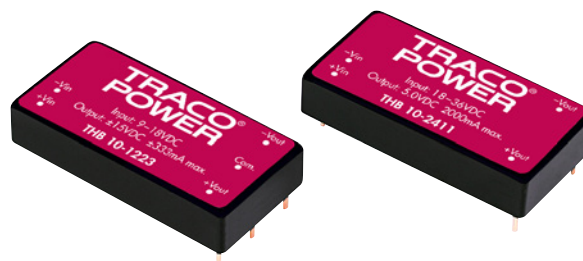


## Features

- ◆ Supplementary and reinforced insulation
- ◆ I/O isolation 4000 VACrms rated for 300 Vrms working voltage
- ◆ 2 x MOOP Medical safety according to AAMI/ANSI ES 60601-1:2005(R) and IEC/EN 60601-1 3rd edition
- ◆ Industrial safety to UL/IEC/EN 60950-1
- ◆ Wide 2:1 input voltage ranges
- ◆ Extended operating temperature range -40°C to 75°C max.
- ◆ Input filter meets EN55022, class A
- ◆ Continuous short-circuit protection
- ◆ High reliability
- ◆ 3-year product warranty



The THB 10 series is a range of high performance DC/DC converter modules with double reinforced insulation system. It complies to latest medical safety standard IEC 60950-1 3rd edition for MOOP (Means of Operator Protection). The product comes in a 2"x1" industry standard package. All 12 models features wide 2:1 input voltage range and fully regulated output voltage. The converters offer an economical solution for demanding applications in industrial and medical instrumentation.

## Models

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
THB 10-1211	9 - 18 VDC (12 VDC nominal)	5.1 VDC	1600 mA	75 %
THB 10-1212		12.0 VDC	835 mA	80 %
THB 10-1222		±12.0 VDC	±417 mA	80 %
THB 10-1223		±15.0 VDC	±333 mA	81 %
THB 10-2411	18 - 36 VDC (24 VDC nominal)	5.1 VDC	2000 mA	76 %
THB 10-2412		12.0 VDC	835 mA	81 %
THB 10-2422		±12.0 VDC	±417 mA	81 %
THB 10-2423		±15.0 VDC	±333 mA	82 %
THB 10-4811	36 - 75 VDC (48 VDC nominal)	5.1 VDC	2000 mA	76 %
THB 10-4812		12.0 VDC	835 mA	81 %
THB 10-4822		±12.0 VDC	±417 mA	81 %
THB 10-4823		±15.0 VDC	±333 mA	82 %

### Input Specifications

Input current at no load	12 V models: 30 mA typ. 24 V models: 20 mA typ. 48 V models: 10 mA typ.
Start up voltage / under voltage shutdown (hysteresis) long term operation with under-voltage may cause damage	12 Vin models: 9.0 / 8.5 VDC (or lower) 24 Vin models: 18 / 16 VDC (or lower) 48 Vin models: 36 / 34 VDC (or lower)
Recommended external input fuse (slow blow)	12 Vin models: 3 A 24 Vin models: 1.5 A 48 Vin models: 0.75 A
Surge voltage (1 sec. max.)	12 Vin models: 25 VDC max. 24 Vin models: 50 VDC max. 48 Vin models: 100 VDC max.
Input filter	EN 55022 class A and FCC, level A

### Output Specifications

Voltage set accuracy	±1.0 %
Regulation	– Input variation Vin min. to Vin max. 0.5 % max. – Load variation 15 – 100 %: single output models: 1.0 % max. dual output models: 2.0 % max. balanced load
Minimum load	no minimum load required
Ripple and noise (20 MHz bandwidth)	5 VDC models: 100 mVp-p max. other models: 150 mVp-p max.
Transient Response (25% load step change)	600 µs max.
Current limitation	>120 % Iout max.
Short circuit protection	continuous
Capacitive load	5 VDC output models: 1000 µF max. 12 VDC output models: 470 µF max. dual output models: 220 µF max. (each output)

