

# Medium Duty Incremental Encoders (SAE Dimension Encoders)

## TRDA-20 series

### Features

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<br>(Totem-pole and Line-driver Output Models) |          |                       |               |                            |           |
|----------------------------------------------------------------------------------------------------|----------|-----------------------|---------------|----------------------------|-----------|
| Part Number                                                                                        | Price    | Pulses per Revolution | Input Voltage | Output                     | Body Dia. |
| <a href="#"><u>TRDA-20R1N100RZD</u></a>                                                            | \$154.00 | 100                   | 5–30 VDC      | Totem-pole sink/source     | 2.0 in.   |
| <a href="#"><u>TRDA-20R1N360RZD</u></a>                                                            | \$154.00 | 360                   |               |                            |           |
| <a href="#"><u>TRDA-20R1N500RZD</u></a>                                                            | \$154.00 | 500                   |               |                            |           |
| <a href="#"><u>TRDA-20R1N1000RZD</u></a>                                                           | \$154.00 | 1000                  |               |                            |           |
| <a href="#"><u>TRDA-20R1N1024RZD</u></a>                                                           | \$165.00 | 1024                  |               |                            |           |
| <a href="#"><u>TRDA-20R1N2500RZD</u></a>                                                           | \$167.00 | 2500                  |               |                            |           |
| <a href="#"><u>TRDA-20R1N100VD</u></a>                                                             | \$154.00 | 100                   | 5VDC          | Line-driver (differential) |           |
| <a href="#"><u>TRDA-20R1N360VD</u></a>                                                             | \$154.00 | 360                   |               |                            |           |
| <a href="#"><u>TRDA-20R1N500VD</u></a>                                                             | \$154.00 | 500                   |               |                            |           |
| <a href="#"><u>TRDA-20R1N1000VD</u></a>                                                            | \$154.00 | 1000                  |               |                            |           |
| <a href="#"><u>TRDA-20R1N1024VD</u></a>                                                            | \$166.00 | 1024                  |               |                            |           |
| <a href="#"><u>TRDA-20R1N2500VD</u></a>                                                            | \$167.00 | 2500                  |               |                            |           |

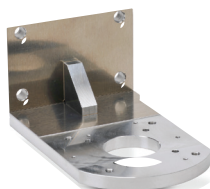
### Accessories

| Accessories for TRDA-20 Series Encoders *                                                                                            |          |                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------|
| Part Number *                                                                                                                        | Price    | Description                                         |
| <a href="#">TRDA-20R1D</a>                                                                                                           | \$27.00  | Mounting flange, round, 1.5 inch bolt-hole circle   |
| <a href="#">TRDA-20R2D</a>                                                                                                           | \$39.00  | Mounting flange, round, 1.625 inch bolt-hole circle |
| <a href="#">TRDA-20SND</a>                                                                                                           | \$59.00  | Mounting flange, square                             |
| <a href="#">LM-001D**</a>                                                                                                            | \$120.00 | Mounting bracket for TRDA-20 & TRDA-25 encoders     |
| * The accessories in this table work only with TRDA-20R1Nxxxxxx series encoders, unless marked otherwise.                            |          |                                                     |
| ** Use of LM-001D also requires a TRDA-20SND replacement mounting flange, plus four customer-supplied 6-32 x 0.50 in long fasteners. |          |                                                     |

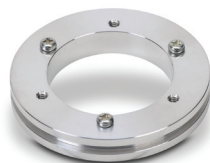
### Couplings

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.



LM-001D



TRDA-20R1D



TRDA-20R2D



TRDA-20SND

# Medium Duty Incremental Encoders (SAE Dimension Encoders)

## Specifications – TRDA-20 series

| Electrical Specifications (SAE Dimension Medium Duty)                            |                                          |         |                                                                                                                                                                              |                                   |                                          |  |
|----------------------------------------------------------------------------------|------------------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------|--|
| Model                                                                            |                                          |         | TRDA-20R1NxxxxRZD<br>(Totem-pole)                                                                                                                                            | TRDA-20R1NxxxxVD<br>(Line Driver) |                                          |  |
| Power Supply                                                                     | Operating Voltage *                      |         | 5–30 VDC (nominal) *<br>Range: 4.75–30.0 VDC                                                                                                                                 |                                   | 5VDC (nominal) *<br>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 / resolution) x 60                                                                                                                                   |                                   |                                          |  |
|                                                                                  | Duty Ratio (Symmetry)                    |         | 50% ±25%                                                                                                                                                                     |                                   |                                          |  |
|                                                                                  | Index Signal Width<br>(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)]<br>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.<br>** With a cable of 2m or less; Max load. |                                          |         |                                                                                                                                                                              |                                   |                                          |  |
| Mechanical Specifications                                                        |                                          |         |                                                                                                                                                                              |                                   |                                          |  |
| Starting Torque                                                                  |                                          |         | 0.003 N·m (0.002 lb·ft) max @ 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 <sup>2</sup> [24 AWG] shielded, oil-resistant PVC                                                                                                                     |                                   |                                          |  |
| Mounting Orientation                                                             |                                          |         | can be mounted in any orientation                                                                                                                                            |                                   |                                          |  |
| 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 <sup>2</sup> applied three times along three axes<br>11 ms ~ 600 P/R glass slit 490 m/s <sup>2</sup> applied three times along three axes |                                   |                                          |  |
| Protection                                                                       |                                          |         | IP50                                                                                                                                                                         |                                   |                                          |  |
| Agency Approvals                                                                 |                                          |         | cUL <sub>US</sub> (E189395)                                                                                                                                                  |                                   |                                          |  |

# Medium Duty Incremental Encoders (SAE Dimension Encoders)

## Specifications – TRDA-20 series

### Wiring Diagrams

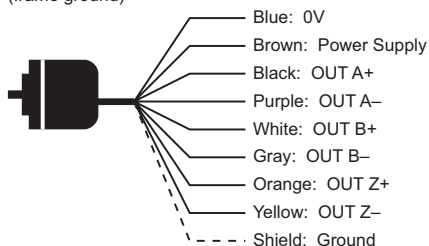
#### Totem Pole Connections

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

#### 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.

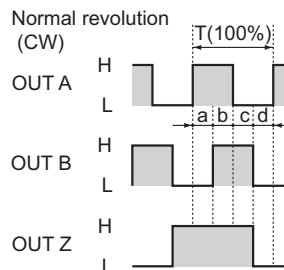
OUT Z is the absolute reference added to an incremental encoder and is also known as home position. It signifies a full rotation of the encoder shaft.

