

# Medium-duty Absolute Encoders

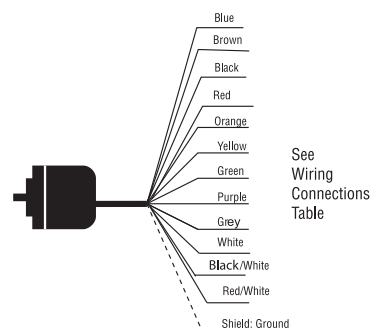
## Features

Why use an absolute encoder? When power is cycled using an incremental encoder, any positioning information is lost until **home** position is triggered. An absolute encoder uses gray code to describe each position, so position data is not lost when power is cycled. Features include:

- Small body with 50 mm diameter and 35 mm depth
- Splash proof (IP65 rating)
- 8 mm standard shaft
- Absolute resolution available from 32 pulses per revolution to 1024 pulses per revolution
- Open collector output
- Up to 20 kHz response frequency



**Standard shaft (TRD-NA) model**



See Wiring Connections Table

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

Absolute Medium Duty Standard Shaft Encoders					
Part Number	Price	Resolution	Input Voltage	Output	Body Dia.
TRD-NA32NWD	<--->	5 bit gray code, 32 pulses per revolution	10-26 VDC	NPN open collector	50mm
TRD-NA64NWD	<--->	6 bit gray code, 64 pulses per revolution			
TRD-NA128NWD	<--->	7 bit gray code, 128 pulses per revolution			
TRD-NA180NWD	<--->	8 bit gray code, 180 pulses per revolution			
TRD-NA256NWD	<--->	8 bit gray code, 256 pulses per revolution			
TRD-NA360NWD	<--->	9 bit gray code, 360 pulses per revolution			
TRD-NA512NWD	<--->	9 bit gray code, 512 pulses per revolution			
TRD-NA720NWD	<--->	10 bit gray code, 720 pulses per revolution			
TRD-NA1024NWD	<--->	10 bit gray code, 1024 pulses per revolution			

Wiring Connections							
Wire color	Connector Pin No.	1024/720 Resolution	512/360 Resolution	256/180 Resolution	128 Resolution	64 Resolution	32 Resolution
Blue	1	0V	0V	0V	0V	0V	0V
Brown	2	12/24V	12/24V	12/24V	12/24V	12/24V	12/24V
Black	3	bit 1 (2 <sup>0</sup> )	No connection	No connection	No connection	No connection	No connection
Red	4	bit 2 (2 <sup>1</sup> )	bit 1 (2 <sup>0</sup> )	No connection	No connection	No connection	No connection
Orange	5	bit 3 (2 <sup>2</sup> )	bit 2 (2 <sup>1</sup> )	bit 1 (2 <sup>0</sup> )	No connection	No connection	No connection
Yellow	6	bit 4 (2 <sup>3</sup> )	bit 3 (2 <sup>2</sup> )	bit 2 (2 <sup>1</sup> )	bit 1 (2 <sup>0</sup> )	No connection	No connection
Green	7	bit 5 (2 <sup>4</sup> )	bit 4 (2 <sup>3</sup> )	bit 3 (2 <sup>2</sup> )	bit 2 (2 <sup>1</sup> )	bit 1 (2 <sup>0</sup> )	No connection
Purple	8	bit 6 (2 <sup>5</sup> )	bit 5 (2 <sup>4</sup> )	bit 4 (2 <sup>3</sup> )	bit 3 (2 <sup>2</sup> )	bit 2 (2 <sup>1</sup> )	bit 1 (2 <sup>0</sup> )
Gray	9	bit 7 (2 <sup>6</sup> )	bit 6 (2 <sup>5</sup> )	bit 5 (2 <sup>4</sup> )	bit 4 (2 <sup>3</sup> )	bit 3 (2 <sup>2</sup> )	bit 2 (2 <sup>1</sup> )
White	10	bit 8 (2 <sup>7</sup> )	bit 7 (2 <sup>6</sup> )	bit 6 (2 <sup>5</sup> )	bit 5 (2 <sup>4</sup> )	bit 4 (2 <sup>3</sup> )	bit 3 (2 <sup>2</sup> )
Black/white	11	bit 9 (2 <sup>8</sup> )	bit 8 (2 <sup>7</sup> )	bit 7 (2 <sup>6</sup> )	bit 6 (2 <sup>5</sup> )	bit 5 (2 <sup>4</sup> )	bit 4 (2 <sup>3</sup> )
Red/white	12	bit 10 (2 <sup>9</sup> ) (MSB)	bit 9 (2 <sup>8</sup> ) (MSB)	bit 8 (2 <sup>7</sup> ) (MSB)	bit 7 (2 <sup>6</sup> ) (MSB)	bit 6 (2 <sup>5</sup> ) (MSB)	bit 5 (2 <sup>4</sup> ) (MSB)
-	13	Not connected	Not connected	Not connected	Not connected	Not connected	Not connected
Shield*	-	GND	GND	GND	GND	GND	GND

