

# PFC 450W Single Output power supply

# AK450 series



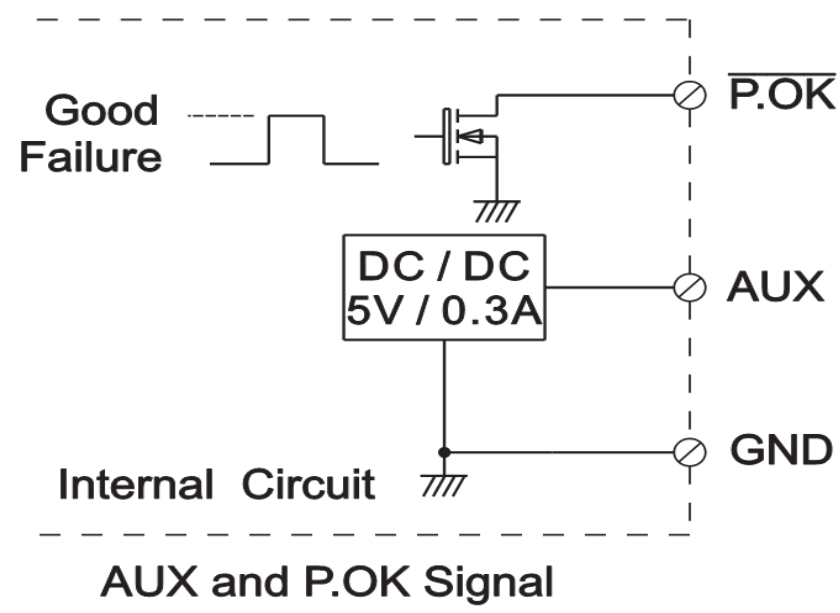
## Features :

- Universal AC input with active PFC
- High efficiency up to 93%
- +5V / 0.3A auxiliary output
- 150% Peak load Capability
- 1U profile, High power density
- Built-in Constant current limiting circuit
- Power OK signal ( Power good, Logic low)
- Remote ON-OFF, Remote sense function
- Protections : OVP, OLP, OTP, SCP, Fan failure
- 3 years warranty

