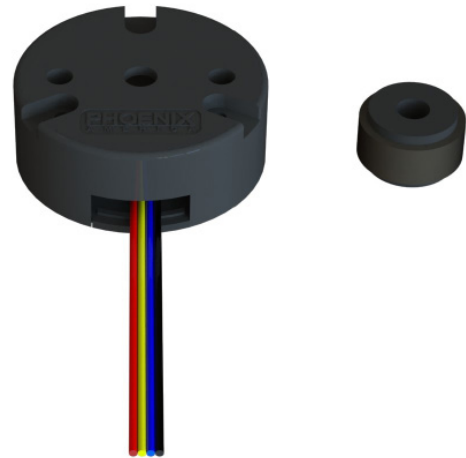


Features and Benefits

- 30 mm O.D. Miniature size
- Magnetic technology offers robust performance.
- 100% Non-contacting design (no bearings or bushings) provides an extremely long life and is tolerant to harsh environments.
- Simple two piece design (magnet rotor + encoder) for easy alignment and installation.
- Bi-directional two channel incremental quadrature output.
- Mounting holes for 2-bolt (.750" BHC x .125" O.D.) or 3-bolt pattern (.823" BHC x .078" O.D.)
- Magnet rotor for standard shaft sizes from 2 mm to 8mm. Custom bore size available.
- Options for 32 - 2500 pulse per channel per revolution.
- Customizable lead wires, cables, and or connectors.



Kit - Encoder with Magnet Rotor
Shown with shaft pass through hole and single ended wiring
Wire color order varies with part configuration

Application Example

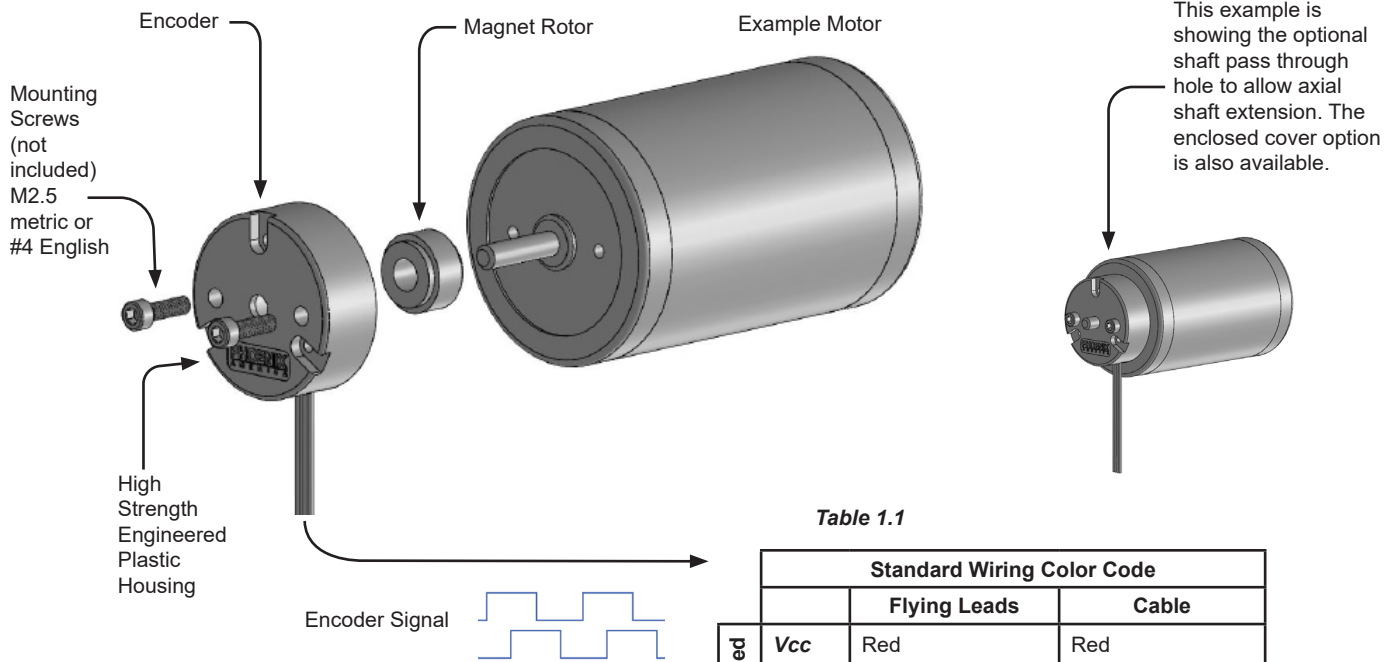
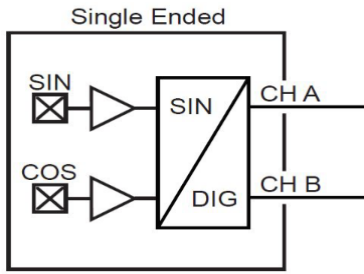


