AC/DC Power Supply

TPI 125A-J Series, 125 Watt

• 125 Watt open frame power supplies in a 3" x 2" package
• Compact and cost efficient design
• Peak power function up to 120%
• I/O reinforced isolation 4000 VAC
• Operating temperature range −40°C to +85°C
• No load input power <0.3W (acc. ErP directive)
• High efficiency up to 92%
• Internal EN 55032 class B filter
• Protection class II prepared
• 3 year product warranty

The TPI 125A-J is a 125 Watt AC/DC open frame power supplies series with a 4000 VAC reinforced isolation system. Our TPI line specifically focuses on providing cost efficient industrial power supplies in compact designs. This series offers a peak power function which enables the unit to deliver up to 120% of the rated power for up to 10 seconds. Excellent efficiency of up to 92% allows a compact design and an operating temperature range (natural convection) of −40°C to +50°C without derating, while going up to +85°C with either load derating or forced cooling. They are designed to meet the ErP directive (< 0.3 W no load power consumption) and come with an EMC characteristics dedicated for applications in industrial/automation and test & measurement fields. High reliability is provided by use of industrial high-quality grade components and an excellent thermal management. It makes the TPI 125A-J an ideal solution for any demanding industrial devices or space critical applications.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>TPI 125-112A-J</td>
<td></td>
<td>12 VDC [9.6 - 13.2 VDC]</td>
<td>10'420 mA</td>
<td>8'340 mA</td>
<td>12'500 mA</td>
<td>91 %</td>
</tr>
<tr>
<td>TPI 125-115A-J</td>
<td></td>
<td>15 VDC [12.0 - 16.5 VDC]</td>
<td>8'340 mA</td>
<td>6'670 mA</td>
<td>10'000 mA</td>
<td>92 %</td>
</tr>
<tr>
<td>TPI 125-124A-J</td>
<td>125 W</td>
<td>24 VDC [19.2 - 26.4 VDC]</td>
<td>5'210 mA</td>
<td>4'170 mA</td>
<td>6'250 mA</td>
<td>92 %</td>
</tr>
<tr>
<td>TPI 125-136A-J</td>
<td></td>
<td>36 VDC [28.8 - 39.6 VDC]</td>
<td>3'480 mA</td>
<td>2'780 mA</td>
<td>4'167 mA</td>
<td>91 %</td>
</tr>
<tr>
<td>TPI 125-148A-J</td>
<td></td>
<td>48 VDC [38.4 - 52.8 VDC]</td>
<td>2'610 mA</td>
<td>2'090 mA</td>
<td>3'125 mA</td>
<td>91 %</td>
</tr>
</tbody>
</table>
## Input Specifications

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>Operational Range: 85 - 264 VAC (Full Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rated Range: 100 - 240 VAC (Full Range)</td>
</tr>
<tr>
<td>DC Range</td>
<td>Operational Range: 120 - 370 VDC (Designed for, no certification)</td>
</tr>
<tr>
<td></td>
<td>Polarity: +DC: L / −DC: N</td>
</tr>
</tbody>
</table>

### Input Frequency

Operational Range: 47 - 440 Hz
Certified: 50/60 Hz

### Input Current

- Full Load & Vin = 230 VAC: 700 mA max.
- Full Load & Vin = 115 VAC: 1'800 mA max.

### Power Consumption

- No load & Vin = 230 VAC: 300 mW max. (Ready to meet ErP directive)
- No load & Vin = 115 VAC: 300 mW max.

### Input Inrush Current

- At 230 VAC: 100 A max.
- At 115 VAC: 60 A max.

### Power Factor

- At 230 VAC: 0.95 min. (Active Power Factor Correction)
- At 115 VAC: 0.95 min. (Active Power Factor Correction)

### Input Protection

T 3.15 A / 250 VAC (Internal Fuse in L)

### Recommended Input Fuse

(The need of an external fuse has to be assessed in the final application.)

## Output Specifications

### Output Voltage Adjustment

−20% to +10% (For trim-down lower than −10% a minimum load of 0.25 W is required)
(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.

### Boost Power

Output Current peak: See model table
150 W max. peak power (≥ 130 VAC input)
140 W max. peak power (< 130 VAC input)
Peak power time: 10 s max.
Peak power duty cycle: 20% max.
Average operation power: 55% of full load
(detailed description see application note)

### Ripple and Noise (20 MHz Bandwidth)

<table>
<thead>
<tr>
<th>Model</th>
<th>Ripple and Noise (mVp-p typ.)</th>
<th>Capacitive Load (µF max.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 VDC model</td>
<td>140 mVp-p typ. (w/ 10 µF, 25 V, MLCC)</td>
<td>5’700 µF max.</td>
</tr>
<tr>
<td>15 VDC model</td>
<td>150 mVp-p typ. (w/ 10 µF, 25 V, MLCC)</td>
<td>5’600 µF max.</td>
</tr>
<tr>
<td>24 VDC model</td>
<td>160 mVp-p typ. (w/ 1 µF, 50 V, MLCC)</td>
<td>2’200 µF max.</td>
</tr>
<tr>
<td>36 VDC model</td>
<td>190 mVp-p typ. (w/ 1 µF, 50 V, MLCC)</td>
<td>1’000 µF max.</td>
</tr>
<tr>
<td>48 VDC model</td>
<td>340 mVp-p typ. (w/ 0.1 µF, 100 V, MLCC)</td>
<td>550 µF max.</td>
</tr>
</tbody>
</table>

### Capacitive Load

12 VDC model: 8’700 µF max.
15 VDC model: 5’600 µF max.
24 VDC model: 2’200 µF max.
36 VDC model: 1’000 µF max.
48 VDC model: 550 µF max.

