TRDA-2E series

Accessories

	Acc	essories for TRDA-2E Series Encoders
Part Number	Price	Description
<u>F-2D</u>	\$42.50	JTEKT round mounting flange, 1.86in bolt hole circle, (1.05in height), metal. For use with JTEKT TRDA-2E series encoders. Flange and encoder mounting hardware included.
<u>F-3D</u>	\$75.00	JTEKT round mounting flange, 2.95in bolt hole circle (1.34in height), metal. For use with JTEKT TRDA-2E series encoders. Flange and encoder mounting hardware included.
<u>F-6D</u>	\$57.50	JTEKT round mounting flange, 1.86in bolt hole circle, (1.34in height), metal. For use with JTEKT TRDA-2E series encoders. Flange and encoder mounting hardware included.
<u>F-7D</u>	\$42.50	JTEKT round mounting flange, 1in bolt hole circle (0.20in height), metal. For use with JTEKT TRDA-2E series encoders. Flange and encoder mounting hardware included.
<u>F-8D</u>	\$57.50	JTEKT round mounting flange, 2.95in bolt hole circle, (1.71in height), metal. For use with JTEKT TRDA-2E series encoders. Flange and encoder mounting hardware included.
<u>2ET-035D</u>	\$60.00	JTEKT right angle bracket, metal. For use with JTEKT TRDA-2E series encoders. Bracket and encoder mounting hardware included.

Couplings

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

See the "Encoder Couplings" section for more information.



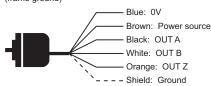
Specifications – TRDA-2E series

Electrical S	pecifications (SAE Di	mension Light	Duty)
Model			TRDA-2ExxxxBD (open collector)	TRDA-2ExxxxVD (line driver)
Dawar Suralu	Operating Voltage *		12–24 VDC (nominal) * Range: 10.8–26.4 VDC	5VDC (nominal) * Range: 4.75–5.25 VDC
Power Supply		3% rms	max.	
	Current Consumption	1	50mA max	. no load
	Signal Waveform		Quadrature + h	nome position
	Max. Response Frequ	iency	2004	Hz
Output Waveform	Operating Speed		(max response freque	ncy / resolution) x 60
	Duty Ratio (Symmetr	y)	50% ±	25%
	Index Signal Width (at Home Position)		100% :	±50%
	Rise/Fall Time **		1µs max. **	100 ns max. **
	Output Type		Open collector (NPN sinking)	Line driver (26C31 or equivalent)
	Output Logic		Negative logic (active low)	Positive logic (active high)
Output	Output Current	Inflow	30mA max.	20mA max.
ouipui		Outflow	_	
	Output Voltage	H	_	2.5 V min.
		L	0.4 V max.	0.5 V max.
	Load Power Supply Voltage		30VDC max.	-
	Short-circuit Protecti	ion	Between eachoutput and 0V	-
* To be supplied by Class II source. ** With a cable of 2m or less; Max loa	d.			
	Mechanical	Specifi	cations	
Starting Torque	0.01 N·m [0.09 lb·in] m			
Max. Allowable Shaft Load	Axial: 20N [4.5 lb]; Rad	dial: 30N [6.7	7 lb]	
Max. Allowable Speed	5000 rpm (highest spee	ed that can s	upport the mechanical inte	egrity of encoder)
Wire Size	26 AWG, shielded, oil-r	esistant PVC	;	
Mounting Orientation	can be mounted in any	orientation		
Weight	approx. 170g [6.0 oz] (v	with 2m cable	e)	
	Environmenta		fications	
Ambient Temperature	-10 to 70 °C [14 to 158	3 °F]		
Storage Temperature	-25 to 85 °C [-13 to 18	5 °F]		
Operating Humidity	35-85% RH (non-cond	ensing)		
Voltage Withstand			a 630V cap is connected b	etween 0V & FG lines)
Insulation Resistance	$50 \text{ M}\Omega$ min. (excluding	,		
Vibration Resistance		-	es @ 10 to 55 Hz with 0.7	5 mm half-amplitude
Shock Resistance	490 m/s ² (11 ms applie	d three times	along three axes)	
Protection	IP50			
Agency Approvals	_C UL _{US} (E189395)			

