



CFM500M SERIES 500 WATT MEDICAL AC-DC POWER SUPPLY WITH PFC

Features

- Universal Input Range 80~264Vac
- High Efficiency up to 94.5%
- 3"x 5" Compact Size
- High Power Density Up to 20.96W/Inch³
- 390W Natural, 470 ~ 500W Conduction Convection
- No Load Power Consumption<0.5W
- Over Temperature Protection
- PS On/Off Remote Control
- Power Good & Power Fail Signal
- +5V Stand-by, 12V Fan Output
- Low Inrush Current
- Active PFC Meets EN61000-3-2
- Meets EN55011 Class B, 2MOPP
- Meets IEC/EN60335
- Class I



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT			VOLTAGE ACCURACY	RIPPLE & NOISE	VOLTAGE ADJ. RANGE	LINE REGULATION	LOAD REGULATION	%EFF. (Typ)
		NOTE1								
		With Fan	Without Fan							
	Cover	Open	NOTE2	NOTE3	NOTE4	NOTE5				
CFM500M120	12 V	41.67A	27.5A	25A	±1%	1%	11.4~12.6 V	±0.5%	±1%	91.5%
CFM500M180	18 V	27.78A	18.33A	16.67A	±1%	1%	17.1~18.9 V	±0.5%	±1%	92.5%
CFM500M240	24 V	20.83A	17.08A	15.83A	±1%	1%	22.8~25.2 V	±0.5%	±1%	93%
CFM500M360	36 V	13.89A	11.39A	10.56A	±1%	1%	34.2~37.8 V	±0.5%	±1%	94.5%
CFM500M480	48 V	10.42A	8.54A	7.92A	±1%	1%	45.6~50.4 V	±0.5%	±1%	94%
Stand-by Output Voltage										
All	+5V	1A			±3%	1%	---	±1%	±5%	---
Fan Output Voltage										
All	+12V	0.5A (NOTE 6)			---	---	---	---	---	---

Note:

1. Forced air Convection with 21CFM Fan.
2. Voltage accuracy is set at full load and 25°C Ta.
3. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for Ripple & Noise measuring @20MHz B.W.
4. Line regulation is measured from High Line to Low Line with rated load.
5. Load regulation is measured from full load to 10% rated load.
6. Fan output can only operate normal when the Stand-by output is above 0.5A.

PART NUMBER

Series	Number of Outputs	Nominal Output Voltage	Type
CFM500	O	XXX	Y (Option)
CFM500	M: Medical	120: 12VDC 180: 18VDC 240: 24VDC 360: 36VDC 480: 48VDC	None: Open frame C: With Cover

Part Number Example:

- CFM500M120: Open Frame, 500W, 12Vdc Output
- CFM500M120C: With Case, 500W, 12Vdc Output



CFM500M Series

TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage	Safety approvals only to the AC input	All	80		264	V_{ac} V_{dc}
Operating Case Temperature	See Derating Curve	All	-40		85	°C
Storage Temperature		All	-40		85	°C
Operating Altitude		All			5000	m

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	100		240	V_{ac}
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Load, $V_{in}=100V_{ac}$	All			6	A
Leakage Current		All			0.1	mA
Inrush Current	$V_{in}=240V_{ac}$, Cold Start at 25°C.	All		8.5		A

