

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 (target magnet + 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.)
- Target magnet for standard shaft sizes from 2 mm to 8mm. Custom bore sizes available.
- Options for 32 - 2500 pulse per channel per revolution.
- Customizable lead wires, cables, and or connectors.



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

Application Example

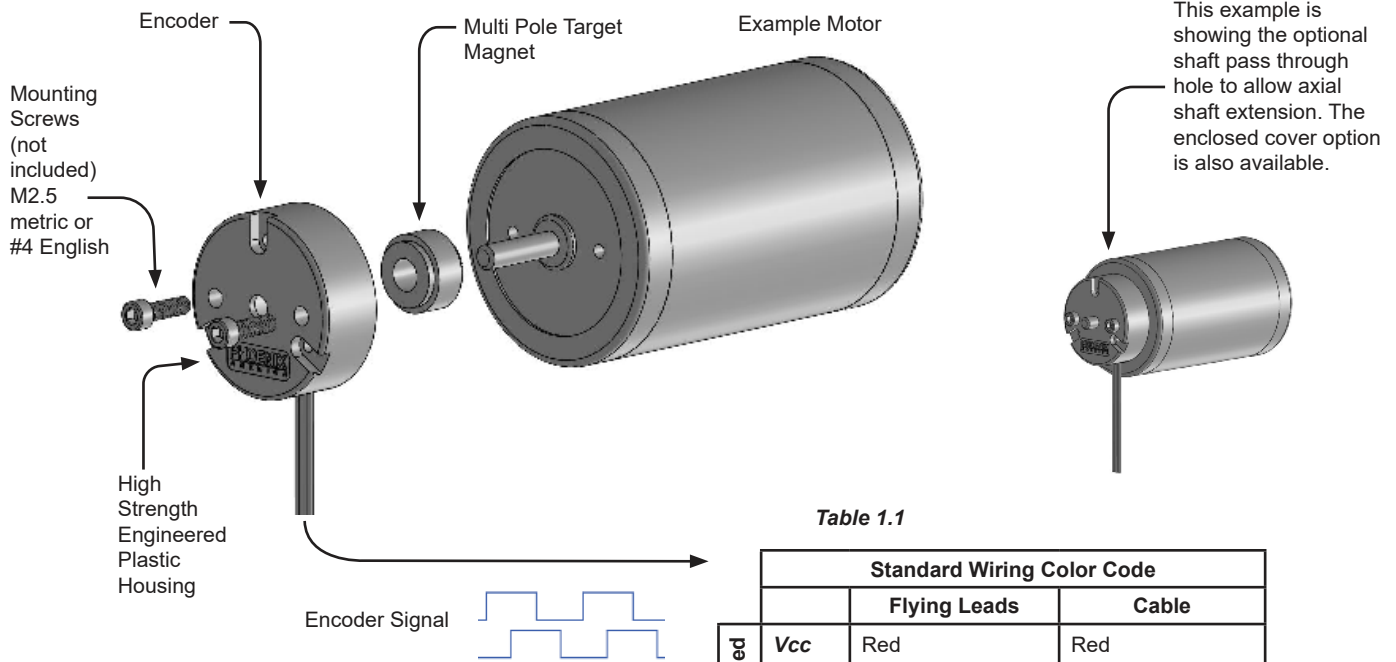
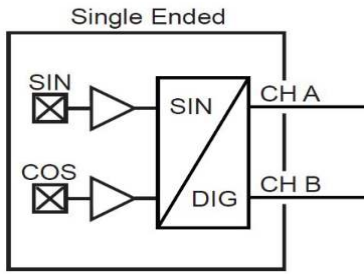


