

For achieving Carbon-Neutral society,
Designing and manufacturing Control Panel with
Low power loss & Space Saving



For building green control panels

Natural disasters caused by global warming and climate change are become global social issue, that drives over 150 countries and regions worldwide to take action toward decarbonization. Our goal is to reduce greenhouse gas (GHG) emissions toward half by through new ways of building control panels, that key figure of the manufacturing site.



Process

Realize greatly reduces design/ manufacturing work

Innovation for design, building Process

Further Evolution for Panels

Panel

Realize compact & highly reliable control panels

Building sustainable control panels

Creating green control panels

Simple & Easy People

People

Provide reliable and comfortable manufacturing for all people who deal with control panels

Green

Reducing GHG emission of control panels to achieve carbon neutrality





Integrating green perspectives into Value Design

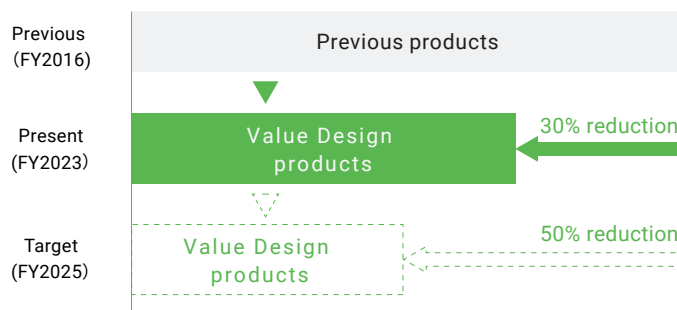
Value Design for Panel (Value Design) is the common concept shared across OMRON's in-panel product specifications to deliver new value to your control panels.

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



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

CFP of control panel (total GHG emissions)^{*4}



*1. Expect for some products

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

*3. Greener design compared to previous (2016) products

*4. CFP (carbon footprint) of control panel is a calculation result of referring the life cycle assessment method that based on international standards ISO14067 which define CO₂ quantitative conversion of the environmental burden at every stage, from manufacturing, transportation, use, and disposal of the control panel (product). According to OMRON investigation in May 2023.

For building green control panels

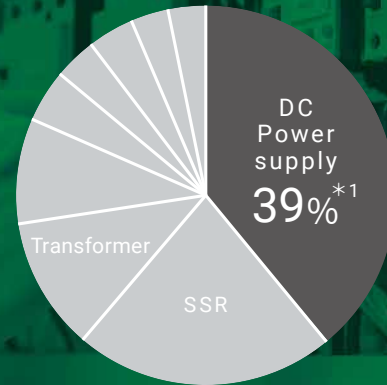
Reducing GHG emissions of control panels

