

SL POWER TF3000HV SERIES

3000 Watts Single Output
Industrial Grade



Industrial



AT A GLANCE

Total Power

Up to 3000 Watts

Input Voltage

90 to 264 VAC

of Outputs

Single

SPECIAL FEATURES

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

- RoHS Compliant
- Global Control via RS232

SAFETY

- EN/UL62368-1



ELECTRICAL SPECIFICATIONS

| Input | |
|--|--|
| Input Voltage and Frequency ¹ | 90 to 264 VAC, 47 to 63 Hz, 1Ø 127 to 370 VDC |
| Input Current | 19.7 A @ 115 VAC (2000 W output), 14.5 A @ 230 VAC (3000 W output) |
| Inrush Current | 33 A/115 VAC, 65 A/230 VAC |
| Efficiency | See Model Selection Table |
| Power Factor | 0.95/230 VAC, 0.98/115 VAC at full load |
| Leakage Current | <3.5 mA/240 VAC |
| Output | |
| Output Voltage | See Model Selection Table |
| Output Power ¹ | 3000 W continuous - see models chart for specific voltage model ratings |
| Voltage Range | ±5.0% typical adjustment by potentiometer (VR1) |
| Voltage Tolerance | See Model Selection Table |
| Hold-Up Time | 14 mS/230 VAC at full load |
| Turn On Time | 1100 mS |
| Rise Time | 300 mS at full load |
| Ripple and Noise | See Model Selection Table |
| Line/Load Regulation | See Model Selection Table |
| Auxiliary Signals | |
| Auxiliary Power | Selectable +5 V/0.5 A or +9 V/0.3 A auxiliary output |
| Remote On / Off Control | By external switch |
| Power OK Signa | Open drain signal low when PSU turns on. Max sink current: 20 mA. Max drain voltage: 40 V |
| Output Voltage Trim | Adjustment of output voltage is between 0 to 105% of rated output |
| Output Current Trim | Adjustment of output voltage is between 0 to 105% of rated output |
| Parallel (Current Sharing) ² | Please refer to current sharing with remote sensing (parallel connection) diagram |
| Reliability | |
| MTBF | >112,000 hours per MIL-HDBK-217F |
| 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 |
| Overload Protection | 105% of rated power, constant current type |
| Overtemperature Protection | 85±5°C measured on NTC, auto-recovery |
| Safety | |
| Safety Certifications | EN62368-1, UL62368-1 |
| Isolation Specifications | |
| Isolation ³ | Input-Output: 3000 VAC Input-Ground: 1500 VAC Output-Ground: 500 VAC |
| Isolation Resistance | I/P-O/P, I/P-FG, O/P-FG: 100 Mohms/500 VDC |

Notes:

1. Derating may apply in low input voltage. Please check the derating curve for details.

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

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

EMI/EMC COMPLIANCE

| | |
|--|---|
| Conducted Emissions | Certified EN55022; EN61204-3; EN61000-6-3 |
| Radiated Emissions | Certified EN55022; EN61204-3; EN61000-6-3 |
| 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)/Burst | 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/IEC/EN61000-4-11 |
| Harmonic Current Emissions | EN61000-3-2 |
| Flicker Test | EN61000-3-3 |

Note:

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.

