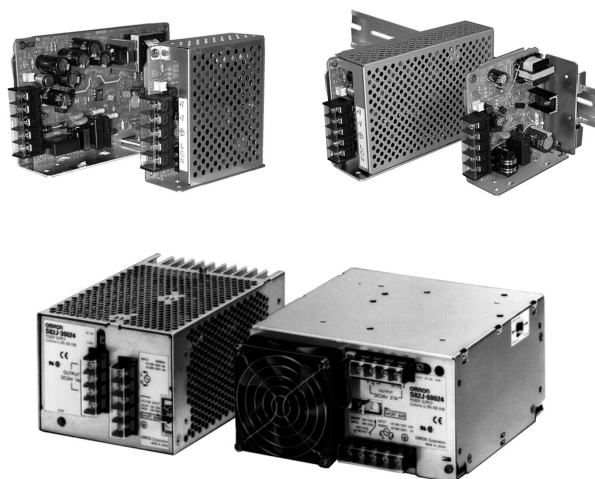


Switching Power Supply

S82J

DIN-Rail Mounting Industrial Power Supplies with Capacity Up to 600 W

- Models range from 10 to 600 W.
- UL 508 approval.
- Class 2 approval available for models below 100 W.
- Universal input or selectable input.
- Wide range of output voltages: 5 V, 12 V, 15 V, or 24 V.
- UL, CSA, VDE, and CE Approvals.
- 3-Year warranty.



Ordering Information

■ OPEN-FRAME TYPE POWER SUPPLIES

Stock Note: Shaded models are normally stocked.

Rated input voltage	Power ratings	Output		Part number	
		Voltage	Current	Front-mounting bracket	DIN-rail mounting bracket
100 to 240 VAC	10 W	5 V	2 A	S82J-01005A	S82J-01005AD
		12 V	1 A	S82J-01012A	S82J-01012AD
		15 V	0.7 A	S82J-01015A	S82J-01015AD
		24 V	0.5 A	S82J-01024A	S82J-01024AD
	25 W	5 V	5 A	S82J-02505A	S82J-02505AD
		12 V	2.1 A	S82J-02512A	S82J-02512AD
		15 V	1.7 A	S82J-02515A	S82J-02515AD
		24 V	1.1 A	S82J-02524A	S82J-02524AD
	50 W	5 V	10 A	S82J-05005A	S82J-05005AD
		12 V	4.2 A	S82J-05012A	S82J-05012AD
		24 V	2.1 A	S82J-05024A	S82J-05024AD
	100 W	5 V	20 A	S82J-10005A	S82J-10005AD
120 or 240 VAC (automatically selected)		12 V	8.5 A	S82J-10012A	S82J-10012AD
		15 V	7 A	S82J-10015A	S82J-10015AD
100 to 240 VAC		24 V	4.5 A	S82J-10024A	S82J-10024AD
120 or 240 VAC (automatically selected)	150 W	24 V	6.5 A	S82J-15024A	S82J-15024AD

■ COVERED-FRAME TYPE POWER SUPPLIES

Stock Note: Shaded models are normally stocked.

Rated input voltage	Power ratings	Output		Part number	
		Voltage	Current	Front-mounting bracket	DIN-rail mounting bracket
100 to 240 VAC	10 W	5 V	2 A	S82J-01005D	S82J-01005DD
		12 V	1 A	S82J-01012D	S82J-01012DD
		15 V	0.7 A	S82J-01015D	S82J-01015DD
		24 V	0.5 A	S82J-01024D	S82J-01024DD
	25 W	5 V	5 A	S82J-02505D	S82J-02505DD
		12 V	2.1 A	S82J-02512D	S82J-02512DD
		15 V	1.7 A	S82J-02515D	S82J-02515DD
		24 V	1.1 A	S82J-02524D	S82J-02524DD
	50 W	5 V	10 A	S82J-05005D	S82J-05005DD
		12 V	4.2 A	S82J-05012D	S82J-05012DD
		24 V	2.1 A	S82J-05024D	S82J-05024DD
120 or 240 VAC (automatically selected)	100 W	5 V	20 A	S82J-10005D	S82J-10005DD
		12 V	8.5 A	S82J-10012D	S82J-10012DD
		15 V	7 A	S82J-10015D	S82J-10015DD
100 to 240 VAC		24 V	4.5 A	S82J-10024D	S82J-10024DD
120 or 240 VAC (automatically selected)	150 W	24 V	6.5 A	S82J-15024D	S82J-15024DD

■ ENCLOSED-FRAME TYPE POWER SUPPLIES

Stock Note: Shaded models are normally stocked.

Input voltage	Power rating	Output		Part number
		Voltage	Current	
120 or 230 VAC (selectable)	300 W	24 V	14.0 A	S82J-30024
	600 W	24 V	27.0 A	S82J-60024

- Note: 1. A mounting bracket is included with each power supply.
 2. To order without a mounting bracket (normally included with the 300 W or 600 W), add an "N" at the end of the part number.
 3. For other accessories, refer to the *Accessories* section that follows.

■ ACCESSORIES

Stock Note: Shaded models are normally stocked.

Description	Applicable power supplies	Part number
Front-mounting bracket	for 100-W, 24-V models	S82Y-J10F
DIN-rail	1 m (3.28 ft) length for 10- to 150-W models	PFP-100N/PFP-100N2
	0.5 m (1.64 ft) length for 10- to 150-W models	PFP-50N
Cover	for 10-W models	S82Y-J01K
	for 25-W models	S82Y-J02K
	for 50-W models	S82Y-J05K
	for 100-W, 24-V models	S82Y-J10K
Fan	for 600-W models	S82Y-JFAN
Ferrite ring core (a set of 3 pieces in package)	for 300-W and 600-W models	S82Y-JC-T
Noise filter	for 300-W models for 200 to 230 VAC input	S82Y-JF3-N
	for 600-W models for 200 to 230 VAC input	S82Y-JF6-N

■ MODEL NUMBER LEGEND

S82J -

--	--	--	--	--	--	--

1
2
3
4

1. Power ratings

010: 10 W
025: 25 W
050: 50 W
100: 100 W
150: 150 W
300: 300 W
600: 600 W

2. Output voltage

05: 5 V
12: 12 V
15: 15 V
24: 24 V

3. Configuration

A: Open-frame type, front terminals
B: Covered-type, front terminals
None: Enclosed-type, front terminals
with mounting bracket

4. Mounting Bracket

None: Front-mounting Bracket Type
D: DIN-rail Mounting Bracket Type

Specifications

Item			100 to 240 VAC input				120 or 240 VAC (selected automatically)		120 or 230 VAC (selectable)		
			10 W	25 W	50 W	100 W (24 V)	100 W (5, 12, 15 V)	150 W	300 W	600 W	
Efficiency (typical)			67% min. (77% min. for 50-W, 24-V models)			83% min.	75% min.	82% min.			
Input	Voltage		100 to 240 VAC (85 to 264 VAC) 110 to 170 VDC (set the terminal (L) to + side) (See Note 1.)		100 to 240 VAC (85 to 264 VAC)		120 (85 to 132) or 240 (170 to 264) VAC (selected auto- matically)		120 (85 to 132) or 230 (170 to 253) VAC (selectable)		
	Frequency		50/60 Hz (47 to 450 Hz)								
	Current (See Note 2.)	100 VAC input	0.35 A max.	0.8 A max.	1.4 A max.	2.5 A max.	2.5 A max.	3.5 A max.	8 A max.	14 A max.	
		200 VAC input	0.3 A max.	0.6 A max.	0.8 A max.	1.15 A max.	1.4 A max.	2.1 A max.	4 A max.	7 A max.	
	Leakage current (See Note 2.)	100 VAC input	0.5mA max.								
		200 VAC input	1mA max.								
	Inrush cur- rent (25°C, cold start) (See Note 2.)	100 VAC input	25 A max.								30 A max.
		200 VAC input	50 A max.								60 A max.
	Noise filter		Yes								
Output (See Note 3.)	Voltage adjustment range		±10% (adjustable with variable resistor (V.ADJ))								
	Ripple (See Note 2.)		2% (p-p) max.								
	Input variation influence		0.4% max								
	Load variation influence		0.8% max. (with rated input, 10% to 100% load)								
	Temperature variation influence		0.05%/°C max. (with rated input and output)								
	Startup time		500 ms max. (up to 90% of output voltage at rated input and out- put)							300 ms max. (up to 90% of output voltage at rated input and out- put)	
	Hold time (See Note 2.)		20 ms min.								
Additional function	Overload protection		105% to 160% of rated load current, in- verted L drop/intermittent operation type, automatic reset				105% min. of rated load current, inverted L drop type, automatic reset (For the 600-W model, the circuit will be shut OFF when the overload ex- ceeds 5s. Protection-ON alarm indicator lit (See Note 5.)				
	Overvoltage protection		NO			Yes (See Note 4.)	Yes (5-V output models only) (See Note 4.)	No	Yes, protection-ON alarm indicator lit (See Note 5.)		
	Overheat protection		No							Yes, protec- tion ON alarm indi- cator lit (See Note 5.)	

