

Medium Duty Incremental Encoders

Features

The medium duty encoder offers the greatest flexibility of choice in a very high-quality encoder, all for a very low price.

Features:

- Small body with 50 mm diameter and 35 mm depth
- Splash proof (IP65 rating)
- 8 mm standard shaft or 8 mm hollow shaft
- Incremental resolution available from 3 pulses per revolution to 2500 pulses per revolution
- Line driver or Totem-pole output
- Up to 100 kHz response frequency



Standard shaft (TRD-N) model



Hollow shaft (TRD-NH) model

Note: Yellow shaded part numbers are non-stock. Availability may range from four to six weeks.

Incremental Medium Duty Standard Shaft Encoders (Totem-pole Output, TRD-Nxxx-RZVD)					
Part Number		Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-N3-RZVD		3	5-30 VDC	Totem-pole sink/source	50mm
TRD-N4-RZVD		4			
TRD-N5-RZVD		5			
TRD-N10-RZVD		10			
TRD-N30-RZVD		30			
TRD-N40-RZVD		40			
TRD-N50-RZVD		50			
TRD-N60-RZVD		60			
TRD-N100-RZVD		100			
TRD-N120-RZVD		120			
TRD-N200-RZVD		200			
TRD-N240-RZVD		240			
TRD-N250-RZVD		250			
TRD-N300-RZVD		300			
TRD-N360-RZVD		360			
TRD-N400-RZVD		400			
TRD-N480-RZVD		480			
TRD-N500-RZVD		500			
TRD-N600-RZVD		600			
TRD-N750-RZVD		750			
TRD-N1000-RZVD		1000			
TRD-N1024-RZVD		1024			
TRD-N1200-RZVD		1200			
TRD-N2000-RZVD		2000			
TRD-N2500-RZVD		2500			

Incremental Medium Duty Hollow Shaft Encoders (Totem-pole Output, TRD-NHxxx-RZVD)					
Part Number		Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-NH3-RZVD		3	5-30 VDC	Totem-pole sink/source	50mm
TRD-NH4-RZVD		4			
TRD-NH5-RZVD		5			
TRD-NH10-RZVD		10			
TRD-NH30-RZVD		30			
TRD-NH40-RZVD		40			
TRD-NH50-RZVD		50			
TRD-NH60-RZVD		60			
TRD-NH100-RZVD		100			
TRD-NH120-RZVD		120			
TRD-NH200-RZVD		200			
TRD-NH240-RZVD		240			
TRD-NH250-RZVD		250			
TRD-NH300-RZVD		300			
TRD-NH360-RZVD		360			
TRD-NH400-RZVD		400			
TRD-NH480-RZVD		480			
TRD-NH500-RZVD		500			
TRD-NH600-RZVD		600			
TRD-NH750-RZVD		750			
TRD-NH1000-RZVD		1000			
TRD-NH1200-RZVD		1200			
TRD-NH2000-RZVD		2000			
TRD-NH2500-RZVD		2500			

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Note: Yellow shaded part numbers are non-stock. Availability may range from four to six weeks.

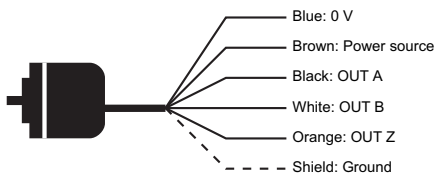
Incremental Medium Duty Standard Shaft Encoders (Line Driver Output, TRD-Nxxx-RZVWD)				
Part Number	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-N3-RZVWD	3	5VDC	Line driver (differential)	50mm
TRD-N4-RZVWD	4			
TRD-N5-RZVWD	5			
TRD-N10-RZVWD	10			
TRD-N30-RZVWD	30			
TRD-N40-RZVWD	40			
TRD-N50-RZVWD	50			
TRD-N60-RZVWD	60			
TRD-N100-RZVWD	100			
TRD-N120-RZVWD	120			
TRD-N200-RZVWD	200			
TRD-N240-RZVWD	240			
TRD-N250-RZVWD	250			
TRD-N300-RZVWD	300			
TRD-N360-RZVWD	360			
TRD-N400-RZVWD	400			
TRD-N480-RZVWD	480			
TRD-N500-RZVWD	500			
TRD-N600-RZVWD	600			
TRD-N750-RZVWD	750			
TRD-N1000-RZVWD	1000			
TRD-N1024-RZVWD	1024			
TRD-N1200-RZVWD	1200			
TRD-N2000-RZVWD	2000			
TRD-N2500-RZVWD	2500			

