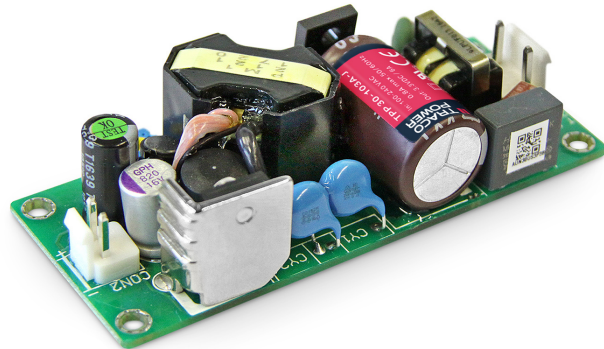


- High power density power supply (open frame)
- Certification according to IEC/EN/ES 60601-1 3rd edition for 2 x MOPP
- Low leakage current <75  $\mu$ A rated for BF applications
- EMC compliance to IEC 60601-1-2 4th edition
- Risk management process according to ISO 14971 incl. risk management file
- 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 <60 mW
- 5-year product warranty



The TPP 30A-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  $\mu$ A what makes the units suitable for BF (body floating) applications. The excellent efficiency of up to 92% offers a high power density in the packaging format 1.36" x 3.34". 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. (adjustable)	Output Current max.	Efficiency typ.
TPP 30-103A-J	20 W	3.3 VDC (2.97 - 3.63 VDC)	6'000 mA	84 %
TPP 30-105A-J	30 W	5 VDC (4.5 - 5.5 VDC)	6'000 mA	87 %
TPP 30-109A-J		9 VDC (8.1 - 9.9 VDC)	3'340 mA	88 %
TPP 30-112A-J		12 VDC (10.8 - 13.2 VDC)	2'500 mA	91 %
TPP 30-115A-J		15 VDC (13.5 - 16.5 VDC)	2'000 mA	91 %
TPP 30-124A-J		24 VDC (21.6 - 26.4 VDC)	1'250 mA	90 %
TPP 30-136A-J		36 VDC (32.4 - 39.6 VDC)	840 mA	90 %
TPP 30-148A-J		48 VDC (43.2 - 52.8 VDC)	630 mA	92 %

### 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	400 mA max.
	- Full Load & Vin = 115 VAC	800 mA max.
Power Consumption	- At no load	60 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)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

### Output Specifications

Output Voltage Adjustment		±10% (By trim potentiometer) Output power must not exceed rated power!
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)		50 mVp-p typ. (w/ 10 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.
	48 VDC model:	130 µF max.
Minimum Load		Not required
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)

### Safety Specifications

Safety 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
	- Power Transformers	2 x MOPP (Means Of Patient Protection) IEC 61558-1 IEC 61558-2-16
	- Certification Documents	<a href="http://www.tracopower.com/overview/tpp30a-j">www.tracopower.com/overview/tpp30a-j</a>
Protection Class		Class I & II (Prepared): Reinforced Insulation
Pollution Degree		PD 2
Over Voltage Category		OVC II

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

## EMC Specifications

<b>EMI Emissions</b>		EN 60601-1-2 edition 4 (Medical Devices)
- Conducted Emissions		EN 55011 class B (internal filter) EN 55014-1 (internal filter) EN 55032 class B (internal filter) FCC Part 15 class B (internal filter) FCC Part 18 class B (internal filter)
- Radiated Emissions		EN 55011 class B (internal filter) EN 55014-1 (internal filter) EN 55032 class B (internal filter) FCC Part 15 class B (internal filter) FCC Part 18 class B (internal filter)
- Harmonic Current Emissions		EN 61000-3-2, class A
- Voltage Fluctuations & Flicker		EN 61000-3-3
<b>EMS Immunity</b>		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, $\pm 15$ kV, perf. criteria A
	Contact:	EN 61000-4-2, $\pm 8$ kV, perf. criteria A
- RF Electromagnetic Field		EN 61000-4-3, 20 V/m, perf. criteria A
- EFT (Burst) / Surge		EN 61000-4-4, $\pm 2$ kV, perf. criteria A
	L to L:	EN 61000-4-5, $\pm 1$ kV, perf. criteria A
	L to PE:	EN 61000-4-5, $\pm 2$ kV, perf. criteria A
- Conducted RF Disturbances		EN 61000-4-6, 20 Vrms, perf. criteria A
- PF Magnetic Field	Continuous:	EN 61000-4-8, 30 A/m, perf. criteria A
- Voltage Dips & Interruptions	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