#### 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.

### Channel Timing Charts

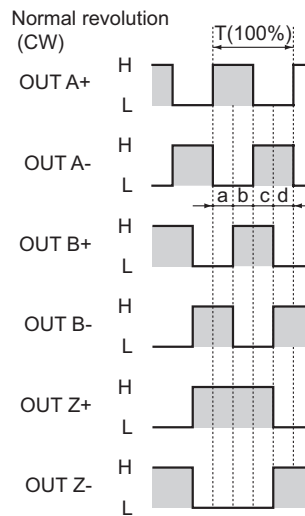
#### Totem Pole Models (TRDA-20R1NxxxRZD)



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

"Normal" means clockwise revolution viewed from the shaft

#### Line Driver Models (TRDA-20R1NxxxVD)



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

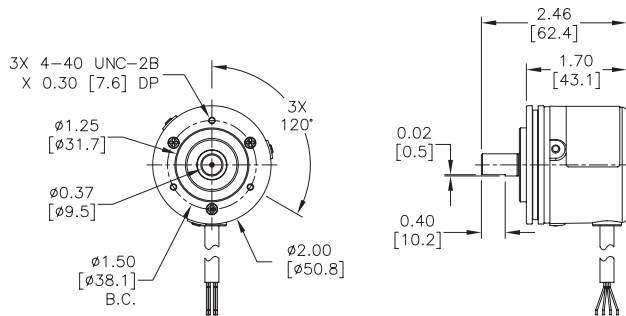
"Normal" means clockwise revolution viewed from the shaft

# Medium Duty Incremental Encoders (SAE Dimension Encoders)

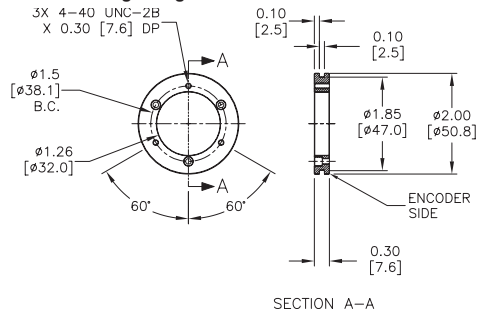
## Dimensions – TRDA-20 series

Dimensions = in [mm]

