Autonics

Switching Mode Power Supply
SPB SERIES

INSTRUCTION MANUAL

CE c UL US LISTED

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.
※⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ 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.

⚠ Warning

1. **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 fire, personal injury, or economic loss.
2. **Install on the DIN rail, and ground to the F.G. terminal separately.**
   Failure to follow this instruction may result in electric shock or fire.
3. **Do not connect, repair, or inspect the unit while connected to a power source.**
   Failure to follow this instruction may result in electric shock or fire.
4. **Check 'Wiring Diagram' before wiring.**
   Failure to follow this instruction may result in fire.
5. **Do not disassemble or modify the unit.**
   Failure to follow this instruction may result in electric shock or fire.

⚠ Caution

1. **When connecting the F.G. terminal, use AWG 14 (2.1mm²) cable or over and tighten the terminal screw with a tightening torque of 0.7 to 0.9N·m.**
   When connecting the F.G. terminal of SPB-015/030 model, tighten the terminal screw with a tightening torque of 0.3 to 0.5N·m.
   Failure to follow this instruction may result in fire or malfunction due to contact failure.
2. **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.
3. **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.
4. **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 fire or explosion.
5. **Keep metal chip, dust, and wire residue from flowing into the unit.**
   Failure to follow this instruction may result in fire or product damage.
6. **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.
7. **Upon occurrence of an error, disconnect the power source.**
   Failure to follow this instruction may result in fire or product damage.

■ Ordering Information

SPB - 120 - 24

Output voltage	5	5VDC
	12	12VDC
	24	24VDC
	48	48VDC
Output power	015	15W
	030	30W
	060	60W
	120	120W
	180	180W
	240	240W
Item	SPB	Switching Mode Power Supply

