

- High power block with excellent thermal convection
- Operating temperature -40°C to +80°C
- 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 55022, class A
- Under voltage lock-out circuit



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 +55°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 makes these converters also an interesting solution for battery operated systems.

Models

Order Code	Input Voltage Range	Output Voltage nom. (adjustable)	Output Current max.	Efficiency typ.
TEQ 300-4812WIR	18 - 75 VDC (48 VDC nom.)	12 VDC (9.6 - 14.4 VDC)	25'000 mA	89 %
TEQ 300-4815WIR		24 VDC (19.2 - 28.8 VDC)	12'500 mA	92 %
TEQ 300-4816WIR		28 VDC (22.4 - 33.6 VDC)	10'800 mA	91 %
TEQ 300-4818WIR		48 VDC (38.4 - 57.6 VDC)	6'300 mA	92 %
TEQ 300-7212WIR	43 - 160 VDC (110 VDC nom.)	12 VDC (9.6 - 14.4 VDC)	25'000 mA	89 %
TEQ 300-7215WIR		24 VDC (19.2 - 28.8 VDC)	12'500 mA	91 %
TEQ 300-7216WIR		28 VDC (22.4 - 33.6 VDC)	10'800 mA	91 %
TEQ 300-7218WIR		48 VDC (38.4 - 57.6 VDC)	6'300 mA	92 %

Options

TEQ-MK2	- Optional DIN-Rail Mounting Kit: www.tracopower.com/products/teq-mk2.pdf
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Note - Max. Power up to 400 W (depending on temperature and duty cycle)

Input Specifications

Input Current	- At no load	48 Vin models: 30 mA typ. 110 Vin models: 20 mA typ.
Surge Voltage		48 Vin models: 100 VDC max. (1 s max.) 110 Vin models: 185 VDC max. (1 s max.)
Under Voltage Lockout		48 Vin models: 15.6 VDC min. / 16 VDC typ. / 16.8 VDC max. 110 Vin models: 33 VDC min. / 34.5 VDC typ. / 36 VDC max.
Recommended Input Fuse		48 Vin models: 25'000 mA (fast acting) 110 Vin models: 12'000 mA (fast acting) (The need of an external fuse has to be assessed in the final application.)
Input Filter		Internal Common Mode Choke + Pi-Type

Output Specifications

Output Voltage Adjustment		±20% (By trim potentiometer) Output power must not exceed rated power!
Voltage Set Accuracy		±1% max.
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (0 - 100%)	0.2% max. 0.5% max.
Ripple and Noise (20 MHz Bandwidth)		12 Vout models: 100 mVp-p typ. 24 Vout models: 200 mVp-p typ. 28 Vout models: 200 mVp-p typ. 48 Vout models: 300 mVp-p typ. 12 Vout models: 125 mVp-p max. 24 Vout models: 250 mVp-p max. 28 Vout models: 250 mVp-p max. 48 Vout models: 350 mVp-p max.
Capacitive Load		Infinite
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Start-up Time		140 ms typ.
Short Circuit Protection		Automatic recovery
Overload Protection		Constant Current Mode
Output Current Limitation		105 - 115% of Iout max.
Overvoltage Protection		125 - 140% of Vout nom.
Transient Response	- Response Time	250 µs typ. (25% Load Step)
Load Share Function	- Refer to application note	www.tracopower.com/overview/teq300wir
Load Share Accuracy		10%

Safety Specifications

Safety Standards	- IT / Multimedia Equipment - Industrial Control Equipment - Railway Applications - Certification Documents	EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1 UL 508 EN 50155 www.tracopower.com/overview/teq300wir
Pollution Degree		PD 2
Over Voltage Category		OVC II

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

EMC Specifications

EMI Emissions		EN 50121-4 (Railway Application Signalling)
- Conducted Emissions		EN 55011 class A (internal filter)
		EN 55032 class A (internal filter)
- Radiated Emissions		EN 55011 class A (internal filter)
		EN 55032 class A (internal filter)
EMS Immunity		EN 50155 (Railway Applications)
		EN 50121-3-2 (EMC for Rolling Stock)
		EN 55024 (IT Equipment)
- Electrostatic Discharge	Air:	EN 61000-4-2, ± 8 kV, perf. criteria A
	Contact:	EN 61000-4-2, ± 6 kV, perf. criteria A
- RF Electromagnetic Field		EN 61000-4-3, 20 V/m, perf. criteria A
- EFT (Burst) / Surge		EN 61000-4-4, ± 2 kV, perf. criteria A
		EN 61000-4-5, ± 1 kV, perf. criteria A
		EN 61000-4-5, ± 2 kV, perf. criteria A
- Conducted RF Disturbances		EN 61000-4-6, 10 Vrms, perf. criteria A
- PF Magnetic Field	Continuous:	EN 61000-4-8, 100 A/m, perf. criteria A