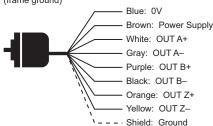
Specifications – TRDA-2E series

Wiring Diagrams

Open Collector Connections Cable shield is connected to the encoder body (frame ground)

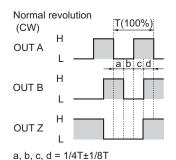


Line Driver Connections Cable shield is connected to the encoder body (frame ground)



Channel Timing Charts

Open Collector Models (TRDA-2ExxxBD)



How to read the timing charts

Open Collector Models

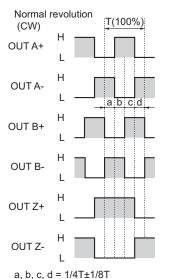
Out A and Out B are 90 degrees out of phase. Like any quadrature encoder, four unique logic states are created internally to the encoder. This is based on the rising edge to rising edge (one cycle) on channel A or B that indicates one set of bars on the internal encoder disk has passed by the optical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

Line Driver Models (TRDA-2ExxxVD)

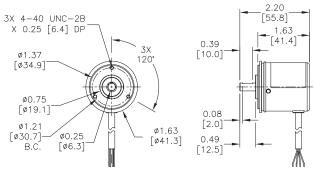


"Normal" means clockwise revolution viewed from the shaft

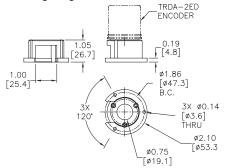
Dimensions – TRDA-2E series

Dimensions = in [mm]

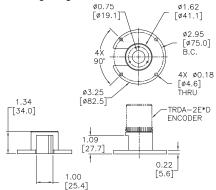
TRDA-2ExxxxD



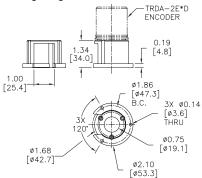
F-2D Mounting Flange



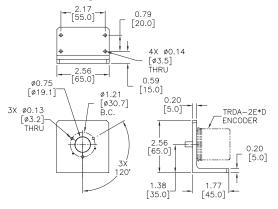
F-3D Mounting Flange



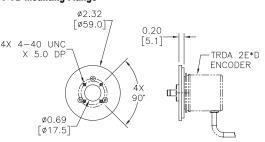
F-6D Mounting Flange



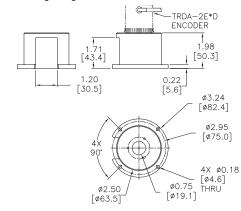
2ET-035D Mounting Bracket



F-7D Mounting Flange



F-8D Mounting Flange



TRD-MX series Features

A light duty incremental rotary encoder that is cost-effective for small applications; has the following features:

- Small body with 25 mm diameter and 29 mm depth
- 4 mm diameter solid shaft
- Resolution available from 100 pulses per revolution to 1024 pulses per revolution
- Open collector output (4.5–13.2 or 10.8–26.4 VDC), or line driver output (4.75–5.25 VDC)
- Up to 100 kHz response frequency
- Two-meter cable with tinned ends
- IP50 environmental rating
- Mounting bracket and couplings are available



TRD-MXxxxx-AD/BD models



TRD-MXxxxx-VD models

ight Duty Solid-shaft Incremental Encoders.	\$							
NPN Open-collector Output, TRD-MXxxxAD	/							

<u>BD</u>													
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.								
TRD-MX100AD	\$96.00	100	4.5–13.2	NPN									
TRD-MX360AD	\$96.00	360	VDC	Open	25 mm								
TRD-MX500BD	Retired	500	10.8–26.4 VDC	Collector									

Light Duty Solid-shaft Incremental Encoders (Line Driver Output, TRD-MXxxxVD)											
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.						
TRD-MX100VD	Retired	100									
TRD-MX360VD	Retired	360	4.75–5.25 VDC	Line Driver	25 mm						
TRD-MX500VD	Retired	500	100	DINE							

Accessories

Accessories for TRD-MX Series Encoders								
Part Number	Price	Description						
<u>MM-4D</u>	Retired	Servo mounting clamp for TRD-MX series encoders						
<u>MT-030D</u>	\$39.00	Right-angle mounting bracket for TRD-MX series encoders						





Couplings

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

See the "Encoder Couplings" section for more information.



