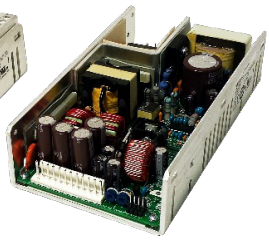
150 WATTS

SINGLE/MULTI OUTPUT AC-DC

FEATURES:

- **Compact 4.0" x 7.0" x 1.75" Size**
- **2 Year Warranty**
- **Universal 85-264V Input**
- **1-4 Tightly-Regulated Outputs**
- **High Efficiency**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 62368-1 2nd ed. Certification**
- **IEC 60601-1-2 4th ed. EMC**
- **Class B Emissions per EN55011/32**
- **Optional Remote Inhibit/Enable**
- **Optional Power Fail Warning**
- **Optional Perforated Cover**

CHASSIS/COVER



OPEN CHASSIS

SAFETY SPECIFICATIONS

	Underwriters Laboratories File E137708/E140259	UL 62368-1:2014, 2nd Edition CAN/CSA-C22.2 No. 62368-1-14, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012 CAN/CSA-C22.2 No. 60601-1:2014
	CB Reports/Certificates (including all National and Group Deviations)	IEC 62368-1:2014, 2nd Edition IEC 60601-1:2005/A1:2012
	TUV SUD America	EN 62368-1:2014, 2nd Edition EN 60601-1:2006/A1:2013
	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2015/863/EU of March 2015)
	Electrical Equipment (Safety) Regulations 2016 SI No. 1101 Restriction of the Use of Certain Hazardous Substances in EEE Regulations 2012 SI No. 3032 + 2019 SI No.492	

MODEL LISTING

MODEL NO.	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
CE-150-4001	+3.3V/15A	+5V/5A	+12V/2A	-12V/2A
CE-150-4002	+5V/15A	+3.3V/5A	+12V/2A	-12V/2A
CE-150-4003	+5V/15A	+3.3V/5A	+15V/2A	-15V/2A
CE-150-4004	+5V/15A	-5.2V/5A	+12V/2A	-12V/2A
CE-150-4005	+5V/15A	-5.2V/5A	+15V/2A	-15V/2A
CE-150-4006	+5V/15A	+12V/5A	+12V/2A	-12V/2A
CE-150-4007	+5V/15A	+12V/5A	+15V/2A	-15V/2A
CE-150-4008	+15V/5A	-15V/5A	24V/1A	24V/1A
CE-150-4009	+5V/15A	+12V/5A	+15V/2A	-12V/2A
CE-150-4011	+5V/15A	+12V/5A	-5V/1A	-12V/1A
CE-150-4101	+5V/15A	+24V/5A	+12V/2A	-12V/2A
CE-150-4102	+5V/15A	+24V/5A	+15V/2A	-15V/2A
CE-150-4103IT	+5V/15A	+24V/5A(6ApK)	+12V/2A	-12V/2A
CE-150-3001	+5V/15A	+12V/5A		-12V/2A
CE-150-3002	+5V/15A	+15V/5A		-15V/2A
CE-150-3003	+15V/5A	-15V/5A	+5V/2A	
CE-150-3004	+5V/15A	+15V/5A	+36V/2.5A	
CE-150-2001	+12V/7.5A	-12V/5A		
CE-150-2002	+15V/5A	-15V/5A		
CE-150-2003	+5V/15A	+12V/6A		
CE-150-2101	+5V/15A	+24V/5A		
CE-150-1001	3.3V/30A(18)			
CE-150-1002	5V/30A(18)			
CE-150-1003	12V/12.5A			
CE-150-1004	15V/10A			
CE-150-1005	24V/6.25A			
CE-150-1006	28V/5.4A			
CE-150-1007	48V/3.1A			

ORDERING INFORMATION

Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

CO – Cover
PF – Power Fail
TS – Terminal Strip
OVP – Overvoltage Protection
I/O – Isolated Outputs
RE – Remote Inhibit

