) Conforms to EN/IEC 61558-2-16
	SEMI		Conforms to F47-0706 (200 to 240 VAC input)

- EMI (radiated emissions) conform to Class B when this Power Supply is installed in a control panel.
- EN/IEC 61558-2-16
  The S8VK-X 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 conforms to EN/IEC 61558-2-16.
- Using DC input
  - When DC is used, UL 62368-1, cUR (CSA C22.2 No. 62368-1), EN/IEC 62368-1, EN 62477-1 and EN/IEC 61558-2-16 are applicable to safety standards.
  - Input voltage: 90 to 350 VDC
  - When using an input voltage less than 140 VDC, reduce the load calculated with derating 0.5%V.
  - To meet safety standards when you use a DC input, use one of the following rated fast-acting fuses on Positive side (L side)
    S8VK-X24024A-SGN: 350 VDC min., 8A
    S8VK-X48024A-SGN: 350 VDC min., 12A
- To comply with PELV output requirements for EN/IEC 60204-1, ground the negative side of the output (-V) to a protective earth (PE).

Definitions of the Terms Under Ratings, Characteristics, and Functions

Input conditions	Efficiency	The value is when both rated output voltage and rated output current are satisfied.
	Voltage range	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 smoking 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.
	Frequency	
	Input current	The value is when both rated output voltage and rated output current are satisfied.
	Power factor	The value is when both rated output voltage and rated output current are satisfied.
	Leakage current	The value is determined according to the Electrical Appliances and Material Safety Act.
	Inrush current	Values for a cold start at 25°C. Refer to *Inrush Current, Startup Time, and Output Hold Time* on page 4 for details.
Output characteristics	Voltage adjustment range	If the output voltage adjuster (V. ADJ) is turned, the voltage will increase by more than of 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.
	Ripple noise voltage	The value is when both rated output voltage and rated output current are satisfied. A characteristic when the ambient operating temperature is 25°C.
	Static input variation influence	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.
	Load variation influence	100 to 240 VAC input, in the range of 0 A to the rated output current.
	Startup time	The value is 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 4 for details.
	Hold time	The value is 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 4 for details.
Additional functions	Display of various states	Displayed on 7-segment LED. (character height: 8 mm)
	Output voltage indicator	Resolution of output voltage indicator: 0.1 V and output voltage indication accuracy: ±2% (percentage of output voltage value, ±1 digit max.)
	Output current indicator	Resolution of output current indicator: 0.1 A and output current indication accuracy: ±5% F.S. ±1 digit max. (specified by rated output voltage)
	Peak hold current indication	Resolution of peak hold current indication: 0.1 A Peak hold current indication accuracy: ±5% F.S. ±1 digit max. (specified by rated output voltage) Signal amplitude required for peak hold current indication: 20 ms
Environment	Ambient operating temperature	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.
Reliability	MTBF	MTBF is calculated according to JEITA RCR-9102. MTBF stands for Mean Time Between Failures, which is calculated according to the probability of accidental device failures, and indicates reliability of devices. Therefore, it does not necessarily represent a life of the product.
	Life expectancy	Refer to *Recommended Replacement Periods and Periodic Replacement for Preventive Maintenance* on page 19 for details.

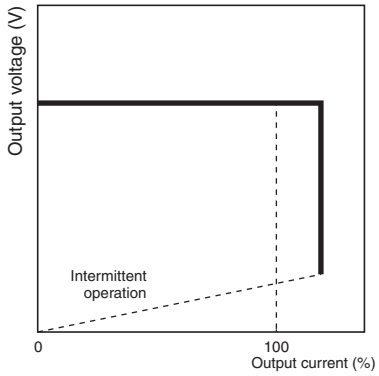
Inrush Current, Startup Time, and Output Hold Time



Note: Twice the normal inrush current will flow during parallel operation or for backup operation. Also, if crossover wiring is used for N number of Power Supplies, an inrush current of N times the inrush current for a standalone Power Supply will flow. 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

When the load current reaches 151% to 165% of the rated current, output voltage is automatically lowered to protect the Power Supply from short-circuit currents and overcurrents.
When the output current falls within the rated range, the overload protection function is automatically cleared.



Note: 1. Internal parts may possibly deteriorate or be damaged if a short-circuited or overcurrent state continues during operation.
2. Internal parts may possibly deteriorate or be damaged if the Power Supply is used for applications with frequent inrush current or overloading at the load end. Do not use the Power Supply for such applications.

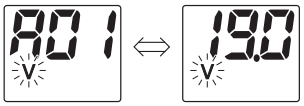
Overvoltage Protection

Overvoltage will be detected to prevent the load from being subjected to excessive voltage when the feedback circuit in the Power Supply fails, etc. If an excessive voltage that is approximately 130% of the rated output voltage or more is output, the output voltage is shut OFF. Reset the input power by turning it OFF for at least three minutes and then turning it back ON again.

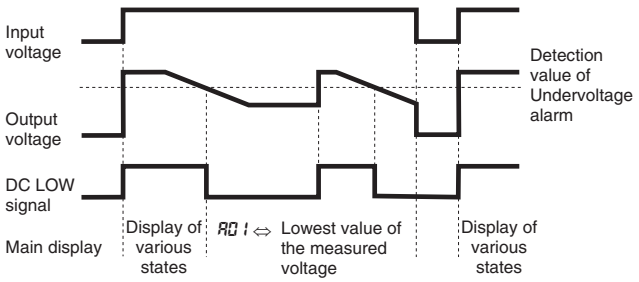
Note: Do not turn ON the power again until the cause of the overvoltage has been removed.

Undervoltage alarm Function (Indication and output)

When output voltage drop is detected, an alarm (AU1) and lowest value of the measured voltage are indicated alternately. The detected voltage is fixed at 20.0 V.
Further, the alarm is output from MOS FET relay (Undervoltage signal output terminal (DC LOW)) to an external device. (Upon output voltage alarm: OFF; no continuity at the undervoltage signal output terminal (DC LOW))



In the case that the output voltage drops below the detected voltage value (19 V) and an alarm is issued

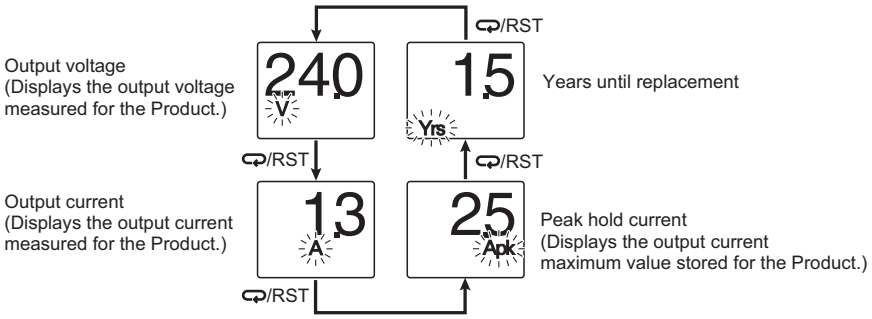


Note: 1. Operation begins after about 3 seconds since the AC power is supplied.
2. Press the reset key (↺/RST) after the output voltage is restored, to reset alarm indication.
3. The undervoltage alarm function monitors the output terminal voltage of the Product. To check the voltage accurately, measure the voltage at the load end.
4. Detecting function for undervoltage may be activated when the input voltage fails and recovers within 20 ms or more.
5. Detecting function for undervoltage may be also activated when the output current over the rated one is flown at the start.

Description of the operation and function

Switching the Display

Various states are indicated by the switching display key (/RST) of the Product.



Note: The output voltage will be displayed when the power supply is first turned on after it is received from the factory. Thereafter, the output voltage will be indicated in the same display when shutting down.