(This table continues on the next page.)

Specifications Table – continued from previous page

Item			100 to 240 VAC input				120 or 240 VAC (selected automatically)		120 or 230 VAC (selectable)	
			10 W	25 W	50 W	100 W (24V)	100 W (5, 12, 15 V)	150 W	300 W	600 W
Additional function	Protection-ON alarm indicator		No						Yes (color, red)	
	Parallel operation		No						Yes, 5 units max.	
	Series operation		No		Yes					
Other	Ambient temperature	Operating	See the derating curve in the Engineering Data Section.							
		Storage	-25°C to 65°C (-13°F to 149°F) with no condensation and icing							
	Ambient humidity	Operating	25% to 85%							
		Storage:	25% to 90%							
	Dielectric strength		3.0 k VAC, 50/60 Hz for 1 min (between all inputs and all outputs)							
			2.2 k VAC, 50/60 Hz for 1 min (between all inputs and GR terminal)							
			1.0 k VAC, 50/60 Hz for 1 min (between all outputs and GR terminal)							
	Insulation resistance		100 MΩ min. (between all outputs and all inputs/GR terminals at 500 VDC)							
	Vibration resistance		10 to 55 Hz, 0.375-mm double amplitude for 2 h each in X, Y, and Z directions							
	Shock resistance		300 m/s ² , 3 times each in ±X, ±Y, and ±Z directions							
	Terminal screw tightening		0.74 N • m				1.08 N • m			
	Output indicator		Yes (green)							
	Electromagnetic interference (See Note 2.)		Conforms to FCC Class A							
	EMC		Emission Enclosure: EN55011 class A Emission AC Mains: EN55011 class A Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 Vm (80 MHz to 1 GHz) (level 3) Immunity Conducted Disturbance: ENV50141: 10 V (0.5 to 80 MHz) (level 3) Immunity Burst EN61000-4-4 2 kV power-line (level 3) 2 kV output line (level 4)							
	EMC standards		Conforms to EN50081-2 and EN50082-2						Conforms to EN50081-2 and EN50082-2 (See Note 6.) With noise filter, confirms to EN50081-1 (See Note 6 and 7.)	
	Approved standards	UL	UL508 (Listing), 1950, Class 2 (per UL1310) (See Note 8.)			UL508 (Listing), 1012, 1950			UL508/1012	
		CSA	CSA C22.2 No. 14, No. 950, Class 2 (See Note 8.)			CSA C22.2 No. 14, No. 950			CSA EB1402C	
VDE		EN50178 (VDE0160) and EN60950 Terminal types (only terminal part): VDE0106/P100								
Weight (See Note 9.)			250 g max.	350 g max.	400 g max.	500 g max.	1,000 g max		2,000 g max.	2,500 g max.
Mean time between failures			135,000 hrs min. (MTBF is calculated according to the probability of accidental device failures, and indicates reliability of devices. It does not necessarily represent a life of the product.							
Life expectancy			10 yrs. min. (Used at 40°C at the rated input with a 50% load, standard installation).							

- Note: 1. DC inputs are not included in safety standard approvals.
2. At 100% load for rated input voltage (100 VAC or 200 VAC)
3. The output specification is defined at the power supply output terminals.
4. For resetting, turn OFF the power supply, leave for more than one minute, and then turn ON the power supply.
5. For resetting, turn OFF the power supply, leave for more than 90 seconds min. (3 minutes for the 600-W models), and then turn ON the power supply.
6. To ensure the Emission Enclosure rating ferrite ring cores (recommended model: S82Y-JC-T) should be used on all cabling.
7. To ensure the Emission AC Mains rating for EN50081-1 (only for 230 VAC input), a noise filter (recommended models: S82Y-JF3-N for 300-W, S82Y-JF6-N for 600-W) should be used on the input lines.
8. Class 2 approval on 10-W (12, 15, 24 V), 25-W (12, 15, 24 V) and 50-W (24 V) models.
9. The weight indicated is the weight of the open-frame type. (Includes the covers for 300-W and 600-W models)

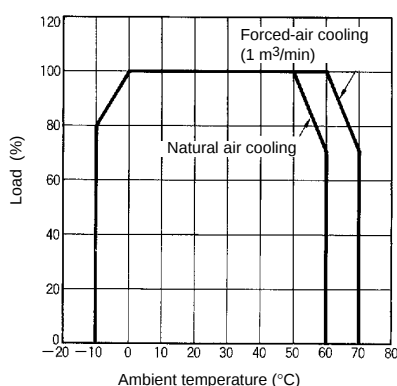
Engineering Data

DERATING CURVE

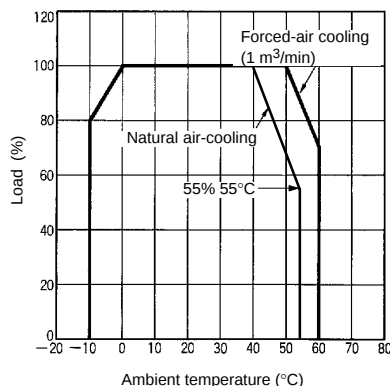
S82J 10/25/50/100/150 W

- Note: 1. The derating curve shown is for standard installation. The derating curve depends on the mounting direction of the Power Supply.
2. Provide a minimum clearance of 20 mm between the Power Supplies. Refer to the *Mounting* information in the *Dimensions* section.

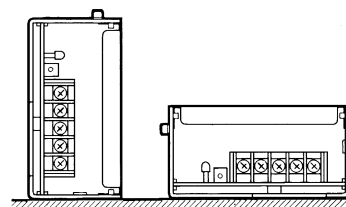
Open-frame type



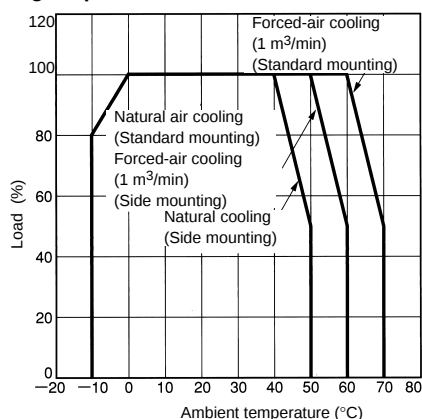
Covered-type



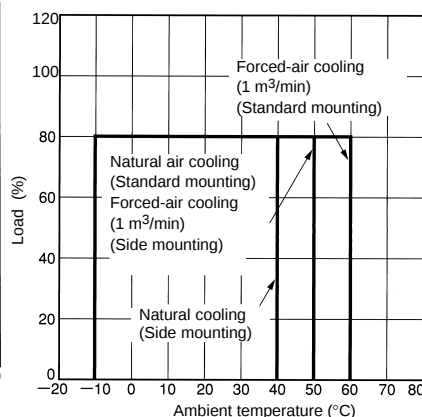
Mounting Position for Standard Installation



