

MODEL TR3 TRU-TRAC™ - LINEAR MEASUREMENT SOLUTION



FEATURES

Integrated heavy duty encoder and measuring wheel in one
 Spring-loaded torsion arm for quick wheel pressure adjustments
 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 TR3 Heavy Duty Tru-Trac™ is an integrated, heavy duty encoder and spring loaded measuring wheel assembly all in one unit. Available in both single or optional dual-wheel format, the TR3 Heavy Duty Tru-Trac™ is a versatile solution for tracking velocity, position or distance over a wide variety of surfaces in many industrial applications. Its spring loaded torsion arm provides a simple-to-adjust torsion load, allowing the TR3 Heavy Duty Tru-Trac™ to be mounted in any orientation, even upside-down. The TR3 Heavy Duty Tru-Trac™ housing is an all metal work horse, specifically designed to take on your toughest application environments at operating speeds up to 3000 feet per minute. Just one look and it's easy to see the TR3 Heavy Duty Tru-Trac™ is the ideal solution for countless applications.

COMMON APPLICATIONS

Lumber, Corrugated, Converting, Metal Roll Forming, Paper Monitoring, Glue Dispensing, Linear Material Monitoring, Conveyor Systems, Printing, Labeling, Mining, Construction

MODEL TR3 HEAVY DUTY TRU-TRAC™ ORDERING GUIDE

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

Mechanical			Electrical				Optional Features - Leave blank for standard options							
TR3	U3	A	0500	N	V1	A	OC	F00						
MODEL TR3 Tru-Trac™			CYCLES PER REVOLUTION See CPR Options below Price adder for >1999					OUTPUT TYPE OC Open Collector PP Push-Pull HV Line Driver ³ PU Pull-Up Resistor ^{2,4} OD Open Collector with Differential Outputs	CONNECTOR ORIENTATION (See drawing) Standard rear exit L1 60° from Standard L2 120° from Standard L3 180° from Standard L4 240° from Standard L5 300° from Standard	OPERATING TEMPERATURE -20° to 85° C (Std) T1 -40° to 85° C ⁹ T2 -20° to 100° C		SEALING IP50 (Std) S3 IP66 S4 IP67		
WHEEL CONFIGURATION A Single B Double		INPUT VOLTAGE V1 5 to 28 VDC												
WHEEL TYPE & CIRCUMFERENCE U3 Urethane 12" cir U5 Urethane 300 mm cir K3 Knurled 12" cir K5 Knurled 300 mm cir 25 No wheel - 3/8" (0.375") shaft A3 Hard Anodized Knurled 12" cir A5 Hard Anodized Knurled 300 mm cir		NUMBER OF CHANNELS¹ A Channel A Channel A Leads B Q Quadrature A & B R Quadrature A & B with Index Channel B Leads A ³ K Reverse Quadrature A & B D Reverse Quadrature A & B with Index		CONNECTOR TYPE⁵ F00 18" Cable ⁶ (Std) F01 12" Cable F02 24" Cable F03 36" Cable M00 2M Cable ⁷ SMW 6-pin MS ⁸ SMY 7-pin MS ⁸ SMX 10-pin MS ⁸ SMJ 5-pin M12 ^{3,8} SMK 8-pin M12 ³		MAXIMUM FREQUENCY Standard F3 Extended See Specifications		CERTIFICATION None (Std) CE CE Marked ¹⁰						

NOTES:

- 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.
- 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 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.
- Body Mount connector options only available with connector orientation L1 thru L5.
- Rated to -40° C during encoder operation. Storage and startup below -25° C not recommended.
- Please refer to Technical Bulletin TB-100: When to Choose the CE Mark at encoder.com.

Model TR3 CPR Options

0001 thru 0189*	0198	0200	0250	0256	0300	0315
0360	0400	0500	0512	0580	0600	0750
1000	1024	1200	1250	1500	1800	2000
2500	2540	3000	3600	4000	4096	5000
7200	8192	10,000				6000

*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.

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MODEL TR3 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 shaft side. (For units with dual wheels, orient the encoder so that the label is readable). See Waveform Diagrams.
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. 1 to 400 CPR: Ungated 401 to 10,000 CPR: Gated to output A See Waveform Diagrams.
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).

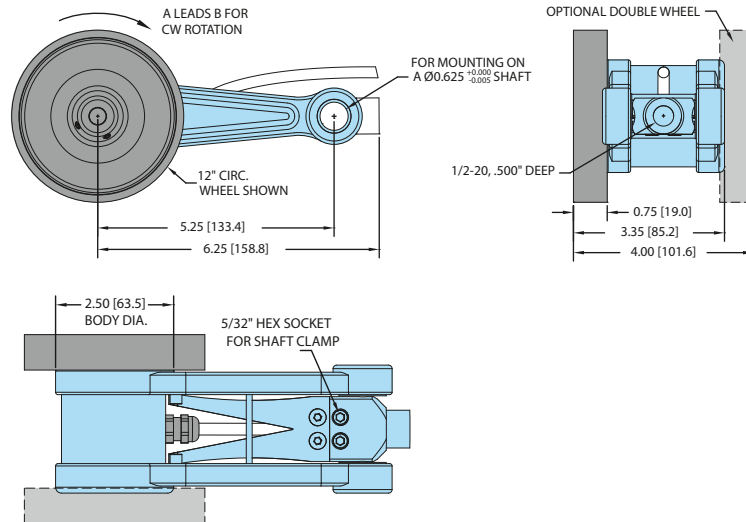
Mechanical

Max Linear Speed.....	3000 FPM not to exceed a maximum shaft speed of 6000 RPM.
Shaft Material	Stainless Steel
Radial Shaft Load.....	Up to 10 lb max. Controlled by spring torsion feature
Starting Torque	1.0 oz-in typical with IP50 seal 2.5 oz-in typical with IP66 seal and single wheel 4.0 oz-in typical with IP66 seal and dual wheel 7.0 oz-in typical with IP67 seal and single wheel 14.0 oz-in typical with IP67 seal and dual wheel
Housing.....	Powder coated aluminum
Wheel Width.....	3/4" standard
Weight.....	2.5 lb typical with single wheel 3.0 lb typical with dual wheel

