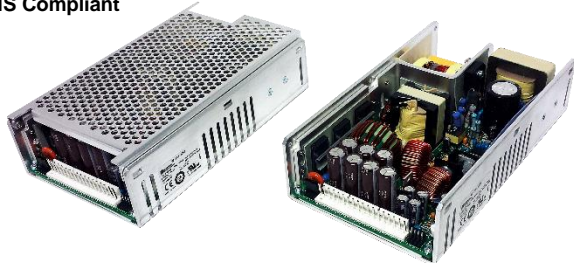


# 225 WATTS

## SINGLE/MULTI OUTPUT AC-DC

### FEATURES:

- Compact 4.75 x 8.0" x 2.0" 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 3<sup>rd</sup> ed. Medical Cert.
- IEC 62368-1 2<sup>nd</sup> ed. Certification
- IEC 60601-1-2 4<sup>th</sup> 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<br>File E137708/E140259   | UL 62368-1:2014, 2 <sup>nd</sup> Edition<br>CAN/CSA-C22.2 No. 62368-1-14, 2 <sup>nd</sup> Edition<br>AAMI/ANSI ES60601-1:2005/(R) 2012<br>CAN/CSA-C22.2 No. 60601-1:2014 |
|  |   | CB Reports/Certificates (including all National and Group Deviations)  |
|  | TUV SUD America   | EN 62368-1:2014, 2 <sup>nd</sup> Edition<br>EN 60601-1:2006/A1:2013  |
|  | Low Voltage Directive<br>RoHS Directive (Recast)  | (2014/35/EU of February 2014)<br>(2015/863/EU of March 2015)   |
|  | Electrical Equipment (Safety) Regulations 2016 SI No. 1101<br>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-225-4001 | +3.3V/25A <sup>(16)</sup> | +5V/8A <sup>(16)</sup>   | +12V/2A  | -12V/2A  |
| CE-225-4002 | +5V/25A <sup>(16)</sup>   | +3.3V/8A <sup>(16)</sup> | +12V/2A  | -12V/2A  |
| CE-225-4003 | +5V/25A <sup>(16)</sup>   | +3.3V/8A <sup>(16)</sup> | +15V/2A  | -15V/2A  |
| CE-225-4004 | +5V/25A <sup>(16)</sup>   | -5.2V/8A <sup>(16)</sup> | +12V/2A  | -12V/2A  |
| CE-225-4005 | +5V/25A <sup>(16)</sup>   | -5.2V/8A <sup>(16)</sup> | +15V/2A  | -15V/2A  |
| CE-225-4006 | +5V/25A <sup>(16)</sup>   | +12V/8A <sup>(16)</sup>  | +12V/2A  | -12V/2A  |
| CE-225-4007 | +5V/25A <sup>(16)</sup>   | +12V/8A <sup>(16)</sup>  | +15V/2A  | -15V/2A  |
| CE-225-4008 | +5V/25A <sup>(16)</sup>   | +12V/8A <sup>(16)</sup>  | +9V/2A   | -9V/2A   |
| CE-225-4101 | +5V/25A <sup>(16)</sup>   | +24V/8A <sup>(16)</sup>  | +12V/2A  | -12V/2A  |
| CE-225-4102 | +5V/25A <sup>(16)</sup>   | +24V/8A <sup>(16)</sup>  | +15V/2A  | -15V/2A  |
| CE-225-4104 | +24V/6A <sup>(16)</sup>   | +24V/3A <sup>(16)</sup>  | +12V/2A  | 5V/2A    |
| CE-225-3001 | +5V/25A <sup>(16)</sup>   | +12V/8A <sup>(16)</sup>  |          | -12V/2A  |
| CE-225-3002 | +5V/25A <sup>(16)</sup>   | +15V/8A <sup>(16)</sup>  |          | -15V/2A  |
| CE-225-2001 | +12V/10A <sup>(16)</sup>  | -12V/8A <sup>(16)</sup>  |          |          |
| CE-225-2002 | +15V/10A <sup>(16)</sup>  | -15V/8A <sup>(16)</sup>  |          |          |
| CE-225-2003 | +5V/25A <sup>(16)</sup>   | +12V/8A <sup>(16)</sup>  |          |          |
| CE-225-2004 | +5.2V/30A <sup>(16)</sup> | -9V/6A                   |          |          |
| CE-225-2005 | +3.3V/25A <sup>(16)</sup> | +12V/8A <sup>(16)</sup>  |          |          |
| CE-225-2101 | +5V/25A <sup>(16)</sup>   | +24V/8A <sup>(16)</sup>  |          |          |
| CE-225-1001 | 3.3V/45A <sup>(17)</sup>  |                          |          |          |
| CE-225-1002 | 5V/45A <sup>(17)</sup>    |                          |          |          |
| CE-225-1003 | 12V/18.8A                 |                          |          |          |
| CE-225-1004 | 15V/15A                   |                          |          |          |
| CE-225-1005 | 24V/9.4A                  |                          |          |          |
| CE-225-1006 | 28V/8A                    |                          |          |          |
| CE-225-1007 | 48V/4.7A                  |                          |          |          |
| CE-225-1008 | 48V/4.7A                  |                          |          |          |
| CE-225-1009 | 39V/5.8A                  |                          |          |          |

