

Medium-duty Incremental Encoders (SAE-dimension Encoders)

TRDA-20 series

Features – TRDA-20

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

- Small body with 2.0 in. diameter and 1.7 in. depth
- 0.375 in. diameter solid shaft
- Resolution available from 100 pulses per revolution to 2500 pulses per revolution
- Totem pole or line driver output
- Up to 100 kHz response frequency (totem pole)
- Up to 200 kHz response frequency (line driver)
- Two-meter cable with tinned ends
- IP50 environmental rating



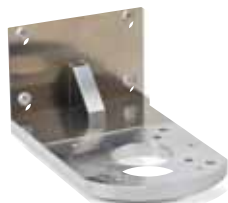
TRDA-20R1N models

TRDA-20 Medium-duty Solid-shaft Incremental Encoders (Totem-pole and Line-driver Output Models)					
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRDA-20R1N100RZD	<--->	100	5-30 VDC	Totem-pole sink/source	2.0 in.
TRDA-20R1N360RZD	<--->	360			
TRDA-20R1N500RZD	<--->	500			
TRDA-20R1N1000RZD	<--->	1000			
TRDA-20R1N1024RZD	<--->	1024			
TRDA-20R1N2500RZD	<--->	2500			
TRDA-20R1N100VD	<--->	100	5VDC	Line-driver (differential)	
TRDA-20R1N360VD	<--->	360			
TRDA-20R1N500VD	<--->	500			
TRDA-20R1N1000VD	<--->	1000			
TRDA-20R1N1024VD	<--->	1024			
TRDA-20R1N2500VD	<--->	2500			

Accessories – TRDA-20

Accessories for TRDA-20 Series Encoders *		
Part Number *	Price	Description
TRDA-20R1D	<--->	Mounting flange, round, 1.5 inch bolt-hole circle
TRDA-20R2D	<--->	Mounting flange, round, 1.625 inch bolt-hole circle
TRDA-20SND	<--->	Mounting flange, square
LM-001D	<--->	Mounting bracket

* The accessories in this table work only with TRDA-20R1Nxxxxx series encoders.



LM-001D



TRDA-20R1D



TRDA-20R2D

TRDA-20SND

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.

Medium-duty Incremental Encoders (SAE-dimension Encoders)

Specifications – TRDA-20 series

Electrical Specifications (SAE-dimension Medium Duty)				
Model		TRDA-20R1NxxxxRZD (Totem-pole)	TRDA-20R1NxxxxVD (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		
Output Waveform	Signal Waveform	Quadrature + home position		
	Max. Response Frequency	100 kHz	200 kHz	
	Operating Speed	(max response frequency / pulse) x 60		
	Duty Ratio (Symmetry)	50% ±25%		
	Index Signal Width (at home position)	100% ±50%		
Output	Rise/Fall Time **	3µs max **	100 ns max **	
	Output Type	Totem-pole	Line driver (26C31 or equivalent)	
	Output Current	Inflow	30 mA max	20 mA max
		Outflow	10 mA max	
	Output Voltage	H	[(power voltage voltage) - (2.5V)] min	2.5V min
		L	0.4V max	0.5V max
	Load Power Supply Voltage	35 VDC max		–
Short-Circuit Protection	between each output and 0V terminal		–	
* To be supplied by Class II source.				
** With a cable of 2m or less; Max load.				
Mechanical Specifications				
Starting Torque		Max: 0.003 N·m (0.002 lb·ft) @ 20 °C [68 °F]		
Max Allowable Shaft Load		Radial: 50N (11.2 lb); Axial: 30N (6.7 lb)		
Max Allowable Speed		5000 rpm (max speed that the mechanical integrity of encoder can support)		
Wire Size		0.2 mm ² [24 AWG] shielded, oil-resistant PVC		
Mounting Orientation		no restrictions		
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 to 85 %RH		
Voltage Withstand		500 VAC @ 50/60Hz for one minute	grounded through capacitor	
Insulation Resistance		50 MΩ min (excluding shield)		
Vibration Resistance		10 to 55 Hz with 0.75 mm half amplitude; durable for one hour along three axes		
Shock Resistance		11 ms ~ 500 P/R metal slit 981 m/s ² applied three times along three axes 11 ms ~ 600 P/R glass slit 490 m/s ² applied three times along three axes		
Protection		IP50		
Agency Approvals		CE, RoHS, cUL _{US} (E189395)		

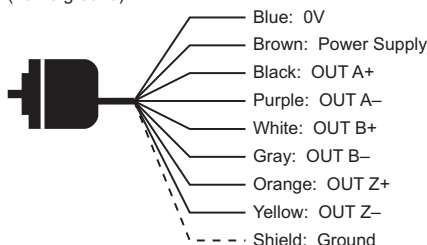
Medium-duty Incremental Encoders (SAE-dimension Encoders)

Specifications – TRDA-20 series

Wiring Diagrams

Line Driver Connections

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



Totem Pole Connections

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



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.