### Isolation / Safety Standards

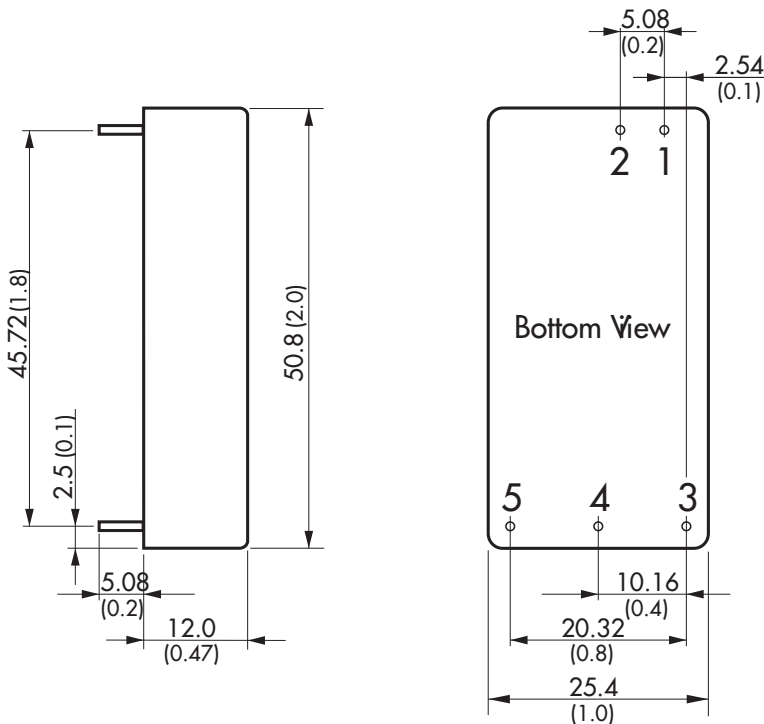
Isolation test voltage (flash tested 1 sec.)	6000 Vpk
I/O isolation voltage (50Hz, 60sec.)	4000 VAC
Leakage current (at 240VAC, 60Hz)	10 µA
I/O isolation capacity (at 100KHz, 1V)	60 pF typ.
I/O isolation resistance (at 500VDC)	>10 Gohm
Safety standards	UL 60950-1, ES 60601-1 (pending) IEC/EN 60950-1, IEC/EN 60601-1 3rd Edition, ANSI/AAMI ES60601-1 and CAN/CSA-C22.2 No. 60601-1, Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance  – Certification documents <a href="http://www.tracopower.com/overview/thb10">www.tracopower.com/overview/thb10</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 - Case - Storage	-40°C to +75°C +95°C max. -50°C to +125°C
Derating		2.5 %/K above 55°C
Humidity (non condensing)		95 % rel H max.
Altitude during operation		4000 m
Temperature coefficient		±0.02 %/K typ.
Reliability, calculated MTBF (MIL-HDBK-217F at +25°C, ground benign)		>1'000'000 h
Switching frequency		150 kHz typ. (puls width modulation)
Casing material		non conductive plastic (UL 94V-0-rated)
Pin Material		copper alloy with gold plate over nickel subplate
Weight		24.5 g (0.86 oz)
Soldering temperature		max. 260°C / 10 sec.

**Outline Dimensions**



Pin-Out		
Pin	Single	Dual
1	+Vin (Vcc)	+Vin (Vcc)
2	-Vin(GND)	-Vin(GND)
3	+Vout	+Vout
4	No pin	Common
5	-Vout	-Vout

Dimensions in [mm], ( ) = Inch  
 Pin diameter  $\varnothing$  1.0  $\pm$ 0.05 (0.04  $\pm$ 0.002)  
 Tolerances  $\pm$ 0.25 ( $\pm$ 0.01)  
 Pin pitch tolerances  $\pm$ 0.13 ( $\pm$ 0.005)

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