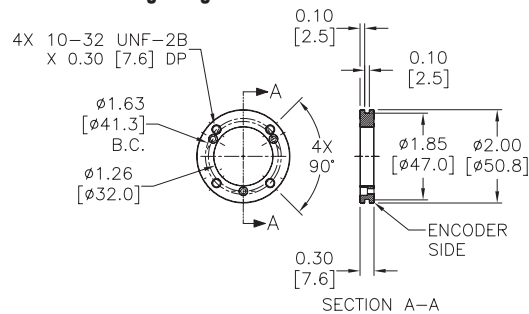
### TRDA-20R1NxxxxxxD



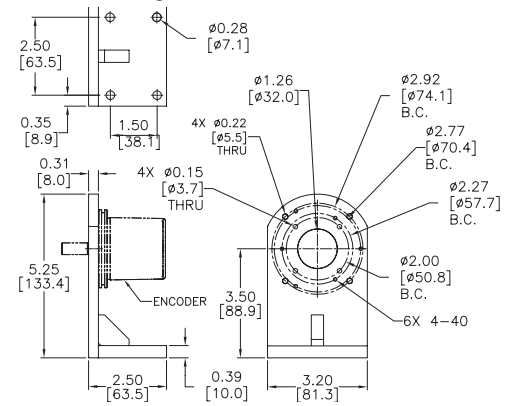
### TRDA-20R1D Mounting Flange



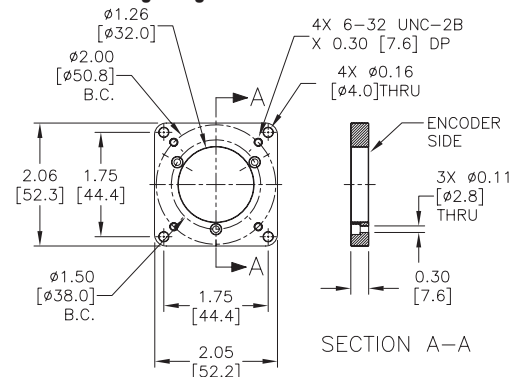
### TRDA-20R2D Mounting Flange



### LM-001D Mounting Bracket



### TRDA-20SND Mounting Flange



# Medium Duty Incremental Encoders (SAE Dimension Encoders)

## TRDA-25 series

### Features

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

#### 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



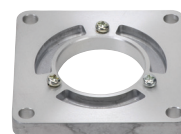
LM-001D



TRDA-25CBL-RZWD



TRDA-25RND



TRDA-25SND



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.                         |
|------------------------------------|----------|-----------------------|---------------|----------------------------|-----------------------------------|
| <a href="#">TRDA25RN100RZWDMS</a>  | \$248.00 | 100                   | 5–30 VDC      | Totem-pole sink/source     | 2.0 in.<br>(2.5 in. round flange) |
| <a href="#">TRDA25RN360RZWDMS</a>  | \$248.00 | 360                   |               |                            |                                   |
| <a href="#">TRDA25RN500RZWDMS</a>  | \$248.00 | 500                   |               |                            |                                   |
| <a href="#">TRDA25RN1000RZWDMS</a> | \$248.00 | 1000                  |               |                            |                                   |
| <a href="#">TRDA25RN1024RZWDMS</a> | \$248.00 | 1024                  |               |                            |                                   |
| <a href="#">TRDA25RN2500RZWDMS</a> | \$268.00 | 2500                  | 5VDC          | Line-driver (differential) |                                   |
| <a href="#">TRDA25RN100VWDMS</a>   | \$248.00 | 100                   |               |                            |                                   |
| <a href="#">TRDA25RN360VWDMS</a>   | \$248.00 | 360                   |               |                            |                                   |
| <a href="#">TRDA25RN500VWDMS</a>   | \$248.00 | 500                   |               |                            |                                   |
| <a href="#">TRDA25RN1000VWDMS</a>  | \$248.00 | 1000                  |               |                            |                                   |
| <a href="#">TRDA25RN1024VWDMS</a>  | \$248.00 | 1024                  |               |                            |                                   |
| <a href="#">TRDA25RN2500VWDMS</a>  | \$269.00 | 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                                                                  |
|--------------------------------------|----------|------------------------------------------------------------------------------|
| <a href="#">TRDA-25RND</a>           | \$39.00  | Mounting flange, round (2.5 in. dia. w/ 1.88 in B.C.)                        |
| <a href="#">TRDA-25SND</a>           | \$39.00  | Mounting flange, square (2.5 in. dia.)                                       |
| <a href="#">TRDA-25CON-RZWD</a>      | \$55.00  | Connector for TRDA-25RNxxxRZWD-MS, Totem Pole output, 7-pin MS connector     |
| <a href="#">TRDA-25CBL-RZWD-10**</a> | \$96.00  | Cable for TRDA-25RNxxxRZWD-MS, Totem Pole output, 7-pin MS connector, 10 ft  |
| <a href="#">TRDA-25CBL-RZWD-20**</a> | \$118.00 | Cable for TRDA-25RNxxxRZWD-MS, Totem Pole output, 7-pin MS connector, 20 ft  |
| <a href="#">TRDA-25CBL-RZWD-30**</a> | \$134.00 | Cable for TRDA-25RNxxxRZWD-MS, Totem Pole output, 7-pin MS connector, 30 ft  |
| <a href="#">TRDA-25CON-VWD</a>       | \$61.00  | Connector for TRDA-25RNxxxVWD-MS, Line Driver output, 10-pin MS connector    |
| <a href="#">TRDA-25CBL-VWD-10**</a>  | \$114.00 | Cable for TRDA-25RNxxxVWD-MS, Line Driver output, 10-pin MS connector, 10 ft |
| <a href="#">TRDA-25CBL-VWD-20**</a>  | \$114.00 | Cable for TRDA-25RNxxxVWD-MS, Line Driver output, 10-pin MS connector, 20 ft |
| <a href="#">TRDA-25CBL-VWD-30**</a>  | \$119.00 | Cable for TRDA-25RNxxxVWD-MS, Line Driver output, 10-pin MS connector, 30 ft |
| <a href="#">LM-001D***</a>           | \$120.00 | Mounting bracket for TRDA-20 & TRDA-25 encoders                              |

\* The accessories in this table work only with TRDA-25RNxxxxWD-MS series encoders, unless marked otherwise.

\*\* Cables have IP65 environmental rating.

\*\*\* Use of LM-001D also requires a TRDA-25SND replacement mounting flange, plus four customer-supplied 6-32 x 0.50 in long fasteners.

# Medium Duty Incremental Encoders (SAE Dimension Encoders)

## Specifications – TRDA-25 series

| Electrical Specifications – TRDA-25 (SAE Dimension Medium Duty)                  |                                          |                                                                                                                                                                              |                                              |                                          |
|----------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------|
| Model                                                                            |                                          | TRDA25RNxxxRZWDMS<br>(Totem-pole)                                                                                                                                            |                                              | TRDA25RNxxxVWDMS<br>(Line Driver)        |
| Power Supply                                                                     | Operating Voltage *                      |                                                                                                                                                                              | 5–30 VDC (nominal) *<br>Range: 4.75–30.0 VDC | 5VDC (nominal) *<br>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 / resolution) x 60   |                                          |
|                                                                                  | Duty Ratio (Symmetry)                    |                                                                                                                                                                              | 50% ±25%                                     |                                          |
|                                                                                  | Index Signal Width<br>(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)]<br>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.<br>** 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                                                             |                                          | can be mounted in any orientation                                                                                                                                            |                                              |                                          |
| 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 <sup>2</sup> applied three times along three axes<br>11 ms ~ 600 P/R glass slit 490 m/s <sup>2</sup> applied three times along three axes |                                              |                                          |
| Protection                                                                       |                                          | IP65                                                                                                                                                                         |                                              |                                          |
| Agency Approvals                                                                 |                                          | cUL <sub>US</sub> (E189395)                                                                                                                                                  |                                              |                                          |

# Medium Duty Incremental Encoders (SAE Dimension Encoders)

## Specifications – TRDA-25 series

### Connector Pin-out

| TRDA25RNxxxRZWDMS (Totem Pole)                                                    |     |              |
|-----------------------------------------------------------------------------------|-----|--------------|
| Connector                                                                         | Pin | Signal       |
|  | 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       |
|  | 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.

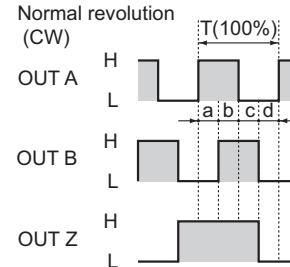
OUT Z is the absolute reference added to an incremental encoder and is also known as home position. It signifies a full rotation of the encoder shaft.

### 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.

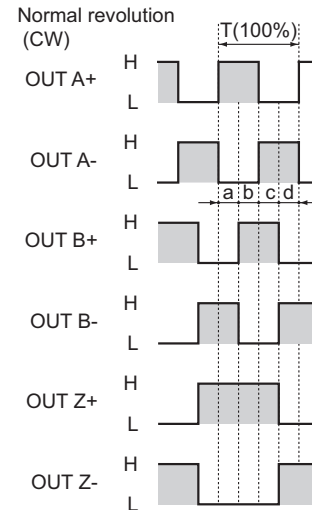
## Channel Timing Charts

### Totem Pole Models (TRDA25RNxxxRZWDxx)



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

### Line Driver Models (TRDA25RNxxxVWDxx)



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

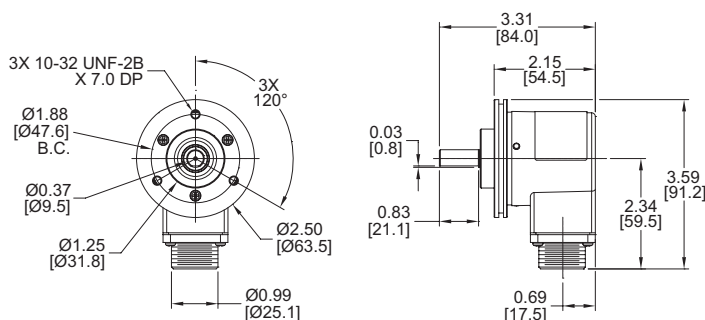


# Medium Duty Incremental Encoders (SAE Dimension Encoders)

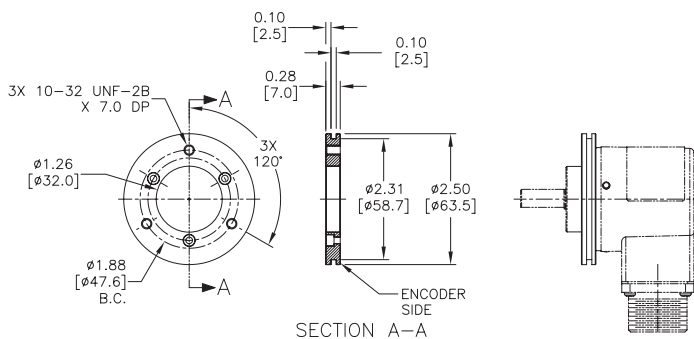
## Dimensions – TRDA-25 series

Dimensions = in [mm]

