

Light Duty Incremental Encoders (Metric Dimension Encoders)

TRD-SR series

Features

A light duty incremental (quadrature) encoder that is cost-effective for small applications and has the following features:

- Small body available in 38mm or 40mm diameters
- Separate dust proof (IP50 rating) and water resistant (IP65) ratings
- 6 mm solid shaft
- Resolution available from 100 pulses per revolution to 2500 pulses per revolution
- Open collector or line driver output
- Up to 200 kHz response frequency
- Two-meter cable, pigtail
- Mounting dimensions: 2 and 3 hole patterns on 28mm and 30mm diameters



Solid-shaft (TRD-SR) model

TRD-SR Light Duty Solid Shaft Incremental Encoders (NPN Open Collector and Line Driver models)								
Part Number	Price	Pulses per Revolution	Drawing	Input Voltage	Output	Weight	Protection Rating	Body Diameter
TRD-SR100AD	\$98.00	100	PDF	5–26 VDC	NPN open collector	160g with 2m cable	IP50	38mm
TRD-SR200AD	\$98.00	200	PDF					
TRD-SR360AD	\$98.00	360	PDF					
TRD-SR500AD	\$98.00	500	PDF					
TRD-SR600AD	\$98.00	600	PDF					
TRD-SR1000AD	\$98.00	1000	PDF					
TRD-SR1024AD	\$104.00	1024	PDF					
TRD-SR2000AD	\$104.00	2000	PDF					
TRD-SR2500AD	\$104.00	2500	PDF					
TRD-SR100VD	\$98.00	100	PDF					
TRD-SR200VD	\$98.00	200	PDF					
TRD-SR360VD	\$98.00	360	PDF					
TRD-SR500VD	\$98.00	500	PDF					
TRD-SR600VD	\$98.00	600	PDF					
TRD-SR1000VD	\$98.00	1000	PDF					
TRD-SR1024VD	\$104.00	1024	PDF					
TRD-SR2000VD	\$104.00	2000	PDF					
TRD-SR2500VD	\$104.00	2500	PDF					
TRD-SR100AWD	\$131.00	100	PDF	5–26 VDC	NPN open collector	190g with 2m cable	IP65	40mm
TRD-SR200AWD	\$131.00	200	PDF					
TRD-SR360AWD	\$131.00	360	PDF					
TRD-SR500AWD	\$131.00	500	PDF					
TRD-SR600AWD	\$131.00	600	PDF					
TRD-SR1000AWD	\$131.00	1000	PDF					
TRD-SR1024AWD	\$137.00	1024	PDF					
TRD-SR2000AWD	\$137.00	2000	PDF					
TRD-SR2500AWD	\$137.00	2500	PDF					
TRD-SR100VWD	\$131.00	100	PDF					
TRD-SR200VWD	\$131.00	200	PDF					
TRD-SR360VWD	\$131.00	360	PDF					
TRD-SR500VWD	\$131.00	500	PDF					
TRD-SR600VWD	\$131.00	600	PDF					
TRD-SR1000VWD	\$131.00	1000	PDF					
TRD-SR1024VWD	\$137.00	1024	PDF					
TRD-SR2000VWD	\$137.00	2000	PDF					
TRD-SR2500VWD	\$137.00	2500	PDF					

Light Duty Incremental Encoders (Metric Dimension Encoders)

TRD-SHR series

Features

A light duty incremental (quadrature) encoder that is cost-effective for small applications and has the following features:

- Small body available in 38mm or 40mm diameters
- Separate dust proof (IP50 rating) and water resistant (IP65) ratings
- 8 mm hollow shaft
- Resolution available from 100 pulses per revolution to 2500 pulses per revolution
- Open collector or line driver output
- Up to 200 kHz response frequency
- Two-meter cable, pigtail
- IP50=45mm Ø mounting pattern (can change to 40mm with SHRS-040D), IP65=40mm Ø mounting pattern



