

# PS5R-V Switching Power Supplies

## Space-saving DIN-rail switching power supplies

- Spring-up terminal accepts wiring of ring terminals.
- Slim size  
Width: 22.5mm (10W/15W/30W), 36mm (60W), 46mm (120W)
- Can be installed in six mounting directions.
- Optional mounting bracket is available for panel mounting.
- CE marked (LVD, EMC/D)
- UL (UL508, UL1310 Class 2\*, ANSI/ISA 12.12.01)  
c-UL (CSA C22.2 No. 107.1, 213, 223)  
TÜV SÜD (EN60950-1, EN50178)
- EN61204-3 (Electromagnetic compatibility Class B)
- Meets SEMI F47 Sag Immunity (208V AC input)
- RoHS compliant
- Five-year warranty



| Applicable Standards   | Mark | File No. or Organization                                |
|--|------|---|
| UL508, UL1310*1<br>ANSI/ISA 12.12.01<br>CSA C22.2 No.107.1<br>CSA C22.2 No.213<br>CSA C22.2 No.223*1 |      | UL/c-UL Listed<br>File No. E467154<br>File No. EF177168 |
| EN60950-1<br>EN50178<br>EN61204-3  | <br> | TÜV SÜD<br>EU Low Voltage Directive<br>EMC Directive    |
| SEMI F47   | —    | EPRI  |

\*1: PS5R-VB/VC/VD only

## PS5R-V

Package Quantity: 1

| Output Capacity | Part No.  | Input Voltage  | Output Voltage | Output Current |
|-----------------|-----------|--|----------------|----------------|
| 10W             | PS5R-VB05 | 100 to 240V AC<br>(Voltage range: 85 to 264V AC /<br>100 to 370V DC) | 5V             | 2.0A           |
| 15W             | PS5R-VB12 |  | 12V            | 1.3A           |
|                 | PS5R-VB24 |  | 24V            | 0.65A          |
| 30W             | PS5R-VC12 |  | 12V            | 2.5A           |
|                 | PS5R-VC24 |  | 24V            | 1.3A           |
| 60W             | PS5R-VD24 |  | 24V            | 2.5A           |
| 120W            | PS5R-VF24 |  | 24V            | 5.0A           |

## DIN Rail (35mm-wide)

| Length | Part No.    | Material | Weight | Package Quantity |
|--------|-------------|----------|--------|------------------|
| 1000mm | BAA1000PN10 | Aluminum | 200g   | 10               |
|        | BAP1000PN10 | Steel    | 320g   |                  |

## End Clip

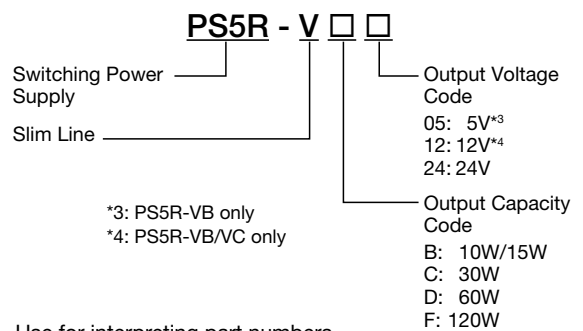
| Part No. | Package Quantity |
|----------|------------------|
| BNL6PN10 | 10               |

## Panel Mounting Bracket\*2

| Applicable Switching Power Supply | Ordering No. | Remarks           |
|-----------------------------------|--------------|-------------------|
| PS5R-VB                           | PS9Z-5R1B    | —                 |
| PS5R-VC                           | PS9Z-5R2B    | For side mounting |
| PS5R-VD                           | PS9Z-5R1C    | —                 |
| PS5R-VF                           | PS9Z-5R1E    | —                 |

\*2: Used for direct panel mounting.