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

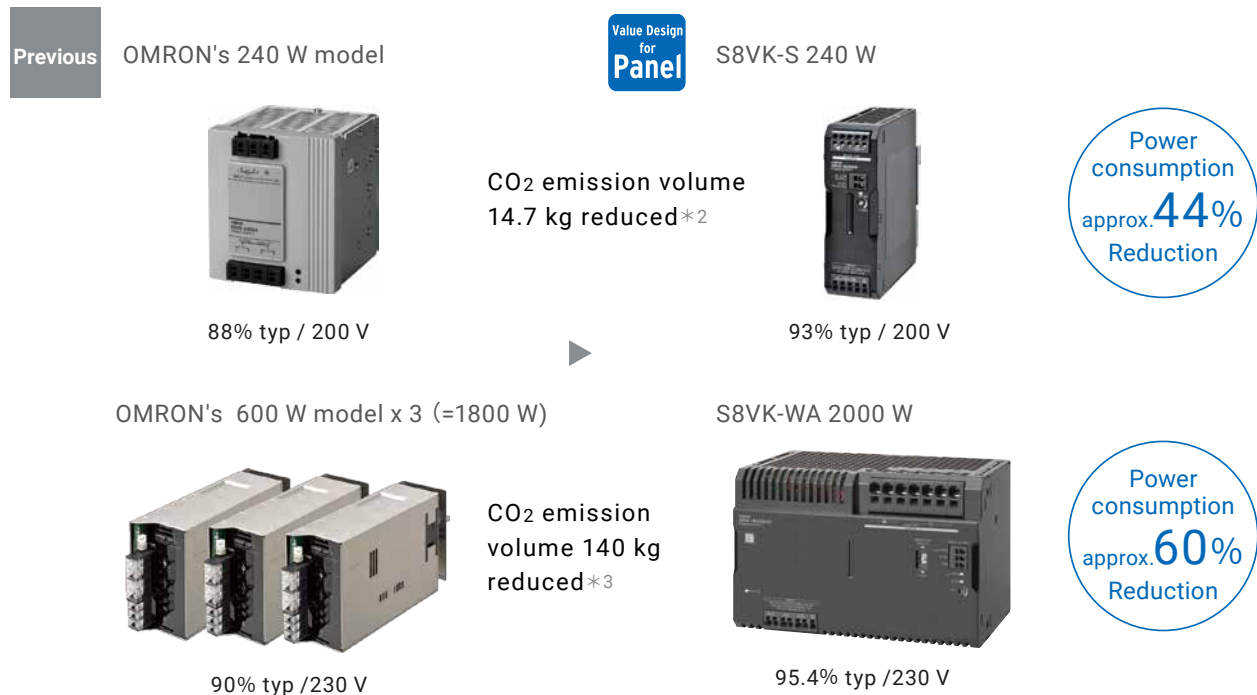


*1. Percentage of power consumption based on the conceptual control panel designed by OMRON, according to OMRON investigation in May 2023.

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

CO₂ is one of the greenhouse gas (GHG). Using a more efficient DC power source reduces the power consumed within control panel and consequently reduces CO₂ 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 CO₂ emission).

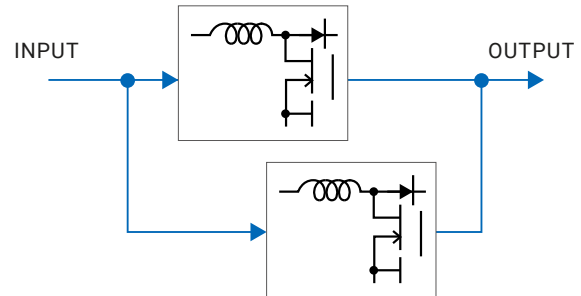
*3. Estimated on 8h/day x 365 days, 1500 W output power, 1 Wh=0.4591 g (the in-house conversion rate from electricity to CO₂ emission).

Technology and data to realize low-power consumption

The achievement of low loss harmonic suppression circuit

Interleave method *1

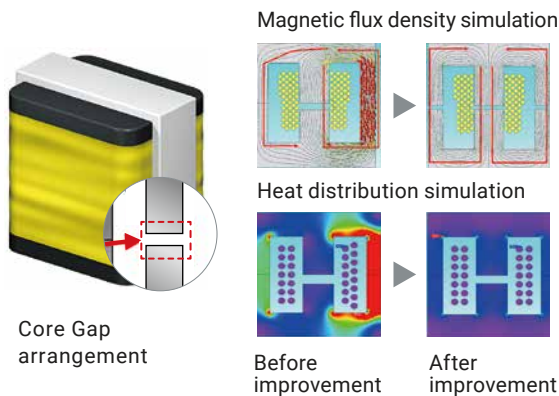
*1. The interleaving method is a technology that reduces ripple electricity by shifting and controlling the phase of two sets of harmonic suppression circuits consisting of transistors, diodes, and inductors.



Distributed control of harmonic suppression circuit configuration in two sets

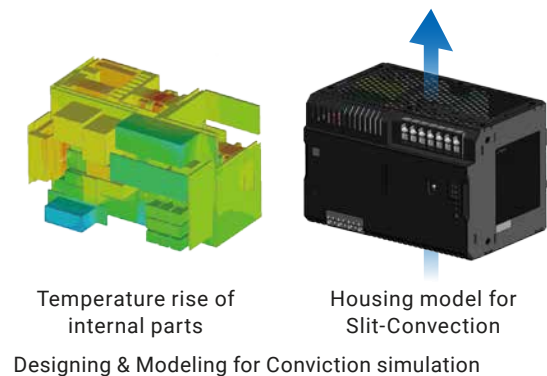
Pursuit of component performance

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



Realization of Natural Air Cooling by Modeling Technology

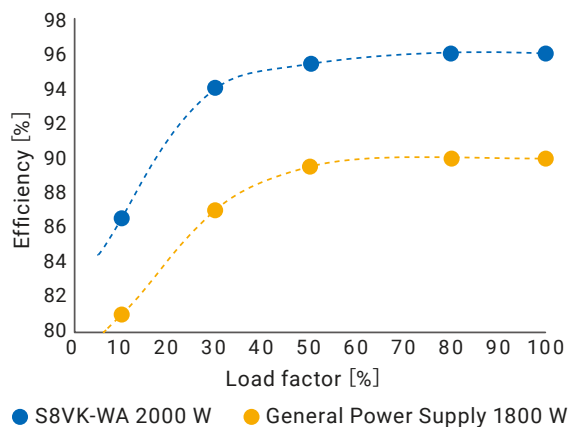
Optimal layout of parts realized by modeling verification of heat generation and convection of parts



