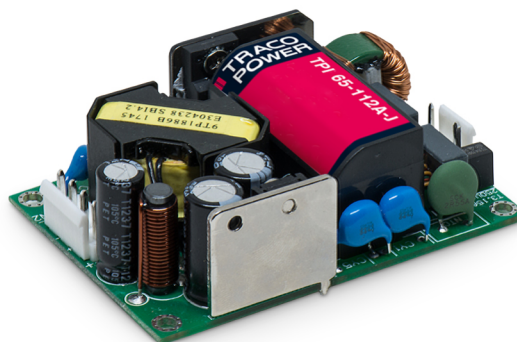


- 65 Watt open frame power supplies in a 3" x 2" package
- Compact and cost efficient design
- Peak power function up to 140%
- I/O reinforced isolation 3000 VAC
- Operating temperature range -40°C to +85°C
- No load input power <0.3W (acc. ErP directive)
- High efficiency up to 93%
- Internal EN 55032 class B filter
- Protection class II prepared
- 3-year product warranty



UL 62368-1 IEC 62368-1

The TPI 65A-J is a 65 Watt AC/DC open frame power supplies series with a 3000 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 140% of the rated power for up to 10 seconds. Excellent efficiency of up to 93% allows a compact design and an operating temperature range (natural convection) of -40°C to +70°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 65A-J an ideal solution for any demanding industrial devices or space critical applications.

| Models         |                      |                                     |                        |                        |                    |
|----------------|----------------------|-------------------------------------|------------------------|------------------------|--------------------|
| Order Code     | Output Power<br>max. | Output Voltage<br>nom. (adjustable) | Output Current<br>max. | Output Current<br>peak | Efficiency<br>typ. |
| TPI 65-105A-JP | 50 W                 | 5 VDC (4.0 - 5.5 VDC)               | 10'000 mA              | 13'000 mA              | 90 %               |
| TPI 65-112A-JP | 65 W                 | 12 VDC (9.6 - 13.2 VDC)             | 5'420 mA               | 7'500 mA               | 93 %               |
| TPI 65-115A-JP |                      | 15 VDC (12.0 - 16.5 VDC)            | 4'340 mA               | 6'000 mA               | 94 %               |
| TPI 65-124A-JP |                      | 24 VDC (19.2 - 26.4 VDC)            | 2'710 mA               | 3'750 mA               | 94 %               |
| TPI 65-136A-JP |                      | 36 VDC (28.8 - 39.6 VDC)            | 1'810 mA               | 2'500 mA               | 93 %               |
| TPI 65-148A-JP |                      | 48 VDC (38.4 - 52.8 VDC)            | 1'360 mA               | 1'875 mA               | 93 %               |
| TPI 65-153A-JP |                      | 53 VDC (42.4 - 58.3 VDC)            | 1'240 mA               | 1'698 mA               | 93 %               |

