

- Conduction cooled design approach
- Fanless operation with up to 100% output power
- Operating temperature range  $-30^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$
- 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 conducted class B filter
- Protection class I prepared
- 3-year product warranty



UL 62368-1 IEC 62368-1

The TCI 240 is a 240 Watt conduction cooled AC/DC encased power supply 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  $+50^{\circ}\text{C}$  without derating, while going up to  $+80^{\circ}\text{C}$  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 240-DC	- Optional Cable: <a href="http://www.tracopower.com/overview/tci240-dc">www.tracopower.com/overview/tci240-dc</a>
TCI-AC1	- Optional Cable: <a href="http://www.tracopower.com/overview/tci-ac1">www.tracopower.com/overview/tci-ac1</a>
on demand (backorder with MOQ non stocking item)	- Optional models with U-Bracket

### Input Specifications

Input Voltage		Operational Range: <b>90 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
Input Frequency		Operational Range: <b>47 - 63 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC - No load & Vin = 115 VAC	<b>500 mW max.</b> (Ready to meet ErP directive) <b>500 mW max.</b>
Input Current	- Full load & Vin = 230 VAC - Full load & Vin = 115 VAC	<b>1'500 mA max.</b> <b>3'000 mA max.</b>
Input Inrush Current	- At 230 VAC - At 115 VAC	<b>90 A max.</b> <b>45 A max.</b>
Power Factor	- At 230 VAC - At 115 VAC	<b>0.9 min.</b> (Active Power Factor Correction) <b>0.9 min.</b> (Active Power Factor Correction)
Input Protection		<b>T 4 A / 250 VAC</b> (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		<b>±5%</b> (By trim potentiometer) Output power must not exceed rated power!
Voltage Set Accuracy		<b>±2% max.</b>
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (0 - 100%)	<b>1% max.</b> <b>1% max.</b>
Ripple and Noise (20 MHz Bandwidth)		12 VDC model: <b>120 mVp-p max.</b> (w/ 0.1 µF ceramic    47 µF KY) 24 VDC model: <b>240 mVp-p max.</b> (w/ 0.1 µF ceramic    47 µF KY) 48 VDC model: <b>480 mVp-p max.</b> (w/ 0.1 µF ceramic    47 µF KY)
Capacitive Load		12 VDC model: <b>8'000 µF max.</b> 24 VDC model: <b>3'000 µF max.</b> 48 VDC model: <b>470 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.05 %/K max.</b>
Hold-up Time	- At 230 VAC - At 115 VAC	<b>10 ms min.</b> <b>10 ms min.</b>
Start-up Time	- At 230 VAC - At 115 VAC	<b>900 ms max.</b> <b>900 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b> (Level 1, nom.) <b>Latch</b> (Level 2, instantaneous high current)
Output Current Limitation		<b>108 - 192% of Iout max.</b>
Overvoltage Protection		<b>111 - 130% of Vout nom.</b>
Transient Response	- Response Deviation - Response Time	<b>3% typ. / 5% max.</b> (25% to 100% Load Step) <b>500 µs typ. / 750 µs max.</b> (25% to 100% Load Step)

### Safety Specifications

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

All specifications valid at 230 VAC, 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 A (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
	- RF Electromagnetic Field	EN 61000-4-3, 3 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 1$ kV, perf. criteria A
		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
	- Conducted RF Disturbances	EN 61000-4-6, 3 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous: EN 61000-4-8, 1 A/m, perf. criteria A
	- Voltage Dips & Interruptions	230 VAC / 50 Hz: EN 61000-4-11 30%, 25 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%, 250 periods, perf. criteria B
EMC / Environmental	- Certification Documents	<a href="http://www.tracopower.com/overview/tci240">www.tracopower.com/overview/tci240</a>

## 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. (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)
Regulator Topology		LCC Converter
Switching Frequency		90 - 132 kHz (PFM)
		110 kHz typ. (PFM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		280 VAC
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 (at 264 VAC / 63 Hz)	- Earth Leakage Current	750 $\mu$ A max.
Distance Through Isolation		7.1 mm
Reliability	- Calculated MTBF	400'000 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
		IEC 60068-2-27 50 g, 3 axis, half sine, 11 ms
	- Mechanical Shock	
Housing Material		Aluminum