※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

■ Specifications

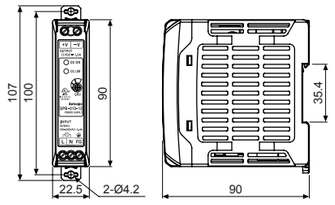
Model		SPB-015-05	SPB-015-12	SPB-015-24	SPB-030-05	SPB-030-12	SPB-030-24	SPB-060-12	SPB-060-24	SPB-060-48	SPB-120-12	SPB-120-24	SPB-120-48	SPB-180-24	SPB-180-48	SPB-240-12	SPB-240-24	SPB-240-48
Output power		15W	15.6W		25W	30W	31.2W	60W		62.4W	96W	120W		180W	182.4W	240W		
Input condition	Voltage※1	100-240VAC～ (permissible voltage: 85-264VAC～/120-370VDC⎓)																
	Frequency	50/60Hz																
	Efficiency※2 (Typical) 100VAC～	76%	80%	83%	77%	82%	84%	81%	84%	85%	82%	85%	85%	89%	89%	87%	89%	89%
	Efficiency※2 (Typical) 240VAC～	76%	79%	82%	78%	83%	85%	83%	86%	87%	85%	88%	88%	92%	92%	90%	92%	92%
	Power factor※2	—			—			—			Min. 0.9			Min. 0.9		Min. 0.9		
	Max. current consumption※2	0.4A			0.8A			1.6A			1.9A			3.0A		3.8A		
	Current consumption※2 (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	2.03A	2.04A	2.76A	2.71A	2.73A
	Current consumption※2 (Typical) 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	0.83A	0.84A	1.14A	1.12A	1.13A
Power factor correction circuit		—			—			—			Built-in			Built-in		Built-in		
Output characteristics	Voltage	5VDC⎓	12VDC⎓	24VDC⎓	5VDC⎓	12VDC⎓	24VDC⎓	12VDC⎓	24VDC⎓	48VDC⎓	12VDC⎓	24VDC⎓	48VDC⎓	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	7.5A	3.8A	20A	10A	5A
	Voltage adjustment range※3	Max. ±10%			Max. ±10%			Max. ±5%			Max. ±5%			Max. ±5%		Max. ±5%		
	Input variation※4	Max. ±0.5%			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%		Max. ±1%		
	Ripple&Ripple noise※2,※5	Max. ±1.5%	Max. ±1%		Max. ±1.5%	Max. ±1%		Max. ±1%			Max. ±1%			Max. ±1%		Max. ±1.5%	Max. ±1%	
	Start-up time※2 (Typical) 100VAC～	500ms	550ms	650ms	600ms	550ms	550ms	520ms	550ms	1200ms	1200ms	1200ms	1200ms	87ms	75ms	75ms	87ms	75ms
	Start-up time※2 (Typical) 240VAC～	550ms	550ms	650ms	600ms	550ms	550ms	530ms	550ms	400ms	400ms	400ms	400ms	56ms	45ms	45ms	56ms	45ms
	Hold time※2 (Typical) 100VAC～	24ms	25ms	25ms	20ms	15ms	15ms	15ms	14ms	15ms	98ms	75ms	87ms	36ms	25ms	33ms	36ms	25ms
	Hold time※2 (Typical) 240VAC～	190ms	190ms	190ms	130ms	110ms	110ms	100ms	110ms	108ms	97ms	43ms	86ms	36ms	25ms	33ms	36ms	25ms
Protection	Inrush current protection (Typical) 100VAC～	7A	7A	7A	7A	7A	6A	13A	14A	10A	9A	11A	10A	8A	8A	8A	8A	8A
	Inrush current protection (Typical) 240VAC～	32A	30A	31A	29A	31A	29A	19A	17A	37A	37A	36A	37A	25A	26A	22A	25A	26A
	Over-current protection※5	105 to 160%			105 to 160%			105 to 160%			105 to 160%			105 to 160%		105 to 160%		
	Over-voltage protection※3	—			—			—			16.0V ±10%	30.0V ±10%	58.0V ±10%	30.0V ±10%	58.0V ±10%	16.0V ±10%	30.0V ±10%	58.0V ±10%
	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%	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)																
Dielectric strength		3,000VAC 50/60Hz for 1 min (between all input and output terminals)																
		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/s² (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※6	-10 to 50℃, storage: -25 to 65℃ (surrounding air temp.: max. 40℃)																
	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)			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		0.7 to 0.9N·m		
Protection structure		IP20 (IEC standard)																
Approval		CE UL			CE UL			CE UL			CE UL			CE UL		CE UL		
Weight※7		Approx. 202g (approx. 129g)			Approx. 249g (approx. 176g)			Approx. 347g (approx. 274g)			Approx. 466g (approx. 466g)			Approx. 570g (approx. 505g)		Approx. 609g (approx. 505g)		Approx. 866g (approx. 736g)

※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.
※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.
※5: It is for the rated input voltage 100-240VAC.
※7: The weight includes packaging. The weight in parenthesis is for unit only.
※2: It is for 100% load.
※4: It is for the rated input voltage 100-240VAC (85-264VAC) and 100% load.
※6: Refer to '■ Output Derating Curve by Ambient Temperature'.
※Environment resistance is rated at no freezing or condensation.

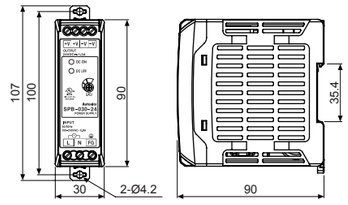
■ Dimensions

(unit: mm)

