

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



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



■ 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 | 240W | 182.4W | 240W | 240W | 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% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Input condition | Power factor ^{*2} | | | | | | | | | | | | | | | | | — | | | | | | | | | | | | | | | | |
| | Max. current consumption ^{*2} | | | | | | | | | | | | | | | | | 0.4A | | | | | | | | | | | | | | | | |
| | 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 | | | | | | | | | | | | | | | | | — | | | | | | | | | | | | | | | | | |
| Output characteristics | Voltage | | | | | | | | | | | | | | | | | 5VDC= 12VDC= 24VDC= 5VDC= 12VDC= 24VDC= 12VDC= 24VDC= 48VDC= 12VDC= 24VDC= 48VDC= 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% | | | | | | | | | | | | | | | | |
| | Input variation ^{*4} | | | | | | | | | | | | | | | | | Max. ±0.5% | | | | | | | | | | | | | | | | |
| | Load variation | | | | | | | | | | | | | | | | | Max. ±1% | | | | | | | | | | | | | | | | |
| | Ripple & Ripple noise ^{*2,*5} | | | | | | | | | | | | | | | | | Max. ±1.5% | | | | | | | | | | | | | | | | |
| Output characteristics | Start-up time ^{*2} | | | | | | | | | | | | | | | | | 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.

| |
|-----------------------------------|
| 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 |

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/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 | | | | | | | | | | | | | | | | | |
| Environment | Ambient temp.※6 | -10 to 50°C, storage: -25 to 65°C (surrounding air temp.: max. 40°C) | | | | | | | | | | | | | | | | |
| | 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 | | |
| Protection | IP20 (IEC standard) | | | | | | | | | | | | | | | | | |
| Approval | CE, TÜV, etc. | | | | | | | | | | | | | | | | | |
| 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.

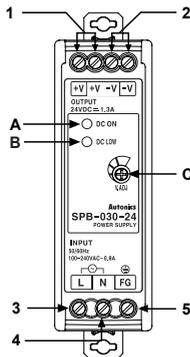
※6: Refer to **Output Derating Curve by Ambient Temperature**.

※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



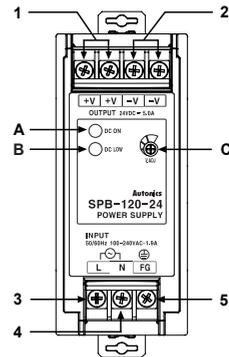
Wiring Diagram

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

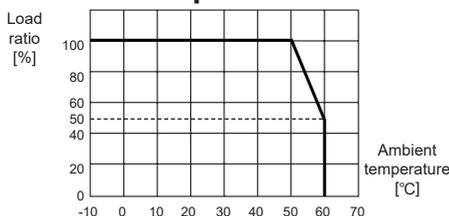
- A. Output (DC ON) indicator (green)
- B. Output low voltage (DC LOW) indicator (red)
- C. Output voltage adjuster (V.ADJ)

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



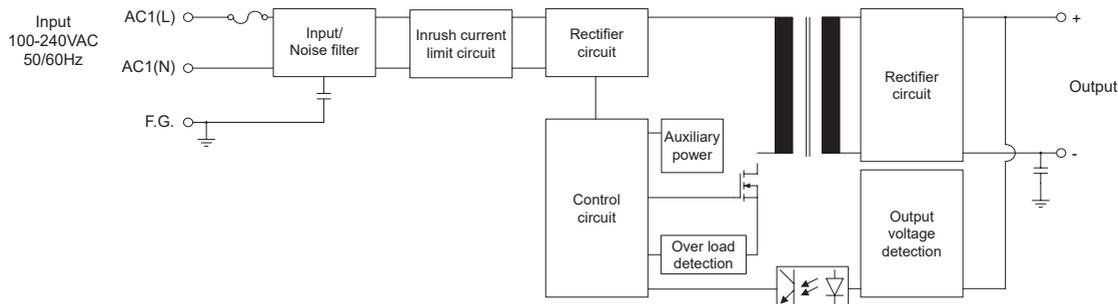
Over-Heating Protection

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.