CE-150

OUTPUT SPECIFICATIONS

Total Output Power(1) (See Derating Chart)	100W 125W 150W	Convection Cooled(16) Convection Cooled, w/1Sq. ft. Baseplate(17) 300LFM Forced-Air Cooled(15)	
Output Voltage Centering	Output 1: Output 2: Output 3: Output 4:	± 0.25% ±0.25% ± 2.0% ± 2.0%	(All outputs at 50% load) (X0XX), ±3.0% (X1XX)
Output Voltage Adjust Range	Outputs 1 –2: Output 1: Output 1: Output 2:	95-105% 95-105% 85-105% 85-105%	(X0XX) (X1XX) (1001, 4001) (4002,4003)
Load Regulation	Output 1: Output 2: (XOXX) (X1XX) Output 3: Output 4:	0.5% 0.5% 3.0% 2.0% 2.0%	(0-100% load change) (0-100% load change) (10-100% load change) (10-100% load change) (0-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation (Output 1 load varied 50-100%)	Output 2: Output 3: Output 4:	0.2% 5.0% 2.0% 2.0%	(X0XX) (X1XX) (Output 1 load varied 50-100%)
Output Noise	Outputs 1 - 4:	1.0%	
Turn on Overshoot	None		
Transient Response Voltage Deviation Recovery Time Load Change	Outputs 1 – 4 5.0% 500µS 50% to 100%		
Output Overvoltage Protection (Optional)	Output 1:	110% to 150%. Shuts down all outputs. Cycle input to restart.	
Output Overpower Protection	165 W Min., Outputs 1 and 2, Outputs cycle on/off, auto recovery		
Output Overcurrent Protection	110% Min., Outputs 3 and 4		
Hold Up Time	20mS min., 150W, 120V Input		
Start Up Time	3 Seconds		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion	 3A at 85V Input 30A 4.25A at 85V Input 0.05
Efficiency	0.68-0.80(varies by model)
Power Factor	0.90 (150 W, 230V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C Derating: See Power Rating Chart
Ambient Storage Temp. Range	- 40°C to + 85°C
Temperature Coefficient	Outputs 1 – 4: 0.02%/°C
Altitude	3,000m ASL – Operating 12,192m ASL – Non-Operating

