

- Conduction cooled design approach
- Fanless operation with up to 100% output power
- Operating temperature range -30°C to +80°C
- I/O reinforced isolation 4250 VAC
- Over voltage category (OVC III)
- High efficiency up to 92%
- Operating up to 5000 m altitude
- Internal EN 55032 class B filter
- Protection class II prepared
- 3 year product warranty



UL 62368-1 IEC 62368-1

The TCI 240 is a 240 Watt conduction cooled AC/DC encased power supplies series with a 4250 VAC reinforced isolation system. Traco Power's new TCI line focuses on maximizing the proficiency of conduction cooled systems as it offers superior temperature behavior when mounted on a metal chassis or baseplate. This way the TCI 240 can deliver up to 100% of the maximum output power without the need for a fan. Excellent efficiency of up to 94% allows the TCI series to operate from -30 to +50°C without derating, while going up to +80°C with either load derating or forced cooling. They also meet OVC III requirements and can operate at up to 5000 m altitude. Active power factor correction, EMC characteristics dedicated for applications in industrial/automation and test & measurement fields and high reliability make the new TCI line an ideal solution for any demanding industrial application.

| Models        |                   |                                  |                                                       |                                          |                 |
|---------------|-------------------|----------------------------------|-------------------------------------------------------|------------------------------------------|-----------------|
| Order Code    | Output Power max. | Output Voltage nom. (adjustable) | Output Current max. (Forced air / Conduction cooling) | Output Current max. (Natural convection) | Efficiency typ. |
| TCI 240-112-J | 240 W             | 12 VDC (11.4 - 12.6 VDC)         | 20'000 mA                                             | 19'500 mA                                | 93 %            |
| TCI 240-124-J |                   | 24 VDC (22.8 - 25.2 VDC)         | 10'000 mA                                             | 10'000 mA                                | 93 %            |
| TCI 240-148-J |                   | 48 VDC (45.6 - 50.4 VDC)         | 5'000 mA                                              | 5'000 mA                                 | 94 %            |

| Options                                          |                                                                                                                            |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| TCI-AC1                                          | - Optional Cable: <a href="http://www.tracopower.com/products/tci-ac1.pdf">www.tracopower.com/products/tci-ac1.pdf</a>     |
| TCI240-DC                                        | - Optional Cable: <a href="http://www.tracopower.com/products/tci240-dc.pdf">www.tracopower.com/products/tci240-dc.pdf</a> |
| on demand (backorder with MOQ non stocking item) | - Optional models with U-Bracket                                                                                           |

## Input Specifications

|                        |                                                                                                                        |
|------------------------|------------------------------------------------------------------------------------------------------------------------|
| Input Voltage          | Operational Range: 90 - 264 VAC (Full Range)<br>Rated Range: 100 - 240 VAC (Full Range)                                |
| Input Frequency        | Operational Range: 47 - 63 Hz<br>Certified: 50/60 Hz                                                                   |
| Input Current          | - Full Load & Vin = 230 VAC<br>- Full Load & Vin = 115 VAC<br>1'500 mA max.<br>3'000 mA max.                           |
| Power Consumption      | - No load & Vin = 230 VAC<br>- No load & Vin = 115 VAC<br>500 mW max. (Ready to meet ErP directive)<br>500 mW max.     |
| Input Inrush Current   | - At 230 VAC<br>- At 115 VAC<br>90 A max.<br>45 A max.                                                                 |
| Power Factor           | - At 230 VAC<br>- At 115 VAC<br>0.9 min. (Active Power Factor Correction)<br>0.9 min. (Active Power Factor Correction) |
| Input Protection       | T 4 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              | ±5% (By trim potentiometer)<br>Output power must not exceed rated power!                                                                                                                     |
| Voltage Set Accuracy                   | ±2% max.                                                                                                                                                                                     |
| Regulation                             | - Input Variation (Vmin - Vmax)<br>- Load Variation (0 - 100%)<br>1% max.<br>1% max.                                                                                                         |
| Ripple and Noise<br>(20 MHz Bandwidth) | 12 VDC model: 120 mVp-p max. (w/ 0.1 µF ceramic    47 µF KY)<br>24 VDC model: 240 mVp-p max. (w/ 0.1 µF ceramic    47 µF KY)<br>48 VDC model: 480 mVp-p max. (w/ 0.1 µF ceramic    47 µF KY) |
| Capacitive Load                        | 12 VDC model: 8'000 µF max.<br>24 VDC model: 3'000 µF max.<br>48 VDC model: 470 µF max.                                                                                                      |
| Minimum Load                           | Not required                                                                                                                                                                                 |
| Temperature Coefficient                | ±0.05 %/K max.                                                                                                                                                                               |
| Hold-up Time                           | - At 115 VAC<br>10 ms min.                                                                                                                                                                   |
| Start-up Time                          | - At 230 VAC<br>- At 115 VAC<br>900 ms max.<br>900 ms max.                                                                                                                                   |
| Short Circuit Protection               | Continuous, Automatic recovery (Level 1, nom.)<br>Latch (Level 2, instantaneous high current)                                                                                                |
| Output Current Limitation              | 108 - 192% of Iout max.                                                                                                                                                                      |
| Overvoltage Protection                 | 111 - 130% of Vout nom.                                                                                                                                                                      |
| Transient Response                     | - Response Deviation<br>- Response Time<br>3% typ. / 5% max. (25% to 100% Load Step)<br>500 µs typ. / 750 µs max. (25% to 100% Load Step)                                                    |

