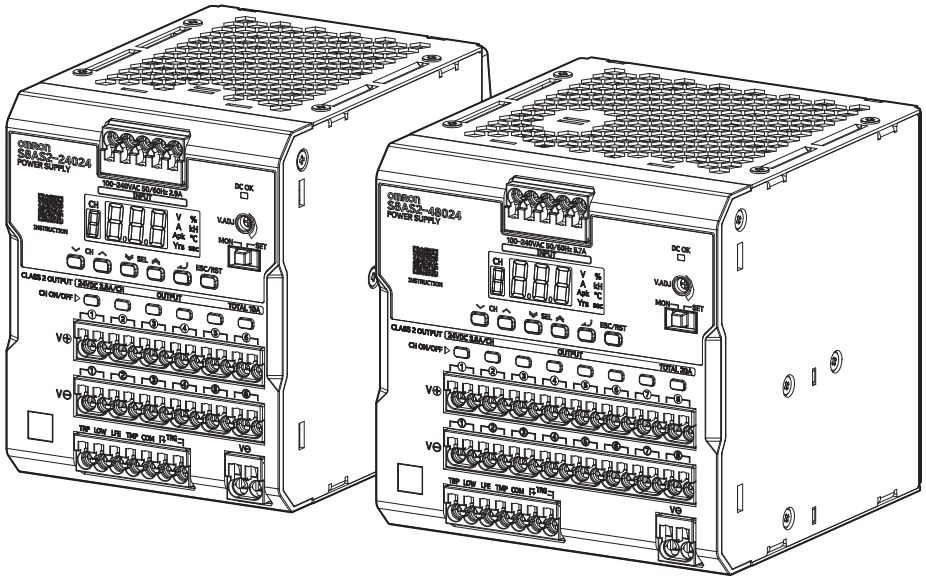
OMRON

Smart Power Supply

User's Manual

S8AS2



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Preface

Thank you for purchasing the S8AS2 Smart Power Supply.

This User's Manual describes the functions, performance, and application methods required to use the S8AS2.

Please read this manual carefully and be sure you understand the information provided before attempting to install or operate the S8AS2 Smart Power Supply.

Keep this User's Manual close at hand and use it for reference during operation.

Make sure that a specialist with a knowledge of electrical systems operates the S8AS2.

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Safety Precautions

Definition of Precautionary Information

The following notation is used in this manual to provide precautions required to ensure safe usage of the S8AS2.

The safety precautions that are provided are extremely important to safety. Always read and heed the information provided in all safety precautions.

The following notation is used.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or there may be property damage.

⚠ WARNING	
If a wire becomes disconnected from the terminal block, electric shock may occur. When connect the wires to the terminal block, insert the solid wire or ferrule straight into the terminal block until the end strikes 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. Working voltage can be 390 V max. inside. This voltage can be also available 30 s after the switch off.	
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.	

Precautions for Safe Use

The S8AS2 Smart Power Supply combines the highly reliable S8VK-S Switch Mode Power Supply with the digital multi circuit protector into a single unit to reduce both wiring and space requirements.

The built-in digital circuit protector uses semiconductor relays to close and trip circuits, and does not contain any contact switching mechanisms, as normal circuit protectors do.

Observe the following precautions when introducing the S8AS2 into or using the S8AS2 in any system.

● Installing/Storage Environment

- Store the Product at a temperature of -40 to 85°C and a humidity of 95% or less.
- To maintain the performance of the maintenance forecast monitor, if long-term storage exceeds three months, store the product at a temperature of -20 to 30°C and a humidity of 25 to 70%.
- Take adequate measures to ensure proper heat dissipation to increase the long-term reliability of the Product. (See page 3-3)
- A different derating curve from the one for the standard mounting must be used if the horizontal separation is less than 15 mm.
- The internal parts may occasionally deteriorate or be damaged. Do not use the Product in areas outside the derating curves.
- Internal parts may possibly be broken. Do not use a current that exceeds the rated total output current. If temporary peak currents occur repetitively, design the system so that the peak currents do not exceed the rated total output current.
- Use the Product at a humidity of 95% or less.
- Do not use the Product in low dew point environments.
- Do not use the Product where it would be subjected to direct sunlight.
- Do not use the Product where it would be subjected to the possibility of penetration of liquid, foreign substance, or corrosive gas.
- Do not use the Product where it would be subjected to shock or vibration. A device such as a contact breaker may be a vibration source. Set the Product as far as possible from possible sources of shock or vibration.
- Poor heat dissipation may deteriorate or damage internal parts. Do not loosen the screws on the side of the Product.
- If the Product is used in an area with excessive electronic noise, be sure to separate the Product as far as possible from the noise sources.
- Cutoff performance is guaranteed according to the ambient operating temperature. Use the Product within the derating range.
- Do not connect a battery or other backup power supply to the output of the Product.
- Although some inverters have an output frequency of 50/60 Hz, they may cause internal temperatures to rise, possibly resulting in burning, if they are connected as the power source for the S8AS2. Do not use the output from an inverter as the power source for the S8AS2.

● Installation/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.
- To prevent wiring materials from smoking or ignition, confirm wire ratings and use the wiring materials given in the following table.

Recommend Wire

Terminal	Recommend Wire Type		
	Model	(mm^2)	(AWG)
Input Terminals	S8AS2-24024-06□	0.5 to 2.5	20 to 14
	S8AS2-48024-08□	0.75 to 2.5	18 to 14
PE (Protective Earth) Terminal	S8AS2-□□-□□	2 to 2.5	14
Positive Branch Output Terminals (+V) Negative Branch Output Terminals (-V)	S8AS2-□□-□□	0.5 to 2.5	20 to 14
Common Output Terminal (-)	S8AS2-24024-06□	2 to 4	14 to 12
	S8AS2-48024-08□	4	12
I/O Signal Terminals	S8AS2-□□-□□	0.25 to 4	24 to 14

Notes: • Use copper stranded or solid wires
• Use heat-resistant wires rated for temperatures above 75°C.

Stripping length

Terminal	Recommend Wire Type	Ferrules length	Recommend Stripping length	
			Ferrules used	Ferrules not used
For terminals other than common output terminal (-)	0.25 to 1.5 mm^2/ AWG24 to 16	8 mm	10 mm	8 mm
		10 mm	12 mm	10 mm
	2 to 2.5mm^2/AWG14	10 mm	12 mm	10 mm
For common output terminal (-)	2 to 2.5mm^2/AWG14	10 mm	12 mm	12 mm
	4mm^2/AWG12	12 mm	14 mm	12 mm

- Do not press down on the terminal block with a force of 40 N or greater (100 N or greater for output terminal blocks) when inserting wires or inserting a flat-blade screwdriver into a release hole.
- 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. Doing so may cause the wire disconnection.
- 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.
- If there is a possibility that the Unit will be subject to vibration or shock, use Wires with Ferrules or Stranded Wires.

- It is conceivable that internal parts may be deteriorated or damaged. Do not repeatedly perform cutoff or recovery operations more than necessary.
- To allow heat to dissipate, always remove the sheet covering the Product for wiring before you turn ON the power.

● Output Voltage Adjustment

- The output voltage adjuster (V.ADJ.) may possibly become damaged. Do not apply more than the required force.
- After adjusting the output voltage, ensure that the total output power and output current of each branch output do not exceed the rated output power and rated total output current.

Precautions for Correct Use

- When the tripping alarm output operates, always remove the cause of the output first and then reset the alarm.
- When cycling the input power supply, always remove any problems first and then turn ON the input power supply.

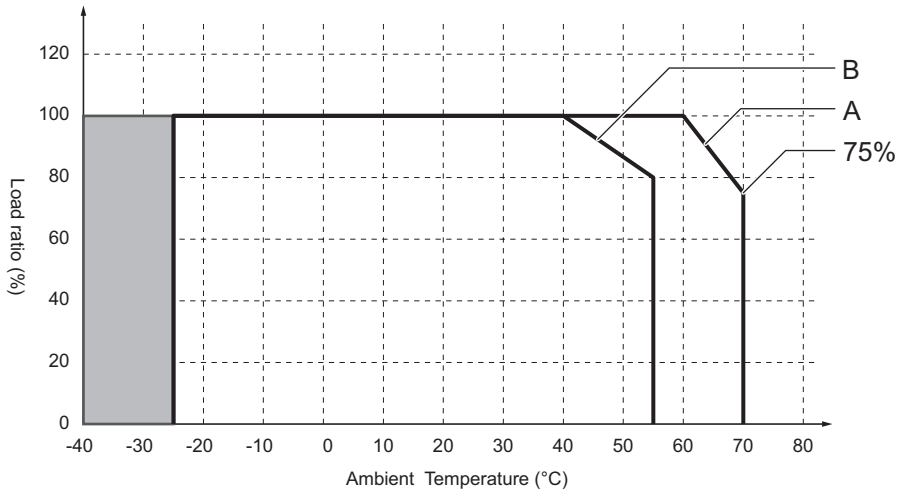
● Mounting

- Mounting Direction
  Mount the S8AS2 using the standard mounting direction. Do not mount it in any other direction, such as face up. (See page 3-4)

● Derating Curve

The temperature range within which the S8AS2 can be used is restricted by the maximum current that normally flows for the total output. This restriction is given as a derating curve.

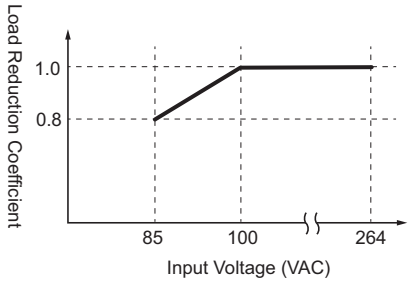
A: Horizontal separation of 15 mm or more (standard mounting)
B: Horizontal separation of less than 15 mm (front flush mounting)



Note 1. In the shaded area, time is required to reach the rated output voltage after the input voltage is applied. Additionally, ripple noise values may fall outside the range specified in sections 2–3.

2. Apply an additional load reduction coefficient based on the input voltage to the load factor indicated in the output derating chart above.

Load Reduction Coefficient Based on Input Voltage



● Input Voltage Tolerance

- Rating: 100 to 240 VAC
- Allowable AC input range: -15 to +10% (85 to 264 VAC)
- When using an input voltage less than 100 VAC, reduce the load calculated with derating 1.33%/V.

● Output Voltage Adjustment

Default Setting: Set at the rated voltage

Adjustment Range: Adjustable with "V.ADJ" (11) on the front surface of the Product from 24 to 28 VDC of the rated output voltage. Turning clockwise increases the output voltage, and turning counterclockwise decreases the output voltage.

Note The output voltage may increase beyond the allowable voltage range when "V.ADJ" (11) operation is performed. When adjusting the output voltage, check the output voltage of the Product and be sure that the load is not damaged. When adjusting to lower the output voltage, this function may activate depending on the set value of the undervoltage detection feature.

● Abnormal Voltage Tripping

1. The S8AS2 is equipped with an abnormal voltage tripping function. If the output voltage exceeds the specified threshold, all branch outputs are automatically shut off. This function, however, does not protect loads and internal parts from high voltages in all cases. Be sure the output voltage is within the rated range.
2. Outputs may be cut off by the abnormal voltage protection with loads that generate reverse peak electromotive force.

● Abnormal Current Tripping

The S8A2S is equipped with an abnormal current tripping function. If the current flowing through any branch output exceeds the preset abnormal cutoff current value, the corresponding branch output is shut off. Also, all branch outputs will be cut off if their total peak output current exceeds a specified value.

Note 1. Continuing operation with overcurrent may occasionally result in deterioration or destruction of internal elements.

2. Do not use the Power Supply Unit for applications in which load inrush current or overload will frequently occur. Doing so may result in deterioration or damage to internal components.

● Maintenance Forecast Monitor Function

The accuracy of the maintenance forecast monitor function will be reduced in applications where the input voltage turns ON and OFF frequently.

Under general usage conditions, the S8AS2 will reach the replacement notification threshold in a few years to over a decade. For long-term use, regularly check that the replacement period is not below 0.5 years by monitoring the display or by following the steps below to ensure that Output Signal LEF-COM is functioning properly:

(a) Set to Monitor Mode.

(b) Confirm that the output between LEF-COM is ON (LEF-COM is conducting).

● Cutoff Performance

There are three methods that can be used to determine abnormal current cutoffs: Standard Detection, Instantaneous Detection, and Extended Detection. The initial setting is Standard Detection. (See page 2-22)

Note 1. When the tripping alarm output operates, always remove the cause of the output first and then reset the alarm.

2. When using a load with a fixed power operation, the S8AS2 may cause a cutoff when the power supply is turned OFF.

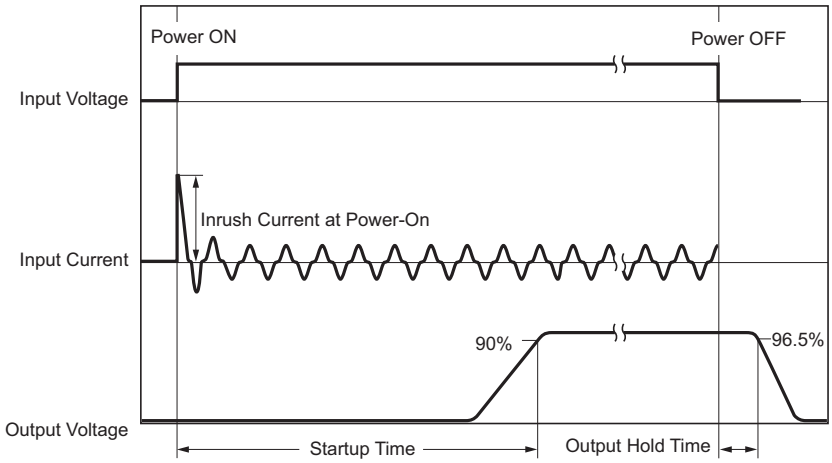
3. Tolerance of current tripping alarm threshold is ±0.3A.

4. Use Extended Detection only when using an OMRON Remote I/O Terminal with short-circuit detection.

● Sound at Power-On

A sound may occur when power is turned on due to the built-in harmonic current suppression circuit. This is a transitional phenomenon that occurs until the internal voltage stabilizes and does not indicate a fault.

● Inrush Current, Startup Time, Output Hold Time



Note When using N units connected with jumper wires, the inrush current will be N times that of a single unit. To prevent external fuses from blowing or breakers from failing to operate due to inrush current, confirm the fuse's melting characteristics and the breaker's operating characteristics before selection.

● Total Peak Output Current

The S8AS2 is designed to provide a temporary peak current to provide the overcurrent required to start load devices. The total peak output current for all branch outputs combined is given below. If the total current exceeds any of these values, all branch outputs will be cut off according to the size of the peak current or application time to ensure safety.

1. 240-W Models
   Peak current/Peak current pulse width:
   17 A max. for 2 s max.
   15 A max. for 5 s max.
   13 A max. for 10 s max.
   12 A max. for 20 s max.
2. 480-W Models
   Peak current/Peak current pulse width:
   27 A max. for 1 s max.
   25 A max. for 2 s max.
   22.5 A max. for 5 s max.

Note 1. If the total output current exceeds the maximum peak current value, internal operation will become unstable and the branch outputs may be cut off.

2. Maintain the total current for normal operation after the load devices have started to within the rated ranges.

● Dielectric Strength Test

The S8AS2 is designed to withstand 3,000 VAC for 1 minute between Input terminal and branch output, I/O signal terminals (3), (4), (5) and (6). When testing, set the cutoff current for the withstand voltage test device to 20 mA. (See page 2-2)

Note 1. The S8AS2 may possibly be damaged from the impulse voltage if a testing device switch is used to abruptly apply or shut off 3000 VAC. Increase the applied voltage gradually using the voltage adjustment on the testing device.

2. When testing terminals together, always short the specified terminals so that the voltage is applied to all of the terminals at the same time.

● Insulation Resistance Test

When testing the insulation resistance, use a DC resistance meter at 500 VDC.

Note To prevent damage, always short branch output terminals (+/-) and all I/O terminals before testing.

● No Output Voltage

The internal circuit's overcurrent protection or overvoltage protection may operate. Alternatively, the latch protection circuit may operate if there is a lightning surge or other large voltage applied to the input. Contact OMRON if there is still no output voltage after checking the following two points:

- Checking Overcurrent Protection
  Check whether the load is in an overcurrent or short-circuited state. Remove the wires to the load before checking.
- Checking Overvoltage Protection and Latching Protection
  Turn the power supply OFF and leave it OFF for at least 3 minutes, then turn it ON again.

● External Tripping Input

For use of this function, refer to *External Output and External Tripping Input Specifications* on page 2-17.

● Tripping Alarm Output, Undervoltage Alarm Output, Maintenance Forecast Monitor Output, and Over Temperature Output

MOS FET relay outputs: 30 VDC max., 50 mA max., residual voltage when ON: 2 V max., leakage current when OFF: 0.1 mA max.

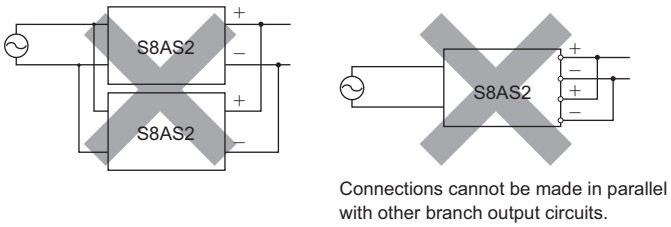
- Wire all output signal circuits correctly. Internal current control circuits are not provided internally for output signals. Do not allow the output current to exceed 50 mA.
- After completing wiring, confirm that the circuits operate correctly.

● Displaying the Output Voltage

The function that detects and displays the output voltage monitors the voltage after AC/DC conversion in the internal circuit. The displayed voltage will be somewhat lower than the value at the output terminals of the power source due to internal voltage drop. To accurately confirm the output voltage, measure it at the branch output terminal.

● Prohibition of Parallel Connection

Do not connect branch outputs from the S8AS2 in parallel. Also, do not connect the branch outputs in parallel with branch outputs of other S8AS2 Units.



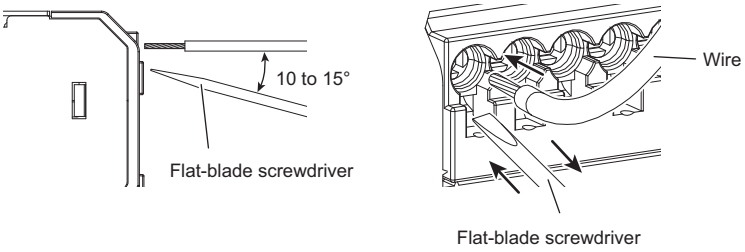
Connections cannot be made in parallel with other branch output circuits.

● Disposal

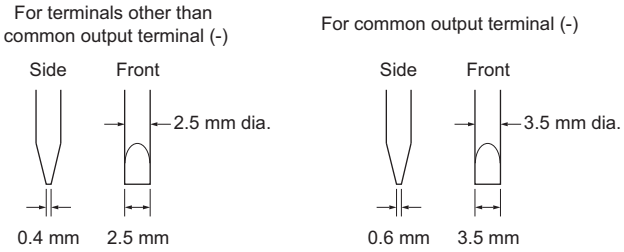
When disposing of the item, treat the S8AS2 as industrial waste.

● Connecting Wires to the Push-In Plus Terminal Block

- When wiring a ferrule terminal or single wire, push it directly into the terminal hole. When wiring a stranded wire, insert the wire into the terminal hole while pushing straight along the taper of the release hole with the recommended flat-blade screwdriver.



- The terminal block may be damaged if a specialized tool is not used. Use a recommended flat-blade screwdriver to insert into a release hole on the terminal block.



Compliance with Safety Standards is as follows:

● EN/IEC 62477-1

- Overvoltage Category III (up to 2000 m)
  Overvoltage Category II (more than 2000 m and up to 3000 m)
- Device Protection Class 1
- Atmospheric Conditions: 3K3

● EN/IEC 61558-2-16

Important Notes:

- Switch mode power supply (SMPS) :
- Short-circuit-proof safety isolating transformer:

● Ambient temperature/ Surrounding Air Temperature

Max. 55°C at 80% load, 40°C at 100% load

(>40°C Load derating: 1.33%/K)

● Pollution degree

Use in pollution degree 2 environment.

● Conformance to RCM

The Power Supply complies with RCM as an industrial device.

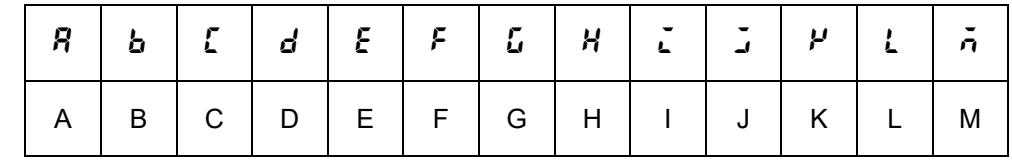
Using this Manual

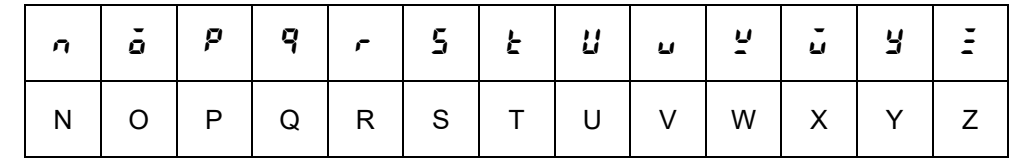
● Notation in this Manual

In this manual, the S8AS2 Smart Power Supply is referred to as the S8AS2.

● Notation of Setting Data

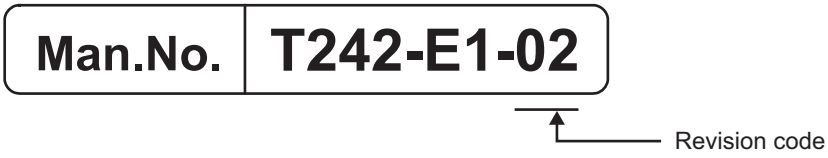
Setting data codes and contents are displayed in seven-segment display characters, as shown in the following diagram.

												
A	B	C	D	E	F	G	H	I	J	K	L	M

												
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

Revision History

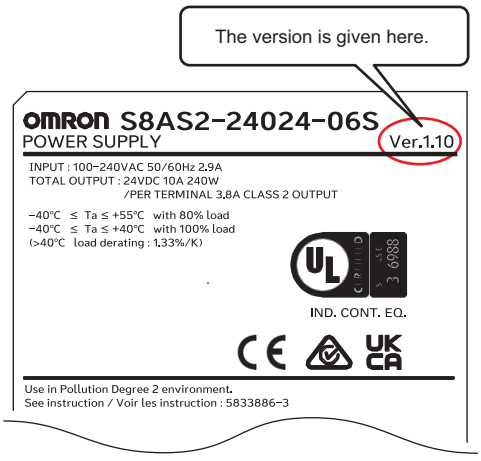
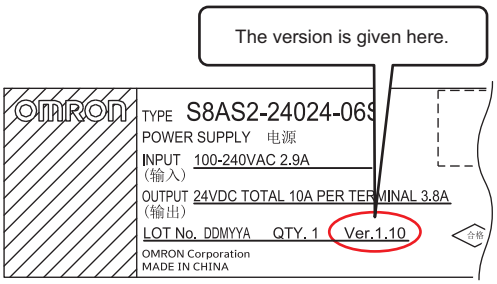
A manual revision code appears as a suffix to the catalog number on the front cover of the manual.



Revision code	Date	Revised content
01	October 2025	Original production
02	July 2026	Added Functions (version 1.1) • Channel ON/OFF key response time setting • Tripping Alarm Output conditions

Versions

Check the version on the nameplate on the S8AS2 Smart Power Supply or on the label on the packing box. If the version is not given, the version of the S8AS2 Smart Power Supply is version 1.00.

Product nameplate	Package label
	

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1

Features and Functions

1-1 Overview of Features and Functions

The S8AS2 Smart Power Supply is a power supply unit that incorporates the highly reliable S8VK-S Switch Mode Power Supply and the Digital Multicircuit Protector into a single unit to reduce both wiring and space.

The input power supply to the S8AS2 is 100 to 240 VAC at 50/60 Hz. Models are available each for 240 W with 6 branch outputs or for 480 W with 8 branch outputs, with and without changeable settings. The S8AS2 provides a stable 24-VDC at an output current of 3.8 A maximum per branch output.

