

Medium Duty Absolute Encoders

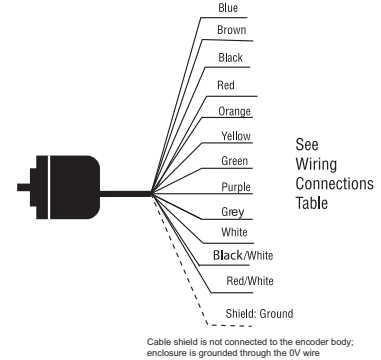
Features

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 100 kHz response frequency



Standard shaft (TRD-NA) model



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 ⁰)	No connection	No connection	No connection	No connection	No connection
Red	4	bit 2 (2 ¹)	bit 1 (2 ⁰)	No connection	No connection	No connection	No connection
Orange	5	bit 3 (2 ²)	bit 2 (2 ¹)	bit 1 (2 ⁰)	No connection	No connection	No connection
Yellow	6	bit 4 (2 ³)	bit 3 (2 ²)	bit 2 (2 ¹)	bit 1 (2 ⁰)	No connection	No connection
Green	7	bit 5 (2 ⁴)	bit 4 (2 ³)	bit 3 (2 ²)	bit 2 (2 ¹)	bit 1 (2 ⁰)	No connection
Purple	8	bit 6 (2 ⁵)	bit 5 (2 ⁴)	bit 4 (2 ³)	bit 3 (2 ²)	bit 2 (2 ¹)	bit 1 (2 ⁰)
Gray	9	bit 7 (2 ⁶)	bit 6 (2 ⁵)	bit 5 (2 ⁴)	bit 4 (2 ³)	bit 3 (2 ²)	bit 2 (2 ¹)
White	10	bit 8 (2 ⁷)	bit 7 (2 ⁶)	bit 6 (2 ⁵)	bit 5 (2 ⁴)	bit 4 (2 ³)	bit 3 (2 ²)
Black/white	11	bit 9 (2 ⁸)	bit 8 (2 ⁷)	bit 7 (2 ⁶)	bit 6 (2 ⁵)	bit 5 (2 ⁴)	bit 4 (2 ³)
Red/white	12	bit 10 (2 ⁹) (MSB)	bit 9 (2 ⁸) (MSB)	bit 8 (2 ⁷) (MSB)	bit 7 (2 ⁶) (MSB)	bit 6 (2 ⁵) (MSB)	bit 5 (2 ⁴) (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		
Model	TRD-NAxxx-NWD	
Power Supply	Operating Voltage	10.8 - 26.4VDC*
	Allowable Ripple	3% rms max.
	Current Consumption	70 mA max.
Output Code	Gray binary (38 gray codes at 180 resolution, 76 at 360 resolution, and 152 at 720 resolution)	
Max. Response Frequency	20kHz (Maximum revolution speed = (max. response frequency / resolution) x 60. The encoder does not respond to revolution faster than the maximum speed.)	
Accuracy	$\frac{360}{\text{Resolution} \times 2}$ = degree of accuracy	
Direction of Rotation	Normal (CW) or reversed (CCW) (When viewed from the shaft, CW is clockwise direction, and CCW is counterclockwise direction)	
Rise/Fall Time	2µs max. (at 1kΩ load resistance and when cable length is 2m or less)	
Output	Output Type	NPN open collector
	Output Logic	Negative logic (active low)
	Sinking Current	16mA
	Residual Voltage	0.4V max.
	Load Power Voltage	30VDC max.
* To be supplied by Class II source		
Mechanical Specifications		
Starting Torque	Max. 0.03 Nm (.0022 ft lbs) max. at 20°C (68°F)	
Max. Allowable Shaft Load	Radial: 50N (11.24 lbs) Axial: 30N (6.74 lbs)	
Max. Allowable Speed	Continuous: 3,000 rpm, instantaneous: 5,000 rpm; (highest speed that can support the mechanical integrity of encoder)	
Wire Size	AWG26	
Weight	Approx. 300g (10.58 oz) with 2m cable	
Environmental Specifications		
Ambient Temperature	10 to 60°C; 14 to 140°F	
Storage Temperature	-25 to 85°C; -13 to 185°F	
Operating Humidity	25-85% RH (with no condensation)	
Insulation Resistance	10MΩ min.	
Vibration Resistance	Durable for one hour along three axes at 10 to 55 Hz with 0.75 mm amplitude	
Shock Resistance	11 ms with 980 m/s ² applied three times along three axes	
Protection	IP65: dust and splash proof	

