

- 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 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, 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 (passive = off) |

Input Specifications

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|------------------------|--------------|--|
| 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.) |
| Input Filter | | Internal Pi-Type |

Output Specifications

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| 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. |
| Hold-up Time | | 10 ms min. (acc. to EN 50155 Class S2, see application note for ext. capacitor calculation: www.tracopower.com/info/holdup_en50155.pdf) |
| 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

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|-----------|-----------------------------|--|
| 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 |

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

| | |
|-----------------------|-------|
| Pollution Degree | PD 2 |
| Over Voltage Category | OVC I |

EMC Specifications

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|---------------------|-----------------------------|---|
| EMI (Emissions) | - Conducted Emissions | EN 50121-3-2 (EMC for Rolling Stock) EN 55032 class B (internal filter) FCC 47 Part 15 class B (internal filter) |
| | - Radiated Emissions | EN 55032 class B (internal filter) FCC 47 Part 15 class B (internal filter) |
| EMS (Immunity) | - Electrostatic Discharge | Air: EN 50121-3-2 (EMC for Rolling Stock) 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 |
| | - Conducted RF Disturbances | EN 61000-4-5, ±1 kV, perf. criteria A |
| | - PF Magnetic Field | EN 61000-4-6, 10 Vrms, perf. criteria A Continuous: EN 61000-4-8, 100 A/m, perf. criteria A 1 s: EN 61000-4-8, 1000 A/m, perf. criteria A |
| EMC / Environmental | - Certification Documents | www.tracopower.com/overview/tep150wi-f |

General Specifications

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| 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 (passive = on) | 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 Remote On/Off function (passive = off)) |
| 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 MΩ min. |
| Isolation Capacitance | - Input to Output, 100 kHz, 1 V | 3'500 pF max. |
| Reliability | - Calculated MTBF | 495'000 h (MIL-HDBK-217F, 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 |
| | - Flammability | EN 45545-2 |
| | | www.tracopower.com/info/en45545-declaration.pdf |

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

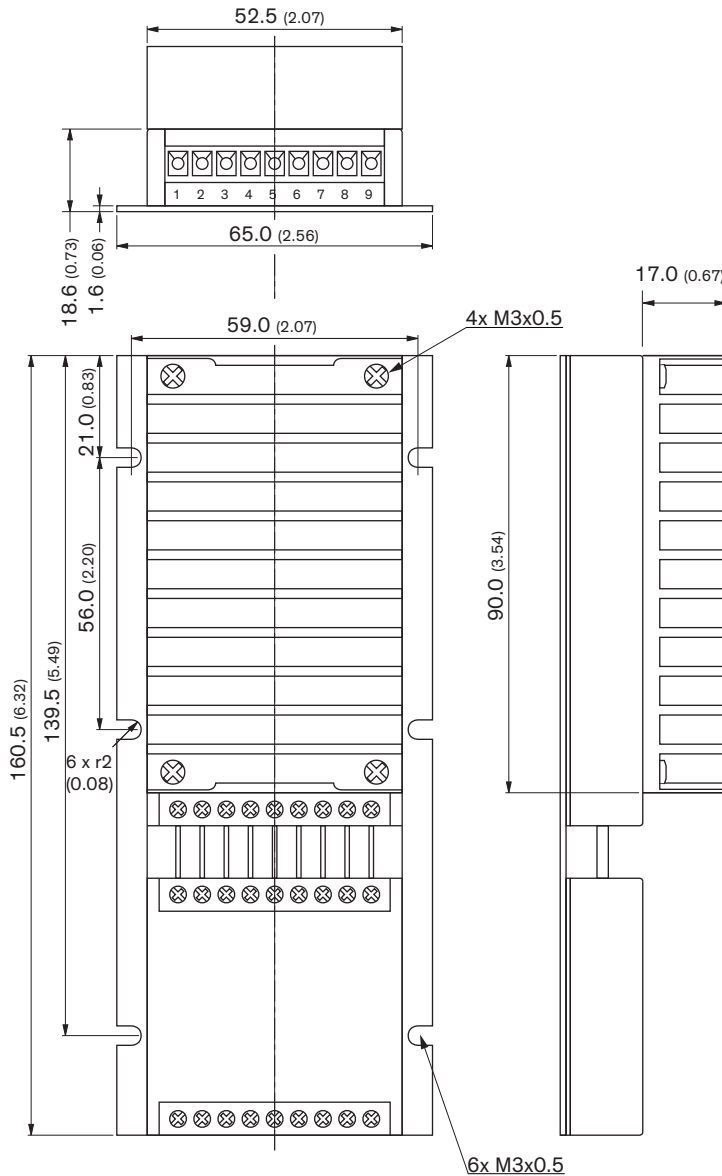
| | |
|--------------------------|---|
| Case Ingress Protection | IP 55 (acc. IEC 60529) |
| Housing Material | Aluminum |
| Potting Material | Silicone (UL 94 V-0 rated) |
| Housing Type | Metal Case |
| Mounting Type | Chassis Mount |
| Connection Type | Screw Terminal |
| Weight | 435 g |
| Environmental Compliance | <p>- REACH Declaration www.tracopower.com/info/reach-declaration.pdf</p> <p>- RoHS Declaration www.tracopower.com/info/rohs-declaration.pdf</p> <p>- SCIP Reference Number 0a4fa6f7-fc99-4700-b630-51e819d0b5bb</p> <p>REACH SVHC list compliant REACH Annex XVII compliant</p> <p>Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)</p> |

Supporting Documents

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| Overview Link (for additional Documents) | www.tracopower.com/overview/tep150wi-f |
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All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

Outline Dimensions



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

Screw locked torque: 0.49 Nm (5.0 kgfcm)
 Terminal screw locked torque: 0.25 Nm (2.5 kgfcm)

| 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 |