Model Number Legend

Model Number Structure

S8AS2 - □□□ □□ - □□ □ □

Series name ① ② ③ ④ ⑤

① Capacity

Symbol	Capacity
240	240 W
480	480 W

② Output voltage

Symbol	Output voltage (DC)
24	24 V

③ Number of output branches (No.r of CH)

Symbol	Number of output branches (No. of CH)
06	6 branch outputs
08	8 branch outputs

④ Class 2-compliant

Symbol	Class 2-compliant
S	UL Class 2-compliant

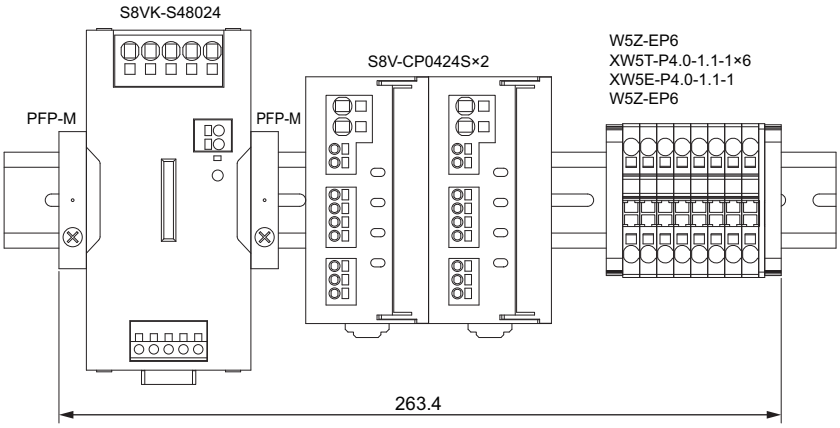
⑤ Setting changeability

Symbol	Setting change
Blank	Changeable
N	Not changeable

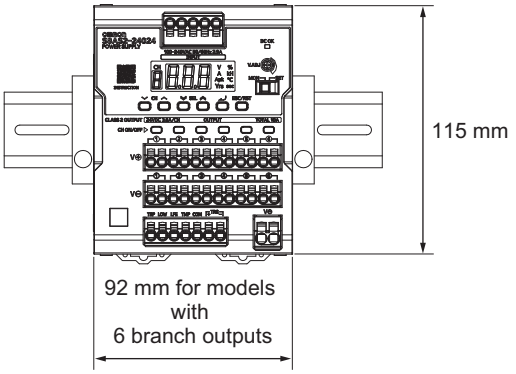
Reduced Space, Wiring, and Work

- Combination of S8VK and S8V-CP

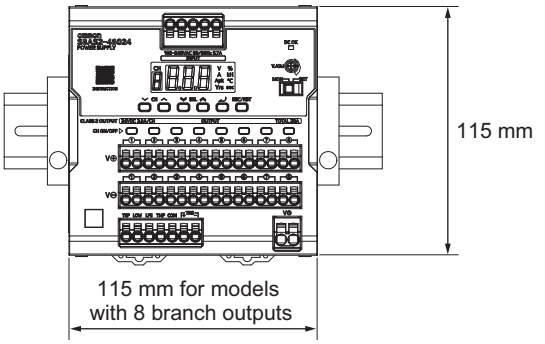
The space required within the control panel and the amount of wiring have been reduced by integrating a Digital Multicircuit Protector into a Switch Mode Power Supply.



- S8AS2-24024-06□ (240 W, 6 Branch Outputs)



- S8AS2-48024-08□ (480 W, 8 Branch Outputs)



Power Supply and Branch Outputs

The power supply section incorporates the AC-DC conversion circuit of the S8VK-S Switch Mode Power Supply which achieves high conversion efficiency in order to produce stable 24-VDC power.

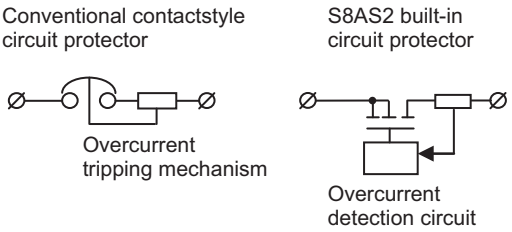
The branch output circuits consist of the protection circuits and tripping circuits that inherit the performance of the S8M Digital Circuit Protector. They support various safety functions, such as overvoltage protection, overcurrent protection, and short-circuit protection, as well as maintenance functions, such as monitoring using the seven-segment display, error indications, and various alarm outputs.

Branch Output Tripping Circuits

● No-contact Switching

The S8AS2 built-in circuit protectors differ from conventional mechanical contact-type circuit protectors in that they use no-contact power MOSFET switching.

Without the contact life of mechanical circuit protectors, semiconductor relays are able to provide a much longer lifetime. Digital processing also provides other benefits, such as being able to specify detailed overcurrent detection conditions.



● Tripping Current Can be Set for Each Branch Output

The abnormal tripping current value can be set for each branch output.

Setting range: 0.5 to 3.8 A (in 0.1 A increments).

Tolerance of current tripping threshold: ±0.3 A.

● Abnormal Current Detection and Tripping Time

The abnormal current tripping characteristics can be set for each branch output. (This is not possible for the S8AS2-□□-□SN.)

There are three methods that can be used to determine abnormal current trippings. (This is not possible for the S8AS2-□□-□SN.)

- Standard Detection
  When the current exceeds the set value, the branch output is cut off within 100 ms.
- Instantaneous Detection
  When the current exceeds the set value, the branch output is cut off within 20 ms.
- Extended Detection
  When the current exceeds the set value, the branch output is cut off within 1,000 ms.

● Error Indication and Alarm Output for Abnormal Current Tripping

The following will occur when an abnormal current is detected and the branch output is cut off:

- The channel ON/OFF key of the branch output will light red.
- The seven-segment display will show the error code A11 and the abnormal current value alternately.
- The external output terminal for tripping alarms (TRP) will turn ON. (The MOSFET relay output will turn OFF.)

Always remove the cause of the abnormal current before resetting the alarm.

● Tripping for Total Peak Output Current

When the total branch output current exceeds the set value for a specified amount of time, all branch outputs will be cut off.

- The channel ON/OFF key of all branch output will light red.
- The seven-segment display will flash the error code A12.
- The external output terminal for tripping alarms (TRP) will turn ON. (The MOSFET relay output will turn OFF.)

● Abnormal Voltage Tripping

If the output voltage exceeds the abnormal voltage tripping setting, all branch outputs will be cut off in order to protect load devices.

The following will happen when this occurs:

- The seven-segment display will show the error code A10 and the abnormal voltage alternately.
- The external output terminal for tripping alarms (TRP) will turn ON. (The MOSFET relay output will turn OFF.)

Internal Temperature Monitor

The S8AS2 has an built-in temperature sensor that constantly measures the internal temperature.

The temperature can be read from the seven-segment display. The temperature display range is -20 to 120°C.

The temperature sensor has one external output (TMP), which can be used to control cooling equipment for the control panel.

The temperature output setting range is 25 to 100°C.

- The seven-segment display will show the error code A30 and temperature (°C) alternately.
- The external output terminal for over-temperature (TMP) will turn ON. (The MOSFET relay output will turn OFF.)

Maintenance Forecast Monitor Function

This function calculates the condition of the electrolytic capacitor based on the power-ON time and internal temperature of the Power Supply to forecast when the Power Supply needs to be replaced.

The monitor value can be set to between 0.0 and 5.0 years (approximate) in increments of 0.1 years.

The following occurs when the estimated replacement time reaches the set value:

- The seven-segment display will show the error code A23 and the replacement time (years) alternately.
- The external output terminal for the maintenance forecast monitor (LFE) will turn ON. (The MOSFET relay output will turn OFF.)

Also, the monitor value can be set not by the number of years but also by the percentage (%) up to the estimated replacement time.

Safety Functions

If an abnormal voltage or current is detected, the power MOSFET will cut off the branch output.

In the unlikely event that the power MOSFET cannot cut off an abnormal current or short-circuit current, the short-circuit protection fuse will cut the circuit to protect the system.

If the branch output is cut off by the fuse, an error indication will not be shown on the seven-segment display and the alarm output (TRP) will not operate.

The overcurrent protection fuse or over-temperature fuse cannot be replaced. If a fuse burns out, use a different branch output or replace the S8AS2.

External Outputs

The S8AS2 has 4 external outputs: the Tripping Alarm Output (TRP), Undervoltage Detection Output (LOW), Maintenance Forecast Monitor Output (LFE), and Over-temperature Output (TMP).

Output	Output condition	Restoration condition
Tripping Alarm Output (TRP)	• Abnormal Voltage Tripping If the output voltage exceeds the abnormal voltage tripping setting, all branch outputs will be cut off. • Abnormal current tripping If a current exceeding the set value is detected, the corresponding branch output is cut off.	The output status is retained when power is interrupted but can reset with the reset operation.
Undervoltage Detection Output (LOW)	Output when the 24 VDC output falls below the undervoltage detection threshold.	This output can be reset with the reset operation. If the alarm is cleared when the power is turned ON, the output will be reset.
Over-temperature Output (TMP)	Output when a temperature exceeding the threshold is detected.	The output is reset automatically when the temperature falls to 3°C below the over-temperature output threshold.
Maintenance Forecast Monitor Output (LFE)	• Output when the estimated replacement time falls below the set value. • Output when the replacement time can no longer be calculated due to rise in temperature of the power supply section.	• Prepare to replace the Power Supply. • Take measures to lower the internal temperature.

Tripping Functions Using External Signals

Branch outputs can be forcibly cut off by turning ON the External Tripping Input (TRG).

- Tripping using the External Tripping Input can be enabled or disabled independently for each branch output. Refer to *Tripping trigger enable/disable* on page 4-11.
- The External Tripping Input directly cuts off a branch output's DC circuit, so it acts even faster than cutting off the output by turning OFF the normal AC power supply.
- When a shutdown sequence has been set, this function can be used to set a time lag for the branch output cutoff. (For details, refer to *2-6 Shutdown Sequence Function* on page 2-30.)
- The tripping input type can be set. (Refer to *2-7 External Tripping Input Function* on page 2-31)
  - EGE: Output cut off when the tripping input changes from OFF to ON.
  - LVL: Output cut off when the tripping input changes from OFF to ON and connected when tripping input changes from ON to OFF.

Additional Functions

● Startup Sequence Function

A delay can be set for the connection of the branch outputs. When you want to apply a startup delay to the branch output, it is not necessary to construct an external sequence circuit.

The inrush current can be suppressed by applying a delay and the Power Supply Unit's load can be reduced. (For details, refer to *2-5 Startup Sequence Function* on page 2-29.)

● Shutdown Sequence Function

The branch outputs' cutoff can be delayed. When you want to apply a shutdown delay to the branch output, it is not necessary to construct an external sequence circuit. (For details, refer to *2-6 Shutdown Sequence Function* on page 2-30.)

● Protecting Parameter Settings (Protection Level Settings)

The Protection Level can be set to restrict access to the parameters. Three levels, levels 0, 1, and 2, are available. This function can be used to prevent parameters from being changed or deleted inadvertently.

Protection level	Restrictions
0	There are no restrictions on reading and changing the parameter settings.
1	Permits only reading and changing of the output voltage, current, internal temperature, and maintenance forecast monitor parameters.
2	Permits only reading of the output voltage, current, internal temperature, and maintenance forecast monitor parameters.

The default setting is protection level 1. (For details, refer to *Protection level* on page 4-14.)

Note The read/write access for models that do not support parameter changes (S8AS2-□□-□SN) cannot be changed regardless of the protection level.

1-2 S8AS2 Operating Modes

The S8AS2 has 2 operating modes: Monitor Mode and Setting Mode.

The operating mode can be changed by the mode selection switch.

24 VDC power is supplied to the branch outputs in both modes (branch outputs are connected). Also, the output voltage, output current, internal temperature, and run time are monitored at all times.

Mode name	Description
Monitor Mode 	This mode is used during normal operation. The monitored values (voltage, current, etc.) of each branch output can be displayed on the seven-segment display. The S8AS2 automatically starts up in this Monitor Mode when it is used for the first time.
Setting Mode 	This mode is used to change the settings of the various parameters. Note, however, that on the S8AS2-□□-□SN, some parameters cannot be changed.

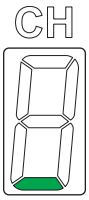
For details on how to display parameters in the Monitor Mode, refer to *4-3 Monitor Mode Parameters* on page 4-5.

For details on how to set parameters in the Setting Mode, refer to *4-4 Setting Mode Parameters* on page 4-8.

Automatic Operation after Power ON and Power OFF

When the rated voltage (100 to 240 VAC at 50/60 Hz) is applied to the AC input terminal block, the branch output indicators, seven-segment display, and unit indicators all light, and then connection of each branch output is initiated. Also, if the startup sequence function (refer to page 2-29) has been set, each of the branch outputs will be connected according to their corresponding settings.

When the power is turned OFF, the lower segment of the branch output indicators lights and the product shuts down.



Operation in Monitor Mode

In Run Mode, the S8AS2 continuously measures the output voltage, branch output circuit currents, and internal temperature, and compares these values to the set values (both user-set parameters and system set values).

● Monitor Operation

The monitored output voltage, branch output currents, branch output peak current, total current, internal temperature, and replacement time can be read on the S8AS2's seven-segment display.

The displayed value on the seven-segment display can be switched with the Channel Down ⌄/Up ⌃ Keys and Selection Down ⌄⌄/Up ⌃⌃ Keys.

● Tripping Operation

If the voltage or current is abnormal, the branch output will be cut off to protect the circuit.

- Abnormal Voltage Tripping

  If the output voltage exceeds the abnormal voltage tripping setting, all branch outputs will be cut off in order to protect the load devices.
- Abnormal Current Tripping Operation

  A branch output will be cut off if an abnormal current is detected using the tripping current threshold (refer to note below) or the current detection method (refer to note below) specified for each individual branch output.

  * The tripping current threshold and current detection method cannot be changed for the S8AS2-□□-□SN.

An error code will be displayed and the tripping alarm output (TRP) will operate when a branch output is cut off.

● Other Tripping Operation

A branch output circuit can be cut off (indicator turned OFF) by pressing the corresponding branch output status switch (red/green) provided for each individual channel. Pressing the switch again connects the branch output circuit (indicator lights in green). As a result of this function, other channels need not be stopped during recovery procedures as only the channel on which the abnormality is occurring can be cut off or connected.

● Other Status Monitoring

The internal temperature and replacement time status are monitored and error processing is performed if an error is detected.

Operation in Setting Mode

Setting Mode can be used to set the various parameters. The S8AS2 is in operating status when it is in Setting Mode. Branch outputs are connected in Setting Mode in the same way as in Monitor Mode.

When an error is detected, branch outputs will be cut off and alarms will be output, just as they are in Monitor Mode.

Note: If an error occurs in Setting Mode, the error code is not displayed.

1-3 Table of Basic Functions

Monitor Functions

Parameter name (display order)	Details
Output voltage	Displays the output voltage.
Output current	Displays the current value of each branch output.
Total current	Displays the total current value of all the branch outputs.
Peak current	Displays individual branch output peak currents.
Years up to replacement time	Displays the remaining number of years up to the replacement time by forecasting the replacement time of the S8AS2.
Percentage up to replacement time	Displays the remaining percentage up to the replacement time by forecasting the replacement time of the S8AS2.
Total running time	Displays the total running time of the S8AS2.
Temperature	Displays the internal temperature of the S8AS2.

For details, refer to *4-3 Monitor Mode Parameters* on page 4-5.

Setting Functions

Parameter name (display order)	Details
Abnormal current tripping threshold	The current tripping threshold can be set for each branch output in 0.1-A increments.
Abnormal current tripping type	The tripping type can be set for each branch output. USU: Standard (tripping within 100 ms) INS: Instantaneous (tripping within 20 ms) LNG: Extended (tripping within 1,000 ms)
Abnormal voltage tripping threshold	The abnormal voltage tripping threshold can be set for the output voltage.
Undervoltage detection threshold	The undervoltage detection output (LOW) is output when the output voltage of the S8AS2 falls below this detection threshold. The detection threshold can be set in 0.1-V increments. Branch outputs will not be cut off.
Maintenance forecast output threshold	Set the expected number of years until the S8AS2 needs to be replaced. When the estimated value falls below the set value, the maintenance forecast monitor output (LFE) will turn ON. (The MOSFET relay output will turn OFF.)
Maintenance forecast percentage threshold	Sets the forecast replacement percentage of the S8AS2. When the estimated value falls below the set value, the maintenance forecast monitor output (LFE) will turn ON. (The MOSFET relay output will turn OFF.)
Running time alarm threshold	Sets the running time alarm threshold of the S8AS2. When the running time exceeds this threshold, the maintenance forecast monitor output (LFE) will activate.

Parameter name (display order)	Details
Temperature alarm threshold	An excessive temperature rise inside the S8AS2 will be detected and the over-temperature output (TMP) will turn ON. (The MOSFET relay output will turn OFF.) This output can be used to control cooling equipment to reduce the temperature in the control panel.
Startup sequence	When connection of branch outputs is initiated when the power is turned ON, a time delay can be set for each individual branch output. Connecting the branch outputs in sequence instead of simultaneously can reduce the inrush current and reduce the load on the Power Supply.
Shutdown sequence	Branch outputs can be disconnected in sequence initiated by communications or an external tripping input (TRP), and a time delay can be set for the sequence.
Tripping trigger enable/disable	The external tripping input function (TRG) can be enabled (ON) or disabled (OFF) for each branch output.
Tripping trigger type	The tripping trigger type can be set for all branches that have the tripping input function enabled.
Software tripping trigger *1	This function allows a trigger input to be virtually entered by only key operation. This enables operation to be checked instead of external tripping input (TRG).
Startup operation check test *1	This function is for checking operation when the power is turned ON by only key operation. This is used to check operation when the power is started up (e.g. startup sequence) when it is difficult to turn the power supply ON and OFF.
Reset function setting	The tripping alarm output and alarm output can be cleared after removing the cause of the alarm by the following two methods. • KEY: RST Key only. • ALL: RST Key or turning power OFF and ON again.
Protection level *1	The Protection Level function can restrict parameter read/write access by setting one of three levels. The default protection level is level 1.
channel ON/OFF key enable/disable *1	Although connection/disconnection can be switched by the channel ON/OFF key, this function can be set to disabled to prevent malfunction. The default is “Enabled”.
Channel ON/OFF key response time setting *1	Change the hold-down time required for a setting to take effect. OFF: Applied immediately ON: Applied only when the key is held down for 1s
Tripping alarm output conditions *1	Configure the conditions under which the abnormal trip output (TRP) is activated. The TRP output can be configured to activate not only when an abnormal voltage or abnormal current is detected, but also when tripping occurs due to operation of the channel ON/OFF switching key or via an external signal. USU: Output only during abnormal tripping ALL: Output under all tripping conditions
Initialize defaults	This is used to return all settings to their default states.

*1. These parameters can be set even on the S8AS2-□□-□SN (model on which settings cannot be made). For details, refer to *4-4 Setting Mode Parameters* on page 4-8.

Tripping/Alarm Functions

There are three ways for the S8AS2's tripping function to operate:
- Tripping by user by channel ON/OFF key
- Tripping by the S8AS2's system monitor
- Tripping by external operation

The external signal outputs include the Tripping Alarm Output (TRP), Undervoltage Detection Output (LOW), Maintenance Forecast Monitor Output (LFE), and Over-temperature Output (TMP).

● Tripping Functions

Setting	Operating range	Parameter set-tings	Outputs cut off
Abnormal Voltage Tripping	Tripping when the output voltage exceeds the abnormal voltage tripping setting	Yes	All branch outputs
Short-circuit current tripping	Output cut off at 16 A for 20 ms max. Output cut off at 11 A for 60 ms max.	None	Individual branch output
Abnormal total current tripping	Output cut off when the sum of all branch output currents exceeds the set value for a specific length of time.	None	All branch outputs
Abnormal current tripping *1	0.5 to 3.8 A (in 0.1-A increments) Select from standard, instantaneous, and extended detection methods.		External tripping input
External tripping input	External input signal (TRG) ON		Specified output *2

*1. The tripping function operates within 100 ms when the S8AS2 is set to standard detection, within 20 ms when it is set to instantaneous detection, and within 1,000 ms when it is set to extended detection.

*2. The TRG signal applies only to the branch outputs for which the external tripping input is enabled. For details, refer to *2-7 External Tripping Input Function* on page 2-31.

● Alarm Output and Error Display Functions

Symbol	Output name	Operation	Error code displayed
TRP	Tripping alarm output	Abnormal Voltage Tripping Operation If the output voltage exceeds the abnormal voltage tripping setting, all branch outputs will be cut off and TRP output will turn ON. (The MOSFET relay output will turn OFF.)	A10
		Abnormal Current Tripping Operation When the branch output current exceeds the set value, the branch output is cut off and the TRP output is turned ON. (The MOSFET relay output is turned OFF.)	A11/Current (alternating)
		Volt-amperage (VA) Tripping Operation When the voltage times the current (VA) exceeds the set value for a specified amount of time, the branch output is cut off and the TRP output is turned ON. (The MOSFET relay output is turned OFF.)	A11/Current (alternating)
		Abnormal Total Current Tripping Operation When the total output current exceeds the set value, all branch outputs are cut off and the TRP output is turned ON. (The MOSFET relay output is turned OFF.)	A12
		Tripping Operation by Channel ON/OFF Key or External Signal Input	No error code is displayed.
LOW	Undervoltage detection output	Setting range: 18.0 to 26.4 VDC (0.1-V increments) When the output voltage falls below the set value, the LOW output is turned ON. (The MOSFET relay output is turned OFF.)	A21/Voltage (alternating)

Symbol	Output name	Operation	Error code displayed
LFE	Maintenance forecast monitor output	When the internally calculated replacement time falls below the set value, the LFE output is turned ON. (The MOSFET relay output is turned OFF.)	A23/Replacement time (alternating)
	Overheating alarm *2	LFE output is turned ON (the MOSFET relay output is turned OFF) when the replacement time cannot be calculated correctly due to rise in internal temperature.	A23/HOT (alternating)
TMP	Over-temperature output	Setting range: 25 to 100°C (1°C increments) When the temperature falls below the set value minus 3°C, the TMP output and the error code shown on the seven-segment display will be automatically cleared.	A30/Temperature (alternating)

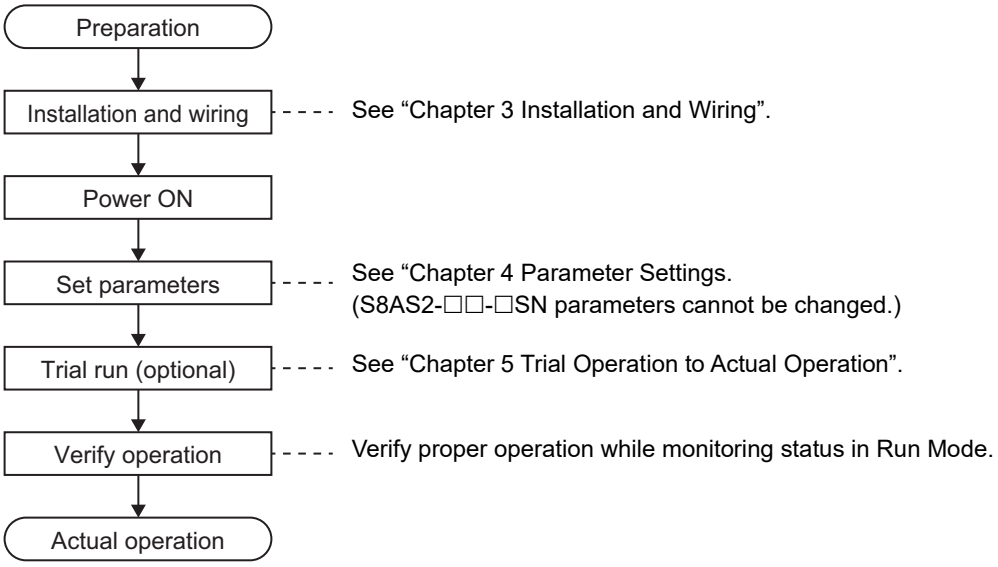
*1. In this manual, the lifetime of the Unit is expressed in years.

*2. If the overheating alarm stays on for more than 3 hours, the abnormal overheating state is reached (“E06” is displayed) and this alarm state can no longer be cleared.

