



Features:

- AC input 180 ~ 264VAC
- AC input active surge current limiting
- High efficiency up to 91%
- Built-in active PFC function, PF>0.95
- Protections: Short circuit / Overload / Over voltage / Over temperature / Fan alarm
- Forced air cooling by built-in DC with fan speed control function
- Output voltage can be trimmed between 20~110% of the rated output voltage
- Current sharing up to 3 units
- Alarm signal output (relay contact and TTL signal)
- Built-in 12V/0.1A auxiliary output for remote control
- Built-in remote ON-OFF control
- Built-in remote sense function

Description

MW3000-PS is a 3kW single output enclosed type AC/DC power supply.

This series operates for 180~264VAC input voltage and offers the models with the DC output mostly demanded from the industry. Each model is cooled by the built-in fan with fan speed control, working with temperatures up to 70°C.

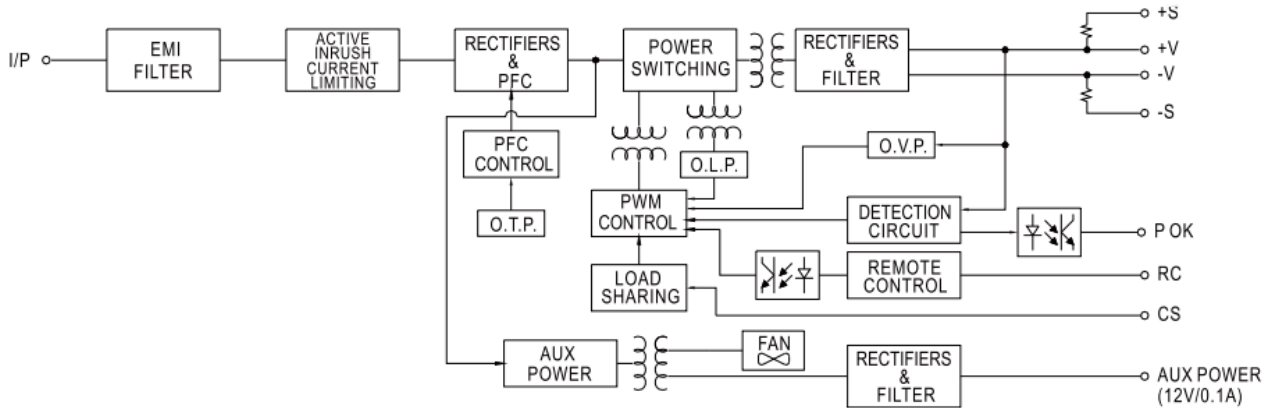
The MW3000-PS provides vast design flexibility by equipping various built-in functions such as the output programming, active current sharing, remote ON/OFF control, auxiliary power, etc.

