

# Medium Duty Incremental Encoders (Metric Dimension Encoders)

## TRD-N(H) series

### Features

The medium duty encoder offers the greatest flexibility of choice in a very high-quality encoder, all for a very low price.

Features:

- Small body with 50 mm diameter and 35 mm depth
- Splash proof (IP65 rating)
- 8 mm solid shaft or 8 mm hollow shaft
- Incremental resolution available from 3 pulses per revolution to 5,000 pulses per revolution
- Line driver or Totem-pole (push-pull) output
- Up to 200 kHz response frequency



**Solid-shaft (TRD-N) model**



**Hollow-shaft (TRD-NH) model**

Incremental Medium Duty Solid Shaft Encoders (Totem-pole Output, TRD-Nxxx-RZWD)					
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-N3-RZWD	\$125.00	3	5-30 VDC	Totem-pole (push-pull) sink/source	50 mm
TRD-N4-RZWD	\$125.00	4			
TRD-N5-RZWD	\$125.00	5			
TRD-N10-RZWD	\$125.00	10			
TRD-N30-RZWD	\$125.00	30			
TRD-N40-RZWD	\$125.00	40			
TRD-N50-RZWD	\$125.00	50			
TRD-N60-RZWD	\$125.00	60			
TRD-N100-RZWD	\$125.00	100			
TRD-N120-RZWD	\$142.00	120			
TRD-N200-RZWD	\$142.00	200			
TRD-N240-RZWD	\$142.00	240			
TRD-N250-RZWD	\$142.00	250			
TRD-N300-RZWD	\$142.00	300			
TRD-N360-RZWD	\$142.00	360			
TRD-N400-RZWD	\$142.00	400			
TRD-N480-RZWD	\$142.00	480			
TRD-N500-RZWD	\$142.00	500			
TRD-N600-RZWD	\$142.00	600			
TRD-N750-RZWD	\$142.00	750			
TRD-N1000-RZWD	\$142.00	1000			
TRD-N1024-RZWD	\$142.00	1024			
TRD-N1200-RZWD	\$185.00	1200			
TRD-N2000-RZWD	\$185.00	2000			
TRD-N2500-RZWD	\$185.00	2500			
TRD-N3000-RZWD	\$185.00	3000			
TRD-N3600-RZWD	\$185.00	3600			
TRD-N5000-RZWD	\$185.00	5000			

Incremental Medium Duty Hollow Shaft Encoders (Totem-pole Output, TRD-NHxxx-RZWD)					
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-NH3-RZWD	\$142.00	3	5-30 VDC	Totem-pole (push-pull) sink/source	50 mm
TRD-NH4-RZWD	\$142.00	4			
TRD-NH5-RZWD	\$142.00	5			
TRD-NH10-RZWD	\$142.00	10			
TRD-NH30-RZWD	\$142.00	30			
TRD-NH40-RZWD	\$142.00	40			
TRD-NH50-RZWD	\$142.00	50			
TRD-NH60-RZWD	\$142.00	60			
TRD-NH100-RZWD	\$142.00	100			
TRD-NH120-RZWD	\$156.00	120			
TRD-NH200-RZWD	\$156.00	200			
TRD-NH240-RZWD	\$156.00	240			
TRD-NH250-RZWD	\$156.00	250			
TRD-NH300-RZWD	\$156.00	300			
TRD-NH360-RZWD	\$156.00	360			
TRD-NH400-RZWD	\$156.00	400			
TRD-NH480-RZWD	\$156.00	480			
TRD-NH500-RZWD	\$156.00	500			
TRD-NH600-RZWD	\$161.00	600			
TRD-NH750-RZWD	\$161.00	750			
TRD-NH1000-RZWD	\$161.00	1000			
TRD-NH1024-RZWD	\$157.00	1024			
TRD-NH1200-RZWD	\$196.00	1200			
TRD-NH2000-RZWD	\$196.00	2000			
TRD-NH2500-RZWD	\$196.00	2500			
TRD-NH3000-RZWD	\$200.00	3000			
TRD-NH3600-RZWD	\$196.00	3600			
TRD-NH5000-RZWD	\$200.00	5000			

