

- Fully encapsulated, dust resistant, and waterproof (IP68 certified)
- Operating temperature range  $-20^{\circ}$  to  $+80^{\circ}\text{C}$
- Mountable in wall outlet boxes
- Screw mountable on wood and inside furniture
- Safety approval IEC/EN 62368-1 and IEC/EN 60335-1
- 2xMOPP certified according to IEC/EN 60601-1 3rd edition
- Leakage current  $< 100 \mu\text{A}$  for body-floating (BF) applications
- I/O isolation 4000 VAC (reinforced)
- Short-circuit protection (SCP), overvoltage protection (OVP) and overtemperature protection (OTP)
- 5-year product warranty



The TMW 24P is a series of fully encapsulated AC/DC power supplies designed for medical, household, and industrial applications. All models come in a compact, dust resistant, and waterproof IP68 housings, are IEC/EN 62368-1, IEC/EN 60335-1 and IEC/EN 60601-1 3rd edition compliant and are certified for 2xMOPP. Featuring a reinforced isolation, the TMW 24P power supplies are prepared for protection class II applications. Their wide operating temperature range from  $-20^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$  makes them ideal candidates for demanding applications.

Models				
Order Code	Output Power max.	Output Voltage nom.	Output Current max.	Efficiency typ.
TMW 24-105P	20.4 W	5.1 VDC	4 A	85 %
TMW 24-112P	24 W	12 VDC	2 A	88 %
TMW 24-124P		24 VDC	1 A	90 %

### Input Specifications

Input Voltage		Operational Range: <b>85 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
Input Frequency		<b>47 - 63 Hz</b>
Power Consumption	- At no load	<b>200 mW max.</b> (Ready to meet ErP directive)
Input Inrush Current	- At 230 VAC	<b>50 A max.</b>
	- At 115 VAC	<b>25 A max.</b>
Power Factor	- At 230 VAC	<b>0.45 min.</b>
	- At 115 VAC	<b>0.55 min.</b>
Input Protection		<b>T 2 A</b> (Internal Fuse)
Recommended Input Fuse		(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)	<b>0.5% max.</b>
	- Load Variation (10 - 90%)	<b>1% max.</b> (12 Vout and 24 Vout model) <b>2% max.</b> (5 Vout model)
Ripple and Noise (20 MHz Bandwidth)		<b>195 mVp-p max.</b>
Capacitive Load		<b>10'000 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±2 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>40 ms min.</b>
	- At 115 VAC	<b>7 ms min.</b>
Start-up Time	- At 230 VAC	<b>500 ms max.</b>
	- At 115 VAC	<b>500 ms max.</b>
Start-up Overshoot Voltage		<b>5% max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>105 - 150% of Iout max.</b>
Overvoltage Protection		<b>130% typ. of Vout nom.</b>
		<b>120 - 160% of Vout nom.</b>
Transient Response	- Response Deviation	<b>5% max.</b> (10% to 90% Load Step)
	- Response Time	<b>2'000 µs max.</b> (10% to 90% Load Step)

### Safety Specifications

Safety Standards	- IT / Multimedia Equipment	<b>EN 62368-1</b> <b>IEC 62368-1</b>
	- Household	<b>EN 60335-1</b> <b>IEC 60335-1</b>
	- Medical Equipment	<b>EN 60601-1</b> <b>IEC 60601-1</b> <b>ANSI/AAMI ES 60601-1</b> <b>CSA-C22.2, No 60601-1</b> <b>2 x MOPP</b> (Means Of Patient Protection)
	- LED Modules Controlgear	<b>EN 61347-2-13</b>
	- Luminaires for Furniture	<b>VDE 0710-14</b>
	- Power Transformers	<b>EN 61558-1</b> <b>IEC 61558-1</b> <b>EN 61558-2-8</b> <b>IEC 61558-2-8</b> <b>EN 61558-2-16</b> <b>IEC 61558-2-16</b>
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmw24p">www.tracopower.com/overview/tmw24p</a>
	Protection Class	<b>Class I &amp; II</b> (Prepared): <b>Reinforced Insulation</b>

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

Pollution Degree	PD 2
Over Voltage Category	OVC II

### EMC Specifications

<b>EMI Emissions</b>		EN 61000-6-3 (Generic Residential) EN 61204-3 (Low Voltage Power Supplies)
- Conducted Emissions		EN 55011 class B (internal filter) EN 55032 class B (internal filter)
- Radiated Emissions		EN 55011 class B (internal filter) EN 55032 class B (internal filter)
- Harmonic Current Emissions		EN 61000-3-2, class A
<b>EMS Immunity</b>		EN 61000-6-2 (Generic Industrial) EN 60601-1-2 edition 4 (Medical Devices)
- RF Electromagnetic Field		EN 61000-4-3, 10 V/m, perf. criteria A
- EFT (Burst) / Surge		EN 61000-4-4, ±2 kV, perf. criteria A
	L to L:	EN 61000-4-5, ±1 kV, perf. criteria A
- Conducted RF Disturbances		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 20%, 250 periods, perf. criteria A 30%, 25 periods, perf. criteria A 60%, 10 periods, perf. criteria A >95%, 5 periods, perf. criteria B >95%, 250 periods, perf. criteria B
	115 VAC / 60 Hz:	EN 61000-4-11 20%, 250 periods, perf. criteria A 30%, 25 periods, perf. criteria B 60%, 10 periods, perf. criteria B >95%, 5 periods, perf. criteria B >95%, 250 periods, perf. criteria B

