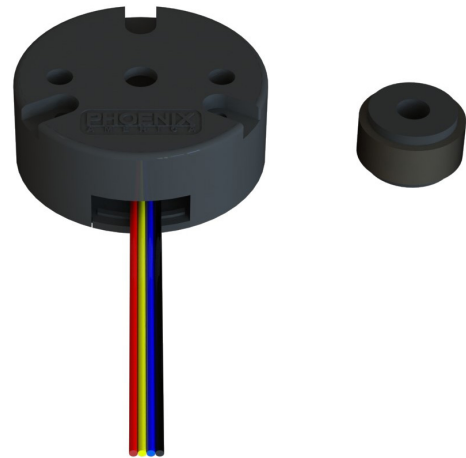


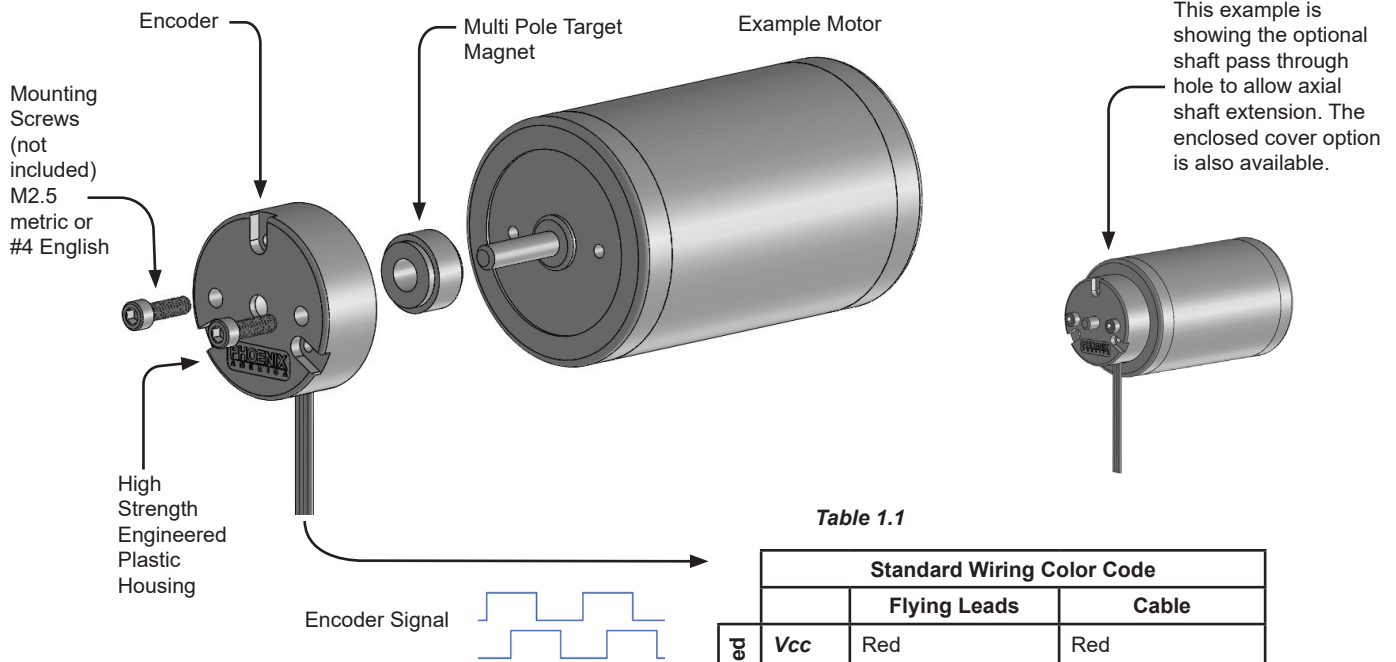
**Features and Benefits**

- 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.
- 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.
- Optional universal target magnet hub to accommodate both metric (2, 3, 4, 5 & 6mm) and inch (1/8, 3/16 & 1/4 In.) shaft diameters.
- 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**

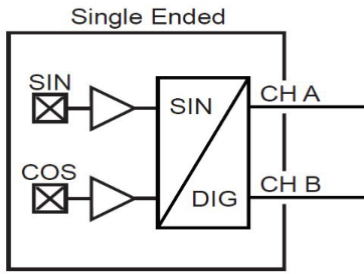


**Table 1.1**

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](mailto: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