## Part No. Development



# PS5R-V Switching Power Supplies

## Specifications

| Part No.   | (10W/15W)<br>PS5R-VB05<br>PS5R-VB12<br>PS5R-VB24  | (30W)<br>PS5R-VC12<br>PS5R-VC24       | (60W)<br>PS5R-VD24  | (120W)<br>PS5R-VF24   |                              |
|--|---|---------------------------------------|---|---|------------------------------|
| Rated Input Voltage<br>(Single-phase two-wire)*1   | 100 to 240V AC<br>(Voltage range: 85 to 264V AC/100 to 370V DC) (Load ≤ 80% at 100-105V DC)   |                                       |   |   |                              |
| Frequency  | 50/60 Hz  |                                       |   |   |                              |
| Input Current<br>(Typ.)                            | 100V AC   | 5V: 0.25A<br>12V, 24V: 0.35A          | 0.7A  | 1.3A  | 1.4A                         |
|  | 230V AC   | 5V: 0.14A<br>12V, 24V: 0.19A          | 0.3A  | 0.8A  | 0.7A                         |
| Inrush Current<br>(Typ.)                           | 100V AC   | 18A max. (Ta = 25°C, cold start)      |   |   |                              |
|  | 230V AC   | 45A max. (Ta = 25°C, cold start)      |   |   |                              |
| Leakage Current                                    | 120V AC   | 0.5 mA max.                           |   |   |                              |
|  | 230V AC   | 1.0 mA max.                           |   |   |                              |
| Efficiency (Typ.)<br>(at rated output)*2           | 100V AC   | 5V: 77%, 12V: 82%, 24V: 84%           | 12V: 83%, 24V: 85%  | 86%   | 88%                          |
|  | 230V AC   | 5V: 73%, 12V: 80%, 24V: 81%           | 12V: 85%, 24V: 87%  | 86%   | 89%                          |
| Power Factor<br>(Typ.)                             | 100V AC   | —                                     |   |   | 0.99                         |
|  | 230V AC   | —                                     |   |   | 0.92                         |
| Rated Voltage/Current                              | 5V/2.0A*3, 12V/1.3A, 24V/0.65A  |                                       | 12V/2.5A, 24V/1.3A  | 24V/2.5A  | 24V/5A                       |
| Adjustable Voltage Range                           | ±10%  |                                       |   |   |                              |
| Output Holding<br>Time (Typ.)<br>(at rated output) | 100V AC   | 5V: 53ms, 12V: 34ms, 24V: 36ms        | 12V: 13ms, 24V: 15ms  | 13ms  | 30ms                         |
|  | 230V AC   | 5V: 330ms<br>12V: 215ms<br>24V: 230ms | 12V: 110ms<br>24V: 110ms  | 105ms   | 33ms                         |
| Start Time (at rated input and output)             | 500 ms max.   |                                       | 600 ms max.   | 800 ms max.   | 700 ms max.                  |
| Rise Time (at rated input and output)              | 5V, 12V: 200ms max.<br>24V: 250ms max.  |                                       | 200ms max.  |   |                              |
| Input Fluctuation                                  | 0.4% max.   |                                       |   |   |                              |
|  | 5V: 2.5% max.<br>12V, 24V: 1.0% max.  |                                       | 1.0% max.   |   |                              |
| Load Fluctuation                                   | 0.4% max.   |                                       |   |   |                              |
| Temperature Change                                 | 0.05%/°C max. (-10 to +65°C)  |                                       | 12V: 0.05%/°C max. (-10 to +50°C)<br>24V: 0.05%/°C max. (-10 to +55°C)  | 0.05%/°C max. (-10 to +55°C)  | 0.05%/°C max. (-25 to +55°C) |
| Ripple<br>(including noise)                        | 5V: 8% p-p max. (-25 to -10°C)<br>12V: 6% p-p max. (-25 to -10°C)<br>24V: 4% p-p max. (-25 to -10°C)  |                                       | 12V: 6% p-p max. (-25 to -10°C)<br>24V: 4% p-p max. (-25 to -10°C)  | 4% p-p max. (-25 to -10°C)  | 4% p-p max. (-25 to -10°C)   |
|  | 5V: 5% p-p max. (-10 to +0°C)<br>12V: 2.5% p-p max. (-10 to +0°C)<br>24V: 1.5% p-p max. (-10 to +0°C)   |                                       | 12V: 2.5% p-p max. (-10 to +0°C)<br>24V: 1.5% p-p max. (-10 to +0°C)  | 1.5% p-p max. (-10 to +0°C)   | 1.5% p-p max. (-10 to +0°C)  |
|  | 5V: 2.5% p-p max. (0 to +65°C)<br>12V: 1.5% p-p max. (0 to +65°C)<br>24V: 1% p-p max. (0 to +65°C)  |                                       | 12V: 1.5% p-p max. (0 to +50°C)<br>24V: 1% p-p max. (0 to +55°C)  | 1% p-p max. (0 to +55°C)  | 1% p-p max. (0 to +55°C)     |
|  | 5V: 2.5% p-p max. (0 to +65°C)<br>12V: 1.5% p-p max. (0 to +65°C)<br>24V: 1% p-p max. (0 to +65°C)  |                                       | 12V: 1.5% p-p max. (0 to +50°C)<br>24V: 1% p-p max. (0 to +55°C)  | 1% p-p max. (0 to +55°C)  | 1% p-p max. (0 to +55°C)     |
| Supplementary<br>Functions                         | Overcurrent Protection  | 105% min. (auto reset)                |   |   | 105 to 130% (auto reset)     |
|  | Operation Indicator   | LED (green)                           |   |   |                              |
| Dielectric Strength                                | Between input and output terminals: 3,000V AC, 1 minute<br>Between input and ground terminals: 2,000V AC, 1 minute<br>Between output and ground terminal: 500V AC, 1 minute |                                       |   |   |                              |
| Insulation Resistance                              | Between input and output terminals: 100MΩ min. (500V DC megger)<br>Between input and ground terminal: 100MΩ min. (500V DC megger)   |                                       |   |   |                              |
| Operating Temperature*4                            | -25 to +75°C (no freezing)  |                                       | -25 to +70°C (no freezing)  | -25 to +65°C (no freezing)  |                              |
| Operating Humidity                                 | 20 to 90% RH (no condensation)  |                                       |   |   |                              |
| Storage Temperature                                | -25 to +75°C (no freezing)  |                                       |   |   |                              |
| Storage Humidity                                   | 20 to 90% RH (no condensation)  |                                       |   |   |                              |
| Vibration Resistance                               | 10 to 55 Hz, amplitude 0.375mm, 2 hours each in 3 axes<br>(when used with part no. BNL6 mounting clips)   |                                       | 10 to 55 Hz, amplitude 0.33mm,<br>2 hours each in 3 axes<br>(when used with part no. BNL6<br>mounting clips)<br>10 to 55 Hz, amplitude 0.375mm,<br>2 hours each in 3 axes (when<br>used with part no. BNL8 mount-<br>ing clips) | 10 to 55 Hz, amplitude 0.21mm,<br>2 hours each in 3 axes<br>(when used with part no. BNL6<br>mounting clips)<br>10 to 55 Hz, amplitude 0.375mm,<br>2 hours each in 3 axes (when<br>used with part no. BNL8 mount-<br>ing clips) |                              |
| Shock Resistance                                   | 300 m/s <sup>2</sup> , 3 times each in 6 directions   |                                       |   |   |                              |
| EMC  | EMI   | EN61204-3 (Class B)                   |   |   |                              |
|  | EMS   | EN61204-3 (industrial)                |   |   |                              |
| Safety Standards                                   | UL508 (Listing), UL1310 Class 2<br>ANSI/ISA-12.12.01<br>CSA C22.2 No. 107.1.213, 223<br>EN60950-1, EN50178  |                                       |   | UL508 (Listing)<br>ANSI/ISA-12.12.01<br>CSA C22.2 No. 107.1.213<br>EN60950-1, EN50178   |                              |
| Other Standard                                     | SEMI F47 (at 208V AC input only)  |                                       |   |   |                              |
| Degree of Protection                               | IP20 (EN60529)  |                                       |   |   |                              |
| Dimensions (mm)                                    | 90H × 22.5W × 95D   |                                       | 95H × 36W × 108D  | 115H × 46W × 121D   |                              |
| Weight (approx.)                                   | 140g  | 150g                                  | 260g  | 470g  |                              |
| Terminal Screw                                     | M3.5  |                                       |   |   |                              |