Table 1.1

Standard Wiring Color Code		
	Flying Leads	Cable
Single Ended	Vcc	Red
	Gnd	Black
	Ch A	Yellow
	Ch B	Blue

Other colors available upon request.
Contact sales@phoenixamerica.com.

Electrical Circuit



Absolute Maximum Ratings

Table 2.1

Characteristic	Symbol	Rating	Units
Forward Supply Voltage	V_{CC}	12	V
Reverse Supply Voltage	V_{RCC}	-0.3	V
Storage Temperature	T_s	125	°C
ESD (HMB, 100pF/1.5Kohm)		2	kV
Operating Temperature*		-40 to 125	°C

*For plastic housing and electronics

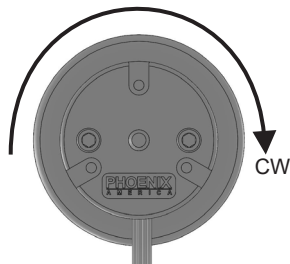
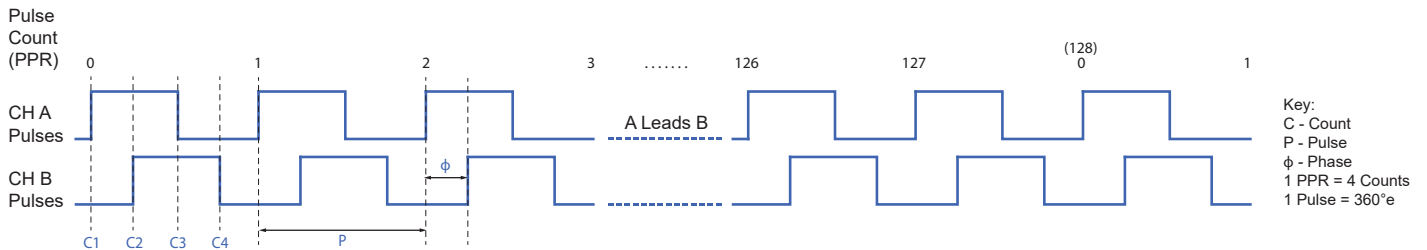
Electrical Specifications - (V_{CC} = 5V, Ambient Temperature= 23 °C)

Table 2.2

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	3.3	5	6	V
Supply Current	I_{CC}	-	14	20	mA
Duty Cycle	-	40	50	60	%
Phase	-	70	90	110	°e
Output Frequency	f_{out}	-	-	42	kHz

