

Designing and manufacturing control panels that save space and reduce energy waste



# Innovation for saving energy and resources in control panels

Global warming and climate change are global social issues that drive over 150 countries and regions worldwide to take action toward decarbonization. Our goal is to help manufacturers by improving energy and material efficiency in control panels by 50%, compared to our previous devices, by 2025. We innovate new ways of building control panels, that are at the heart of manufacturing sites.



## Process

Significantly reduce design and manufacturing effort

Innovation in the design and building process

Further Evolution for Panels

## Panel

Realize compact & highly reliable control panels

Contributing to building more sustainable control panels

Energy and material efficiency

Simple & Easy People

## People

Offer reliable and user-friendly manufacturing for everyone working with control panels

## Environmental impact

Improve energy and material efficiency of control panels, contributing to reaching sustainability goals



# Integrating green perspectives into Value Design

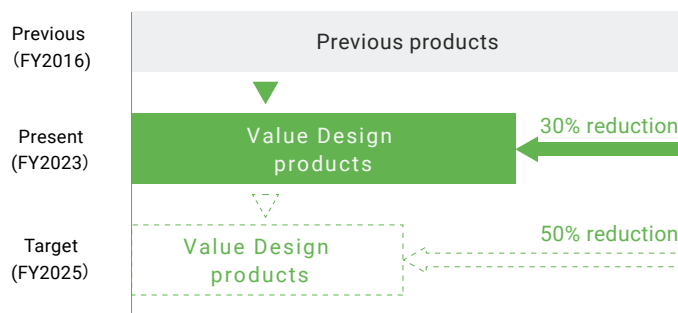
Value Design for Panel (Value Design) is the common concept shared across OMRON's in-panel product specifications to deliver new value to your control panels.

This Value Design also integrates environment consideration concept that enables earth and user-friendly control panel building.

## Value Design for Panel

- 1 ..... Unified height & slim size<sup>\*1</sup>
- 2 ..... Side-by-side mounting at (55°C) ambient temperature<sup>\*2</sup>
- 3 ..... Unique Push-In Plus technology<sup>\*1</sup>
- 4 ..... Front-in and front-release wiring
- 5 ..... eCAD library
- 6 ..... Certification for CE, UL, and CSA
- 7 ..... **Features that save energy and resources<sup>\*3</sup>**

Power consumption and size of devices



\*1. Expect for some products

\*2. Side-by-side mounting is possible in the same series

\*3. Lower power consumption and smaller size of devices compared to previous (2016) products

## Building energy efficient control panels

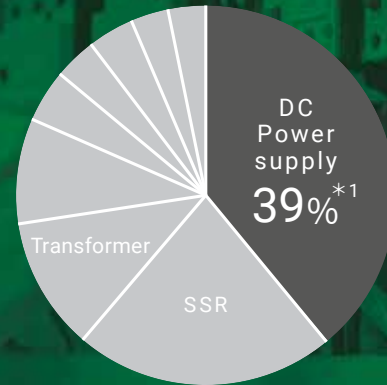
# Reducing power consumption of control panels

Our low power consumption devices allow you to easily build power-saving control panels, without compromising design philosophy.

### Power Issues in control panel

Many devices in control panel consume their own energy, which is then lost as heat. Among them, DC power supplies are one of the most powerful devices.

