

HIGHLIGHTS

- Universal AC input / Full range with active PFC
- Medical safety approval: UL/ CSA / IEC/ EN 60601-1; ANSI/ AAMI ES 60601-1; 2xMOPP
- Programmable output Voltage (0% ~ 105%)
- Programmable output Current (0% ~ 105%)
- Constant current limit
- Selectable +5V / 0.5A or +9V / 0.3A auxiliary output
- Global control via RS232
- Forced current sharing at parallel operation
- Remote setting multiple PSU via RS232, 485 & I C
- Power OK signal (Power good, Logic low)
- Remote ON / OFF, Remote sense function
- Protection: OVP, OLP, OTP, Fan failure
- 3 years warranty

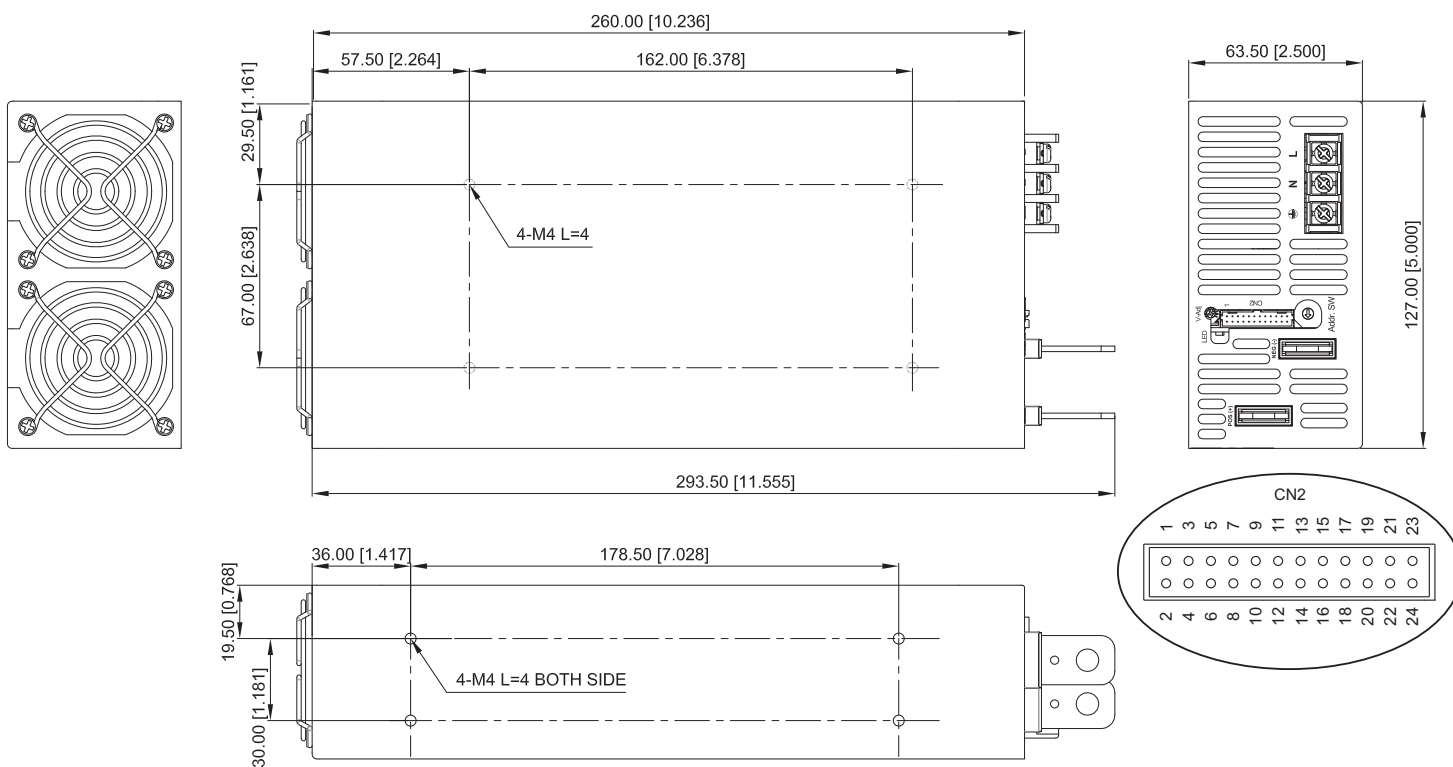


MODEL		ML1200-12	ML1200-15	ML1200-24	ML1200-30	ML1200-36	ML1200-48	ML1200-60	
Output	DC Voltage Range	12V	15V	24V	30V	36V	48V	60V	
	Rated Current	100A	80A	50A	40A	33.4A	25A	20A	
	Current Range	0 ~ 100A	0 ~ 80A	0 ~ 50A	0 ~ 40A	0 ~ 33.4A	0 ~ 25A	0 ~ 20A	
	Rated Power	1200W							
	Ripple & Noise (Max.)	Note.2	120mVp-p	150mVp-p	240mVp-p	300mVp-p	360mVp-p	480mVp-p	600mVp-p
	Voltage Adj. Range	±5.0% Typical adjustment by potentiometer. (VR1)							
	Voltage Tolerance	Note.3	±2.0%						
	Line Regulation	±1.0%							
	Load Regulation	±1.0%							
Input	Setup, Rise Time	800ms, 100ms at full load							
	Hold Up Time (Min.)	16ms / 230VAC at full load							
	Voltage Range	Note.4	90 ~ 264VAC, 127 ~ 370VDC						
	Frequency Range	47 ~ 63Hz							
	Power Factor (Min.)	0.95 / 230VAC, 0.99 / 115VAC at full load							
	Efficiency (Typ.)	89%	90%	91%	92%	92%	93%	93%	
	AC Current (Max.)	14.5A / 115VAC, 6A / 230VAC							
	Inrush Current (Max.)	30A / 115VAC, 45A / 230VAC							
	Leakage Current	For Earth < 300uA / 264VAC, For Patient < 100uA / 264VAC							
Protection	Over Load	105 % rated output power, Protection type: Constant current limit							
	Over Voltage	Variable OVP, 120 ± 7% Vout. Refer to VCI VS OVP curve.							