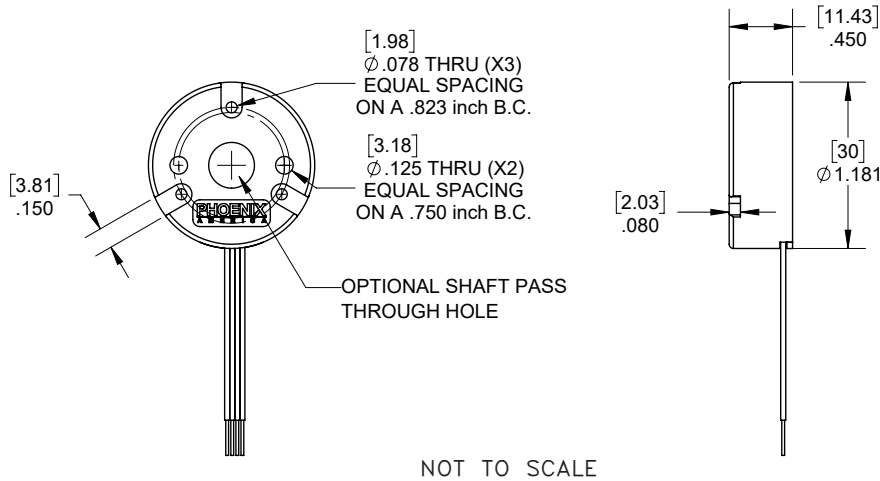
Output Waveforms

Single Ended



Channel A leads Channel B for clockwise shaft rotation (shaft rotation is defined when looking at the branded face of the encoder).

Encoder Physical Outline

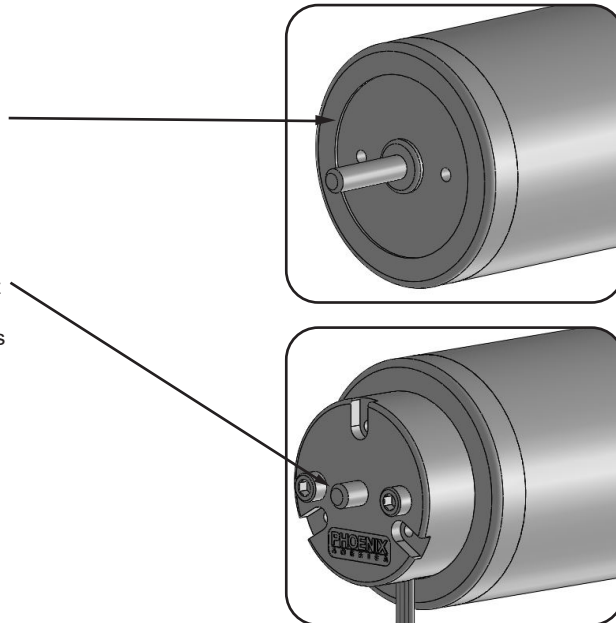


Other shaft pass through hole sizes available upon request. Contact sales@phoenixamerica.com.

Encoder Mounting Guidelines

Concentricity of the encoder housing to the magnet rotor is critical for optimal encoder performance. Considering the following during the design phase will ensure concentricity and ease of assembly.

- Tight molding tolerances allow for the outside diameter of the encoder to be used to locate the encoder housing concentric to the motor shaft and magnet rotor. A machined pocket on the motor endbell works well for alignment. Recommended pocket is 0.015" to 0.020" deep and 1.191" in diameter.
- Extending the shaft through the optional shaft pass through hole is an easy way to align the encoder housing to the motor shaft and magnet rotor. Simply position the encoder so that the shaft is centered concentrically in the shaft pass through hole.
- If previous two methods of alignment are not used it is recommended that the encoder be fastened to the motor using #5-40 or M3 mounting screws. The slightly larger diameter of the #5-40 and M3 screws will compensate for some of the tolerance allowed when using the standard recommended #4-40 or M2.5 mounting screws.



Magnet Rotor Physical Outline - Engineered Polymer Hub (Mounting Style H)