### Minimum Load

Not required

### Temperature Coefficient

±0.02 %/K max.

### Hold-up Time

- At 230 VAC: 40 ms min.
- At 115 VAC: 20 ms min.

### Start-up Time

- At 230 VAC: 730 ms max.
- At 115 VAC: 730 ms max.

### Short Circuit Protection

Continuous, Automatic recovery

### Output Current Limitation

120 - 160% of Iout max.

### Overvoltage Protection

115 - 135% of Vout nom.
(Latch off)

All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.
Transient Response
- Response Deviation 3% max. (50% to 75% Load Step at 2.5 A/µs)
- Response Time 500 µs typ. (50% to 75% Load Step at 2.5 A/µs)

Safety Specifications
Safety Standards
- IT / Multimedia Equipment EN 62368-1
- IEC 62368-1
- UL 62368-1
- Certification Documents www.tracopower.com/overview/tpi125a-j
Protection Class
Class I & II (Prepared: Reinforced Insulation)
Pollution Degree
PD 2
Over Voltage Category
OVC II

EMC Specifications
EMI Emissions
- Conducted Emissions EN 55032 class B (internal filter)
- Radiated Emissions EN 55032 class A (internal filter)
- Harmonic Current Emissions EN 61000-3-2, class A
- Voltage Fluctuations & Flicker EN 61000-3-3
EMS Immunity
- 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
- Conducted RF Disturbances L to L: EN 61000-4-5, ±1 kV, perf. criteria A
L to PE: EN 61000-4-5, ±2 kV, perf. criteria A
- PF Magnetic Field Continuous: EN 61000-4-6, 10 Vrms, perf. criteria A
- Voltage Dips & Interruptions 230 VAC / 50 Hz: EN 61000-4-11
115 VAC / 60 Hz: EN 61000-4-11

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 Depending on model
- Low Input Voltage 1.33 %/V below 100 VAC
See application note: www.tracopower.com/overview/tpi125a-j
Cooling System
- Option 1 Forced air cooling (with external fan, 400 LFM)
- Option 2 Natural convection (20 LFM)
Altitude During Operation 5’000 m max.
Switching Frequency 60 kHz typ. (PWM CR)
Insulation System Reinforced Insulation
Working Voltage (rated): 527 VAC
Isolation Test Voltage
- Input to Output, 60 s 4’000 VAC
Creepage
- Input to Output 8 mm min.
Clearance
- Input to Output 6.8 mm min.
Isolation Resistance
- Input to Output, 500 VDC 100 MΩ min.
Leakage Current
- Touch Current 300 µA max.
Distance Through Isolation 0.4 mm
Reliability
- Calculated MTBF 790’000 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
- Mechanical Shock

IEC 60068-2-6
IEC 60068-2-27

**Housing Type**
Open Frame

**Mounting Type**
Chassis Mount

**Connection Type**
Pin Connector

**Weight**
156 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)).

- SCIP Reference Number
  - e4d5a091-95d0-45c6-8dab-009f826a54f8

**Supporting Documents**
Overview Link (for additional Documents)
www.tracopower.com/overview/tpi125a-j

**Outline Dimensions**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPI 125A-J Series, 125 Watt</td>
<td></td>
</tr>
<tr>
<td>77.2 (3.04)</td>
<td></td>
</tr>
<tr>
<td>69.8 (2.748)</td>
<td></td>
</tr>
<tr>
<td>CON1: JST series</td>
<td></td>
</tr>
<tr>
<td>mates with JST crimp terminal: SVH-21T-P1.1</td>
<td></td>
</tr>
<tr>
<td>and terminal housing: VHR-3N</td>
<td></td>
</tr>
<tr>
<td>CON2: JST series</td>
<td></td>
</tr>
<tr>
<td>mates with JST crimp terminal: SVH-21T-P1.1</td>
<td></td>
</tr>
<tr>
<td>and terminal housing: VHR-4N</td>
<td></td>
</tr>
</tbody>
</table>

**Pin connectors**

<table>
<thead>
<tr>
<th>Input (CON1)</th>
<th>Output (CON2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin</td>
<td>Function</td>
</tr>
<tr>
<td>1</td>
<td>Line</td>
</tr>
<tr>
<td>3</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

Terminal rated for 10 A max. per pin.

Dimensions in mm (inch)
- Tolerances: x.x ±0.5 (x.xx ±0.02)
- Tolerances: x.xx±0.25 (x.xxx ±0.01)
- Mounting screw lock torque: Max. 0.49 Nm (5 kgfcm)

Specifications can be changed without notice.

Rev. September 20, 2023