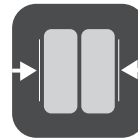


SPB Series

DIN Rail Mount Switching Mode Power Supply



High Conversion Efficiency



Slim Size



Low Noise and Ripple



Terminal Protection Cover
(060/120/240 models)



Various Mounting Methods

■ Features

[Common Features]

- Minimal Noise and Ripple

The SPB series provides stable power supply by minimizing V_{pk-pk}* value of ripple noise.



※V_{pk-pk}: AC noise present in output voltage

- DIN Rail Mount and Screw Mount Methods

DIN rail mount and screw on mounting is possible for higher installation flexibility.

- DIN Rail Mount



- Screw Mount



- Output Indicator, Output Low Voltage Indicator

Users can easily check the operation status and voltage levels with LED status indicators.

Output Indicator
Output Low Voltage Indicator



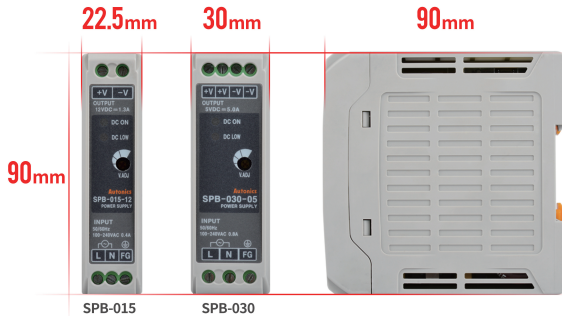
DIN Rail Mount Type Switching Mode Power Supply

■ Features

[SPB-015/030 Features]

● Slim and Compact Size

The slim and compact sized design allows space-saving installation.



● Rising Clamp Type Terminals

Rising clamp type terminals provide easier wiring for users.



[SPB-060/120/240 Features]

● Terminal Protection Covers

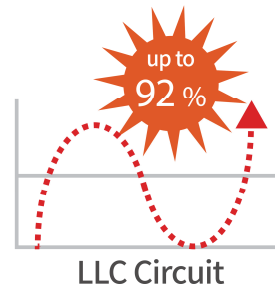
Terminal protection covers protect the units from pollutants and prevent physical impact.



● High Power Conversion Efficiency

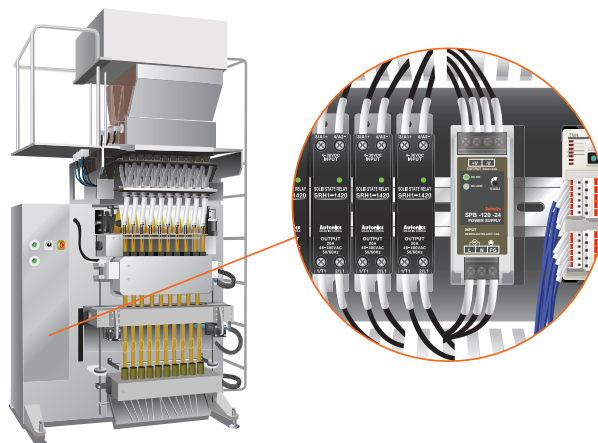
The switching mode power supplies guarantee high power conversion efficiency up to 92% with LLC circuits. (SPB-240)

High Conversion Efficiency Guaranteed



■ Application

Switching mode power supplies used to supply rated power voltage to sugar stick packaging machines



(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets
(H)	Temp. controller
(I)	SSR/ Power controller
(J)	Counter
(K)	Timer
(L)	Panel meter
(M)	Tacho/ Speed/ Pulse meter
(N)	Display unit
(O)	Sensor controller
(P)	Switching mode power supply
(Q)	Stepper motor& Driver&Controller
(R)	Graphic/ Logic panel
(S)	Field network device
(T)	Software
(U)	Other

SPB Series

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-060/120/240)
 - : Easy wiring with rising clamp terminal (SPB-015/030)
 - : Inrush current prevention, output overcurrent 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, 240W

Line-up



⚠ Please read "Caution for your safety" in operation manual before using.



