

## Switching Mode Power Supply with Minimized Noise and Ripple

### ■ Features

- Built-in output short over current protection circuit, output short-circuit protection, overheating and over-voltage protection circuits (SPA-075/100/400)
- Standard on safety EN60950, EN50178
- EMS (electromagnetic susceptibility) EN61000-6-2
- EMI (electromagnetic interference) EN61000-6-4
- Output voltage: 5VDC, 12VDC, 24VDC
- Output power: 30W, 50W, 75W, 100W, 400W



SPA-030/050/075/100 Series



SPA-400-24

⚠ Please read "Safety Considerations" in the instruction manual before using.



### ■ Ordering Information

SPA	—	030	—	24	
				Output voltage	
				Output power	
				Item	

05	5VDC		
12	12VDC		
24	24VDC		
030	30W	100	100W
050	50W	400	400W
075	75W		
SPA	Switching Mode Power Supply		

### ■ Specifications

#### ○ SPA-030/050/075/100 Series

Model	SPA-030-05	SPA-050-05	SPA-030-12	SPA-050-12	SPA-030-24	SPA-050-24	SPA-075-05	SPA-100-05	SPA-075-12	SPA-100-12	SPA-075-24	SPA-100-24								
Output power	30W	50W	30W	50W	30W	50W	75W	100W	75W	100W	75W	100W								
Input condition	Voltage <sup>*1,2</sup>						100-120/200-240VAC~ (permissible voltage: 85-264VAC~)						100-120/200-240VAC~ (permissible voltage: 85-132/170-264VAC~) switching type							
	Frequency						50/60Hz													
Input characteristics	Efficiency <sup>*3</sup>		Min. 60%	Min. 67%	Min. 74%		Min. 80%		Min. 70%		Min. 78%	Min. 72%	Min. 78%	Min. 80%						
	Current consumption <sup>*3</sup>		Max. 1.2A	Max. 1.6A	Max. 1.0A	Max. 1.4A	Max. 0.8A	Max. 1.1A	Max. 3.0A		Max. 2.0A	Max. 3.0A	Max. 2.0A	Max. 2.5A						
Output characteristics	Voltage		5VDC=						12VDC=						24VDC=					
	Current		6A	10A	2.5A	4.2A	1.5A	2.1A	15A	20A	6.3A	8.5A	3.2A	4.2A						
	Voltage adjustment range <sup>*4</sup>		±5%																	
	Input variation <sup>*5</sup>		Max. ±0.5%																	
	Load variation <sup>*3</sup>		Max. ±2%						Max. ±1%											
	Ripple <sup>*3</sup>		Max. ±1%																	
	Start-up time <sup>*3</sup>		Max. 200ms						Max. 150ms						Max. 250ms					
Protection	Hold time <sup>*3</sup>		Min. 10ms																	
	Inrush current protection		Max. 30A (100VAC~) /Max. 40A (200VAC~)			Max. 20A (100VAC~)			Max. 45A (100VAC~) /Max. 50A (240VAC~)			Min. 10ms		Max. 35A (100VAC~) /Max. 40A (240VAC~)		Max. 45A (100VAC~) /Max. 50A (240VAC~)		Max. 35A (100VAC~) /Max. 40A (240VAC~)		
	Over-current protection <sup>*6</sup>		Min. 110%																	
	Over-voltage protection <sup>*4</sup>		—						6.5V ±10%						Min. 105%					
	Output short-circuit protection		Max. 5ms						Max. 10ms						Max. 5ms /Min. 10ms /Max. 5ms					
Indicator		Output indicator: green LED																		
Insulation resistance		Over 100MΩ (at 500VDC megger between all input terminals and F.G.)																		
Dielectric strength		3000VAC 50/60Hz for 1min (between all input and output terminals)																		
Vibration		1500VAC 50/60Hz for 1min (between all input terminals and F.G.)																		
Shock		0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours																		
EMS		300m/s <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times																		
EMI		Conforms to EN61000-6-2																		
Safety standards		Conforms to EN61000-6-4																		
Environment		EN60950, EN50178																		
Tightening torque		Ambient temp. -10 to 50°C /-10 to 40°C /-10 to 50°C																		
Approval		CE						CE												
Unit weight		Approx. 350g						Approx. 400g												