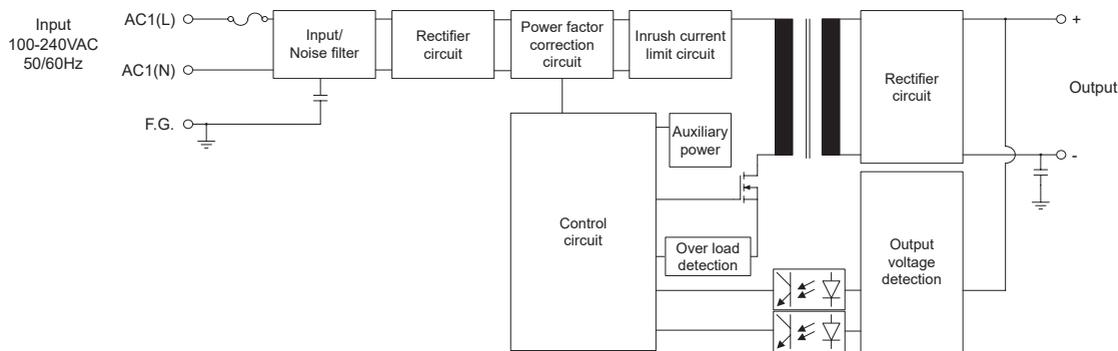
DIN Rail Mount Type Switching Mode Power Supply

Block Diagram

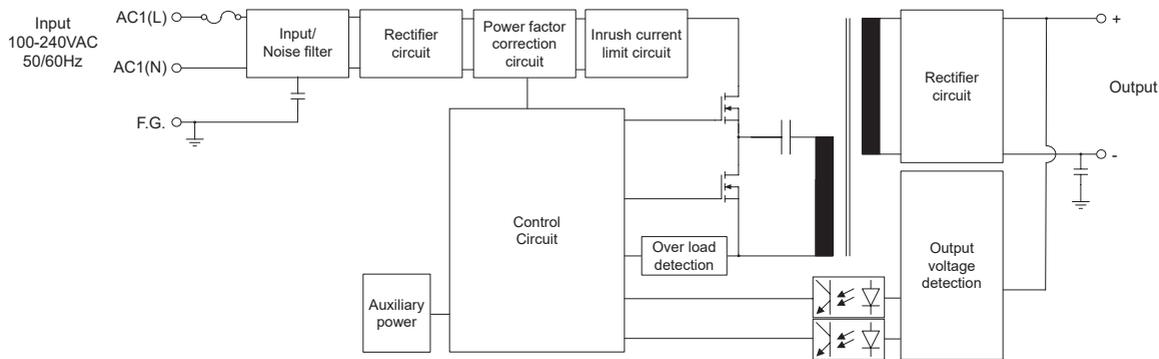
SPB-015/030/060 Series



SPB-120 Series



SPB-180/240 Series



| |
|----------------|
| 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 |

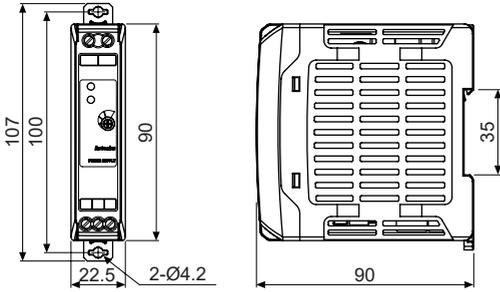
| |
|-----------------------------------|
| (S) Sensor Controllers |
| (T) Switching Mode Power Supplies |

| |
|---------------------------|
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| (V) HMIs |
| (W) Panel PC |
| (X) Field Network Devices |