GENERAL SPECIFICATIONS

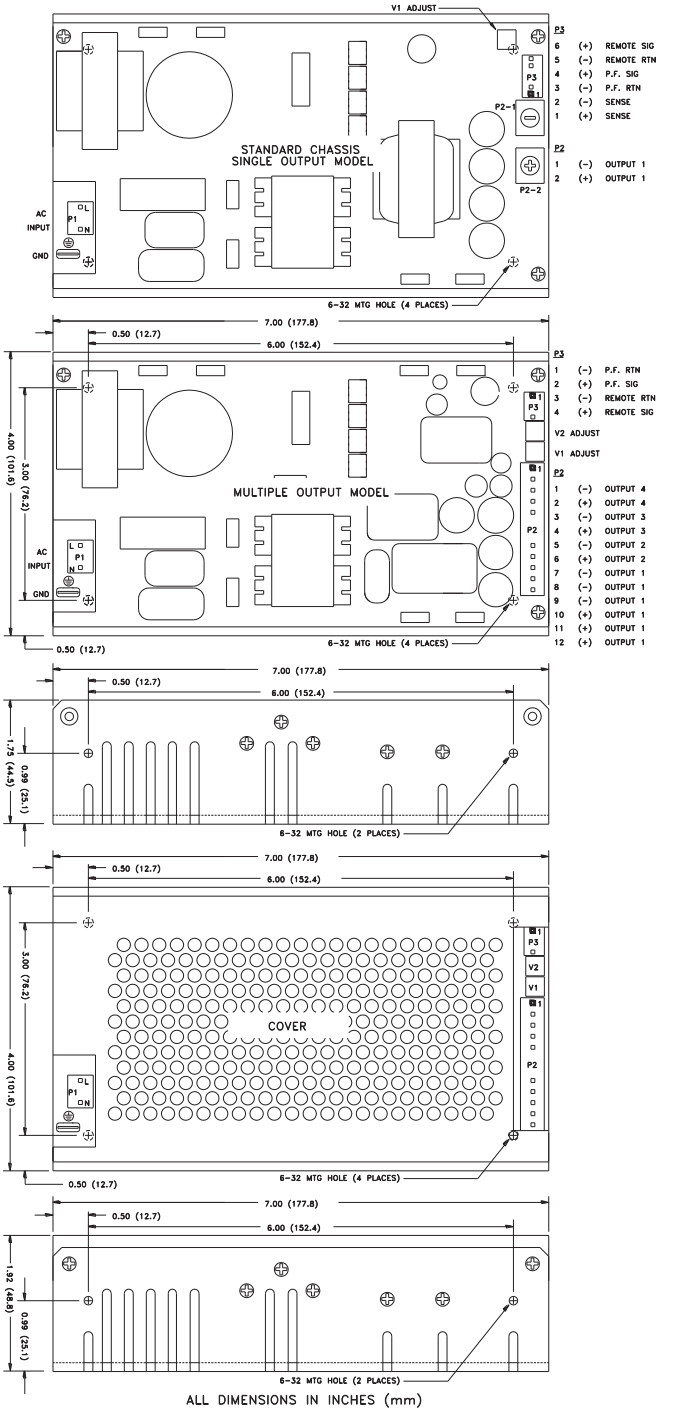
Means of Protection Primary to Secondary Primary to Ground Secondary to Ground	 2MOPP (Means of Patient Protection) 1MOPP (Means of Patient Protection) Operational Insulation(Consult factory for 1MOPP)
Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation	 5656 VDC, Primary to Secondary 2121 VDC, Primary to Ground 707 VDC, Secondary to Ground
Leakage Current Earth Leakage Touch Current	 <300µA NC, <1000µA SFC <100µA NC, <500µA SFC
Power Fail Signal(14) (Optional)	Logic low with input power failure 10 ms minimum prior to Output 1 dropping 1%
Remote Inhibit (optional)	Contact closure inhibits all outputs
Remote Sense(Single models)(10)	250mV compensation of output cable losses
Mean-Time Between Failures	150,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	2.0 Lbs.

All specifications are maximum at 25°C/150W unless otherwise stated, may vary by model and are subject to change without notice.

EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ed./IEC 61000-6-2:2005)

Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	A
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	A
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	A
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line	A
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	A
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 300 cycles, 0°	100/240V B/B
Radiated Emissions	EN 55011/32	Class B	
Conducted Emissions	EN 55011/32	Class B	
Harmonic Current Emissions	EN 61000-3-2	Class A	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

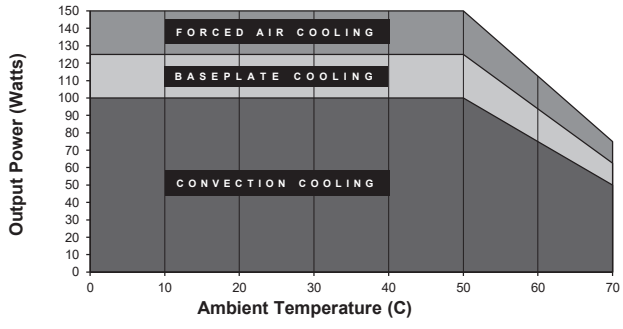
CE-150 SERIES MECHANICAL SPECIFICATIONS



APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 100, 125 or 150W, as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure, 5V/10mA.
15. Forced-Air cooling rating of 150W requires an air speed of 300LFM flowing past a point one inch above the main isolation transformer.
16. Free-Air convection cooling, 100W maximum output power.
17. Baseplate-cooled rating of 125W requires a one-square-foot 0.09"-thick aluminum area attached to bottom four mounting holes.
18. Rated 20A maximum when convection cooled only.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



CONNECTOR SPECIFICATIONS

P1	AC Input	0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.
P2	DC Output (Single)	6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb max)
P2	DC Output (Multiple)	0.156 friction lock header mates with Molex 09-50-3121 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	Option/Sense (Single)	0.100 friction lock header mates with Molex 22-01-2067or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
P3	Option/Sense (Multiple)	0.100 friction lock header mates with Molex 22-01-2047or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.

REV V 10/6/2022