

## AC/DC Power Supply

## TPI 300-M Series, 300 Watt

- **High power-density: 300 Watt in 4.6"x2.44" package (encased)**
- **I/O isolation 3000 VAC rated for 250 VAC working voltage**
- **Certification according to IEC/EN/UL 62368-1**
- **Peak power operation up to 360 Watt for 5s**
- **Operating temperature -40°C to 80°C**
- **Active power factor correction >0.9**
- **Operating up to 5000m altitude**
- **High efficiency up to 93%**
- **Protection class II prepared**
- **3-year product warranty**



The TPI 300-M series is a set of AC/DC power supplies in an encased package style. They feature a reinforced double I/O isolation (3000 VAC) system according to latest industrial safety standards. The excellent efficiency of up to 93% allows a high power-density and compact design (4.6" x 2.44"). The operating temperature range is -40°C to +80°C with derating above 50°C. In natural convection operation these power supplies deliver 180 Watt going up to 300 Watt with forced air cooling. Additionally, they can deliver 360 Watt peak power for 5s. The EMC characteristic is dedicated for applications in industrial and medical fields. High reliability is provided by using high quality components and an excellent thermal management making the TPI 300-M an ideal solution for industrial and medical devices and for demanding safety and space critical applications.

### Models

Order Code	Output Power max.	Output Voltage nom. (adjustable)	Output Current max.	Output Current peak	Efficiency typ.
TPI 300-112-M	300 W	12 VDC (10.8 - 13.2 VDC)	25'000 mA	30'000 mA	91 %
TPI 300-115-M		15 VDC (13.5 - 16.5 VDC)	20'000 mA	24'000 mA	92 %
TPI 300-124-M		24 VDC (21.6 - 26.4 VDC)	12'500 mA	15'000 mA	93 %
TPI 300-136-M		36 VDC (32.4 - 39.6 VDC)	8'330 mA	10'000 mA	93 %
TPI 300-148-M		48 VDC (43.2 - 52.8 VDC)	6'250 mA	7'500 mA	93 %
TPI 300-153-M		53 VDC (47.7 - 58.3 VDC)	5'670 mA	6'790 mA	93 %

### Options

<b>on demand</b> (backorder with MOQ non stocking item)	- Optional model with 18 VDC and 16'667 mA - Optional model with 28 VDC and 10'710 mA
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### Input Specifications

Input Voltage	- AC Range	Operational Range: <b>85 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>120 - 370 VDC</b> (Designed for, no certification) Polarity: <b>+DC: L / -DC: N</b>
Input Frequency		Operational Range: <b>47 - 440 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC	<b>3'000 mW max.</b>
	- No load & Vin = 115 VAC	<b>3'000 mW max.</b>
Input Current	- Full load & Vin = 230 VAC	<b>1'600 mA max.</b>
	- Full load & Vin = 115 VAC	<b>3'900 mA max.</b>
Input Inrush Current	- At 230 VAC	<b>70 A max.</b>
	- At 115 VAC	<b>40 A max.</b>
Power Factor	- At 230 VAC	<b>0.9 min.</b> (Active Power Factor Correction)
	- At 115 VAC	<b>0.9 min.</b> (Active Power Factor Correction)
Input Protection		<b>T 5 A / 250 VAC</b> (Internal Fuse in L & N)
Recommended Input Fuse		<b>5'000 mA</b> (slow blow) (The need of an external fuse has to be assessed in the final application.)

### Output Specifications

Output Voltage Adjustment		<b>±10%</b> (By trim potentiometer) 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>0.5% max.</b>
Boost Power		Output Current peak: See model table Peak power time: <b>5 s max.</b> Peak power duty cycle: <b>20% max.</b> Average operation power: <b>50% of full load</b>
Ripple and Noise (20 MHz Bandwidth)	12 VDC model:	<b>150 mVp-p max.</b> (w/ 1 µF X7R)
	15 VDC model:	<b>180 mVp-p max.</b> (w/ 1 µF X7R)
	18 VDC model:	<b>210 mVp-p max.</b> (w/ 1 µF X7R)
	24 VDC model:	<b>270 mVp-p max.</b> (w/ 1 µF X7R)
	28 VDC model:	<b>310 mVp-p max.</b> (w/ 1 µF X7R)
	36 VDC model:	<b>390 mVp-p max.</b> (w/ 1 µF X7R)
	48 VDC model:	<b>510 mVp-p max.</b> (w/ 1 µF X7R)
Capacitive Load	53 VDC model:	<b>540 mVp-p max.</b> (w/ 1 µF X7R)
	12 VDC model:	<b>20'000 µF max.</b>
	15 VDC model:	<b>12'000 µF max.</b>
	18 VDC model:	<b>9'000 µF max.</b>
	24 VDC model:	<b>2'400 µF max.</b>
Minimum Load	28 VDC model:	<b>2'000 µF max.</b>
	36 VDC model:	<b>1'000 µF max.</b>
	48 VDC model:	<b>650 µF max.</b>
	53 VDC model:	<b>470 µF max.</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>5 ms min.</b>
	- At 115 VAC	<b>5 ms min.</b>
Start-up Time	- At 230 VAC	<b>2'000 ms max.</b>
	- At 115 VAC	<b>2'000 ms max.</b>
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		<b>135 - 165% of Iout max.</b>
		<b>150% typ. of Iout max.</b>

