Medical Industrial Test Broadcast Comms Renewable

300W convection / 400W fan cooled, AC-DC power supply

Features	Benefits
• Convection cooled	Silent operation
• Reinforced isolation	Simplifies equipment design
• Full digital control	Improves Product Performance
• ErP and Climate Savers Gold level	Minimises heat in system
• 5 year warranty	Low cost of ownership

Input

Input Voltage	85-264Vac (100-240Vac nominal)	Input Frequency	47 - 63Hz (440Hz with reduced PFC - consult sales office)
Input Harmonics	EN61000-3-2 compliant	Inrush Current	<25A at 25°C and 230Vac (cold start) (meets EN61000-3-3).
Input Fuse	Dual fuses (Live + Neutral) Fast acting (not user accessible)		
Earth Leakage Current	140µA at 120Vac (60Hz), 280µA max at 240Vac (60Hz) Worst case leakage current is less than 300µA at 240Vac, 63Hz (normal condition, 0.5mA Single Fault Condition) Touch Current is <100µA NC, <500µA SFC at 264Vac, 60Hz		

Quick Selector (Standard models). Additional variants available - see below

Output		Convection cooled units / units without fan				Units with top fan	
Volts	Current (fan/conv)	U-Chassis		Cover + Chassis		Cover + Chassis	
		Description	Order Code	Description	Order Code	Description	Order Code
12V	33.3A / 25A	CFE400M-12-5C-N1UML-NT	U7Y0032	CFE400M-12-5C-N1CML-NT	U7Y0087	CFE400M-12-5C-TFCML-NT	U7Y0098
24V	16.7A / 12.5A	CFE400M-24-5C-N1UML-NT	U7Y0054	CFE400M-24-5C-N1CML-NT	U7Y0101	CFE400M-24-5C-TFCML-NT	U7Y0112
48V	8.3A / 6.25A	CFE400M-48-5C-N1UML-NT	U7Y0123	CFE400M-48-5C-N1CML-NT	U7Y0134	CFE400M-48-5C-TFCML-NT	U7Y0145

How To Create A Product Description

Output	Adjustment range
12	10.8 - 14.4 V
24	21.6 - 28.8 V
48	43.2 - 50 V

Adjustable by potentiometer

Fan Option	
-NN	No fan, no fan supply
-N1	No fan, 12V / 0.25A fan supply
-TF	Top fan, no additional fan supply (needs 'C' cover')

-Y = ORing FET included
-N = ORing FET not included

M = Molex

CFE400M-	Vout	-	Standby	Fan Option	Cover	Input Connec-tor	Earth Leakage	ORing FET	Remote On/Off

Standby Supply
NN = None (only with 'N' remote on/off)
5C = 5V / 80mA (0.5W standby mode power)

U = Chassis only
C = Chassis + cover (also for 'TF' fan)

L = 300µA

N = none
E = Enable
T = Inhibit

Confirm availability of created product with sales office

Isolation

Input to Output	Reinforced	2 x MOPPs (3rd edition 60601) 4kVac, 5.7kVdc type tested to 4kVac (equivalent to 5.7kVdc), production tested to 4.3kVdc.		
Input to Earth	Basic	1.5kVac, 2.3kVdc	Output to Earth	1.5kVac

Output Specification

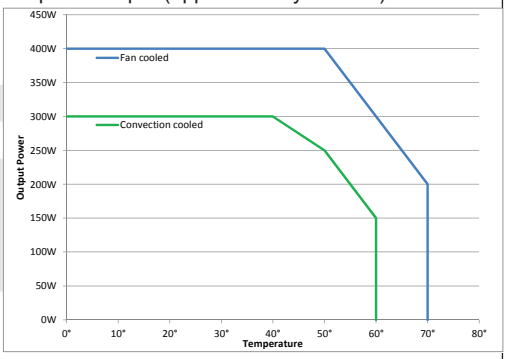
	Fan cooled	Convection	
Output Power	400W	300W	Continuous (including fan supply) or RMS (including Peak power) See handbook for details.
Peak Power	450W	450W	for 10 seconds. RMS power not to exceed Output Power stated above
Total Regulation	better than 2.25%		Including Line regulation of 0.25% (for 90-264Vac input change), Load regulation of 1% (for 0-100% load change) and thermal regulation of 0.02%/°C (0-50°C)
Ripple & Noise	1%		pk-pk, using EIAJ test method & 20MHz bandwidth
Voltage Setting Accuracy	±1%		at 50% load
Turn on Time	1.5s max		at 90 Vac & 100% rated output power
Efficiency	up to 94%		for 48V and 24V (up to 91% for 12V). At 230Vac, 75% load
Hold up	13ms		minimum at 100% of 400W load
Min Load	None		
Transient Response	<5%		of set voltage for 50% of 300W load change (in 500µs within the range 25 - 100% load)
Recovery	2ms max		for recovery to 2% of set voltage
Short circuit protection	Yes		Auto recovery after removal of short circuit
Over Temperature protection	Yes		Primary - auto recovers, secondary - cycle power to restart
Over Voltage Protection	Yes		Latching, need to cycle ac to restart unit.
Fan supply	12V / 0.25A		Depending on 'Fan Option' selected. See 'how to create a product description' for details
Parallel connection	Possible		For N+1 redundancy with ORing FET option. To increase output power requires optional droop share (contact sales office for details)

