

### Features

- ◆ Fully encapsulated low profile plastic casing in PCB- or chassis mount version
- ◆ 2 x MOPP Medical safety according to AAMI/ANSI ES 60601-1:2005(R) and IEC/EN 60601-1 3rd edition
- ◆ IT and industrial safety according to IEC/EN/UL 60950-1 and UL 508
- ◆ Ready to meet ErP directive <0.3W no load power consumption
- ◆ -40°C start-up temperature
- ◆ Safety class II prepared
- ◆ Protection against over-temperature overload and short circuit
- ◆ 3-year product warranty



Also see:

**TMM 40 Series, 40 Watt**

[www.tracopower.com/products/tmm40.pdf](http://www.tracopower.com/products/tmm40.pdf)

**TMM 60 Series, 60 Watt**

[www.tracopower.com/products/tmm60.pdf](http://www.tracopower.com/products/tmm60.pdf)

The TMM 24 Series of fully encapsulated 24 Watt AC/DC power supply modules feature a reinforced/double I/O isolation system according to latest medical safety standards 60601-3 3rd edition for 2 x MOPP (Means Of Patient Protection). The high efficiency and the use of highest grade components make the units suitable for an operating temperature range of -40°C to +65°C while it goes up to 75°C with 50% load derating. EMI/EMC characteristics and the safety approval package qualify these modules not only for medical devices but also for demanding applications in transportation systems and for equipment in industrial an commercial environment.

### 24 Watt Models

| Order code |               | Output power max. | Output 1          | Output 2          | Efficiency |
|------------|---------------|-------------------|-------------------|-------------------|------------|
| PCB mount  | Chassis mount |                   |                   |                   |            |
| TMM 24105  | TMM 24105C    | 15 W              | 5.0 VDC / 3000 mA |                   | 77 %       |
| TMM 24112  | TMM 24112C    | 24 W              | 12 VDC / 2000 mA  |                   | 83 %       |
| TMM 24115  | TMM 24115C    |                   | 15 VDC / 1600 mA  |                   | 82 %       |
| TMM 24124  | TMM 24124C    |                   | 24 VDC / 1000 mA  |                   | 85 %       |
| TMM 24212  | TMM 24212C    |                   | +12 VDC / 1000 mA | -12 VDC / 1000 mA | 84 %       |
| TMM 24215  | TMM 24215C    |                   | +15 VDC / 800 mA  | -15 VDC / 800 mA  | 84 %       |

### Input Specifications

|  |   |  |
|--|---|--|
| Input voltage  | <ul style="list-style-type: none"> <li>- nominal</li> <li>- AC range (universal input)</li> <li>- DC range</li> </ul> | 100 – 240 VAC<br>85 – 264 VAC<br>120 – 370 VDC |
| Input frequency  |   | 47 – 440 Hz                                    |
| Input current at full load (115 VAC / 230 VAC nominal input) | 5.0 VDC model:<br>other models:   | 285 mA / 170 mA typ.<br>425 mA / 255 mA typ    |
| Leakage current  |   | 80 $\mu$ A typ.                                |
| No-load power consumption                                    |   | <0.3 W   |
| Internal fuse  |   | T2A 250VAC (both life and neutral)             |

### Output Specifications

|  |   |  |
|--|---|--|
| Voltage set accuracy                                     |   | $\pm$ 2% typ.  |
| Minimum load   |   | no minimum load required   |
| Regulation   | <ul style="list-style-type: none"> <li>- Input variation</li> <li>- Load variation (0-100%)</li> </ul>          | 0.5% typ.<br>single output models: 0.5% typ.<br>dual output models: 2.5% typ.  |
| Temperature coefficient                                  |   | 0.02 %/K   |
| Ripple and noise (20 MHz bandwidth)                      | 5.0 VDC model:<br>other models:   | 1.8% of Vout [Vp-p] max.<br>1.3% of Vout [Vp-p] max.   |
| Current limitation                                       |   | above 105 % of rated output current.<br>hiccup, auto recovery  |
| Overvoltage protection by Zener diode (main output only) |   | 120 % of Vout typ.   |
| Short circuit protection                                 |   | continuous, automatic recovery   |
| Max. capacitive load                                     | 5.0 VDC model:<br>12 VDC model:<br>15 VDC model:<br>24 VDC model:<br>$\pm$ 12 VDC model:<br>$\pm$ 15 VDC model: | 2200 $\mu$ F<br>1000 $\mu$ F<br>680 $\mu$ F<br>480 $\mu$ F<br>470 $\mu$ F (each output)<br>330 $\mu$ F (each output) |

