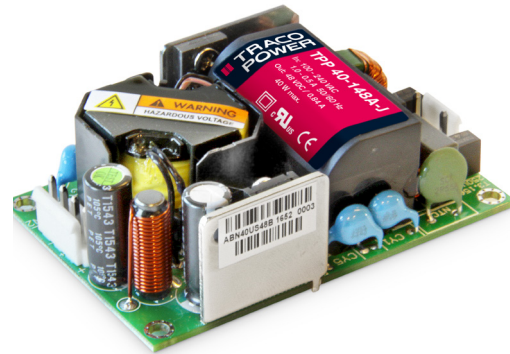


AC/DC Medical Power Supply

TPP 40A Series, 40 Watt

- Open frame power supply pin connector
- Certification according to IEC/EN/ES 60601-1 3rd edition for 2×MOPP
- Low leakage current <75 µA rated for BF applications
- Risk management process according to ISO 14971 including risk management file
- Acceptance criteria for electronic assemblies according to IPC-A-610 Level 3
- EMC emission to IEC 60601-1-2 ed.4
- Protection class I & II
- Approved for operation up to 5000 m MSL
- Ready to meet ErP directive, < 0.15 W no load power consumption
- 5 year product warranty



Encased version with screw terminal connection see TPP 40 Series

www.tracopower.com/overview/tpp40

The TPP 40A Series of 40 Watt AC/DC power supplies feature a reinforced double I/O isolation system according to latest medical safety standards IEC/EN ES 60601-1 3rd edition for 2 × MOPP up to 5000 m MSL. The earth leakage current is below 75 µA what makes the units suitable for BF (body floating) applications. The excellent efficiency of up to 92% allows a high power density for the standard 2.44" x 3.0" packaging format. The full load operating temperature range is -40°C to +70°C while it goes up to 85°C with 50% load derating. The EMC characteristic complies to IEC 60601-1-2 ed.4 and is dedicated for applications in industrial and domestic fields. High reliability is provided by use of industrial quality grade components and an excellent thermal management. It makes the products an ideal solution for medical devices and for demanding safety and space critical applications.

Models			
Order code	Output voltage	Output current max.	Efficiency max.
TPP 40-105A-J	5 VDC	8.0 A	90 %
TPP 40-112A-J	12 VDC	3.34 A	92 %
TPP 40-124A-J	24 VDC	1.67 A	92 %
TPP 40-148A-J	48 VDC	0.84 A	92 %

Note: - Output is adjustable by ±10% with internal potentiometer
 - Other output voltages are available on request

Input Specifications

Input voltage range	– AC range (universal input) – DC range	85 – 264 VAC 120 – 370 VDC
Input frequency		47 – 63 Hz
Input current at full load	– at 115 VAC / 230 VAC	1.05 A max. / 0.55 A max.
Input protection		T3.15 A/250 VAC (internal fuse in both line & neutral)
Input inrush current	– at 230 VAC	60 A max.
Zero load power consumption		0.15 W max. (acc. ErP directive)

Output Specifications

Voltage set accuracy		±1%
Regulation	– Input variation – Load variation (0 - 100%)	0.2% max. 5 VDC model: 0.7% max. other models: 0.5% max.
Minimum load		not required
Temperature coefficient		0.02%/K
Hold-up time	– Vin = 115 VAC	25 ms typ.
Start-up time		<1 s
Rise time		20 ms typ.
Ripple and noise (20MHz Bandwidth)	5 & 12 VDC output: 24 VDC output: 48 VDC output:	75 mVp-p typ. w. cap. 10µF/25V 1206 X7R MLCC 75 mVp-p typ. w. cap. 1µF/50V 1206 X7R MLCC 150 mVp-p typ. w. cap. 0.1µF/100V 1206 X7R MLCC
Overvoltage protection		125 – 140% of nominal Vout
Current limitation		at 145% Iout typ.
Short circuit protection		hiccup mode (automatic recovery)
Transiente response	– Peak deviation – Recovery time	3% max. (25% load step change) 600 µs typ.
Capacitive load	5 Vout model: 12 Vout model: 24 Vout model: 48 Vout model:	16'000 µF max. 2'785 µF max. 700 µF max. 175 µF max.

