



### 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/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 24 Series, 24 Watt**

[www.tracopower.com/products/tmm24.pdf](http://www.tracopower.com/products/tmm24.pdf)

**TMM 40 Series, 40 Watt**

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

The TMM 60 Series of fully encapsulated 60 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 +60°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.

| Order code |               | Output power max. | Output             | Efficiency |
|------------|---------------|-------------------|--------------------|------------|
| PCB mount  | Chassis mount |                   |                    |            |
| TMM 60105  | TMM 60105C    | 60 W              | 5.1 VDC / 10000 mA | 86 %       |
| TMM 60112  | TMM 60112C    |                   | 12 VDC / 5000 mA   | 87 %       |
| TMM 60115  | TMM 60115C    |                   | 15 VDC / 4000 mA   | 87 %       |
| TMM 60124  | TMM 60124C    |                   | 24 VDC / 2500 mA   | 87 %       |
| TMM 60148  | TMM 60148C    |                   | 48 VDC / 1250 mA   | 87 %       |

### Input Specifications

|  |                                       |  |
|--|---------------------------------------|--|
| Input voltage ranges   | – nominal<br>– AC input<br>– DC Input | 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:       | 860 mA / 515 mA typ.<br>1000 mA / 600 mA typ   |
| Leakage current  |                                       | 80 µA typ.                                     |
| No-Load power consumption                                    |                                       | <0.3 W   |
| External input fuse required (recommended value)             |                                       | 3 A slow blow type or characteristic C         |

### Output Specifications

|   |  |   |
|---|--|---|
| Voltage set accuracy                                      |  | ±1% typ.  |
| Minimum load  |  | no minimum load required                                      |
| Regulation  | – Input variation<br>– Load variation (0-100%)                                     | 0.2% typ.<br>: 0.5% typ.                                      |
| Temperature coefficient                                   |  | 0.02 %/K  |
| Ripple and noise (20 MHz bandwidth)                       | 5.0 VDC model:<br>other models:  | <3% of Vout [Vp-p] max.<br><1.5% of Vout [Vp-p] max.          |
| Current limitation  |  | above 105 % of rated output current.<br>hiccup, auto recovery |
| Overvoltage protection by Zehner diode (main output only) |  | 120 % of Vout typ.  |
| Short circuit protection                                  |  | continuous  |
| Max. capacitive load                                      | 5.0 VDC model:<br>12 VDC model:<br>15 VDC model:<br>24 VDC model:<br>48 VDC model: | 8000 µF<br>3900 µF<br>3300 µF<br>1500 µF<br>680 µF            |

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

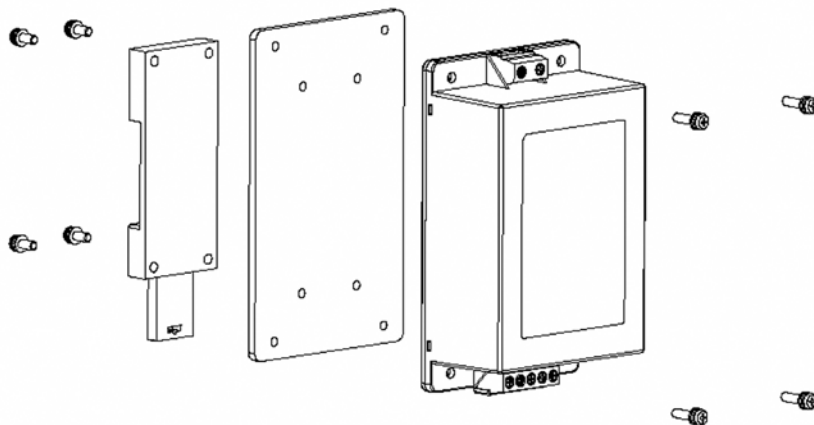
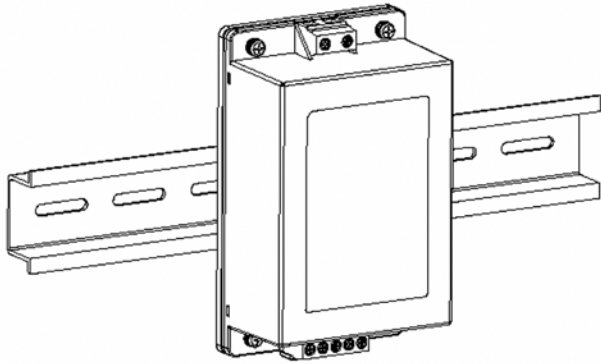
## General Specifications