Output Voltage and Current Indication Function

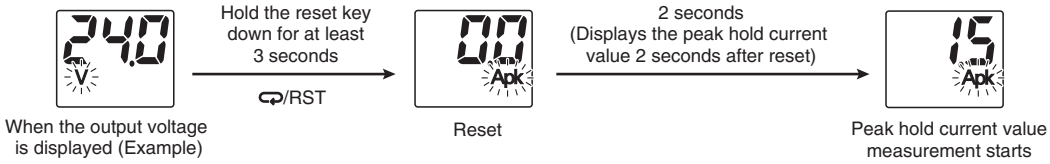
The output voltage and current of the power supply unit are monitored and indicated.
Note: Operation begins after about 3 seconds since the AC power is supplied.

Peak Hold Current Indication Function

The output current maximum value is stored and indicated as the peak hold current (10 ms average value). The maximum output current is always updated whatever the indication mode is. The peak hold current is retained even if the AC power is turned off.
Note: Operation begins after about 3 seconds since the AC power is supplied.

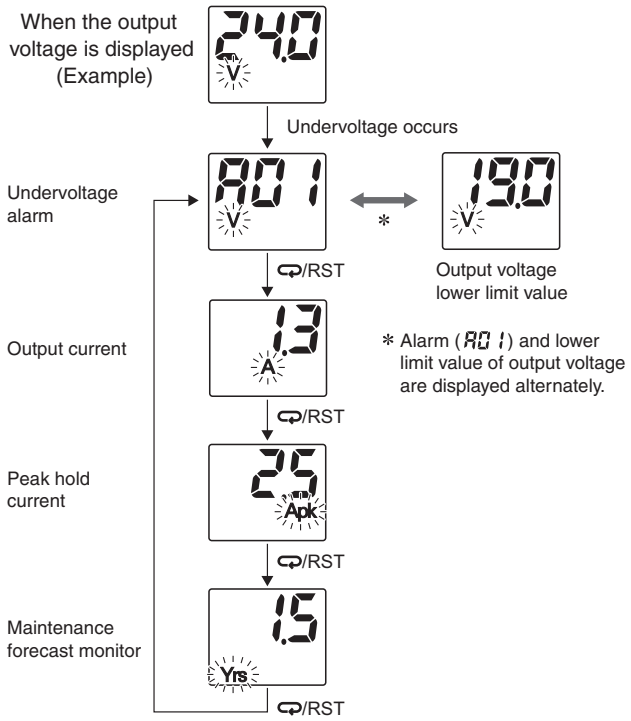
Peak Hold Current Reset

Hold the reset key (/RST) down for at least 3 seconds from any state display to reset the peak hold current value.



Undervoltage Alarm Indication

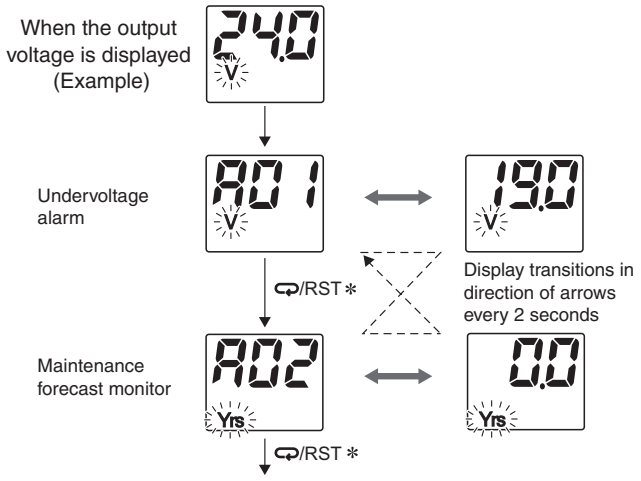
Indicates when the output voltage is low.



Note: When the voltage returns to the set value or above, press the /RST key while A01 is displayed to return to the output voltage indicator, clear the alarm A01, and return to the normal output voltage display.

Multiple Alarms

When multiple alarms occur at the same time



* When undervoltage alarm is displayed:
Press /RST to go to output current indicator
When maintenance forecast monitor or overheating alarm is displayed:
Press /RST to transition to undervoltage alarm display

Maintenance Forecast Monitor Function (Indication and output)

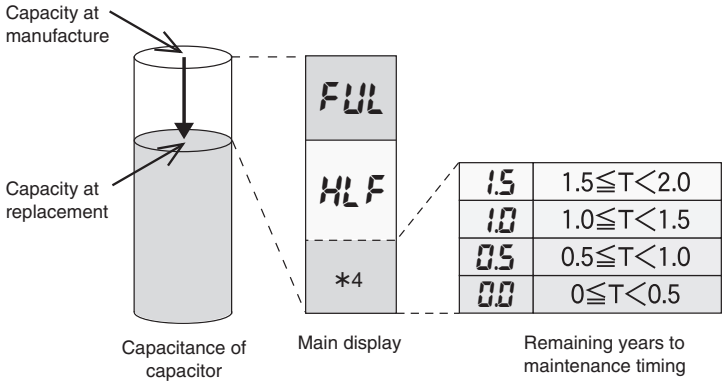
What is “Maintenance Forecast Monitor Function”?

The Product is equipped with electrolytic capacitors.
The electrolyte inside the electrolytic capacitor penetrates the sealing rubber and evaporates as time passes since it is manufactured, which causes deterioration of characteristics such as decreasing the capacitance, etc.
Due to this deterioration of the characteristics of the electrolytic capacitor, the performance of the Product decreases as time passes.
The maintenance forecast monitor function shows an approximate period left for maintenance of the Product due to deterioration of electrolytic capacitors. If the remaining time of the Product maintenance falls below 0.5 years (6 months), an alarm is indicated and an output signal is triggered. Use this function to know the approximate replacement timing of the Product.

Principle of operation

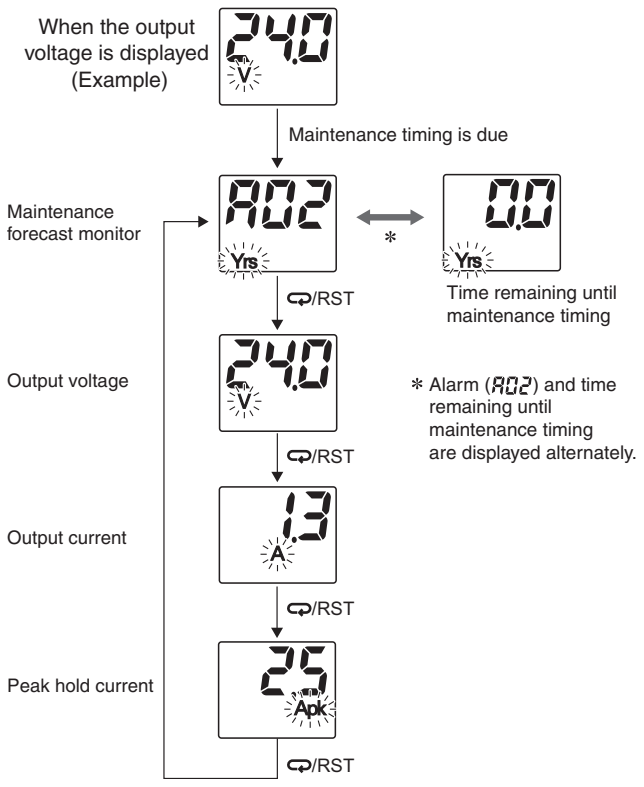
The deterioration speed of the electrolytic capacitors varies considerably according to the ambient temperature. (Generally the speed follows “Rule of Two for every 10°C”; for every 10°C increase in temperature the rate of degradation doubles according to Arrhenius’s equation.)
This Product monitors the temperature inside it, and calculates the amount of deterioration according to the running hours and internal temperature. Judging by this amount of deterioration, the Product will show the alarm indication and output when the period left for maintenance reaches the set value.

