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New Product

OMRON

Redundancy Unit
S8VK-R

Contribute to build high reliable systems
Compact and Cost-effective solution for Back-up applications
Easy setup for system reliability requirement



- Redundancy operating LED for the status confirmation
- A signal output for failure detection of power supplies
- By adjusting the power supply voltage to light up Balance LED, the lifetime of power supplies will be more than twice. ✻1
- Wide range input
  DC5-30V (S8VK-R10), DC10-60V (S8VK-R20)
- Wide operation temperature range: -40 to 70 °C
- Safety standards:
  UL508/60950-1, CSA C22.2 No. 107.1/60950-1
  EN50178, EN60950-1 Lloyd's standards ✻2
- EMS: EN61000-6-2
  EMI: EN61000-6-3
- 5 year warranty ✻3

⚠ Refer to *Safety Precautions for All Power Supplies* and *Safety Precautions* on page 9.

✻1. The lifetime will depend on the connected power supply.
Refer to *Functions* on page 5.
✻2. Scheduled to obtain certification in September, 2013.
✻3. Five-year warranty conditions: Rated input voltage, 80% load, Ambient operating temperature: 40°C, Standard mounting.

Model Number Structure

Model Number Legend

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

S8VK-R□□
1

1. Output current
10: 10 A
20: 20 A

Ordering Information

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

Input voltage	Output current	Model number
DC5-30V	10 A	**S8VK-R10**
DC10-60V	20 A	**S8VK-R20**

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S8VK-R

Specifications

Ratings, Characteristics, and Functions

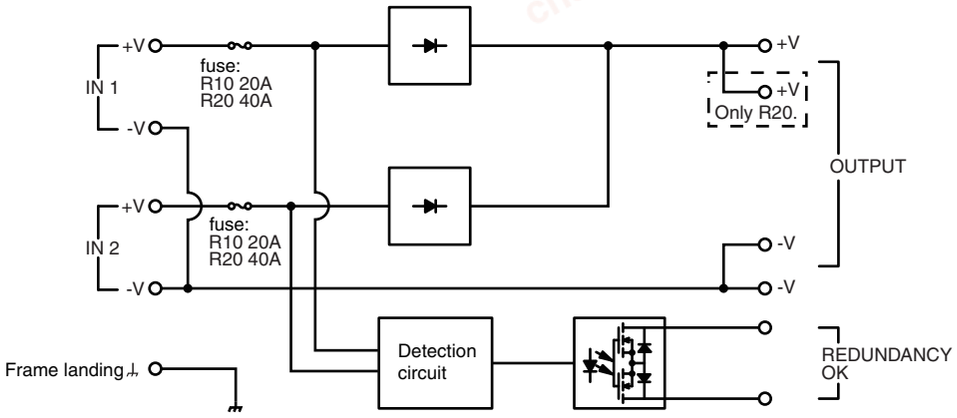
Item	Output Current		10 A	20 A
Input	Voltage		5 to 30 VDC	10 to 60 VDC
	Current		2x 0 to 5 A	2x 0 to 10 A
			1x 0 to 10 A	1x 0 to 20 A
Output	Current	Continuous	10 A	20 A
		Power Boost	12 A (Refer to Engineering Data)	24 A (Refer to Engineering Data)
Voltage drop	Input to Output		0.56 V typ. 2x5 A 0.63 V typ. 1x10 A 0.7 V max. (-40°C 1x10 A)	0.67 V typ. 2x10 A 0.78 V typ. 1x20 A 0.9 V max. (-40°C 1x20 A)
Power losses			6.5 W 2x5 A 7.1 W 1x10 A 0.8 W 0 A	15.8 W 2x10 A 18.0 W 1x20 A 0.8 W 0 A
Additional functions	REDUNDANCY OK	Indicator	Lighting: Voltage difference between Vin1 and Vin2 is less than 2.4 V typ. (color: green)	
		Contact	Photo switch contact ON: Voltage difference between Vin1 and Vin2 is less than 2.4 V typ.	
			Contact Ratings: 30 VDC, 50 mA	
	BALANCE	Indicator	Lighting: Voltage difference between Vin1 and Vin2 is less than 50 mV typ. (color: green)	
Others	Ambient operating temperature		-40 to 70°C (Refer to Engineering Data)	
	Storage temperature		-40 to 85°C	
	Ambient operating humidity		0% to 95% (Storage humidity: 0% to 95%)	
	Dielectric strength (detection current: 20 mA)		1.0 kVAC for 1 min. (between all inputs outputs and ⏚ terminal) 0.5 kVAC for 1 min. (between all inputs outputs and Signal contact)	
	Vibration resistance		10 to 55 Hz, 0.375-mm single amplitude for 2 h each in X, Y, and Z directions	
			10 to 150 Hz, 0.35-mm single amplitude (5 G max.) for 80 min each in X, Y, and Z directions	
	Shock resistance		150 m/s^2, 3 times each in ±X, ±Y, and ±Z directions	
	EMI	Conducted Emission	Conforms to EN61204-3 EN55011 Class B and based on FCC Class B	
		Radiated Emission	Conforms to EN61204-3 EN55011 Class B	
	EMS		Conforms to EN61000-6-2	
	Approved Standards		UL Listed: UL508 (Listing) UL UR: UL60950-1 (Recognition) cUL: CSA C22.2 No.107.1 cUR: CSA C22.2 No.60950-1 EN: EN50178, EN60950-1 Lloyd's standards ✻	
	Degree of protection		IP20 by EN/IEC60529	
	Weight		183 g	462 g