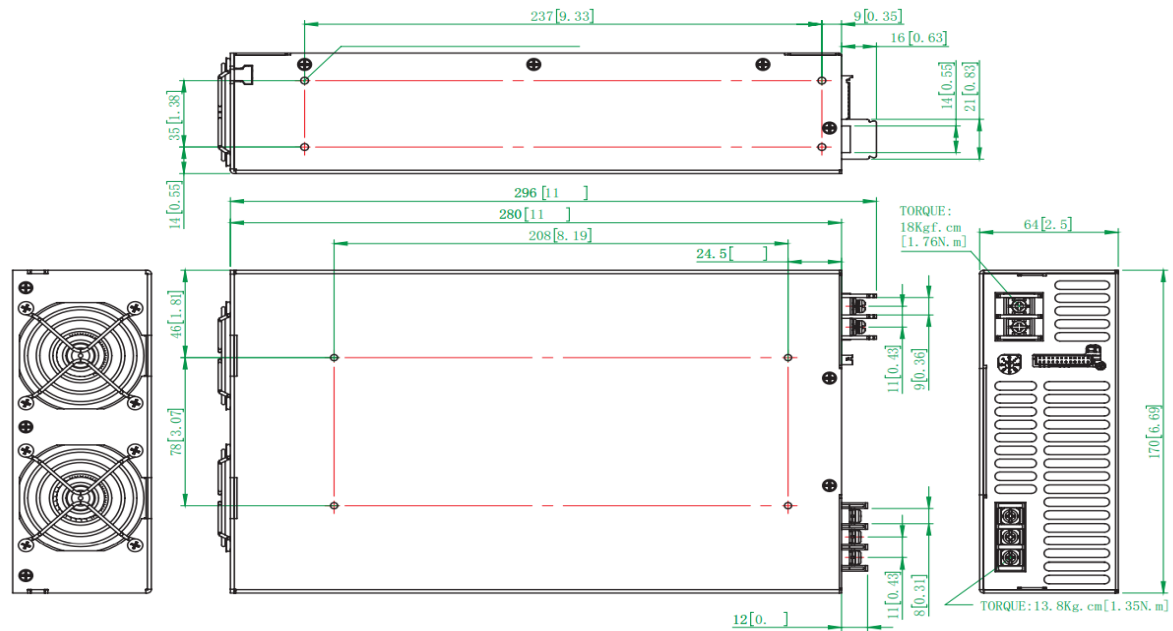
ENVIRONMENTAL SPECIFICATIONS

| | |
|----------------------------------|--|
| Operating Temperature | -25°C to +60°C (Refer to load de-rating curve) |
| Temperature Derating | See derating curve |
| Vibration | 10 to 500 Hz, 2 G 10 min./1 cycle, period for 60 min. each along X, Y, Z axes Compliance to IEC68-2-6, IEC68-2-64 |
| Dimensions | 170 x 64 x 280 mm (6.69 x 2.5 x 11.02 in) |
| Cooling | Load and temperature control fan |
| Relative Humidity | 20% to 90%, non-condensing |
| Storage Temperature and Humidity | -40 to +85°C, 10 to 95% RH |
| Weight & Packing | 2.6 kg 6 pcs/carton, 16.6 kg/1.86 CUFT |

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 4 |
| 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 |

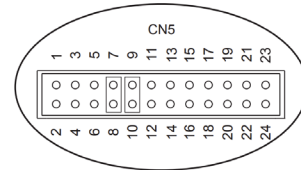
MECHANICAL DRAWING



Unit: mm / inch

Recommended screw length is measured from the power supply surface.

| Pin No. | Assignment |
|---------|------------|
| L | VS+ |
| N | VO+ |
| | |



| 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+ | | |

MECHANICAL DRAWING (CONTINUED)

| CN5 Function | | | | | |
|--------------|----------|--|---------|----------|---|
| Pin No. | Function | Description | Pin No. | Function | Description |
| 1 | AUX | +5 V / 0.5 A or +9 V / 0.3 A auxiliary power | 13 | VCI | V program |
| 2 | GND | Ground | 14 | GND | Ground |
| 3 | POK | Power OK | 15 | AUX | +5 V / 0.5 A or +9 V / 0.3 A auxiliary power |
| 4 | GND | Ground | 16 | GND | Ground |
| 5 | PAR | Parallel operation current share | 17 | NC. | 13 |
| 6 | VSET | Aux output setting | 18 | NC. | 14 |
| 7 | EN- | Inhibit ON/OFF (-) | 19 | +5VC | +5 V power supply, needs to be used with GND1 |
| 8 | GND | Ground | 20 | GND1 | Ground, needs to be used with +5VC |
| 9 | EN+ | Inhibit ON/OFF (+) | 21 | SCL | Serial clock for I ² C interface |
| 10 | AUX | +5 V / 0.5 A or +9 V / 0.3 A auxiliary power | 22 | SDA | Serial data for I ² C interface |
| 11 | ACI | I program | 23 | DA- | For RS485 data- interface |
| 12 | GND | Ground | 24 | DA+ | For RS485 data+ interface |

LED STATUS INDICATOR

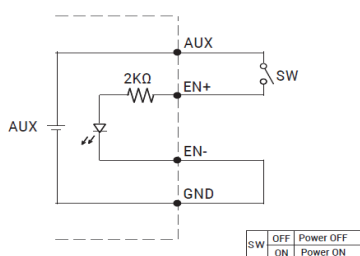
| LED | LED Signal | Status |
|--------------------------|------------|-----------------------------------|
| Solid (Green) | | Power OK (Local Mode) |
| Solid (Orange) | | Power OK (Remote Mode) |
| Slow Blink (Green) | | Power Standby (Local mode) |
| Slow Blink (Orange) | | Power Standby (Remote mode) |
| 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.

