

- Fully encapsulated, dust resistant, and waterproof (IP68 certified)
- Operating temperature range -20° to +80°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 µA 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°C to +80°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: 85 - 264 VAC (Full Range) Rated Range: 100 - 240 VAC (Full Range)
Input Frequency		47 - 63 Hz
Power Consumption	- At no load	200 mW max. (Ready to meet ErP directive)
Input Inrush Current	- At 230 VAC - At 115 VAC	50 A max. 25 A max.
Power Factor	- At 230 VAC - At 115 VAC	0.45 min. 0.55 min.
Input Protection		T 2 A (Internal Fuse)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

### Output Specifications

Voltage Set Accuracy		±2% max.
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (10 - 90%)	0.5% max. 1% max. (12 Vout and 24 Vout model) 2% max. (5 Vout model)
Ripple and Noise (20 MHz Bandwidth)		195 mVp-p max.
Capacitive Load		10'000 µF max.
Minimum Load		Not required
Temperature Coefficient		±2 %/K max.
Hold-up Time	- At 230 VAC - At 115 VAC	40 ms min. 7 ms min.
Start-up Time	- At 230 VAC - At 115 VAC	500 ms max. 500 ms max.
Start-up Overshoot Voltage		5% max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		105 - 150% of Iout max.
Overvoltage Protection		130% typ. of Vout nom. 120 - 160% of Vout nom.
Transient Response	- Response Deviation - Response Time	5% max. (10% to 90% Load Step) 2'000 µs max. (10% to 90% Load Step)

### Safety Specifications

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

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 V <sub>rms</sub> , 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

<b>Relative Humidity</b>		100% max.
<b>Temperature Ranges</b>		
- Operating Temperature		-20°C to +80°C
- Storage Temperature		-40°C to +90°C
<b>Power Derating</b>		
- High Temperature		2 %/K above 50°C
- Low Input Voltage		2 %/V below 100 VAC
<b>Over Temperature Protection Switch Off</b>		
- Protection Mode		85°C min. / 90°C typ. / 95°C max. (Automatic recovery)
- Measurement Point		Case
<b>Cooling System</b>		Natural convection (20 LFM)
<b>Altitude During Operation</b>		5'000 m max. (4'000 m max. for IEC 61558-2-8)
<b>Switching Frequency</b>		25 - 140 kHz (PWM QR)
<b>Insulation System</b>		Reinforced Insulation
<b>Isolation Test Voltage</b>		
- Input to Output, 60 s		4'000 VAC
- Input to Output, 1 s		4'000 VAC
<b>Creepage</b>		8 mm min.
<b>Clearance</b>		8 mm min.
<b>Isolation Resistance</b>		100 MΩ min.
<b>Isolation Capacitance</b>		1'100 pF typ. / 1'300 pF max.
<b>Leakage Current (at 240 VAC / 60 Hz)</b>		100 μA max.
<b>Reliability</b>		
- Calculated MTBF		3'400'000 h (see application note) (IEC 61709)
<b>Washing Process</b>		Not allowed

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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-1 rated)
Potting Material		Polyurethane (UL 94 V-2 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.)

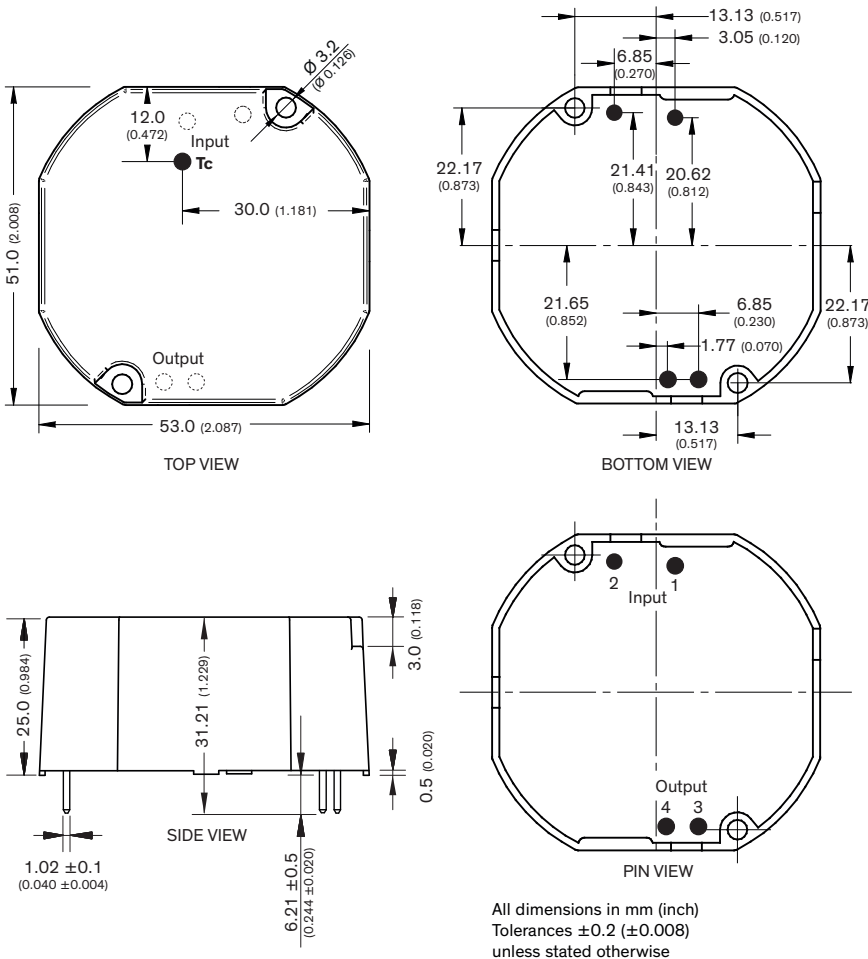
## Supporting Documents

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