Light Duty Incremental Encoders (SAE Dimension Encoders)

TRDA-2E series

Features

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

- Small body with 1.5 in. diameter and 1.6 in. depth
- 0.25 in. diameter solid shaft
- Resolution available from 100 pulses per revolution to 2500 pulses per revolution
- Open collector or line driver output
- Up to 200kHz response frequency
- Two-meter cable with tinned ends
- IP50 environmental rating

TRDA-2Exxx-BD models

TRDA-2Exxx-VD models

Incremental Light Duty Solid-shaft Encoders (NPN Open-collector Output, TRDA-2ExxxBD)

Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRDA-2E100BD	$96.00	100	12–24 VDC	NPN Open Collector	1.5 in.
TRDA-2E360BD	$96.00	360			
TRDA-2E500BD	$96.00	500			
TRDA-2E1000BD	$96.00	1000			
TRDA-2E1024BD	$96.00	1024			
TRDA-2E2500BD	$96.00	2500			

Incremental Light Duty Solid-shaft Encoders (Line-driver Output, TRDA-2ExxxVD)

Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRDA-2E100VD	$96.00	100	5VDC	Line Driver (differential)	1.5 in.
TRDA-2E360VD	$96.00	360			
TRDA-2E500VD	$96.00	500			
TRDA-2E1000VD	$96.00	1000			
TRDA-2E1024VD	$96.00	1024			
TRDA-2E2500VD	$96.00	2500			

Accessories

Accessories for TRDA-2E Series Encoders

Part Number	Price	Description
F-2D	$36.00	Mounting flange, 1.86 inch bolt hole circle (1.05 inch height), metal. For use with Koyo TRDA-2E series encoders. Flange and encoder mounting hardware included.
F-3D	$36.00	Mounting flange, 2.95 inch bolt hole circle (1.34 inch height), metal. For use with Koyo TRDA-2E series encoders. Flange and encoder mounting hardware included.
F-6D	$36.00	Mounting flange, 1.86 inch bolt hole circle (1.34 inch height), metal. For use with Koyo TRDA-2E series encoders. Flange and encoder mounting hardware included.
F-7D	$36.00	Mounting flange, 1 inch bolt hole circle (0.20 inch height), metal. For use with Koyo TRDA-2E series encoders. Flange and encoder mounting hardware included.
F-8D	$36.00	Mounting flange, 2.95 inch bolt hole circle (1.71 inch height), metal. For use with Koyo TRDA-2E series encoders. Flange and encoder mounting hardware included.
2ET-035D	$39.50	Mounting bracket for TRDA-2E series encoders

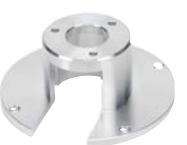
Couplings

For encoders with a solid shaft, please select a coupling that fits your encoder. All couplings are in stock, ready to ship.

See the "Encoder Couplings" section for more information.

2ET-035D

F-2D



F-3D

F-6D

F-7D

F-8D

Light Duty Incremental Encoders (SAE Dimension Encoders)

Specifications – TRDA-2E series

Electrical Specifications (SAE Dimension Light Duty)				
Model			**TRDA-2ExxxxBD (open collector)**	**TRDA-2ExxxxVD (line driver)**
Power Supply	**Operating Voltage ***		12–24 VDC (nominal) * Range: 10.8–26.4 VDC	5VDC (nominal) * Range: 4.75–5.25 VDC
	Allowable Ripple		3% rms max.	
	Current Consumption		50mA max. no load	
Output Waveform	**Signal Waveform**		Quadrature + home position	
	Max. Response Frequency		200kHz	
	Operating Speed		(max response frequency / resolution) x 60	
	Duty Ratio (Symmetry)		50% ±25%	
	Index Signal Width (at Home Position)		100% ±50%	
Output	**Rise/Fall Time ******		1µs max. **	100 ns max. **
	Output Type		Open collector (NPN sinking)	Line driver (26C31 or equivalent)
	Output Logic		Negative logic (active low)	Positive logic (active high)
	Output Current	**Inflow**	30mA max.	20mA max.
		Outflow	–	
	Output Voltage	**H**	–	2.5 V min.
		L	0.4 V max.	0.5 V max.
	Load Power Supply Voltage		30VDC max.	–
	Short-circuit Protection		Between eachoutput and 0V	–