Power Consumption in Control Panel

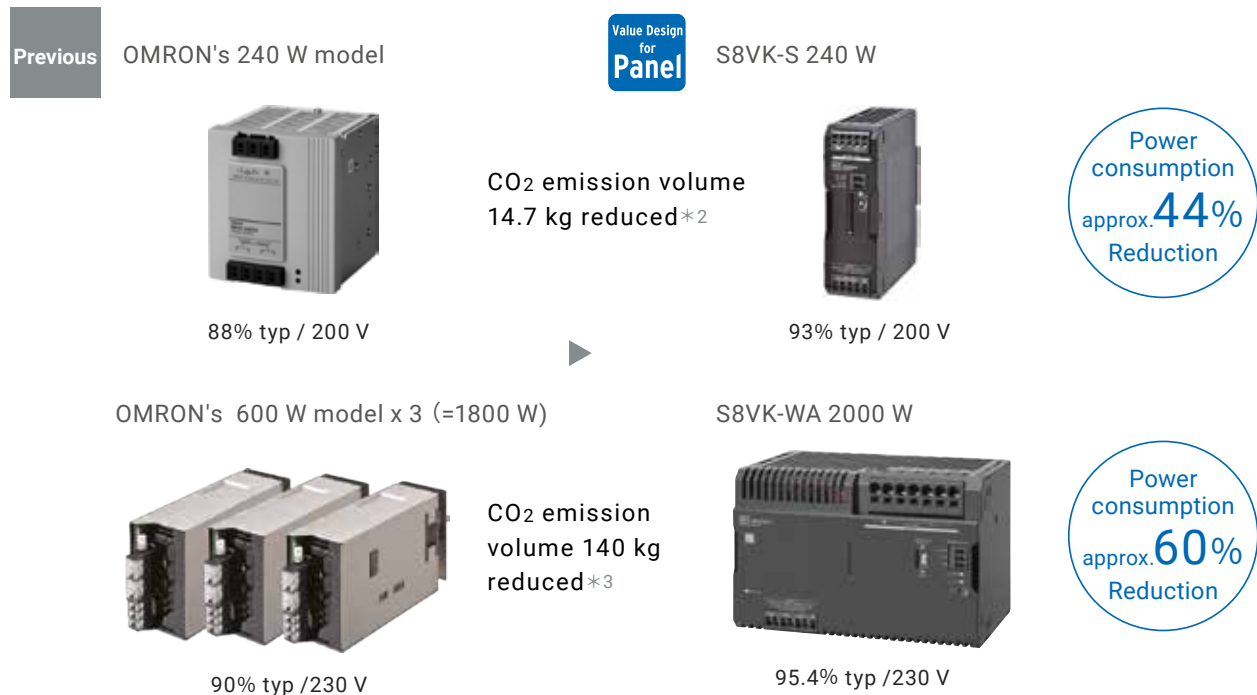


\*1. Percentage of power consumption based on the conceptual control panel designed by OMRON, according to OMRON investigation in May 2023.

## Effect in reducing power loss through the selection of highly efficient DC power sources

Using a more efficient DC power source reduces the power consumed within control panel and consequently contributes to the reduction of estimated CO<sub>2</sub> emissions.

### Case example



\*2. Estimated on 8h/day x 365 days, 180 W output power, 1 Wh=0.4591 g (the in-house conversion rate from electricity to CO<sub>2</sub> emission).

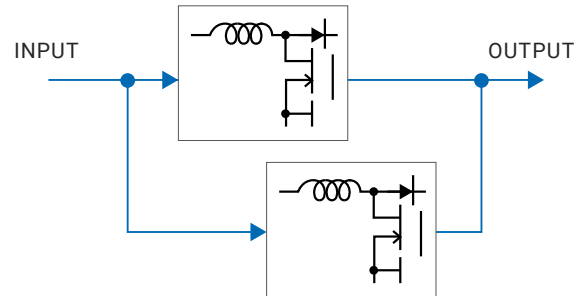
\*3. Estimated on 8h/day x 365 days, 1500 W output power, 1 Wh=0.4591 g (the in-house conversion rate from electricity to CO<sub>2</sub> emission).

## Technology and data to realize low-power consumption

### The achievement of low loss harmonic suppression circuit

#### Interleave method \*1

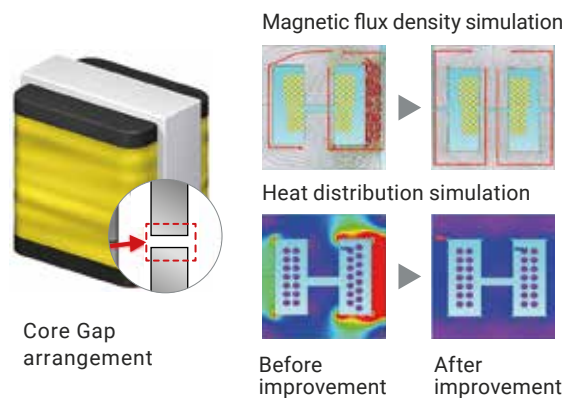
\*1. The interleaving method is a technology that reduces ripple electricity by shifting and controlling the phase of two sets of harmonic suppression circuits consisting of transistors, diodes, and inductors.