Note: 1. Due to degradation of internal electronic parts, replace the Product at least once every 15 years even if indication and output of maintenance forecast monitor are not issued.
2. The maintenance forecast is accelerated or decelerated according to operating conditions. Periodically check indication.
3. The output may turn ON and OFF alternately according to the acceleration or deceleration of Maintenance forecast.
4. The accuracy of Maintenance forecast monitor may become worse in the application having frequent ON/OFF for the input voltage.
5. THE MAINTENUNCE FORECAST MONITOR FUNCTION INDICATES AN APPROXIMATE PERIOD LEFT FOR MAINTENANCE, BASED ON DETERIORATION OF THE ELECTROLYTIC CAPACITOR. IT DOES NOT PREDICT FAILURES CAUSED BY OTHER REASONS.

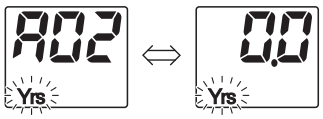


Indication and Output

Indicates that the set maintenance timing has been reached.



When the Product is purchased, “FUL” will be indicated. As electrolytic capacitors deteriorate, indication changes to “HLF”. After the remaining time to maintenance is reduced to two years, indication automatically changes to a value, which decreases from “1.5” to “1.0” to “0.5” to “0.0” (year) as the running hours increase.
If the remaining time falls below 0.5 years (6 months), an alarm (A02) and 0.0 are indicated alternately.
With this Product, an output is issued to an external device from the MOS FET relay (Yrs) to notify of the maintenance timing, together with indication. (The output is turned off after the maintenance timing is reached; with no continuity.)



In the case that the remaining time is reduced to smaller than 0.5 year and an alarm is issued.

Note: 1. The remaining time to maintenance does not include the time when the Product is turned off.
2. Until the total operating time reaches around one month, indication is fixed at “FUL” to estimate the extent of deterioration, while the Yrs output remains turned on (with continuity).

PERIODIC CHECK

It may take from several years to several tens of years under general operating conditions for this Product to issue the maintenance forecast monitor alarm. During operation over an extended period of time, periodically check from the display monitor that the amount of time left till the maintenance period is not below 0.5 years (6 months).

Difference between Expected Life and Replacement Time

OMRON calculates the expected life based on the following conditions.

1. Rated input voltage
2. Load rate: 50%
3. Ambient temperature: +40°C
4. Standard mounting

Note: As the values were calculated using an aluminum electrolytic condenser temperature rise test, they are not guaranteed. Use this data as a reference for maintenance and replacement time calculation.
The expected life span of the S8VK-X is 10 years minimum.
Also, a replacement time calculation function is included among the functions of the S8VK-X. The replacement time is the service life (the Power Supply's internal temperature is monitored at all times) of the internal electrolytic capacitor in actual operating conditions, and varies according to the customers operating conditions. 15 years is taken as the maximum period of the maintenance forecast.

Self-diagnostic Function

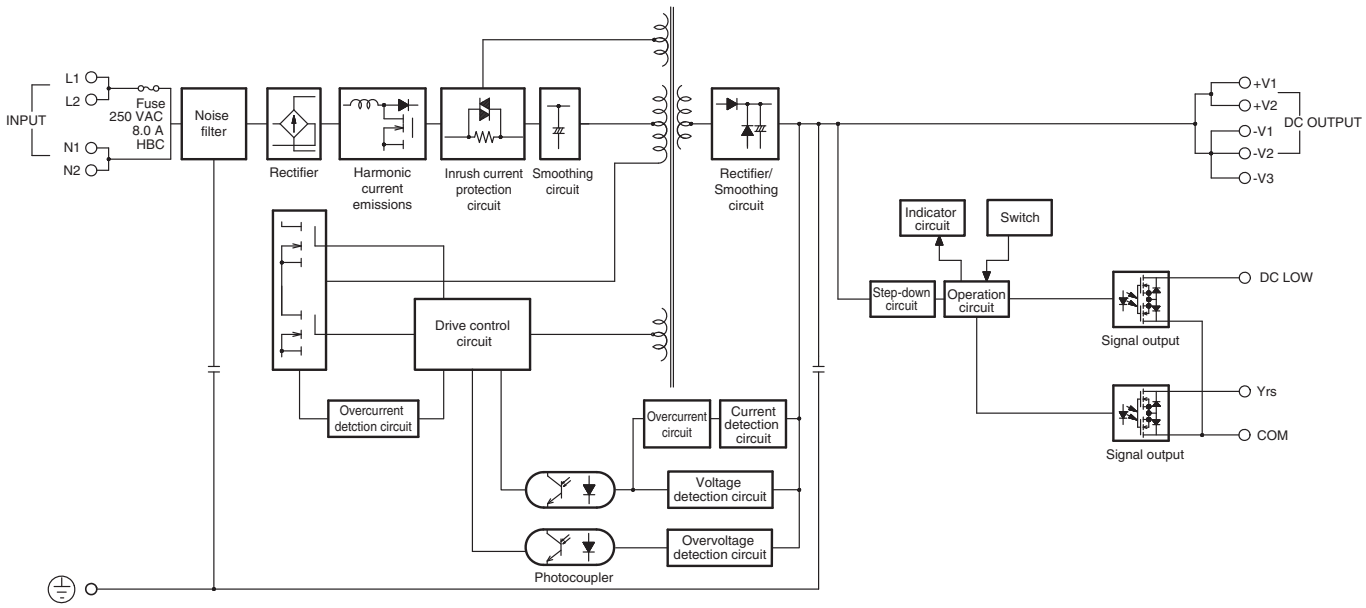
Main display	Description	Signal output state	Restoration method
- - -	Noise detected in voltage or current	No change	Automatic restoration
Hot	Overheated	Maintenance forecast monitor signal output (Yrs): OFF	Automatic restoration
E01	Memory error	Undervoltage signal output (DC LOW): OFF	Turn the AC input off then on again. If the Product is not reset, contact the dealer.
E02		Maintenance forecast monitor signal output (Yrs): OFF	
E03		Undervoltage signal output (DC LOW): OFF Maintenance forecast monitor signal output (Yrs): OFF	

Note: 1. External noise is probable as a cause of "- - -" and "E0*" errors.
2. Operation out of the derating curve area, ventilation error, and incorrect mounting direction are probable as a cause of "Hot" error.
3. If the "Hot" error state continues for about three hours, the maintenance forecast monitor function becomes invalid. The indication for maintenance forecast monitor remains as "Hot" even after the overheat condition is removed, and the Yrs output remains OFF (with no continuity).
REPLACE THE PRODUCT IF THIS CONDITION OCCURS EVEN IF THE DC OUTPUT IS CORRECT, AS INTERNAL PARTS MAY BE DETERIORATED.

