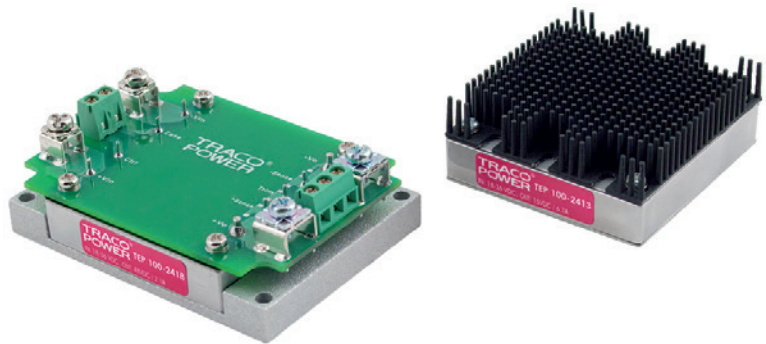


Features

- ◆ Rugged, compact metal case
- ◆ Screw terminal adaptor available for easy connection
- ◆ EN 50155 approval for railway applications
- ◆ Optional DIN-rail mounting kit
- ◆ Ultra wide 4:1 input voltage range
- ◆ Full load operation up to +60°C with convection cooling
- ◆ Undervoltage lockout
- ◆ Reverse input voltage protection
- ◆ Input protection filter
- ◆ 3-year product warranty



(Models pictured with chassis mount adaptor / optional heatsink)

The TEP-75WI Series is a family of isolated high performance DC/DC converter modules with ultra-wide 4:1 input voltage ranges which come in a rugged, sealed metal case. These converters are suitable for a wide range of applications, but the product is designed particularly also for industrial applications where often no PCB mounting is possible but the module has to be mounted on a chassis. Four threaded M3 inserts in the module makes chassis mount or attachment of a heatsink for optimal thermal management very simple. For easy connection there is also an unique adaptor available with screw terminals. A very high efficiency allows an operating temperature up to +60°C with natural convection cooling without power derating. Further features include output voltage trimming, Remote On/Off and under voltage lockout. The very wide input voltage range and reverse input voltage protection make these converters also an interesting solution for battery operated systems.

Models				
Order code*	Input voltage	Output voltage	Output current max.	Efficiency typ.
TEP 75-2411WI	9 – 36 VDC (24 VDC nominal)	5.0 VDC	15.0 A	88 %
TEP 75-2412WI		12 VDC	6.3 A	88 %
TEP 75-2413WI		15 VDC	5.0 A	88 %
TEP 75-2415WI		24 VDC	3.2 A	87 %
TEP 75-2416WI		28 VDC	2.7 A	87 %
TEP 75-2418WI		48 VDC	1.6 A	87 %
TEP 75-4811WI	18 – 75 VDC (48 VDC nominal)	5.0 VDC	15 A	90 %
TEP 75-4812WI		12 VDC	6.3 A	90 %
TEP 75-4813WI		15 VDC	5.0 A	89 %
TEP 75-4815WI		24 VDC	3.2 A	88 %
TEP 75-4816WI		28 VDC	2.7 A	88 %
TEP 75-4818WI		48 VDC	1.6 A	87 %
TEP 75-7211WI	43 – 160 VDC (110 VDC nominal)	5.0 VDC	15 A	91 %
TEP 75-7212WI		12 VDC	6.3 A	91 %
TEP 75-7213WI		15 VDC	5.0 A	91 %
TEP 75-7215WI		24 VDC	3.2 A	90 %
TEP 75-7216WI		28 VDC	2.7 A	90 %
TEP 75-7218WI		48 VDC	1.6 A	90 %
on demand	Models with 3.3 VDC / ~ 20 A			
	Negative (passive = Off) Remote On/Off function (standard is passive = On)			

Input Specifications

suffix -CM	Chassis mount models with screw terminal block, see page 5
suffix -CMF	Chassis mount models with screw terminal block and input filter to meet EN 55022 class A, see page 5
TEP-HS1	Heat-sink for standard version (incl. mounting screws and thermal pad), see page 4
TEP-MK1	Din-rail mounting kit for chassis mount models (incl. mounting screws), see page 6
TCK-xxx	Common mode chokes for filter proposals to meet EN55022 class A/B --> see application note