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

# CE-225

## OUTPUT SPECIFICATIONS

|   |  |   |
|---|--|---|
| Total Output Power <sup>(1)</sup><br>(See Derating Chart) | 150W<br>225W   | Convection Cooled <sup>(18)</sup><br>300LFM Forced-Air Cooled <sup>(15)</sup>   |
| Output Voltage Centering                                  | Output 1:<br>Output 2:<br>Output 3:<br>Output 4:                     | ± 0.25% (All outputs at 50% load)<br>± 0.25% (X0XX), ± 5.0% (X1XX)<br>± 2.0%<br>± 2.0%  |
| Output Voltage Adjust Range                               | Outputs 1-2:<br>Output 1:<br>Output 1:<br>Output 2:                  | 95 - 105% (X0XX)<br>95 - 105% (X1XX)<br>85 - 105% (1001, 4001)<br>85 - 105% (4002, 4003)  |
| Load Regulation   | Output 1:<br>Output 2:<br>(X0XX)<br>(X1XX)<br>Output 3:<br>Output 4: | 0.5% (10-100% load change)<br>0.5% (0-100% load change)<br>5.0% (10-100% load change)<br>2.0% (0-100% load change)<br>2.0% (0-100% load change) |
| Source Regulation   | Outputs 1 – 4:   | 0.5%  |
| Cross Regulation  | Outputs 2:<br>Output 3:<br>Output 4:                                 | 0.2% (X0XX), 0.5% (X1XX)<br>2.0%<br>2.0%  |
| Output Noise  | Outputs 1 - 4:   | 1.0%  |
| Turn on Overshoot   |  | None  |
| Transient Response  | Outputs 1 – 4  |   |
| Voltage Deviation   |  | 5.0%  |
| Recovery Time   |  | 500µs   |
| Load Change   |  | 50% to 100%   |
| Output Overvoltage Protection (Optional)                  | Output 1:<br>Shuts down all outputs<br>Cycle input to restart        | 110% to 150%  |
| Output Overpower Protection                               | 250 W Min., Output 1 and 2<br>Outputs, cycle on/off, auto recovery   |   |
| Output Overcurrent Protection                             |  | 110% Min., Outputs 3 & 4  |
| Hold Up Time  |  | 20ms min., 225W Output, 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            | 4.25A at 85V Input          |
| Peak Inrush         | 30A                         |
| Peak Repetitive     | 6.0A at 85V Input           |
| Harmonic Distortion | 0.05                        |
| Efficiency          | 0.68-0.80 (varies by model) |
| Power Factor        | 0.92 (225 Watts, 230V)      |

### ENVIRONMENTAL SPECIFICATIONS

|                             |   |
|-----------------------------|---|
| Ambient Operating           | 0°C to + 70°C   |
| Temperature Range           | 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<br>12,192m ASL – Non-Operating |

### GENERAL SPECIFICATIONS

|  |   |
|--|---|
| Means of Protection                          |   |
| Primary to Secondary                         | 2MOPP (Means of Patient Protection)   |
| Primary to Ground                            | 1MOPP (Means of Patient Protection)   |
| Secondary to Ground                          | Operational Insulation(Consult factory for 1MOPP)                             |
| Dielectric Strength <sup>(8, 9)</sup>        |   |
| Reinforced Insulation                        | 5656 VDC, Primary to Secondary  |
| Basic Insulation                             | 2121 VDC, Primary to Ground   |
| Operational Insulation                       | 707 VDC, Secondary to Ground  |
| Leakage Current                              |   |
| Earth Leakage                                | <300µA NC, <1000µA SFC  |
| Touch Current                                | <100µA NC, <500µA SFC   |
| Power Fail Signal (optional) <sup>(14)</sup> | Logic low with input power failure 10ms minimum prior to Output 1 dropping 1% |
| Remote Inhibit (optional)                    | Contact closure inhibits all outputs  |
| Remote Sense <sup>(10)</sup>                 | 250mV compensation of output cable losses                                     |
| Mean-Time Between Failures                   | 100,000 Hours min., MIL-HDBK-217F, 25° C, GB                                  |
| Weight                                       | 3.00 Lbs.   |

All specifications are maximum at 25°C/225W unless otherwise stated, may vary by model and are subject to change without notice.



