TF3000HV Family

3000W Single Output
Industrial Grade

Industrial

FEATURES AND BENEFITS

3000W Fan-Cooled (Load & Temp. Controlled)	Remote Setting Multi PSU via RS232,RS485 & I²C
Programmable Output Voltage (0% ~ 105%)	Power OK Signal
Programmable Output Current (0% ~ 105%)	Remote ON/OFF, Remote Sense Function
Forced Current Sharing at Parallel Operation	Protection: OVP, OLP, OTP, Fan Failure
Constant Current Limit	3 Year Warranty
Selectable +5V/0.5A or +9V/0.3A Aux Output	Global Control via RS232

MODEL SELECTION

Model Number[4]	Output Volts	Rated Current	Current Range	Output Power	Ripple & Noise[1]	Line Regulation	Load Regulation	Voltage Tolerance[3]	Efficiency
TF3000A150K	150V	20A	0-20A	3000W	1500mV pk-pk	±1%	±1%	±2%	93%
TF3000A200K	200V	15A	0-15A	3000W	2000mV pk-pk	±1%	±1%	±2%	93%
TF3000A250K	250V	12A	0-12A	3000W	2500mV pk-pk	±1%	±1%	±2%	93%
TF3000A300K	300V	10A	0-10A	3000W	3000mV pk-pk	±1%	±1%	±2%	93%
TF3000A400K	400V	7.5A	0-7.5A	3000W	4000mV pk-pk	±1%	±1%	±2%	93%

Notes : 1. De-rating may apply in low input voltage. Check the derating curve for details
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uF & 47uF parallel capacitor.
4. Tolerance: includes setup time tolerance, line regulation and load regulation.
5. Other output voltages available, consult factory.
6. All specifications are typical at 230Vac, full load, at 25°C ambient unless noted.

INPUT

Input Voltage and Frequency[1]	100-240Vac, ±10%, 47-63Hz, 1Ø127-370Vdc
Input Current	115Vac: 19.7A (2000W output) 230Vac: 14.5A (3000W output)
Inrush Current	33A/115VAC, 65A/230VAC
Efficiency	See Model Selection Table
Power Factor	0.95/230VAC, 0.98/115VAC at full load
Leakage Current	< 3.5mA/240VAC

Notes : 1. De-rating may apply in low input voltage. Please check the de-rating curve for more details

OUTPUT

Output Voltage	See Model Selection Table on pg 1
Output Power[1]	3000W continuous – See model selection table for specific voltage model ratings
Voltage Range	±5.0% Typical adjustment by potentiometer (VR1)
Voltage Tolerance	See Model Selection Table on pg 1
Hold-Up Time	14ms/230VAC at full load
Turn On Time Rise Time	1100ms 300ms at full load
Ripple and Noise	See Model Selection Table on pg 1
Line/Load Regulation	See Model Selection Table on pg 1

Notes : 1. De-rating may apply in low input voltage. Please check the de-rating curve for more details

CONNECTOR INFORMATION

	Input Connector	Output Connector	Signal Connector
Pinout:	Term. 1) AC LINE Term. 2) NEUTRAL Term. 3) GROUND	+ and -	See Signal Connector Table on pg 3
Mating Connector /terminal:	#10 wire lugs	1/4-20 Wire Lugs	Connector: JST PHDR-24VS or equivalent Pins: JST SPHD-002T-P0.5 or equivalent

EMI/EMC COMPLIANCE

Conducted Emissions	Certified EN 55022; EN 61204-3; EN 61000-6-3
Radiated Emissions	Certified EN 55022; EN 61204-3; EN 61000-6-3
Electro-Static Discharge (ESD) Immunity on Power ports	EN55024/IEC61000-4-2
Radiated RF EM Fields Susceptibility	EN55022/EN61000-4-3
Electrical Fast Transients (EFT) /Bursts	EN55024/IEC61000-4-4
Surges, Line to Line (Diff Mode) and Line to GND (CMN Mode)	EN55024/IEC61000-4-5
Conducted Disturbances induced by RF Fields	EN55022/IEC61000-4-6
Rated Power frequency magnetic fields	EN55024/IEC1000-4-8
Voltage Interruptions, Dips, Sags & Surges	EN55024/IECEN61000-4-11
Harmonic Current Emissions	EN61000-3-2
Flicker Test	EN61000-3-3

Notes : 1. 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.