※1: The rated input voltage of SPA-100-05 is 100-120/200-240VAC(100-132/190-264VAC).  
 ※2: Since there is no separate input overvoltage protection for the voltage over the rated input voltage range, supplying overvoltage may result in product damage.  
 ※3: 100% load for rated input voltage(100VAC).  
 ※4: 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.  
 ※5: Rated input voltage [ • SPA-030/050 Series : 100-240VAC(85-264VAC) ] is under 100% of load.  
 [ • SPA-075/100 Series : 100-120/200-240(85-132/170-264VAC) ] is under 100% of load.  
 SPA-100-05 is under 100% of load for [100-120/200-240VAC(100-132/190-264VAC)].  
 ※6: Rated input voltage(100VAC). ※Environment resistance is rated at no freezing or condensation.

SENSORS
CONTROLLERS
MOTION DEVICES
SOFTWARE

(J) Temperature Controllers
(K) SSRs
(L) Power Controllers
(M) Counters
(N) Timers
(O) Digital Panel Meters
(P) Indicators
(Q) Converters
(R) Digital Display Units
(S) Sensor Controllers
(T) Switching Mode Power Supplies
(U) Recorders
(V) HMIs
(W) Panel PC
(X) Field Network Devices

# SPA Series

## ■ Specifications

### ◎ SPA-400-24

Model		SPA-400-24	
Output power		400.8W	
Input condition	Voltage		200-240VAC~ (permissible voltage: 190-264VAC~)
	Frequency		50/60Hz
	Efficiency (typical) <sup>※1</sup>	220VAC~	85% (after 10 min of power ON)
	Current consumption (typical)	220VAC~	Max. 4.6A
	Leakage current (typical)	220VAC~	Max. 1mA
Output characteristics	Voltage		24VDC=
	Current		16.7A
	Voltage adjustment range <sup>※2</sup>		22.8-25.2VDC=
	Input variation		Max. ±0.5%
	Load variation		Max. ±1%
	Temperature drift		360mV
	Ripple&Ripple noise		Max. 290mV
	Start-up time (typical) <sup>※1</sup>	220VAC~	1800-2300ms
	Hold time (typical) <sup>※1</sup>	220VAC~	Max. 17ms
	Protection	Inrush current protection (typical) <sup>※1</sup>	220VAC~
Over-current protection		110 to 160% (recovers automatically after the cause for over-current is removed)	
Over-voltage protection		27-33VDC	
Temp. rising limit		Yes	
Remote control		Yes (output voltage ON for shorting, output voltage OFF for open)	
Indicator		Output indicator: green LED	
Insulation resistance		Over 100MΩ (at 500VDC megger between all input terminals and F.G.)	
Dielectric strength		3,000VAC 50/60Hz for 1 min (between all input and output terminals)	
		2,000VAC 50/60Hz for 1 min (between all input terminals and F.G.)	
Vibration		0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours	
EMS		Conforms to EN61000-6-2	
EMI		Conforms to EN61000-6-4	
Safety standards		EN60950, EN50178	
Environment	Ambient temperature	-10 to 50°C, storage: -20 to 75°C	
	Ambient humidity	20 to 90%RH, storage: 20 to 90%RH	
Fan life cycle		70,000 hours (based on 40°C of ambient temperature )	
Input cable		AWG18 to 16	
Tightening torque		0.7 to 0.9N·m	
Approval		CE	
Weight <sup>※3</sup>		Approx. 975g (approx. 885g)	

※1: Since there is no separate input overvoltage protection for the voltage over the rated input voltage range, supplying overvoltage may result in product damage.

※2: It is for 100% load.

