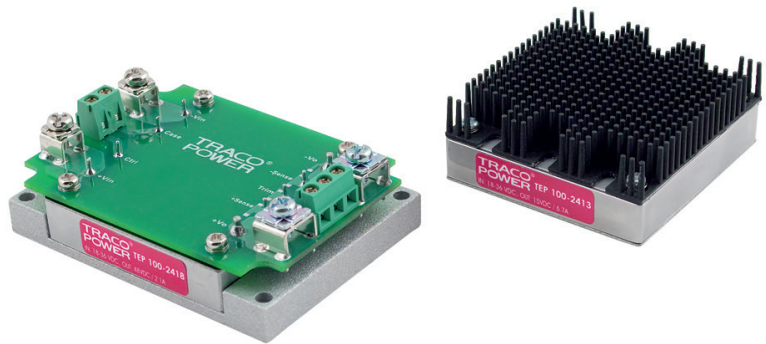


### Features

- ◆ 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<br>(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               | 88 %            |
| TEP 75-4811WI | 18 – 75 VDC<br>(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<br>(72 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<br>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 555022 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 EN55022 class A/B --> see <a href="#">application note</a> |

## Input Specifications

|                                                        |                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input current at no load                               | 24 Vin; 5 – 15 VDC models: <b>185 mA typ.</b><br>24 Vin; 24 – 48 VDC models: <b>85 mA typ.</b><br>48 Vin; 5 – 15 VDC models: <b>90 mA typ.</b><br>48 Vin; 24 – 48 VDC models: <b>50 mA typ.</b><br>72 Vin; 5 – 15 VDC models: <b>40 mA typ.</b><br>72 Vin; 24 – 48 VDC models: <b>25 mA typ.</b> |
| Input current at full load                             | 24 Vin models: <b>3600 mA typ.</b> (see Note 1)<br>48 Vin models: <b>1800 mA typ.</b><br>72 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><br>48 Vin models: <b>18 VDC / 16 VDC (or lower)</b><br>72 Vin models: <b>43 VDC / 36 VDC (or lower)</b>                                                                                                                                         |
| Surge voltage (100 msec. max.)                         | 24 Vin models: <b>50 V max.</b><br>48 Vin models: <b>100 V max.</b><br>72 Vin models: <b>185 V max.</b>                                                                                                                                                                                          |
| Conducted noise                                        | – with option <b>-CMF</b><br>– for PCB mount version<br><b>EN 55022 class A, FCC part 15, level A</b><br>See application note for to meet EN 55022 class A or B                                                                                                                                  |
| ESD (electrostatic discharge)                          | <b>EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A</b>                                                                                                                                                                                                                                  |
| Radiated immunity                                      | <b>EN 61000-4-3, 10 V/m, perf. criteria A</b>                                                                                                                                                                                                                                                    |
| Fast transient / Surge (with external input capacitor) | <b>EN 61000-4-4, ±2 kV, perf. criteria A</b><br><b>EN 61000-4-5, ±1 kV perf. criteria A</b><br>Nippon chemi-con KY 200 µF, 100V, ESR 48 mOhm<br>Ruby-con BXF series, 100µF/250V<br>capacitor included                                                                                            |
| Conducted immunity                                     | <b>EN 61000-4-6, 10 Vrms, perf. criteria A</b>                                                                                                                                                                                                                                                   |
| Reverse voltage protection                             | <b>parallel diode</b> (external input fuse required)                                                                                                                                                                                                                                             |
| Recommended input fuse (slow blow)                     | 24 Vin models: <b>10 A</b><br>48 Vin models: <b>5 A</b><br>72 Vin models: <b>3.15 A</b>                                                                                                                                                                                                          |

