DIN Rail Mount Switching Mode Power Supply

▣ Features

- DIN rail type mount and screw mount methods
- Efficient power conversion
  : high conversion efficiency up to 92% with LLC circuit (SPB-240)
  : stable power supply with minimal noise and ripple
- Space efficient design
  : slim and compact size for maximum space efficiency
  : uniform depth size (except SPB-015/030) for neat and tidy installation
- Safety and user-friendly features
  : terminal protection cover (SPB-060/120/180/240)
  : easy wiring with rising clamp terminal (SPB-015/030)
  : inrush current prevention, output over-current prevention, output overvoltage prevention, output short-circuit protection, circuit overheating protection
  : low output voltage indicator (red LED), output indicator (green LED)
- Output power: 15W, 30W, 60W, 120W, 180W, 240W

SPB-015/030 Series | SPB-060 Series | SPB-120 Series | SPB-180 Series | SPB-240 Series

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

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▣ Ordering Information

SPB — **120** — **24**

Output voltage	05	5VDC	24	24VDC
	12	12VDC	48	48VDC
Output power	015	15W	120	120W
	030	30W	180	180W
	060	60W	240	240W
Item	SPB	Switching Mode Power Supply		

▣ 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~	77%	80%	83%	77%	82%	84%	81%	84%	85%	82%	85%	85%	89%	89%	87%	89%	89%
		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			3.0 A		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
		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
		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
		240VAC~	190ms	190ms	190ms	130ms	110ms	110ms	100ms	110ms	108ms	97ms	43ms	86ms	36ms	25ms	33ms	36ms	25ms

※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: It is for the rated input voltage 100-240VAC (85-264VAC) and 100% load.
※5: It is for the rated input voltage 100-240VAC.

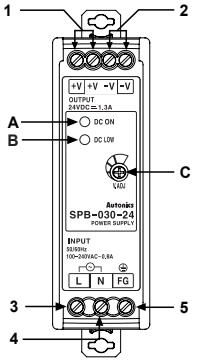
▣ Specifications

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
Protection	Inrush current protection (typical)	100VAC~	7A	7A	7A	7A	7A	6A	13A	14A	10A	9A	11A	10A	8A	8A	8A	8A	8A
		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 terminals and output terminals)																
Dielectric strength			3,000VAC 50/60Hz for 1 min (between all input terminals and output terminals)																
			1,500VAC 50/60Hz for 1 min (between all input terminals and F.G.)																
Vibration			0.75mm amplitude at frequency 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hour																
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 temp.※6		-10 to 50℃, storage: -25 to 65℃ (surrounding air temp.: max. 40℃)																
	Ambient humi.		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			IP20 (IEC standard)																
Approval			CE, cULus LISTED																
Weight※7			Approx. 202g (approx. 129g)			Approx. 249g (approx. 176g)			Approx. 347g (approx. 274g)			Approx. 570g (approx. 466g)			Approx. 609g (approx. 505g)		Approx. 866g (approx. 736g)		

※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. ※6: Refer to '▣ Output Derating Curve by Ambient Temperature'.
※7: 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

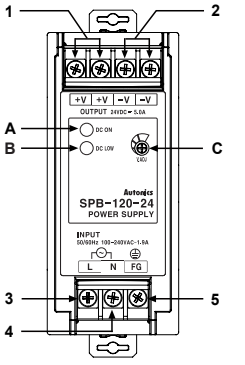
◎ SPB-015/030 Series



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

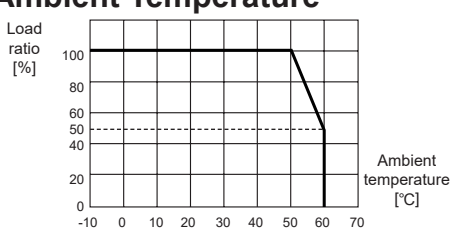
● **Unit Description**
A. Output (DC ON) indicator (green)
B. Output low voltage (DC LOW) indicator (red)
C. Output voltage adjuster (V.ADJ)