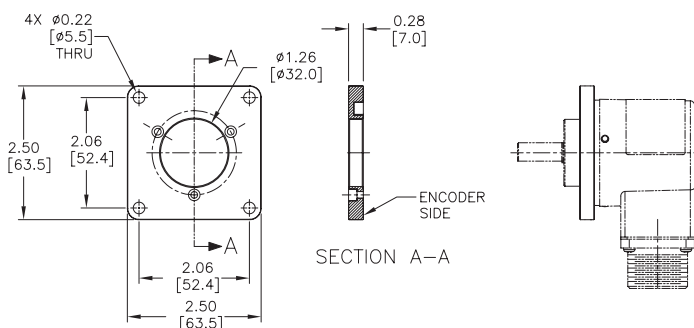
### TRDA25RN Encoder



### 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 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<br>(Totem-pole Output, TRD-Nxxx-RZWD) |          |                       |               |                                    |           |
|------------------------------------------------------------------------------------|----------|-----------------------|---------------|------------------------------------|-----------|
| Part Number                                                                        | Price    | Pulses per Revolution | Input Voltage | Output                             | Body Dia. |
| <a href="#">TRD-N3-RZWD</a>                                                        | \$160.00 | 3                     | 5–30 VDC      | Totem-pole (push-pull) sink/source | 50 mm     |
| <a href="#">TRD-N4-RZWD</a>                                                        | \$160.00 | 4                     |               |                                    |           |
| <a href="#">TRD-N5-RZWD</a>                                                        | \$160.00 | 5                     |               |                                    |           |
| <a href="#">TRD-N10-RZWD</a>                                                       | \$160.00 | 10                    |               |                                    |           |
| <a href="#">TRD-N30-RZWD</a>                                                       | \$160.00 | 30                    |               |                                    |           |
| <a href="#">TRD-N40-RZWD</a>                                                       | \$160.00 | 40                    |               |                                    |           |
| <a href="#">TRD-N50-RZWD</a>                                                       | \$160.00 | 50                    |               |                                    |           |
| <a href="#">TRD-N60-RZWD</a>                                                       | \$160.00 | 60                    |               |                                    |           |
| <a href="#">TRD-N100-RZWD</a>                                                      | \$160.00 | 100                   |               |                                    |           |
| <a href="#">TRD-N120-RZWD</a>                                                      | \$180.00 | 120                   |               |                                    |           |
| <a href="#">TRD-N200-RZWD</a>                                                      | \$180.00 | 200                   |               |                                    |           |
| <a href="#">TRD-N240-RZWD</a>                                                      | \$180.00 | 240                   |               |                                    |           |
| <a href="#">TRD-N250-RZWD</a>                                                      | \$180.00 | 250                   |               |                                    |           |
| <a href="#">TRD-N300-RZWD</a>                                                      | \$180.00 | 300                   |               |                                    |           |
| <a href="#">TRD-N360-RZWD</a>                                                      | \$180.00 | 360                   |               |                                    |           |
| <a href="#">TRD-N400-RZWD</a>                                                      | \$180.00 | 400                   |               |                                    |           |
| <a href="#">TRD-N480-RZWD</a>                                                      | \$180.00 | 480                   |               |                                    |           |
| <a href="#">TRD-N500-RZWD</a>                                                      | \$180.00 | 500                   |               |                                    |           |
| <a href="#">TRD-N600-RZWD</a>                                                      | \$180.00 | 600                   |               |                                    |           |
| <a href="#">TRD-N750-RZWD</a>                                                      | \$180.00 | 750                   |               |                                    |           |
| <a href="#">TRD-N1000-RZWD</a>                                                     | \$180.00 | 1000                  |               |                                    |           |
| <a href="#">TRD-N1024-RZWD</a>                                                     | \$180.00 | 1024                  |               |                                    |           |
| <a href="#">TRD-N1200-RZWD</a>                                                     | \$235.00 | 1200                  |               |                                    |           |
| <a href="#">TRD-N2000-RZWD</a>                                                     | \$235.00 | 2000                  |               |                                    |           |
| <a href="#">TRD-N2500-RZWD</a>                                                     | \$236.00 | 2500                  |               |                                    |           |
| <a href="#">TRD-N3000-RZWD</a>                                                     | \$236.00 | 3000                  |               |                                    |           |
| <a href="#">TRD-N3600-RZWD</a>                                                     | \$236.00 | 3600                  |               |                                    |           |
| <a href="#">TRD-N5000-RZWD</a>                                                     | \$236.00 | 5000                  |               |                                    |           |

