

## Features

- ◆ Highest power density encased  
150 W power supply in 2.44" x 4" package
- ◆ 2 x MOPP Medical safety according to  
AAMI/ANSI ES 60601-1:2005(R) and  
IEC/EN 60601-1 3rd edition
- ◆ Low leakage current <100 µA rated for  
BF applications
- ◆ Highest efficiency 91 to 92%  
across 10% – 100% load range
- ◆ Active power factor correction (>95)
- ◆ Protection class II prepared
- ◆ Operating up to 5000m altitude
- ◆ Adjustable output voltage
- ◆ 3-year product warranty



The TPP 150 Series of 150 Watt AC/DC power supplies feature a reinforced double I/O isolation system according to latest medical safety standards (60601-1 3rd edition, 2 x MOPP). The earth leakage current is below 100 µA what makes the units suitable for BF (body floating) applications.

The excellent efficiency of up to 92% allows a high power density for the standard 2.44" x 4.0" packaging format. The full load operating temperature range is -25°C to +50°C while it goes up to 70°C with 50% load derating.

They come with an active power factor correction and the EMC characteristic is dedicated for applications in industrial and domestic fields.

High reliability is provided by use of industrial quality grade components and an excellent thermal management. It makes the products an ideal solution for medical devices and for demanding safety and space critical applications.

## Models

| Order code  | Output voltage<br>(adjustment range) | Output current<br>max. | Efficiency<br>max. |
|-------------|--------------------------------------|------------------------|--------------------|
| TPP 150-112 | 12 VDC (10.8 - 13.2)                 | 12.5 A                 | 91 %               |
| TPP 150-115 | 15 VDC (13.5 - 16.5)                 | 10.0 A                 | 92 %               |
| TPP 150-124 | 24 VDC (21.6 - 26.4)                 | 6.25 A                 | 92 %               |
| TPP 150-128 | 28 VDC (25.2 - 30.8)                 | 5.36 A                 | 92 %               |
| TPP 150-136 | 36 VDC (32.4 - 39.6)                 | 4.17 A                 | 92 %               |
| TPP 150-148 | 48 VDC (43.2 - 52.8)                 | 3.13 A                 | 92 %               |

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**POWER  
WITHOUT  
LIMITS**

## Input Specifications

|                            |  |  |
|----------------------------|--|--|
| Input voltage range        | - AC range (universal input)<br>- DC range | 85 – 264 VAC<br>120 – 370 VDC                          |
| Input frequency            |  | 47 – 63 Hz   |
| Input current at full load | - at 115 VAC / 230 VAC                     | 1.7 A max. / 0.8 A max.                                |
| Input protection           |  | T3.15 A/250 VAC (internal fuse in both line & neutral) |
| Harmonic limits            | - Power factor                             | EN 61000-3-2, Class A & D<br>0.95                      |

## Output Specifications

|   |  |   |
|---|--|---|
| Voltage set accuracy                          |  | ±1%   |
| Regulation                                    | - Input variation<br>- Load variation (0 - 100%)   | 0.2% max.<br>0.5% max.  |
| Minimum load                                  |  | not required  |
| Temperature coefficient                       |  | 0.02%/K   |
| Hold-up time                                  | - $V_{in} = 115 \text{ VAC} / 230 \text{ VAC}$   | 16 ms min.  |
| Start-up time                                 |  | <1s   |
| Rise time                                     |  | 20ms typ.   |
| Output voltage adjustment                     |  | ±10%  |
| Ripple and noise (20Mhz Bandwidth)            | 12 VDC model:<br>15 VDC model:<br>24 VDC model:<br>28 VDC model:<br>36 VDC model:<br>48 VDC model: | 120 mVp-p typ. with cap. 1µF/25V 1206 X7R MLCC<br>150 mVp-p typ. with cap. 1µF/25V 1206 X7R MLCC<br>220 mVp-p typ. with cap. 1µF/50V 1206 X7R MLCC<br>220 mVp-p typ. with cap. 1µF/50V 1206 X7R MLCC<br>250 mVp-p typ. with cap. 1µF/50V 1206 X7R MLCC<br>250 mVp-p typ. with cap. 0.1µF/100V 1206 X7R MLCC |
| Overvoltage protection                        |  | 115 – 135% of nominal $V_{out}$   |
| Overload protection by current limit          |  | at 115 – 150% $I_{out}$ max.  |
| Short circuit protection                      |  | continuous (automatic recovery)   |
| Transiente response<br>(25% load step change) | - Peak deviation<br>- Recovery time  | 3% of $V_{out}$<br>500µs  |