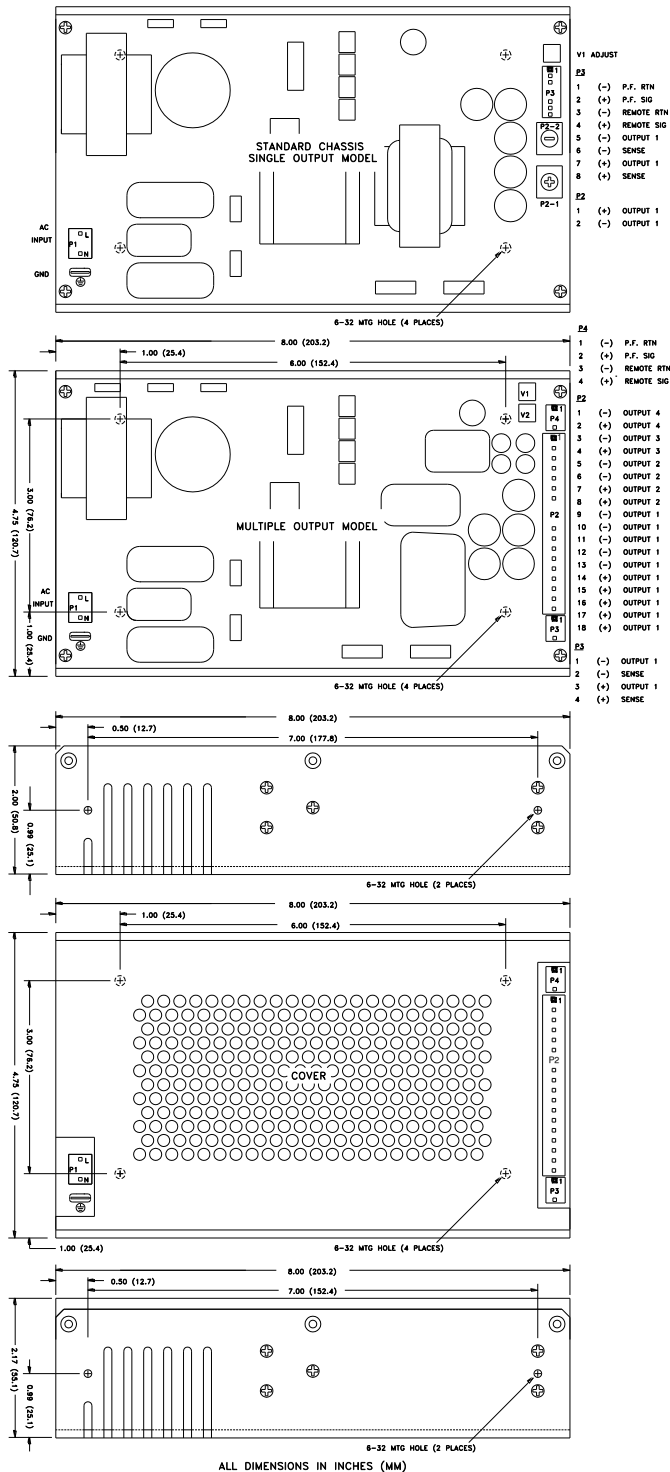
INTEGRATED  
POWER DESIGNS

300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com

## EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4<sup>TH</sup> 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 <sub>T</sub> , 0.5 cycles, 0-315°   | 100/240V A/A |
|                                   |               | 0% U <sub>T</sub> , 1 cycles, 0°         | 100/240V A/A |
|                                   |               | 40% U <sub>T</sub> , 10/12 cycles, 0°    | 100/240V B/A |
|                                   |               | 70% U <sub>T</sub> , 25/30 cycles, 0°    | 100/240V B/A |
| Voltage Interruptions             | EN 61000-4-11 | 0% U <sub>T</sub> , 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                                |              |

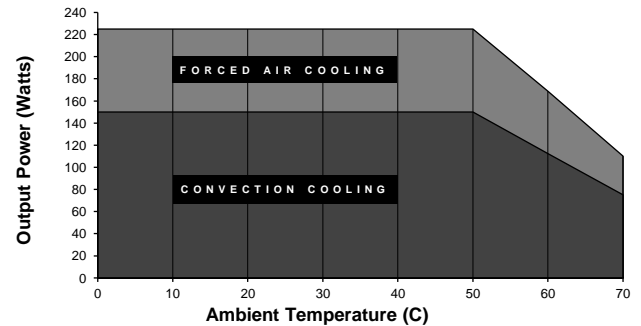
## CE-225 SERIES MECHANICAL SPECIFICATIONS



## APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 150 or 225W, as determined by the cooling method.
- 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.
- Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
- 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.
- A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
- 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.
- 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.
- 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 UL 60601-1 1<sup>st</sup> Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
- 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.
- 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.
- Maximum screw penetration into chassis mounting holes is 0.250 inches.
- 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.
- Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
- 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.
- Forced-Air cooling rating of 225W requires an air speed of 300LFM flowing past a point one inch above the main isolation transformer.
- Derated 20% when convection cooled.
- Rated 30A maximum when convection cooled only.
- Free-Air convection cooling, 150W maximum output power.

## MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



## CONNECTOR SPECIFICATIONS

|                               |   |
|-------------------------------|---|
| 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.  |
| P2 DC Output (Multiple)       | 0.156 friction lock header mates with Molex 09-50-3181 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 22-01-2087 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.       |
| P3/P4 Option/Sense (Multiple) | 0.100 friction lock header mates with Molex 22-01-2047 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.       |