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	$V_{in}=\text{Nominal } V_{in}$, $I_o=I_o \text{ max.}$, $T_c=25^\circ\text{C}$.	CFM500M120	11.88	12	12.12	V_{dc}
		CFM500M180	17.82	18	18.18	
		CFM500M240	23.76	24	24.24	
		CFM500M360	35.64	36	36.36	
		CFM500M480	47.52	48	48.48	
Operating Output Current Range		CFM500M120			41.67	A
		CFM500M180			27.78	
		CFM500M240			20.83	
		CFM500M360			13.89	
		CFM500M480			10.42	
Holdup Time	$V_{in}=115V_{ac}$	All		16		ms
Output Voltage Regulation						
Load Regulation	10% Load to Full Load	All			±1.0	%
Line Regulation	$V_{in}=\text{High Line to Low Line}$	All			±0.5	%
Over Voltage Protection	Latch Off (AC Recycle to Reset)	CFM500M120			16	V_{dc}
		CFM500M180			30	
		CFM500M240			35	
		CFM500M360			50	
		CFM500M480			63	
Over Current Protection	Auto Recovery	All	120		190	%
Short Circuit Protection	Auto Recovery	All				
Output Ripple and Noise	1. Add a 0.1uF Ceramic Capacitor and a 10uF Aluminum Electrolytic Capacitor to Output. 2. Oscilloscope is 20MHz Band Width. 3. Ambient Temperature=25°C	CFM500M120			120	mV
		CFM500M180			150	
		CFM500M240			150	
		CFM500M360			200	
		CFM500M480			250	
Load Capacitance	1. Ambient Temperature=25°C 2. Input Voltage is 115VAC and 230VAC 3. Output is max. Load	CFM500M120			42900	uF
		CFM500M180			28600	
		CFM500M240			20800	
		CFM500M360			14000	
		CFM500M480			10800	



CFM500M Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Efficiency	Output is Rated Load Ambient Temperature=25°C @ Input Voltage is 230VAC	CFM500M120		91.5		%
		CFM500M180		92.5		
		CFM500M240		93		
		CFM500M360		94.5		
		CFM500M480		94		
PS-On Signal	Power on	All	0		2	Vdc
	Power off (PS-ON and GND open)			4		
	Power on (PS-ON and GND short)			10		mA
	Power-off (PS-ON and GND open)			0		
Power Good (PG)	1. Input voltage is 90VAC~264VAC 2. Output is max. load 3. The TTL goes high after power set up	All	100		500	ms
Power Fail (PF)	1. Input voltage is 90VAC~264VAC 2. Output is max. load 3. The TTL goes low before Vo below 90% rated value	All	1	10		ms

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute	All			4000	V _{ac}
Isolation Resistance	Input to Output	All	100			MΩ

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pout=max. rated power	All		65		kHz
Output Voltage adjustment		All	-5		+5	%

GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I _o =100%; T _a =25°C per MIL-HDBK-217F	All		200		K hours
Humidity	Nom-condensing	All			93	% RH
Shock	Meet MIL-STD-810F Table 516.5, Table 516.5-1 10ms, each axis 3 times(±X、±Y、±Z axis)	All		75		g
Vibration	Meet MIL-STD-810F Table 514.5C-VIII, 15~2000Hz, X、Y、Z axis, 1 hour (each axis), Total 3 hrs.	All		4		g
Weight	Open Frame Versions	All		515		g
	Covered Versions			635		
Dimensions	Open Frame	All	5.000x3.000x1.540 Inches (127.00x76.20x39.10mm)			
	C (with Cover)	All	5.354x3.425x1.673 Inches (136.00x87.00x42.50mm)			
Safety	Class I, IEC/EN/UL60601-1					Ed 3.1
EMC Emission	EN55011 Class B, EN61000-3-2:2014, EN6100-3-3:2013, FCC CFR47 Part 15					Ed 4.0
Conducted Disturbance	EN55011, FCC CFR 47 Part 15					Class B
Radiated Disturbance	EN55011, FCC CFR 47 Part 15					Class B
Harmonic Current Emissions	EN61000-3-2:2014					Class A, C, D
Voltage Fluctuations & Flicker	EN61000-3-3:2013					
EMC Immunity	EN60601-1-2:2015, IEC61000-4-2,3,4,5,6,8,11					
Electrostatic Discharge (ESD)	IEC61000-4-2:2008, Air Discharge: ±8kV, Contact Discharge: ±4kV					Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC61000-4-3:2010					Criterion A
Electrical Fast Transient (EFT)	IEC61000-4-4:2012, ±1kV, ±2kV					Criterion A
Surge	IEC61000-4-5:2014, L-N: ±0.5kV, ±1kV, L-E(Ground): ±0.5kV, ±1kV, ±2kV					Criterion A