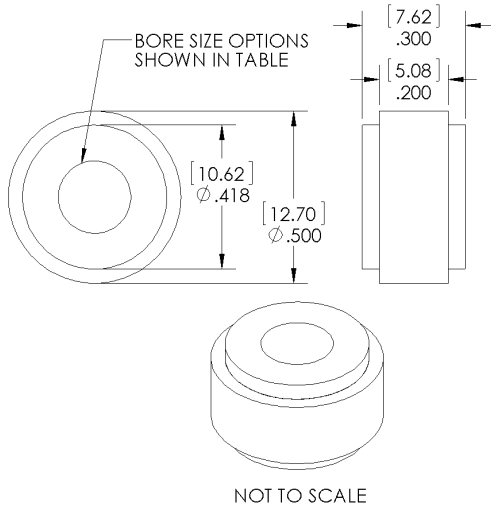


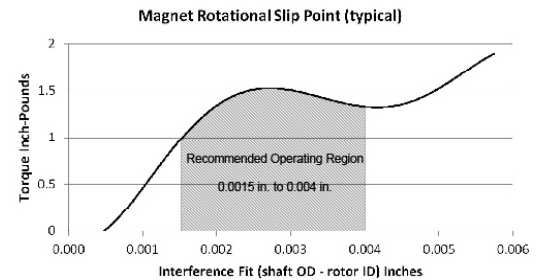
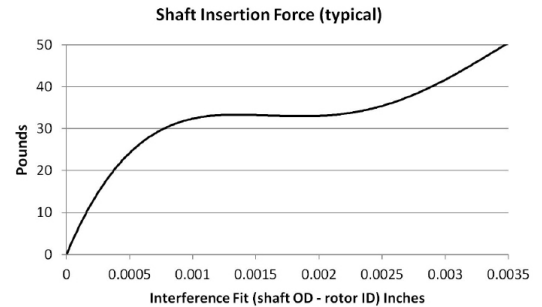
Table 5.1

Bore Size (.inch)	Motor Shaft OD Size (nominal)	NEMA Guide Shaft Tolerance	Magnet Bore MIN. (inch)	Magnet Bore MAX. (inch)
079	2 mm (.0787")	+0.0000"/-0.0005"	.0727	.0757
118	3 mm (.1181")		.1121	.1151
125	1/8 in (.1250")		.1190	.1220
156	5/32 in (.1563")		.1503	.1533
157	4 mm (.1575")		.1515	.1545
188	3/16 in (.1875")		.1815	.1845
197	5 mm (.1969")		.1909	.1939
236	6 mm (.2364")		.2304	.2334
250	1/4 in (.2500")		.2440	.2470
276	7 mm (.2758")		.2698	.2728
313	5/16 in (.3125")		.3065	.3095
315	8 mm (.3150")		.3090	.3120

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

Magnet Rotor Mounting Guidelines - Engineered Polymer Hub (Mounting Style H) For Press Fit Application

- Proper alignment of the magnet rotor to the encoder sensing element is critical for optimal encoder performance. Insure that the rotor is mounted to the specified height shown below.
- A machined step on the motor shaft provides a quick and repeatable method for positioning the magnet rotor. Spacers or other fixturing should be used if no mechanical locating features are on the shaft.
- A chamfered lead in on the shaft will aid in aligning the magnet rotor.
- Prior to insertion, the motor shaft should be clean and free of any oils, lubricants, or solvents.
- Proper fixtures and support must be used to ensure the magnet rotor is pressed on straight and aligned with the motor shaft.
- Opposite end of motor shaft should be supported to avoid undue stress on motor bearings during the pressing operation.
- In applications with high torque or environmental extremes, a retaining compound can be used to enhance the strength of the press fit.



Magnet Rotor Physical Outline - Universal Hub (Mounting Style U)

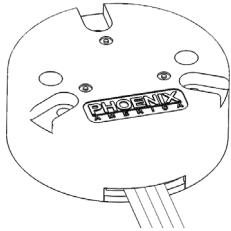
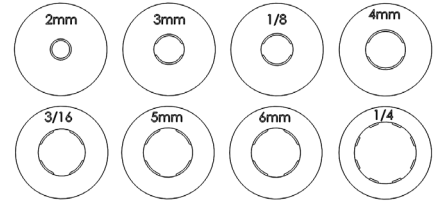
A universal hub kit is available to provide a range of bore sizes to fit several popular industry shaft diameters.