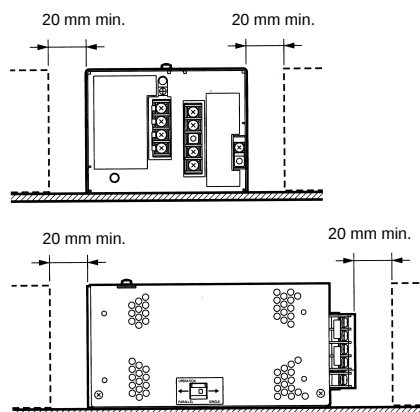
300-W Model Single Operation



Parallel Operation

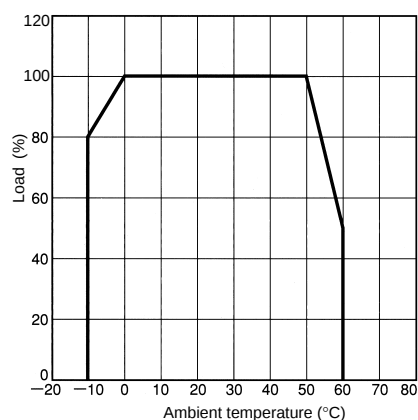


Mounting Position for Standard Installation

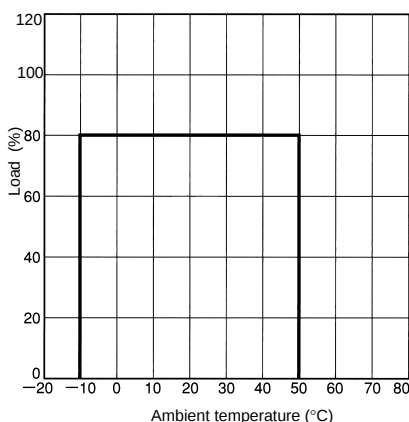


600-W Model

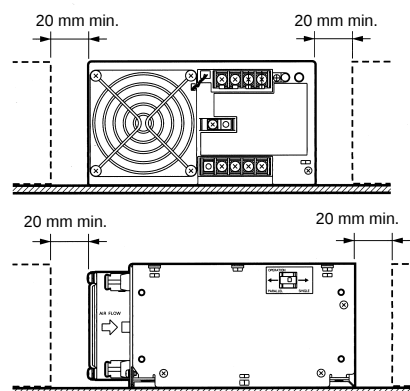
Single Operation



Parallel Operation



Mounting Position for Standard Installation

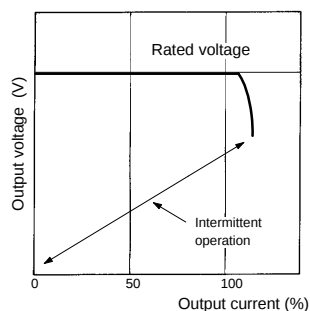


OVERLOAD PROTECTION

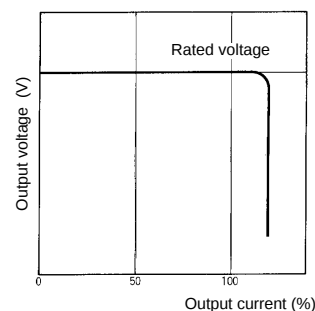
10- to 300-W Models

The Power Supply is provided with an overload protection function that protects the load and the power supply from possible damage by overcurrent. When the output current rises above 105% to 160% of the rated output current, the protection function is triggered, decreasing the output voltage. When the output current falls within the rated range, the overload protection function is automatically cleared.

10-W to 100-W (24-V) Models



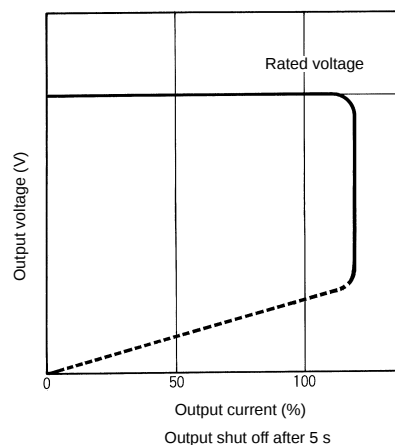
100-W (5, 12, 15-V), 150-W, 300-W models



600-W Models

If an excessive current flows for 5 sec or more, the output will be turned off and simultaneously protection-ON alarm indicator will be lit. To reset the S82J, turn off the input voltage, leave the S82J for at least three minutes, and then apply the input voltage again.

Note: Do not continue using the S82J with the output terminals short-circuited or the overcurrent condition continued, otherwise the internal elements of the S82J may be damaged or broken.



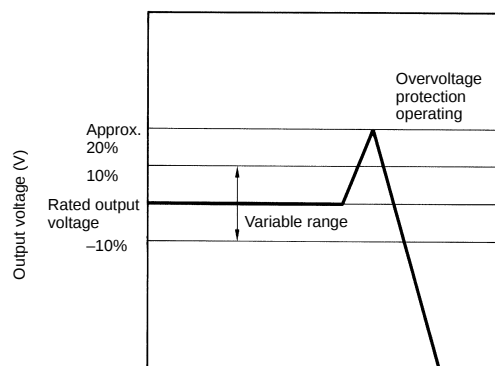
OVERVOLTAGE PROTECTION

100-W (5, 24 V) Output Models

These power supplies have an overvoltage protection function that protects the load and the power supply from possible damage by overvoltage. When the output voltage rises above a set value (120% of the rated output voltage), the protection function is triggered, shutting off the output voltage. If this occurs, reset the power supply by turning it off for 1 minute minimum and then turning it on again.

300- and 600-W Models

If a voltage that is 120% of the rated output voltage or above is output, the output voltage will be turned off and simultaneously protection-ON alarm indicator will be lit. To reset the S82J, turn off the input voltage, leave the S82J for at least three minutes if it is a 600-W model or at least 90 seconds if it is a 300-W model, and then apply the input voltage again.



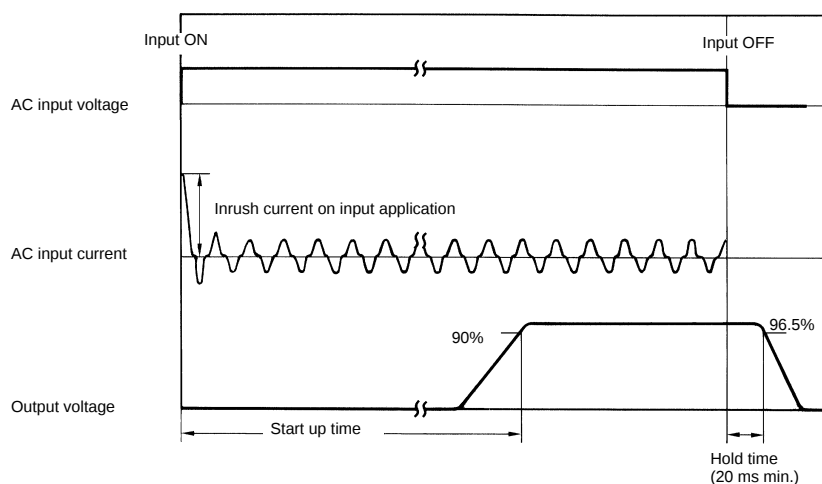
Note: The output voltage can be varied by the V. ADJ adjuster on the front panel. When it is set to a value 10% higher than the rated value, the overvoltage protection function may be effected.

OVERHEAT PROTECTION FUNCTION

600-W Model Only

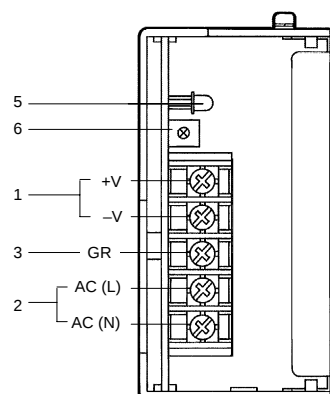
If the internal temperature of the S82J rises excessively as a result of fan failure or any other reason, the overheat protection circuit will be triggered to protect the internal elements of the S82J and simultaneously a protection-ON alarm indicator will be lit. To reset the S82J, turn off the input voltage, leave the S82J for at least three minutes, and then apply the input voltage again.