✻ Scheduled to obtain certification in September, 2013.

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Connections

Block Diagrams

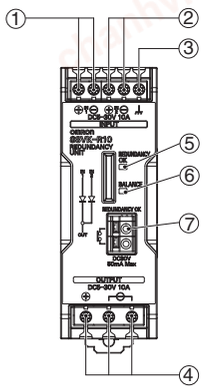


Construction and Nomenclature

Nomenclature

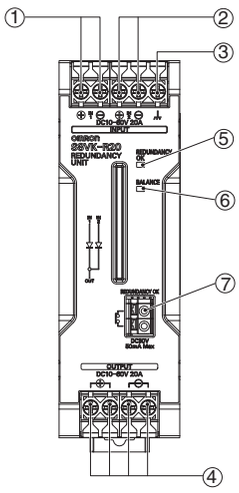
10 A Models

S8VK-R10



20 A Models

S8VK-R20



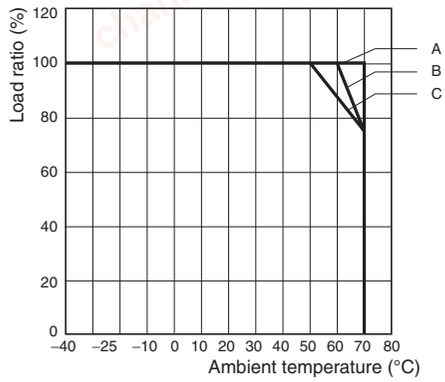
No.	Name	Function
1	Input terminal 1	Connect the input 1 lines to these terminals.
2	Input terminal 2	Connect the input 2 lines to these terminals.
3	⏚ terminal	Connect the ground line to these terminals.
4	Output terminal	Connect the load lines to these terminals.
5	Status indicator (redundancy OK: Green)	Lighting: Voltage difference between Vin1 and Vin2 is less than 2.4 V typ.
6	Status indicator (voltage balance: Green)	Lighting: Voltage difference between Vin1 and Vin2 is less than 50 mV typ.
7	Status contact (redundancy OK: photo switch)	Photo switch contact ON: Voltage difference between Vin1 and Vin2 is less than 2.4 V typ.

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S8VK-R

Engineering Data

Derating Curve



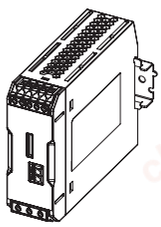
A: Standard mounting

B: Standard mounting, when contact mounted with S8VK-G
60°C and over: the derating is 2.5%/°C (when contact mounted with S8VK-G)

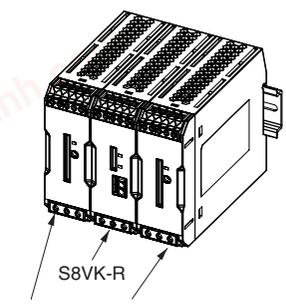
C: Face-up mounting
50°C and over: the derating is 1.25%/°C