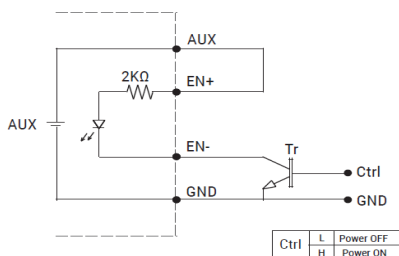
REMOTE ON/OFF

(A) Default Setting



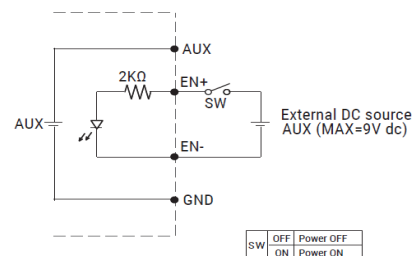
(A) Using internal 5V auxiliary source

(B)



(B) ON / OFF Control by NPN transistor

(C)



(C) Using external voltage source

Note:

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

MODEL SELECTION

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

Notes:

1. Other output voltages available, consult factory.

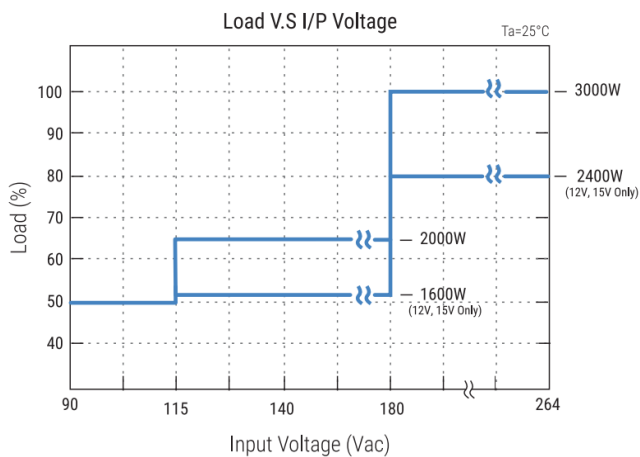
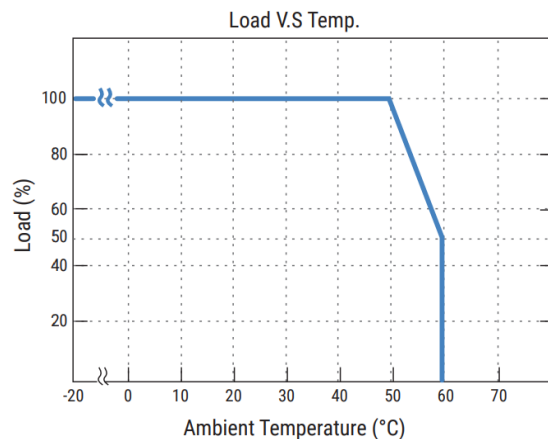
2. Ripple & noise are measured at 20 MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 uF & 47 uF parallel capacitor.

3. Tolerance: includes setup time tolerance, line regulation and load regulation.

4. All specifications are typical at 230 VAC, full load, at 25°C ambient unless noted.

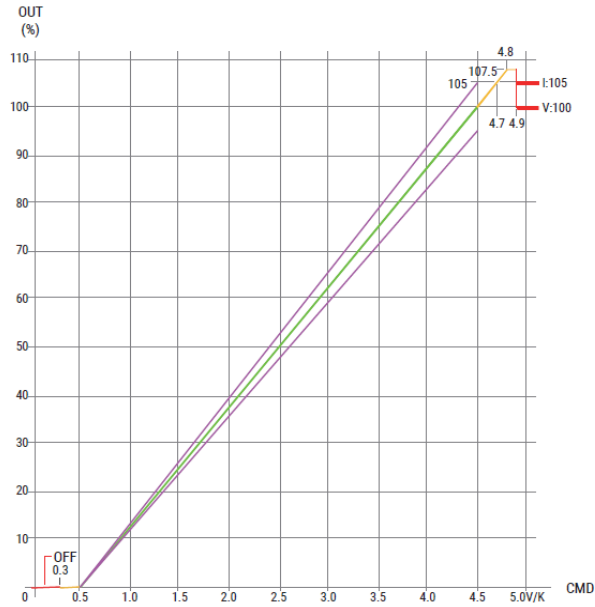
5. De-rating may apply in low input voltage. Check the derating curve for details

