

# MODEL TR1 TRU-TRAC™ LINEAR SOLUTION ENCODER



## FEATURES

Encoder and Measuring Wheel Solution Integrated Into One Compact Unit  
 Spring Loaded Torsion Arm Makes Wheel Pressure Adjustments a Snap  
 Easily Installed in a Vertical, Horizontal or Upside Down Orientation  
 Operates Over a Variety of Surfaces at Speeds up to 3000 Feet per Minute  
 Integrated Module Simplifies Your System Design, Reducing Cost

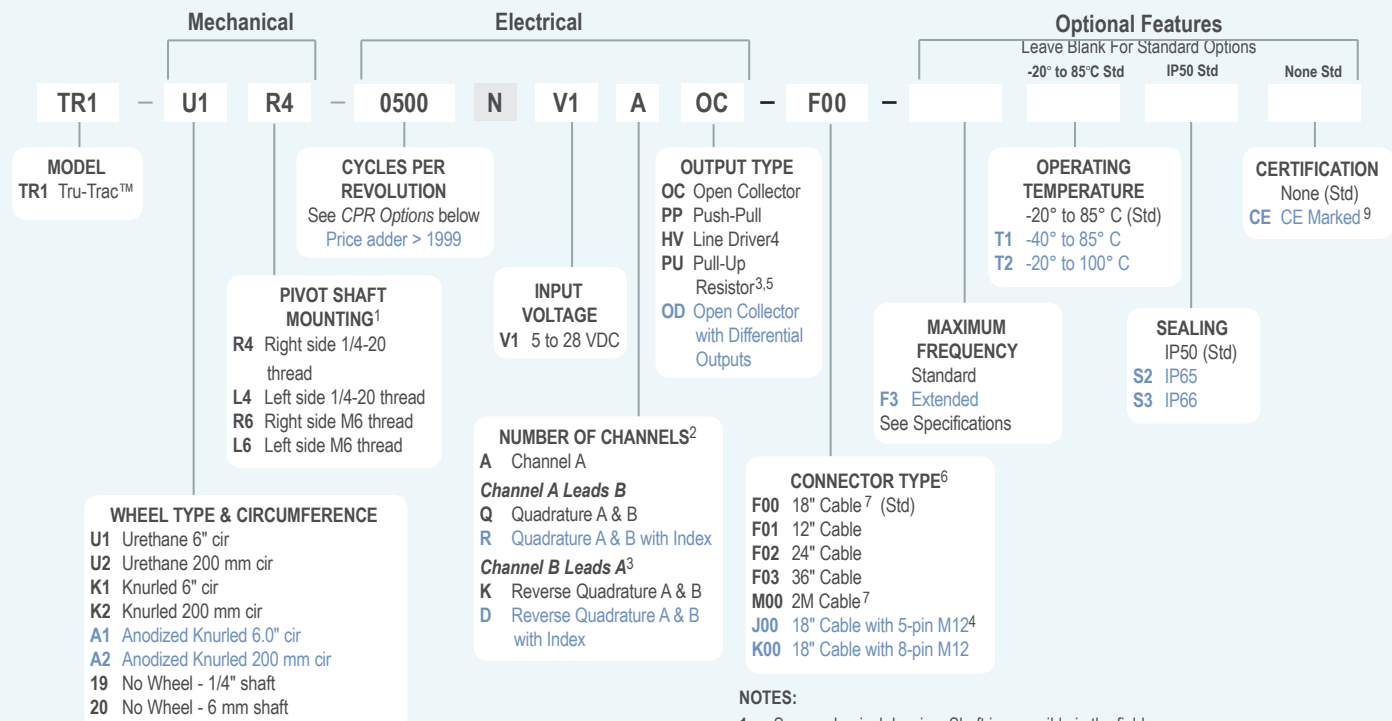
With operating speeds up to 3000 feet per minute and a wide variety of configuration options, the TR1 Tru-Trac™ is the versatile solution for tracking velocity, position, or distance over a wide variety of surfaces in almost any application. An integrated encoder and spring-loaded measuring wheel assembly available in one unit, the TR1 is both easy-to-use and compact. Plus, the TR1 housing is a durable, conductive composite material that will eliminate static build up. Its spring-loaded torsion arm offers adjustable torsion load, allowing the TR1 to be mounted in almost any orientation – even upside-down. And the threaded shaft on the pivot axis is easily reversible in the field, providing mounting access from either side. The TR1 is your solution for a compact, linear encoder.