SAFETY

Safety Certifications	UL62368-1, EN62368-1

RELIABILITY

MTBF	>112,000 hours per MIL-HDBK-217F

AUXILIARY SIGNALS

Auxiliary Power	Selectable +5V/0.5A or +9V/0.3A auxiliary output
Remote ON / OFF Control	By external switch
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)[1]	Please refer to Current Sharing with Remote Sensing (Parallel Connection) Diagram

Notes : 1. In parallel connection only one unit will operate if the total output load is less than 5% of the rated power.

PROTECTION

Overvoltage Protection	Variable OVP Refer to VCI VS OVP curve.(OVP Tolerance 7%), Latch Type (Recovery after reset AC power ON or inhibit).
Short Circuit Protection	Constant current, auto-recovery
Overtemperature Protection	85±5°C measured on NTC. Auto recovery
Overload Protection	105% of rated power, constant current type

ISOLATION SPECIFICATIONS

Isolation[1]	Input-Output: 3000Vac Input-Ground: 1500Vac Output-Ground: 500Vac
Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG: 100M Ohms/500VDC

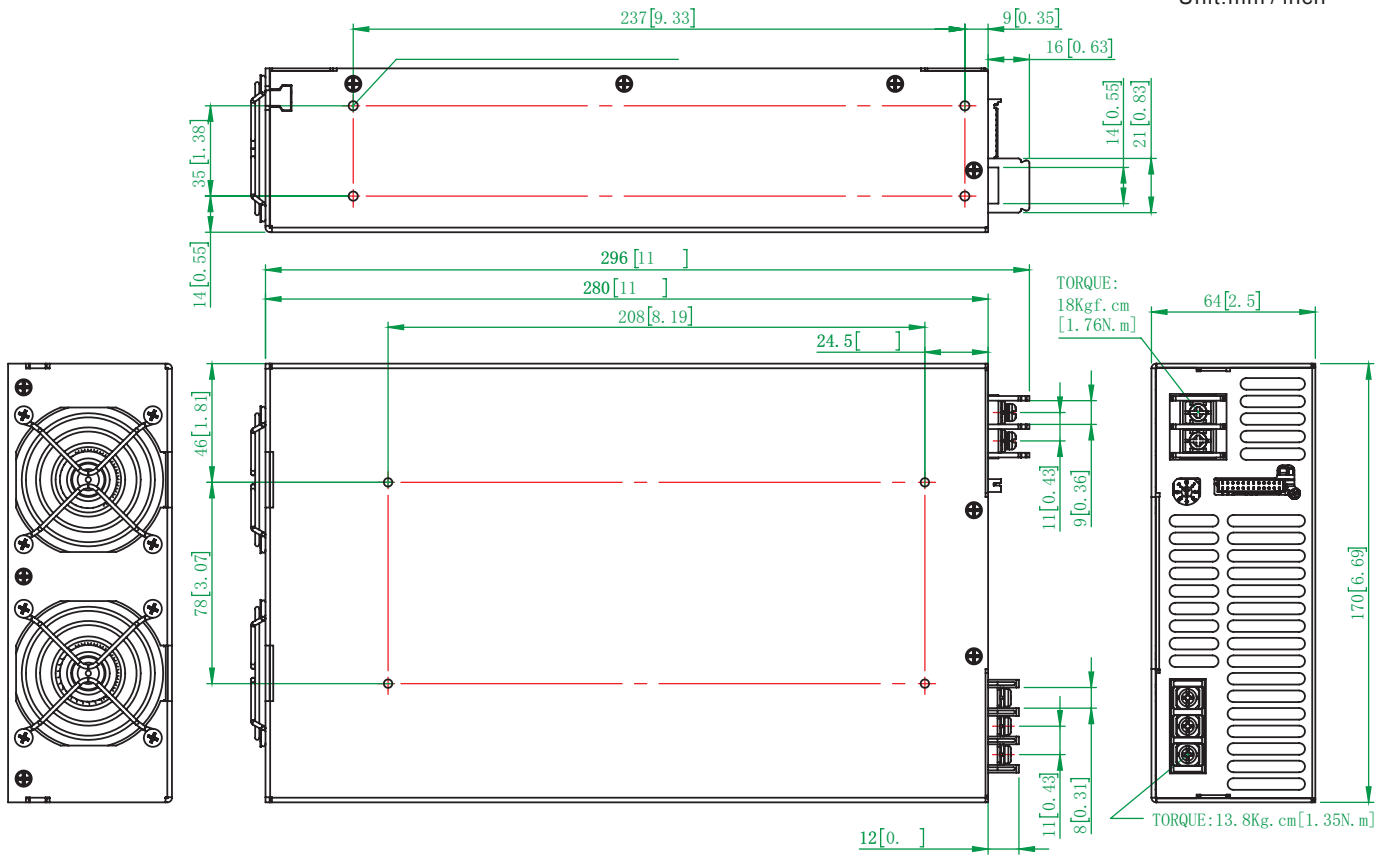
Notes : 1. This test is done without enclosure: I/P-O/P 4242VDC. If with enclosure: I/P-O/P 2121VDC,I/P-FG:2121VDC, O/P-FG: 707VDC