To be supplied by Class II source.
****With a cable of 2m or less; Max load.***

Mechanical Specifications	
Starting Torque	0.01 N·m [0.09 lb·in] max. @ 20 °C [68 °F]
Max. Allowable Shaft Load	Axial: 20N [4.5 lb]; Radial: 30N [6.7 lb]
Max. Allowable Speed	5000 rpm (highest speed that can support the mechanical integrity of encoder)
Wire Size	26 AWG, shielded, oil-resistant PVC
Mounting Orientation	can be mounted in any orientation
Weight	approx. 170g [6.0 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 (non-condensing)
Voltage Withstand	630V grounded through capacitor (a 630V cap is connected between 0V & FG lines)
Insulation Resistance	50 MΩ min. (excluding shield)
Vibration Resistance	durable for one hour along three axes @ 10 to 55 Hz with 0.75 mm half-amplitude
Shock Resistance	490 m/s^2 (11 ms applied three times along three axes)
Protection	IP50
Agency Approvals	$_cUL_{US}$ (E189395)

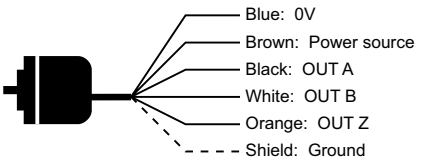
Light Duty Incremental Encoders (SAE Dimension Encoders)

Specifications – TRDA-2E series

Wiring Diagrams

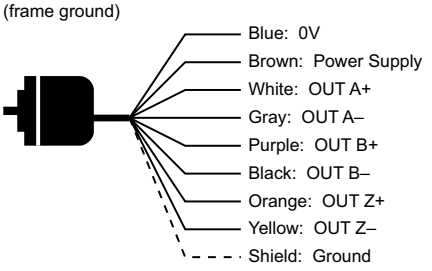
Open Collector Connections

Cable shield is connected to the encoder body (frame ground)



Line Driver Connections

Cable shield is connected to the encoder body (frame ground)



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.

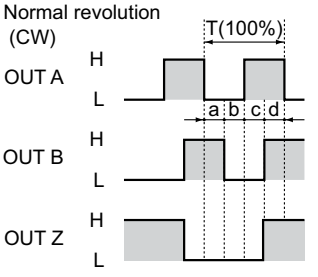
OUT Z is the absolute reference added to an incremental encoder and is also known as home position. It signifies a full rotation of the encoder shaft.

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 shaft.

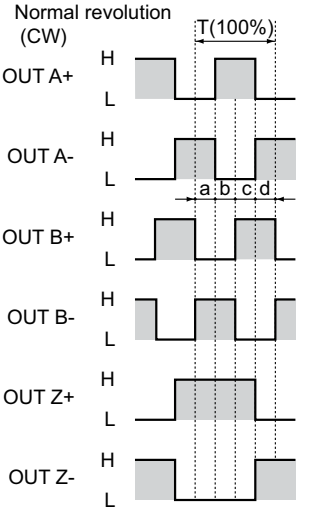
Channel Timing Charts

Open Collector Models (TRDA-2ExxxBD)



a, b, c, d = 1/4T±1/8T
"Normal" means clockwise revolution viewed from the shaft

Line Driver Models (TRDA-2ExxxVD)