At normal temperature and humidity unless otherwise specified.

\*1: DC input voltage is not subject to safety standards. When using on DC input, connect a fuse to the input terminal for DC input protection.

\*2: Under stable state. \*3: PS5R-VB05 (5V DC/2.0A) is 10W (Up to 3.0A at Ta = 0 to 40°C. Not subject to safety standards over 2.0A and over.)

\*4: See the output derating curves on page 3.

## Reference Value

|                 |  |
|-----------------|--|
| Expected Life*5 | 8 years minimum (at the rated input, 50% load, operating temperature +40°C, standard mounting direction) |
|-----------------|--|

\*5: Calculation of the expected life is based on the actual life of the aluminum electrolytic capacitor. The expected life depends on operating conditions.

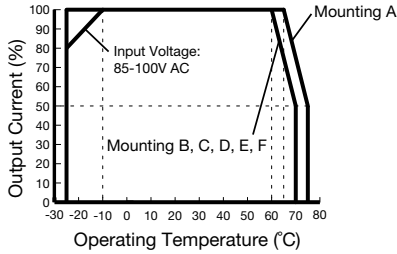
# PS5R-V Switching Power Supplies

## Characteristics

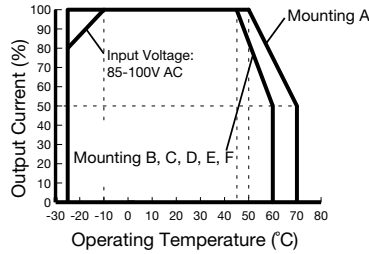
### Operating Temperature vs. Output Current (Derating Curves)

Conditions: Natural air cooling (Operating temperature is the temperature around the switching power supply.)