Hollow-shaft (TRD-SHR) model

TRD-SHR Light Duty Hollow Shaft Incremental Encoders (NPN Open Collector and Line Driver models)								
Part Number	Price	Pulses per Revolution	Drawing	Input Voltage	Output	Weight	Protection Rating	Body Diameter
TRD-SHR100A5D	\$105.00	100	PDF	5-26 VDC	NPN open collector	170g with 2m cable	IP50	38mm
TRD-SHR200A5D	\$105.00	200	PDF					
TRD-SHR360A5D	\$105.00	360	PDF					
TRD-SHR500A5D	\$105.00	500	PDF					
TRD-SHR600A5D	\$105.00	600	PDF					
TRD-SHR1000A5D	\$105.00	1000	PDF					
TRD-SHR1024A5D	\$109.00	1024	PDF					
TRD-SHR2000A5D	\$109.00	2000	PDF					
TRD-SHR2500A5D	\$109.00	2500	PDF					
TRD-SHR100V5D	\$105.00	100	PDF	5VDC	Line driver (differential)	170g with 2m cable	IP50	38mm
TRD-SHR200V5D	\$105.00	200	PDF					
TRD-SHR360V5D	\$105.00	360	PDF					
TRD-SHR500V5D	\$105.00	500	PDF					
TRD-SHR600V5D	\$105.00	600	PDF					
TRD-SHR1000V5D	\$105.00	1000	PDF					
TRD-SHR1024V5D	\$109.00	1024	PDF					
TRD-SHR2000V5D	\$109.00	2000	PDF					
TRD-SHR2500V5D	\$109.00	2500	PDF					
TRD-SHR100AW0D	\$138.00	100	PDF	5-26 VDC	NPN open collector	200g with 2m cable	IP65	40mm
TRD-SHR200AW0D	\$138.00	200	PDF					
TRD-SHR360AW0D	\$138.00	360	PDF					
TRD-SHR500AW0D	\$138.00	500	PDF					
TRD-SHR600AW0D	\$138.00	600	PDF					
TRD-SHR1000AW0D	\$138.00	1000	PDF					
TRD-SHR1024AW0D	\$142.00	1024	PDF					
TRD-SHR2000AW0D	\$142.00	2000	PDF					
TRD-SHR2500AW0D	\$142.00	2500	PDF					
TRD-SHR100VW0D	\$138.00	100	PDF	5VDC	Line driver (differential)	200g with 2m cable	IP65	40mm
TRD-SHR200VW0D	\$138.00	200	PDF					
TRD-SHR360VW0D	\$138.00	360	PDF					
TRD-SHR500VW0D	\$138.00	500	PDF					
TRD-SHR600VW0D	\$138.00	600	PDF					
TRD-SHR1000VW0D	\$138.00	1000	PDF					
TRD-SHR1024VW0D	\$142.00	1024	PDF					
TRD-SHR2000VW0D	\$142.00	2000	PDF					
TRD-SHR2500VW0D	\$142.00	2500	PDF					

Light Duty Incremental Encoders (Metric Dimension Encoders)

Specifications – TRD-SR/SRH series

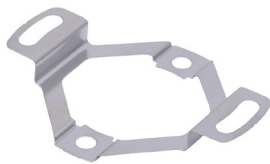
Electrical Specifications				
Model		TRD-SRxxxxAx TRD-SHRxxxxAxx (open collector)	TRD-SRxxxxVx TRD-SHRxxxxVxx (line driver)	
Power Supply	Operating Voltage *	5–26 VDC (nominal) * Range: 4.75–26.4 VDC	5VDC (nominal) * Range: 4.75–5.25 VDC	
	Allowable Ripple	3% max.		
	Current Consumption	90mA max.		
Signal Waveform		Quadrature + home position		
Resolutions Available		100 to 2500 pulses per revolution		
Max. Response Frequency		200kHz		
Max. Electrical Speed**		(max response frequency / resolution) x 60		
Duty Ratio		50% ±25%		
Phase Difference Width		25% ±12.5%		
Signal Width at Home Position		100 ±50%		
Output	Rise/Fall Time	1µs max. (when cable length is 1m)		
	Output Type	NPN open collector output, sinking	Line driver output (26C31 or equivalent)	
	Output Logic	Negative logic (active low)	Positive logic (active high)	
	Output Voltage	H	–	2.5 V min.
		L	0.4 V max.	0.5 V max.
	Current	30mA max.	20 mA max.	
	Load Power Voltage	30 VDC max.	–	
	Short-Circuit Protection	Between output and power supply	–	
Mechanical Specifications				
Starting Torque	0.001 Nm (0.00074 ft/lb) max			
Shaft Moment of Inertia	0.6 x 10 ⁴ kg·m ²			
Max. Allowable Shaft Load	Radial: 30N (6.7 lb-f); Axial: 20N (4.5 lb-f)			
Max. Mechanical Speed**	6000rpm (maximum possible without compromising encoder mechanical integrity)			
Wire Size	AWG26			
Mounting Orientation	can be mounted in any orientation			
Environmental Specifications				
Ambient Temperature	-10 to 80 °C (14 to 176 °F)			
Storage Temperature	-25 to 85°C (-13 to 185°F)			
Operating Humidity	35–85% RH (non-condensing)			
Withstand Voltage	Grounded through capacitor			
Insulation Resistance	50MΩ min.			
Vibration Resistance	durable for one hour along three axes at 10 to 55 Hz with 0.75 mm amplitude			
Shock Resistance	11 ms with 490 m/s ² applied three times along three axes			
Protection	IP50 standard encoders. IP65 for encoders with "W" in the part number.			
Agency Approvals	cUL _{US} (E189395)			
* To be supplied by Class II source.				
** Encoder maximum speed is the lesser value of Max. Electrical Speed and Max. Mechanical Speed.				