### General Specifications

Relative Humidity		100% max.
Temperature Ranges	- Operating Temperature	-20°C to +80°C
	- Storage Temperature	-40°C to +90°C
Power Derating	- High Temperature	2 %/K above 50°C
	- Low Input Voltage	2 %/V below 100 VAC
Over Temperature Protection Switch Off	- Protection Mode	85°C min. / 90°C typ. / 95°C max. (Automatic recovery)
	- Measurement Point	Case
Cooling System		Natural convection (20 LFM)
Altitude During Operation		5'000 m max. (4'000 m max. for IEC 61558-2-8)
Switching Frequency		25 - 140 kHz (PWM QR)
Insulation System		Reinforced Insulation
Isolation Test Voltage	- Input to Output, 60 s	4'000 VAC
	- Input to Output, 1 s	4'000 VAC
Creepage	- Input to Output	8 mm min.
Clearance	- Input to Output	8 mm min.
Isolation Resistance	- Input to Output, 500 VDC	100 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	1'100 pF typ. / 1'300 pF max.
Leakage Current (at 240 VAC / 60 Hz)	- Touch Current	100 μA max.
Reliability	- Calculated MTBF	3'400'000 h (see application note) (IEC 61709)

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Environment	- Vibration - Mechanical Shock	IEC 60068-2-6 3 g, 3 axis, sine sweep, 10-55 Hz, 1 oct/min IEC 60068-2-27 25 g, 3 axis, half sine, 11 ms
Case Ingress Protection		IP68 (acc. IEC 60529)
Housing Material		Plastic (UL 94 V-0 rated)
Potting Material		Epoxy (UL 94 V-0 rated)
Pin Material		Brass (Alloy 360/385)
Pin Surface Plating		Tin (200 - 300 µm), matte
Housing Type		Plastic Case
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Weight	- single output	5.1 VDC model: <b>112 g</b> 12 VDC model: <b>114 g</b> 24 VDC model: <b>114 g</b>
Power Back Immunity		5.1 VDC model: <b>6.4 V max.</b> 12 VDC model: <b>15 V max.</b> 24 VDC model: <b>30 V max.</b>
Environmental Compliance	- REACH Declaration  - RoHS 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 <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 6a, 6c, 7a, 7c-I, 7c-II (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.)

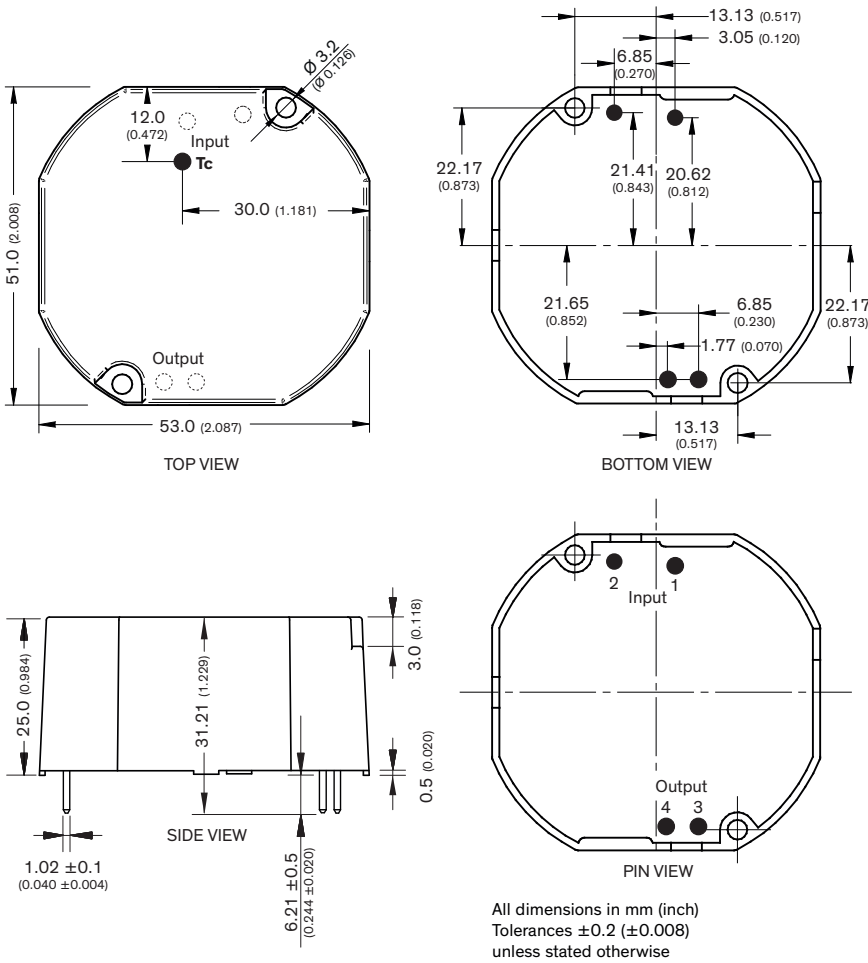
## Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tmw24p](http://www.tracopower.com/overview/tmw24p)

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### Outline Dimensions



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