1-4 S8AS2 Operating Procedure

Using the S8AS2

● Typical Startup Procedure Using the S8AS2's Keys



Summary of Application Objectives and Settings

Desired objective/usage	Settings	Reference page
Use as a circuit breaker with overcurrent tripping.	In Setting Mode, set the abnormal current tripping threshold (C-V) for the branch output being used and set the abnormal current tripping detection setting (C-T) to standard detection (USU).	Page 2-20 Page 4-9
Use as a circuit breaker for short-circuit current protection.	In Setting Mode, set the abnormal current tripping threshold (C-V) for the branch output being used and set the abnormal current tripping detection setting (C-T) to instantaneous detection (INS).	
Detect a drop in power supply voltage.	In Setting Mode, set the undervoltage detection threshold (V-U). Take the alarm signal from the Undervoltage Detection Output (LOW) terminal. During operation, the seven-segment display will show error code A21 and the LOW output MOSFET relay output will go OFF.	Page 2-19 Page 3-16 Page 4-9
Apply a separate time lag when connecting each branch output.	In Setting Mode, set the startup sequence (UPS).	Page 2-29 Page 4-11
Apply a separate time lag when cutting off each branch output.	In Setting Mode, set the shutdown sequence (DWS) and enable the External Tripping Input (TRG).	Page 2-30 Page 4-11

Desired objective/usage	Settings	Reference page
Use the S8AS2 replacement time for better maintenance.	The seven-segment display and the LFE terminal signal output can be used to check the estimated replacement time using the maintenance forecast monitor function.	Page 2-24 Page 4-9
Monitor temperature rise in control panel and prevent overheating.	In Setting Mode, set the over-temperature output threshold (TMP). Take the signal from the Overtemperature Output (TMP) terminal and use that signal to operate a fan or air conditioner.	Page 2-26 Page 3-16 Page 4-10
Restrict read/write access of parameters to prevent mistaken operations.	Select the protection level setting (PRT) from the Mode Selection Menu and set the desired protection level.	Page 4-2 Page 4-14

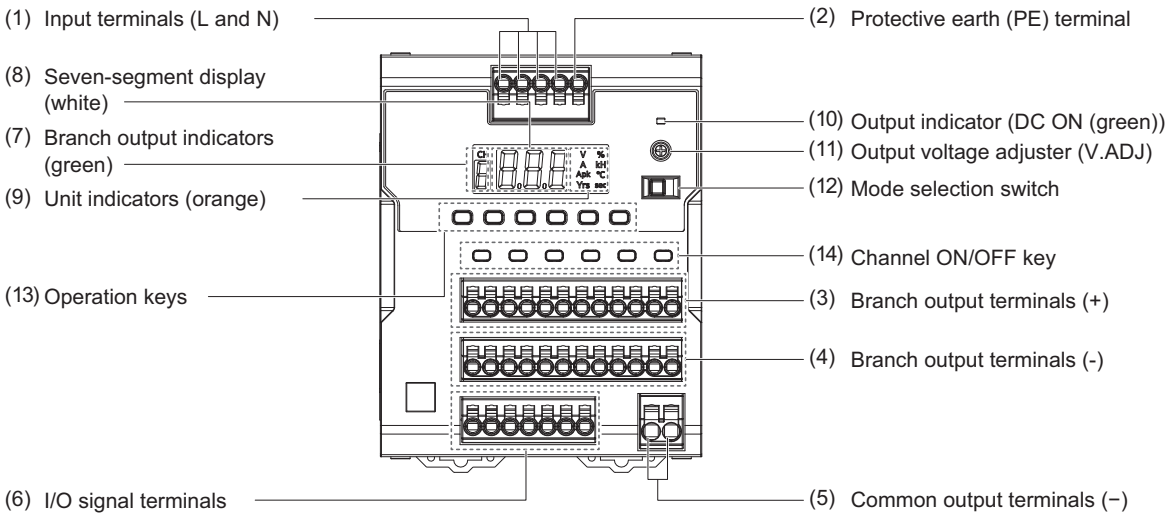
2

Specifications and Functions

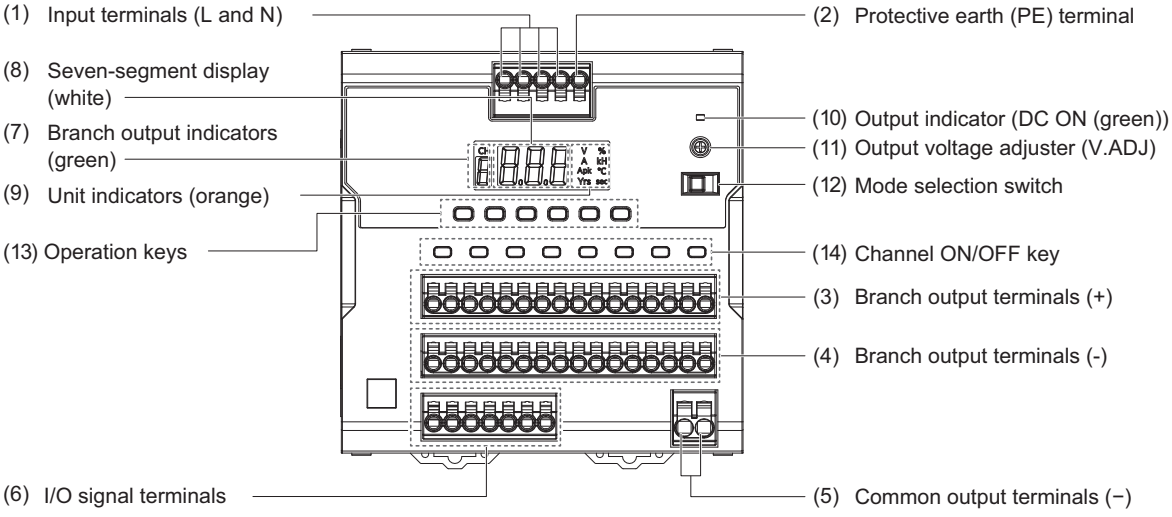
2-1 Component Names and Functions

Component Names

● S8AS2-24024-06□



● S8AS2-48024-08□

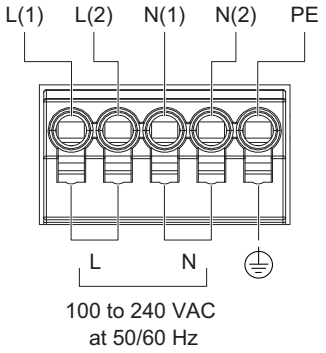


(1) Input terminal blocks (L and N) and (2) Protective Earth (PE) Terminal

Connect the input power supply (100 to 240 VAC, 50/60 Hz) (commercial power) to the Power Supply.

Do not connect an inverter output as the power supply.

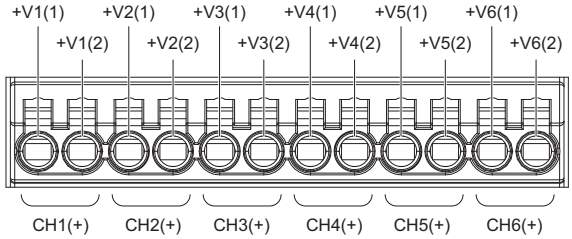
Make sure that the protective earth (PE) terminal is connected to ground to prevent electric shock or malfunction.

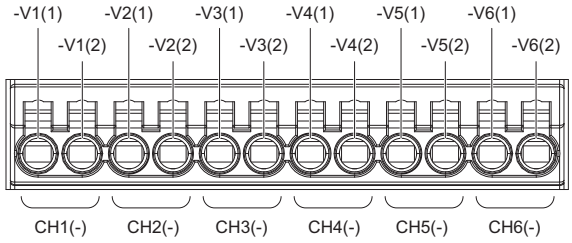


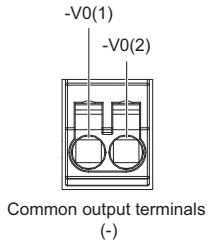
(3) Positive (+), (4) Negative (-) Branch Output Terminals and (5) Common output terminals (-)

Connect to each branch output. Positive and negative branch outputs are connected to separate terminal blocks with two positive and two negative terminals for each branch output.

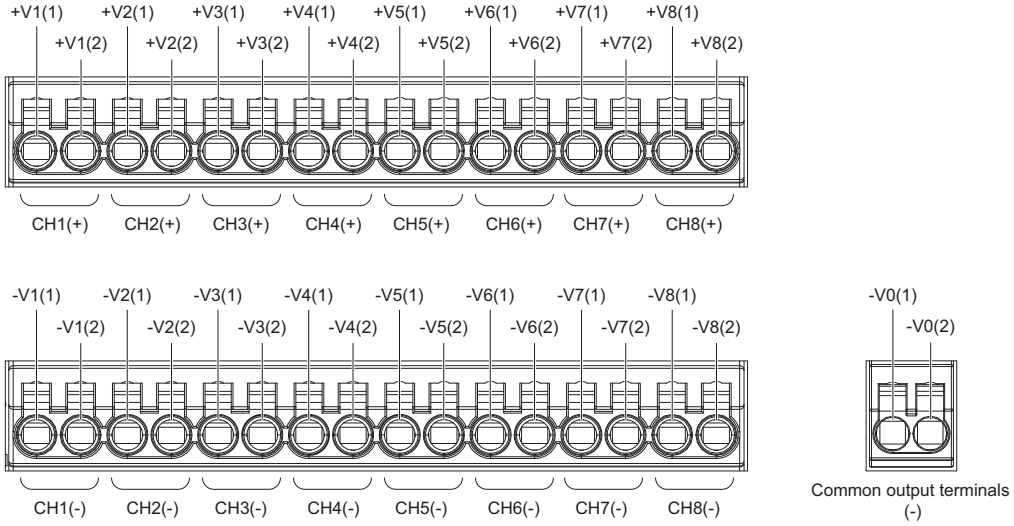
- 240-W Model Output Terminals



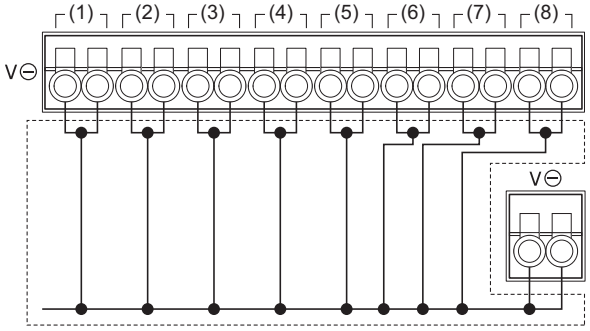




- 480-W Model Output Terminals

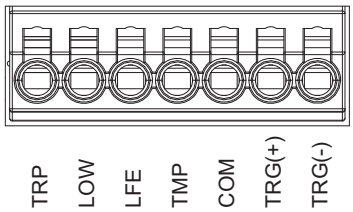


The internal circuit configuration of the (4) Negative Branch Output Terminals (-) and (5) Common Output Terminal (-) is as follows. The 480W type is shown as an example.



(6) I/O Signal Terminals

Connect the external outputs and external tripping inputs.



TRP	Tripping alarm output	Turns ON to indicate when an abnormal voltage or current was detected and the output was cut off (The MOSFET relay output will turn OFF.).
LOW	Undervoltage detection output	Turns ON when the 24-VDC output voltage from the S8AS2 falls below the threshold. (The MOSFET relay output will turn OFF.).
LFE	Maintenance forecast monitor output	Turns ON to indicate when the number of years to the set replacement time has been reached (The MOSFET relay output will turn OFF.).
TMP	Over-temperature output	Turns ON to indicate that the temperature exceeded the over-temperature output threshold (The MOSFET relay output will turn OFF.).

COM	Common Terminal	Common terminal shared by the four alarm outputs above.
TRG (+) TRG (-)	External Tripping Input	Can be used to send an input signal from an external device to cut off a branch output.

(7) Branch Output Indicators (Green)

Displays the branch output No. on the seven-segment display.

1 to 6: 240 W 1 to 8: 480 W	Lit or flashing when the display is related to the corresponding branch output.

(8) Seven-segment Display (White)

Displays measured values or set values on a 3-digit LED display.

(9) Unit Indicators (Orange)

Shows the unit for values shown in the seven-segment display.

V	Lit when displaying the output voltage.
A	Lit when displaying the output current.
Apk	Lit when displaying the peak output current.
Yrs	Lit when the number of years to the set replacement time is displayed.
°C	Lit when displaying the temperature.
%	Lit when displaying the percentage up to replacement time.
kH	Lit when displaying the total running time.
sec	Lit when setting the startup sequence time or shutdown sequence time.

(10) Output Indicator (DC ON)

The indicator is lit green when the S8AS2 is in normal operation. It indicates that the 24 VDC output can be used as a supply voltage.

DC OK

(11) Output Voltage Adjuster (V.ADJ)

The output voltage is set at a default of the 24-VDC rated voltage.

Use the output voltage adjuster to adjust the output voltage.

The adjustable range is 24 to 28 VDC. Turning the adjuster clockwise increases the output voltage, and turning it counterclockwise decreases the output voltage.

Note 1. If the output voltage is set to less than 20.0 V (default setting), the undervoltage detection may be activated.

2. Do not exceed the rated output capacity and rated total output current after adjusting the output voltage.
3. The output voltage may increase beyond the allowable voltage range (rated voltage +10%) when the V.ADJ adjuster is used.
   When adjusting the output voltage, check the output voltage of the power supply to make sure that the load is not damaged.
4. Do not use excessive force to turn the adjuster (V.ADJ). It may be damaged.

(12) Mode selection switch

Switches between the Monitor Mode 

and Setting Mode 

.

(13) Operation Keys

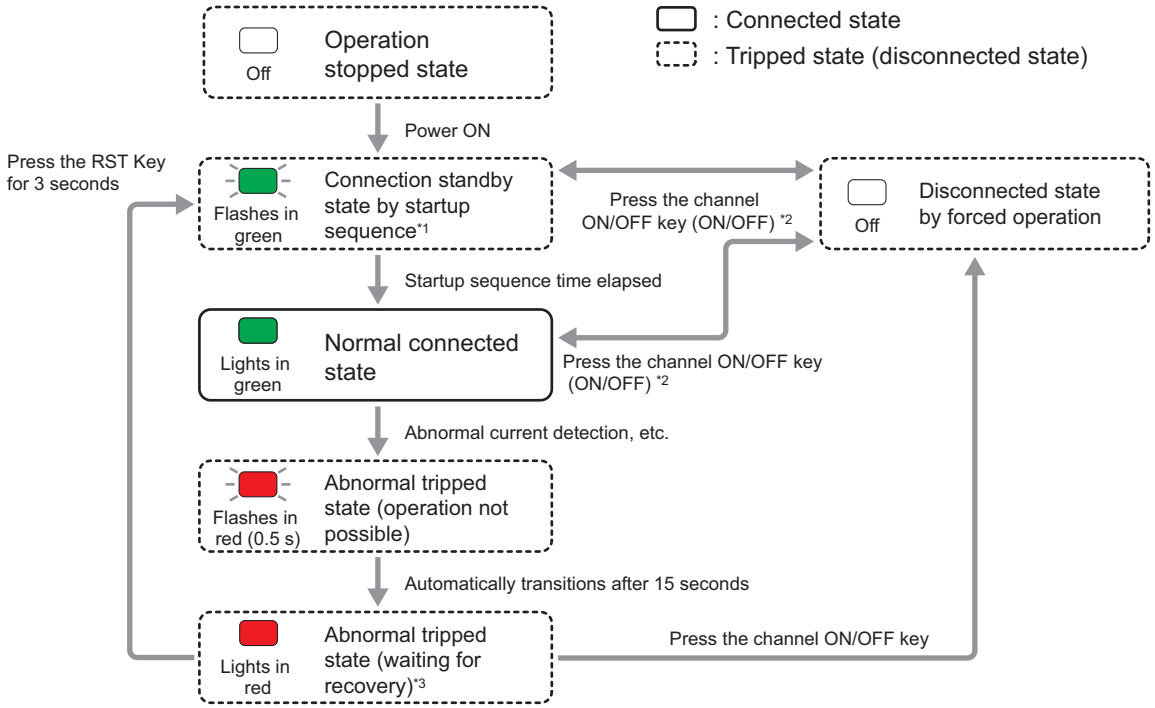
Channel Down Key		Used to switch the branch output.
Channel Up Key		
Selection Down Key		Used to change the display item forward or to decrease a set value.
Selection Up Key		Used to change the display item backward or to increase a set value.
Enter Key		Used to switch the display item, enter or execute settings, etc.
Cancel (ESC)/ Reset (RST) Key		Used to clear the error status when a branch output was cut off by an error or there was an alarm output.

(14) Channel ON/OFF key

The connected/tripped (disconnected) state of each branch output is shown by an indicator.

Connection/tripping (disconnection) of each branch output is selected by a pushbutton switch.

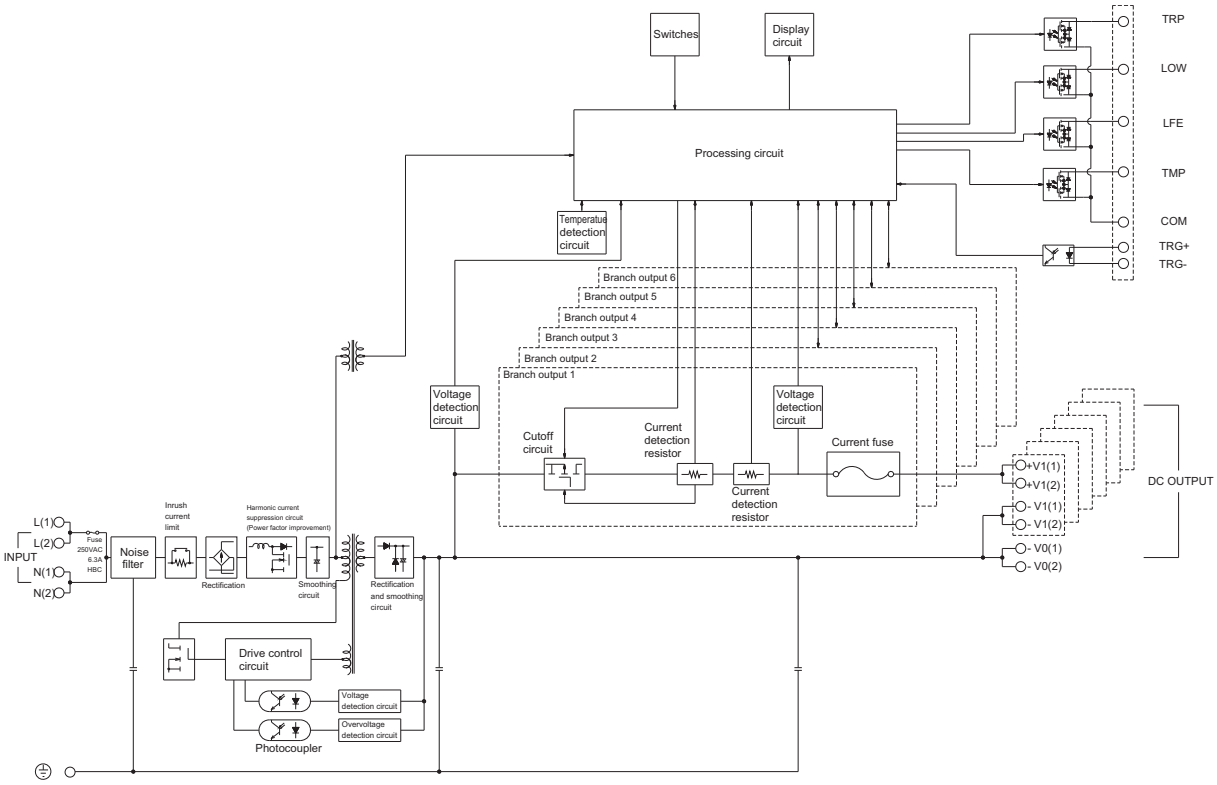
When branch outputs are already set to a connected state beforehand, state transition is as follows.



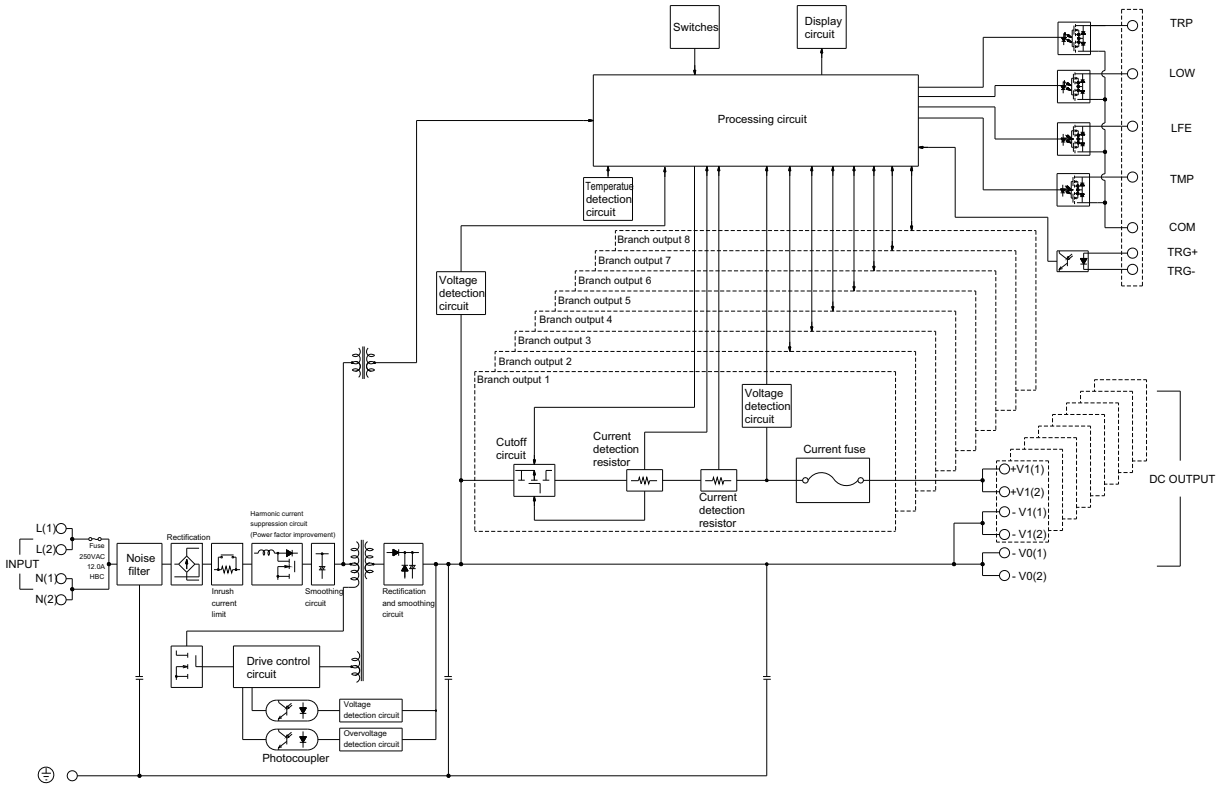
*1. When 0 s is set to the startup sequence, the branch output is connected normally without waiting for the connection.
*2. When ON/OFF operation is performed continuously, OFF is switched to ON only after at least 3 seconds have elapsed since the previous ON.
*3. If a tripped state occurs due to an internal error (waiting for recovery), the indicator flashes in red at 0.25 second intervals.

2-2 Internal Configuration

● **S8AS2-24024-06□**



● S8AS2-48024-08□



- The S8AS2 compares the measured output voltage, current, and internal temperature with the preset parameters. These values can be read on the S8AS2's seven-segment display.
- When an error is detected, the branch output will be cut off or an alarm will be output. The error code and PV will be displayed alternately on the seven-segment display.
- When an abnormal voltage or current is detected, the power MOSFET will cut off the branch output. In the unlikely event that the power MOSFET cannot cut off an abnormal current or short-circuit current, the redundant protection circuit, and the short-circuit protection fuse will operate to protect the system.
- The S8AS2 has a built-in temperature sensor, which can detect a temperature rise inside the S8AS2. When the internal temperature exceeds the detection threshold, the Over-temperature Output (TMP) MOSFET relay output will turn OFF.

2-3 Specifications

Ratings and Characteristics

● S8AS2-24024-06□

Model			S8AS2-24024-06S	S8AS2-24024-06SN
Efficiency	At AC 100 V input *1		93% typ. (Power section only: 94% typ.)	
	At AC 230 V input *1		95% typ. (Power section only: 96% typ.)	
Input conditions	Allowable input voltage range *3		85 to 264 VAC	
	Frequency *3		50/60 Hz (47 to 63 Hz)	
	Input current		2.6 A max. (100 VAC input)	
			1.3 A max. (200 VAC input)	
	Power factor		0.9 min.	
	Leakage current		0.5 mA max. (100 VAC input)	
			1 mA max. (200 VAC input)	
	Inrush current (for a cold start at 25°C)		14 A max. (100 VAC input)	
			28 A max. (200 VAC input)	
Output characteristics	Number of branches		6	
	Maximum cutoff output current (per branch)		3.8A	
	Total output current		10A	
	Allowable voltage range *4		24 to 28 V (with V.ADJ)	
	Ripple Noise Voltage (at rated input/output) *1		80 mV max. Frequency bandwidth: 20 MHz	
	Ripple noise voltage		80mV max. (for rated input and output voltage) *4	
	Output leakage current		10 mA max.	
	Static input fluctuation		0.5% max. (Input: 85 to 264 VAC, 100 % load) *2	
	Static load fluctuation		4.0% max. (rated input, 0% to 100% load) *2	
	Ambient temperature fluctuation		0.05%/°C max.	
	Startup time *5		600 ms max. *1	
	Output hold time *5		30 ms typ. (for rated input and output voltage) *1	
Provided functions	Tripping functions	Abnormal voltage tripping	26.0 to 32.0 V	32.0 V (Cannot be changed.)
		Abnormal current tripping *2	Setting range: 0.5 to 3.8 A (in 0.1-A increments)	3.8 A (Cannot be changed.)
		Abnormal current tripping type	Standard (default)	Extended time (Cannot be changed.)
		Abnormal total current tripping	Branch outputs are cut off when the total output current is more than 17 A for 2 s, 15 A for 5 s, 13 A for 10 s, or 12 A for 20 s.	
		Tripping alarm output	MOSFET relay output 30 VDC max. and 50 mA max., Leakage current: 0.1 mA max., Residual voltage: 2 V max.	
	Undervoltage detection functions	Undervoltage detection	Setting range: 18.0 to 26.4 V (in 0.1-V increments)	20.0 V (Cannot be changed.)
		Undervoltage detection output	MOSFET relay output 30 VDC max. and 50 mA max., Leakage current: 0.1 mA max., Residual voltage: 2 V max.	