CFM500M Series

GENERAL SPECIFICATIONS

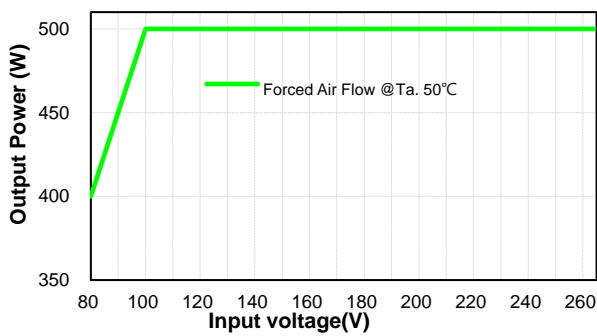
Conducted Disturbances, Induced by RF Fields	IEC61000-4-6:2013	Criterion A
Power Frequency Magnetic Field	IEC61000-4-8:2009	Criterion A
Voltage Dips	IEC61000-4-11:2004, Dip: 30% Reduction, Dip >95% Reduction	Criterion A
Voltage Interruptions	IEC61000-4-11:2004, >95% Reduction	Criterion B
Application Note Link	CFM500M Series App Notes	

CHARACTERISTIC CURVE

Power Derating Curve

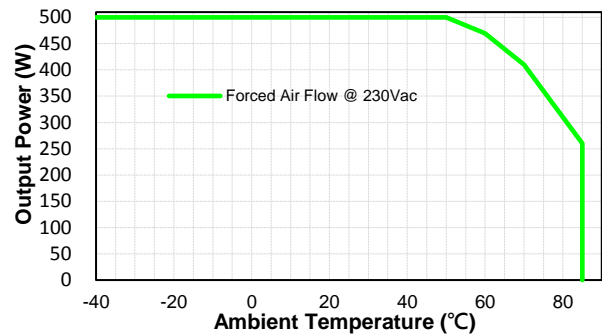
Forced Air Flow

Output power & Input voltage