Couplings

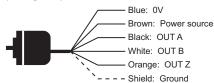
Specifications – TRD-MX series

	Electrical Sp	ecificat	ions (Metric Din	nension Light Du	ty TRD-MX)					
Model			TRD-MXxxxAD (open collector)	TRD-MXxxxBD (open collector)	TRD-MXxxxVD (line driver)					
	del wer Operating Voltage * Allowable Ripple Current Consumption Circuit Protection Required Signal Waveform Max. Response Frequency Operating Speed Duty Ratio (Symmetry) Index Signal Width (at Home Position) Rise/Fall Time ** Output Type Output Current Inflow Output Voltage H Load Power Voltage Short-circuit Protection vb esupplied by Class II source. sable length <2m or less. Maximum load.		5–12 VDC (nominal) * 4.5–13.2 VDC	12–24 VDC (nominal) * 10.8–26.4 VDC	5VDC (nominal) * 4.75–5.25 VDC					
Power										
Suppry		n		1)						
	Circuit Protection R	equired	Limit current to	100 mA or less	-					
	Signal Waveform			TRD-MXxxxBD (open collector) TRD-MXxxxVD (line driver) * 12–24 VDC (nominal)* 10.8–26.4 VDC 5VDC (nominal) 4.75–5.25 VDC 3% rms max 50 mA max (no load) ent to 100 mA or less – Quadrature + home position 100 kHz (max response frequency / resolution) x 60 Hz 50% ±25% 100% ±50% 100% ±50% ink current < 30 mA)	sition					
	Max. Response Freq	uency		100 kHz						
Output Woveform	Operating Speed		(ma	ax response frequency / resol	ution) x 60 Hz					
wavelonii	Duty Ratio (Symmet	ry)		50% ±25%						
	Indel Operating Voltage * Index Allowable Ripple Current Consumption Circuit Protection Required Circuit Protection Required Signal Waveform Max. Response Frequency Operating Speed Duty Ratio (Symmetry) Index Signal Width (at Home Position) Index Signal Width (at Home Position) Inflow Rise/Fall Time ** Output Logic Output Logic Inflow Output Voltage H Load Power Voltage Short-circuit Protection To be supplied by Class II source. Cable length ≤2m or less. Maximum load. Max. Allowable Shaft Load Inflow Max. Allowable Speed Inflow Vire Size Inflow With Stand Voltage * Inflow Intersperature Inflow Intersistance			100% ±50%						
	Rise/Fall Time **		2µs ** (sink c	urrent < 30 mA)	0.1 µs max ** (source current < 20 mA)					
	Output Type		Open collecto	r (NPN sinking)	Line driver (26C31 or equivalent)					
	Output Logic		Negative log	ic (active low)	Positive logic (active high)					
	er er oly Allowable Ripple Current Consumption Circuit Protection Re Signal Waveform Max. Response Frequ Operating Speed Duty Ratio (Symmetr Index Signal Width (at Home Position) Rise/Fall Time ** Output Type Output Logic Output Logic Output Voltage Load Power Voltage Short-circuit Protect ble length <2m or less. Maximum load. Mechanical S ting Torque Allowable Shaft Load Allowable Speed e Size ght Environmental ient Temperature age Temperature age Temperature age Temperature age Temperature ation Resistance ation Resistance ation Resistance ation Resistance ation Resistance ation Resistance ation Gesistance ation Resistance ation Resistance ation Resistance ation Resistance ation Resistance ation Resistance ation Gesistance ation Resistance Allowable Shaft Load	Inflow	30 m	A max	20 m/ may					
Power Supply Dutput Dutput Waveform Dutput	ouipui curreni	Outflow		2ν ΠΑ Πάλ						
	Allowable Ripple Current Consumption Circuit Protection Requit Signal Waveform Max. Response Frequent Operating Speed Duty Ratio (Symmetry) Index Signal Width (at Home Position) Rise/Fall Time ** Output Type Output Logic Output Voltage Bhort-circuit Protection supplied by Class II source. length ≤2m or less. Maximum load. Mechanical Speed g Torque Ilowable Speed Vize t Environmental Speed vize ton Resistance vin Resistance <	Н		-	2.5V min (source current < 20 n					