Model			S8AS2-24024-06S	S8AS2-24024-06SN
Provided functions	Maintenance Forecast Monitor Function	Years up to replacement time	Setting range: 0.0 to 5.0 yr (in 0.1-yr increments)	0.5 yr (Cannot be changed.)
		Percentage up to replacement time	Setting range: 0.0 to 99.9% (in 0.1-% increments)	0% (Cannot be changed.)
		Total running time	Setting range: 0 to 132 kH (in 1-kH increments)	132 kH (Cannot be changed.)
		Maintenance forecast monitor output	MOSFET relay output 30 VDC max. and 50 mA max., Leakage current: 0.1 mA max., Residual voltage: 2 V max.	
	Over-temperature detection function	Over-temperature	Setting range: 25 to 100°C (in 1°C increments)	100°C (Cannot be changed.)
		Over-temperature output	MOSFET relay output 30 VDC max. and 50 mA max., Leakage current: 0.1 mA max., Residual voltage: 2 V max.	
	Display functions	Output voltage display	Display range: 16.3 to 32.0 V Display accuracy: 2% rdg ±1 digit max.	
		Output current display	Branch output display range: 0.0 to 20.0 A Peak output current display range: 0.0 to 20.0 A Total current display range: 0.0 to 60.0 A Display accuracy: 5% FS (4 A) ±1 digit max.	
		Maintenance forecast monitor display (yr)	Display range: FUL (Full)/HLF (Half)/0.0 to 4.9 yr	
		Maintenance forecast monitor display (percentage)	Display range: 0.0 to 99.9%	
		Total running time	Setting range: 0 to 132 kH	
		Temperature display	Display range: -20 to 120°C Display accuracy: 2°C ±1 digit max.	
	External Tripping Input		The input can be enabled or disabled for each branch output. 19.2 to 30.0 VDC, minimum signal width: 10 ms, tripping after input within 20 ms + the shutdown sequence set time	All branch outputs: Enabled (Cannot be changed.) 19.2 to 30.0 VDC, minimum signal width: 10 ms, tripping after input within 20 ms
	Startup sequence		Setting range: 0.0 to 99.9 s in 0.1-s increments	Branch output 1: 0.0 s (Cannot be changed.) Branch output 2: 0.4 s (Cannot be changed.) Branch output 3: 0.8 s (Cannot be changed.) Branch output 4: 1.2 s (Cannot be changed.) Branch output 5: 1.6 s (Cannot be changed.) Branch output 6: 2.0 s (Cannot be changed.)
	Shutdown sequence		Setting range: 0.0 to 99.9 s in 0.1-s increments	All branch outputs: 0.0 s (Cannot be changed.)
	Series connection		Not supported.	
	Parallel connection		Not supported.	
	Output indicator		Provided (Color: green)	

Model			S8AS2-24024-06S	S8AS2-24024-06SN
Provided functions	Indication monitor	Measurement/ displayed details	See 4-1 Parameter Table.	
		Main display area	Seven-segment display (Color: white)	
		Channel display area	Seven-segment display (Color: green)	
		Unit display area	Provided (Color: yellow)	
Withstand voltage	Withstand voltage		3 kVAC for 1 min between all input terminals collectively and all branch output terminals, all I/O signal terminals collectively (Detection current: 20 mA)	
			2 kVAC for 1 min between all input terminals collectively and protective earth (Detection current: 20 mA)	
			1 kVAC for 1 min between protective earth and all branch output terminals, all I/O signal terminals collectively (Detection current: 30 mA)	
			500 VAC for 1 min between all branch output terminals and all I/O signal terminals collectively (Detection current: 20 mA)	
			500 VAC for 1 min between all input signal terminals collectively and all output signal terminals collectively (detection current: 20 mA)	
	Insulation resistance		100 MΩ min. at 500 VDC between the protective earth terminal or all input terminals collectively and all branch output terminals, and all I/O signal terminals collectively	
Environment	Ambient operating temperature		-25 to 70°C (no icing or condensation). *5	
	Storage temperature		-40 to 85°C	
	Ambient operating humidity		95% max.	
	Storage humidity		95% max.	
	Vibration resistance		No abnormality after 10 to 55 Hz at 0.375-mm single amplitude for 2 h each in 3 directions.	
	Shock resistance		No abnormality after 150 m/s^2 3 times each in 6 directions.	
Reliability	MTBF		36,000 years or more	
	Expected life		10 years	
Structure	Weight (main unit)		1050 g max.	
	Cooling fan		Blank	
	Protective structure		Conforms to IP20, EN/IEC60529	
Compatible standards	Harmonic suppression		Conforms to EN61000-3-2	
	EMI	Conducted EMI	Conforms to EN 61204-3 Class B and EN 55011 Class B	
		Radiated EMI	Conforms to EN 61204-3 Class B and EN 55011 Class B *6	
	EMS		EN 61204-3 high severity levels	
	Safety Standards *7		UL 508 (Listing, Class 2 Output: Per UL 1310) CSA C22.2 No.107.1 (cUL, Class 2 Output: Per CSA C22.2 No.223) EN/IEC 62477-1 (SELV/ES1 Output), OVC II (≤2,000 m), OVC I (2,000 m < and ≤ 3,000 m), Pollution Degree 2 Compliant with PELV (EN/IEC 60204-1) Compliant with EN/IEC 61558-2-16 RCM (EN61000-6-4)	
	SEMI Standard		SEMI Standard Compliant with SEMI F47-0706 (at AC 200–240 V input)	

*1. Rated input/output conditions: Rated input voltage, rated frequency, rated output voltage, and rated total output current.

*2. 100% load conditions: Rated output voltage and rated total output current.

*3. Some inverters may indicate an output frequency of 50/60 Hz as part of their specifications. However, using inverter output as the power supply for this unit may cause internal temperature rise, leading to smoke or damage. Do not use inverter output as the power source.
When connecting a UPS to the input, do not use units with square wave output. Internal temperature rise may result in smoke or damage.

*4. When adjusting the V.ADJ volume, the output voltage may rise above 28 V. When varying the output voltage, confirm the actual output to avoid damage to the load. If the output voltage exceeds the abnormal shutdown threshold, all branch outputs will be shut off.

*5. For details, refer to *Inrush Current, Startup Time, Output Hold Time* on page 10

*6. EMI (radiated emission field strength) complies with Class B when installed inside a control panel.

*7. Refer to *Compliance with Standards* below.

● Compliance with Standards

Regarding EN/IEC 61558-2-16

When acquiring certification under EN/IEC 60204-1 (Safety of Machinery), control circuits typically require isolation via a control transformer. However, products certified under OVC III or those incorporating transformers compliant with EN/IEC 61558-2-16 may not require a separate control transformer.

● S8AS2-48024-08□

Model			S8AS2-48024-08S	S8AS2-48024-08SN
Efficiency	At AC 100 V input *1		93% typ. (Power section only: 94% typ.)	
	At AC 230 V input *1		95% typ. (Power section only: 96% typ.)	
Input conditions	Allowable input voltage range *3		85 to 264 VAC	
	Frequency *3		50/60 Hz (47 to 63 Hz)	
	Input current		5.2 A max. (100 VAC input)	
			2.6 A max. (200 VAC input)	
	Power factor		0.9 min.	
	Leakage current		0.5 mA max. (100 VAC input)	
			1 mA max. (200 VAC input)	
	Inrush current (for a cold start at 25°C)		28 A max. (200 VAC input)	
			14 A max. (100 VAC input)	
Output characteristics	Number of branches		8	
	Maximum cutoff output current (per branch)		3.8 A	
	Total output current		20 A	
	Allowable voltage range *4		24 to 28 V (with V.ADJ)	
	Ripple noise voltage		190 mV max. (for rated input and output voltage) *1	
	Output leakage current		10 mA max.	
	Static input fluctuation		0.5% max. (Input: 85 to 264 VAC, 100 % load) *2	
	Static load fluctuation		4.0% max. (rated input, 0% to 100% load) *2	
	Ambient temperature fluctuation		0.05%/°C max.	
	Startup time *5		600 ms max. *1	
	Output hold time *5		30 ms typ. (for rated input and output voltage) *1	
Provided functions	Tripping functions	Abnormal voltage tripping	26.0 to 32.0 V	32.0 V (Cannot be changed.)
		Abnormal current tripping *5	Setting range: 0.5 to 3.8 A (in 0.1-A increments)	3.8 A (Cannot be changed.)
		Abnormal current tripping type	Standard (default)	Extended time (Cannot be changed.)
		Abnormal total current tripping	Branch outputs are cut off when the total output current is more than 27 A for 1 s, 25 A for 2 s, or 22.5 A for 5 s.	
		Tripping alarm output	MOSFET relay output 30 VDC max. and 50 mA max., Leakage current: 0.1 mA max., Residual voltage: 2 V max.	
	Undervoltage detection functions	Undervoltage detection	Setting range: 18.0 to 26.4 V (in 0.1-V increments)	20.0 V (Cannot be changed.)
		Undervoltage detection output	MOSFET relay output 30 VDC max. and 50 mA max., Leakage current: 0.1 mA max., Residual voltage: 2 V max.	
	Maintenance Forecast Monitor Function	Years up to replacement time	Setting range: 0.0 to 5.0 yr (in 0.1-yr increments)	0.5 yr (Cannot be changed.)
		Percentage up to replacement time	Setting range: 0.0 to 99.9% (in 0.1-% increments)	0% (Cannot be changed.)
		Total running time	Setting range: 0 to 132 kH (in 1-kH increments)	132 kH (Cannot be changed.)
		Maintenance forecast monitor output	MOSFET relay output 30 VDC max. and 50 mA max., Leakage current: 0.1 mA max., Residual voltage: 2 V max.	
	Over-temperature detection function	Over-temperature	Setting range: 25 to 100°C (in 1°C increments)	100°C (Cannot be changed.)
		Over-temperature output	MOSFET relay output 30 VDC max. and 50 mA max., Leakage current: 0.1 mA max., Residual voltage: 2 V max.	

Model			S8AS2-48024-08S	S8AS2-48024-08SN
Provided functions	Display functions	Output voltage display	Display range: 16.3 to 32.0 V Display accuracy: 2% rdg ±1 digit max.	
		Output current display	Branch output display range: 0.0 to 20.0 A Peak output current display range: 0.0 to 20.0 A Total current display range: 0.0 to 60.0 A Display accuracy: 5% FS (4 A) ±1 digit max.	
		Maintenance forecast monitor display (yr)	Display range: FUL (Full)/HLF (Half)/0.0 to 4.9 yr	
		Maintenance forecast monitor display (percentage)	Display range: 0.0 to 99.9%	
		Total running time	Setting range: 0 to 132 kH	
		Temperature display	Display range: -20 to 120°C Display accuracy: 2°C ±1 digit max.	
	External Tripping Input		The input can be enabled or disabled for each branch output. 19.2 to 30.0 VDC, minimum signal width: 10 ms, tripping after input within 20 ms + the shutdown sequence set time	All branch outputs: Enabled (Cannot be changed.) 19.2 to 30.0 VDC, minimum signal width: 10 ms, tripping after input within 20 ms
	Startup sequence		Setting range: 0.0 to 99.9 s in 0.1-s increments	Branch output 1: 0.0 s (Cannot be changed.) Branch output 2: 0.4 s (Cannot be changed.) Branch output 3: 0.8 s (Cannot be changed.) Branch output 4: 1.2 s (Cannot be changed.) Branch output 5: 1.6 s (Cannot be changed.) Branch output 6: 2.0 s (Cannot be changed.) Branch output 7: 2.4 s (Cannot be changed.) Branch output 8: 2.8 s (Cannot be changed.)
	Shutdown sequence		Setting range: 0.0 to 99.9 s in 0.1-s increments	All branch outputs: 0.0 s (Cannot be changed.)
	Series connection		Not supported.	
	Parallel connection		Not supported.	
	Output indicator		Provided (Color: green)	
	Indication monitor	Measurement/ displayed details	See *4-1 Parameter Table*.	
		Main display area	Seven-segment display (Color: white)	
		Channel display area	Seven-segment display (Color: green)	
		Unit display area	Provided (Color: yellow)	

Model			S8AS2-48024-08S	S8AS2-48024-08SN
Withstand voltage	Withstand voltage		3 kVAC for 1 min between all input terminals collectively and all branch output terminals, all I/O signal terminals collectively (Detection current: 20 mA)	
			2 kVAC for 1 min between all input terminals collectively and protective earth (Detection current: 20 mA)	
			1 kVAC for 1 min between protective earth and all branch output terminals, all I/O signal terminals collectively (Detection current: 30 mA)	
			500 VAC for 1 min between all branch output terminals and all I/O signal terminals collectively (Detection current: 20 mA)	
			500 VAC for 1 min between all input signal terminals collectively and all output signal terminals collectively (detection current: 20 mA)	
	Insulation resistance		100 MΩ min. at 500 VDC between the protective earth terminal or all input terminals collectively and all branch output terminals, and all I/O signal terminals collectively	
Environment	Ambient operating temperature		-25 to 70°C (no icing or condensation). *5	
	Storage temperature		-40 to 85°C	
	Ambient operating humidity		95% max.	
	Storage humidity		95% max.	
	Vibration resistance		No abnormality after 10 to 55 Hz at 0.375-mm single amplitude for 2 h each in 3 directions.	
	Shock resistance		No abnormality after 150 m/s^2 3 times each in 6 directions.	
Reliability	MTBF		36,000 years or more	
	Expected life		10 years	
Structure	Weight (main unit)		1,400 g max.	
	Cooling fan		blank	
	Protective structure		Conforms to IP20, EN/IEC60529	
Compatible standards	Harmonic suppression		Conforms to EN61000-3-2	
	EMI	Conducted EMI	Conforms to EN 61204-3 Class B and EN 55011 Class B	
		Radiated EMI	Conforms to EN 61204-3 Class B and EN 55011 Class B *6	
	EMS		EN 61204-3 high severity levels	
	Safety Standards *7		UL 508 (Listing, Class 2 Output: Per UL 1310) CSA C22.2 No.107.1 (cUL, Class 2 Output: Per CSA C22.2 No.223) EN/IEC 62477-1 (SELV/ES1 Output), OVC II (≤2,000 m), OVC I (2,000 m < and ≤ 3,000 m), Pollution Degree 2 Compliant with PELV (EN/IEC 60204-1) Compliant with EN/IEC 61558-2-16 RCM (EN61000-6-4)	
	SEMI Standard		SEMI Standard Compliant with SEMI F47-0706 (at AC 200–240 V input)	

*1. Rated input/output conditions: Rated input voltage, rated frequency, rated output voltage, and rated total output current.

*2. 100% load conditions: Rated output voltage and rated total output current.

*3. Some inverters may indicate an output frequency of 50/60 Hz as part of their specifications. However, using inverter output as the power supply for this unit may cause internal temperature rise, leading to smoke or damage. Do not use inverter output as the power source.
When connecting a UPS to the input, do not use units with square wave output. Internal temperature rise may result in smoke or damage.

*4. When adjusting the V.ADJ volume, the output voltage may rise above 28 V. When varying the output voltage, confirm the actual output to avoid damage to the load. If the output voltage exceeds the abnormal shutdown threshold, all branch outputs will be shut off.

*5. For details, refer to *Inrush Current, Startup Time, Output Hold Time* on page 10

*6. EMI (radiated emission field strength) complies with Class B when installed inside a control panel.

*7. Refer to *Compliance with Standards* below.

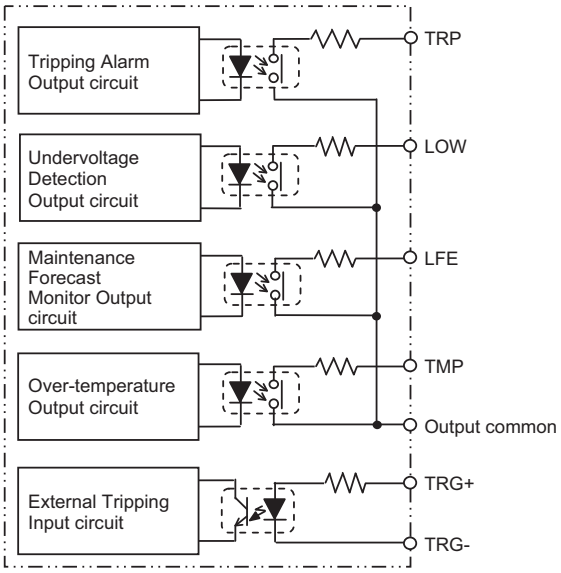
● Compliance with Standards

Regarding EN/IEC 61558-2-16

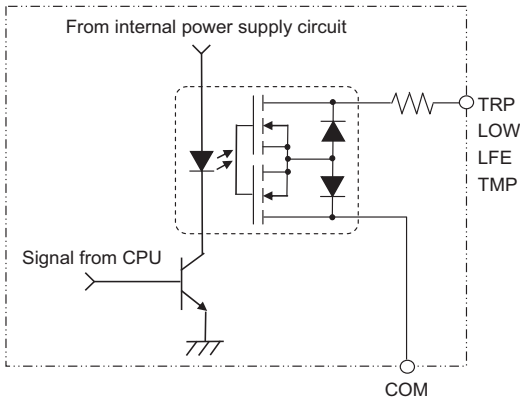
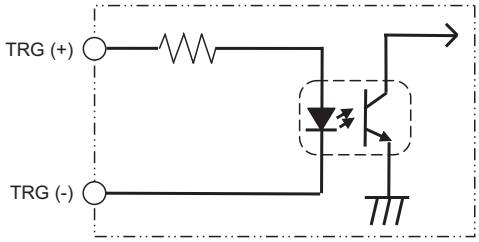
When acquiring certification under EN/IEC 60204-1 (Safety of Machinery), control circuits typically require isolation via a control transformer. However, products certified under OVC III or those incorporating transformers compliant with EN/IEC 61558-2-16 may not require a separate control transformer.

External Output and External Tripping Input Specifications

The S8AS2 has 4 external outputs: the Tripping Alarm Output (TRP), Undervoltage Detection Output (LOW), Maintenance Forecast Monitor Output (LFE), and Over-temperature Output (TMP). It also has an External Tripping Input (TRG).



I/O Circuit Configuration

Name	Circuit configuration	I/O specifications
Tripping Alarm Output (TRP), Undervoltage Detection Output (LOW), Maintenance Forecast Monitor Output (LFE) and Over-temperature Output (TMP) Note: A photo relay with a photo MOS-FET and infrared diode coupling is used.	Output circuit 	DC 30 V 50 mA Max.
External Tripping Input (TRG)	Input circuit 	19.2 to 30.0 VDC Minimum signal width: 10 ms

Additional Information

When a branch output is cut off with the External Tripping Input, it cuts off power to the branch output even faster than turning OFF the S8AS2's power supply.

2-4 Basic Function Details

2-4-1 Voltage Monitoring and Protection Functions

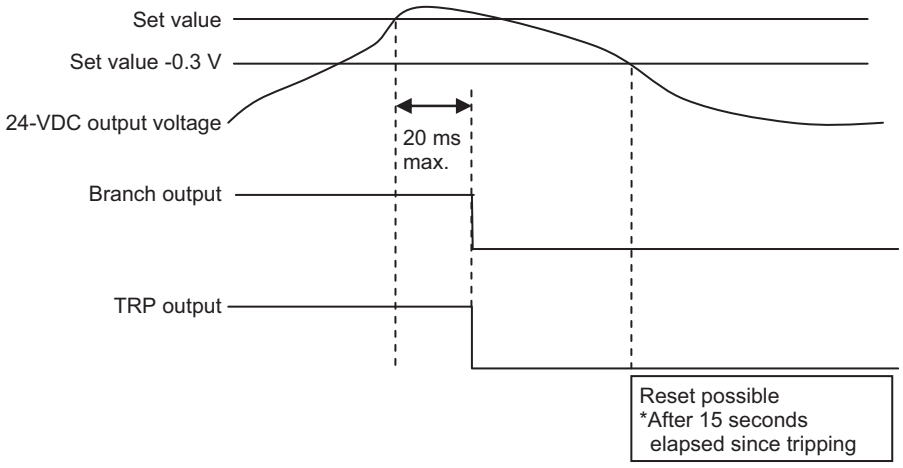
Abnormal Voltage Tripping

When the output voltage converted from AC to DC exceeds the abnormal voltage tripping threshold, all of the branch outputs will be cut off simultaneously and a TRP alarm will be output.

The seven-segment display will show error code A10.

It is not necessary for the user to set any parameters for this function.

Setting range	Default value	Operation	Seven-segment display	Outputs	Conditions required to reset
26.0 to 32.0 VDC	32.0 V	Cut off within 20 ms if a voltage exceeding the set value continues for 10 ms or more.	Alternately displays error code A10 and the voltage.	The Tripping Alarm Output (TRP) photoswitch output turns OFF.	Voltage below set value -0.3 V and after 15 seconds or more elapsed since tripping



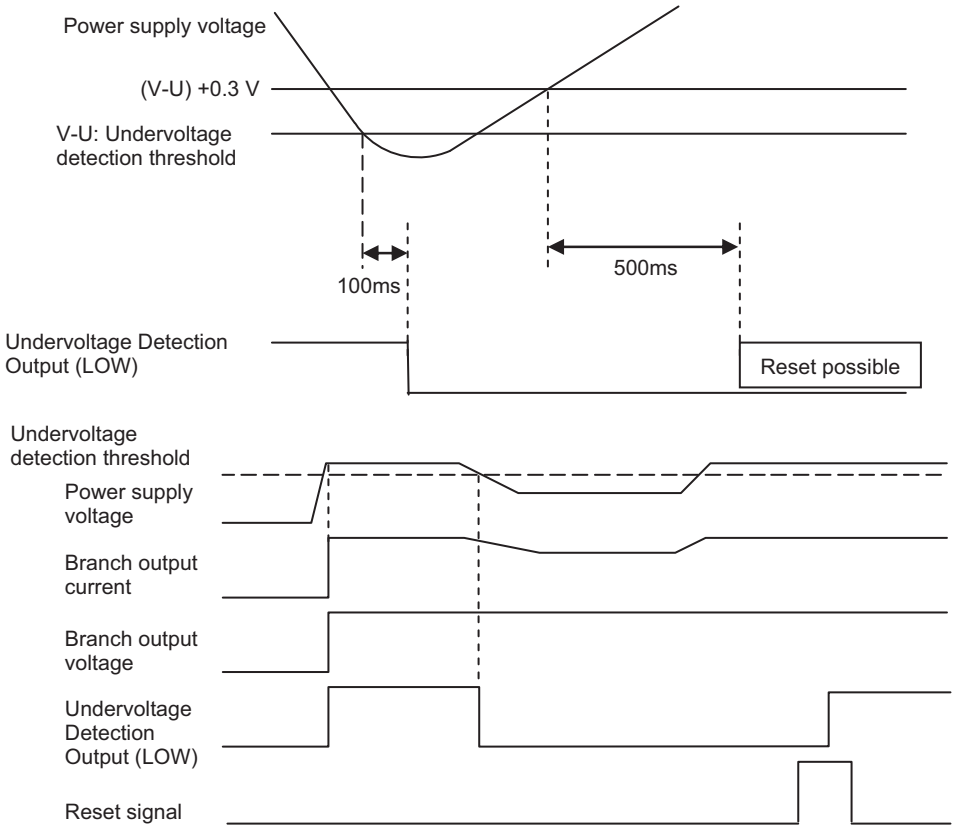
Undervoltage Detection

An undervoltage detection threshold can be set between 18.0 and 26.4 V.

Setting range	Default value	Operation	Seven-segment display	Outputs	Conditions required to reset
18.0 to 26.4 VDC	20.0 V	When the voltage is lower than the detection threshold continuously for 80 ms or more, the alarm is output within 100 ms.	Alternately displays error code A21 and the voltage.	The Undervoltage Detection Output (LOW) MOSFET relay turns OFF.	Voltage above the detection threshold +0.3 V continuously for at least 500 ms.

● Operation

- If the output voltage falls below the detection threshold, the seven-segment display will show the error code A21 and the voltage value, and the Undervoltage Detection Output (LOW) will turn OFF within 100 ms.
- The error display and Alarm Output can be reset when the voltage has been above the detection threshold +0.3 V for 500 ms longer.



2-4-2 Over-current Protection Functions

Abnormal Current Tripping Function

When an abnormal current is detected, the S8AS2 cuts off the branch outputs via power MOSFET. Each branch output's tripping current can be set between 0.5 and 3.8 A (in 0.1-A increments).

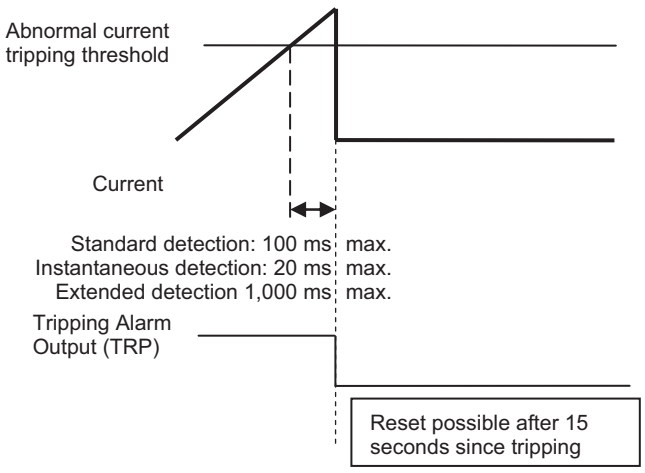
One of the following three detection methods can be selected for each branch in order to detect abnormal currents (except for the S8AS2-□□-□SN, which always use the same detection method.)

- Standard detection (tripping within 100 ms)
- Instantaneous detection (tripping within 20 ms)
- Extended time detection (tripping within 1,000 ms)

Set-ting range	Default value	Tripping type	Operation	Error code and alarm output	Conditions required to reset
0.5 to 3.8 A	3.8 A	Standard	When a current higher than the set value is detected, the branch output is cut off within 100 ms.	The error codeA11 and current are displayed alternately on the seven-segment display and the Tripping Alarm Output (TRP) MOSFET relay output turns OFF.	After 15 seconds or more elapsed since tripping
		Instantaneous	When a current higher than the set value is detected, the branch output is cut off within 20 ms.		
		Extended time	When a current higher than the set value is detected, the branch output is cut off within 1,000 ms.		

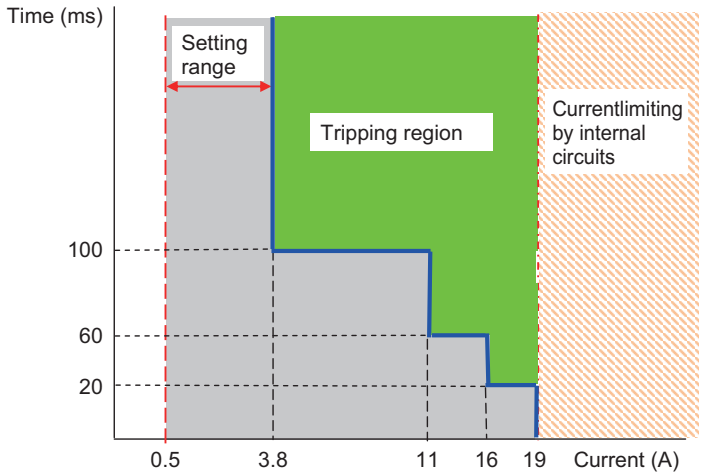
When the abnormal current is detected and branch output is cut off, the error code (A11) and present current are displayed alternately on the seven-segment display and the Tripping Alarm Output (TRP) is turned OFF. The channel ON/OFF key of the branch output that was cut off will flash red.

To clear the error, eliminate the cause of the error, and then press the Reset Key. Recovery by the Reset Key or channel ON/OFF key is possible 15 seconds or more have elapsed since tripping.



● Current Tripping Characteristics

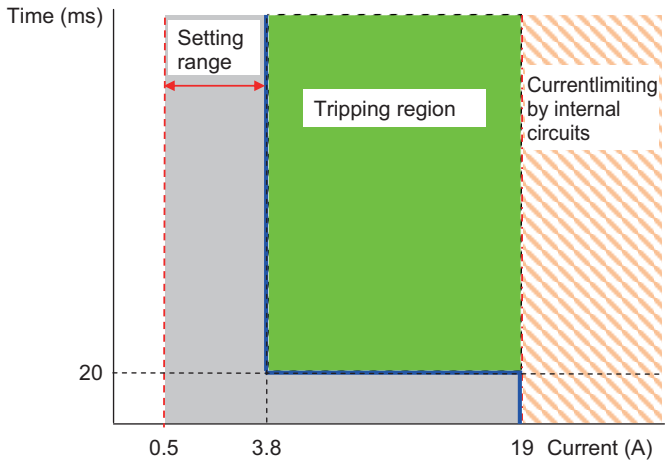
- Standard Detection



Tolerance of current tripping alarm threshold: ±0.3 A.

