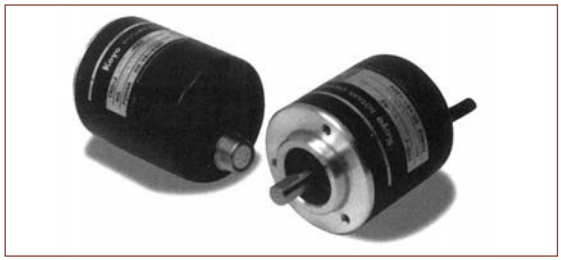


ROTARY ENCODERS

TRD-J Series Incremental Encoders



Features

- ø8 mm thick shaft and ø50 mm body
- Vibration and shock resistant metal slit plate durable at 1,000 P/R
- Operating voltage ranging from 4.75 to 30 VDC
- Totem-pole output facilitating cable extension

List of Model Numbers

Type	Appearance	Model Number	Output	Pulse / Revolution
With rear cable		TRD-J□-S	One-phase	10 30 40 50 60 100 120 200 240 300 360 400 500 600 750 1000
		TRD-J□-RZ	Two-phase with home position in normal operation	
		TRD-J□-RZL	Two-phase with home position in reverse operation	
		TRD-J□-RZV	Two-phase with home position and line driver	
Dust and splash proofed		TRD-J□-SW	One-phase	
		TRD-J□-RZW	Two-phase with home position in normal operation	
		TRD-J□-RZWL	Two-phase with home position in reverse operation	
		TRD-J□-RZVW	Two-phase with home position and line driver	
With connector		TRD-J□-SC	One-phase	
		TRD-J□-RZC	Two-phase with home position in normal operation	
		TRD-J□-RZCL	Two-phase with home position in reverse operation	
		TRD-J□-RZVC	Two-phase with home position and line driver	
Dust and splash proofed with connector		TRD-J□-SCW	One-phase	
		TRD-J□-RZCW	Two-phase with home position in normal operation	
		TRD-J□-RZCWL	Two-phase with home position in reverse operation	
		TRD-J□-RZVCW	Two-phase with home position and line driver	
With side cable		TRD-J□-SS ^{Note1}	One-phase	* One-phase only for 10 pulse
		TRD-J□-RZS ^{Note1}	Two-phase with home position in normal operation	
		TRD-J□-RZSL ^{Note1}	Two-phase with home position in reverse operation	
		TRD-J□-RZVS ^{Note1}	Two-phase with home position and line driver	
Dust and splash proofed with side cable		TRD-J□-SWS ^{Note1}	One-phase	
		TRD-J□-RZWS ^{Note1}	Two-phase with home position in normal operation	
		TRD-J□-RZWSL ^{Note1}	Two-phase with home position in reverse operation	
		TRD-J□-RZVWS ^{Note1}	Two-phase with home position and line driver	

Note: Consult your KOYO dealer for delivery period.

Model Numbering System



- Series
- Pulse/revolution
- Output signal
S: One-phase/RZ: Two-phase with home position in normal operation
- Output type
Blank: Totem-pole/V: Line driver
- Connection
Blank: Rear cable
W: Dust and splash proofed/C: Connector/CW: Dust and splash proofed with connector
S: Side cable/WS: Dust and splash proofed with side cable
- Home position reverse operation symbol
If output signal is RZ, model numbers with "L" are home position reverse operation type.
- (Available options)

ROTARY ENCODERS

Pulse and Frequencies

Pulse / Revolution	10	30	40	50	60	100	120	200	240	300	360	400	500	600	750	1000
Max. response frequency (kHz)*	0.5	1.5	2	2.5	3	5	6	10	12	15	18	20	25	30	37.5	50
Applicable models	TRD-J□-S□	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	TRD-J□-RZ□		●	●	●	●	●	●	●	●	●	●	●	●	●	●
	TRD-J□-RVZ□		●	●	●	●	●	●	●	●	●	●	●	●	●	●

* Maximum response frequency is defined by the the following formula : Maximum revolution speed = (Maximum response frequency / Pulse) x 60
The encoder does not respond to revolution faster than the maximum speed.