DERATING CURVE

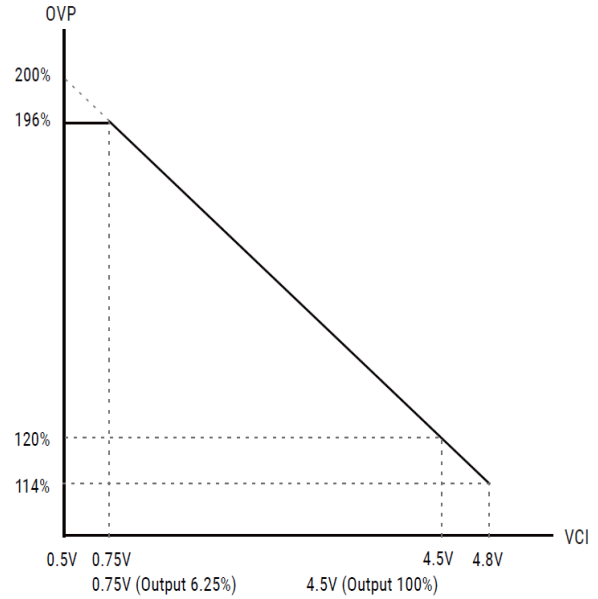


DERATING CURVE (CONTINUED)

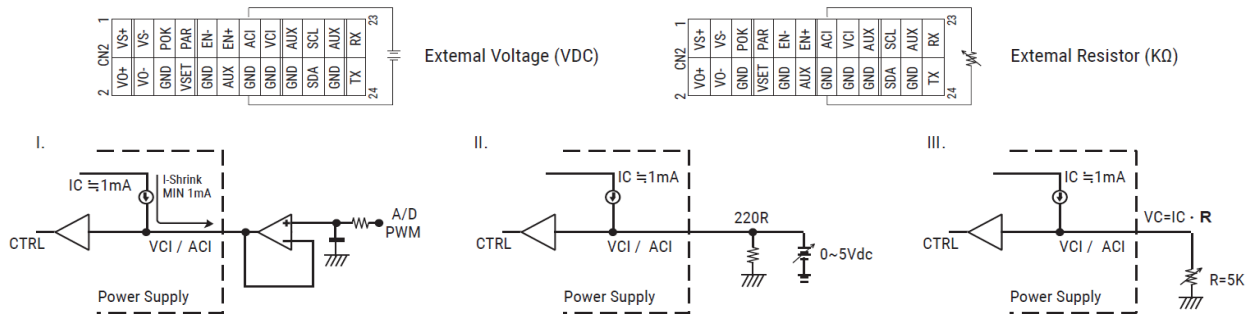
CMD vs Output Curve



VCI vs OVP 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 24 V unit, please adjust the DC output voltage above 2.4 V to ensure accuracy; same applies to the output current)



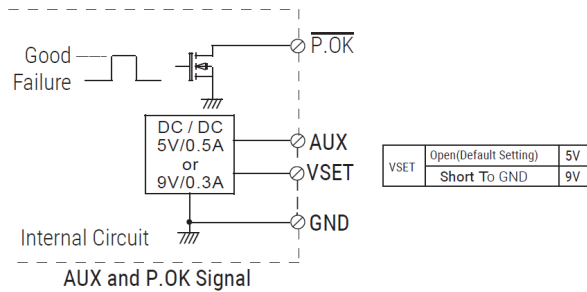
DERATING CURVE (CONTINUED)

Power OK Signal & Auxiliary Power Setting

The grounding of "AUX" power and P.O.K 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.

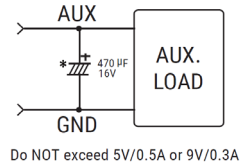
P.O.K sink current: 20 mA, Max, drain voltage: 40 V.



