

# Autonics SWITCHING MODE POWER SUPPLY SPB SERIES

## INSTRUCTION MANUAL



Thank you for choosing our Autonics product.  
Please read the following safety considerations before use.

### Safety Considerations

- ※Please observe all safety considerations for safe and proper product operation to avoid hazards.
- ※Safety considerations are categorized as follows.
  - Warning** Failure to follow these instructions may result in serious injury or death.
  - Caution** Failure to follow these instructions may result in personal injury or product damage.
- ※The symbols used on the product and instruction manual represent the following.
  - ⚠ symbol represents caution due to special circumstances in which hazards may occur.

### Warning

- 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, fire, or economic loss.
- Do not disassemble or modify the unit. Please contact us if necessary.**  
Failure to follow this instruction may result in electric shock, fire or product damage.
- Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in electric shock.
- Power input voltage must be within the rated range and power line should be used as the rated wire standard by each model.**  
Failure to follow this instruction may result in electric shock, or fire.
- Check the connection before supplying the power.**  
Failure to follow this instruction may result in electric shock, fire, or product damage.
- Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire, product damage.
- Do not insert fingers or other objects into the open part.**  
Failure to follow this instruction may result in electric shock, personal injury, or product damage.
- Do not use the unit outdoors or where flammable or explosive gas, water, vibration or impact may be present.**  
Failure to follow this instruction may result in electric shock, fire or personal injury.
- Ground the unit individually and ground cable should be over than AWG16.**  
Failure to follow this instruction may result in electric shock.
- This unit must be installed on DIN rail or a device panel.**  
Failure to follow this instruction may result in electric shock.

### Caution

- Do not put obstacles around the unit which may obstruct ventilation.**  
Failure to follow this instruction may result in product damage or malfunction to peripheral devices by heating.
- Do not touch the unit during operation or after stopping.**  
Failure to follow this instruction may result in burn due to high temperature of surface.
- Please stop this unit when mechanical trouble occurs.**  
Failure to follow this instruction may result in fire or product damage.
- Make sure to tighten the terminal screw bolt above 0.3N·m to 0.9N·m.**  
Failure to follow this instruction may result in fire or product damage.
- Do not touch the terminals during insulation resistance test or insulation dielectric strength test.**  
Failure to follow this instruction may result in electric shock.
- Do not use the unit where heavy vibration may be present.**  
Failure to follow this instruction may result in product damage.
- Do not use water or oil-based detergent when cleaning the unit. Use dry cloth to clean the unit.**  
Failure to follow this instruction may result in electric shock or fire.
- When disposing the unit, please categorize it as industrial waste.**
- Do not use the unit outdoors.**
- Keep dust and wire residue from flowing into the unit.**  
Failure to follow this instruction may result in shortening the life cycle of the unit or electric shock.

### Ordering Information

SPB - 120 - 24	5	5VDC
	12	12VDC
	24	24VDC
	48	48VDC
	015	15W
	030	30W
	060	60W
	120	120W
	240	240W
Item	SPB	Switching Mode Power Supply

