1 Connection for Standard Use

■To use UMPS series, connection shown in Fig.1.1.

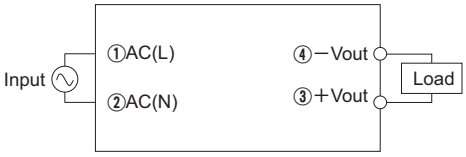


Fig.1.1 Connection for standard use

2 Wiring Input/Output Pin

■The UMPS series basically does not require an output capacitor, but the ripple voltage can be reduced by connecting an output capacitor.

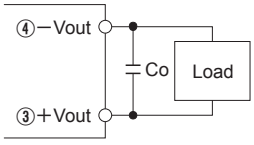


Fig.2.1 Connecting example of an external capacitor to the output side

■If output current decreases rapidly, output voltage rises transiently and the overvoltage protection circuit may operate.In this case, please Install an external capacitor Co between +Vout and -Vout pins for stable operation of the power supply.

■Connectable external capacitor on the output side is shown in Table 2.1.

Table 2.1 Connectable external capacitor on the output side

No.	Output voltage	UMPS30F/UMPS60F
1	5V	0 - 6,800μF
2	12V	0 - 4,700μF
3	24V	0 - 1,000μF
4	48V	0 - 470μF

■When connect the output to FG of an equipment, a noise may become big. The noise can be reduced by connecting external filter and grounding capacitor on tha input side.

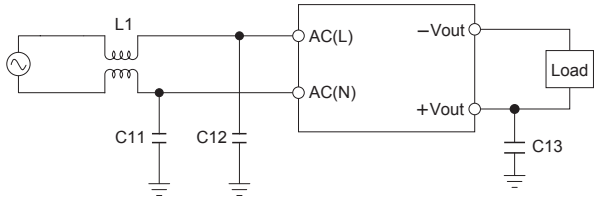


Fig.2.2 Recomemended circuit of connect output to FG

3 Functions

3.1 Input Voltage Range

■The range is from 85VAC to 264VAC
In cases that conform with safety standard, input voltage range is 100VAC to 240VAC (50/60Hz).

■Power factor correction is not built-in.

■If the input voltage is outside the rated range, the power supply my malfunction. Operate in accordance within in the specifications.

■If the input voltage changes suddenly, the output voltage may go outside the specifications. Consult us for more details.

3.2 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, have enough intervals for the power supply to cool down before being turned on again.

3.3 Overcurrent Protection

■Overcurrent protection is built-in. It works at more than 105% of the 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.

■Hiccup Operation Mode
When overcurrent protection works and the output voltage drops, the output voltage goes into Hiccup mode so that the average output current can decrease.

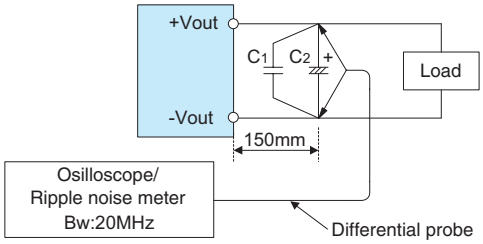
3.4 Overvoltage Protection

■An overvoltage protection circuit is built-in. If the overvoltage protection circuit is activated, shut down the input voltage, wait more than 3 minutes and turn on the AC input again to recover the output voltage. Recovery time varies depending on such factors as input voltage value at the time of the operation.

Remarks : Please avoid applying a voltage exceeding the rated voltage to an output terminal. Doing so may cause a power supply to malfunction or fail. If you cannot avoid doing so, for example, if you need to operate a motor, etc., please install an external diode on the output terminal to protect the unit.

3.5 Output Ripple Noise

■Output ripple noise may be influenced by the measuring environment.
The measuring method shown in Fig. 3.1 is recommended.



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

Fig.3.1 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.

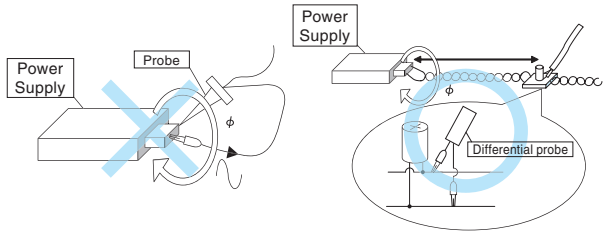


Fig.3.2 Example of measuring output ripple noise

3.6 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.

3.7 Low Power Consumption

■The power supplies are designed for low power consumption at no load.

■When the load factor is low (Io=0~20%typ), the switching power loss is reduced by burst operation, which will cause 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.

4 Series Operation and Parallel Operation

4.1 Series Operation

■The power supplies can be used in series connection. The output current in series operation must be lower than the rated current of the power supply with the lowest rated current among the power supplies connected in series. Make sure no current exceeding the rated current flows into a power supply.

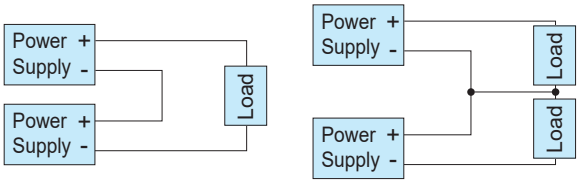


Fig.4.1 Examples of connecting in series operation

4.2 Parallel Operation

■Redundant operation is possible by wiring as shown below.

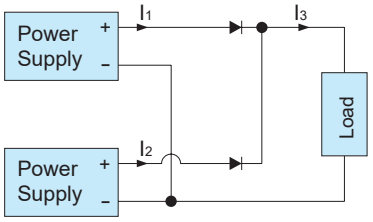


Fig.4.2 Example of redundancy operation

■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.

$I_3 \leqq$ the rated current value

■Parallel operation is not possible.

5 Cleaning

■Cleaning agents : IPA (Solvent type)

■Cleaning period : When cleaning the unit, the unit must be washed with a brush, and IPA must be kept out of the unit.

■After cleaning, dry them enough.

6 Life Expectancy and Warranty

■Warranty

Table 6.1 Warranty (UMPS30F)

Cooling Method	Voltage	Average ambient temperature	Warranty [years]	
			Load factor Io≦75%	Load factor 75%<Io≦100%
Convection	5V - 48V	Ta = 30°C or less	5	5
		Ta = 40°C	5	3

Table 6.2 Warranty (UMPS60F)

Cooling Method	Voltage	Average ambient temperature	Warranty [years]	
			Load factor Io≦75%	Load factor 75%<Io≦100%
Convection	5V, 12V	Ta = 30°C or less	5	5
		Ta = 35°C	5	3
	24V, 48V	Ta = 30°C or less	5	5
		Ta = 40°C	5	3

7 Others

7.1 Medical Isolation Grade

■UMPS series meets 2MOPP

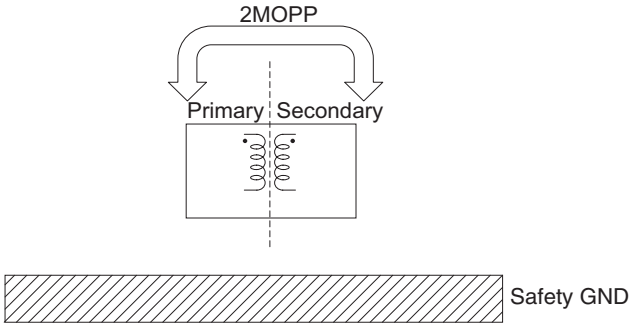


Fig.7.1 Medical Isolation Grade