Specification

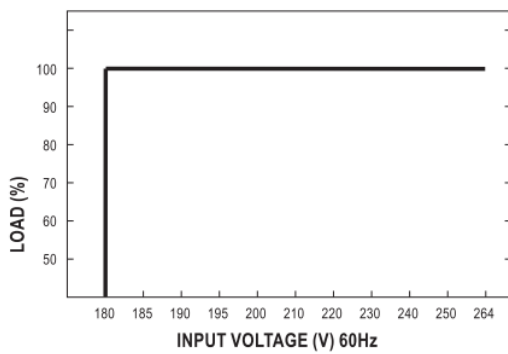
Model	MW3000-PS12	MW3000-PS24	MW3000-PS48		
Output	DC Voltage	12V	24V	148V	
	Rated Current	200A	125A	62.5A	
	Current Range	0 – 200A	0 – 125A	0 – 62.5A	
	Rated Power	2400W	3000W	3000W	
	Ripple + Noise Max. ¹	150mVp-p	150mVp-p	200mVp-p	
	Voltage Adj. Range	10.8 - 13.2V	22 - 28V	43 - 56V	
	Voltage Tolerance ²	±1.0%	±1.0%	±1.0%	
	Line Regulation	±0.5%	±0.5%	±0.5%	
	Load Regulation	±0.5%	±0.5%	±0.5%	
	Setup – Rise Time	1000ms, 80ms at full load			
Hold Up Time (Typ.)	10ms at full load				
Input	Voltage Range	180 – 264V AC, 254-370V DC			
	Frequency Factor	47-63Hz			
	Power Factor (Typ.)	0.95/230VAC at full load			
	Efficiency (Typ.)	87.5%	90%	91.5%	
	AC Current (Typ.)	20A/180VAC	16A/230VAC		
	Inrush Current	60A/230VAC			
	Leakage Current	<2mA / 240VAC			
Protection	Overload	100-112% rated output power User adjustable continuous constant current limiting or constant current limiting with delay shutdown after 5 seconds, re-power on to recover			
	Over Voltage	13.8 - 16.8V	28.8 - 33.6V	57.6 – 67.2V	
	Over Temperature	Shut down output voltage, recovers automatically after temperature goes down			
		Protection type : Shut down output voltage, re-power on to recover			
Function	Output Voltage Programmable (PV)	2.4 – 13.2V	4.8 – 28V	9.6 – 56V	
	Current Sharing	Up to 9000W or (2+1) units. Please refer to the Function Manual			
	Auxiliary Power (AUX)	12V@0.1A (Only for Remote ON/OFF control)			
	Remote ON/OFF Control	Please refer to the Function Manual			
	Remote Sense	Compensate voltage drop on the load wiring up to 0.25V. Please refer to the Function Manual			
	Alarm Signal Output	Power OK signal, Please refer to the Function Manual			
	Environment	Working Temp.	-20 - +70°C (refer to “Derating Curve”)		
Working Humidity		20 - 90% RH non-condensing			
Storage Temp. Humidity		-40 - +85°C, 10-95% RH non-condensing			
Temp. Coefficient		±0.05% / °C (0-50°C)			
Vibration		10-500Hz, 5G 10 min./1 cycle, 60 min. each along X, Y, Z axes			
Safety and EMC ³		Safety Standards	UL60950-1, TUV EN60950-1 approved		
	Withstand Voltage	I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC			
	Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C/ 70% RH			
	EMC Emission	Parameter	Standard		Test Level / Note
		Conducted	EN55032 (CISPR32) / EN55011 (CISPR11)		Class B
		Radiated	EN55032 (CISPR32) / EN55011 (CISPR11)		Class A
		Harmonic Current	EN61000-3-2		---
		Voltage Flicker	EN61000-3-2		---
	EMC Immunity	EN61204-3, EN55024, EN61000-6-2			
		Parameter	Standard		Test Level / Note
		ESD	EN61000-4-2		Level 3, 8KV air; Level 2, 4KV
		Radiated	EN61000-4-3		Level 3
		EFT / Burst	EN61000-4-4		Level 3
		Surge	EN61000-4-5		Level 3, 2KV/Line-Earth; Level 2, 1KV/Line
Conducted		EN61000-4-6		Level 3	
Magnetic Field		EN61000-4-8		Level 4	
Voltage Dips and Interruptions	EN61000-4-11		>95% dip 0.5 periods, 30% dip 25 periods, >95% inter. 250 periods		
Others	MTBF	223.8K hrs min. Telcordia SR-332 (Bellcore); 75.1K hrs min. MIL-HDBK-217F (25°C)			
	Dimension	278 x 177.8 x 63.5mm (LxWxH)			
Note	<p>All parameters NOT specially mentioned are measured at 230V AC input, rated load and 25°C of ambient temperature.</p> <ol style="list-style-type: none"> Ripple and noise are measured at 20MHz of bandwidth by using a 12” twisted pair-wire terminated with a 0.1uF and 47uF parallel capacitor. Tolerance: includes set up tolerance, line regulation and load regulation. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. 				

