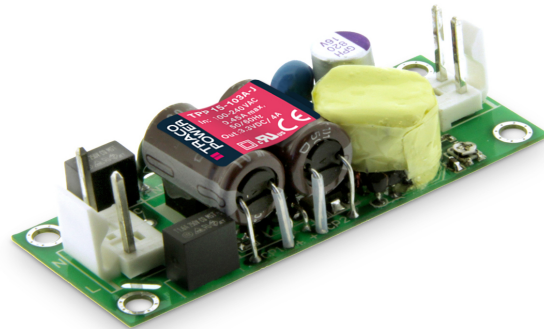


- High power density power supply (open frame)
- Certification according to IEC/EN/ES 60601-1 3rd edition for 2 x MOPP
- Low leakage current <75 μ A rated for BF applications
- EMC compliance to IEC 60601-1-2 4th edition
- Risk management process according to ISO 14971 incl. risk management file
- Acceptance criteria for electronic assemblies acc. to IPC-A-610 Level 3
- Protection class I and II
- Operating up to 5000 m altitude
- Ready to meet ErP directive, no load power consumption <75 mW
- 5-year product warranty



The TPP 15A-J AC/DC power supplies feature a reinforced double I/O isolation system according to medical safety standards IEC/EN/ES 60601-1 3rd edition for 2 x MOPP approved for an operating altitude of 5000 m. The earth leakage current is below 75 μ A what makes the units suitable for BF (body floating) applications. The excellent efficiency of up to 89% offers a high power density in the packaging format 1.0" x 2.6". The full load operating temperature range covers -40°C to +60°C while it goes up to 85°C with 50% load derating. The units operate in compliance to the medical EMC emission and immunity levels according to latest standard IEC 60601-1-2 4th edition.

Models

Order Code	Output Power max.	Output Voltage nom.	Output Current max.	Efficiency typ.
TPP 15-103A-J	13.2 W	3.3 VDC	4'000 mA	84 %
TPP 15-105A-J	15 W	5 VDC	3'000 mA	86 %
TPP 15-109A-J		9 VDC	1'670 mA	86 %
TPP 15-112A-J		12 VDC	1'250 mA	87 %
TPP 15-115A-J		15 VDC	1'000 mA	87 %
TPP 15-124A-J		24 VDC	625 mA	88 %
TPP 15-136A-J		36 VDC	417 mA	88 %
TPP 15-148A-J		48 VDC	313 mA	89 %

Input Specifications

Input Voltage	- AC Range	85 - 264 VAC (Full Range)
	- DC Range	120 - 370 VDC (Designed for, no certification)
Input Frequency		47 - 63 Hz
Input Current	- Full Load & Vin = 230 VAC	300 mA max.
	- Full Load & Vin = 115 VAC	450 mA max.
Power Consumption	- at no Load	75 mW max. (Ready to meet ErP directive)
Input Inrush Current	- at 230 VAC	40 A max.
Input Protection		T 1.6 A / 250 VAC (Internal Fuse in L & N)

Output Specifications

Voltage Set Accuracy		±1% max.
Regulation	- Input Variation (Vmin - Vmax)	0.2% max.
	- Load Variation (0 - 100%)	0.7% max. (3.3 and 5 VDC model)
		0.5% max. (other output models)
Ripple and Noise (20 MHz Bandwidth)	3.3 VDC model:	40 mVp-p typ. (with 10 µF X5R)
	5 VDC model:	40 mVp-p typ. (with 10 µF X5R)
	9 VDC model:	70 mVp-p typ. (with 10 µF X5R)
	12 VDC model:	70 mVp-p typ. (with 10 µF X5R)
	15 VDC model:	70 mVp-p typ. (with 10 µF X5R)
	24 VDC model:	100 mVp-p typ. (with 10 µF X5R)
	36 VDC model:	100 mVp-p typ. (with 10 µF X5R)
	48 VDC model:	140 mVp-p typ. (with 1 µF X7R)
Capacitive Load	3.3 VDC model:	6'000 µF max.
	5 VDC model:	4'000 µF max.
	9 VDC model:	1'860 µF max.
	12 VDC model:	1'200 µF max.
	15 VDC model:	820 µF max.
	24 VDC model:	470 µF max.
	36 VDC model:	220 µF max.
48 VDC model:	150 µF max.	
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Hold-up Time	- at 115 VAC	8 ms min.
Start-up Time	- at 230 VAC	500 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		120 - 200% of Iout max.
		145% typ. of Iout max.
Overvoltage Protection		125 - 140% of Vout nom.
Transient Response	- Response Deviation	8% max. (75% to 100% Load Step)
	- Response Time	500 µs typ. (75% to 100% Load Step)

