

# TRD-2E Series


## Features

### φ40 Incremental Type

- Small design with an outside diameter of φ40 mm / depth of 36 mm
- Equipped with short-circuit protection circuit, reverse connection protection circuit (For resolutions up to 2,500 P/R)
- Realizes IP54 protective structure.



## Model Number List

Type	Appearance	Model Number	Supply Voltage	Output	Output Form	Pulse Number / Rotation
Shaft Type		TRD-2E□A	4.5 to 13.2 V DC	Output with 2-phase origin (Origin reverse action □)	Open collector output	10, 20, 30, 40, 50, 60, 100, 200, 240, 250, 300, 360, 400, 500, 512, 600, 800, 1,000, 1,024, 1,200, 2,000, 2,500, 3,600
		TRD-2E□B	10.8 to 26.4 V DC			
		TRD-2E□V	4.75 to 5.25 V DC	Output with 2-phase origin (Origin direct action □)	Line driver output	

**TRD-2E** □ **A**

- Series classification

- Pulse number

- Form

**A:** Supply voltage 4.5 to 13.2 V DC    Open collector output  
**B:** Supply voltage 10.8 to 26.4 V DC    Open collector output  
**V:** Supply voltage 4.75 to 5.25 V DC    Line driver output

## Pulse and Frequencies

Pulse Number per Rotation	10	20	30	40	50	60	100	200	240	250	300	360	400	500	512	600	800	1,000	1,024	1,200	2,000	2,500	3,600
Maximum Response Frequency (kHz)*	0.8	1.6	2.5	3.3	4.1	5.0	8.3	16	20	20	25	30	33	41	42	50	66	83	85	100	166	200	200
Applicable Models	TRD-2E□A	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	TRD-2E□B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	TRD-2E□V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

\* The electric maximum response frequency is specified by resolution (pulse number) and the maximum number of revolutions.

Electrical maximum number of revolutions = [(Maximum response frequency/Resolution) x 60]

Therefore, if the encoder rotates at a speed greater than the electrical maximum number of revolutions, the signals do not electrically follow.



## Electrical Specifications

Model Number		TRD-2E□A/B	TRD-2E□V
Power Supply	Supply Voltage*	A: 4.5 to 13.2 V DC/B: 10.8 to 26.4 V DC	
	Allowable Ripple	3% rms or less	
	Consumption Current (No Load)	50 mA or lower	
Output Waveform	Signal Format	2-phase output + home position	
	Maximum Response Frequency	200 kHz	
	Maximum Response Number of Revolutions	(Maximum Response Frequency/Resolution) x 60	
	Duty Ratio	50 ± 25%	
	Signal Width at Home Position	100 ± 50%	
Output	Rise / Fall Time	Not larger than 1 μs (Cable length 1 m, maximum load)	
	Output Form	NPN open collector output	Line driver output (Equivalent to 26C31)
	Output Logic	Negative logic (Active low)	Positive logic (Active high)
	Output Current	Sink	Up to 30 mA
		Source	Up to 20 mA
	Output Voltage	"H"	2.5 V or higher
		"L"	0.4 V or lower
	Load Supply Voltage	30 V DC or lower	—
	Short-circuit Protection	Between output and power supply	—

\* To be supplied by Class II source.

# TRD-2E Series

## Specifications/Dimensions

P L C H M I SENSOR ENCODER COUNTER INFORMATION Rotary Encoder  
Lineup

Selection Guide

Incremental  
Type

Absolute Type

TRD-MX

TRD-S/SH

TRD-2E

TRD-N/NH

TRD-J

TRD-GK

### Mechanical Specifications

Starting Torque	0.01 N·m or less (+20°C)
Moment of Inertia	$0.3 \times 10^{-6} \text{ kg} \cdot \text{m}^2$
Shaft Allowable Load	Radial: 30N
	Thrust: 20N
Maximum Allowable Number of Revolutions (Note 1)	5,000 rpm
Cable	Outside diameter $\phi 5 \text{ mm}$
	5-core shielded oil-resistant vinyl chloride cable (Line driver output is 8 cores)
	Core wire nominal cross-sectional area: $0.14 \text{ mm}^2$
Weight	Approx. 110 g (With 1 m cable)

Note 1: Maximum number of revolutions that can be mechanically endured

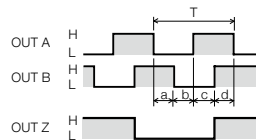
### Environmental Requirements

Use Ambient Temperature	-10 to +70°C
Storage Ambient Temperature	-25 to +85°C
Use Ambient Humidity	35 to 85% RH (No condensation)
Withstand Voltage	Excluded due to capacitor grounding*
Insulation Resistance	50 MΩ or higher*
Vibration Resistance (Endurance)	Displacement half amplitude: 0.75 mm, 10 to 55 Hz, 3 axial directions, each 1 h
Impact Resistance (Endurance)	490m/s <sup>2</sup> 11 ms, each 3 times in 3 axial directions
Protective Structure	Dustproof type: Splash-proof type: IP54

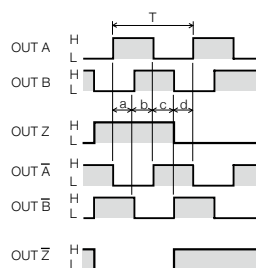
\* The power supply, signal lines, and shield between the cases are excluded.

### Output Waveform

#### Open Collector



#### Line Driver



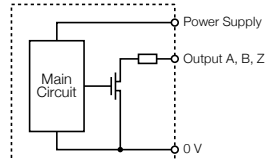
$$a, b, c, d = 1/4T \pm 1/8T$$

Note: Clockwise rotation when the main body is the axle side is the normal rotation.

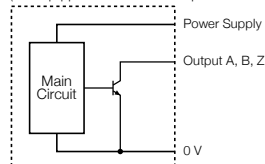
### Output Circuit

#### Open Collector

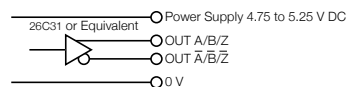
(Equipped with short-circuit protection circuit, up to 2,500 P/R)



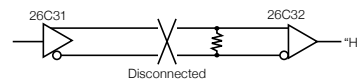
(Not equipped with short-circuit protection circuit, 2,500 P/R or higher)



#### Line Driver



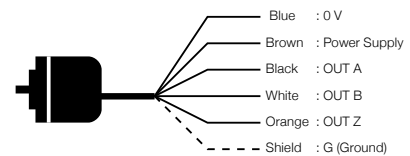
- When the transmission line or connector is disconnected, the output becomes "H."



### Connection Diagram

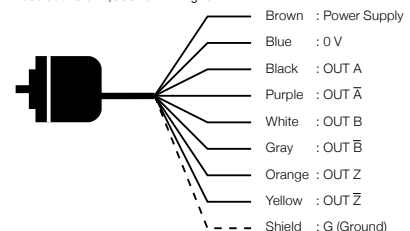
#### Open Collector

The shielded wire is not connected to the main body for resolutions up to 2,500 P/R.  
Shielded wire is connected to FG (frame ground) for resolutions of 2,500 P/R or higher.



#### Line Driver

The shielded wire is not connected to the main body for resolutions up to 2,500 P/R.  
Shielded wire is connected to FG (frame ground) for resolutions of 2,500 P/R or higher.



### Dimensions (Unit: mm)