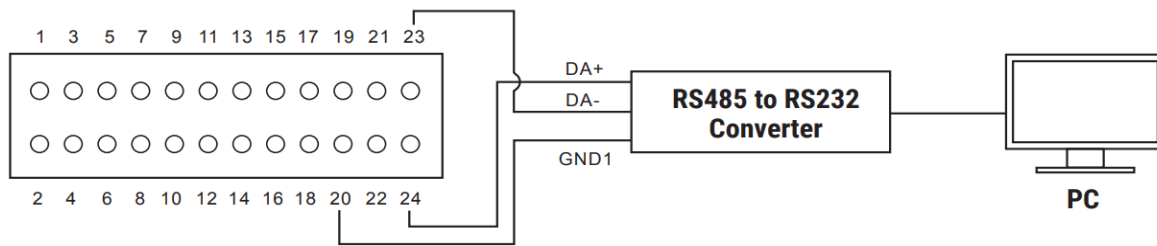
Note:

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

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



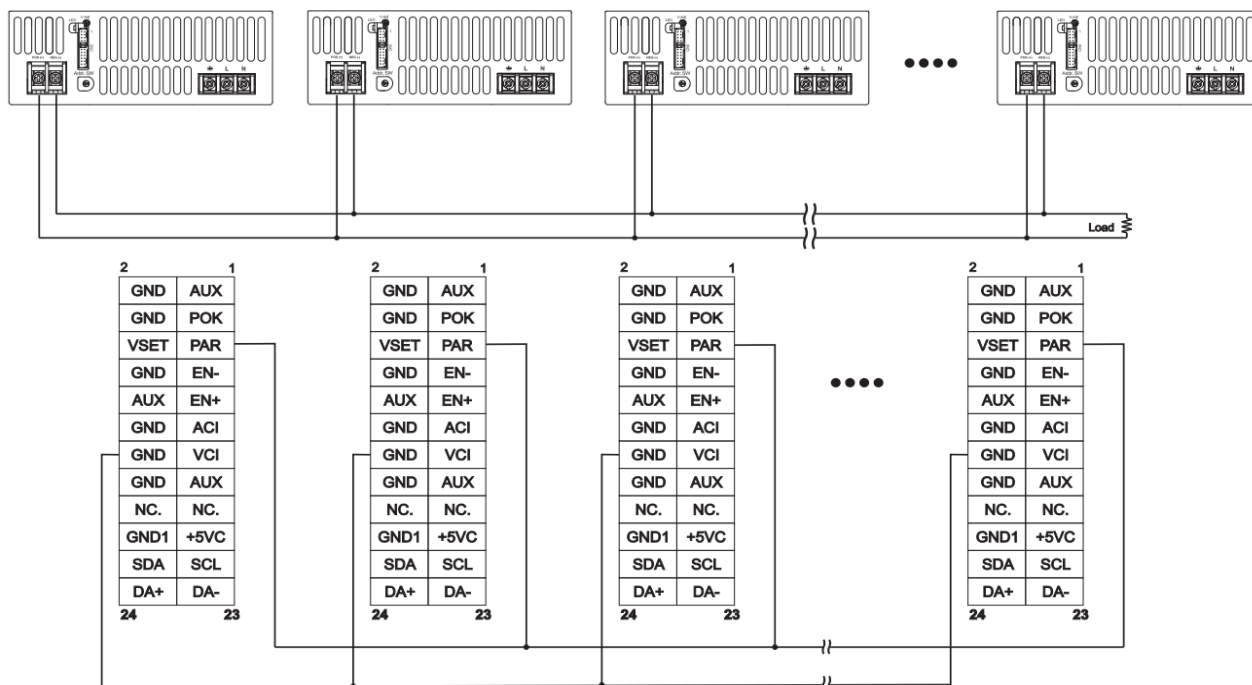
RS485 Communication Connection Diagram



Note:

Make sure GND1 (pin 20) is connected to the external communication kit when using RS485 / I²C.

