

- High power density power supply (encapsulated)
- Certification according to IEC/EN/ES 60601-1 edition 3.2 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 II
- Operating up to 5000 m altitude
- Ready to meet ErP directive, no load power consumption <60 mW
- 5-year product warranty



ES 60601-1 IEC 60601-1
UL 62368-1 IEC 60335-1
IEC 62368-1

The TPP 30-J AC/DC power supplies feature a reinforced double I/O isolation system according to medical safety standards IEC/EN/ES 60601-1 edition 3.2 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 91.5% offers a high power density in the packaging format 1.5" x 3.95". 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 30-103-J	20 W	3.3 VDC	6'000 mA	84 %
TPP 30-105-J	30 W	5 VDC	6'000 mA	87 %
TPP 30-109-J		9 VDC	3'340 mA	88 %
TPP 30-112-J		12 VDC	2'500 mA	91 %
TPP 30-115-J		15 VDC	2'000 mA	91 %
TPP 30-124-J		24 VDC	1'250 mA	90 %
TPP 30-136-J		36 VDC	840 mA	90 %
TPP 30-148-J		48 VDC	630 mA	92 %

Input Specifications

Input Voltage	- AC Range	Operational Range: 85 - 264 VAC (Full Range) Rated Range: 100 - 240 VAC (Full Range)
	- DC Range	Operational Range: 120 - 370 VDC (Designed for, no certification) Polarity: +DC: L / -DC: N
Input Frequency		Operational Range: 47 - 440 Hz Certified: 50/60 Hz
Power Consumption	- No load & Vin = 230 VAC	60 mW max. (Ready to meet ErP directive)
	- No load & Vin = 115 VAC	60 mW max.
Input Current	- Full load & Vin = 230 VAC	400 mA max.
	- Full load & Vin = 115 VAC	800 mA max.
Input Inrush Current	- At 230 VAC	40 A max.
	- At 115 VAC	25 A max.
Input Protection		T 1.6 A / 250 VAC (Internal Fuse in L & N)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

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:	50 mVp-p typ. (w/ 10 µF X7R)
	5 VDC model:	50 mVp-p typ. (w/ 10 µF X7R)
	9 VDC model:	50 mVp-p typ. (w/ 10 µF X7R)
	12 VDC model:	50 mVp-p typ. (w/ 1 µF X7R)
	15 VDC model:	50 mVp-p typ. (w/ 1 µF X7R)
	24 VDC model:	50 mVp-p typ. (w/ 1 µF X7R)
	36 VDC model:	50 mVp-p typ. (w/ 1 µF X7R)
	48 VDC model:	50 mVp-p typ. (w/ 0.1 µF X7R)
Capacitive Load	3.3 VDC model:	10'000 µF max.
	5 VDC model:	12'000 µF max.
	9 VDC model:	3'720 µF max.
	12 VDC model:	2'085 µF max.
	15 VDC model:	1'350 µF max.
	24 VDC model:	520 µF max.
	36 VDC model:	235 µF max.
Minimum Load	48 VDC model:	130 µF max.
Temperature Coefficient		±0.02 %/K max.
Hold-up Time	- At 115 VAC	16 ms min.
Start-up Time	- At 230 VAC	1'500 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		110 - 170% of Iout max.
		140% typ. of Iout max.
Overvoltage Protection		125 - 140% of Vout nom.
Transient Response	- Response Deviation	3% max. (50% to 75% Load Step)
	- Response Time	500 µs typ. (50% to 75% Load Step)

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

Safety Specifications

Standards	- IT / Multimedia Equipment	EN 62368-1 IEC 62368-1 UL 62368-1
	- Household	EN 60335-1 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/tp30-j
Protection Class	Class I & II (Prepared): Reinforced Insulation	
	See application note: www.tracopower.com/info/protection-class.pdf	
Pollution Degree	PD 2	
Over Voltage Category	OVC II	

EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 60601-1-2 edition 4 (Medical Devices) EN 55011 class A (internal filter) EN 55011 class B (internal filter) EN 55014-1 (internal filter) EN 55032 class A (internal filter) EN 55032 class B (internal filter) FCC 47 Part 15 class A (internal filter) FCC 47 Part 15 class B (internal filter) FCC 47 Part 18 class A (internal filter) FCC 47 Part 18 class B (internal filter)
	- Radiated Emissions	EN 55011 class A (internal filter) EN 55011 class B (internal filter) EN 55014-1 (internal filter) EN 55032 class A (internal filter) EN 55032 class B (internal filter) FCC 47 Part 15 class A (internal filter) FCC 47 Part 15 class B (internal filter) FCC 47 Part 18 class A (internal filter) FCC 47 Part 18 class B (internal filter)
	- Harmonic Current Emissions	EN 61000-3-2, class A
	- Voltage Fluctuations & Flicker	EN 61000-3-3