Mounting

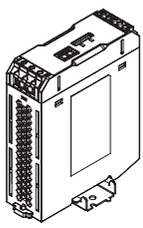
(A) Standard (Vertical) mounting



(B) Contact Mounting



(C) Face-up mounting



Combinations with the S8VK-G

Power supply model	Redundant unit model	
	Redundancy	Higher capasity
S8VK-G015□□	S8VK-R10	S8VK-R10
S8VK-G030□□		
S8VK-G060□□		
S8VK-G12024		
S8VK-G24024		S8VK-R20
S8VK-G24048	S8VK-R20	
S8VK-G48024		
S8VK-G48048		

Power Boost Function

This function is possible when used in combination with S8VK-G (All Models).

Power Boost is a function that can output the temporary repeated boost current larger than the rated current.

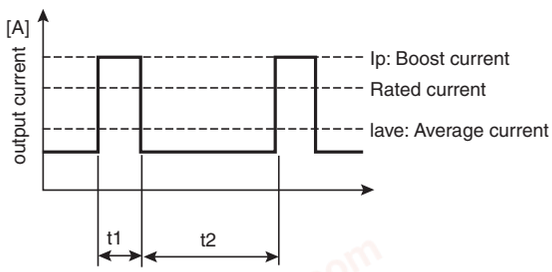
However, it should meet the following four Boost current conditions.

1. Time that the boost current flows: t1
2. The maximum value of the boost current: Ip
3. The average output current: Iave
4. The time ratio of the boost current flow: Duty

Note: Boost current conditions

- t1 ≤ 10 s
- Ip ≤ Rated boost current
- Iave ≤ Rated current

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



- Do not allow the boost current to continue for more than 10 seconds.
  Also, do not let the duty cycle exceed the boost current conditions.
  These conditions may damage the Power supply.
- Ensure that the average current of one cycle of the boost current does not exceed the rated output current.
  This may damage the Power Supply.
- Lessen the load of the boost load current by adjusting the ambient temperature and the mounting direction.

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Functions

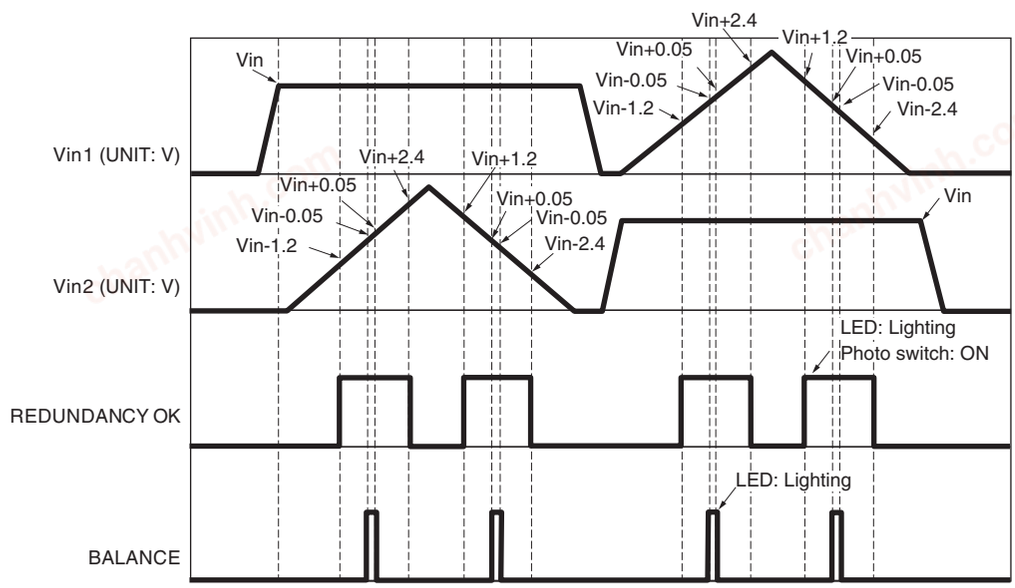
Functions

Status	Output	Display
Redundancy	Relay switch output: OFF (Normally ON)	Green
Voltage Balance	---	Green