Block Diagram

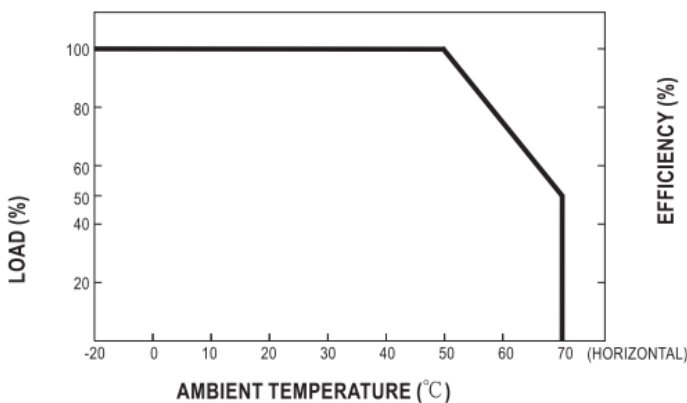
PFC fosc: 88kHz
PWM fosc: 100kHz



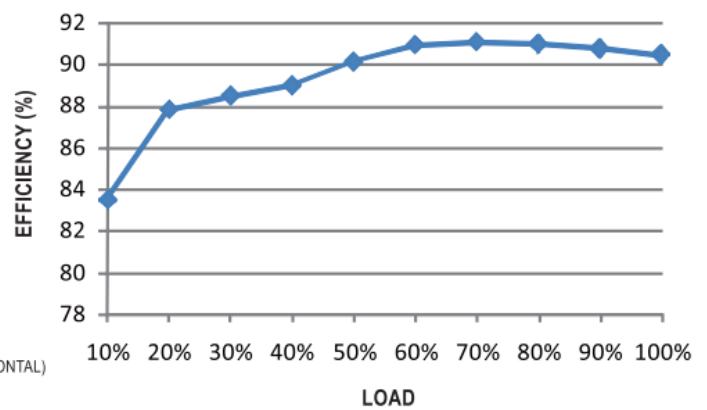
Static Characteristics



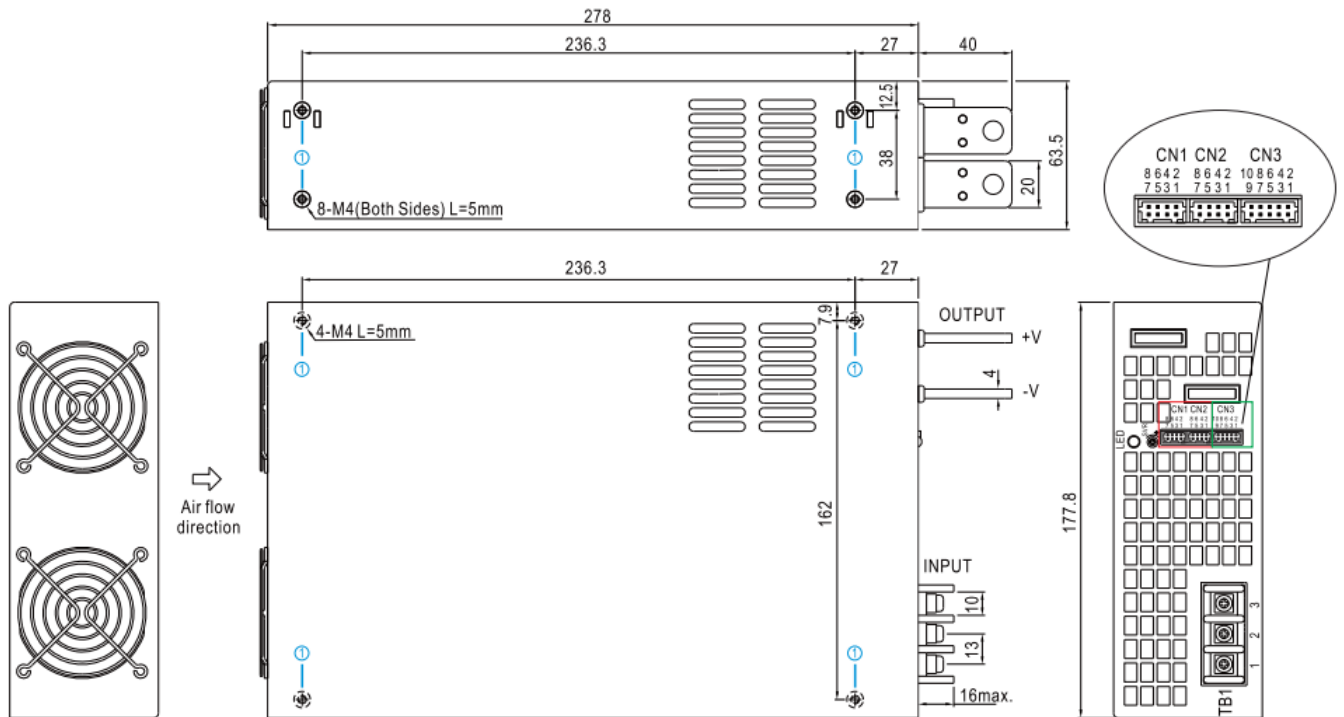
Derating Curve



Efficiency vs Load (48V model)

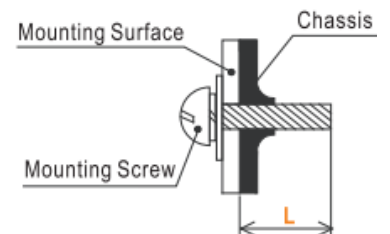


Mechanical Specification

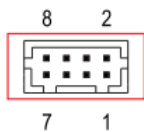


Mounting Instruction

Hole No.	Recommended Screw Size	Max Penetration Depth L	Recommended mounting torque
1	M4	5mm	7 - 10Kgf-cm