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

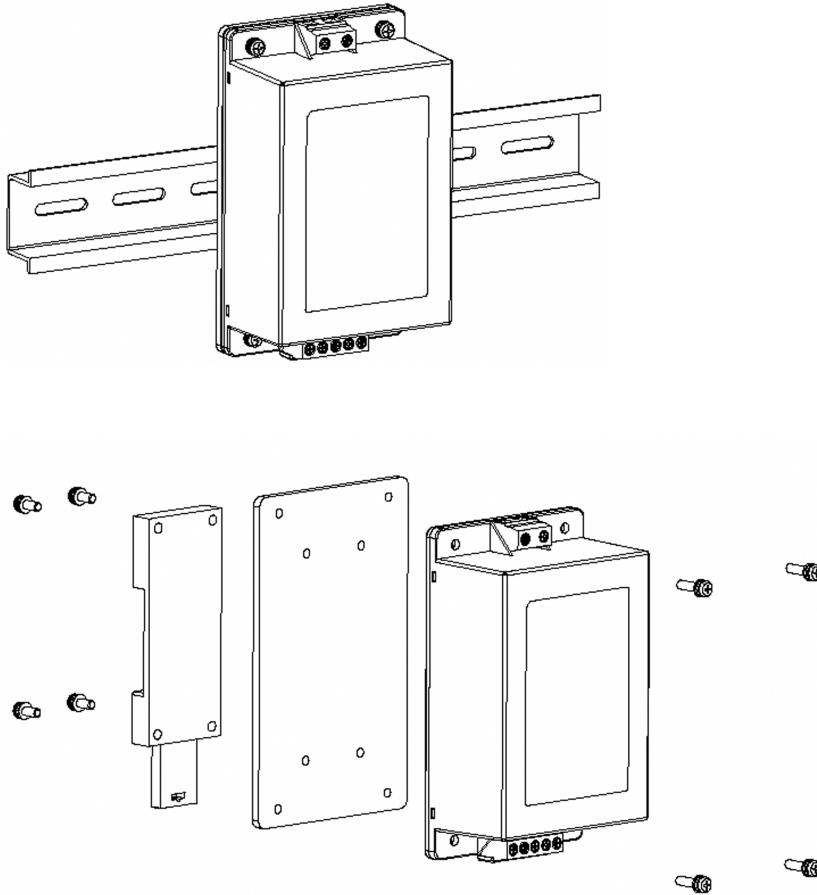
### General Specifications

|   |   |   |
|---|---|---|
| Temperature ranges  | <ul style="list-style-type: none"> <li>- Operating (natural convection cooling 20 LFM)</li> <li>- Power derating above +65°C</li> <li>- Storage (non operating)</li> </ul>  | -40°C to +80°C<br>5.0 %/K<br>-40°C to +95°C   |
| Over temperature protection   | shutdown:<br>automatic recovery:  | above 90°C (142°C internal IC temperature)<br>at approx 67°C  |
| Humidity (non condensing)   |   | 95 % rel max.   |
| Altitude during operation   |   | 5000 m  |
| Switching frequency (pulse width modulation PWM)                      |   | 132 kHz typ.  |
| Hold-up time  | 115 VAC:<br>230 VAC:  | 20 ms typ.<br>80 ms typ.  |
| Isolation voltage   | - Input/Output  | 4'000 VAC   |
| Isolation resistance  | - at 500 VDC  | 1'000 MOhm  |
| Reliability /calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) |   | >400'000 h  |
| EMI / RFI conducted and radiated                                      |   | EN 55022, class B, FCC part 15, level B<br>EN 55011 class B   |
| Electromagnets compatibility (EMC), immunity                          | <ul style="list-style-type: none"> <li>- Electrostatic discharge ESD</li> <li>- RF field immunity</li> <li>- Electrical fast transients</li> <li>- Surge</li> <li>- Conducted RF</li> <li>- Magnetic field immunity</li> <li>- Voltage dip and interruptions (115 VAC / 60 Hz)</li> </ul> | IEC / EN 61000-4-2, 8kV/4kV perf. criteria A<br>IEC / EN 61000-4-3, 10V/m perf. criteria A<br>IEC / EN 61000-4-4, ±2kV perf. criteria A<br>IEC / EN 61000-4-5, ±1kV perf. criteria A<br>IEC / EN 61000-4-6, 10 Vr.m.s perf. criteria A<br>IEC / EN 61000-4-8, 30 A/m perf. criteria A<br>IEC / EN 61000-4-11 30%,10ms perf. criteria A<br>IEC / EN 61000-4-11 >95%, 5s perf. criteria B |
| Protection class II   |   | according IEC/EN 60536  |
| Safety standards  | <ul style="list-style-type: none"> <li>- Certification documents</li> </ul>   | UL 60950-1, IEC/EN 60950-1,<br>IEC 60601-1 3rd edition, 2 x MOPP<br>ANSI/AAMI ES 60601-1:2005(R)2012<br>UL 508 for chassis mount version<br><a href="http://www.tracopower.com/overview/tmm24">www.tracopower.com/overview/tmm24</a>  |
| Casing material   |   | plastic resin (UL 94V-0 rated)  |
| Environmental compliance  | <ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>   | <a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a><br>RoHS directive 2011/65/EU   |