Incremental Medium Duty Hollow Shaft Encoders (Line Driver Output, TRDH-Nxxx-RZVWD)				
Part Number	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-NH3-RZVWD	3	5VDC	Line driver (differential)	50mm
TRD-NH4-RZVWD	4			
TRD-NH5-RZVWD	5			
TRD-NH10-RZVWD	10			
TRD-NH30-RZVWD	30			
TRD-NH40-RZVWD	40			
TRD-NH50-RZVWD	50			
TRD-NH60-RZVWD	60			
TRD-NH100-RZVWD	100			
TRD-NH120-RZVWD	120			
TRD-NH200-RZVWD	200			
TRD-NH240-RZVWD	240			
TRD-NH250-RZVWD	250			
TRD-NH300-RZVWD	300			
TRD-NH360-RZVWD	360			
TRD-NH400-RZVWD	400			
TRD-NH480-RZVWD	480			
TRD-NH500-RZVWD	500			
TRD-NH600-RZVWD	600			
TRD-NH750-RZVWD	750			
TRD-NH1000-RZVWD	1000			
TRD-NH1024-RZVWD	1024			
TRD-NH1200-RZVWD	1200			
TRD-NH2000-RZVWD	2000			
TRD-NH2500-RZVWD	2500			

Wiring diagrams

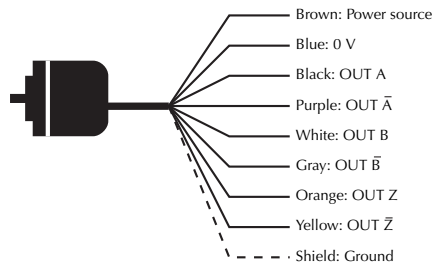
Totem-pole connections

Cable shield is not connected to the encoder body; enclosure is grounded through the 0V wire



Line driver connections

Cable shield is not connected to the encoder body; enclosure is grounded through the 0V wire



PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/ Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/ Lights

Process

Relays/ Timers

Comm.

TB's & Wiring

Power

Circuit Protection

Enclosures

Appendix

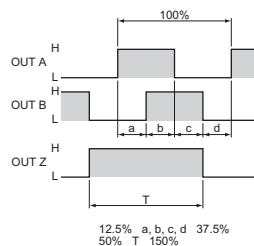
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Electrical Specifications				
Model		TRD-N/NHxxx-RZWD (Totem-pole)	TRD-N/NHxxx-RZVWD (Line Driver)	
Power Supply	Operating Voltage	4.75 - 30VDC*	+4.75 - 5.25VDC*	
	Allowable Ripple	3% rms max.	-	
	Current Consumption	60 mA max.		
Signal Waveform		Two-phase + home position		
Max. Response Frequency		100kHz max.		
Duty Ratio		50 ± 25% (square wave)		
Signal Width at Home Position		100 ± 50%		
Output	Rise/Fall Time	3µs max. (when cable length is 1m)	-	
	Output Type	Totem-pole	Line driver output (26C31 or equivalent)	
	Output Logic	Negative logic (active low)	Negative logic (active high)	
	Output Current	"H"	10mA max.	-
		"L"	30mA max.	-
	Output Voltage	"H"	[(Load power volt) - 2.5V]	-
		"L"	0.4V max.	-
Load Power Voltage	35 VDC max.		-	
* To be supplied by Class II source				
Mechanical Specifications				
Starting Torque	Max. 0.03 Nm (.0022 ft lbs)			
Max. Allowable Shaft Load	Radial: 50N (11.24 lbs) Axial: 30N (6.74 lbs)			
Max. Allowable Speed	5000 rpm (dust and splash proofed: continuous: 3,000 rpm, instantaneous: 5,000 rpm) (highest speed that can support the mechanical integrity of encoder)			
Wire Size	AWG24			
Weight	Approx. 250g (8.82 oz) with 2m cable			
Environmental Specifications				
Ambient Temperature	10 to 70°C; 14 to 158°F			
Storage Temperature	-25 to 85°C; -13 to 185°F			
Operating Humidity	35-85% RH			
Voltage Withstand	500VAC (50/60Hz) for one minute			
Insulation Resistance	50MΩ min. (excluding shield between power supply, signal cable and case)			
Vibration Resistance	Durable for one hour along three axes at 10 to 55 Hz with 0.75 mm amplitude (excluding shield between power supply, signal cable and case)			
Shock Resistance	11 ms with 490 m/s ² applied three times along three axes			
Protection	IP50: dust proof; IP65: dust and splash proof			

Channel timing chart

Output Signal Timing Chart - Totem Pole Models



The above waveforms apply to normal (clockwise) revolution viewed from the shaft. OUT Z phase is reversed on the RZL and RZWL models.

