

- 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> (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> (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. 110 Vin models: 25 mA typ.
Surge voltage (1 s max.)	48 Vin models: 100 V max. 110 Vin models: 185 V max.
Start-up voltage	48 Vin models: 18 VDC (or lower) 110 Vin models: 43 VDC (or lower)
Under voltage shut down	48 Vin models: 16.8 VDC (or lower) 110 Vin models: 36.0 VDC (or lower)
External fuse (required)	48 Vin models: 25 A (fast acting) 110 Vin models: 12 A (fast acting)
Input filter	Common mode choke and Pi type
EMC emissions	– Conducted and radiated input suppression EN 55032, EN 55011 class A (internal filter)
EMC immunity	– ESD (electrostatic discharge) EN 61000-4-2, air $\pm 8$ kV, contact $\pm 6$ kV, perf. criteria A – Radiated immunity EN 61000-4-3, 20 V/m, perf. criteria A – Fast transient / surge EN 61000-4-4, $\pm 2$ kV, perf. criteria A (without external input capacitor) EN 55024: EN 61000-4-5, $\pm 1$ kV perf. criteria A EN 50155: EN 61000-4-5, $\pm 2$ kV perf. criteria A – Conducted immunity EN 61000-4-6, 10 Vrms, perf. criteria A – Power frequency magnetic field 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 – Max. output power	300W up to 400W (depending on temperature and duty cycle)
Regulation	– Input variation (Vin min. to Vin max.) – Load variation (0 to 100 %)	0.2 % max. 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. 24 & 28 Vout models: 250 mVp-p max. 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 – Max. output power of 3 pcs. paralleled – Load share accuracy – For further information refere to application note	540 W 810 W 10 % max. <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

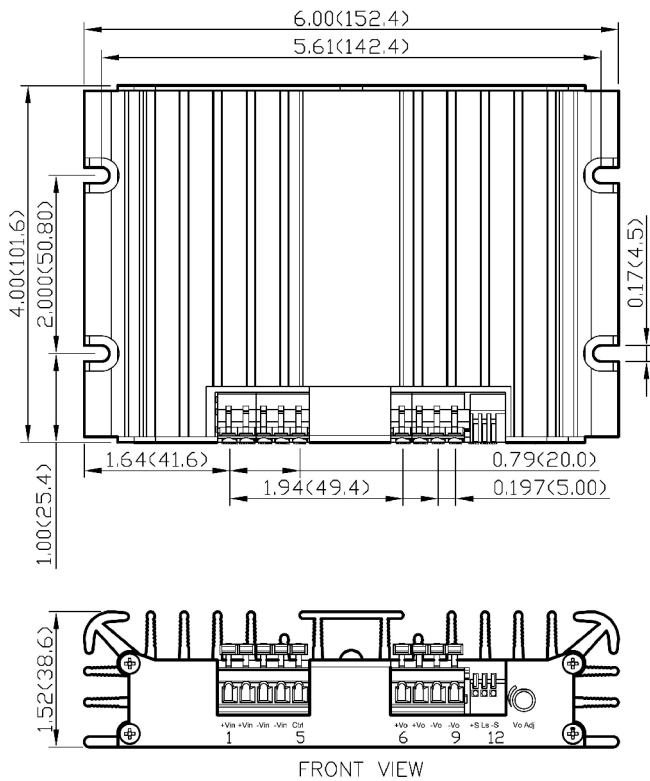
Temperature ranges	– Operating (natural convection: 20 LFM, 0.1 m/s) – Storage temperature	–40°C to +80°C –40°C to +105°C
Thermal impedance (mounted on metal plate 19"x5.25"x0.063")		1.1 K/W
Derating		2.2 %/K above 60°C
Over temperature protection		at 105°C typ.
Humidity (non condensing)		5 - 95 % rel 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 – Input to Output	1'500 VAC 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: 110 Vin models:	225 kHz typ. (PWM) 200 kHz typ. (PWM)
Safety standards & approvals	– CB test certificate – UL online certification E188913, OQGQ2 – CSA certificate of compliance – Railway immunity – Certification documents	IEC/EN 62368-1, IEC/EN 60950-1 UL 60950-1 UL 508 EN 50155 <a href="http://www.tracopower.com/overview/teq300wir">www.tracopower.com/overview/teq300wir</a>
Remote On/Off	– Positive logic  – Off idle current:	On: 3 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit 3 & 4 with 5 4 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>