		Protection type: Latch-style (Recovery after reset AC power ON or inhibit)							
Function	Over Temperature	100 ±5°C detect on heat sink of secondary side Protection type: Shut down o/p voltage (Recovers automatically after temperature goes down)							
	Auxiliary Power	Selectable +5V / 0.5A or +9V / 0.3A auxiliary output							
	Remote ON / OFF Control	Please refer to page 4 (Isolated from output)							
	Power OK Signal	Open drain signal low when PSU turns on, Max. sink current: 20mA, Max. drain voltage: 40V.							
	Output Voltage Trim	Adjustment of output voltage is between 0 ~ 105% of rated output							
	Output Current Trim	Adjustment of output current is between 0 ~ 105% of rated output							
	Parallel (Current Sharing)	Note.5	Please refer to page 5 (8 units max.)						
Environment	Working Temp.	-20 ~ +60°C (Refer to de-rating curve)							
	Working Humidity	20 ~ 90% RH non-condensing							
	Storage Temp. & Humidity	-40 ~ +85°C, 10 ~ 95% RH							
	Temp. Coefficient	±0.02% / °C (0 ~ 50°C)							
	Vibration	10 ~ 500Hz, 2G 10min. / 1cycle, period for 60min. each along X, Y, Z axes Certified IEC60068-2-6-2007; IEC 60068-2-64-2008							
Safety & EMC	Safety Standards	Certified UL / cUL (ANSI / AAMI ES 60601-1; CAN / CSA-C22.2 No.60601-1); NFPA 99 Certified TUV (EN 60601-1; IEC 60601-1); MOPP approval							
	Withstand Voltage	Note.7	I/P-O/P: 4KVAC, I/P-FG: 1.8KVAC, O/P-FG: 0.5KVAC						
	Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG: 100M Ohms / 500VDC							
	EMI Conduction & Radiation	Certified EN 55011							
	Harmonic Current	Certified EN 61000-3-2; EN 61000-3-3							
	EMS Immunity	Note.6	Certified EN 60601-1-2; IEC 61000-4-2, 3, 4, 5, 6, 8, 11						
Other	Cooling	Load and temperature control fan							
	Dimension (WxHxD)	127.0x63.5x260.5 mm / 5.000x2.500x10.256 inch							
	Packing	2.6 kg; 6pcs / 16.6kg / 1.86CUFT							