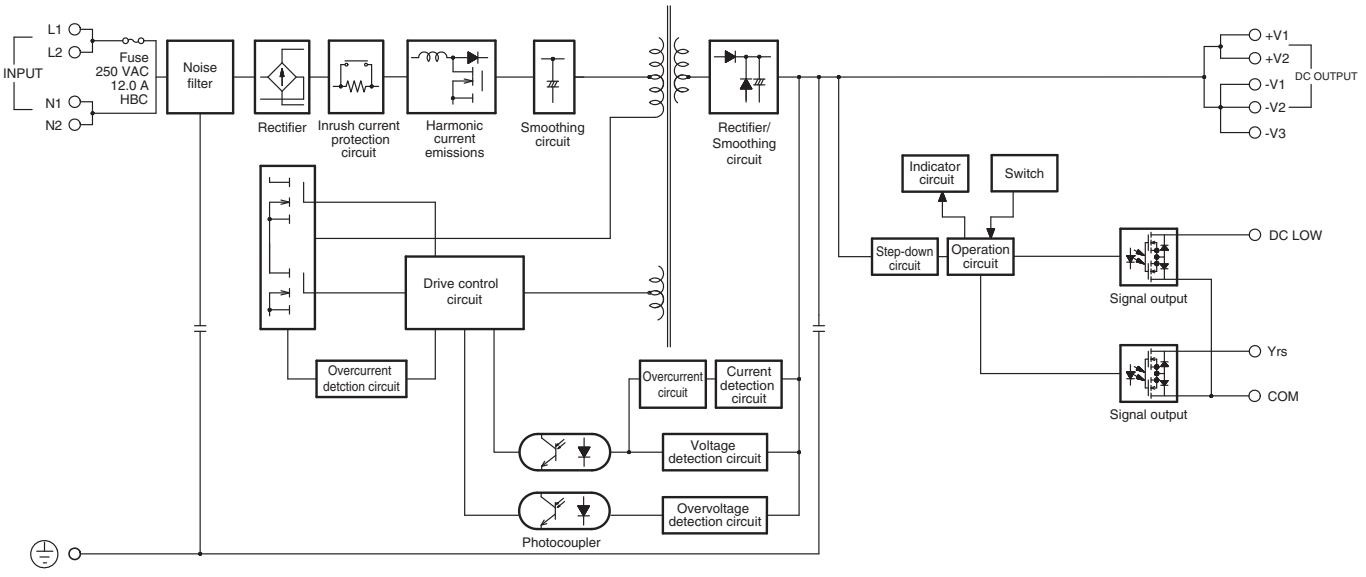
Connections

Block Diagrams

S8VK-X24024A-SGN



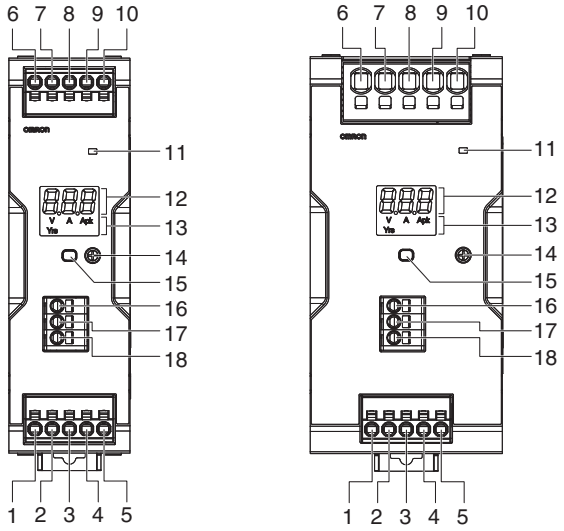
S8VK-X48024A-SGN



Nomenclature

With Indication Monitor

240 W	480 W
S8VK-X24024A-SGN	S8VK-X48024A-SGN

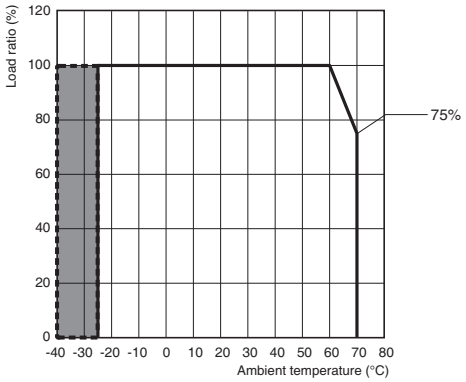


Name		Description	
1, 2	Input terminal (L1, L2)	Connect the input wire. The fuse is located on the (L1, L2) side.	
3, 4	Input terminal (N1, N2)		
5	PE (protective earthing) terminal (⏚)	Connect fully to ground. A PE (protective earthing) terminal stipulated in the safety standards is used.	
6, 7	DC output terminal (+V)	Connect the load wire.	
8, 9, 10	DC output terminal (-V)		
11	Output indicator (DC ON: green)	Lights while a direct current voltage output is ON.	
12	Main display (white)	Displays the measurement values.	
13	Operation display (white)	V	Lights up when the output voltage is indicated.
		A	Lights up during indication of output current.
		Apk	Lights up during indication of peak hold current.
		Yrs	Lights up during indication of maintenance forecast monitor.
14	Output voltage adjuster (V.ADJ)	Adjusts the output voltage.	
15	Switching display and reset key (↺/RST)	Used to switch the parameter to be displayed. Used to reset the peak hold current value.	
16	Undervoltage signal output terminal (DC LOW)	Output when a drop is detected in the output voltage (voltage drop = MOS FET relay OFF).	
17	Maintenance forecast monitor signal output terminal (Yrs)	Triggers an output signal when the maintenance period is reached. (MOS FET relay OFF)	
18	COM terminal (COM)	Common terminal for output terminals 16 and 17.	

Engineering Data

Derating Curves

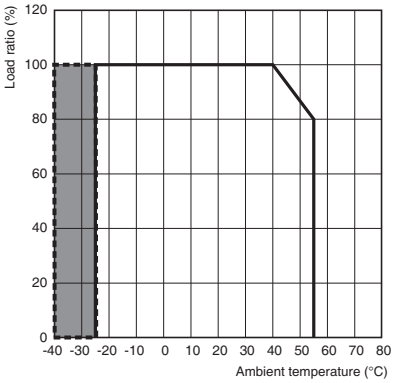
Horizontal separation: 15 mm or more



Note: 1. 1%/V derating at less than 100 VAC
2. 0.5%/V derating at less than 140 VDC
3. In the shaded area, time is required to reach the rated output voltage after the input voltage is applied. Also, the ripple noise value in this area may exceed the range given on page 2.

A: Standard mounting, mounted with front-mounting brackets

Horizontal separation: Less than 15 mm

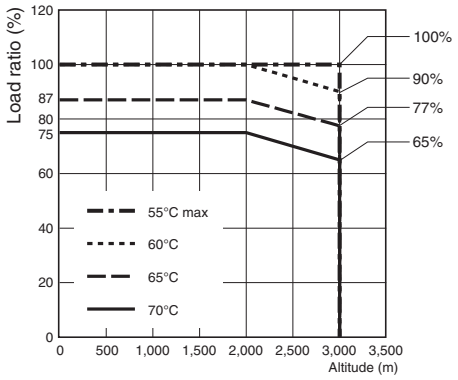


Note: 1. Apply the rated voltage.
2. In the shaded area, time is required to reach the rated output voltage after the input voltage is applied. Also, the ripple noise value in this area may exceed the range given on page 2.

B: Front, side-by-side mounting

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

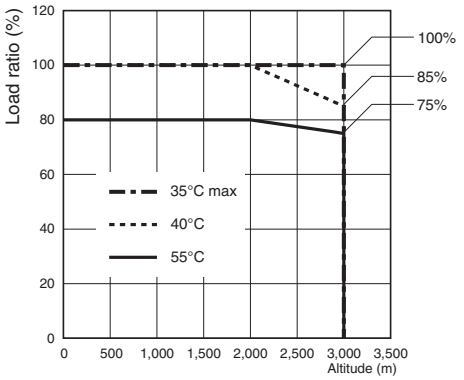
Horizontal separation: 15 mm or more



Note: 1. 1%/V derating at less than 100 VAC
2. 0.5%/V derating at less than 140 VDC

A: Standard mounting, mounted with front-mounting brackets.

Horizontal separation: Less than 15 mm



Note: Apply the rated voltage.