Status Functions

Functions	Operation
Redundancy Status (Refer to Chart 1.)	Redundancy OK signal and LED will turn ON and light up when the input voltage difference is 2.4 V typ or less. The signal and LED will detect the failure of a power supply on one side, or connecting errors of power supply voltage.
Voltage Balance Status (Refer to Chart 1.)	Balance LED will light up when the input voltage difference is 50 mV typ or less. By adjusting the input voltage to light up LED, output current of each power supply will be balanced. The lifetime as a power supply system will be more than twice comparing when there is only one power supply. Applicable models: S8VK-G03005, S8VK-G06012, S8VK-G12024, S8VK-G240□□, S8VK-G480□□ By adjusting the input voltage to light up LED, the fluctuation of the output voltage will be less when one of the power supply breaks.

Chart 1: Operation Timing



Reference Value

	Value
Reliability (MTBF)	S8VK-R10: 720,000 hrs. S8VK-R20: 680,000 hrs.
Definition	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	10 yrs. Min.
Definition	The life expectancy indicates average operating hours under the ambient temperature of 40°C and a load rate of 50%. Normally this is determined by the life expectancy of the built-in aluminum electrolytic capacitor.

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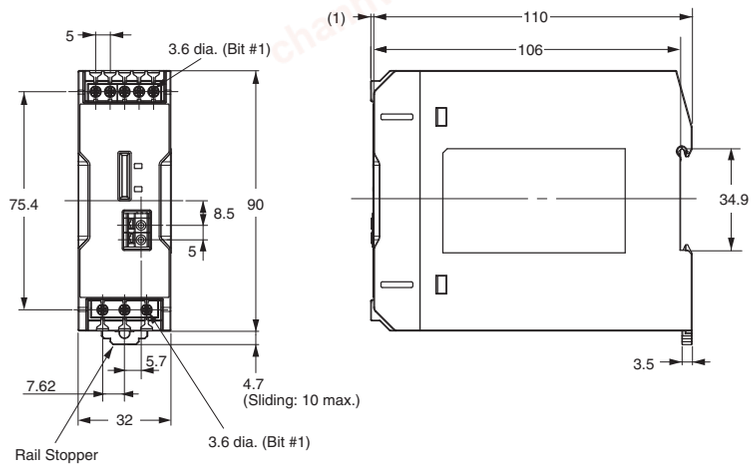
S8VK-R

Dimensions

(Unit: mm)

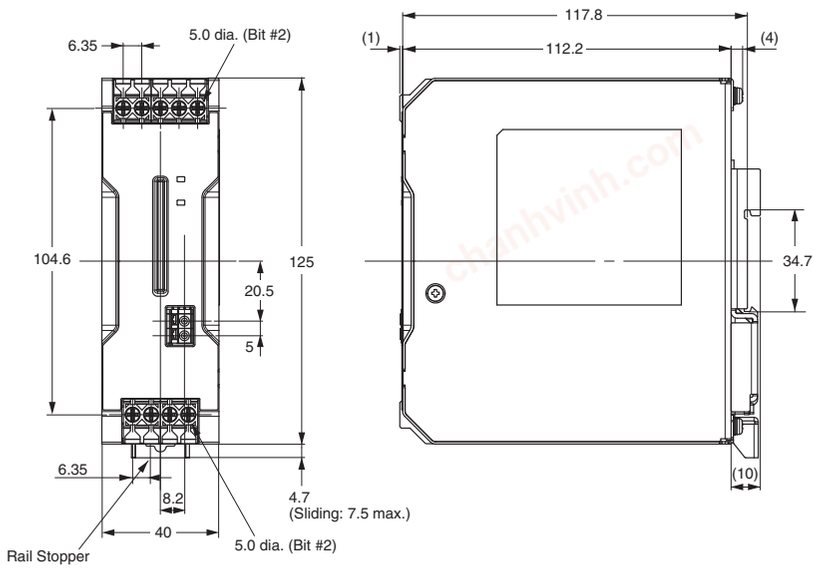
S8VK-R10





S8VK-R20





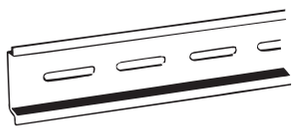
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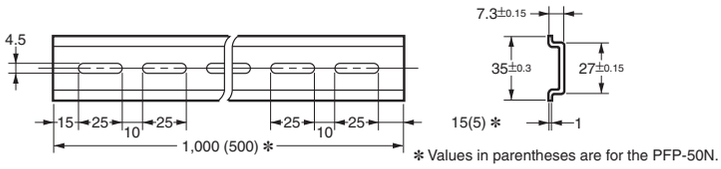
DIN Rail (Order Separately)

Note: All units are in millimeters unless otherwise indicated.