| Incremental Medium Duty Hollow Shaft Encoders<br>(Totem-pole Output, TRD-NHxxx-RZWD) |          |                       |               |                                    |           |
|--------------------------------------------------------------------------------------|----------|-----------------------|---------------|------------------------------------|-----------|
| Part Number                                                                          | Price    | Pulses per Revolution | Input Voltage | Output                             | Body Dia. |
| <a href="#">TRD-NH3-RZWD</a>                                                         | \$180.00 | 3                     | 5–30 VDC      | Totem-pole (push-pull) sink/source | 50 mm     |
| <a href="#">TRD-NH4-RZWD</a>                                                         | \$180.00 | 4                     |               |                                    |           |
| <a href="#">TRD-NH5-RZWD</a>                                                         | \$180.00 | 5                     |               |                                    |           |
| <a href="#">TRD-NH10-RZWD</a>                                                        | \$180.00 | 10                    |               |                                    |           |
| <a href="#">TRD-NH30-RZWD</a>                                                        | \$180.00 | 30                    |               |                                    |           |
| <a href="#">TRD-NH40-RZWD</a>                                                        | \$180.00 | 40                    |               |                                    |           |
| <a href="#">TRD-NH50-RZWD</a>                                                        | \$180.00 | 50                    |               |                                    |           |
| <a href="#">TRD-NH60-RZWD</a>                                                        | \$180.00 | 60                    |               |                                    |           |
| <a href="#">TRD-NH100-RZWD</a>                                                       | \$180.00 | 100                   |               |                                    |           |
| <a href="#">TRD-NH120-RZWD</a>                                                       | \$200.00 | 120                   |               |                                    |           |
| <a href="#">TRD-NH200-RZWD</a>                                                       | \$200.00 | 200                   |               |                                    |           |
| <a href="#">TRD-NH240-RZWD</a>                                                       | \$200.00 | 240                   |               |                                    |           |
| <a href="#">TRD-NH250-RZWD</a>                                                       | \$200.00 | 250                   |               |                                    |           |
| <a href="#">TRD-NH300-RZWD</a>                                                       | \$200.00 | 300                   |               |                                    |           |
| <a href="#">TRD-NH360-RZWD</a>                                                       | \$200.00 | 360                   |               |                                    |           |
| <a href="#">TRD-NH400-RZWD</a>                                                       | \$200.00 | 400                   |               |                                    |           |
| <a href="#">TRD-NH480-RZWD</a>                                                       | \$200.00 | 480                   |               |                                    |           |
| <a href="#">TRD-NH500-RZWD</a>                                                       | \$200.00 | 500                   |               |                                    |           |
| <a href="#">TRD-NH600-RZWD</a>                                                       | \$205.00 | 600                   |               |                                    |           |
| <a href="#">TRD-NH750-RZWD</a>                                                       | \$205.00 | 750                   |               |                                    |           |
| <a href="#">TRD-NH1000-RZWD</a>                                                      | \$205.00 | 1000                  |               |                                    |           |
| <a href="#">TRD-NH1024-RZWD</a>                                                      | \$201.00 | 1024                  |               |                                    |           |
| <a href="#">TRD-NH1200-RZWD</a>                                                      | \$251.00 | 1200                  |               |                                    |           |
| <a href="#">TRD-NH2000-RZWD</a>                                                      | \$251.00 | 2000                  |               |                                    |           |
| <a href="#">TRD-NH2500-RZWD</a>                                                      | \$251.00 | 2500                  |               |                                    |           |
| <a href="#">TRD-NH3000-RZWD</a>                                                      | \$255.00 | 3000                  |               |                                    |           |
| <a href="#">TRD-NH3600-RZWD</a>                                                      | \$251.00 | 3600                  |               |                                    |           |
| <a href="#">TRD-NH5000-RZWD</a>                                                      | \$255.00 | 5000                  |               |                                    |           |

# Medium Duty Incremental Encoders (Metric Dimension Encoders)

## TRD-N(H) series

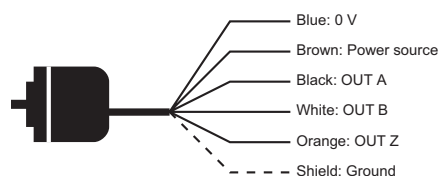
| Incremental Medium Duty Solid Shaft Encoders<br>(Line Driver Output, TRD-Nxxx-RZVWD) |          |                       |               |                            |           |
|--------------------------------------------------------------------------------------|----------|-----------------------|---------------|----------------------------|-----------|
| Part Number                                                                          | Price    | Pulses per Revolution | Input Voltage | Output                     | Body Dia. |
| <a href="#">TRD-N3-RZVWD</a>                                                         | \$167.00 | 3                     | 5VDC          | Line driver (differential) | 50 mm     |
| <a href="#">TRD-N4-RZVWD</a>                                                         | \$167.00 | 4                     |               |                            |           |
| <a href="#">TRD-N5-RZVWD</a>                                                         | \$167.00 | 5                     |               |                            |           |
| <a href="#">TRD-N10-RZVWD</a>                                                        | \$167.00 | 10                    |               |                            |           |
| <a href="#">TRD-N30-RZVWD</a>                                                        | \$167.00 | 30                    |               |                            |           |
| <a href="#">TRD-N40-RZVWD</a>                                                        | \$167.00 | 40                    |               |                            |           |
| <a href="#">TRD-N50-RZVWD</a>                                                        | \$167.00 | 50                    |               |                            |           |
| <a href="#">TRD-N60-RZVWD</a>                                                        | \$167.00 | 60                    |               |                            |           |
| <a href="#">TRD-N100-RZVWD</a>                                                       | \$167.00 | 100                   |               |                            |           |
| <a href="#">TRD-N120-RZVWD</a>                                                       | \$198.00 | 120                   |               |                            |           |
| <a href="#">TRD-N200-RZVWD</a>                                                       | \$198.00 | 200                   |               |                            |           |
| <a href="#">TRD-N240-RZVWD</a>                                                       | \$198.00 | 240                   |               |                            |           |
| <a href="#">TRD-N250-RZVWD</a>                                                       | \$198.00 | 250                   |               |                            |           |
| <a href="#">TRD-N300-RZVWD</a>                                                       | \$198.00 | 300                   |               |                            |           |
| <a href="#">TRD-N360-RZVWD</a>                                                       | \$198.00 | 360                   |               |                            |           |
| <a href="#">TRD-N400-RZVWD</a>                                                       | \$198.00 | 400                   |               |                            |           |
| <a href="#">TRD-N480-RZVWD</a>                                                       | \$198.00 | 480                   |               |                            |           |
| <a href="#">TRD-N500-RZVWD</a>                                                       | \$198.00 | 500                   |               |                            |           |
| <a href="#">TRD-N600-RZVWD</a>                                                       | \$198.00 | 600                   |               |                            |           |
| <a href="#">TRD-N750-RZVWD</a>                                                       | \$198.00 | 750                   |               |                            |           |
| <a href="#">TRD-N1000-RZVWD</a>                                                      | \$200.00 | 1000                  |               |                            |           |
| <a href="#">TRD-N1024-RZVWD</a>                                                      | \$200.00 | 1024                  |               |                            |           |
| <a href="#">TRD-N1200-RZVWD</a>                                                      | \$235.00 | 1200                  |               |                            |           |
| <a href="#">TRD-N2000-RZVWD</a>                                                      | \$235.00 | 2000                  |               |                            |           |
| <a href="#">TRD-N2500-RZVWD</a>                                                      | \$235.00 | 2500                  |               |                            |           |
| <a href="#">TRD-N3000-RZVWD</a>                                                      | \$236.00 | 3000                  |               |                            |           |
| <a href="#">TRD-N3600-RZVWD</a>                                                      | \$236.00 | 3600                  |               |                            |           |
| <a href="#">TRD-N5000-RZVWD</a>                                                      | \$236.00 | 5000                  |               |                            |           |