Distributed control of harmonic suppression circuit configuration in two sets

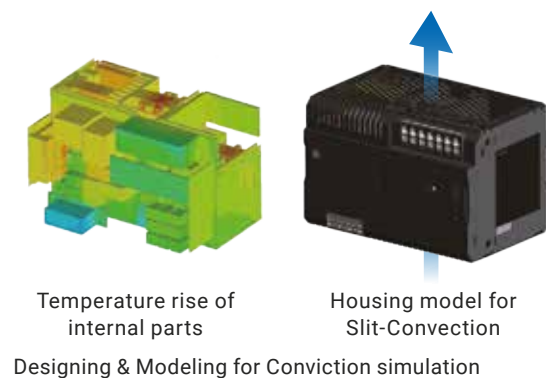
### Pursuit of component performance

Magnetic simulation technology optimizes transformer winding specifications/core gap to reduce power consumption (heat generation)



### Realization of Natural Air Cooling by Modeling Technology

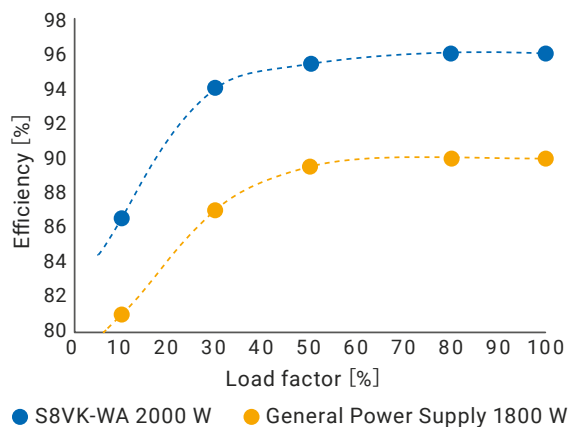
Optimal layout of parts realized by modeling verification of heat generation and convection of parts



## Efficiency improvement effect

### High efficiency even under light load

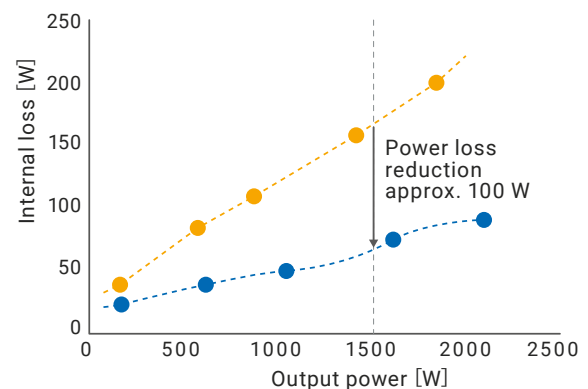
Efficiency Characteristics for Load Factor of Power Supply



Note. According to OMRON investigation in May 2023

### Contribute to reducing CO<sub>2</sub> at the same load by higher efficiency

Internal loss to the output power of the power supply



## Further Evolution for Panels

# Space-saving and high functionality of control panel

## Space-related issues in control panels

While equipment functionality needs to be enhanced, there is often not enough space for additional devices.

