

# Panel Mount SMPS



## SPA-400-24 Series PRODUCT MANUAL

**For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.**

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

### Major Features

- Built-in over-current protection circuit, output short-circuit protection circuit, and over-voltage protection circuit
- EN 60950 (Safety of information technology equipment) compliant
- EN 50178 (Electronic equipment for use in power installations) compliant
- EN 61000-6-2 (EMC: immunity for industrial environments) compliant
- EN 61000-6-4 (EMC: emission standard for industrial environments) compliant
- Output voltage: 24 VDC $\equiv$
- Output power: 400 W

### Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- $\triangle$  symbol indicates caution due to special circumstances in which hazards may occur.

**$\triangle$  Warning** Failure to follow instructions may result in serious injury or death.

- 01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**  
Failure to follow this instruction may result in personal injury, economic loss or fire.
- 02. Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**  
Failure to follow this instruction may result in explosion or fire.
- 03. Install on the device panel, and ground to the F.G. terminal separately.**  
Failure to follow this instruction may result in fire or electric shock.
- 04. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire or electric shock.
- 05. Check 'Connections' before wiring.**  
Failure to follow this instruction may result in fire.
- 06. Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire or electric shock.

**$\triangle$  Caution** Failure to follow instructions may result in injury or product damage.

- 01. When connecting the F.G. terminal, use AWG 14 (2.1 mm<sup>2</sup>) cable or over and tighten the terminal screw with a tightening torque of 0.7 to 0.9 N·m.**  
Failure to follow this instruction may result in fire or malfunction due to contact failure.
- 02. Use the unit within the rated specifications.**  
Failure to follow this instruction may result in shortening the life cycle of the product, fire, or product damage.
- 03. Use dry cloth to clean the unit, and do not use water or organic solvent.**  
Failure to follow this instruction may result in electric shock or fire.
- 04. Keep metal chip, dust, and wire residue from flowing into the unit.**  
Failure to follow this instruction may result in fire or product damage.
- 05. Do not touch the product during operation or for a certain period of time after stopping.**  
Failure to follow this instruction may result in burns.
- 06. Upon occurrence of an error, disconnect the power source.**  
Failure to follow this instruction may result in fire or product damage.

### Cautions during Use

- Follow instructions in 'Cautions during Use'.  
Otherwise, it may cause unexpected accidents.
- Do not connect the output voltage neither in serial nor in parallel.
- Since there is no harmonic suppression or power factor correction circuit, install the circuit separately if necessary.
- Since using the condenser input method, power factor is in the range of 0.4 to 0.6.  
When using distribution board or transformer, check the capacity of the input voltage.  
$$\text{Input apparent power[VA]} = \frac{\text{Output active power[W]}}{\text{Power factor} \times \text{Efficiency}}$$
- Even though a noise filter is installed inside the product, the product can be affected by noise depending on the installation location or wiring.
- If the internal fuse is damaged, please contact our A/S center.
- To ensure the reliability of the product, install the product on the panel or metal surface vertically to the ground.
- Install the unit in the well ventilated place.

- Do not use near the equipment which generates strong magnetic force or high frequency noise.
- This unit may be used in the following environments.
  - Indoors (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000m
  - Pollution degree 2
  - Installation category II

## Specifications

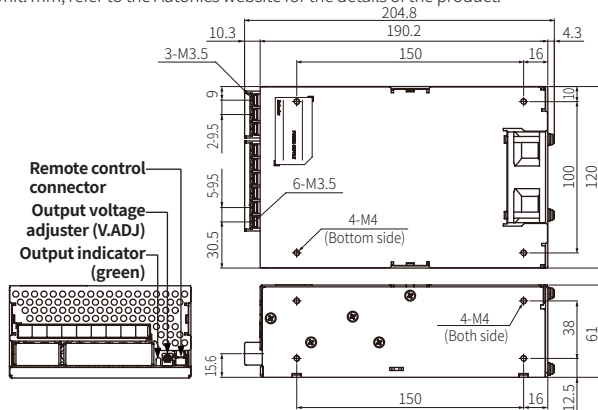
<b>Model</b>	<b>SPA-400-24</b>
<b>Output power</b>	400.8 W
<b>Input condition</b>	
Voltage <sup>(01)</sup>	200 - 240 VAC~ (permissible voltage: 190 - 264 VAC~)
Frequency	50 / 60 Hz
Efficiency <sup>(02)</sup> (typical)	≥ 85% (10 min after power ON)
Current consumption <sup>(02)</sup> (typical)	≤ 4.6 A
Leakage current <sup>(02)</sup> (typical)	≤ 1 mA
Inrush current protection <sup>(02)</sup> (typical)	40 A
<b>Output characteristics</b>	
Voltage	24 VDC≒
Current	16.7 A
Voltage adjustment range <sup>(03)</sup>	≤ ± 5%
Input variation	≤ ± 0.5%
Load variation	≤ ± 1%
Temperature drift	360 mV
Ripple noise	≤ 290 mV
Start-up time <sup>(02)</sup> (typical)	1,800 to 2,300 ms
Hold time <sup>(02)</sup> (typical)	≥ 17 ms
<b>Protection</b>	
Over-current protection	110 to 160% (recovers automatically after the cause for over current is removed)
Over-voltage protection <sup>(03)</sup>	27 - 33 VDC≒
Temperature rising limit	Yes
Remote control	Yes (output voltage ON for shorting, output voltage OFF for open)
<b>Product Components</b>	• Product • Instruction manual
<b>Certification</b>	CE UK
<b>Unit weight (package)</b>	≈ 885 g (≈ 975 g)

