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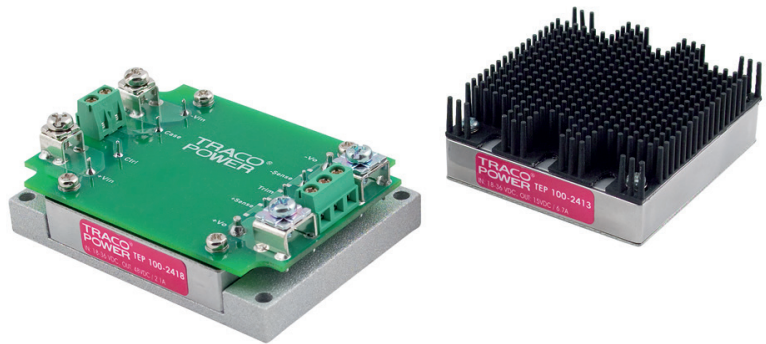
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### Features

- ◆ 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)			



### Options

suffix <b>-CM</b>	Chassis mount models with screw terminal block, see page 5
suffix <b>-CMF</b>	Chassis mount models with screw terminal block and input filter to meet EN 55032 class A, see page 5
<b>TEP-HS1</b>	Heat-sink for standard version (incl. mounting screws and thermal pad), see page 4
<b>TEP-MK1</b>	Din-rail mounting kit for chassis mount models (incl. mounting screws), see page 6
<b>TCK-xxx</b>	Common mode chokes for filter proposals to meet EN55032 class A/B, see application note

### Input Specifications

Input current at no load	24 Vin; 5 – 15 VDC models: <b>185 mA typ.</b> 24 Vin; 24 – 48 VDC models: <b>85 mA typ.</b> 48 Vin; 5 & 12 VDC models: <b>85 mA typ.</b> 48 Vin; 15 – 48 VDC models: <b>50 mA typ.</b> 110 Vin; 5 – 48 VDC models: <b>10 mA typ.</b>
Input current at full load	24 Vin models: <b>3600 mA typ.</b> (see Note 1) 48 Vin models: <b>1800 mA typ.</b> 110 Vin models: <b>1350 mA typ.</b>
Start-up voltage / under voltage lockout	24 Vin models: <b>9 VDC / 7.5 VDC (or lower)</b> 48 Vin models: <b>18 VDC / 16 VDC (or lower)</b> 110 Vin models: <b>43 VDC / 36 VDC (or lower)</b>
Surge voltage (100 msec. max.)	24 Vin models: <b>50 V max.</b> 48 Vin models: <b>100 V max.</b> 110 Vin models: <b>185 V max.</b>
Conducted noise	– with option <b>-CMF</b> – for PCB mount version <b>EN 55032 class A, FCC part 15, level A</b> See application note for to meet EN 55032 class A or B
EMC immunity	– ESD (electrostatic discharge) – Radiated immunity – Fast transient / surge (with external input capacitor) <b>EN 50121-3-2</b> <b>EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A</b> <b>EN 61000-4-3, 20 V/m, perf. criteria A</b> <b>EN 61000-4-4, ±2 kV, perf. criteria A</b> <b>EN 61000-4-5, ±2 kV perf. criteria A, EN55024/EN51055</b> 24 & 48 Vin models: Nippon chemi-con KY 220 µF/100V, ESR 48 mOhm 110 Vin models: Ruby-con BXF series, 150µF/200V CMF option models: capacitor included – Conducted immunity – PF Magnetic Field <b>EN 61000-4-6, 10 Vrms, perf. criteria A</b> <b>EN 61000-4-8, 100 A/m, perf. criteria A</b>
Reverse voltage protection	<b>parallel diode (external input fuse required)</b>

### Output Specifications

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

#### 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:	100 mVp-p max. 125 mVp-p max. 250 mVp-p max. 350 mVp-p 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		continuous, 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 (with derating) +105°C max. –55°C to +125°C
Thermal impedance	– without Heatsink – with Heatsink	6.7 K/W 4.7 K/W
Over temperature protection		at +115°C
Thermal shock, mechanical shock & vibration	– Test conditions	EN 61373:1999, MIL-STD-810F <a href="http://www.tracopower.com/products/mil810.pdf">www.tracopower.com/products/mil810.pdf</a>
Humidity (non condensing)		5 – 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 online certification E188913, QQGG2  – Railway immunity – Cold / dry heat / damp heat cyclic – Certification documents	UL 60950-1 2nd edition + AM1 EN 60950-1:2006 + A11:2009-03 IEC 60950-1(2nd edition) EN 50155:2007 EN 60068-2-1, EN 60068-2-2, EN 60068-2-30 <a href="http://www.tracopower.com/overview/tep75wi">www.tracopower.com/overview/tep75wi</a>
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 – Flamability identified acc. EN 45545-2	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> RoHS directive 2011/65/EU <a href="http://www.tracopower.com/info/en45545-declaration.pdf">www.tracopower.com/info/en45545-declaration.pdf</a>