## Input Specifications

|                        |                             |                                                                                                              |
|------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
| Input Voltage          | - AC Range                  | Operational Range: <b>85 - 264 VAC</b> (Full Range)<br>Rated Range: <b>100 - 240 VAC</b> (Full Range)        |
|                        | - DC Range                  | Operational Range: <b>120 - 370 VDC</b> (Designed for, no certification)<br>Polarity: <b>+DC: L / -DC: N</b> |
| Input Frequency        |                             | Operational Range: <b>47 - 440 Hz</b><br>Certified: <b>50/60 Hz</b>                                          |
|                        |                             |                                                                                                              |
| Power Consumption      | - No load & Vin = 230 VAC   | <b>180 mW max.</b> (Ready to meet ErP directive)                                                             |
|                        | - No load & Vin = 115 VAC   | <b>180 mW max.</b>                                                                                           |
| Input Current          | - Full load & Vin = 230 VAC | <b>900 mA max.</b>                                                                                           |
|                        | - Full load & Vin = 115 VAC | <b>1'600 mA max.</b>                                                                                         |
| Input Inrush Current   | - At 230 VAC                | <b>75 A max.</b>                                                                                             |
|                        | - At 115 VAC                | <b>40 A max.</b>                                                                                             |
| Input Protection       |                             | <b>T 3.15 A / 250 VAC</b> (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              |                                 | <b>-20% to +10%</b> (By trim potentiometer)<br>Output power must not exceed rated power!                                                                                                                              |
| Voltage Set Accuracy                   |                                 | <b>±1% max.</b>                                                                                                                                                                                                       |
| Regulation                             | - Input Variation (Vmin - Vmax) | <b>0.2% max.</b>                                                                                                                                                                                                      |
|                                        | - Load Variation (0 - 100%)     | <b>0.7% max.</b> (5 VDC model)                                                                                                                                                                                        |
|                                        |                                 | <b>0.5% max.</b> (other output models)                                                                                                                                                                                |
| Boost Power                            |                                 | Output Current peak: See model table<br>Peak power time: <b>5 s max.</b><br>Peak power duty cycle: <b>20% max.</b><br>Average operation power: <b>70% of full load</b><br>(detailed description see application note) |
| Ripple and Noise<br>(20 MHz Bandwidth) | 5 VDC model:                    | <b>75 mVp-p typ.</b> (w/ 10 $\mu$ F, 25 V, MLCC)                                                                                                                                                                      |
|                                        | 12 VDC model:                   | <b>75 mVp-p typ.</b> (w/ 10 $\mu$ F, 25 V, MLCC)                                                                                                                                                                      |
|                                        | 15 VDC model:                   | <b>75 mVp-p typ.</b> (w/ 10 $\mu$ F, 25 V, MLCC)                                                                                                                                                                      |
|                                        | 24 VDC model:                   | <b>75 mVp-p typ.</b> (w/ 1 $\mu$ F, 50 V, MLCC)                                                                                                                                                                       |
|                                        | 36 VDC model:                   | <b>75 mVp-p typ.</b> (w/ 1 $\mu$ F, 50 V, MLCC)                                                                                                                                                                       |
|                                        | 48 VDC model:                   | <b>150 mVp-p typ.</b> (w/ 0.1 $\mu$ F, 100 V, MLCC)                                                                                                                                                                   |
|                                        | 53 VDC model:                   | <b>150 mVp-p typ.</b> (w/ 0.1 $\mu$ F, 100 V, MLCC)                                                                                                                                                                   |
| Capacitive Load                        | 5 VDC model:                    | <b>20'000 <math>\mu</math>F max.</b>                                                                                                                                                                                  |
|                                        | 12 VDC model:                   | <b>4'520 <math>\mu</math>F max.</b>                                                                                                                                                                                   |
|                                        | 15 VDC model:                   | <b>2'900 <math>\mu</math>F max.</b>                                                                                                                                                                                   |
|                                        | 24 VDC model:                   | <b>1'130 <math>\mu</math>F max.</b>                                                                                                                                                                                   |
|                                        | 36 VDC model:                   | <b>520 <math>\mu</math>F max.</b>                                                                                                                                                                                     |
|                                        | 48 VDC model:                   | <b>285 <math>\mu</math>F max.</b>                                                                                                                                                                                     |
|                                        | 53 VDC model:                   | <b>235 <math>\mu</math>F max.</b>                                                                                                                                                                                     |
| Minimum Load                           |                                 | Not required                                                                                                                                                                                                          |
| Temperature Coefficient                |                                 | <b>±0.02 %/K max.</b>                                                                                                                                                                                                 |
| Hold-up Time                           | - At 230 VAC                    | <b>90 ms min.</b>                                                                                                                                                                                                     |
|                                        | - At 115 VAC                    | <b>15 ms min.</b>                                                                                                                                                                                                     |
| Start-up Time                          | - At 230 VAC                    | <b>800 ms max.</b>                                                                                                                                                                                                    |
|                                        | - At 115 VAC                    | <b>950 ms max.</b>                                                                                                                                                                                                    |
| Short Circuit Protection               |                                 | Continuous, Automatic recovery                                                                                                                                                                                        |
| Output Current Limitation              |                                 | <b>165% typ.</b> of Iout max.                                                                                                                                                                                         |
| Overvoltage Protection                 |                                 | <b>125 - 140% of Vout nom.</b>                                                                                                                                                                                        |
| Transient Response                     | - Response Deviation            | <b>3% max.</b> (50% to 75% Load Step at 2.5 A/ $\mu$ s)                                                                                                                                                               |
|                                        | - Response Time                 | <b>600 <math>\mu</math>s typ.</b> (50% to 75% Load Step at 2.5 A/ $\mu$ s)                                                                                                                                            |

All specifications valid at 230 VAC, resistive full load and +25°C after warm-up time, unless otherwise stated.