## SPECIFICATION

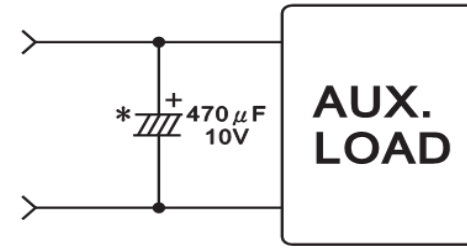
INPUT	Voltage and Frequency RANGE <sup>2</sup>	90 ~ 264VAC 47 ~ 63Hz, or 127 ~ 370VDC				
	AC CURRENT	4.5A / 115VAC 2.2A / 230VAC				
	INRUSH CURRENT(Typ.)	27A / 115VAC 54A / 230VAC				
	LEAKAGE CURRENT	<1.0mA / 240VAC				
	Power Factor (Typ.)	0.98 / 230VAC, 0.99 / 115VAC at full load				
MODEL		AK-450-12	AK-450-24	AK-450-30	AK-450-36	AK-450-48
OUTPUT	DC VOLTAGE RANGE	5V	12V	30V	36V	48V
	RATED CURRENT	60A	30A	15A	12.7A	9.5A
	CURRENT RANGE	0~60A	0~30A	0~15.0A	0~12.7A	0~9.5A
	RATED POWER	300W	360W	450W	457W	456W
	Ripple & Noise (max.) <sup>3</sup>	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	±10% Typical adjustment by potentiometer				
	VOLTAGE TOLERANCE <sup>4</sup>	±1.0%				
	Line Regulation	±0.5%				
	Load Regulation	±0.5%				
	Setup, Rise Time	800ms, 60ms at full load				
	Hold Up Time (Typ.)	16ms / 230VAC at full load				
	EFFICIENCY (Typ.)	89%	91%	91%	92%	93%
PROTECTION	Over Load	Normally works within 105 ~ 150% rated output power for more than 3 sec and then shutdown O/P voltage with auto-recovery, >150% rated power or short circuit is constant current limiting, if o/p drop to 40% rating output voltage then shutdown and auto-recover 5 time, if fault condition not remove in this 5 time, the system will be shutdown and re-power on to recover.				
	Over Voltage	14.4 ~ 15.6V	28.8 ~ 31.2V	36.0 ~ 39.0V	43.2 ~ 46.8V	57.8 ~ 62.4V
		Protection type: Latch-style (Recovery after reset AC power ON or inhibit)				
	Over Temperature	By detecting primary and secondary heat sink. Protection type: Shut down o/p voltage (Auto recovers automatically after temperature goes down)				
FUNCTION	Auxiliary Power	5V @ 0.3A ( +/- 3% )				
	Remote ON/OFF Control	External switch or NPN Transistor to turn ON / OFF				
	Power OK Signal	Open drain signal low when PSU turns on, Max. sink current: 20mA, Max. drain voltage: 40V.				
ENVIRONMENT	WORKING TEMP.	-20 ~ +70°C (Refer to output load de-rating curve)				
	WORKING HUMIDITY	20 ~ 90% R.H non-condensing				
	STORAGE TEMP., HUMIDITY	-40~+85°C, 10 ~95% R.H				
	TEMP. COEFFICIENT	±0.02%/°C (0 ~ 50°C)				
	VIBRATION	10 ~ 500Hz, 5G 10min./1 cycle, period for 60 min. Each along X,Y,Z axes Compliance to IEC 68-2-6, IEC 68-2-64				
SAFETY & EMC	SAFETY STANDARDS	UL 60950-1, 2nd Edition, TUV EN60950-1 : 2006+A11 Approved				
	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC I/P-FG: 1.5KVAC O/P-FG: 0.5KVAC				
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG: 100MΩ / 500VDC				
	EMI CONDUCTION & RADIATION	EN55022 : 1998+A1 : 2000+A2 : 2003 Class B				
	HARMONIC CURRENT	EN61000-3-2 :2000+A2:2005 Class A, EN61000-3-3 : 1995+A1 :2001				
	EMS IMMUNITY	IEC61000-4-2,3,4,5,6,8,11				
OTHERS	MTBF	161K HRS Compliance : MIL-HDBK-217F				
	DIMENSION	199*105*41 mm / 7.83*4.13*1.61 inch				
	PACKING	1.05 kg ; 15pcs / 15.75kg / 0.69 CUFT				
NOTE	<p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. De-rating may be needed under low input voltages. Please check the de-rating curve for more details.</p> <p>3. Ripple &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf &amp; 47 uf parallel capacitor.</p> <p>4. Tolerance: includes set up tolerance, line regulation and load regulation.</p> <p>5. 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.</p>					

## 1. Power OK Signal and Auxiliary output



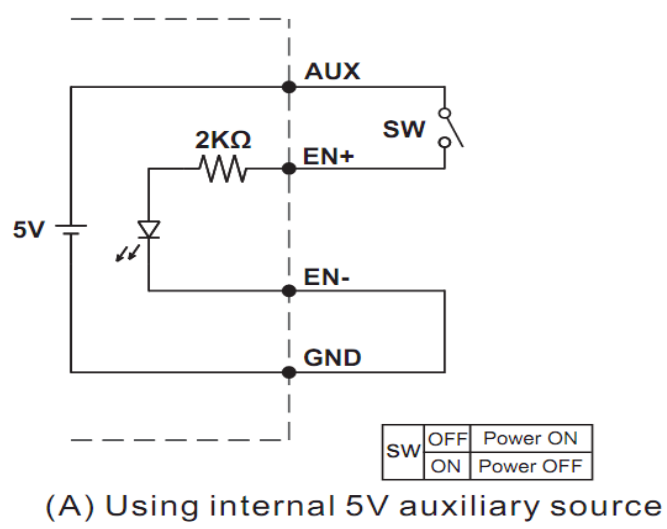
\*Place an additional capacitor to have a better performance of auxiliary power operation.

\*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.



