

- Highest power density 150 W open frame power supply in 2" x 4" package
- I/O reinforced isolation 3000 VDC
- Ready to meet ErP directive, < 0.3 W no load power consumption
- Highest efficiency 91 - 92% across 10% - 100% load range
- Active power factor correction > 95
- Protection class II prepared
- Operating up to 5000 m altitude
- Adjustable output voltage
- 3-year product warranty



The TPI 150A Series of 150 Watt AC/DC power supplies features a 3000 VDC I/O reinforced isolation. 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 -40°C to +50°C while it goes up to +80°C with load derating. The power supplies are designed to meet the ErP directive (< 0.3 W no load power consumption). 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 any demanding industrial devices and space critical applications.

Models					
Order Code	Output Power max.	Output Voltage nom. (adjustable)	Output Current max. (Forced air cooling)	Output Current max. (Natural convection)	Efficiency typ.
TPI 150-112A-J	150 W	12 VDC (10.8 - 13.2 VDC)	12'500 mA	8'340 mA	91 %
TPI 150-115A-J		15 VDC (13.5 - 16.5 VDC)	10'000 mA	7'340 mA	92 %
TPI 150-124A-J		24 VDC (21.6 - 26.4 VDC)	6'250 mA	4'590 mA	92 %
TPI 150-128A-J		28 VDC (25.2 - 30.8 VDC)	5'360 mA	3'930 mA	92 %
TPI 150-136A-J		36 VDC (32.4 - 39.6 VDC)	4'170 mA	3'060 mA	92 %
TPI 150-148A-J		48 VDC (43.2 - 52.8 VDC)	3'130 mA	2'090 mA	92 %

### Input Specifications

Input Voltage	- AC Range	85 - 264 VAC (Full Range)
	- DC Range	120 - 370 VDC (Designed for, no certification)
Input Frequency		47 - 63 Hz
Input Current	- Full Load & Vin = 230 VAC	800 mA max.
	- Full Load & Vin = 115 VAC	1'700 mA max.
Power Consumption	- At no load	300 mW max. (Ready to meet ErP directive)
Input Inrush Current	- At 230 VAC	100 A max.
Power Factor	- At 230 VAC	0.95 min.
	- At 115 VAC	0.95 min.
Input Protection		T 3.15 A / 250 VAC (Internal Fuse in L & N)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

### Output Specifications

Output Voltage Adjustment		±10% (By trim potentiometer) Output power must not exceed rated power!
Voltage Set Accuracy		±1% max.
Regulation	- Input Variation (Vmin - Vmax)	0.2% max.
	- Load Variation (0 - 100%)	0.5% max.
Ripple and Noise (20 MHz Bandwidth)	12 VDC model:	120 mVp-p typ. (w/ 1 µF X7R)
	15 VDC model:	150 mVp-p typ. (w/ 1 µF X7R)
	24 VDC model:	220 mVp-p typ. (w/ 1 µF X7R)
	28 VDC model:	220 mVp-p typ. (w/ 1 µF X7R)
	36 VDC model:	250 mVp-p typ. (w/ 1 µF X7R)
	48 VDC model:	250 mVp-p typ. (w/ 0.1 µF X7R)
Capacitive Load	12 VDC model:	10'400 µF max.
	15 VDC model:	6'600 µF max.
	24 VDC model:	2'600 µF max.
	28 VDC model:	1'900 µF max.
	36 VDC model:	1'150 µF max.
	48 VDC model:	650 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Hold-up Time	- At 230 VAC	16 ms min.
	- At 115 VAC	16 ms min.
Start-up Time	- At 230 VAC	1'000 ms max.
	- At 115 VAC	1'000 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		115 - 150% of Iout max.
Overvoltage Protection		115 - 135% of Vout nom.
Transient Response	- Response Deviation	3% max. (50% to 75% Load Step)
	- Response Time	500 µs typ. (50% to 75% Load Step)

### Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Certification Documents	<a href="http://www.tracopower.com/overview/tpi150a">www.tracopower.com/overview/tpi150a</a>
Protection Class		Class I & II (Prepared): Reinforced Insulation
Pollution Degree		PD 2
Over Voltage Category		OVC II

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

## EMC Specifications

<b>EMI Emissions</b>		EN 61000-6-4 (Generic Industrial)
- Conducted Emissions		EN 55011 class B (internal filter) EN 55032 class B (internal filter) FCC Part 15 class B (internal filter)
- Radiated Emissions		EN 55011 class A (internal filter) EN 55032 class A (internal filter) FCC Part 15 class A (internal filter)
- Harmonic Current Emissions		EN 61000-3-2, class A EN 61000-3-2, class D
- Voltage Fluctuations & Flicker		EN 61000-3-3
<b>EMS Immunity</b>		EN 55024 (IT Equipment)
- Electrostatic Discharge		Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A EN 61000-4-3, 20 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A
- RF Electromagnetic Field		L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria A L to PE: EN 61000-4-5, $\pm 2$ kV, perf. criteria A
- EFT (Burst) / Surge		EN 61000-4-6, 20 Vrms, perf. criteria A
- Conducted RF Disturbances		Continuous: EN 61000-4-8, 10 A/m, perf. criteria A
- PF Magnetic Field		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
- Voltage Dips & Interruptions		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