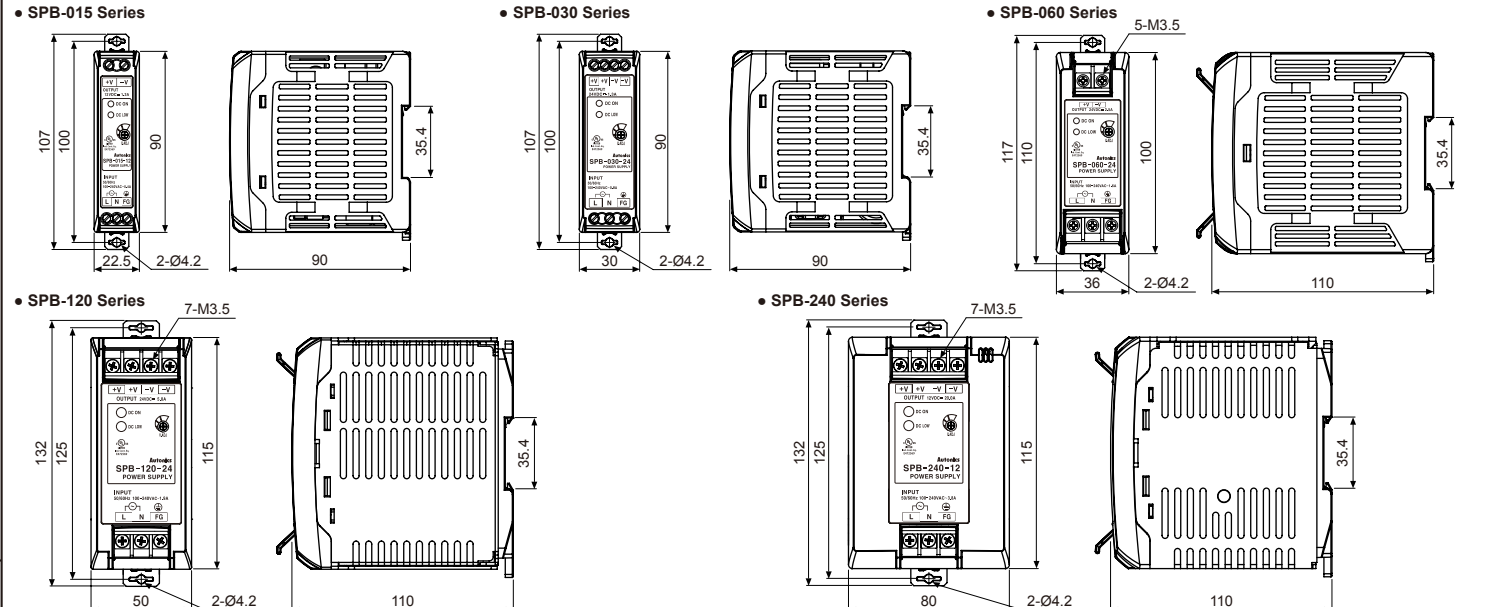
※The above specifications are subject to change and some models may be discontinued without notice.

