

# High-Quality, Rugged Encoders

**Encoders can be used with controllers for position monitoring or control; be sure to evaluate product specifications to ensure application compatibility**

## Where can I use an encoder?

Encoders are used in all types of motion sensing applications, including machine tooling, semiconductor positioning and multi-axis positioning. All Koyo encoders feature a reinforced aluminum diecast casing and come equipped with a two-meter cable or MS connector. Use the incremental encoders with our PLC high-speed counter modules<sup>1</sup> for accurate position monitoring and control. Or use our absolute encoders to monitor position with gray code and standard PLC DC inputs.

## Why buy an encoder from us?

There are several distinct advantages to purchasing your encoder from AUTOMATIONDIRECT:

### Price

As with all of our product lines, our prices are often well below the list prices of traditional automation suppliers. Our direct business model allows us to operate more efficiently than other suppliers and pass the savings on to you.

### Quality

All encoders carry a 1-year warranty, and a 30-day money-back guarantee. If for any reason you are not satisfied with your purchase, send it back and we will refund your money.

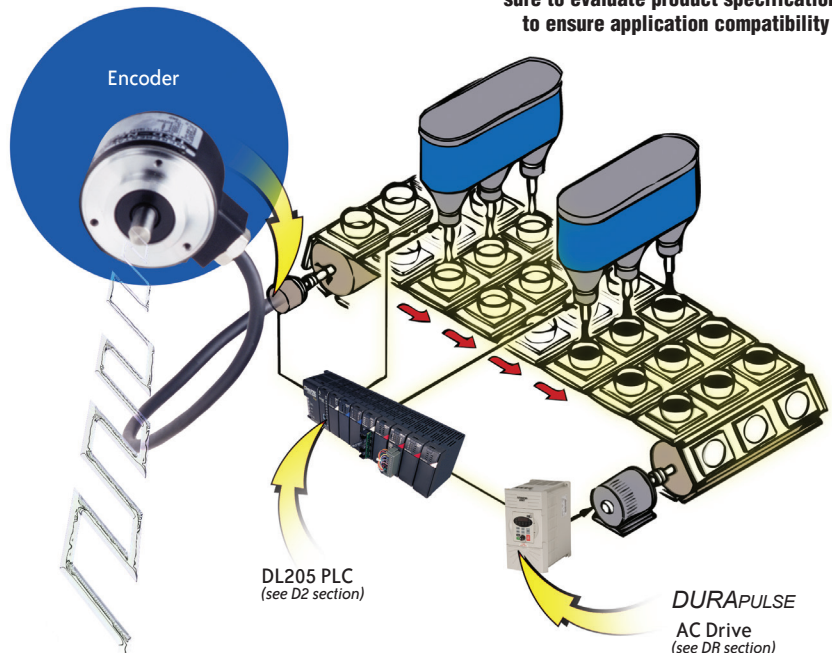
## What is a light-duty encoder?

**Includes series: TRD-MX, TRDA-2E, TRD-S, TRD-SH**

A light-duty encoder is a cost-effective encoder requiring minimal load on the shaft. Ours offer the following features:

- Size 10 (1.0 inch or 25mm) diameter body or Size 15 (1.5 inch or 38mm) diameter body
- Dustproof (IP40 or IP50) rating
- 4mm, 6 mm or 1/4" standard shaft or 8 mm hollow shaft
- Resolution available from 100 pulses/revolution to 2500 pulses/revolution
- Open collector or line driver outputs
- Up to 200 kHz response frequency

<sup>1</sup> Absolute encoders are not compatible with the PLC high-speed counter modules, but can be used with general purpose DC input cards.