# Medium Duty Incremental Encoders (Metric Dimension Encoders)

## TRD-N(H) series

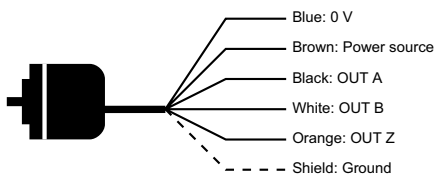
Incremental Medium Duty Solid Shaft Encoders (Line Driver Output, TRD-Nxxx-RZVWD)					
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-N3-RZVWD	\$131.00	3	5VDC	Line driver (differential)	50 mm
TRD-N4-RZVWD	\$131.00	4			
TRD-N5-RZVWD	\$131.00	5			
TRD-N10-RZVWD	\$131.00	10			
TRD-N30-RZVWD	\$131.00	30			
TRD-N40-RZVWD	\$131.00	40			
TRD-N50-RZVWD	\$131.00	50			
TRD-N60-RZVWD	\$131.00	60			
TRD-N100-RZVWD	\$131.00	100			
TRD-N120-RZVWD	\$155.00	120			
TRD-N200-RZVWD	\$155.00	200			
TRD-N240-RZVWD	\$155.00	240			
TRD-N250-RZVWD	\$155.00	250			
TRD-N300-RZVWD	\$155.00	300			
TRD-N360-RZVWD	\$155.00	360			
TRD-N400-RZVWD	\$155.00	400			
TRD-N480-RZVWD	\$155.00	480			
TRD-N500-RZVWD	\$155.00	500			
TRD-N600-RZVWD	\$155.00	600			
TRD-N750-RZVWD	\$155.00	750			
TRD-N1000-RZVWD	\$156.00	1000			
TRD-N1024-RZVWD	\$156.00	1024			
TRD-N1200-RZVWD	\$185.00	1200			
TRD-N2000-RZVWD	\$185.00	2000			
TRD-N2500-RZVWD	\$185.00	2500			
TRD-N3000-RZVWD	\$185.00	3000			
TRD-N3600-RZVWD	\$185.00	3600			
TRD-N5000-RZVWD	\$185.00	5000			

Incremental Medium Duty Hollow Shaft Encoders (Line Driver Output, TRD-NHxxx-RZVWD)					
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-NH3-RZVWD	\$142.00	3	5VDC	Line driver (differential)	50 mm
TRD-NH4-RZVWD	\$142.00	4			
TRD-NH5-RZVWD	\$142.00	5			
TRD-NH10-RZVWD	\$142.00	10			
TRD-NH30-RZVWD	\$142.00	30			
TRD-NH40-RZVWD	\$142.00	40			
TRD-NH50-RZVWD	\$142.00	50			
TRD-NH60-RZVWD	\$142.00	60			
TRD-NH100-RZVWD	\$142.00	100			
TRD-NH120-RZVWD	\$155.00	120			
TRD-NH200-RZVWD	\$155.00	200			
TRD-NH240-RZVWD	\$155.00	240			
TRD-NH250-RZVWD	\$155.00	250			
TRD-NH300-RZVWD	\$155.00	300			
TRD-NH360-RZVWD	\$155.00	360			
TRD-NH400-RZVWD	\$155.00	400			
TRD-NH480-RZVWD	\$155.00	480			
TRD-NH500-RZVWD	\$155.00	500			
TRD-NH600-RZVWD	\$170.00	600			
TRD-NH750-RZVWD	\$170.00	750			
TRD-NH1000-RZVWD	\$170.00	1000			
TRD-NH1024-RZVWD	\$170.00	1024			
TRD-NH1200-RZVWD	\$196.00	1200			
TRD-NH2000-RZVWD	\$196.00	2000			
TRD-NH2500-RZVWD	\$196.00	2500			
TRD-NH3000-RZVWD	\$196.00	3000			
TRD-NH3600-RZVWD	\$196.00	3600			
TRD-NH5000-RZVWD	\$196.00	5000			

## Wiring diagrams

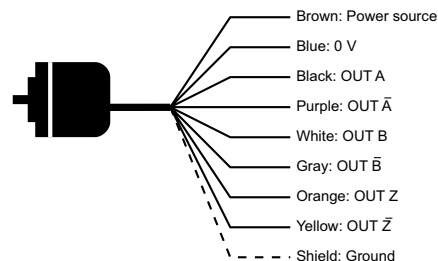
### Totem-pole (push-pull) connections

Cable shield is not connected to the encoder body; enclosure is grounded through the 0V wire