Electrical Specifications

Model		TRD-J□-S□	TRD-J□-RZ□	TRD-J□-RVZ□	
Power source	Power source voltage	4.7 to 30 VDC	4.7 to 30 VDC	4.75 to 5.25 VDC	
	Allowable ripple	3% rms max.	3% rms max.	3% rms max.	
	Current consumption (no load)	40 mA max.	60 mA max.	130 mA max.	
Output wave form	Output signal type	One-phase	Two-phase + home position	Two-phase + home position	
	Duty ratio	50 ±25%	50 ±25% (square wave)	50 ±25% (square wave)	
	Signal with a home position	-	50 to 150%	50 to 150%	
	Rise / Fall time	3 μs (Max. Cable 50 cm) max.	3 μs (Max. Cable 50 cm) max.	2 μs (Max. Cable 50 cm) max.	
Output	Output type	Totem-pole	Totem-pole	Line-driver *	
	Output current	Outflow "H"	10 mA max.	10 mA max.	-
		Inflow "L"	30 mA max.	30 mA max.	-
	Output voltage	"H"	[(Load power voltage) -2.5V] min.	[(Load power voltage) -2.5V] min.	2.5 V max.
		"L"	0.4 V max.	0.4 V max.	0.5 V max.
	Output standard	TTL 5V	10TTL	10TTL	-
Load power voltage		30 VDC max.	30 VDC max.	-	

* Equivalent to 26C31, (Output signal is compatible to TTL)

Mechanical Specifications

Initial torque	0.003N·m (+20°C) max. (Dust & splash proofed: Min. 0.02 N·m)
Moment of inertia	2 x 10 ⁻⁶ kg·m ²
Allowable load	Radial: 50N
	Thrust: 30N
Maximum allowable speed (Note 1)	5000 rpm (Dust and splash proofed: 3000 rpm)
Service life of bearing	5 x 10 ⁹ revolution (calculated value at the maximum load)
Cable	External diameter ø5 mm (W type: ø6 mm)
	5-wire oil-proof shielded vinyl chloride cable
	Nominal section area of core: 0.3 mm ² (Line driver output: 8 cores, 0.14 mm ²)
Weight	220 g (with 0.5 m cable) max.

Note 1: Highest speed that can support mechanical integrity of the encoder.

Environmental Requirements

Ambient temperature	-10 to +50°C
Storage temperature	-25 to +80°C
Operating humidity	35 to 85% RH (with no condensation)
Withstand voltage	500VAC for 1 minute (between terminals and case)
Insulation resistance	50 MΩ min.
Vibration resistance	Durable for 1 hour along 3 axes at 10 to 55 Hz with 0.75mm amplitudes
Shock resistance	11 ms with 490 m/s ² applied 3 times along 3 axes
Protection	IP50: Dust proofed IP65: Dust and splash proofed

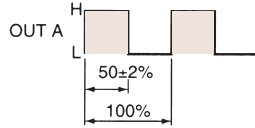
ROTARY ENCODERS

TRD-J Series

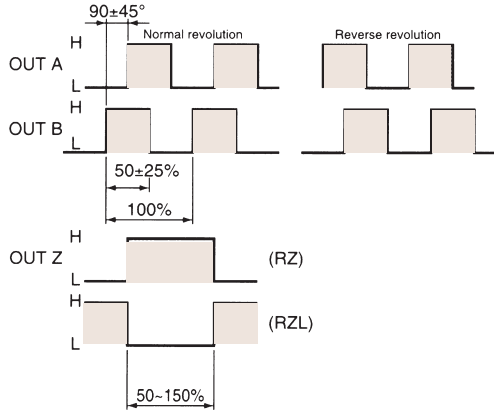
Totem-pole output **TRD-J** **-S** / **TRD-J** **-RZ**

Output signal timing chart

One-phase: **TRD-J** **-S**



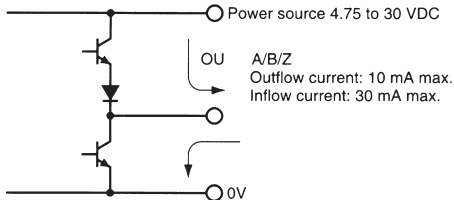
Two-phase with home position: **TRD-J** **-RZ**



"Normal" means clockwise revolution viewed from the shaft.

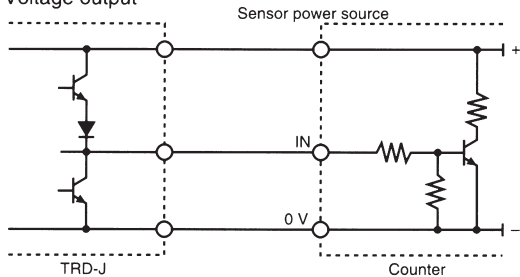
Output circuit

Totem-pole output:

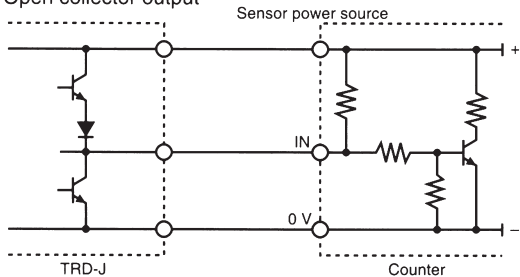


The above circuit can be applied to voltage output or open collector output as follows:

● Voltage output

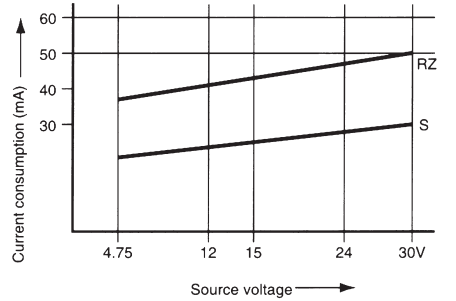


● Open collector output



Electrical characteristics

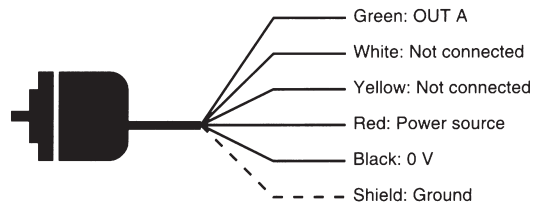
Current consumption characteristics



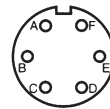
Terminal assignment

Shielded cable is not connected to the encoder body.

One-phase: **TRD-J** **-S**



Pin out of connector

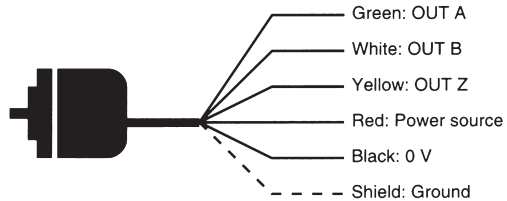


Rear view

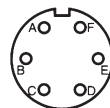
Pin code

- A: OUT A
- B: Not connected
- C: Not connected
- D: Power source
- E: 0V
- F: Not connected

Two-phase with home position: **TRD-J** **-RZ**



Pin out of connector



Rear view

Pin code

- A: OUT A
- B: OUT B
- C: OUT Z
- D: Power source
- E: 0 V
- F: Not connected



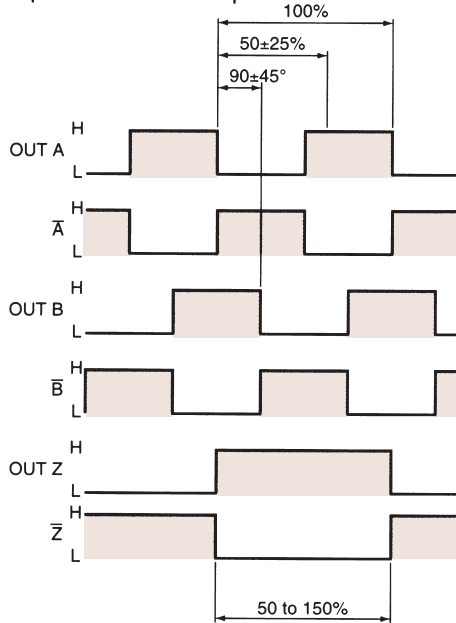
ROTARY ENCODERS

TRD-J Series

Line driver TRD-J -RZV

Output Signal Timing Chart

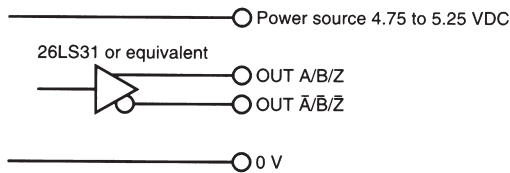
Two-phase with home position: TRD-J -RZV



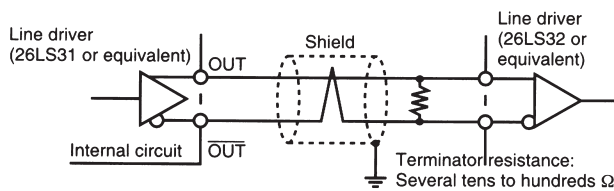
"Normal" means clockwise revolution viewed from the shaft.

Output Circuit

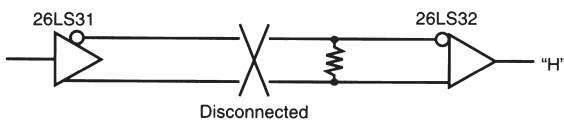
Line driver Output



- The line driver can use a RS-422A compliant twisted pair cable of up to 1,200 m.

