# TRACO POWER

## DC/DC Converter

## TMDC 40 Series, 40 Watt

- **Fully encapsulated low profile plastic case**
- **Ultra wide 4:1 input voltage range**
- **Operating temperature range –40°C to +85°C**
- **I/O isolation 2500 VDC**
- **Excellent efficiency up to 92 %**
- **Input filter to meet EN 55022, class A**
- **Optional DIN-Rail mount adapter**
- **No minimum load required**
- **Power good LED indicator and remote on/off function**
- **3-year product warranty**




UL 62368-1 IEC 62368-1

The TMDC 40 Series is a range of encapsulated high performance DC/DC converter modules. With a very high efficiency of up to 92% and the use of highest reliable components these 40 W converters are avialable as a chassis-mount with screw terminlas or PCB versions. The 8 models have a wide 4:1 input voltage range and a tight output voltage regulation. They do not need a minimum load and offer a high efficiency also at low load conditions. They feature a remote control input and a green power good LED which indicates the presence of the output voltage. Protection against overload and short circuit are standard features of these converters. EMC characteristics and safety certifications are aligned for the operation in industrial environment.

## Models

| Order Code | Input Voltage Range | Output Voltage nom. | Output Current max. | Efficiency typ. |
|---|---|---|---|---|
| **TMDC 40-2411** | 9 - 36 VDC (24 VDC nom.) | 5.1 VDC | 8'000 mA | 90 % |
| **TMDC 40-2412** | | 12 VDC | 3'330 mA | 90 % |
| **TMDC 40-2415** | | 24 VDC | 1'670 mA | 90 % |
| **TMDC 40-2418** | | 48 VDC | 835 mA | 89 % |
| **TMDC 40-4811** | 18 - 75 VDC (48 VDC nom.) | 5.1 VDC | 8'000 mA | 89 % |
| **TMDC 40-4812** | | 12 VDC | 3'330 mA | 91 % |
| **TMDC 40-4815** | | 24 VDC | 1'670 mA | 92 % |
| **TMDC 40-4818** | | 48 VDC | 835 mA | 90 % |

## Options

| | |
|---|---|
| **TMP-MK2** | - Optional DIN-Rail Mounting Kit: www.tracopower.com/overview/tmp-mk2 |



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## Input Specifications

| | | | |
|---|---|---|---|
| Input Current | - At no load | 24 Vin models: | 90 mA typ. |
| | | 48 Vin models: | 55 mA typ. |
| | - At full load | 24 Vin models: | 1'868 mA typ. |
| | | 48 Vin models: | 927 mA typ. |
| Surge Voltage | | 24 Vin models: | 50 VDC max. (100 ms max.) |
| | | 48 Vin models: | 100 VDC max. (100 ms max.) |
| Under Voltage Lockout | | 24 Vin models: | 7.5 VDC typ. |
| | | 48 Vin models: | 16 VDC typ. |
| Recommended Input Fuse | | | (The need of an external fuse has to be assessed in the final application.) |
| Input Filter | | | Internal Pi-Type |

## Output Specifications

| | | | |
|---|---|---|---|
| Voltage Set Accuracy | | | ±2% max. |
| Regulation | - Input Variation (Vmin - Vmax) | | 0.5% max. |
| | - Load Variation (0 - 100%) | | 1% max. |
| Ripple and Noise (20 MHz Bandwidth) | | 5.1 Vout models: | 100 mVp-p max. |
| | | 12 Vout models: | 150 mVp-p max. |
| | | 24 Vout models: | 150 mVp-p max. |
| | | 48 Vout models: | 200 mVp-p max. |
| Capacitive Load | | 5.1 Vout models: | 13'600 µF max. |
| | | 12 Vout models: | 2'400 µF max. |
| | | 24 Vout models: | 600 µF max. |
| | | 48 Vout models: | 150 µF max. |
| Minimum Load | | | Not required |
| Temperature Coefficient | | | ±0.02 %/K max. |
| Start-up Time | | | 30 ms max. |
| Short Circuit Protection | | | Continuous, Automatic recovery |
| Output Current Limitation | | | 150% typ. of Iout max. |
| Overvoltage Protection | | | 120% typ. of Vout nom. (By Zener diode) |
| Transient Response | - Response Deviation | | 5% max. (75% to 100% Load Step) |
| | - Response Time | | 250 µs typ. (75% to 100% Load Step) |

## Safety Specifications

| | | |
|---|---|---|
| Standards | - IT / Multimedia Equipment | CSA-C22.2, No. 60950-1<br>EN 60950-1<br>EN 62368-1<br>IEC 60950-1<br>IEC 62368-1<br>UL 60950-1<br>UL 62368-1 |
| | - Certification Documents | www.tracopower.com/tmdc40-safety-cert/ |
| Energy Source | - Output, acc. to 62368-1 | ES1 |
| Power Source | - Output, acc. to 62368-1 | PS3 |
| Pollution Degree | | PD 2 |
| Over Voltage Category | | Not mains connected |

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



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## EMC Specifications

| | | | |
|---|---|---|---|
| EMI (Emissions) | | | EN 61000-6-4 (Generic Industrial) |
| | | | EN 61204-3 (Low Voltage Power Supplies) |
| | - Conducted Emissions | | EN 55032 class A (internal filter) |
| | | | FCC 47 Part 15 class A (internal filter) |
| | - Radiated Emissions | | EN 55032 class A (with external filter) |
| | | | FCC 47 Part 15 class A (with external filter) |
| | | External filter proposal: | www.tracopower.com/tmdc40-emc-filter/ |
| EMS (Immunity) | | | EN 55024 (IT Equipment) |
| | | | EN 55035 (Multimedia) |
| | - Electrostatic Discharge | Air: | EN 61000-4-2, ±8 kV, perf. criteria A |
| | | Contact: | EN 61000-4-2, ±4 kV, perf. criteria A |
| | - 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 |
| | | | EN 61000-4-5, ±2 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 |
| EMC / Environmental | - Certification Documents | | www.tracopower.com/tmdc40-emc-cert/ |