Efficiency improvement effect

High efficiency even under light load

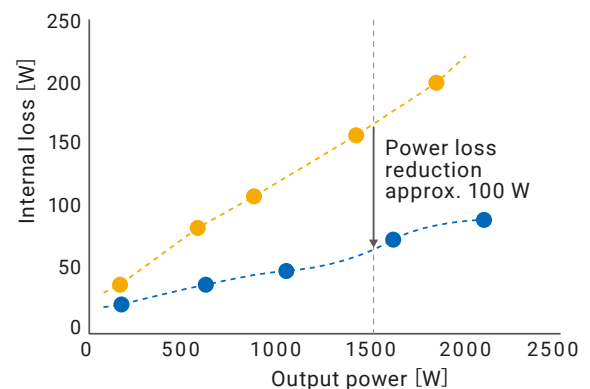
Efficiency Characteristics for Load Factor of Power Supply



Note. According to OMRON investigation in May 2023

Contribute to reducing CO₂ at the same load by higher efficiency

Internal loss to the output power of the power supply



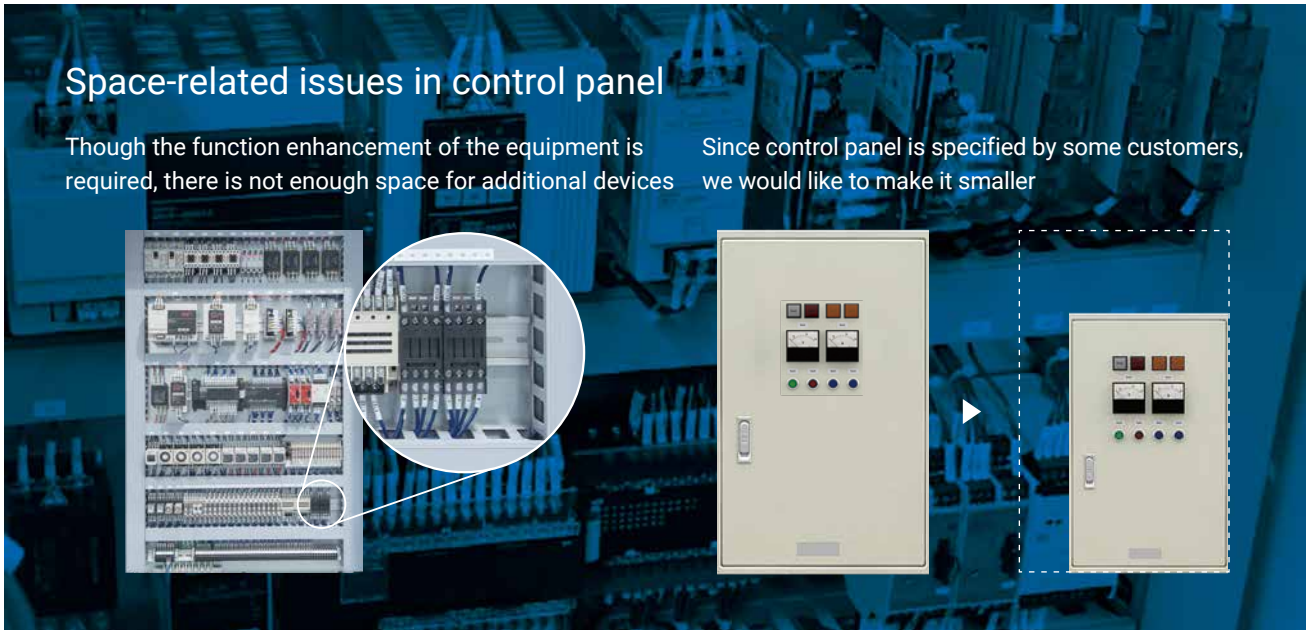
Further Evolution for Panels

Space-saving and high functionality of control panel

Space-related issues in control panel

Though the function enhancement of the equipment is required, there is not enough space for additional devices

