Light Duty Incremental Encoders

Features

A light-duty encoder is a cost-effective encoder for small applications and has the following features:

- Small body with 38 mm diameter and 30 mm depth
- Dust proof (IP40 rating)
- 6 mm standard shaft or 8 mm hollow shaft
- Resolution available from 100 pulses per revolution to 2500 pulses per revolution
- Open collector or line driver output
- Up to 200 kHz response frequency
- Two-meter cable, tinned ends

Standard shaft (TRD-S) model

Hollow shaft (TRD-SH) model

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

Light Duty Standard Shaft Incremental Encoders (NPN Open Collector and Line Driver models)

Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Diameter
TRD-S100-BD	<--->	100	12-24 VDC	NPN open collector	38mm
TRD-S200BD	<--->	200			
TRD-S250BD	<--->	250			
TRD-S300BD	<--->	300			
TRD-S360-BD	<--->	360			
TRD-S400BD	<--->	400			
TRD-S500-BD	<--->	500			
TRD-S600BD	<--->	600			
TRD-S800BD	<--->	800			
TRD-S1000-BD	<--->	1000			
TRD-S1024-BD	<--->	1024			
TRD-S1200BD	<--->	1200			
TRD-S2000BD	<--->	2000			
TRD-S2500-BD	<--->	2500			
TRD-S100-VD	<--->	100	5VDC	Line driver (differential)	
TRD-S200VD	<--->	200			
TRD-S250VD	<--->	250			
TRD-S300VD	<--->	300			
TRD-S360-VD	<--->	360			
TRD-S400VD	<--->	400			
TRD-S500-VD	<--->	500			
TRD-S600VD	<--->	600			
TRD-S800VD	<--->	800			
TRD-S1000-VD	<--->	1000			
TRD-S1024-VD	<--->	1024			
TRD-S1200VD	<--->	1200			
TRD-S2000VD	<--->	2000			
TRD-S2500-VD	<--->	2500			

Light Duty Hollow Shaft Incremental Encoders (NPN Open Collector and Line Driver models)

Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Diameter
TRD-SH100-BD	<--->	100	12-24 VDC	NPN open collector	38mm
TRD-SH200BD	<--->	200			
TRD-SH250BD	<--->	250			
TRD-SH300BD	<--->	300			
TRD-SH360-BD	<--->	360			
TRD-SH400BD	<--->	400			
TRD-SH500-BD	<--->	500			
TRD-SH600BD	<--->	600			
TRD-SH800BD	<--->	800			
TRD-SH1000-BD	<--->	1000			
TRD-SH1024BD	<--->	1024			
TRD-SH1200BD	<--->	1200			
TRD-SH2000BD	<--->	2000			
TRD-SH2500-BD	<--->	2500			
TRD-SH100-VD	<--->	100	5VDC	Line driver (differential)	
TRD-SH200VD	<--->	200			
TRD-SH250VD	<--->	250			
TRD-SH300VD	<--->	300			
TRD-SH360-VD	<--->	360			
TRD-SH400VD	<--->	400			
TRD-SH500-VD	<--->	500			
TRD-SH600VD	<--->	600			
TRD-SH800VD	<--->	800			
TRD-SH1000-VD	<--->	1000			
TRD-SH1024VD	<--->	1024			
TRD-SH1200VD	<--->	1200			
TRD-SH2000VD	<--->	2000			
TRD-SH2500-VD	<--->	2500			

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Specifications

Electrical Specifications				
Model			***TRD-Sxxxx-BD TRD-SHxxxxBD (open collector)***	***TRD-Sxxxx-VD TRD-SHxxxxVD (line driver)***
Power Supply	***Operating Voltage***		10.8 - 26.4VDC*	+4.75 - 5.25VDC*
	Allowable Ripple		3% max.	-
	Current Consumption		50 mA max.	
Signal Waveform			Two-phase + home position	
Max. Response Frequency			200kHz	
Duty Ratio			50 ± 25%	
Phase Difference Width			25 ± 12.5%	
Signal Width at Home Position			100 ± 50%	
Output	***Rise/Fall Time***		1µs max. (when cable length is 1m)	-
	Output Type		NPN open collector output, sinking	Line driver output (26C31 or equivalent)
	Output Logic		Negative logic (active low)	Negative logic (active high)
	Output Current	***H***	-	2.5 V min.
	Output Voltage	***L***	0.4 V max.	0.5 V max.
	Influx Current		30mA max.	-
	Load Power Voltage		35 VDC max.	-
	Short-Circuit Protection		Between output and power supply	
* To be supplied by Class II source				

Mechanical Specifications	
Starting Torque	Max. 0.001 Nm (.00074 ft./lbs)
Max. Allowable Shaft Load	Radial: 20N (4.5 lbs) Axial: 10N (2.25 lbs)
Max. Allowable Speed	6000 rpm (highest speed that can support the mechanical integrity of encoder)
Wire Size	AWG26
Weight	Approx. 150g (5.3 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.
Vibration Resistance	Durable for one hour along three axes at 10 to 55 Hz with 0.75 amplitude
Shock Resistance	11 ms with 490 m/s^2 applied three times along three axes
Protection	IP40: dust proof

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.

