The TPP 100 Series of 100 Watt AC/DC encased 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 75 µA which 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 3.6" packaging format. The full load operating temperature range is –25°C to +60°C while it goes up to 80°C with 50% load derating. The EMC characteristic is dedicated for applications in industrial and medical fields. High reliability is provided by the 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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TPP 100-112</td>
<td>100 W</td>
<td>12 VDC (10.8 - 13.2 VDC)</td>
<td>8'340 mA</td>
<td>91 %</td>
</tr>
<tr>
<td>TPP 100-115</td>
<td></td>
<td>15 VDC (13.5 - 16.5 VDC)</td>
<td>6'670 mA</td>
<td>92 %</td>
</tr>
<tr>
<td>TPP 100-124</td>
<td></td>
<td>24 VDC (21.6 - 26.4 VDC)</td>
<td>4'170 mA</td>
<td>92 %</td>
</tr>
<tr>
<td>TPP 100-128</td>
<td></td>
<td>28 VDC (25.2 - 30.8 VDC)</td>
<td>3'580 mA</td>
<td>92 %</td>
</tr>
<tr>
<td>TPP 100-136</td>
<td></td>
<td>36 VDC (32.4 - 39.6 VDC)</td>
<td>2'780 mA</td>
<td>91 %</td>
</tr>
<tr>
<td>TPP 100-148</td>
<td></td>
<td>48 VDC (43.2 - 52.8 VDC)</td>
<td>2'090 mA</td>
<td>91 %</td>
</tr>
</tbody>
</table>
### Input Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>AC Range</th>
<th>DC Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Range</td>
<td>85 - 264 VAC (Full Range)</td>
<td>120 - 370 VDC (Designed for, no certification)</td>
</tr>
<tr>
<td>Rated Range</td>
<td>100 - 240 VAC (Full Range)</td>
<td></td>
</tr>
<tr>
<td>Power Frequency</td>
<td>47 - 440 Hz</td>
<td></td>
</tr>
<tr>
<td>Input Frequency</td>
<td>Certified: 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Input Current</td>
<td>- Full Load &amp; Vin = 230 VAC</td>
<td>550 mA max.</td>
</tr>
<tr>
<td>- Full Load &amp; Vin = 115 VAC</td>
<td>1'150 mA max.</td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td>- No load &amp; Vin = 230 VAC</td>
<td>300 mW max. (Ready to meet ErP directive)</td>
</tr>
<tr>
<td>- No load &amp; Vin = 115 VAC</td>
<td>300 mW max.</td>
<td></td>
</tr>
<tr>
<td>Input Inrush Current</td>
<td>- At 230 VAC</td>
<td>60 A max.</td>
</tr>
<tr>
<td>- At 115 VAC</td>
<td>35 A max.</td>
<td></td>
</tr>
<tr>
<td>Power Factor</td>
<td>- At 230 VAC</td>
<td>0.95 min. (Active Power Factor Correction)</td>
</tr>
<tr>
<td>- At 115 VAC</td>
<td>0.95 min. (Active Power Factor Correction)</td>
<td></td>
</tr>
<tr>
<td>Input Protection</td>
<td>T 3.15 A / 250 VAC [Internal Fuse in L &amp; N]</td>
<td></td>
</tr>
<tr>
<td>Recommended Input Fuse</td>
<td>(The need of an external fuse has to be assessed in the final application.)</td>
<td></td>
</tr>
</tbody>
</table>