CURRENT SHARING

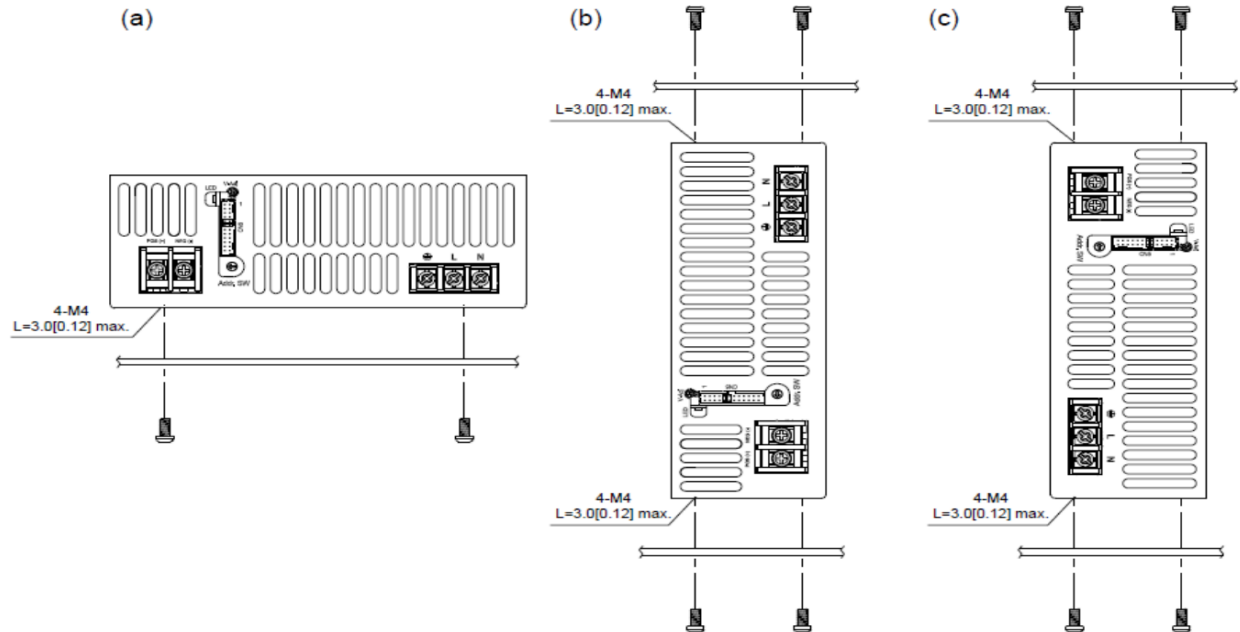


Remarks:

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 <0.2 VDC (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 I²C/RS485, Pin 19, 20 and +5VC

MOUNTING INSTRUCTIONS

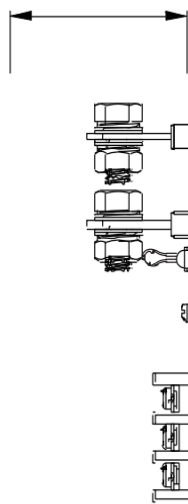
Recommended Standard Mounting Configurations:



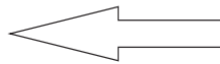
Notes:

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. 50 mm space for air flow. See below.
3. Recommended torque of M4 mounting screws is 1.27 N · m (13.0 kgf · cm).

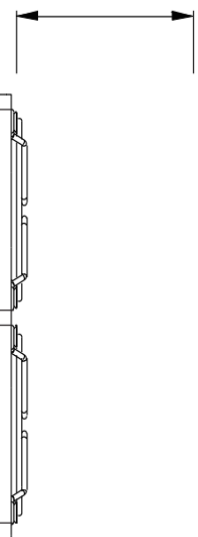
More than 50mm



Air flow



More than 50mm



Disclaimer: The information and specifications contained herein are believed to be correct at the time of publication. However, AE accepts no responsibility for consequences arising from reproduction errors or inaccuracies. Specifications are subject to change without notice.



For international contact information,
visit advancedenergy.com.

powersales@aei.com (Sales Support)
productsupport.ep@aei.com (Technical Support)
+1 888 412 7832

ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE | TRUST

Specifications are subject to change without notice. Not responsible for errors or omissions. ©2023 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy®, and AE® are U.S. trademarks of Advanced Energy Industries, Inc.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

SL Power:

[TF3000A150K](#) [TF3000A200K](#) [TF3000A250K](#) [TF3000A300K](#) [TF3000A400K](#)