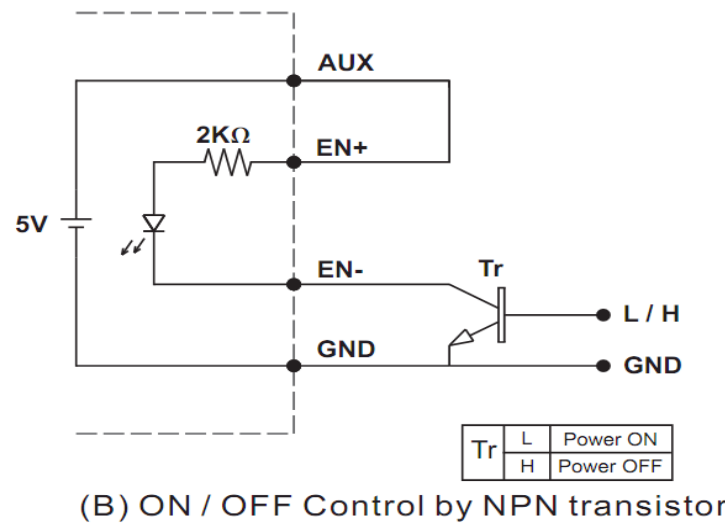
## 2. Remote ON/OFF Control

(A)



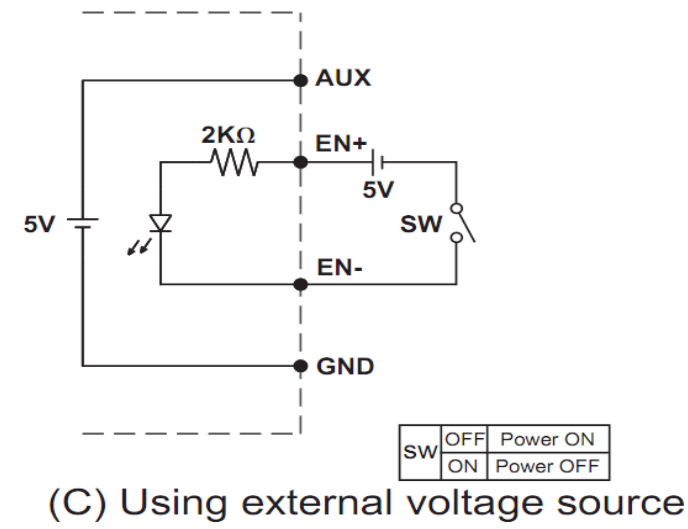
(A) Using internal 5V auxiliary source

(B)