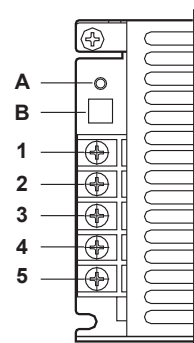
※3: Use the output voltage adjusting volume within the voltage variable range. If the voltage exceeds the output voltage range, overvoltage protection function is activated and the output is cut off.

※4: The weight includes packaging. The weight in parenthesis is for unit only.

※Environment resistance is rated at no freezing or condensation.

## ■ Wiring Diagram/Unit Description

### ◎ SPA-030/050/075/100 Series



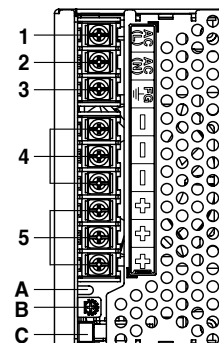
#### ● Wiring Diagram

1. Output power [+] terminal
2. Output power [-] terminal
3. Frame ground [F.G.] terminal
4. Input power [N] terminal
5. Input power [L] terminal

#### ● Unit Description

1. Output indicator (green)
2. Output voltage adjuster (V.ADJ)

### ◎ SPA-400-24



#### ● Wiring Diagram

1. Input power [L] terminal
2. Input power [N] terminal
3. Frame Ground [F.G.] terminal
4. Output power [-] terminal
5. Output power [+] terminal

#### ● Unit Description

- A. Output indicator (green)
- B. Output voltage adjuster (V.ADJ)
- C. Remote control connector

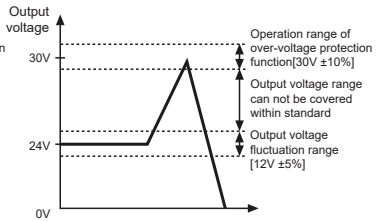
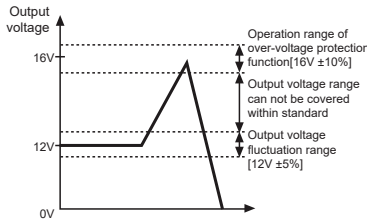
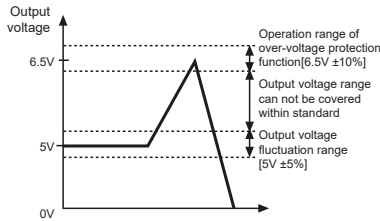
# General-Purpose Switching Mode Power Supply

## Feature Data of Over-Voltage Protection

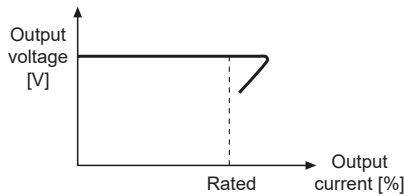
○ SPA-075-05/SPA-100-05

○ SPA-075-12/SPA-100-12

○ SPA-075-24/SPA-100-24/  
SPA-400-24



## Feature Data of Over-Current Protection

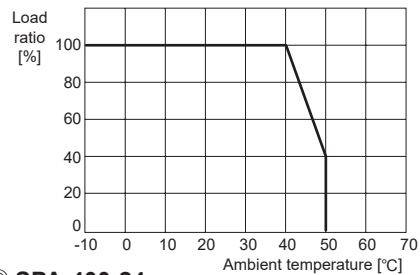
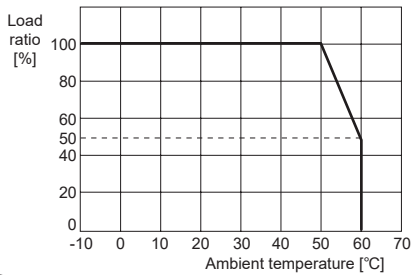


- It is when the rated input voltage is 100VAC, 100% load. In case of SPA-400-24, the rated input voltage is 220VAC, 100% load.
- It is able to protect over-current by load with built-in over-current protection circuit. When the over rated current is flowed, the circuit is operated (output voltage is fallen) and it is cancelled when the load current is under the rated current. (it is returned to the rated output voltage)