ENVIRONMENT

Operating Temperature	-25 ~ +60°C (Refer to load de-rating curve)
Temperature Derating	See Derating Curve
Vibration	10 ~ 500Hz, 2G 10min./1 cycle, period for 60min. each along X, Y, Z axes Compliance to IEC 68-2-6, IEC 68-2-64
Dimensions	170 x 64 x 280mm 6.69 x 2.5 x 11.02 inch
Cooling	Load and temperature control fan
Relative Humidity	20% to 90%, non-condensing
Storage Temperature and Humidity	-40 ~ +85°C, 10 ~ 95% RH
Weight & Packing	2.6kg 6pcs/carton, 16.6kg/1.86CUFT

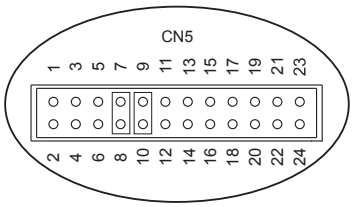
MECHANICAL DRAWING

Unit:mm / inch



Pin No.	Assignment
L	ACL
N	ACN
⏚	⏚

Note: Recommended screw length is measured from the power supply surface AC Input Terminal Pin No. Assignment



Control pin number assignment (CN5): JST S24B-PHDSS or equivalent

Pin No.	Assignment	Pin No.	Assignment	Pin No.	Assignment	Mating Housing / Contact	
1	AUX	9	EN+	17	NC.	JST PHDR-24VS or equivalent	JST SPHD-002T-P0.5 or equivalent
2	GND	10	AUX	18	NC.		
3	POK	11	ACI	19	+5VC		
4	GND	12	GND	20	GND1		
5	PAR	13	VCI	21	SCL		
6	VSET	14	GND	22	SDA		
7	EN-	15	AUX	23	DA-		
8	GND	16	GND	24	DA+		

CN5 Function:

Pin No.	Function	Description	Pin No.	Function	Description
1	AUX	+5V / 0.5A or +9V / 0.3A Auxiliary power	13	VCI	V Program
2	GND	Ground	14	GND	Ground
3	POK	Power OK	15	AUX	+5V / 0.5A or +9V / 0.3A Auxiliary power
4	GND	Ground	16	GND	Ground
5	PAR	Parallel operation current share	17	NC.	
6	VSET	Aux output setting	18	NC.	
7	EN-	Inhibit ON/OFF (-)	19	+5VC	+5V power supply ,needs to be used with GND1
8	GND	Aux output setting	20	GND1	Ground ,needs to be used with +5VC
9	EN+	Inhibit ON/OFF (+)	21	SCL	Serial Clock for I²C interface
10	AUX	+5V / 0.5A or +9V / 0.3A Auxiliary power	22	SDA	Serial Data for I²C interface
11	ACI	I Program	23	DA-	For RS485 Data- Interface
12	GND	Ground	24	DA+	For RS485 Data+ Interface