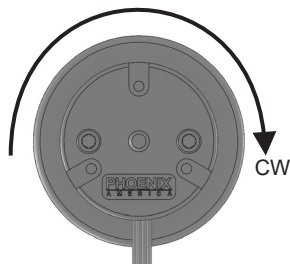
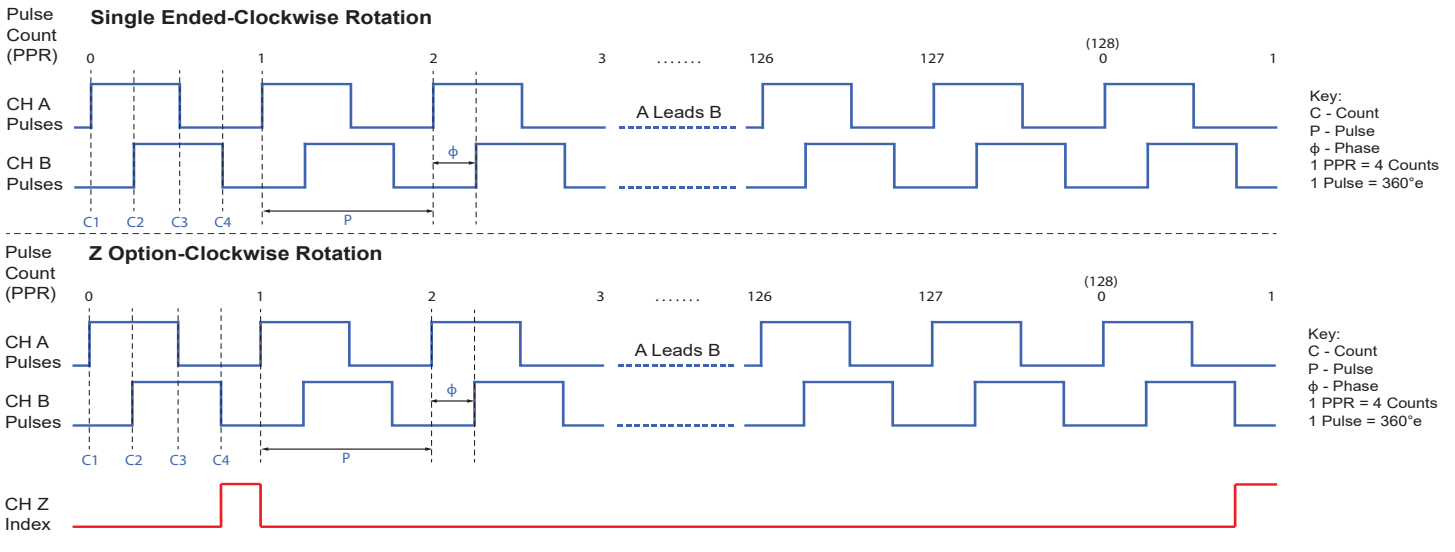
\*For plastic housing and electronics

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

Table 2.2

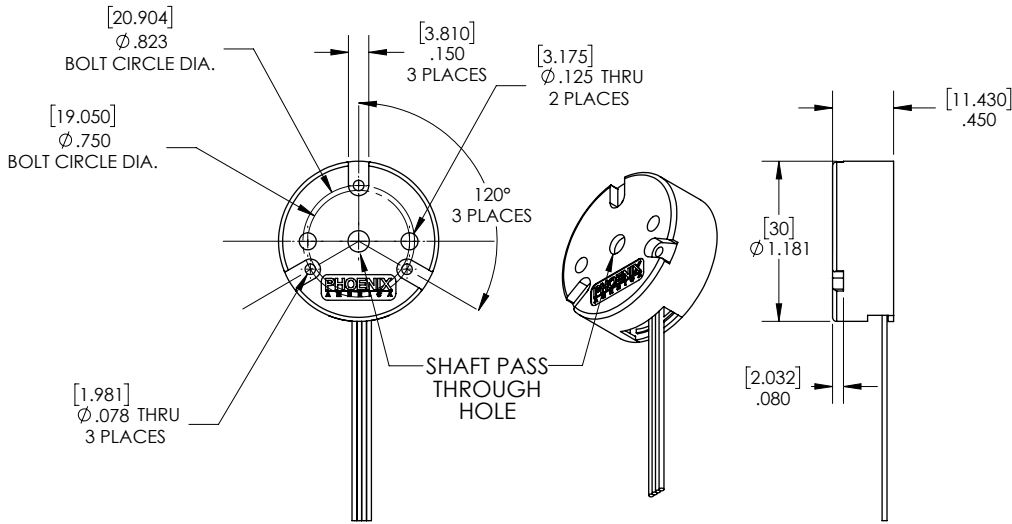
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	$V_{CC}$	3.3	5	6	V
Supply Current	$I_{CC}$	-	14	20	mA
Duty Cycle	-	40	50	60	%
Phase	-	70	90	110	°e
Output Frequency	$f_{out}$	-	-	42	kHz