INRUSH CURRENT, START UP TIME, HOLD TIME

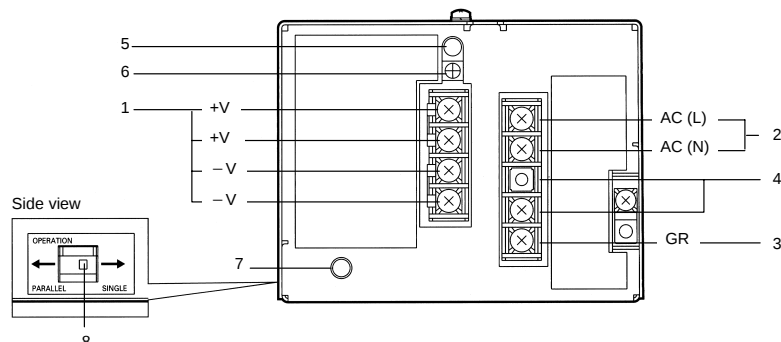


Installation

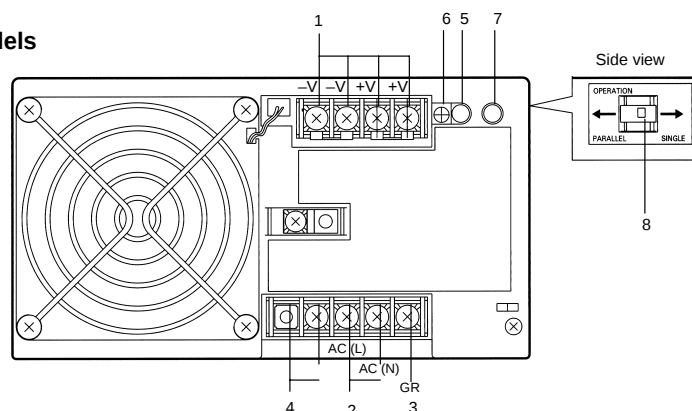
■ S82J 10 W TO 150 W



300-W Models



600-W Models



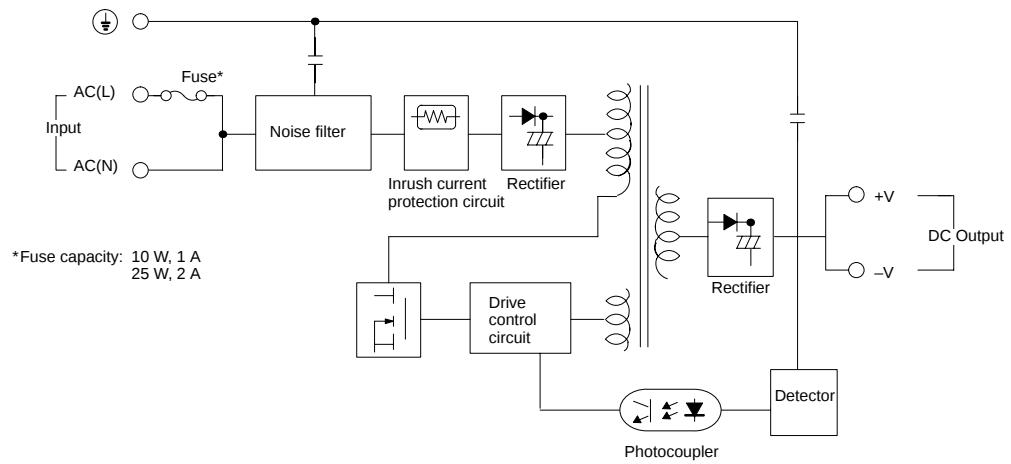
1. **DC Output Terminals:** Connect the load lines to these terminals.
2. **Input Terminals:** Connect the input lines to these terminals.
3. **Ground Terminal (GR):** Connect a ground line to this terminal.
4. **Input Voltage Selector Terminals:** Short-circuit the terminals if the input is 100 to 120 VAC and open the terminals if the input is 200 to 230 VAC
 - Only for 300-W and 600-W unit.
5. **Output Indicator (DC ON):** Lights while a Direct Current (DC) output is ON.
6. **Output Voltage Adjuster (V.ADJ):** It is possible to increase or decrease the output voltage by 10%.
7. **Protection-ON Alarm Indicator:** The red indicator will be lit if the overvoltage (for a 300-/600-W model) or overheat protection (for a 600-W model) circuit is triggered. This indicator will also be lit when overcurrent (for a 600-W model) is detected.
8. **Parallel/Single Operation Selector:** Set the selector to PARALLEL if the Units are in parallel operation.

Operation

■ BLOCK DIAGRAMS

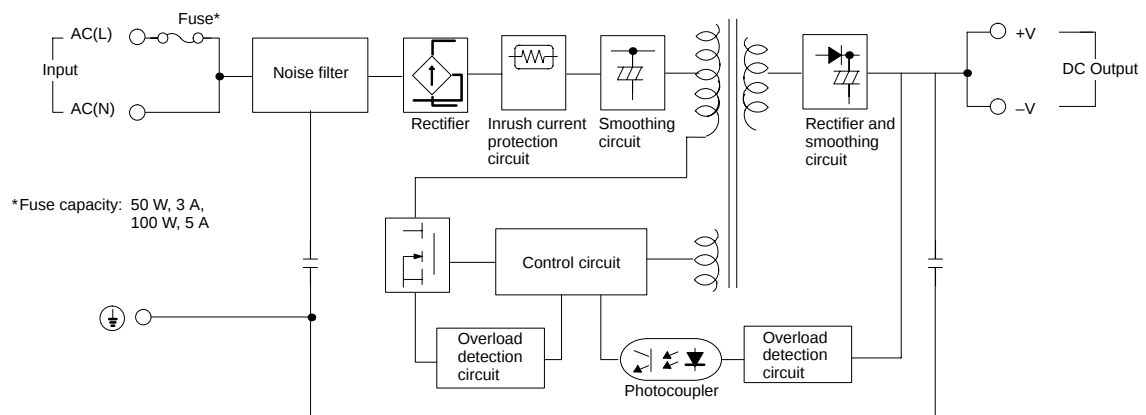
S82J-010 (10 W)

S82J-025 (25 W)

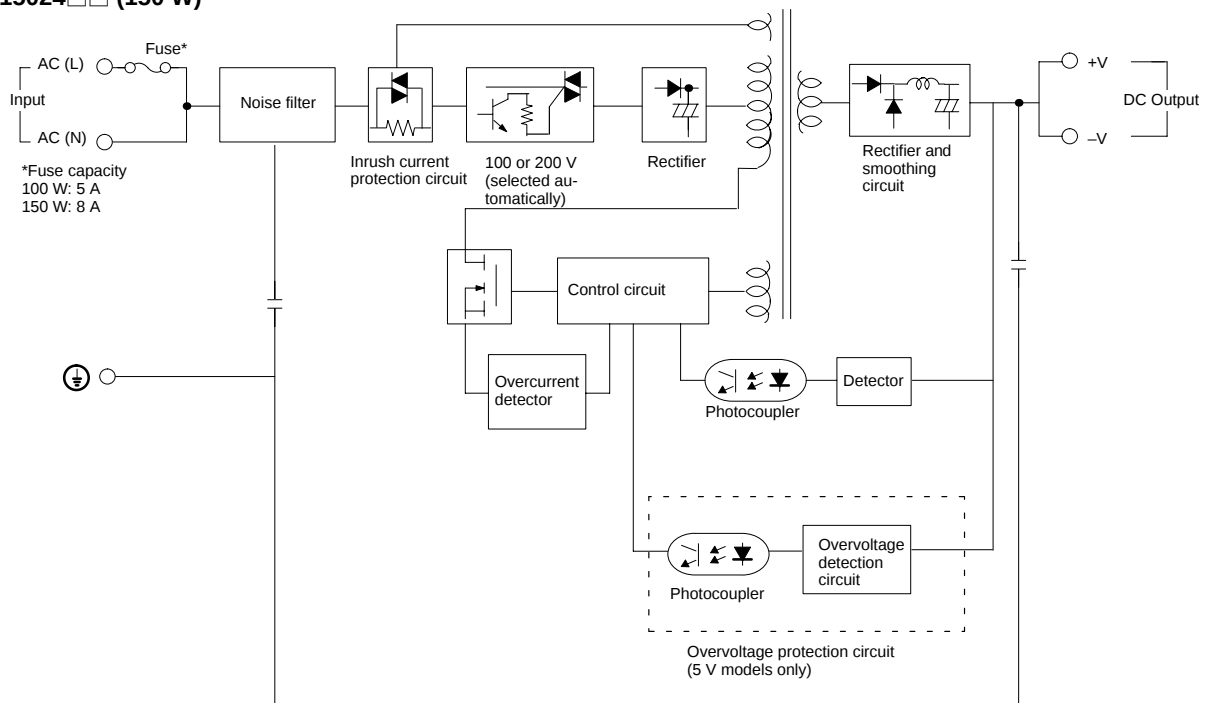


S82J-050 (50 W)

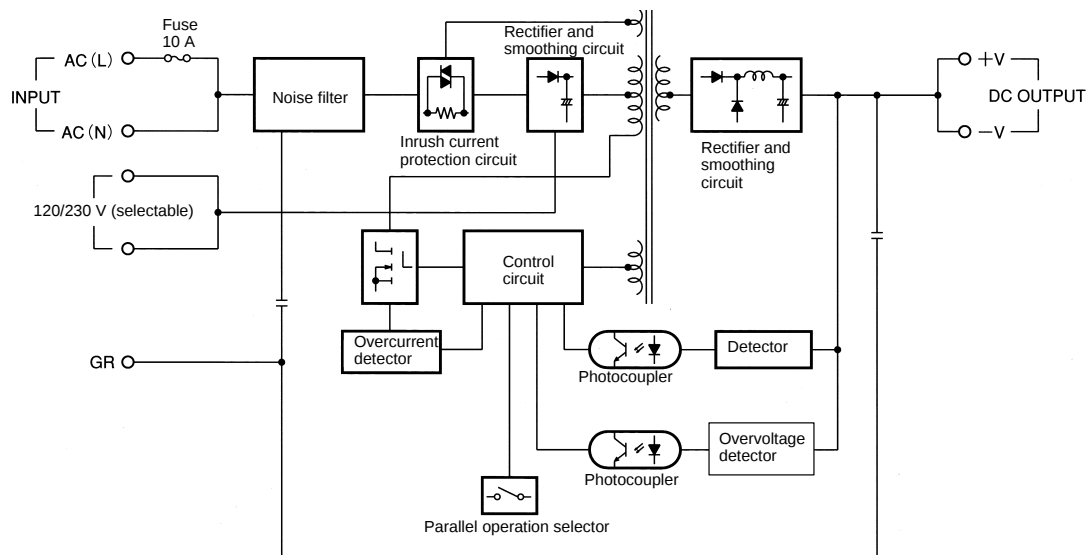
S82J-10024 (100 W)



