

# TRD-S/SH Series



## Features

### φ38 Incremental Type

- Thin design with an outside diameter of φ38 mm / depth of 30 mm
- Small diameter lineup with resolutions up to 2,500 P/R
- Low price contributes to cost reduction of the system.
- IP40 protective structure



## Model Number List

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

TRD-S□A

- Series classification
- S** : Shaft type
- SH** : Hollow shaft type

- 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	250	300	360	400	500	512	600	800	1,000	1,024	1,200	2,000	2,500
Maximum Response Frequency (kHz)*	1	2	3	4	5	6	10	20	25	30	36	40	50	50	60	80	100	100	120	200	200
Applicable Models	TRD-S□A/TRD-SH□A	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	TRD-S□B/TRD-SH□B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	TRD-S□V/TRD-SH□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-S□A/TRD-SH□A	TRD-S□B/TRD-SH□B	TRD-S□V/TRD-SH□V
Power Supply	Supply Voltage	4.5 to 13.2 V DC	10.8 to 26.4 V DC	4.75 to 5.25 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		
	Duty Ratio	50±25%		
	Phase Difference Width	25±12.5%		
	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*
	Output Logic		Negative logic (Active low)	Positive logic (Active high)
	Output Voltage	"H"	—	2.5 V or higher
		"L"	0.4 V or lower	0.5 V or lower
	Output Current		Up to 30 mA (Sink current)	Up to 20 mA
	Load Supply Voltage		30 V DC or lower	—

\* Equivalent to 26C31. The receiver is equivalent to 26C32.

# TRD-S/SH 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	0.001 N·m or less (+20°C)
Moment of Inertia	$0.3 \times 10^{-6} \text{ kg} \cdot \text{m}^2$
Shaft Allowable Load	Radial: 20 N
	Thrust: 10 N
Maximum Allowable Number of Revolutions (Note 1)	6,000 rpm
Cable	Outside diameter $\phi 5 \text{ mm}$ 5-core shielded oil-resistant vinyl chloride cable Core wire nominal cross-sectional area: $0.14 \text{ mm}^2$ (Line driver output is 8 cores, $0.14 \text{ mm}^2$ )
Weight	Approx. 100 g (With 1 m cable)

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

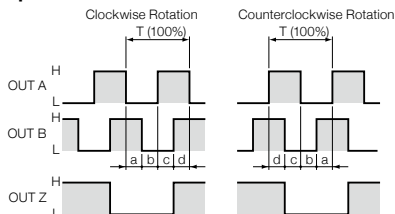
### Environmental Requirements

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 60 pulses or lower: 500 V AC (50/60 Hz) 1 minute*
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)	490 m/s <sup>2</sup> 11 ms, each 3 times in 3 axial directions
Protective Structure	Simple Dustproof type: IP40

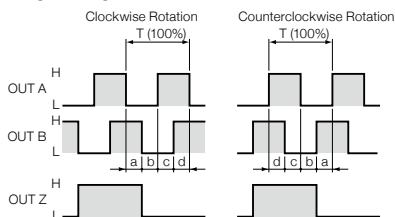
\* The power supply, signal lines, and shield between the cases are excluded.

### Output Waveform

#### Open Collector



#### Line Driver

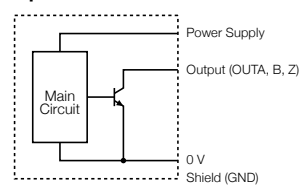


a, b, c, d =  $1/4T \pm 1/8T$

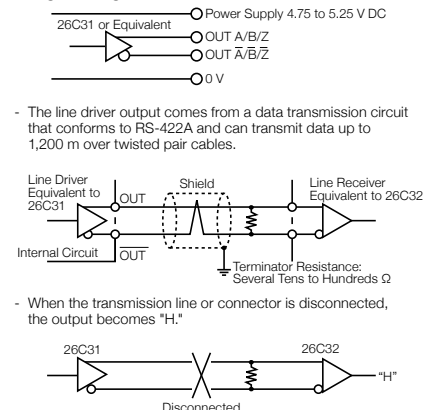
Note: Clockwise rotation when the main body is seen from the axle side is the normal rotation.

### Output Circuit

#### Open Collector



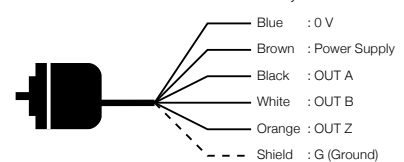
#### Line Driver



### Connection Diagram

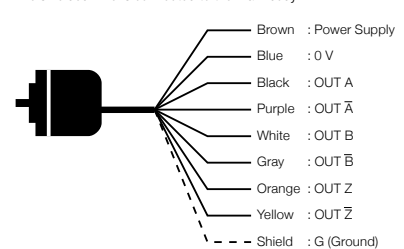
#### Open Collector

The shielded wire is connected to the main body.



#### Line Driver

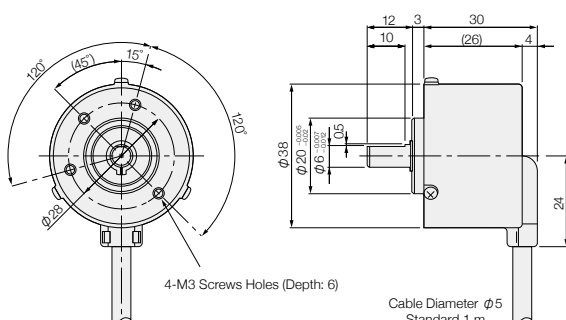
The shielded wire is connected to the main body.



### Dimensions

(Unit: mm)

TRD-S□A/TRD-S□B/TRD-S□V



TRD-SH□A/TRD-SH□B/TRD-SH□V

