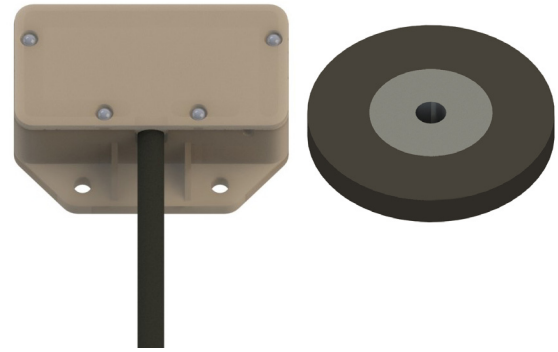


Features and Benefits

- Two channel quadrature output
- Industry standard 7272 line driver output
- RS-422 compatible output
- 5V output standard; 24V output available
- Options up to 5000 pulses per channel per revolution
- Higher pulse counts available
- Operates in harsh environments
- No moving parts provide robust, trouble-free operation



Kit - Encoder with Target Magnet

Resolution - Pulses Per Revolution

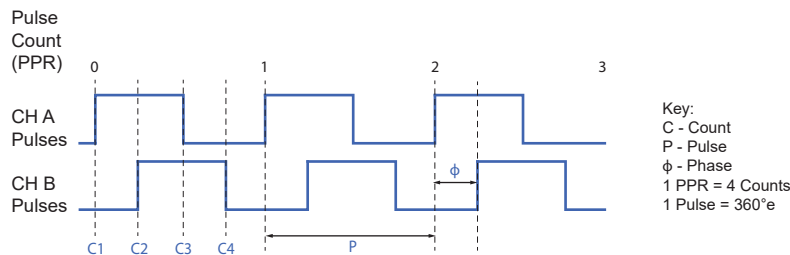
1 PPR = 4 Counts

Table 1.1

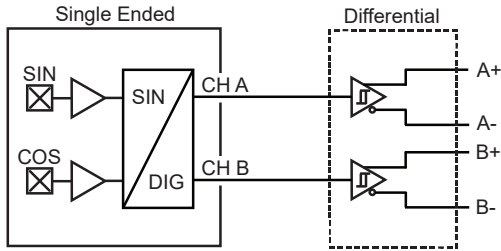
Output PPR - Decade	Maximum Shaft Speed, RPM
50	15,000
100	15,000
200	15,000
320	7,500
400	15,000
500	4,800
640	7,500
800	15,000
1000	4,800
1250	7,800
1600	12,000
2000	4,800
2500	7,800
3200	6,000
4000	4,800
5000	3,750

Output PPR - Binary	Maximum Shaft Speed, RPM
32	15,000
64	15,000
128	15,000
256	15,000
512	15,000
1024	15,000
2048	9,500
4096	4,500

Contact sales@phoenixamerica.com for higher shaft speeds.



Electrical Circuit



Absolute Maximum Ratings

Table 2.1

Characteristic	Symbol	Rating for 5V	Rating for 6V to 25V	Units
Forward Supply Voltage	V_{CC}	6	28	V
Reverse Supply Voltage	V_{RCC}	-0.3	-20	V
Storage Temperature	T_S	150	150	°C
ESD (HMB, 100pF/1.5Kohm)		4	4	kV

Specifications - 5V Supply

Table 2.2

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	Operating, $T_J < 165\text{ °C}$	4.75	5	5.5	V
Supply Current	I_{CC}	$V_{CC} = 12V$	-	32	50	mA
Operating Temperature	T_A		-40	-	125	°C
Duty Cycle	-	$V_{CC} = 5V, T = 25\text{ °C}$	45	50	55	%
Phase	-	$V_{CC} = 5V, T = 25\text{ °C}$	80	90	100	°e

