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1 Function

1.1 Input Voltage Range

- The rated input voltage range of the power supply is AC90-132V/AC180-264V (See SPECIFICATIONS for more details).
- To comply with the safety standards, use the power supply with the input voltage range of AC90-132V/AC180-264V (50/60Hz).
- If the input voltage is outside the rated range, the power supply may not operate in accordance with the specifications and/or start hunting or fail.
- If the input voltage changes suddenly, the output voltage may go out of the specifications. Consult us for more details.

1.2 Inrush Current Limiting

- Inrush current protection is built-in.
- If you need to use a switch on the input side, select one that can withstand an input inrush current.
- Thermistor is used in the inrush current limiting circuit. When you turn the power supply on and off repeatedly within a short period of time, have enough intervals for the power supply to cool down before being turned on again.

1.3 Overcurrent Protection

- Overcurrent protection is built-in. It works at more than rated output current. The power supply recovers automatically when the overcurrent condition is removed. Do not use the power supply under a short-circuit or overcurrent condition.
- Intermittent Operation Mode
When overcurrent protection works and the output voltage drops, the output voltage goes into intermittent mode so that the average output current can decrease.

1.4 Overvoltage Protection

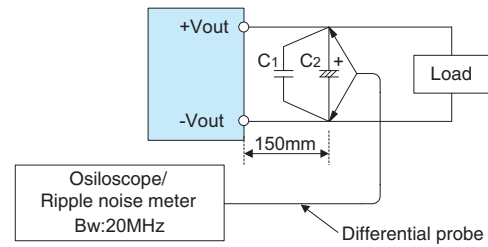
- Overvoltage protection is built-in. If overvoltage protection works, shut down the input voltage, wait more than 3 minutes, and turn on the input voltage again to recover the output voltage. The recovery time varies depending on the input voltage, etc.

Remarks :

Avoid applying an overrated voltage to the output terminals as it may cause the power supply to malfunction or fail. In case the above-mentioned situation is expected in operating such loads as a motor, for example, consult us for advice.

1.5 Output Ripple Noise

- Output ripple noise may be influenced by the measuring environment.
The measuring method shown in Fig. 1.1 is recommended.



C1 : Film capacitor 0.1 μ F
C2 : Aluminum electrolytic capacitor 47 μ F

Fig.1.1 Measuring method of Ripple Noise

Remarks : When measuring output ripple noise with an oscilloscope, do not let the oscilloscope's GND cable cross the magnetic flux from the power supply. Otherwise there may be electrical potential generated on the GND cable and the measuring result may not be accurate.

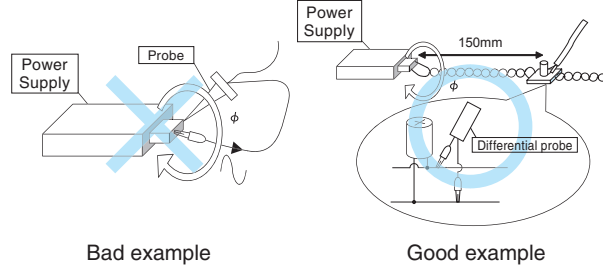


Fig.1.2 Example of measuring output ripple noise

1.6 Output Voltage Adjustment

- The output voltage can be adjusted within the specified range by turning the built-in potentiometer clockwise (up) or counterclockwise (down).
- Please operate the potentiometer slowly.

1.7 Isolation

- For a receiving inspection, such as Hi-Pot test, gradually increase (decrease) the voltage for the start (shut down). Avoid using Hi-Pot tester with the timer because it may generate voltage a few times higher than the applied voltage, at ON/OFF of a timer.

1.8 Low Power Consumption

- These power supplies are designed for low power consumption at no load.
- When the load factor is low (I_o :0-20%typ), the switching power loss is reduced by burst operation, which will cause ripple and ripple noise to go beyond the specifications.
- Ripple noise during burst operation will change depending on the input voltage and the output current. Consult us for advice on how to reduce ripple noise.
- When there is a need to measure the stand-by power consumption, measure it by using the average mode of the tester. The measuring environment may influence the result. Consult us for more details.

2 Parallel Operation

Redundant operation is possible by wiring as shown below.

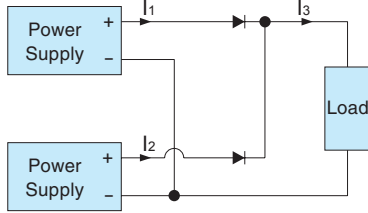


Fig.2.1 Example of redundancy operation

Even a slight difference in output voltage can affect the balance between the values of I_1 and I_2 .