When the tripping current (0.5 to 3.8 A) is detected, it is cut off within 100 ms.

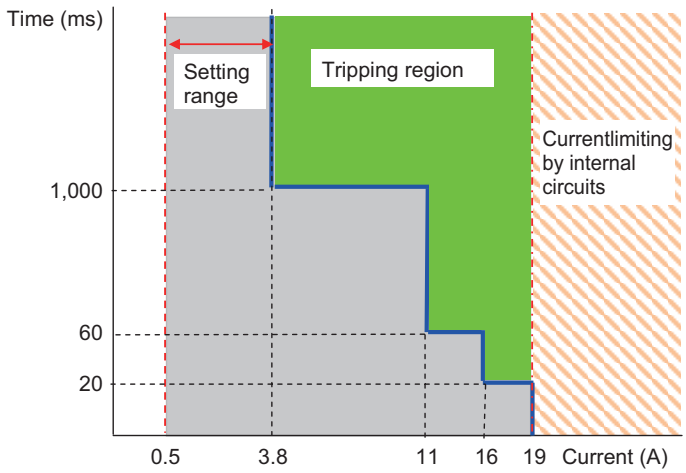
- Instantaneous Detection



Tolerance of current tripping alarm threshold: ±0.3 A.

When the tripping current (0.5 to 3.8 A) is detected, it is cut off within 20 ms.

- Extended Detection



Tolerance of current tripping alarm threshold: ±0.3 A.

When the tripping current (0.5 to 3.8 A) is detected, it is cut off within 1,000 ms.

Note The S8AS2 contains a current-restricting circuit that prevents a current above a specific value from flowing.
The current is thus restricted during the time required to cut off the output.

Abnormal Total Current Tripping Function

The S8AS2 monitors the total output current as well as the branch output currents. When the total output current exceeds the set value, all branch outputs will be cut off.

There are a number of conditions for the tripping current and time. If even one of these conditions is detected, the abnormal total current tripping function will be activated.

The following table outlines the tripping conditions.

Power-ON time (s)	Total current (A)		Operation	Error code and alarm output	Conditions required to reset
	240 W	480 W			
1 s min.	---	27	When the total current reaches these values, all branches will be cut off within 20 ms.	The error code A12 will flash on the seven-segment display and the Tripping Alarm Output (TRP) MOSFET relay output will turn OFF.	After 15 seconds or more elapsed since tripping
2 s min.	17	25			
5 s min.	15	22.5			
10 s min.	13	---			
20 s min.	12	---			

--- : Not applicable

Note 1. If the total output current exceeds the maximum peak current value, internal operation will become unstable and the branch outputs may be cut off.

2. Maintain the total current for normal operation after the load devices have started to within the rated ranges.

Safety Functions

● Short-circuit Protection Fuse

If an error occurs that prevents the power MOSFET from cutting off a branch output, the short-circuit protection fuse will blow to protect the circuit.

Note If the fuse blows, that branch output cannot be used.

2-4-3 Maintenance Forecast Monitor Function

This product has a built-in electrolytic capacitor. Electrolytic capacitors undergo degradation in characteristics, such as a decrease in capacitance, over time due to the evaporation of the internal electrolyte solution. This degradation begins at the time of manufacture as the impregnated electrolyte solution permeates the sealing rubber. Due to degradation of this electrolytic capacitor's characteristics, this product will become unable to perform sufficiently over time. The maintenance forecast monitor function calculates an estimated period until this product will no longer be able to perform sufficiently due to degradation of the electrolytic capacitor's characteristics. This feature can be used as a guideline for finding out when to replace the product main unit.

Note The maintenance forecast monitor function indicates an estimated period until the product will no longer be able to perform sufficiently due to degradation of the electrolytic capacitor. This function does not cover failures caused by other factors.

Principle of Operation

The degradation rate of an electrolytic capacitor varies considerably with ambient temperature (generally following the doubling for every 10°C rule and the Arrhenius equation). The S8AS2 monitors the internal temperature of the product while powered ON, and calculates the degradation level of the electrolytic capacitor based on running time and internal temperature.

Note 1. Depending on the durability of the electronic components, we recommend replacing the electrolytic capacitors approximately 15 years after purchase, regardless of the maintenance forecast monitor number of years or percentage displayed.

2. The replacement time varies depending on changes in operating conditions. Check the display periodically.

3. In applications where the input power is frequently turned ON and OFF, the accuracy of the maintenance forecast monitor function may deteriorate.

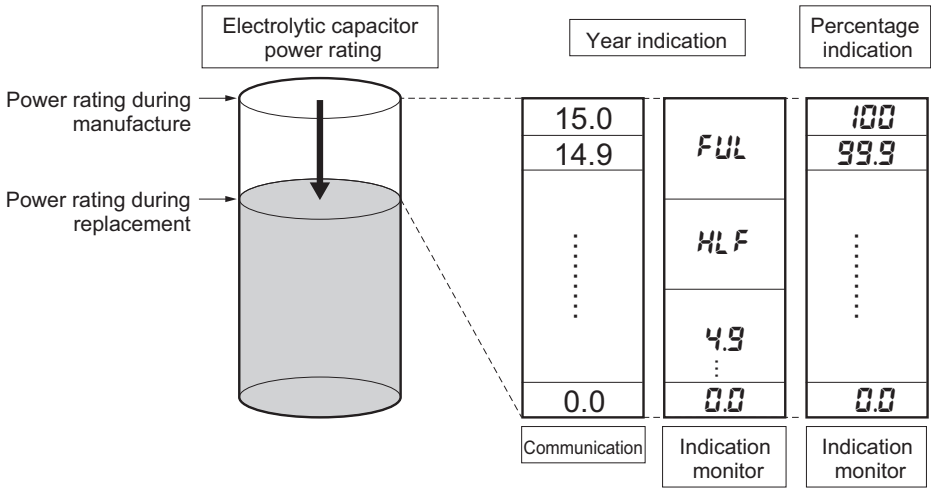
Years until replacement

FUL is indicated at the time of purchase (when initially powered on), and continues to be indicated for approximately one month. Afterward, the state of deterioration for the electrolytic capacitor is calculated based on the usage environment, HLF and is indicated when deterioration progresses. When the years until replacement reaches 5 years or less, it is indicated in 0.1 step increments within the range of 0.0 to 4.9. (Depending on the usage environment, the number of years may be indicated after FUL without HLF being indicated.)

Note The number of years until replacement may vary if there are frequent load variations or in locations where the ambient temperature fluctuates drastically.

Percentage until replacement

With the number of years until replacement at the time of manufacture set as 100%, as deterioration of the electrolytic capacitor progresses through use, it decreases in 0.1% step increments.



Relationship between electrolytic capacitor power rating and indicator

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 S8AS2 is 10 years minimum. Also, a replacement time calculation function is included among the functions of the S8AS2.

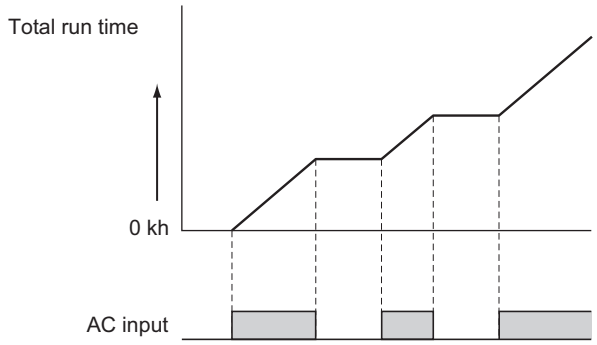
The replacement time is the service life (the Power Supply's internal temperature is monitored at all times) of the internal electrolytic capacitor in actual operating conditions, and varies according to the customers operating conditions. 15 years is taken as the maximum period of the maintenance forecast.

2-4-4 Total Run Time

The accumulated value of the product's time powered on is measured as the total run time.

Total run time increases in 1 (kh) steps.

Time Chart



Note 1. The total run time does not include the time that the Power Supply is OFF.

2. The total run time measures the total time that power is being supplied and is not related in any way to deterioration in the electrolytic capacitor built into the Power Supply or to the effects of the ambient temperature.

2-4-5 Over-temperature output

When the temperature exceeds the set value continuously for more than 1 s, the seven-segment display will show error code A30 and the Over-temperature Output (TMP) will go OFF.

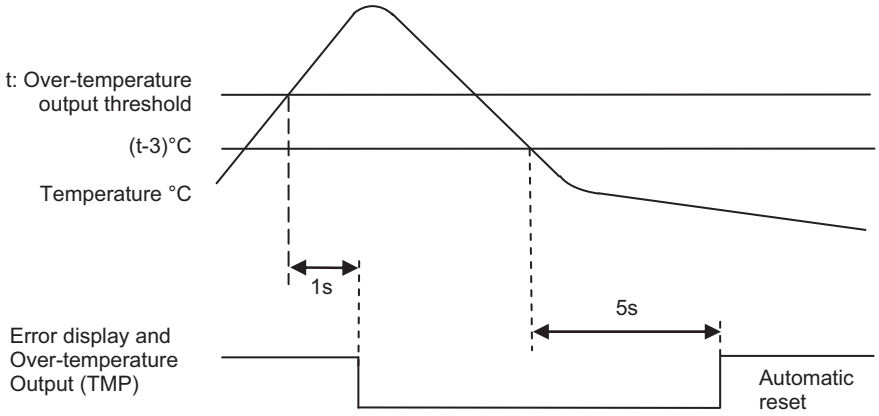
The error display and Over-temperature Output are reset automatically when the temperature has been below the set value minus 3°C for more than 5 s.

Setting range	Default value	Operation	Seven-segment display	Outputs	Restoration condition
25 to 100°C	100°C	The output is turned OFF when the temperature higher than the set value continuously for more than 1 s.	Alternately displays error code A30 and the temperature (°C).	The Over-temperature Output (TMP) MOSFET relay output turns OFF.	Reset automatically when the temperature falls below the set value minus 3°C.

● Over-temperature Output (TMP)

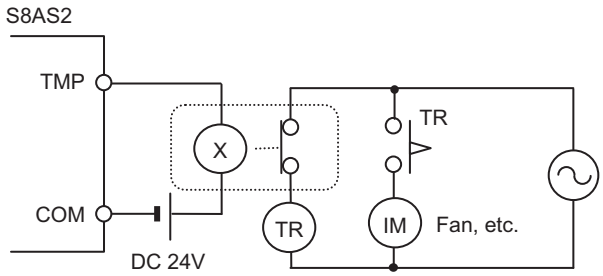
When the temperature falls below the set value minus 3°C, the over-temperature output automatically turns ON.

- The over-temperature output (TMP) can be used to start an exhaust fan or air conditioner to reduce the temperature in the control panel.
- The initial value is set at 100°C so that the over-temperature output is essentially disabled at the beginning.



● Example Application

The output is normally closed (ON) and goes OFF when there is an error, so receive the TMP output through an auxiliary relay. In addition, the output will go ON momentarily when the power is turned ON, so receive the output through a time-delay relay. (For details, refer to page 3-16.)



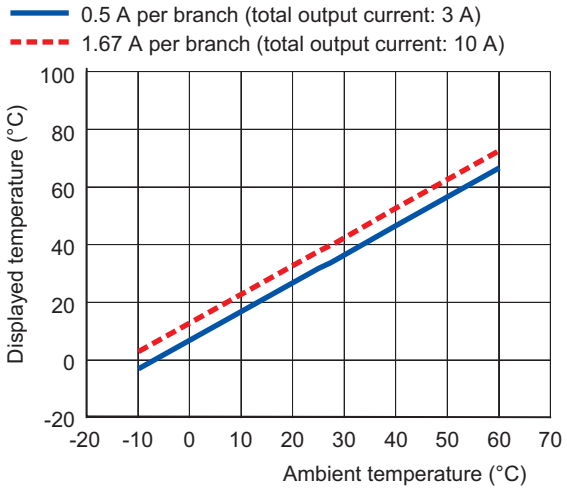
● Relationship between Control Panel Temperature and S8AS2 Internal Temperature

The internal temperature of the S8AS2 is displayed. This is not necessarily the same as the ambient temperature of the S8AS2 or the temperature inside the control panel. The difference between the internal temperature of the S8AS2 and the ambient temperature depends on the current flowing through the S8AS2. Consider this difference in the application.

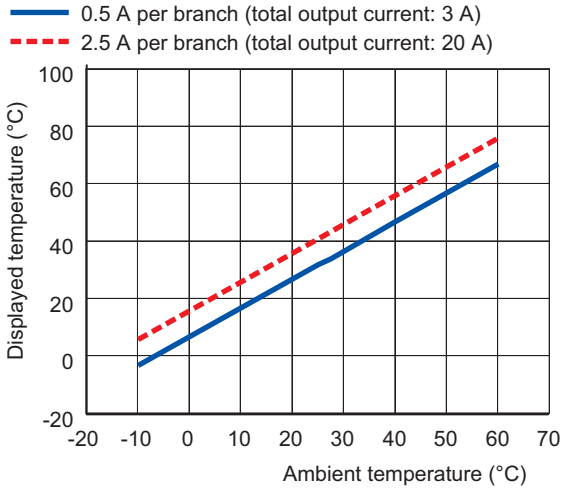
The following graph provides reference information on the displayed internal temperature and the ambient temperature.

Conditions: The same current was output from all branch outputs in a constant-temperature bath held at a constant temperature

- 240 W



- 480W

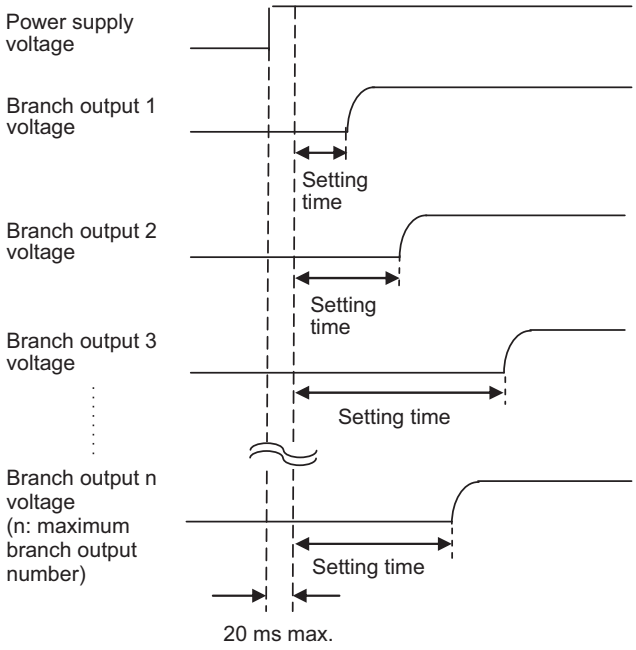


2-5 Startup Sequence Function

The inrush current may cause a voltage drop if all of the branch outputs are connected simultaneously and there is little spare capacity in the power supply or the loads connected to the branch outputs are capacitive loads. A significant voltage drop may cause an output to be cut off. In this case, a time delay can be applied between the connections of the branch outputs to minimize the voltage drop.

Note 1. The time delay can be set between 0.0 and 99.9 s. (If the delay is set to 0.0 s, the startup sequence will not operate and the branch output will be connected immediately.)

2. The startup sequence is designed for the four branch outputs on one S8AS2. It does not provide time synchronization between outputs on more than one S8AS2.



- The branch output's status indicator will flash green during the startup sequence time until it is connected.
- For details on verification of the startup sequence, refer to *5-3 Checking Sequence Operation* on page 5-4.
- The startup sequence for models with unchangeable settings (S8AS2-□□-□SN) cannot be changed.

Branch output number	1	2	3	4	5	6	7	8
Setting time	0.0 s	0.4 s	0.8 s	1.2 s	1.6 s	2.0 s	2.4s	2.8 s

Additional Information

The startup sequence functions in the following processes:

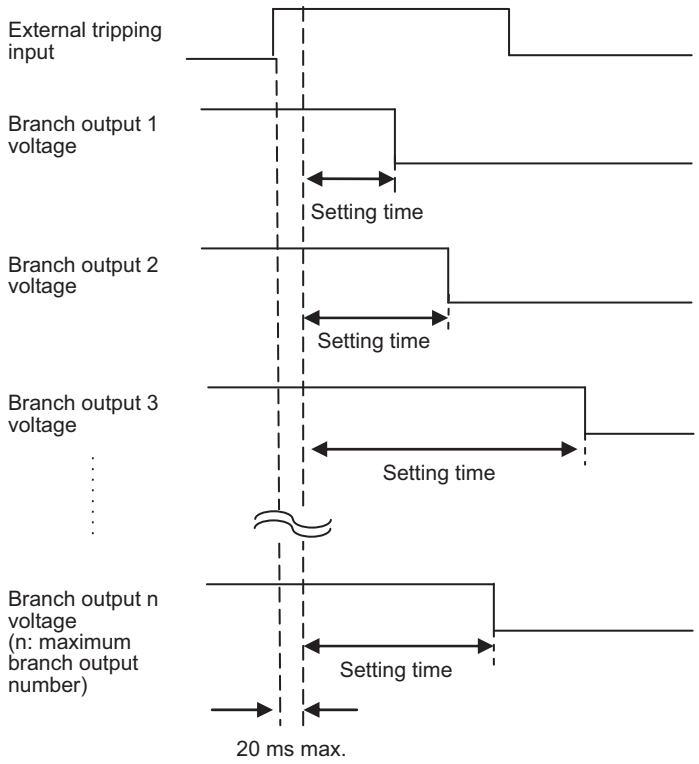
- Connecting when power is turned ON
- Reconnecting during a reset operation
- External signal tripping input or operation by “software tripping trigger”

2-6 Shutdown Sequence Function

When the S8AS2's input power supply is turned OFF, all of the branch outputs are turned OFF (disconnected) simultaneously. On the other hand, when the branch outputs are cut off by the external tripping input or communications, a time delay can be applied between the branch output disconnections.

Note 1. The time delay can be set between 0.0 and 99.9 s. (If the delay is set to 0.0 s, the startup sequence will not operate and the branch output will be cut off immediately.)

2. The startup sequence is designed for the four branch outputs on one S8AS2. It does not provide time synchronization between outputs on more than one S8AS2.
3. When operation is cut off due to an abnormal voltage, all of the branch outputs will be cut off simultaneously.
4. The shutdown sequence function will operate on a branch output only if the external tripping input is enabled for that branch output. For details, refer to *Tripping trigger enable/disable* on page 4-11.
5. The shutdown sequence setting times for all branch outputs for the S8AS2-☐☐-☐SN are set to 0.0 s and cannot be changed.



- For details on verification of the shutdown sequence, refer to *5-3 Checking Sequence Operation* on page 5-4.

Additional Information

The shutdown sequence functions in the following processes:

- Cutoff processing for the external tripping input
- Operation by parameter “software tripping input”

2-7 External Tripping Input Function

The external tripping input (TRG) can be used to cut off or reconnect branch outputs using an external input signal.

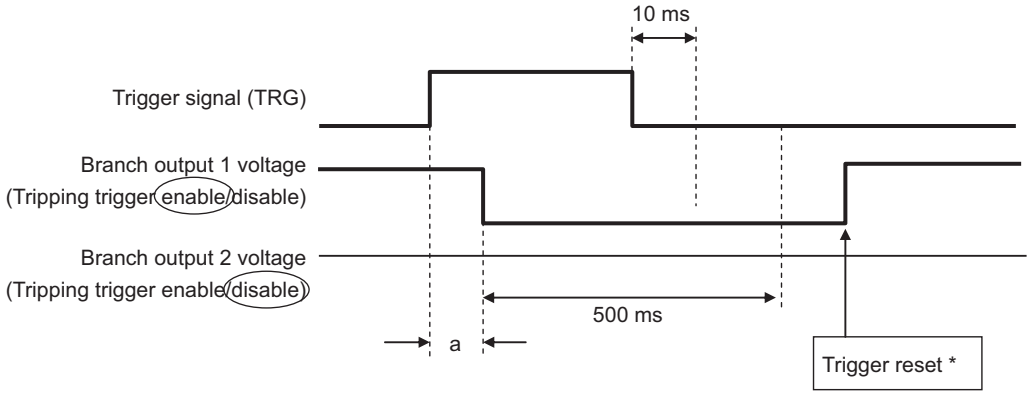
The following settings are required to use this function.

Item	Function	Settings
Tripping trigger enable/disable	Enables the external tripping input (TRG) function for each branch.	ON (enabled) OFF (disabled)
Tripping trigger type	Sets the external tripping input trigger signal type.	EGE (edge trigger) LVL (level trigger)

(The external tripping input is enabled and tripping type for the S8AS2-□□-□SN is set to EGE and these settings cannot be changed.)

● Tripping Trigger Type: Edge Trigger (EGE)

Tripping is performed at the rising edge of tripping input (state changes from OFF to ON).

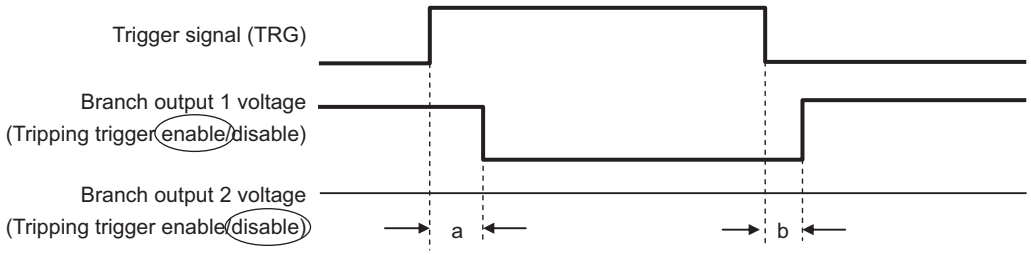


a: 20 ms + Shutdown sequence setting time
*: Connected after startup sequence setting time has elapsed.

If the trigger signal (TRG) stays OFF for 10 ms or more and the branch output is disconnected for 500 ms or more, the trigger reset can be accepted.

● Tripping Trigger Type: Level Trigger (LVL)

Tripping is performed at the rising edge of tripping input (state changes from OFF to ON), and the connection is made at the falling edge (state changes from ON to OFF).



a: 20 ms + Shutdown sequence setting time
b: 20 ms + Startup sequence setting time

3

Installation and Wiring

3-1 Installing the S8AS2

To increase the S8AS2 system's reliability and take full advantage of the S8AS2's functions, observe the following precautions when installing the S8AS2.

Installation Site

Avoid locations with any of the following conditions when installing the S8AS2.

To increase the S8AS2 system's reliability and take full advantage of the S8AS2's functions, observe the following precautions when installing the S8AS2.

- Locations subject to a temperature below -25°C to 70°C
- Locations subject to a humidity below 95%RH (no condensation/icing)
- Low dew-point environments
- Locations subject to direct sunlight
- Locations subject to exposure to liquids, debris, or corrosive gases
- Locations subject to severe shock or vibration
- Locations near equipment that generates strong high-frequency noise or surges

Always enclose or protect the S8AS2 sufficiently in the following locations.

- Locations subject to static electricity or other forms of noise.
- Locations subject to strong electromagnetic fields.
- Locations subject to possible exposure to radioactivity.
- Locations close to power lines.

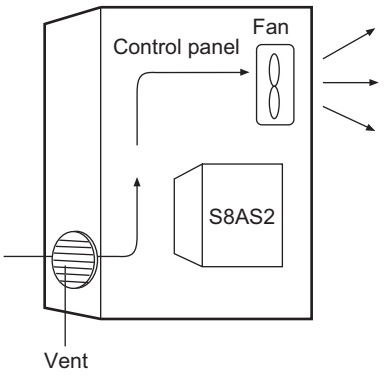
Installation in Cabinets or Control Panels

When the S8AS2 is being installed in a cabinet or control panel, always provide suitable ambient conditions as well as access for operation and maintenance.

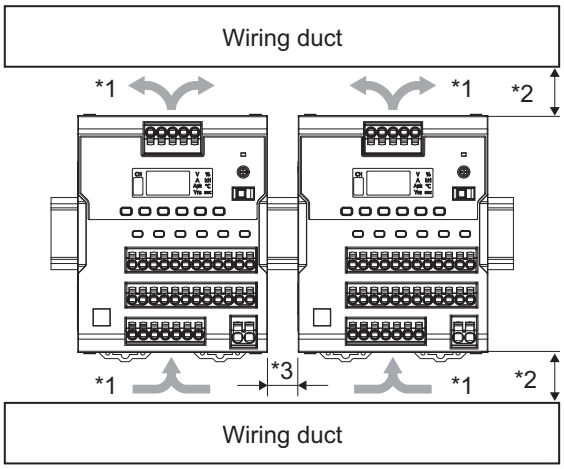
● Ambient Temperature

The operating temperature range for the S8AS2 is -25°C to 70°C. Observe the following precautions.

- Provide enough space for good air flow.
- Do not install the S8AS2 above equipment that generates a large amount of heat, such as heaters, transformers, or high-capacity resistors.
- If the ambient temperature in the cabinet may exceed 70°C, install an exhaust fan or air conditioner and use the Over-temperature Output to operate the cooling equipment.



- Mount the S8AS2 at least 15 mm away from heat sources.
- Leave at least 25 mm between the S8AS2 and other devices above and below it.