B: Front, side-by-side mounting

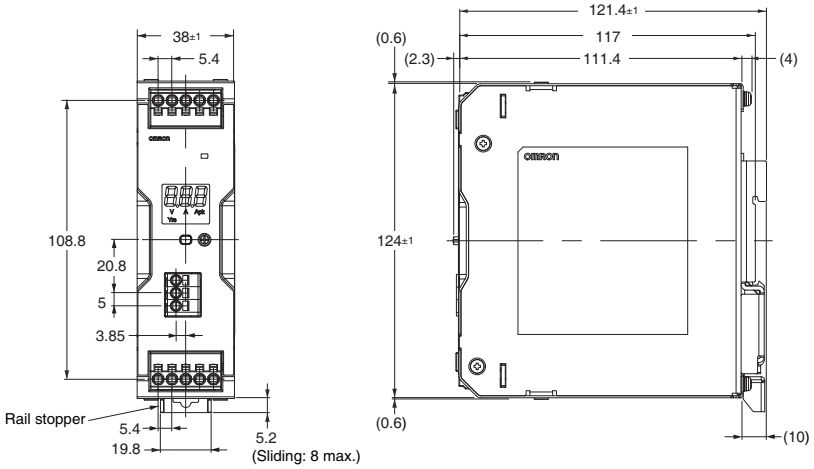
Dimensions

(Unit: mm)

Unit

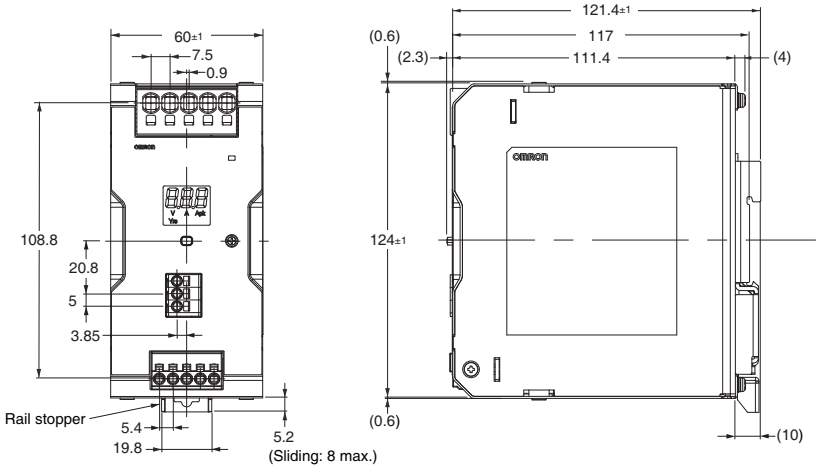
S8VK-X24024A-SGN (240W)



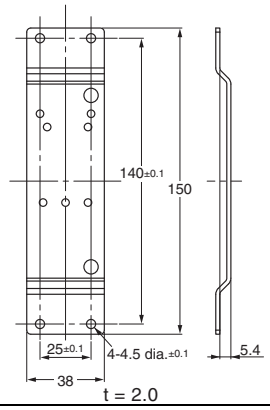
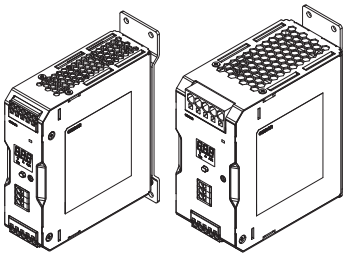


S8VK-X48024A-SGN (480W)





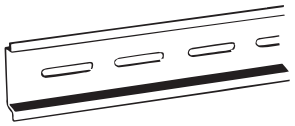
Mounting brackets (Order seperately)

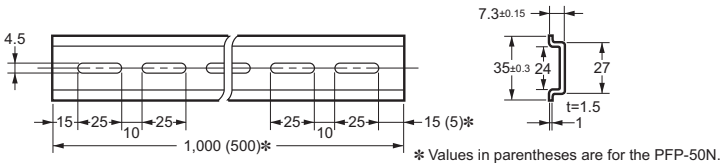
Name	Model number	Dimensions	Appearance
Front-mounting bracket (For 240 W and 480 W models)	**S82Y-VK10F**	 240 W Three locations Mounting screw tightening torque: 0.5 to 0.6 N·m 480 W Four locations Mounting screw tightening torque: 0.5 to 0.6 N·m Be sure to use the accessory screws.	

DIN Rail Mounting (Order Separately)

Mounting Rail (Material: Aluminum)

PFP-100N
PFP-50N

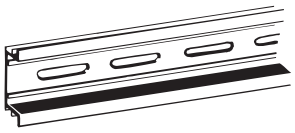


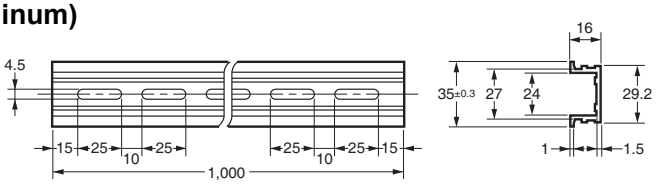


* Values in parentheses are for the PFP-50N.

Mounting Rail (Material: Aluminum)

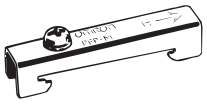
PFP-100N2

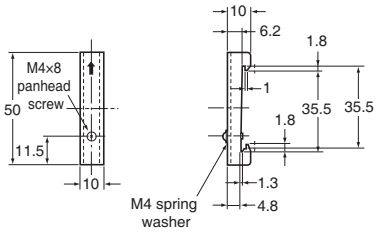




End Plate

PFP-M





Note: 1. If there is a possibility that the Unit will be subject to vibration or shock, use a steel DIN Rail. Otherwise, metallic filings may result from aluminum abrasion.
2. If the Unit may be subjected to sliding to either side, attach an End Plate (model PFP-M) on each side of the Unit.

Safety Precautions

Warning Indications

WARNING	**Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally, there may be significant property damage.**
CAUTION	**Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.**
Precautions for Safe Use	**Supplementary comments on what to do or avoid doing, to use the product safely.**
Precautions for Correct Use	**Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.**

Meaning of Product Safety Symbols

	**Used to warn of the risk of electric shock under specific conditions.**
	**Used to warn of the risk of minor injury caused by high temperatures.**
	**Used to indicate prohibition when there is a risk of minor injury from electrical shock or other source if the product is disassembled.**
	**Used for general mandatory action precautions for which there is no specified symbol.**

⚠ WARNING

The electrical wire may come out and an electric shock may be caused. Insert the solid wire or ferrule straight into the terminal block until the end touches the terminal block.



⚠ CAUTION

Minor electric shock, fire, or Product failure may occasionally occur. Do not disassemble, modify, or repair the Product or touch the interior of the Product.



Minor burns may occasionally occur. Do not touch the Product while power is being supplied or immediately after power is turned OFF.



Minor injury due to electric shock may occasionally occur. Do not touch the terminals while power is being supplied.



Minor electric shock, fire, or Product failure may occasionally occur. Do not allow any pieces of metal, conductors, or cuttings from installation work to enter the Power Supply.



Precautions for Safe Use

Ambient Operating and Storage Environments

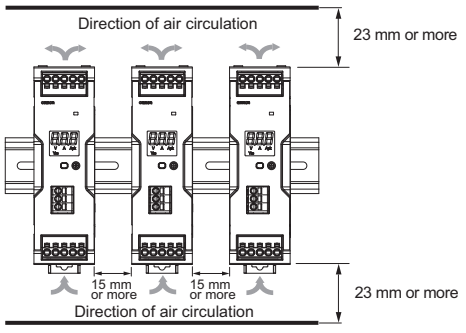
- Store the Power Supply at a temperature of -40 to 85°C and a humidity of 95% or less.
- To maintain performance of the replacement time calculation functions, make sure the following conditions are satisfied for long-term storage. For storage exceeding three months, keep the Product at a temperature of -25 to 30°C and a relative humidity of 25 to 70%.
- Do not use the Power Supply in areas outside the derating curve as doing so may result in internal parts occasionally deteriorating or being damaged.
- Use the Power Supply at a humidity of 95% max.
- Do not use the Power Supply in locations subject to direct sunlight.
- Do not use locations where liquids, foreign matter, or corrosive gases may enter the interior of the Product.