Note: Numbers in parentheses ( ) are the bits corresponding to binary code.

\* GND (shielded cable) is not connected to encoder body; the enclosure is grounded through the 0VDC line.

Note: Modules that support absolute encoder signals at high speed (220 Hz) are not currently offered.

# Medium-duty Absolute Encoders

Electrical Specifications		
<b>Model</b>	<b>TRD-NAxxx-NWD</b>	
<b>Power Supply</b>	<b>Operating Voltage</b>	10.8 - 26.4VDC*
	<b>Allowable Ripple</b>	3% rms max.
	<b>Current Consumption</b>	70 mA max.
<b>Output Code</b>	Gray binary (38 gray codes at 180 resolution, 76 at 360 resolution, and 152 at 720 resolution)	
<b>Max. Response Frequency</b>	20 kHz (Maximum revolution speed = (max. response frequency / resolution) x 60. The encoder does not respond to revolution faster than the maximum speed.)	
<b>Accuracy</b>	$\frac{360}{\text{Resolution} \times 2}$ = degree of accuracy	
<b>Direction of Rotation</b>	Normal (CW) or reversed (CCW) (When viewed from the shaft, CW is clockwise direction, and CCW is counterclockwise direction)	
<b>Rise/Fall Time</b>	2 $\mu$ s max. (at 1kW load resistance and when cable length is 2m or less)	
<b>Output</b>	<b>Output Type</b>	NPN open collector
	<b>Output Logic</b>	Negative logic (active low)
	<b>Sinking Current</b>	16mA
	<b>Residual Voltage</b>	0.4V max.
	<b>Load Power Voltage</b>	30VDC max.
* To be supplied by Class II source		
Mechanical Specifications		
<b>Starting Torque</b>	Max. 0.03 Nm (.0022 ft lbs) max. at 20°C (68°F)	
<b>Max. Allowable Shaft Load</b>	Radial: 50N (11.24 lbs) Axial: 30N (6.74 lbs)	
<b>Max. Allowable Speed</b>	Continuous: 3,000 rpm, instantaneous: 5,000 rpm; (highest speed that can support the mechanical integrity of encoder)	
<b>Wire Size</b>	AWG26	
<b>Weight</b>	Approx. 300g (10.58 oz) with 2m cable	
Environmental Specifications		
<b>Ambient Temperature</b>	10 to 60°C; 14 to 140°F	
<b>Storage Temperature</b>	-25 to 85°C; -13 to 185°F	
<b>Operating Humidity</b>	25-85% RH (with no condensation)	
<b>Insulation Resistance</b>	10M $\Omega$ min.	
<b>Vibration Resistance</b>	Durable for one hour along three axes at 10 to 55 Hz with 0.75 mm amplitude	
<b>Shock Resistance</b>	11 ms with 980 m/s <sup>2</sup> applied three times along three axes	
<b>Protection</b>	IP65: dust and splash proof	