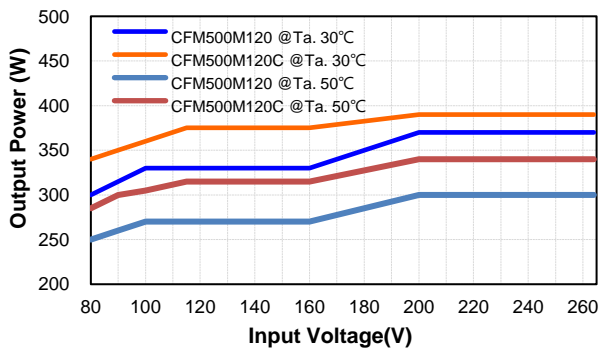
Forced Air Flow

Output power vs Ambient Temperature



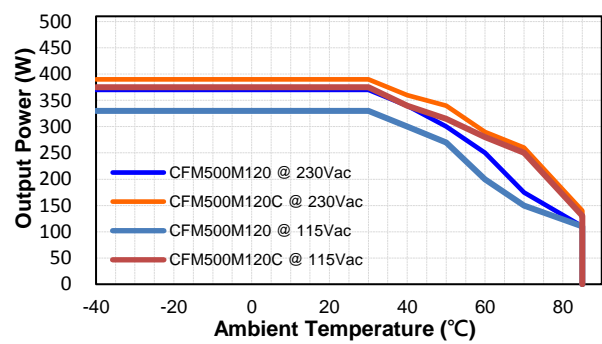
Natural Convection

Output power & Input Voltage

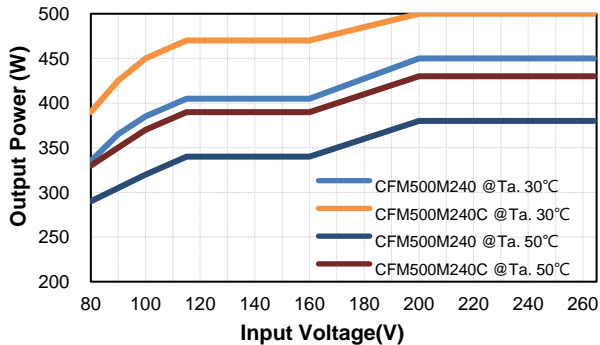


Natural Convection

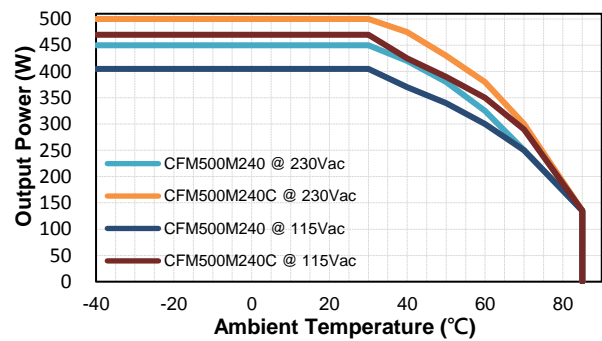
Output power vs Ambient Temperature



Output power & Input Voltage



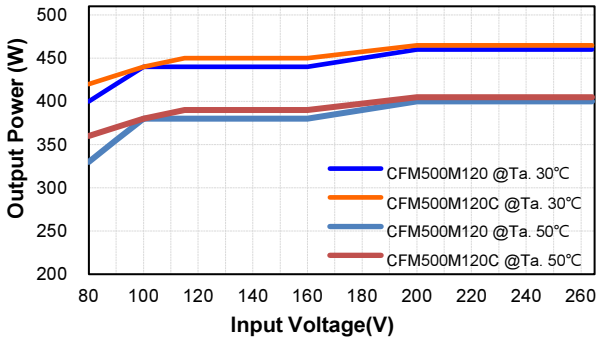
Output power vs Ambient Temperature





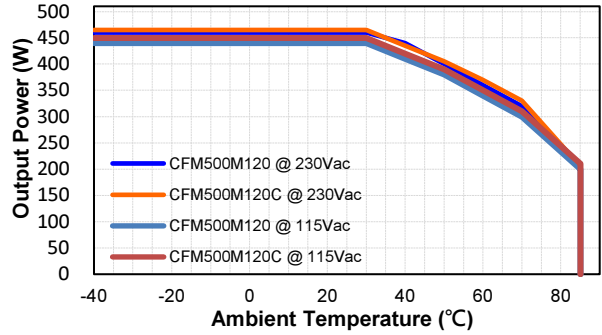
**Conduction Convection with External Baseplate
(48x24.8x0.12cm)**

