

### Features

- ◆ Encapsulated power Supplies
- ◆ PCB mount or chassis mount with screw terminals
- ◆ Single, dual and triple output models
- ◆ Universal input 85–264 VAC, 47–440 Hz
- ◆ EMI meets EN 55022, class B and FCC, level B
- ◆ Low ripple and noise
- ◆ Short circuit and overload protection
- ◆ 3-year product warranty



The TML series are ultra compact AC/DC power supplies in a fully encapsulated plastic case. They feature versions with screw terminals for easy installation or with solder pins for direct PCB mounting. International safety approvals qualify this product for worldwide markets. The TML series AC/DC modules offer an interesting solution for many space critical applications in commercial and industrial electronic equipment.

### Models

| Order Code | Output Power max. | Output 1      | Output 2 | Output 3       |
|------------|-------------------|---------------|----------|----------------|
| TML 05105  | 5 Watt            | 5 VDC/1000 mA |          |                |
| TML 05112  |                   | 12 VDC/416 mA |          |                |
| TML 05115  |                   | 15 VDC/333 mA |          |                |
| TML 05124  |                   | 24 VDC/200 mA |          |                |
| TML 05205  |                   | 5 VDC/500 mA  |          | -5 VDC/500 mA  |
| TML 05212  |                   | 12 VDC/200 mA |          | -12 VDC/200 mA |
| TML 05215  |                   | 15 VDC/160 mA |          | -15 VDC/160 mA |
| TML 10105  | 10 Watt           | 5 VDC/2000 mA |          |                |
| TML 10112  |                   | 12 VDC/833 mA |          |                |
| TML 10115  |                   | 15 VDC/666 mA |          |                |
| TML 10124  |                   | 24 VDC/416 mA |          |                |
| TML 10205  |                   | 5 VDC/800 mA  |          | -5 VDC/800 mA  |
| TML 10212  |                   | 12 VDC/380 mA |          | -12 VDC/380 mA |
| TML 10215  |                   | 15 VDC/300 mA |          | -15 VDC/300 mA |

| Models       |                  |                |                |                 |                |
|--------------|------------------|----------------|----------------|-----------------|----------------|
| Order Code   |                  | Output Power   | Output 1       | Output 2        | Output 3       |
| PCB-mounting | Chassis mounting | max.           |                |                 |                |
| TML 15105    | TML 15105C       | 15 Watt        | 5 VDC/3000 mA  |                 |                |
| TML 15112    | TML 15112C       |                | 12 VDC/1250 mA |                 |                |
| TML 15115    | TML 15115C       |                | 15 VDC/1000 mA |                 |                |
| TML 15124    | TML 15124C       |                | 24 VDC/625 mA  |                 |                |
| TML 15205    | TML 15205C       |                | 5 VDC/1500 mA  | -5 VDC/1500 mA  |                |
| TML 15212    | TML 15212C       |                | 12 VDC/650 mA  | -12 VDC/650 mA  |                |
| TML 15215    | TML 15215C       |                | 15 VDC/500 mA  | -15 VDC/500 mA  |                |
| TML 15512    | TML 15512C       |                | 5 VDC/2000 mA  | 12 VDC/200 mA   | -12 VDC/200 mA |
| TML 15515    | TML 15515C       |                | 5 VDC/2000 mA  | 15 VDC/150 mA   | -15 VDC/150 mA |
| TML 30103    | TML 30103C       |                | 30 Watt        | 3.3 VDC/6000 mA |                |
| TML 30105    | TML 30105C       | 5 VDC/6000 mA  |                |                 |                |
| TML 30112    | TML 30112C       | 12 VDC/2500 mA |                |                 |                |
| TML 30115    | TML 30115C       | 15 VDC/2000 mA |                |                 |                |
| TML 30124    | TML 30124C       | 24 VDC/1250 mA |                |                 |                |
| TML 30205    | TML 30205C       | 5 VDC/3000 mA  |                | -5 VDC/3000 mA  |                |
| TML 30212    | TML 30212C       | 12 VDC/1300 mA |                | -12 VDC/1300 mA |                |
| TML 30215    | TML 30215C       | 15 VDC/1000 mA |                | -15 VDC/1000 mA |                |
| TML 30252    | TML 30252C       | *5 VDC/3000 mA |                | *12 VDC/1250 mA |                |
| TML 30512    | TML 30512C       | *5 VDC/3000 mA |                | 12 VDC/630 mA   | -12 VDC/630 mA |
| TML 30515    | TML 30515C       | *5 VDC/3000 mA |                | 15 VDC/500 mA   | -15 VDC/500 mA |