Accessories

Couplings

If you selected an encoder with a solid shaft, please select a coupling that fits your encoder. All couplings are in stock, ready to ship.

See page 20-16 for more information.

Mounting bracket

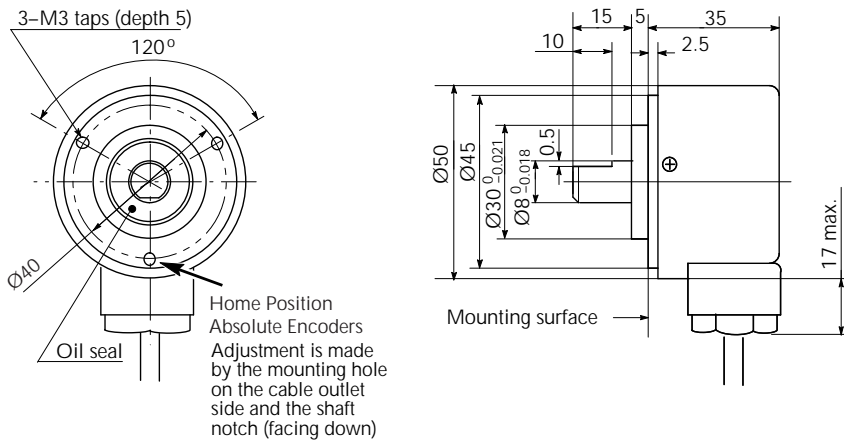
JT-035D metal mounting bracket can be used for all TRD-N/NH/NA encoders.

Medium Duty Absolute and Incremental

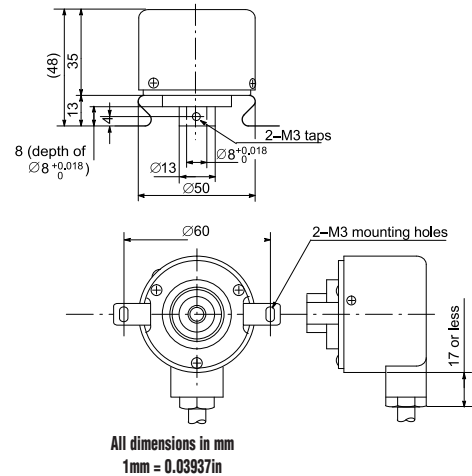
Dimensions

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

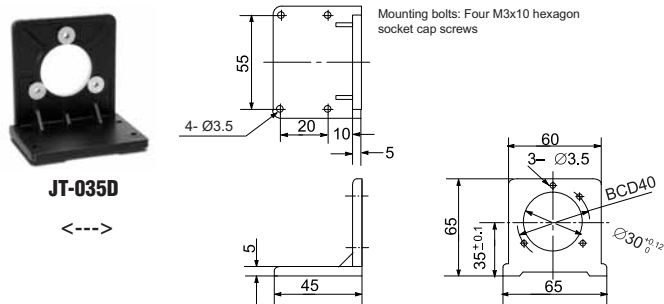
Standard shaft incremental and absolute encoders (TRD-N, TRD-NA)



Hollow shaft incremental encoders only (TRD-NH)



Optional mounting bracket for all medium duty encoders



PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

TB's & Wiring

Power

Circuit Protection

Enclosures

Appendix

Part Index