S82J-10005□□ (100 W)
 S82J-10012□□ (100 W)
 S82J-10015□□ (100 W)
 S82J-15024□□ (150 W)

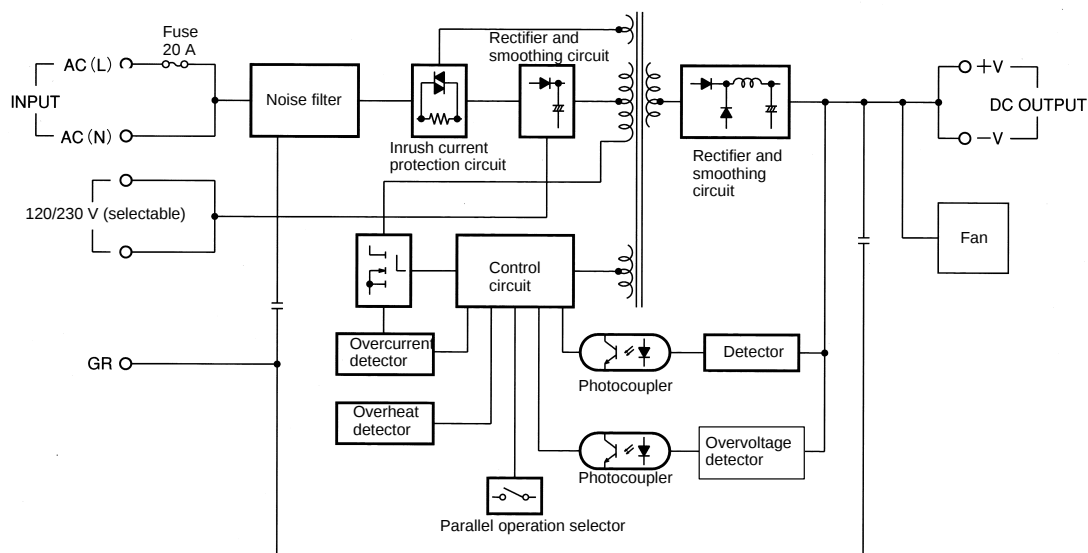


S82J-30024 (300 W)



Note: Short-circuit the input voltage selector terminals if the input is 100 to 120 VAC. Keep the terminals open if the input is 200 to 230 VAC.

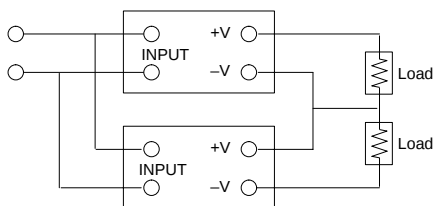
S82J-60024 (600 W)



Note: Short-circuit the input voltage selector terminals if the input is 100 to 120 VAC. Keep the terminals open if the input is 200 to 230 VAC.

■ GENERATING OUTPUT VOLTAGE ($\pm$)

An output of $\pm$ can be generated by using two power supplies as shown below, because the power supply produces a floating output.



If operation amplifiers as loads are connected in series, connect a diode between the positive and negative output terminals of each Switching Power Supplies as shown in the illustration below. Without these diodes, the Power Supplies may not start when power is turned on, possibly damaging internal circuits over a period of time.

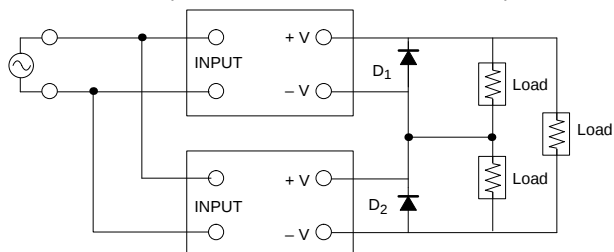
Use Schottky barrier diodes with a low forward voltage (V_F). Other types of diodes will not be effective.

Guidelines for the dielectric strength and current of the diodes are as follows:

Dielectric strength: At least twice the rated output voltage of the Power Supply

Forward current: At least twice the rated output current

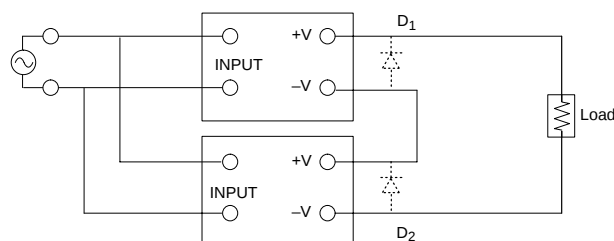
No diodes are required for models that allow series operation.



■ SERIES OPERATION

Only models with power ratings of 50/100/150/300/600 W allow series operation.

As shown in the following diagram, the output voltage from each Switching Power Supply can be added.

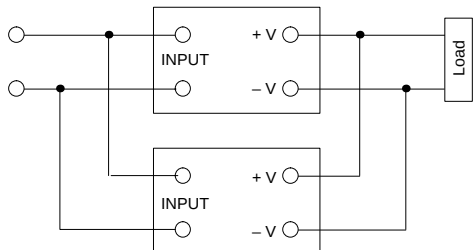


With the S82J-050□□□□ or S82J-10024□□, if the load is shorted a reverse voltage may result in the Power Supply causing deterioration and damage. It is recommended that diodes are connected as shown in the previous diagram (D_1 , D_2).

■ PARALLEL OPERATION

Only 300- and 600-W models can be in parallel operation. Do not operate any other models in parallel. The output of the models in parallel operation is a maximum of 80% of the rated output.

Set the parallel operation selector to PARALLEL if the Units are in parallel operation and make sure that the thickness and the length of all wires connected to the load are the same to ensure that the wires will have no voltage drop differences.

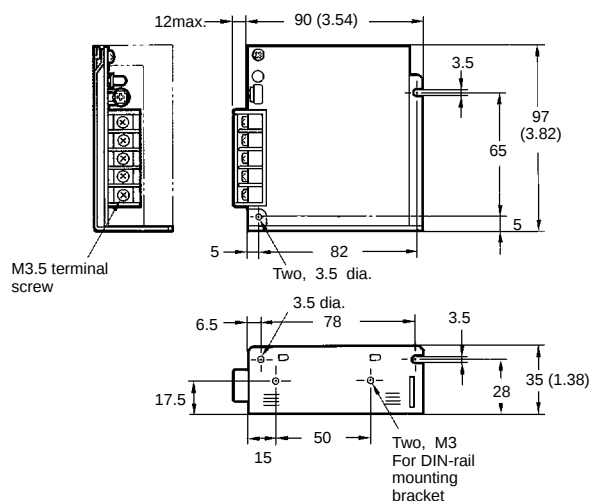
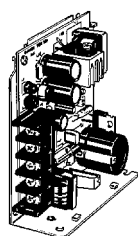


Dimensions

Unit: mm (inch)

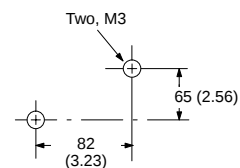
FRONT-MOUNTING BRACKET TYPES

S82J-010 (10 W)

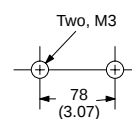


Mounting Holes
(Surface Screw Mounting)

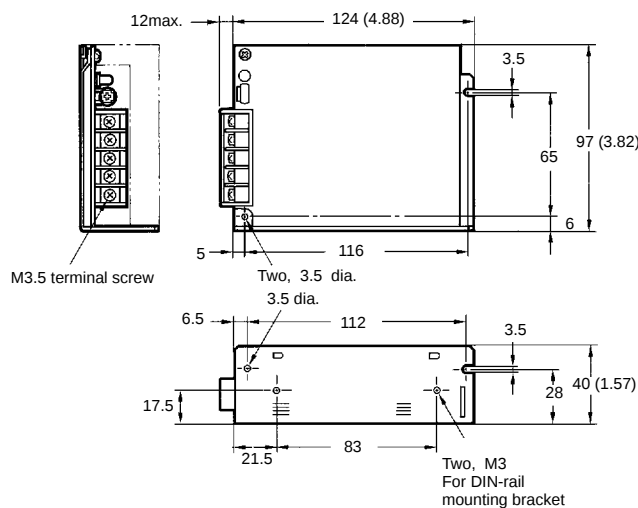
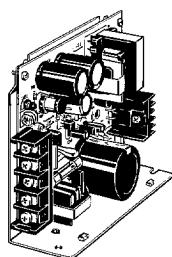
Side Mounting



Bottom Mounting

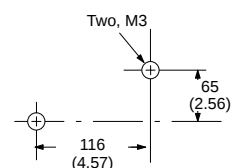


S82J-025 (25 W)

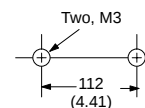


Mounting Holes
(Surface Screw Mounting)