## Safety Specifications

|                  |                             |                                                                                                                                                                  |
|------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards        | - IT / Multimedia Equipment | EN 62368-1<br>IEC 62368-1<br>UL 62368-1                                                                                                                          |
|                  | - Certification Documents   | <a href="http://www.tracopower.com/overview/tpi65a-j">www.tracopower.com/overview/tpi65a-j</a>                                                                   |
| Protection Class | See application note:       | Class I & II (Prepared): Reinforced Insulation<br><a href="http://www.tracopower.com/info/protection-class.pdf">www.tracopower.com/info/protection-class.pdf</a> |
| Pollution Degree |                             | PD 2                                                                                                                                                             |

## EMC Specifications

|                 |                                  |                                                                                                                                                                                                                                              |
|-----------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMI (Emissions) | - Conducted Emissions            | EN 55011 class A (internal filter)<br>EN 55011 class B (internal filter)<br>EN 55032 class A (internal filter)<br>EN 55032 class B (internal filter)<br>FCC 47 Part 15 class A (internal filter)<br>FCC 47 Part 15 class B (internal filter) |
|                 | - Radiated Emissions             | EN 55011 class A (internal filter)<br>EN 55011 class B (internal filter)<br>EN 55032 class A (internal filter)<br>EN 55032 class B (internal filter)<br>FCC 47 Part 15 class A (internal filter)<br>FCC 47 Part 15 class B (internal filter) |
|                 | - Harmonic Current Emissions     | EN 61000-3-2, class A                                                                                                                                                                                                                        |
|                 | - Voltage Fluctuations & Flicker | EN 61000-3-3                                                                                                                                                                                                                                 |
| EMS (Immunity)  |                                  | EN 55024 (IT Equipment)<br>EN 55035 (Multimedia)                                                                                                                                                                                             |
|                 | - Electrostatic Discharge        | Air: EN 61000-4-2, $\pm 15$ kV, perf. criteria A<br>Contact: EN 61000-4-2, $\pm 6$ kV, perf. criteria A                                                                                                                                      |
|                 | - RF Electromagnetic Field       | EN 61000-4-3, 20 V/m, perf. criteria A                                                                                                                                                                                                       |
|                 | - EFT (Burst) / Surge            | EN 61000-4-4, $\pm 4$ kV, perf. criteria A                                                                                                                                                                                                   |
|                 |                                  | L to L: EN 61000-4-5, $\pm 2$ kV, perf. criteria A                                                                                                                                                                                           |
|                 | - Conducted RF Disturbances      | EN 61000-4-6, 20 Vrms, perf. criteria A                                                                                                                                                                                                      |
|                 | - PF Magnetic Field              | Continuous: EN 61000-4-8, 100 A/m, perf. criteria A                                                                                                                                                                                          |
|                 | - Voltage Dips & Interruptions   | 230 VAC / 50 Hz: EN 61000-4-11<br>115 VAC / 60 Hz: EN 61000-4-11                                                                                                                                                                             |

## General Specifications

|                              |                                                  |                                                                                                |
|------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------|
| Relative Humidity            |                                                  | 95% max. (non condensing)                                                                      |
| Temperature Ranges           | - Operating Temperature<br>- Storage Temperature | -40°C to +85°C<br>-40°C to +85°C                                                               |
| Power Derating               | - High Temperature<br>- Low Input Voltage        | Depending on model<br>4 %/V below 90 VAC                                                       |
|                              | See application note:                            | <a href="http://www.tracopower.com/overview/tpi65a-j">www.tracopower.com/overview/tpi65a-j</a> |
| Cooling System               |                                                  | Natural convection (20 LFM)                                                                    |
| Altitude During Operation    |                                                  | 5'000 m max.                                                                                   |
| Regulator Topology           |                                                  | Flyback Converter                                                                              |
| Switching Frequency          |                                                  | 60 kHz typ. (PWM QR) (5 VDC models)<br>120 kHz typ. (PWM QR) (other models)                    |
| Insulation System            |                                                  | Reinforced Insulation                                                                          |
| Working Voltage (rated)      |                                                  | 273 VAC                                                                                        |
| Isolation Test Voltage       | - Input to Output, 60 s                          | 3'000 VAC                                                                                      |
| Creepage                     | - Input to Output                                | 8 mm min.                                                                                      |
| Clearance                    | - Input to Output                                | 8 mm min.                                                                                      |
| Isolation Resistance         | - Input to Output, 500 VDC                       | 100 M $\Omega$ min.                                                                            |
| Leakage Current (at 264 VAC) | - Earth Leakage Current                          | 75 $\mu$ A max.                                                                                |