## General Specifications

<b>Relative Humidity</b>		95% max. (non condensing)
<b>Temperature Ranges</b>		-40°C to +85°C
- Operating Temperature		-40°C to +85°C
- Storage Temperature		(-40°C startup: 80% load max. at Vin >100 VAC -40°C startup: 100% load max. at Vin >200 VAC)
<b>Power Derating</b>		See application note: <a href="http://www.tracopower.com/overview/tpi150a">www.tracopower.com/overview/tpi150a</a> 1.33 %/V below 100 VAC
- High Temperature		
- Low Input Voltage		
<b>Cooling System</b>		Forced air cooling (with external fan, 10 CFM) Natural convection (20 LFM)
- Option 1		
- Option 2		
<b>Fan Power Source</b>		Variable fan speed (temperature regulated) 12 VDC 500 mA max.
- Characteristic		
- Output Voltage		
- Output Current		
<b>Altitude During Operation</b>		5'000 m max.
<b>Switching Frequency</b>		45 - 75 kHz (PWM QR)
<b>Insulation System</b>		Reinforced Insulation
<b>Working Voltage (rated)</b>		344 VAC
<b>Isolation Test Voltage</b>		3'000 VAC
- Input to Output, 60 s		2'000 VAC
- Input to Case or PE, 60 s		2'000 VAC
- Output to Case or PE, 60 s		
<b>Isolation Resistance</b>		100 M $\Omega$ min.
- Input to Output, 500 VDC		
<b>Leakage Current (at 264 VAC)</b>		300 $\mu$ A max.
- Touch Current		
<b>Reliability</b>		786'100 h (MIL-HDBK-217F, ground benign)
- Calculated MTBF		

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

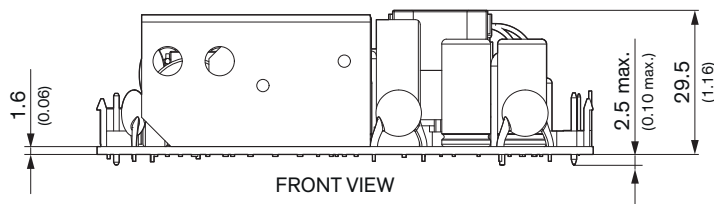
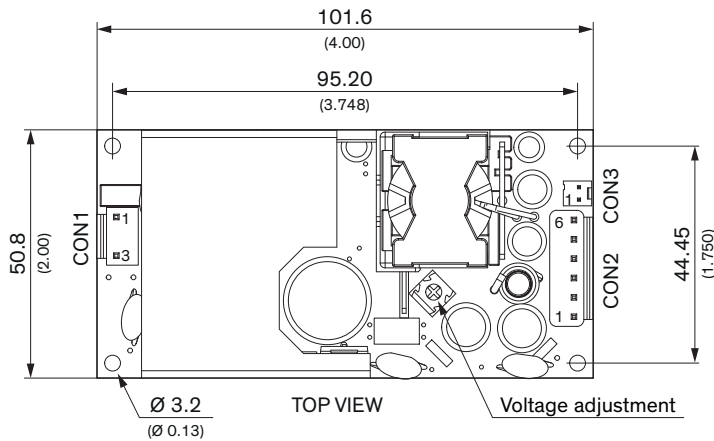
Environment	- Vibration	IEC 60068-2-6 1 g, 3 axis, sine sweep, 10-55 Hz, 1 oct/min
	- Mechanical Shock	IEC 60068-2-27 10 g, 3 axis, half sine, 11 ms 20 g, 3 axis, 3 shocks
Connection Type		JST
Weight		187 g
Environmental Compliance	- REACH Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7a, 7c-1

### Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tpi150a](http://www.tracopower.com/overview/tpi150a)

### Outline Dimensions



Dimension in mm, ( ) = inch  
Tolerances: x.x ±0.50 (±0.02)  
x.xx ±0.25 (±0.01)

#### Pin connectors

Input (CON1)		Output (CON2)		Fan (CON3)	
Pin	Function	Pin*	Function	Pin	Function
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 split)

**CON1:** JST series  
mates with JST crimp terminal: SVH-21T-P1.1  
and terminal housing: VHR-3N

**CON2:** JST series  
mates with JST crimp terminal: SVH-21T-P1.1  
and terminal housing: VHR-6N

**CON3:** Molex series  
mates with Molex crimp terminals: 2759  
and Molex housing: 22-01-1022