Table 1.1

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

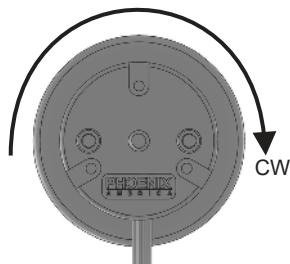
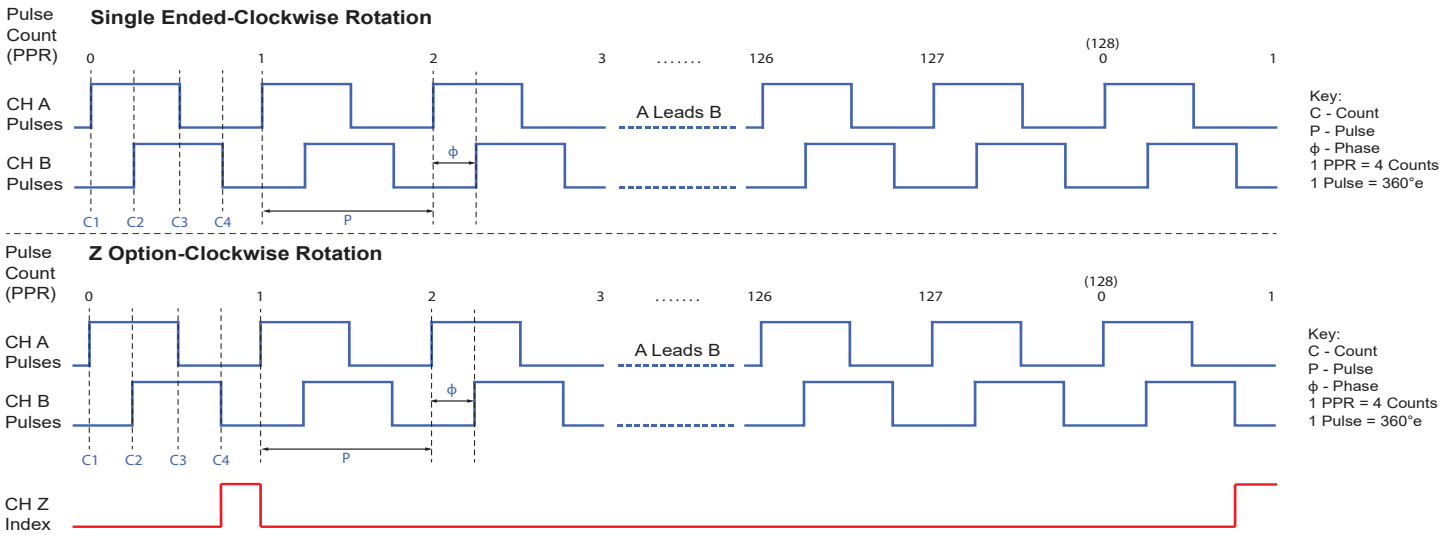
*For plastic housing and electronics

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

Table 2.2

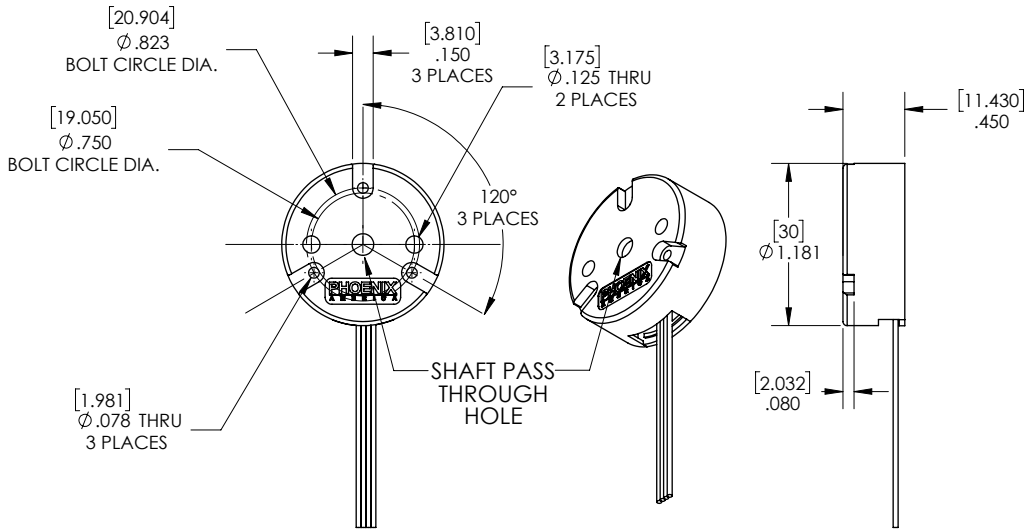
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	3.3	5	6	V
Supply Current	I_{CC}	-	14	20	mA
Duty Cycle	-	40	50	60	%
Phase	-	70	90	110	°e
Output Frequency	f_{out}	-	-	42	kHz