Notes 1. All parameters NOT especially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uF & 0.47uF parallel capacitor.
3. Tolerance includes setup time tolerance, line regulation and load regulation. 4. Line regulation is measured from low line to high line at rated load. 5. Load regulation is measured from 0% to 100% rated load.
6. 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.
7. Length of setup time is measured at first cold start. Turning ON/OFF the power supply continuously may increase the setup time.

Mechanical Drawings:

Unit: mm[inch]



AC Input Terminal Pin No. Assignment

Pin No.	Assignment
1	ACL
2	ACN
3	⏏

Control pin number assignment (CN2): JST S24B-PHDSS or equivalent

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment	Mating Housing / Contact	
1	VS+	9	EN-	17	AUX	JST PHDR-24VS or equivalent	JST SPHD-002T-P0.5 or equivalent
2	VO+	10	GND	18	GND		
3	VS-	11	EN+	19	SCL		
4	VO-	12	AUX	20	SDA		
5	POK	13	ACI	21	AUX		
6	GND	14	GND	22	GND		
7	PAR	15	VCI	23	NC.		
8	VSET	16	GND	24	NC.		

CN2 Function Description:

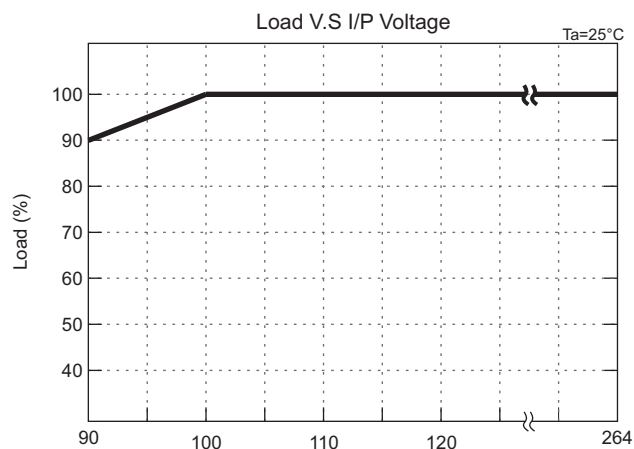
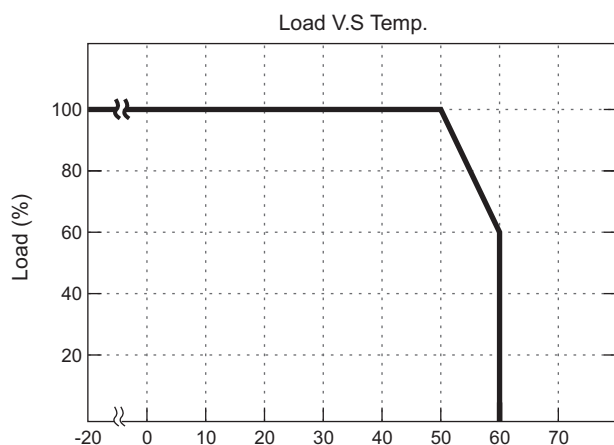
Pin No.	Function		Pin No.	Function	Description
1	VS+	Positive output voltage	13	ACI	I Program
2	VO+	Remote sense (+)	14	GND	Ground
3	VS-	Remote sense (-)	15	VCI	V Program
4	VO-	Negative output voltage	16	GND	Ground
5	POK	Power OK	17	AUX	+5V / 0.5A or +9V / 0.3A Auxiliary power
6	GND	Ground	18	GND	Ground
7	PAR	Parallel operation current share	19	SCL	Serial Clock used in the I ² C interface
8	VSET	Aux output setting	20	SDA	Serial Data used in the I ² C interface
9	EN-	Inhibit ON/OFF (-)	21	AUX	+5V / 0.5A or +9V / 0.3A Auxiliary power
10	GND	Ground	22	GND	Ground
11	EN+	Inhibit ON/OFF (+)	23	NC.	For RS232 Transmission function
12	AUX	+5V / 0.5A or +9V / 0.3A Auxiliary power	24	NC.	For RS232 Receiver function

