

## Features

- ◆ High power block with excellent thermal convection
- ◆ Operating temperature -40°C to +85° without derating
- ◆ Increased shock & vibration resistance
- ◆ Ultra wide 4:1 input voltage range
- ◆ EN 50155 approval for railway applications
- ◆ Excellent efficiency up to 90%
- ◆ Input filter meet EN 55022, class A
- ◆ I/O isolation 2250 VDC
- ◆ Under voltage lock-out circuit
- ◆ Soft start
- ◆ Input protection filter



The TEQ-100WIR 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 +85°C with natural convection cooling without power derating and up to +95°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 100-2412WIR	<b>9 – 36 VDC</b> (24 VDC nominal)	12 VDC (9.6 – 13.2)	8.4 A	90 %
TEQ 100-2415WIR		24 VDC (19.2 – 26.4)	4.2 A	90 %
TEQ 100-2416WIR		28 VDC (22.4 – 30.8)	3.6 A	90 %
TEQ 100-2418WIR		48 VDC (38.4 – 52.8)	2.1 A	90 %
TEQ 100-4812WIR	<b>18 – 75 VDC</b> (48 VDC nominal)	12 VDC (9.6 – 13.2)	8.4 A	90 %
TEQ 100-4815WIR		24 VDC (19.2 – 26.4)	4.2 A	90 %
TEQ 100-4816WIR		28 VDC (22.4 – 30.8)	3.6 A	90 %
TEQ 100-4818WIR		48 VDC (38.4 – 52.8)	2.1 A	90 %
TEQ 100-7212WIR	<b>43 – 160 VDC</b> (110 VDC nominal)	12 VDC (9.6 – 13.2)	8.4 A	89 %
TEQ 100-7215WIR		24 VDC (19.2 – 26.4)	4.2 A	90 %
TEQ 100-7216WIR		28 VDC (22.4 – 30.8)	3.6 A	90 %
TEQ 100-7218WIR		48 VDC (38.4 – 52.8)	2.1 A	90 %

### Input Specifications

Input current at no load	24 Vin models: 25 mA typ. 48 Vin models: 20 mA typ. 110 Vin models: 10 mA typ.
Start-up voltage	24 Vin models: 9.0 VDC (or lower) 48 Vin models: 18.0 VDC (or lower) 110 Vin models: 43.0 VDC (or lower)
Under voltage shut down (lock-out circuit)	24 Vin models: 7.3 VDC min. 48 Vin models: 15.8 VDC min. 110 Vin models: 34.5 VDC min
Surge voltage (1 sec. max.)	24 Vin models: 50 V max. 48 Vin models: 100 V max. 110 Vin models: 185 V max.
Conducted noise	EN 55022 class A
EMC immunity	EN 50121-3-2 EN 61000-4-2, air $\pm 8$ kV, contact $\pm 6$ kV, perf. criteria A EN 61000-4-3, 20 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A EN 61000-4-5, $\pm 1$ kV, perf. criteria A EN 61000-4-6, 10 Vrms, perf. criteria A EN 50155
	– ESD (electrostatic discharge)
	– Radiated immunity
	– Fast transient / surge
	– Conducted immunity
	– Railway immunity
Reverse voltage protection	parallel diode

### Output Specifications

Voltage set accuracy	$\pm 1$ %
Output voltage adjustment	+10 % / -20 %
Regulation	– Input variation Vin min. to Vin max. 0.1 % max. – Load variation (0 – 100 %) 0.1 % max.
Temperature coefficient	$\pm 0.02$ %/K
Minimum load	not required
Remote sense	up to Vout nom. +10%
Ripple and noise (20 MHz Bandwidth)	12 VDC models: 125 mVpk-pk max. 24 & 28 VDC models: 250 mVpk-pk max. 48 VDC models: 350 mVpk-pk max.

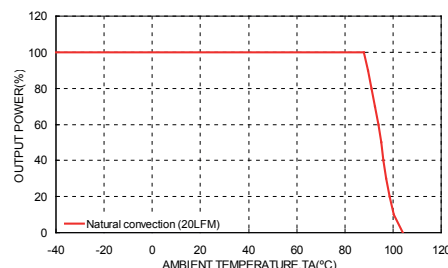
### Output Specifications

Start up time (nominal Vin and constant resistive load)	75 ms typ. (at power On or remote On)
Transient response (25% load step change)	250 $\mu$ s max.
Output current limitation	at 120 -150 % of Iout max.
Over voltage protection	at 115 -130 % of Vout nom.
Short circuit protection	hiccup, automatic recovery
Capacitive load	12 VDC models: 7'000 $\mu$ F max. 24 VDC models: 1'750 $\mu$ F max. 28 VDC models: 1'280 $\mu$ F max. 48 VDC models: 430 $\mu$ F max.