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

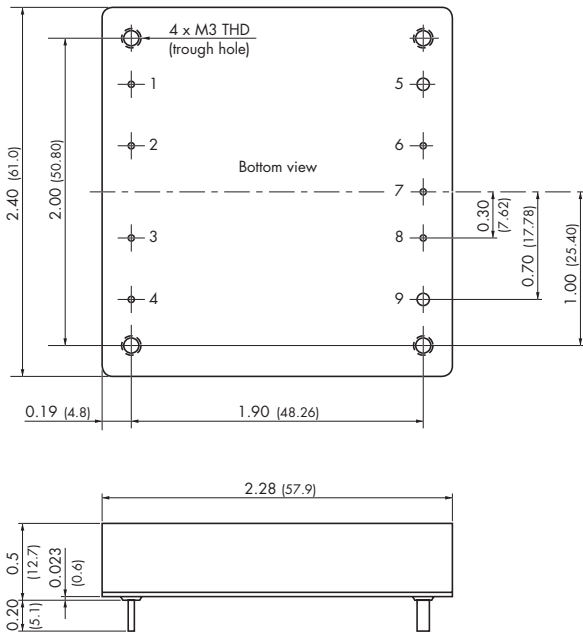
**General Specifications**

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

**Supporting documents:** [www.tracopower.com/overview/tep75wi](http://www.tracopower.com/overview/tep75wi)

**Dimensions**

TEP 75 module



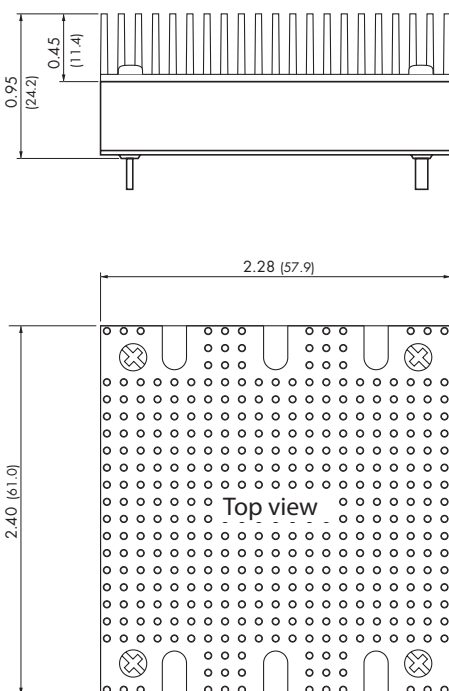
Weight: 97 g (3.42oz)

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  $\pm 0.02$  ( $\pm 0.5$ )  
Pin pitch tolerances  $\pm 0.01$  ( $\pm 0.25$ )  
Mounting hole pitch tolerances  $\pm 0.01$  ( $\pm 0.25$ )

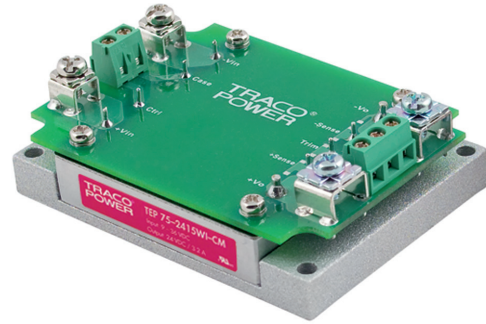
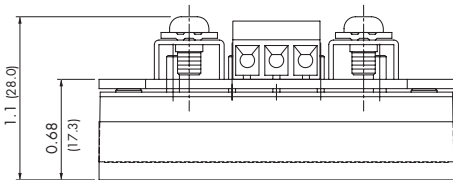
**Option Chassis Mount**