LED STATUS INDICATOR

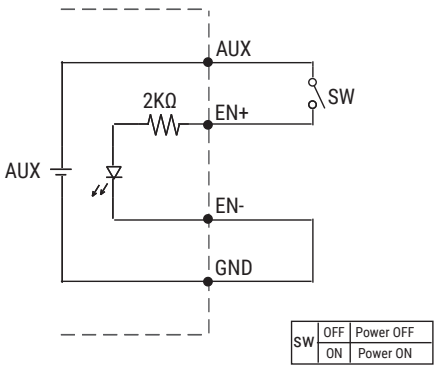
LED	LED Signal	Status
Solid(Green)		Power OK (Local mode)
Solid(Orange)		Power OK (Remote mode)
Slow Blink(Green)		Power Standby (Local mode)
Slow Blink(Orange)		Power Standby (Remote mode)
Fast Blink(Red)		Over Voltage Protection (OVP)
Solid(Red)		Over Load Protection (OLP)
Slow Blink(Red)		Over Temperature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

*Local mode : Use ACI/VCI to control output current and voltage.

Remote mode : Use RS-232/485 or I²C command to control output current and voltage.

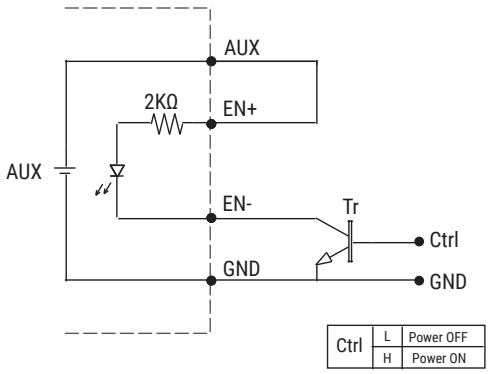
REMOTE ON/OFF

(A) Default Setting



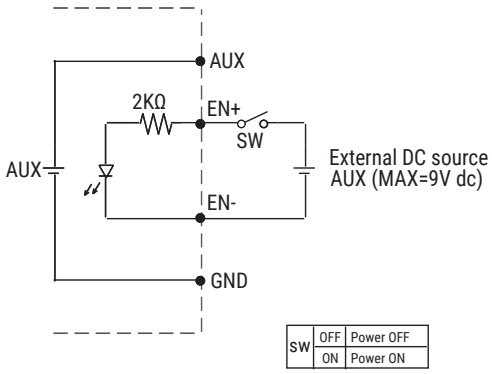
(A) Using internal 5V auxiliary source

(B)



(B) ON / OFF Control by NPN transistor

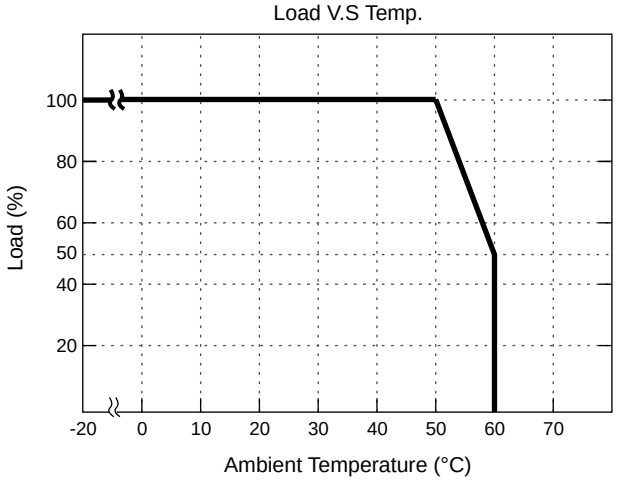
(C)