Input Specifications

Input current at no load	24 Vin; 5 – 15 VDC models: 120 mA typ. 24 Vin; 24 – 48 VDC models: 85 mA typ. 48 Vin; 5 – 15 VDC models: 70 mA typ. 48 Vin; 24 – 48 VDC models: 50 mA typ. 110 Vin; 5 – 48 VDC models: 10 mA typ.
Input current at full load	24 Vin models: 3600 mA typ. (see Note 1) 48 Vin models: 1800 mA typ. 110 Vin models: 1350 mA typ.
Start-up voltage / under voltage lockout	24 Vin models: 9 VDC / 7.5 VDC (or lower) 48 Vin models: 18 VDC / 16 VDC (or lower) 110 Vin models: 43 VDC / 36 VDC (or lower)
Surge voltage (100 msec. max.)	24 Vin models: 50 V max. 48 Vin models: 100 V max. 110 Vin models: 185 V max.
Conducted noise	– with option -CMF – for PCB mount version EN 55022 class A, FCC part 15, level A See application note for to meet EN 55022 class A or B
EMC immunity	– ESD (electrostatic discharge) – Radiated immunity – Fast transient / surge (with external input capacitor) 24 & 48 Vin models: Nippon chemicon KY 200 µF, 100V, ESR 48 mOhm 110 Vin models: Ruby-con BXF series, 100µF/250V CMF option models: capacitor included – Conducted immunity EN 50121-3-2 EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A EN 61000-4-3, 20 V/m, perf. criteria A EN 61000-4-4, ±2 kV, perf. criteria A EN 61000-4-5, ±2 kV perf. criteria A, EN55024/EN51055 EN 61000-4-6, 10 Vrms, perf. criteria A
Reverse voltage protection	parallel diode (external input fuse required)

Output Specifications

Voltage set accuracy	±1 %
Output voltage adjustment	+10 % / –20 % by external resistor see application note:
Regulation	– Input variation Vin min. to Vin max. 0.1 % max. – Load variation (0 – 100 %) 5 – 15 VDC models: 0.1 % max. 24 – 48 VDC models: 0.1 % max.
Temperature coefficient	±0.02 %/K
Minimum load	not required

Note 1:

For 24 VDC input voltage models an input capacitor 4.7µF/50V X7R MLCC or 68µF/100V, 110mOhm Nippon chemi-con KY series is recommended for a reliable supply of the pulse current. Capacitor is already include with chassis mount option **-CM** and **-CMF**

Output Specifications

Remote sense		10 % max. of Vout nom. (trim up value to subtract)
Ripple and noise (20 MHz Bandwidth)	5 VDC models: 12 & 15 VDC models: 24 & 28 VDC models: 48 VDC models:	75 mVpk-pk max. 100 mVpk-pk max. 200 mVpk-pk max. 300 mVpk-pk max.
Start up time (nominal Vin and constant resistive load)	110 VDC input: Others:	60 ms typ. (at power On or remote On) 25 ms typ. (at power On or remote On)
Transient response (25 % load step change)		200 µs typ.
Output current limitation	110 VDC input: Others:	at 150 % of Iout max. at 110 – 140 % of Iout max.
Over voltage protection		at 115 – 130 % of Vout nom.
Short circuit protection		indefinite, automatic recovery.
Capacitive load	5 VDC models: 12 VDC models: 15 VDC models: 24 VDC models: 28 VDC models: 48 VDC models:	30'000 µF max. 5'250 µF max. 3'330 µF max. 1'330 µF max. 960 µF max. 330 µF max.

General Specifications

Temperature ranges	– Operating – Case temperature – Storage	–40°C to +75°C +105°C max. –55°C to +125°C
Thermal impedance	– without Heatsink – with Heatsink	6.7°C/W 4.7°C/W
Derating		see application note
Over temperature protection		at +115°C
Thermal shock, mechanical shock & vibration	– Test conditions	EN 61373, MIL-STD-810F www.tracopower.com/products/mil810.pdf
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +70°C, ground benign)		336'000 h
Isolation voltage (60sec.)	– Input/Output – Input/Case	2'250 VDC (basic insulation) 1'600 VDC
Isolation capacitance	– Input/Output	2500 pF max.
Isolation resistance	– Input/Output (500 VDC)	>1 GOhm min.
Switching frequency		300 kHz typ. (puls width modulation)
Safety standards		UL 60950-1, IEC/EN 60950-1, EN50155
Safety approvals	– UL/cUL – Railway	www.ul.com -> certifications -> File e188913 www.tracopower.com/products/tep-50155.rar
Remote On/Off	– positive logic (standard) – negative logic (optional on demand) – Off idle current:	– On: 3 to 12 VDC or open circuit – Off: 0 to 1.2 VDC or short circuit pin 1 and 3 – On: 0 to 1.2 VDC or short circuit pin 1 and 3 – Off: 3 to 12 VDC or open circuit 3 mA
Environmental compliance	– Reach – RoHS	www.tracopower.com/products/reach-declaration.pdf RoHS directive 2011/65/EU