|  |   |  |
|--|---|--|
| Temperature ranges   | <ul style="list-style-type: none"> <li>- Operating (natural convection cooling 20 LFM)</li> <li>- Power derating above +60°C</li> <li>- Storage (non operating)</li> </ul>  | -40°C to +75°C<br>3.75 %/K<br>-40°C to +95°C   |
| Over temperature protection  |   | shutdown: at 90°C<br>automatic recovery: at approx 67°C  |
| Humidity (non condensing)  |   | 95 % rel max.  |
| Altitude during operation  |   | 5000 m   |
| Switching frequency (pulse width modulation PWM)                                   |   | 100 kHz typ.   |
| Hold-up time   |   | 115 VAC: 20 ms typ.<br>230 VAC: 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)              |   | >125'000 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/burst immunity</li> <li>- Surge</li> <li>- Conducted RF</li> <li>- Magnetic field immunity</li> </ul>                           | IEC / EN 61000-4-2, 8kV/4kV perf. criteria B<br>IEC / EN 61000-4-3, 10V/m perf. criteria A<br>IEC / EN 61000-4-4, ± 2kV perf. criteria B<br>IEC / EN 61000-4-5, ± 1kV/± 2kV perf. criteria B<br>IEC / EN 61000-4-6, 10 Vr.m.s perf. criteria B<br>IEC / EN 61000-4-8, 30A/m perf. criteria A   |
| Voltage dip and interruptions according to EN 61000-4-11 reference: 115 VAC / 60Hz |   | 30%, 10ms perf. criteria B<br>60%, 100ms perf. criteria C<br>95%, 5000ms perf. criteria C  |
| Protection class II  |   | according IEC/EN 60536   |
| Safety standards   |   | UL 60950-1, IEC/EN 60950-1,<br>IEC/EN 60601-1 3rd edition, 2 x MOPP<br>ANSI/AAMI ES60601-1:2005(R)2012<br>UL 508 for chassis mount version   |
| Safety approvals and certifications  | <ul style="list-style-type: none"> <li>- UL certificate (ES60601-1:2005(R)2012)</li> <li>- UL certificate (UL 60950-1)</li> <li>- UL approval for UL 508</li> <li>- CB certificate (60601-1 3rd edition 2 x MOPP)</li> <li>- CB certificate (IEC/EN 60950-1)</li> </ul> | <a href="http://www.tracopower.com/products/tmm60-ES60601-1_CoC.pdf">www.tracopower.com/products/tmm60-ES60601-1_CoC.pdf</a><br><a href="http://www.tracopower.com/products/tmm60-UL60950-1_CoC.pdf">www.tracopower.com/products/tmm60-UL60950-1_CoC.pdf</a><br><a href="http://www.tracopower.com/products/tmm60-UL508_CoC.pdf">www.tracopower.com/products/tmm60-UL508_CoC.pdf</a><br><a href="http://www.tracopower.com/products/tmm60-IEC60601-1_CB.pdf">www.tracopower.com/products/tmm60-IEC60601-1_CB.pdf</a><br><a href="http://www.tracopower.com/products/tmm60-IEC60950-1_CB.pdf">www.tracopower.com/products/tmm60-IEC60950-1_CB.pdf</a> |
| Casing material  |   | plastic resin + fiberglass (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**

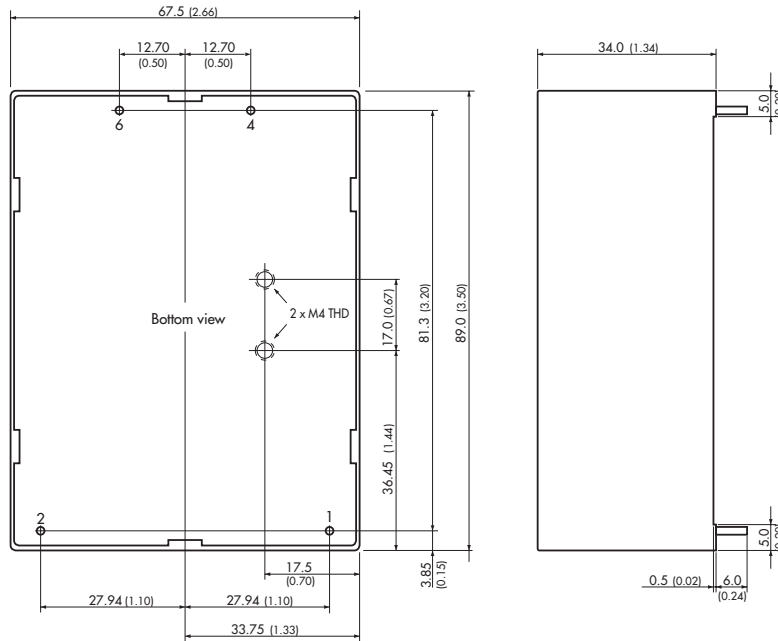
| Order code | For models |
|------------|------------|
| TMP-MK2    | TMM 60xxxC |

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

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**Outline Dimensions**

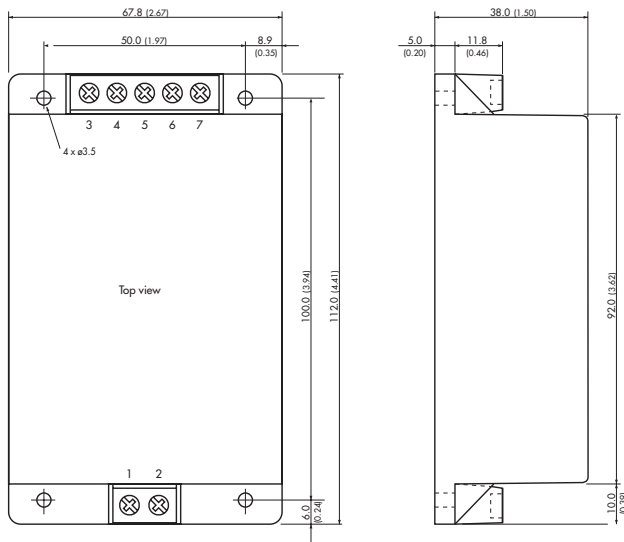
**TMM 60:**  
for PCB mount:



Pin diameter  $\varnothing$  1.0 mm (0.039)

**Weight: 360 g (12.70oz)**

**TMM 60C:**  
for chassis mount:



**Weight: 380 g (13.4oz)**

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

NC = not to connect

Dimensions in [mm], ( ) = Inches  
Tolerances = 0.5mm (0.02)