## Physical Specifications

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

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### Outline Dimensions

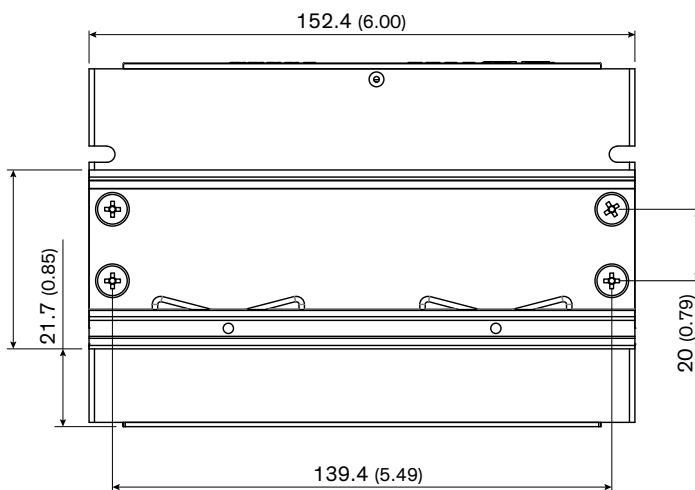
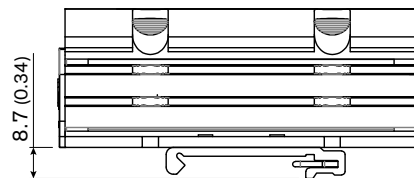
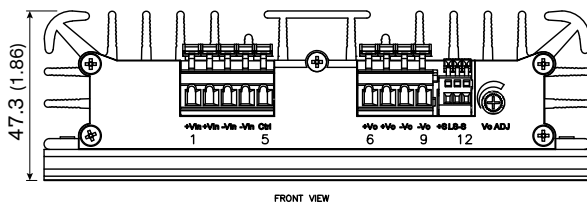


Terminal connection		
Terminal	Pin Function	Recommended Wire
1, 2	+Vin	12-16 AWG
3, 4	-Vin (GND)	12-16 AWG
5	On/Off Ctrl	12-28 AWG
6, 7	+Vout	12-16 AWG
8, 9	-Vout	12-16 AWG
10	+Sense*	20-28 AWG
11	LS (Loadshare)	20-28 AWG
12	-Sense*	20-28 AWG

\* 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:

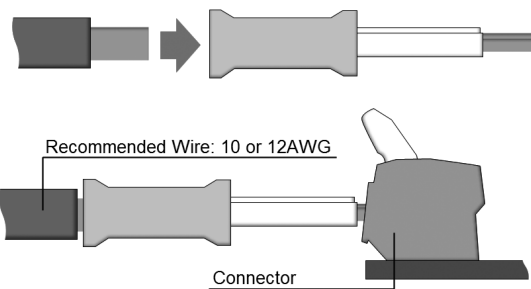
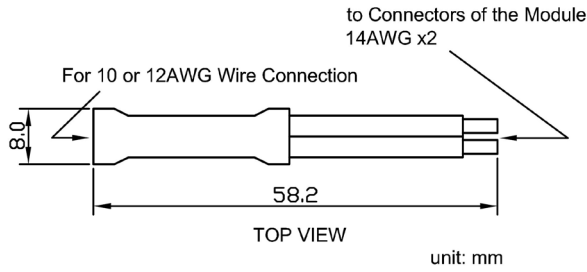


Order Code: **TEQ-MK2**

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**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> <b>CV mode</b>	≥ 23 Vin	1 pole
	< 23 Vin	2 poles
<b>400 W</b> <b>CC mode</b>	≥ 32 Vin	1 pole
	< 32 Vin	2 poles