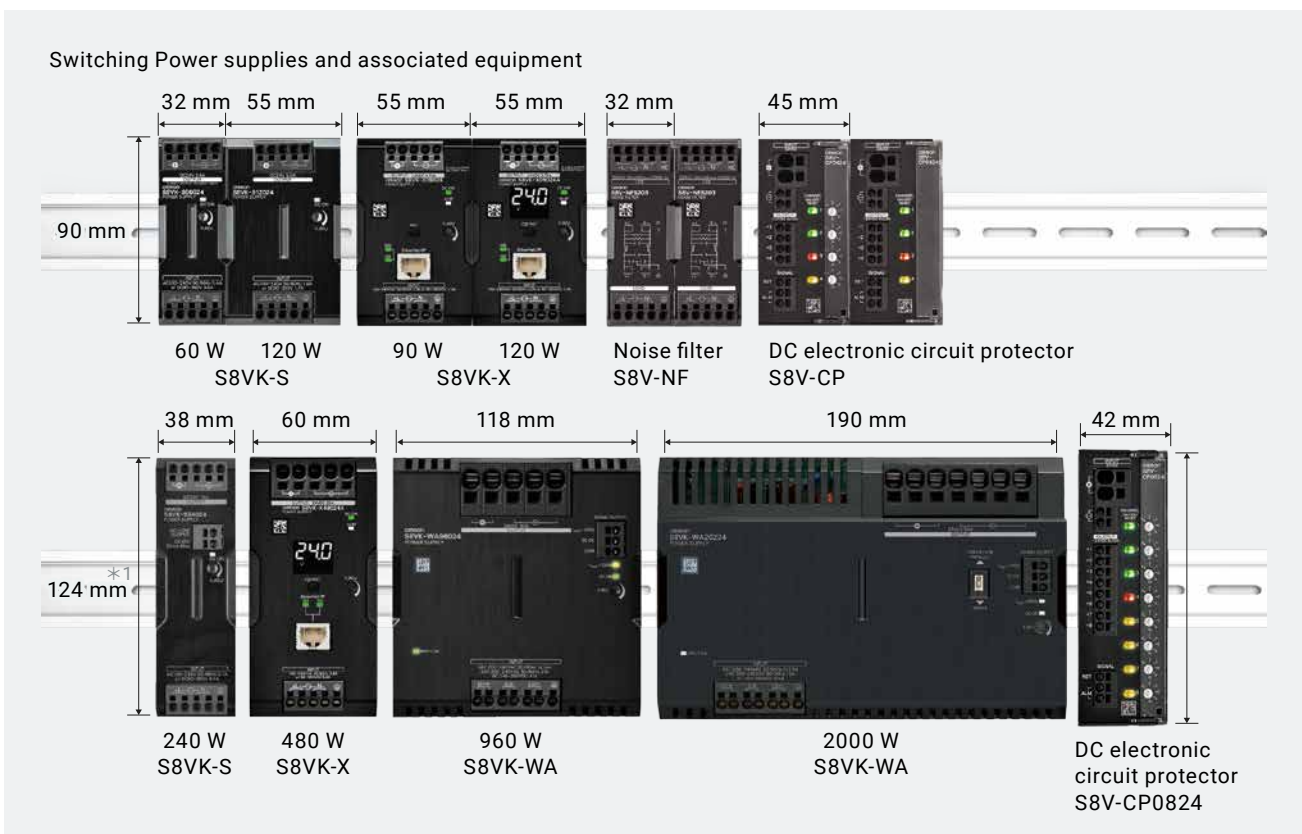
Since control panel is specified by some customers, we would like to make it smaller



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. Reduces dead-space and reduces the size of control panel.



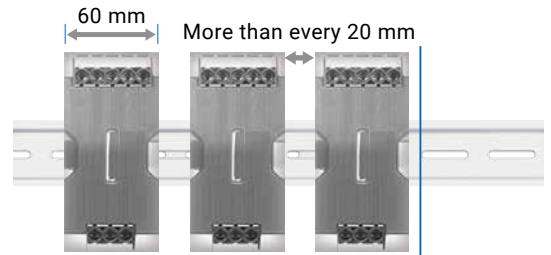
*1. Height: 124 mm, but S8V-CP0824 excluded

Contact mounting possible at an ambient temperature of 55°C^{*1}

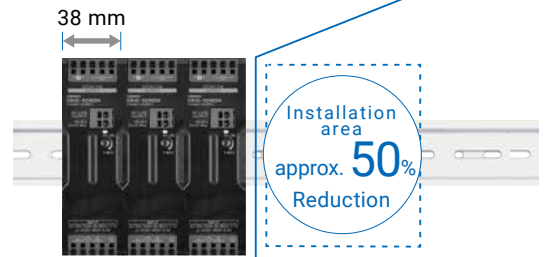
Close mounting can greatly reduce the installation space.

