

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%			
Output	Signal Width at Home Position	100 ± 50%			
	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

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 mm^2 (Line driver output is 8 cores, 0.14 mm^2)
Weight	Approx. 100 g (With 1 m cable)

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

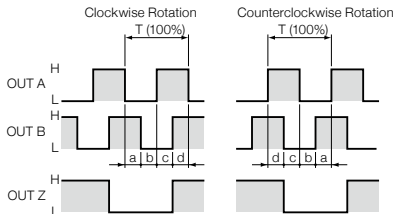
Environmental Requirements

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 M Ω 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 ² 11 ms, each 3 times in 3 axial directions
Protective Structure	Simple Dustproof type: IP40

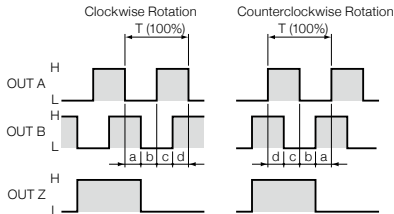
* The power supply, signal lines, and shield between the cases are excluded.

Output Waveform

Open Collector



Line Driver

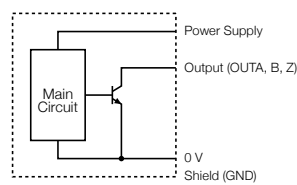


$$a, b, c, d = 1/4T \pm 1/8T$$

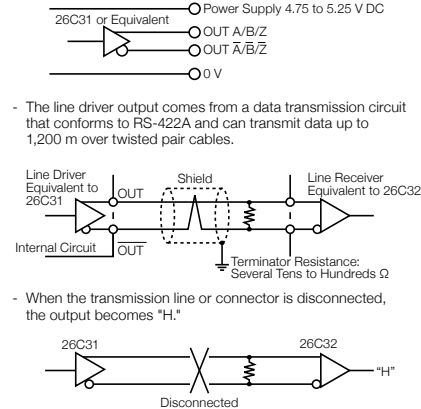
Note: Clockwise rotation when the main body is seen from the axle side is the normal rotation.

Output Circuit

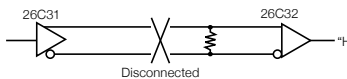
Open Collector



Line Driver



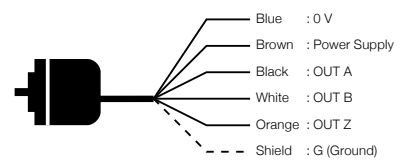
- When the transmission line or connector is disconnected, the output becomes "H."



Connection Diagram

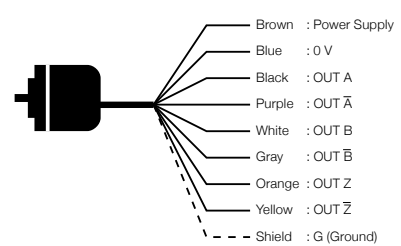
Open Collector

The shielded wire is connected to the main body.



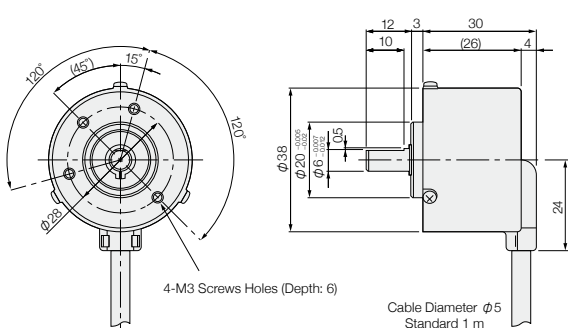
Line Driver

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