Control Pin No, Assignment (CN1, CN2) : HRS DF11-8DP-2DS or equivalent

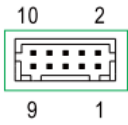


Mating Housing	RS DF11-8DS or equivalent
Terminal	HRS DF11-**SC or equivalent

Pin-out CN1, CN2 (CN1 and CN2 are connected internally)

Pin No.	Function	Description
1	RCG	Remote ON/OFF Ground
2	RC	Remote ON/OFF
3	PV	Connection for output voltage programming
4	PS	Reference Voltage Terminal
5, 7	-S	Negative sensing for remote sense
6	CS	Current Share
8	+S	Positive sensing for remote sense

Control Pin No, Assignment (CN3) : HRS DF11-8DP-2DS or equivalent



Mating Housing	RS DF11-8DS or equivalent
Terminal	HRS DF11-**SC or equivalent

Pin-out CN3

Pin No.	Function	Description
1	P OK GND	Power OK Ground
2	P OK	Power OK Signal (Relay Contact)
3	P OK GND2	Power OK Ground
4	P OK2	Power OK Signal (TTL Signal)
5	RCG	Remote ON/OFF Ground
6	RC	Remote ON/OFF
7	AUXG	Auxiliary Ground
8	AUX	Auxiliary Output
9	OLP	Overload (OLP) type select
10	OL-SD	

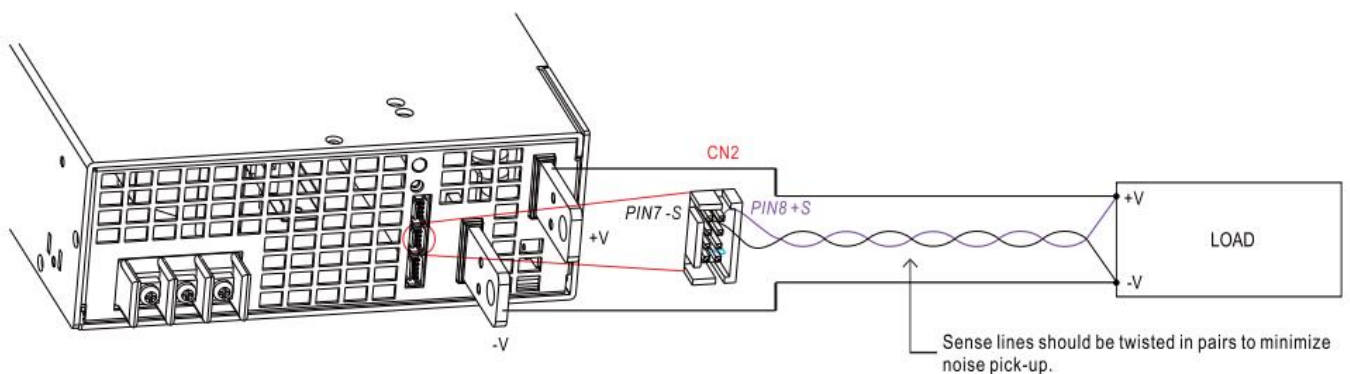
AC input Terminal Pin No. Assignment

Pin No.	Assignment	Diagram	Maximum mounting torque
1	AC/L		18Kgf-cm
2	AC/N		
3	PE/FG		