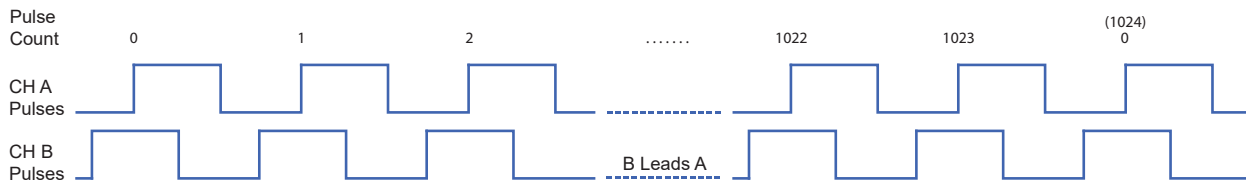
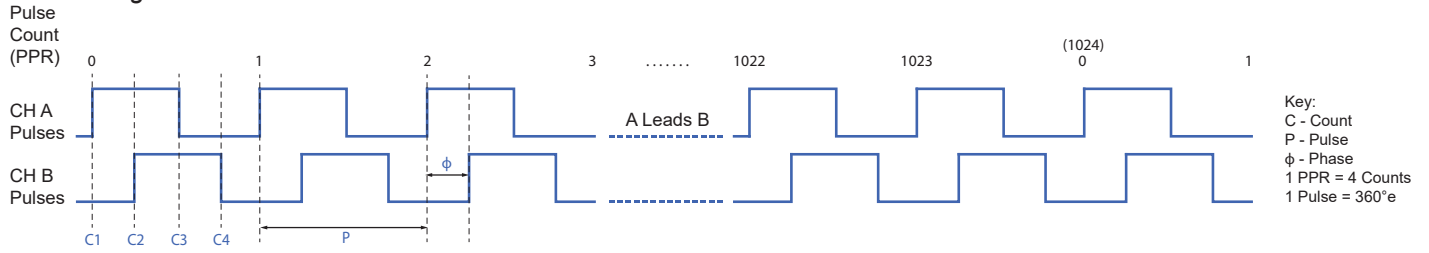
Specifications - 24V Supply

Table 2.3

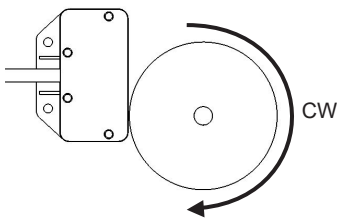
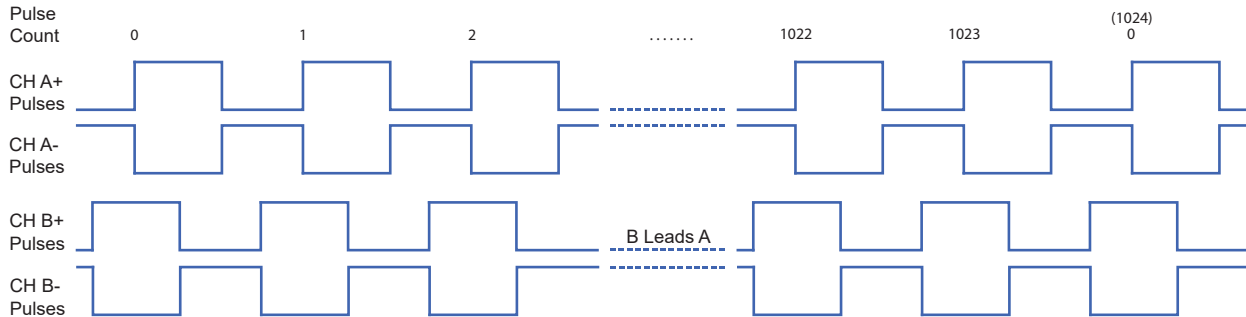
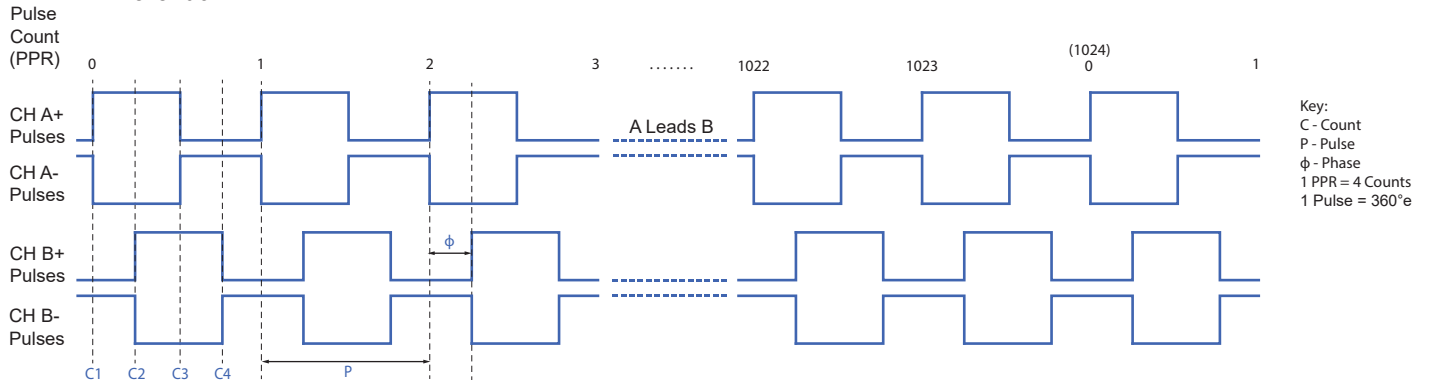
Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	Operating, $T_J < 165\text{ °C}$	7	12	24	V
Supply Current	I_{CC}	$V_{CC} = 12V$	-	40	65	mA
Operating Temperature	T_A		-40	-	125	°C
Duty Cycle	-	$V_{CC} = 12V, T = 25\text{ °C}$	45	50	55	%
Phase	-	$V_{CC} = 12V, T = 25\text{ °C}$	80	90	100	°e

