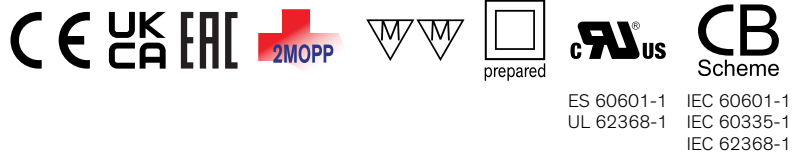


- Fully encapsulated, dust resistant, and waterproof (IP68 certified)
- Operating temperature range  $-20^{\circ}$  to  $+80^{\circ}\text{C}$
- Mountable in wall outlet boxes
- Safety approval IEC/EN 62368-1 and IEC/EN 60335-1
- 2xMOPP certified according to IEC/EN 60601-1 3rd edition
- Leakage current  $< 100 \mu\text{A}$  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 36P is a series of fully encapsulated AC/DC power supplies designed for medical, household, and industrial applications. All models come in 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 36P 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 36-112P | 36 W              | 12 VDC              | 3'000 mA            | 87 %            |
| TMW 36-124P |                   | 24 VDC              | 1'500 mA            | 88 %            |

### Input Specifications

|                        |  |   |
|------------------------|--|---|
| Input Voltage          |  | Operational Range: <b>85 - 264 VAC</b> (Full Range)<br>Rated Range: <b>100 - 240 VAC</b> (Full Range) |
| Input Frequency        |  | Operational Range: <b>47 - 63 Hz</b><br>Certified: <b>50/60 Hz</b>                                    |
| Power Consumption      | - No load & Vin = 230 VAC<br>- No load & Vin = 115 VAC | <b>200 mW max.</b> (Ready to meet ErP directive)<br><b>200 mW max.</b>                                |
| Input Inrush Current   | - At 230 VAC<br>- At 115 VAC                           | <b>50 A max.</b><br><b>25 A max.</b>  |
| Power Factor           | - At 230 VAC<br>- At 115 VAC                           | <b>0.45 min.</b><br><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)<br>- Load Variation (10 - 90%) | <b>0.5% max.</b><br><b>1% max.</b>  |
| Ripple and Noise<br>(20 MHz Bandwidth) |  | 12 VDC model: <b>195 mVp-p max.</b> (w/ 0.1 µF / 50 V)<br>24 VDC model: <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<br>- At 115 VAC                                   | <b>40 ms min.</b><br><b>7 ms min.</b>   |
| Start-up Time                          | - At 230 VAC<br>- At 115 VAC                                   | <b>500 ms max.</b><br><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><br><b>120 - 160% of Vout nom.</b>                               |
| Transient Response                     | - Response Deviation<br>- Response Time                        | <b>5% max.</b> (10% to 90% Load Step)<br><b>2'000 µs max.</b> (10% to 90% Load Step)          |

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

## Safety Specifications

|                       |                             |  |
|-----------------------|-----------------------------|--|
| Standards             | - IT / Multimedia Equipment | EN 62368-1<br>IEC 62368-1<br>UL 62368-1  |
|                       | - Household                 | EN 60335-1<br>IEC 60335-1  |
|                       | - Medical Equipment         | EN 60601-1<br>IEC 60601-1<br>ANSI/AAMI ES 60601-1<br>CSA-C22.2, No 60601-1<br>2 x MOPP (Means Of Patient Protection) |
|                       | - LED Modules Controlgear   | EN 61347-2-13  |
|                       | - Luminaires for Furniture  | VDE 0710-14  |
|                       | - Power Transformers        | EN 61558-1<br>IEC 61558-1<br>EN 61558-2-8<br>IEC 61558-2-8<br>EN 61558-2-16<br>IEC 61558-2-16                        |
|                       | - Certification Documents   | <a href="http://www.tracopower.com/overview/tmw36p">www.tracopower.com/overview/tmw36p</a>                           |
| Protection Class      |                             | Class I & II (Prepared): Reinforced Insulation   |
| Pollution Degree      |                             | PD 2   |
| Over Voltage Category |                             | OVC II   |

## EMC Specifications

|                     |                                |   |
|---------------------|--------------------------------|---|
| EMI (Emissions)     | - Conducted Emissions          | EN 61000-6-3 (Generic Residential)<br>EN 61204-3 (Low Voltage Power Supplies)<br>EN 55011 class B (internal filter)<br>EN 55032 class B (internal filter)   |
|                     | - Radiated Emissions           | EN 55011 class B (internal filter)<br>EN 55032 class B (internal filter)  |
|                     | - Harmonic Current Emissions   | EN 61000-3-2, class A   |
| EMS (Immunity)      | - RF Electromagnetic Field     | EN 61000-6-2 (Generic Industrial)<br>EN 60601-1-2 edition 4.1 (Medical Devices)   |
|                     | - EFT (Burst) / Surge          | EN 61000-4-3, 10 V/m, perf. criteria A<br>EN 61000-4-4, $\pm 2$ kV, perf. criteria A<br>L to L: EN 61000-4-5, $\pm 1$ 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<br>20%, 250 periods, perf. criteria A<br>30%, 25 periods, perf. criteria A<br>60%, 10 periods, perf. criteria A<br>>95%, 5 periods, perf. criteria B<br>115 VAC / 60 Hz: EN 61000-4-11<br>20%, 250 periods, perf. criteria A<br>30%, 25 periods, perf. criteria B<br>60%, 10 periods, perf. criteria B<br>>95%, 5 periods, perf. criteria B<br>>95%, 250 periods, perf. criteria B |
| EMC / Environmental | - Certification Documents      | <a href="http://www.tracopower.com/overview/tmw36p">www.tracopower.com/overview/tmw36p</a>  |