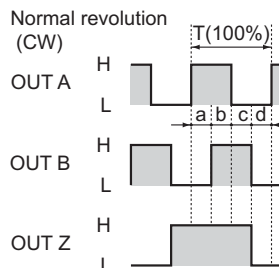
OUT Z is the absolute reference added to an incremental encoder and is also known as home position. It signifies a full rotation of the encoder disk.

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.

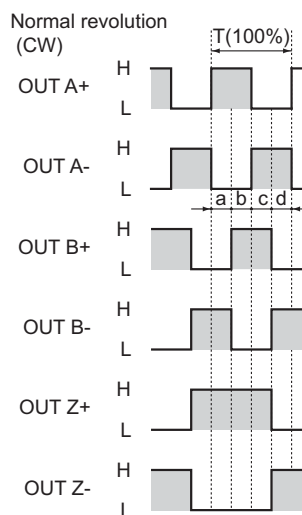
Channel Timing Charts

Totem Pole Models (TRDA-20R1NxxxRZD)



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

Line Driver Models (TRDA-20R1NxxxVD)



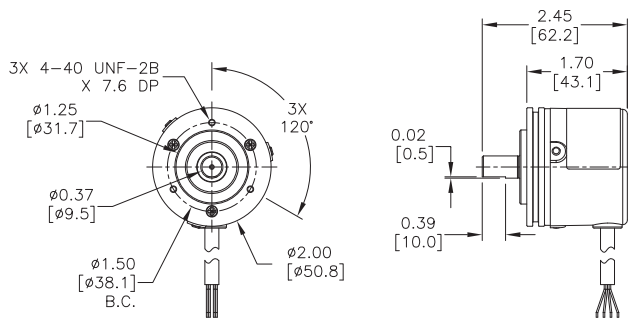
$a, b, c, d = 1/4T \pm 1/8T$
"Normal" means clockwise revolution viewed from the shaft

Medium-duty Incremental Encoders (SAE-dimension Encoders)

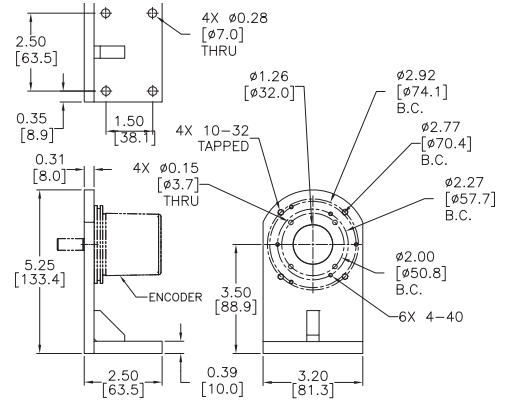
Dimensions – TRDA-20 series

Dimensions = in [mm]

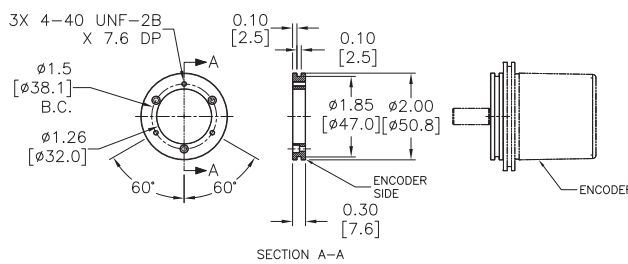
TRDA-20R1NxxxxxD



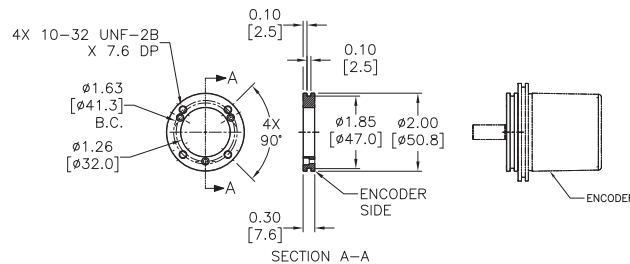
LM-001D Mounting Bracket



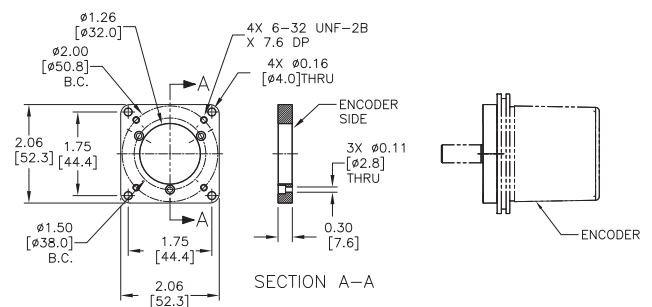
TRDA-20R1D Mounting Flange



TRDA-20R2D Mounting Flange



TRDA-20SND Mounting Flange



Medium-duty Incremental Encoders (SAE-dimension Encoders)

TRDA-25 series

Features – TRDA-25

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

- Small body with 2.0 in. diameter and 2.15 in. depth
- 0.375 in diameter solid shaft
- Removable 2.5 in. round flange
- Resolution available from 100 pulses per revolution to 2500 pulses per revolution
- Totem pole or line driver output
- Up to 100 kHz response frequency (totem pole)
- Up to 200 kHz response frequency (line driver)
- Military-style connector (cable sold separately)
- IP65 environmental rating



TRDA-25 models

Accessories – TRDA-25

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 on.



