Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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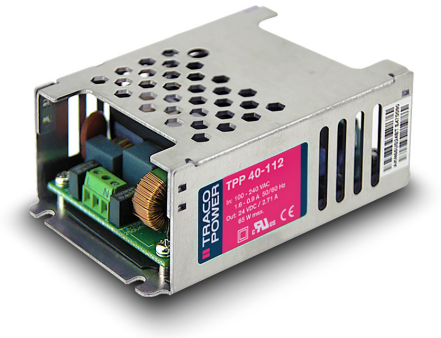
TRACO POWER

AC/DC Medical Power Supply

TPP 40 Series, 40 Watt

- **Enclosed power supply with screw terminal connection**
- **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 and 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**



ErP ready · CE · CB Scheme · prepared · cULus ES 60601-1

Open frame version with pin connection see TPP 40A Series

www.tracopower.com/overview/tpp40a

The TPP 40 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.
	Vout 1	Vout 2	Vout 3	Vout 1	Vout 2	Vout 3	
TPP 40-105	5 VDC			8.0 A			90 %
TPP 40-112	12 VDC			3.34 A			92 %
TPP 40-115	15 VDC			2.67 A			92 %
TPP 40-124	24 VDC			1.67 A			92 %
TPP 40-221	+12 VDC	+5 VDC		3.34 A	4 A		89 %
TPP 40-231	+15 VDC	+5 VDC		2.67 A	4 A		88.5 %
TPP 40-251	+24 VDC	+5 VDC		1.67 A	4 A		86 %
TPP 40-321M2	+12 VDC	+5 VDC	–12 VDC	3.34 A	4 A	0.5 A	88 %
TPP 40-331M3	+15 VDC	+5 VDC	–15 VDC	2.67 A	4 A	0.5 A	88 %
TPP 40-3512	+24 VDC	+5 VDC	+12 VDC	1.67 A	4 A	0.5 A	86 %

Note: - Vout 1 is ajustable by ±10% with internal potentiomet
- Multi output models have a common ground (not isolated)
- Total power should not exceed 40 Watt for continuose operation
- 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		single output: multi output:	±1% ±1% Vout1 ±2% Vout2, Vout3
Regulation - single output	– Input variation		0.2% max.
	– Load variation (0 - 100%)	5 VDC model: other models:	0.7% max. 0.5% max.
Regulation - multi output	– Input variation		0.2% max.
	– Load variation (0 - 100%)	Vout1: Vout2: Vout3:	0.5% max. 1.5% max. (0.1W to full load: 0.7% max.) 0.7% max.
	– cross regulation (25% / 100%)		1.5% max.
Minimum load			not required (Vout 3 requires 0.5 W over Vout 1/Vout 2 to be stabilized)
Temperature coefficient			0.02%/K
Hold-up time	– Vin = 115 VAC		25 ms typ.
Start-up time			<1s
Rise time			20 ms typ.
Ripple and noise (20MHz Bandwidth)	- single output model	5-15 VDC outputs: 24 VDC output:	75 mVp-p typ. w. cap. 10µF/25V 1206 X7R MLCC 75 mVp-p typ. w. cap. 1µF/50V 1206 X7R MLCC
	- multi output Vout 1	12 VDC: 15 VDC: 24 VDC	120 mVp-p typ. w. cap. 1µF/50V 1206 X7R MLCC 150 mVp-p typ. w. cap. 1µF/50V 1206 X7R MLCC 240 mVp-p typ. w. cap. 1µF/50V 1206 X7R MLCC
	– Vout 2	5 VDC:	100 mVp-p typ. w. cap. 10µF/25V 1206 X7R MLCC
	– Vout 3	(-)12 VDC: 15 VDC:	120 mVp-p typ. w. cap. 10µF/25V 1206 X7R MLCC 150 mVp-p typ. w. cap. 10µF/25V 1206 X7R MLCC
Overvoltage protection			125 – 140% of nominal Vout
Current limitation		single output: multi output:	at 145% Iout typ. at 145% Pout1 +Pout2
Short circuit protection			hiccup mode (automatic recovery)
Transiente response	– Peak deviation – Recovery time	Vout1:	3% max. (25% load step change) 600 µs typ.
Capactive load		5 VDC output model: 12 VDC output model: 15 VDC output model: 24 VDC output model: +12 VDC / +5 VDC output model: +15 VDC / +5 VDC output model: +24 VDC / +5 VDC output model: +12 VDC / +5 VDC / -12 VDC output model: +15 VDC / + 5 VDC / -15 VDC output model: +24 VDC / +5 VDC / -12 VDC output model:	16‘000 µF max. 2,785 µF max. 1‘780 µF max. 700 µF max. 1‘750 µF / 2’000 µF max. 1‘670 µF / 2’000 µF max. 440 µF / 2’000 µF max. 1‘750 µF / 2’000 µF / 420 µF max. 1‘670µF / 2’000 µF / 420 µF max. 440 µF / 2’000 µF / 420 µF max.