Output Waveforms



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



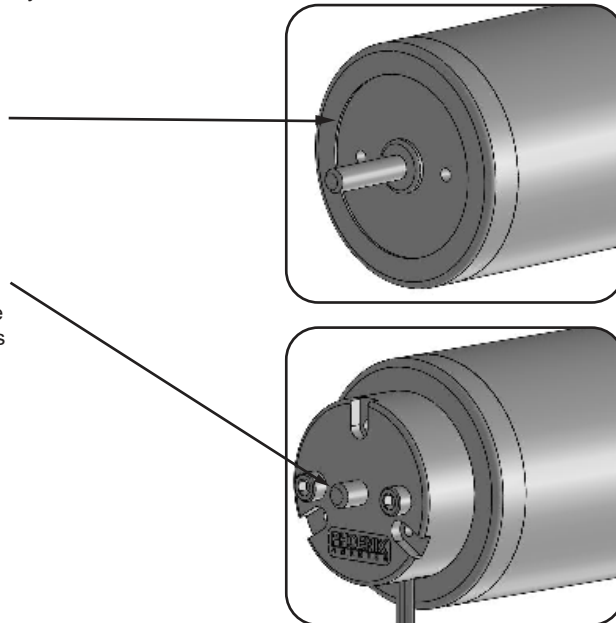
NOT TO SCALE

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

Encoder Mounting Guidelines

Concentricity of the encoder housing to the target magnet 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 target magnet. 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 target magnet. 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.



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

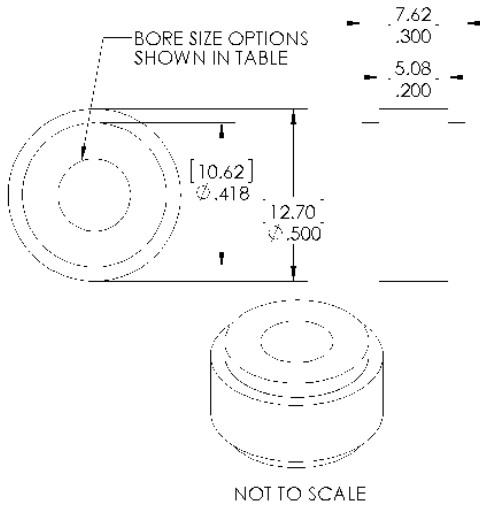


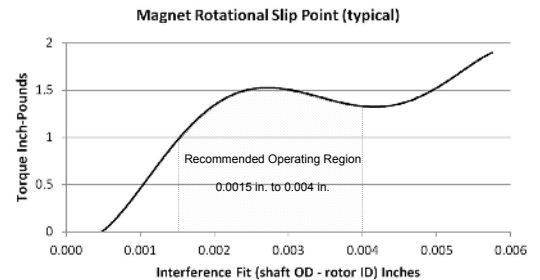
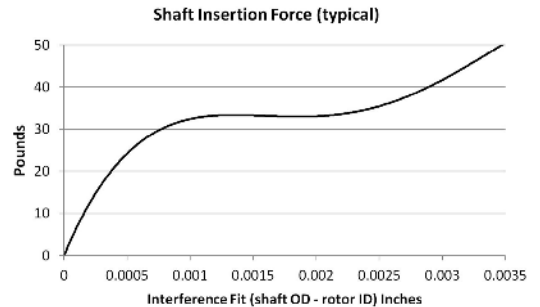
Table 5.1

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.

