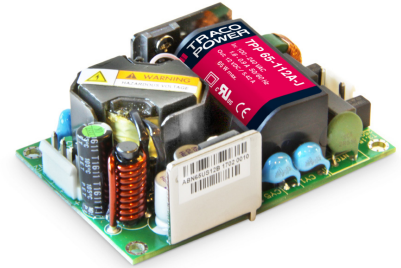


- Open frame power supply with pin connection
- Certification according to IEC/EN/ES 60601-1 3rd edition for 2×MOPP
- Low leakage current <75 µA rated for BF applications
- Risk management process according to ISO 14971 including risk management file
- Acceptance criteria for electronic assemblies according to IPC-A-610 Level 3
- EMC emission to IEC 60601-1-2-ed.4
- Protection class I and II
- Operating up to 5000m altitude
- Ready to meet ErP directive, < 0.15 W no load power consumption
- 5 year product warranty



Encased version with screw terminal connection see TPP 65 Series



[www.tracopower.com/overview/tpp65](http://www.tracopower.com/overview/tpp65)

The TPP 65A Series of 65 Watt AC/DC power supplies feature a reinforced double I/O isolation system according to latest medical safety standards (60601-1 3rd edition, 2 × MOPP). 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 +60°C while it goes up to 85°C with 50% load derating. The EMC characteristic is dedicated for applications in industrial and domestic fields. High reliability is provided by the 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.
TPP 65-105A-J	5 VDC	10.0 A	90 %
TPP 65-112A-J	12 VDC	5.42 A	92.5 %
TPP 65-124A-J	24 VDC	2.71 A	93.5 %
TPP 65-148A-J	48 VDC	1.36 A	93 %

Note: - Output is adjustable by ±10% with internal potentiometer  
 - 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	1.65 A max. / 0.95 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		±1%
Regulation - single output	– Input variation – Load variation (0 - 100%)	0.2% max. 5 VDC model: 0.7% max. other models: 0.5% max.
Regulation - multi output	– Input variation – Load variation (0 - 100%)	0.2% max. 0.5% max.
Minimum load		not required
Temperature coefficient		0.02%/K
Hold-up time	– Vin = 115 VAC	16 ms typ.
Start-up time		<1 s
Rise time		20 ms typ.
Ripple and noise (20Mhz Bandwidth)	5 & 12 VDC models: 24 VDC models: 48 VDC model:	75 mVp-p typ. w. cap. 10µF/25V 1206 X7R MLCC 75 mVp-p typ. w. cap. 1µF/50V 1206 X7R MLCC 150 mVp-p typ. w. cap. 0.1µF/100V 1206 X7R MLCC
Overvoltage protection		125 – 140% of nominal Vout
Overload protection by current limit		at 145% Iout typ.
Short circuit protection		hiccup mode (automatic recovery)
Transiente response	– Peak deviation – Recovery time	3% max. (25% load step change) 600 µs typ.

## General Specifications

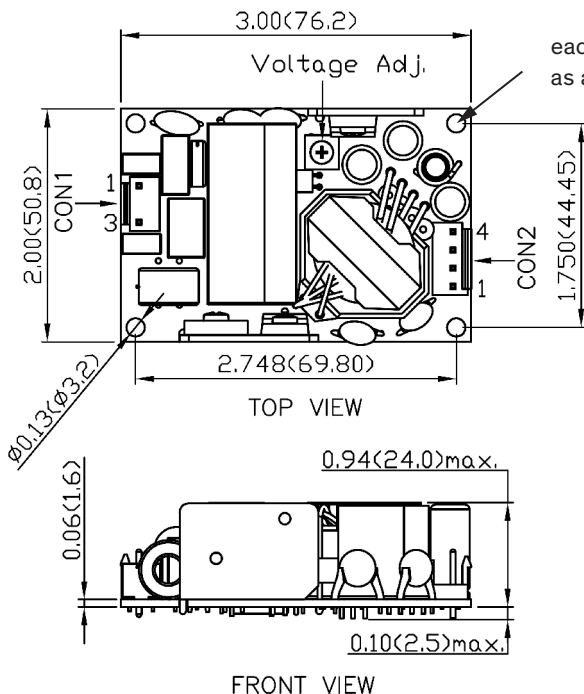
Operating temperature		–40°C to +85°C with derating
Output power derating	– Temperature	2 %/K above +60°C at 230 VAC 2 %/K above +55°C at 115 VAC
Storage temperature		–40°C to +85°C
Humidity (non condensing)		5 – 95 % rel. H max.
Altitude during operation		5000 m
Switching frequency (at 230 VAC)	5 VDC model: other models:	60 kHz typ. (pulse frequency modulation) 120 kHz typ. (pulse frequency modulation)
Isolation voltage (2 × MOPP insulation)	– Input / Output (60 sec.) – Input / Case (60 sec.)	4000 VAC 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	1'500'000 h for single output models 1'000'000 h for multi output models
Protection class		class II prepared

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

### General Specifications (continued)

Electromagnetic compatibility – Conducted & Radiated input suppression (EMC), emissions	– Harmonic current emissions – Voltage flicker	EN 55011 limits to IEC 60601-1-2 4th edition EN 55032 class B (internal filter) IEC / EN 61000-3-2, class A IEC / EN 61000-3-3, (class tba.)
Electromagnets compatibility (EMC), immunity	– Electrostatic discharge ESD – RF field immunity – Electrical fast transients/burst immunity – Surge – Conducted RF – Magnetic field (only for single output models)	IEC / EN 60601-1-2 IEC / EN 61000-4-2, 8kV/15kV perf. criteria A IEC / EN 61000-4-3, 20V/m perf. criteria A IEC / EN 61000-4-4, ± 2kV perf. criteria A IEC / EN 61000-4-5, ± 1kV/± 2kV perf. criteria A IEC / EN 61000-4-6, 20 Vrms perf. criteria A 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 <a href="http://www.ul.com">www.ul.com</a> File e188913		UL 60950-1, IEC/EN 60950-1, IEC/EN 60601-1 3rd edition, ANSI/AAMI ES60601-1:2005(R)2012
Environment	– Vibration acc. IEC 60068-2-6 – Shock acc. IEC 60068-2-27	3 axis, sine sweep, 10–55Hz, 1g, 1oct/min 3 axis, 10g half sine, 11msShock 20 G (3 directions each 3 times)
Environmental compliance	– Reach – RoHS	<a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a> RoHS directive 2011/65/EU
Connection		screw terminal / pin connector

### Outline Dimensions



Screw Terminal			
Input (Con 1)		Output (Con 2)	
Pin	Single	Pin*	Dual
1	Line	1,2	-Vout
3	Neutral	3,4	+Vout

\*Terminal rated for 7 A max.  
(at higher current connection has to be split)

**CON 1:** JST series  
mates with JST crimp terminal: BVH-21T-P1.1  
and terminal housing: VHR-3N

**CON 2:** JST series  
mates with JST crimp terminal: BVH-21T-P1.1  
and terminal housing: VHR-4N

**Weight:** 114g (4.02 oz)

Dimensions in inch, ( ) = mm  
Tolerances: x.xx±0.02 (x.x±0.5) x.xxx±0.01 (x.xx±0.25)