Mounting Rail (Material: Aluminum)

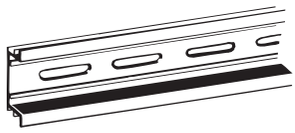
PFP-100N
PFP-50N

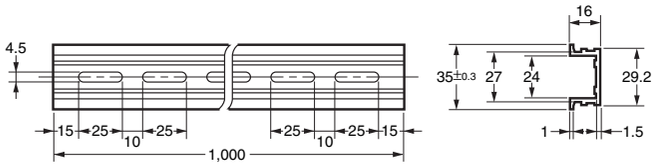




Mounting Rail (Material: Aluminum)

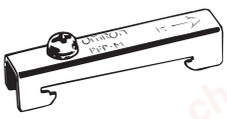
PFP-100N2

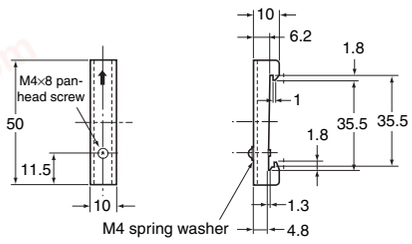




End Plate

PFP-M



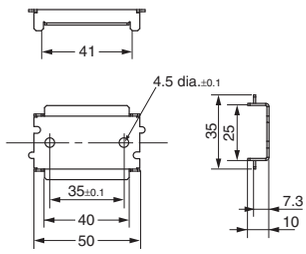
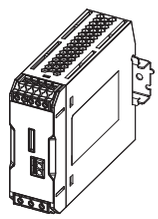
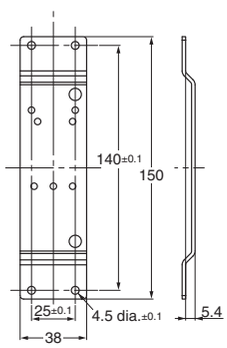
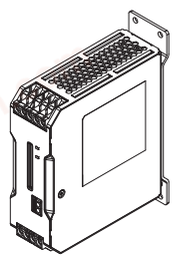
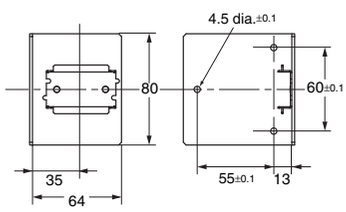
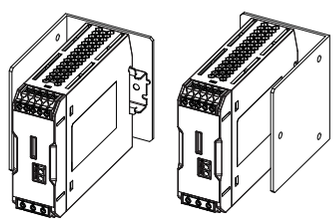
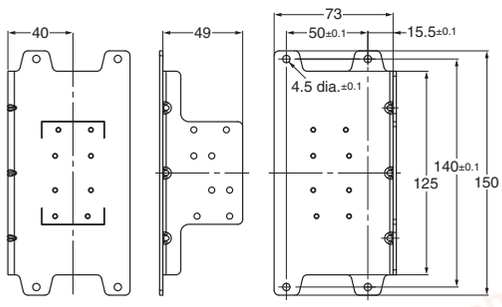
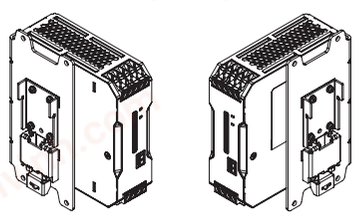


Note: If there is a possibility that the Unit will be subject to vibration or shock, use a steel DIN Rail. Otherwise, metallic filings may result from aluminum abrasion.

