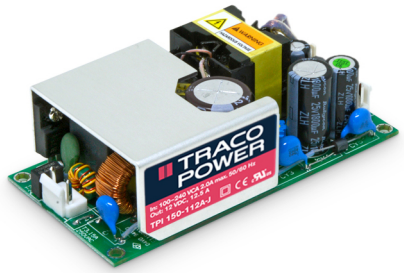
TRACO POWER

AC/DC Industrial Power Supply

TPI 150A Series, 150 Watt

- **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**



UL 62368-1 IEC 62368-1

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	Operational Range:	85 - 264 VAC (Full Range)
		Rated Range:	100 - 240 VAC (Full Range)
	- DC Range	Operational Range:	120 - 370 VDC (Designed for, no certification)
		Polarity:	+DC: L / –DC: N
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	www.tracopower.com/overview/tpi150a
Protection Class		Class I & II (Prepared): Reinforced Insulation

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

Pollution Degree			PD 2
Over Voltage Category			OVC II

EMC Specifications

EMI Emissions			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
EMS Immunity			EN 55024 (IT Equipment)
	- Electrostatic Discharge	Air:	EN 61000-4-2, ±8 kV, perf. criteria A
		Contact:	EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field		EN 61000-4-3, 20 V/m, perf. criteria A
	- EFT (Burst) / Surge		EN 61000-4-4, ±2 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		EN 61000-4-6, 20 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous:	EN 61000-4-8, 10 A/m, perf. criteria A
	- Voltage Dips & Interruptions	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

General Specifications

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

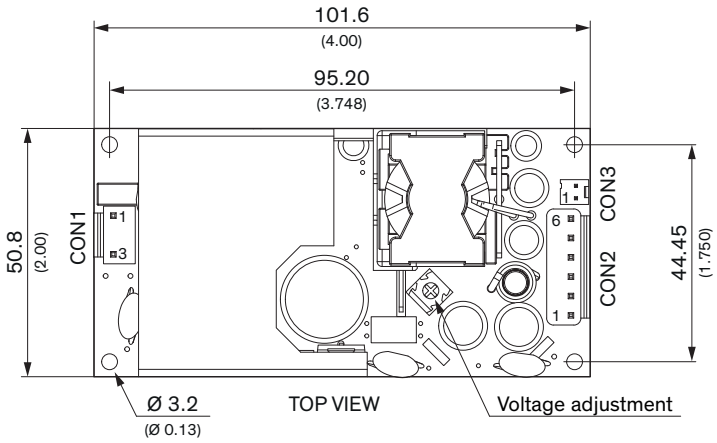
All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

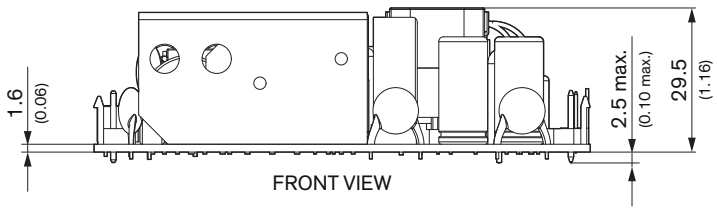
Environment	- Vibration	IEC 60068-2-6 1 g, 3 axis, sine sweep, 10-55 Hz, 1 oct/min
	- Mechanical Shock	IEC 60068-2-27 10 g, 3 axis, half sine, 11 ms 20 g, 3 axis, 3 shocks
Housing Type		Open Frame
Mounting Type		Chassis Mount
Connection Type		Pin Connector
Weight		187 g
Environmental Compliance	- REACH 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/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