TRDA-25-CON-RZWD



TRDA-25-CON-VWD



TRDA-25RND



TRDA-25SND



TRDA-25CBL-RZWD



TRDA-25CBL-VWD

TRDA-25 Medium-duty Solid-shaft Incremental Encoders – (Totem-pole and Line-driver Output Models) – MS Connector *					
Part Number *	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRDA25RN100RZWDMS	<-->	100	5–30 VDC	Totem-pole sink/source	2.0 in. (2.5 in. round flange)
TRDA25RN360RZWDMS	<-->	360			
TRDA25RN500RZWDMS	<-->	500			
TRDA25RN1000RZWDMS	<-->	1000			
TRDA25RN1024RZWDMS	<-->	1024			
TRDA25RN2500RZWDMS	<-->	2500			
TRDA25RN100VWDMS	<-->	100	5VDC	Line-driver (differential)	
TRDA25RN360VWDMS	<-->	360			
TRDA25RN500VWDMS	<-->	500			
TRDA25RN1000VWDMS	<-->	1000			
TRDA25RN1024VWDMS	<-->	1024			
TRDA25RN2500VWDMS	<-->	2500			

* TRDA25RNxxxxWDMS encoders do NOT include cables or connectors, which are sold separately in the “Accessories” section.

Accessories for TRDA-25 Series Encoders *		
Part Number *	Price	Description
TRDA-25RND	<-->	Mounting flange, round (2.5 in. dia. w/ 1.88 in B.C.)
TRDA-25SND	<-->	Mounting flange, square (2.5 in. dia.)
TRDA-25CON-RZWD	<-->	Connector for TRDA-25RNxxxRZWD-MS, Totem Pole output, 7-pin MS connector
TRDA-25CBL-RZWD-10	<-->	Cable for TRDA-25RNxxxRZWD-MS, Totem Pole output, 7-pin MS connector, 10 ft
TRDA-25CBL-RZWD-20	<-->	Cable for TRDA-25RNxxxRZWD-MS, Totem Pole output, 7-pin MS connector, 20 ft
TRDA-25CBL-RZWD-30	<-->	Cable for TRDA-25RNxxxRZWD-MS, Totem Pole output, 7-pin MS connector, 30 ft
TRDA-25CON-VWD	<-->	Connector for TRDA-25RNxxxVWD-MS, Line Driver output, 10-pin MS connector
TRDA-25CBL-VWD-10	<-->	Cable for TRDA-25RNxxxVWD-MS, Line Driver output, 10-pin MS connector, 10 ft
TRDA-25CBL-VWD-20	<-->	Cable for TRDA-25RNxxxVWD-MS, Line Driver output, 10-pin MS connector, 20 ft
TRDA-25CBL-VWD-30	<-->	Cable for TRDA-25RNxxxVWD-MS, Line Driver output, 10-pin MS connector, 30 ft

* The accessories in this table work only with TRDA-25RNxxxxWD-MS series encoders.

Medium-duty Incremental Encoders (SAE-dimension Encoders)

Specifications – TRDA-25 series

Electrical Specifications – TRDA-25 (SAE-dimension Medium Duty)				
Model		TRDA25RNxxxRZWDMS (Totem-pole)	TRDA25RNxxxVWDMS (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		
Output Waveform	Signal Waveform	Quadrature + home position		
	Max. Response Frequency	100 kHz	200 kHz	
	Operating Speed	(max response frequency / pulse) x 60		
	Duty Ratio (Symmetry)	50% ±25%		
	Index Signal Width (at home position)	100% ±50%		
Output	Rise/Fall Time **	3µs max **	100 ns max **	
	Output Type	Totem-pole	Line driver (26C31 or equivalent)	
	Output Current	Inflow	30 mA max	20 mA max
		Outflow	10 mA max	
	Output Voltage	H	[(power voltage voltage) - (2.5V)] min	2.5V min
		L	0.4V max	0.5V max
	Load Power Supply Voltage	35 VDC max		–
Short-Circuit Protection	between each output and 0V terminal		–	
* To be supplied by Class II source. ** With a cable of 2m or less; Max load.				
Mechanical Specifications				
Starting Torque		0.05 N·m [0.04 lb-ft] @ 20 °C [68 °F]		
Max Allowable Shaft Load		Radial: 50N [11.2 lb]; Axial: 30N [6.7 lb]		
Max Allowable Speed		3000 rpm (max speed that the mechanical integrity of encoder can support)		
Wire Size		–		
Mounting Orientation		no restrictions		
Weight		approx 280g [9.88 oz]		
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 to 85 %RH		
Voltage Withstand		500 VAC @ 50/60Hz for one minute	grounded through capacitor	
Insulation Resistance		50 MΩ min (excluding shield)		
Vibration Resistance		10 to 55 Hz with 0.75 mm half amplitude; durable for one hour along three axes		
Shock Resistance		11 ms ~ 500 P/R metal slit 981 m/s ² applied three times along three axes 11 ms ~ 600 P/R glass slit 490 m/s ² applied three times along three axes		
Protection		IP65		
Agency Approvals		CE, RoHS, cUL _{US} (E189395)		