Safety Specifications

Safety Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Household	IEC 60335-1
	- Medical Equipment	EN 60601-1 IEC 60601-1
		ANSI/AAMI ES 60601-1
		2 x MOPP (Means Of Patient Protection)
	- Power Transformers	IEC 61558-1 IEC 61558-2-16
	- Certification Documents	www.tracopower.com/overview/tpp15a-j

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

Protection Class	Class I (Prepared): Connection to PE Class II (Prepared): Reinforced Insulation
Pollution Degree	PD 2
Over Voltage Category	OVC II

EMC Specifications

EMI Emissions	EN 60601-1-2 edition 4 (Medical Devices) EN 55011 class B (internal filter) EN 55014-1 EN 55032 class B (internal filter) FCC Part 15, class B FCC Part 18, class B
- Conducted Emissions	
- Radiated Emissions	EN 55011 class B (internal filter) EN 55014-1 EN 55032 class B (internal filter) FCC Part 15, class B FCC Part 18, class B
- Harmonic Current Emissions	EN 61000-3-2, class A
- Voltage Fluctuations & Flicker	EN 61000-3-3
EMS Immunity	EN 55024 (IT Equipment) EN 60601-1-2 edition 4 (Medical Devices) EN 55014-2 (Household Appliances Tools)
- Electrostatic Discharge	Air: EN 61000-4-2, ± 15 kV, perf. criteria A Contact: EN 61000-4-2, ± 8 kV, perf. criteria A EN 61000-4-3, 20 V/m, perf. criteria A EN 61000-4-4, ± 2 kV, perf. criteria A
- RF Electromagnetic Field	L to L: EN 61000-4-5, ± 1 kV, perf. criteria A
- EFT (Burst)	L to PE: EN 61000-4-5, ± 2 kV, perf. criteria A EN 61000-4-6, 20 Vrms, perf. criteria A
- Surge	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A 230 VAC / 50 Hz: EN 61000-4-11 30%, 25 periods, perf. criteria A 60%, 1 period, perf. criteria A >95%, 1 period, perf. criteria A >95%, 250 periods, perf. criteria A
- Conducted RF Disturbances	115 VAC / 60 Hz: EN 61000-4-11 30%, 25 periods, perf. criteria A 60%, 1 period, perf. criteria A >95%, 1 period, perf. criteria A >95%, 250 periods, perf. criteria A
- PF Magnetic Field	
- Voltage Dips & Interruptions	

General Specifications

Relative Humidity	95% max. (non condensing)
Temperature Ranges	- Operating Temperature: -40°C to $+85^{\circ}\text{C}$ - Storage Temperature: -40°C to $+85^{\circ}\text{C}$
Power Derating	See application note: www.tracopower.com/overview/tp15a-j 4 %/V below 90 VAC
Cooling System	Natural convection (20 LFM)
Altitude During Operation	5'000 m max.
Switching Frequency	75 - 95 kHz (PWM)
Insulation System	Reinforced Insulation
Working Voltage (rated)	250 VAC
Isolation Test Voltage	- Input to Output, 60 s: 4'000 VAC - Input to Case or PE, 60 s: 1'500 VAC - Output to Case or PE, 60 s: 1'500 VAC
Creepage	- Input to Output: 8 mm min.
Clearance	- Input to Output: 8 mm min.

All specifications valid at nominal voltage, full load and $+25^{\circ}\text{C}$ after warm-up time unless otherwise stated.

Isolation Resistance	- Input to Output, 500 VDC	100 MOhm min.
Leakage Current (at 264 VAC)	- Touch Current	75 µA max.
Reliability	- Calculated MTBF	3'100'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration - Mechanical Shock	IEC 60068-2-6 IEC 60068-2-27
Connection Type		JST
Weight		19 g
Environmental Compliance	- Reach - RoHS	www.tracopower.com/info/reach-declaration.pdf www.tracopower.com/info/rohs-declaration.pdf

