

## AC/DC Power Supply

## TMPW 50 Series, 50 Watt

- Compact PCB power module in 2.92" x 1.85" package
- Wide input voltage range 90-305 VAC
- Certified according to EN 60335-1 and IEC/EN/UL 62368-1
- I/O-Isolation 4'000 VAC
- Operating temperature range -40°C to +70°C
- No load input power <0.1W (acc. ErP directive)
- High efficiency up to 89%
- Internal EN 55032 class B filter
- Protection class II prepared
- 3-year product warranty



The TMPW 50 is a 50 Watt AC/DC series with an extended input range of 90-305 VAC and is suitable for industrial and household/building technology applications and comes in a compact encapsulated plastic case. The 305 VAC (277 VAC  $\pm 10\%$ ) threshold is derived from a 480 VAC three-phase supply voltage often used in heavy industrial applications. Through the increased voltage level, the drawn current from the load is effectively reduced, which allows for an overall more compact and lightweight design approach. They offer an I/O-isolation voltage of 4000 VAC, a high temperature range of -40 to +70°C and are prepared for protection class II applications. Additionally, an internal EN 55-032 class B filter saves valuable board space for an otherwise often mandatory external filter setup. An energy efficient design (<0.1 Watt standby power consumption) and safety approvals according to IEC/EN/UL 62368-1 and EN 603-35-1 make this series suitable for a wide range of industrial and household/building technology applications.

Models				
Order Code	Output Power max.	Output Voltage nom.	Output Current max.	Efficiency typ.
TMPW 50-112	50 W	12 VDC	4'167 mA	89 %
TMPW 50-115		15 VDC	3'333 mA	88 %
TMPW 50-124		24 VDC	2'083 mA	88 %

## Input Specifications

Input Voltage	- AC Range	Operational Range: <b>90 - 305 VAC</b> (Full Range) Rated Range: <b>100 - 277 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>100 - 430 VDC</b> Certified Range: <b>100 - 250 VDC</b> Polarity: <b>irrelevant</b> (The rated range refers to 62368-1. For 60335-1 certification the rated input voltage is 100 - 240 VAC and DC input is not permitted.)
Input Frequency		Operational Range: <b>47 - 440 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC - No load & Vin = 115 VAC	<b>100 mW max.</b> (Ready to meet ErP directive) <b>100 mW max.</b>
Input Current	- Full load & Vin = 230 VAC - Full load & Vin = 115 VAC	<b>600 mA max.</b> <b>1'000 mA max.</b>
Input Inrush Current	- At 230 VAC - At 115 VAC	<b>90 A max.</b> <b>45 A max.</b>
Input Protection		<b>T 3.15 A / 300 V</b>
Recommended Input Fuse		<b>2'500 mA</b> (slow blow) (The need of an external fuse has to be assessed in the final application.)

## Output Specifications

Voltage Set Accuracy		<b>±2% max.</b>
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (0 - 100%)	<b>2% max.</b> <b>2.5% max.</b>
Ripple and Noise (20 MHz Bandwidth)		12 VDC model: <b>120 mVp-p max.</b> (w/ 0.1 µF    47 µF) 15 VDC model: <b>150 mVp-p max.</b> (w/ 0.1 µF    47 µF) 24 VDC model: <b>240 mVp-p max.</b> (w/ 0.1 µF    47 µF)
Capacitive Load		12 VDC model: <b>3'500 µF max.</b> 15 VDC model: <b>3'000 µF max.</b> 24 VDC model: <b>2'200 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.05 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>10 ms min.</b>
Start-up Time	- At 230 VAC - At 115 VAC	<b>130 ms max.</b> <b>130 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>130 - 215% of Iout max.</b>
Overvoltage Protection		<b>105 - 145% of Vout nom.</b> (By Zener diode)
Transient Response	- Response Deviation - Response Time	<b>2% typ. / 3% max.</b> (50% to 75% Load Step) <b>500 µs max.</b> (50% to 75% Load Step)

## Safety Specifications

Standards	- IT / Multimedia Equipment  - Household  - Power Transformers  - Certification Documents	EN 62368-1 IEC 62368-1 UL 62368-1 EN 60335-1 IEC 60335-1 IEC 61558-1 IEC 61558-2-16 <a href="http://www.tracopower.com/overview/tmpw50">www.tracopower.com/overview/tmpw50</a>
Protection Class		<b>Class I &amp; II</b> (Prepared): <b>Reinforced Insulation</b>
Pollution Degree		<b>PD 2</b>
Over Voltage Category		<b>OVC II</b>