## Output Specifications

|                           |                                                                                                                                                                        |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage set accuracy      | <b>±1 %</b>                                                                                                                                                            |
| Output voltage adjustment | <b>+10 % / -20 % by external resistor</b><br>see application note:                                                                                                     |
| Regulation                | – Input variation Vin min. to Vin max. <b>0.1 % max.</b><br>– Load variation (0 – 100 %) 5 – 15 VDC models: <b>0.1 % max.</b><br>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.<br>(trim up value to subtract)                                           |
| Ripple and noise (20 MHz Bandwidth)                     | 5 VDC models:<br>12 & 15 VDC models:<br>24 & 28 VDC models:<br>48 VDC models:                           | 75 mVpk-pk max.<br>100 mVpk-pk max.<br>200 mVpk-pk max.<br>300 mVpk-pk max.                     |
| Start up time (nominal Vin and constant resistive load) | 72VDC input:<br>Others:                                                                                 | 60 ms typ. (at power On or remote On)<br>25 ms typ. (at power On or remote On)                  |
| Transient response (25 % load step change)              |                                                                                                         | 200 µs typ.                                                                                     |
| Output current limitation                               | 72VDC input:<br>Others:                                                                                 | at 150 % of Iout max.<br>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:<br>12 VDC models:<br>15 VDC models:<br>24 VDC models:<br>28 VDC models:<br>48 VDC models: | 30'000 µF max.<br>5'250 µF max.<br>3'330 µF max.<br>1'330 µF max.<br>960 µF max.<br>330 µF max. |

## General Specifications

|                                                                       |                                                                                             |                                                                                                                                                                                          |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature ranges                                                    | – Operating<br>– Case temperature<br>– Storage                                              | –40°C to +75°C<br>+105°C max.<br>–55°C to +125°C                                                                                                                                         |
| Thermal impedance                                                     | – without Heatsink<br>– with Heatsink                                                       | 6.7°C/W<br>4.7°C/W                                                                                                                                                                       |
| Derating                                                              |                                                                                             | see <a href="#">application note</a>                                                                                                                                                     |
| Over temperature protection                                           |                                                                                             | at +115°C                                                                                                                                                                                |
| Thermal shock, mechanical shock & vibration                           | – Test conditions                                                                           | EN 61373, MIL-STD-810F<br><a href="http://www.tracopower.com/products/mil810.pdf">www.tracopower.com/products/mil810.pdf</a>                                                             |
| Humidity (non condensing)                                             |                                                                                             | 95 % rel H max.                                                                                                                                                                          |
| Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign) |                                                                                             | 75'000 h                                                                                                                                                                                 |
| Isolation voltage (60sec.)                                            | – Input/Output<br>– Input/Case                                                              | 2'250 VDC (basic insulation)<br>1'500 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<br>– Railway                                                                       | <a href="http://www.ul.com">www.ul.com</a> -> certifications -> File e188913<br><a href="http://www.tracopower.com/products/tep-50155.rar">www.tracopower.com/products/tep-50155.rar</a> |
| Remote On/Off                                                         | – positive logic (standard)<br>– negative logic (optional on demand)<br>– Off idle current: | – On: 3 to 12 VDC or open circuit<br>– Off: 0 to 1.2 VDC or short circuit pin 1 and 3<br>– On: 0 to 1.2 VDC or short circuit pin 1 and 3<br>– Off: 3 to 12 VDC or open circuit<br>3 mA   |
| Environmental compliance                                              | – Reach<br>– RoHS                                                                           | <a href="http://www.tracopower.com/products/tep75wi-reach.pdf">www.tracopower.com/products/tep75wi-reach.pdf</a><br>RoHS directive 2011/65/EU                                            |

**Application note:** [www.tracopower.com/products/tep75wi-application.pdf](http://www.tracopower.com/products/tep75wi-application.pdf)

