

- 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
- With input filter for 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. (adjustable)	Output Current max.	Efficiency typ.
TEP 150-2412WI-F	9 - 36 VDC (24 VDC nom.)	12 VDC (12.0 - 14.4 VDC)	12'500 mA	86 %
TEP 150-2413WI-F		15 VDC (15.0 - 18.0 VDC)	10'000 mA	86 %
TEP 150-2415WI-F		24 VDC (24.0 - 28.8 VDC)	6'300 mA	87 %
TEP 150-2416WI-F		28 VDC (28.0 - 33.6 VDC)	5'400 mA	87 %
TEP 150-2418WI-F		48 VDC (48.0 - 57.6 VDC)	3'200 mA	86 %
TEP 150-4812WI-F	18 - 75 VDC (48 VDC nom.)	12 VDC (12.0 - 14.4 VDC)	12'500 mA	88 %
TEP 150-4813WI-F		15 VDC (15.0 - 18.0 VDC)	10'000 mA	89 %
TEP 150-4815WI-F		24 VDC (24.0 - 28.8 VDC)	6'300 mA	89 %
TEP 150-4816WI-F		28 VDC (28.0 - 33.6 VDC)	5'400 mA	89 %
TEP 150-4818WI-F		48 VDC (48.0 - 57.6 VDC)	3'200 mA	88 %
TEP 150-7212WI-F	43 - 160 VDC (110 VDC nom.)	12 VDC (12.0 - 14.4 VDC)	12'500 mA	88 %
TEP 150-7213WI-F		15 VDC (15.0 - 18.0 VDC)	10'000 mA	89 %
TEP 150-7215WI-F		24 VDC (24.0 - 28.8 VDC)	6'300 mA	89 %
TEP 150-7216WI-F		28 VDC (28.0 - 33.6 VDC)	5'400 mA	89 %
TEP 150-7218WI-F		48 VDC (48.0 - 57.6 VDC)	3'200 mA	88 %

Options	
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 max. 48 Vin models: 15.6 - 16.8 VDC max. 110 Vin models: 33 - 36 VDC max.
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) (The need of an external fuse has to be assessed in the final application.)
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-f 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	EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Railway Applications	EN 50155
	- Certification Documents	www.tracopower.com/overview/tep150wi-f
Pollution Degree		PD 2
Over Voltage Category		OVC I

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

EMC Specifications

EMI Emissions		EN 50121-3-2 (EMC for Rolling Stock) EN 55032 class B (internal filter) FCC Part 15 class B (internal filter)
- Conducted Emissions		
- Radiated Emissions		EN 55032 class B (internal filter) FCC Part 15 class B (internal filter)
EMS Immunity		EN 50155 (Railway Applications) EN 50121-3-2 (EMC for Rolling Stock)
- Electrostatic Discharge	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		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
		(Mount on conducting surface to optimize thermal coupling)
Power Derating	- High Temperature	Depending on model
		See application note: www.tracopower.com/overview/tep150wi-f
Over Temperature Protection Switch Off	- Protection Mode	110°C typ. (Automatic recovery)
Cooling System		Natural convection (20 LFM)
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
	- Off Idle Input Current	3.5 mA typ.
		(Optional models with inverse logic (passiv = off) available)
Altitude During Operation		5'000 m max.
Switching Frequency		203 - 330 kHz (PWM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	2'250 VDC
	- Input to Case, 60 s	1'600 VDC
	- Output to Case, 60 s	1'600 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 M Ω min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	3'500 pF max.
Reliability	- Calculated MTBF	495'000 h (MIL-HDBK-21 7F, ground benign)
Environment	- Vibration	MIL-STD-810F EN 61373 7.7 g, 3 axis, random waveform, 60 min
	- Mechanical Shock	MIL-STD-810F EN 61373 50 g, 3 axis, 11 ms
	- Thermal Shock	MIL-STD-810F EN 50155
Case Ingress Protection		IP 55 (acc. IEC 60529)
Housing Material		Aluminum
Potting Material		Silicone (UL 94 V-0 rated)
Housing Type		Metal Case

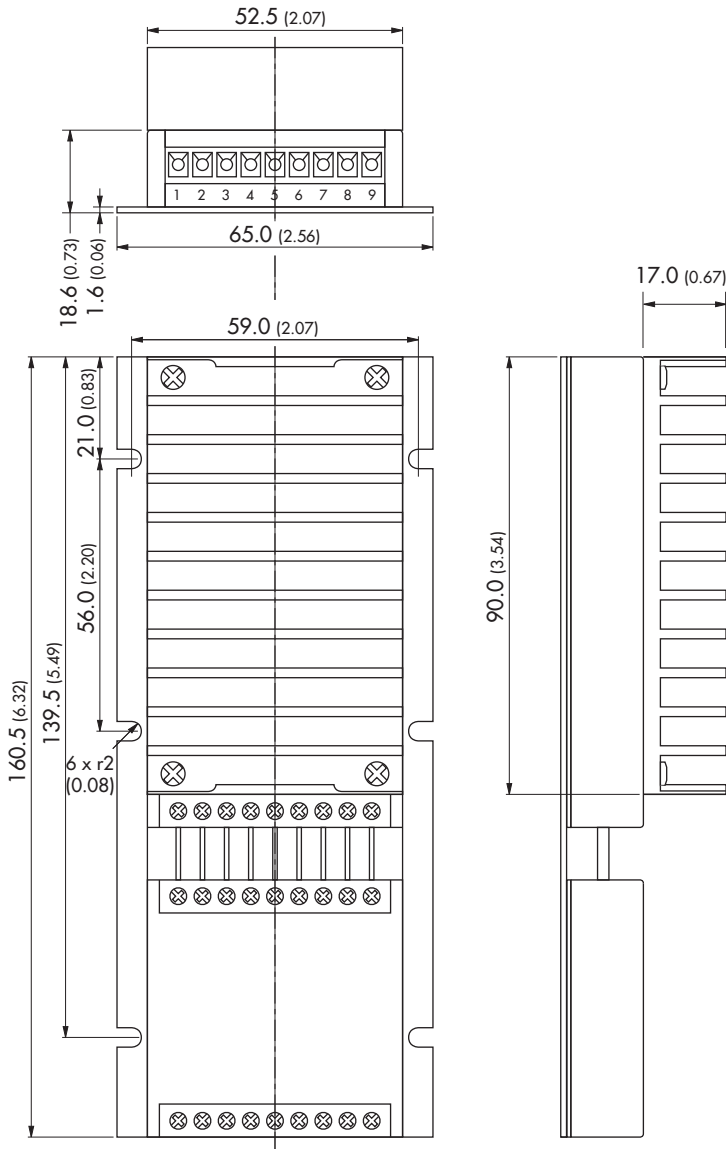
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Mounting Type	Chassis Mount
Connection Type	Screw Terminal
Weight	435 g
Environmental Compliance	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.) www.tracopower.com/info/en45545-declaration.pdf
- REACH Declaration	
- RoHS Declaration	
- Flammability (EN 45545-2)	

Supporting Documents	Weight
Overview Link (for additional Documents)	www.tracopower.com/overview/tep150wi-f

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Outline Dimensions



Dimensions in mm (inch)
 Mounting slot tolerance ± 0.25 (± 0.001)
 case tolerance ± 0.5 (± 0.02)

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 1	14 – 24 AWG
9	Trim 2	14 – 24 AWG