LED Status:

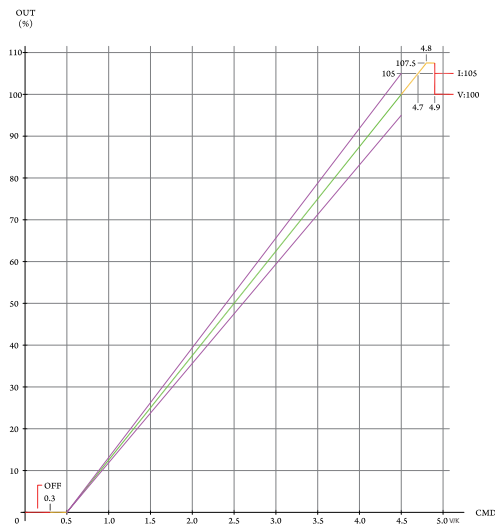
LED	LED Signal	Status
Solid(Green)		Power OK (Local mode)
Slow Blink(Green)		Power Standby
Fast Blink(Red)		Over Voltage Protection (OVP)
Solid(Red)		Over Load Protection (OLP)
Slow Blink(Red)		Over Temperature Protection (OTP)
Intermittent Blink(Red)		Fan Failure
Interface Blink(Red)		Power Failure

*Local mode : Use ACI/VCI to control output current and voltage.
Remote mode : Use RS-232 or I²C command to control output current and voltage.

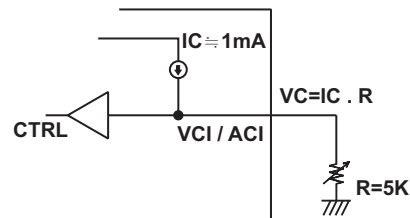
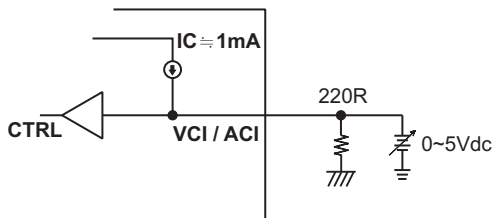
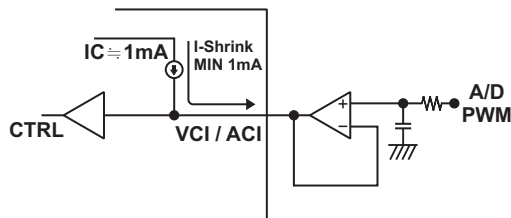
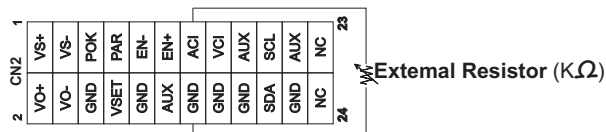
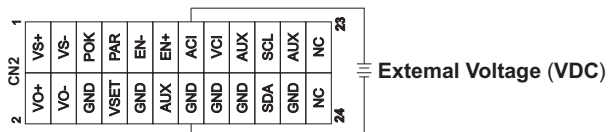
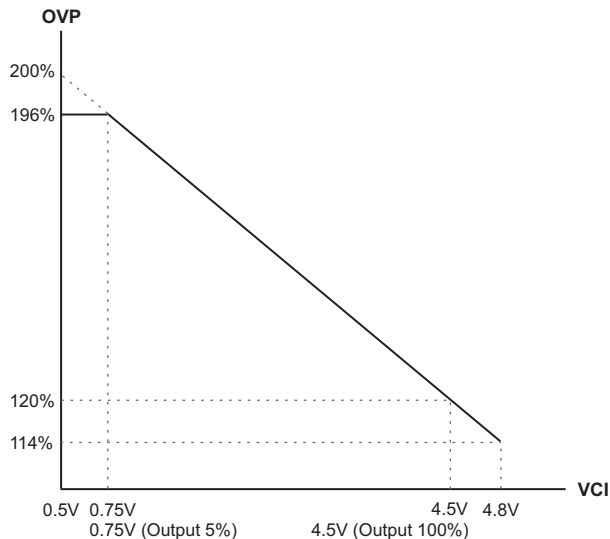
De-rating Curve:



CMD VS Output Curve:

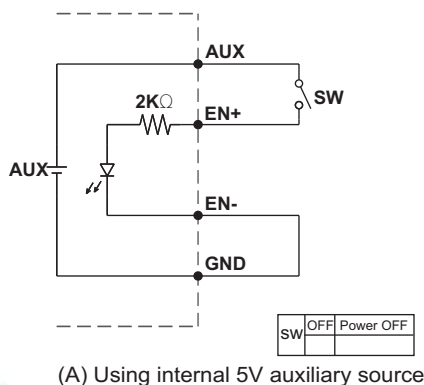


VCI VS OVP Curve:

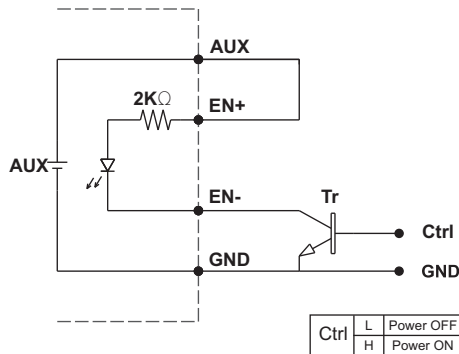


Remote ON/OFF:

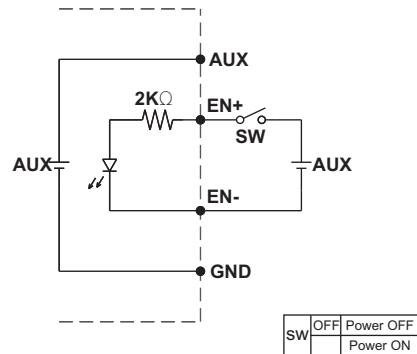
(A) Default Setting



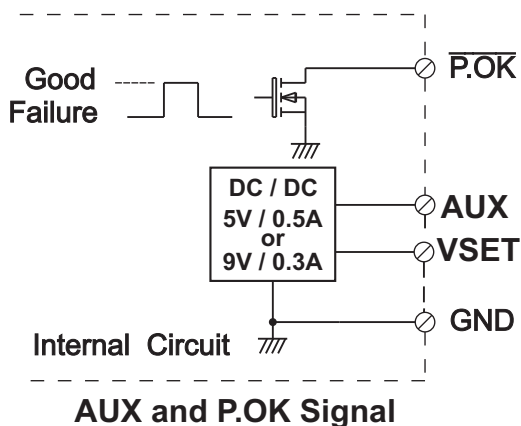
(B) ON / OFF Control by NPN transistor



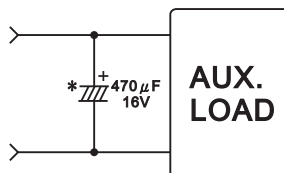
(C) Using external voltage source



Power OK Signal & Auxiliary Power Setting:



*Place an additional capacitor to have a better performance of auxiliary power operation.

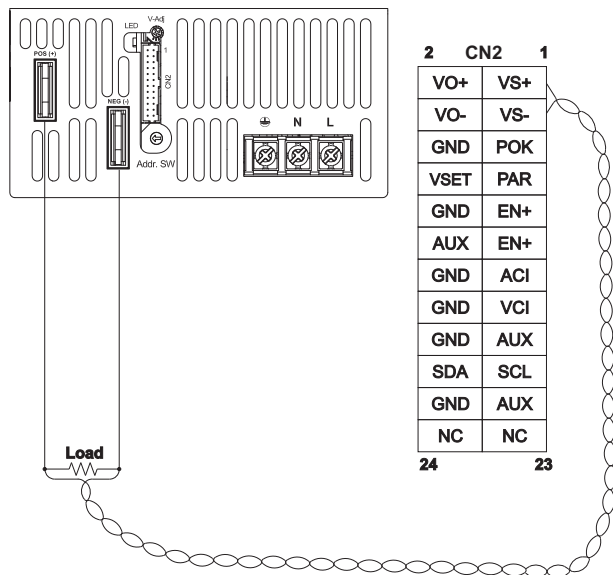


*The grounding of "AUX" power should be connected to "GND" port. If "V-" is connected as Grounding, make sure to short the GND and V- ports.