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

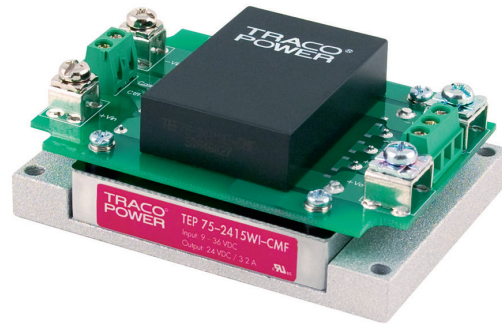
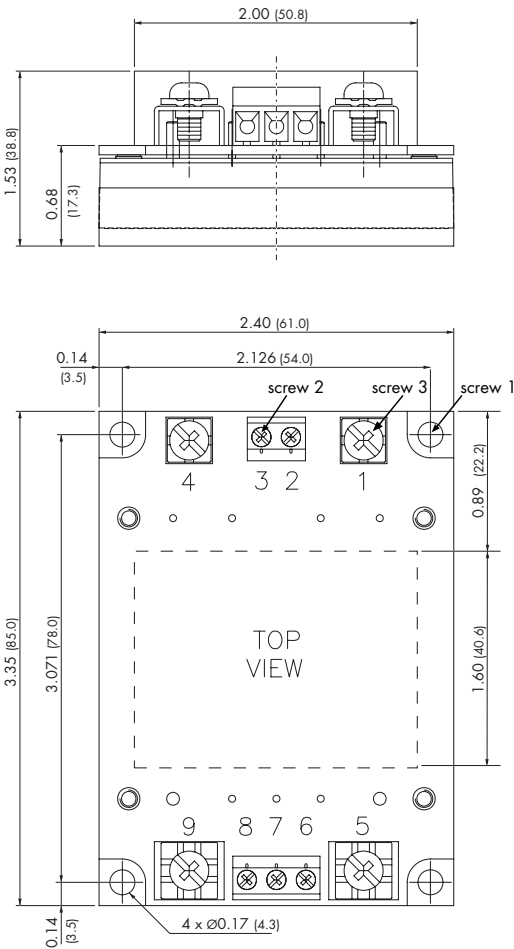
For easy chassis mounting the converter modules can be supplied with an adaptor option consisting of a screw terminal connection board (soldered to converter pins) and a chassis mount adaptor.

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  $\pm 0.02$  ( $\pm 0.5$ )

Mounting hole pitch tolerances  $\pm 0.01$  ( $\pm 0.25$ )

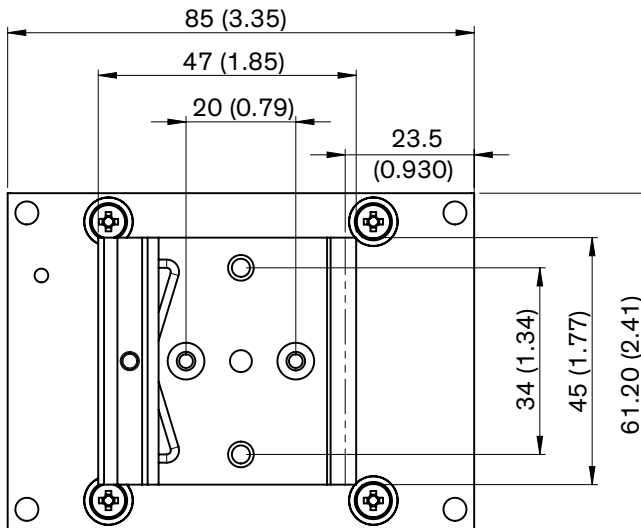
The screw 1 locked torque: MAX 11.2kgf-cm/1.10N-m

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

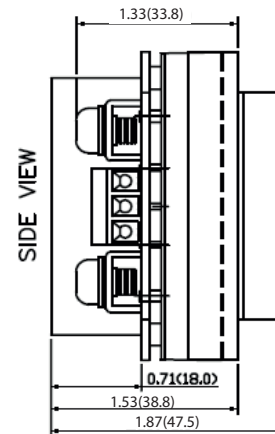
The screw 3 locked torque: MAX 12kgf-cm/1.18N-m

**Option DIN-Rail Clip**

TEP-MK1 DIN-rail clip for chassis mount models



DIN RAIL CLIPPER  
Countersink Head screw  
M3X0.5 Length: 4mm



Order code: **TEP-MK1**

Includes DIN-rail clip and mounting screws.

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