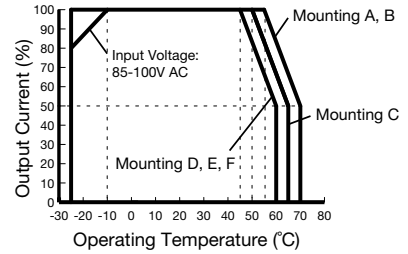
PS5R-VB05, -VB12, -VB24



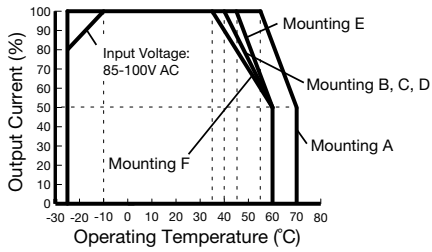
PS5R-VC12



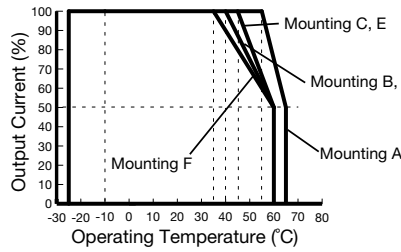
PS5R-VC24



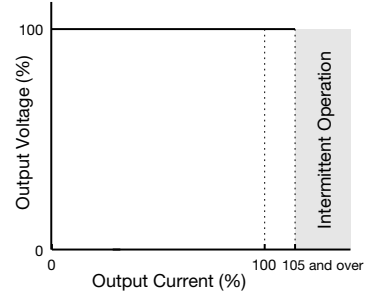
PS5R-VD24



PS5R-VF24



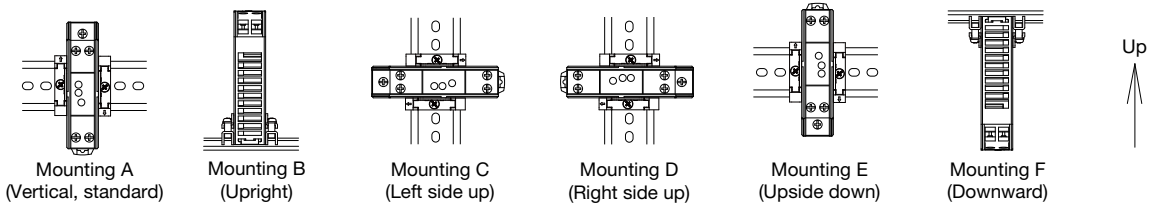
### Overcurrent Protection Characteristics



### Operating Temperature Approved by Safety Standards

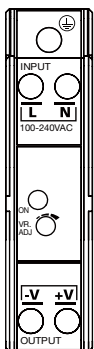
| Part No.                | UL508, CSA C22.2 No.107.1, ANSI/ISA12.12.01, EN60950-1, EN50178 |            |            |            |            |            |
|-------------------------|---|------------|------------|------------|------------|------------|
|                         | Mounting A  | Mounting B | Mounting C | Mounting D | Mounting E | Mounting F |
| PS5R-VB05, -VB12, -VB24 | 65  | 60         | 60         | 60         | 60         | 60         |
| PS5R-VC12               | 50  | 45         | 45         | 45         | 45         | 45         |
| PS5R-VC24               | 55  | 55         | 50         | 45         | 45         | 45         |
| PS5R-VD24               | 55  | 40         | 40         | 40         | 45         | 35         |
| PS5R-VF24               | 55  | 40         | 45         | 40         | 45         | 35         |

### Mounting Style

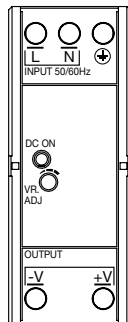


### Parts Description

PS5R-VB/VC



PS5R-VD/VF

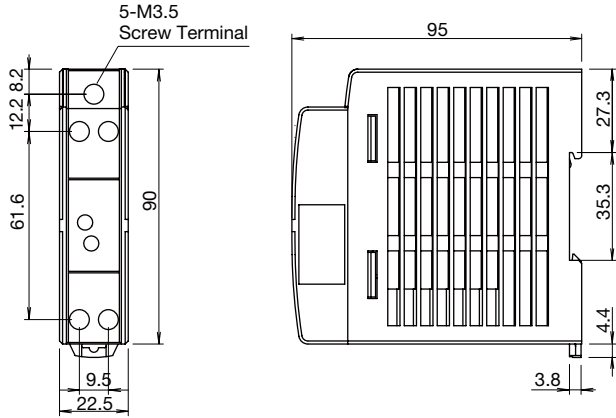


| Marking | Name                        | Description   |
|---------|-----------------------------|---|
| L, N    | AC Input Terminal           | Voltage range: 85 to 264V AC/100 to 370V DC   |
| ⊕       | Ground Terminal             | Be sure to connect this terminal to a proper ground.  |
| +V, -V  | DC Output Terminals         | +V: Positive output terminal<br>-V: Negative output terminal  |
| VR.ADJ  | Output Voltage Adjustment   | Turning clockwise increases the output voltage.<br>Turning counterclockwise decreases the output voltage. |
| DC ON   | Operation Indicator (green) | Lights when the output voltage is on.   |