## General Specifications

| | | | |
|---|---|---|---|
| Relative Humidity | | | 95% max. (non condensing) |
| Temperature Ranges | - Operating Temperature | | –40°C to +85°C |
| | - Approved Ambient Temp. | 60950-1: | +65°C max. |
| | - Case Temperature | | +95°C max. |
| | - Storage Temperature | | –50°C to +125°C |
| Power Derating | - High Temperature | | 4.5 %/K above 73°C (average) |
| | | See application note: | www.tracopower.com/tmdc40-cc/ |
| Cooling System | | | Natural convection (20 LFM) |
| Remote Control | - Voltage Controlled Remote (passive = on) | | On: 3.5 to 12 VDC or open circuit<br>Off: 0 to 1.2 VDC or short circuit<br>Refers to 'Remote' and '-Vin' Pin |
| | - Off Idle Input Current | | 3 mA typ. |
| | - Remote Pin Input Current | | -0.5 to 0.5 mA |
| Altitude During Operation | | | 6'000 m max. |
| Switching Frequency | | | 285 kHz typ. (PWM) |
| Insulation System | | | Functional Insulation |
| Isolation Test Voltage | - Input to Output, 60 s | | 2'500 VDC |
| Isolation Resistance | - Input to Output, 500 VDC | | 1'000 MΩ min. |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | | 2'800 pF max. |
| Reliability | - Calculated MTBF | | 644'300 h (MIL-HDBK-217F, ground benign) |
| Environment | - Vibration | | IEC 60068-2-6 |
| Housing Material | | | Plastic resin (UL 94 V-0 rated) |
| Potting Material | | | Silicone (UL 94 V-0 rated) |
| Housing Type | | | Plastic Case |
| Mounting Type | | | Chassis Mount |
| Connection Type | | | Screw Terminal |
| Weight | | | 162 g |
| Thermal Impedance | - Case to Ambient | | 4.75 K/W typ. |

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



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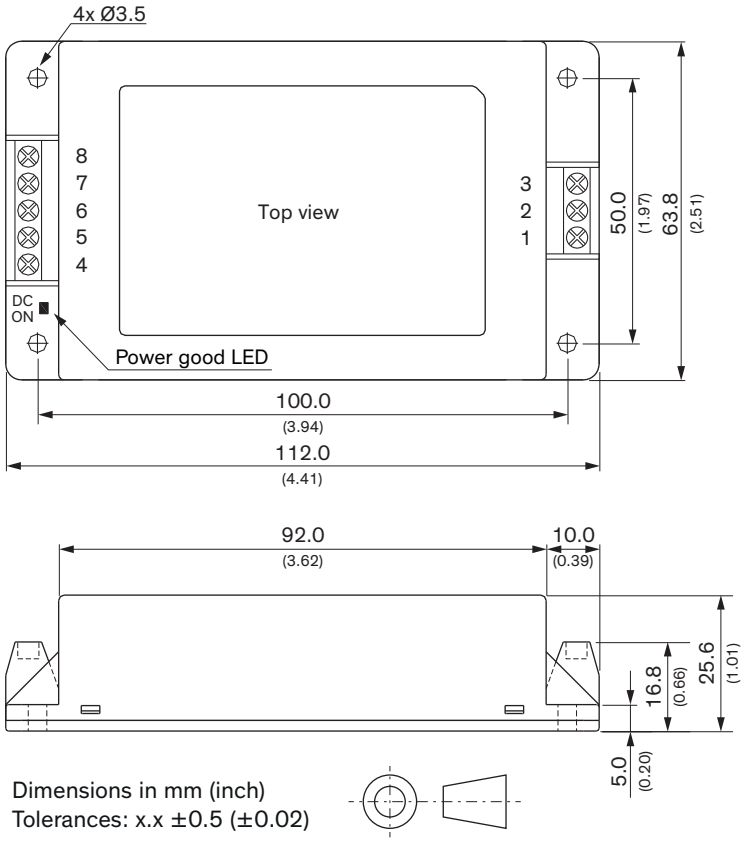
| | | |
|---|---|---|
| Environmental Compliance | - REACH Declaration | www.tracopower.com/info/reach-declaration.pdf<br>REACH SVHC list compliant<br>REACH Annex XVII compliant |
| | - RoHS Declaration | www.tracopower.com/info/rohs-declaration.pdf<br>Exemptions: 6(c), 7(c)-I<br>(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).) |
| | - SCIP Reference Number | 79c56f45-780c-49a4-92e6-91bca3c9dcf8 |

## Additional Information

| | |
|---|---|
| Supporting Documents | www.tracopower.com/overview/tmdc40 |
| Frequently Asked Questions | www.tracopower.com/glossary-faq |
| Glossary | www.tracopower.com/info/glossary.pdf |
| Service Portal | www.tracoserviceportal.com |

## Outline Dimensions




Dimensions in mm (inch)
Tolerances: x.x ±0.5 (±0.02)

Mounting screw locked torque: 0.49 Nm (5.0 kgfcm)

| Pinout | |
|---|---|
| **Pin*** | **Function** |
| 1 | Remote |
| 2 | –Vin (GND) |
| 3 | +Vin (Vcc) |
| 4 | +Vout |
| 5 | NC |
| 6 | –Vout |
| 7 | NC |
| 8 | NC |

NC: Not connected

Terminal screw locked torque: 0.5 Nm max.

Wire dimension: 1.5 $mm^2$ max.

Note: The size of the wires has to be assessed in the final application.

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