### Output Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Voltage Adjustments</td>
<td>±10% (By trim potentiometer)</td>
</tr>
<tr>
<td>Voltage Set Accuracy</td>
<td>±1% max.</td>
</tr>
<tr>
<td>Regulation</td>
<td>Input Variation (Vmin - Vmax): 0.2% max.</td>
</tr>
<tr>
<td>Ripple and Noise</td>
<td>Load Variation (0 - 100%): 0.5% max.</td>
</tr>
<tr>
<td>Ripple and Noise (20 MHz Bandwidth)</td>
<td>12 VDC model: 120 mVp-p typ. (w/ 10 µF X7R)</td>
</tr>
<tr>
<td>- 15 VDC model</td>
<td>150 mVp-p typ. (w/ 10 µF X7R)</td>
</tr>
<tr>
<td>- 24 VDC model</td>
<td>160 mVp-p typ. (w/ 1 µF X7R)</td>
</tr>
<tr>
<td>- 28 VDC model</td>
<td>180 mVp-p typ. (w/ 1 µF X7R)</td>
</tr>
<tr>
<td>- 36 VDC model</td>
<td>190 mVp-p typ. (w/ 1 µF X7R)</td>
</tr>
<tr>
<td>- 48 VDC model</td>
<td>340 mVp-p typ. (w/ 0.1 µF X7R)</td>
</tr>
<tr>
<td>Capacitive Load</td>
<td>12 VDC model: 6'950 µF max.</td>
</tr>
<tr>
<td>- 15 VDC model</td>
<td>4'450 µF max.</td>
</tr>
<tr>
<td>- 24 VDC model</td>
<td>1'750 µF max.</td>
</tr>
<tr>
<td>- 28 VDC model</td>
<td>1'280 µF max.</td>
</tr>
<tr>
<td>- 36 VDC model</td>
<td>770 µF max.</td>
</tr>
<tr>
<td>- 48 VDC model</td>
<td>430 µF max.</td>
</tr>
<tr>
<td>Minimum Load</td>
<td>Not required</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>±0.02 %/K max.</td>
</tr>
<tr>
<td>Hold-up Time</td>
<td>- At 230 VAC: 16 ms min.</td>
</tr>
<tr>
<td>- At 115 VAC</td>
<td>16 ms min.</td>
</tr>
<tr>
<td>Start-up Time</td>
<td>- At 230 VAC: 1'000 ms max.</td>
</tr>
<tr>
<td>- At 115 VAC</td>
<td>1'000 ms max.</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Continuous, Automatic recovery</td>
</tr>
<tr>
<td>Output Current Limitation</td>
<td>115 - 150% of Iout max.</td>
</tr>
<tr>
<td>Overvoltage Protection</td>
<td>115 - 135% of Vout nom.</td>
</tr>
<tr>
<td>Transient Response</td>
<td>Response Deviation: 3% max. (50% to 75% Load Step)</td>
</tr>
<tr>
<td>- Response Time</td>
<td>500 µs typ. (50% to 75% Load Step)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Safety Standards</th>
<th>EN 60950-1</th>
<th>EN 62368-1</th>
<th>IEC 60950-1</th>
<th>IEC 62368-1</th>
<th>UL 60950-1</th>
<th>UL 62368-1</th>
<th>ANSI/AAMI ES 60601-1</th>
<th>IEC 60601-1</th>
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<tbody>
<tr>
<td>- IT / Multimedia Equipment</td>
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<tr>
<td>- Medical Equipment</td>
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<tr>
<td>- Certification Documents</td>
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</table>

**Protection Class**
- Class I & II (Prepared: Reinforced Insulation)

**Pollution Degree**
- PD 2

**Over Voltage Category**
- OVC II

### EMC Specifications

<table>
<thead>
<tr>
<th>EMI Emissions</th>
<th>EN 60610-1-2 edition 4 (Medical Devices)</th>
<th>EN 55011 class B (internal filter)</th>
<th>EN 55032 class B (internal filter)</th>
<th>FCC Part 15 class B (internal filter)</th>
<th>FCC Part 18 class B (internal filter)</th>
<th>EN 55011 class A (internal filter)</th>
<th>EN 55032 class A (internal filter)</th>
<th>FCC Part 15 class A (internal filter)</th>
<th>FCC Part 18 class A (internal filter)</th>
<th>EN 61000-3-2, class A</th>
<th>EN 61000-3-2, class D</th>
<th>EN 61000-3-3</th>
</tr>
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<tbody>
<tr>
<td>- Conducted Emissions</td>
<td></td>
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<tr>
<td>- Radiated Emissions</td>
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<tr>
<td>- Harmonic Current Emissions</td>
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<tr>
<td>- Voltage Fluctuations &amp; Flicker</td>
<td></td>
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</tbody>
</table>