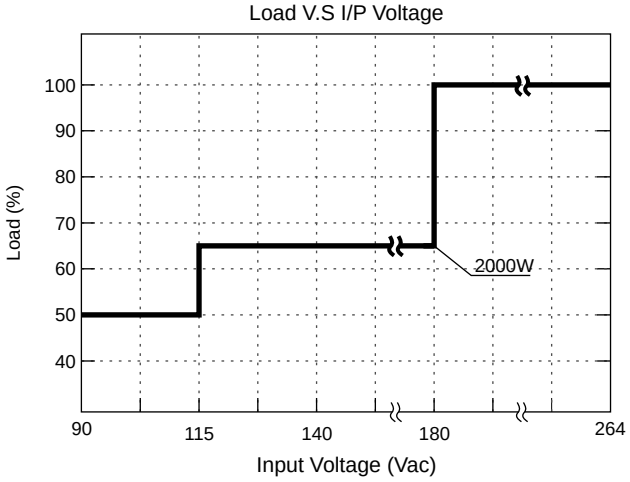


(C) Using external voltage source

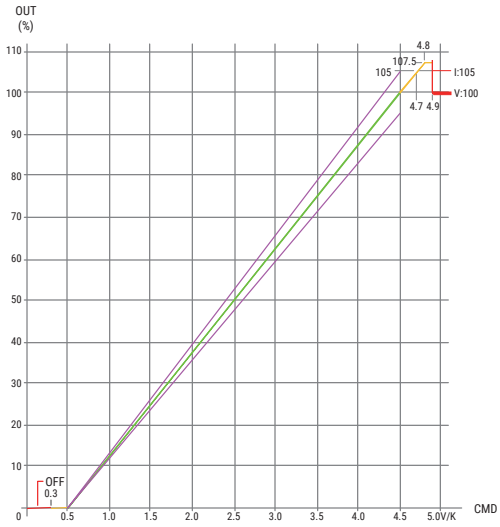
GND shown in above diagram is referring to the GND of CN2, not the Grounding from main power(NEG-).

DERATING CURVE



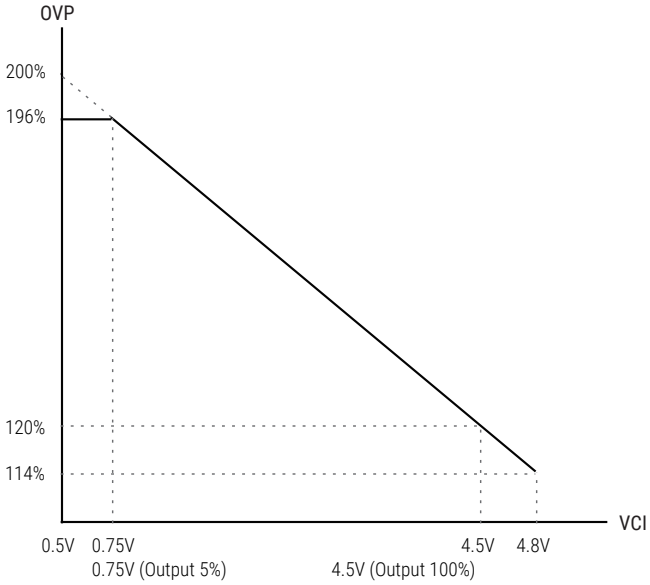


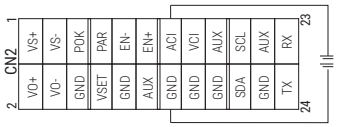
CMD vs Output Curve



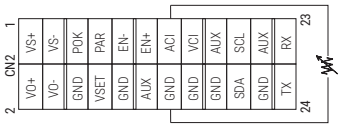
To ensure the power supply output voltage and current could be accurately adjusted, please make sure to adjust the output voltage and current > 10% vs. the rated voltage and current. (e.g. for a 300V unit, please adjust the DC output voltage above 30V to ensure accuracy; same applies to the output current)