Installation Environment

- Do not use the Product in locations subject to shocks or vibrations. In particular, install the Power Supply as far away as possible from contactors or other devices that are a vibration source.
- Install the Power Supply well away from any sources of strong, high-frequency noise and surge.
- 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 smoking 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.

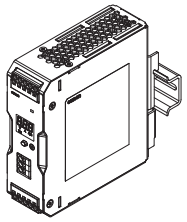
Mounting

- Take adequate measures to ensure proper heat dissipation to increase the long-term reliability of the Power Supply.
  Be sure to allow convection in the atmosphere around devices when mounting. Do not use in locations where the ambient temperature exceeds the range of the derating curve.
- When cutting out holes for mounting, make sure that cuttings do not enter the interior of the Power Supplies.
- The internal parts may occasionally deteriorate and be broken due to adverse heat radiation. Do not loosen the screws on the Power Supply.

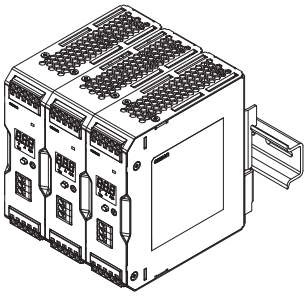


- S8VK-X can be used in combinations with a horizontal separation of less than 15 mm (front, side-by-side mounting) only in cases of the same model being used.
  In such cases, use the product in accordance with a derating curve with a horizontal separation of less than 15 mm.

(A) Standard (vertical) mounting



(B) Front, side-by-sidemounting



Wiring

- Connect the ground completely. A protective earthing terminal stipulated in safety standards is used. Electric shock or malfunction may occur if the ground is not connected completely.
- Minor fire may possibly occur. Ensure that input and output terminals are wired correctly.
- The Product is not equipped with an internal current limiting circuit, so be sure that the current flowing to the signal output terminals does not exceed 50 mA. Be sure to check that the signal output terminals are working normally after wiring.
- When you insert wires or insert a screwdriver into a release hole, do not press down on the terminal block with a force of 40 N or greater.
- Do not wire anything to the release holes.
- Do not tilt or twist a flat-blade screwdriver while it is inserted into a release hole on the terminal block. The terminal block may be damaged.
- Insert a flat-blade screwdriver into the release holes at an angle. The terminal block may be damaged if you insert the screwdriver straight in.
- Do not allow the flat-blade screwdriver to fall out while it is inserted into a release hole.
- Do not bend a wire past its natural bending radius or pull on it with excessive force. This may cause a wire to be broken.
- Do not insert more than one wire into each terminal insertion hole.
- Do not pre-solder the ends of the wires. Doing so will inhibit proper connection.
- Be sure to remove the sheet covering the S8M for machining before power-ON so that it does not interfere with heat dissipation.
- If there is a possibility of vibration or shock, please use wires and stranded wires with ferrules.
- Use the following material for the wires after confirming the rating of the wires in order to prevent smoking or ignition.

Recommended Wire Type

Terminal	Model number	Recommended wire gauge	
		(mm^2)	(AWG)
Input	S8VK-X24024A-SGN	0.5 to 2.5	20 to 14
	S8VK-X48024A-SGN	0.75 to 2.5	18 to 14
Output	S8VK-X24024A-SGN	2 to 2.5	14
	S8VK-X48024A-SGN	3.5 to 6	12 to 10
Signal output/COM	S8VK-X□□□24A-SGN	0.25 to 2.5	24 to 14
PE (protective earth) terminal	S8VK-X□□□24A-SGN	2 to 2.5	14

Note: Use copper stranded or solid wires.

- Input crossover wiring can be used for the input side of this Power Supply.
- Do not use crossover wiring for more than five Power Supplies, and do not allow the steady-state current to the input terminals to exceed 10 A. The above table gives the recommended wires for one Power Supply.
- If you use crossover wiring for N number of Power Supplies, a current that is N times the current for a standalone Power Supply may flow to the input terminals.Take this into consideration when you select wiring materials.

Stripping Length

S8VK-X24024A-SGN: Input and output terminals
S8VK-X48024A-SGN: Input terminals

Recommended wire gauge	Stripping length (Ferrules not used)
0.34 to 1.5 mm^2/AWG22 to 16	8 mm
2 to 2.5 mm^2/AWG14	10 mm

S8VK-X48024A-SGN: Output terminals

Recommended wire gauge	Stripping length (Ferrules not used)
3.5 to 6 mm^2/AWG12 to 10	15 mm

S8VK-X□□□24A-SGN: Signal output terminals/ COM terminals

Recommended wire gauge	Stripping length (Ferrules not used)
0.25 to 2.5 mm^2/AWG24 to 14	10 mm

Output indicator

- If the output voltage is set to less than 90% of the rated output voltage, the Output indicator may go off.
- The output voltage may be generated even if the Output indicator does not light. Be sure to check the output voltage when connecting to the load.

Specifications of the Signal Output Terminals (between the Undervoltage signal output terminal and COM terminal, and between the Maintenance forecast monitor signal output terminal and COM terminal)

When using the alarm output, adequately consider the maximum rating, residual voltage, and leakage current.
30 VDC max., 50 mA max., residual voltage when ON less than 2 V, leakage current when OFF less than 0.1 mA.

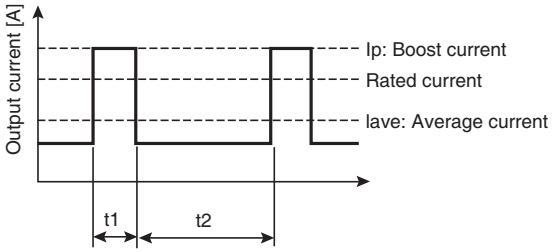
Note: 1. The Product is not equipped with an internal current limiting circuit, so be sure that the current flowing to the signal output terminals does not exceed 50 mA.
2. Be sure to check that the signal output terminals are working normally after wiring.

Power Boost Function

The boost current is a temporary current that exceeds the rated current.
However, it should meet the following four boost current conditions.

- Time that the boost current flows: t1 ≤ 10 s
- The boost current: Ip ≤ Maximum boost current
- The average output current: Iave ≤ Rated output current
- The time ratio of the boost current flow: Duty ≤ 30%

$$\text{Duty} = \frac{t1}{t1 + t2} \times 100\ [\%] \leq 30\%$$



- Do not allow the boost current to continue for more than 10 seconds. Do not allow the duty to exceed 30%. The Power Supply may be damaged.
- Ensure that the average current of one cycle of the boost current does not exceed the specified value. The Power Supply may be damaged.
- Derate the load at the boost current and average output current according to the ambient operating temperature and mounting.

Charging a Battery

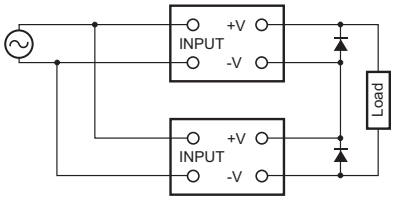
If you connect a battery as the load, install overcurrent control and overvoltage protection circuits.

Output voltage adjuster (V. ADJ)

- The output voltage adjuster (V. ADJ.) may possibly become damaged. Do not apply more than the required force.
- After completing output voltage adjustment, be sure that the output power or output current does not exceed the rated output electric power or rated output current.

Series Operation

Two Power Supplies can be connected in series.



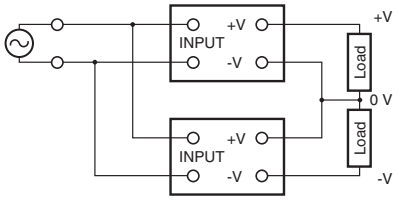
Note: 1. If the load is short-circuited, a reverse voltage will be generated inside the Power Supply. If this occurs the product may possibly deteriorate or be damaged. Always connect a diode as shown in the figure. Select diodes with the following ratings.