\* Output floating

## Input Specifications

|                          |                          |  |
|--------------------------|--------------------------|--|
| Input voltage ranges     | - AC input<br>- DC Input | 85–264 VAC<br>TML 30 models: 100 – 370 VDC<br>output power derating 1 %/V below 110 VDC<br>other models: 85 – 370 VDC<br>output power derating 0.8 %/V below 110 VDC       |
| Input frequency          |                          | 47–440 Hz  |
| Input current no load    |                          | 115 VAC / 230 VAC<br>TML 5 models: 10 mA / 15 mA typ<br>TML 10 models: 15 mA / 20 mA typ<br>TML 15 models: 18 mA / 25 mA typ.<br>TML 30 models: 30 mA / 55 mA typ.         |
| Input current full load  |                          | 115 VAC / 230 VAC<br>TML 5 models: 160 mA / 80 mA typ.<br>TML 10 models: 200 mA / 120 mA typ<br>TML 15 models: 280 mA / 165 mA typ.<br>TML 30 models: 550 mA / 320 mA typ. |
| External fuse (required) |                          | 1.5 A slow blow type (recommendation)  |

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

### Output Specifications

|                                     |   |   |
|-------------------------------------|---|---|
| Voltage set accuracy                |   | $\pm 2\%$   |
| Regulation                          | <ul style="list-style-type: none"> <li>- Input variation</li> <li>- Load variation (10–100%)</li> </ul>     | <b>0.3 % max.</b><br><br>single output models: <b>1.0 % max.</b><br>dual / triple output models: <b>5 % max.</b>  |
| Minimum load                        |   | single output models: <b>5 %</b><br>dual output models: <b>3 %</b> (each output)<br>triple output 15W models: <b>10 %</b> (main output only)<br>triple output 30W models: <b>20 %</b> (each output) |
| Ripple and noise (20 MHz bandwidth) | <ul style="list-style-type: none"> <li>- 3.3 &amp; 5 VDC output models:</li> <li>- other models:</li> </ul> | <b>&lt;1.5 % of Vout</b><br><b>&lt;1.0 % of Vout</b>  |
| Current limitation                  |   | <b>120– 80 % fold back</b>  |
| Short circuit protection            |   | <b>hiccup mode, indefinite</b> (automatic recovery)   |
| Maximum capacitive load             |   | <b>470–50'000 <math>\mu</math>F</b> depending on model  |