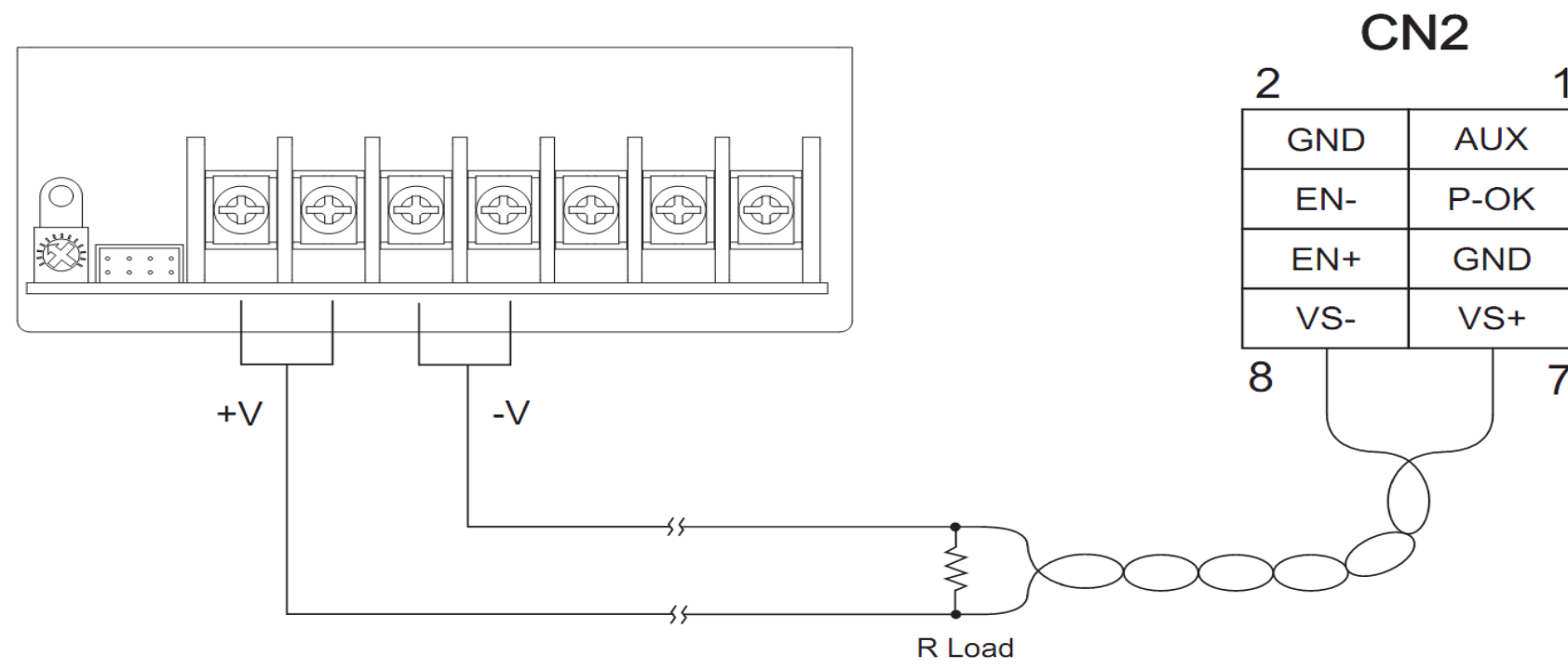
(B) ON / OFF Control by NPN transistor

(C)

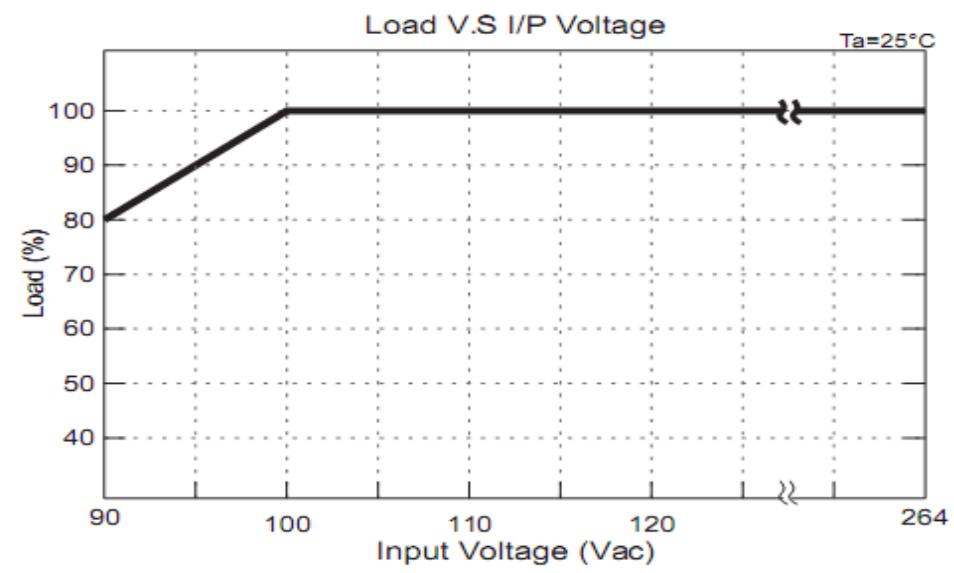
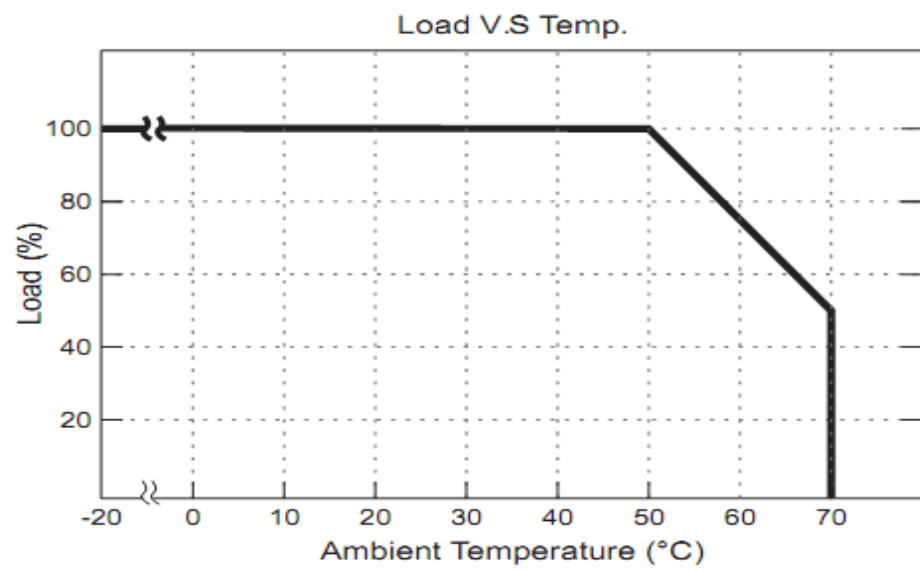