Output Waveforms

Single Ended

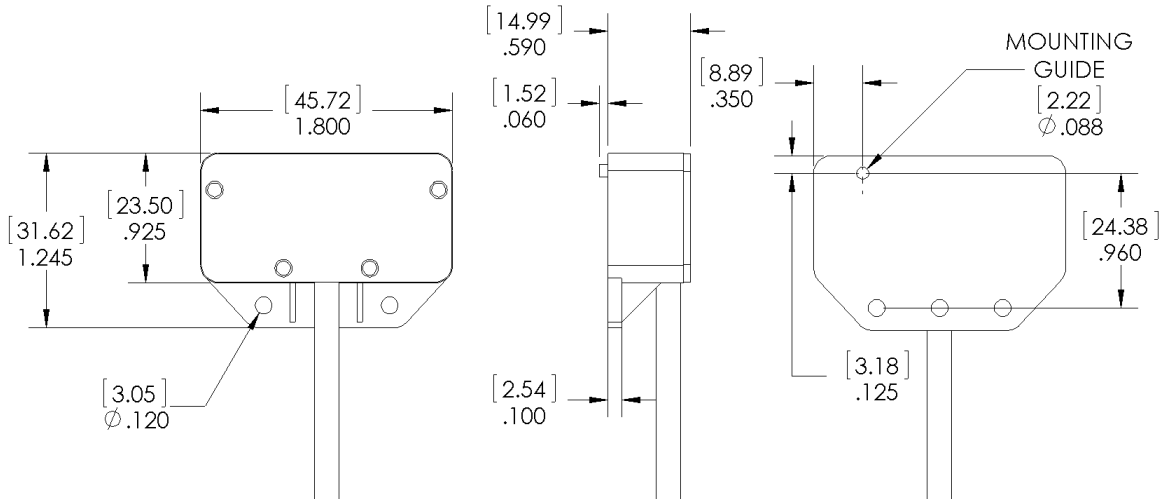


Differential



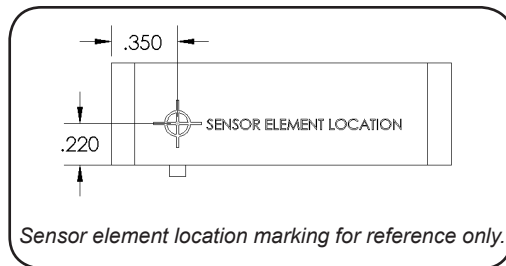
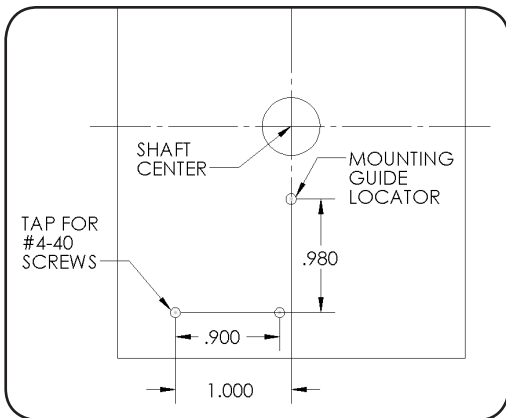
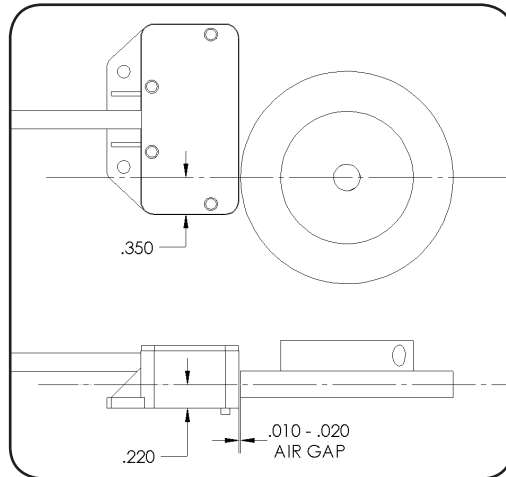
Channel A leads Channel B for clockwise shaft rotation (shaft rotation is defined when looking at the encoder mounting surface).