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

EMS (Immunity)		EN 60601-1-2 edition 4 (Medical Devices) EN 55024 (IT Equipment) EN 55035 (Multimedia) EN 55014-2 (Household Appliances Tools) 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 L to L: EN 61000-4-5, ± 1 kV, perf. criteria A EN 61000-4-6, 20 Vrms, perf. criteria A 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 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
- Electrostatic Discharge - RF Electromagnetic Field - EFT (Burst) / Surge - Conducted RF Disturbances - PF Magnetic Field - Voltage Dips & Interruptions		
EMC / Environmental	- Certification Documents	www.tracopower.com/overview/tpp30-j

General Specifications		
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature - Storage Temperature	-40°C to +85°C -40°C to +85°C
Power Derating	- High Temperature - Low Input Voltage	Depending on model 4 %/V below 90 VAC See application note: www.tracopower.com/overview/tpp30-j
Cooling System		Natural convection (20 LFM)
Altitude During Operation		5'000 m max.
Regulator Topology		Flyback Converter
Switching Frequency		30 - 60 kHz (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		272 VAC
Isolation Test Voltage	- Input to Output, 60 s - Input to Case or PE, 60 s - Output to Case or PE, 60 s	4'000 VAC 1'500 VAC 1'500 VAC
Creepage	- Input to Output	8 mm min.
Clearance	- Input to Output	8 mm min.
Isolation Resistance	- Input to Output, 500 VDC	100 M Ω min.
Leakage Current (at 264 VAC)	- Touch Current	75 μ A max.
Reliability	- Calculated MTBF	3'300'000 h (MIL-HDBK-217F, ground benign)
Environment	- Vibration - Mechanical Shock	IEC 60068-2-6 IEC 60068-2-27
Potting Material		Silicone (UL 94 V-0 rated)
Housing Type		Plastic Case
Mounting Type		Chassis Mount
Connection Type		Pin Connector
Weight		119 g

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

Environmental Compliance - REACH Declaration

www.tracopower.com/info/reach-declaration.pdf

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

www.tracopower.com/info/rohs-declaration.pdf

Exemptions: 7(a), 7(c)-I

(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)

- SCIP Reference Number

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Additional Information

Supporting Documents

www.tracopower.com/overview/tpp30-j

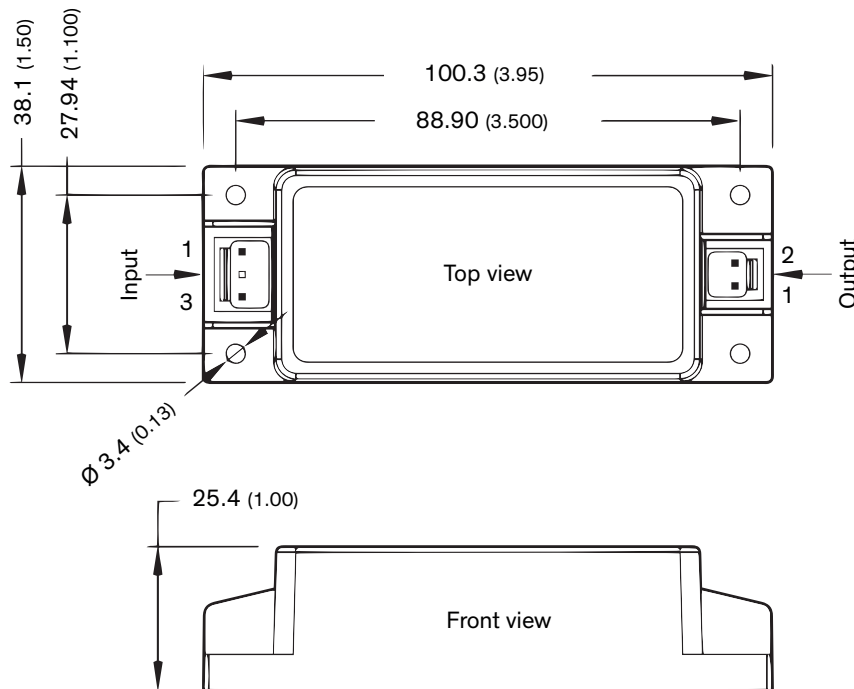
Frequently Asked Questions

www.tracopower.com/glossary-faq

Glossary

www.tracopower.com/info/glossary.pdf

Outline Dimensions



Pin connectors

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

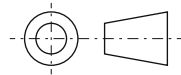
Input: JST series
mates with JST crimp terminal: SVH-21T-P1.1
and terminal housing: VHR-3N

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

Dimension in mm (inch)

Tolerances: x.x ± 0.50 (± 0.02)

x.xx ± 0.25 (± 0.01)



Mounting screw locked torque: 5.0 kgfcm / 0.49 Nm