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Potting Material	Silicone (UL 94 V-0 rated) (the converter is partly potted on the bottom)
Housing Type	Metal Case
Mounting Type	Chassis Mount
Connection Type	Pin Connector
Weight	365 g (for standard version) 650 g (for optional U-Bracket models)
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-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule.) - SCIP Reference Number 0841b696-b53c-4fae-a062-5132d1598eab

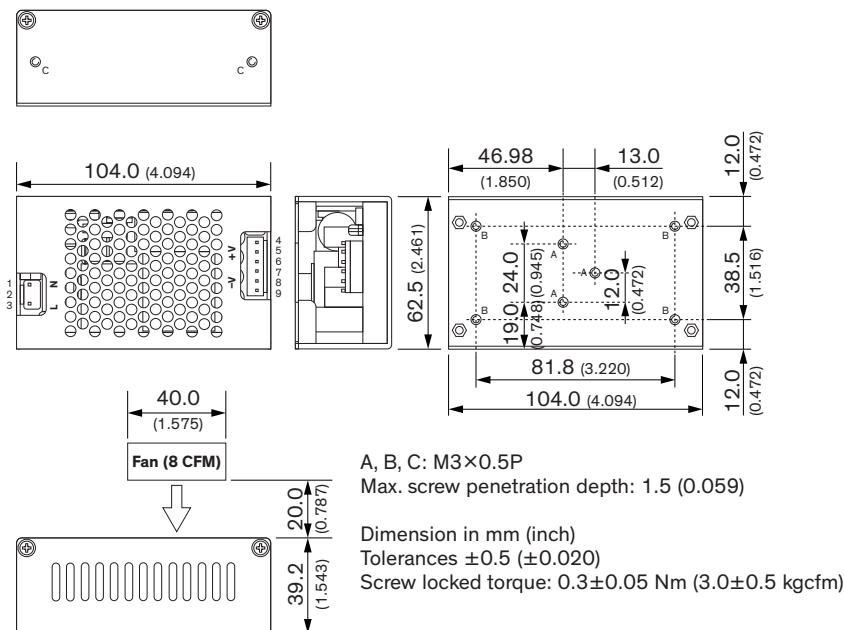
### Supporting Documents

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)

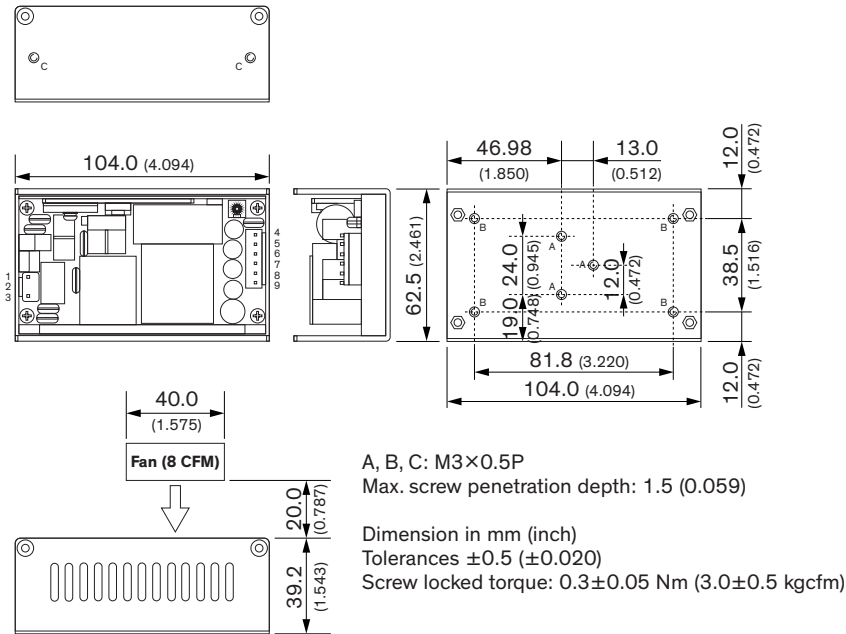
Pos	Function
A	For mounting on chassis only
B	For mounting on PCB or chassis, and connecting PE
C	For connecting PE only

**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 230 VAC, 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