◎ SPB-060/120/180/240 Series



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

▣ Output Derating Curve by Ambient Temperature

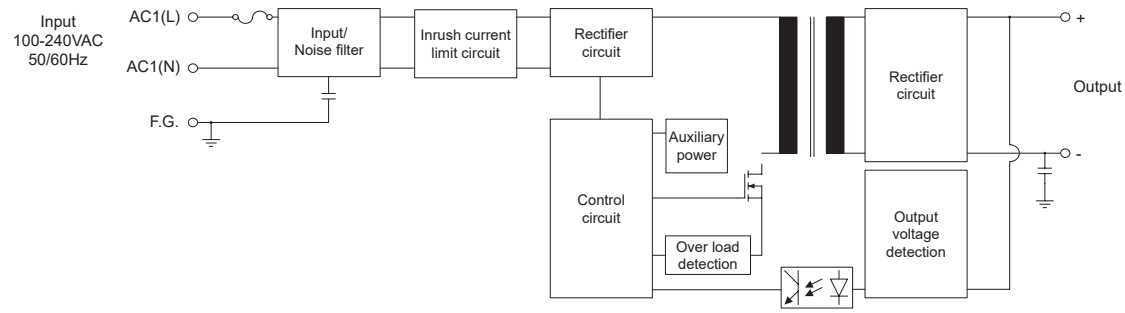


▣ Over-Heating Protection

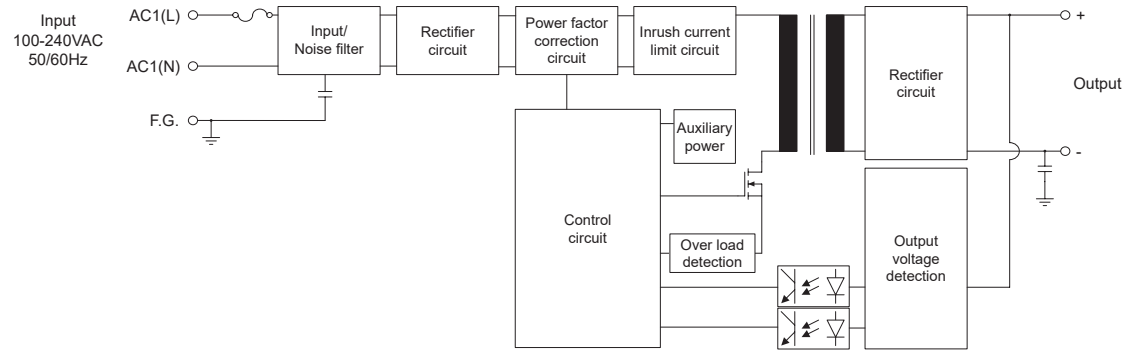
The overheat protection function cuts off the output voltage, when the temperature in an element increases due to overheating.
This product has the overheat protection function within itself.
When the overheat protection function is activated and the product does not work properly, please resupply power.

▣ Block Diagram

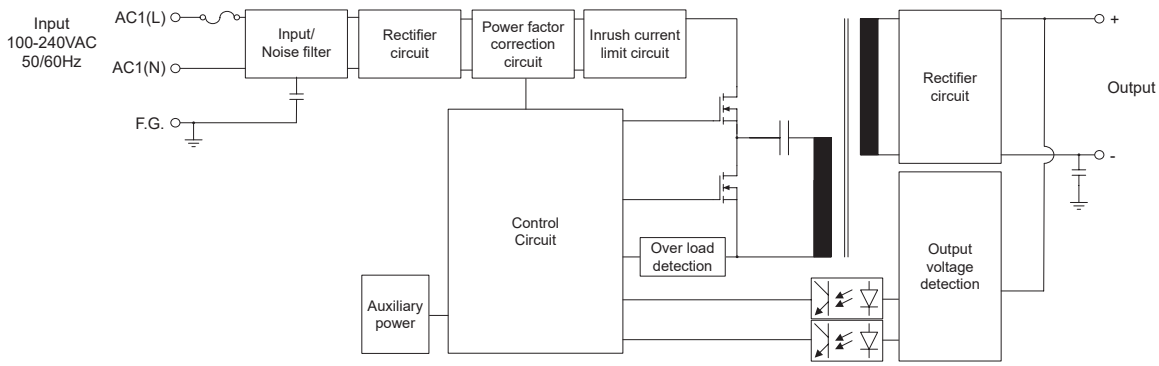
◎ SPB-015/030/060 Series



◎ SPB-120 Series



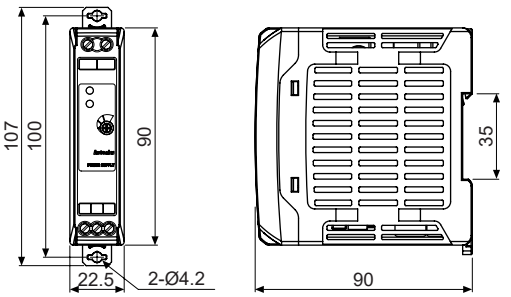
◎ SPB-180/240 Series



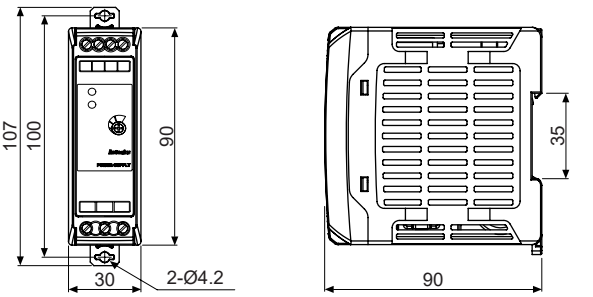
▣ Dimensions

(unit: mm)