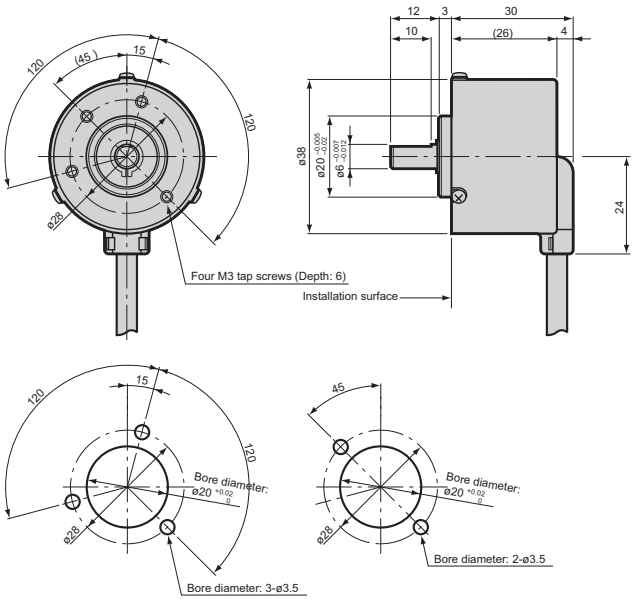
See page 20-16 for more information on couplings.

Mounting brackets are not available for light-duty encoders.

Light Duty Incremental Encoders

Dimensions

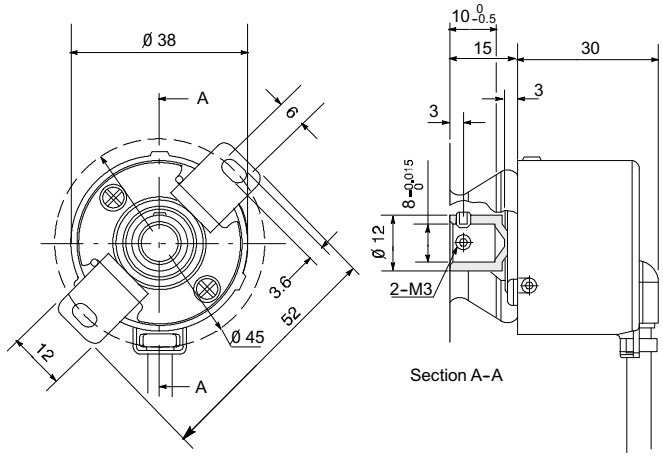
Standard shaft models



Mounting hole panel cutout (3 holes)

Mounting hole panel cutout (2 holes)

Hollow shaft models

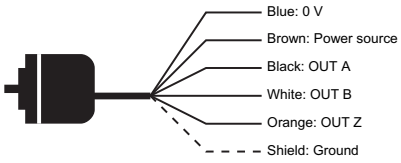


All dimensions in mm
1mm = 0.03937in

Wiring diagrams

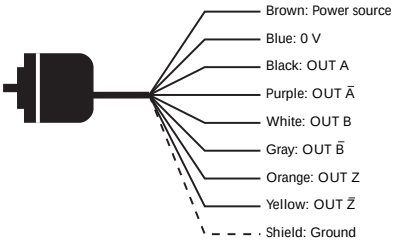
Open collector connections

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



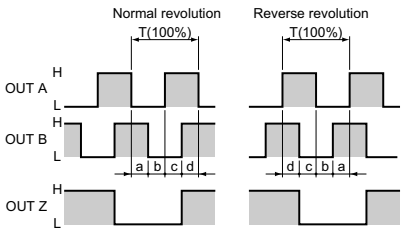
Line driver connections

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

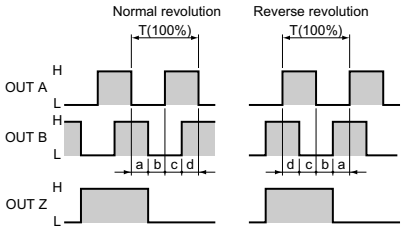


Channel timing charts

Open Collector Models



Line Driver Models



a, b, c, =1/4T±1/8T

"Normal" means clockwise revolution viewed from the shaft.

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 internally to the encoder. This is based on the rising edge to rising edge (one cycle) on channel A or B that indicates 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.