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

- Proper alignment of the target magnet to the encoder sensing element is critical for optimal encoder performance. Insure that the target magnet is mounted to the specified height shown below.
- A machined step on the motor shaft provides a quick and repeatable method for positioning the target magnet. 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 target magnet.
- 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 target magnet 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.



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

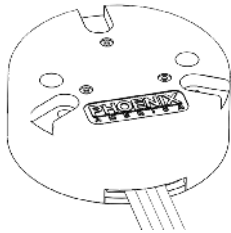
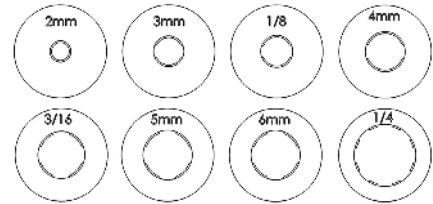
A universal hub kit is available to provide a range of bore sizes to fit several popular industry shaft diameters.

Kit contents (*not shown to scale*)

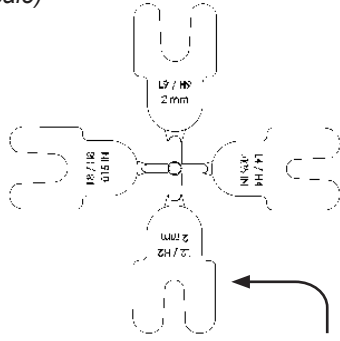
Includes 2 of each size for closed cover option.

Includes 3 of each size for shaft pass through option.

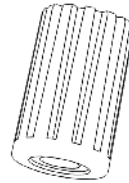
Hubs



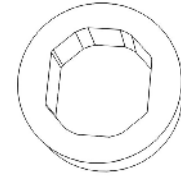
Encoder



Gap Tool (2 mm needed for H2)



Magnet Insertion Tool



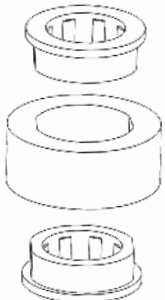
Target Magnet

Assembly Guidelines

Without shaft pass-through option

Step 1

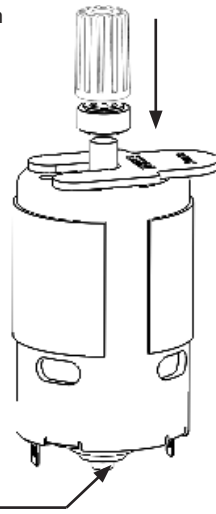
Attach two of the desired hub size on each side of the target magnet. Make sure the flats are in-line with each other.



Step 2

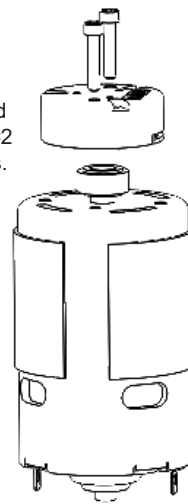
Use the insertion tool to push the target magnet assembly **straight** onto the shaft until the bottom face of the hub is resting on the 2 mm gap tool.

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



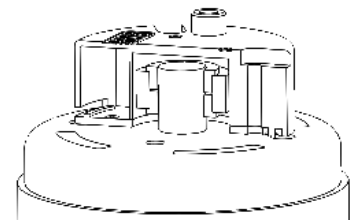
Step 3

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.