## What is a medium-duty encoder?

**Includes series: TRD-N, TRD-NH, TRDA-20, TRDA-25, TRD-NA**

A medium-duty encoder is the most popular encoder we offer. The product line offers the greatest flexibility of choice while maintaining very high quality, all for a very low price. Our medium-duty encoders offer:

- Size 20 (2.0 inch or 50mm) diameter body or Size 25 (2.5 inch flange with 2.0 inch diameter body) frames
- Dust Proof (IP50) or splash-proof (IP65) ratings
- 8 mm or 3/8" standard shaft or 8 mm hollow shaft
- Incremental or absolute (gray code) operation
- Incremental resolution available from 3 pulses/revolution to 5000 pulses/revolution
- Absolute resolution available from 32 pulses/revolution to 1024 pulses/revolution
- Open collector, Totem-pole or line driver output versions
- Up to 200 kHz response frequency
- MS connector models available

## What is a heavy-duty encoder?

**Includes series: TRD-GK**

A heavy-duty encoder is the most rugged encoder you can buy. Top-of-the-line bearings help maintain a service life of 12 billion revolutions. Our heavy-duty encoders offer:

- Rugged size 30 (3.0 inch or 78mm) diameter body
- Splash-proof (IP65) rating
- 10 mm standard shaft
- Incremental operation from 30 pulses/revolution to 5000 pulses/revolution
- Totem-pole output
- Up to 100 kHz response frequency

# Great Encoder Selection at Great Prices


**Koyo®**

Heavy-duty TRD-GK

Medium Duty TRD-NH

Medium Duty TRD-N

Medium Duty TRDA-25 (w/MS connector)

Light-duty TRD-MX

							Operating Voltage (VDC) and Electrical Output*		Max Radial Load (N)	Max Axial Load (N)	
	Duty	Family	Size	Encoder diameter	Shaft diameter	Solid or Hollow Shaft		IP Rating			Available resolutions
Incremental	Light Duty	TRD-MX	10	25mm	4mm	solid	5V Line Driver or 5-12V OC or 12-24V OC	IP50	10	5	100, 360, 500, 1000, 1024
		TRDA-2E	15	1.5"	1/4"	solid	5V Line Driver or 12-24V OC	IP50	30	20	100, 360, 500, 1000, 1024, 2500
		TRD-S	15	38mm	6mm	solid	5V Line Driver or 12-24V OC	IP40	20	10	100, 200, 250, 300, 360, 400, 500, 600, 800, 1000, 1024, 1200, 2000, 2500
		TRD-SH	15	38mm	8mm	hollow	5V Line Driver or 12-24V OC	IP40	20	10	100, 200, 250, 300, 360, 400, 500, 600, 800, 1000, 1024, 1200, 2000, 2500
	Medium Duty	TRDA-20	20	2"	3/8"	solid	5V Line Driver or 5-30V P/P	IP50	50	30	100, 360, 500, 1000, 1024, 2500
		TRDA-25	25 (w/size 20 body)	2.5" flange (w/ 2.0" body)	3/8"	solid	5V Line Driver or 5-30V P/P	IP65	50	30	100, 360, 500, 1000, 1024, 2500
		TRD-N	20	50mm	8mm	solid	5V Line Driver or 5-30V P/P	IP65	50	30	3, 4, 5, 10, 30, 40, 50, 60, 100, 120, 200, 240, 250, 300, 360, 400, 480, 500, 600, 750, 1000, 1024, 1200, 2000, 2500, 3000, 3600, 5000
		TRD-NH	20	50mm	8mm	hollow	5V Line Driver or 5-30V P/P	IP65	50	30	3, 4, 5, 10, 30, 40, 50, 60, 100, 120, 200, 240, 250, 300, 360, 400, 480, 500, 600, 750, 1000, 1024, 1200, 2000, 2500, 3000, 3600, 5000
	Heavy Duty	TRD-GK	30	78mm	10mm	solid	10-30V P/P	IP65	100	50	30, 100, 120, 200, 240, 250, 300, 360, 400, 500, 600, 800, 1000, 1200, 1500, 1800, 2000, 2500, 3600, 5000
	Medium Duty Absolute	TRD-NA	20	50mm	8mm	solid	10-30V OC	IP65	50	30	32, 64, 128, 180, 256, 360, 512, 720, 1024 (grey code)

All our encoders feature an integral 2m cable except for the TRDA-25 series which has an MS connector

\*Operating Voltage and Electrical Output:

- LD = Line Driver (all Line Drivers require 5VDC supply)
- OC = NPN Open Collector (at Operating Voltage)
- P/P = Push Pull or Totem Pole (at Operating Voltage)

## Accessories

### Couplings

A variety of couplings - metric-to-metric, inch-to-inch (SAE - SAE), and metric-to-inch are in stock, ready to ship.