Untput Output Loau Sho * To be supplied by Class ** Cable length ≤2m or les	output vonage	L	0.4V max (sink	current < 30 mA)	0.5V max (source current < 20 mA					
	Load Power Voltage		30 VE	DC max	-					
		tion		-	-					
* To be supplied ** Cable length	≤2m or less. Maximum load.									
	Mechanical S	pecifica	ations (Metric Di	mension Light D	uty TRD-MX)					
Starting Torq	ue		0.001 N·	m [0.009 lb·in] max @ 20 °C	[68 °F]					
Max. Allowal	ble Shaft Load		Axial: 5N [1.1 lb]; Radial: 10N [2.2 lb]							
Max. Allowal	ble Speed		6000 rpm (highest speed	that can support the mechan	ical integrity of encoder)					
Wire Size			26 A	WG, shielded, oil-resistant P	VC					
Weight				approx 120g [0.3 lb]						
	Environmental	Specifi	cations (Metric D	Dimension Light I	Duty TRD-MX)					
Ambient Tem	Signal Waveform Quadrature + home position Max. Response Frequency 100 kHz Operating Speed (max response frequency / resolution) x 60 Hz Duty Ratio (Symmetry) 50% ±25% Index Signal Width (at Home Position) 100% ±50% Rise/Fall Time ** 2µs ** (sink current < 30 mA) 0.1 µs max ** (source cu mA) Output Type Open collector (NPN sinking) Line driver (26C31 or eq 0utput Logic Output Current Inflow 30 mA max 20 mA max Output Voltage H - 2.5V min (source current Load Power Voltage 0.5V max (source current Load Power Voltage - Stort-circuit Protection - - - - Atlowable Shaft Load Axiai: SN [1.1 lb]: Radiai: 10N [2.2 lb] . Allowable Shaft Load 6000 rpm (highest speed that can support the mechanical integrity of encoder) e e Size 26 AWG, shielded, oil-resistant PVC . ght approx 120g [0.3 lb] . Environmental Specifications (Metric Dimension Light Duty TRD-MX) . e Size 26 AWG, shielded, oil-resistant PVC ght									
Storage Tem	perature		50% ±25% 100% ±50% 2µs ** (sink current < 30 mA) 0.1 µs max ** (source current mA) Open collector (NPN sinking) Line driver (26C31 or equival Negative logic (active low) Positive logic (active high 30 mA max 20 mA max 20 mA max - 2.5V min (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.4V max (sink current < 30 mA) 0.5V max (source current < 20 0.01 N·m [0.009 lb·in] max @ 20 °C [68 °F] - Axial: 5N [1.1 lb]; Radial: 10N [2.2 lb] 6000 rpm (highest speed that can support the mechanical integrity of encoder) 26 AWG, shielded, oil-resistant PVC approx 120g [0.3 lb] ications (Metric Dimension Light Duty TRD-MX) -10 to 70 °C							
Operating Hu	ımidity		0.4V max (sink current < 30 mA)							
Withstand Vo	oltage *		26 AWG, shielded, oil-resistant PVC approx 120g [0.3 lb] ecifications (Metric Dimension Light Duty TRD-MX) -10 to 70 °C [14 to 158 °F] -25 to 85 °C [-13 to 185 °F] 35–85% RH (non-condensing) 630V grounded through capacitor (a 630V cap is connected between 0V & FG lines)							
Insulation Re	esistance	35–85% RH (non-condensing) 630V grounded through capacitor (a 630V cap is connected between 0V & FG lin 20 MΩ min								
Vibration Rea	sistance									
Shock Resist	tance		490 m/s ²	(11 ms applied 3-times, each	X, Y, Z)					
	ientation		car	be mounted in any orientation	n					
Protection				IP50						
Agency Appr	ovals		(CE, RoHS, _C UL _{US} (E189395)						
* Withstand vol	tage is good for power supply	, signal, and c	ase; not good for shield wire.							

