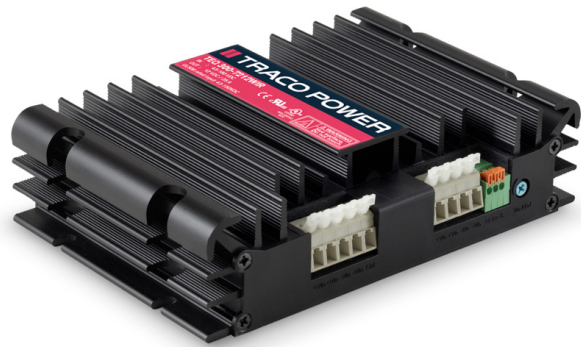


- High power block with excellent thermal convection
- Operating temperature -40°C to +80°
- Increased shock & vibration resistance
- Ultra wide 4:1 input voltage range
- EN 50155 approval for railway applications
- Excellent efficiency up to 92%
- Constant current output characteristic for battery load applications
- Power sharing (up to 3 pcs in parallel)
- Input filter meet EN 55032 class A
- I/O isolation 3000 VDC
- Infinite capacitive load
- Under voltage lock-out circuit
- Soft start
- Input protection filter



The TEQ-300WIR 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. A very high efficiency and the overall heatsink construction allows an operating temperature up to +60°C with natural convection cooling without power derating and up to +80°C with power derating. Further features include output voltage trimming, Remote On/Off and under voltage lockout. The ultra 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. |
| TEQ 300-4812WIR | <b>18 - 75 VDC</b><br>(nominal 48 VDC)   | 12 VDC         | 25 A                | 89 %            |
| TEQ 300-4815WIR |  | 24 VDC         | 12.5 A              | 92 %            |
| TEQ 300-4816WIR |  | 28 VDC         | 10.8 A              | 91 %            |
| TEQ 300-4818WIR |  | 48 VDC         | 6.3 A               | 92 %            |
| TEQ 300-7212WIR | <b>43 - 160 VDC</b><br>(nominal 110 VDC) | 12 VDC         | 25 A                | 89 %            |
| TEQ 300-7215WIR |  | 24 VDC         | 12.5 A              | 91 %            |
| TEQ 300-7216WIR |  | 28 VDC         | 10.8 A              | 91 %            |
| TEQ 300-7218WIR |  | 48 VDC         | 6.3 A               | 92 %            |

## Input Specifications

|                          |   |
|--------------------------|---|
| Input current no load    | 48 Vin models: 30 mA typ.<br>110 Vin models: 25 mA typ.   |
| Surge voltage (1 s max.) | 48 Vin models: 100 V max.<br>110 Vin models: 185 V max.   |
| Start-up voltage         | 48 Vin models: 18 VDC (or lower)<br>110 Vin models: 43 VDC (or lower)   |
| Under voltage shut down  | 48 Vin models: 16.8 VDC (or lower)<br>110 Vin models: 36.0 VDC (or lower)   |
| External fuse (required) | 48 Vin models: 25 A (fast acting)<br>110 Vin models: 12 A (fast acting)   |
| Input filter             | Common mode choke and Pi type   |
| EMC emissions            | – Conducted and radiated input suppression<br>EN 55032, EN 55011 class A (internal filter)  |
| EMC immunity             | – ESD (electrostatic discharge)<br>EN 61000-4-2, air $\pm 8$ kV, contact $\pm 6$ kV, perf. criteria A<br>– Radiated immunity<br>EN 61000-4-3, 20 V/m, perf. criteria A<br>– Fast transient / surge<br>EN 61000-4-4, $\pm 2$ kV, perf. criteria A<br>(without external input capacitor) EN 55024: EN 61000-4-5, $\pm 1$ kV perf. criteria A<br>EN 50155: EN 61000-4-5, $\pm 2$ kV perf. criteria A<br>– Conducted immunity<br>EN 61000-4-6, 10 Vrms, perf. criteria A<br>– Power frequency magnetic field<br>EN 61000-4-8, 100 A/m, perf. criteria A |