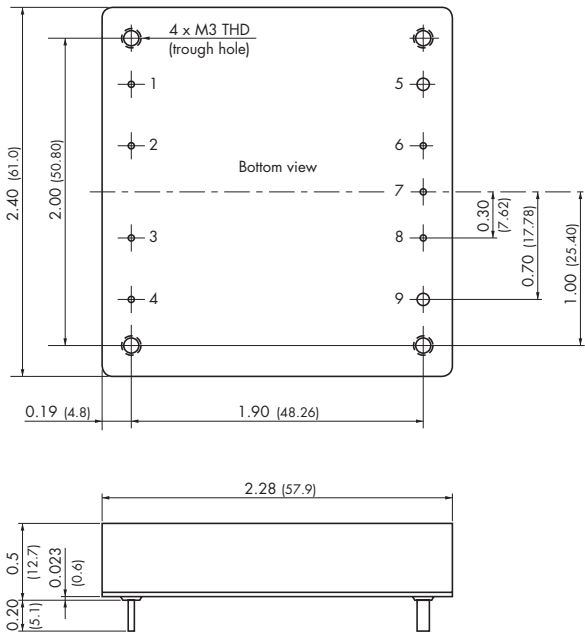
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

**General Specifications**

|                  |                                                                               |
|------------------|-------------------------------------------------------------------------------|
| Casing material  | 24, 48VDC input: metal<br>72VDC input: aluminium base-plate with plastic case |
| Potting material | silicone (UL94V-0 rated)                                                      |
| Base material    | 24, 48VDC input: FR4                                                          |

**Dimensions**

TEP 75 module



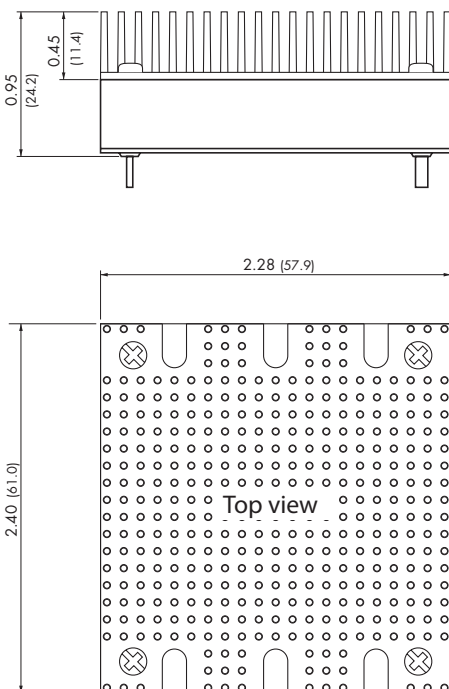
| Pin-Out |               |
|---------|---------------|
| Pin     |               |
| 1       | - Vin         |
| 2       | Case          |
| 3       | Remote On/Off |
| 4       | + Vin         |
| 5       | - Vout        |
| 6       | - Sense*      |
| 7       | Trim          |
| 8       | + Sense*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

Weight: 97g (3.42 oz)

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

\*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: 135g (4.76 oz)  
(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  $\pm 0.01$  ( $\pm 0.25$ )

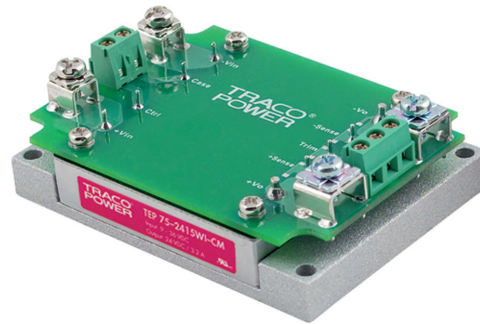
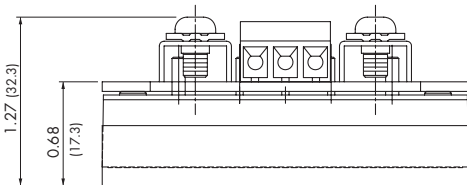
**Option Chassis Mount**