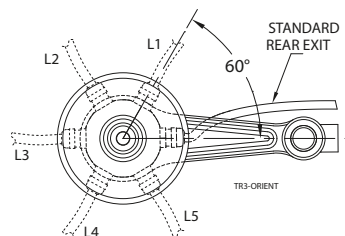
Environmental

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; IP66 or IP67 optional

MODEL TR3 HEAVY DUTY TRU-TRAC™

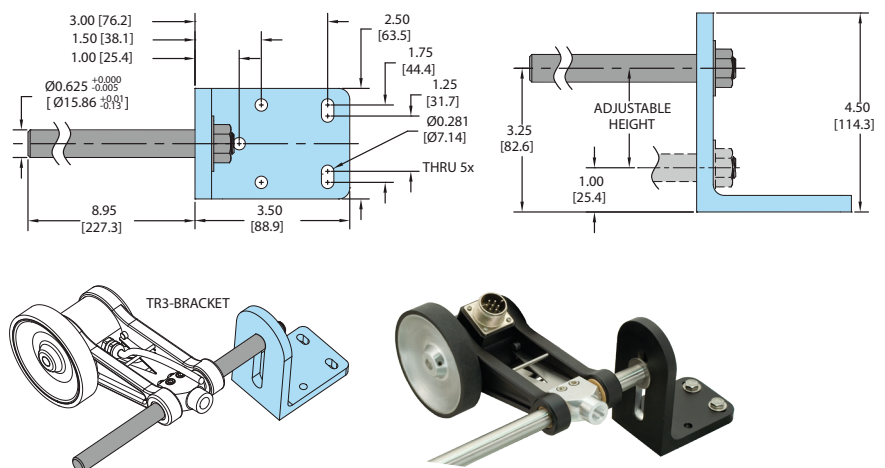


MODEL TR3 CONNECTOR ORIENTATION



MODEL TR3 MOUNTING BRACKET

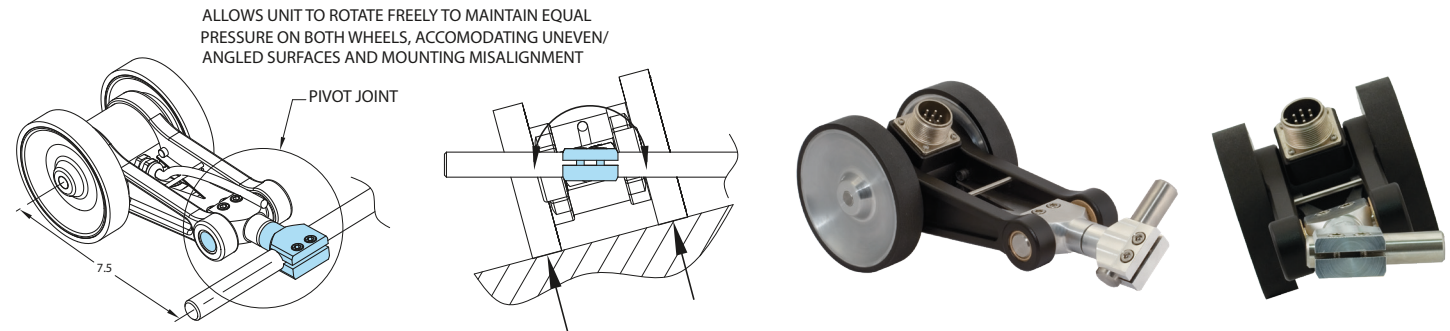
Optional accessory **Mounting Bracket stock #176389-01** for TR3 Heavy Duty Tru-Trac™ can be ordered separately



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MODEL TR3 DOUBLE WHEEL PIVOT

Optional accessory **Double Pivot Kit stock #176391-01** for TR3 Heavy Duty Tru-Trac™ can be ordered separately



WIRING TABLE

For EPC-supplied mating cables, refer to wiring table provided with cable.

Trim back all unused wires.

Function	Gland Cable [†] Wire Color	5-pin M12**	8-pin M12**	10-pin MS	7-pin MS HV, OD	7-pin MS PU, PP, OC	6-pin MS PU, PP, OC
Com	Black	3	7	F	F	F	A, F
+VDC	White	1	2	D	D	D	B
A	Brown	4	1	A	A	A	D
A'	Yellow	--	3	H	C	--	--
B	Red	2	4	B	B	B	E
B'	Green	--	5	I	E	--	--
Z	Orange	5	6	C	--	C	C
Z'	Blue	--	8	J	--	--	--
Case	--	--	--	G	G	G	--
Shield	Bare*	--	--	--	--	--	--

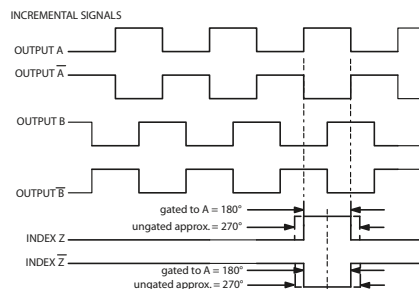
*CE Option: Cable shield (bare wire) is connected to internal case.

[†]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 MOUNTING FACE

NOTE: ALL DEGREE REFERENCES ARE ELECTRICAL DEGREES. Waveform shown with optional complementary signals \bar{A} , \bar{B} , \bar{Z} for HV output only.