

- 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 µA 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
UL 62368-1

IEC 60601-1
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 µA 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	-40°C to +85°C
	- Storage Temperature	-40°C to +85°C
Power Derating	- High Temperature	Depending on model
	- Low Input Voltage	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	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.
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	IEC 60068-2-6
	- Mechanical Shock	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

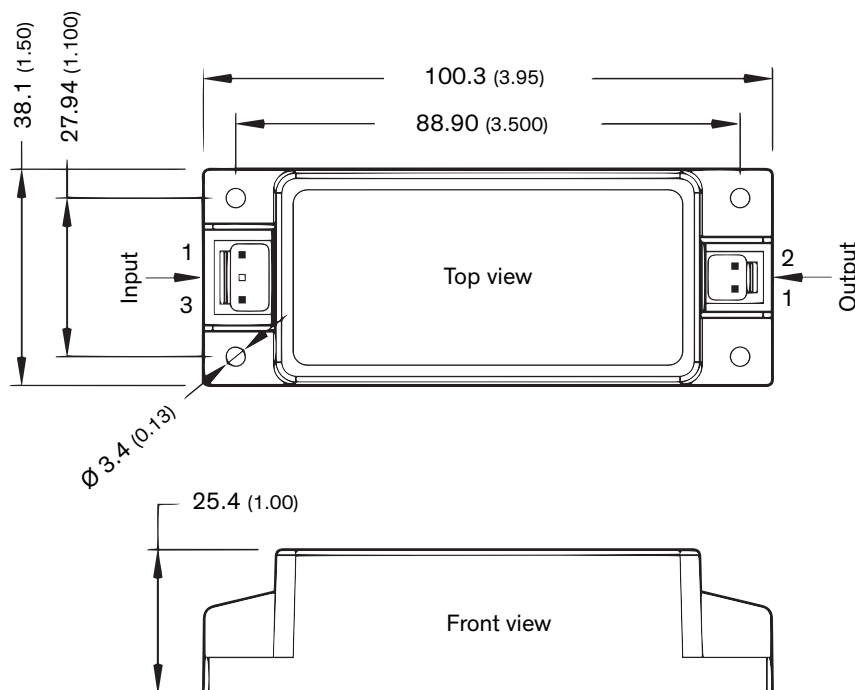
Frequently Asked Questions

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

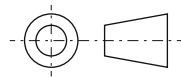
Input: JST series
mates with JST crimp terminal: SVH-21T-P1.1
and terminal housing: VHR-3N

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