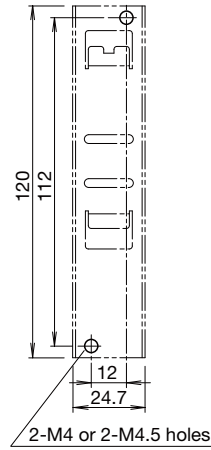
# PS5R-V Switching Power Supplies

## Dimensions

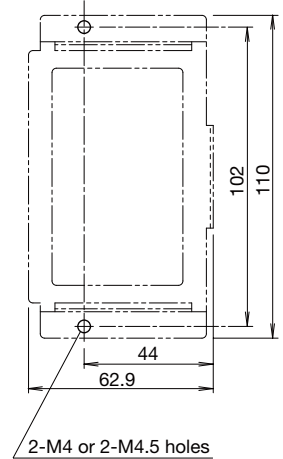
**PS5R-VB/VC**



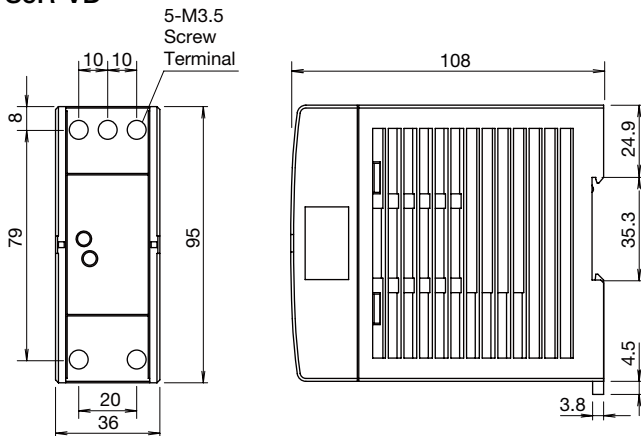
**PS9Z-5R1B**  
Panel Mounting Bracket



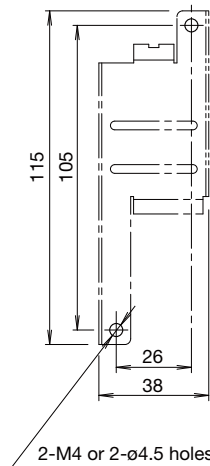
**PS9Z-5R2B**  
Side-mount  
Panel Mounting Bracket



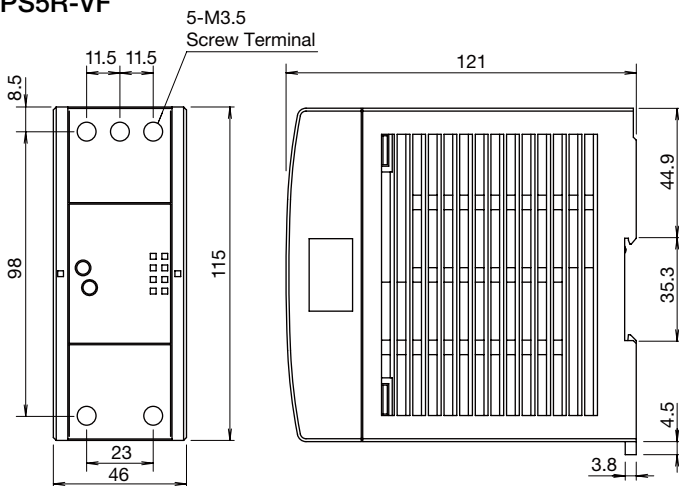
**PS5R-VD**



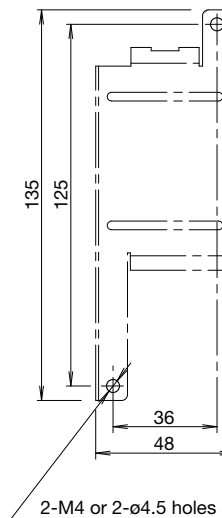
**PS9Z-5R1C** Panel Mounting Bracket



**PS5R-VF**



**PS9Z-5R1E** Panel Mounting Bracket



All dimensions in mm.  
Tolerance: ±1mm

## Safety Precautions

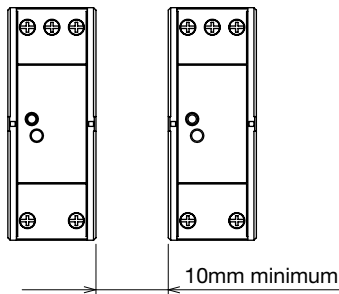
Mount the PS5R-V in an enclosure. Do not use the PS5R-V alone as an Electric Facilities for General Use.  
Use the PS5R-V for electric facilities for business use only.