VCI vs OVP Curve

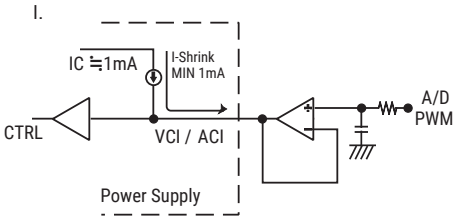


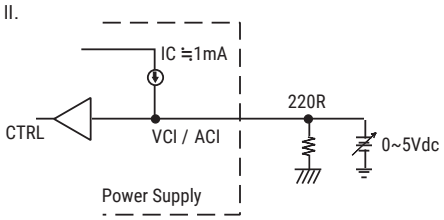


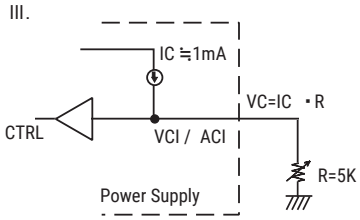
Extemal Voltage (VDC)



Extemal Resistor (KΩ)



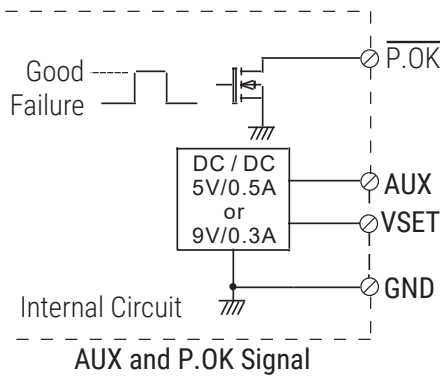




Power OK Signal & Auxiliary Power Setting

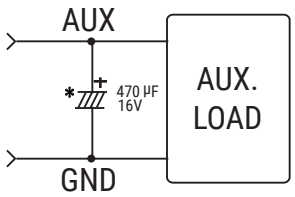
*The grounding of "AUX" power and P.OK signal should be connected to "GND" port. If "VO-" is connected as Grounding, make sure to short the GND and VO- ports.

Open drain signal low when PSU turns on. Max.
P.OK sink current: 20mA, Max, drain voltage: 40V.



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

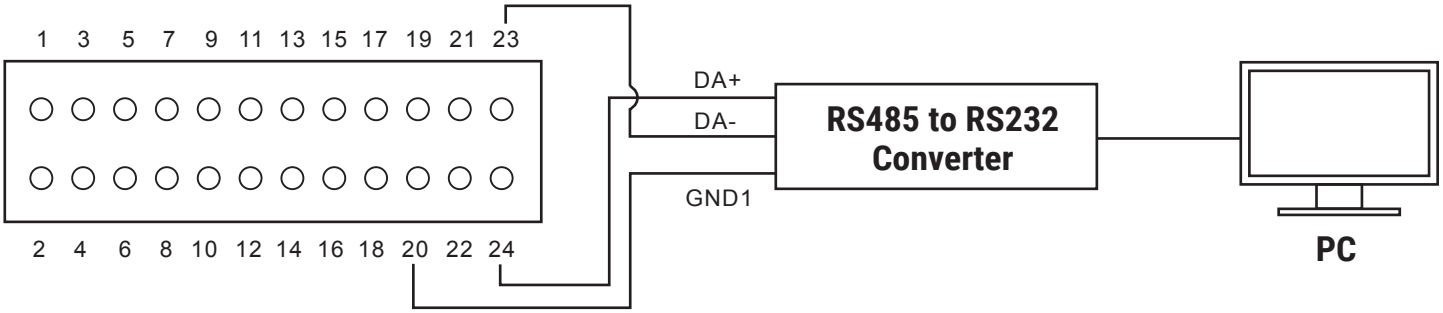
*Place an additional capacitor to have a better performance of auxiliary power operation.