| Incremental Medium Duty Hollow Shaft Encoders<br>(Line Driver Output, TRD-NHxxx-RZVWD) |          |                       |               |                            |           |
|----------------------------------------------------------------------------------------|----------|-----------------------|---------------|----------------------------|-----------|
| Part Number                                                                            | Price    | Pulses per Revolution | Input Voltage | Output                     | Body Dia. |
| <a href="#">TRD-NH3-RZVWD</a>                                                          | \$180.00 | 3                     | 5VDC          | Line driver (differential) | 50 mm     |
| <a href="#">TRD-NH4-RZVWD</a>                                                          | \$180.00 | 4                     |               |                            |           |
| <a href="#">TRD-NH5-RZVWD</a>                                                          | \$180.00 | 5                     |               |                            |           |
| <a href="#">TRD-NH10-RZVWD</a>                                                         | \$180.00 | 10                    |               |                            |           |
| <a href="#">TRD-NH30-RZVWD</a>                                                         | \$180.00 | 30                    |               |                            |           |
| <a href="#">TRD-NH40-RZVWD</a>                                                         | \$180.00 | 40                    |               |                            |           |
| <a href="#">TRD-NH50-RZVWD</a>                                                         | \$180.00 | 50                    |               |                            |           |
| <a href="#">TRD-NH60-RZVWD</a>                                                         | \$180.00 | 60                    |               |                            |           |
| <a href="#">TRD-NH100-RZVWD</a>                                                        | \$180.00 | 100                   |               |                            |           |
| <a href="#">TRD-NH120-RZVWD</a>                                                        | \$198.00 | 120                   |               |                            |           |
| <a href="#">TRD-NH200-RZVWD</a>                                                        | \$198.00 | 200                   |               |                            |           |
| <a href="#">TRD-NH240-RZVWD</a>                                                        | \$198.00 | 240                   |               |                            |           |
| <a href="#">TRD-NH250-RZVWD</a>                                                        | \$198.00 | 250                   |               |                            |           |
| <a href="#">TRD-NH300-RZVWD</a>                                                        | \$198.00 | 300                   |               |                            |           |
| <a href="#">TRD-NH360-RZVWD</a>                                                        | \$198.00 | 360                   |               |                            |           |
| <a href="#">TRD-NH400-RZVWD</a>                                                        | \$198.00 | 400                   |               |                            |           |
| <a href="#">TRD-NH480-RZVWD</a>                                                        | \$198.00 | 480                   |               |                            |           |
| <a href="#">TRD-NH500-RZVWD</a>                                                        | \$198.00 | 500                   |               |                            |           |
| <a href="#">TRD-NH600-RZVWD</a>                                                        | \$217.00 | 600                   |               |                            |           |
| <a href="#">TRD-NH750-RZVWD</a>                                                        | \$217.00 | 750                   |               |                            |           |
| <a href="#">TRD-NH1000-RZVWD</a>                                                       | \$217.00 | 1000                  |               |                            |           |
| <a href="#">TRD-NH1024-RZVWD</a>                                                       | \$217.00 | 1024                  |               |                            |           |
| <a href="#">TRD-NH1200-RZVWD</a>                                                       | \$251.00 | 1200                  |               |                            |           |
| <a href="#">TRD-NH2000-RZVWD</a>                                                       | \$251.00 | 2000                  |               |                            |           |
| <a href="#">TRD-NH2500-RZVWD</a>                                                       | \$251.00 | 2500                  |               |                            |           |
| <a href="#">TRD-NH3000-RZVWD</a>                                                       | \$251.00 | 3000                  |               |                            |           |
| <a href="#">TRD-NH3600-RZVWD</a>                                                       | \$251.00 | 3600                  |               |                            |           |
| <a href="#">TRD-NH5000-RZVWD</a>                                                       | \$251.00 | 5000                  |               |                            |           |

## Wiring diagrams

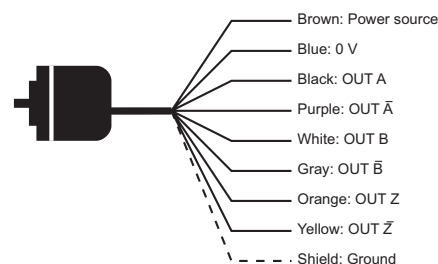
### Totem-pole (push-pull) connections

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



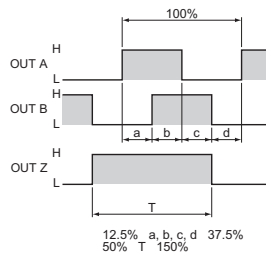
# Medium Duty Incremental Encoders (Metric Dimension Encoders)

## Specifications – TRD-N(H) series

| Electrical Specifications                                                                 |  |                                                                                                                                                                                              |                                              |                                                |                                      |
|-------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------|--------------------------------------|
| Model                                                                                     |  |                                                                                                                                                                                              | TRD-N(H)xxxx-RZWD<br>(Totem-pole)            | TRD-N(H)xxxx-RZVWD<br>(Line Driver)            |                                      |
| Power Supply                                                                              |  | Operating Voltage *                                                                                                                                                                          | 5–30 VDC (nominal) *<br>Range: 4.75–30.0 VDC | 5VDC (nominal) *<br>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<br>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<br>(Push Pull)                      | Line Driver<br>(26C31 or equivalent) |
|                                                                                           |  | Output Current                                                                                                                                                                               |                                              | 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                                       | 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)<br>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<br>≥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. |  |                                                                                                                                                                                              |                                              |                                                |                                      |

## Channel timing chart

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.