### Line driver connections

Cable shield is not connected to the encoder body; enclosure is grounded through the 0V wire



# Medium Duty Incremental Encoders

(Metric Dimension Encoders)

Specifications – TRD-N(H) series

## Accessories

### Couplings

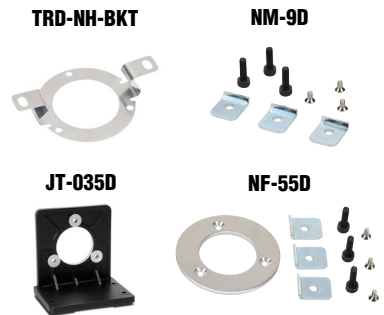
For encoders with a **solid shaft**, please select a coupling that fits your encoder. All couplings are typically in stock, ready to ship.

See the “Encoder Couplings” section for more information.

### Mounting Flange & Brackets

Mounting Accessories		
Part #	Price	Description
<b>JT-035D</b>	\$11.00	Mounting Bracket: Metal; for use with all TRD-N/NH/NA encoders
<b>NM-9D*</b>	\$6.25	Mounting Clamp: Metal; for use with all TRD-N/NA encoders *
<b>NF-55D*</b>	\$15.50	Mounting Flange Kit: includes aluminum flange & NM-9D clamp; for use with all TRD-N/NA encoders *
<b>TRD-NH-BKT</b>	\$5.25	Flexible mounting bracket, replacement. For use with Koyo TRD-NH series hollow shaft encoders

\* Order NF-55D (flange & clamp) for new installations. Order NM-9D (clamp) for replacement parts only.



Electrical Specifications				
Model		TRD-N(H)xxx-RZWD (Totem-pole)	TRD-N(H)xxx-RZVWD (Line Driver)	
Power Supply	Operating Voltage *	5–30 VDC (nominal) * Range: 4.75–30.0 VDC	5VDC (nominal) * Range: 4.75–5.25 VDC	
	Allowable Ripple	3% rms max.		
	Current Consumption	60 mA max.		
Signal Waveform		Quadrature + home position		
Max. Response Frequency		100 kHz	100kHz for ≤ 3000 ppr 200kHz for > 3000 ppr	
Operating Speed		(max response frequency / resolution) x 60		
Duty Ratio		50% ±25% (square wave)		
Signal Width at Home Position		100% ±50%		
Output	Rise/Fall Time **	3µs max **	100 ns max **	
	Output Type	Totem Pole (Push Pull)	Line Driver (26C31 or equivalent)	
	Output Current	Negative logic (active low)	Positive logic (active high)	
	Output Current “H” (inflow)	“H” (inflow)	30 mA max.	20 mA max
		“L” (outflow)	10 mA max.	
	Output Voltage “H”	“H”	[(Load power volt) - 2.5V]	2.5V min
		“L”	0.4V max	0.5V max
Load Power Voltage		35 VDC max	–	

\* To be supplied by Class II source

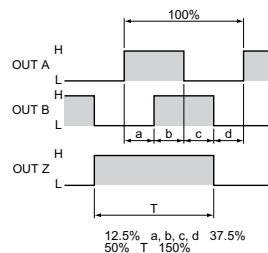
\*\* Cable length ≤ 2m or less. Maximum load.

Mechanical Specifications	
Starting Torque	N (solid shaft): 0.02 N-m [0.18 lb-ft]; NH (hollow shaft): 0.05 N-m [0.44 lb-ft]
Max. Allowable Shaft Load	Radial: 50N [11.24 lb]; Axial: 30N [6.74 lb]
Max. Allowable Speed	Continuous: 3,000 rpm; Instantaneous: 5,000 rpm
Wire Size	24 AWG
Weight	Approx. 270g [9.52 oz] with 2m cable

Environmental Specifications		
Ambient Temperature	-10 to 70 °C [14 to 158 °F]	
Storage Temperature	-25 to 85 °C [-13 to 185 °F]	
Operating Humidity	35–85% RH	
Withstand Voltage *	500 VAC (50/60Hz) for one minute *	Grounded through a capacitor
Insulation Resistance	50 MΩ min. (excluding shield between power supply, signal cable and case)	
Vibration Resistance	durable for one hour along three axes at 10 to 55 Hz with 0.75 mm amplitude (excluding shield between power supply, signal cable and case)	
Shock Resistance	≤500 ppr (metal slit) = 11 ms with 981 m/s <sup>2</sup> applied three times along three axes ≥600 ppr (glass slit) = 11 ms with 490 m/s <sup>2</sup> applied three times along three axes	
Mounting Orientation	can be mounted in any orientation	
Protection	IP65	
Agency Approvals	cUL <sub>US</sub> (E189395)	

\* Voltage withstand is good for power supply, signal, and case; not good for shield wire.