Medium-duty Incremental Encoders (SAE-dimension Encoders)

Specifications – TRDA-25 series

Connector Pin-out

TRDA25RNxxxRZWDMS (Totem Pole)		
Connector	Pin	Signal
<p>Viewed from wiring side (rear)</p>	A	Out A
	B	Out B
	C	Out Z
	D	Power Supply
	E	n.c.
	F	0V
	G	ground

A shielding wire is connected to frame ground.

TRDA25RNxxxVWDMS (Line Driver)		
Connector	Pin	Signal
<p>Viewed from wiring side (rear)</p>	A	Out A+
	B	Out B+
	C	Out Z+
	D	Power Supply
	E	n.c.
	F	0V
	G	ground
	H	Out A-
	I	Out B-
	J	Out Z-

A shielding wire is connected to frame ground.

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.

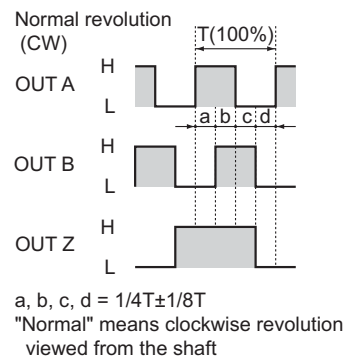
OUT Z is the absolute reference added to an incremental encoder and is also known as home position. It signifies a full rotation of the encoder disk.

Line Driver Models

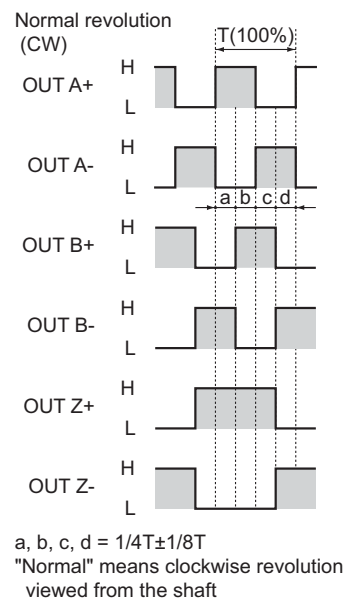
Channel A (OUT A and A-not) and Channel B (OUT B and B-not) are also 90 degrees out of phase on line driver encoders. OUT Z is the same as on open collector models, and is the absolute reference (home position). It signifies one full rotation of the encoder.

Channel Timing Charts

Totem Pole Models (TRDA25RNxxxRZWDxx)



Line Driver Models (TRDA25RNxxxVWDxx)

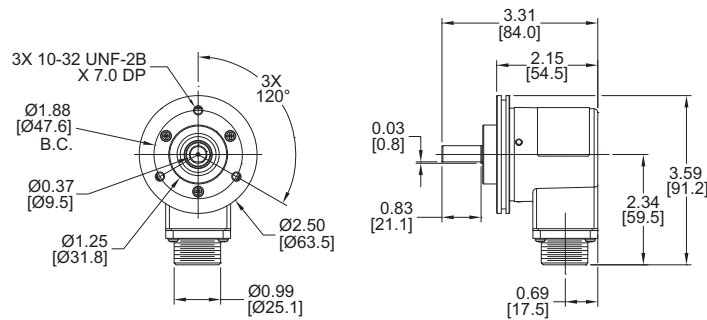


Medium-duty Incremental Encoders (SAE-dimension Encoders)

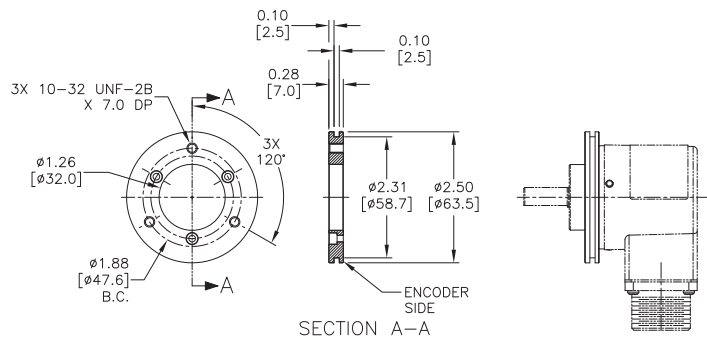
Dimensions – TRDA-25 series

Dimensions = in [mm]