## 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>                                                                                            | \$18.00 | Mounting Bracket: Metal; for use with all TRD-N/NH/NA encoders                                               |
| <b>NM-9D*</b>                                                                                             | \$8.00  | Mounting Clamp: Metal; for use with all TRD-N/NA encoders *                                                  |
| <b>NF-55D*</b>                                                                                            | \$20.00 | Mounting Flange Kit: includes aluminum flange & NM-9D clamp; for use with all TRD-N/NA encoders *            |
| <b>TRD-NH-BKT</b>                                                                                         | \$6.50  | JTEKT flexible mounting bracket, replacement, metal. For use with JTEKT TRD-NH series hollow shaft encoders. |
| * Order NF-55D (flange & clamp) for new installations.<br>Order NM-9D (clamp) for replacement parts only. |         |                                                                                                              |

TRD-NH-BKT



NM-9D



JT-035D



NF-55D



## 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

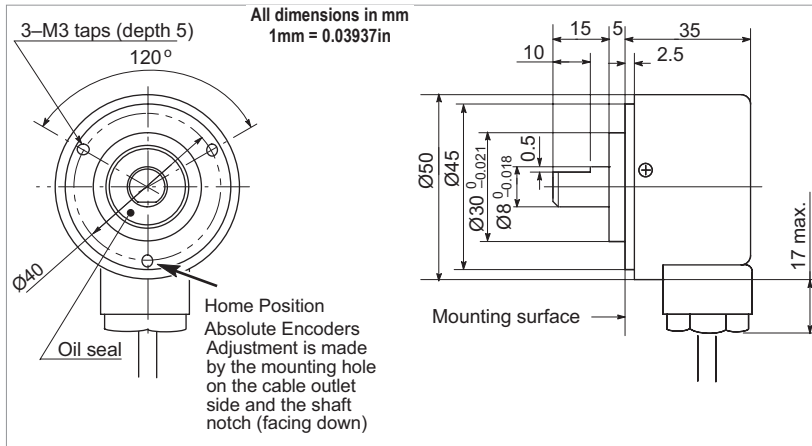
Channel A (OUT A and A-not) and Channel B (OUT B and B-not) are also 90 degrees out of phase on line driver encoders. OUT Z is the same as on open collector models, and is the absolute reference (home position). It signifies one full rotation of the encoder shaft.

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

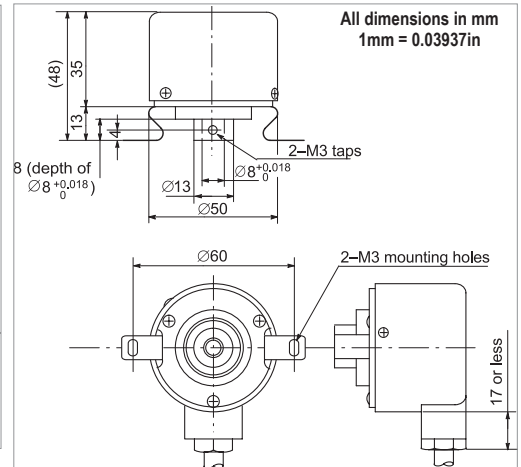
## Dimensions – TRD-N(H) & TRD-NA series

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)



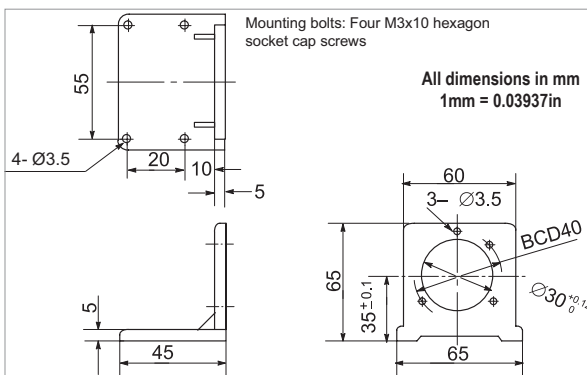
### Hollow Shaft Incremental Encoders only (TRD-NH)



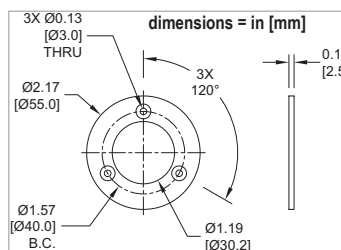
### Optional Mounting Flange and Brackets for Medium Duty Encoders

**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.

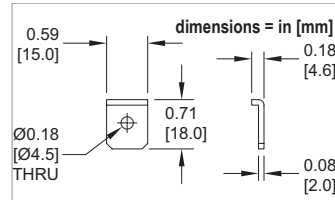
#### JT-035D (bracket)



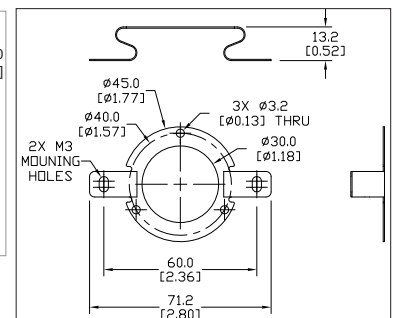
#### NF-55D (flange)



