UL62368-1 IEC62368-1

Size:
11.02in x 6.69in x 2.52in
280mm x 170mm x 64mm

Weight
7.28lbs (3.3kg)

FEATURES

- Universal AC Input/Full Range
- 3000 Watts Output Power
- High Efficiency up to 92%
- Constant Current Limit
- Global Control via RS232/RS485
- Power OK Signal & Remote ON/OFF Function
- EN 62368-1, UL 62368-1 Safety Approvals
- Remote Setting Multiple PSU via RS232, RS485 & I²C
- Programmable Output Voltage (0~105%)
- Programmable Output Current (0~105%)
- Single Outputs Ranging from 150VDC to 400VDC
- Selectable +5V/0.5A or +9V/0.3A Auxiliary Output
- Forced Current Sharing at Parallel Operation
- Built-In Active PFC Function and ORing Diode
- Built-In I2C and RS485 Communication Interface
- Protection: OLP, OVP, OTP, SCP, Fan Failure

DESCRIPTION

The PSAEK3000HV-OR series of AC/DC switching power supplies provides 3000 Watts of output power in an 11.02" x 6.69" x 2.52" enclosed case. This series consists of single output models ranging from 150VDC to 400VDC with a universal input voltage range of 90~264VAC (127~370VDC). Standard features include high efficiency up to 92%, programmable output voltage and output current, remote on/off, active PFC function, and ORing diode. This series also has over temperature, over voltage, over load, and short circuit protection as well as EN 62368-1 and UL 62368-1 safety approvals.

MODEL SELECTION TABLE

Model Number	Input Voltage (1)	Output Voltage	Output Current	Line Regulation	Load Regulation	Output Power	Ripple & Noise (2)	Max. Efficiency
PSAEK-3000HVOR-150	90~264 VAC (127~370 VDC)	150VDC	20A	±1.0%	±1.0	3000W	1500mVp-p	91%
PSAEK-3000HVOR-200		200VDC	15A	±1.0%	±1.0	3000W	2000mVp-p	91%
PSAEK-3000HVOR-250		250VDC	12A	±1.0%	±1.0	3000W	2500mVp-p	91%
PSAEK-3000HVOR-300		300VDC	10A	±1.0%	±1.0	3000W	3000mVp-p	92%
PSAEK-3000HVOR-400		400VDC	7.5A	±1.0%	±1.0	3000W	4000mVp-p	92%

SPECIFICATIONS: PSAEK3000HV-OR SERIES

All specifications are based on 25°C Ambient Temperature, 230VAC Input, and Rated Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
INPUT SPECIFICATIONS					
Input Voltage (See Note 1)	AC input voltage range	90		264	VAC
	DC input voltage range	127		370	VDC
Input Frequency		47		63	Hz
AC Current	At 115VAC (2000W)		19.7		A
	At 230VAC (3000W)		14.5		
Inrush Current	At 115VAC and cold start		33		A
	At 230VAC and cold start		65		
Power Factor	At 115VAC and full load	0.98			
	At 230VAC and full load	0.95			
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Voltage Tolerance	Rated output voltage of single unit	-2.0		+2.0	%
Voltage Adjustment Range	Typical adjustment by potentiometer. Via V-Adj from PSU front panel	-5.0		+5.0	%
Line Regulation	Low Line to High Line	-1.0		+1.0	%
Load Regulation	0% to 100% full load	-1.0		+1.0	%
Output Power		See Table			
Output Current		See Table			
Current Tolerance	Rated output current of single unit	-3		+3	%
Ripple & Noise (20MHz BW)	Measured with 0.1µF and 47µF capacitors in parallel	See Table			
Hold-up Time	At 230VAC and full load		14		ms
Setup Time	full load		1100		ms
Rise Time	full load		350		ms
Temperature Coefficient	0~50°C	-0.02		+0.02	%/°C
PROTECTION					
Short Circuit Protection		Yes			
Over Voltage Protection (see page 4)	Protection type: latch-style. Recovery after reset AC power ON or inhibit	Variable OVP, Refer to VCI VS OVP curve. OVP Tolerance 7%			
Over Load Protection	Protection type: constant current limit	105% rated output power			
Over Temperature Protection	Protection type: auto-recovery after temperature goes down	85°C±5°C detect on NTC			