### Specifications

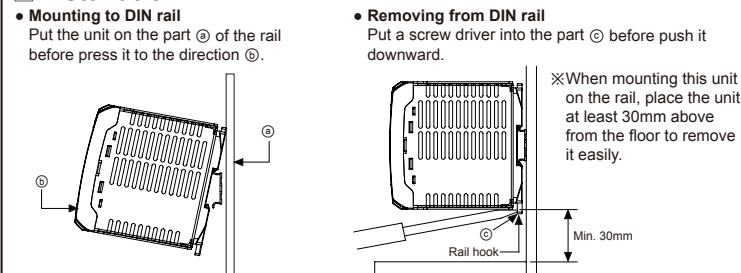
Model	SPB -015-05	SPB -015-12	SPB -015-24	SPB -030-05	SPB -030-12	SPB -030-24	SPB -060-12	SPB -060-24	SPB -060-48	SPB -120-12	SPB -120-24	SPB -120-48	SPB -240-12	SPB -240-24	SPB -240-48		
Output power	15W	15.6W	30W	25W	30W	31.2W	60W	62.4W	96W	120W	120W	120W	240W	240W	240W		
Voltage	100-240VAC~ (permissible voltage: 85-264VAC~/120-370VDC=)																
Frequency	50/60Hz																
Input condition	Efficiency <sup>*1</sup> (Typical)	100VAC~ 240VAC~	77% 76%	80% 79%	83% 82%	77% 78%	82% 83%	84% 85%	81% 87%	84% 86%	85% 87%	82% 85%	85% 88%	85% 88%	87% 90%	89% 92%	
	Power factor <sup>*1</sup>	—															
Current consumption <sup>*1</sup> (Typical)	100VAC~	0.35A	0.35A	0.34A	0.56A	0.63A	0.63A	1.24A	1.21A	1.19A	1.19A	1.49A	1.43A	2.76A	2.71A	2.73A	
	240VAC~	0.19A	0.19A	0.19A	0.30A	0.35A	0.35A	0.66A	0.65A	0.64A	0.52A	0.61A	0.61A	1.14A	1.12A	1.13A	
Power factor correction circuit	—																
Output characteristics	Voltage	5VDC=	12VDC=	24VDC=	5VDC=	12VDC=	24VDC=	12VDC=	24VDC=	48VDC=	12VDC=	24VDC=	48VDC=	12VDC=	24VDC=	48VDC=	
	Current	3A	1.3A	0.65A	5A	2.5A	1.3A	5A	2.5A	1.3A	8A	5A	2.5A	20A	10A	5A	
	Voltage adjustment range <sup>*2</sup>	Max. ±10%			Max. ±10%			Max. ±5%			Max. ±5%			Max. ±5%			
	Input variation <sup>*3</sup>	Max. ±0.5%			Max. ±0.5%			Max. ±0.5%			Max. ±0.5%			Max. ±0.5%			
	Load variation	Max. ±1%			Max. ±1%			Max. ±1%			Max. ±1%			Max. ±1%			
	Ripple&Ripple noise <sup>*1,*4</sup>	Max. ±1.5% Max. ±1%			Max. ±1.5% Max. ±1%			Max. ±1%			Max. ±1%			Max. ±1.5% Max. ±1%			
	Start-up time <sup>*1</sup> (Typical)	100VAC~	500ms	550ms	650ms	600ms	550ms	550ms	520ms	550ms	1200ms	1200ms	1200ms	1200ms	75ms	87ms	75ms
	Hold time <sup>*1</sup> (Typical)	100VAC~	24ms	25ms	25ms	20ms	15ms	15ms	15ms	14ms	15ms	98ms	75ms	87ms	33ms	36ms	25ms
	240VAC~	190ms	190ms	190ms	130ms	110ms	110ms	100ms	110ms	108ms	97ms	43ms	86ms	33ms	36ms	25ms	
	Inrush current protection (Typical)	100VAC~	7A	7A	7A	7A	7A	6A	6A	13A	14A	10A	8A	8A	8A	8A	
240VAC~	32A	30A	31A	29A	31A	29A	19A	17A	37A	36A	37A	22A	22A	25A	26A		
Over-current protection <sup>*4</sup>	105 to 160%																
Over-voltage protection	—																
Output low-voltage indicate	4.2V ±10%	9.6V ±10%	20.0V ±10%	4.2V ±10%	9.6V ±10%	20.0V ±10%	9.6V ±10%	20.0V ±10%	43.0V ±10%	9.6V ±10%	20.0V ±10%	43.0V ±10%	10.0V ±10%	20.0V ±10%	43.0V ±10%		
Indicator	Output indicator: Green LED, Output low-voltage indicator: Red LED																
Insulation resistance	Over 100MΩ (at 500VDC megger between all input and output terminals) 3,000VAC 50/60Hz for 1 min (between all input and output terminals)																
Dielectric strength	1,500VAC 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 times																
Shock	300m/s <sup>2</sup> (approx. 30G) in each X, Y, Z direction for 3 times																
EMS	Conforms to EN61000-6-2																
EMI	Conforms to EN61000-6-4																
Safety standards	EN60950, EN50178																
Environment	Ambient temperature <sup>*5</sup>	-10 to 50°C, storage: -25 to 65°C (surrounding air temp.: max. 40°C)															
Ambient humidity	25 to 85%RH, storage: 25 to 90%RH																
Input cable	AWG24 to 19 (material: Cu)			AWG24 to 19 (material: Cu)			AWG21 to 19 (material: Cu)			AWG21 to 19 (material: Cu)			AWG18 to 16 (material: Cu)				
Terminal tightening torque	0.3 to 0.5N·m			0.3 to 0.5N·m			0.7 to 0.9N·m			0.7 to 0.9N·m			0.7 to 0.9N·m				
Protection structure	IP20 (IEC standard)																
Approval	CE, UL, etc.																
Weight <sup>*6</sup>	Approx. 202g (approx. 129g)			Approx. 249g (approx. 176g)			Approx. 347g (approx. 274g)			Approx. 570g (approx. 466g)			Approx. 866g (approx. 736g)				

※1: It is for 100% load. ※2: The output voltage adjuster (V.ADJ) should be used within voltage adjustment range.  
 ※3: It is for the rated input voltage 100-240VAC (85-264VAC) and 100% load. ※4: It is for the rated input voltage 100-240VAC.  
 ※5: Refer to 'Output Derating Curve By Ambient Temperature'. ※6: The weight includes packaging. The weight in parenthesis is for unit only.