SPB Series

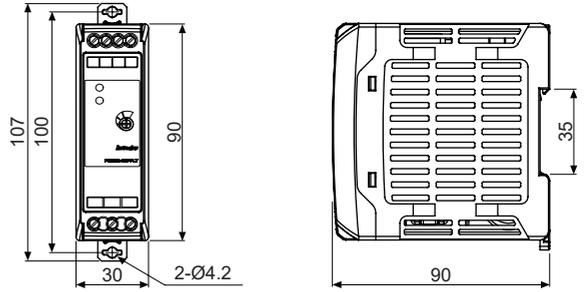
▣ Dimensions

◎ SPB-015 Series

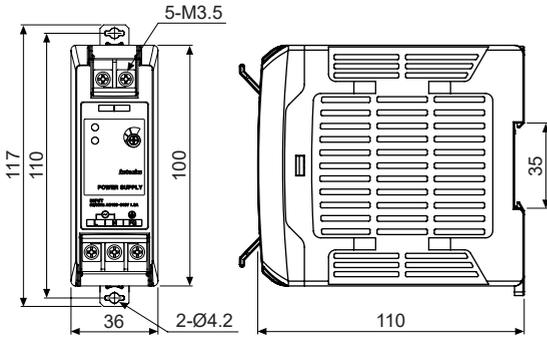


◎ SPB-030 Series

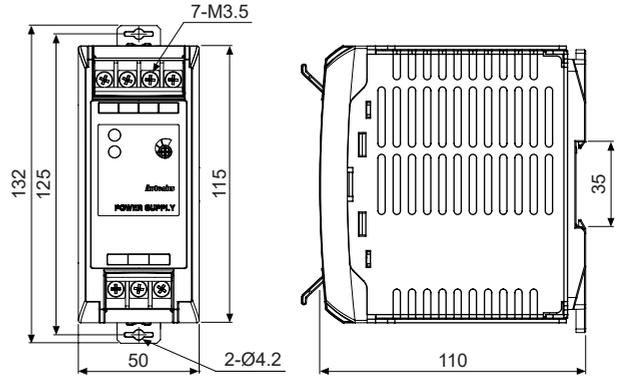
(unit: mm)



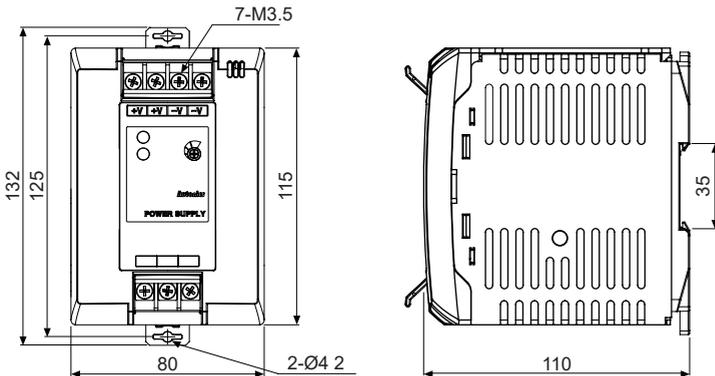
◎ SPB-060 Series



◎ SPB-120/180 Series



◎ SPB-240 Series



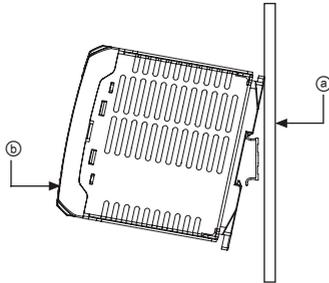
DIN Rail Mount Type Switching Mode Power Supply

■ Installation

○ DIN rail mounting

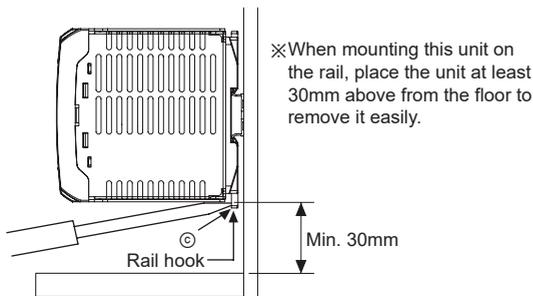
● Mounting to DIN rail

Put the unit on the part ① of the rail before press it to the direction ②.



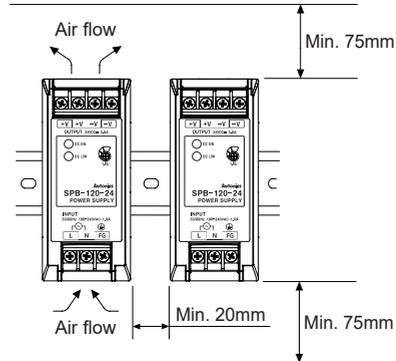
● Removing from DIN rail

Put a screw driver into the part ③ before push it downward.



○ Spacing

When installing multiple SMPSSs, please keep space at least 20mm between SMPSSs 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.
 - ① Indoors (in the environment condition rated in 'Specifications')
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - ④ Installation category II

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