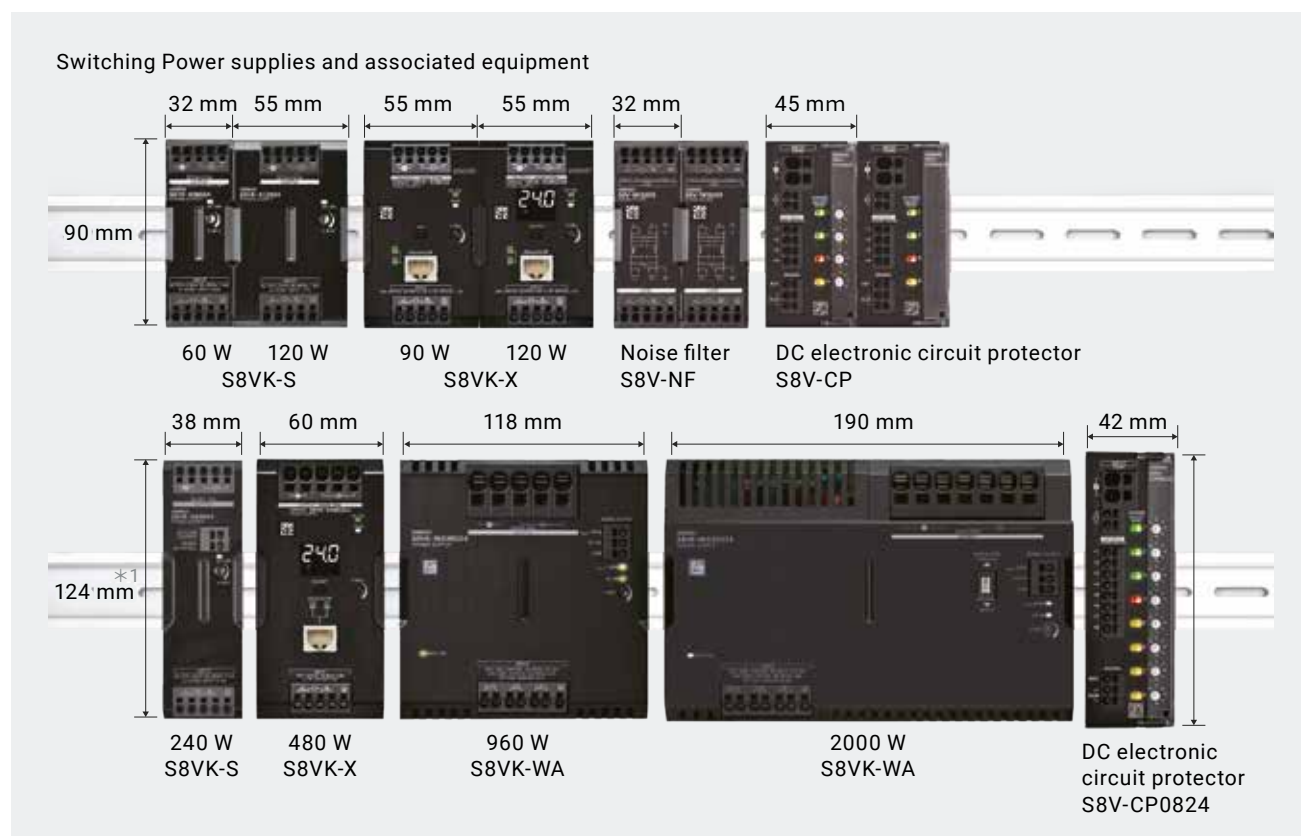
Since some customers specify the control panel size, we aim to make it more compact.



## Unified height reduces dead-space and miniaturizes control panel



Value Design for Panel compliant switching power supplies, noise filters, and DC electronic circuit protectors are standardized in height. This reduces dead-space and the size of control panel.

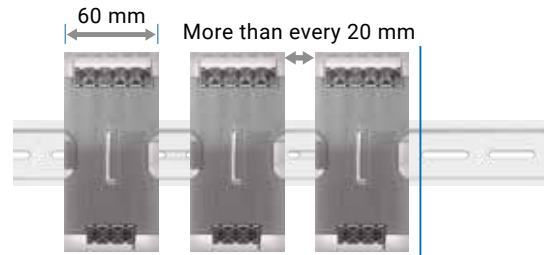


## Contact mounting possible at an ambient temperature of 55°C<sup>\*1</sup>

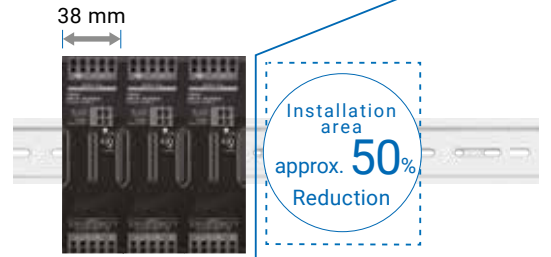
Close mounting can greatly reduce the installation space.

\*1. Refer to the data sheet of each product for detailed usage conditions.