## Safety Specifications

|                       |                                                                                                                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety Standards      | - IT / Multimedia Equipment<br>- Certification Documents<br>EN 62368-1<br>IEC 62368-1<br>UL 62368-1<br><a href="http://www.tracopower.com/overview/tci240">www.tracopower.com/overview/tci240</a> |
| Protection Class      | Class I (Prepared): Connection to PE                                                                                                                                                              |
| Pollution Degree      | PD 2                                                                                                                                                                                              |
| Over Voltage Category | OVC II                                                                                                                                                                                            |

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

## EMC Specifications

|               |                                |                                                     |
|---------------|--------------------------------|-----------------------------------------------------|
| EMI Emissions | - Conducted Emissions          | EN 55032 class B (internal filter)                  |
|               | - Radiated Emissions           | EN 55032 class B (internal filter)                  |
|               | - Harmonic Current Emissions   | EN 61000-3-2, class A                               |
| EMS Immunity  |                                | EN 55035 (Multimedia)                               |
|               | - Electrostatic Discharge      | Air: EN 61000-4-2, $\pm 4$ kV, perf. criteria A     |
|               |                                | Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A |
|               |                                | EN 61000-4-3, 3 V/m, perf. criteria A               |
|               |                                | EN 61000-4-4, $\pm 1$ 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 |
|               |                                | EN 61000-4-6, 3 Vrms, perf. criteria A              |
|               |                                | Continuous: EN 61000-4-8, 1 A/m, perf. criteria A   |
|               | - Voltage Dips & Interruptions | 230 VAC / 50 Hz: EN 61000-4-11                      |