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

Previous
OMRON's 240 W model



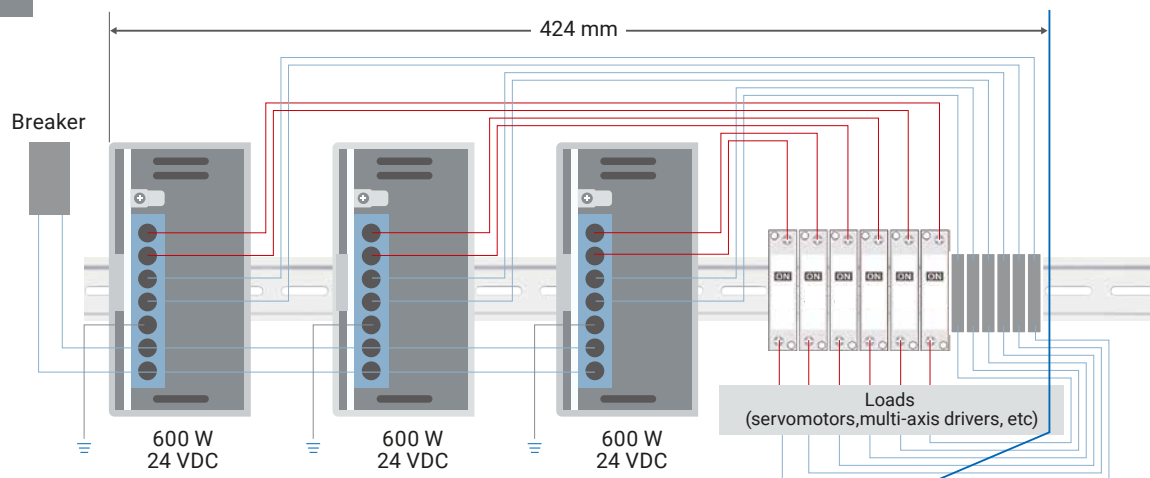
Value Design for Panel
S8VK-S 240 W



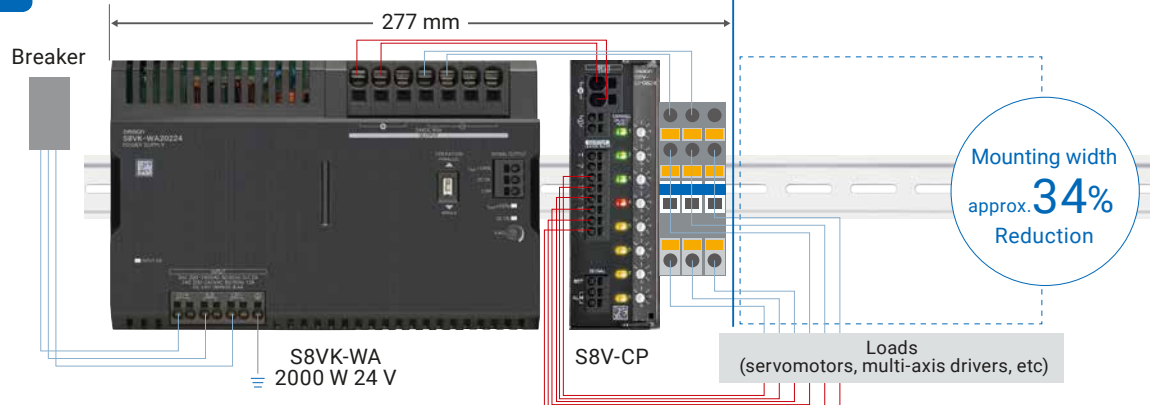
Reduced mounting space by using new DC distribution methods

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



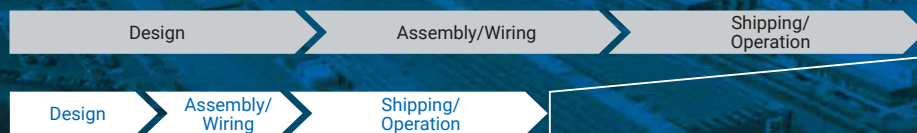
Innovation for design, building Process

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



Zuken Inc.



EPLAN



ECAD Co., Ltd.
Solutions

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.