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges		-40°C to +80°C
- Operating Temperature		+55°C max. (stand-alone)
- Approved Ambient Temp.		+60°C max. (on 19"x5.25"x0.063" FE base plate) (for compliance with 62368-1)
		+105°C max.
- Case Temperature		-40°C to +105°C
- Storage Temperature		
Power Derating		Depending on model
- High Temperature		See application note: www.tracopower.com/overview/teq300wir
Over Temperature Protection Switch Off		100°C min. / 105°C typ. / 115°C max. (Automatic recovery)
Cooling System		Natural convection (20 LFM)
Sense Function		10% max. of Vout nom.
Remote Control		On: 3.0 to 12 VDC or open circuit
- Voltage Controlled Remote		Off: 0 to 1.2 VDC or short circuit
		Refers to 'Remote' and '-Vin' Pin
- Off Idle Input Current		10 mA max.
- Remote Pin Input Current		-0.5 to 1.0 mA
Altitude During Operation		5'000 m max.
Switching Frequency		225 kHz typ. (PWM) ($\pm 10\%$, 48 VDC models)
		200 kHz typ. (PWM) ($\pm 20\%$, 110 VDC model)
Insulation System		Reinforced Insulation
Working Voltage (rated)		236 VAC
Isolation Test Voltage		3'000 VAC
- Input to Output, 60 s		1'500 VAC
- Input to Case, 60 s		1'500 VAC
- Output to Case, 60 s		
Isolation Resistance		1'000 M Ω min.
- Input to Output, 500 VDC		
Isolation Capacitance		14'000 pF typ.
- Input to Output, 100 kHz, 1 V		
Reliability		149'000 h (MIL-HDBK-217F, ground benign)
- Calculated MTBF		
Environment		MIL-STD-810F
- Vibration		EN 61373
		7.6 g, 3 axis, 60 min, 20-2000 Hz
- Mechanical Shock		MIL-STD-810F
		EN 61373
- Thermal Shock		MIL-STD-810F
		EN 50155
Housing Material		Aluminum
Potting Material		Silicone (UL 94 V-0 rated)

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

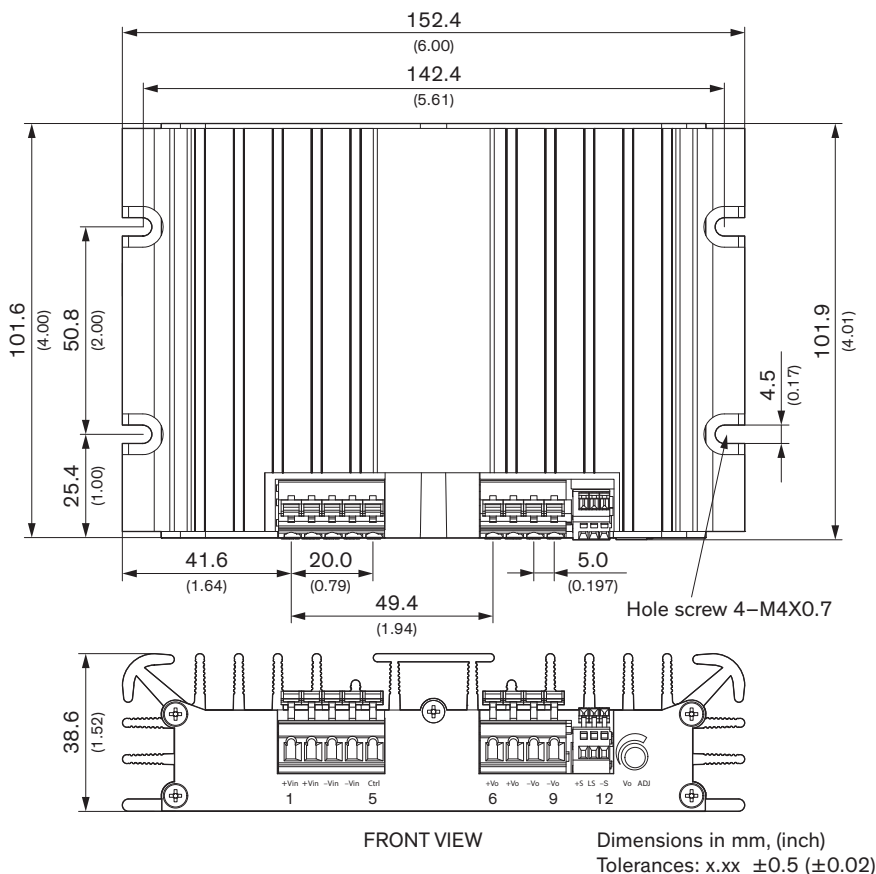
Housing Type	Metal Case
Mounting Type	Chassis Mount
Connection Type	Spring Clamps
Weight	900 g
Thermal Impedance	- Case to Ambient 1.2 K/W typ. (stand-alone) 1.1 K/W typ. (mounted on 19" x 5.25" x " 0.063" iron base plate)
Environmental Compliance	- REACH Declaration www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant - RoHS Declaration www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.) - Flammability (EN 45545-2) www.tracopower.com/info/en45545-declaration.pdf

Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/teq300wir

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 - 16 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_{out} max. + Current limitation).