**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**



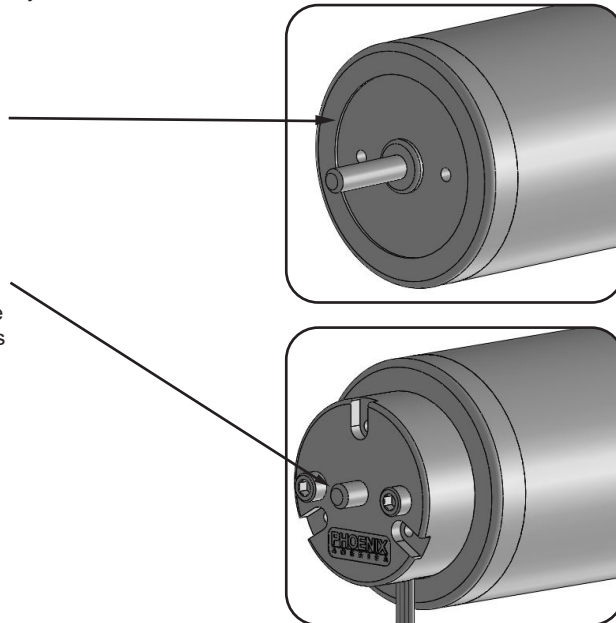
NOT TO SCALE

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

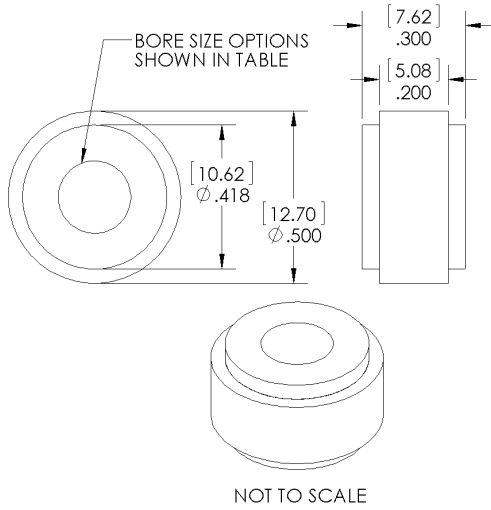
**Encoder Mounting Guidelines**

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)**



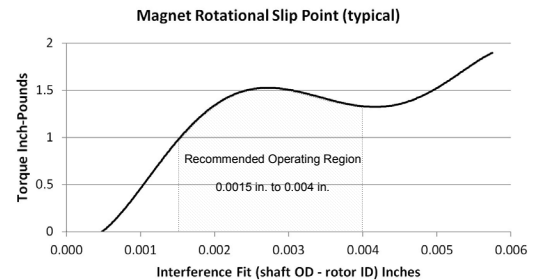
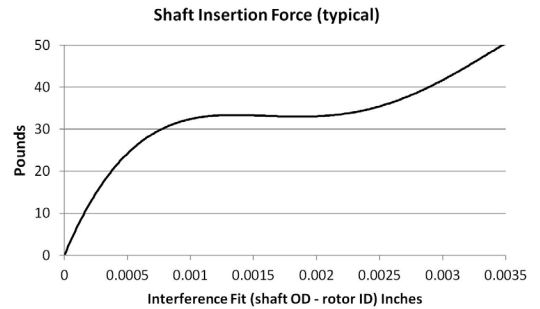
**Table 5.1**

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](mailto: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)**

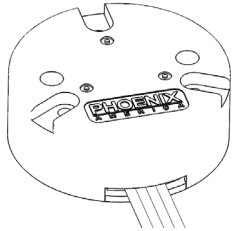
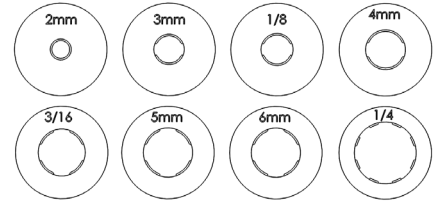
A universal hub kit is available to accommodate both metric (2, 3, 4, 5 & 6mm) and inch (1/8, 3/16 & 1/4 In.) industry standard shaft diameters.