Output Signal Timing Chart - Totem Pole Models



The above waveforms apply to normal (clockwise) revolution viewed from the shaft. OUT Z phase is reversed on the RZL and RZW models.

## Channel timing chart

## How to read the timing charts

### Totem Pole Models

Out A and Out B are 90 degrees out of phase. Like any quadrature encoder, four unique logic states are created internally to the encoder. This is based on the rising edge to rising edge (one cycle) on channel A or B that indicates one set of bars on the internal encoder disk has passed by the optical sensor.

OUT Z is the absolute reference added to an incremental encoder and is also known as home position. It signifies a full rotation of the encoder shaft.

### Line Driver Models

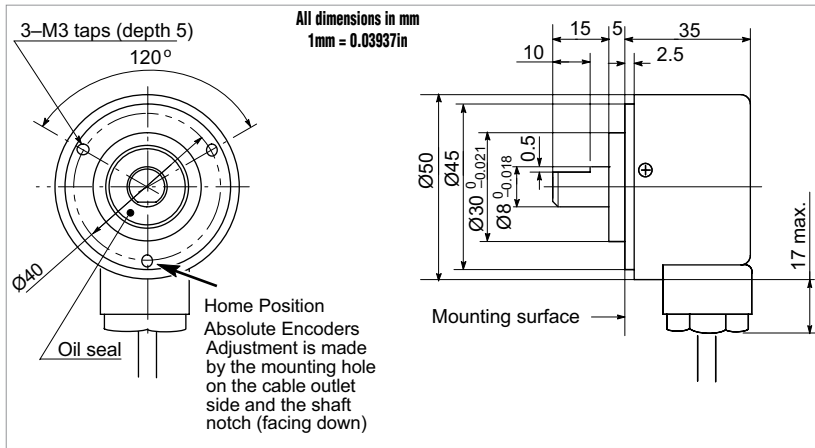
Channel A (OUT A and A-not) and Channel B (OUT B and B-not) are also 90 degrees out of phase on line driver encoders. OUT Z is the same as on open collector models, and is the absolute reference (home position). It signifies one full rotation of the encoder shaft.

# Medium Duty Absolute and Incremental Encoders (Metric Dimension Encoders)

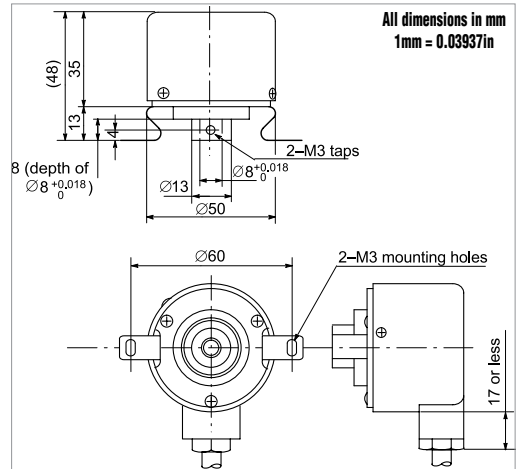
## Dimensions – TRD-N(H) & TRD-NA series

The following are the external dimensions of both incremental and absolute medium duty encoders and optional mounting accessories.

### Solid Shaft Incremental and Absolute Encoders (TRD-N, TRD-NA)



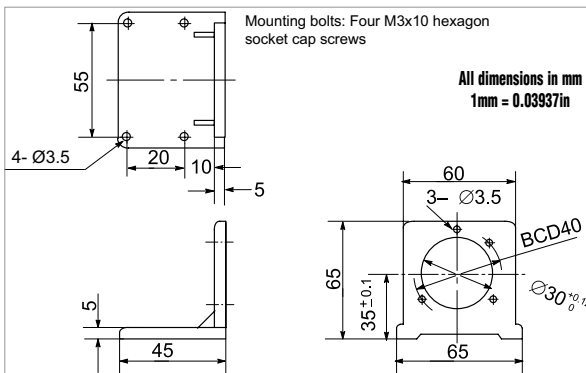
### Hollow Shaft Incremental Encoders only (TRD-NH)