Previous  
OMRON's  
240 W  
model



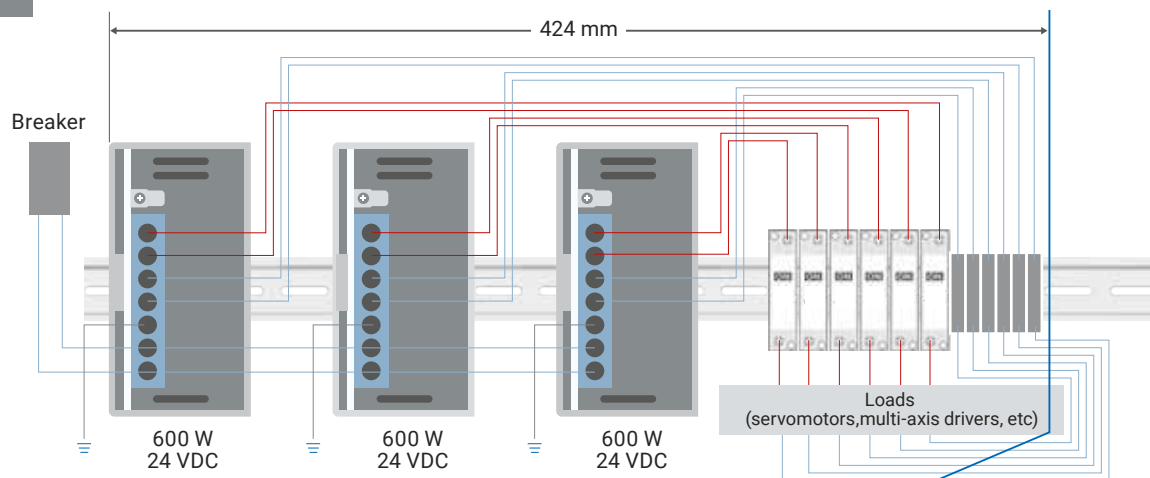
Value Design  
for  
Panel  
S8VK-S  
240 W



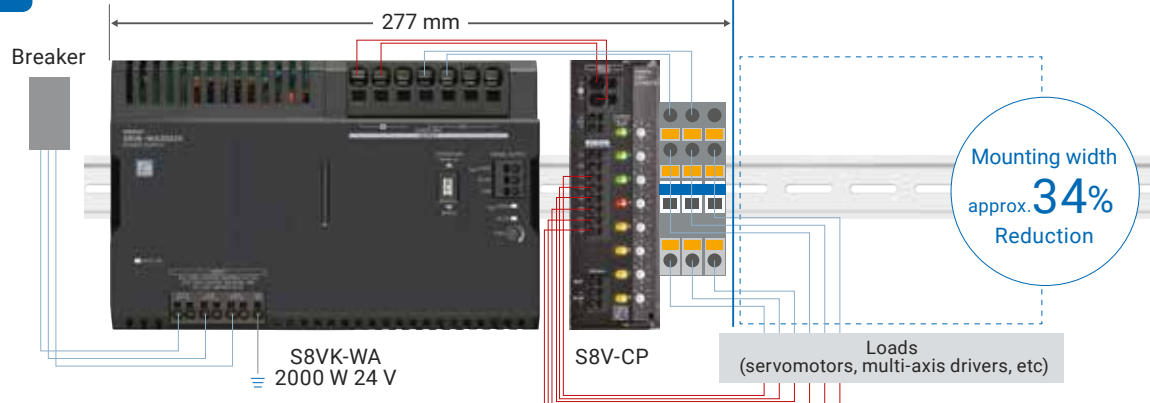
## Reduced mounting space by using new DC distribution methods

Examples of S8VK-WA 2000 W Types: Space-saving implementation by solving wire issues by providing branch methods and protective devices

Previous OMRON's 600 W model × 3 unit + mechanical circuit protector + terminal block



Value Design  
for  
Panel  
S8VK-WA 2000 W + Electronic circuit protector S8V-CP0824 + general terminal block



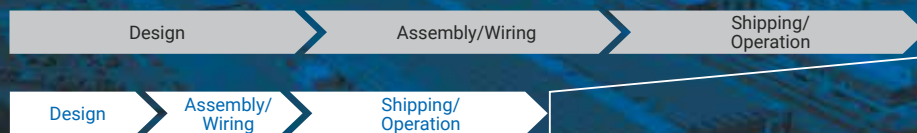
## Innovation for design and building process

# Shortening Lead Time for Control Panel Building

Compatible with eCAD and worldwide safety standards, accelerating an entire process of control panel manufacturing

### Processing Challenges in control panel

Improvement of customer response ability is required by speeding up various processes.



#### Design

The most suitable products can be selected from a wide range of input specifications and capacity types, dramatically reducing design work

#### eCAD library provided for all models greatly reduces design work

Compatible with eCAD and worldwide safety standards, accelerating an entire process of control panel manufacturing. OMRON provides the libraries for over 48,000 models\*1, highest in the industry, to achieve the great reduction of works for electrical design drawing and data creation.