Do NOT exceed 5V/0.5A or 9V/0.3A

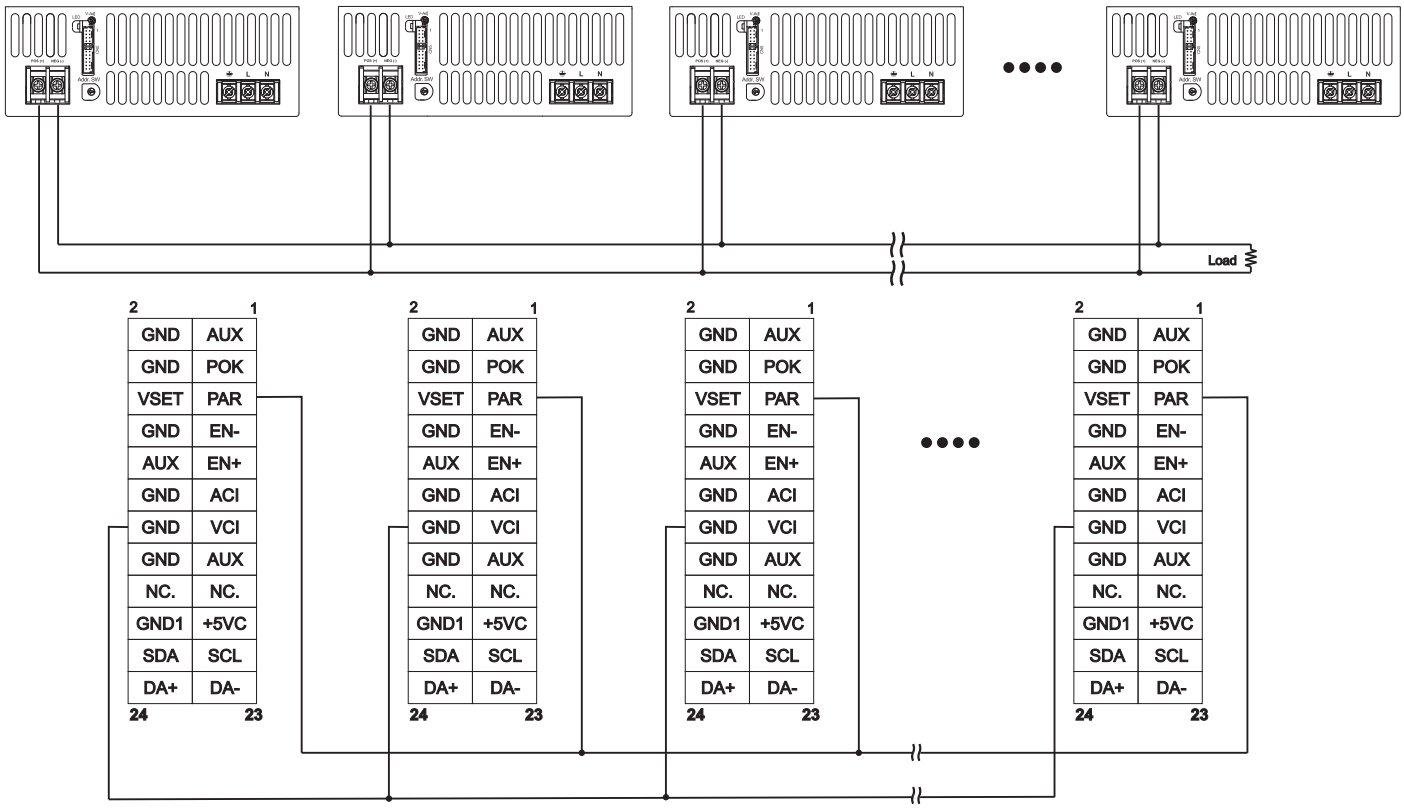
GND shown in above diagram is referring to the GND of CN2, not the Grounding from main power(NEG-)

RS485 Communication Connection Diagram



Note: Make sure GND1 (pin 20) is connected to the external communication kit when using RS485 / I^2C