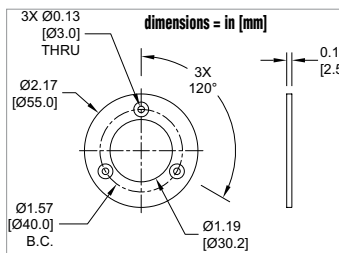
### Optional Mounting Flange and Brackets for Medium Duty Encoders

**NOTE: NF-55D flange & included NM-9D bracket: Requires (3) M4 x 0.7 tapped holes equally spaced on a 64mm bolt circle in the mounting surface.**

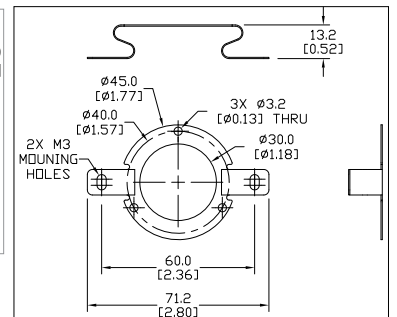
#### JT-035D (bracket)



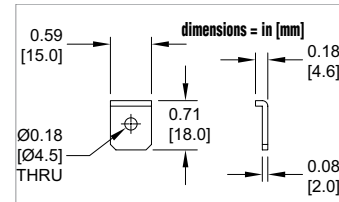
#### NF-55D (flange)



#### TRD-NH-BKT (bracket)



#### NM-9D (clamp)(included with NF-55D)

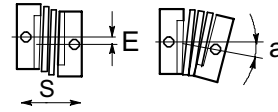


# Encoder Accessories – Couplings

## Encoder Couplings

Couplings provide a connection between solid-shaft encoders and solid shafts. We offer aluminum, fiberglass, and polymer couplings for metric, S.A.E. and metric-to-S.A.E. applications.