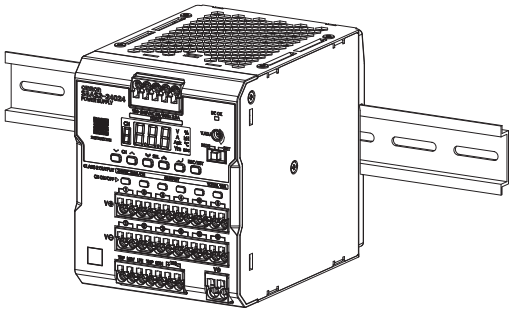
*1 Air convection
*2 Vertical spacing 25 mm min.
*3 Horizontal spacing 15 mm min.
(standard mount)

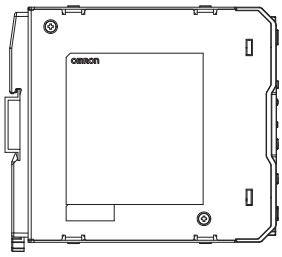
3-2 Installation

When mounting the S8AS2 in a panel, use DIN Rail. The product cannot be directly mounted to the control panel using screws or other fasteners.

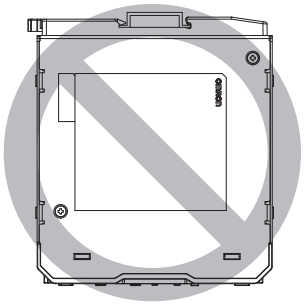
Mounting in a Panel

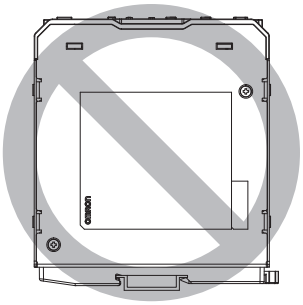
- The S8AS2 must be installed in the orientation shown below to ensure adequate cooling.

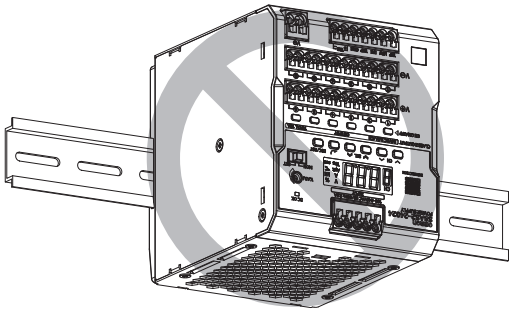


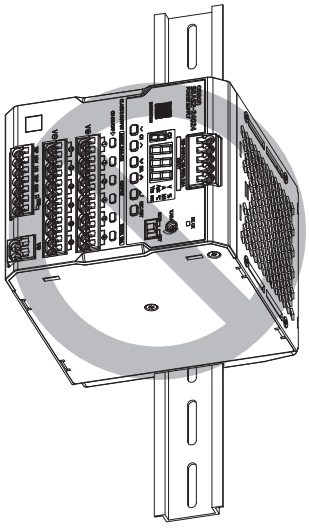


- Do not install the S8AS2 in any of the following orientations.



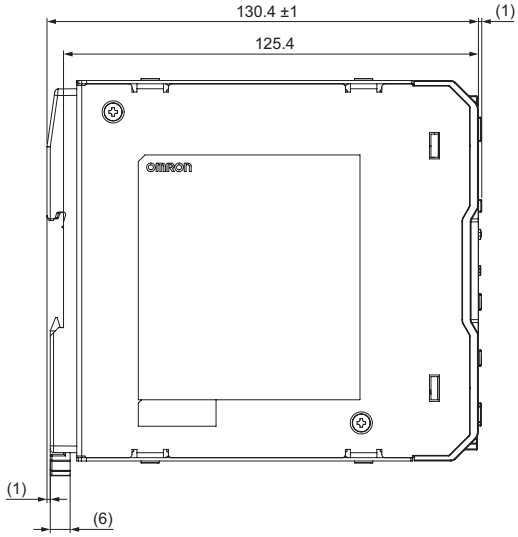


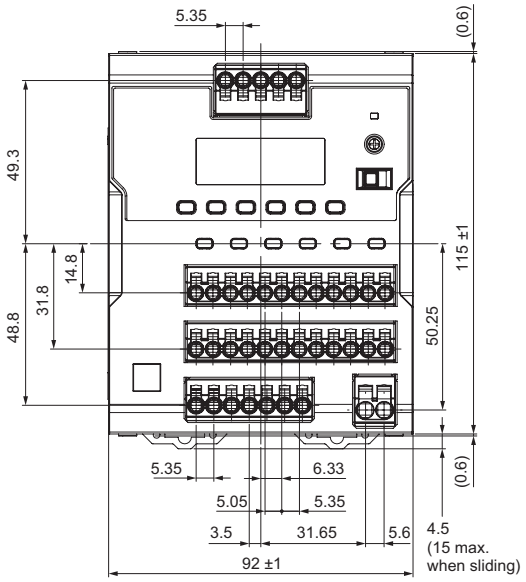




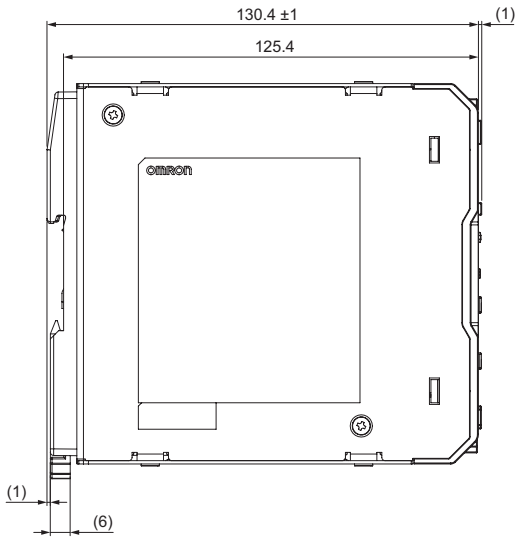
External Dimensions

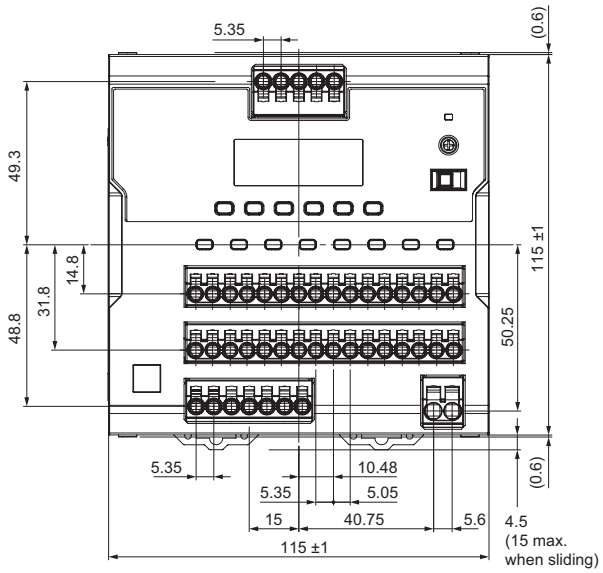
● S8AS2-24024-06☐ (240-W Model with 6 Branch Outputs)





● S8AS2-48024-08☐ (480-W Model with 8 Branch Outputs)





DIN Rail Installation

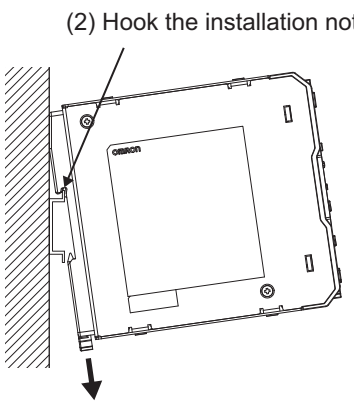
Always install the S8AS2 on DIN Rail.

Mount the DIN Rail with M4 screws in at least three places, with a maximum separation of 210 mm (6 holes) between screws. The tightening torque is 1.2 N·m (10.8 in·lb).

● Attachment to the DIN Rail

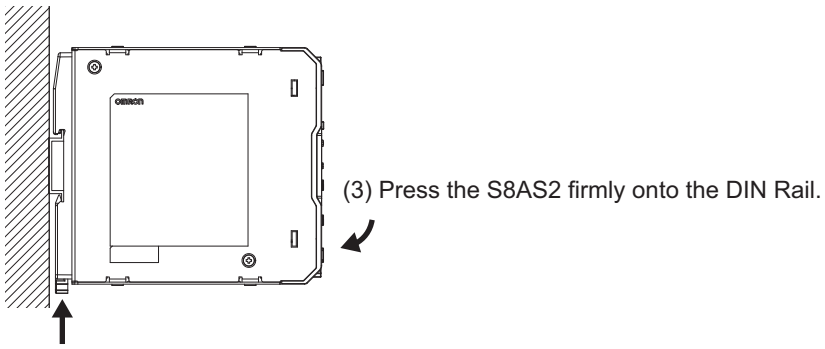
1 Pull out the two lock levers on the S8AS2.

Lower the S8AS2 so that the installation notch hooks onto the top of the DIN Rail.



2 Press the S8AS2 onto the DIN Rail and push in the lock levers.

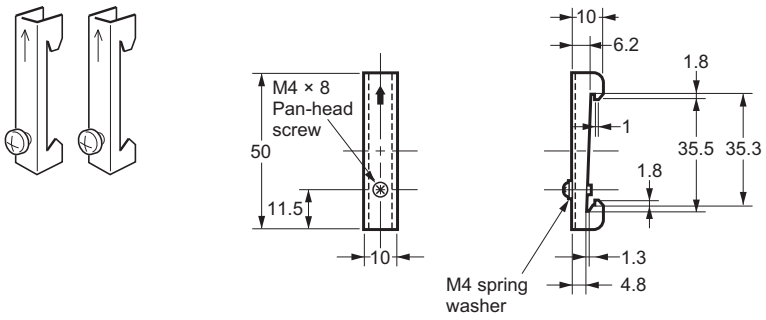
Press the lock levers until the locks engage securely.



After the S8AS2 is mounted on the DIN Rail, attach an End Plate on each side of the Power Supply to secure it in place.

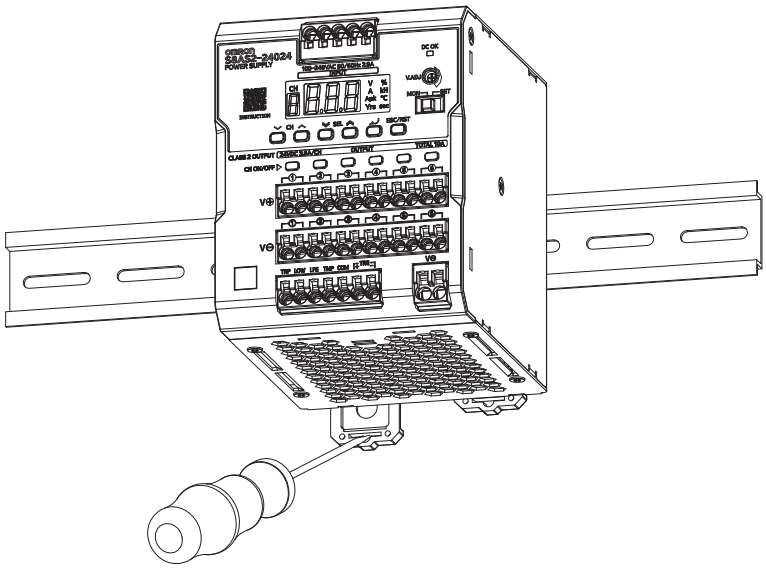
- **Recommended End Plate**

  PFP-M



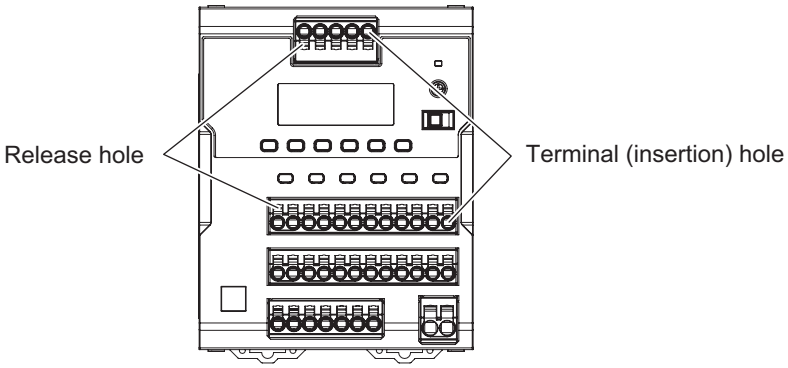
● Removal

When removing the S8AS2 from the DIN Rail, pull the lock lever down with a flat-blade screwdriver and pivot the S8AS2 upward to remove it.



3-3 How to Connect to the Push-In Terminal Blocks

Component Names

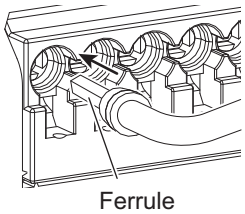


Name	Function
Terminal (insertion) hole	Used to insert wires with ferrules, solid wires, and stranded wires.
Release hole	Releases the wire when the specified flat-blade screwdriver is inserted. Also used when you insert stranded wires.

Connecting Wires with Ferrules and Solid Wires

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

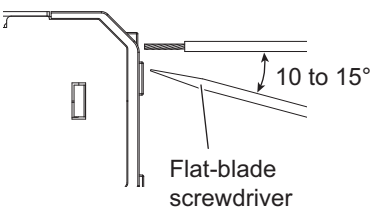
If it is difficult to insert fine solid wires, insert the wire with a screwdriver inserted into the release hole, and then remove the screwdriver while ensuring that the fine solid wire is still held.



Connecting Stranded Wires

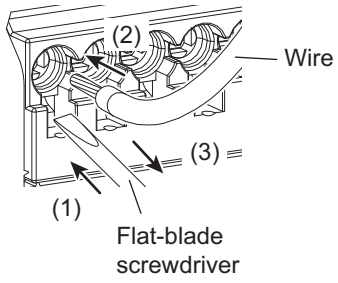
- Hold a flat-blade screwdriver at an angle and insert it into the release hole. The angle should be between 10º and 15º.

  If the flat-blade screwdriver is inserted correctly, you will feel the spring in the release hole.



Precautions for Correct Use

- Do not apply more than 50 N force to the terminal block when you insert wiring or insert a flat-blade screwdriver into the release hole.
- 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.

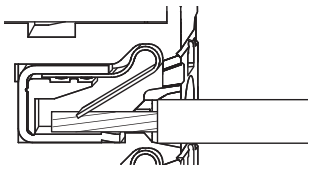


- Insert the wire straight into the terminal block until the end touches the terminal block.

- Remove the flat-blade screwdriver from the release hole.

Checking Connections

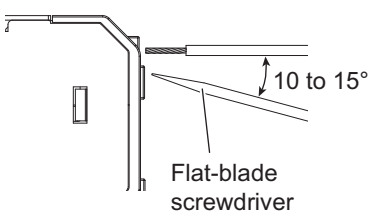
After the insertion, pull gently on the wire to make sure that it will not come off and the wire is securely fastened to the terminal block.



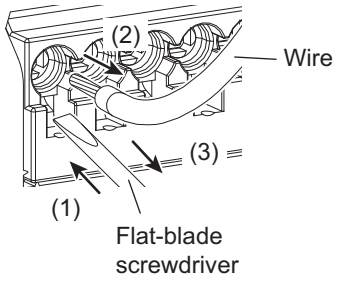
When you use a stranded wire, make sure that the stranded wire does not bend or touch the adjacent terminal.

Removing Wires from the Push-In Terminal Blocks

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



- Hold a flat-blade screwdriver at an angle and insert it into the release hole. The angle should be between 10º and 15º.
  If the flat-blade screwdriver is inserted correctly, you will feel the spring in the release hole.



- Remove the wire.
- Remove the flat-blade screwdriver from the release hole.

Push-In Terminal Blocks Specifications

● Specifications

Item	Construction	
Construction	Push-In Terminal Blocks	
Applicable wires	Stranded wires, solid wires, and ferrules	
Insertion force of the Screwdriver into the release hole	Terminal block for other than common output terminals (-)	Not to exceed 40 N of force
	Terminal block for common output terminals (-)	Not to exceed 100 N of force

● Recommended Wire

Installation and wiring

- Connect the ground completely. The ground is a protective earth (PE) terminal specified in safety standards. If the ground is not connected completely, electric shock or malfunction may occur.
- Minor fire may possibly occur. Ensure that input and output terminals are wired correctly.
- To prevent smoke and fire generated from wiring materials, verify the wire rating, and use the wire materials listed in the table below.

Recommended Wire

Terminal	Recommended Wire		
	Model	(mm^2)	(AWG)
AC Input Terminals	S8AS2-24024-06□	0.5 to 2.5	20 to 14
	S8AS2-48024-08□	0.75 to 2.5	18 to 14
Protective earth (PE) terminal	S8AS2-□□-□□	2 to 2.5	14
Branch output terminals (+) Branch output terminals (-)	S8AS2-□□-□□	0.5 to 2.5	20 to 14
Common output terminals (-)	S8AS2-24024-06□	2 to 4	14 to 12
	S8AS2-48024-08□	4	12
I/O signal terminals	S8AS2-□□-□□	0.25 to 4	24 to 14

Notes: • The wire should be copper, either stranded or solid.
• Use heat-resistant wire rated for 75°C or higher.

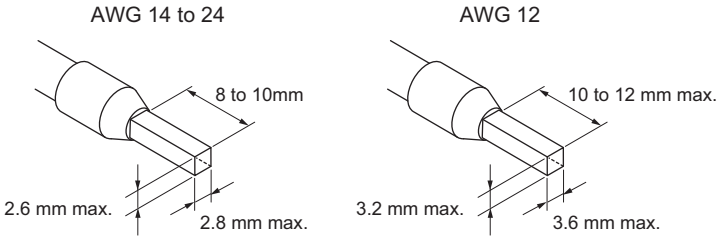
Stripping length

Terminal	Recommend Wire Type	Ferrules length	Recommend Stripping length	
			Ferrules used	Ferrules not used
For terminals other than common output terminal (-)	0.25 to 1.5 mm^2/ AWG24 to 16	8 mm	10 mm	8 mm
		10 mm	12 mm	10 mm
For common output terminal (-)	2 to 2.5mm^2/AWG14	10 mm	12 mm	10 mm
	4mm^2/AWG12	12 mm	14 mm	12 mm

Recommended Ferrules

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	FE-0.25-8N-YE
		10	12	AI 0,25-10	---	---
0.34	22	8	10	AI 0,34-8	H0.34/12	FE-0.34-8N-TQ
		10	12	AI 0,34-10	---	---
0.50	20	8	10	AI 0,5-8	H0.5/14	FE-0.5-8N-WH
		10	12	AI 0,5-10	H0.5/16	FE-0.5-10N-WH
0.75	18	8	10	AI 0,75-8	H0.75/14	FE-0.75-8N-GY
		10	12	AI 0,75-10	H0.75/16	FE-0.75-10N-GY
1/1.25	18/17	8	10	AI 1-8	H1.0/14	FE-1.0-8N-RD
		10	12	AI 1-10	H1.0/16	FE-1.0-10N-RD
1.25/1.5	17/16	8	10	AI 1,5-8	H1.5/14	FE-1.5-8N-BK
		10	12	AI 1,5-10	H1.5/16	FE-1.5-10N-BK
2.5	14	10	12	AI 2,5-10	H2.5/16DS	FE-2.5-10N-BU
4	12	12	14	AI 4-12	H4.0/20D	FE-4.0-12N-GY
Recommended crimp tool				CRIMPFOX6 CRIMPFOX6T-F CRIMPFOX10S	PZ6 roto	Variocrimp4

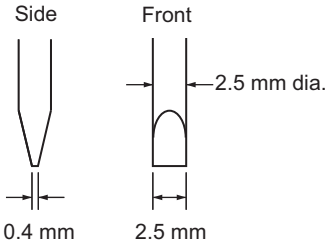
Notes: 1. Make sure that the outer diameter of the wire coating is smaller than the inner diameter of the insulation sleeve of the recommended ferrule.
2. Check that the processing dimensions of the ferrule terminal conform to the following shape.



Recommended Flat-blade Screwdrivers

Terminal block for other than common output terminals (-)

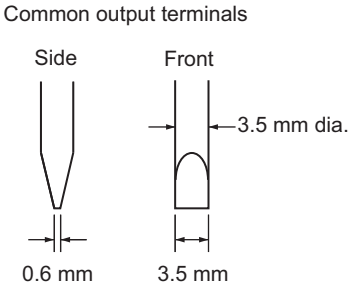
Model	Manufacturer
ESD 0,40×2,5	Wera
SZS 0,4×2,5 SZF 0-0,4×2,5*	Phoenix Contact
0.4×2.5×75 302	Wiha
AEF.2,5×75	Facom
210-719	Wago
SDI 0.4×2.5×75	Weidmuller



* You can purchase the SZF 0-0,4×2,5 flat-blade screwdriver made by PHOENIX CONTACT with OMRON model XW4Z-00B.

Terminal block for common output terminals (-)

Model	Manufacturer
ESD 0,60×3,5	Wera
SZS 0,6×3,5 SZF 1-0,6×3,5*	Phoenix Contact
0.6×3.5×100 302	Wiha
AEF.3,5×75	Facom
210-720	Wago
SDIS 0.4×2.5×75	Weidmuller
1-64-984	Stanley



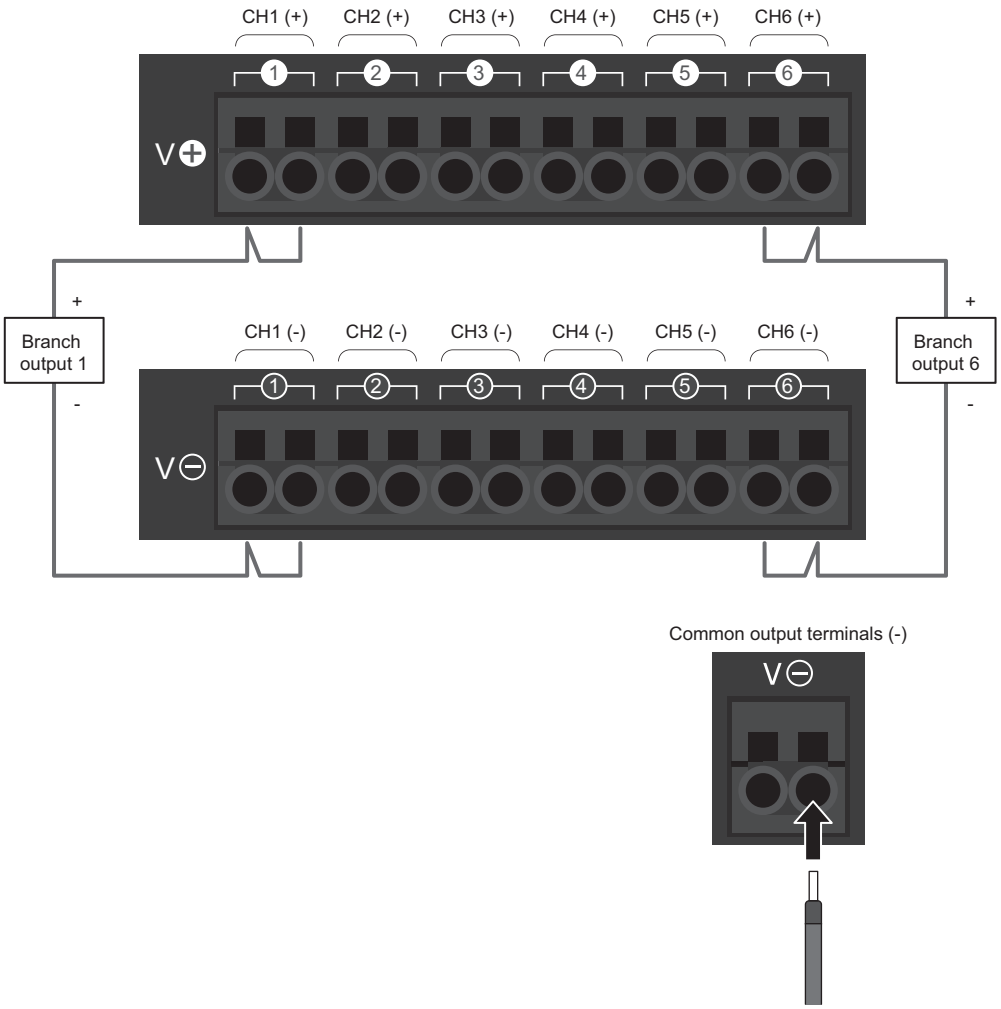
Wiring the Branch Outputs

Two positive and two negative terminals are used for each branch output.