SPECIFICATIONS: PSAEK3000HV-OR SERIES

All specifications are based on 25°C Ambient Temperature, 230VAC Input, and Rated Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION		TEST CONDITIONS	Min	Typ	Max	Unit
GENERAL SPECIFICATIONS						
Efficiency			See Table			
Withstand Voltage[4]	Input to Output	Test is done without enclosure	3000VAC (4242VDC)			
	Input to FG		1500VAC (2121VDC)			
	Output to FG		500VAC (707VDC)			
Isolation Resistance		Input to Output, Input to FG, Output to FG	100MΩ/500VDC (25°C/70%PH)			
Leakage Current		At 240VAC			3.5	mA
FUNCTIONS						
Auxiliary Power			Selectable +5V/0.5A or +9V/0.3A aux. output			
Remote ON/OFF Control			By external switch			
Power OK Signal		Max. Sink Current: 20mA max.; Max Drain Voltage: 40V max.	Open drain signal low when PSU turns on			
Output Voltage Trim			0		105	%Vo
Output Current Trim			0		105	%Io
Parallel Operation (Current Sharing)			See page 6			
Communication Interface			Built-in RS484 and I²C. RS232 (Optional)			
Communication Protocol			RS232, RS485 and I²C			
ENVIRONMENTAL SPECIFICATIONS						
Working Temperature		See derating curve	-20		+60	°C
Storage Temperature			-40		+85	°C
Working Humidity		Non-condensing	20		90	% RH
Storage Humidity			10		95	% RH
Cooling			Load and temperature control fan			
Vibration		10~500Hz, 2G 10 min./1 cycle, period for 60 min. each along X, Y, Z axes. Compliance to IEC60068-2-6, IEC60068-2-64				
PHYSICAL SPECIFICATIONS						
Weight			7.28 lbs (3.3kg)			
Dimensions (W x H x D)		11.02in x 6.69in x 2.52in (280mm x 170mm x 64mm)				
Packing		3.3kg; 6pcs/22.7kg/2.48CUFT				
SAFETY & EMC (See Note 4)						
Safety Standards			EN 62368-1; UL 62368-1			
EMI Conduction Radiation			EN 55032			
Power Harmonic & Voltage Fluctuation and Flicker			EN61000-3-2; EN61000-3-3			
EMS Immunity		EN55024; IEC61000-4-2, 3, 4, 5, 6, 8, 11				

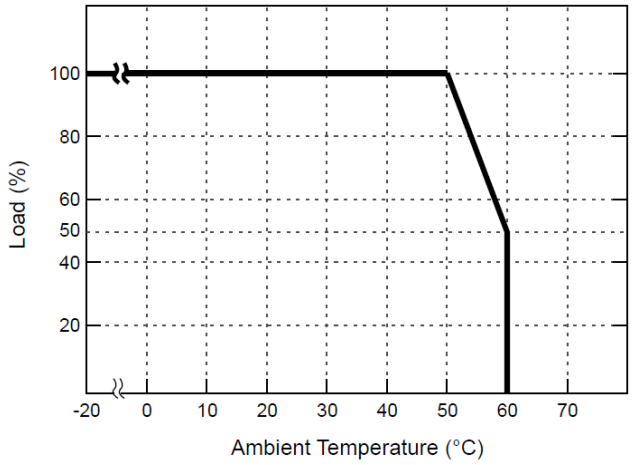
NOTES

1. Derating may apply in low input voltage. See derating curve for more details.
2. Ripple & noise is measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μF & 47μF capacitor.
3. When in parallel operation only one unit might operate if the total output load is less than 5% of the rated load condition.
4. 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
5. The power supply is considered a component which will be installed into final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
6. This product is Listed to applicable standards and requirements by UL.