Side Mounting

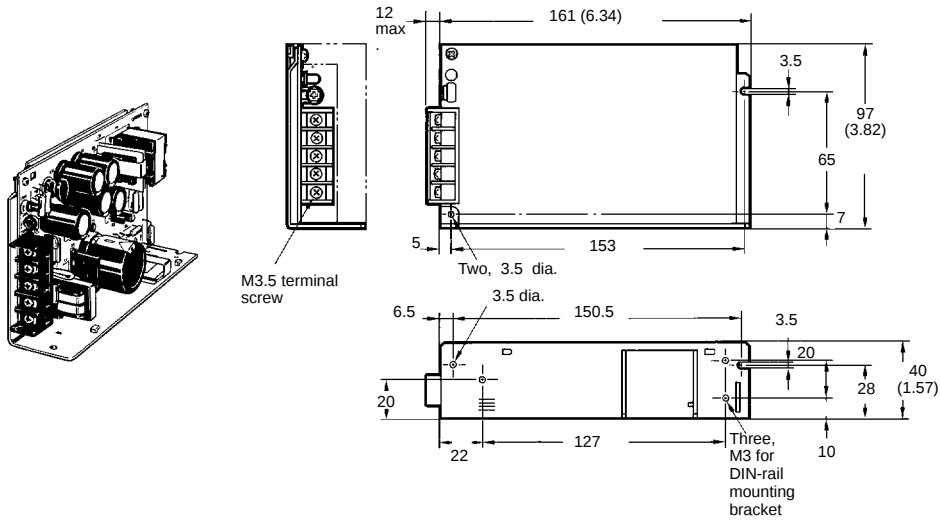


Bottom Mounting



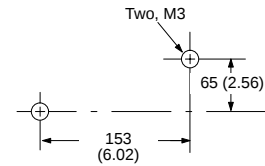
Unit: mm (inch)

S82J-050 (50 W)

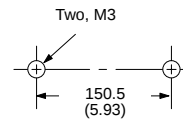


Mounting Holes

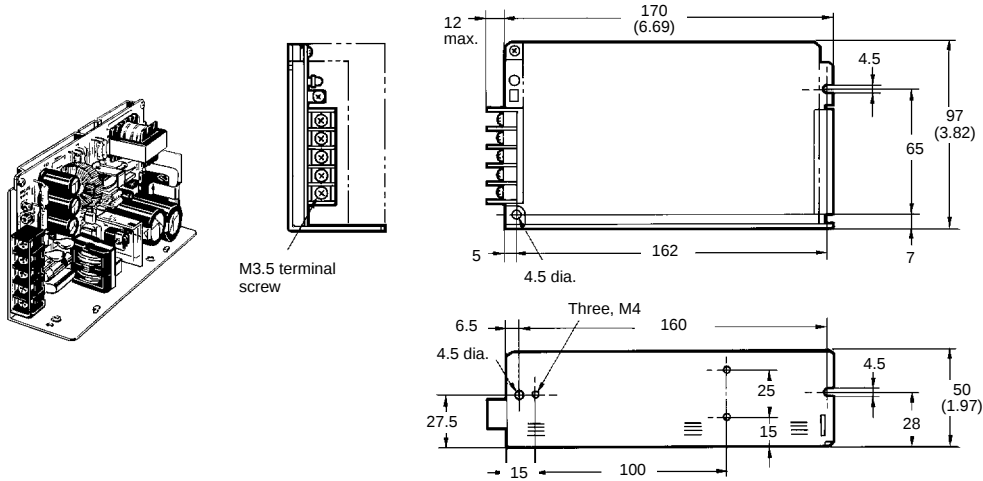
Side Mounting



Bottom Mounting

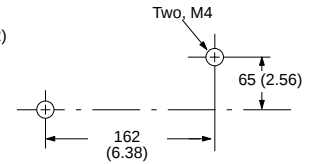


S82J-10024 (100 W)

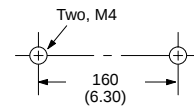


Mounting Holes

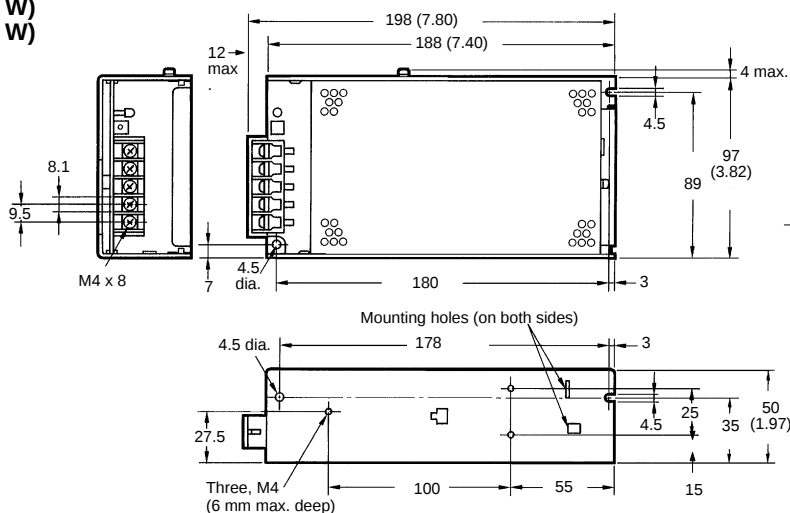
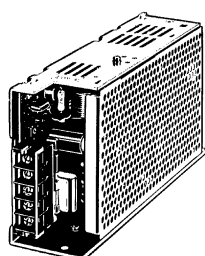
Side Mounting



Bottom Mounting

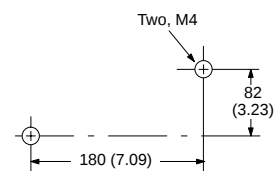


S82J-10005 (100 W)
 S82J-10012 (100 W)
 S82J-10015 (100 W)
 S82J-15024 (150 W)

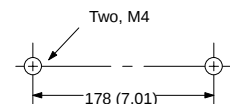


Mounting Holes

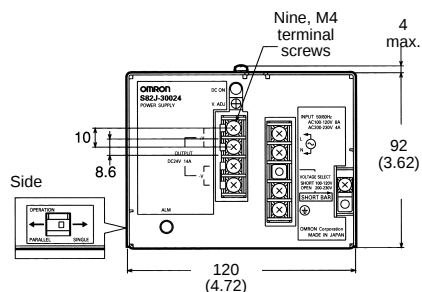
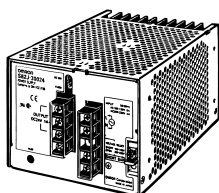
Side Mounting



Bottom Mounting

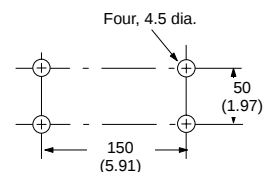


S82J-30024 (300 W)

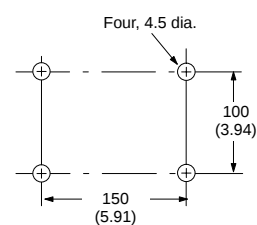


Mounting Holes

Side Mounting

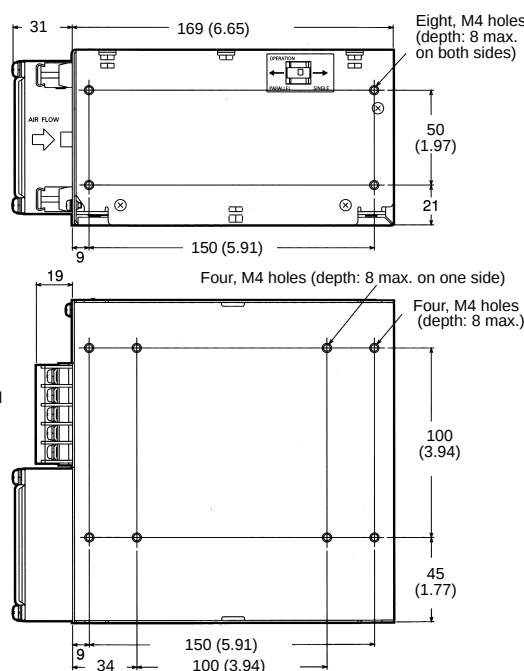
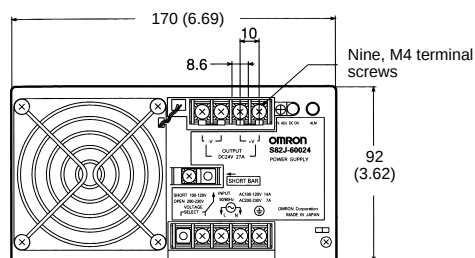
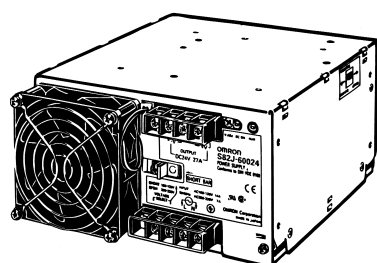