Light Duty Incremental Encoders (Metric Dimension Encoders)

TRD-SR/SHR series Mounting Accessories

Mounting Accessories					
Part Number	Price	Description	Weight	Drawing	Compatibility
SHRS-040D*	\$9.00	Flexible mounting bracket for IP50 hollow shaft encoders, converts standard 45mm mounting to 40mm mounting.	<2g	PDF	TRD-SHR series, IP50
SHRS-045D*	\$9.00	Replacement 45mm flexible mounting bracket for IP50 rated hollow shaft encoders.		PDF	
SHRS-W40D*	\$9.00	Replacement 40mm flexible mounting bracket for IP65 rated hollow shaft encoders.		PDF	
SRT-035D	\$23.00	Right angle mounting bracket for solid shaft TRD-SR encoders.	140g	PDF	TRD-SR series

* Note: The IP50 flexible mounting brackets will not fit on the IP65 encoders. Likewise, the IP65 flexible mounting bracket will not fit on the IP50 encoders.



SHRS-040D



SHRS-045D



SHRS-W40D

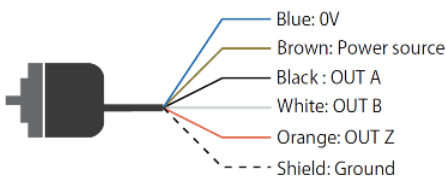


SRT-035D

Wiring diagrams

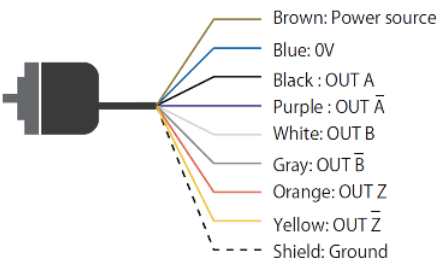
Open Collector Models

Cable shield is NOT connected to the encoder body (frame ground)



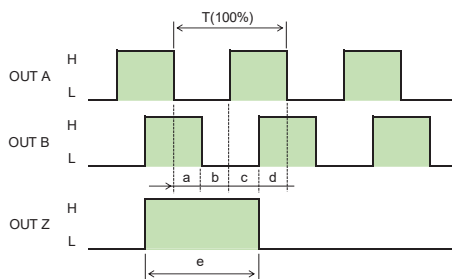
Line Driver Models

Cable shield is NOT connected to the encoder body (frame ground)

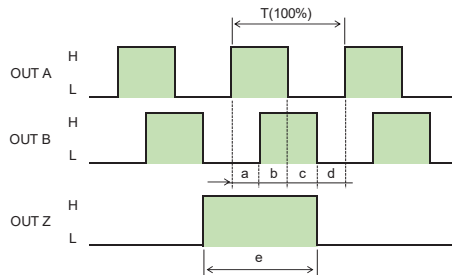


Channel timing charts

TRD-SR/SHR "A" Models



TRD-SR/SHR "V" Models



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

This Output waveform is Normal revolution (CW).
"Normal" means clockwise revolution viewed from the shaft end.

How to read the timing charts

Open Collector 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

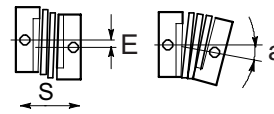
Channel A (OUT A and A-not) and Channel B (OUT B and B-not) are also 90 degrees out of phase on line driver encoders. OUT Z is the same as on open collector models, and is the absolute reference (home position). It signifies one full rotation of the encoder shaft.