Global Signals

Remote on/off	Enable - TTL logic level low (relative to Standby 0V) enables channel 1 and fan supply Inhibit - TTL logic level low (relative to Standby 0V) inhibits channel 1 and fan supply
Standby Supply	5V / 80mA isolated supply, not affected by remote on/off.
Power Good	Logic high indicates ac supply is good and Ch1 is within regulation. Not available on units with no standby supply.
ORing FET	Allows redundant connection of power supplies with no additional/external diodes required.

Environment

Temperature	See derating chart. Fan cooled is with 1.5m/s air blown from input to output (approximately 12CFM) -40°C to 70°C storage (max 12 months). Fan cooling required if the unit is mounted with no free air circulation above (see handbook for mounting details)
Low Temp Startup	-20°C
Humidity	5 - 95% RH non condensing
Shock	±3 x 30g shocks in each plane, total 18 shocks 30g shock = 11ms (+/-0.5msec), half sine Conforms to EN60068-2-27, EN60068-2-47, IEC68-2-27, IEC68-2-47, JIS C0041-1987. Conforms to MIL-STD-810E/F, Method 516.5, Pro I, IV, VI
Vibration	Single axis 10 - 500 Hz at 2*g* (sweep and endurance at resonance) in all 3 planes Conforms to EN60068-2-6, IEC68-2-6 Conforms to MIL-STD-810E, Method 514.4, Pro I, Cat 1,9
Altitude	Medical approval = -200 to 5000 metres operational (-200 to 3000m for 2nd edition 60601) Non medical approval = -200 to 5000 metres operational -200 to 5000m storage/transportation
Pollution	Degree 2, Material group IIIb



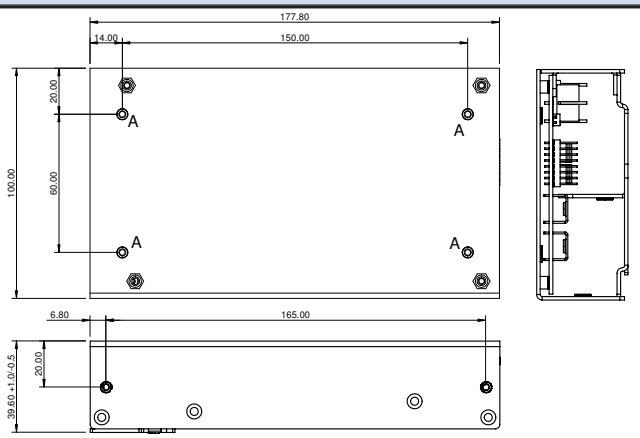
Emissions EN61000-6-3:2007, EN60601-1-2:2007

Radiated Electric Field	EN55011, EN55032	(as per CISPR.11/22) Class B, FCC47 part 15 subpart B see application note for details
Conducted Emissions	EN55011, EN55032	(as per CISPR.11/22) Class B, FCC47 part 15 subpart B
Conducted Harmonics	EN61000-3-2	Class A
Flicker	EN61000-3-3	Compliant - d_{max} only