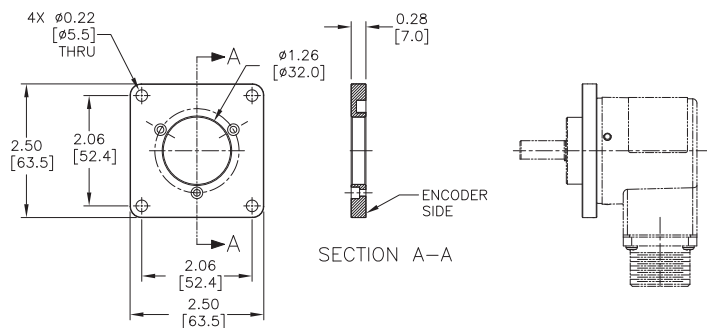
TRDA25RN Encoder



TRDA-25RND Mounting Flange



TRDA-25SND Mounting Flange



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 standard shaft or 8 mm hollow shaft
- Incremental resolution available from 3 pulses per revolution to 2500 pulses per revolution
- Line driver or Totem-pole output
- Up to 100 kHz response frequency



Standard shaft (TRD-N) model



Hollow shaft (TRD-NH) model

Note: Yellow shaded part numbers are non-stock. Availability may range from four to six weeks.

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

Incremental Medium Duty Hollow Shaft Encoders (Totem-pole Output, TRD-NHxxx-RZVD)					
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-NH3-RZWD	<--->	3	5-30 VDC	Totem-pole sink/source	50mm
TRD-NH4-RZWD	<--->	4			
TRD-NH5-RZWD	<--->	5			
TRD-NH10-RZWD	<--->	10			
TRD-NH30-RZWD	<--->	30			
TRD-NH40-RZWD	<--->	40			
TRD-NH50-RZWD	<--->	50			
TRD-NH60-RZWD	<--->	60			
TRD-NH100-RZWD	<--->	100			
TRD-NH120-RZWD	<--->	120			
TRD-NH200-RZWD	<--->	200			
TRD-NH240-RZWD	<--->	240			
TRD-NH250-RZWD	<--->	250			
TRD-NH300-RZWD	<--->	300			
TRD-NH360-RZWD	<--->	360			
TRD-NH400-RZWD	<--->	400			
TRD-NH480-RZWD	<--->	480			
TRD-NH500-RZWD	<--->	500			
TRD-NH600-RZWD	<--->	600			
TRD-NH750-RZWD	<--->	750			
TRD-NH1000-RZWD	<--->	1000			
TRD-NH1200-RZWD	<--->	1200			
TRD-NH2000-RZWD	<--->	2000			
TRD-NH2500-RZWD	<--->	2500			

Medium-duty Incremental Encoders (Metric-dimension Encoders)

TRD-N(H) series

Note: Yellow shaded part numbers are non-stock. Availability may range from four to six weeks.

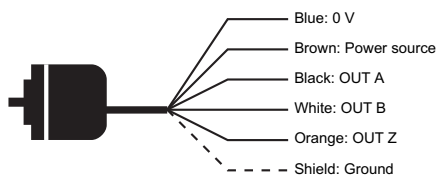
Incremental Medium Duty Standard Shaft Encoders (Line Driver Output, TRD-Nxxx-RZVWD)					
Part Number	Price	Pulses per Revolution	Input Voltage	Output	Body Dia.
TRD-N3-RZVWD	<--->	3	5VDC	Line driver (differential)	50mm
TRD-N4-RZVWD	<--->	4			
TRD-N5-RZVWD	<--->	5			
TRD-N10-RZVWD	<--->	10			
TRD-N30-RZVWD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

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

Wiring diagrams

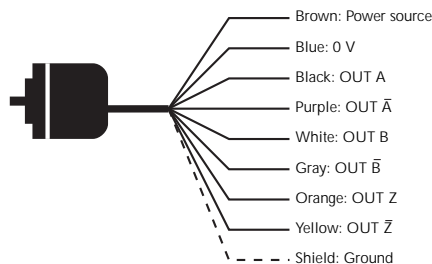
Totem-pole connections

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

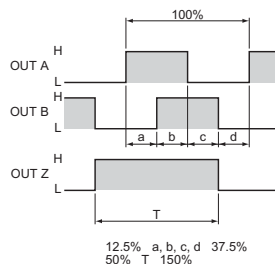


Medium-duty Incremental Encoders (Metric-dimension Encoders)