Kit contents (*not shown to scale*)

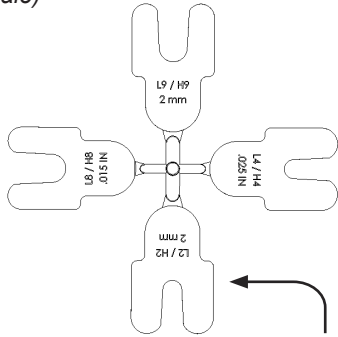
Includes 2 of each size for closed cover option.

Includes 3 of each size for shaft pass through option.

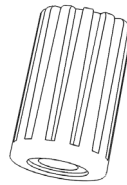
Hubs



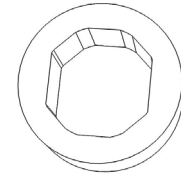
Encoder



Gap Tool (2 mm needed for H2)



Magnet Insertion Tool



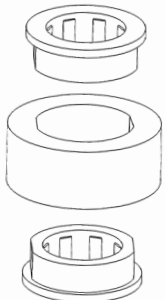
Magnet Ring

Assembly Guidelines

Without shaft pass-through option

Step 1

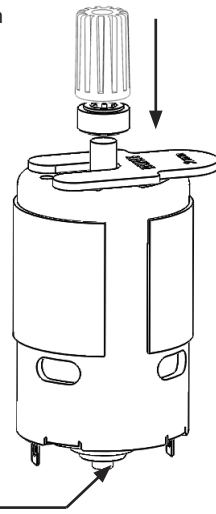
Attach two of the desired hub size on each side of the magnet rotor. Make sure the flats are in-line with each other.



Step 2

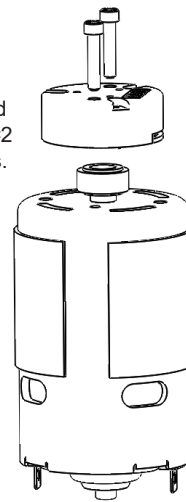
Use the insertion tool to push the magnet rotor assembly **straight** onto the shaft until the bottom face of the hub is resting on the 2 mm gap tool.

tip - Support the bottom of the motor with a fixture or holding clamp.



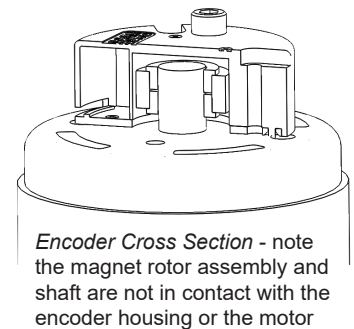
Step 3

Place the encoder onto the motor and secure with #2 or M2 screws.



Step 4

Manually spin the shaft to verify that the shaft/magnet is not interfering with the encoder.

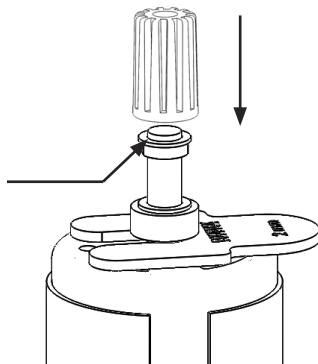


Encoder Cross Section - note the magnet rotor assembly and shaft are not in contact with the encoder housing or the motor

With shaft pass-through option

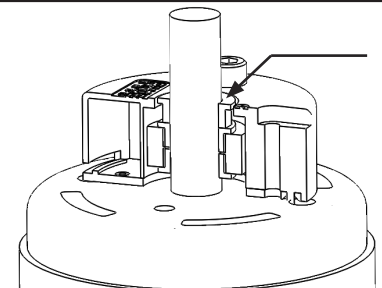
Step 2a

Insert an additional hub piece as shown. This is used as a space filler to match the opening in the encoder housing.



Step 3a

Place the encoder onto the motor and secure with #2 or M2 screws.

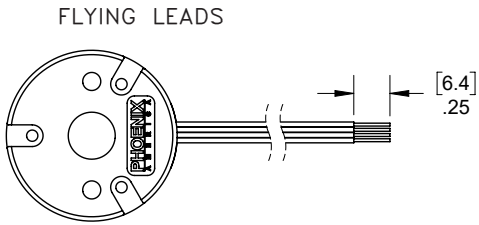


Encoder Cross Section - note the top face of the filler hub should be flush with the top face of the encoder housing as shown by the arrow pointer.