Output power & Input Voltage

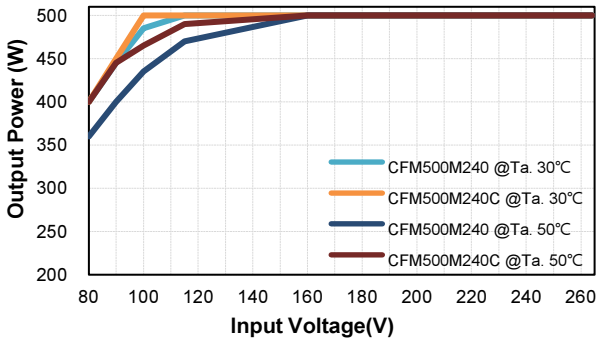


**CFM500M Series
Conduction Convection with External Baseplate
(48x24.8x0.12cm)**

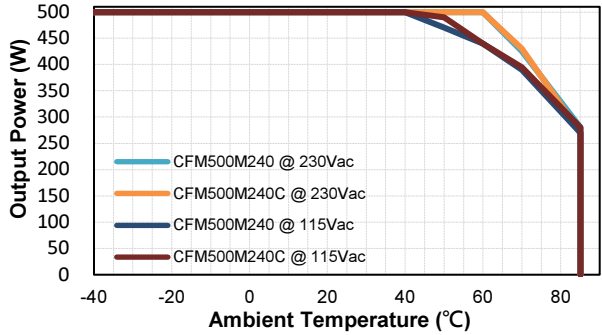
Output power vs Ambient Temperature



Output power & Input Voltage

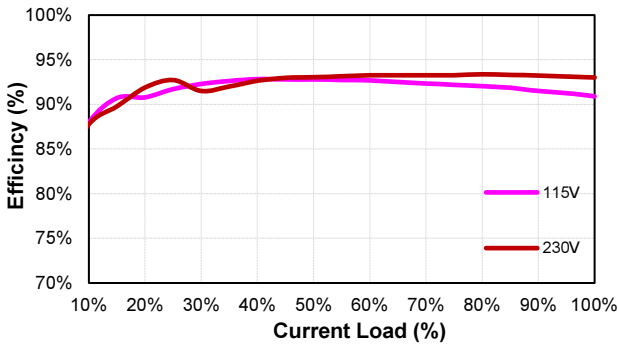


Output power vs Ambient Temperature

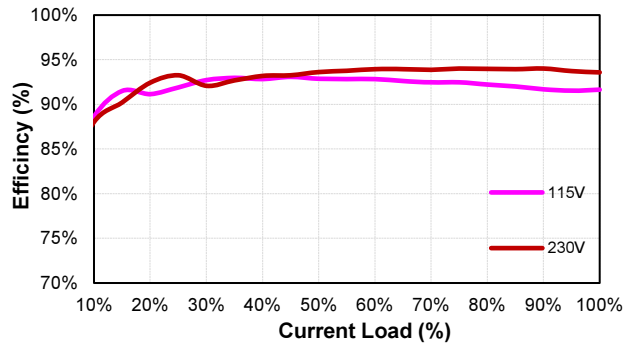


Performance Data

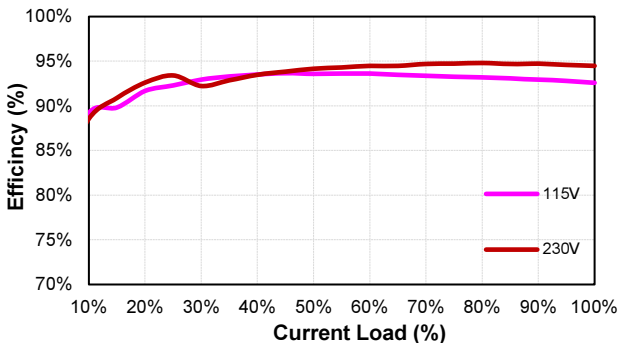
CFM500M120 (Eff Vs Io)



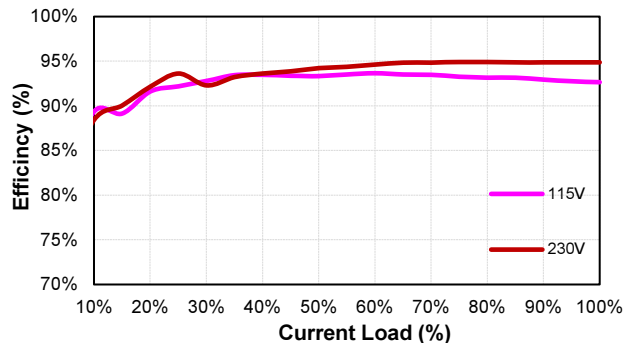
CFM500M180 (Eff Vs Io)



CFM500M240 (Eff Vs Io)