## General Specifications

|   |                                      |  |
|---|--------------------------------------|--|
| Operating temperature                                   |                                      | -25°C to +80°C with derating see below         |
| Output power derating                                   | - Temperature<br>- Low input voltage | 2.33 %/K above +50°C<br>1.33 %/V below 100 VAC |
| Storage temperature                                     |                                      | -40°C to +85°C                                 |
| Humidity (non condensing)                               |                                      | 5 – 95 % rel. H max.                           |
| Altitude during operation                               |                                      | 5000 m   |
| Switching frequency                                     |                                      | 60 kHz typ. (pulse width modulation)           |
| Isolation voltage $I_{min}$ (2 x MOPP insulation)       | - Input / Output<br>- Input / Case   | 4000 VAC<br>2000 VAC                           |
| Leakage current (at 264 VAC/60Hz)                       |                                      | 100 µA max.                                    |
| Isolation resistance (at 500 VDC)                       |                                      | 100 Mohm min.                                  |
| Reliability, calculated MTBF at +25°C acc. to IEC 61709 |                                      | > 790'000h                                     |
| Protection class  |                                      | class II prepared                              |

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

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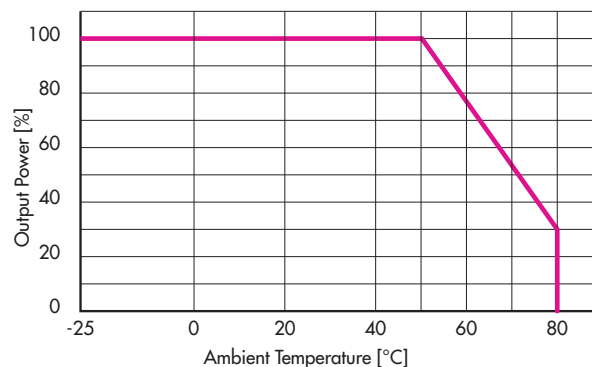
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## General Specifications

|   |  |   |
|---|--|---|
| Electromagnetic compatibility (EMC), emissions                                    | <ul style="list-style-type: none"> <li>– Conducted input RI suppression</li> <li>– Harmonic current emissions</li> <li>– Voltage flicker</li> <li>– Radiated input suppression</li> </ul>  | EN 55022, class B<br>IEC / EN 61000-3-2, class A & D<br>IEC / EN 61000-3-3, (class tba.)<br>EN 55011, class A<br>IEC / EN 60601-1-2 (for medical equipment)   |
| Electromagnets compatibility (EMC), immunity                                      | <ul style="list-style-type: none"> <li>– Electrostatic discharge ESD</li> <li>– RF field immunity</li> <li>– Electrical fast transients/burst immunity</li> <li>– Surge</li> <li>– Conducted RF</li> <li>– Power frequency magnetic field</li> </ul> | IEC / EN 60601-1-2<br>IEC / EN 61000-4-2, 8kV/6kV perf. criteria A<br>IEC / EN 61000-4-3, 20V/m perf. criteria A<br>IEC / EN 61000-4-4, ± 2kV perf. criteria A<br>IEC / EN 61000-4-5, ± 1kV/± 2kV perf. criteria A<br>IEC / EN 61000-4-6, 20 Vrms perf. criteria A<br>IEC / EN 61000-4-8, 10 A/M perf. criteria A |
| Voltage dip and interruptions according to EN 60601-1-2 reference: 100 VAC / 50Hz |  | 30%, 500ms perf. criteria A<br>60%, 100ms perf. criteria B<br>> 95%, 10ms perf. criteria A<br>> 95%, 5000ms perf. criteria B  |
| Safety standards  | <ul style="list-style-type: none"> <li>– Information technology equipment</li> <li>– Information medical equipment</li> <li>– Certification documents</li> </ul>   | UL 60950-1, IEC/EN 60950-1,<br>IEC/EN 60601-1 3rd edition, (2x MOPP)<br>ANSI/AAMI ES60601-1:2005(R)2012<br><a href="http://www.tracopower.com/overview/tpp150">www.tracopower.com/overview/tpp150</a>   |
| Environment   | <ul style="list-style-type: none"> <li>– Vibration acc. IEC 60068-2-6;</li> <li>– Shock acc. IEC 60068-2-27</li> </ul>   | 3 axis, sine sweep, 10–55Hz, 1g, 1oct/min<br>3 axis, 10g half sine, 11msShock<br>20 G (3 directions each 3 times)   |
| Environmental compliance  | <ul style="list-style-type: none"> <li>– Reach</li> <li>– RoHS</li> </ul>  | <a href="http://www.tracopower.com/overview/tpp150">www.tracopower.com/overview/tpp150</a><br>RoHS directive 2011/65/EU   |
| Connection  |  | screw terminal  |