Encoder Physical Outline



Encoder Mounting Guidelines

- Air gap between magnet rotor and encoder housing should be set to the minimum that can be achieved, taking into account radial play and mounting tolerances. 0.010" to 0.020" is a good target. Air gaps up to 0.040" are acceptable under good conditions.
- The centerline of the magnet rotor should be located 0.220" above the mounting surface of the encoder.
- The encoder and rotor should be mounted perpendicular to the shaft the rotor is mounted on.
- Locating plate is suggested on motor to ensure proper alignment. See sample mounting template below.



Images show two inch magnet rotor, but alignment targets hold true for all sizes.

Target Rotor Physical Outline - Aluminum Hub (Mounting Style B)

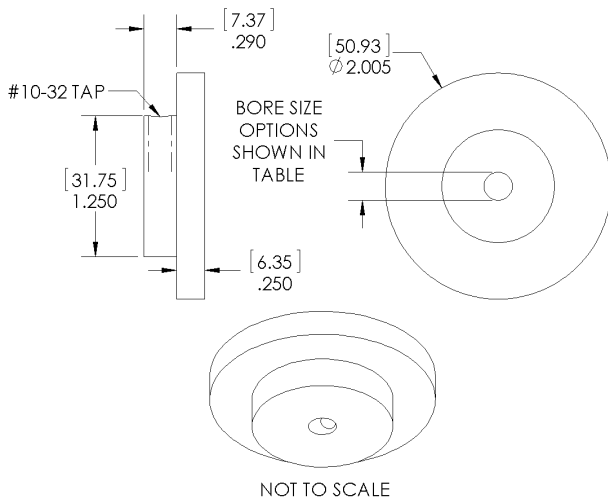


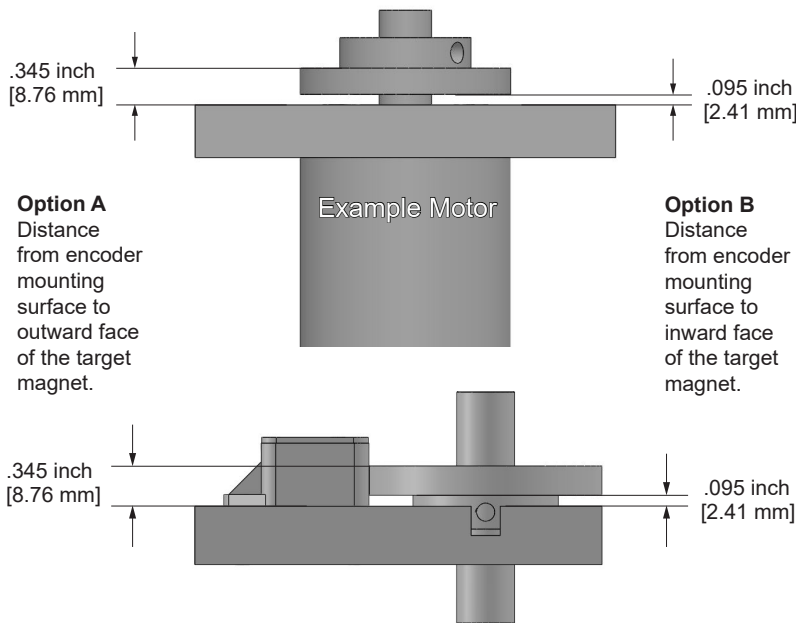
Table 5.1

Bore Size (.inch)	Motor Shaft OD Size (nominal)	NEMA Guide Shaft Tolerance	Magnet Bore MIN. (inch)	Magnet Bore MAX. (inch)
250	1/4 in (.2500")	+0.0000"/-0.0005"	.2507	.2516
276	7 mm (.2758")		.2767	.2778
313	5/16 in (.3125")		.3134	.3145
315	8 mm (.3150")		.3159	.3170
375	3/8 in (.3750")		.3759	.3770
394	10 mm (.3940")		.3949	.3960
473	12 mm (.4728")		.4737	.4748
500	1/2 in (.5000")		.5009	.5020
625	5/8 in (.6250")		.6259	.6270
750	3/4 in (.7500")		.7509	.7520
875	7/8 in (.8750")		.8759	.8770
985	25 mm (.9850")		.9859	.9870

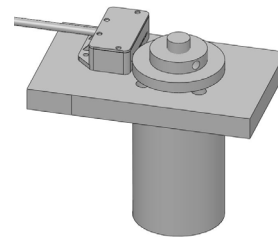
Other bore sizes available upon request.
Contact sales@phoenixamerica.com.