### Flanges

A collection of flanges that ease encoder mounting. Several models are available with round flanges, square flanges and miscellaneous mounting options.



### Mounting brackets

Simplify your installation with a ready-to-use right-angle mounting bracket for light, medium and heavy-duty encoders



### Cables

For encoders that require a connector cable, we have cables in stock, priced right and ready to ship.



# Encoder Selection Guide

## SAE-dimension Encoders & Metric-dimension Encoders

SAE-dimension Encoder Selection						
Specification	TRDA-2E Series		TRDA-20 Series		TRDA-25 Series	
	TRDA-2ExxxBD	TRDA-2ExxxVD	TRDA-20R1NxxxRZD	TRDA-20R1NxxxVD	TRDA-25R1NxxxRZWDMS	TRDA-25R1NxxxVWDMS
<b>Description</b>	Light-duty incremental encoder with solid shaft		Medium-duty incremental encoder with solid shaft		Medium-duty incremental encoder with solid shaft	
<b>Size</b>	Body: 1.5 in. diameter and 1.6 in. depth; Shaft: 0.25 in. diameter		Body: 2.0 in. diameter and 1.7 in. depth; Shaft: 0.375 in. diameter		Removable Flange: 2.5 in. round; Body: 2.0 in. diameter and 2.15 in. depth; Shaft: 0.375 in. diameter	
<b>Output Configuration</b>	NPN open collector (BD)	Line driver (VD)	Totem pole (RZD)	Line driver (VD)	Totem pole (RZWD)	Line driver (VWD)
<b>Input Power</b>	12–24 VDC (nominal) Range: 10.8–26.4 VDC	5VDC (nominal) Range: 4.75–5.25 VDC	5–30 VDC (nominal) Range: 4.75–30.0 VDC	5VDC (nominal) Range: 4.75–5.25 VDC	5–30 VDC (nominal) Range: 4.75–30.0 VDC	5VDC (nominal) Range: 4.75–5.25 VDC
<b>Resolutions Available</b>	100 to 2500 pulses per revolution		100 to 2500 pulses per revolution		100 to 2500 pulses per revolution	
<b>Output Type</b>	Cable – 2m [6.6 ft], tinned		Cable – 2m [6.6 ft], tinned		Military style (MS) connector	
<b>Frequency Response</b>	200 kHz		100 kHz	200 kHz	100 kHz	200 kHz
<b>Rating</b>	IP50		IP50		IP65	
<b>Accessories Available</b>	couplings, mounting bracket, mounting flanges		couplings, mounting bracket, mounting flanges		cables, couplings, mounting flanges	

Metric-dimension Encoder Selection			
Specification	TRD-MX Series		
	TRD-MXxxxAD	TRD-MXxxxBD	TRD-MXxxxVD
<b>Description</b>	Light duty incremental encoder with solid shaft		
<b>Size</b>	Body: 25 mm diameter and 29 mm depth; Shaft: 4mm diameter		
<b>Output Configuration</b>	NPN open collector (AD)	NPN open collector (BD)	Line driver (VD)
<b>Input Power</b>	5–12 VDC (nominal); Range: 4.5–13.2 VDC	12–24 VDC (nominal); Range: 10.8–26.4 VDC	5VDC (nominal); Range: 4.75–5.25 VDC
<b>Resolutions Available</b>	100 to 1024 pulses per revolution		
<b>Output Type</b>	Cable (two meter, tinned)		
<b>Frequency Response</b>	100 kHz max		
<b>Rating</b>	IP50		
<b>Accessories Available</b>	Metric-to-metric and metric-to-S.A.E. couplings, mounting brackets		