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

**DIN-Rail Mounting Kit**

Adapter for mounting on DIN-rails as per EN 50022-35 (snap-on mounting)

**DIN-Rail Mounting Kit**

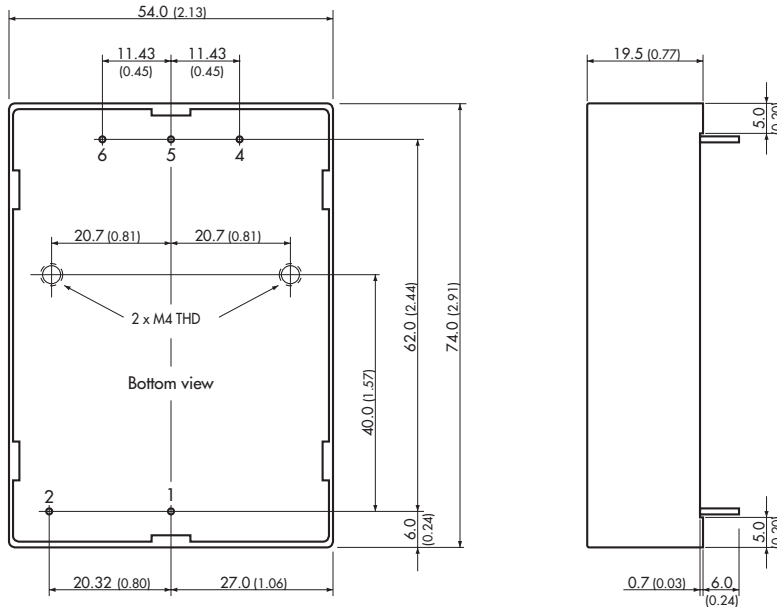
| Order code | For models |
|------------|------------|
| TMP-MK1    | TMM 24xxxC |

Kit contains interface plate, DIN-rail clip and necessary screws.

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

**Outline Dimensions**

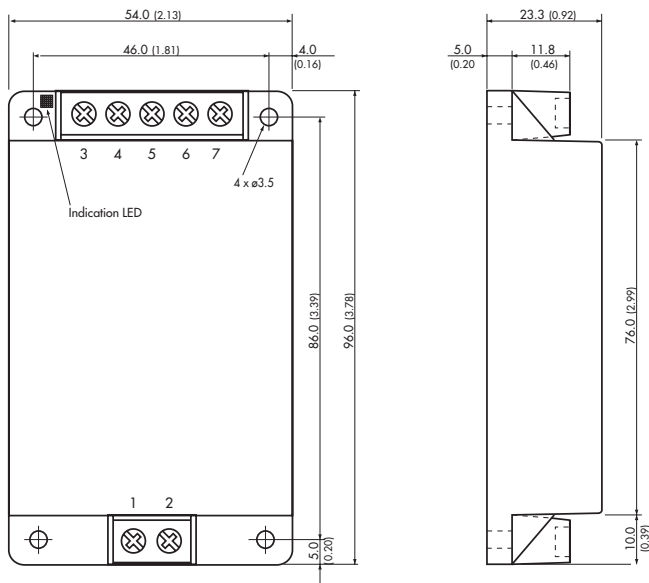
**TMM 24:**  
for PCB mount:



**Weight:** 137 g (4.83oz)

Pin diameter  $\varnothing$  1.0 mm (0.039)

**TMM 24C:**  
for chassis mount:



**Weight:** 147 g (5.19oz)

**Pinout / Connection**

| Pin/con. | Single      | Dual        |
|----------|-------------|-------------|
| 1        | AC (N)      | AC (N)      |
| 2        | AC (L)      | AC(L)       |
| 3        | No Pin / NC | No Pin / NC |
| 4        | -Vout       | -Vout       |
| 5        | No Pin / NC | Common      |
| 6        | +Vout       | +Vout       |
| 7        | No Pin / NC | No Pin / NC |

NC = not to connect

Dimensions in [mm], ( ) = Inches  
Tolerances = 0.5mm (0.02)  
Pin diameter  $\varnothing$   $\pm$ 0.1 mm (0.004)

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)