## COMMON APPLICATIONS

Web Tension Control, Paper Monitoring, Glue Dispensing, Linear Material Monitoring, Conveyor Systems, Printing, Labeling, Document Handling

## MODEL TR1 TRU-TRAC™ ORDERING GUIDE

Blue type indicates price adder options. Not all configuration combinations may be available. Contact Customer Service for details.



### MODEL TR1 TRU-TRAC™ CPR OPTIONS

0001 thru 0189*	0198	0200	0250	0256	0300	0315	0360
0400	0500	0512	0580	0600	0750	0800	1024
1200	1250	1500	1800	2000	2048	2500	2540 3000
3600	4000	4096	5000	6000	7200	8192	10,000

\*Contact Customer Service for Availability

New CPR values are periodically added to those listed. Contact Customer Service to determine all currently available values. Special disk resolutions are available upon request and may be subject to a one-time NRE fee.

### NOTES:

- See mechanical drawing. Shaft is reversible in the field.
- Contact Customer Service for non-standard index gating or phase relationship options.
- Reverse Quadrature not available with Pull-Up Resistor Output Type.
- Line Driver output not available with 5-pin M12 connector. Additional cable lengths available. Please consult Customer Service.
- With Input Voltage above 16 VDC, operating temperature is limited to 85° C.
- For mating connectors, cables, and cordsets see [Accessories](#) at encoder.com. For Connector Pin Configuration Diagrams, see Technical Information or see [Connector Pin Configuration Diagrams](#) at encoder.com.
- For non-standard English cable lengths enter 'F' plus cable length expressed in feet. Example: F06 = 6 feet of cable. Frequency above 300 kHz standard cable lengths only.
- For non-standard metric cable lengths enter 'M' plus cable length expressed in meters. Example: M06 = 6 meters of cable.
- Please refer to Technical Bulletin [TB100: When to Choose the CE Mark](#) at encoder.com.

## MODEL TR1 TRU-TRAC™ SPECIFICATIONS

### Electrical

Input Voltage..... 4.75 to 28 VDC max for temperatures up to 85° C  
4.75 to 24 VDC for temperatures between 85° C and 100° C

Input Current ..... 100 mA max (65 mA typical) with no output load

Output Format..... Incremental – Two square waves in quadrature with channel A leading B for clockwise shaft rotation, as viewed from the shaft side. See *Waveform Diagram*.

Output Types..... Open Collector – 20 mA max per channel  
Push-Pull – 20 mA max per channel  
Pull-Up – Open Collector with 2.2K ohm internal resistor, 20 mA max per channel  
Line Driver – 20 mA max per channel (Meets RS 422 at 5 VDC supply)

Index..... Once per revolution.  
0001 to 0189 CPR: Ungated  
0190 to 10,000 CPR: Gated to output A  
See *Waveform Diagram*.

Max. Frequency ..... Standard Frequency Response is  
200 kHz for CPR 1 to 2540  
500 kHz for CPR 2541 to 5000  
1 MHz for CPR 5001 to 10,000  
Extended Frequency Response (optional) is 300 kHz for CPR 2000, 2048, 2500, and 2540

Electrical Protection .. Reverse voltage and output short circuit protected. NOTE: Sustained reverse voltage may result in permanent damage.

Noise Immunity..... Tested to BS EN61000-6-2;  
BS EN50081-2; BS EN61000-4-2;  
BS EN61000-4-3; BS EN61000-4-6;  
BS EN500811

Quadrature..... 67.5° electrical or better is typical,  
Edge Separation 54° electrical minimum at temperatures > 99° C

Waveform Symmetry... 180°(±18°) electrical (single channel encoder)  
Accuracy..... Within 0.017° mechanical or 1 arc-minute from true position (for CPR > 189)

### Mechanical

Max Shaft Speed..... 6000 RPM. Higher speeds may be achievable;- contact Customer Service.