Specifications – TRD-N(H) series

Electrical Specifications			
Model		TRD-N/NHxxxx-RZWD (Totem-pole) TRD-N/NHxxxx-RZVWD (Line Driver)	
Power Supply	Operating Voltage *	5–30 VDC (nominal) * Range: 4.75–30.0 VDC	
	Allowable Ripple	3% rms max.	
	Current Consumption	60 mA max.	
Signal Waveform		Quadrature + home position	
Max. Response Frequency		100 kHz 200 kHz	
Duty Ratio		50% ±25% (square wave)	
Signal Width at Home Position		100% ±50%	
Output	Rise/Fall Time	3µs max. (when cable length is 1m) 100 ns max. (when cable length is 2m)	
	Output Type	Totem Pole (Push Pull) Line Driver (26C31 or equivalent)	
	Output Logic	Negative logic (active low) Positive logic (active high)	
	Output Current	“H” (inflow)	30 mA max. 20 mA max.
		“L” (outflow)	10 mA max.
	Output Voltage	“H”	[(Load power volt) - 2.5V] 2.5V min.
“L”		0.4V max.	
Load Power Voltage		35 VDC max. —	
* To be supplied by Class II source			
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		5000 rpm (dust and splash proofed: continuous: 3,000 rpm, instantaneous: 5,000 rpm) (highest speed that can support the mechanical integrity of encoder)	
Wire Size		AWG24	
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	
Voltage Withstand *		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 ² applied three times along three axes ≥600 ppr (glass slit) = 11 ms with 490 m/s ² applied three times along three axes	
Protection		IP65	
* 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 RZWL models.

Channel timing chart

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
JT-035D	<--->	Mounting Bracket: Metal; for use with all TRD-N/NH/NA encoders
NM-9D	<--->	Mounting Bracket: SPCC; for use with all TRD-N/NA encoders
NF-55D	<--->	Mounting Flange Kit: includes aluminum flange & NM-9D bracket; for use with all TRD-N/NA encoders



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 internal to the encoder. This is based on the rising edge to rising edge (one cycle) on channel A or B that indicates that 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 disk.

Line Driver Models

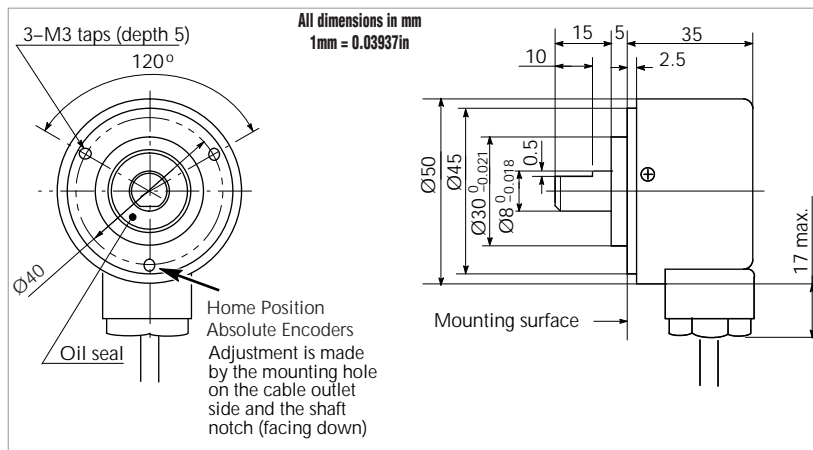
Channel A (OUT A and A-not) and Channel B (OUT B and B-not) are also 90 degrees out of phase on line driver encoders. OUT Z is the same as on open collector models, and is the absolute reference (home position). It signifies one full rotation of the encoder.

Medium-duty Absolute and Incremental Encoders (Metric-dimension Encoders)

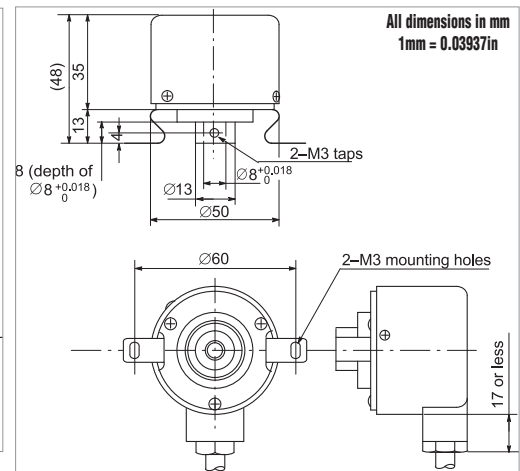
Dimensions – TRD-N(H) & TRD-NA series

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

Standard-shaft Incremental and Absolute Encoders (TRD-N, TRD-NA)

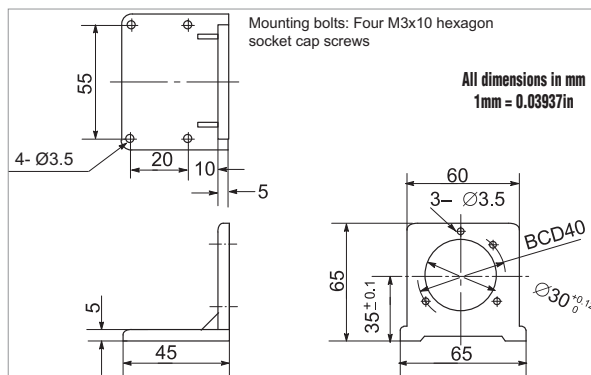


Hollow-shaft Incremental Encoders only (TRD-NH)