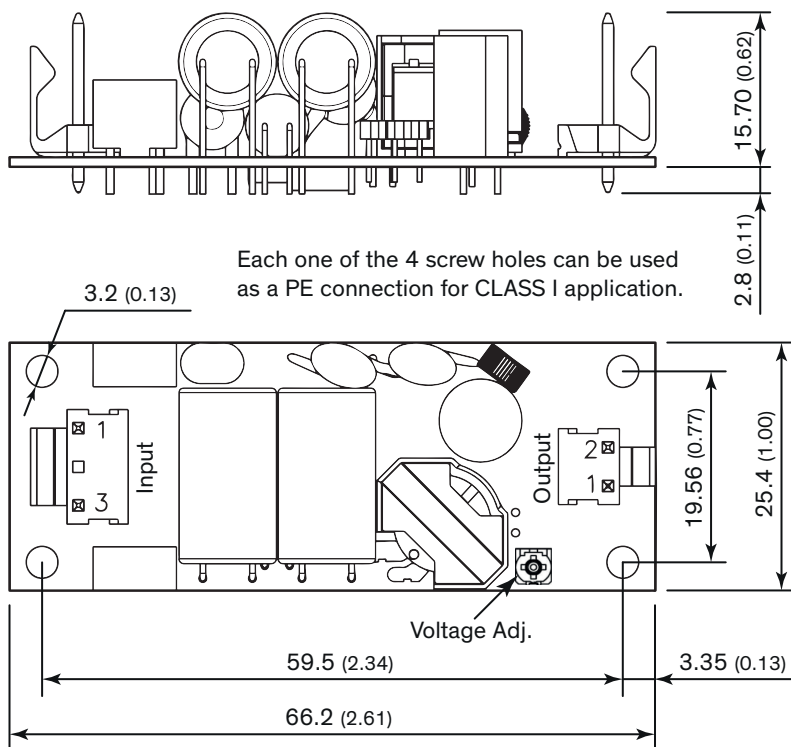
Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/tp15a-j

Outline Dimensions

12, 15, 24, 36, and 48 VDC models - without heatsink



Pin connectors			
Input		Output	
Pin	Function	Pin	Function
1	Line	1	-Vout
3	Neutral	2	+Vout

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

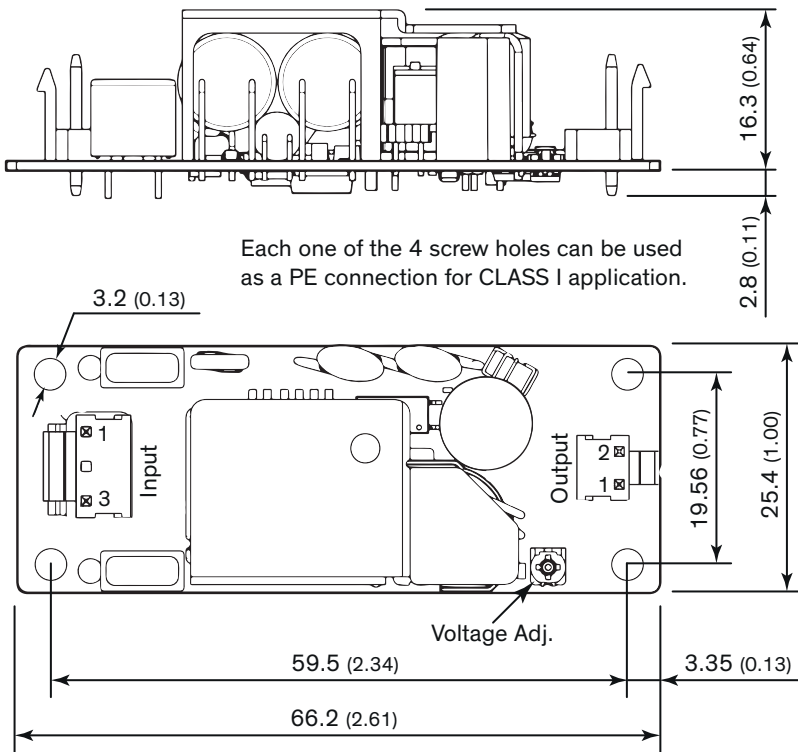
Output: JST series
mates with JST crimp terminal: SVH-21T-P1.1
and terminal housing: VHR-2N

Print thickness: 1.0 mm (0.04 inch)

Dimension in mm, () = inch
Tolerances: x.x ±0.50 (±0.02)
x.xx ±0.25 (±0.01)

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

3.3, 5, and 9 VDC models - with heatsink



Print thickness: 1.0 mm (0.04 inch)

Dimension in mm, () = inch
 Tolerances: x.x ±0.50 (±0.02)
 x.xx ±0.25 (±0.01)

Pin connectors			
Input		Output	
Pin	Function	Pin	Function
1	Line	1	-Vout
3	Neutral	2	+Vout

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

Output: JST series
 mates with JST crimp terminal: SVH-21T-P1.1
 and terminal housing: VHR-2N