

- Shielded metal case with screw terminals
- Ultra wide 4:1 input voltage ranges 9–36, 18–75, 43–160 VDC
- EN 50155 approval for railway applications
- Very high efficiency up to 89%
- Constant current output characteristic for battery load applications
- Optional with input filter to meet EN 55032 class B
- Wide Operating temperature range: –40°C to +75°C
- Under voltage lock-out, overtemperature & reverse input protection
- Easy chassis and wall mounting
- 3-year product warranty



The modules have originally been designed for harsh industrial environment. High EMC immunity against surge, burst, radiated and conducted disturbances and the shock/ vibration and thermal shock resistance make them very popular for stringent requirements. With the extended input voltage ranges that cover the nominal 24, 36, 72 and 110 VDC with $\pm 40\%$ tolerance and the approval in accordance to EN 50155 standard they now also offer a reliable solution for mobile and stationary railway applications. At 100% load the current characteristics goes from constant voltage to constant current what makes the units also suitable for battery charger applications. With protection against over-temperature, overload, short-circuit, reverse input, overvoltage and input under-voltage lock-out they are hard to destroy.

Models

Order Code	Input Voltage Range	Output Voltage nom.	Output Current max.	Efficiency typ.
TEP 150-2412WI	9 - 36 VDC (24 VDC nom.)	12 VDC	12'500 mA	86 %
TEP 150-2413WI		15 VDC	10'000 mA	86 %
TEP 150-2415WI		24 VDC	6'300 mA	87 %
TEP 150-2416WI		28 VDC	5'400 mA	87 %
TEP 150-2418WI		48 VDC	3'200 mA	86 %
TEP 150-4812WI	18 - 75 VDC (48 VDC nom.)	12 VDC	12'500 mA	88 %
TEP 150-4813WI		15 VDC	10'000 mA	89 %
TEP 150-4815WI		24 VDC	6'300 mA	89 %
TEP 150-4816WI		28 VDC	5'400 mA	89 %
TEP 150-4818WI		48 VDC	3'200 mA	88 %
TEP 150-7212WI	43 - 160 VDC (110 VDC nom.)	12 VDC	12'500 mA	88 %
TEP 150-7213WI		15 VDC	10'000 mA	89 %
TEP 150-7215WI		24 VDC	6'300 mA	89 %
TEP 150-7216WI		28 VDC	5'400 mA	89 %
TEP 150-7218WI		48 VDC	3'200 mA	88 %

Options

Suffix -F	- Optional models with input filter to meet EN 55032 class B: www.tracopower.com/products/tep150wi-f.pdf
on demand (backorder with MOQ non stocking item)	- Optional models with inverse remote on/off function (passiv = off)

Input Specifications

Input Current	- At no load	24 Vin models: 100 mA typ. 48 Vin models: 65 mA typ. 110 Vin models: 30 mA typ.
Surge Voltage		24 Vin models: 50 VDC max. (1 s max.) 48 Vin models: 100 VDC max. (1 s max.) 110 Vin models: 185 VDC max. (1 s max.)
Under Voltage Lockout		24 Vin models: 7.9 - 8.5 VDC 48 Vin models: 15.6 - 16.8 VDC 110 Vin models: 33 - 36 VDC
Recommended Input Fuse		24 Vin models: 30'000 mA (slow blow) 48 Vin models: 15'000 mA (slow blow) 110 Vin models: 7'000 mA (slow blow)
Reverse Voltage Protection		Parallel diode (External input fuse required)
Input Filter		Internal Pi-Type

Output Specifications

Output Voltage Adjustment		0% to +20% (By external trim resistor) See application note: www.tracopower.com/overview/tep150wi Output power must not exceed rated power!
Voltage Set Accuracy		±1% max.
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (0 - 100%)	0.2% max. 0.4% max.
Ripple and Noise (20 MHz Bandwidth)		12 Vout models: 100 mVp-p max. 15 Vout models: 100 mVp-p max. 24 Vout models: 200 mVp-p max. 28 Vout models: 200 mVp-p max. 48 Vout models: 300 mVp-p max.
Capacitive Load		12 Vout models: 40'000 µF max. 15 Vout models: 26'000 µF max. 24 Vout models: 10'000 µF max. 28 Vout models: 7'600 µF max. 48 Vout models: 2'600 µF max.
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Start-up Time		35 ms typ.
Short Circuit Protection		Continuous, Automatic recovery
Overload Protection		Constant Current Mode
Output Current Limitation		105 - 120% of Iout max.
Overvoltage Protection		125 - 140% of Vout nom.
Transient Response	- Response Time	200 µs typ. (25% Load Step)

Safety Specifications

Safety Standards	- IT / Multimedia Equipment - Railway Applications - Certification Documents	IEC 60950-1 EN 60950-1 UL 60950-1 EN 50155 www.tracopower.com/overview/tep150wi
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All specifications valid at nominal voltage, full load and +25°C after warm-up time unless otherwise stated.

