

DC/DC Converter

TMDC 40H Series, 40 Watt

- Fully encapsulated chassis mount modules
- High 2:1 input voltage range: 80-160 VDC
- Reinforced I/O-isolation 3'000 VAC
- Harsh industrial EMC capabilities: Integrated filters for emission (EN 55032) & immunity (EN 55035)
- Operating temperature range -40 to +75°C without derating
- Protection against overload, undervoltage and short circuit
- DC-OK (LED) and Remote On/Off function
- IEC/EN/UL 62368-1 safety approvals
- 3-year product warranty



The TMDC 40H series complements Traco Power's successful TMDC line of Industrial DC/DC off-board modules. All models provide a high 2:1 input voltage range from 80-160 VDC and a reinforced 3000 VAC isolation voltage as well as fully regulated outputs. Internal filters limit conducted and radiated emissions (EN 55032 class A) but also increase the modules EMC immunity (EN 55035). The modules come in fully encapsulated plastic packages and feature a high temperature range from -40° up to 75°C without derating. Latest IT safety certifications (UL 62368-1) and DC-OK and remote on/off functions complete the package to provide an ideal solution for many harsh industrial and 110 VDC battery applications in need of a reinforced isolation to provide a safe SELV output.

Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I _{max}	Vnom	I _{max}	
TMDC 40-7211H	80 - 160 VDC (110 VDC nom.)	5.1 VDC	8'000 mA			87 %
TMDC 40-7212H		12 VDC	3'330 mA			89 %
TMDC 40-7213H		15 VDC	2'670 mA			89 %
TMDC 40-7215H		24 VDC	1'670 mA			89 %
TMDC 40-7218H		48 VDC	840 mA			87 %
TMDC 40-7222H		+12 VDC	1'670 mA	-12 VDC	1'670 mA	89 %
TMDC 40-7223H		+15 VDC	1'330 mA	-15 VDC	1'330 mA	89 %
TMDC 40-7225H		+24 VDC	830 mA	-24 VDC	830 mA	87 %

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	10 mA typ.
	- At full load	415 mA typ.
Surge Voltage		170 VDC max. (100 ms max.)
Under Voltage Lockout		65 VDC min. / 78 VDC typ.
Recommended Input Fuse		2'500 mA (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)	single output models: 1% max. dual output models: 1% max.
	- Load Variation (0 - 100%)	single output models: 1% max. dual output models: 1% max. (Output 1) 1% max. (Output 2)
	- Voltage Balance (symmetrical load)	dual output models: 2% max.
	- Cross Regulation (25% / 100% asym. load)	dual output models: 5% max.
	- single output	5.1 Vout models: 100 mVp-p max. 12 Vout models: 150 mVp-p max. 15 Vout models: 150 mVp-p max. 24 Vout models: 200 mVp-p max. 48 Vout models: 200 mVp-p max.
	- dual output	12 / -12 Vout models: 150 / 150 mVp-p max. 15 / -15 Vout models: 150 / 150 mVp-p max. 24 / -24 Vout models: 200 / 200 mVp-p max.
Ripple and Noise (20 MHz Bandwidth)	- single output	5.1 Vout models: 100 mVp-p max. 12 Vout models: 150 mVp-p max. 15 Vout models: 150 mVp-p max. 24 Vout models: 200 mVp-p max. 48 Vout models: 200 mVp-p max.
	- dual output	12 / -12 Vout models: 150 / 150 mVp-p max. 15 / -15 Vout models: 150 / 150 mVp-p max. 24 / -24 Vout models: 200 / 200 mVp-p max.
Capacitive Load	- single output	5.1 Vout models: 13'600 µF max. 12 Vout models: 2'400 µF max. 15 Vout models: 1'500 µF max. 24 Vout models: 600 µF max. 48 Vout models: 150 µF max.
	- dual output	12 / -12 Vout models: 1'200 / 1'200 µF max. 15 / -15 Vout models: 750 / 750 µF max. 24 / -24 Vout models: 300 / 300 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Start-up Time		30 ms typ. / 60 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		180% max. of Iout max.
		150% typ. of Iout max.
Overvoltage Protection		120% typ. of Vout nom. (5.1, 15, ±15 Vout models)
		125% typ. of Vout nom. (other models) (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	EN 62368-1 IEC 62368-1 UL 62368-1
	- Certification Documents	www.tracopower.com/overview/tmdc40h
Pollution Degree		PD 3