## Output Specifications

|   |   |   |
|---|---|---|
| Voltage adjustability                           | – Max. output deviation is incl. remote sense   | $\pm 20$ %  |
| Remote Sense                                    | – Remote sense can compensate maximal   | +10% of Vout nom.   |
| Voltage set accuracy                            |   | $\pm 1$ %   |
| Output power                                    | – Rated output power<br>– Max. output power   | 300W<br>up to 400W<br>(depending on temperature and duty cycle)   |
| Regulation                                      | – Input variation (Vin min. to Vin max.)<br>– Load variation (0 to 100 %)   | 0.2 % max.<br>0.5 % max.  |
| Temperature coefficient                         |   | $\pm 0.02$ %/K typ.   |
| Start up time (constant resistive load)         |   | 140 ms  |
| Minimum load                                    |   | not required  |
| Ripple and noise (20 MHz Bandwidth)             | 12 Vout models: 125 mVp-p max.<br>24 & 28 Vout models: 250 mVp-p max.<br>48 Vout models: 350 mVp-p max.   |   |
| Transient response (25% load step change)       |   | 250 $\mu$ s typ.  |
| Over voltage protection                         |   | at 125 - 140 % of Vout nom. (Latch mode)  |
| Over current protection (constant current mode) |   | at 105 - 120 % of rated lout max.   |
| Short circuit protection                        |   | continuous, automatic recovery  |
| Capacitive load                                 |   | infinite  |
| Power sharing                                   | – Max. output power of 2 pcs. paralleled<br>– Max. output power of 3 pcs. paralleled<br>– Load share accuracy<br>– For further information refere to application note | 540 W<br>810 W<br>10 % max.<br><a href="http://www.tracopower.com/overview/teq300wir">www.tracopower.com/overview/teq300wir</a> |

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

## General Specifications

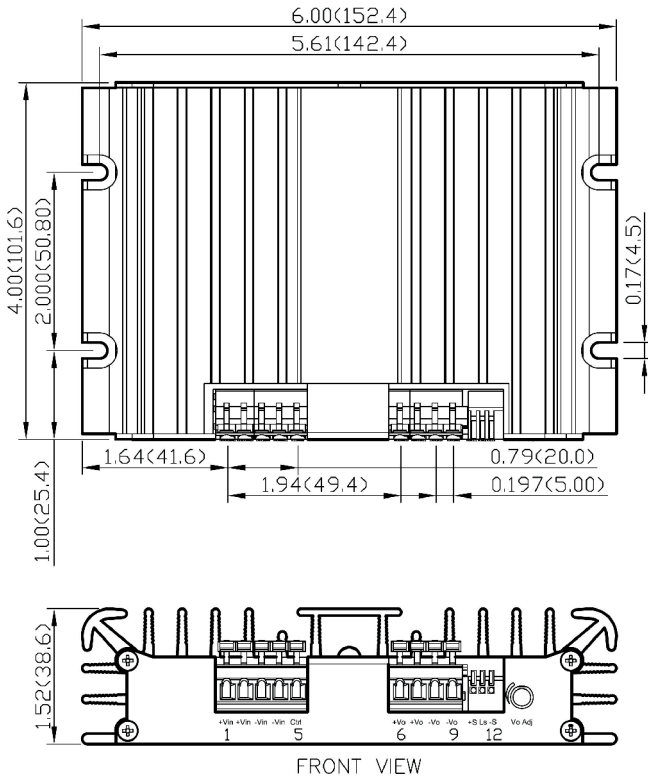
|  |   |   |
|--|---|---|
| Temperature ranges   | – Operating (natural convection: 20 LFM, 0.1 m/s)<br>– Storage temperature  | –40°C to +80°C<br>–40°C to +105°C   |
| Thermal impedance (mounted on metal plate 19"x5.25"x0.063")          |   | 1.1 K/W   |
| Derating   |   | 2.2 %/K above 60°C  |
| Over temperature protection  |   | at 105°C typ.   |
| Humidity (non condensing)  |   | 5 - 95 % rel H max.   |
| Mechanical shock   |   | acc. EN61373, MIL-STD-810F  |
| Thermal shock  |   | acc. MIL-STD-810F   |
| Vibration  |   | 20 - 2000Hz, 7.6grms, 3 axes (total 3 hours)  |
| Isolation voltage (60 s)   | – Input/Output to Case<br>– Input to Output   | 1'500 VAC<br>3'000 VAC  |
| Isolation capacitance (input to output)                              |   | 14'000 pF typ.  |
| Isolation resistance (input to output)                               |   | >1 GOhm   |
| Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign) |   | 149'000 h   |
| Altitude during operation  |   | 3000 m max.   |
| Switching frequency  | 48 Vin models:<br>110 Vin models:   | 225 kHz typ. (PWM)<br>200 kHz typ. (PWM)  |
| Safety standards & approvals   | – CB test certificate<br>– UL online certification E188913, OQGQ2<br>– CSA certificate of compliance<br>– Railway immunity<br>– Certification documents | IEC/EN 62368-1, IEC/EN 60950-1<br>UL 60950-1<br>UL 508<br>EN 50155<br><a href="http://www.tracopower.com/overview/teq300wir">www.tracopower.com/overview/teq300wir</a>  |
| Remote On/Off  | – Positive logic<br><br>– Off idle current:   | On: 3 to 12 VDC or open circuit<br>Off: 0 to 1.2 VDC or short circuit 3 & 4 with 5<br>4 mA  |
| Environmental compliance   | – Reach<br>– RoHS<br>– Flamability identified acc. EN 45545-2   | <a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a><br>RoHS directive 2011/65/EU<br><a href="http://www.tracopower.com/info/en45545-declaration.pdf">www.tracopower.com/info/en45545-declaration.pdf</a> |