Pollution Degree	PD 2
Over Voltage Category	OVC I

EMC Specifications

EMI Emissions	- Conducted Emissions	EN 50121-3-2 (EMC for Rolling Stock) EN 55032 class A (internal filter) FCC Part 15, class A
	- Radiated Emissions	EN 55032 class A (internal filter) FCC Part 15, class A
EMS Immunity	- Electrostatic Discharge	EN 50155 (Railway Applications) EN 50121-3-2 (EMC for Rolling Stock) Air: EN 61000-4-2, ± 8 kV, perf. criteria A Contact: EN 61000-4-2, ± 6 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, ± 1 kV, perf. criteria A
	- Conducted RF Disturbances	Ext. input component: 24 Vin models: KY 470 μ F, ESR 45 mOhm 48 Vin models: KY 220 μ F, ESR 48 mOhm 110 Vin models: KXJ 150 μ F EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous: EN 61000-4-8, 100 A/m, perf. criteria A 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +75°C
	- Case Temperature	+100°C max.
	- Storage Temperature	-55°C to +125°C
Power Derating	- High Temperature	See application note: www.tracopower.com/overview/tep150wi
Over Temperature	- Protection Mode	110°C typ. (Automatic recovery)
Protection Switch Off		
Cooling System		Optimize thermal coupling to heat conducting surface. Not to mount on flammable surface!
Remote Control	- Voltage Controlled Remote	On: 3.0 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 3.5 mA typ. (Optional models with inverse logic (passiv = off) available)
	- Off Idle Input Current	
Altitude During Operation		2'000 m max.
Switching Frequency		203 - 330 kHz (PWM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	1'591 VAC
	- Input to Case, 60 s	1'061 VAC
	- Output to Case, 60 s	1'061 VAC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MOhm min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	3'500 pF max.
Reliability	- Calculated MTBF	495'000 h (MIL-HDBK-217F at 70°C, ground benign)
Environment	- Vibration	MIL-STD-810F EN 61373 3 axis, random waveforms, 7.76 g (each 1h)
	- Mechanical Shock	MIL-STD-810F EN 61373 3 axis, 50 g, terminal-peak sawtooth, 11 ms
	- Thermal Shock	MIL-STD-810F
Case Ingress Protection		IP 55 (acc. IEC 60529)

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

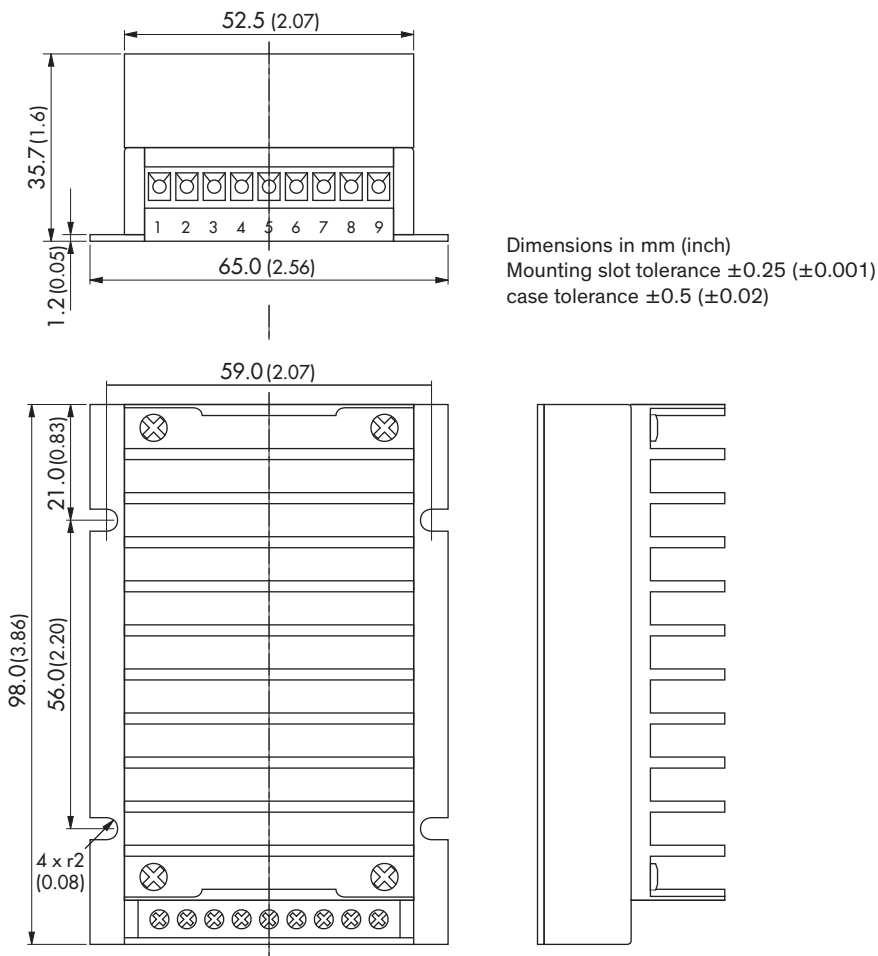
Housing Material	Aluminium
Potting Material	Silicone (UL 94 V-0 rated)
Connection Type	Screw Terminal
Weight	300 g
Environmental Compliance	<ul style="list-style-type: none"> - Reach www.tracopower.com/info/reach-declaration.pdf - RoHS www.tracopower.com/info/rohs-declaration.pdf - Flammability (EN 45545-2) www.tracopower.com/info/en45545-declaration.pdf

Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/tep150wi

Outline Dimensions



Pinout		
Pin	Function	recommended wire
1	+ Vin	14 – 16 AWG
2	+ Vin	14 – 16 AWG
3	- Vin	14 – 16 AWG
4	- Vin	14 – 16 AWG
5	Remote	14 – 24 AWG
6	+ Vout	14 – 16 AWG
7	- Vout	14 – 16 AWG
8	Trim	14 – 24 AWG
9	Trim	14 – 24 AWG