## General Specifications

|                    |                         |                |
|--------------------|-------------------------|----------------|
| Relative Humidity  |                         | 100% max.      |
| Temperature Ranges | - Operating Temperature | -20°C to +80°C |
|                    | - Storage Temperature   | -40°C to +90°C |

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

|  |                                 |   |
|--|---------------------------------|---|
| Power Derating                         | - High Temperature              | 2 %/K above 50°C (at $V_{in} \geq 187$ VAC)<br>2 %/K above 40°C (at $V_{in} < 187$ VAC)   |
|  | - 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)   |
| Regulator Topology                     |                                 | Flyback Converter   |
| 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.   |
| Distance Through Isolation             |                                 | 2 mm  |
| Reliability                            | - Calculated MTBF               | 3'400'000 h (see application note) (IEC 61709)  |
| Washing Process                        |                                 | Not allowed   |
| Environment                            | - Vibration                     | IEC 60068-2-6<br>3 g, 3 axis, sine sweep, 10-55 Hz, 1 oct/min<br>IEC 60068-2-27   |
|  | - Mechanical Shock              | 25 g, 3 axis, half sine, 11 ms  |
| Case Ingress Protection                |                                 | IP 68 (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)   |
| Soldering Profile                      |                                 | Lead-Free Wave Soldering<br>260°C / 4 s max.  |
| Weight                                 | - single output                 | 12 VDC model: 143 g<br>24 VDC model: 145 g  |
| Power Back Immunity                    |                                 | 12 VDC model: 15 V max.<br>24 VDC model: 30 V max.  |
| Environmental Compliance               | - REACH Declaration             | <a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a><br>REACH SVHC list compliant<br>REACH Annex XVII compliant   |
|  | - RoHS Declaration              | <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a><br>Exemptions: 7a, 7c-I<br>(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule)) |
|  | - SCIP Reference Number         | e425dd0d-e647-4e75-91c8-1005009631d0  |

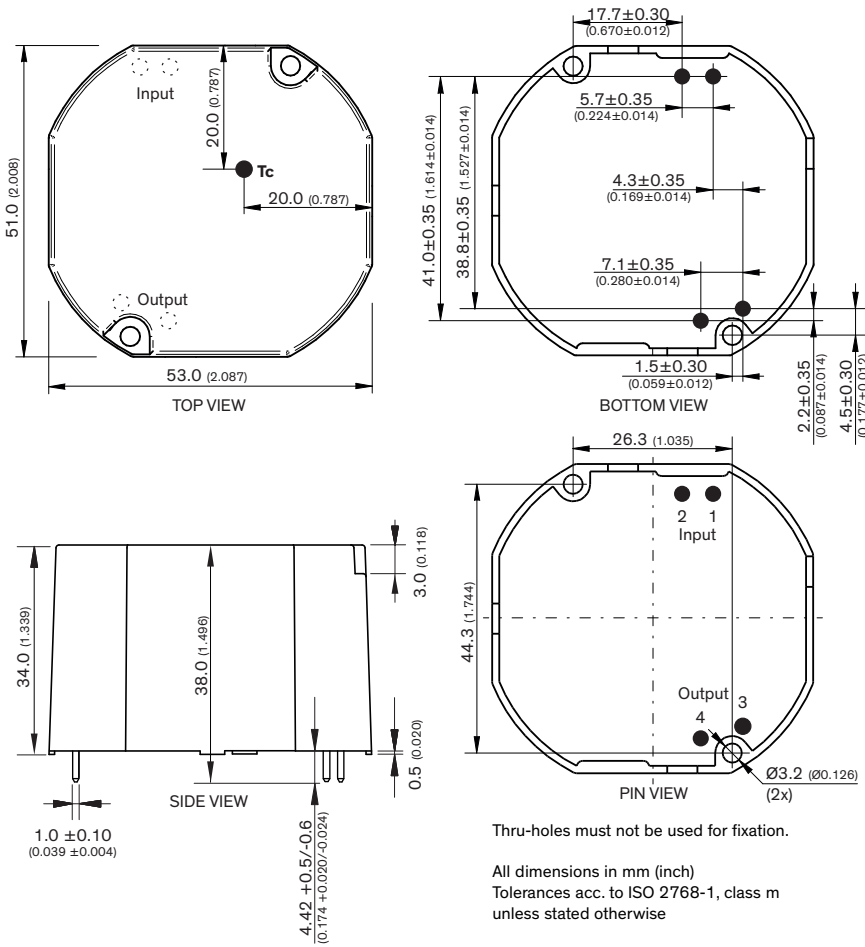
## Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tmw36p](http://www.tracopower.com/overview/tmw36p)

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

### Outline Dimensions



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