Bottom Mounting



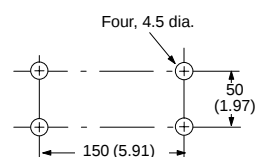
Unit: mm (inch)

S82J-60024 (600 W)

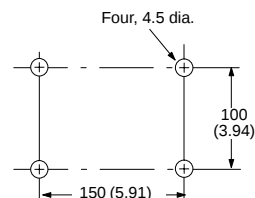


Mounting Holes

Side Mounting



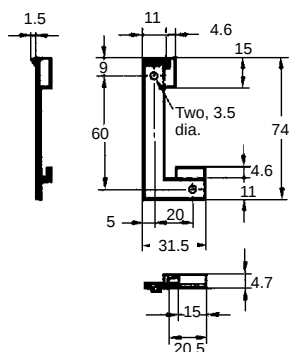
Bottom Mounting



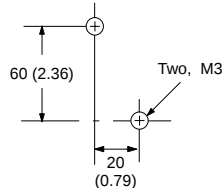
■ MOUNTING BRACKET (INCLUDED WITH POWER SUPPLY UNIT)

S82J 10-/25-/50-/100-W (24-V) Models

Front-mounting Bracket (Included)

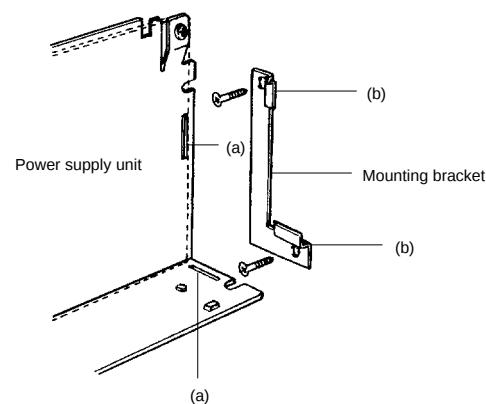


Mounting Holes



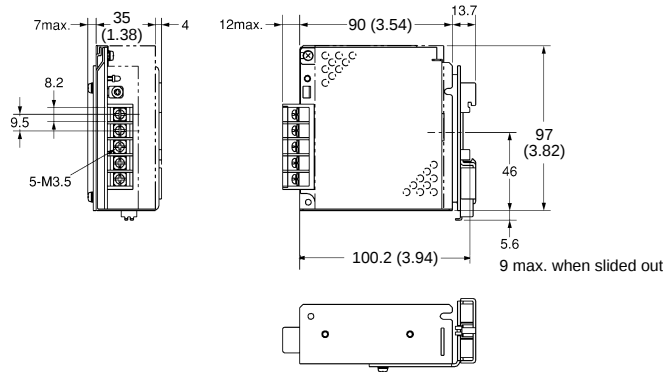
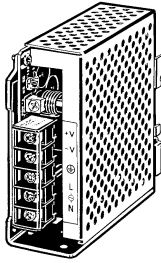
Using the Mounting Bracket

Attach the mounting bracket to the panel and loosely tighten the two screws. Insert the projected parts of the bracket (b) to the square holes of the power supply (a). Then securely tighten the screws.

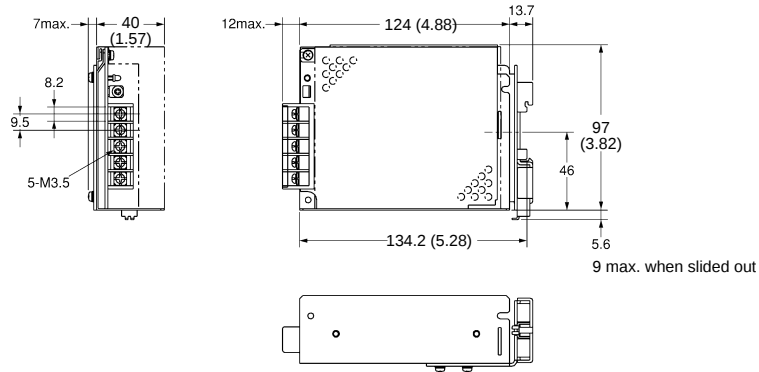
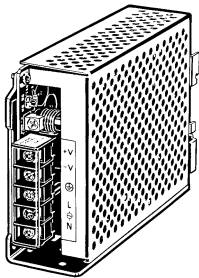


■ DIN-RAIL MOUNTING BRACKET TYPES

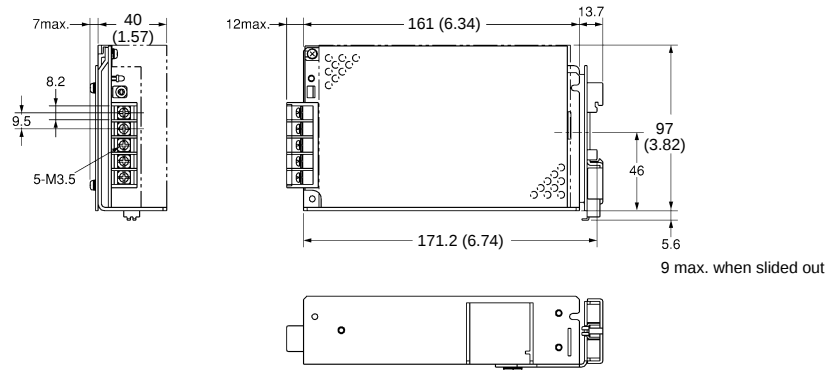
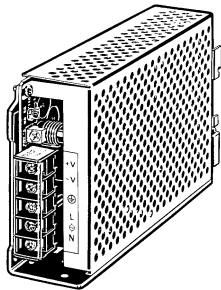
S82J-010□□□D (10 W)



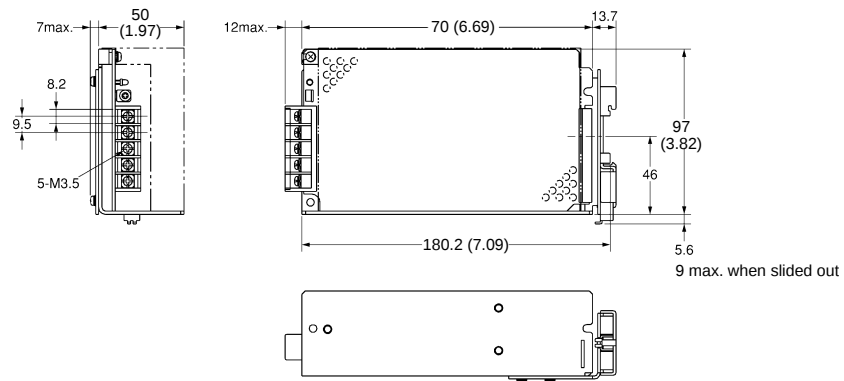
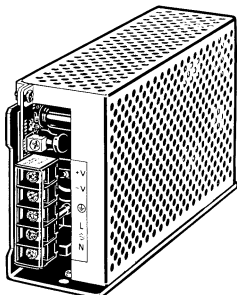
S82J-025□□□D (25 W)



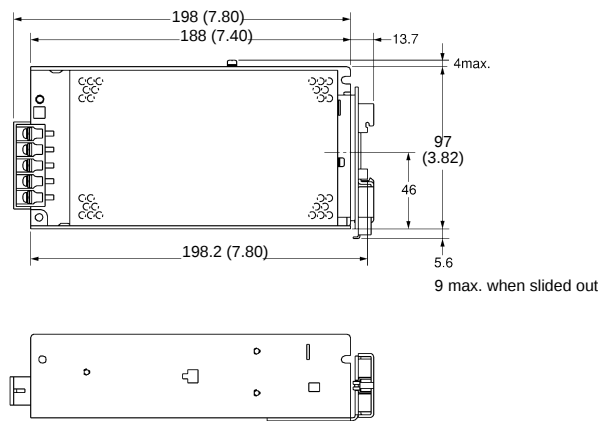
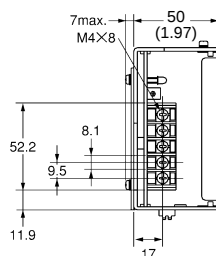
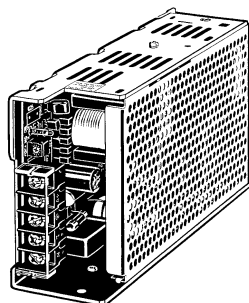
S82J-050□□□D (50 W)