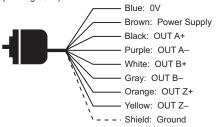
Specifications – TRD-MX series

Wiring Diagrams

Open Collector Connections Cable shield is connected to the encoder body (frame ground)



Line Driver Connections Cable shield is connected to the encoder body (frame ground)



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.

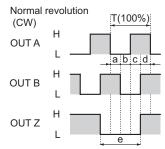
OUT Z is the absolute reference added to an incremental encoder and is also known as home position. It signifies a full rotation of the encoder shaft. It pulses once per revolution.

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. It pulses once per revolution.

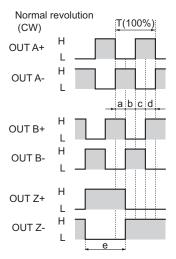
Channel Timing Charts

Open Collector Models (TRD-MXxxxAD/BD)



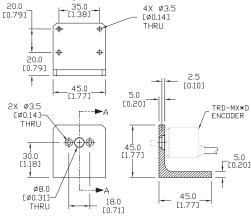
a, b, c, d = 0.25T ±0.125T; e = 1T ±0.125T "Normal" means clockwise revolution viewed from the shaft

Line Driver Models (TRD-MXxxxVD)



a, b, c, d = 0.25T ±0.125T; e = 1T ±0.125T "Normal" means clockwise revolution viewed from the shaft

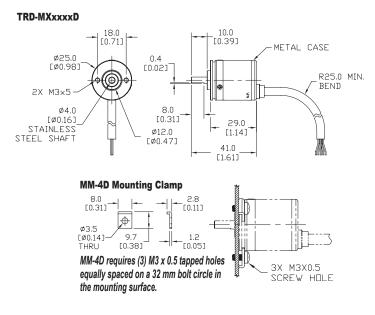
MT-030D Mounting Bracket



SECTION A-A

Dimensions – TRD-MX series

Dimensions = mm [in]



TRD-S(H) series Features

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

- Small body with 38 mm diameter and 30 mm depth
- Dust proof (IP40 rating)
- 6 mm solid shaft or 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, tinned ends



Solid-shaft (TRD-S) model



Hollow-shaft (TRD-SH) model

Light Duty Solid Shaft Incremental Encoders									
(NPN Open Collector and Line Driver models)									

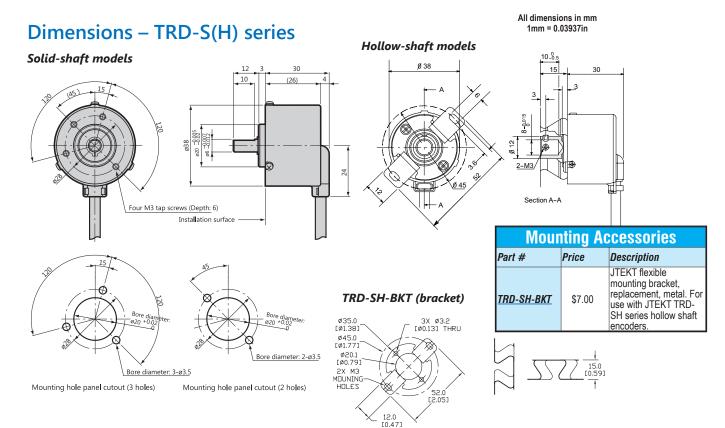
Part Number	Imber Price Revolution V 6100AD Retired 100 3360AD Retired 360 3500AD Retired 360 3500AD Retired 500 51000AD Retired 1000 61000AD Retired 1000 61024AD Retired 1024 62500AD Retired 2500 6250BD Retired 250 6300BD Retired 300 6600BD Retired 1000 61000-BD Retired 1000		Input Voltage	Output	Body Diameter
TRD-S100AD	Retired	100			
TRD-S360AD	Retired	360	indext Voltage Untput indext 5-12 VDC NPN open collector indext 5-12 VDC NPN open collector indext 12-24 NPN open collector indext 12-24 NPN open collector indext 12-24 NPN open collector indext 5VDC Line driver (differential) indext 5VDC Line driver (differential)		
TRD-S500AD	Retired	500	5-12 VDC	NPN open	
TRD-S1000AD	Retired	1000	J-12 VDC	collector	
TRD-S1024AD	Retired	1024			
TRD-S2500AD	Retired	2500			
TRD-S250BD	Retired	250		NPN open	
<u>TRD-S300BD</u>	Retired	300			
TRD-S600BD	Retired	600	12–24	NPN open	
TRD-S1000-BD	Retired	1000	VDC	collector	38mm
TRD-S1024-BD	Retired	1024			301111
TRD-S1200BD	Retired	1200			
TRD-S100-VD	\$111.00	100			
TRD-S250VD	Retired	250			
<u>TRD-S300VD</u>	\$111.00	300			
TRD-S400VD	Retired	400	EV/DC	Line driver	
TRD-S800VD	\$111.00	800	5000	(differential)	
TRD-S1000-VD	Retired	1000			
TRD-S1200VD	\$111.00	1200			
TRD-S2500-VD	Retired	2500			