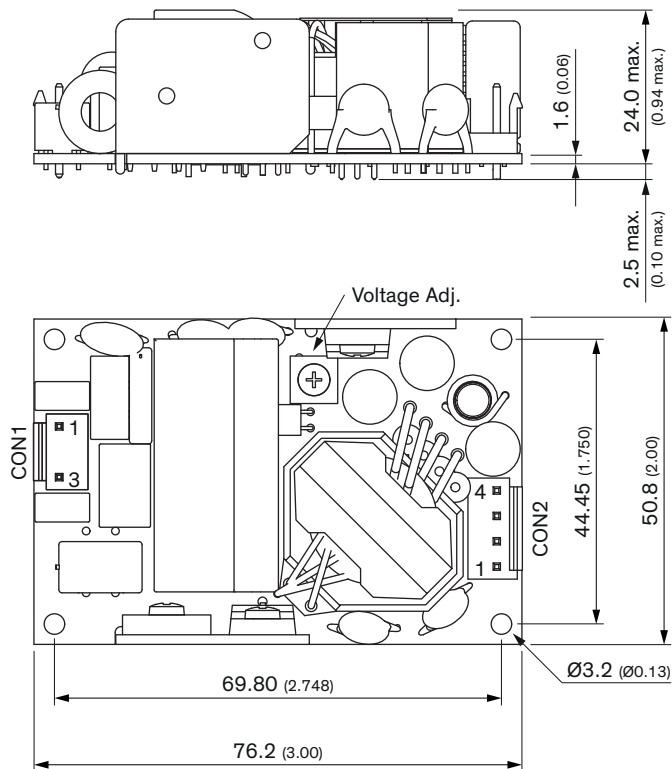
All specifications valid at 230 VAC, resistive full load and +25°C after warm-up time, unless otherwise stated.

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Distance Through Isolation | 0.4 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Reliability                | - Calculated MTBF<br>1'490'000 h (MIL-HDBK-217F, ground benign)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Environment                | - Vibration<br>IEC 60068-2-6<br>- Mechanical Shock<br>IEC 60068-2-27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Housing Type               | Open Frame                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Mounting Type              | Chassis Mount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Connection Type            | Pin Connector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Weight                     | 117 g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Environmental Compliance   | - REACH Declaration<br><a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a><br>REACH SVHC list compliant<br>REACH Annex XVII compliant<br><a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a><br>Exemptions: 7(a), 7(c)-I<br>(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)<br>- RoHS Declaration<br>- SCIP Reference Number<br>54f38b10-a6c9-46f7-9475-640404133b0c |

### Additional Information

|                            |                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------|
| Supporting Documents       | <a href="http://www.tracopower.com/overview/tpi65a-j">www.tracopower.com/overview/tpi65a-j</a> |
| Frequently Asked Questions | <a href="http://www.tracopower.com/glossary-faq">www.tracopower.com/glossary-faq</a>           |
| Glossary                   | <a href="http://www.tracopower.com/info/glossary.pdf">www.tracopower.com/info/glossary.pdf</a> |

### Outline Dimensions



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

### Pin connectors

| Input (CON1) |          | Output (CON2) |          |
|--------------|----------|---------------|----------|
| Pin          | Function | Pin           | Function |
| 1            | Line     | 1,2*          | -Vout    |
| 3            | Neutral  | 3,4*          | +Vout    |

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

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

**Output:** JST series  
mates with JST crimp terminal: SVH-21T-P1.1  
and terminal housing: VHR-4N

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