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

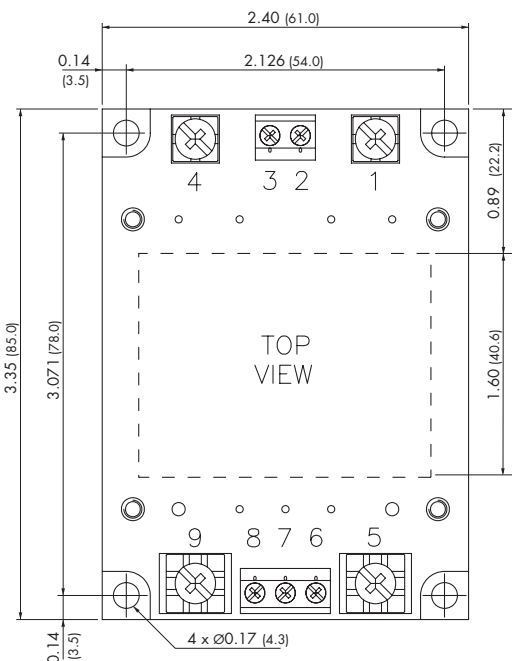
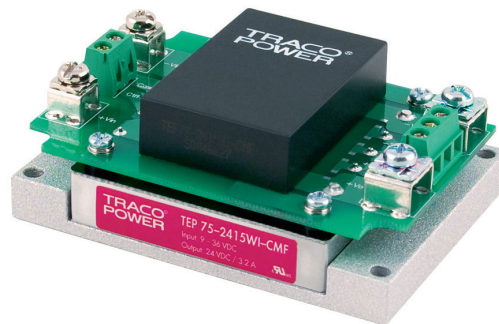
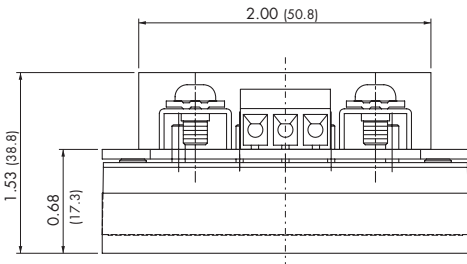
For easy chassis mounting the converter modules can be supplied with an adaptor option consisting of a screw terminal connection board (soldered to converter pins) and a chassis mount adaptor.

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**

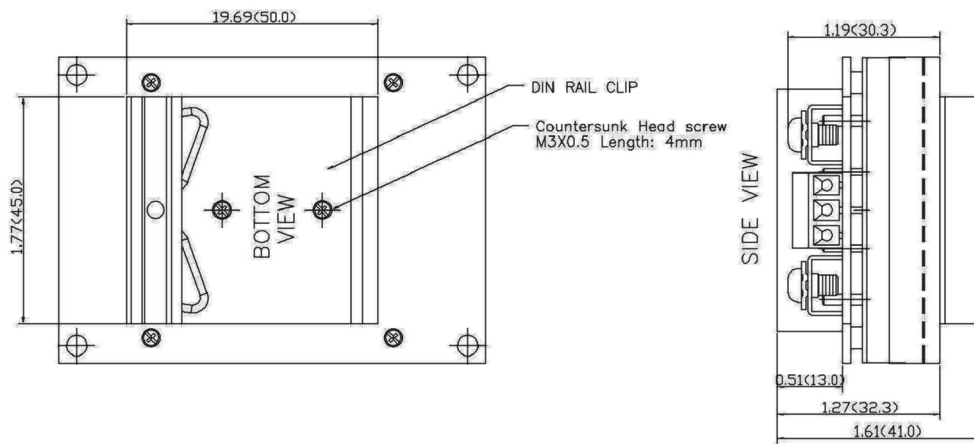
| Pin | Connection    |
|-----|---------------|
| 1   | - Vin         |
| 2   | Case          |
| 3   | Remote On/Off |
| 4   | + Vin         |
| 5   | - Vout        |
| 6   | - Sense*      |
| 7   | Trim          |
| 8   | + Sense*      |
| 9   | + Vout        |

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

Dimensions in Inch, ( ) = mm  
Tolerances  $\pm 0.02$  ( $\pm 0.5$ )  
Mounting hole pitch tolerances  $\pm 0.01$  ( $\pm 0.25$ )

Weight: -CM 196 g (6.91 oz)  
Weight: -CMF 238 g (8.39 oz)

**Option DIN-Rail Clip**



Order code: **TEP-MK1**

Includes DIN-rail clip and mounting screws.  
To order modules with mounted DIN-rail clip ask factory.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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