Application note: www.tracopower.com/products/tep75wi-application.pdf

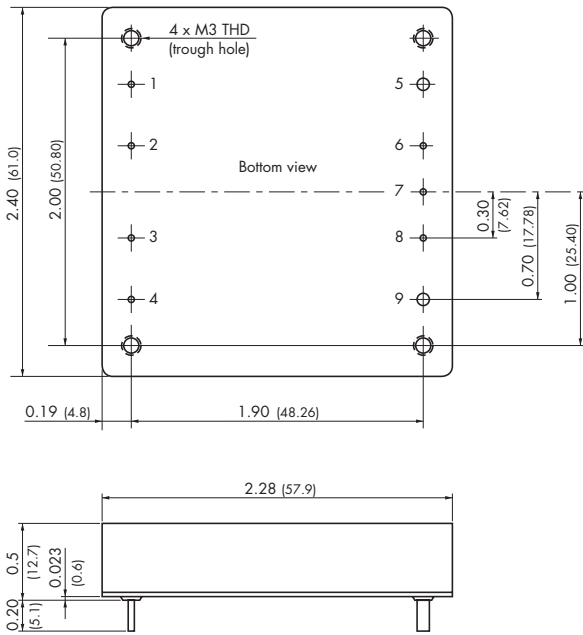
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

General Specifications

Casing material	24 & 48 VDC input: metal 110 VDC input: aluminium base-plate with plastic casing
Potting material	silicone (UL94V-0 rated)
Base material	24 & 48 VDC input: FR4

Dimensions

TEP 75 module



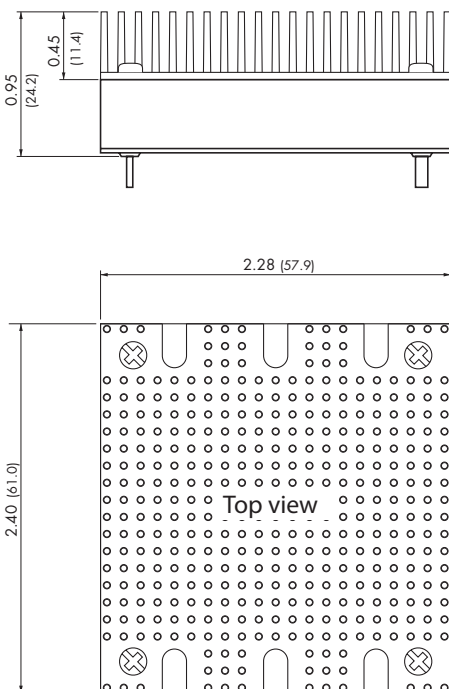
Weight: 97 g (3.42oz)

Pin diameter pin 5 & 9: 0.08 (2.0)
Pin diameter other pins: 0.04 (1.0)

Pin-Out	
Pin	
1	- Vin
2	Case
3	Remote On/Off
4	+ Vin
5	- Vout
6	- Sense*
7	Trim
8	+ Sense*
9	+ Vout

*Sense line to be connected to the output either at the module or at the load under regard of polarity.

Option Heatsink



Order code: **TEP-HS1**

Includes heatsink with thermal pad and mounting screws
To order modules with mounted heatsink ask factory.

Weight: 135 g (4.76oz)
(Heatsink + Converter)

Dimensions in Inch, () = mm
Tolerances ± 0.02 (± 0.5)
Pin pitch tolerances ± 0.01 (± 0.25)
Mounting hole pitch tolerances ± 0.01 (± 0.25)

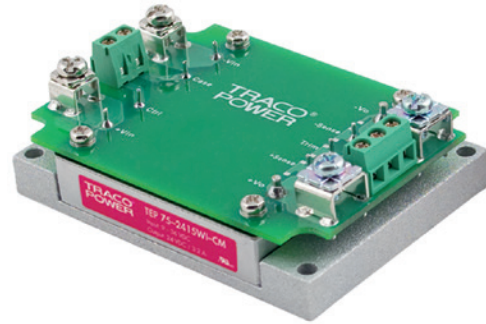
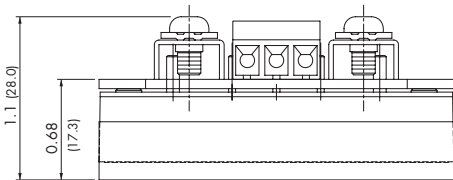
Option Chassis Mount

TEP 75 module with chassis mount adaptor (suffix -CM or -CMF)