Light Duty Hollow Shaft Incremental Encoders (NPN Open Collector and Line Driver models)

Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Diameter
TRD-SH100AD	Retired	100			
TRD-SH360AD	\$113.00	360]		
TRD-SH500AD	Retired	500	5-12 VDC	NPN open	
TRD-SH1000AD	Retired	1000	J-12 VDC	collector	
TRD-SH1024AD	Retired	1024			
TRD-SH2500AD	Retired	2500			
TRD-SH400BD	Retired	400			
TRD-SH500-BD	Retired	500			- 38mm
TRD-SH600BD	Retired	600	12–24		
TRD-SH1000-BD	Retired	1000	12-24 VDC	NPN open collector	
TRD-SH1200BD	Retired	1200			
TRD-SH2000BD	Retired	2000			
TRD-SH2500-BD	Retired	2500			
TRD-SH100-VD	Retired	100			
TRD-SH200VD	Retired	200			
TRD-SH250VD	\$113.00	250			
TRD-SH300VD	\$113.00	300			
TRD-SH360-VD	Retired	360			
TRD-SH400VD	\$113.00	400		Line driver	
TRD-SH500-VD	Retired	500	5VDC	(differential)	
TRD-SH600VD	Retired	600			
TRD-SH800VD	\$113.00	800			
TRD-SH1000-VD	Retired	1000			
TRD-SH1200VD	\$119.00	1200			
TRD-SH2000VD	Retired	2000			
TRD-SH2500-VD	Retired	2500			