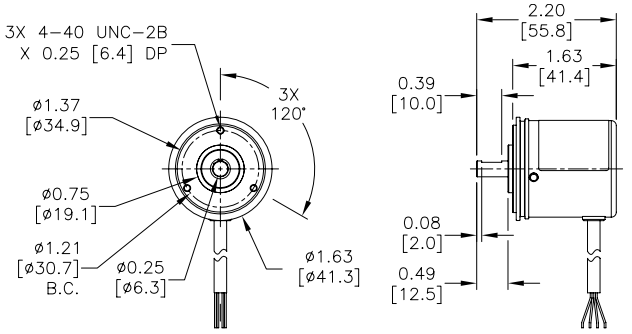
a, b, c, d = 1/4T±1/8T
"Normal" means clockwise revolution viewed from the shaft

Light Duty Incremental Encoders (SAE Dimension Encoders)

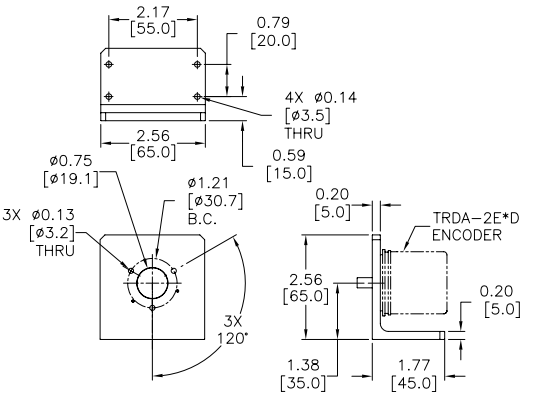
Dimensions – TRDA-2E series

Dimensions = in [mm]

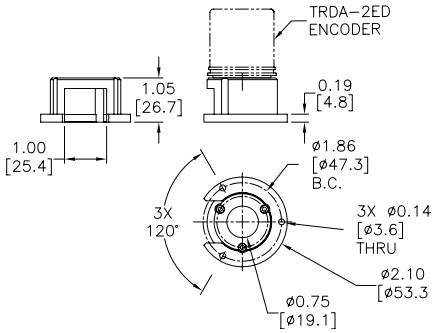
TRDA-2ExxxxD



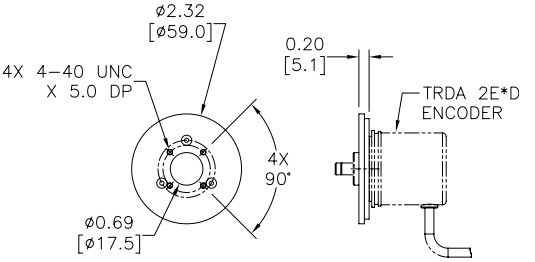
2ET-035D Mounting Bracket



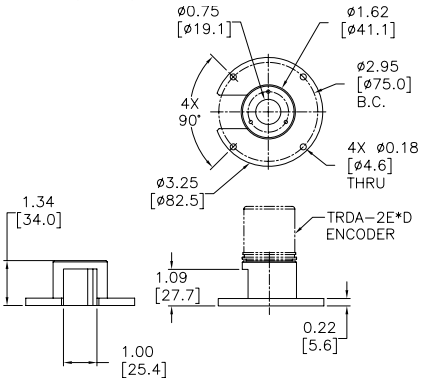
F-2D Mounting Flange



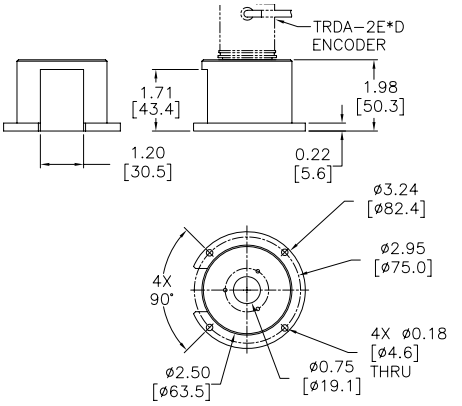
F-7D Mounting Flange



F-3D Mounting Flange



F-8D Mounting Flange



F-6D Mounting Flange