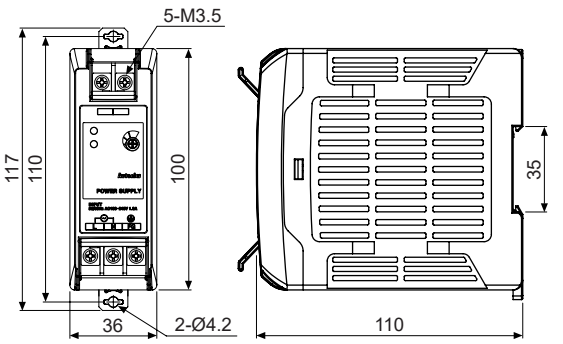
◎ SPB-015 Series



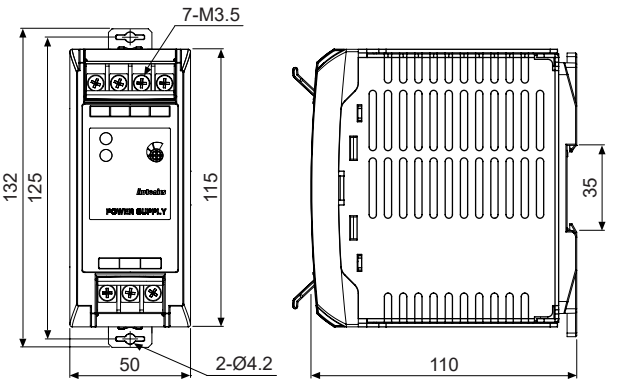
◎ SPB-030 Series



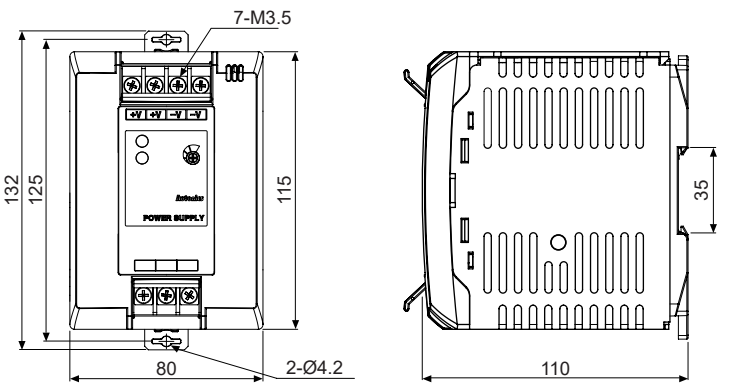
◎ SPB-060 Series



◎ SPB-120/180 Series



◎ SPB-240 Series

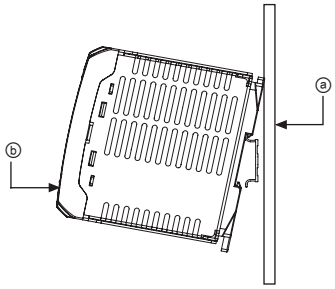


▣ Installation

◎ DIN rail mounting

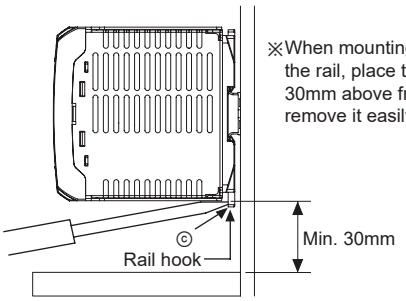
● Mounting to DIN rail

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



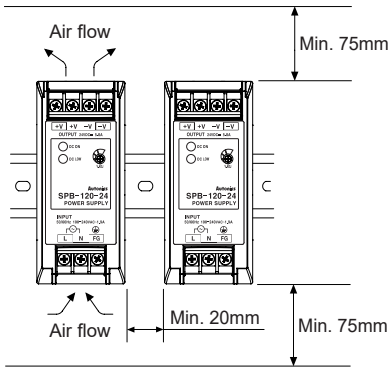
● Removing from DIN rail

Put a screw driver into the part ⓒ before push it downward.



◎ Spacing

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.



▣ Proper Usage

⚠ Cautions during use

1. Follow instructions in 'Proper Usage'. 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.

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

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. 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