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

EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 55032 class A (internal filter) FCC 47 Part 15 class A (internal filter)
	- Radiated Emissions	EN 55032 class A (internal filter) FCC 47 Part 15 class A (internal filter)
EMS (Immunity)	- Electrostatic Discharge	Air: EN 55035 (Multimedia) Contact: EN 61000-4-2, ± 8 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
	- Conducted RF Disturbances	EN 61000-4-5, ± 2 kV, perf. criteria A
	- PF Magnetic Field	EN 61000-4-6, 10 Vrms, perf. criteria A
EMC / Environmental	- Certification Documents	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A www.tracopower.com/overview/tmdc40h

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +90°C
	- Case Temperature	+105°C max.
	- Storage Temperature	-50°C to +125°C
Power Derating	- High Temperature	3.33 %/K above 75°C See application note: www.tracopower.com/overview/tmdc40h
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on)	On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current	3 mA typ.
	- Remote Pin Input Current	-0.5 to 0.5 mA
Switching Frequency		179 - 245 kHz (PWM)
		210 kHz typ. (PWM)
Insulation System		Reinforced Insulation
Working Voltage (rated)		1'000 VAC
Isolation Test Voltage	- Input to Output, 60 s	3'000 VAC
Isolation Resistance	- Input to Output, 500 VDC	1'000 M Ω min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	2'400 pF max.
Reliability	- Calculated MTBF	580'000 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
Environmental Compliance	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf Exemptions: 6c, 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	70a30ce8-39b1-47aa-bdf0-fe57fdaabb00

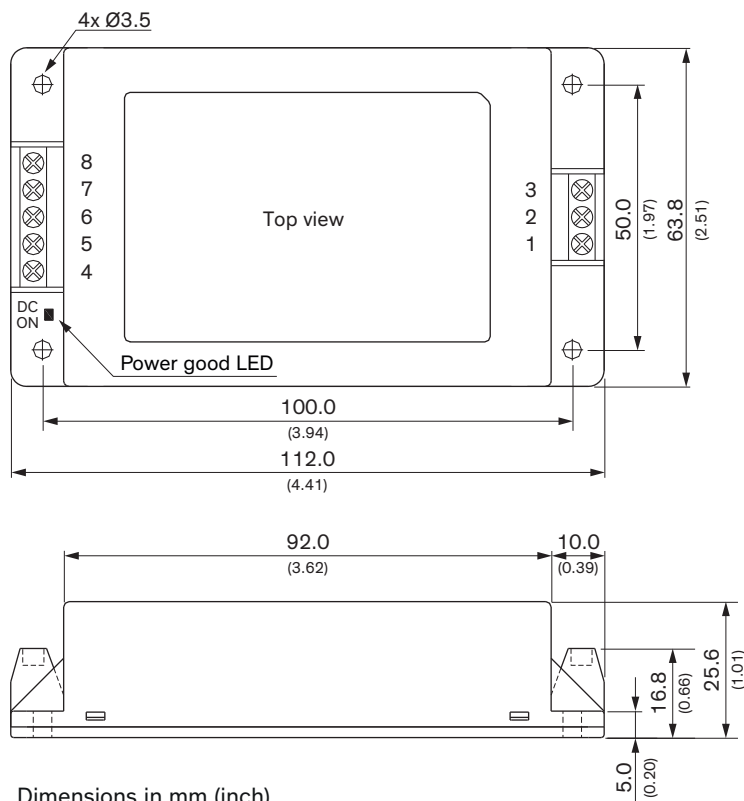
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Supporting Documents

[Overview Link](#) (for additional Documents)

www.tracopower.com/overview/tmdc40h

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*	Single Output	Dual Output
1	Remote	Remote
2	–Vin (GND)	–Vin (GND)
3	+Vin (Vcc)	+Vin (Vcc)
4	+Vout	+Vout
5	NC	NC
6	–Vout	Common
7	NC	NC
8	NC	–Vout

NC: Not connected

* Wires 1.5 mm² max.

Terminal screw locked torque: 0.5 Nm max.

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