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

Overvoltage Protection		115 - 135% of Vout nom. (Latch off)
Transient Response	- Response Deviation	3% typ. / 10% max. (50% to 75% Load Step)
	- Response Time	600 $\mu$ s typ. (50% to 75% Load Step)

### Safety Specifications

Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents	<a href="http://www.tracopower.com/overview/tpi300-m">www.tracopower.com/overview/tpi300-m</a>
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) FCC 47 Part 15 class B (internal filter)	
	- Radiated Emissions	EN 55032 class A (internal filter) FCC 47 Part 15 class A (internal filter)	
	- Harmonic Current Emissions	EN 61000-3-2, class A	
	- Voltage Fluctuations & Flicker	EN 61000-3-3	
EMS (Immunity)		EN 60601-1-2 edition 4 (Medical Devices) EN 55024 (IT Equipment) EN 55035 (Multimedia)	
	- Electrostatic Discharge	Air: EN 61000-4-2, $\pm 15$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 8$ kV, perf. criteria A	
	- RF Electromagnetic Field	EN 61000-4-3, 20 V/m, perf. criteria A	
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 2$ kV, perf. criteria A L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria A	
	- Conducted RF Disturbances	EN 61000-4-6, 20 Vrms, perf. criteria A	
	- PF Magnetic Field	Continuous: EN 61000-4-8, 30 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	
EMC / Environmental	- Certification Documents	<a href="http://www.tracopower.com/overview/tpi300-m">www.tracopower.com/overview/tpi300-m</a>	

### General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +80°C
	- Storage Temperature	-40°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/tpi300-m">www.tracopower.com/overview/tpi300-m</a>
Over Temperature Protection Switch Off	- Protection Mode	118°C min. / 125°C typ. / 132°C max. (Automatic recovery at 112°C typ.)
	- Measurement Point	See application note: <a href="http://www.tracopower.com/overview/tpi300-m">www.tracopower.com/overview/tpi300-m</a> (Internal Thermistor)
Cooling System		Forced air cooling (with internal fan)
Fan Power Source	- Characteristic	Variable fan speed (temperature regulated)
	- Output Voltage	12 VDC
	- Output Current	500 mA max.

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

Standby Power Source	- Output Voltage - Output Current	5 VDC 1000 mA max. (Fan Power Source and Standby Power Source total power must not exceed 8 W.)
Remote Control	- Voltage Controlled Remote (passive = on)  - Off Idle Input Current  - Remote Pin Input Current	On: 3.0 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to '+Remote' and '-Remote' Pin 16 mA typ. / 25 mA max. (excl. Standby power source and Fan power source) -0.5 to 1.0 mA (Standby power source and Fan power source are always present)
Altitude During Operation		5'000 m max.
Regulator Topology		LLC Converter
Switching Frequency		100 - 180 kHz (PWM) 140 kHz typ. (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		250 VAC
Isolation Test Voltage	- Input to Output, 60 s - Input to Case or PE, 60 s - Output to Case or PE, 60 s	3'000 VAC 2'000 VAC 2'000 VAC
Creepage	- Input to Output - Input to Case or PE - Output to Case or PE	13.6 mm min. 5 mm min. 4.2 mm min.
Clearance	- Input to Output - Input to Case or PE - Output to Case or PE	9.7 mm min. 5 mm min. 4.2 mm min.
Isolation Resistance	- Input to Output, 500 VDC	100 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	1'250 pF typ. / 1'500 pF max.
Leakage Current (264 VAC / 63 Hz)	- Earth Leakage Current	300 μA max.
Distance Through Isolation		0.4 mm
Reliability	- Calculated MTBF	1'056'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration  - Mechanical Shock  - Thermal Shock	IEC 60068-2-6 5 g, 3 axis, sine sweep, 3x30 min, 5-500 Hz IEC 60068-2-27 50 g, 3 axis, half sine, 11 ms MIL-STD-810F
Housing Material		Aluminum
Housing Type		Metal Case
Mounting Type		Chassis Mount
Connection Type		Pin Connector
Weight		318 g
Power OK Signal	- Trigger Threshold   - Power OK - Power Off  - Pin Specifications	Open collector output 12 VDC model: 10 - 10.8 VDC 15 VDC model: 12.5 - 13.5 VDC 18 VDC model: 15.3 - 16.2 VDC 24 VDC model: 20 - 21.6 VDC 28 VDC model: 24 - 25.2 VDC 36 VDC model: 31 - 32.4 VDC 48 VDC model: 41.5 - 43.2 VDC 53 VDC model: 46 - 47.7 VDC Low level High resistance (Refers to 'PG' and '-Vout' Pin) 50 VDC / 50 mA max.