## General Specifications

|                                         |                                                                                                                  |                                                                              |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Relative Humidity                       |                                                                                                                  | 90% max. (non condensing)                                                    |
| Temperature Ranges                      | - Operating Temperature                                                                                          | -30°C to +80°C                                                               |
|                                         | - Storage Temperature                                                                                            | -30°C to +80°C                                                               |
| Power Derating                          | - High Temperature                                                                                               | Depending on model                                                           |
|                                         | - Low Input Voltage                                                                                              | 2 %/V below 100 VAC                                                          |
|                                         | See application note: <a href="http://www.tracopower.com/overview/tci240">www.tracopower.com/overview/tci240</a> |                                                                              |
| Over Temperature Protection Switch Off  | - Protection Mode                                                                                                | 115°C min. / 120°C typ. / 125°C max.<br>(Automatic recovery at 90°C typ.)    |
|                                         | - Measurement Point                                                                                              | Internal IC temperature                                                      |
| Cooling System                          |                                                                                                                  | Forced air (with external fan, 8 CFM)                                        |
|                                         |                                                                                                                  | Natural convection (20 LFM)                                                  |
|                                         |                                                                                                                  | Conduction Cooling (with a 300 x 300 x 3.0 mm aluminum plate)                |
| Altitude During Operation               |                                                                                                                  | 4'000 m max. (for OVC III)                                                   |
|                                         |                                                                                                                  | 5'000 m max. (for OVC II)                                                    |
| Switching Frequency                     |                                                                                                                  | 90 - 132 kHz (PFM)                                                           |
|                                         |                                                                                                                  | 110 kHz typ. (PFM)                                                           |
| Insulation System                       |                                                                                                                  | Reinforced Insulation                                                        |
| Isolation Test Voltage                  | - Input to Output, 60 s                                                                                          | 4'250 VAC (6'000 VDC)                                                        |
|                                         | - Input to Case or PE, 60 s                                                                                      | 2'830 VAC (4'000 VDC)                                                        |
|                                         | - Output to Case or PE, 60 s                                                                                     | 1'500 VAC (2'121 VDC)                                                        |
| Isolation Resistance                    | - Input to Output, 500 VDC                                                                                       | 100 M $\Omega$ min.                                                          |
| Leakage Current<br>(at 264 VAC / 50 Hz) | - Earth Leakage Current                                                                                          | 750 $\mu$ A max.                                                             |
|                                         | - Touch Current                                                                                                  | 750 $\mu$ A max.                                                             |
| Distance Through Isolation              |                                                                                                                  | 7.1 mm                                                                       |
| Reliability                             | - Calculated MTBF                                                                                                | 250'000 h (MIL-HDBK-217F, ground benign)                                     |
| Washing Process                         |                                                                                                                  | Not allowed                                                                  |
| Environment                             | - Vibration                                                                                                      | IEC 60068-2-6                                                                |
|                                         |                                                                                                                  | 2 g, 3 axis, 60 min, 10-500 Hz, 10 min/cycle                                 |
|                                         | - Mechanical Shock                                                                                               | IEC 60068-2-27                                                               |
|                                         |                                                                                                                  | 50 g, 3 axis, half sine, 11 ms                                               |
| Housing Material                        |                                                                                                                  | Aluminum                                                                     |
| Potting Material                        |                                                                                                                  | Silicone (UL 94 V-0 rated)<br>(the converter is partly potted on the bottom) |
| Housing Type                            |                                                                                                                  | Metal Case                                                                   |

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

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mounting Type            | Chassis Mount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Connection Type          | Pin Connector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Weight                   | 365 g (for standard version)<br>650 g (for optional U-Bracket models)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Environmental Compliance | <p>- REACH Declaration</p> <p><a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a></p> <p>REACH SVHC list compliant</p> <p>REACH Annex XVII compliant</p> <p><a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a></p> <p>Exemptions: 7a, 7c-I</p> <p>(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)</p> <p>- RoHS Declaration</p> <p>- SCIP Reference Number</p> <p>0841b696-b53c-4fae-a062-5132d1598eab</p> |

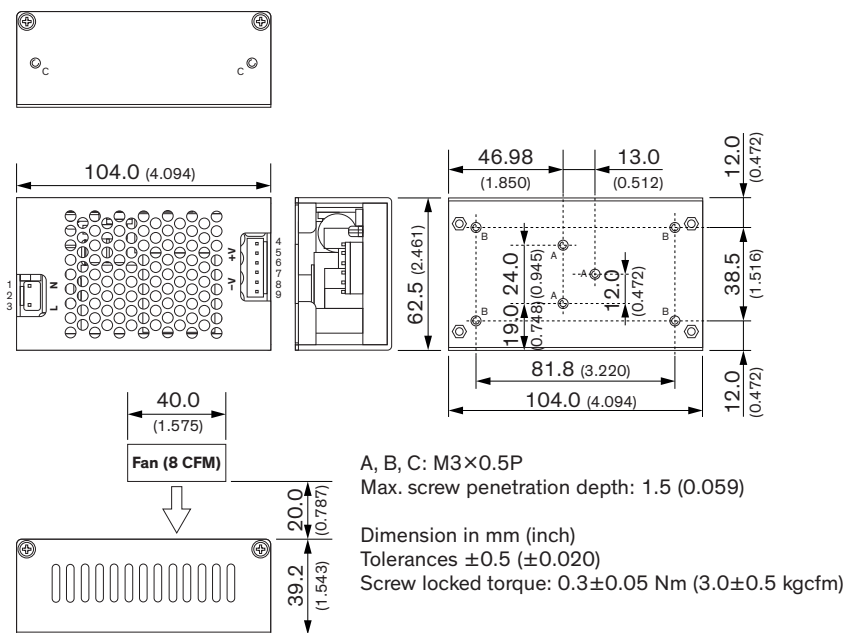
## Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tci240](http://www.tracopower.com/overview/tci240)