(C) Using external voltage source

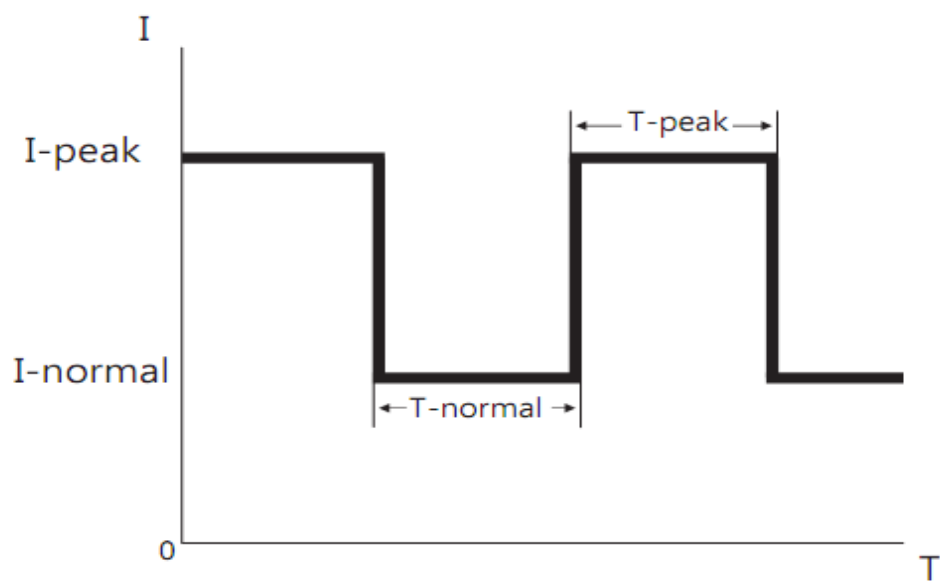
## 3. Remote Sense



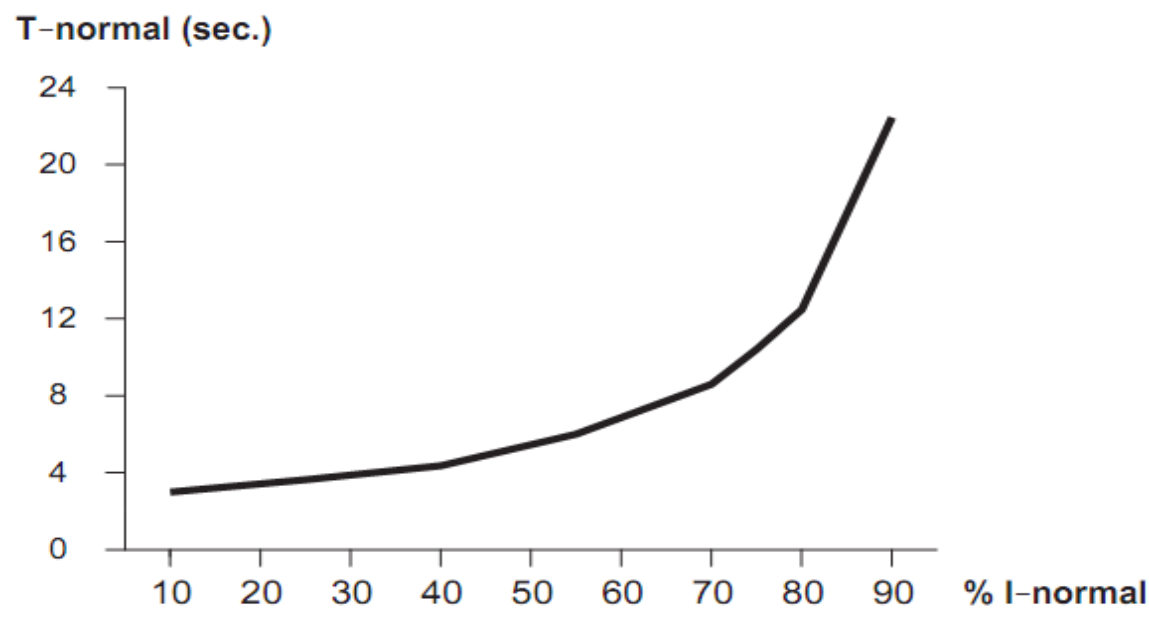
**De-rating Curve**



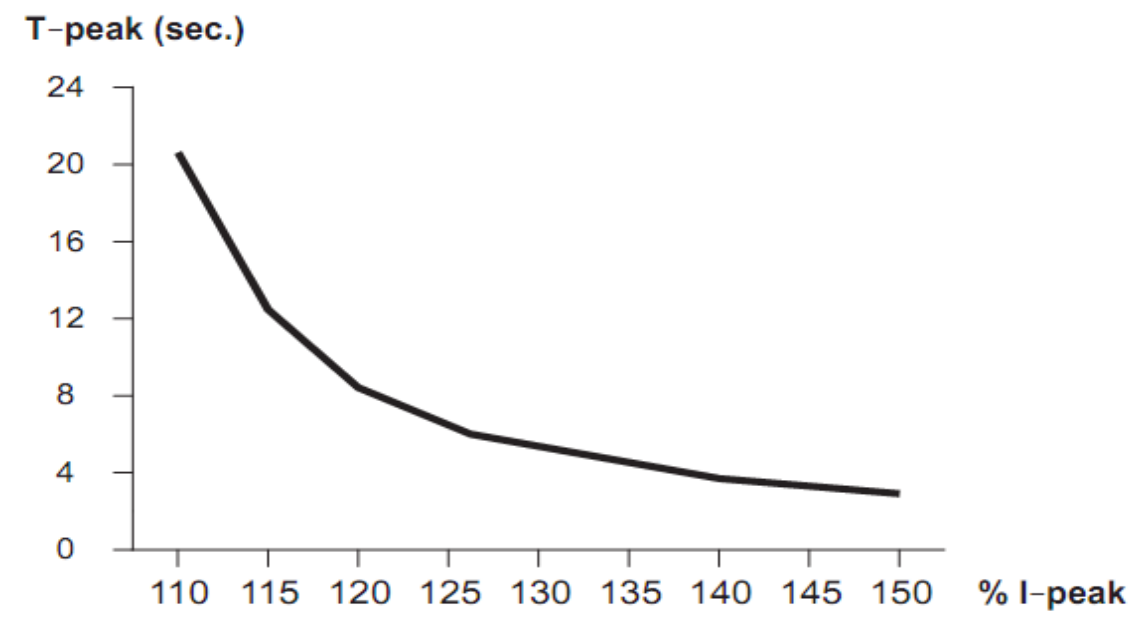
**Peak Loading**



$T$ -PEAK represents the period during which the output current is at 110% to 150% of nominal (shown as  $I$ -PEAK). Curve B shows the relationship between the percentage of peak current ( $I$ -PEAK) and the allowable duration ( $T$ -PEAK). If the peak current is taken for longer than the allowed duration indicated by curve B, the output current will drop to a constant limited current of 105% of nominal, then. The unit between peak currents ( $T$ -NORMAL) is dependant up on the output current drawn between the peaks ( $I$ -NORMAL) and curve A shows the relationship between the two. The higher the percentage of normal current ( $I$ -NORMAL) is of the nominal current, the longer the interval ( $T$ -NORMAL) before the next peak current can be drawn.