**EMS Immunity**
- Electrostatic Discharge
  - Air: EN 61000-4-2, ±15 kV, perf. criteria A
  - Contact: EN 61000-4-2, ±8 kV, perf. criteria A
  - L to L: EN 61000-4-5, ±1 kV, perf. criteria A
  - L to PE: EN 61000-4-5, ±2 kV, perf. criteria A
- Conducted RF Disturbances
  - Continuous: EN 61000-4-8, 10 V/m, perf. criteria A
  - 230 VAC / 50 Hz: EN 61000-4-11
    - 30%, 25 periods, perf. criteria A
    - >95%, 0.5 periods, perf. criteria A
    - >95%, 250 periods, perf. criteria B
  - 115 VAC / 60 Hz: EN 61000-4-11
    - 30%, 25 periods, perf. criteria A
    - >95%, 0.5 periods, perf. criteria A
    - >95%, 250 periods, perf. criteria B
- RF Electromagnetic Field
- EFT (Burst) / Surge

### General Specifications

<table>
<thead>
<tr>
<th>Relative Humidity</th>
<th>95% max. (non condensing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Ranges</td>
<td>Operating Temperature: -25°C to +85°C</td>
</tr>
<tr>
<td></td>
<td>Storage Temperature: -40°C to +85°C</td>
</tr>
<tr>
<td>Power Derating</td>
<td>High Temperature: 2.4 %/K above 60°C</td>
</tr>
<tr>
<td></td>
<td>Low Input Voltage: 1.33 %/V below 100 VAC</td>
</tr>
<tr>
<td>Cooling System</td>
<td>Natural convection (20 LFM)</td>
</tr>
<tr>
<td>Altitude During Operation</td>
<td>5'000 m max.</td>
</tr>
<tr>
<td>Switching Frequency</td>
<td>45 - 75 kHz (PWM CR)</td>
</tr>
</tbody>
</table>

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

Working Voltage (rated)
250 VAC

Isolation Test Voltage
- Input to Output, 60 s: 4'000 VAC
- Input to Case or PE, 60 s: 1'500 VAC
- Output to Case or PE, 60 s: 1'500 VAC

Isolation Resistance
- Input to Output: 500 VDC, 100 MΩ min.

Leakage Current (at 264 VAC)
- Touch Current: 75 µA max.

Reliability
- Calculated MTBF: 790'000 h (MIL-HDBK-217F, ground benign)

Environment
- Vibration: IEC 60068-2-6
  5 g, 3 axis, sine sweep, 5-500 Hz, 1 oct/min
- Mechanical Shock: IEC 60068-2-27
  50 g, 3 axis, half sine, 11 ms

Housing Material
Alu alloy, black anodized coating

Housing Type
Metal Case

Mounting Type
Chassis Mount

Connection Type
Screw Terminal

Weight
210 g

Environmental Compliance
- REACH Declaration
  www.tracopower.com/info/reach-declaration.pdf
  REACH SVHC list compliant
  REACH Annex XVII compliant
- RoHS Declaration
  www.tracopower.com/info/rohs-declaration.pdf
  Exemptions: 7a, 7c-I
  (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).
  The SCIP number is provided on request.)

Supporting Documents
Overview Link (for additional Documents)
www.tracopower.com/overview/tpp100

Outline Dimensions

Screw Terminal

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Line</td>
<td>1,2</td>
<td>–Vout</td>
</tr>
<tr>
<td>3</td>
<td>Neutral</td>
<td>3,4</td>
<td>+Vout</td>
</tr>
</tbody>
</table>

CON1: Terminal Block
mates with Screw locked torque MAX 2Kgf.cm/0.2N.m
Wire dimension range: 26 - 16 AWG

CON2: Terminal Block
mates with Screw locked torque MAX 2Kgf.cm/0.2N.m
Wire dimension range: 26 - 16 AWG