Immunity EN61000-6-2:2005				Criteria
Electrostatic Discharge	EN61000-4-2	Level 4	Level 3 for Fan supply Not applicable to open frame units	A
Electromagnetic Field	EN61000-4-3	Level 3		A
Fast / Burst Transient	EN61000-4-4	Level 4		A
Surge Immunity	EN61000-4-5	Level 3		A
Conducted RF Immunity	EN61000-4-6	Level 3		A
Power Frequency Magnetic Field	EN61000-4-8	Level 3		A
Voltage Dips, Variations, Interruptions	EN61000-4-11	Class 3	Criteria B for 5 sec interruption Criteria B for 1 cycle interruption Criteria B for dip to 40% for 5 cycles below 154Vac (300W convection) or 176Vac (400W forced air cooled)	A
Ring Wave	EN61000-4-12	Level 3		A
Voltage Fluctuations	EN61000-4-14	Class 3		A

Approvals / Accreditations	
IEC/EN 62368-1, UL62368-1 / CSA 22.2 No 62368-1	File E135494
IEC/EN 60950-1, UL60950-1 / CSA 22.2 No 60950-1	File E135494
IEC/EN 60601-1, UL/CSA 60601-1, ANSI/AAMI ES60601-1 CAN/CSA-C22.2 No 60601-1-08	File E349607
IEC/EN 61010-1 (designed to meet)	
CE Mark (EN62368-1)	Low Voltage Directive (LVD), electromagnetic compatibility (EMC) and Restriction of Hazardous Substances (RoHS)
CB certificate and Report available on request	*Please check with technical sales for status of approvals*
Designed and manufactured under the control of ISO9001 and ISO13485 (including risk management).	

Outline & Connection Drawings



J1

PIN	CONNECTION
1	EARTH
2	NOT CONNECTED
3	LIVE
4	NOT CONNECTED
5	NEUTRAL

J2

PIN	CONNECTION
1	FAN SUPPLY
2	REMOTE ON/OFF
3	PWR GOOD
4	FAN SUPPLY RTN
5	STANDBY RTN
6	STANDBY
7	- SENSE
8	+ SENSE

MATING PARTS

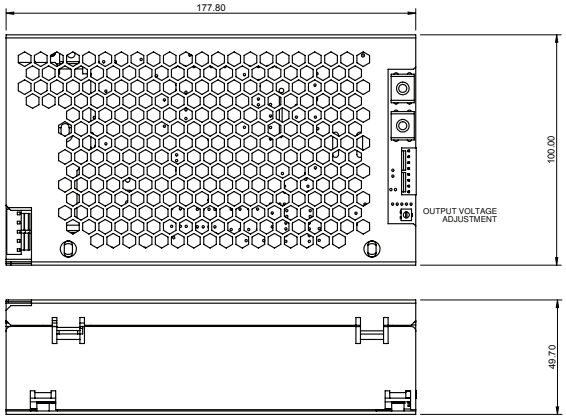
CONNECTOR	HOUSING	CRIMP PIN	MANUFACTURER
J1	09-50-8051	08-52-0113	MOLEX
J2	22-01-2085	0850-0032	MOLEX
J5 & J6	N/A	TAG 19073-0165	MOLEX

Connectors are not included with the product but they are available from TDK-Lambda
1 off input connector and 3 crimps are available as part number is 94910.
1 off feature connector and 8 crimps are available as part number 95109.

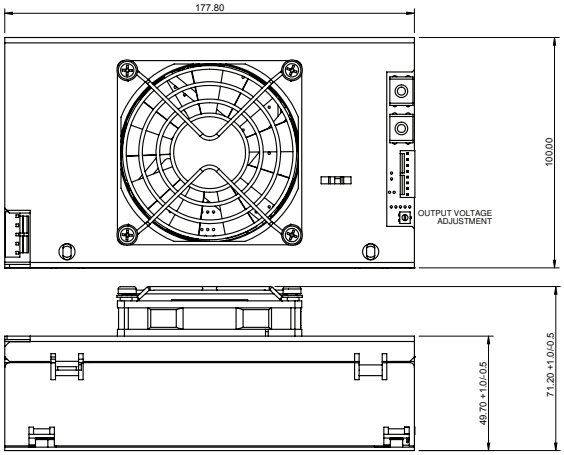
NOTE:

A 6 OFF FIXING HOLES FOR M3, MAXIMUM PENETRATION 3.3mm, MAXIMUM TORQUE 0.9Nm.
ALL TOLERANCES +/-0.5mm (unless otherwise specified).

CHASSIS WITH COVER



CHASSIS WITH TOP MOUNTED FAN



All specifications at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

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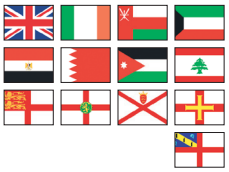

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