**S82J-10024□D
(100 W, 24-V Output)**



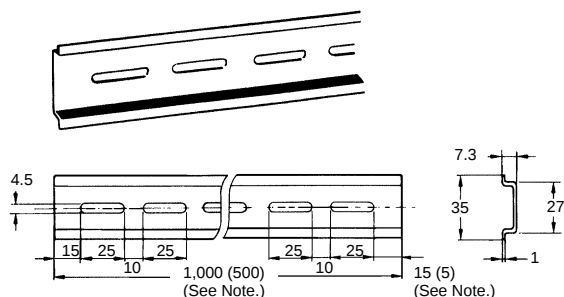
S82J-10005□D (100 W)
 S82J-10012□D (100 W)
 S82J-10015□D (100 W)
 S82J-15024□D (150 W)



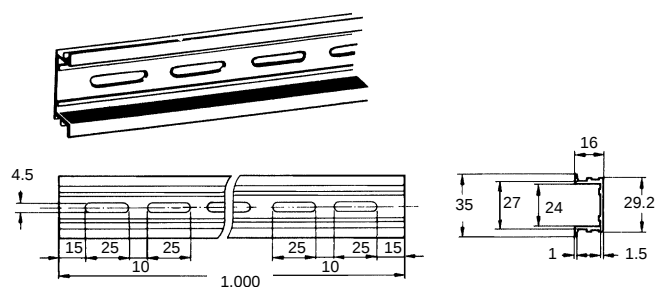
Accessories (Order Separately)

■ DIN RAIL (ORDER SEPARATELY)

PFP-100N/PFP-50N



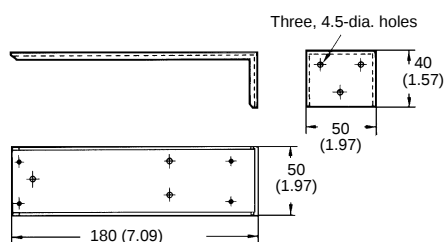
PFP-100N2



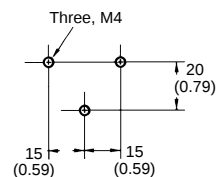
Note: The values shown in parentheses are for the PFP-50N.

■ FRONT-MOUNTING BRACKET FOR S82J-10024A AND S82J-10024D (ORDER SEPARATELY)

S82Y-J10F



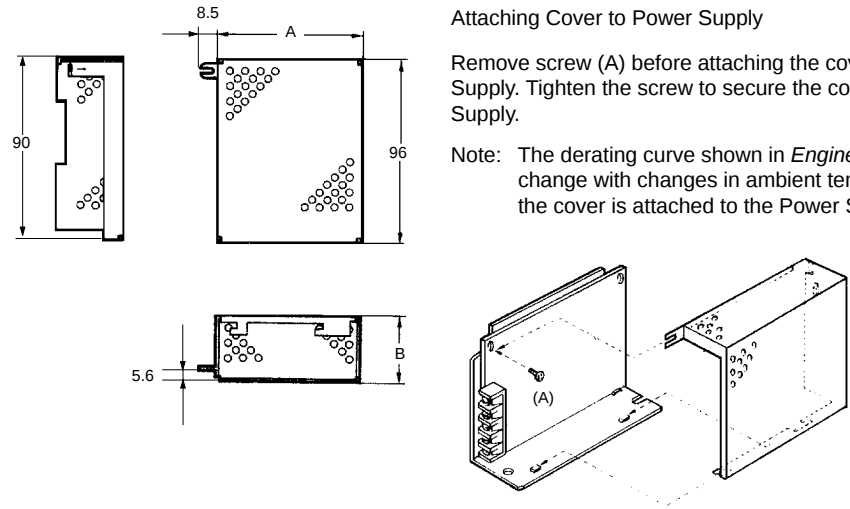
Mounting Holes



Note: The front mounting bracket (above) cannot be used for S82J 100-W (5, 12, 15 V) or 150-W models.

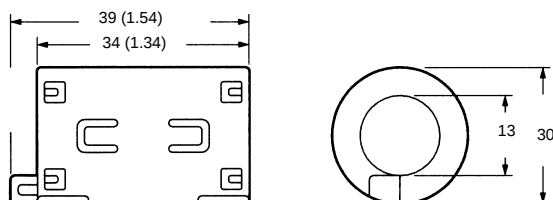
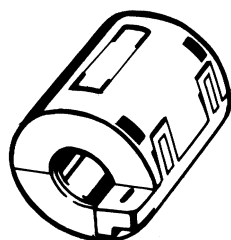
■ COVER (ORDER SEPARATELY)

Note: This optional cover is available for the open-frame models also.

Item	S82Y-J01K	S82Y-J02K	S82Y-J05K	S82Y-J10K
Applicable supply unit	S82J-010□□□□	S82J-025□□□□	S82J-050□□□□	S82J-10024□□□
Dimensions	 Attaching Cover to Power Supply Remove screw (A) before attaching the cover to the Power Supply. Tighten the screw to secure the cover on the Power Supply. Note: The derating curve shown in <i>Engineering Data</i> may change with changes in ambient temperature when the cover is attached to the Power Supply.			
Dimensions: A	75 mm (2.95)	109 mm (4.29)	146 mm (5.75)	154 mm (6.06)
B	35 mm (1.38)	39 mm (1.54)	38 mm (1.50)	48 mm (1.89)

■ FERRITE RING CORE (ORDER SEPARATELY)

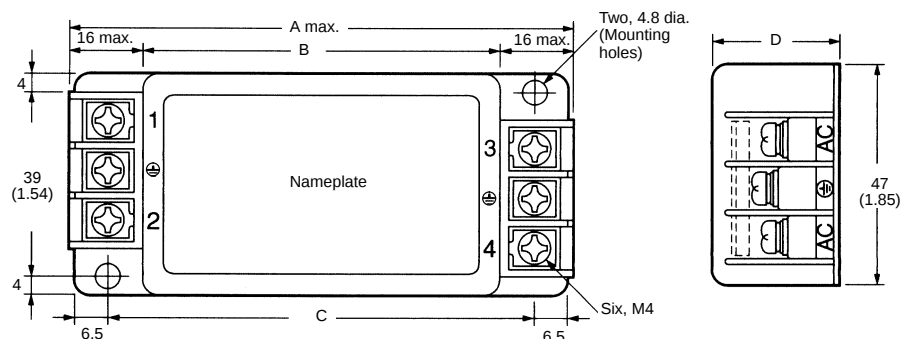
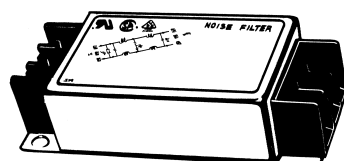
S82Y-JC-T



■ NOISE FILTER (ORDER SEPARATELY)

S82Y-JF3-N for 300-W Models for 200 to 230 VAC input

S82Y-JF6-N for 600-W Models for 200 to 230 VAC input



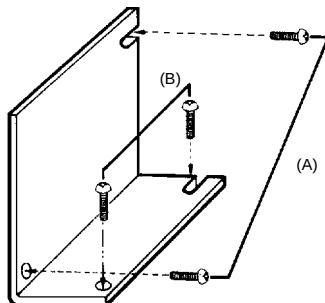
Model	A	B	C	D
S82Y-JF3-N	107 (4.21)	75 (2.95)	90 (3.54)	26 (1.02)
S82Y-JF6-N	117 (4.60)	85 (3.35)	100 (3.94)	30 (1.18)

■ MOUNTING METHODS

S82J 10/25/50/100 (24 V) W

The following three mounting methods are available.

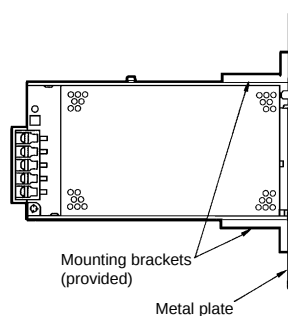
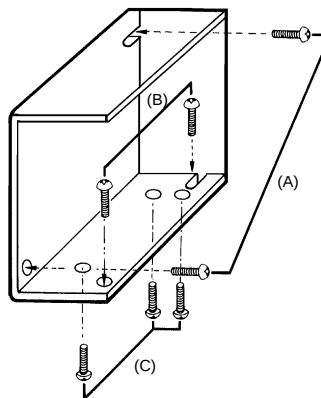
- (A) Side mounting
- (B) Bottom mounting



S82J 100 (5, 12, 15 V)/150 W

The following mounting methods are available.

- (A) Side mounting
- (B) Bottom mounting (secured with screws from the inside of the power supply)
- (C) Bottom mounting (secured with screws from the back of the power supply)



- (D) Front mounting
Front mounting is possible with the mounting brackets provided. Refer to the *Dimensions* Section.

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 - c. All sales and shipments of Goods shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Goods shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Goods until the full purchase price is paid by Buyer;
 - d. Delivery and shipping dates are estimates only.
 - e. Seller will package Goods as it deems proper for protection against normal handling and extra charges apply to special conditions.
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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.



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