Make sure the value of I_3 does not exceed the rated output current of the power supply.

$$I_3 \leq \text{the rated current value}$$

Parallel operation is not possible.

3 Assembling and Installation Method

3.1 Installation Method

Do not insert a screw more than 4mm away from the outside of a power supply to keep enough insulation distance between the screw and internal components.

In order to withstand vibrations and impact, support which is shown in Figure 3.2 is necessary.

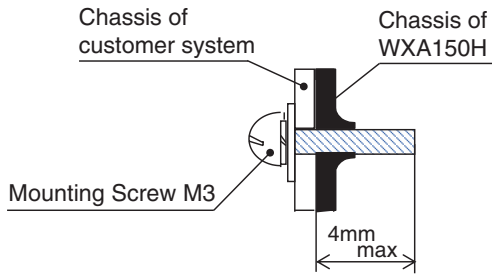


Fig.3.1 Mounting screw

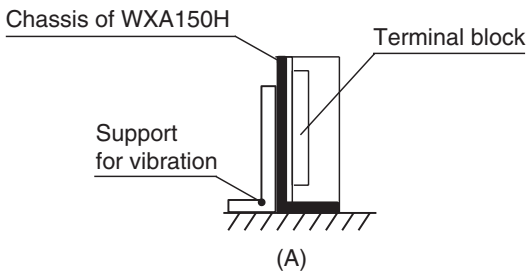


Fig.3.2 Installation method

If you use two or more power supplies side by side, please keep a sufficient distance between them to allow enough air ventilation.

Ambient temperature around each power supply should not exceed the temperature range shown in the derating curve.

3.2 Derating

Input Voltage Derating Curve

The input voltage derating curve is shown in Fig. 3.3.

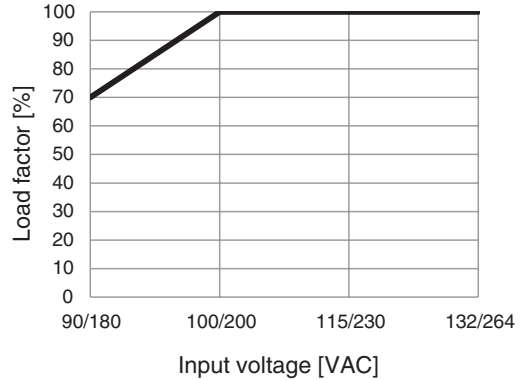


Fig.3.3 Input voltage derating curve

Ambient Temperature Derating Curve

The derating curves by the ambient temperature are shown in Fig. 3.4.

*The specifications of ripple and ripple noise change in the shaded area.

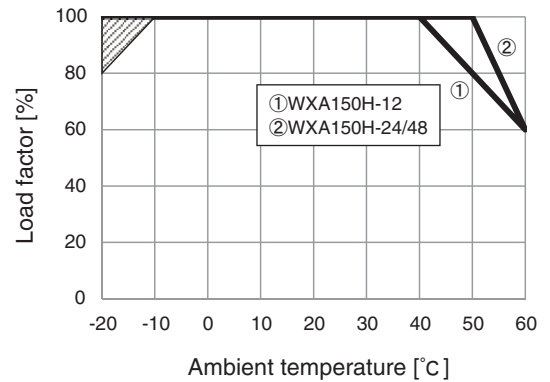


Fig.3.4 Ambient temperature derating curve

The ambient temperature should be measured 5 to 10 cm away from the power supply so that it won't be influenced by the heat from the power supply. Please consult us for more details.

3.3 Expected Life and Warranty

Expected Life

The expected life of the power supply is shown below.

Table 3.1 Expected lifetime

Mounting Method	Cooling Method	Average ambient temperature	Expected lifetime [years]
			$I_o=0-100\%$
A	Convection	$T_a = 30^\circ\text{C}$	5
		$T_a = 40^\circ\text{C}$	3

4 Ground

When installing the power supply, make sure the FG terminal and the chassis (at more than 2 places) are connected to the safety earth ground.

5 Others

- Note that the case of the power supply remains hot for a while after it is turned off.
- If large capacitors are connected to the output terminals (load side), the output voltage may stop or become unstable. Consult us for advice.
- If the power supply is turned off at no load, the output voltage remains for a few minutes as the power supply is designed for low internal power consumption. Be careful of electrical shock at the time of maintenance.