Specification	TRD-S Series		TRD-SH Series		TRD-N Series	
	TRD-Sxxx-BD	TRD-Sxxx-VD	TRD-SHxxx-BD	TRD-SHxxx-VD	TRD-Nxxx-RZWD	TRD-Nxxx-RZVWD
<b>Description</b>	Light duty incremental encoder with solid shaft		Light duty incremental encoder with hollow shaft		Medium duty incremental encoder with solid shaft	
<b>Size</b>	Body: 38 mm diameter and 30 mm depth; Shaft: 6mm diameter		Body: 38 mm diameter and 30 mm depth; Shaft: 8mm diameter		Body: 50 mm diameter and 35 mm depth; Shaft: 8mm diameter	
<b>Output Configuration</b>	NPN open collector (BD)	Line driver (VD)	NPN open collector (BD)	Line driver (VD)	Totem pole (RZWD)	Line driver (RZVWD)
<b>Input Power</b>	12–24 VDC (nominal) Range: 10.8–26.4 VDC	5VDC (nominal) Range: 4.75–5.25 VDC	12–24 VDC (nominal) Range: 10.8–26.4 VDC	5VDC (nominal) Range: 4.75–5.25 VDC	5–30 VDC (nominal) Range: 4.75–30.0 VDC	5VDC (nominal) Range: 4.75–5.25 VDC
<b>Resolutions Available</b>	100 to 2500 pulses per revolution		100 to 2500 pulses per revolution		3 to 5000 pulses per revolution	
<b>Output Type</b>	Cable (two meter, tinned)		Cable (two meter, tinned)		Cable (two meter, tinned)	
<b>Frequency Response</b>	200 kHz		200 kHz		100 kHz max	100 kHz max (≤3000 ppr) 200 kHz max (>3000 ppr)
<b>Rating</b>	IP40		IP40		IP65	
<b>Accessories Available</b>	Metric-to-metric and metric-to-S.A.E. couplings		—		Metric-to-metric and metric-to-S.A.E. couplings, mounting brackets	

Specification	TRD-NH Series		TRD-NA Series		TRD-GK Series	
	TRD-NHxxx-RZWD	TRD-NHxxx-RZVWD	TRD-NAxxxNWD		TRD-GKxxx-RZD	
<b>Description</b>	Medium duty incremental encoder with hollow shaft		Medium duty absolute encoder with solid shaft		Heavy duty incremental encoder with solid shaft	
<b>Size</b>	Body: 50 mm diameter and 35 mm depth; Shaft: 8mm diameter		Body: 50 mm diameter and 35 mm depth; Shaft: 8mm diameter		Body: 78 mm diameter and 60 mm depth; Shaft: 10 mm diameter	
<b>Output Configuration</b>	Totem pole (RZWD)	Line driver (RZVWD)	NPN open collector		Totem pole	
<b>Input Power</b>	5–30 VDC (nominal) Range: 4.75–30.0 VDC	5VDC (nominal) Range: 4.75–5.25 VDC	12–24 VDC (nominal) Range: 10.8–26.4 VDC		10–30 VDC (nominal) Range: 9.7–30.9 VDC	
<b>Resolutions Available</b>	3 to 5000 pulses per revolution		32 to 1024 pulses per revolution		30 to 5000 pulses per revolution	
<b>Output Type</b>	Cable (two meter, tinned)		Cable (two meter, tinned)		Cable (two meter, tinned)	
<b>Frequency Response</b>	100 kHz max	100 kHz max (≤3000 ppr) 200 kHz max (>3000 ppr)	20 kHz max		100 kHz	
<b>Rating</b>	IP65		IP65		IP65	
<b>Accessories Available</b>	—		Metric-to-metric and metric-to-S.A.E. couplings, mounting brackets		Metric-to-metric and metric-to-S.A.E. couplings, mounting brackets	