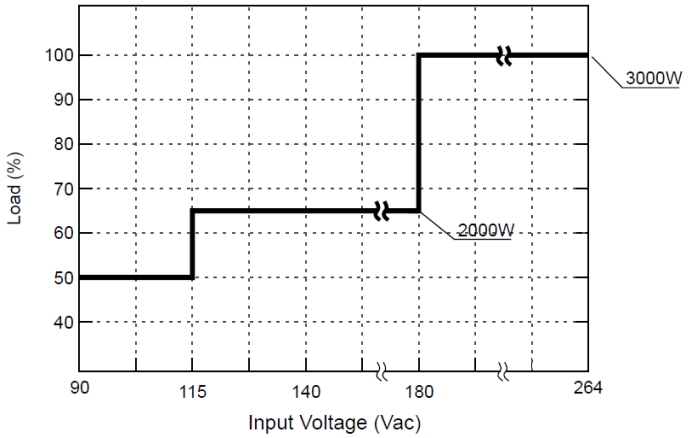
**Due to advances in technology, specifications subject to change without notice.*

CHARACTERISTIC CURVES

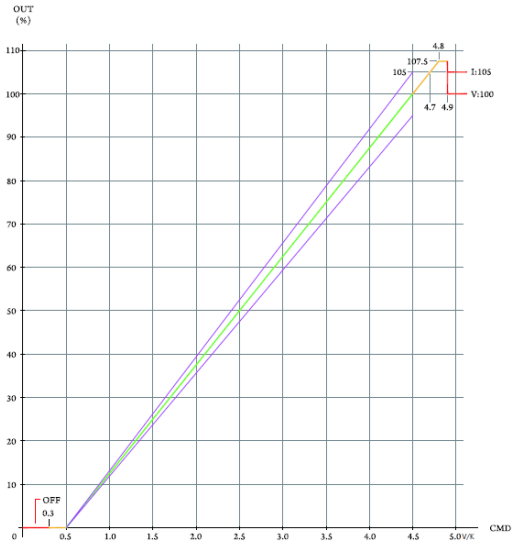
Load vs Temperature



Load vs Input Voltage

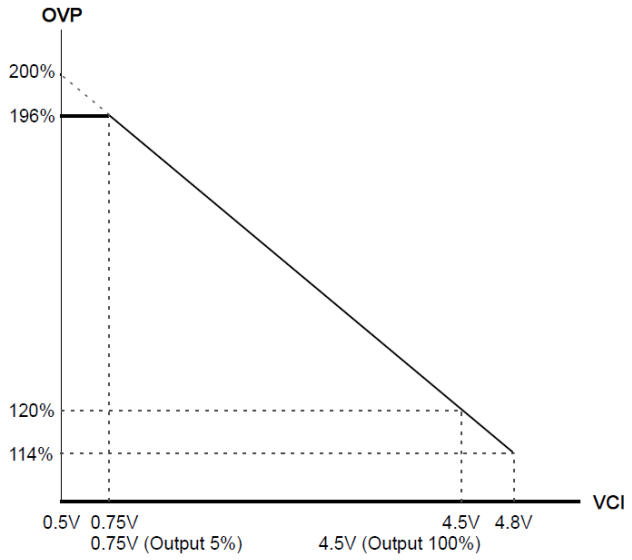


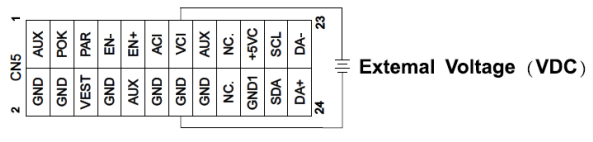
CMD vs Output Curve

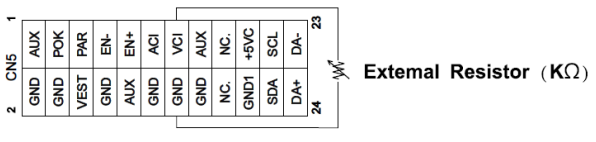


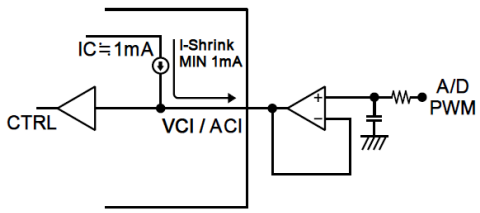
To ensure the power supply output voltage and output current can be accurately adjusted, make sure to adjust the output voltage and current >10% vs the rated voltage and current (e.g. for a 300V unit, adjust the DC output voltage above 30V to ensure accuracy; same applies to the output current