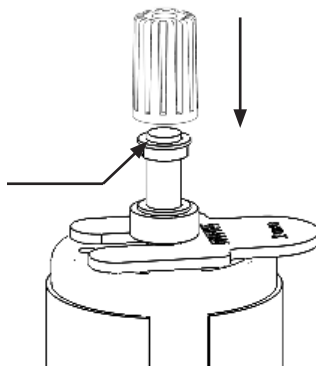


Encoder Cross Section - note the target magnet assembly and shaft are not in contact with the encoder housing or the motor

With shaft pass-through option

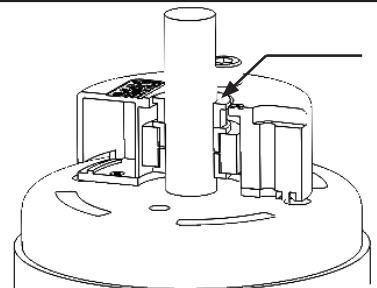
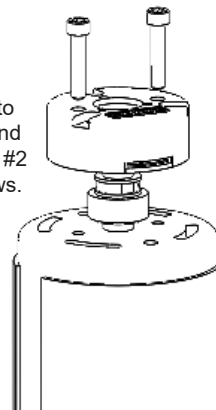
Step 2a

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



Step 3a

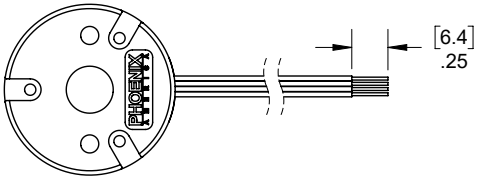
Place the encoder onto the motor and secure with #2 or M2 screws.



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.

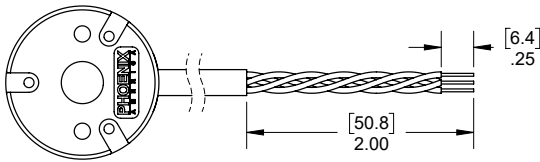
Wiring (Single ended option depicted)

FLYING LEADS



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

CABLE



- 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

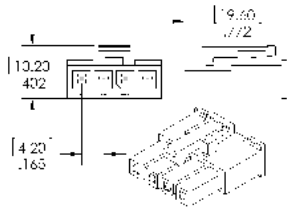
Table 6.1

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

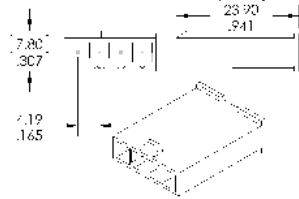
Custom lengths and insulation materials available. Contact sales@phoenixamerica.com.

Connector Options (Single ended option depicted)

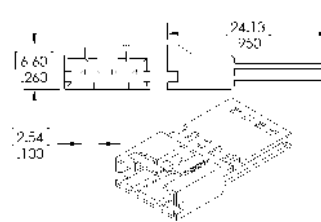
Molex Mini-Fit Jr. (Male)



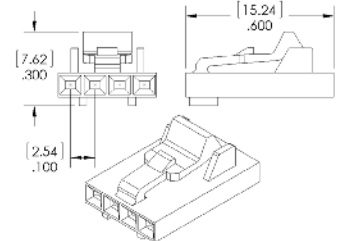
Molex Mini-Fit Jr. (Female)



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								0625	1800	0079 2mm
	0040	0192								0680	2000	0118 3mm
	0045	0200								0720	2048	0125 1/8 in
	0050	0240								0768	2100	0156 5/32 in
	0056	0250								0800	2400	0157 4mm
	0060	0256								0800	2500	0188 3/16 in (default)
	0064	0300								0900		0197 5mm
	0075	0360								1000		0236 6mm
	0080	0384								1024		0250 1/4 in
	0096	0400								1250		0276 7mm
	0100	0480								1280		0313 5/16 in
	0120	0500								1440		0315 8mm
	0125	0512								1500		0000*
	0128	0572								1600		
	0150	0600								1650		

*Use for Universal Hub Option

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