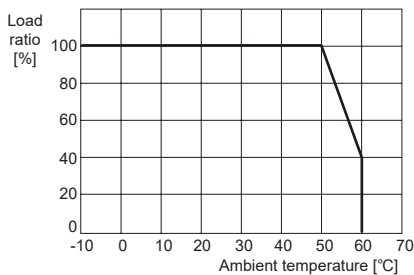
## Output Derating Curve by Ambient Temperature

○ SPA-030-05/SPA-030-24/SPA-050-24/  
SPA-075-05/SPA-075-24/SPA-100-05/  
SPA-100-12/SPA-100-24

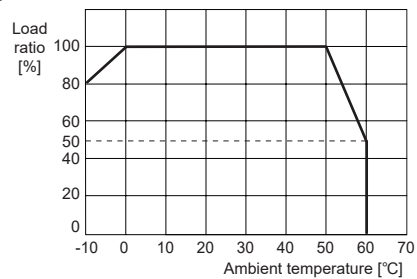
○ SPA-030-12/SPA-050-05/SPA-050-12



○ SPA-075-12

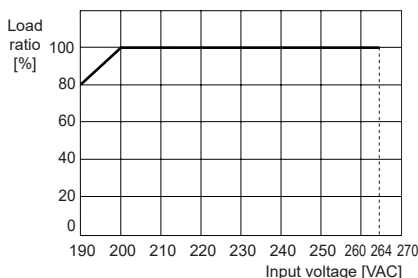


○ SPA-400-24



## Output Static Characteristics by Input Voltage

○ SPA-400-24

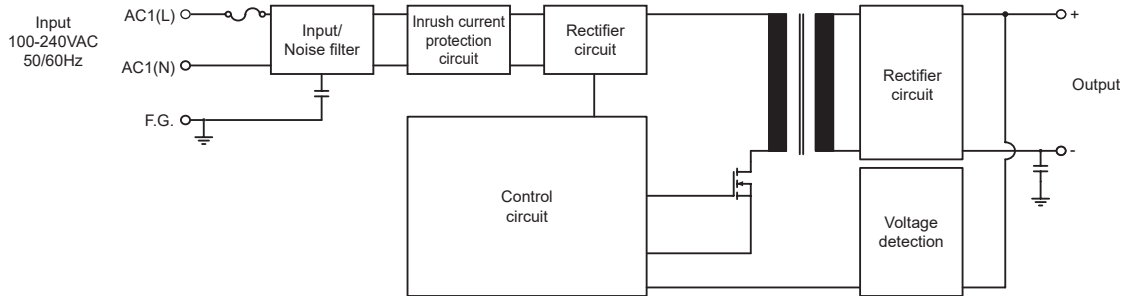


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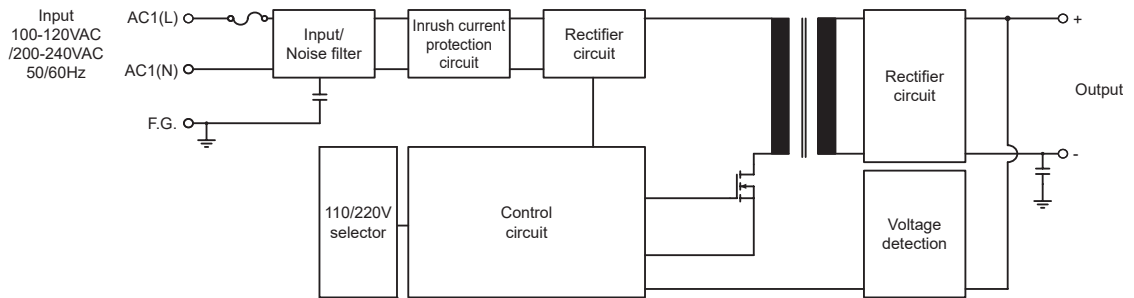
# SPA Series