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Sense Function	10% max. of Vout nom. (If sense function is not used, sense pins should be left open/floating.)
Environmental Compliance - REACH Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a>
- RoHS Declaration	REACH SVHC list compliant REACH Annex XVII compliant <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a>
- SCIP Reference Number	Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).) <b>2a3253e0-dd29-4343-b244-8c5c82676138</b>

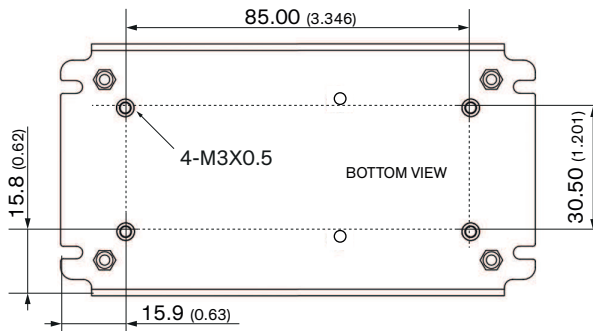
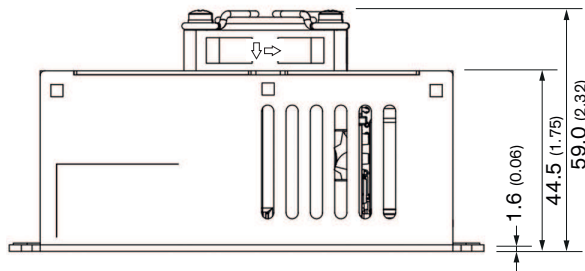
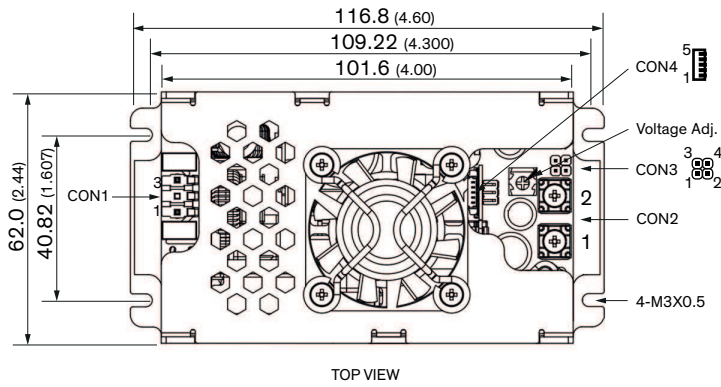
## Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tpi300-m](http://www.tracopower.com/overview/tpi300-m)

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### Outline Dimensions

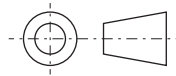


All dimensions in mm (inch)

Tolerance: X.X ±0.5 (±X.XX 0.02)  
X.XX ±0.25 (±0.01)

Max. screw penetration depth: 3.3 (0.130)

Setup screw locked torque: max. 2.5 kgfcm / 0.25 Nm  
CON2 screw locked torque: max. 16.8 kgfcm / 1.65 Nm  
wires 24 - 14 AWG



Input	
CON1	
Pin	Function
1	AC (L) / DC (+)
3	AC (N) / DC (-)

Output	
CON2	
Pin	Function
1	+ Vout
2	- Vout

Auxiliary	
CON3	
Pin	Function
1	+ Fan
2	- Fan
3	+ Sense
4	- Sense

Auxiliary	
CON4	
Pin	Function
1	+ Standby
2	- Standby
3	PG
4	- Remote
5	+ Remote

**CON1:** Molex Housing 09-50-8031  
Molex Crimp Terminals 08500106 (2478),  
08520112 (6838),  
45570

**CON2:** KST Ring Terminal RVS2-3.7

**CON3:** Molex Housing 90143-0004  
Molex Crimp Terminals 90119

**CON4:** Molex Housing 51021-0500  
Molex Crimp Terminals 50058, 50078