## 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 couplings.

### Mounting bracket

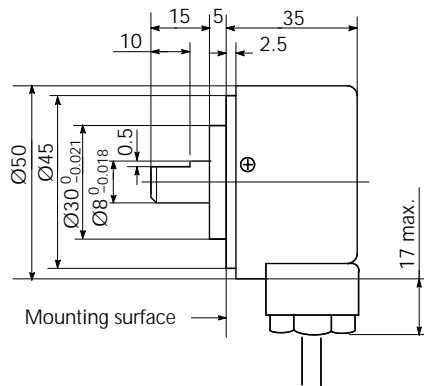
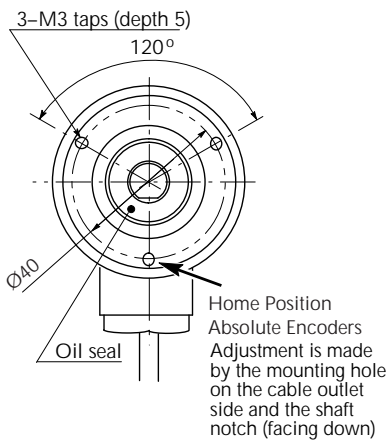
JT-035D metal mounting bracket can be used for all TRD-N/NH/NA encoders.

# Medium-duty Absolute and Incremental

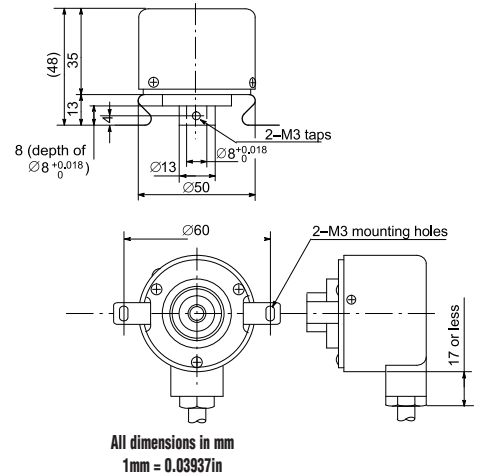
## Dimensions

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

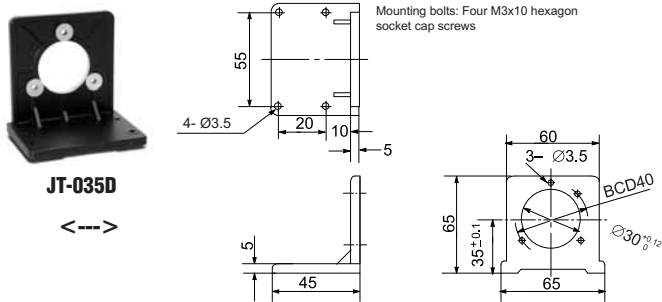
### Standard shaft incremental and absolute encoders (TRD-N, TRD-NA)



### Hollow shaft incremental encoders only (TRD-NH)



### Optional mounting bracket for all medium duty encoders



# Great Selection at Great Prices



## Encoder Selection Guide

<b>Type</b>	<b>Incremental</b>	<b>Absolute</b>	<b>Standard Shaft</b>	<b>Hollow Shaft</b>	<b>Output*</b>	<b>Rating</b>
Light-duty	X		X	X	OC, LD	IP40
Medium-duty	X	X (gray code)	X	X	P/P, LD, OC	IP65
Heavy-duty	X		X		P/P	IP65

\* OC=open collector, P/P=push/pull, LD=line driver

## Accessories

### Couplings

Aluminum alloy and glass-fiber reinforced plastic couplings, including:

6 mm to 6 mm  
8 mm to 8 mm  
10 mm to 10 mm



Aluminum alloy couplings, including:

6 mm to 1/4"  
8 mm to 1/4", 3/8"  
10 mm to 1/4", 3/8"



### Mounting brackets

Simplify your installation with a ready-to-use mounting device for medium and heavy-duty encoders