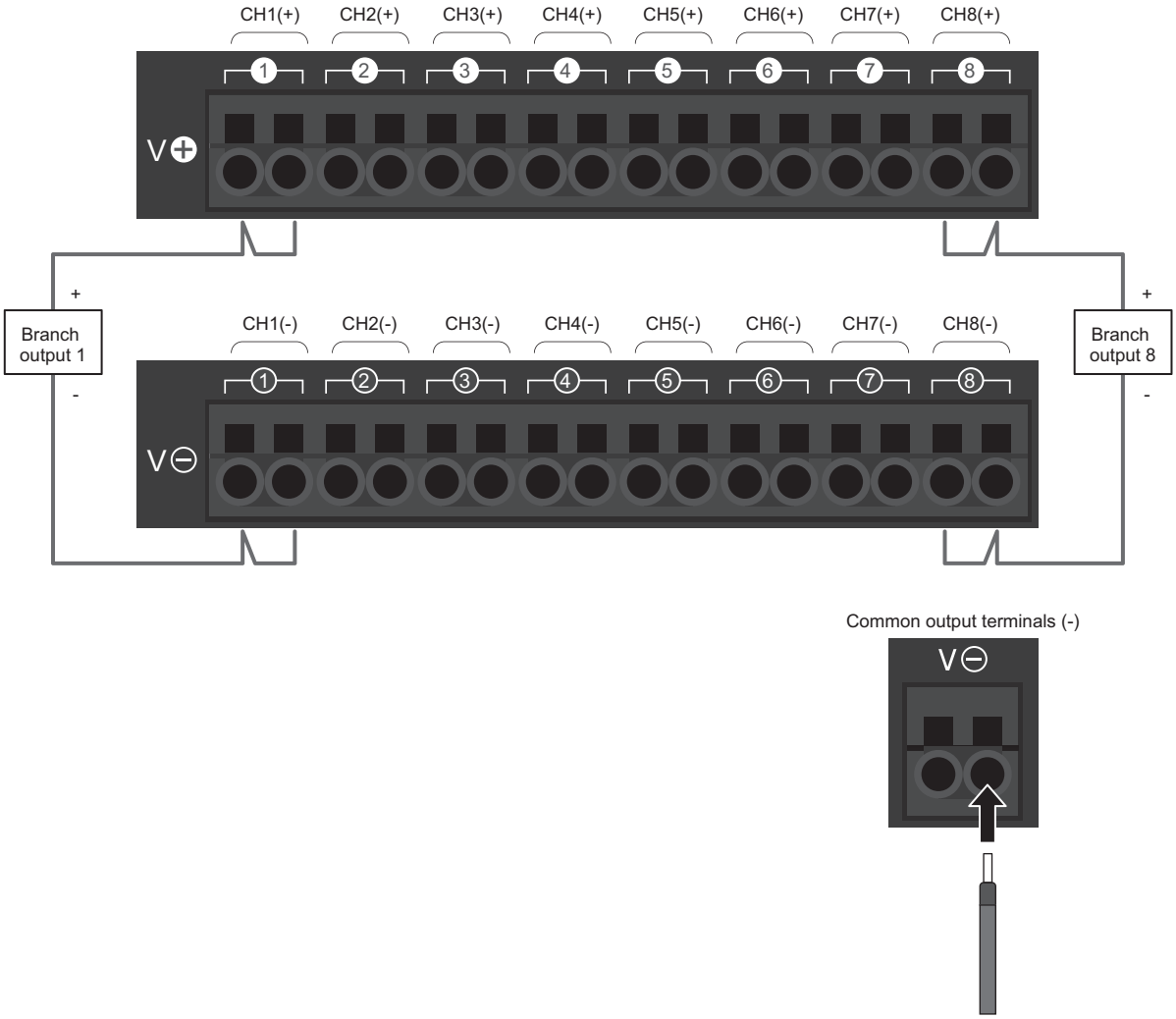
The negative terminals are all connected internally.

● Wiring the Branch Output Connector

• 240 W

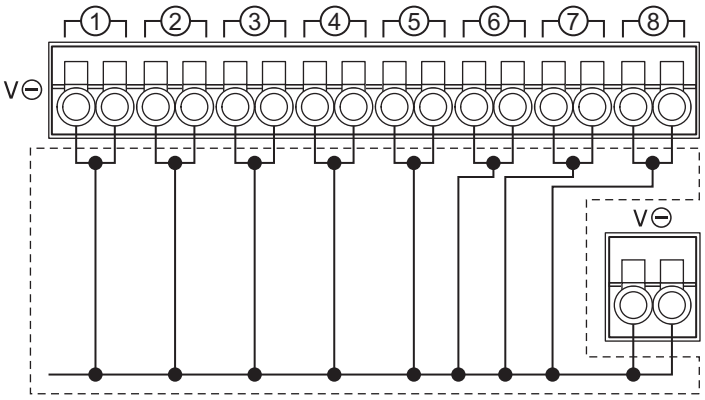


• 480 W



• 480 W internal circuit

Using 480 W as an example, the internal circuit configuration is shown below.



Internal circuit configuration

Precautions for Correct Use

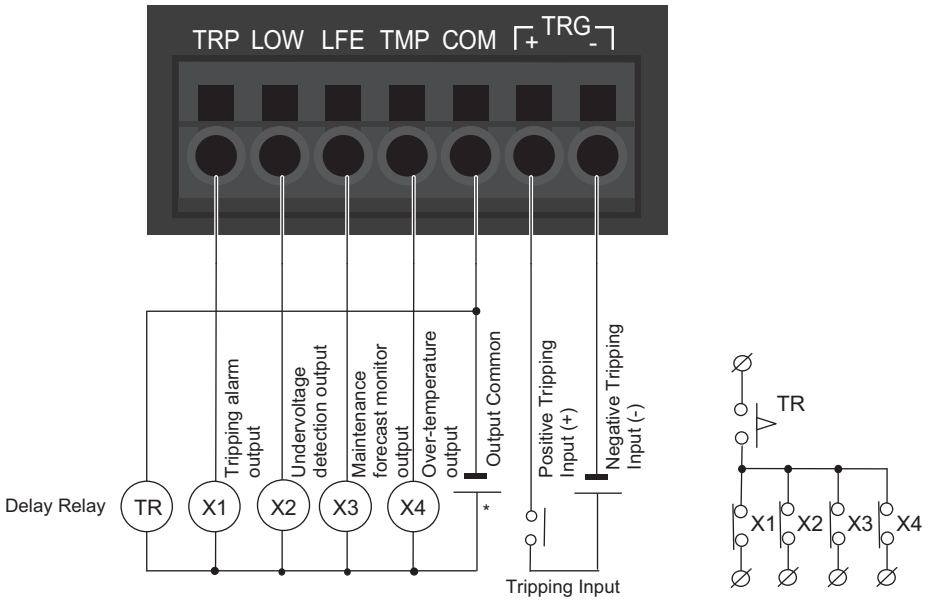
You may connect the positive terminals or the negative terminals of the same branch output in parallel, but do not connect them with other branch outputs.

Wiring the External Outputs and External Tripping Input

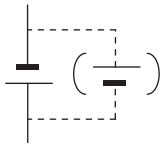
The TRP, LOW, LFE, and TMP outputs operate as normally closed outputs, which are OFF when the power is OFF, ON during normal operation, and OFF when an error has occurred.

If you want to use these an external output as a normally open output, invert the signal through an auxiliary relay (X). When doing so, the alarm may turn ON momentarily when the power supply is turned ON. To prevent this, delay the signal through the delay relay (TR).

The branch output is cut off when the External Tripping Input (TRG) is ON (connected).



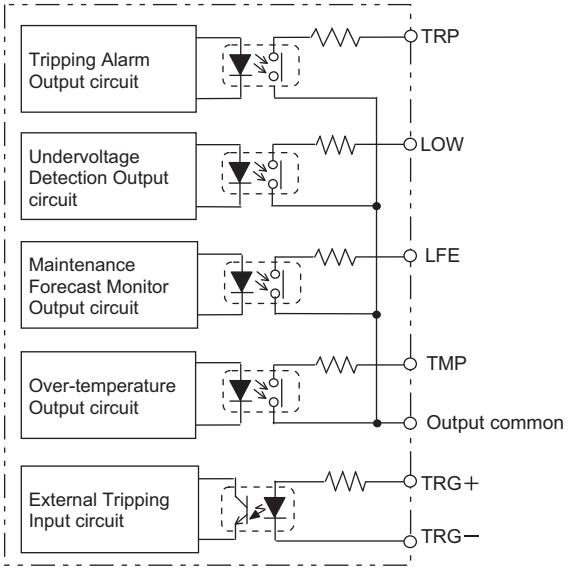
* Output terminals do not have polarity.



No.	Name		Function
1	TRP	Tripping Alarm Output	The MOSFET relay output turns OFF when a branch circuit is cut off due to abnormal detection or an external signal tripping operation.
2	LOW	Undervoltage Detection Output	The MOSFET relay output turns OFF when the output voltage drops below the set value.
3	LFE	Maintenance Forecast Monitor Output	The MOSFET relay output turns OFF when the estimated replacement time drops below the set value.
4	TMP	Over-temperature Output	The MOSFET relay output turns OFF when the S8AS2's internal temperature exceeds the over-temperature output threshold.
5	COM	Output Common	Common terminal for the four outputs described above.
6	TRG+	External Tripping Input (+)	Branch outputs can be cut off from an external operation. (The shutdown sequence is applied in this case.)
7	TRG-	External Tripping Input (-)	

• Internal Circuits

Output circuit	DC 30V 50mA Max. MOSFET relay output
Input circuit	DC 19.2 to 30.0V Minimum signal width: 10 ms



4

Parameter Settings

The method for setting parameters for model S8AS2 is explained below.

4-1 Parameter Table

This is the parameter table for the S8AS2. The Monitor Mode and Setting Mode each have their own parameters. Switch the operating mode and display content by using the mode selection switch. For details, refer to *1-2 S8AS2 Operating Modes* on page 1-9.

● Monitor Mode

Monitor Mode parameters only display measured values. No changes are made to settings.

Parameter name (display order)	(1) Branch output indicators	(2) Seven-segment display	(3) Unit	Display range	Page reference for details
Output voltage	Not lit.	Value	V	16.3 to 32.0	Page 4-5
Output current	1 to 6 (8)	Value	A	0.0 to 20.0	Page 4-5
Total current	Not lit.	Value	A	0.0 to 60.0	Page 4-5
Peak current	1 to 6 (8)	Value	Apk	0.0 to 20.0	Page 4-6
Years up to replacement time	Not lit.	Value	Yrs	0.0 to 4.9	Page 4-6
Percentage up to replacement time	Not lit.	Value	%	0.0 to 99.9	Page 4-7
Total running time	Not lit.	Value	kH	0 to 132	Page 4-7
Temperature	Not lit.	Value	°C	-20 to 120	Page 4-7

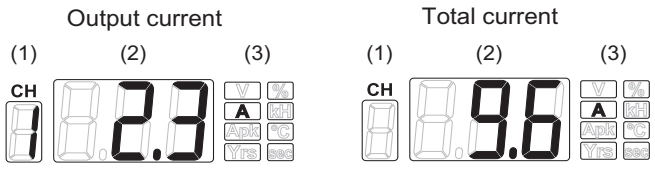
The Monitor Mode parameters are identified by the following three LED indicators.

(1) Branch output indicators

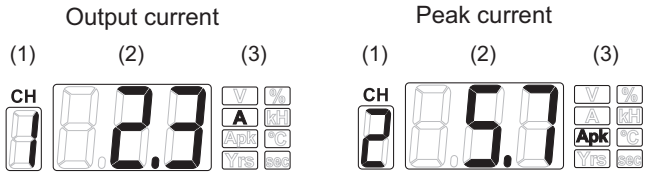
(2) Seven-segment display

(3) Unit indicators

"Output current" and "Total current" are identified by the presence or absence of the display in (1).



"Output current" and "Peak current" are identified by the difference in the display in (3).



● Setting Mode

The parameters in the Setting Mode can be used to set alarm values and operations.

(Note, however, that settings cannot be viewed or changed depending on the protection level setting.) For details, refer to *Protection level* in *4-4 Setting Mode Parameters*.

Parameter name (display order)	(1) Branch output indicators	(2) Seven-segment display	(3) Unit	Setting range	Default value *2	Page reference for details
Abnormal current tripping threshold	1 to 6 (8)	C-□	A	0.5 to 3.8	3.8	Page 4-8
Abnormal current tripping type	1 to 6 (8)	C-t	—	USU/CnS/LnG	USU	Page 4-9
Abnormal voltage tripping threshold	Not lit.	□-□	V	26.0 to 32.0	32.0	Page 4-9
Undervoltage detection threshold	Not lit.	U-□	V	18.0 to 26.4	20.0	Page 4-9
Maintenance forecast output threshold	Not lit.	LFE	Yrs	0.0 to 5.0	0.5	Page 4-9
Maintenance forecast percentage threshold	Not lit.	LFP	%	0.0 to 99.9	0	Page 4-10
Running time alarm threshold	Not lit.	tLn	kH	0 to 132	132	Page 4-10
Temperature alarm threshold	Not lit.	tnP	°C	25 to 100	100	Page 4-10
Startup sequence	1 to 6 (8)	UPS	Sec	0.0 to 99.9	0	Page 4-11
Shutdown sequence	1 to 6 (8)	dYS	Sec	0.0 to 99.9	0	Page 4-11
Tripping trigger enable/disable	1 to 6 (8)	trG	—	oFF/on	on	Page 4-11
Tripping trigger type	Not lit.	tGS	—	EGE/LuL	EGE	Page 4-11
Software tripping trigger *1	Not lit.	SSt	—	no/YES	no	Page 4-12
Startup operation check test *1	Not lit.	SUt	—	no/YES	no	Page 4-13
Reset function setting	Not lit.	rSt	—	ALL/MEY	ALL	Page 4-13
Protection level*1	Not lit.	Prt	—	Lu.0/Lu.1/Lu.2	Lu.1	Page 4-14
Channel ON/OFF key enable/disable *1	Not lit.	CHM	—	on/oFF	on	Page 4-15
Channel ON/OFF key response time setting *1	Not lit.	CHd	—	oFF/on	oFF	Page 4-15
Tripping alarm output conditions *1	Not lit.	trt	—	USU/ALL	USU	Page 4-15
Initialize defaults	Not lit.	Cnt	—	no/YES	no	Page 4-15

*1. These parameters can be set even on the S8AS2-□□-□SN (model on which settings cannot be made).

*2. On the S8AS2-□□-□SN (model on which settings cannot be made), parameters other than those marked with *1 cannot be displayed or set; however, default values are preset.
Note, however, that the abnormal current tripping type is set to Extended (LNG), and the startup sequence is as follows.

Branch output number	1	2	3	4	5	6	7	8
Setting time	0.0 s	0.4 s	0.8 s	1.2 s	1.6 s	2.0 s	2.4 s	2.8 s

4-2 Switching the Operating Mode

The S8AS2 has 2 operating modes: Monitor Mode and Setting Mode.

The operating mode can be changed by the mode selection switch.

24 VDC power is supplied to the branch outputs in both modes (branch outputs are connected). Also, the output voltage, output current, internal temperature, and run time are monitored at all times.

Mode name	Description
Monitor Mode 	This mode is used during normal operation. The monitored values (voltage, current, etc.) of each branch output can be displayed on the seven-segment display. The S8AS2 automatically starts up in this Monitor Mode when it is used for the first time.
Setting Mode 	This mode is used to change the settings of the various parameters. Note, however, that on the S8AS2-□□-□SN, some parameters cannot be changed.

For details on how to display parameters in the Monitor Mode, refer to *4-3 Monitor Mode Parameters* on page 4-5.

For details on how to set parameters in the Setting Mode, refer to *4-4 Setting Mode Parameters* on page 4-8.

4-3 Monitor Mode Parameters

This section describes the parameters in the Monitor Mode.

Display transition between parameters is performed by the Selection Down/Up Keys.

To switch the branch No. for branch output-related parameters, use the Channel Down/Up Keys.

The display state is held when the Monitor Mode is temporarily exited using the mode selection switch. When the display transitions to the Monitor Mode again, the subsequent display state is the top display.

Output voltage

Common parameter

Displays the current output voltage value.

Display range	Unit
16.3 to 32.0	V

Output current

Branch output parameter

* Branch output available

Displays the output current value of the current channel.

Pressing the Channel Down/Up Keys switches the display to another channel.

Display range	Unit
0.0 to 20.0	A

Total current

Common parameter

Displays the current total current value of all the branch outputs.

In addition to the maximum value limits for each branch output, note that there is also a maximum limit for the total current value.

Refer to *Total Peak Output Current* in *Precautions for Correct Use*.

Display range	Unit
0.0 to 60.0	A

Peak current

Branch output parameter

* Branch output available

Displays the peak current value of the current channel.

Pressing the Channel Down/Up Keys switches the display to another channel.

Display range	Unit
0.0 to 20.0	Apk

●The peak current output can be cleared by following the procedure below.

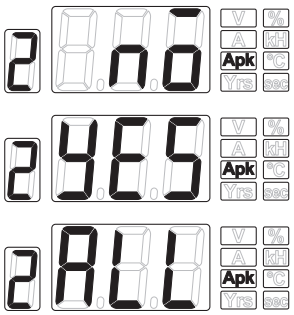
1 Press the Enter Key.

2 From NO display, select either of using the Selection Down/Up Keys.

YES: Clear currently selected branch output

ALL: Clear all branch outputs

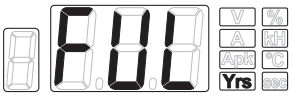
Pressing the ESC/RST Key returns to the previous screen without clearing branch outputs.



3 Press the Enter Key.

Years up to replacement time

Common parameter



Displays the remaining number of years up to the replacement time by forecasting the replacement time of the S8AS2.

Alarm judgment is performed based on this value.

For details, refer to *Maintenance Forecast Monitor Function* on page 24.

Display range	Unit
0.0 to 4.9, HLF, FUL	Yrs

Percentage up to replacement time

Common parameter

Displays the remaining percentage up to the replacement time by forecasting the replacement time of the S8AS2.

Alarm judgment is performed based on this value.

For details, refer to *Maintenance Forecast Monitor Function* on page 2-24.

Display range	Unit
0.0 to 99.9	%

Total running time

Common parameter

Displays the running time of the S8AS2.

Alarm judgment is performed based on this value.

Example) When the seven-segment display indicates “12”
This indicates a running time of 12,000 hours.

Display range	Unit
0 to 132	kH

Temperature

Common parameter

Displays the internal temperature of the S8AS2.

Alarm judgment is performed based on this value.

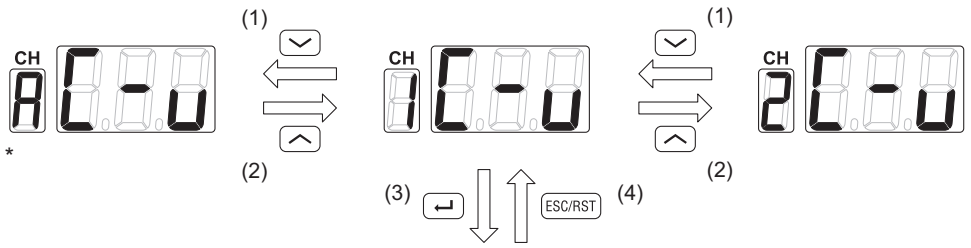
Display range	Unit
-20 to 120	°C

4-4 Setting Mode Parameters

This section describes the parameters in the Setting Mode.

Parameter settings in the Setting Mode are made using the following 6 keys.

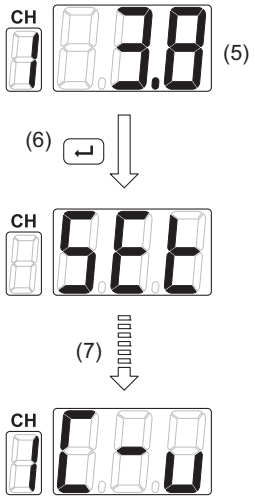
Selection Down Key	Channel Down Key	Enter Key
Selection Up Key	Channel Up Key	ESC/RST Key



(1) Pressing the Channel Down Key at a parameter display switches to the previous branch output.

(2) Pressing the Channel Up Key at a parameter display switches to the next branch output.

(3) Pressing the Enter Key at a parameter display causes transition to the set value changed state.



(4) Pressing the ESC/RST Key while in the set value changed state returns the display to the parameter display state.

(5) In the set value changed state, you can change the set value by pressing the Selection Down/Up Keys. Also, holding down a key speeds up the change in the set value.

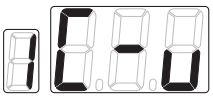
(6) Pressing the Enter Key in the set value changed state, the screen will dim and then display “SET”.

(7) After the “SET” display ends, the set value is confirmed and the display transitions to the parameter display state.

* The “A” on the branch output indicators stands for “ALL.” In this case, you can set the parameters for all channels together to the same value.

Abnormal current tripping threshold

Branch output parameter



* Branch output available

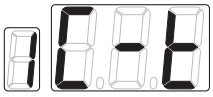
Set the abnormal current trip threshold of each branch output.

If the current value at the branch output exceeds this set value, the circuit will be tripped and the tripping alarm output (TRP) will activate.

Setting range	Unit	Default value
0.5 to 3.8	A	3.8

Abnormal current tripping type

Branch output parameter



* Branch output available

Standard/Instantaneous/Extended time can be selected as the threshold time of abnormal current tripping for each branch output.

Standard (tripping within 100 ms)

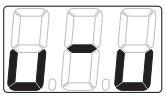
Instantaneous (tripping within 20 ms)

Extended time (tripping within 1,000 ms)

Setting range	Unit	Default value
USU : Standard InS : Instantaneous LnG : Extended time	—	USU

Abnormal voltage tripping threshold

Common parameter



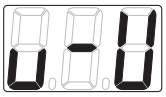
Sets the abnormal voltage tripping threshold for the output voltage.

If the output voltage exceeds this set value, the circuit will be tripped and the tripping alarm output (TRP) will activate.

Setting range	Unit	Default value
26.0 to 32.0	V	32.0

Undervoltage detection threshold

Common parameter



Sets the undervoltage alarm threshold for the output voltage.

If the output voltage falls below this set value, the undervoltage detection output (LOW) will activate.

The circuit will not be tripped.

Setting range	Unit	Default value
18.0 to 26.4	V	20.0

Maintenance forecast output threshold

Common parameter

Sets the maintenance forecast output threshold.

When the running time and the life expectancy (number of years) calculated from the internal temperature fall below this threshold, the maintenance forecast monitor output (LFE) will activate.

Setting range	Unit	Default value
0.0 to 5.0	Yrs	0.5 years

Maintenance forecast percentage threshold

Common parameter

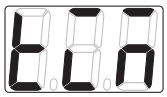
Sets the maintenance forecast percentage threshold.

When the running time and the life expectancy (percentage) calculated from the internal temperature fall below this threshold, the maintenance forecast monitor output (LFE) will activate.

Setting range	Unit	Default value
0.0 to 99.9	%	0.0

Running time alarm threshold

Common parameter



Sets the running time alarm threshold.

When the running time exceeds this threshold, the maintenance forecast monitor output (LFE) will activate.

Example) When the set value is “12”
An alarm will be output at a running time of 12,000 hours or more.

Setting range	Unit	Default value
0 to 132	kH	132

Temperature alarm threshold

Common parameter

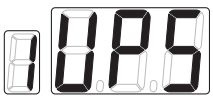
Sets the temperature alarm threshold.

When the internal temperature exceeds the threshold, the temperature output (TMP) will activate.

Setting range	Unit	Default value
25 to 100	°C	100

Startup sequence

Branch output parameter



* Branch output available

When the startup sequence is set, a time delay can be provided to connections to each branch output at power ON. This function can reduce inrush current at power ON.

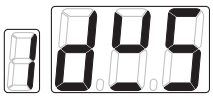
Setting range	Unit	Default value
0.0 to 99.9	Sec	0.0 *1

*1. On the S8AS2-□□-□SN (model on which settings cannot be made), the following values are fixed.

Branch output number	1	2	3	4	5	6	7	8
Setting time	0.0 s	0.4 s	0.8 s	1.2 s	1.6 s	2.0 s	2.4 s	2.8 s

Shutdown sequence

Branch output parameter



* Branch output available

When using the external tripping input (TRG) to trip branch outputs, tripping can be performed with a time delay provided for each branch output.

Setting range	Unit	Default value
0.0 to 99.9	Sec	0.0

Tripping trigger enable/disable

Common parameter

Sets whether to enable (ON) or disable (OFF) tripping by the external tripping input (TRG) for each individual branch output.

Setting range	Unit	Default value
OFF: Disabled ON: Enabled	—	ON

Tripping trigger type

Common parameter

The type of tripping trigger input used in common for branch outputs for which the external tripping input (TRG) is enabled can be set.

Setting range	Unit	Default value
Edge trigger Level trigger	—	EGE

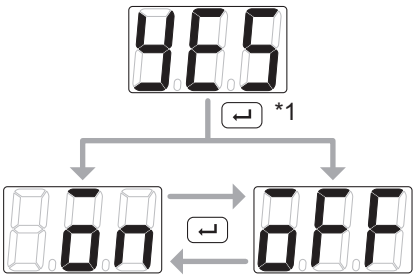
Software tripping trigger

Common parameter

Sets whether to enable (YES) or disable (NO) the software tripping trigger.

Setting range	Unit	Default value
NO: Disabled YES: Enabled	—	NO

●When the software tripping trigger is set to disabled (NO), the display will return to the parameter screen.
When it is set to enabled (YES), the display transitions to the following screen. Operation when a tripping trigger is input by key operation can be checked.



*1. The display will show either ON or OFF depending on the input state of the external tripping input (TRG) when the Enter Key is pressed.

When the Enter Key is pressed, S8AS2 executes the tripping (ON) or connection (OFF) trigger operation.

The following settings are reflected in operation.

"Startup sequence"

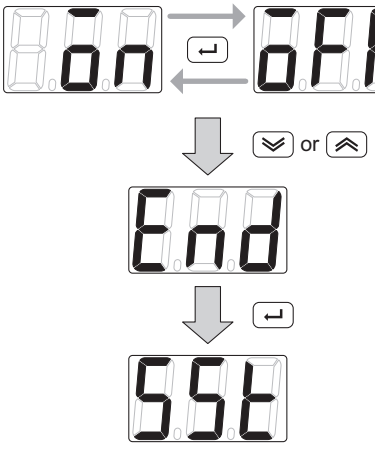
"Shutdown sequence"

"Tripping trigger enable/disable"

"Tripping trigger type"

Setting range	Unit	Default value
OFF: The tripping trigger is not input. (Virtual TRG input is turned OFF.) ON: The tripping trigger is input. (Virtual TRG input is turned ON.)	—	The input state of the external tripping trigger (TRG) is reflected.

●Procedure for ending the operation check with a software tripping trigger



Press the Selection Down/Up Keys.

“END” will be displayed. Press the Enter Key to return to the parameter screen.

Startup operation check test

Common parameter

Operation at power ON can be checked by key operation.

This function is used to check operation at power ON when it is difficult to turn the power supply ON and OFF.

The following settings are reflected in operation.

"Startup sequence"

"Tripping trigger enable/disable"

"Tripping trigger type"

Setting range	Unit	Default value
NO: Startup test is not executed. YES: Startup test is executed.	—	NO

Reset function setting

Common parameter

Sets the method for resetting the abnormal state after an abnormality occurs and its cause has been eliminated.