Target Rotor Mounting Guidelines - Aluminum Hub (Mounting Style B)

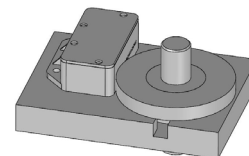
- Proper alignment of the target rotor to the encoder sensing element is critical for optimal encoder performance. Insure that the rotor is mounted to the specified height using one of the options shown in the diagram below.
- A machined step on the motor shaft provides a quick and repeatable method for positioning the target rotor. Spacers or other fixturing should be used to properly position the rotor if no mechanical locating features are on the shaft.
- While the hub is held in the proper position, use a hex wrench to tighten #10-32 set screw.
- For permanent applications, a threadlocker or retaining compound is advised in conjunction with the set screw.



Example 1: Exposed rotor hub

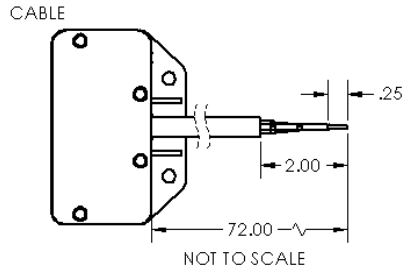


Example 2: Recessed rotor hub



Images show two inch magnet rotor, but alignment targets hold true for all sizes.

Wiring



- 26 AWG
- 6 Conductor with Foil Shield and Drain
- Stranded Tinned Copper
- PVC Insulation
- Grey PVC Jacket
- UL Style 2464, CSA
- Temperature Rating: 105°C

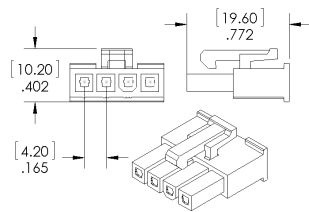
Table 6.1

Differential Wiring	
Vcc	Red
Gnd	Black
Ch A	Yellow
Ch A-	Brown
Ch B	Green
Ch B-	Orange

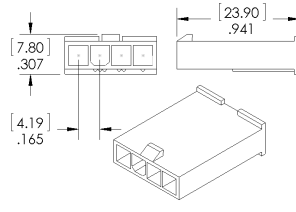
Custom lengths and insulation materials available. Contact sales@phoenixamerica.com.

Connector Options (Single ended option depicted)

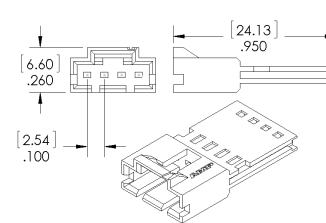
Molex Mini-Fit Jr. (Male)



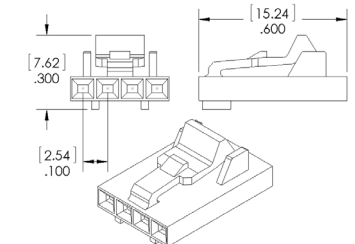
Molex Mini-Fit Jr. (Female)



TE AmpModu MTE (Male)



TE AmpModu MTE (Female)



Need a different connector? Contact sales@phoenixamerica.com.

Part Number Description

N4 - 256 - 375 - 24 - N - D - B - C - E - X

Series	PPR	Bore Size	Supply Voltage	Index	Output Type	Target Magnet Mounting	Wiring	Length (Meters)	Connector
N4	32	250 1/4 in	05 5 V	N A,B	S Single-Ended	B Aluminum Hub	C Cable	A .5 (19.685")	X None (default)
	50	276 7 mm		Quadrature (default)	D Differential (default)			B 0.914 (36")	A1 TE AmpModu MTE (Male)
	64	313 5/16 in	24 24 V (default)					C 1 (39.370")	A2 TE AmpModu MTE (Female)
	100	315 8 mm						D 2 (78.740")	M1 Molex Mini-Fit Jr. (Male)
	128	375 3/8 in						E 1.829 (72") (default)	M2 Molex Mini-Fit Jr. (Female) (default)
	200	394 10 mm							
	256	473 12 mm							
	320	500 1/2 in							
	400	625 5/8 in							
	500	750 3/4 in							
	512	875 7/8 in							
	640	985 25 mm							
	800								
	1000								
	1024								
	1250								
	1600								
	2000								
	2048								
	2500								
	3200								
	4000								
	4096								
	5000								

Example: N4-256-375-24-N-D-B-C-E-X

Contact sales@phoenixamerica.com for additional resolutions and rotor configurations.