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



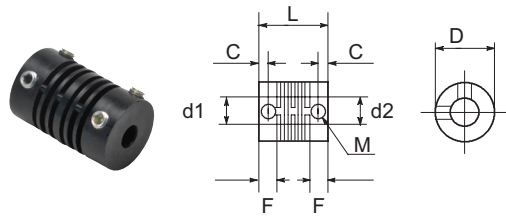
Couplings Selection Guide and Dimensions																
Type	Part Number	Price	Applicable Encoders (shaft size)	Shaft Diameter		D	L	F	C	M	a	E	S	Working Torque (N-m)	Torsional Rigidity	Material
				d1	d2	(mm [in])					max					
				(mm [in])												
Fiberglass (metric)	GJ-4D	\$12.00	TRD-MX (4mm)	4mm	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	\$9.25	TRD-S/SR (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	\$11.00	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	\$12.00	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	\$22.00	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	\$27.00	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	\$30.00	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	\$30.00	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	\$51.50	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	\$58.00	TRD-S/SR (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	\$51.50	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	\$60.00	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	\$51.50	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	\$51.50	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	\$33.00	TRD-S/SR (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	\$43.00	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	\$44.00	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	\$54.00	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	\$55.00	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	\$52.00	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	\$50.00	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

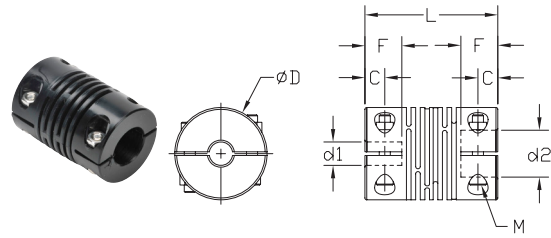
Encoder Accessories – Couplings

Encoder Couplings – Dimensions

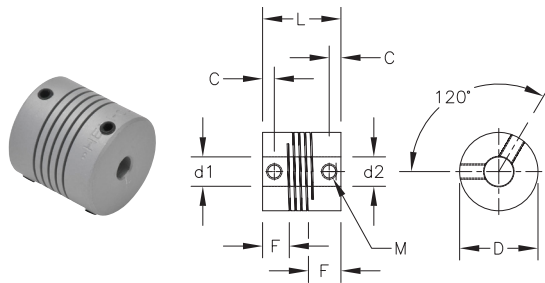
GJ-xxD Fiberglass Couplings (metric) & GJx-xxxD Fiberglass Couplings (SAE)



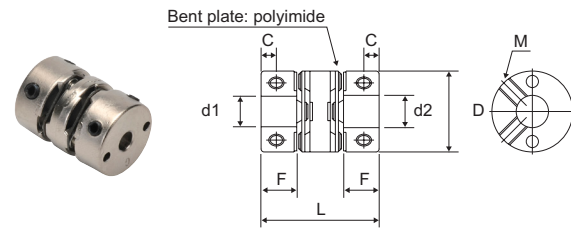
STP-MTRA-SC-xxxx Polymer Couplings



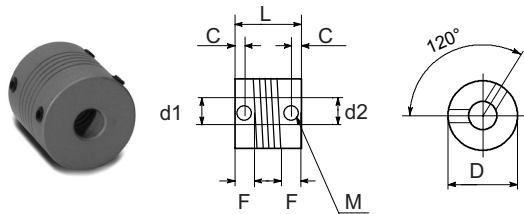
ARM-xxxxxxD Aluminum Couplings (metric & SAE)



MCGLxx Aluminum Couplings & ML1xP-4-xxxD Aluminum Couplings



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



Great Encoder Selection at Great Prices



Kit Encoder AMT



Light-duty TRD-SR



Medium Duty TRDA-25 (w/MS connector)



Medium Duty TRD-N



Medium Duty TRD-NH



Heavy-duty TRD-GK

		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 (PPR)
Incremental	Modular/Kit	AMT (CUI Devices)		11, 15	28mm, 42mm	2/3/4/5/6/8/9/10/11/12/13/14mm, 3/16", 1/4", 3/8", 1/2", 5/8"	hollow	5V Line Driver or 5V P/P	IP20	NA**	NA**	Programmable Up to 4096
		STP-MTRA-ENC		12	31mm	5mm, 1/4", 3/8"	hollow	5V Line Driver or 5V P/P	IP20	NA**	NA**	400, 1000
	Light Duty	TRD-SR		15	38 or 40mm	6mm	solid	5V Line Driver or 5-26V OC	IP50 or IP65	20	10	100, 200, 360, 500, 600, 1000, 1024, 2000, 2500
		TRD-SHR		15	38 or 40mm	8mm	hollow	5V Line Driver or 5-26V OC	IP50 or IP65	20	10	100, 200, 360, 500, 600, 1000, 1024, 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
		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
	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, 1000, 1200, 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)

Modular/Kit and TRDA-25 encoders have connectors and require separate cables. All other encoders feature an integral 2m cable.

- *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)

**Modular/Kit encoders are direct mount, there are no load ratings.

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.