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



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

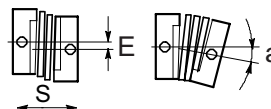


# Encoder Accessories – Couplings

## 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



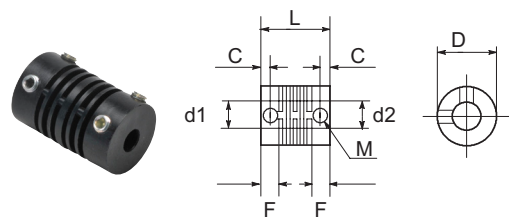
| Couplings Selection Guide and Dimensions |                                    |         |                                         |                |           |             |             |             |            |              |        |             |              |                |                    |                                        |
|------------------------------------------|------------------------------------|---------|-----------------------------------------|----------------|-----------|-------------|-------------|-------------|------------|--------------|--------|-------------|--------------|----------------|--------------------|----------------------------------------|
| 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] ) |             | ( mm [in] ) |            |              | ( N-m) |             |              |                |                    |                                        |
| Fiberglass (metric)                      | <a href="#">GJ-4D</a>              | \$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           |
|                                          | <a href="#">GJ-6D</a>              | \$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         |                                        |
|                                          | <a href="#">GJ-8D</a>              | \$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         |                                        |
|                                          | <a href="#">GJ-10D</a>             | \$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)                         | <a href="#">GJ-635D</a>            | \$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           |
|                                          | <a href="#">GJK-953D</a>           | \$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)                            | <a href="#">STP-MTRA-SC-1412</a>   | \$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                     |
|                                          | <a href="#">STP-MTRA-SC-3812</a>   | \$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)                        | <a href="#">ARM-075-5-4D</a>       | \$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                         |
|                                          | <a href="#">RU-075D</a>            | \$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        |                                        |
|                                          | <a href="#">JU-100D</a>            | \$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       |                                        |
|                                          | <a href="#">RU-100D</a>            | \$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)                 | <a href="#">ML13P-4-476D</a>       | \$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) |
|                                          | <a href="#">ML16P-4-635D</a>       | \$51.50 | TRD-MX (4mm)<br>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         |                                        |
|                                          | <a href="#">MCGL16-6-635</a>       | \$33.00 | TRD-S/SR (6mm)<br>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         |                                        |
|                                          | <a href="#">MCGL20-8-635</a>       | \$43.00 | TRD-N/NA (8mm)<br>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        |                                        |
|                                          | <a href="#">MCGL20-8-952</a>       | \$44.00 | TRD-N/NA (8mm)<br>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        |                                        |
|                                          | <a href="#">MCGL25-10-635</a>      | \$54.00 | TRD-GK (10 mm)<br>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        |                                        |
|                                          | <a href="#">MCGL25-10-952</a>      | \$55.00 | TRD-GK (10 mm)<br>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)                           | <a href="#">ARM-075-635-635D</a>   | \$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                         |
|                                          | <a href="#">ARM-100-9525-9525D</a> | \$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                     |                                    |         |                                         |                |           |             |             |             |            |              |        |             |              |                |                    |                                        |

\* mm ÷ 25.4 = inches

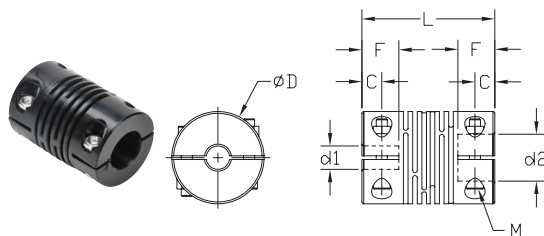
# Encoder Accessories – Couplings

## Encoder Couplings – Dimensions

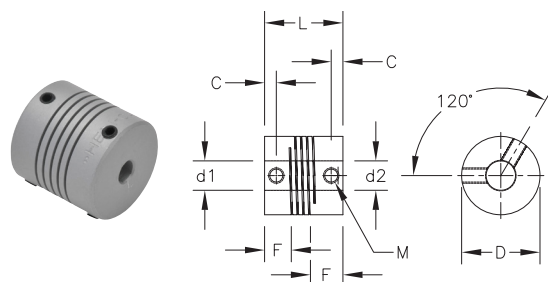
**GJ-xxD Fiberglass Couplings (metric) & GJx-xxxD Fiberglass Couplings (SAE)**



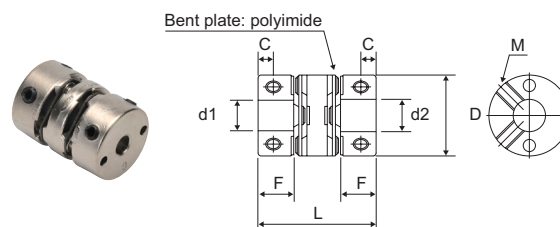
**STP-MTRA-SC-xxxx Polymer Couplings**



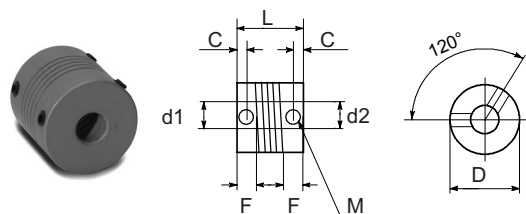
**ARM-xxxxxxD Aluminum Couplings (metric & SAE)**



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



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





| Max Radial Load (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                                                                 | lika     |
| 20                  | 20                 | 360, 1000, 1024, 2048                                                                                                 |          |
| 30                  | 30                 | 1024                                                                                                                  |          |
| 100                 | 100                | Programmable from 1 to 16,384 (default 1024)                                                                          |          |
| 50                  | 50                 | 250 (linear res: 0.36 deg/cts)<br>1250 (linear res: 0.072 deg/cts)                                                    |          |
| 50                  | 30                 | 100, 360, 500, 1000, 1024, 2500                                                                                       | JTEKT    |
| 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                              |          |
| 50                  | 30                 | 32, 64, 128, 180, 256, 360, 512, 720, 1024 (gray code)                                                                |          |

\*JTEKT/JTEKT encoders are direct mount, there are no load ratings

## Mounting Brackets

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

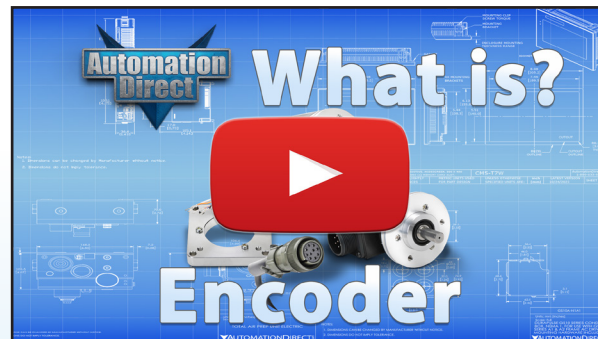


## Flanges

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

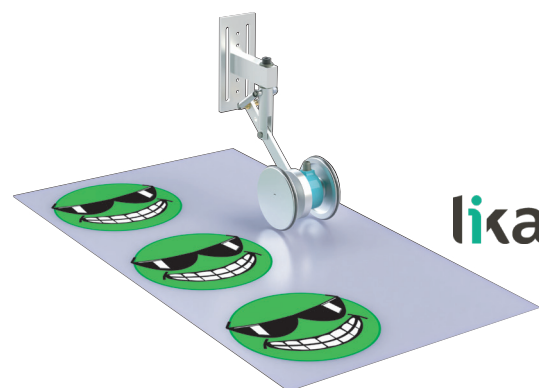


## Learn more about encoders



Click above or go to <http://go2adc.com/encoder> to view

## Need a Measuring Wheel Encoder?



AR01 Series (Priced at \$299.00)

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.

- Metric and US/imperial wheel sizes
  - Standard 4" wheel (12.5" circumference)
  - Optional 80mm wheel (250mm circumference)
- Spring loaded arm with up to 30mm deflection
- IP65 environmental rating