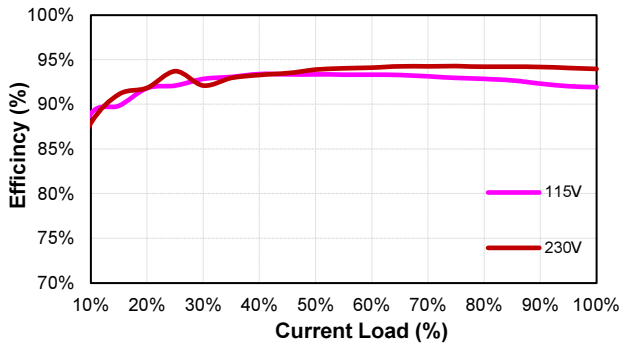
CFM500M360 (Eff Vs Io)



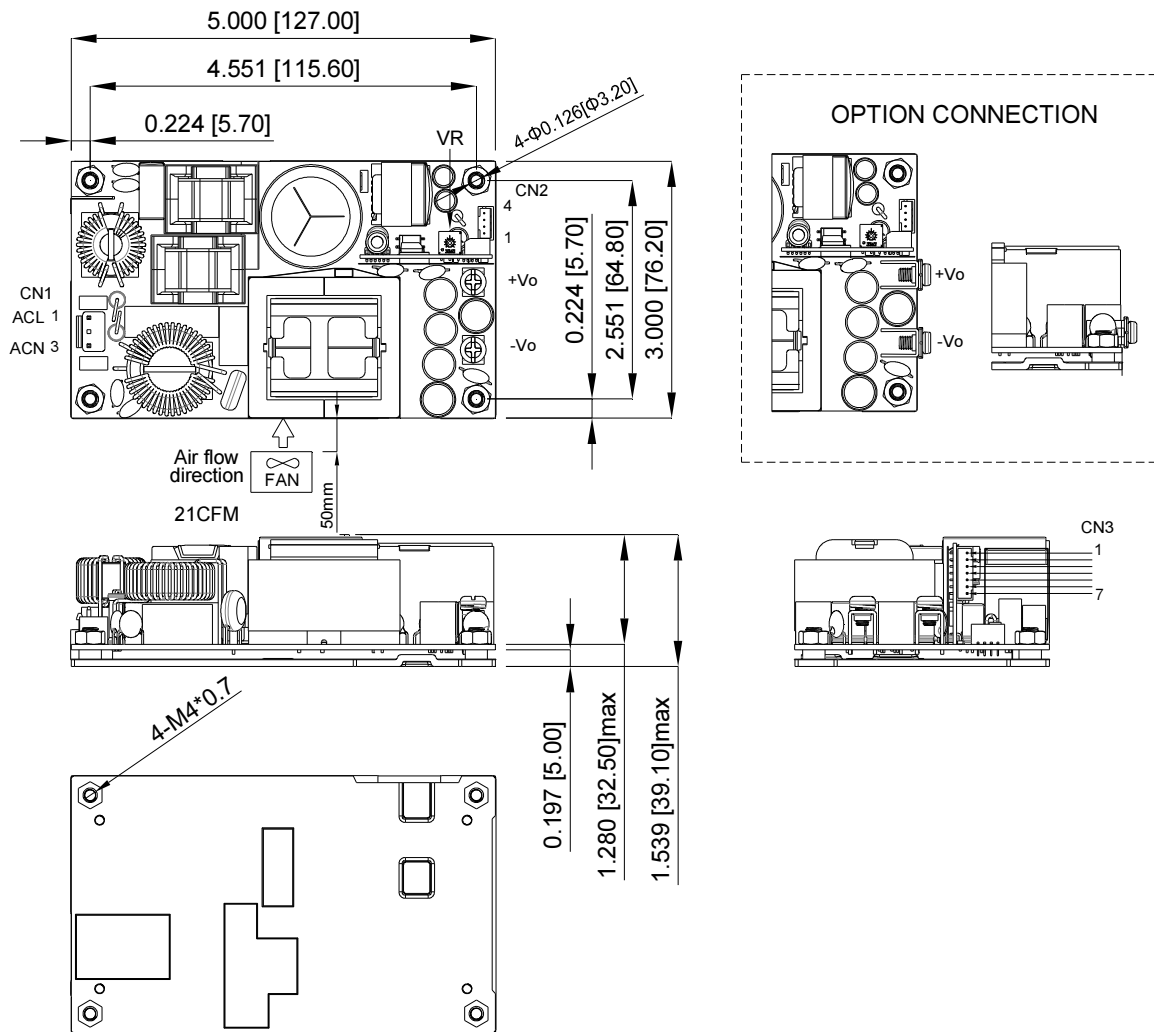


CFM500M Series

CFM500M480 (Eff Vs Io)

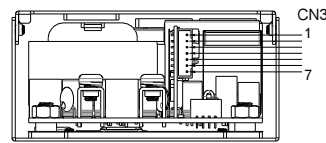
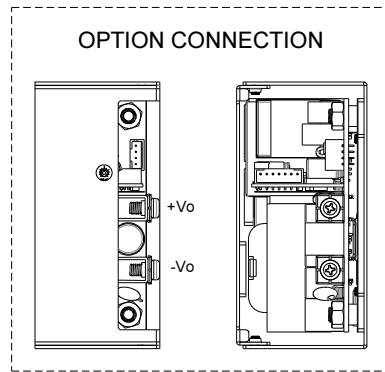
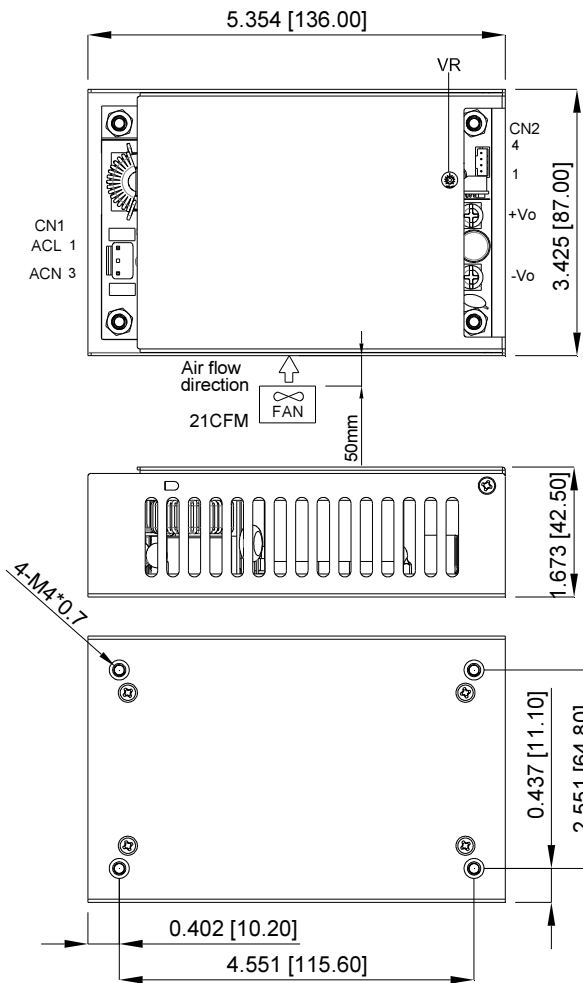


MECHANICAL SPECIFICATION





CFM500M Series



CN1:
PIN CONNECTION

Pin	Function
1	ACL
2	-
3	ACN

CN2:
PIN CONNECTION

Pin	Function
1	GND
2	+5VSB
3	GND
4	+12V-FAN

CN3:
PIN CONNECTION

Pin	Function
1	GND
2	PF
3	FAN-EN
4	PS-ON
5	-Sense
6	+Sense
7	OPTION

All Dimensions In Inches[mm]
Tolerance Inches:x.xxx= ± 0.02
Millimeters: x.xx = ± 0.5

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