The default is “ALL.” In this case, cycling the power supply will clear the abnormal state information and restart the product. *1

If “KEY” is set, the abnormal state information will not be cleared even after cycling the power supply. Use this feature to leave a record of the abnormality.

*1. If the cause of the abnormality has not been eliminated, the abnormality will be judged each time it occurs, and it may recur.

This parameter setting does not affect the reset operation performed by holding down the RST Key for 3 seconds.

Setting range	Unit	Default value
KEY: RST Key only enabled ALL: RST Key and power cycle	—	ALL

Protection level

Common parameter

3 levels of restriction can be applied to parameter read/setting operations.

This prevents parameter changes or loss due to inadvertent operation.

At shipment from the factory, the protection level is set to “1.”

Setting range	Unit	Default value
lv.0: All parameters can be read or changed. lv.1: Read/change of only operation settings related to voltage and current is permitted. lv.2: Parameter reading is restricted and all change operations are prohibited.	—	Lv1

The following table shows whether or not parameters can be set for each protection level.

The meaning of the symbols is as follows:

✓✓: Set value is changeable.

✓: Cannot be set. Set value can be displayed.

—: Cannot be set. Not even displayed.

Parameter name (display order)	(3) Unit		
	Level 2	Level 1	Level 0
Abnormal current tripping threshold	✓	✓✓	✓✓
Abnormal current tripping type	×	—	✓✓
Abnormal voltage tripping threshold	✓	✓✓	✓✓
Undervoltage detection threshold	✓	✓✓	✓✓
Maintenance forecast output threshold	✓	✓✓	✓✓
Maintenance forecast percentage threshold	✓	✓✓	✓✓
Running time alarm threshold	✓	✓✓	✓✓
Temperature alarm threshold	✓	✓✓	✓✓
Shutdown sequence	—	—	✓✓
Tripping trigger enable/disable	—	—	✓✓
Tripping trigger type	—	—	✓✓
Startup filter enable/disable	—	—	✓✓
Software tripping trigger *1	—	—	✓✓
Startup operation check test *1	—	—	✓✓
Reset function setting	—	—	✓✓
Protection level*1	✓✓	✓✓	✓✓
Channel ON/OFF key enable/disable *1	✓✓	✓✓	✓✓
Channel ON/OFF key response time setting *1	✓	✓✓	✓✓
Tripping alarm output conditions *1	✓	✓✓	✓✓
Initialize defaults	—	—	✓✓

*1. These parameters can be set even on the S8AS2-□□-□SN (model on which settings cannot be made).

Channel ON/OFF key enable/disable

Common parameter

Sets whether to enable (ON) or disable (OFF) the channel ON/OFF key in the Monitor Mode.

Setting range	Unit	Default value
OFF: Disabled ON: Enabled	—	ON

Channel ON/OFF key response time setting Ver.1.10

Common parameter

Change the hold-down time required for a setting to take effect.

Setting range	Unit	Default value
OFF: Applied immediately ON: Applied only when the key is held down for 1s	—	OFF

Tripping alarm output conditions Ver.1.10

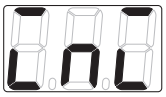
Common parameter

Configure the conditions under which the abnormal trip output (TRP) is activated. The TRP output can be configured to activate not only when an abnormal voltage or abnormal current is detected, but also when tripping occurs due to operation of the channel ON/OFF switching key or via an external signal.

Setting range	Unit	Default value
USU: Output only during abnormal tripping ALL: Output under all tripping conditions	—	USU

Initialize defaults

Common parameter



This is used to return all settings to their default states.

Setting range	Unit	Default value
NO: Not initialized. YES: Initialization is executed.	—	NO

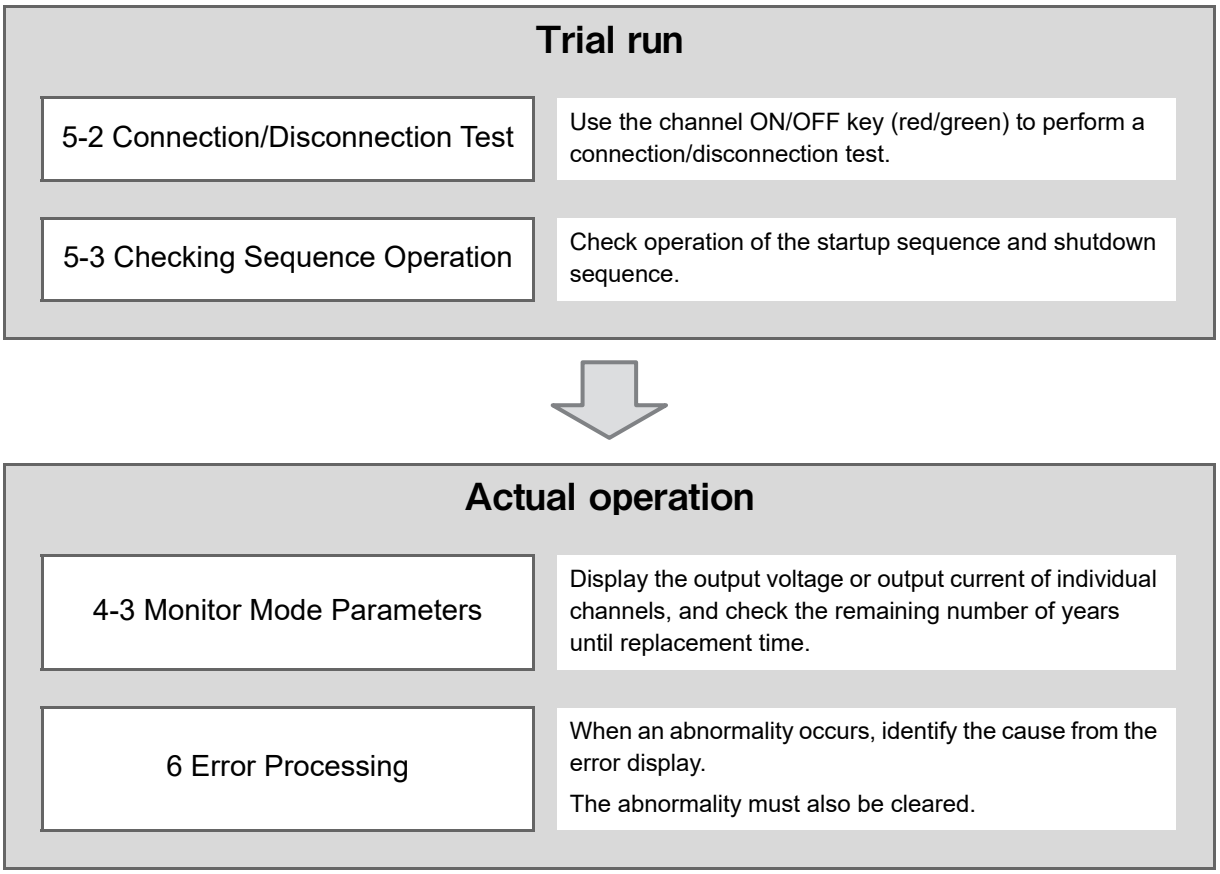
5

Trial Operation to Actual Operation

5-1 Trial run

Before starting actual operation of the equipment, each branch output can be manually activated individually to check the connection state.

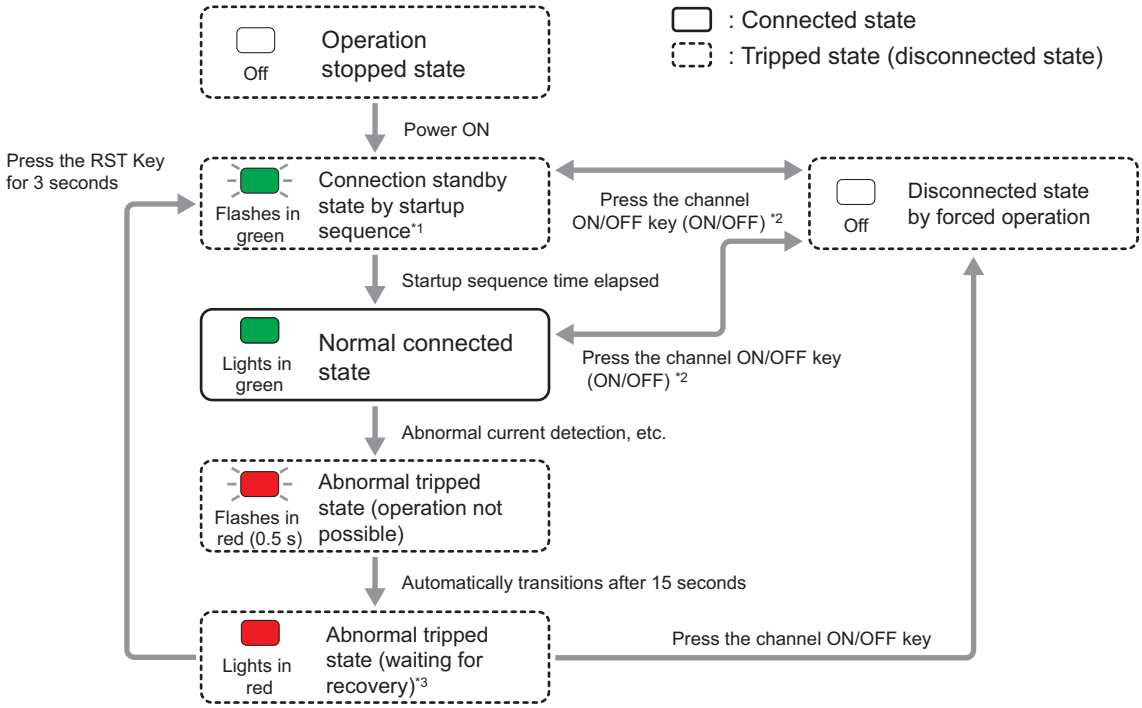
Operation at startup also can be checked.



5-2 Connection/Disconnection Test

Before performing the connection/disconnection test, always sufficiently check that it is safe to do so and will not adversely affect the equipment.

Pressing the “channel ON/OFF key” toggles the target circuit between the connected and tripped (disconnected) state. Check that each individual circuit can be connected/tripped (disconnected) and that there are no problems.



*1. When 0 s is set to the startup sequence, the branch output is connected normally without waiting for the connection.
*2. When ON/OFF operation is performed continuously, OFF is switched to ON only after at least 3 seconds have elapsed since the previous ON.
*3. If a tripped state occurs due to an internal error (waiting for recovery), the indicator flashes in red at 0.25 second intervals.

5-3 Checking Sequence Operation

Check operation of the startup sequence/shutdown sequence functions.
Perform this after ensuring that there will be no impact on the equipment.

■ **Checking the startup sequence**
■ **Checking the shutdown sequence**

There are 3 ways to check sequence operation as follows.

[Method 1] Procedure using external tripping input (TRG)

Procedure	Description	Reference
1. Wiring	Connect the ± wiring to the external tripping input (TGR).	*Wiring the External Outputs and External Tripping Input* on page 3-16 in *3-3 How to Connect to the Push-In Terminal Blocks*
2. Parameter settings	Set the following. "Tripping trigger enable/disable" "Tripping trigger type"	*2-7 External Tripping Input Function* on page 2-31 *Applicable parameters* on page 4-11 in *4-4 Setting Mode Parameters*
3. Trigger input	Input the voltage signal to the external tripping input (TRG).	Signal specifications are given in external signal tripping input in *2-3 Specifications* on page 2-11, 2-11.

[Method 2] Procedure using software tripping trigger

Procedure	Description	Reference
1. Wiring (optional)	External tripping input (TRG) can be omitted. Wiring may be performed after checking the operation using the software tripping trigger.	*Wiring the External Outputs and External Tripping Input* on page 3-16 in *3-3 How to Connect to the Push-In Terminal Blocks*
2. Parameter settings	Set the following. "Tripping trigger enable/disable" "Tripping trigger type"	*2-7 External Tripping Input Function* on page 2-31 *Applicable parameters* on page 4-11 in *4-4 Setting Mode Parameters*
3. Trigger input	The following parameter is manipulated. "Software tripping trigger"	*Applicable parameters* on page 4-12 in *4-4 Setting Mode Parameters*

[Method 3] Procedure using startup operation check test

The startup operation check test checks only the startup sequence. This method differs from Method 1 and Method 2 in that operation of both the startup sequence and shutdown sequence cannot be checked.

Procedure	Description	Reference
1. Wiring (optional)	When the external tripping input (TRG) is not used, the following need not be set.	*Wiring the External Outputs and External Tripping Input* on page 3-16 in *3-3 How to Connect to the Push-In Terminal Blocks*
2. Parameter settings (optional)	When the external tripping input (TRG) is not used, the following need not be set. "Tripping trigger enable/disable" "Tripping trigger type"	*2-7 External Tripping Input Function* on page 2-31 *Applicable parameters* on page 4-11 in *4-4 Setting Mode Parameters*
3. Trigger input	The following parameter is manipulated. "Startup operation check test"	*Applicable parameters* on page 4-12 in *4-4 Setting Mode Parameters*

6

Error Processing

Measures to take in the event of an anomaly for model S8AS2 are explained below.

6-1 Troubleshooting

If the S8AS2 is not operating properly, check the items listed in the following table before requesting repairs. If the problem cannot be remedied, contact your OMRON sales representative.

	Observed problem	Possible cause	Remedy	Reference page
Installation	The S8AS2 was installed on a DIN Rail, but the bottom of the S8AS2 is not attached.	The S8AS2's bottom latch is not mounted properly.	Check that the S8AS2 has been pressed until the bottom latch clicks.	Page 3-6
Parameter settings	The desired parameter is not being displayed.	The setting is not allowed in the present protection level.	Change the protection level setting.	Page 4-14
	The set value was changed, but the change wasn't accepted.	The new setting was not saved.	After changing the numerical value with the Up/Down Keys, press the ENT Key to make the value flash, then press the ENT Key again. When the set value is applied, "SEt" is displayed.	Page 4-8 Page 4-9
	The branch outputs are not working.	Branch outputs are tripped by the channel ON/OFF key.	Press the channel ON/OFF key to connect the branch outputs.	Page 5-3
Equipment setup	After connecting in the Setting Mode, the connection was immediately tripped and a re-connection was no longer possible.	Check to see if the channel ON/OFF key is lit red. The current may be higher than the abnormal current tripping threshold.	Check for problems such as output wiring and load connection problems. If no problems are found, press the Reset Key.	Page 5-2 Page 6-6
Operation	The displayed temperature is clearly different from the ambient temperature.	The S8AS2 detects the S8AS2's internal temperature, which can be 10 to 20°C higher than the ambient temperature.	If the over-temperature output is being used to control a fan or cooling equipment, set the over-temperature output threshold based on the graph on page P. 2-29.	Page 2-26 Page 4-10
	An alarm was output and the cause of the alarm was eliminated, but the alarm display was not cleared.	The S8AS2 doesn't disregard temporary errors, so the display and output are maintained even after the cause of the alarm is cleared.	The alarm can be cleared by pressing the Reset Key.	Page 6-6
	The peak output current is not displayed and the display shows "- - -."	The current may have exceeded the measurable range.	Clear the peak output current in Run Mode.	Page 4-6

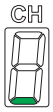
	Observed problem	Possible cause	Remedy	Reference page
Operation	The output was not designed for a current that high, but the output is cut off as soon as power is supplied.	The abnormal current tripping type may be set to “instantaneous. ” With instantaneous detection, an abnormal current is detected very quickly and the output may be cut off due to excessive current during equipment operation.	Either change the abnormal current tripping type from instantaneous to standard or increase the current tripping threshold.	Page 2-20 Page 4-8 Page 4-9
		There may be a large number of devices connected to the output. The more devices that are connected, the higher the operating current.	Connect the devices to different branch outputs and use the S8AS2's startup sequence to offset the connections to the devices.	Page 2-29 Page 4-11
	During operation, the display appears normal, but the output of a specific channel is not present.	To protect the internal circuitry of the S8AS2, the short-circuit protection fuse may have blown.	Turn OFF the input power supply. After the lower segment (“_”) of the branch output number LED turns OFF, turn the power ON again and confirm that “E94” is displayed.	Page 6-4
Branch output cutoff	After tripping, normal operation cannot be restored by pressing the Reset Key.	To protect its internal circuits, the S8AS2 requires at least 15 seconds after tripping before it can be reset.	The product cannot be reset while the channel ON/OFF key is flashing in red. Before performing a reset, check that the key is lit red.	Page 2-20 Page 6-6
	The output was reset, but it was immediately cut off again.	The original cause of the cutoff may not have been eliminated. After resetting the error, a large current may have flowed again.	Eliminate the problem that caused the cutoff and press the Reset Key.	Page 6-6
Saving or maintenance	“E06” (abnormal overheating state) is displayed.	If the overheating state continues for 3 hours or more, the overheating alarm (A23/HOT alternating display) can no longer be cleared. (This is because the power supply life expectancy can no longer be calculated correctly.)	Use the product under operating conditions that prevent prolonged overheating.	Page 1-13
	After initializing parameters, all outputs became connected.	“Initialize defaults” returns the various settings to their factory default settings. At shipment from the factory, all branch outputs are set to a connected state.	After using “Initialize defaults,” mode changes to the Run Mode. Transition to the Test Mode and redo the connection/disconnection settings.	Page 4-6

6-2 Seven-segment Error Codes

Error Display List

Seven-segment display	Error code	Meaning	Probable cause and remedy	
E-P	ERP	Memory error on power supply side	These are S8AS2 system errors. When one of these error codes is displayed, check the system configuration and clear the error, and then turn the power supply OFF and ON again. If the error code persists, contact your OMRON representative regarding the error.	
.	—	S8AS2 hardware error		
E98	E98	RAM error		
E97	E97	EEPROM read error		
E96	E96	EEPROM write error		
E94	E94	Short circuit failure		
E00	E00	EEPROM initialization error		
E01	E01	EEPROM error		
E02	E02	Model error		
E03	E03	Factory default detection mode		
E06	E06	Product overheating error	An overheating state has continued for over 180 minutes.	Internal components may have degraded, so replace the main unit.
E10	E10	Data is corrupted.	There is an error in the parameter settings.	Press the Mode Key to switch to the parameter initialization display. After initializing the parameters, set them again. This error is treated as a system error for the S8AS2-□□-□SN.
A10	A10	Abnormal Voltage Tripping	The power supply voltage has exceeded the abnormal voltage tripping threshold.	Check the power supply voltage.
A11	A11	Abnormal current tripping	The branch output's current exceeded the current tripping threshold.	Check whether the connected device is correct and check whether the set value is appropriate.
A12	A12	Total current tripping	All branch outputs were cutoff because the total current and the power-ON time exceeded the abnormal total current tripping conditions.	Check whether the connected devices are suitable and operating within the total current limit.

Seven-segment display	Error code	Meaning	Probable cause and remedy	
A21	A21	Undervoltage alarm	The output voltage dropped below the undervoltage detection threshold.	Check the power supply voltage and the set value.
A23	A23	The unit for this is displayed in 2 ways: Yrs or % is lit: Maintenance forecast monitor output kH is lit: Running time alarm	The replacement time calculated by the S8AS2 is lower than the notification time.	Indicates that the replacement time is approaching.
A23/HOt	A23/HOT	Overheating alarm	The S8AS2 is overheated.	Take steps to reduce the internal temperature.
A30	A30	Over-temperature output	The S8AS2's internal temperature exceeded the over-temperature output threshold.	Check for a high ambient temperature and check the setting of the over-temperature output threshold. Take steps to reduce the temperature in the control panel.

Branch Output Number Indicator	Error code	Meaning	Probable cause and remedy
	—	Measurement circuit is in a standby state.	This is displayed temporarily when the power is interrupted. If this is displayed when the power is turned ON, this may indicate a malfunction. If this is displayed at all times, cycle the power supply. If the error code persists, contact your OMRON representative regarding the error.

- When two or more errors occur simultaneously, the higher priority error (higher in the table above) will be displayed.
- The A11 error may occur simultaneously in two or more branch outputs. In this case, the corresponding branch output indicators will not be lit.

6-3 Clearing Errors

When an error has occurred, the error code will be displayed on the sevensegment display.

Eliminate the cause of the error and clear the error display.

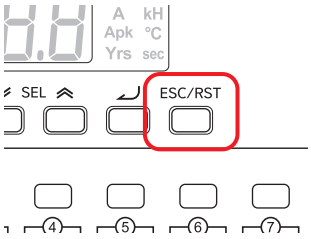
To clear the error display, 15 seconds or more must have elapsed since tripping to protect the internal circuits.

There are 3 ways to clear an error. The following describes each of these ways.

- Reset Key
- Cycle the power supply
- Channel ON/OFF key

Clearing Errors with the Reset Key

Hold the Reset Key down for at least 3 seconds. This clears the error and reconnects the tripped circuit.



After holding down for 3 seconds, “rst” will be displayed on the seven-segment display.

Note, however, that the reset operation will be invalid and the error cannot be cleared in the following states:

- From the parameter display screen in Setting Mode
- From the Yes/No display when clearing the peak current
- From the parameter initialization Yes/No display
- When an E** error has occurred

Clearing Errors by Turning Power OFF and ON

Branch outputs that have been cut off can be reconnected by turning the input power OFF and then ON again. This function can be enabled or disabled by setting the Reset Method Setting (RST) parameter. The default setting allows errors to be reset by turning the power supply OFF and ON again.

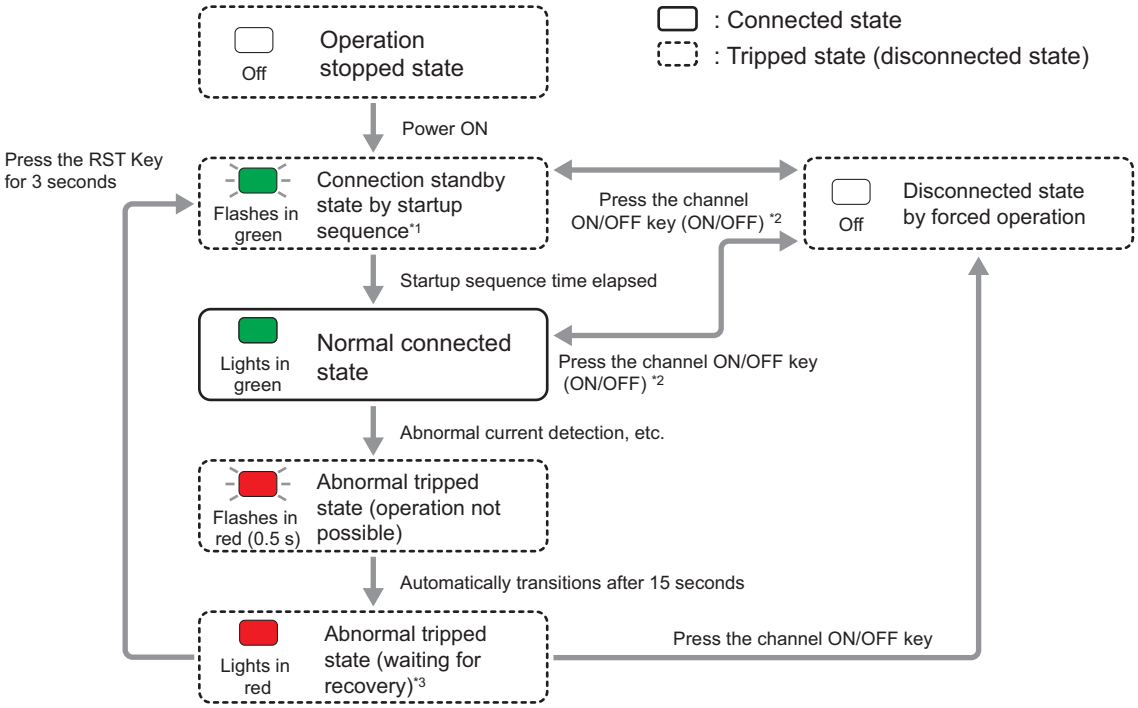
Clearing Error by Channel ON/OFF key

Pressing the “channel ON/OFF key” toggles the target circuit between the connected and tripped (disconnected) state.

Eliminate the cause of the error and clear the error display.

When in an abnormal tripped state with the light lit red (waiting for recovery), pressing the channel ON/OFF key once will switch to the light OFF disconnected state.

Pressing the key again changes the state to the connected state with the light lit green to indicate that the product has recovered.



*1. When 0 s is set to the startup sequence, the branch output is connected normally without waiting for the connection.
*2. When ON/OFF operation is performed continuously, OFF is switched to ON only after at least 3 seconds have elapsed since the previous ON.
*3. If a tripped state occurs due to an internal error (waiting for recovery), the indicator flashes in red at 0.25 second intervals.

Additional Information

When there is no reaction by pressing the “channel ON/OFF key,” check the following parameter setting.

- Check to see if parameter “Channel ON/OFF key enable/disable” is not set to “Disabled” (default: Enabled).

Identifying and Correcting the Cause of the Error

When an error code is displayed on the seven-segment display, determine whether an error actually occurred or there is a problem with the parameter setting.

● Correcting Abnormal Current Tripping (A11) Errors

When error code A11 (abnormal current tripping) and the current are displayed alternately on the seven-segment display, there are two possible causes. Check whether the load connected to the output is too large or the current setting is too low.

- If there are too many loads connected, split up the loads.
- If the current setting is too low, increase the setting.
- If the overcurrent is occurring momentarily, check the abnormal current tripping type setting on page 62. The detection of short-lived abnormal currents can be prevented by changing the setting from instantaneous detection (detection after 10 ms) to standard detection (detection after 80 ms).

● Over-temperature Output (A30) Displayed

When error code A30 (over-temperature) and the temperature are displayed alternately on the seven-segment display, there are two possible causes. Check whether the S8AS2's internal temperature is too high or the setting of the over-temperature output threshold is too low.

● Maintenance Forecast Monitor Output (A23) Displayed

When error code A23 (maintenance forecast monitor output) is displayed on the seven-segment display, it indicates that the replacement time calculated by the S8AS2 has fallen below the set value. The number of years left before replacement is required will be displayed in 0.1-year increments. Prepare to replace the Power Supply.

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