- Do not use switching power supplies with electric equipment whose malfunction or inadvertent operation may damage the human body or life directly.
- Make sure that the input voltage and output current do not exceed the ratings. If the input voltage and output current exceed the ratings, electric shock, fire, or malfunction may occur.
- Do not touch the terminals of the switching power supply while input voltage is applied, otherwise electric shock may occur.
- Provide the final product with protection against malfunction or damage that may be caused by malfunction of the switching power supply.
- Operating temperatures should not exceed the ratings. Be sure to note the derating characteristics. If the operating temperature exceeds the ratings, electric shock, fire, or malfunction may occur.
- Blown fuses indicate that the internal circuits are damaged. Contact IDEC for repair. Do not just replace the fuse and reoperate, otherwise electric shock, fire, or malfunction may occur.
- Do not use the switching power supplies to charge rechargeable batteries.
- Do not overload or short-circuit the switching power supply for a long period of time, otherwise the internal elements may be damaged.
- Do not disassemble, repair, or modify the power supplies, otherwise the high voltage internal part may cause electric shock, fire, or malfunction.
- The fuse inside the PS5R-V switching power supply is for AC input. Use a DC fuse for DC input.

## Operating Instructions

### Notes for installation

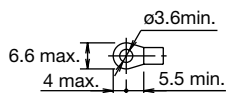
- Do not close the top and bottom openings of the PS5R-V to allow for heat radiation by convection.
- Maintain a minimum of 10 mm clearance around the PS5R-V, except for the top and bottom openings.
- When mounting multiple PS5R-V switching power supplies side by side, maintain a minimum of 10 mm clearance. Observe the derating curves in consideration of the ambient temperature.



- When the derating voltage may exceed the recommended value, provide forced air-cooling.
- Make sure to wire the ground terminal correctly.
- For wiring, use wires of heat resistance of 60°C or higher (PS5R-VB: 80°C or higher). Use copper wire of the following sizes, according to the rated current.
- Recommended wire size: AWG18 to 14 (cross section: 0.823 to 2.081mm<sup>2</sup>)

Note: Wires of the above size must be used to comply with UL508, CSA C22.2 No. 107.1.

### Applicable crimp terminal (reference)



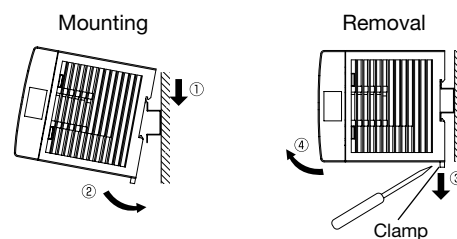
- Recommended tightening torque of the input and output terminals is 1.0 to 1.3 N·m (0.8 N·m for UL).

### Mounting on DIN Rails

1. Use a 35mm-wide DIN rail.
2. Fasten the DIN rail to a mounting plate using screws.
3. Place the PS5R-V on the DIN rail as shown with input terminal side up (①), and press the PS5R-V towards the DIN rail (②). Make sure that the PS5R-V is installed firmly.
4. Use BNL6 mounting clips for fastening the PS5R-V on the DIN rail. Use of BNL8 mounting clips is recommended when excessive vibration or shock is anticipated. Do not use the PS5R-V when it is subject to vibration constantly.

### Removal

- Insert a flat screwdriver into the slot in the clamp, and pull out the clamp until it clicks (③). The lock mechanism is released and the PS5R-V can be removed (④). When mounting the PS5R-V again, push in the latch first.



