

### Features

- ◆ Highest power density encased  
150 W power supply in 2" x 4" package
- ◆ 2 x MOPP Medical safety according to  
AAMI/ANSI ES 60601-1:2005(R) and  
IEC/EN 60601-1 3rd edition
- ◆ 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 (60601-3 3rd edition, 2 x MOPP)

The excellent efficiency of up to 92% allows a high power density for the standard 2.0" 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 (adjustment range)	Output current max.	Efficiency 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 150-136	36 VDC (32.4 - 39.6)	4.17 A	92 %
TPP 150-148	48 VDC (43.2 - 52.8)	3.13 A	92 %

### Input Specifications

Input voltage range	– AC range (universal input) – DC range	85 – 264 VAC 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 0.95

### Output Specifications

Voltage set accuracy		±1%
Regulation	– Input variation – Load variation (0 - 100%)	0.2% max. 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: 15 VDC model: 24 VDC model: 36 VDC model: 48 VDC model:	120 mVp-p typ. with cap. 1µF/25V 1206 X7R MLCC 150 mVp-p typ. with cap. 1µF/25V 1206 X7R MLCC 220 mVp-p typ. with cap. 1µF/50V 1206 X7R MLCC 250 mVp-p typ. with cap. 1µF/50V 1206 X7R MLCC 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)
Transient response (25% load step change)	– Peak deviation – Recovery time	3% of $V_{out}$ 500µs

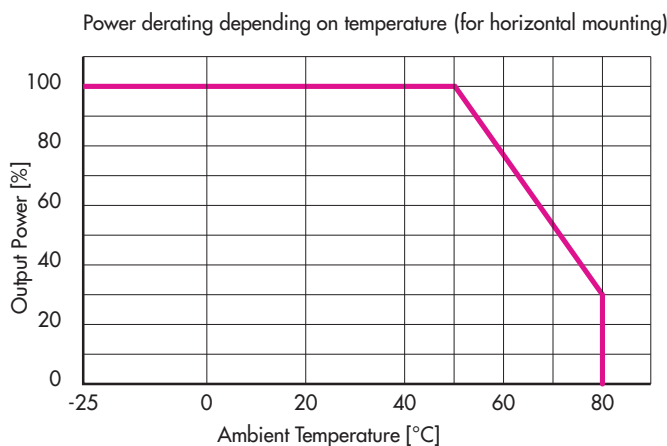
### General Specifications

Operating temperature		–25°C to +80°C with derating see below
Output power derating	– Temperature – Low input voltage	2.33 %/K above +50°C 1.33 %/V below 100 VAC
Storage temperature		–40°C to +85°C
Humidity (non condensing)		0 – 90 % rel. H max.
Altitude during operation		5000 m
Switching frequency		60 kHz typ. (pulse width modulation)
Isolation voltage 1min (2 x MOPP insulation)	– Input / Output – Input / Case	4000 VAC 1500 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.

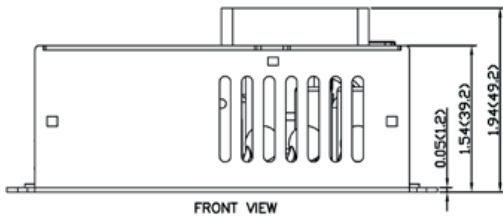
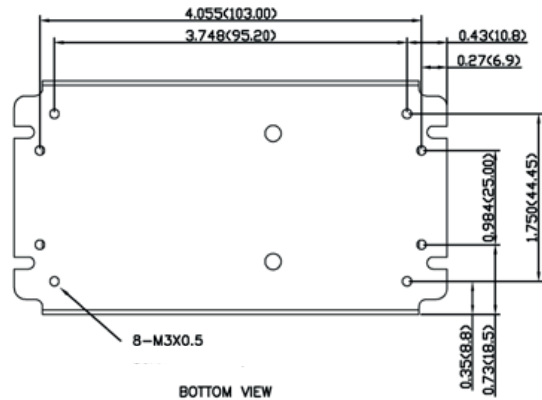
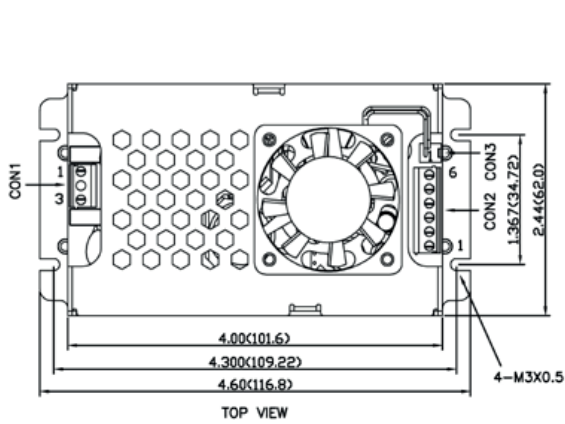
**General Specifications**

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 IEC / EN 61000-3-2, class A & D IEC / EN 61000-3-3, (class tba.) EN 55011, class A
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> </ul>	IEC / EN 61000-4-2, 8kV/6kV perf. criteria A IEC / EN 61000-4-3, 20V/m perf. criteria A IEC / EN 61000-4-4, ± 2kV perf. criteria A IEC / EN 61000-4-5, ± 1kV/± 2kV perf. criteria A IEC / EN 61000-4-6, 20 Vr.m.s perf. criteria A
Voltage dip and interruptions according to EN 60601-1-2 reference: 100 VAC / 50Hz		30%, 500ms perf. criteria A 60%, 100ms perf. criteria B > 95%, 10ms perf. criteria A > 95%, 5000ms perf. criteria B
Safety standards		UL 60950-1, IEC/EN 60950-1, IEC/EN 60601-1 3rd edition, ANSI/AAMI ES60601-1:2005(R)2012
Safety approvals and certifications	<ul style="list-style-type: none"> <li>- UL online certification (ES60601-1:2005(R)2012)</li> <li>- UL certificate (UL 60950-1)</li> <li>- CB certificate (60601-1 3rd edition 2 x MOPP)</li> <li>- CB certificate (IEC/EN 60950-1)</li> </ul>	<a href="http://www.ul.com">www.ul.com</a> File e188913, copy: e188913qqhm2.pdf <a href="http://www.ul.com">www.ul.com</a> File e188913, copy: e188913qqgq2.pdf <a href="http://www.tracopower.com/products/tpp150-cb60601.pdf">www.tracopower.com/products/tpp150-cb60601.pdf</a> <a href="http://www.tracopower.com/products/tpp150-cb60950.pdf">www.tracopower.com/products/tpp150-cb60950.pdf</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 3 axis, 10g half sine, 11msShock 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/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a> RoHS directive 2011/65/EU
Connection		screw terminal



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

**Dimensions**



Weight: 272g (9.59 oz)

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

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

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

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