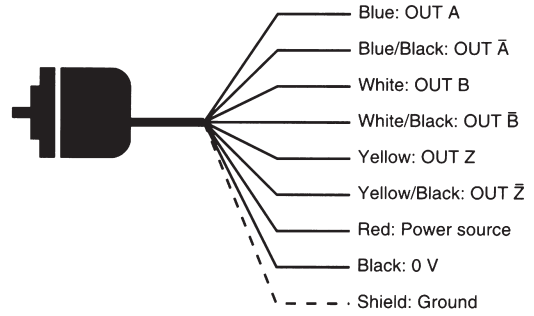


- Output signal turns to "H" level when the cable or connector is disconnected.



Terminal Assignment

Shielded cable is not connected to



Pin out of connector



Pin code

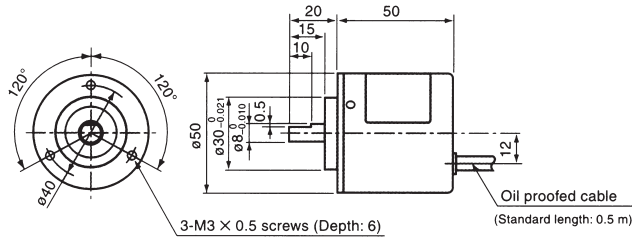
- A: OUT A
- B: OUT A-bar
- C: OUT B
- D: OUT B-bar
- E: OUT Z
- F: OUT Z-bar
- G: Power source
- H: 0 V

TRD-J Series

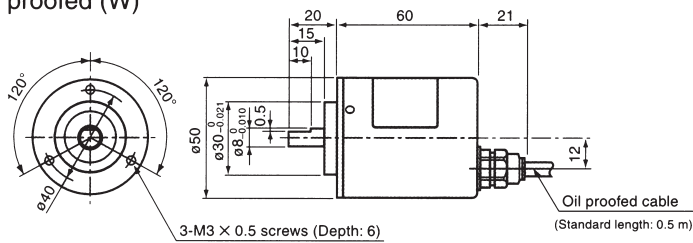
External Dimensions

(in mm)

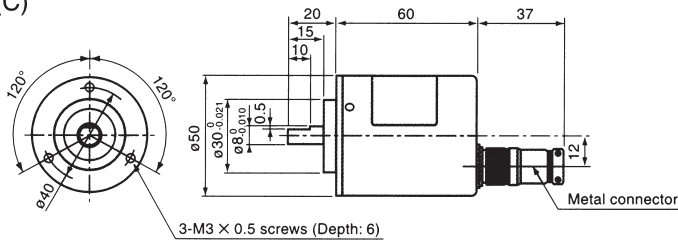
● With side cable



● Dust and splash proofed (W)



● With connector (C)

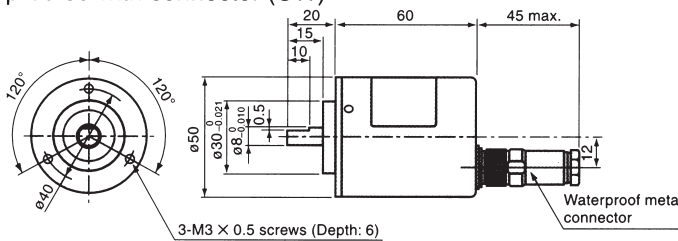


Model numbers of connectors

- Totem-pole (S□/RZ□)
Body: R03-R6F
Cable: R03-PB6M (Attached)
- Line driver (RZV□)
Body: R03-R8F
Cable: R03-PB8M (Attached)
(of Tajimi Musen)

* Section area: Max. 0.3 mm²
Diameter of cable duct : $\phi 6.2$

● Dust and splash proofed with connector (CW)

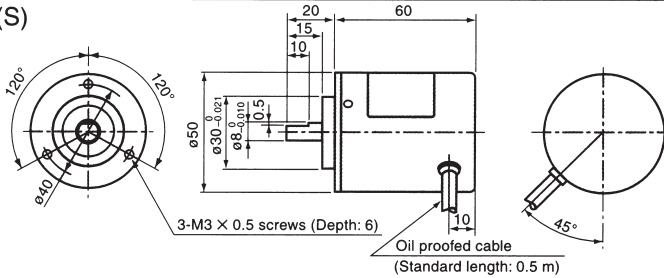


Model numbers of connectors

- Totem-pole (S□/RZ□)
Body: R04-R6F
Cable: R04-P6M (Attached)
- Line driver (RZV□)
Body: R04-R8F
Cable: R04-P8M (Attached)
(of Tajimi Musen)

* Section area: Max. 0.3 mm²
Diameter of cable duct : $\phi 6.2$

● With side cable (S)



● Dust and splash proofed with side cable (WS)