Function Manual

1. Remote Sense

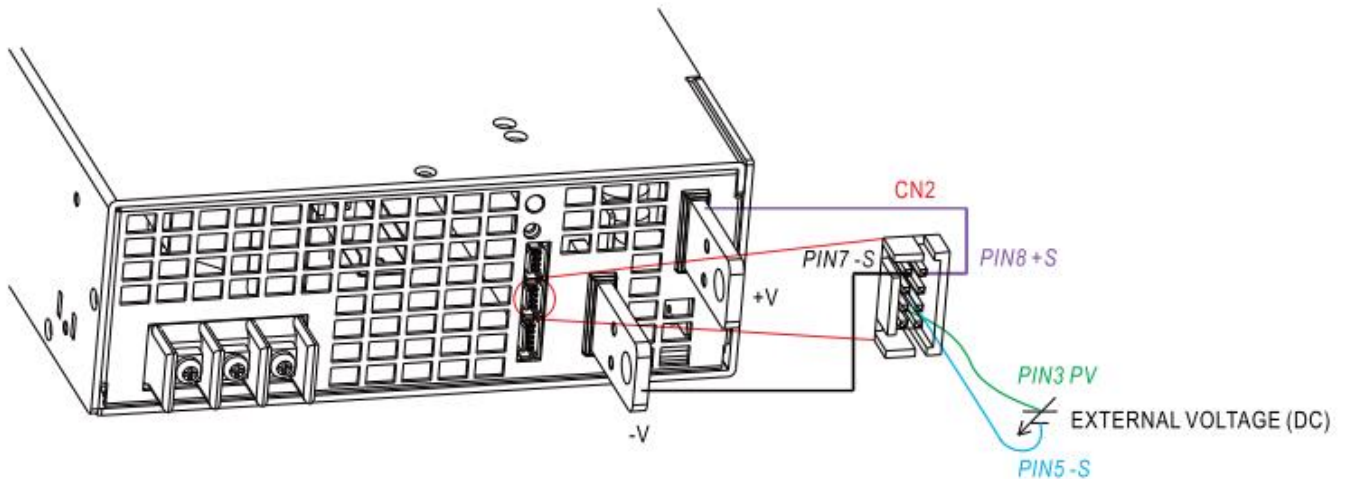
The Remote Sense compensates voltage drop on the load wiring up to 0.25V



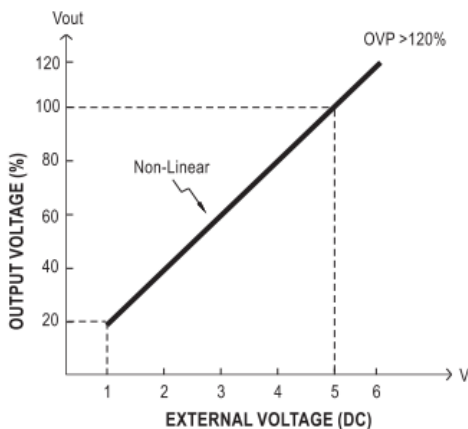
CAUTION: The power supply, by factory default (also the assumption for other sections), is shipped with -S and -V on CN2, as well +S and +V shorted by connector. When activating the Remote Sense, the +S signal should be connected to the positive terminal of the load and -S to the negative terminal of the load.

2. Output Voltage Programming (or, PV/remote voltage programming / remote adjust / margin programming / dynamic voltage trim)

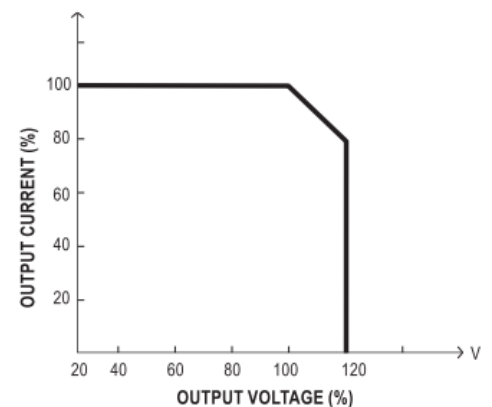
In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed to 20-110% (Typ.) of the nominal voltage by applying external voltage.



Connecting an external DC source between PV and -S on CN2, and +S and +V, -S and -V also need to be connected.



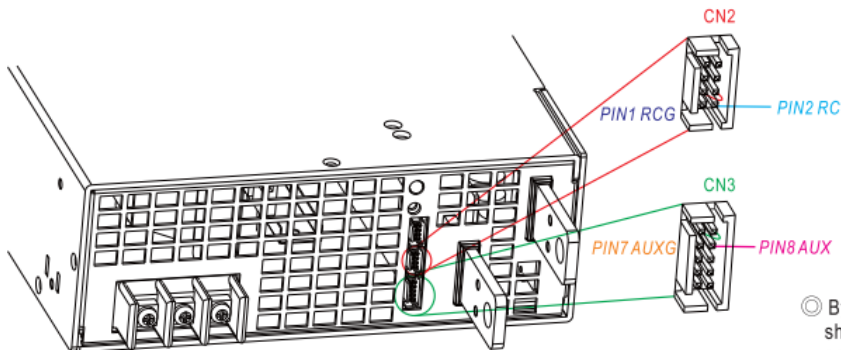
MODEL	12V	24V	48V
PV Range	2.4 ~ 13.2V	4.8 ~ 28V	9.6 ~ 56V