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

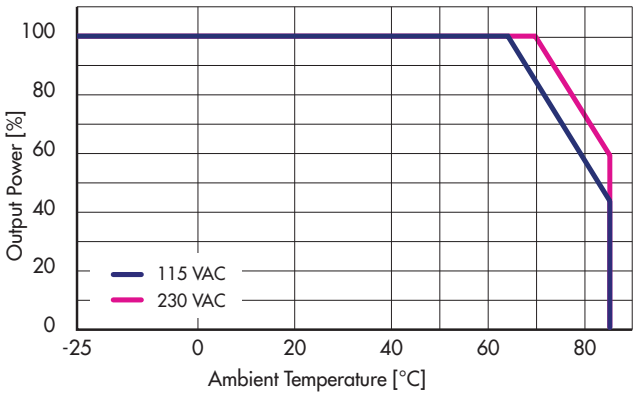
General Specifications

Operating temperature			–40°C to +85°C with derating, see graph on p.4
Output power derating	– Temperature	single output:	2.67 %/K above +70°C at 230 VAC 2.75 %/K above +65°C at 115 VAC
		multi output:	1.60 %/K above +60°C at 230 VAC 1.67 %/K above +55°C at 115 VAC
	– Low input voltage		1.33 %/V below 100 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: other models:	70 kHz typ. (pulse frequency modulation) 120 kHz typ. (pulse frequency modulation)
Switching frequency - multi output (at 230 VAC)	– Vout 1	5 VDC model: other models:	70 kHz typ. (pulse frequency modulation) 115 kHz typ. (pulse frequency modulation)
	– Vout 2		750 kHz typ. (pulse frequency modulation)
	– Vout 3		510 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 for single output models 1‘700‘000 h for multi output models
Protection class			class II prepared
Electromagnetic compatibility (EMC), emissions	– Conducted & Radiated input surpression		EN 55011 limits to IEC 60601-1-2 4th editon EN 55032 class B (internal filter)
	– Harmonic current emissions		IEC / EN 61000-3-2, class B
	– Voltage flicker		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 (only for single output models)		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
	– Certification documents		www.tracopower.com/overview/tpp40
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			screw terminal

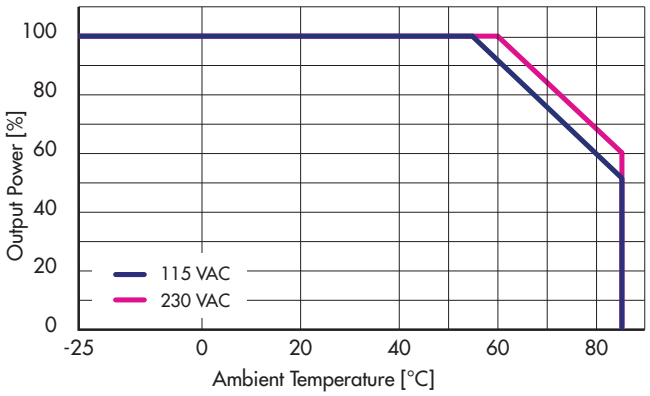
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Derating graphs

Single output models:

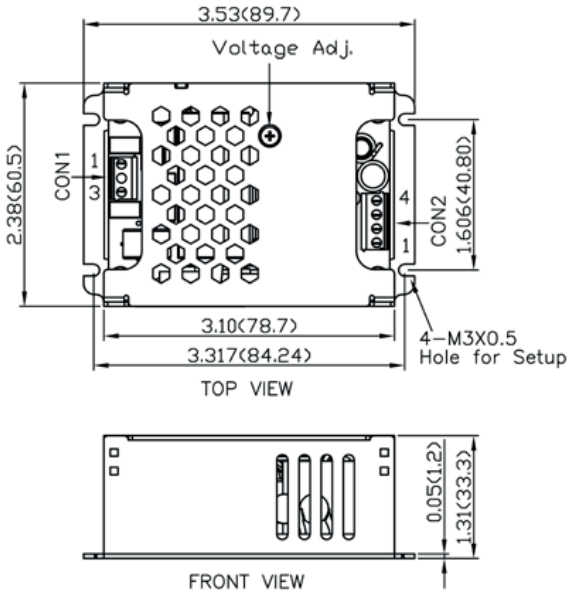


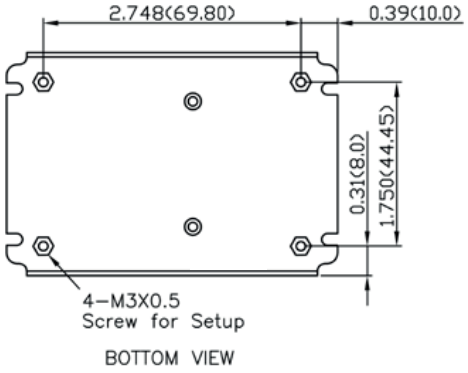
Multi output models:



Outline Dimensions

Single output enclosed:



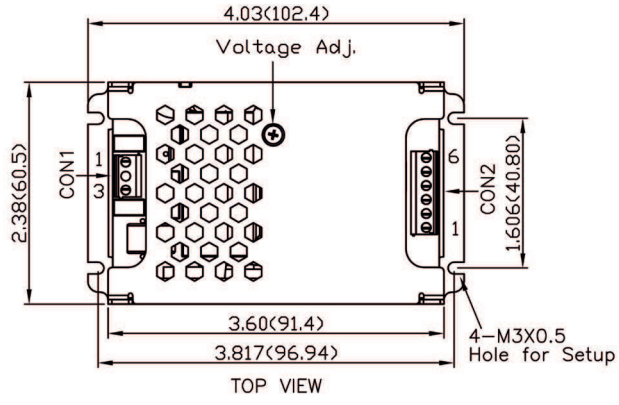


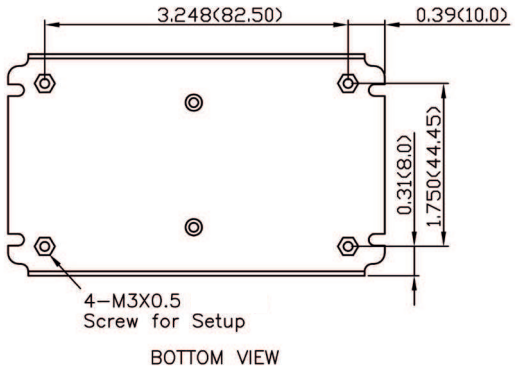
Screw Terminal			
Input		Output	
Pin	Single	Pin*	Dual
1	Line	1,2	–Vout
3	Neutral	3,4	+Vout

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

Weight: 169 g (5.96 oz)

Multi output enclosed:





Screw Terminal			
Input		Output	
Pin	Single	Pin*	Dual
1	Line	1	Vout 3
3	Neutral	2,3	Com
		4,5	Vout 2
		6	Vout 1

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

Weight: 216 g (7.80 oz)

Dimensions in inch, () = mm
Tolerances: x.xx±0.02 (x.x±0.5) x.xxx±0.01 (x.xx±0.25)
Wire dimensions range 26 - 16 AWG
M3×0.5 screw locked torque MAX 5Kgf.cm/0.49N.m
Terminal screw locked torque MAX 2Kgf.cm/0.2N.m