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Mounting Brackets

Name	Model
Front-mounting bracket (for S8VK-R10)	**S82Y-VS10F**
Front-mounting bracket (for S8VK-R20)	**S82Y-VK10F**
Side-mounting bracket (for S8VK-R10)	**S82Y-VS10S**
Side-mounting bracket (for S8VK-R20)	**S82Y-VK10S**

Type	Model	Dimensions	Appearance
Front-mounting bracket (for S8VK-R10)	**S82Y-VS10F**	 t = 1.0	
Front-mounting bracket (for S8VK-R20)	**S82Y-VK10F**	 t = 2.0	
Side-mounting bracket (for S8VK-R10)	**S82Y-VS10S**	 t = 2.0	Left-side mounting Right-side mounting 
Side-mounting bracket (for S8VK-R20)	**S82Y-VK10S**	 t = 2.0	Left-side mounting Right-side mounting 

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Safety Precautions

Warning Indications

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

⚠ CAUTION

Risk of a mild burn on rare occasions. Do not touch the device unit while it is powered on or immediately after the power is turned off. 

The ignition may accidentally be caused. Tighten terminal screws to a specified torque 4.43 to 5.31 lb-in (0.5 to 0.6 N·m). 

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

Risk of product damage. Do not reverse the polarity of the device input terminals when wiring. 

Risk of internal component deterioration and damage. Do not connect an AC power supply. 

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. 

Precautions for Safe Use

Wiring

- Minor fire may possibly occur. Ensure that input and output terminals are wired correctly.
- Increases in the temperature of internal parts resulting from heating of wiring materials may result in deterioration or damage to parts. Use wiring materials suitable to the current being used. The following wiring materials, torque and strip length are recommended to prevent heating and possible fires in wiring materials.

Terminal	Model	Recommend Wire Type		
		AWG	Solid wire	Twisted wire
Input	S8VK-R10	AWG14 to 12	2.5 to 4 mm^2	2.5 mm^2
	S8VK-R20	AWG12 to 10	4 to 6 mm^2	4 mm^2
Output	S8VK-R10	AWG14 to 12	2.5 to 4 mm^2	2.5 mm^2
	S8VK-R20	AWG12 to 10	4 to 6 mm^2	4 mm^2
Status contact	S8VK-R□□	AWG16	1.5 mm^2	---
All terminals	wires to be stripped: 8 mm			

- On rare occasions there is a risk of internal element deterioration and damage if use is continued in a short-circuit or over-current state.
- Do not apply more than 75N force to the terminal block when tightening it.
- Use within a range that does not exceed the output current rating. When a load short-circuit occurs, the short-circuit current of two power supply units flows. Use output wiring that can handle the short-circuit current of two units. If the wiring does not have sufficient current capacity, connect a fuse on the output side. Recommended fuse S8VK-R10: 15 A, S8VK-R20: 30 A Fast-acting type
  If the current rating of the output terminal is exceeded on the S8VK-R20, always use multiple terminals simultaneously.
- Risk of damage to internal components. Do not use in a state that exceeds the rated current of the signal output.

Installation Environment

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

Ambient Operating and Storage Environments

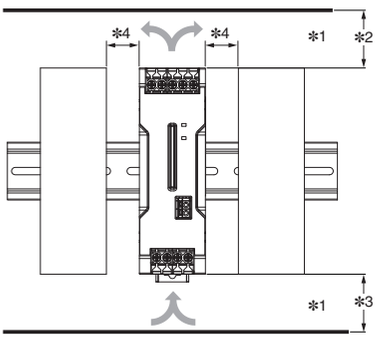
- Store the product with ambient temperature –40 to 85°C, and relative humidity 0 to 95%.
- The internal parts may occasionally be deteriorated or broken. Do not use at a temperature that exceed the operating temperature range for the mounting type.
- Use the product where the relative humidity is 0 to 95%.
- Avoid places where the product is subjected to direct sunlight.
- Avoid places where the product is subjected to penetration of liquid, foreign substance, or corrosive gas.
- Avoid places subject to shock or vibration.A device such as a contact breaker may be a vibration source.
  Set the Redundancy Unit as far as possible from possible sources of shock or vibration.
- If the Redundancy Unit is used in an area with excessive electronic noise or surge, be sure to separate the Redundancy Unit as far as possible from the noise sources.