### Misalignment compensation



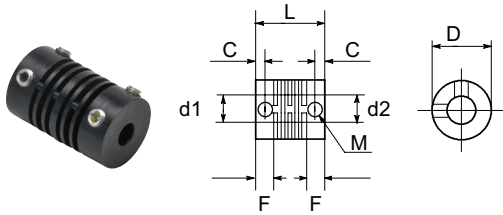
Couplings Selection Guide and Dimensions																
Type	Part Number	Price	Applicable Encoders (shaft size)	Shaft Diameter		D	L	F	C	M	a	E	S	Working Torque	Torsional Rigidity	Material
				d1	d2											
				max			( mm [in] )				( N-m )					
Fiberglass (metric)	GJ-4D	\$9.50	TRD-MX (4mm)	4mm	4mm	13 [0.51]	21 [0.83]	5.3 [0.21]	3 [0.12]	M3 set screw	5°	0.4 [0.02]	0.4 [0.02]	0.6 N-m	6 N-m/rad	Glass-fiber reinforced resin
	GJ-6D	\$7.50	TRD-S (6mm)	6mm	6mm	15 [0.59]	22 [0.87]	5.2 [0.20]	3 [0.12]	M3 set screw	6°	0.5 [0.02]	0.12 [0.005]	0.8 N-m	10 N-m/rad	
	GJ-8D	\$7.50	TRD-N/NA (8mm)	8mm	8mm	19 [0.75]	24 [0.94]	6.8 [0.27]	3.5 [0.14]	M4 set screw	5°	0.5 [0.02]	0.4 [0.016]	1.5 N-m	20 N-m/rad	
	GJ-10D	\$9.75	TRD-GK (10 mm)	10 mm	10 mm	22 [0.87]	26 [1.02]	7.1 [0.28]	4 [0.16]	M4 set screw	5°	0.5 [0.02]	0.12 [0.005]	2.0 N-m	32 N-m/rad	
Fiberglass (SAE)	GJ-635D	\$10.50	TRDA-2E (0.25 in)	0.25 in	0.25 in	15 [0.59]	22 [0.87]	5.2 [0.20]	3 [0.12]	M3 set screw	5°	0.5 [0.02]	0.12 [0.005]	0.8 N-m	10 N-m/rad	Glass-fiber reinforced resin
	GJK-953D	\$16.00	TRDA-20/25 (0.375 in)	0.375 in	0.375 in	25 [0.98]	32 [1.26]	7.3 [0.29]	3.5 [0.14]	M4 set screw	5°	0.5 [0.02]	0.12 [0.005]	2.0 N-m	32 N-m/rad	
Polymer (SAE)	STP-MTRA-SC-1412	\$20.00	TRDA-2E (0.25 in)	0.25 in	0.50 in	25 [0.98]	38 [1.50]	9.9 [0.39]	5.4 [0.21]	M3 cap screw	5°	0.3 [0.01]	0.12 [0.005]	3.7 N-m	0.36 °/lb-in	Engineered polymer
	STP-MTRA-SC-3812	\$20.00	TRDA-20/25 (0.375 in)	0.375 in	0.50 in	25 [0.98]	38 [1.50]	9.9 [0.39]	5.4 [0.21]	M3 cap screw	5°	0.3 [0.01]	0.12 [0.005]	3.7 N-m	0.36 °/lb-in	
Aluminum (metric)	ARM-075-5-4D	\$29.50	TRD-MX (4mm)	4mm	5mm	19.1 [0.75]	19.1 [0.75]	4.6 [0.18]	2.4 [0.09]	M3 set screw	5°	0.25 [0.01]	0.25 [0.01]	2.3 N-m	8.2 N-m/rad	Aluminum alloy
	RU-075D	\$46.00	TRD-S (6mm)	6mm	6mm	19.1 [0.75]	19.1 [0.75]	4.6 [0.18]	2.4 [0.09]	M3 set screw	5°	0.25 [0.01]	0.12 [0.005]	1.0 N-m	8.2 N-m/rad	
	JU-100D	\$42.00	TRD-N/NA (8mm)	8mm	8mm	25.4 [1.00]	25.4 [1.00]	6.6 [0.26]	3.8 [0.15]	M5 set screw	5°	0.25 [0.01]	0.25 [0.01]	1.6 N-m	14.3 N-m/rad	
	RU-100D	\$45.00	TRD-GK (10 mm)	10 mm	10 mm	25.4 [1.00]	25.4 [1.00]	6.6 [0.26]	3.8 [0.15]	M5 set screw	5°	0.25 [0.01]	0.12 [0.005]	1.6 N-m	14.3 N-m/rad	
Aluminum (metric-to-SAE)	ML13P-4-476D	\$29.50	TRD-MX (4mm)	4mm	0.1875 in	13 [0.51]	19 [0.75]	5.5 [0.22]	2.5 [0.10]	M2 set screw	5°	0.4 [0.02]	0.2 [0.01]	0.25 N-m	44 N-m/rad	Aluminum alloy (Bent plate: Polyimide)
	ML16P-4-635D	\$29.50	TRD-MX (4mm) TRDA-2E (0.25 in)	4mm	0.25 in	16 [0.63]	23 [0.91]	7 [0.28]	3 [0.12]	M3 set screw	5°	0.6 [0.02]	0.3 [0.01]	0.4 N-m	70 N-m/rad	
	MCGL16-6-635	\$20.00	TRD-S (6mm) TRDA-2E (0.25 in)	6mm	0.25 in	16 [0.63]	23.2 [0.91]	7 [0.28]	3 [0.12]	M3 set screw	3.5°	0.3 [0.01]	0.3 [0.01]	0.4 N-m	70 N-m/rad	
	MCGL20-8-635	\$29.00	TRD-N/NA (8mm) TRDA-2E (0.25 in)	8mm	0.25 in	20 [0.79]	26 [1.02]	7.5 [0.30]	3.7 [0.15]	M3 set screw	3.5°	0.3 [0.01]	0.4 [0.02]	0.6 N-m	130 N-m/rad	
	MCGL20-8-952	\$29.00	TRD-N/NA (8mm) TRDA-20/25 (0.375 in)	8mm	0.375 in	20 [0.79]	26 [1.02]	7.5 [0.30]	3.7 [0.15]	M3 set screw	3.5°	0.3 [0.01]	0.4 [0.02]	0.6 N-m	130 N-m/rad	
	MCGL25-10-635	\$33.00	TRD-GK (10 mm) TRDA-2E (0.25 in)	10 mm	0.25 in	25 [0.98]	30.2 [1.19]	9 [0.35]	4 [0.16]	M4 set screw	3.5°	0.3 [0.01]	0.5 [0.02]	1.4 N-m	240 N-m/rad	
	MCGL25-10-952	\$33.00	TRD-GK (10 mm) TRDA-20/25 (0.375 in)	10 mm	0.375 in	25 [0.98]	30.2 [1.19]	9 [0.35]	4 [0.16]	M4 set screw	3.5°	0.3 [0.01]	0.5 [0.02]	1.4 N-m	240 N-m/rad	
Aluminum (SAE)	ARM-075-635-635D	\$27.50	TRDA-2E (0.25 in)	0.25 in	0.25 in	19.1 [0.75]	19.1 [0.75]	4.6 [0.18]	2.4 [0.09]	M3 set screw	5°	0.25 [0.01]	0.25 [0.01]	1.0 N-m	8.2 N-m/rad	Aluminum alloy
	ARM-100-9525-9525D	\$29.50	TRDA-20/25 (0.375 in)	0.375 in	0.375 in	25.4 [1.00]	25.4 [1.00]	6.6 [0.26]	3.8 [0.15]	M5 set screw	5°	0.25 [0.01]	0.25 [0.01]	1.6 N-m	14.3 N-m/rad	