■ Ordering Information

SPB	—	120	—	24	
					Output voltage
					Output power
Item					

5	5VDC		
12	12VDC		
24	24VDC		
48	48VDC		
015	15W	120	120W
030	30W	240	240W
060	60W		
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-240-12	SPB-240-24	SPB-240-48	
Output power	15W	15.6W		25W	30W	31.2W	60W		62.4W	96W	120W		240W			
Input	Voltage															
	100-240VAC (permissible voltage: 85-264VAC/120-370VDC)															
	Frequency															
	50/60Hz															
Efficiency ^{*1} (typical)	100VAC	77%	80%	83%	77%	82%	84%	81%	84%	85%	82%	82%	85%	87%	89%	89%
	240VAC	76%	79%	82%	78%	83%	85%	83%	86%	87%	85%	85%	88%	90%	92%	92%
Power factor ^{*1}	—			—			—			Min. 0.9			Min. 0.9			
Current consumption ^{*1} (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	—			—			—			Built-in			Built-in			
Output	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 ^{*2}															
	Max. ±10% Max. ±10% Max. ±5% Max. ±5% Max. ±5%															
	Input variation ^{*3}															
	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 ^{*1,*4}																
Max. ±1.5% Max. ±1% Max. ±1.5% Max. ±1% Max. ±1% Max. ±1% Max. ±1.5% Max. ±1%																
Start-up time ^{*1} (typical)	100VAC	500ms	550ms	650ms	600ms	550ms	550ms	520ms	550ms	1200ms	1200ms	760ms	1200ms	75ms	87ms	75ms
	240VAC	550ms	550ms	650ms	600ms	550ms	550ms	530ms	550ms	400ms	400ms	280ms	400ms	45ms	56ms	45ms
Hold time ^{*1} (typical)	100VAC	24ms	25ms	25ms	20ms	15ms	15ms	15ms	14ms	15ms	98ms	81ms	87ms	33ms	36ms	25ms
	240VAC	190ms	190ms	190ms	130ms	110ms	110ms	100ms	110ms	108ms	97ms	81ms	86ms	33ms	36ms	25ms

※1: It is for 100% load.

※2: Adjusting voltage by the output adjuster (V.ADJ), it is changed the below 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.

DIN Rail Mount Type Switching Mode Power Supply

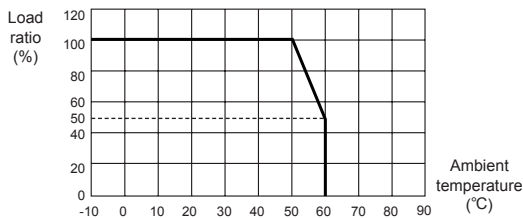
Specifications

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-240-12	SPB-240-24	SPB-240-48
Protection	Inrush current protection (typical)	100VAC 7A	7A	7A	7A	7A	6A	13A	14A	10A	9A	16A	10A	8A	8A	8A
	240VAC	32A	30A	31A	29A	31A	29A	19A	17A	37A	37A	20A	37A	22A	25A	26A
	Over-current protection※4	105 to 160%			105 to 160%			105 to 160%			105 to 160%			105 to 160%		
	Over-voltage protection	—			—			—			16.0V ±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%	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 of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hour															
Shock	300m/s ² (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															
Environ-ment	Ambient temp.	-10 to 50°C, storage: -25 to 65°C														
	Ambient humi.	25 to 85%RH, storage: 25 to 90%RH														
Input cable	AWG24 to 19			AWG24 to 19			AWG21 to 19			AWG21 to 19			AWG18 to 16			
Protection	IP20 (IEC standard)															
Approval	CE															
Weight※5	Approx. 202g (approx. 129g)			Approx. 249g (approx. 176g)			Approx. 347g (approx. 274g)			Approx. 570g (approx. 466g)			Approx. 866g (approx. 736g)			

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

※Environment is rated at no freezing or condensation.