## ■ Block Diagram

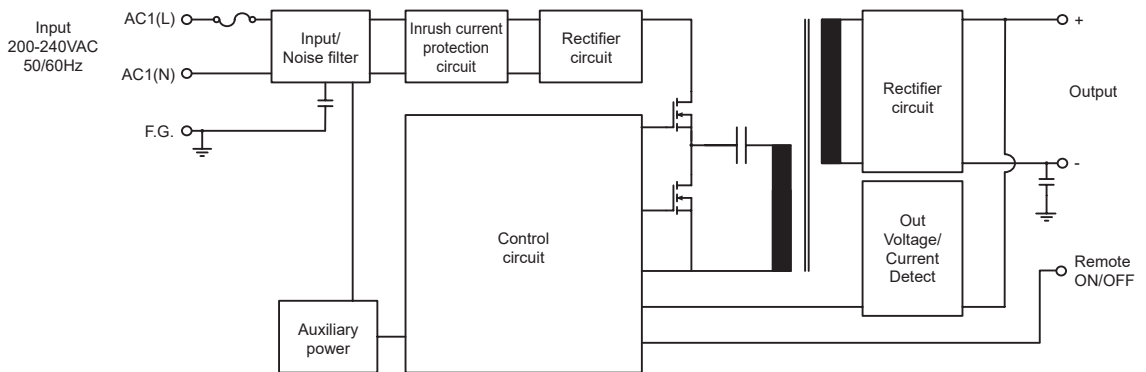
### ◎ SPA-030/050 Series



### ◎ SPA-075/100 Series



### ◎ SPA-400-24

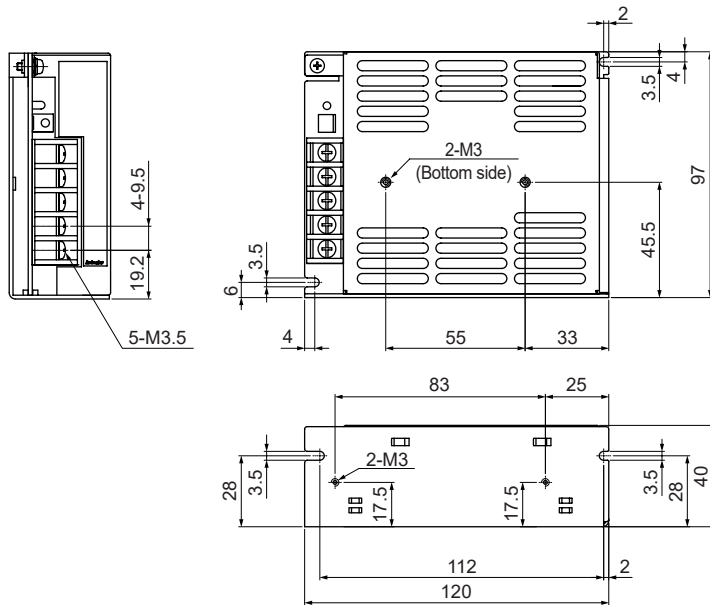


# General-Purpose Switching Mode Power Supply

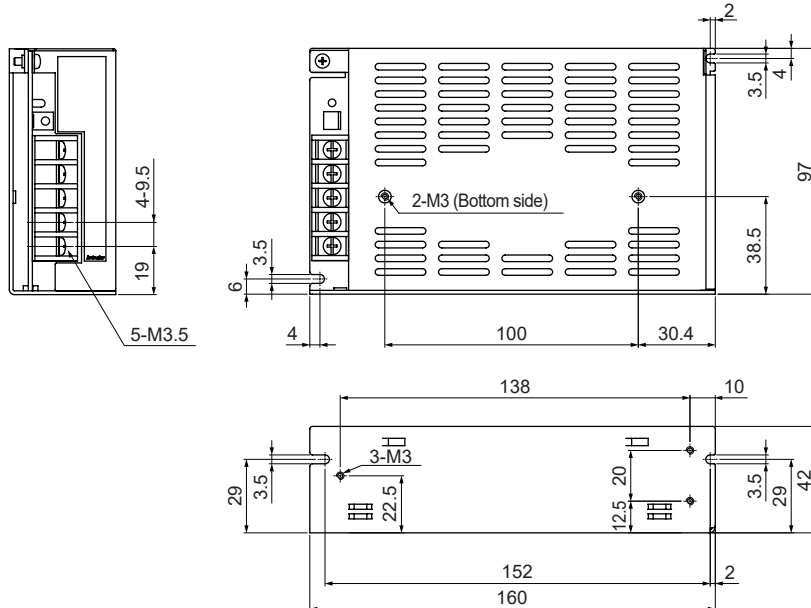
## ■ Dimensions

### ◎ SPA-030/050 Series

(unit: mm)



### ◎ SPA-075/100 Series

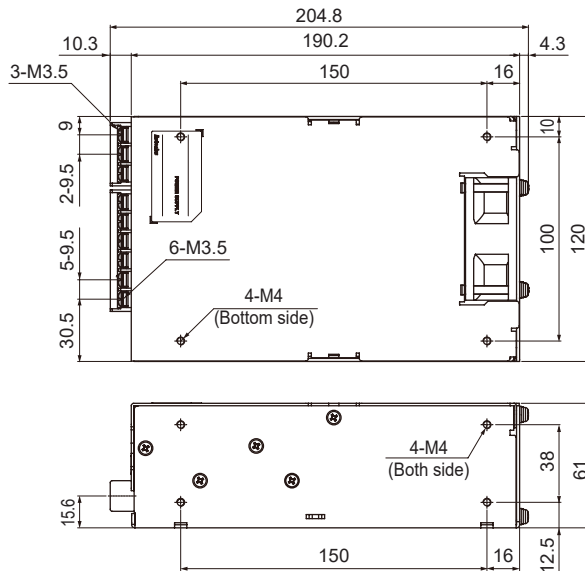


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# SPA Series

## ◎ SPA-400-24



### ■ Specification of Input Cable

Specification of input cable	AWG21 to 19	AWG18 to 16
Model	SPA-030-05, SPA-030-12, SPA-030-24, SPA-050-12, SPA-050-24, SPA-075-12, SPA-075-24, SPA-100-24	SPA-050-05, SPA-075-05, SPA-100-05, SPA-100-12, SPA-400-24

### ■ Over-Heating Protection

The overheat protection function cuts off the output voltage, when the temperature in an element increases due to overheating. This product has the overheat protection function within itself. When the overheat protection function is activated and the product does not work properly, please resupply power.  
 ※Except SPA-400-24 model.

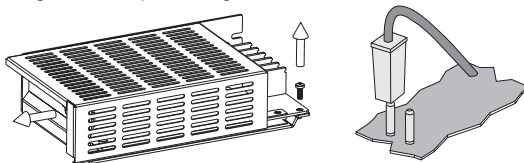
### ■ Proper Usage

#### ⚠ Cautions during use

1. Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
2. Do not connect the output voltage neither in serial nor in parallel.
3. Since there is no harmonic suppression or power factor correction circuit, install the circuit separately if necessary.
4. 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.

$$\text{Input apparent power[VA]} = \frac{\text{Output active power[W]}}{\text{Powerfactor} \times \text{Efficiency}}$$

5. Even though a noise filter is installed inside the product, the product can be affected by noise depending on the installation location or wiring
6. If the internal fuse is damaged, please contact our A/S center.
7. In case of models using the user switching method for the input voltage selection, factory default is set to 220V. When switching over to 110V, remove the case of the product as below and select the voltage with the jumper switch within the range of the input voltage.



8. To ensure the reliability of the product, install the product on the panel or metal surface.
9. Install the unit in the well ventilated place.
10. Do not use near the equipment which generates strong magnetic force or high frequency noise.

11. This unit may be used in the following environments.

- ① Indoors (in the environment condition rated in 'Specifications')
- ② Altitude max. 2,000m
- ③ Pollution degree 2
- ④ Installation category II