## Physical Specifications

|                  |                           |
|------------------|---------------------------|
| Casing material  | aluminium                 |
| Potting material | silicone (UL94 V-0 rated) |
| Weight           | 900 g (31.74 oz)          |

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

### Outline Dimensions



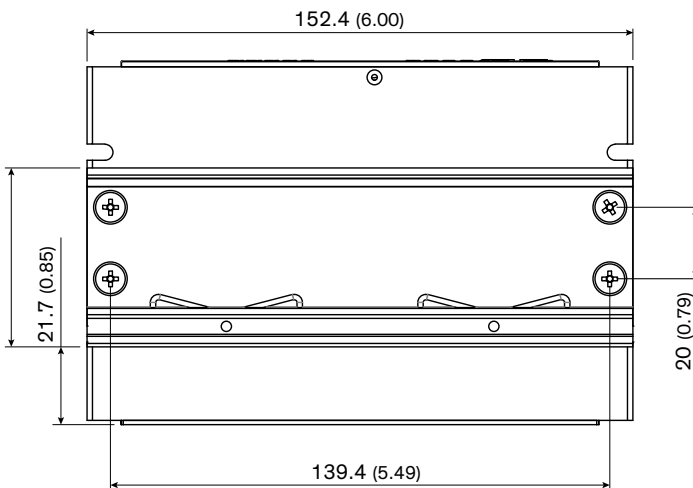
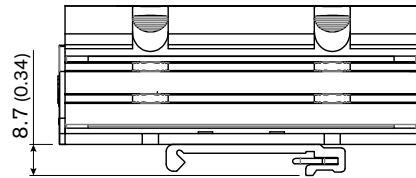
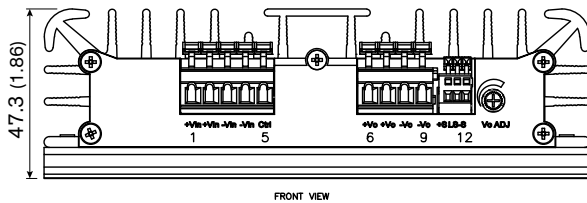
### Terminal connection

| Terminal | Pin Function   | Recommended Wire |
|----------|----------------|------------------|
| 1, 2     | +Vin           | 12–16 AWG        |
| 3, 4     | –Vin (GND)     | 12–16 AWG        |
| 5        | On/Off Ctrl    | 12–28 AWG        |
| 6, 7     | +Vout          | 12–16 AWG        |
| 8, 9     | –Vout          | 12–16 AWG        |
| 10       | +Sense*        | 20–28 AWG        |
| 11       | LS (Loadshare) | 20–28 AWG        |
| 12       | –Sense*        | 20–28 AWG        |

\* Sense line to be connected to the output either at the module or at the load under regard of polarity.  
– Wire size shall be selected to withstand the peak current (I<sub>out</sub> max. + Current limitation)

Dimensions in [Inch], ( ) = mm  
Tolerances: x.xx ±0.5 (±0.02)

### DIN-Rail clip:

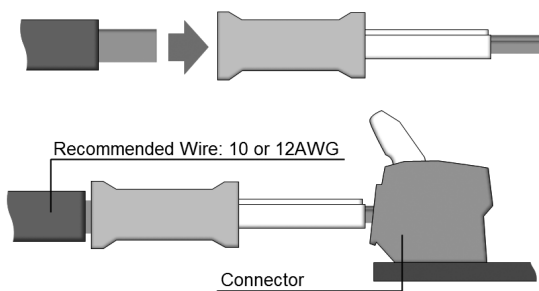
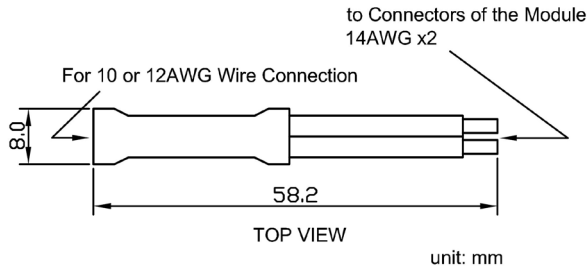


Order Code: **TEQ-MK2**

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

**Current Line Splitter**

each 48 Vin module has 2 bypacked splitters included



The current rating of the terminal block is 15 A/pole. It's recommended to use 2 poles in parallel if the peak output current can exceed 15 A.

Table for Input voltage vs. Input terminal specifications:

| Output power                   | Input voltage | Input terminal |
|--------------------------------|---------------|----------------|
| <b>300 W</b><br><b>CV mode</b> | ≥ 23 Vin      | 1 pole         |
|                                | < 23 Vin      | 2 poles        |
| <b>400 W</b><br><b>CC mode</b> | ≥ 32 Vin      | 1 pole         |
|                                | < 32 Vin      | 2 poles        |

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