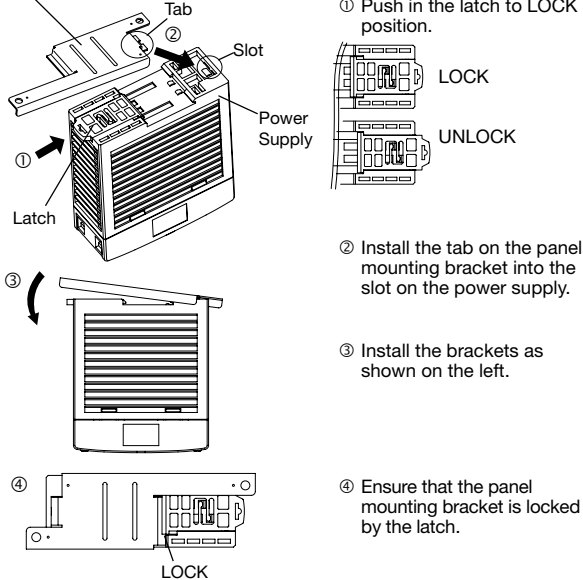
# PS5R-V Switching Power Supplies

## Operating Instructions

### Installing the Panel Mounting Bracket

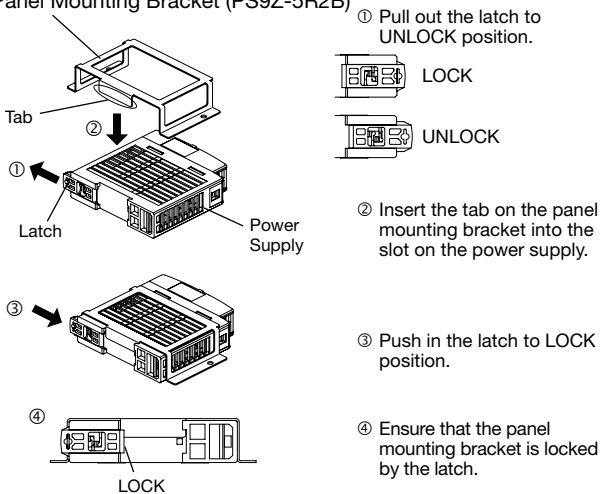
#### <Installing PS9Z-5R1□ Panel Mounting Bracket>

Panel Mounting Bracket (PS9Z-5R1□)



#### <Installing PS9Z-5R2B Panel Mounting Bracket>

Panel Mounting Bracket (PS9Z-5R2B)



### Adjustment of Output Voltage

The output voltage can be adjusted within  $\pm 10\%$  of the rated output voltage by using the VR.ADJ control on the front. Turning the VR.ADJ clockwise increases the output voltage. Turning the VR.ADJ counterclockwise decreases the output voltage.

### Overcurrent Protection

The output voltage drops automatically when an overcurrent flows due to an overload or short circuit. Normal voltage is automatically restored when the load returns to normal conditions.

### Insulation/Dielectric Test

When performing an insulation/dielectric test, short-circuit the input (between L and N) and output (between +V and -V). Do not apply or interrupt the voltage quickly, otherwise surge voltages may be generated and the PS5R-V may be damaged.

### Notes for Operation

- Output interruption may indicate blown fuses. Contact IDEC.
- The PS5R-V switching power supply contains an internal fuse for AC input. When using with DC input, install an external fuse for DC input. To avoid blown fuses, select a fuse in consideration of the rated current of the internal fuse.

### Rated Current of Internal Fuses

| Part No.   | Internal Fuse Rated Current |
|------------|-----------------------------|
| PS5R-VB/VC | 2A                          |
| PS5R-VD/VF | 4A                          |

- Avoid overload and short-circuit for a long period of time, otherwise the internal elements may be damaged.
- DC input operation is not subject to safety standards.

### Rust and Scratches on Metal parts

Hot-dip galvanized steel and bonderized steel are used for the PS5R-V. Rust on the edge and scratches on the surfaces may be developed depending on the storage condition, but the performance of the PS5R-V is not affected.

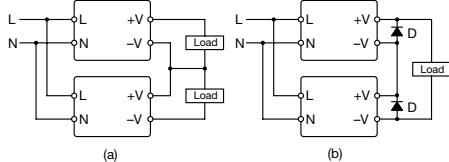
### Noise

Small acoustic noise inside the PS5R-V may be heard depending on the input voltage and load, but the performance of the PS5R-V is not affected.

## Operating Instructions

### Series Operation

The following series operation is allowed. Connect Schottky barrier diodes D as shown below. DC-DC converter unit cannot be connected in series. Select a Schottky diode in consideration of the rated current. The diode's reverse voltage must be higher than the PS5R-V's output voltage.

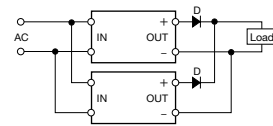


### Parallel Operation

Parallel operation is not possible to increase the output capacity, because the internal elements and load may be damaged.

### Backup Operation

Backup operation is a connection method of two switching power supplies in parallel for emergency. Normally one switching power supply has a sufficient output. If one switching power supply fails, another one operates to continue the output. Make sure that the sum of power consumption by load and diode is not greater than the rated wattage (rated voltage × rated current) of one switching power supply.



Select a diode in consideration of:  
Diode's current must be more than double the PS5R-V's output current. Take heat dissipation into consideration.