Accessories

Couplings

If you selected an encoder with a solid shaft, please select a coupling that fits your encoder. All couplings are in stock, ready to ship.

See page 20-16 for more information.

Mounting bracket

JT-035D metal mounting bracket can be used for all TRD-N/NH/NA encoders.

JT-035D



How to read the timing charts

Open Collector Models

Out A and Out B are 90 degrees out of phase. Like any quadrature encoder, four unique logic states are created internal to the encoder. This is based on the rising edge to rising edge (one cycle) on channel A or B that indicates that one set of bars on the internal encoder disk has passed by the optical sensor.

OUT Z is the absolute reference added to an incremental encoder and is also known as home position. It signifies a full rotation of the encoder disk.

Line Driver Models

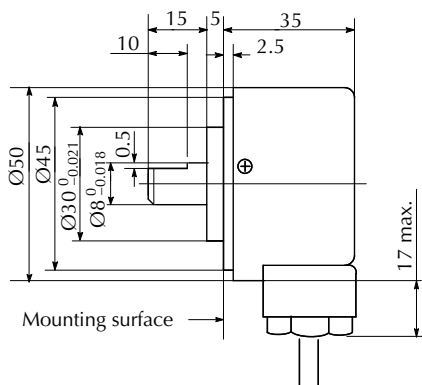
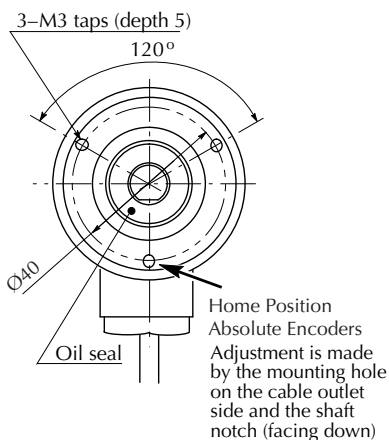
Channel A (OUT A and A-not) and Channel B (OUT B and B-not) are also 90 degrees out of phase on line driver encoders. OUT Z is the same as on open collector models, and is the absolute reference (home position). It signifies one full rotation of the encoder.

Medium Duty Absolute and Incremental

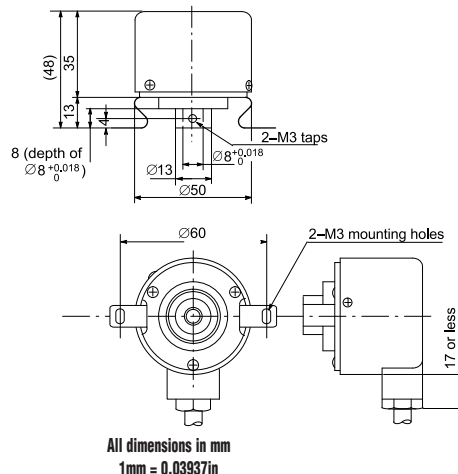
Dimensions

The following are the external dimensions of both incremental and absolute medium duty encoders and the optional mounting bracket.

Standard shaft incremental and absolute encoders (TRD-N, TRD-NA)



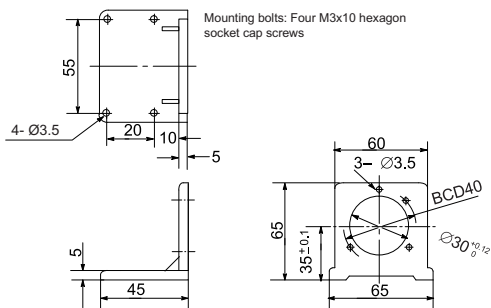
Hollow shaft incremental encoders only (TRD-NH)



Optional mounting bracket for all medium duty encoders



JT-035D



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