CURRENT SHARING



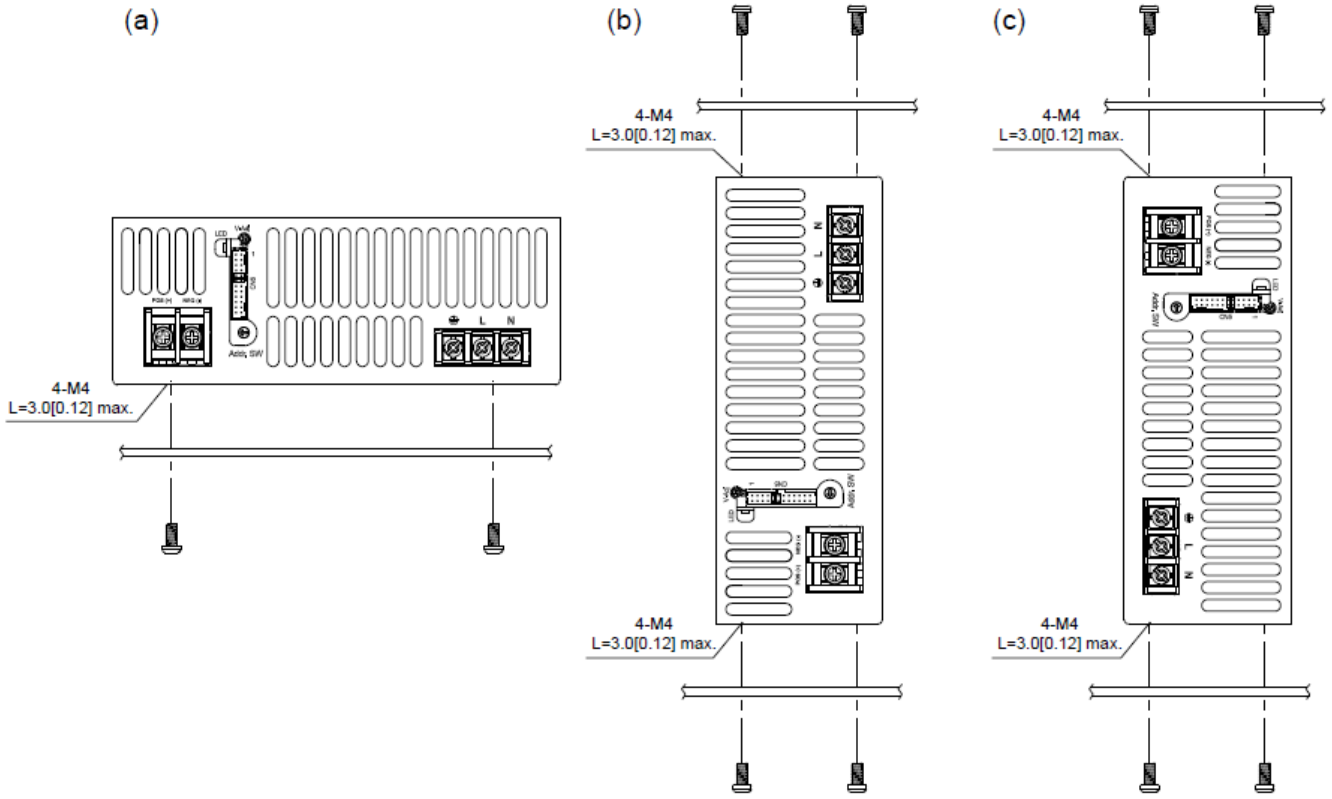
Remarks:

1. AEK-3000-HV Oring diode has the built-in active current sharing function to support max. of 8pcs connected in parallel condition to support higher output power. When performing parallel connection, make sure to note the followings:
   a. Please connect PAR pins together for current sharing function
   b. Among the parallel connection units, output voltage difference of each PSU should be <0.2VDC (This can be set via V-adj from the PSU front panel VR)
   c. Total output current must not exceed 90% of the rated power in parallel condition
      Maximum output current at parallel condition = rated current per unit x number of unit x 0.9
   d. To ensure current share balance, output current of each unit must be >10% vs. the rated output current

2. For Series connection, please find some of the remarks as follow:
   a. Max. units for series connection is 2pcs
   b. Total output current must not exceed 90% of the rated power in series condition
      maximum output current at series condition = rated current per unit x 0.9
   c. Make sure to isolate all the signals from CN5, except I^2C/RS485, Pin 19, 20 and +5VC

MOUNTING INSTRUCTIONS

Recommended standard mounting configurations



Notes:
1. Recommended screw length is measured from the power supply surface.
2. Ventilating holes on the front and back side panels should not be obstructed. Allow min. 50mm space for air flow. See below.
3. Recommended torque of M4 mounting screws is 1.27N • m (13.0kgf • cm)