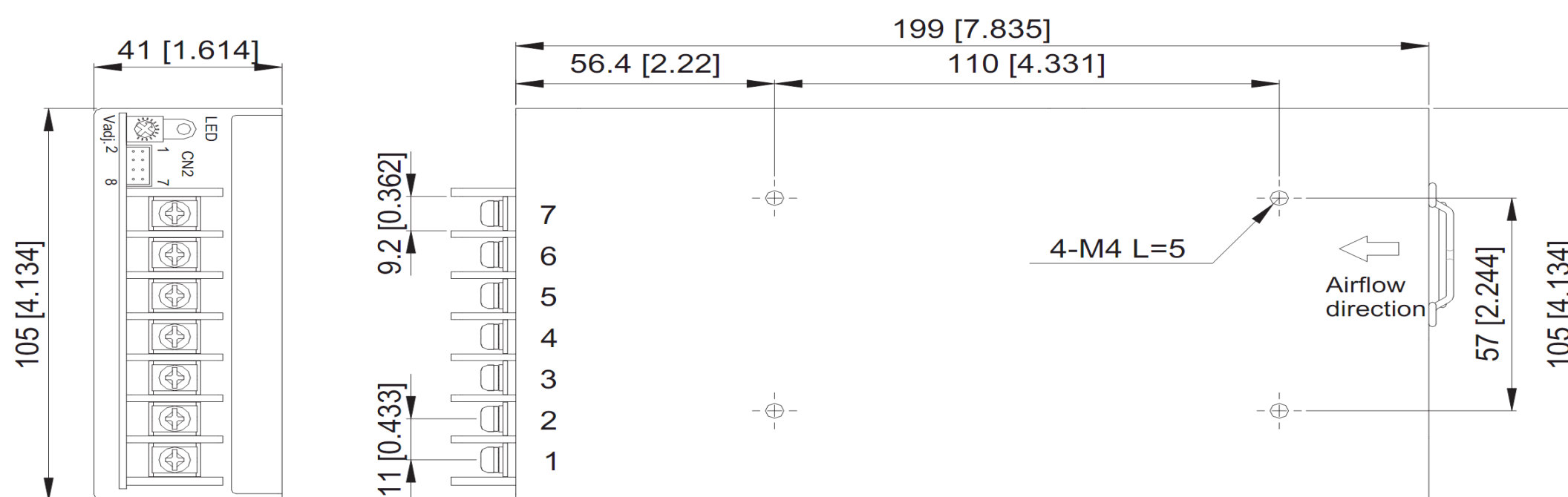
CURVE A



CURVE B

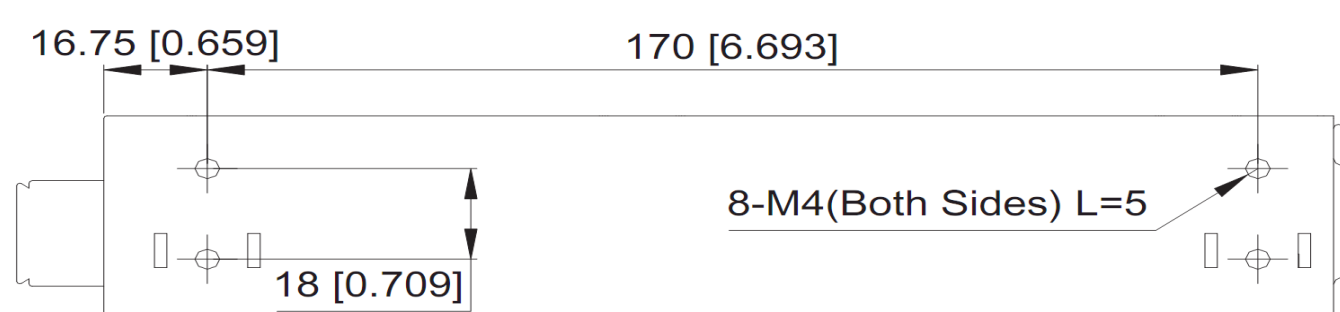
## Mechanical Specification

Unit:mm[inch]



### AC Input & DC Output Pin No. Assignment

Pin No.	Assignment
1	AC/L
2	AC/N
3	FG
4,5	-V
6,7	+V



Control pin number assignment (CN2) : JST S8B-PHDSS or equivalent

Pin No.	Assignment	Pin No.	Assignment	Mating Housing	Terminal
1	AUX	5	GND	PHDR-08VS	SPHD-002T-P05
2	GND	6	EN+		
3	P-OK	7	VS+		
4	EN-	8	VS-		

## Function Description of CN2

Pin No.	Function	Description
1	AUX	+5V / 0.3A auxiliary power
2	GND	Ground
3	P. OK	Power OK
4	EN-	Remote ON/OFF (-)
5	GND	Ground
6	EN+	Remote ON/OFF (+)
7	VS+	Remote voltage sense (+)
8	VS-	Remote voltage sense (-)