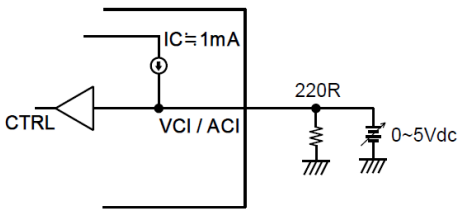
VCI vs OVP Curve

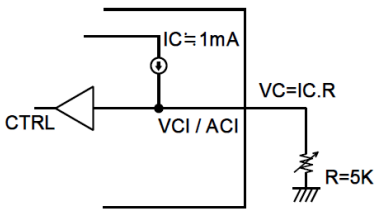




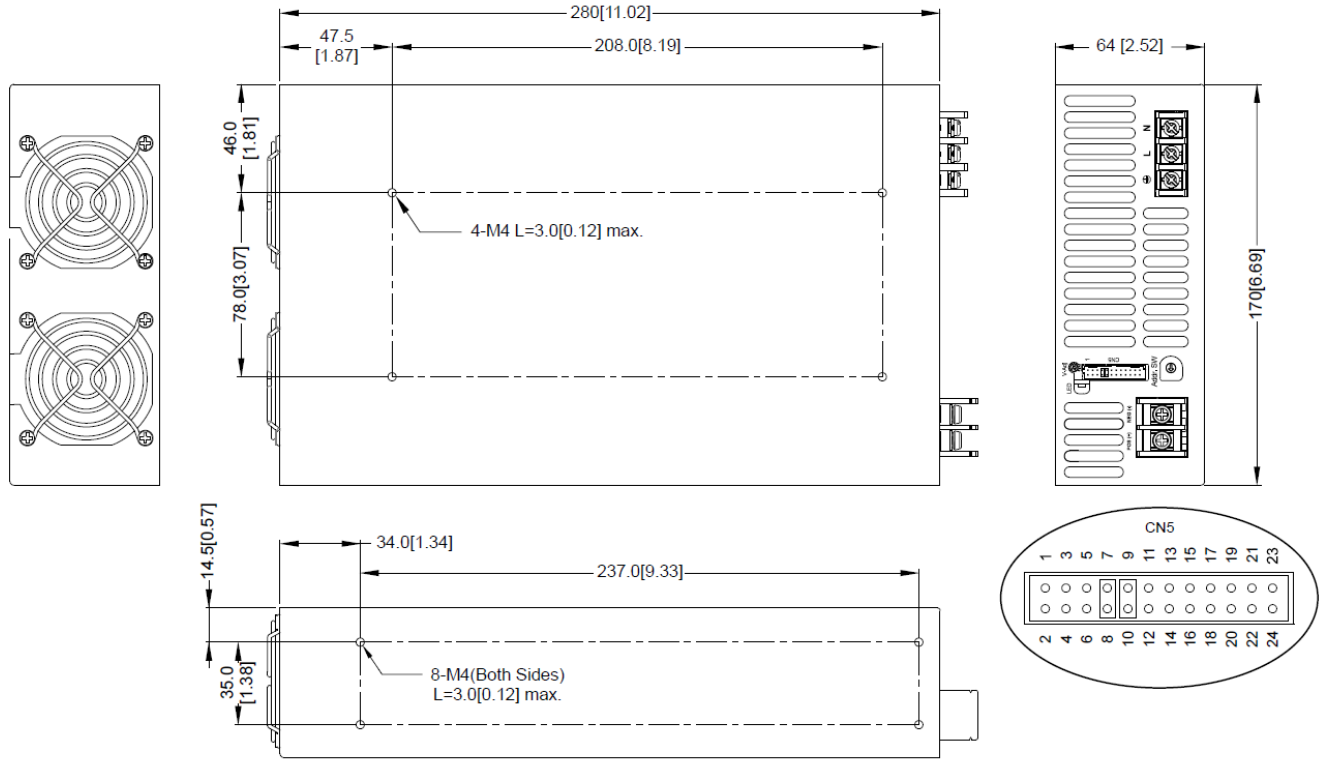








MECHANICAL DRAWING



Note:
Unit: mm/inch
Recommended screw length is measured from the power supply surface