## Warranty

### Warranty

IDEC warrants the PS5R-V switching power supplies for a period of five years from the date of shipment.

### Scope

IDEC agrees to repair or replace the PS5R-V switching power supply if the product has been operated under the following conditions. The maximum value of output capacity is within the range shown in "Operating Temperature vs. Output Current" on page 3.

1. Average operating temperature (ambient temperature of switching power supply) is 40°C maximum.
2. The load is 80% maximum.
3. Input voltage is the rated input voltage.
4. Standard mounting style

IDEC shall not be liable for other damages including conse-

quential, contingent or incidental damages. Warranty does not apply if the PS5R-V switching power supply was subject to:

1. Inappropriate handling, or operation beyond the specifications.
2. Modification or repair by other than IDEC.
3. Failure caused by other than the PS5R-V switching power supply.
4. Failure caused by natural disasters.

Specifications and other descriptions in this brochure are subject to change without notice.



## IDEC CORPORATION

6-64, Nishi-Miyahara 2-Chome, Yodogawa-ku, Osaka 532-0004, Japan  
Tel: +81-6-6398-2527, Fax: +81-6-6398-2547  
E-mail: marketing@idec.co.jp

### IDEC CORPORATION (USA)

1175 Elko Drive, Sunnyvale, CA 94089-2209, USA  
Tel: +1-408-747-0550 / (800) 262-IDECA (4332)  
Fax: +1-408-744-9055 / (800) 635-6246  
E-mail: opencontact@idec.com

### IDEC CANADA LIMITED

3155 Pepper Mill Court, Unit 4  
Mississauga, Ontario, L5L 4X7, Canada  
Tel: +1-905-890-8561, Toll Free: (888) 317-IDECA (4332)  
Fax: +1-905-890-8562  
E-mail: sales@ca.idec.com

### IDEC AUSTRALIA PTY. LTD.

Unit 17, 104 Ferntree Gully Road,  
Oakleigh, Victoria 3166, Australia  
Tel: +61-3-8523-5900, Toll Free: 1800-68-4332  
Fax: +61-3-8523-5999  
E-mail: sales@au.idec.com

### IDEC ELECTRONICS LIMITED

Unit 2, Beechwood, Chineham Business Park,  
Basingstoke, Hampshire RG24 8WA, UK  
Tel: +44-1256-321000, Fax: +44-1256-327755  
E-mail: sales@uk.idec.com

### IDEC ELEKTROTECHNIK GmbH

Heselerstruecken 8, 22453 Hamburg, Germany  
Tel: +49-40-25 30 54 - 0, Fax: +49-40-25 30 54 - 24  
E-mail: service@idec.de

### IDEC (SHANGHAI) CORPORATION

Room 701-702 Chong Hing Finance Center,  
No. 288 Nanjing Road West, Shanghai 200003, PRC  
Tel: +86-21-6135-1515  
Fax: +86-21-6135-6225 / +86-21-6135-6226  
E-mail: idec@cn.idec.com

### IDEC (BEIJING) CORPORATION

Room 211B, Tower B, The Grand Pacific Building,  
8A Guanghua Road, Chaoyang District,  
Beijing 100026, PRC  
Tel: +86-10-6581-6131, Fax: +86-10-6581-5119

### IDEC (SHENZHEN) CORPORATION

Unit AB-3B2, Tian Xiang Building, Tian'an Cyber Park,  
Fu Tian District, Shenzhen, Guang Dong 518040, PRC  
Tel: +86-755-8356-2977, Fax: +86-755-8356-2944

### IDEC IZUMI (H.K.) CO., LTD.

Unit G & H, 26/F., MG Tower,  
No. 133 Hoi Bun Road, Kwun Tong, Kowloon,  
Hong Kong  
Tel: +852-2803-8989, Fax: +852-2565-0171  
E-mail: info@hk.idec.com

### IDEC TAIWAN CORPORATION

8F-1, No. 79, Hsin Tai Wu Road, Sec. 1,  
Hsi-Chih District, 22101 New Taipei City, Taiwan  
Tel: +886-2-2698-3929, Fax: +886-2-2698-3931  
E-mail: service@tw.idec.com

### IDEC IZUMI ASIA PTE. LTD.

No. 31, Tannery Lane #05-01,  
HB Centre 2, Singapore 347788  
Tel: +65-6746-1155, Fax: +65-6844-5995  
E-mail: info@sg.idec.com

### IDEC ASIA (THAILAND) CO., LTD.

20th Fl., Sorachai Bldg., No.23/78,  
Soi Sukhumvit 63, Sukhumvit Rd.,  
Klongton-nua, Wattana, Bangkok 10110  
Tel: +662-392-9765, Fax: +662-392-9768  
E-mail: sales@th.idec.com