\* mm ÷ 25.4 = inches

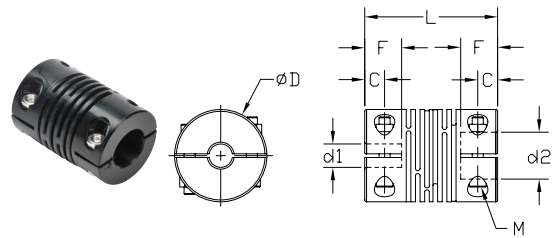
# Encoder Accessories – Couplings

## Encoder Couplings – Dimensions

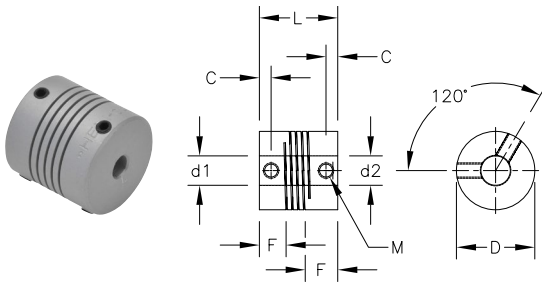
**GJ-xxD Fiberglass Couplings (metric) & GJx-xxxD Fiberglass Couplings (SAE)**



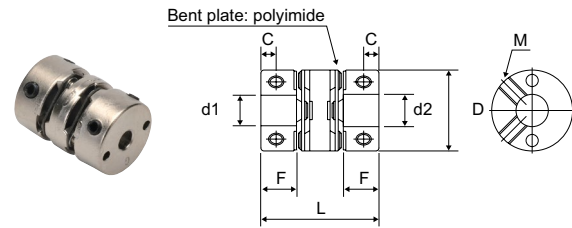
**STP-MTRA-SC-xxxx Polymer Couplings**



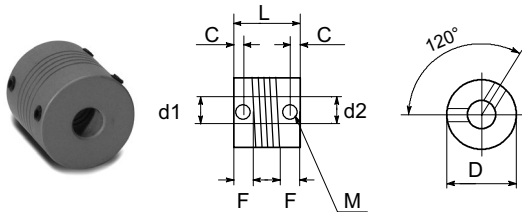
**ARM-xxxxxD Aluminum Couplings (metric & SAE)**



**MCGLxx Aluminum Couplings & ML1xP-4-xxxD Aluminum Couplings**



**RU-075D, RU-100D, and JU-100D Aluminum Couplings**





# Great Encoder Selection at Great Prices



## Koyo

Duty	Family	Size	Encoder diameter	Shaft diameter	Solid or Hollow Shaft	Operating Voltage (VDC) and Electrical Output*	IP Rating	Max Radial Load (N)	Max Axial Load (N)	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 5-12V OC 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 5-12V OC 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
		TRD-NA	20	50mm	8mm	solid	10-30V OC	IP65	50	30	32, 64, 128, 180, 256, 360, 512, 720, 1024, 2048 (Gray code)
Medium Duty Absolute	TRD-NA	20	50mm	8mm	solid	10-30V OC	IP65	50	30	32, 64, 128, 180, 256, 360, 512, 720, 1024, 2048 (Gray 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.