AC Input Terminal		Control Pin Number Assignment (CN5): JST S24B-PHDSS or Equivalent							
Pin	Function	Pin	Function	Description	Pin	Function	Description	Mating Housing / Contact	
L	ACL	1	AUX	+5V/0.5A or +9V/0.3A Auxiliary Power	13	VCI	V Program	JST PHDR-24VS or equivalent	JST SPHD-002T-P0.5 or Equivalent
N	ACN	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 +5VC		
		8	GND	Aux Output Setting	20	GND1	Ground, needs to be used with +5VC		
		9	EN+	Inhibit ON/OFF (+)	21	SCL	Serial Clock for I^2C Interface		
		10	AUX	+5V/0.5A or +9V/0.3A Auxiliary Power	22	SDA	Serial Data for I^2C Interface		
		11	ACI	I Program	23	DA-	For RS485 Data- Interface		
		12	GND	Ground	24	DA	For RS485 Data+ Interface		

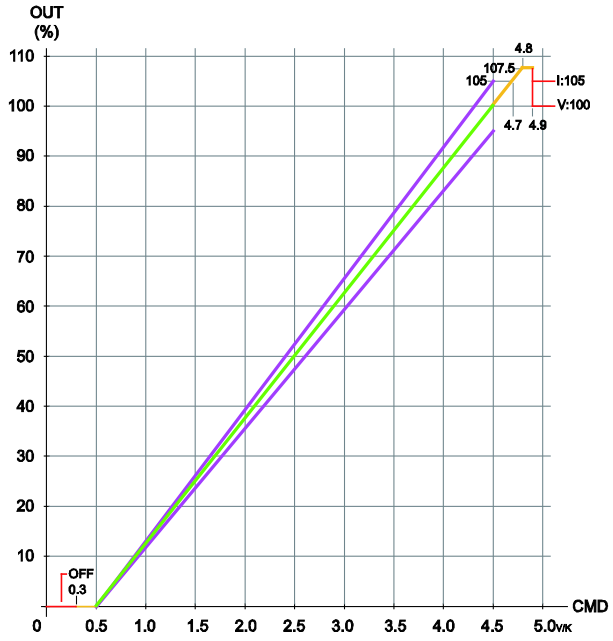
LED STATUS

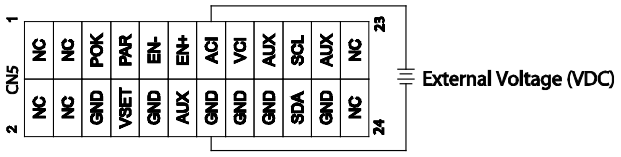
LED	LED Signal	Status
Solid (Green)		Power OK (Local Mode)
Solid (Orange)		Power OK (Remote Mode)
Slow Blink (Green)		Power Standby
Fast Blink (Red)		Over Voltage Protection (OVP)
Solid (Red)		Over Load Protection (OLP)
Slow Blink (Red)		Over Temperature Protection (OTP)
Intermittent Blink (Red)		Fan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

* Local mode: Use ACI/VCI to control output current and voltage
* Remote Mode: Use RS232 or I²C command to control output current and voltage