Output Derating Curve By Ambient Temperature



Over-Heating Protection

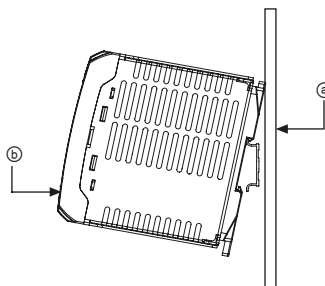
If the inner temperature of the switching element is around 140°C by overheat, it stops switching operation and becomes open state. Output voltage is not output.

Installation

○ DIN rail mounting

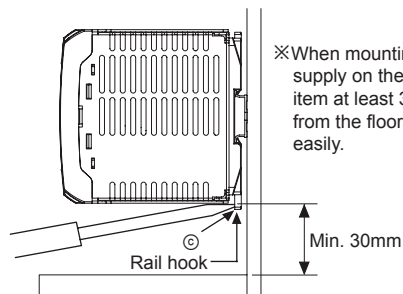
● To mount the power supply on the rail

First put the power supply on the part ㉑ of the rail and then press it for the direction ㉒.



● To remove the power supply on the rail

First put a screw driver into the part ㉓ and push it downward.

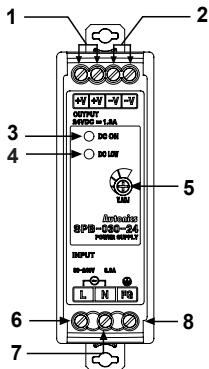


(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets
(H)	Temp. controller
(I)	SSR/ Power controller
(J)	Counter
(K)	Timer
(L)	Panel meter
(M)	Tacho/ Speed/ Pulse meter
(N)	Display unit
(O)	Sensor controller
(P)	Switching mode power supply
(Q)	Stepper motor& Driver&Controller
(R)	Graphic/ Logic panel
(S)	Field network device
(T)	Software
(U)	Other

SPB Series

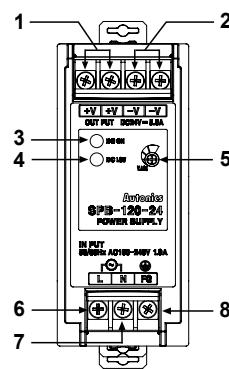
Unit Description

● SPB-015/030 Series



1. Output power [+V] terminal
2. Output power [-V] terminal
3. Output (DC ON) indicator (green)
4. Output low voltage (DC LOW) indicator (red)
5. Output voltage adjuster (V.ADJ)
6. Input power [L] terminal
7. Input power [N] terminal
8. Frame ground [F.G.] terminal