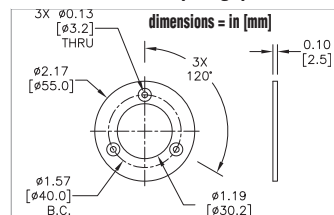


Optional Mounting Flange and Brackets for Medium-duty Encoders

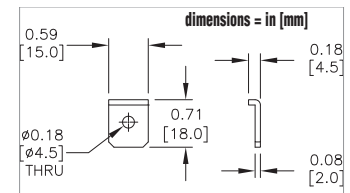
JT-035D (bracket)



NF-55D (flange)



NM-9D (clamp)



Encoder Accessories – Couplings

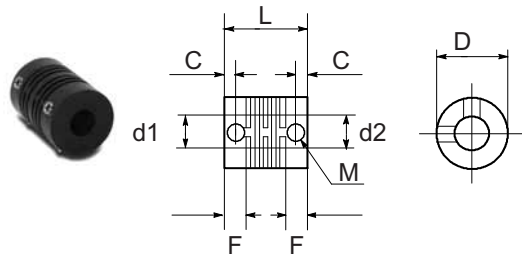
Encoder Couplings

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

Couplings Selection Guide and Dimensions																
Type	Part Number	Price	Applicable Encoders (shaft size)	Material	Working Torque (N-m)	Torsional Rigidity (N-m / rad)	Shaft Diameter		D	L	F	C	M	a	E	S
							d1	d2								
							(mm) *									
Fiber-glass (metric)	GJ-6D	<--->	TRD-S (6mm)	Glass-fiber reinforced resin	0.8	10	6	6	15	22	5.2	3	M3 set screw	6° max	0.5 max	0.12 max
	GJ-8D	<--->	TRD-N, -NA (8mm)		1.5	20	8	8	19	24	6.8	3.5	M4 set screw	5° max	0.5 max	0.12 max
	GJ-10D	<--->	TRD-GK (10 mm)		2.0	32	10	10	22	26	7.1	4	M4 set screw	5° max	0.5 max	0.12 max
Fiber-glass (SAE)	GJ-635D	<--->	TRDA-2E (0.25 in)	Aluminum alloy	0.8	10	6.4 [0.25 in]	6.4 [0.25 in]	15	22	5.2	3	M3 set screw	5° max	0.5 max	0.12 max
	GJK-953D	<--->	TRDA-20, -25 (0.375 in)		2.0	32	9.5 [0.375]	9.5 [0.375]	25	32	7.3	3.5	M4 set screw	5° max	0.5 max	0.12 max
Aluminum (metric)	RU-075D	<--->	TRD-S (6mm)	Aluminum alloy	1.0	8.2	6	6	19.1	19.1	4.6	2.4	M3 set screw	5° max	0.25 max	0.12 max
	JU-100D	<--->	TRD-N, -NA (8mm)		1.6	14.3	8	8	25.4	25.4	6.6	3.8	M5 set screw	5° max	0.25 max	0.12 max
	RU-100D	<--->	TRD-GK (10 mm)		1.6	14.3	10	10	25.4	25.4	6.6	3.8	M5 set screw	5° max	0.25 max	0.12 max
Aluminum (metric-to-SAE)	MCGL16-6-635	<--->	TRD-S (6mm)	Aluminum alloy (Bent plate: Polyimide)	0.4	70	6	6.35 (0.25")	16	23.2	7	3	M3 set screw	3.5° max	0.3 max	0.3 max
	MCGL20-8-635	<--->	TRD-N, -NA (8mm)		0.6	130	8	6.35 (0.25")	20	26	7.5	3.7	M3 set screw	3.5° max	0.3 max	0.4 max
	MCGL20-8-952	<--->	TRD-N, -NA (8mm)		0.6	130	8	9.52 (0.375")	20	26	7.5	3.7	M3 set screw	3.5° max	0.3 max	0.4 max
	MCGL25-10-635	<--->	TRD-GK (10 mm)		1.4	240	10	6.35 (0.25")	25	30.2	9	4	M4 set screw	3.5° max	0.3 max	0.5 max
	MCGL25-10-952	<--->	TRD-GK (10 mm)		1.4	240	10	9.52 (0.375")	25	30.2	9	4	M4 set screw	3.5° max	0.3 max	0.5 max
Aluminum (SAE)	ARM-075-635-635D	<--->	TRDA-2E (0.25 in)	Aluminum alloy	1.0	8.2	6.4 [0.25 in]	6.4 [0.25 in]	19.1	19.1	4.6	2.4	M3 set screw	5° max	0.25 max	0.25 max
	ARM-100-9525-9525D	<--->	TRDA-20, -25 (0.375 in)		1.6	14.3	9.5 [0.375]	9.5 [0.375]	25.4	25.4	6.6	3.8	M5 set screw	5° max	0.25 max	0.25 max