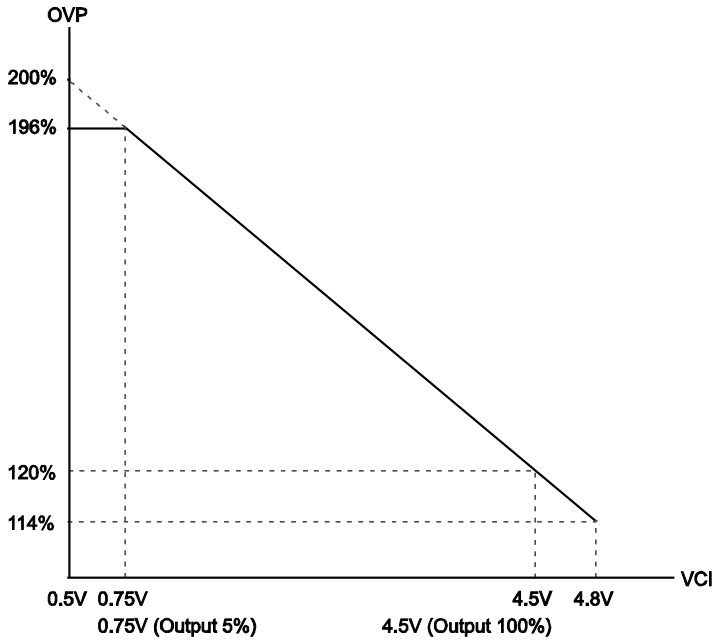
CURVES

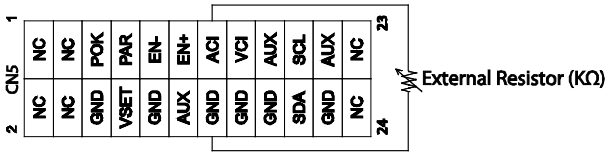
CMD vs Output Curve

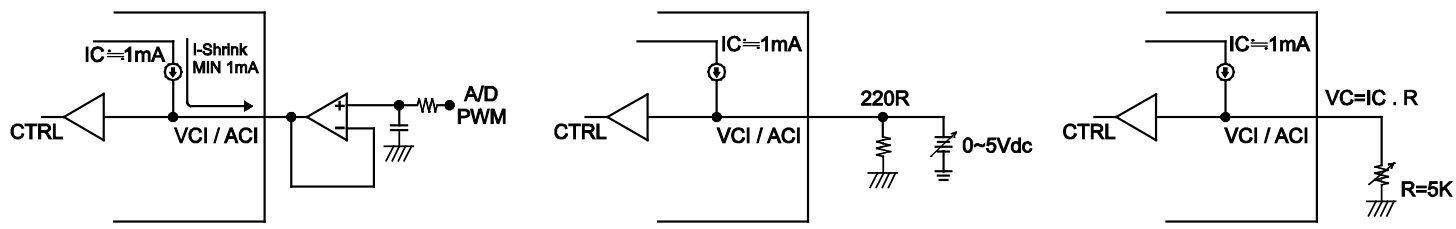




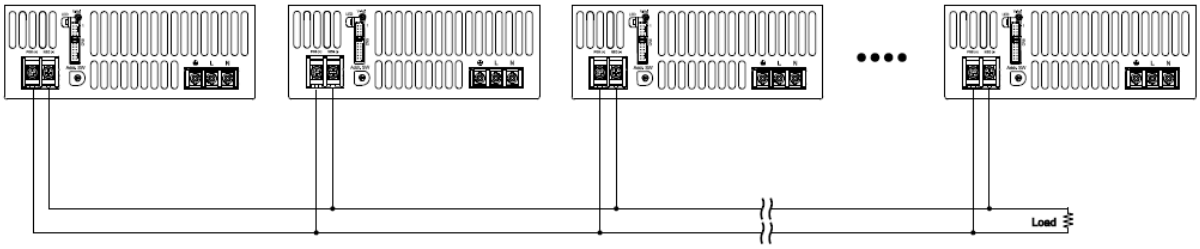
VCI vs OVP Curve

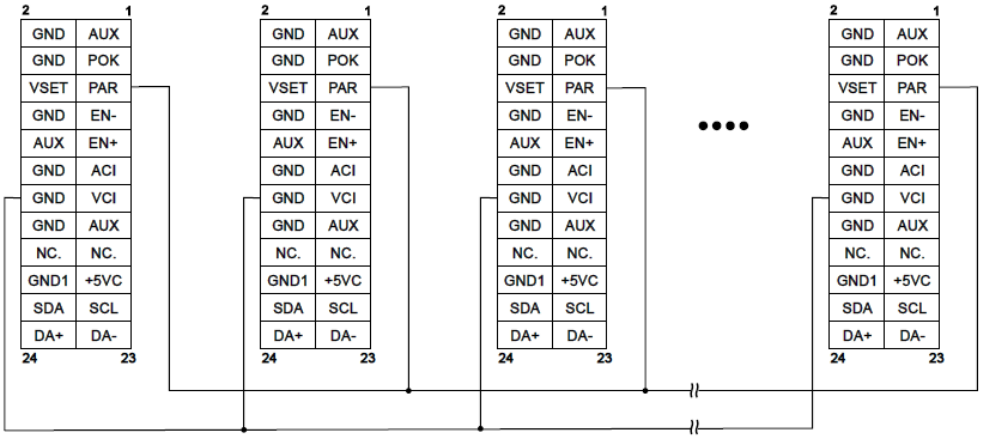






CURRENT SHARING



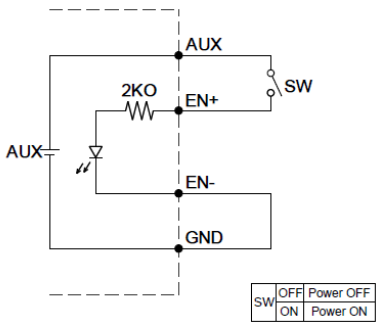


PSAEK3000HV-OR has the built-in active current sharing function to support max. of 8pcs connected in parallel condition to support higher output power. When performing parallel connection, make sure to note the followings:
a. Please connect PAR pins together for current sharing function
b. Among the 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

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