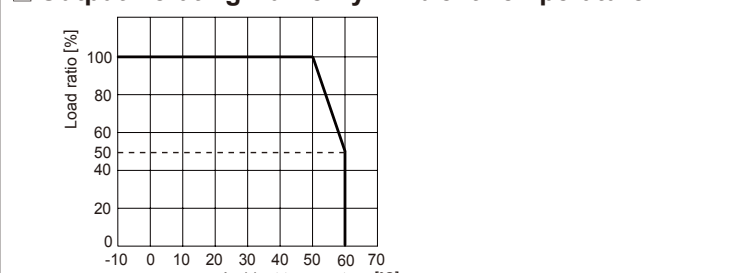
### Dimensions



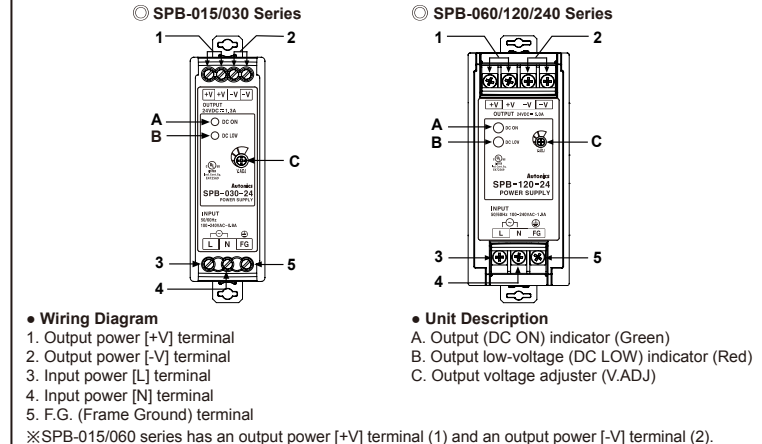
### Installation



### Output Derating Curve By Ambient Temperature



### Wiring Diagram/Unit Description



### Over-Heating Protection

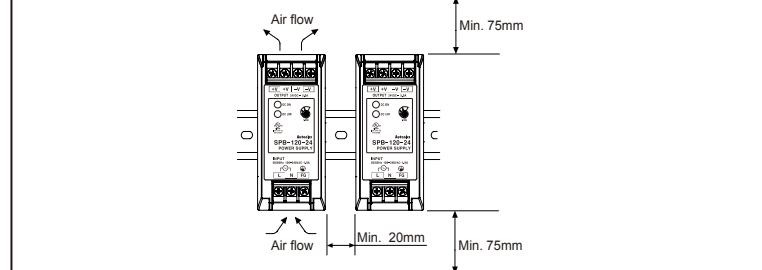
If the inner temperature of the switching element is around 140°C by overheat, it stops switching operation and becomes open state. Output voltage is not output.

### Cautions During Use

- Cautions for operating**
  - This product does not have the function for parallel or series operation.
  - The output current must be used within the rated specification. If over current is applied to the product, over-current protection is operating. It causes shorten the life cycle of the product.
  - The output voltage must be used within the rated output specification.
  - For the product, which has the control function for over-voltage, if making the output voltage adjuster (V.ADJ) to over rated voltage, the function starts to work.
  - This product has the function of over-heating protection. The over-heating protection operates when the product has over-heating condition. The product normally operates if the load is removed for over 5 minutes.
  - In case of the SPB-015/030/060, it does not have the harmonics suppression and power factor improvement circuit. To improve harmonics suppression and power factor, install the additional device.
  - In case of the SPB-015/030/060, it uses condenser rectification, and power factor is within 0.4 to 0.6 range. To use a cabinet panel or a electric transformer, select input power capacity of this product as below formula.

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

- This product is provided with a noise filter, but noise is variable according to operating conditions such as installation environment and wiring.
- When the inner fuse is damaged, replace the fuse of same specification.
- Cautions for mounting**
  - Mount this product on the surface of metal panel vertically for the reliability.
  - Mount this product at a well-ventilated place in order to increase the heat radiation efficiency.
  - Mounting  
When installing more than two power supplies, min. 20mm distance is required to radiate heat effectively. Assure min. 75mm distance of the upper or the lower product and mount the products as following figure.



- Dielectric or insulation resistance test when this unit is installed in the control panel.**
  - Separate the unit completely from a control panel circuit.
  - Short all terminals of the unit.
- Caution for connecting the input power terminal**  
Connect input line (AC) to the input terminal correctly. When you connect this to the other terminal, it may cause damage to the power supply.
- Do not use the unit in the following environments.**
  - Environments with high vibration or shock.
  - Environments with strong alkalis or acids.
  - Environments with exposure to direct sunlight.
  - Near machinery which produce strong magnetic force or electric noise.
- This unit may be used in the following environments.**
  - Indoors
  - Max. altitude: 2,000m
  - Pollution degree 2
  - Installation category II

### Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connectors/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, Co., Nd:YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse (Rate) Meters
- Display Units
- Sensor Controllers

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