

MODEL TR1 – 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

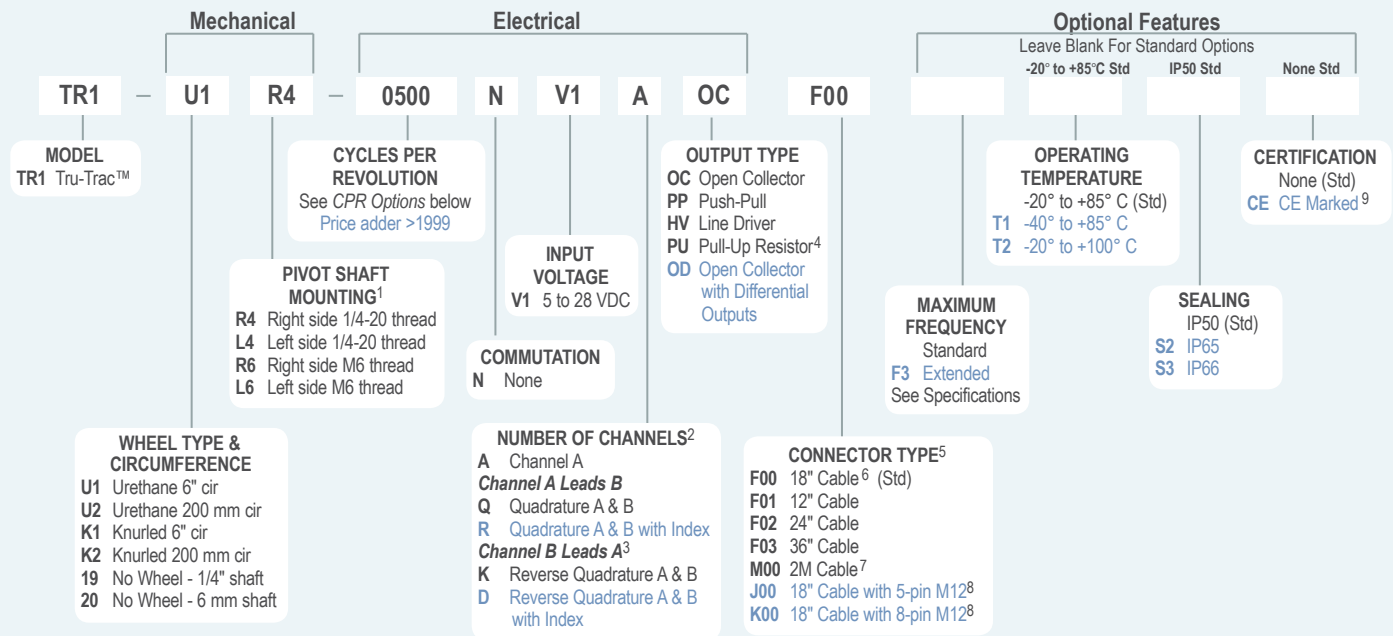
The TR1 Tru-Trac™ is a versatile solution for tracking velocity, position, or distance over a wide variety of surfaces in almost any application. An integrated encoder and spring loaded measuring wheel assembly available in one, the TR1 is both easy-to-use and compact. Its spring-loaded torsion arm offers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

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	1000
1125	1200	1250	1500	1800	2000	2048	2500
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 PU output type.
- With Input Voltage above 16 VDC, operating temperature is limited to 85° C.
- For mating connectors, cables, and cordsets see Encoder Accessories on page 102 or visit www.encoder.com. For Pin Configuration Diagrams, see page 107 or visit www.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.
- 5-pin not available with Line Driver (HV) output. Additional cable lengths available. Please consult Customer Service.
- Please refer to **Technical Bulletin TB100: When to Choose the CE Option** at www.encoder.com.

MODEL TR1 TRU-TRAC™ SPECIFICATIONS

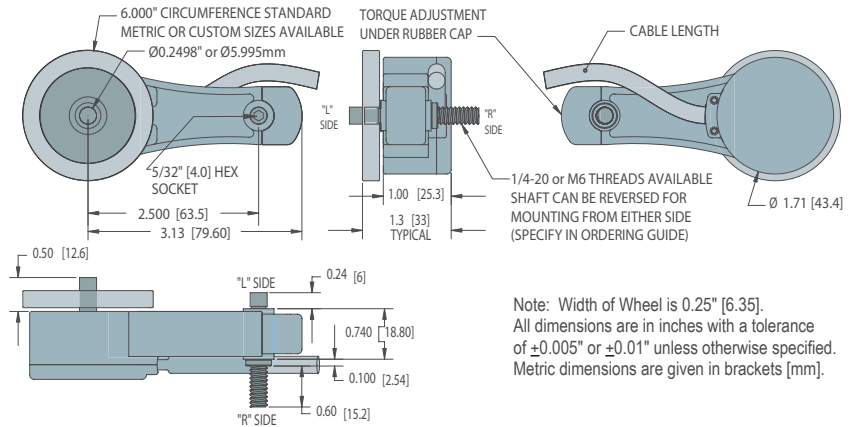
Electrical

Input Voltage.....	4.75 to 28 VDC max for temperatures up to 85° C 4.75 to 24 VDC for temperatures between 85° C to 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 wheel side. See <i>Waveform Diagram</i> .
Output Types.....	Open Collector- 20 mA max per channel Push-Pull- 20 mA max per channel Pull-Up- Open collector with 2.2K ohm Pull-Up Resistor- 20mA 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 <i>Waveform Diagram</i> .
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
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 x 10 ¹⁰ revolutions
Axial Shaft Load	5 lb max. Rated load of 2 to 3 lb for bearing life of 1.2 x 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™



MODEL TR1 TRU-TRAC™ APPLICATIONS



For linear applications the Tru-Trac™ can be mounted above or below the moving object, and the tension on the wheel adjusted for a wide range of applications such as packaging, conveyors, mail sorting, cut to length, labeling, gantries, etc.

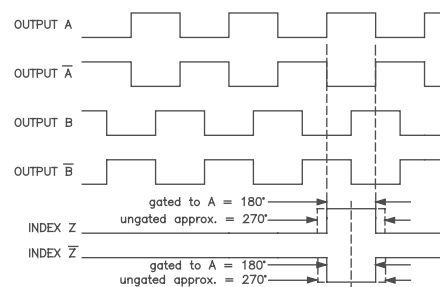


For rotational applications the Tru-Trac™ can be mounted in any orientation to monitor the position or velocity of many types of rotating equipment such as web tension control drums, rotary tables, printing, spooling, etc.



WAVEFORM DIAGRAM

Incremental Signals



NOTE: ALL DEGREE REFERENCES ARE ELECTRICAL DEGREES.
 WAVEFORM SHOWN WITH OPTIONAL COMPLEMENTARY SIGNALS
 A-bar, B-bar, Z-bar FOR HV OUTPUT ONLY.

WIRING TABLE

Function	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.

**Non-CE Option: Cable shield is connected to M12 connector body.

CE Option: Cable shield is connected to M12 connector body and internal case.

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