### General Specifications

Temperature ranges	- Operating - Storage	-40°C to +105°C (up to +85°C w/o derating) -40°C to +105°C
Thermal impedance		1.45°C/W
Derating		See derating graph below
Over temperature protection		at 120°C
Thermal shock		acc. MIL-STD-810F
Shock & Vibration		acc. EN61373, MIL-STD-810F
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217F, at +25°C, ground benign)		TBD
Isolation voltage (60sec.)	- Input/Output - Input/Case	2'250 VDC (basic insulation) 1'600 VDC
Isolation resistance	- Input/Output (500 VDC)	>1 GOhm min.
Switching frequency	24 & 48 Vin models: 110 Vin models:	250 kHz typ. (puls width modulation) 300 kHz typ. (puls width modulation)
Safety standards	- CB test certificate - CSA certificate of compliance - UL online certification E188913, QGGQ2 - Railway immunity - Flamability identified acc. - Certification documents	IEC/EN 60950-1 (ed. 2), EN 60950-1:2006/ A11:2009/A1:2010/A12:2011/A2:2013 UL 508, CSA C22.2 No. 107.1-01 UL 60950-1 2nd ed. +Am1 EN50155 EN45545-2 <a href="http://www.tracopower.com/overview/teq100wir">www.tracopower.com/overview/teq100wir</a>
Remote On/Off	- positive logic (standard) - negative logic (option -N) - Off idle current:	- On: 3 to 12 VDC or open circuit - Off: 0 to 1.2 VDC or short circuit terminal 1 and 4 - On: 0 to 1.2 VDC or short circuit terminal 1 and 4 - Off: 3 to 12 VDC or open circuit 3 mA
Environmental compliance	- Reach document - RoHS	<a href="http://www.tracopower.com/overview/teq100wir">www.tracopower.com/overview/teq100wir</a> RoHS directive 2011/65/EU

### Temperature derating



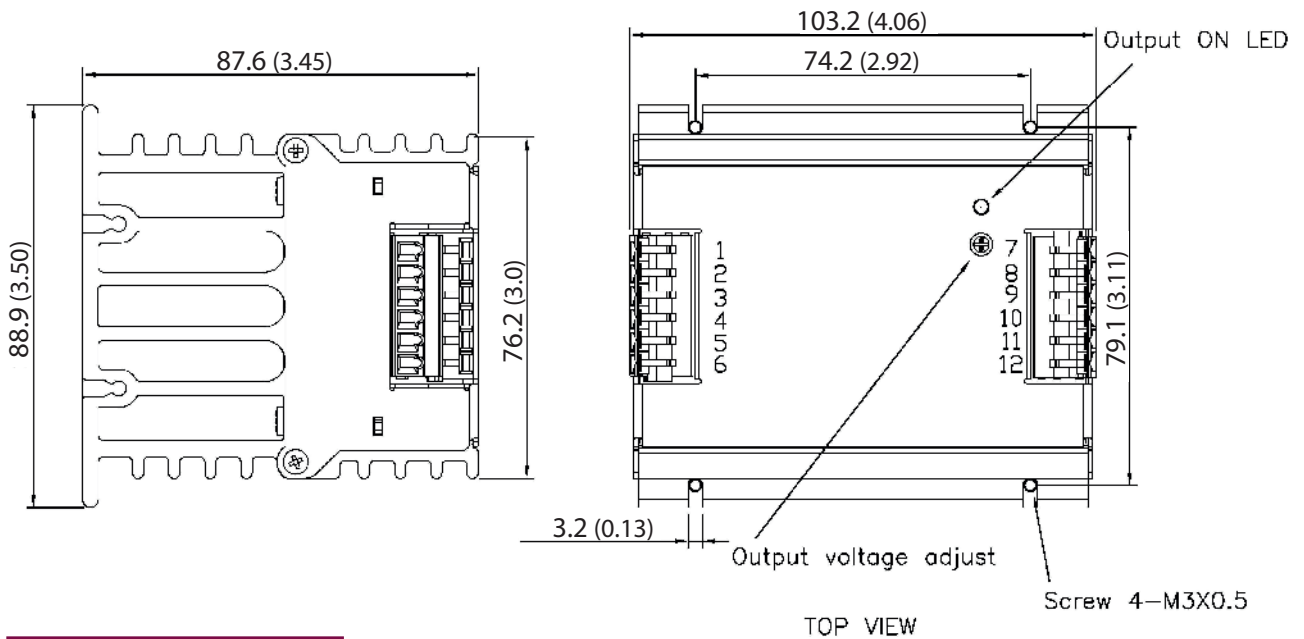
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

### Physical Specifications

Casing material	aluminium
Potting material	silicone (UL94V-0 rated)
Base material	FR4
Weight	800 g (28.22oz)

### Dimensions

TEQ 100WIR module:



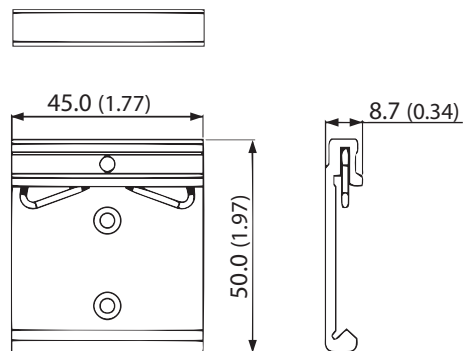
Weight: 800 g (28.22 oz)

Connection	
Terminal	
1	- Vin
2	- Vin
3	NC
4	Ctrl (Remote On/Off)
5	+ Vin
6	+ Vin
7	- Vout
8	- Vout
9	- Sense*
10	+ Sense*
11	+ Vout
12	+ Vout

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

DIN-Rail clip:

Order code: TEP-MK1



Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at [www.tracopower.com](http://www.tracopower.com)