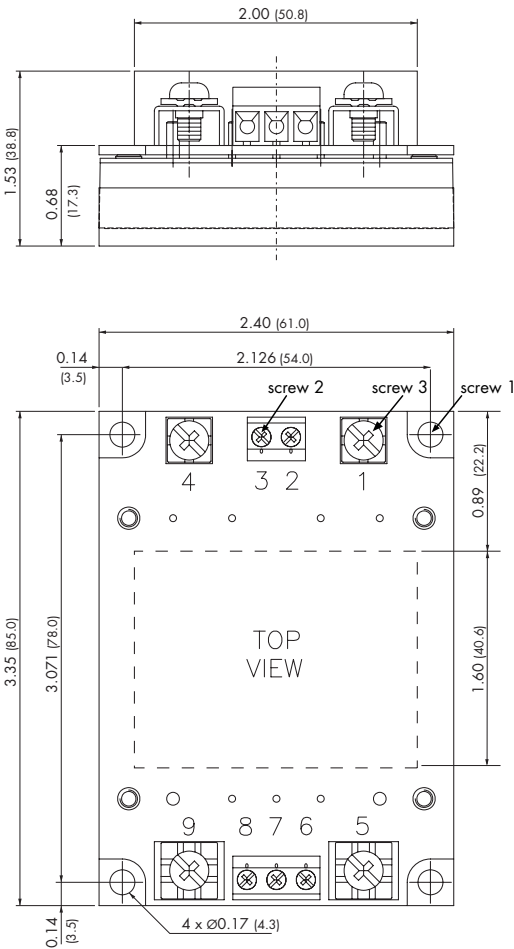
For easy chassis mounting the converter modules can be supplied with an adaptor option consisting of a screw terminal connection board (soldered to converter pins) and a chassis mount adaptor.

In addition this Chassis mount option is available with an EMI-filter (see EMI specification)

Suffix **-CM**: Chassis mount adaptor



Suffix **-CMF**: Chassis mount adaptor with EMI filter



Please note that adaptors cannot be ordered as separate items but are factory assembled.

Connection	
Pin	
1	-Vin
2	NC
3	Remote On/Off
4	+Vin
5	-Vout
6	-Sense*
7	Trim
8	+Sense*
9	+Vout

*Sense line to be connected to the output either at the module or at the load under regard of polarity.

Weight: -CM 200 g (7.05oz)
Weight: -CMF 287 g (10.12oz)

Dimensions in Inch, () = mm

Tolerances ± 0.02 (± 0.5)

Mounting hole pitch tolerances ± 0.01 (± 0.25)

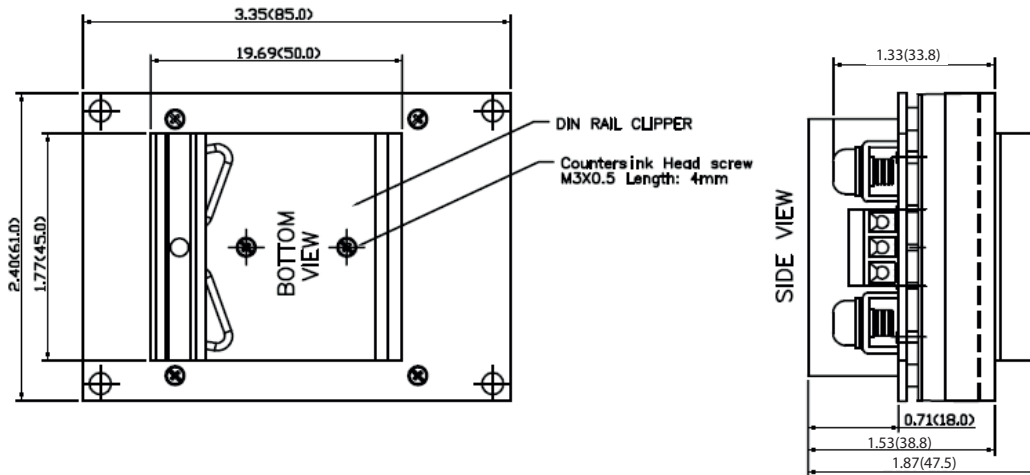
The screw 1 locked torque: MAX 11.2kgf-cm/1.10N-m

The screw 2 locked torque: MAX 5.2kgf-cm/0.51N-m

The screw 3 locked torque: MAX 12kgf-cm/1.18N-m

Option DIN-Rail Clip

TEP-MK1 DIN-rail clip for chassis mount models



Order code: **TEP-MK1**

Includes DIN-rail clip and mounting screws.

To order modules with mounted DIN-rail clip ask factory.