## Outline Dimensions

### Standard version



| Pin connectors |          |        |          |
|----------------|----------|--------|----------|
| Input          |          | Output |          |
| Pin            | Function | Pin    | Function |
| 1              | AC (N)   | 4-6    | +Vout    |
| 2              | No Pin   | 7-9    | -Vout    |
| 3              | AC (L)   |        |          |

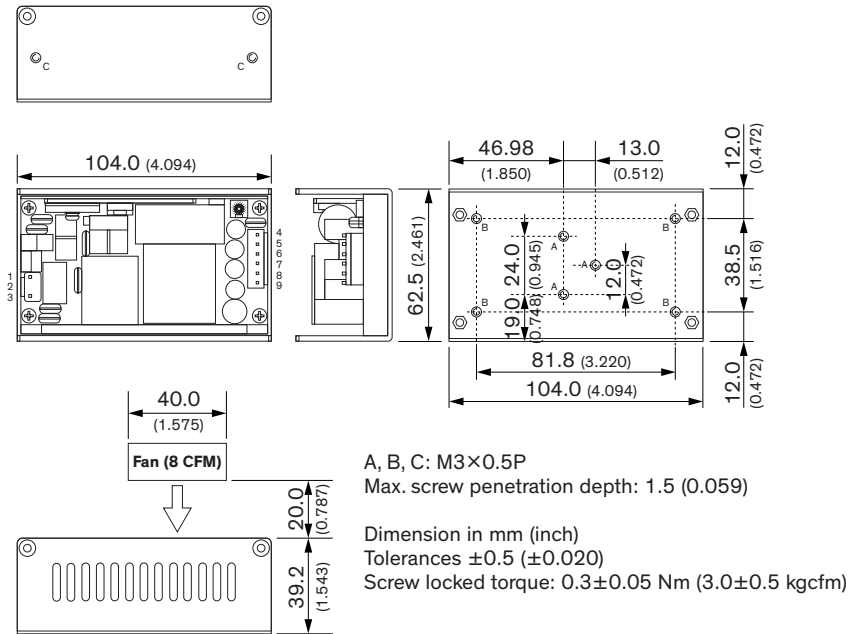
| Case                     |                                                   |
|--------------------------|---------------------------------------------------|
| (no dedicated connector) |                                                   |
| Pos                      | Function                                          |
| A                        | For mounting on chassis only                      |
| B                        | For mounting on PCB or chassis, and connecting PE |
| C                        | For connecting PE only                            |

**Input:** JST series  
mates with JST crimp terminal: SVH-41T-P1.1 or Equivalent  
and terminal housing: VHR-3N or Equivalent

**Output:** JST series  
mates with JST crimp terminal: SVH-41T-P1.1 or Equivalent  
and terminal housing: VHR-6N or Equivalent

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

### Optional version with U-Bracket



### Pin connectors

| Input |          | Output |          |
|-------|----------|--------|----------|
| Pin   | Function | Pin    | Function |
| 1     | AC (N)   | 4-6    | +Vout    |
| 2     | No Pin   | 7-9    | -Vout    |
| 3     | AC (L)   |        |          |

### Case

(no dedicated connector)

| Pos | Function                                          |
|-----|---------------------------------------------------|
| A   | For mounting on chassis only                      |
| B   | For mounting on PCB or chassis, and connecting PE |
| C   | For connecting PE only                            |

#### Input: JST series

mates with JST crimp terminal: SVH-41T-P1.1 or Equivalent  
and terminal housing: VHR-3N or Equivalent

#### Output: JST series

mates with JST crimp terminal: SVH-41T-P1.1 or Equivalent  
and terminal housing: VHR-6N or Equivalent