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

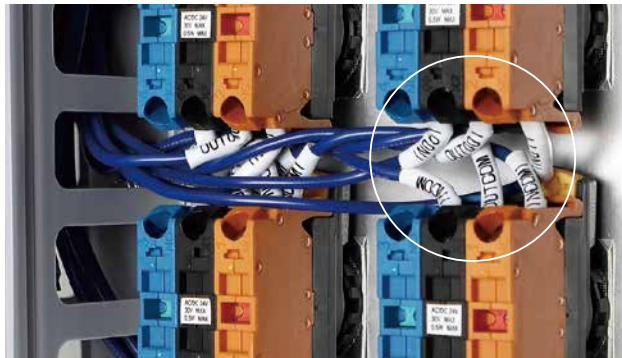


Push-In Plus technology completes by a single step

Simple & Easy People Reducing Wiring Work

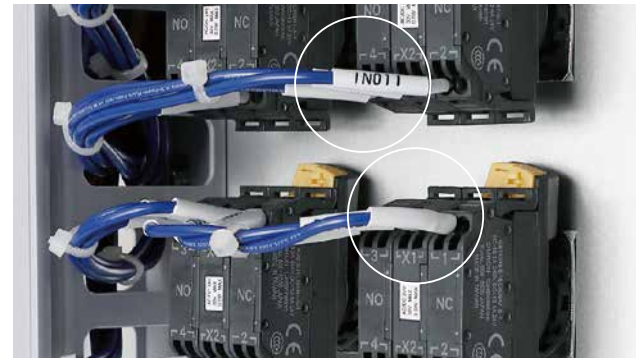
Push-In Plus technology and Front-in / Front-release Wiring allow wiring work easier and speedier.

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 the large capacity of power supplies



Previous

The connection of some power supplies with large capacity needs special tools like bolts or nuts, which is complicated and time-consuming



Value Design
for
Panel

The push-in terminal allows the easiness of wiring even in the large capacity of 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

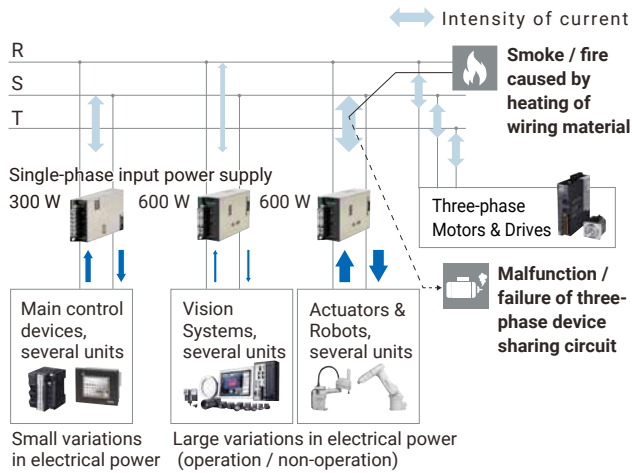
Situation	Output current exceeds rated current	Output short-circuit	No input/Input voltage is lower than the specified value.
LED display			

Reduces issues by preventing failures due to three-phase imbalance and fire risks caused by heat concentration in wiring material

S8VK-WA/WB

Before

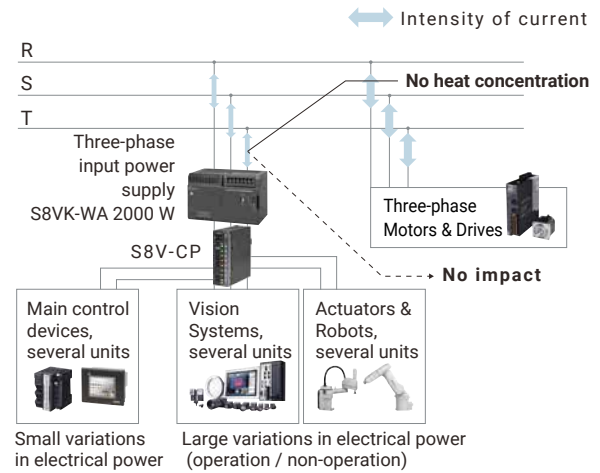
System composition with single-phase input
DC power supply



Constant input current imbalance / workload required to minimize three phase imbalance

Value Design
for
Panel

System composition with three-phase input
DC power supply (2,000 W, 1 unit)



No input current imbalance / no workload required to minimize three phase imbalance

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
Single-phase 200-240 VAC (Allowable range:170 to 264 VAC, 240 to 384 VDC)	24VDC	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

*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

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



Creating green control panels

Cat. No. Y235-E1

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