\*1. Based on Omron investigation as of December 2020 for EPLAN  
\*2. For the Zuken E3.series

#### eCAD Partners

By cooperating with various partners, we offer you more choices for your eCAD solutions.

E3.series is a product name of Zuken Inc. for their Electrical and Control Cable Design Solution. EPLAN is a registered trademark of EPLAN Software & Service GmbH & Co. KG.



Zuken Inc.



EPLAN



ECAD Co., Ltd.  
Solutions

#### Assembly/ Wiring

Push-In Plus technology requires only a single step, greatly reducing wiring work



\*3. Information for Push-In Plus and Screw Terminal Blocks is based on OMRON's actual measurement data



- ① Remove the screw
- ② Connect with the terminal
- ③ Tighten the screw
- ④ Put a check mark
- ⑤ Retighten the screw



- ① Insert the terminal

#### Previous

A lot of steps are required to complete wiring for the screw terminal



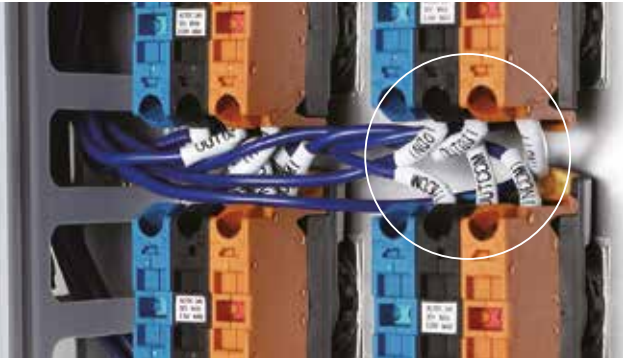
Push-In Plus technology completes by a single step

# Simple and easy to use

## Reducing Wiring Work

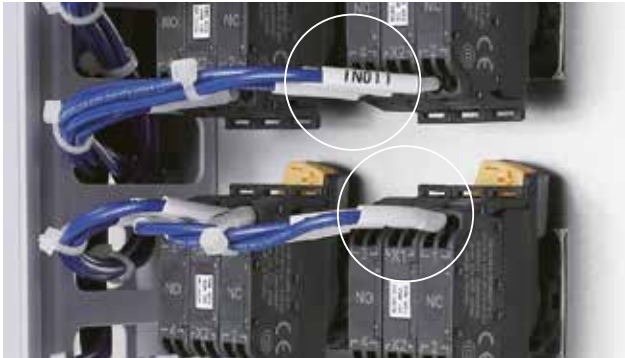
Push-In Plus technology and front-in/front-release wiring make wiring work easier and faster.

Front-in Wiring improves workability and safety without interference of wires even in the narrow space among devices



Previous

Hard wiring in the narrow space by the interference of wires due to the screw terminals requiring wiring in vertical direction



Value Design for Panel

No interference of wiring helps improve workability and safety

Easy wiring with Push-In Plus technology is also available for high-capacity power supplies



Previous

High-capacity power supplies often require special tools, such as bolts or nuts, making connections complex and time-consuming.



Value Design for Panel

Push-in terminals simplify wiring, even for high-capacity power supplies.

Shipping/Operation

LED indicators visualize input power supply / output current status, allowing for faster check-ups upon startup or during operation

S8VK-WA/WB

Situation	Output current exceeds rated current	Output short-circuit	No input/Input voltage is lower than the specified value.
LED display			

# Selections

OMRON's wide variety of products compliant with the "Value Design for Panel" concept



## Single-phase 200 to 240 VAC Input S8VK-WA

Rated input voltage	Rated output voltage	Capacity	Rated output current	Maximum peak current	Efficiency at single-phase 230 VAC input*1	Model	External Dimensions W×H×D(mm)
Single-phase 200-240 VAC (Allowable range:170 to 264 VAC, 240 to 350 VDC)	24VDC	240W	10A	15A	93% typ.	◎S8VK-WA24024	55×124×117
		480W	20A	30A	94% typ.	◎S8VK-WA48024	65×124×117
		960W	40A	60A	95% typ.	◎S8VK-WA96024	118×124×117
		2000W	85A	127.5A	95% typ.	◎S8VK-WA20224	190×124×129
	48VDC	2000W	45A	67.5A	96% typ.	◎S8VK-WA20248	190×124×129