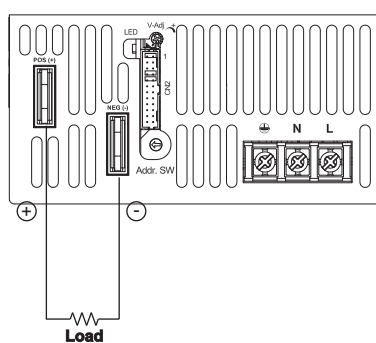
*Auxiliary Power

VSET	Open(Default Setting)	5V
	Short To GND	9V

1. Remote Sense

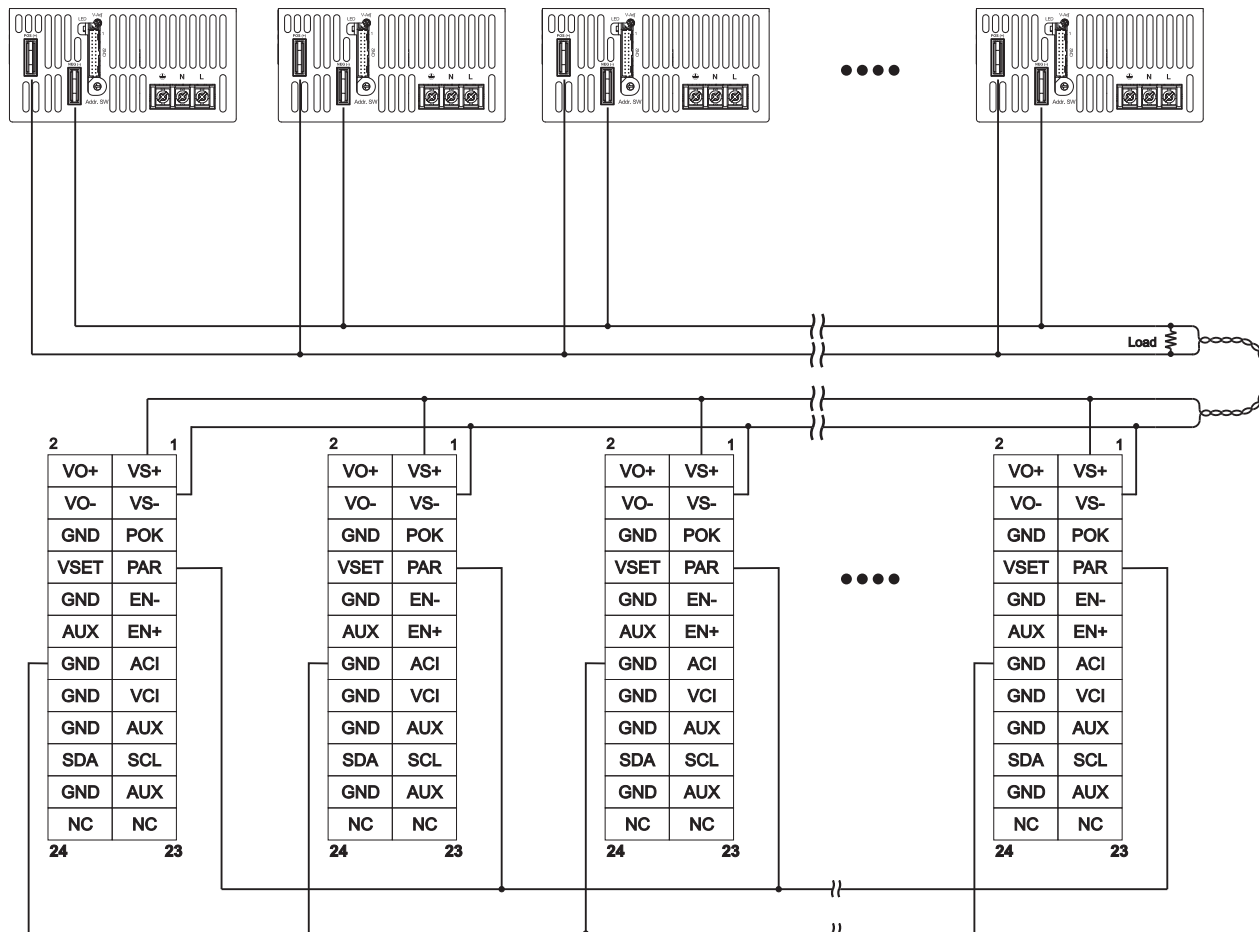


2. Local Sense (Default setting)

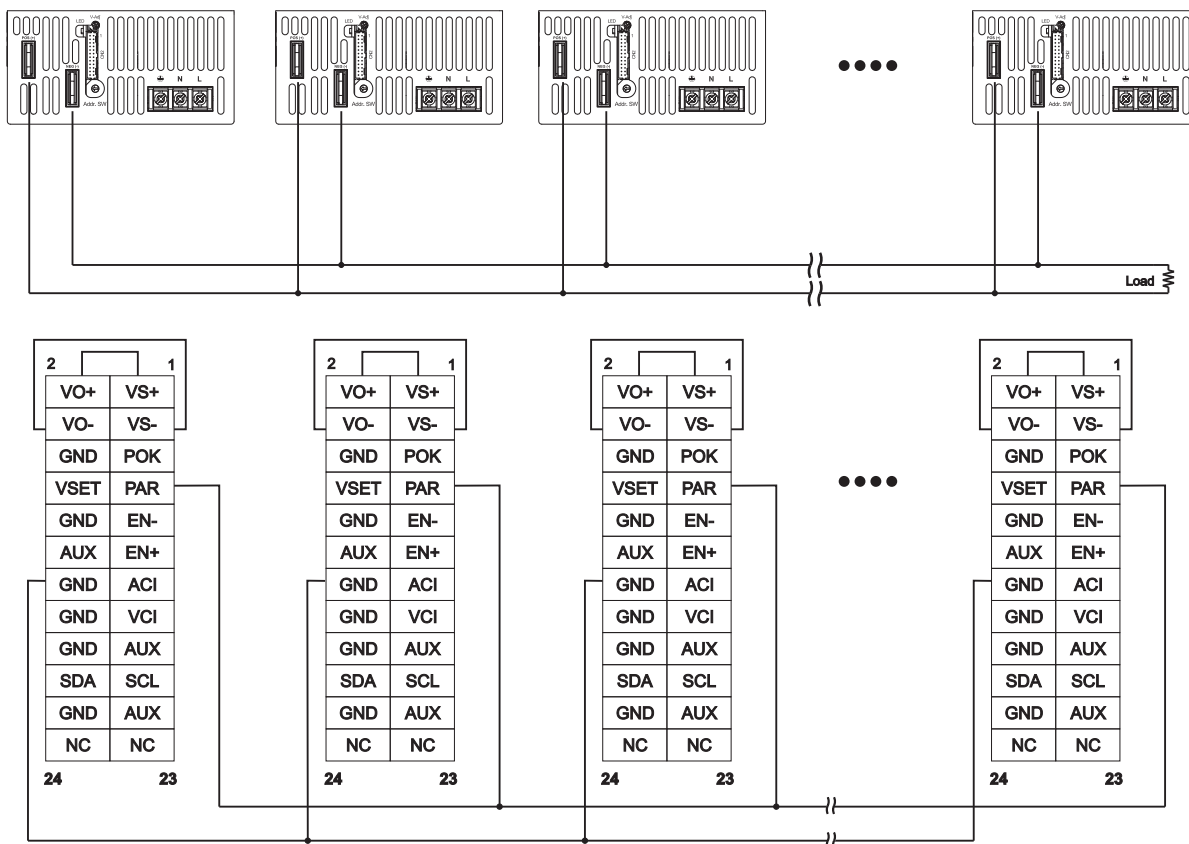


CN2	
2	1
VO+	VS+
VO-	VS-
GND	POK
VSET	PAR
GND	EN+
AUX	EN+