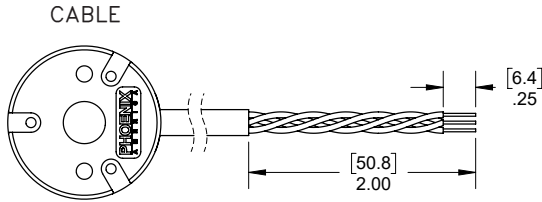
Wiring (Single ended option depicted)

Table 6.1

Single Ended Wiring			
	Leads	Cable	Connector Pin-Out
Ch A	Yellow	Brown	1
Ch B	Blue	Orange	2
Gnd	Black	Black	3
Vcc	Red	Red	4



- 24 AWG
- 7x32 Strands, Tinned Copper
- PVC Insulation
- MIL M16878/1
- Temperature Rating: 105°C



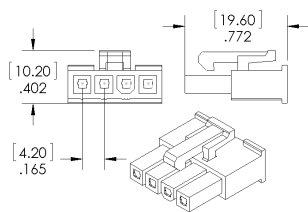
- 24 (or 26) AWG
- 4 (or 6) Conductor with Foil Shield and Drain
- Stranded Tinned Copper
- PVC Insulation
- Grey PVC Jacket
- UL Style 2464, CSA
- Temperature Rating: 105°C

NOT TO SCALE

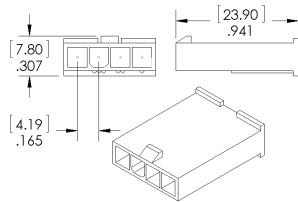
Custom lengths and insulation materials available. Contact sales@phoenixamerica.com.

Connector Options (Single ended option depicted)

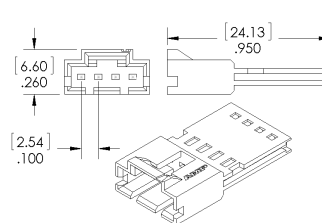
Molex Mini-Fit Jr. (Male)



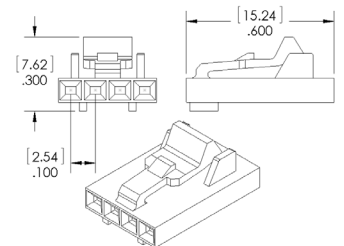
Molex Mini-Fit Jr. (Female)



TE AmpModu MTE (Male)



TE AmpModu MTE (Female)



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

Part Number Description

H2 - 0128 - 0188 - 05 - A - N - H - F - B - XX

Series	PPR	Bore Size	Supply Voltage	Output Type	Shaft Pass Through Hole	Target Magnet Mounting	Wiring	Length (Meters)	Connector	
H2	0032	0160	05 5V (default)	A AB - 5V B ABZ - 5V	N None (default) Y Hole size will match Table 4.1	H Engineered Polymer Hub U Universal Hub	F Flying Leads (default) C Cable	A .5 (19.685") B 0.914 (36") (default) C 1 (39.370") D 2 (78.740")	XX None (default) A1 TE AmpModu M E (Male) A2 TE AmpModu MTE (Female) M1 Molex Mini-Fit Jr. (Male) M2 Molex Mini-Fit Jr. (Female)	
	0036	0180								0079 2mm
	0040	0192								0118 3mm
	0045	0200								0125 1/8 in
	0050	0240								0156 5/32 in
	0056	0250								0157 4mm
	0060	0256								0188 3/16 in (default)
	0064	0300								0197 5mm
	0075	0360								0236 6mm
	0080	0384								0250 1/4 in
	0096	0400								0276 7mm
	0100	0480								0313 5/16 in
	0120	0500								0315 8mm
	0125	0572								0000*
	0128	0600								
	0150	0625								

*Use for Universal Hub Option

Example: H2-0128-0188-05-A-N-H-F-B-XX