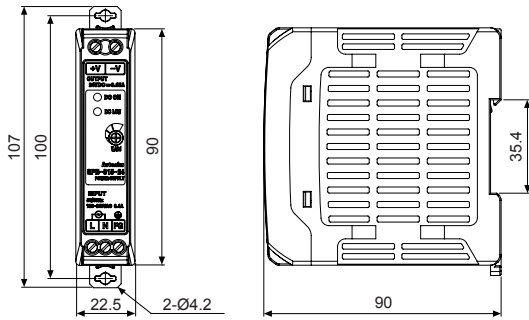
● SPB-060/120/240 Series



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

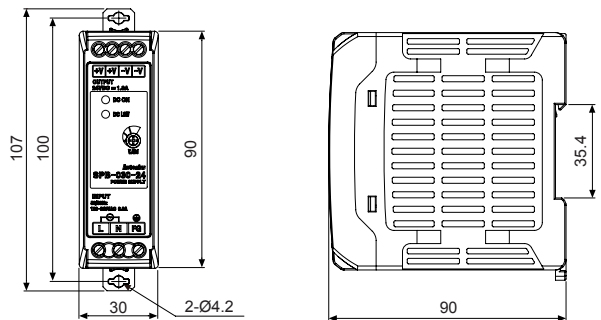
Dimensions

● SPB-015 Series

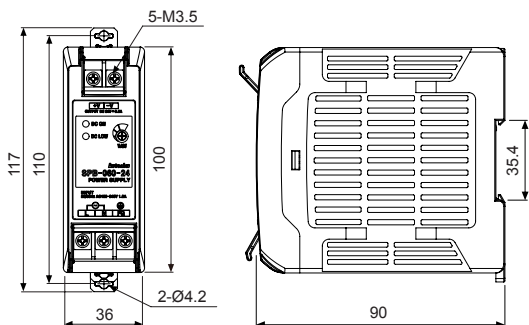


● SPB-030 Series

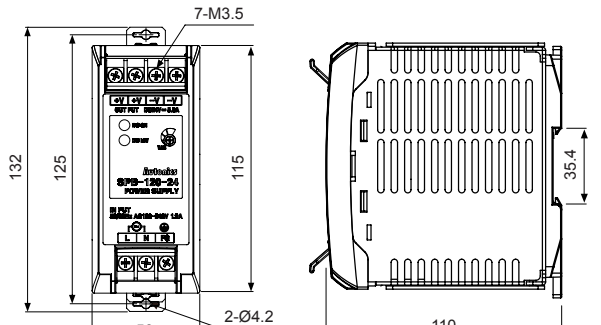
(unit: mm)



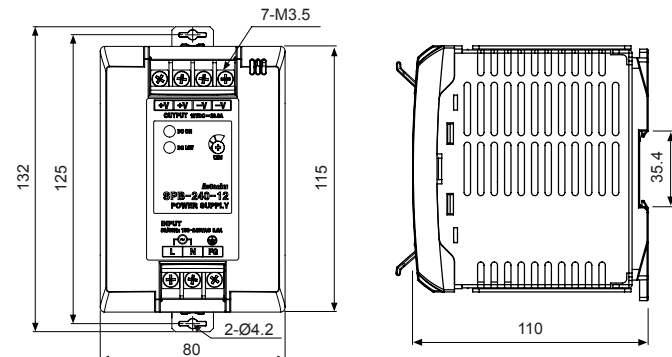
● SPB-060 Series



● SPB-120 Series



● SPB-240 Series



DIN Rail Mount Type Switching Mode Power Supply

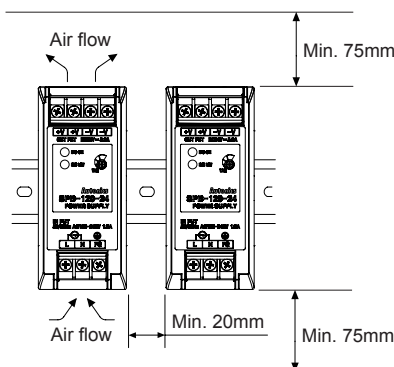
■ Proper Usage

- Caution 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-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-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.

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

- 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.
- Caution for mounting
- Mount this product on the surface of metal panel vertically for the reliability.
- Please mount this product at a well-ventilated place in order to increase the heat radiation efficiency.
- Effective 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 this unit at below places.
 - Place where there are severe vibration or impact.
 - Place where strong alkalis or acids are used.
 - Place where there is direct ray of the sun.
 - Place where strong magnetic field or electric noise are generated.
- Installation environment
 - Indoors
 - Max. altitude: 2000m
 - Pollution Degree 2
 - Installation Category II

(A)	Photo electric sensor
(B)	Fiber optic sensor
(C)	Door/Area sensor
(D)	Proximity sensor
(E)	Pressure sensor
(F)	Rotary encoder
(G)	Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets
(H)	Temp. controller
(I)	SSR/ Power controller
(J)	Counter
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(L)	Panel meter
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