

### Features

- ◆ High power block with excellent thermal convection
- ◆ Operating temperature -40°C to +75° 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 insulation 2250 VDC
- ◆ Under voltage lock-out circuit
- ◆ Soft start
- ◆ Input protection filter



The TEQ-160WIR 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 +75°C with natural convection cooling without power derating and up to +90°C with 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.
TEQ 160-4812WIR	<b>18 – 75 VDC</b> (48 VDC nominal)	12 VDC (9.6 – 13.2)	13 A	90 %
TEQ 160-4815WIR		24 VDC (19.2 – 26.4)	6.5 A	90 %
TEQ 160-4816WIR		28 VDC (22.4 – 30.8)	5.5 A	90 %
TEQ 160-4818WIR		48 VDC (38.4 – 52.8)	3.2 A	90 %
TEQ 160-7212WIR	<b>43 – 160 VDC</b> (110 VDC nominal)	12 VDC (9.6 – 13.2)	15 A	89 %
TEQ 160-7215WIR		24 VDC (19.2 – 26.4)	7.5 A	89 %
TEQ 160-7216WIR		28 VDC (22.4 – 30.8)	6.5 A	89 %
TEQ 160-7218WIR		48 VDC (38.4 – 52.8)	3.8 A	89 %

### Input Specifications

Input current at no load	48 Vin models: 20 mA typ. 110 Vin models: 10 mA typ.
Start-up voltage	48 Vin models: 18.0 VDC (or lower) 110 Vin models: 43.0 VDC (or lower)
Under voltage shut down (lock-out circuit)	48 Vin models: 15.8 VDC min. 110 Vin models: 34.5 VDC min
Surge voltage (1 sec. 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
– ESD (electrostatic discharge)	EN 61000-4-2, air ±8 kV, contact ±6 kV, perf. criteria A
– Radiated immunity	EN 61000-4-3, 20 V/m, perf. criteria A
– Fast transient / 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 immunity	EN 61000-4-6, 10 Vrms, perf. criteria A
– Railway immunity	EN 50155
Reverse voltage protection	parallel diode

### Output Specifications

Voltage set accuracy	±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	±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.

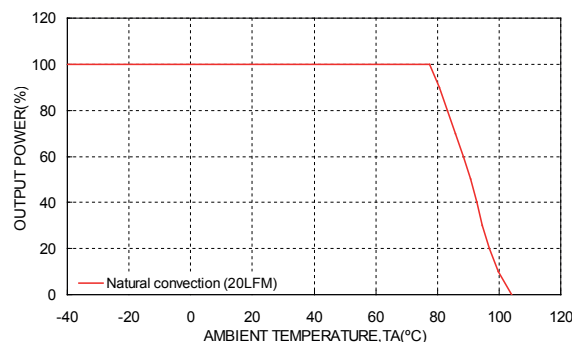
**Output Specifications**

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 µs 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 (48Vin / 110Vin)	12 VDC models: 10'800 / 12'500 µF max. 24 VDC models: 2'700 / 3'100 µF max. 28 VDC models: 1'900 / 2'300 µF max. 48 VDC models: 660 / 790 µF max.

**General Specifications**

Temperature ranges	- Operating - Storage	-40°C to +105°C (up to +75°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 (60 sec.)	- Input/Output - Input/Case	2'250 VDC (basic insulation) 1'600 VDC
Isolation resistance	- Input/Output (500 VDC)	>1 GOhm min.
Switching frequency		250 kHz typ. (puls width modulation)
Safety standards	- CB test certificate  - CSA certificate of compliance - UL online certification E188913, QQGQ2 - 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/teq160wir">www.tracopower.com/overview/teq160wir</a>
Remote On/Off	- positive logic (standard)  - Off idle current:	- On: 3 to 12 VDC or open circuit - Off: 0 to 1.2 VDC or short circuit terminal 1 and 4 3 mA
Environmental compliance	- Reach document - RoHS	<a href="http://www.tracopower.com/overview/teq160wir">www.tracopower.com/overview/teq160wir</a> RoHS directive 2011/65/EU

Temperature derating



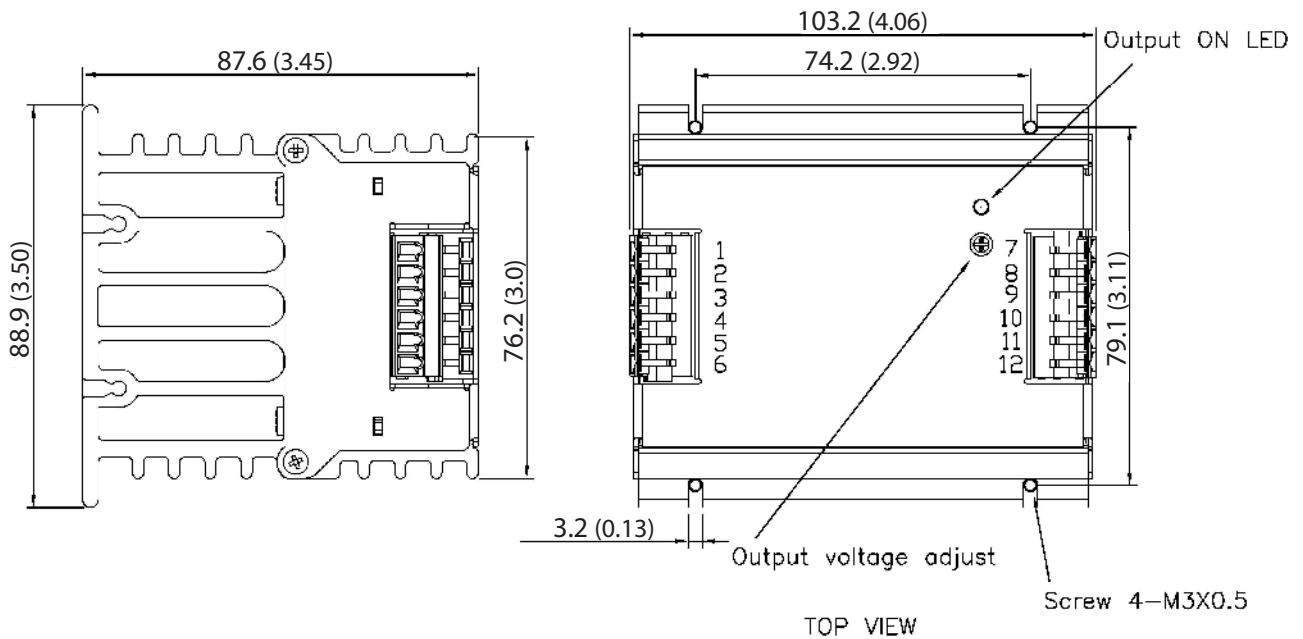
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

**Physical Specifications**

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

**Dimensions**

TEQ 160WIR module:

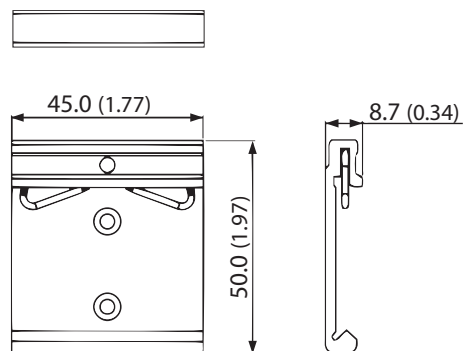


Weight: 800 g (28.22oz)

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)



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;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- 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

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.