- ! Please do not adopt PWM signal as the EXTERNAL VOLTAGE.
- ! The rated current should change with the Output Voltage Programming accordingly
- ! By factory default, the Output Voltage Programming is not activated, and PV (pin3) and PS (pin4) are shorted by connector. Whenever this function is not needed to activate, as assumed in other sections' diagrams, please keep PV (pin3) and PS (pin4) of CN2 shorted. Otherwise the power supply will have no output!
- ! PV (pin3) and PS (pin4) of CN1 or CN2 must be disconnected if 'Output Voltage Programming' function is used. Otherwise the internal electrical components may be damaged

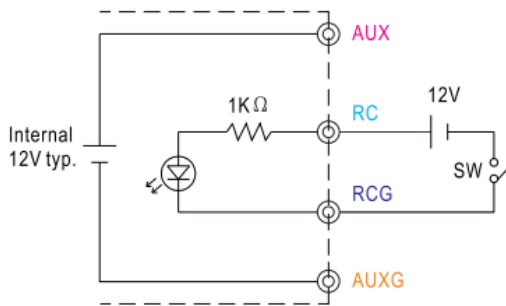
3 Remote ON/OFF

Remote ON-OFF is activated by the configuration with respect to CN1, CN2 and CN3 as shown in the following diagram.

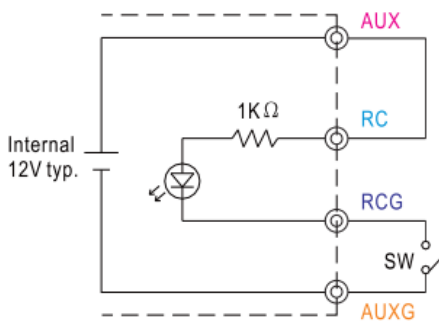


⊙ By factory default, PV(PIN3) and PS(PIN4) on CN2 are shorted by connector; likewise, OLP(PIN9) and OL-SD(PIN10) on CN3 are shorted when shipped.

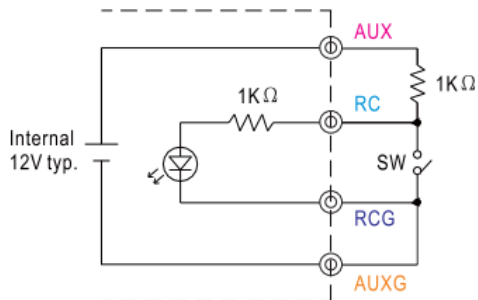
Example 3.2(A): Using external voltage source



Example 3.2(B): Using internal 12V auxiliary output



Example 3.2(C): Using internal 12V auxiliary output

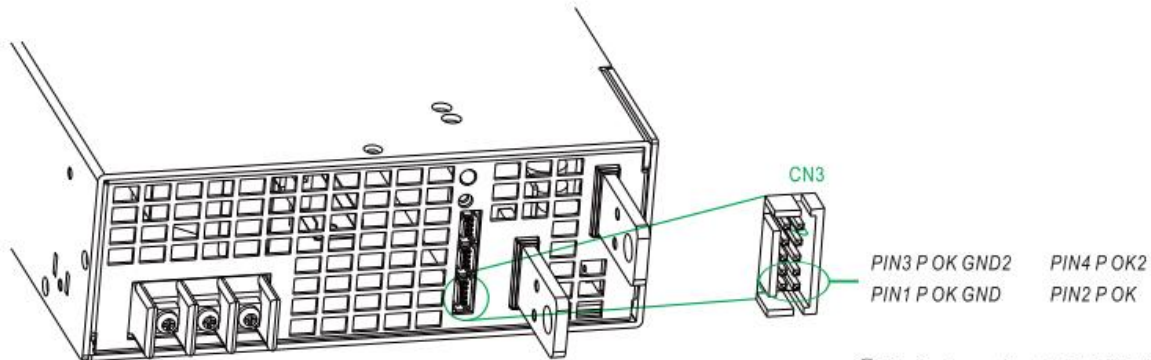


Connection Method

		Example 3.1(A)	Example 3.1(B)	Example 3.1(C)
SW logic	Power Supply output ON	SW Open	SW Open	SW Closed
	Power Supply output OFF	SW Closed	SW Closed	SW Open

4. Alarm Signal Output

Alarm signal is sent out through “P OK” & “P OK GND” and “P OK2” & “P O GND2” pins on CN3. Please acknowledge an external voltage source is required for this function.