Power derating depending on temperature (for horizontal mounting)



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

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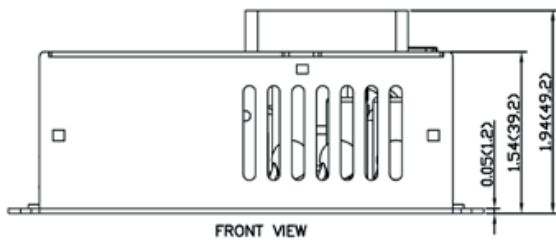
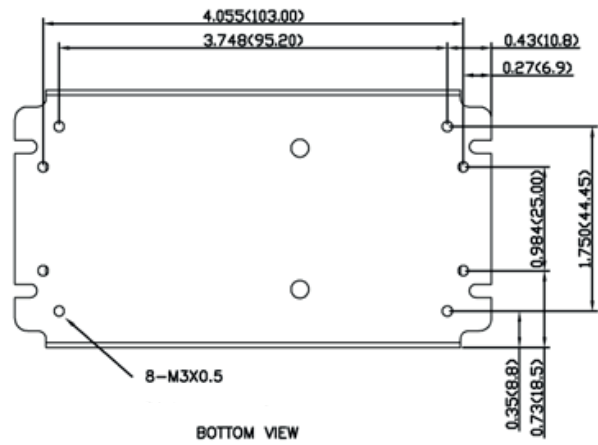
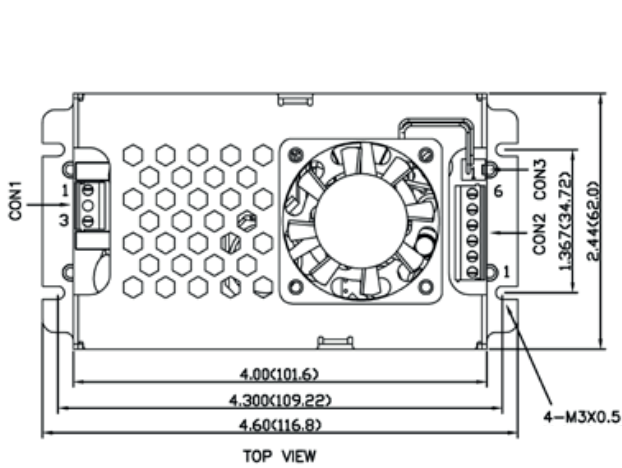


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Weight: 272g (9.59 oz)

| Screw Terminal |         |        |      | Pin Connector |       |
|----------------|---------|--------|------|---------------|-------|
| Pin            | Input   | Output | Pin* | Fan           | CON 3 |
| 1              | Line    | - Vout | 1-3  | 1             | - FAN |
| 3              | Neutral | + Vout | 4-6  | 2             | + FAN |

\*Terminal rated for 10 A max.  
(at higher current connection has to be splitted)

Dimensions in inch, (l) = mm  
Tolerances: x.xx±0.02 (x.x±0.5) x.xxx±0.01 (x.xx±0.25)  
Wire dimensions range 26 - 16 AWG

**Costumized versions on request (e.g. open frame, PIN-connector, DIN-rail clip)**

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