Type	Schottky Barrier diode
Dielectric strength (V_{RRM})	Twice the output voltage or above
Forward current (If)	Twice the rated output current or above

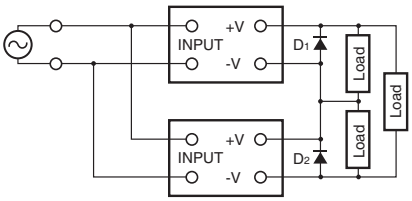
Note: 2. Though Power Supplies having different specifications can be connected in series, the current flowing through the load must not exceed the smaller rated output current.

Making Positive/Negative Outputs

- The outputs are floating outputs (i.e., the primary circuits and secondary circuits are separated). You can therefore make positive and negative outputs by using two Power Supplies.
  If positive and negative outputs are used, connect Power Supplies of the same series as in the following figure. (Combinations with different output capacities or output voltages can be made. However, use the lower of the two maximum rated output currents as the current to the loads.)



- Depending on the model, internal circuits may be damaged due to startup failure when the power is turned ON if loads such as a servomotor or operational amplifier may operate in series. Therefore, connect bypass diodes (D1, D2) as shown in the following figure.



- Use the following information as a guide to the diode type, dialectic strength, and current.

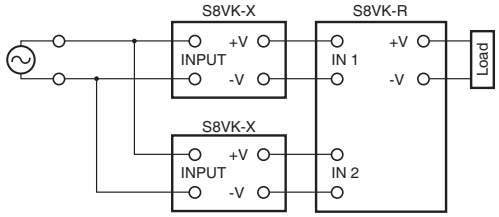
Type	Schottky Barrier diode
Dielectric strength (V_{RRM})	Twice the output voltage or above
Forward current (If)	Twice the rated output current or above

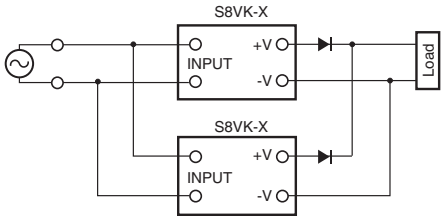
Parallel Operation

Parallel operation is used when the output current from one Power Supply is insufficient for the load. Power Supplies are connected in parallel to increase the output current. Two Power Supplies can be connected in parallel.

You must meet the following conditions to use parallel operation.

- Rated input voltage range
- Output voltage 25 V or less
- Output current per unit
  100% or less of the rated output current
- Ambient temperature: -25 to 40°C
- Standard mounting.
- Horizontal separation: 15 mm or more
- Vertical separation: 23 mm or more
- Adjust the output voltage difference of each Power Supply to 50 mV or less, using the output voltage adjuster (V. ADJ).
- There is no current balancing function for S8VK-X. A high output voltage unit may work at overcurrent state and in this situation, a life of a Power Supply will be extremely short. After adjusting the output voltage, confirm the output current of the Power Supplies balances.
- For Parallel Operation, to balance the current of the each unit, the length and thickness of each wire connected to the load and each unit must be same as much as possible.
- If you use the output voltage may drop by several volts if the load changes rapidly (e.g., if the load starts or is disconnected). Use the S8VK-R or connect external diodes as shown in the figure.
  For parallel operation with 240 W Power Supplies, use the S8VK-R20.
- Do not use parallel operation when there is the possibility that the input voltage will vary outside of the rated input range.





- Use the following information as a guide to the diode type, dialectic strength, and current.

Type	Schottky Barrier diode
Dielectric strength (V_{RRM})	Twice the output voltage or above
Forward current (I_F)	Twice the rated output current or above

<Backup Operation>

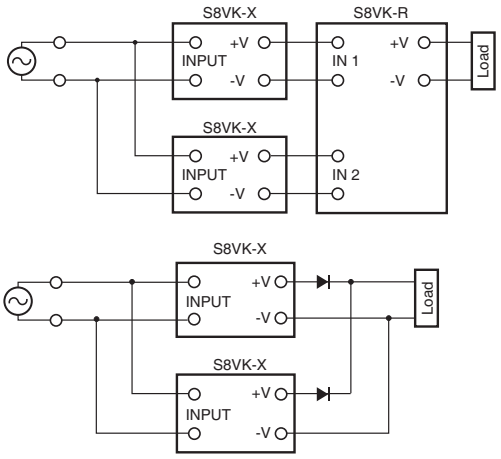
Backup operation is possible if you use two Power Supplies of the same model.

Even if one Power Supply fails, operation can be continued with the other Power Supply.

Make sure that the maximum load does not exceed the capacity of one Power Supply.

Use the S8VK-R or connect external diodes.

For backup operation with 240 W Power Supplies, use the S8VK-R20.



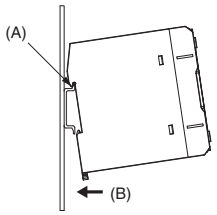
- Use the following information as a guide to the diode type, dialectic strength, and current.

Type	Schottky Barrier diode
Dielectric strength (V_{RRM})	Twice the output voltage or above
Forward current (I_F)	Twice the rated output current or above

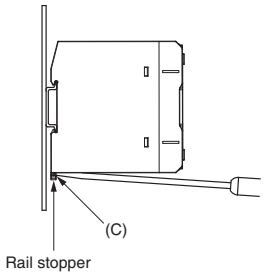
Precautions for Correct Use

DIN Rail Mounting

To mounting on a DIN Rail, hook portion (A) of the Block onto the rail and press in the (B) direction.

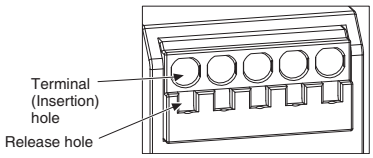


To dismount the Block, pull down portion (C) with a flat-blade screwdriver and pull out the Block.



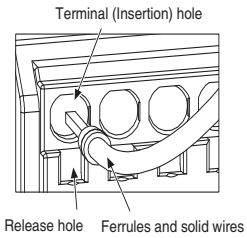
Connecting Wires to the Push-In Plus Terminal Block

Part Names of the Terminal Block



Connecting Wires with Ferrules and Solid Wires

Insert the solid wire or ferrule straight into the terminal block until the end touches the terminal block.

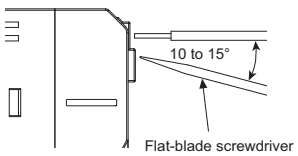


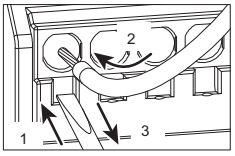
- If a wire is difficult to connect because it is too thin, use a flat-blade screwdriver in the same way as when connecting stranded wire.

Connecting Stranded Wires

Use the following procedure to connect the wires to the terminal block.

1. Hold a flat-blade screwdriver at an angle and insert it into the release hole.
   The angle should be between 10° and 15°. If the flat-blade screwdriver is inserted correctly, you will feel the spring in the release hole.
2. With the flat-blade screwdriver still inserted into the release hole, insert the wire into the terminal hole until it strikes the terminal block.
3. Remove the flat-blade screwdriver from the release hole.





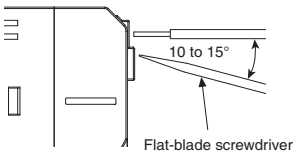
Checking Connections

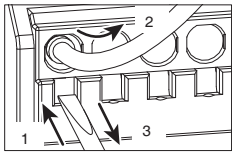
- After the insertion, pull gently on the wire to make sure that it will not come off and the wire is securely fastened to the terminal block.
- The insulation distance is still satisfied although some of the conductor may still be visible after being inserted into the terminal block, even though the recommended ferrule is used.