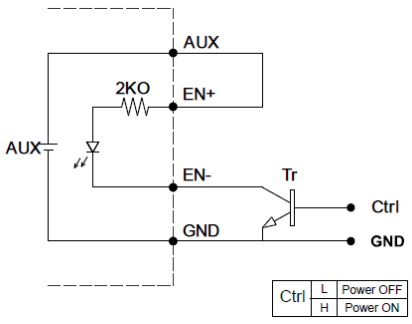
REMOTE ON/OFF

(1) Using Internal 5V Auxiliary Source

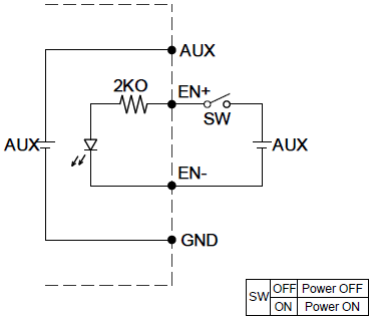


Default setting

(2) ON/OFF Control by NPN Transistor



(3) Using External Voltage Source

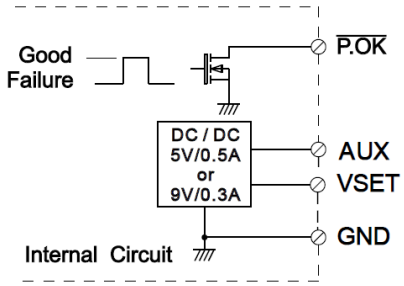


GND shown in above diagram is referring to the GND of CN5, not the Grounding from main power (NEG-)

POWER OK SIGNAL

*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.

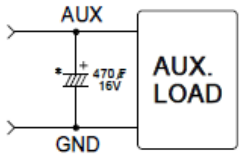
Open drain signal low when PSU turns on, Max. P.OK sink current: 20mA, Max. drain voltage: 40V



AUX and P.OK Signal

*GND shown in above diagram is referring to the GND of CN5, not the Grounding from main power (NEG-)