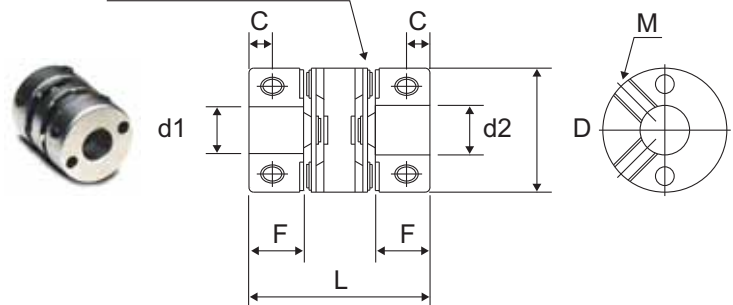
* mm ÷ 25.4 = inches

GJ-6D, GJ-8D, and GJ-10D fiberglass couplings

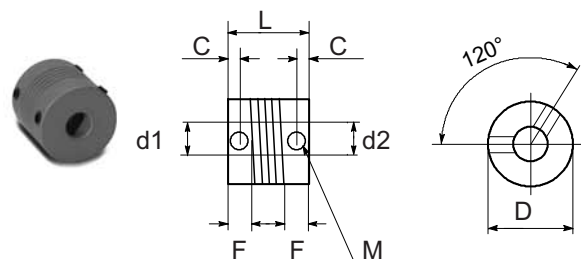


MCGLxx aluminum couplings

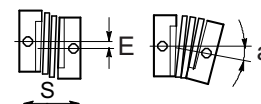
Bent plate: polyimide



RU-075D, RU-100D, and JU-100D aluminum couplings



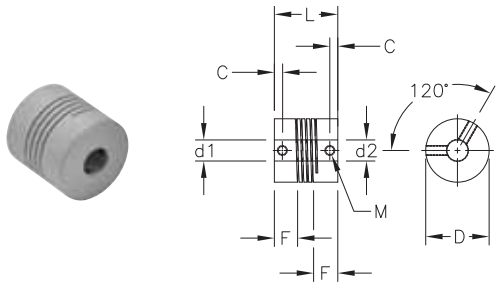
Misalignment compensation



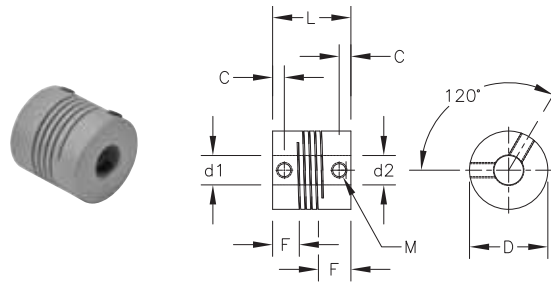
Encoder Accessories – Couplings

Encoder Couplings – Dimensions

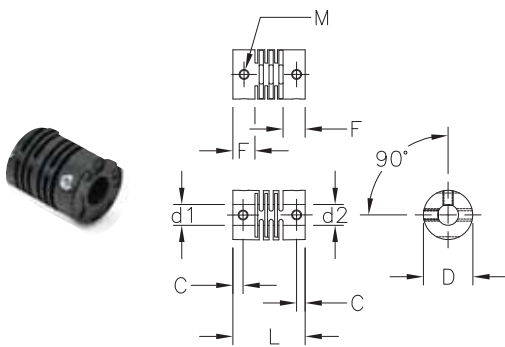
ARM-075-635-635D Coupling
Dimensions = in [mm]



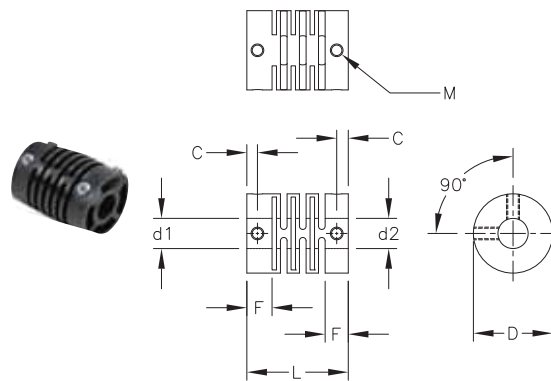
ARM-100-9525-9525D Coupling
Dimensions = in [mm]



GJ-635D Coupling
Dimensions = in [mm]



GJK-953D Coupling
Dimensions = in [mm]



Great Selection at Great Prices



Encoder Selection Guide

Type	Series	Incremental	Absolute	Standard Shaft	Hollow Shaft	Output	Rating
Light-duty (size 15)	TRDA-2E, TRD-S, TRD-SH	X		X	X	OC, LD	IP40, IP50
Medium-duty (size 20+**)	TRDA-20, TRDA-25, TRD-N, TRDA-NA	X	X (gray code)	X	X	P/P, LD, OC	IP50, IP65
Heavy-duty (size 30)	TRD-GK	X		X		P/P	IP65

* OC=open collector, P/P=push/pull (totem-pole), LD=line driver

**TRDA-25 has a 2.5 inch flange and a 2.0 inch body

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.