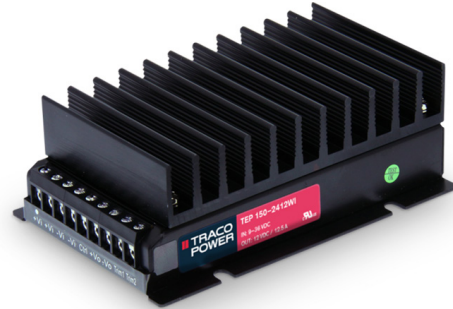


Features

- ◆ 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 EN55032 class B
- ◆ Overtemperature protection
- ◆ Wide Operating temperature range:
–40°C to +75°C
- ◆ Reverse input protection
- ◆ Under voltage lock-out
- ◆ I/O isolation 2250 VDC
- ◆ 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 EN50155 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	Output voltage	Output current max.	Efficiency typ.
TEP 150-2412WI	9 – 36 VDC (24 VDC nominal)	12 VDC	12.5 A	86 %
TEP 150-2413WI		15 VDC	10 A	86 %
TEP 150-2415WI		24 VDC	6.3 A	87 %
TEP 150-2416WI		28 VDC	5.4 A	87 %
TEP 150-2418WI		48 VDC	3.2 A	86 %
TEP 150-4812WI	18 – 75 VDC (48 VDC nominal)	12 VDC	12.5 A	88 %
TEP 150-4813WI		15 VDC	10 A	89 %
TEP 150-4815WI		24 VDC	6.3 A	89 %
TEP 150-4816WI		28 VDC	5.4 A	89 %
TEP 150-4818WI		48 VDC	3.2 A	88 %
TEP 150-7212WI	43 – 160 VDC (110 VDC nominal)	12 VDC	12.5 A	88 %
TEP 150-7213WI		15 VDC	10 A	89 %
TEP 150-7215WI		24 VDC	6.3 A	89 %
TEP 150-7216WI		28 VDC	5.4 A	89 %
TEP 150-7218WI		48 VDC	3.2 A	88 %

Options

suffix –F	Modules with input filter to meet EN 55032 class B, see page 2
on demand	Negative (passive = Off) remote On/Off function (standard is passive = On)range

Input Specifications

Input current (no load)	24 Vin, 12 – 24 VDC models:	80 mA typ.
	24 Vin, 28 – 48 VDC models:	130 mA typ.
	48 Vin, 12 – 24 VDC models:	60 mA typ.
	48 Vin, 28 – 48 VDC models:	70 mA typ.
	110 Vin, 12 – 24 VDC models:	25 mA typ.
	110 Vin, 28 – 48 VDC models:	35 mA typ.
Start-up voltage / under voltage lock-out	24 Vin models:	9 VDC / 8.2 VDC typ.
	48 Vin models:	18 VDC / 16.2 VDC typ.
	110 Vin models:	43 VDC / 34.5 VDC typ.
Surge voltage (1 s max.)	24 Vin models:	50 V
	48 Vin models:	100 V
	110 Vin models:	185 V
Conducted noise (input)	EN 55032 class A, FCC part 15, class A without external components. optional filter for class B – suffix F	
EMC immunity	EN 50121-3-2	
	– ESD (electrostatic discharge) EN 61000-4-2, air ± 8 kV, contact ± 6 kV, perf. criteria A	
	– Radiated immunity EN 61000-4-3, 10 V/m, perf. criteria A	
	– Fast transient / surge EN 61000-4-4, ± 2 kV, perf. criteria A	
	(with input capacitor for models without filter module) EN 61000-4-5, ± 1 kV perf. criteria A	
	– Input capacitor:	24 Vin models: Nippon chemi-con KY 470 μ F, 50 V, ESR 45 mOhm
		48 Vin models: Nippon chemi-con KY 220 μ F, 100 V, ESR 48 mOhm
		110 Vin models: Nippon chemi-con KXJ series, 150 μ F, 200V
	models with filter module (suffix F): no input capacitor required	
	– Conducted immunity EN 61000-4-6, 10 Vrms, perf. criteria A	
	– Power frequency magnetic field EN 61000-4-8, 100 A/m conti., 1000 A/m 1 s	
Reverse voltage protection	parallel diode (input fuse required)	
Recommended input fuse (slow blow)	24 Vin models:	30 A
	48 Vin models:	15 A
	110 Vin models:	7 A

Output Specifications

Voltage set accuracy	1 %	
Output voltage adjustment	+20 % by external resistor (see application note)	
Regulation	– Input variation (Vin min. to Vin max.) – Load variation (0 to 100 %)	±0.2 % max. ±0.4 % max.
Temperature coefficient	±0.02 %/K	
Minimum load	not required	
Ripple and noise (20 MHz Bandwidth)	12 & 15 VDC models: 24 & 28 VDC models: 48 VDC models:	100 mVpk-pk max. 200 mVpk-pk max. 350 mVpk-pk max.
Start up time (nominal Vin and constant resistive load)	35 ms typ. (at power On or remote On)	
Transient response (25 % load step change)	200 µs typ.	
Output current	– Constant voltage (CV) – Constant current (CC)	up to 110 % of Iout max. above 110 % of Iout max.
Over voltage protection	at 125 –140 % of Vout nom.	
Short circuit protection	indefinite, automatic recovery	
Capacitive load	12 VDC models: 15 VDC models: 24 VDC models: 28 VDC models: 48 VDC models:	40'000 µF max. 26'000 µF max. 10'000 µF max. 7'600 µF max. 2'600 µF max.