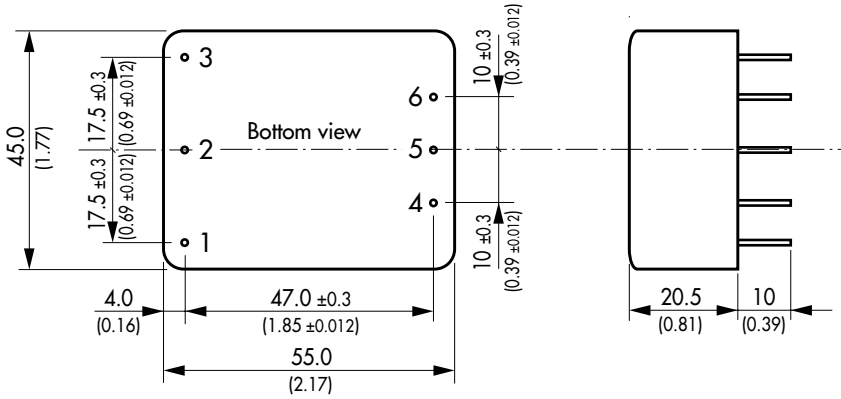
### General Specifications

|  |  |  |
|--|--|--|
| Temperature ranges   | <ul style="list-style-type: none"> <li>- Operating</li> <li>- Power derating above 50 °C</li> <li>- Storage (non operating)</li> </ul>                                       | <b>-25 °C to +60 °C</b><br><b>3.75 %/°C</b><br><b>-40 °C to +85 °C</b>   |
| Temperature coefficient  |  | <b>0.02 %/°C</b>   |
| Efficiency   |  | <b>72–80 %</b> (depending on model)  |
| Humidity (non condensing)  |  | <b>95 % rel max.</b>   |
| Switching frequency  |  | <b>100 kHz typ.</b> (pulse width modulation PWM)   |
| Hold-up time   |  | <b>40 ms min.</b> (Vin 115...230 VAC)  |
| Isolation voltage  | - Input/Output   | <b>3'000 VAC</b>   |
| Reliability /calculated MTBF (MIL-HDBK-217F at +25°C, ground benign) |  | <b>&gt;660'000 h</b>   |
| EMI / RFI conducted  |  | <b>EN 55022, class B, FCC part 15, level B</b>   |
| EMC compliance   | <ul style="list-style-type: none"> <li>- Electrostatic discharge ESD</li> <li>- RF field susceptibility</li> <li>- Electrical fast transients/bursts on mainsline</li> </ul> | <b>IEC / EN 61000-4-2    4 kV / 8 kV</b><br><b>IEC / EN 61000-4-3    3 V/m</b><br><b>IEC / EN 61000-4-4    1 kV</b>                          |
| Safety class II (only 30 watt models)                                |  | <b>to IEC / EN 60536</b>   |
| Safety standards   |  | <b>UL 60950-1, IEC/EN 60950-1</b>  |
| Safety approval  |  | <b>cUL/UL File e188913</b><br><a href="http://www.ul.com">www.ul.com</a> -> <b>certifications</b>  |
| Case material  |  | <b>plastic resin + fiberglass</b><br>(flammability to UL 94-V0)  |
| Environmental compliance   | <ul style="list-style-type: none"> <li>- Reach</li> <li>- RoHS</li> </ul>  | <a href="http://www.tracopower.com/products/tml-reach.pdf">www.tracopower.com/products/tml-reach.pdf</a><br><b>RoHS directive 2011/65/EU</b> |

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

**Outline Dimensions**

**TML 5 Models**



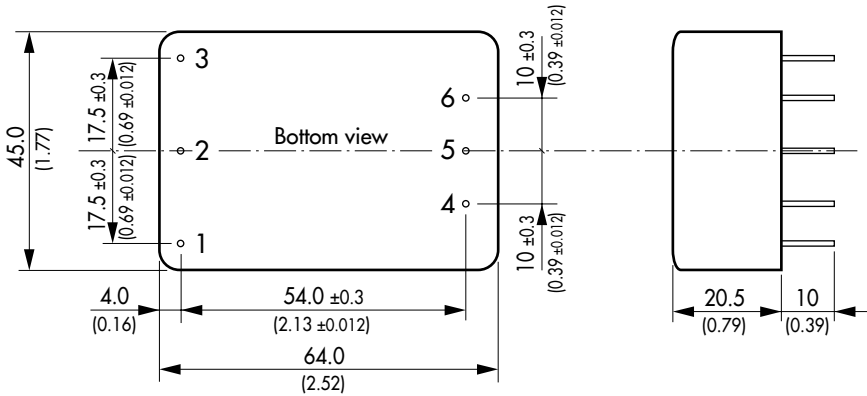
| Pin-Out |        |        |
|---------|--------|--------|
| Pin     | Single | Dual   |
| 1       | FG     | FG     |
| 2       | AC(N)  | AC(N)  |
| 3       | AC(L)  | AC(L)  |
| 4       | -V out | -V out |
| 5       | NC     | Common |
| 6       | +V out | +V out |

NC = Not to connect

Pin diameter  $\varnothing$  1.0 mm

**Weight: 80 g (2.8 oz)**

**TML 10 Models**



| Pin-Out |        |        |
|---------|--------|--------|
| Pin     | Single | Dual   |
| 1       | FG     | FG     |
| 2       | AC(N)  | AC(N)  |
| 3       | AC(L)  | AC(L)  |
| 4       | -V out | -V out |
| 5       | NC     | Common |
| 6       | +V out | +V out |