## General Specifications

<b>Relative Humidity</b>		95% max. (non condensing)
<b>Temperature Ranges</b>	- Operating Temperature	-40°C to +85°C
	- Storage Temperature	-40°C to +85°C
<b>Power Derating</b>	- High Temperature	See application note: <a href="http://www.tracopower.com/overview/tpp30a-j">www.tracopower.com/overview/tpp30a-j</a>
	- Low Input Voltage	4 %/V below 90 VAC
<b>Cooling System</b>		Natural convection (20 LFM)
<b>Altitude During Operation</b>		5'000 m max.
<b>Switching Frequency</b>		30 - 60 kHz (PWM)
<b>Insulation System</b>		Reinforced Insulation
<b>Working Voltage (rated)</b>		272 VAC
<b>Isolation Test Voltage</b>	- 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
<b>Creepage</b>	- Input to Output	8 mm min.
<b>Clearance</b>	- Input to Output	8 mm min.
<b>Isolation Resistance</b>	- Input to Output, 500 VDC	100 M $\Omega$ min.
<b>Leakage Current (at 264 VAC)</b>	- Touch Current	75 $\mu$ A max.
<b>Reliability</b>	- Calculated MTBF	3'300'000 h (MIL-HDBK-217F, ground benign)

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

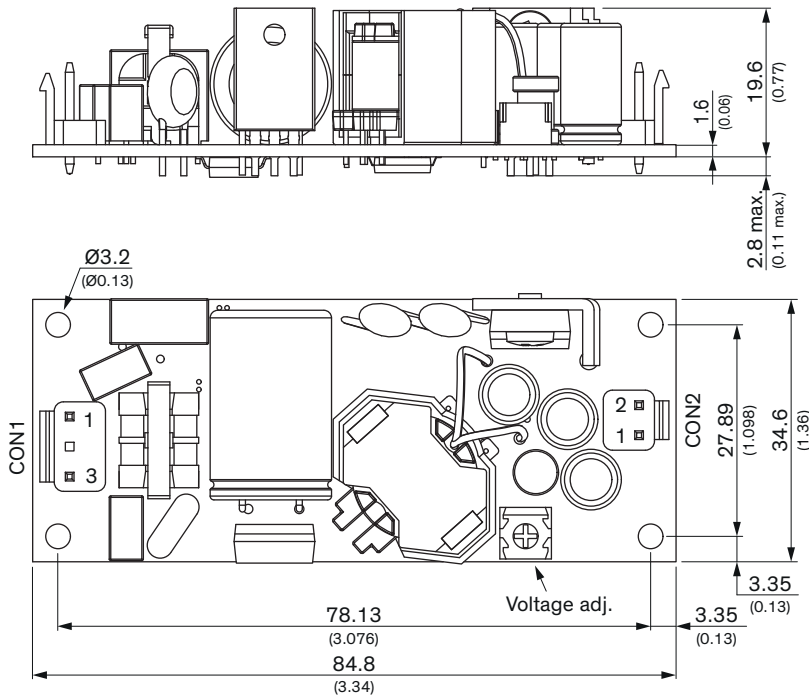
Environment	- Vibration - Mechanical Shock	IEC 60068-2-6 IEC 60068-2-27
Connection Type		JST
Weight		60.5 g
Environmental Compliance	- Reach - RoHS	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a>

### Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tpp30a-j](http://www.tracopower.com/overview/tpp30a-j)

### Outline Dimensions



Dimensions in mm (inch)  
 Tolerances: x.x ±0.50 (±0.02)  
 x.xx ±0.25 (±0.01)  
 Screw lock torque: Max. 0.49 N·m (5 kgf·cm)

### Pin connectors

Input (CON1)		Output (CON2)	
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

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