⊙ By factory default, OLP (PIN9) and OL-SD (PIN10) on CN3 are shorted by connector when shipped.

Function	Description	Output of alarm (P OK, Relay contact)	Output of alarm (P OK2, TTL Signal)
P OK	The signal is "Low" when the power supply is above 80% of the rated output voltage. In other words; Power OK	Low (0.5V max at 500mA)	Low (0.5V max at 10mA)
	The signal turns to "High" when the power supply is under 80% of the rated output voltage. In other words; Power Fail	High or open (External applied voltage, 500mA max.)	High or open (External applied voltage, 10mA max.)

Table 3.1 Explanation of alarm

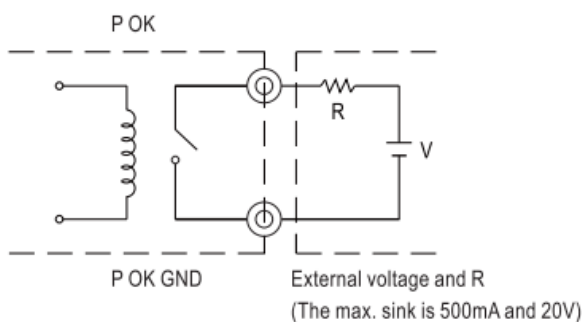


Fig. 4.2 Internal circuit of P OK (Relay total is 10W)

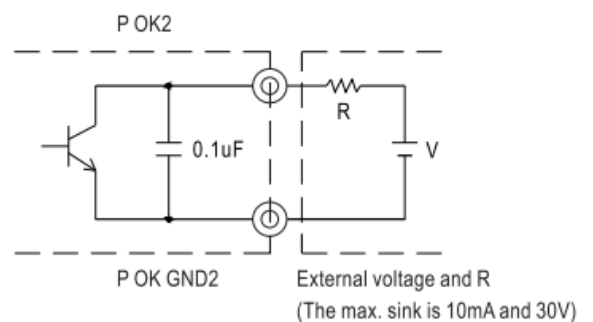


Fig. 4.3 Internal circuit of P OK2 (Open collector)

5. Select Overload Protection Type

1. Insert the shorting connector on CN3 that is shown in Fig 5.2, the Overload Protection Type will be "constant current limiting with delay shutdown after 5 seconds, re-power on to recover. This is the factory default.
2. Remove the shorting connector on CN3 that is shown in Fig 5.1, the Overload Protection Type will be "continuous constant current limiting".

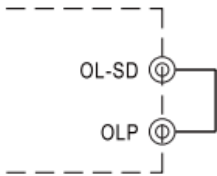


Fig. 5.1 Insert the CN3
Overload Protection Type : constant current limiting with delay shutdown after 5 seconds

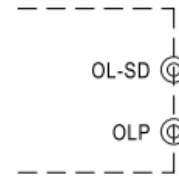


Fig. 5.2 Remove the CN3
Overload Protection Type : constant current limiting

6. Current Sharing with Remote Sense

MW3000-PS has built-in active current sharing function and can be connected in parallel, up to 3 units, to provide higher output power as exhibited below:

- ! The power supplies should be paralleled using short and large diameter wiring and then connected to the load.
- ! Difference of output voltages among parallel units should be less than 0.2V.
- ! The total output current must not exceed the value determined by the following equation:
Maximum output current at parallel operation= (Rated current per unit) x (Number of unit) x 0.9
- ! When the total output current is less than 3% of the total rated current, or say (3% of Rated current per unit) x (Number of units), the current shared among units may not be fully balanced.
- ! When remote sensing is used in parallel operation, the sensing wire must be connected only to the master unit.
- ! Sense lines should be twisted in pairs to minimize noise pick-up.
- ! +S,-S and CS on CN1 or CN2 are connected mutually in parallel.
- ! Under parallel operation, the "Output Voltage Programming" function is not available.