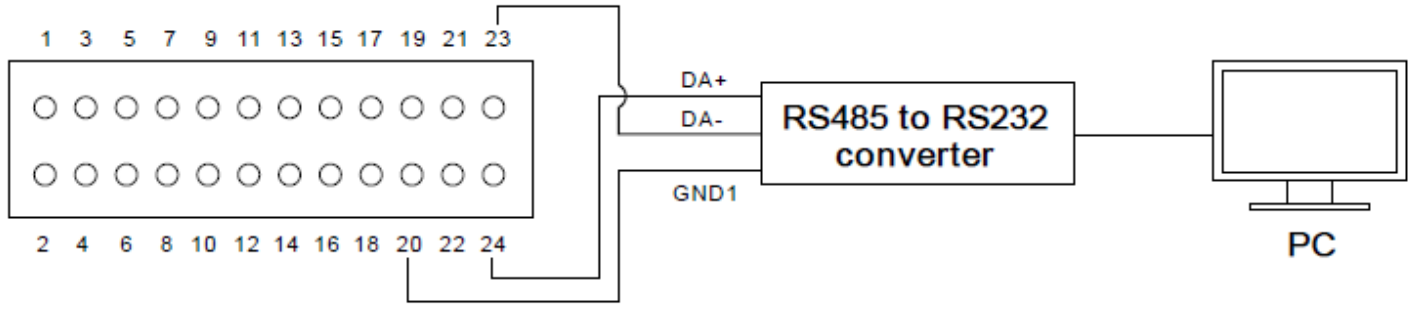
* Place an additional capacitor to have a better performance of auxiliary power operation.



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

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

RS485 COMMUNCATION CONNECTION DIAGRAM



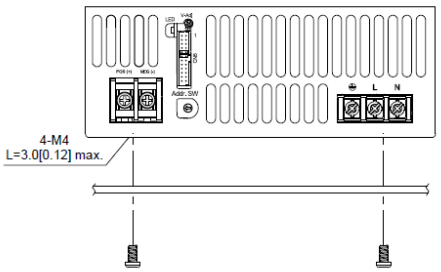
Note: Make sure GND1 (pin 20) is connected to the external communication kit when using RS485 / I2C

INSTALLATION INSTRUCTIONS

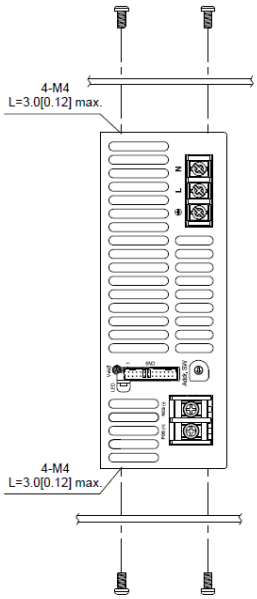
1. Mounting Directions

1-1 Recommended Standard Mounting Methods

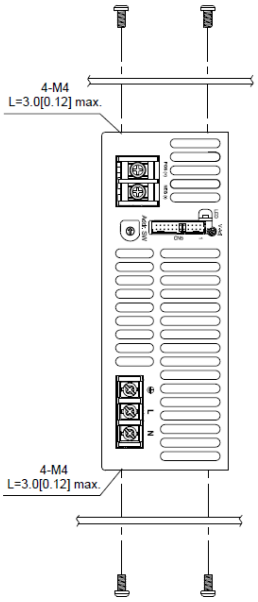
(a)



(b)



(c)



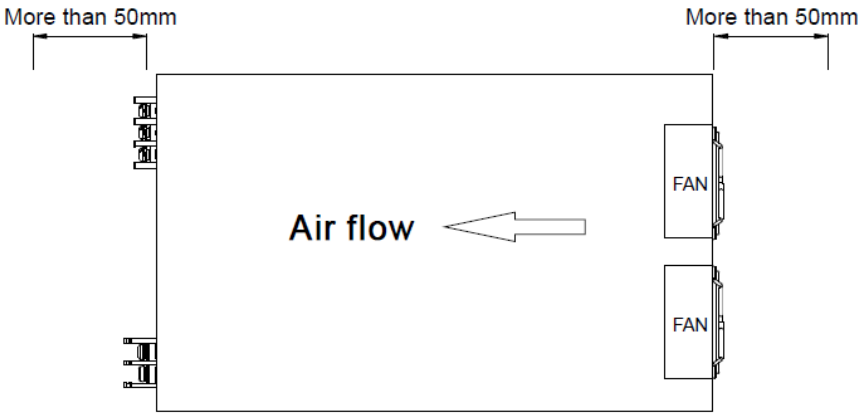
Recommended screw length is measured from the power supply surface

2. Mounting Method

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

2-2 The maximum allowable penetration for the screw is 3mm. Incomplete threading should not be penetrated.

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



COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001: 2015 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833