GND	ACI
GND	VCI
GND	AUX
SDA	SCL
GND	AUX
NC	NC

3. Current Sharing with Remote Sensing (8 Units)



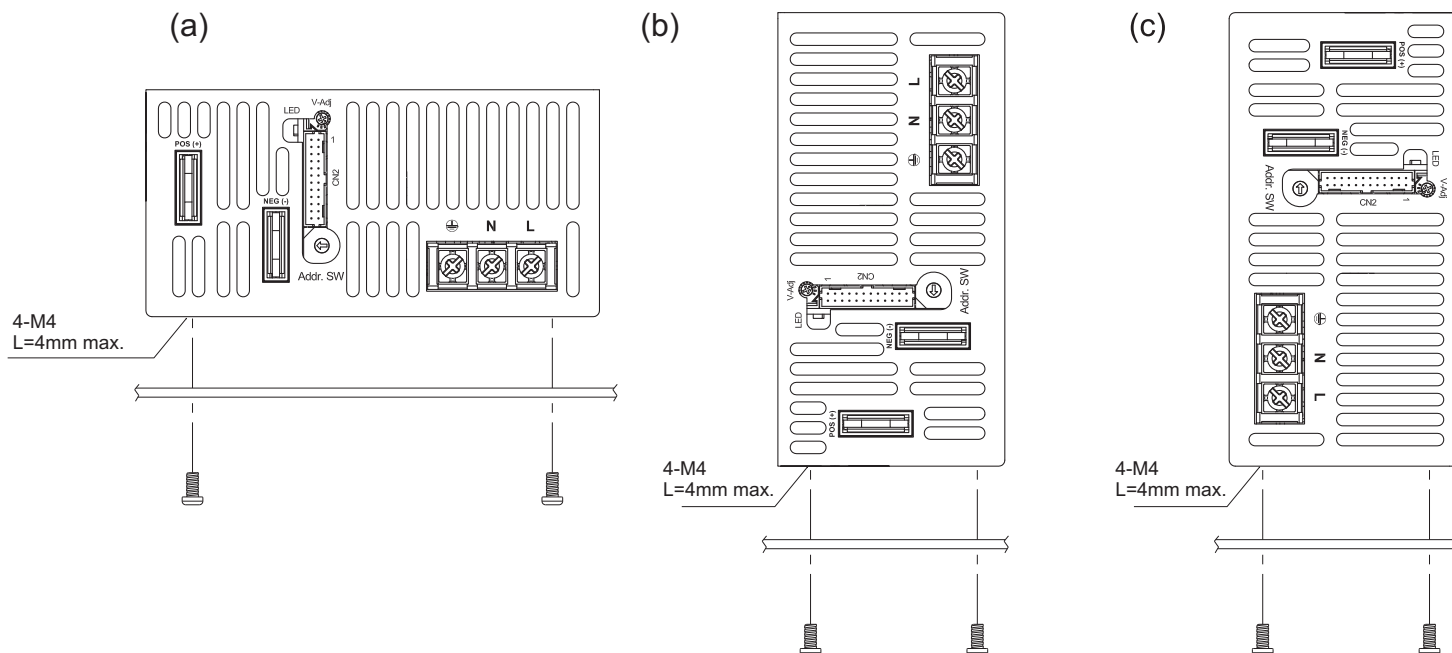
4. Current Sharing with Local Sensing



Installation Instruction:

1. Mounting Directions

1-1 Recommended standard mounting methods:



2. Mounting Method

2-1 There are ventilating holes on the front and back side panels, do not obstruct; allow 50mm at least for air flow.

2-2 The Maximum allowable penetration of screw is 4mm.
Incomplete threading should not be penetrated.

2-3 Recommended the torque of mounting screw:
M4 screw: 1.27N • m (13.0kgf • cm)