Removing Wires from the Push-In Plus Terminal Block

Use the following procedure to remove wires from the terminal block. The same method is used to remove stranded wires, solid wires, and ferrules.

1. Hold a flat-blade screwdriver at an angle and insert it into the release hole.
2. With the flat-blade screwdriver still inserted into the release hole, remove the wire from the terminal insertion hole.
3. Remove the flat-blade screwdriver from the release hole.





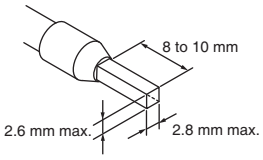
Recommended Ferrules and Crimping Tools

Recommended Ferrules

S8VK-X□□□24A-SGN: Input terminals/PE terminals
S8VK-X24024A-SGN: DC output terminals
S8VK-X□□□24A-SGN: Signal output terminals/PE terminals

Applicable wire		Ferrule Conductor length (mm)	Stripping length (mm) (Ferrules used)	Recommended ferrules		
(mm^2)	(AWG)			Manufactured by Phoenix Contact	Manufactured by Weidmuller	Manufactured by Wago
0.25	24	8	10	AI 0,25-8	H0.25/12	216-301
		10	12	AI 0,25-10	---	---
0.34	22	8	10	AI 0,34-8	H0.34/12	216-302
		10	12	AI 0,34-10	---	---
0.50	20	8	10	AI 0,5-8	H0.5/14	216-201
		10	12	AI 0,5-10	H0.5/16	216-241
0.75	18	8	10	AI 0,75-8	H0.75/14	216-202
		10	12	AI 0,75-10	H0.75/16	216-242
1/1.25	18/17	8	10	AI 1-8	H1.0/14	216-203
		10	12	AI 1-10	H1.0/16	216-243
1.25/1.5	17/16	8	10	AI 1,5-8	H1.5/14	216-204
		10	12	AI 1,5-10	H1.5/16	216-244
2.5	14	10	12	AI 2,5-10	H2.5/16DS	216-246
Recommended crimp tool				CRIMPFOX6 CRIMPFOX6T-F CRIMPFOX10S	PZ6 roto	Variocrimp4

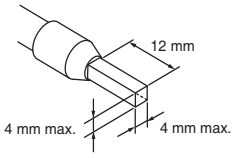
Note: 1. Make sure that the outer diameter of the wire is smaller than the inner diameter of the insulating sleeve of the recommended ferrule.
2. Make sure that the ferrule processing dimensions conform to the following figure.



S8VK-X48024A-SGN: DC Output Terminals

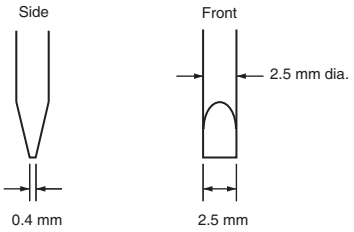
Applicable wire		Ferrule Conductor length (mm)	Stripping length (mm) (Ferrules used)	Recommended ferrules		
(mm^2)	(AWG)			Manufactured by Phoenix Contact	Manufactured by Weidmuller	Manufactured by Wago
4	12	12	14	AI 4-12	H4.0/20D	216-267
6	10	12	16	AI 6-12	H6.0/20	216-208 ✻
Recommended crimp tool				CRIMPFOX6 CRIMPFOX6T-F CRIMPFOX10S	PZ6 roto	Variocrimp4 ✻ Use the Variocrimp16.

Note: 1. Make sure that the outer diameter of the wire is smaller than the inner diameter of the insulating sleeve of the recommended ferrule.
2. Make sure that the ferrule processing dimensions conform to the following figure.



Recommended Flat-blade Screwdriver

Use a flat-blade screwdriver to connect and remove wires. Use the following flat-blade screwdriver.
The following table shows manufacturers and models as of 2018/Dec.



Model number	Manufacturer
ESD 0,40×2,5	Wera
SZS 0,4×2,5 SZF 0-0,4×2,5 ✻	Phoenix Contact
0.4×2.5×75 302	Wiha
AEF.2,5×75	Facom
210-719	Wago
SDIS 0.4×2.5×75	Weidmuller
9900(-2.5×75)	Vessel

✻ OMRON's exclusive purchase model XW4Z-00B is available to order as SZF 0-0,4×2,5 (manufactured by Phoenix Contact).

Audible Noise at Power ON

A harmonic current suppression circuit is built into the Power Supply. This circuit can create noise when the input is turned ON, but it will last only until the internal circuits stabilize and does not indicate any problem in the Product.

In Case There Is No Output Voltage

The possible cause for no output voltage may be that the overload protection or overvoltage protection has operated. The internal protection may operate if a large amount of surge voltage, such as a lightning inrush, is applied to the input.
In case there is no output voltage, please check the following points before contacting us:

Checking overload protected status:
Check whether the load is in overload status or is short-circuited. Remove the load wires when checking.

Checking overvoltage or internal protection:
Switch off the input power supply, and switch back on after at least 3 minutes have elapsed.

Disposal

When disposing of the Product, treat it as industrial waste.

Period and Terms of Warranty

Warranty Period

The Power Supply warranty is valid for a period of Five years from the date of shipment from the factory.

Terms of Warranty

The warranty is valid only for the following operating conditions.
1. Average ambient operating temperature of the Power Supply: 40°C max.
2. Average load rate of 80% max.
3. Mounting method: Standard mounting

Note: The maximum ratings must be within the derating curve.

If the Power Supply fails for reasons attributable to OMRON within the above warranty period, OMRON will repair or replace the faulty part of the Power Supply at the place of purchase or the place where the Power Supply delivered without charge.
This warranty does not cover the following types of failures.

(1) Failures that result from handling or operation of the Power Supply under conditions or in environments that are not given in this document and not given in any other specifications exchanged between OMRON and the customer
(2) Failures that originate in causes other than the delivered product itself
(3) Failures caused by disassembly, modification, or repair of the Power Supply by anyone other than OMRON
(4) Failures caused by applications or uses for which the Power Supply was not originally intended.
(5) Failures caused by factors that could not be anticipated with the scientific or technical knowledge available when the Power Supply was shipped.
(6) Failures caused by other causes for which OMRON is not responsible, such as natural disasters and other acts of God.
This warranty is limited to the individual Power Supply that was delivered and does not cover any secondary, subsequent, or related damages.

Recommended Replacement Periods and Periodic Replacement for Preventive Maintenance

The recommended replacement period for preventive maintenance is greatly influenced by the application environment of the Power Supply. As a guideline, the recommended replacement period is 7 to 10 years.✻
S8VK-X is equipped with a replacement time calculation function, and the approximate number of years until replacement based on the ambient temperature and load rate can be checked via indicator (types with indication monitors only) or communication.
To prevent failures or accidents that can be caused by using a Power Supply beyond its service live, we recommend that you replace the Power Supply as early as possible within the recommended replacement period.
However, bear in mind that the recommended replacement period is for reference only and does not guarantee the life of the Power Supply.

Many electronic components are used in the Power Supply and the Power Supply depends on the correct operation of these components to achieve the original Power Supply functions and performance. However, the influence of the ambient temperature on aluminum electrolytic capacitors is large, and the service life is reduced by half for each 10°C rise in temperature (Arrhenius law). When the capacity reduction life of the electrolytic capacitor is reached, the Power Supply failures or accidents may occur. We therefore recommend that you replace the Power Supply periodically to minimize product failures or accidents in advance.

✻ The recommended replacement period applies under the following conditions: rated input voltage, load rate of 50% max., ambient temperature of 40°C max., and the standard mounting method.
This product model is designed with a service life of 10 years minimum under the above conditions.

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

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Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

Note: Do not use this document to operate the Unit.

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