<b>Indicator</b>	Output indicator (green)
<b>Insulation resistance</b>	Between all input terminals and F.G.: ≥ 100 MΩ (at 500VDC≒ megger)
<b>Dielectric strength</b>	Between all input and output terminals: 3,000 VAC~ 50/60 Hz for 1 min Between the charging part and the F.G.: 2,000 VAC~ 50/60 Hz for 1 min
<b>Vibration</b>	0.75 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
<b>EMS</b>	EN61000-6-2 compliant
<b>EMI</b>	EN61000-6-4 compliant
<b>Safety standards</b>	EN60950, EN50178
<b>Ambient temperature</b>	-10 to 50 °C, storage: -20 to 75 °C (no freezing or condensation)
<b>Ambient humidity</b>	20 to 90%RH, storage: 20 to 90%RH (no freezing or condensation)
<b>Fan life cycle</b>	70,000 hours (based on 40 °C of ambient temperature)

- Since there is no separate input overvoltage protection for the voltage over the rated input voltage range, supplying overvoltage may result in product damage.
- It is for 220 VAC~, 100% load.
- Use the output voltage adjusting volume within the voltage variable range. If the voltage exceeds the output voltage range, overvoltage protection function is activated and the output is cut off.

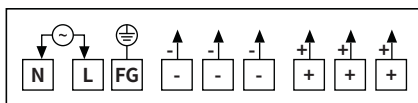
## Dimensions

- Unit: mm, refer to the Autonics website for the details of the product.



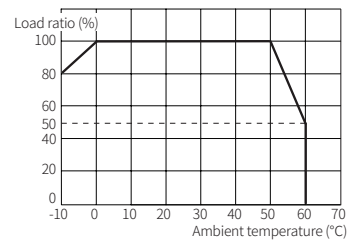
## Connections

- Wire: AWG 18 to 16, Torque: 0.7 to 0.9 N·m

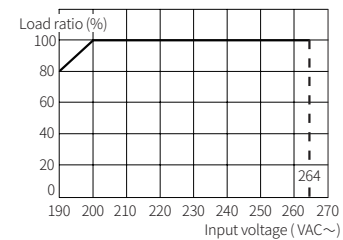


Mark	Function
N, L	Input power
FG	F.G. frame ground
-	GND, output power (-)
+	+24V, output power (+)

## Output De-rating Curve by Ambient Temperature

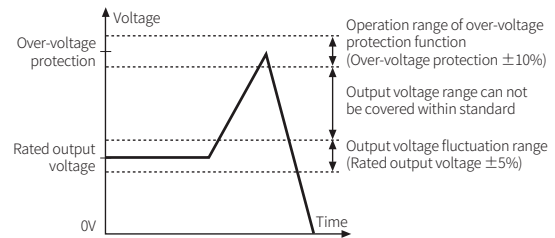


## Feature Data of Input Voltage Protection



## Feature Data of Over-voltage Protection

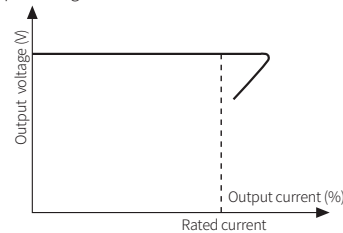
To protect the connected load, the output is disconnected when the over-voltage is detected. When the output is disconnected, apply the power after waiting at least 3 minutes.



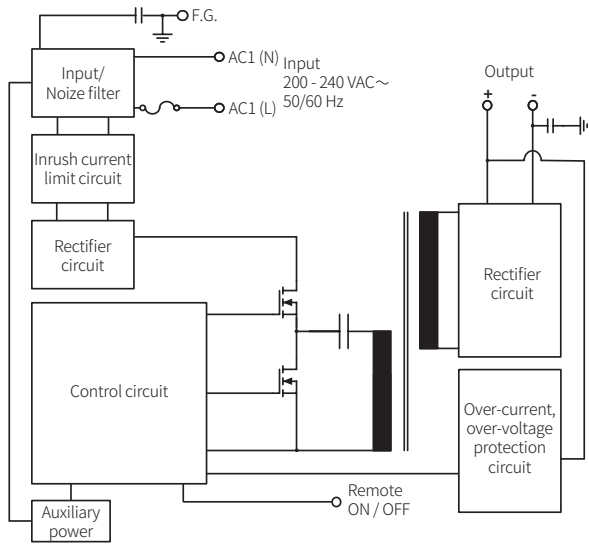
## Feature Data of Over-Current Protection

When the over rated current is flowed, the over-current protection circuit is operated to protect the product by reducing output voltage. The protection circuit is released automatically when the load current is under the rated current.

- It is for the rated input voltage 220 VAC~ with 100% load.



## Block Diagram



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