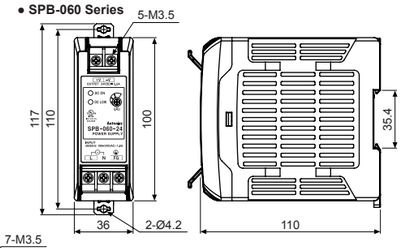
● SPB-015 Series



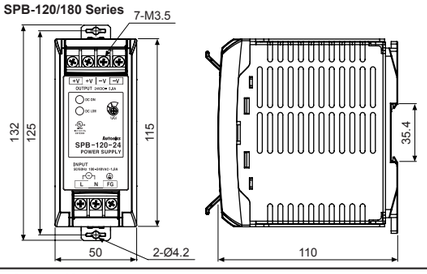
● SPB-030 Series



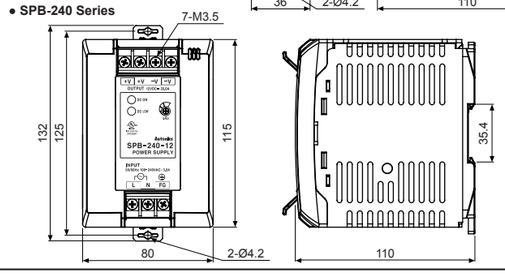
● SPB-060 Series



● SPB-120/180 Series

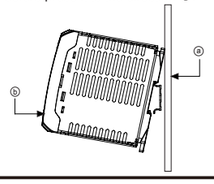


● SPB-240 Series

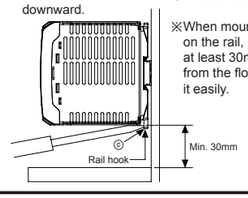


■ Installation

● Mounting to DIN rail
Put the unit on the part ⓐ of the rail before press it to the direction ⓑ.

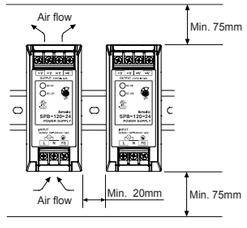


● Removing from DIN rail
Put a screw driver into the part ⓒ before push it downward.



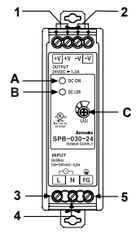
※When mounting this unit on the rail, place the unit at least 30mm above from the floor to remove it easily.

● Installation interval
When installing multiple SMPSs, please keep space at least 20mm between SMPSs for heat radiation.
In case of the top and bottom of the product, please keep space at least 75mm.

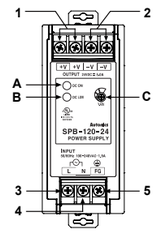


■ Wiring Diagram/Unit Description

◎ SPB-015/030 Series



◎ SPB-060/120/180/240 Series



● Wiring Diagram
1. Output power [+V] terminal
2. Output power [-V] terminal
3. Input power [L] terminal
4. Input power [N] terminal
5. F.G. (Frame Ground) terminal

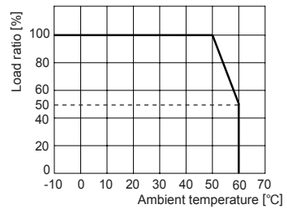
● Unit Description
A. Output (DC ON) indicator (Green)
B. Output low-voltage (DC LOW) indicator (Red)
C. Output voltage adjuster (V.ADJ)

※SPB-015/060 series has an output power [+V] terminal (1) and an output power [-V] terminal (2).

■ 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.

■ Output Derating Curve by Ambient Temperature



■ 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 SPB-015/030/060 models have no harmonic suppression or power factor correction circuit, install the circuit separately if necessary.
4. Since SPB-015/030/060 models use 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.
   $$\text{Input apparent power[VA]} = \frac{\text{Output active power[W]}}{\text{Power factor} \times \text{Efficiency}}$$
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. To ensure the reliability of the product, install the product on the panel or metal surface vertically to the ground.
8. Install the unit in the well ventilated place.
9. Do not use near the equipment which generates strong magnetic force or high frequency noise.
10. This unit may be used in the following environments.
    ①Indoors (in the environment condition rated in 'Specifications')
    ②Altitude max. 2,000m
    ③Pollution degree 2
    ④Installation 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, Co₂, 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

Autonics Corporation
http://www.autonics.com
■ **HEADQUARTERS:**
18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002
TEL: 82-51-519-3232
■ **E-mail:** sales@autonics.com