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

## EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 55032 class B (internal filter)
	- Radiated Emissions	EN 55032 class B (internal filter)
EMS (Immunity)	- Harmonic Current Emissions	EN 61000-3-2, class A
	- Voltage Fluctuations & Flicker	EN 61000-3-3
	- Electrostatic Discharge	Air: EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 2$ kV, perf. criteria A
	- Conducted RF Disturbances	L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria A EN 61000-4-6, 10 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%, 10 periods, perf. criteria A >95%, 0.5 periods, perf. criteria A >95%, 250 periods, perf. criteria B 100%, 0.5 periods, perf. criteria A 100%, 1 period, perf. criteria A 100%, 250 periods, perf. criteria B
		115 VAC / 60 Hz: EN 61000-4-11 30%, 25 periods, perf. criteria A 60%, 10 periods, perf. criteria A >95%, 0.5 periods, perf. criteria A >95%, 250 periods, perf. criteria B 100%, 0.5 periods, perf. criteria A 100%, 1 period, perf. criteria A 100%, 250 periods, perf. criteria B
	EMC / Environmental	- Certification Documents

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +70°C
	- Storage Temperature	-40°C to +85°C
Power Derating	- High Temperature	2.5 %/K above 50°C
	- Low Input Voltage	2 %/V below 100 VAC
	See application note:	<a href="http://www.tracopower.com/overview/tmpw50">www.tracopower.com/overview/tmpw50</a>
Cooling System		Natural convection (20 LFM)
Altitude During Operation		5'000 m max. (acc. IEC 62368-1)
		2'000 m max. (acc. IEC 60335-1)
Switching Frequency		55 - 90 kHz (PWM, PFM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		342 VAC
Isolation Test Voltage	- Input to Output, 60 s	4'000 VAC
Leakage Current	- Touch Current	250 $\mu$ A max.
Reliability	- Calculated MTBF	300'000 h (MIL-HDBK-217F, ground benign)
Washing Process		Not allowed
Environment	- Vibration	IEC 60068-2-6 2 g, 3 axis, 60 min, 10-500 Hz, 10 min/cycle
	- Mechanical Shock	IEC 60068-2-27
Housing Material		Plastic resin (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated) (Hermetical sealed structure, dust-proof only non water-proof)

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

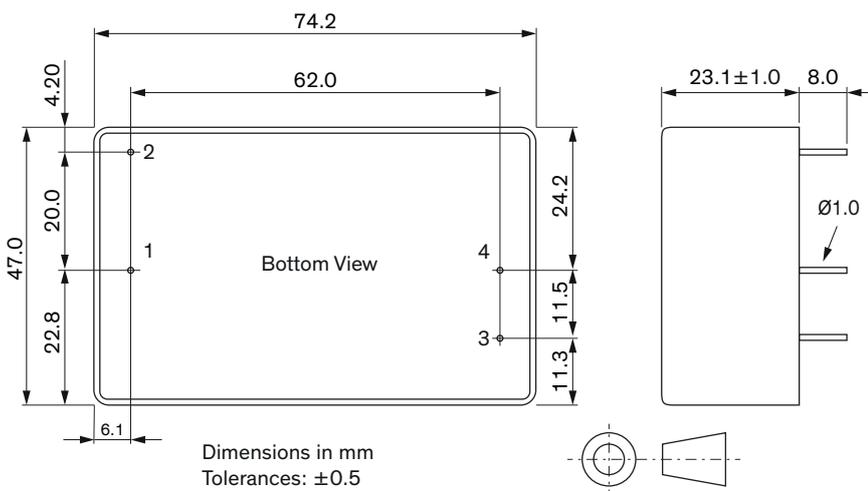
Pin Material	Brass
Pin Surface Plating	Tin (120 µm min.), matte
Housing Type	Plastic Case
Mounting Type	PCB Mount
Connection Type	THD (Through-Hole Device)
Soldering Profile	Lead-Free Wave Soldering 270°C / 3 s max.
Weight	158 g
Environmental Compliance	- REACH Declaration <a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))
	- SCIP Reference Number 0613a8c0-7125-41c2-b2cf-38c78474b2d6

### Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tmpw50](http://www.tracopower.com/overview/tmpw50)

### Outline Dimensions



Pinout	
Pin	Function
1	AC IN (N)
2	AC IN (L)
3	-Vout
4	+Vout