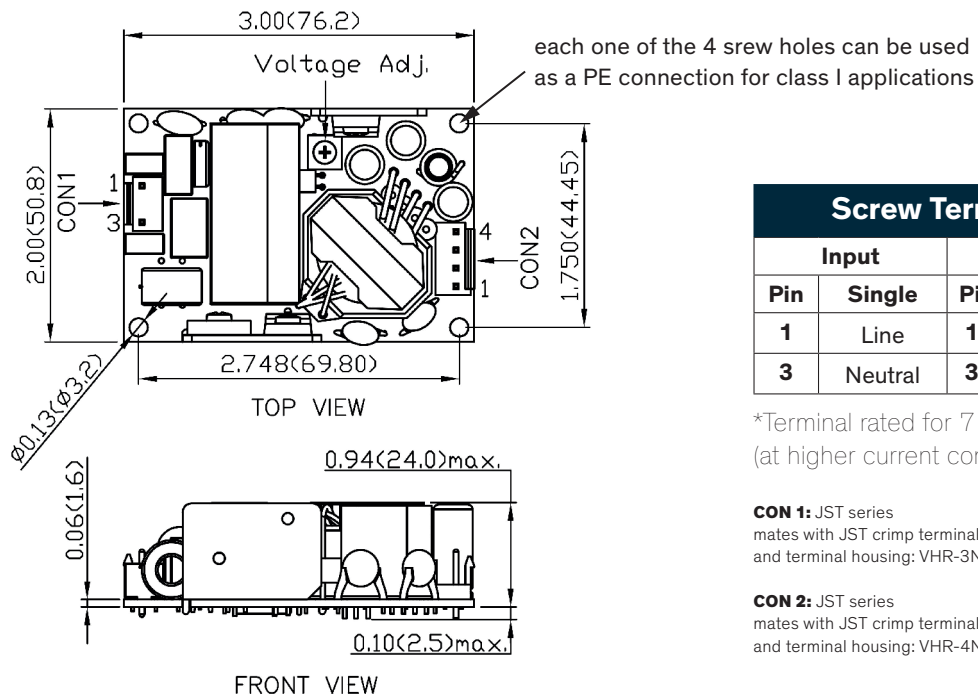
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

General Specifications

Operating temperature	–40°C to +85°C with derating
Output power de-rating	2.67 %/K above +70°C at 230 VAC 2.75 %/K above +65°C at 115 VAC
Storage temperature	–40°C to +85°C
Humidity (non condensing)	5 – 95 % rel. H max.
Altitude during operation	5000 m
Switching frequency - single output (at 230 VAC)	5 VDC model: 70 kHz typ. (pulse frequency modulation) other models: 120 kHz typ. (pulse frequency modulation)
Isolation voltage (2 × MOPP insulation)	– Input / Output (60 s) 4000 VAC – Input / Case (60 s) 2500 VAC
Leakage current (at 264 VAC/60Hz)	75 µA max.
Isolation resistance (at 500 VDC)	100 MOhm min.
Reliability – calculated MTBF at +25°C acc. to IEC 61709	3'000'000 h
Protection class	class II prepared
Electromagnetic compatibility – Conducted & Radiated input suppression (EMC), emissions	EN 55011 limits to IEC 60601-1-2 4th edition EN 55032 class B (internal filter) IEC / EN 61000-3-2, class B IEC / EN 61000-3-3, class B
Electromagnets compatibility (EMC), immunity	IEC / EN 60601-1-2 – Electrostatic discharge ESD IEC / EN 61000-4-2, 8kV/6kV perf. criteria A – RF field immunity IEC / EN 61000-4-3, 20V/m perf. criteria A – Electrical fast transients/burst immunity IEC / EN 61000-4-4, ± 2kV perf. criteria A – Surge IEC / EN 61000-4-5, ± 1kV/± 2kV perf. criteria A – Conducted RF IEC / EN 61000-4-6, 20 Vrms perf. criteria A – Magnetic field IEC / EN 61000-4-8, 10A/m perf. criteria A
Voltage dip and interruptions according to EN 60601-1-2 reference: 100 VAC / 50Hz	30%, 500ms perf. criteria A 60%, 100ms perf. criteria B > 95%, 10ms perf. criteria A > 95%, 5000ms perf. criteria B
Safety standards and certification	IEC/EN 60601-1 3rd edition, ANSI/AAMI ES60601-1:2005(R)2012 www.tracopower.com/overview/tpp40a – Certification documents
Environment	– Vibration acc. IEC 60068-2-6 3 axis, sine sweep, 10–55Hz, 1g, 1oct/min – Shock acc. IEC 60068-2-27 3 axis, 10g half sine, 11msShock 20 G (3 directions each 3 times)
Environmental compliance	– Reach www.tracopower.com/products/reach-declaration.pdf – RoHS RoHS directive 2011/65/EU
Connection	JST pin connector

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

Outline Dimensions



Weight: 114 g (4.02 oz)

Screw Terminal			
Input		Output	
Pin	Single	Pin*	Dual
1	Line	1,2	-Vout
3	Neutral	3,4	+Vout

*Terminal rated for 7 A max.
(at higher current connection has to be split)

CON 1: JST series
mates with JST crimp terminal: BVH-21T-P1.1
and terminal housing: VHR-3N

CON 2: JST series
mates with JST crimp terminal: BVH-21T-P1.1
and terminal housing: VHR-4N

Dimensions in inch, () = mm
Tolerances: $x.xx \pm 0.02$ ($x.x \pm 0.5$) $x.xxx \pm 0.01$ ($x.xx \pm 0.25$)