## Three-phase 380 to 480 VAC Input S8VK-WB

Rated input voltage	Rated output voltage	Capacity	Rated output current	Maximum peak current	Efficiency at three-phase 400 VAC input*1	Model	External Dimensions W×H×D(mm)
Three-phase 380 to 480 VAC (Allowable range: Three-phase 320 to 576 VAC, 450 to 810 VDC)	24 VDC	240 W	10 A	15 A	93% typ.	S8VK-WB24024	55×124×117
		480 W	20 A	30 A	94% typ.	S8VK-WB48024	65×124×117
		960 W	40 A	60 A	95% typ.	S8VK-WB96024	118×124×117
	48 VDC	240 W	5 A	7.5 A	93% typ.	S8VK-WB24048	55×124×117
		480 W	10 A	15 A	95% typ.	S8VK-WB48048	65×124×117
		960 W	20 A	30 A	96% typ.	S8VK-WB96048	118×124×117



## Single-phase 100 to 240 VAC Input S8VK-S

Rated input voltage	Rated output voltage	Capacity	Rated output current	Maximum peak current	Efficiency at single-phase 200 VAC input*1	Model	External Dimensions W×H×D(mm)
Single phase 100 to 240 VAC (Allowable range:85 to 264 VAC or 90 to 350 VDC)	24 VDC	30 W	1.3 A	1.56 A	86% typ.	S8VK-S03024	32×90×86
		60 W	2.5 A	3 A	89% typ.	S8VK-S06024	32×90×86
		120 W	5 A	6 A	92% typ.	S8VK-S12024	55×90×86
		240 W	10 A	15 A	93% typ.	S8VK-S24024	38×124×117.8
		480 W	20 A	30 A	93% typ.	S8VK-S48024	60×124×117.8

## Single-phase 100 to 240 VAC input-type S8VK-X (with display and communication)

Cat. No. T211-E1



With Indication Monitor

Rated input voltage	Rated output voltage	Capacity	Rated output current	Maximum peak current	Efficiency at single-phase 230 VAC input*1	Model	External Dimensions W×H×D(mm)
100 to 240 VAC (Allowable range:85 to 264 VAC or 90 to 350 VDC)	24 VDC	90 W	3.75 A	—	87% typ.	S8VK-X09024A-EIP	55×90×86
		120 W	5 A	6 A	92% typ.	S8VK-X12024A-EIP	55×90×86
		240 W	10 A	15 A	93% typ.	S8VK-X24024A-EIP	38×124×117
		480 W	20 A	30 A	94% typ.	S8VK-X48024A-EIP	60×124×117

Without Indication Monitor

Rated input voltage	Rated output voltage	Capacity	Rated output current	Maximum peak current	Efficiency at single-phase 230 VAC input*1	Model	External Dimensions W×H×D(mm)
100 to 240 VAC (Allowable range:85 to 264 VAC,90 to 350 VDC)	5 VDC	30 W	5 A *2	6 A	77% typ.	S8VK-X03005-EIP	40×90×86
	12 VDC	60 W	4.5 A *3	5.4 A	86% typ.	S8VK-X06012-EIP	40×90×86
			2.5 A	3A	86% typ.	S8VK-X06024-EIP	40×90×86
	24 VDC	90 W	3.75 A	—	88% typ.	S8VK-X09024-EIP	55×90×86
		120 W	5 A	6 A	92% typ.	S8VK-X12024-EIP	55×90×86
		240 W	10 A	15 A	93% typ.	S8VK-X24024-EIP	38×124×117
		480 W	20 A	30 A	94% typ.	S8VK-X48024-EIP	60×124×117

## Noise filter S8V-NF

Cat. No. T214-E



Rated voltage	Rated current	Model	External Dimensions W×H×D (mm)
250 VAC 250 VDC	3 A	S8V-NFS203	32×90×86
	6 A	S8V-NFS206	

## DC electronic circuit protector S8V-CP

Cat. No. T227-E1



Number of branched outputs	UL Class2 Output	Rated input voltage	Model	External Dimensions W×H×D (mm)
4 outputs	None	24 VDC	S8V-CP0424	44.8×90×90.8
	Yes		S8V-CP0424S	
8 outputs	None		S8V-CP0824	42×127×118.1

\*1. At the rated output voltage and the rated input current. \*2. At the rated output current, the output power is 25 W  
\*3. At the rated output current, the output power is 54 W

*Would you like to know more?*

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