Specifications – TRD-S(H) series

	Elec	trica	al Specification	S				
Model			TRD-SxxxxADTRD-Sxxxx-BDTRD-Sxxxx-VTRD-SHxxxADTRD-SHxxxxBDTRD-SHxxxxVD(open collector)(open collector)driver)					
Power Supply Power Supply Power Supply Power Supply Signal Waveform Max. Response Frequency Operating Speed Duty Ratio Phase Difference Width Signal Width at Home Position Isignal Width at Home Position Interference Width Isignal Width at Home Position Isignal With Isignal Width at Home Position Isignal With Isignal Width at Home Position Isignal Width	Operating Voltage *		5–12 VDC (nominal) * Range: 4 75–13 2 VDC	12-24 VDC (nominal) * Range: 10 8-26 4 VDC	5VDC (nominal) * Range: 4.75–5.25 VDC			
Power Supply	Operating Voltage * Allowable Ripple Current Consumption quency Vidth Internet Consumption quency Vidth Internet Consumption quency Vidth Internet Consumption Internet Consumpti		3% max.					
	Current Consumption	erating Voltage * pwable Ripple rrent Consumption e/Fall Time tput Type tput Logic tquar Voltage tput Voltage tquar Voltage trent Mechanic O1 Nm (0.00074 ft/lb) max dial: 20N (4.5 lb); Axial: 10 00 rpm (highest speed that at a fg26 to be mounted in any orienta fg26 to be mounted in any orienta fg26 to a for c; 14 to 158°F to 85°C; -13 to 185°F able for one hour along threform ms with 490 m/s ² applied th		50 mA max.				
Signal Waveform			(Quadrature + home position	n			
Max. Response Frequency				200kHz				
Operating Speed			(max res	sponse frequency / resolu	tion) x 60			
Duty Ratio				50% ±25%				
Phase Difference Width				25% ±12.5%				
Signal Width at Home Position	า			100 ±50%				
	Rise/Fall Time		1µs max. (when c	able length is 1m)	-			
Model TRD-SxxxAD TRD-SkxxxAD (open collector) TRD-SxxxAD (open collector) TRD-SxxxAD (output S0% ±25% TRD-SxxAD (output S0% ±25%) TRD-SxxX-SD (output S0% ±25%) TRD-SxxAD (output S	Output Type		NPN open collect	or output, sinking	Line driver output (26C31 or equivalent)			
	Negative logic (active high)							
Output	Image: contractor (open contector) (open contector) (driver) Operating Voltage * 5-12 VDC (nominal)* Range: 4.75-13.2 VDC 12-24 VDC (nominal)* Range: 10.8-26.4 VDC SVDC (nominal)* SVDC (nominal)* Range: 4.75-5. Allowable Ripple 3% max. 50 mA max. Current Consumption Quadrature + home position 60 mA max. ney 200kHz (max response frequency / resolution) x 60 Solve to the top stress 50% ±25% 50% ±25% to top stress 100 ±50% 100 ±50% Rise/Fall Time 1µs max. (when cable length is 1m) - Output Type NPN open collector output, sinking Line driver or (26C31 or equi (26C14 or equi (26C14 or equi (26C31	2.5 V min.						
	output vonage	L	0.4 V	max.	Line driver output (26C31 or equivalent) Negative logic (active high) 2.5 V min. 0.5 V max. 20 mA max. - -			
Output * To be supplied by Class II source Starting Torque	Current		30mA	max.	20 mA max.			
	Load Power Voltage		35 VD0	-				
	Short-Circuit Protect	tion	Between output a	-				
* To be supplied by Class II source								
	Mech	ianic	al Specificatio	ns				
Starting Torque	0.001 Nm (0.00074 ft/	/lb) max	(
Max. Allowable Shaft Load	Radial: 20N (4.5 lb); /	Axial: 1	0N (2.25 lb)					
Max. Allowable Speed	6000 rpm (highest spe	ed that	can support the mechanic	al integrity of encoder)				
Wire Size	AWG26							
Mounting Orientation	can be mounted in any	y orienta	ation					
Weight	approx. 150g (5.3 oz)	with 2m	n cable					
	Enviro	nme	ntal Specificati	ons				
Ambient Temperature	-10 to 70°C; 14 to 158	8°F						
Storage Temperature	-25 to 85°C; -13 to 18	85°F						
Operating Humidity	35–85% RH							
Withstand Voltage	500VAC (50/60Hz) for	one mi	nute					
Insulation Resistance	50MΩ min.							
Vibration Resistance	durable for one hour a	long thr	ree axes at 10 to 55 Hz wit	h 0.75 amplitude				
Shock Resistance	11 ms with 490 m/s ² a	pplied t	hree times along three axe	S				
			iree times along three axes					



Wiring diagrams

Line driver connections

enclosure is grounded through the 0V wire

Cable shield is not connected to the encoder body;

Brown: Power source

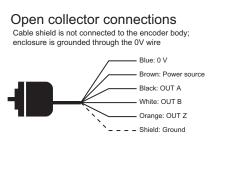
Blue: 0 V

Black: OUT A

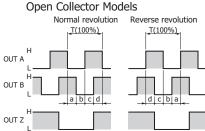
Purple: OUT Ā

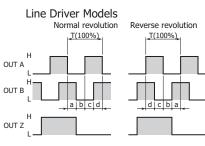
White: OUT B

— Gray: OUT B̄
— Orange: OUT Z̄
— Yellow: OUT Z̄
- · Shield: Ground



Channel timing charts





a, b, c, = $1/4T\pm1/8T$ "Normal" means clockwise revolution viewed from the shaft.

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.

www.automationdirect.com

1-800-633-0405 **Encoder Accessories – Couplings**

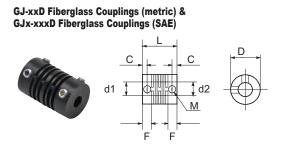
Encoder Couplings Couplings provide a connection between solid-shaft encoders and solid shafts. We offer aluminum, fiberglass, and polymer couplings for matric SAE and matrix to SAE equilibrium for metric, S.A.E. and metric-to-S.A.E. applications.