S8VK-R

Precautions for Correct Use

Mounting

The long-term reliability of the S8VK-R can be increased by installing it properly and sufficiently considering heat dissipation.
Install the S8VK-R so that the air flow circulates around it, because the S8VK-R is designed to radiate heat by means of natural air circulation.
Can be used in a contact mounting with the S8VK-G (not covered by safety certification). Two S8VK-G units cannot be mounted together in a contact mounting.



∗1. Convection of air
∗2. 75 mm min.
∗3. 75 mm min.
∗4. 20 mm min.

Input Voltage

Rating
S8VK-R10: DC5 to 30V
S8VK-R20: DC10 to 60V

Input Power Supply Selection

This product contains an internal fuse. If a power supply other than the S8VK-G is used, the fuse may blow, depending on the state of the load. Do not connect a power supply other than the S8VK-G to this product.
If you are building a redundant system, never use in a state that exceeds the rated current of the power supply. If one of the power supplies goes down, there is a risk that the voltage on the load side cannot be attained.
Use the same model for the power supplies that are connected.
On rare occasions internal element deterioration and damage may occur if use is continued in a short-circuit or over-current state. Do not continue use for more than 10 seconds.
Do not use in applications where load rush current or overload may frequently occur. Slight risk of deterioration and damage due to internal loss.
The signal output / status LED may occasionally not operate stably. When using in environments where the temperature is less than −25 °C, always adjust the 5 V power supply to 5.3 V or higher.

Dielectric Strength Test

The S8VK-R is designed to withstand a voltage test of 1 kV AC between all input/output terminals and the chassis, and 0.5 kV AC between all input/output terminals and the signal output terminal, for one minute.

Note:

1. The S8VK-R may possibly be damaged from the impulse voltage if a testing device switch is used to abruptly apply or shut off 1 kV AC, 0.5 kV AC. Increase the applied voltage gradually using the voltage adjustment on the testing device.
2. When testing, always short-circuit all terminals to prevent damage to the output terminal.

Signal output

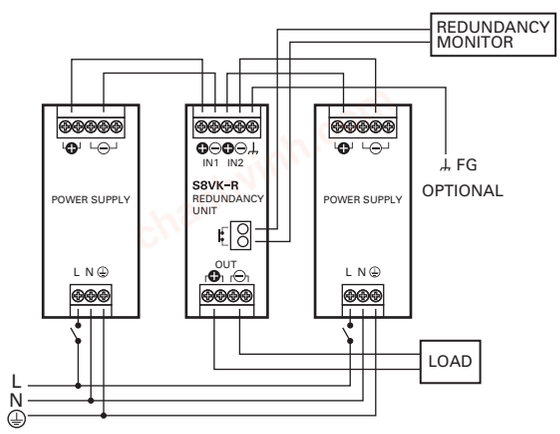
Photo switch output
Photo switch ON when input voltage difference is 2.4 V typ. or less.
30 VDC max. (LVLC), 50 mA max., residual voltage when ON: 2 V max., leakage current when OFF: 0.1 mA max.

Status display LEDs

The status display LEDs show the status of the input power as shown in the table below.
Redundancy OK
Green on: Input voltage difference is 2.4 V typ. or less.
Voltage balance
Green on: Input voltage difference is 50 mV typ. or less.
The redundancy OK display/signal operates when the voltage difference is no more than 2.4 V typ. When using a 5 V or 12 V power supply, verify that there is no difference in the output voltages of the power supplies.
The voltage balance display does not guarantee current balance. The degree of balance varies by model, and therefore if you require operation with balanced current, check the output current of each power supply unit.
The models below use a voltage balance display, and cannot be used as a current balance.
S8VK-G015□□
S8VK-G03012･S8VK-G03024
S8VK-G06024
When adjusting the voltage based on the voltage balance, adjust the voltage of only one power supply. If you must adjust the voltages of both power supplies, be sure to check the output voltage before use.
If you want to use the voltage balance display to ensure that the expected life is obtained, use the same thickness and length of wiring from each S8VK-G to the S8VK-R.

Connections

It is possible to connect S8VK-R like below.



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OMRON EUROPE B.V. • Wegalaan 67-69, NL-2132 JD, Hoofddorp, The Netherlands. • Tel: +31 (0) 23 568 13 00
Fax: +31 (0) 23 568 13 88 • www.industrial.omron.eu

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