NC = Not to connect

Pin diameter  $\varnothing$  1.0 mm

**Weight: 95 g (3.4 oz)**

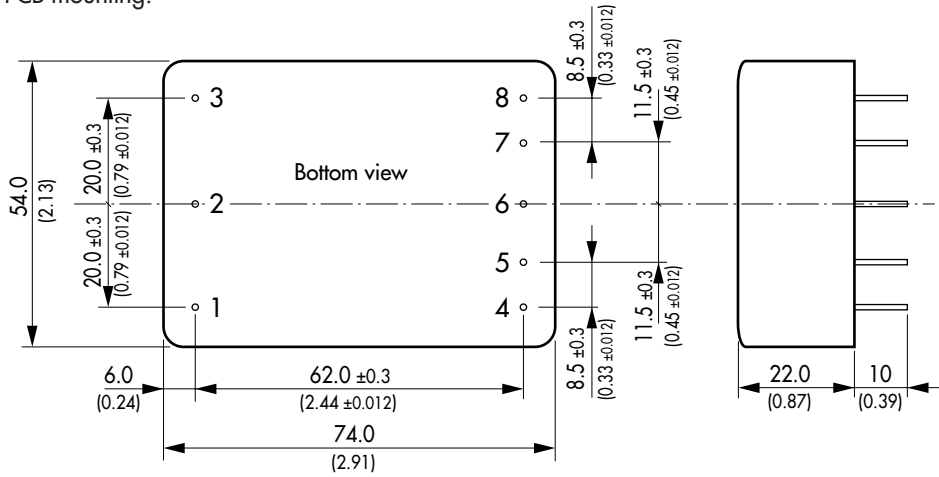
( ) = Inches

Tolerances = 0.5mm (0.02)

**Outline Dimensions**

**TML 15 Models**

PCB mounting:

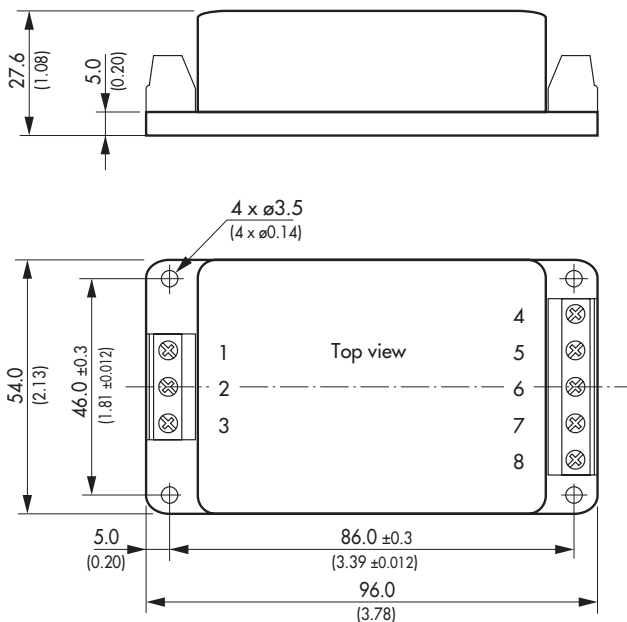


Pin diameter  $\varnothing$  1.0 mm

**Weight: 120 g (4.2 oz)**

**TML 15-C Models**

Chassis mounting:



**Weight: 150 g (5.3 oz)**

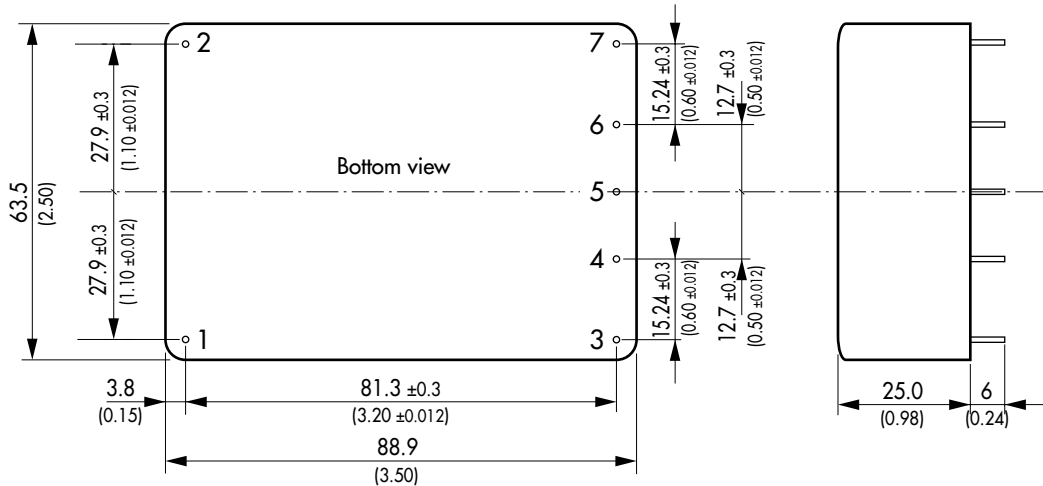
**Pin-Out**

| Pin | Single | Dual   | Triple   |
|-----|--------|--------|----------|
| 1   | FG     | FG     | FG       |
| 2   | AC(N)  | AC(N)  | AC(N)    |
| 3   | AC(L)  | AC(L)  | AC(L)    |
| 4   | No Pin | No Pin | -V out 3 |
| 5   | -V out | -V out | Com. 2/3 |
| 6   | No Pin | Common | +V out 2 |
| 7   | +V out | +V out | -V out 1 |
| 8   | No Pin | No Pin | +V out 1 |

**Outline Dimensions**

**TML 30 Models**

PCB mounting:

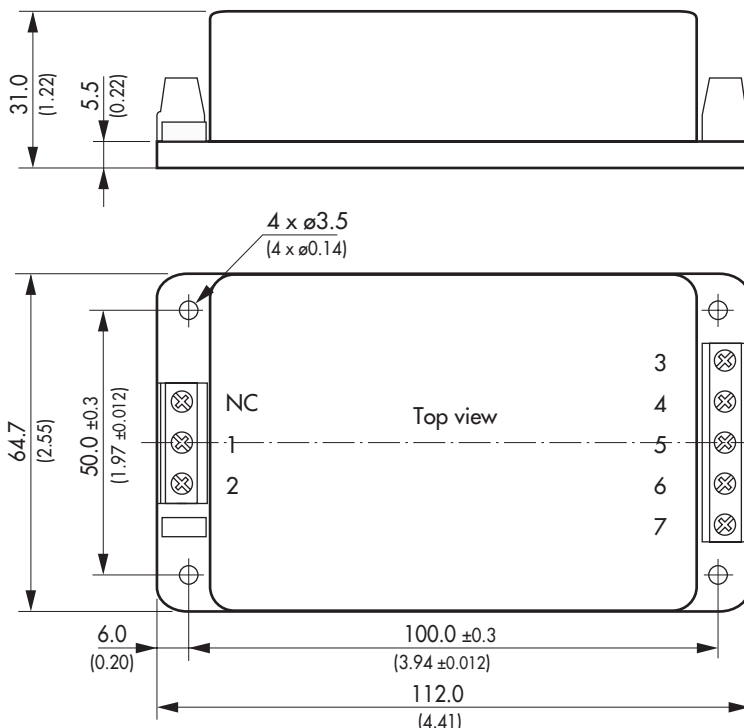


Pin diameter  $\varnothing$  1.0 mm

**Weight : 230 g (8.1 oz)**

**TML 30-C Models**

Chassis mounting:



**Weight : 275 g (9.7 oz)**

| Pin-Out |        |           |            |          |
|---------|--------|-----------|------------|----------|
| Pin     | Single | Dual sym. | Dual asym. | Triple   |
| 1       | AC(N)  | AC(N)     | AC(N)      | AC(N)    |
| 2       | AC(L)  | AC(L)     | AC(L)      | AC(L)    |
| 3       | +V out | +V out    | +V out 2   | +V out 2 |
| 4       | No Pin | No Pin    | +V out 1   | +V out 1 |
| 5       | -V out | Common    | -V out 2   | Com. 2/3 |
| 6       | No Pin | No Pin    | -V out 1   | -V out 1 |
| 7       | NC.    | -V out    | NC.        | -V out 3 |

NC = Not to connect

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

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