Misalignment compensation

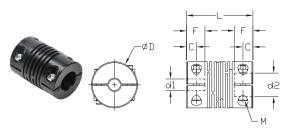
		(Couplings S	electi	ion Gi	uide	and	l Dii	nen	sions						
Туре	Part Number	Price	Applicable Encoders	Shaft Diamete		D	L	F C		М	а	E max	S	Working Torque	Torsional Rigidity	Material
			(shaft size)	d1	d2		([in])				(mm	[in])	<i>(N∙m)</i>	niyiuity	Ма
	<u>GJ-4D</u>	\$12.00	TRD-MX (4mm)	4mm	4mm	13 [0.51]	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	
Fiberglass	<u>GJ-6D</u>	\$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	esin
(metric)	<u>GJ-8D</u>	\$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	Glass-fiber reinforced resin
-	<u>GJ-10D</u>	\$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	-fiber rei
Fiberglass	<u>GJ-635D</u>	\$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
(SAE)	<u>GJK-953D</u>	\$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	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
(SÁE)	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	Engin
	<u>ARM-075-5-4D</u>	\$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	<u>RU-075D</u>	\$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	Aluminum alloy
(metric)	<u>JU-100D</u>	\$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	Aluminu
	<u>RU-100D</u>	\$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	
	<u>ML13P-4-476D</u>	\$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	
	<u>ML16P-4-635D</u>	\$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	imide)
	<u>MCGL16-6-635</u>	\$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	(Bent plate: Polyimide)
Aluminum (metric- to-SAE)	<u>MCGL20-8-635</u>	\$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	(Bent pl
,	<u>MCGL20-8-952</u>	\$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	Aluminum alloy
	<u>MCGL25-10-635</u>	\$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	Alumir
	<u>MCGL25-10-952</u>	\$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	<u>ARM-075-635-635D</u>	\$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
(SAE)	<u>ARM-100-9525-9525D</u>	\$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	Alumint

Encoder Accessories – Couplings

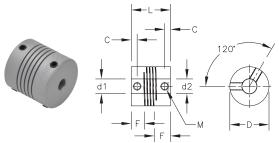
Encoder Couplings – Dimensions



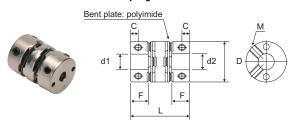
STP-MTRA-SC-xxxx Polymer Couplings



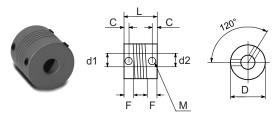
ARM-xxxxxxD Aluminum Couplings (metric & SAE)



MCGLxx Aluminum Couplings & ML1xP-4-xxxD Aluminum Couplings



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



5

ax Radial .oad (N)	Max Axial Load (N)	Available Resolutions (PPR)	Brand
NA*	NA*	Programmable Up to 4096	same sky
NA*	NA*	400, 1000	Surestep.
20	10	100, 200, 360, 500, 600, 1000, 1024, 2000, 2500	JTEKT
20	20	100, 200, 360, 500, 1000, 1024, 200, 2048, 3600, 4096	
20	20	360, 1000, 1024, 2048	
30	30	1024	lika
100	100	Programmable from 1 to 16,384 (default 1024)	
50	50	250 (linear res: 0.36 deg/cts) 1250 (linear res: 0.072 deg/cts)	
50	30	100, 360, 500, 1000, 1024, 2500	
50	30	100, 360, 500, 1000, 1024, 2500	
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	
100	50	30, 100, 120, 200, 240, 250, 300, 360, 400, 500, 600, 1000, 1200, 2000, 2500, 3600, 5000	JT E KT
50	30	32, 64, 128, 180, 256, 360, 512, 720, 1024 (gray code)	

Mounting Brackets



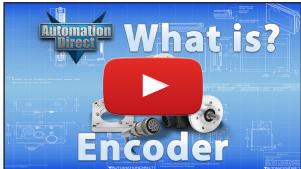
Simplify your installation with a ready-to-use right-angle mounting bracket for light, medium and heavy-duty encoders.

Flanges

Flanges are available to ease encoder mounting to round or square faces along with miscellaneous mounting options.



Learn more about encoders



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Medium-duty measuring wheels ride directly on the product (above or below) or a conveyor to measure or provide speed control feedback. These can also be used for cut-to-length and positioning applications.

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