Shaft Material ..... Stainless Steel

Shaft Tolerance ..... +0.0000/-0.0004" [+0.000/-0.010 mm]

Radial Shaft Load .... 5 lb max. Rated load of 2 to 3 lb for bearing life of  $1.2 \times 10^{10}$  revolutions

Axial Shaft Load ..... 5 lb max. Rated load of 2 to 3 lb for bearing life of  $1.2 \times 10^{10}$  revolutions

Starting Torque ..... IP50 0.05 oz-in  
IP65 0.4 oz-in  
IP66 0.8 oz-in

Housing ..... Stainless steel fibers in a high temperature nylon composite

Wheel Width..... 0.25"

Weight..... 5 oz typical

### Environmental

Storage Temp ..... -25° to 85° C

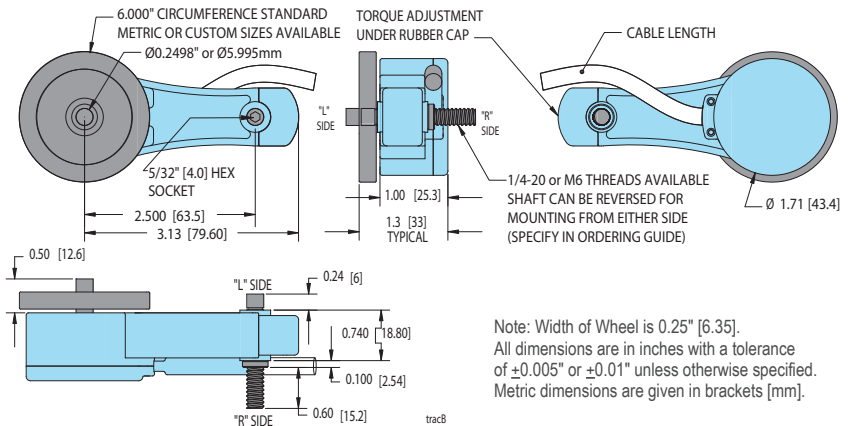
Humidity..... 98% RH non-condensing

Vibration..... 10 g @ 58 to 500 Hz

Shock..... 80 g @ 11 ms duration

Sealing..... IP50 standard; IP65 or IP66 available

## MODEL TR1 TRU-TRAC™



### WIRING TABLE

For EPC-supplied mating cables, refer to wiring table provided with cable.  
Trim back and insulate unused wires.

Function	Gland Cable† Wire Color	5-pin M12**	8-pin M12**
Com	Black	3	7
+VDC	White	1	2
A	Brown	4	1
A'	Yellow	--	3
B	Red	2	4
B'	Green	--	5
Z	Orange	5	6
Z'	Blue	--	8
Shield	Bare*	--	--

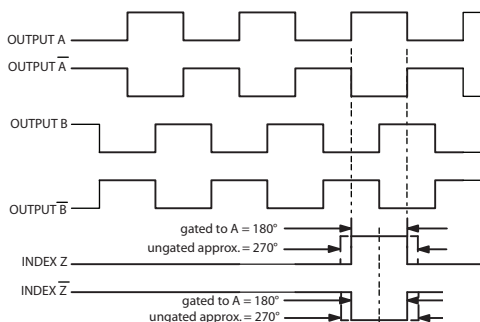
\*CE Option: Cable shield (bare wire) is connected to internal case.

†Standard cable is 24 AWG conductors with foil and braid shield.

\*\*CE Option: Use cable cordset with shield connected to M12 connector coupling nut.

### WAVEFORM DIAGRAM

Incremental Signals



CLOCKWISE ROTATION AS VIEWED FROM THE SHAFT SIDE.

NOTE: ALL DEGREE REFERENCES ARE ELECTRICAL DEGREES.  
WAVEFORM SHOWN WITH OPTIONAL COMPLEMENTARY SIGNALS  
A̅, B̅, Z̅ FOR HV OUTPUT ONLY.