











ROTARY ENCODERS

List of KOYO Rotary Encoders

Only the basic models are listed below. For other models, refer to the description of each series.

Type	Incremental				
Series	TRD-S Series	TRD-SH Series	TRD-2E Series	TRD-N Series	TRD-NH Series
Appearance of basic model	 ø38 x 30 mm Diameter of shaft: ø6 mm	Hollow shaft  ø38 x 30 mm Diameter of the other shaft: ø8 mm	 ø40 x 36 mm Diameter of shaft: ø6 mm	 ø50 x 35 mm Diameter of shaft: ø8 mm	Hollow shaft  ø50 x 35 mm Diameter of the other shaft: ø8 mm
Features	<ul style="list-style-type: none"> Slim design: ø38 mm outer diameter and 30 mm depth Small diameter lineup up to 2,500 P/R Low cost contributes to system-wide cost reductions 200 kHz high-speed response Wide range of resolutions 	<ul style="list-style-type: none"> Able to connect directly to the other shaft without using a coupling Slim design: ø38 mm outer diameter and 30 mm depth Small diameter lineup up to 2,500 P/R Low cost contributes to system-wide cost reductions 200 kHz high-speed response Wide range of resolutions 	<ul style="list-style-type: none"> Slim design: ø40 mm outer diameter and 36 mm depth Small diameter lineup up to 2,500 P/R Dust and splash proofed 200 kHz high-speed response Wide range of resolutions 	<ul style="list-style-type: none"> Small body with only 35 mm depth Protection options to meet environmental requirements Wide range of resolution ø8 mm thick reinforced shaft Source voltage ranging from 5 to 30 V Totem-pole output facilitating cable extension 	<ul style="list-style-type: none"> Able to connect directly to the other shaft without using a coupling Slim design with only 35 mm depth Select protective design to suit operating environmental Wide range of resolutions Solid ø8 mm shaft Source voltage ranging from 5 to 30V Totem-pole output facilitating cable extension
Resolution	10 to 2500 (pulse / revolution)	10 to 2500 (pulse / revolution)	10 to 2500 (pulse / revolution)	1 to 2500 (pulse / revolution)	1 to 2500 (pulse / revolution)
Signal output	Two-phase A and B + Phase Z	Two-phase A and B + Phase Z	Two-phase A and B + Phase Z	One-phase Two-phase A and B + Phase Z	One-phase Two-phase A and B + Phase Z
Max. response frequency	200 kHz	200 kHz	200 kHz	100 kHz	100 kHz
Max. allowable revolution	6000 rpm	6000 rpm	5000 rpm	5000 rpm	5000 rpm
Source voltage	TRD-S□A: 5 to 12 VDC±10% TRD-S□B: 12 to 24 VDC±10% TRD-S□V: 5 VDC±5%	TRD-SH□A: 5 to 12 VDC±10% TRD-SH□B: 12 to 24 VDC±10% TRD-SH□V: 5 VDC±5%	TRD-2E□A: 5 to 12 VDC±10% TRD-2E□B: 12 to 24 VDC±10% TRD-2E□V: 5 VDC±5%	Excluding TRD-N□V: 4.75 to 30 VDC TRD-N□V: 5 VDC±5%	Excluding TRD-NH□V: 4.75 to 30 VDC TRD-NH□V: 5 VDC±5%
Output type	NPN open collector output Line driver output	NPN open collector output Line driver output	NPN open collector output Line driver output	Totem-pole output with partial load short circuit protection Line drive output	Totem-pole output with partial load short circuit protection Line drive output
Max. load to shaft	Radial	20N	20N	30N	50N
	Thrust	10N	10N	20N	30N
Initial torque	0.001 N·m max.	0.001 N·m max.	0.01 N·m max.	Dust proof: 0.003 N·m max. Dust and splash proof: 0.02 N·m max.	Dust proof: 0.003 N·m max. Dust and splash proof: 0.05 N·m max.
Protection	IP40: Simple dust proofed	IP40: Simple dust proofed	IP54: Dust and splash proofed	IP50: Dust proofed IP60: Dust and splash proofed	IP50: Dust proofed IP60: Dust and splash proofed
Operating temperature	-10 to +70°C	-10 to +70°C	-10 to +70°C	-10 to +70°C	-10 to +70°C
Reference	10	10	12	14	14
Price page	45	45	45	45	45

ROTARY ENCODERS

		Absolute		
TRD-J Series	TRD-GK Series	TRD-NA Series	TRD-K Series	TRD-KL Series
				
ø50 x 50 mm Diameter of shaft: ø8 mm	ø78 x 60 mm Diameter of shaft: ø10 mm	ø50 x 35 mm Diameter of shaft: ø8 mm	ø78 x 66 mm Diameter of shaft: ø10 mm	ø78 x 66 mm Diameter of shaft: ø10 mm
<ul style="list-style-type: none"> • ø8 mm thick shaft and 50 mm body • Vibration and shock resistant metal slit plate • Source voltage ranging from 5 to 30 V • Totem-pole output facilitating cable extension 	<ul style="list-style-type: none"> • Strong shaft and durable bearing • Quick response at 100 kHz • Operating temperature ranging from -10 to +70°C • Dust and splash proofed • Totem-pole output facilitating cable extension 	<ul style="list-style-type: none"> • Absolute positioning • Dust and splash proofed • Small body with only 35 mm depth • Reinforced aluminum diecast casing • Accurate Gray code • Vibration and shock resistant metal slit plate 	<ul style="list-style-type: none"> • Absolute positioning • Resolution of up to 10 bits or 1,024 • Strong shaft and durable bearing • Dust and splash proofed • Accurate Gray code • Vibration and shock resistant metal slit plate 	<ul style="list-style-type: none"> • Side cable and connector for minimum space • Absolute positioning • Resolution of up to 10 bits or 1,024 • Reinforced aluminum diecast casing • Dust and splash proofed • Accurate Gray code • Vibration and shock resistant metal slit plate
10 to 1000 (pulse / revolution)	10 to 5000 (pulse / revolution) (BZ: 100 to 5000 pulse / revolution)	32 to 2048 (resolution / revolution)	180 to 1024 (resolution / revolution)	180 to 1024 (resolution / revolution)
One-phase Two-phase A and B + Phase Z	Two-phase A and B + Phase Z (BZ: Normal / Reverse + Phase Z)	Gray binary code (11 bits max.)	Gray binary code (10 bits max.)	Gray binary code (10 bits max.)
50 kHz	100 kHz	20 kHz	20 kHz	20 kHz
5000 rpm	5000 rpm	3000 rpm	5000 rpm	5000 rpm
Excluding TRD-J□: 4.75 to 30 VDC TRD-J□V: 5 VDC±5%	10 to 30 VDC	10.8 to 26.4 VDC	10.8 to 26.4 VDC	10 to 30 VDC
Totem-pole structure preventing partial load short circuit Line drive output	Totem-pole structure preventing load short circuit	Open collector NPN or PNP	Open collector NPN	Open collector NPN
50N	100N	50N	100N	70N
30N	50N	30N	50N	40N
Dust proof: 0.003 N•m max. Dust and splash proof: 0.05 N•m max.	0.1 N•m max.	0.03 N•m max.	0.1 N•m max.	0.1 N•m max.
IP50: Dust proofed IP65: Dust and splash proofed	IP65: Dust and splash proofed	IP65: Dust and splash proofed	IP65: Dust and splash proofed	IP65: Dust and splash proofed
-10 to +50°C	-10 to +70°C	-10 to +60°C	-10 to +50°C	-10 to +60°C
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