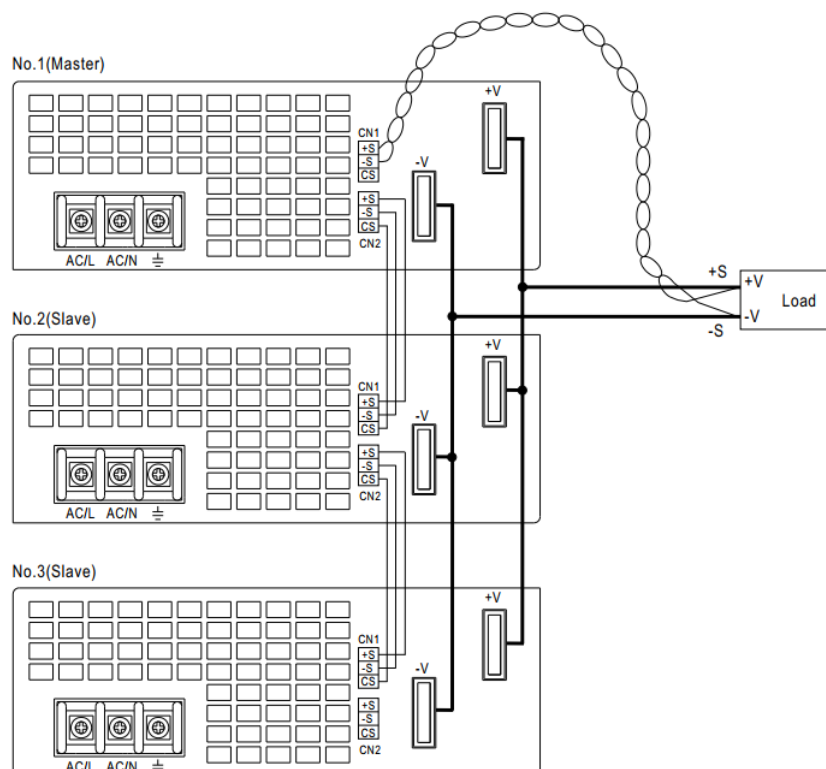


Fig 6.1 Parallel connection with remote sense

6. Three Phase Connect

Users can exploit three units of MW3000-SP (unit1, unit2, unit3) to work with 3 phase power system. Please refer to the following diagrams for configuration.

Fig. A: 3 phase, 3 wire 220V AC system

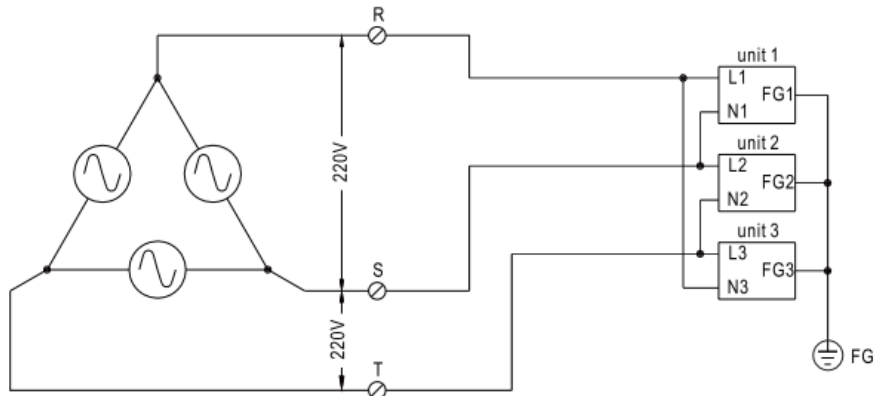


Fig. B: 3 phase, 4 wire 220/380V AC system

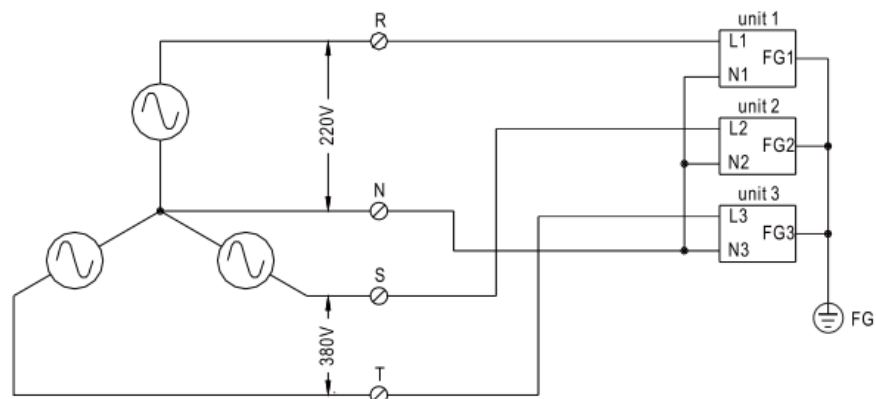


Fig. C: 3 phase, 4 wire 110/190V AC system