Kit contents (not shown to scale)

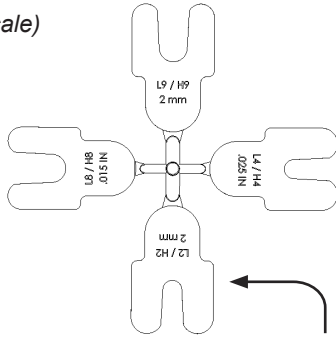
Includes 2 of each size for closed cover option.

Includes 3 of each size for shaft pass through option.

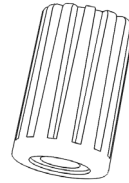
Hubs



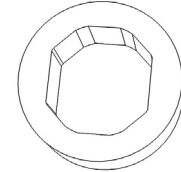
Encoder



Gap Tool (2 mm needed for H2)



Magnet Insertion Tool



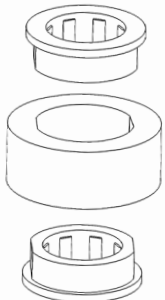
Target Magnet

**Assembly Guidelines**

**Without shaft pass-through option**

Step 1

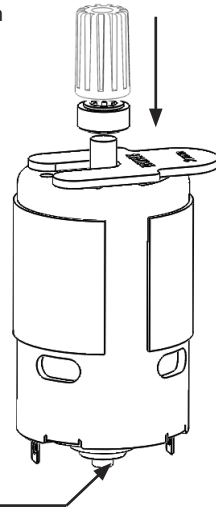
Attach two of the desired hub size on each side of the target magnet. Make sure the flats are in-line with each other.



Step 2

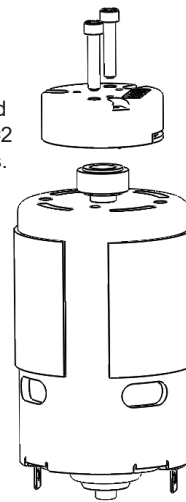
Use the insertion tool to push the target magnet assembly **straight** onto the shaft until the bottom face of the hub is resting on the 2 mm gap tool.

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



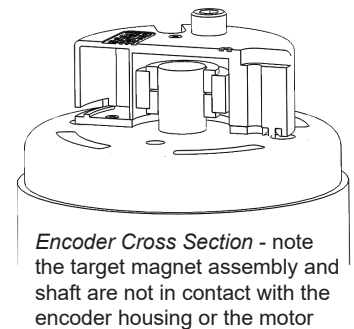
Step 3

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.

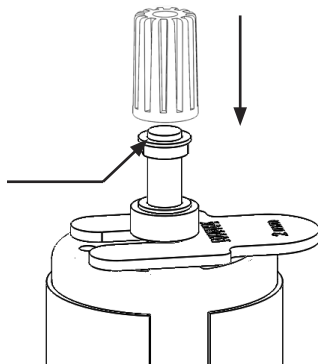


*Encoder Cross Section* - note the target magnet assembly and shaft are not in contact with the encoder housing or the motor

**With shaft pass-through option**

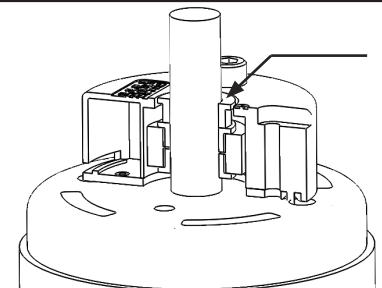
Step 2a

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



Step 3a

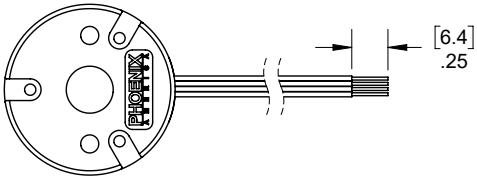
Place the encoder onto the motor and secure with #2 or M2 screws.



*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.

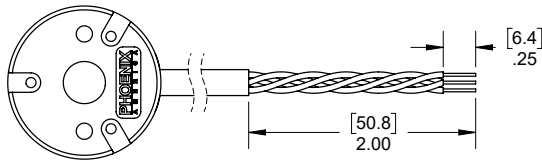
**Wiring** (Single ended option depicted)

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

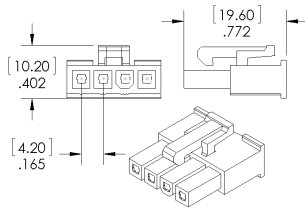
Table 6.1

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

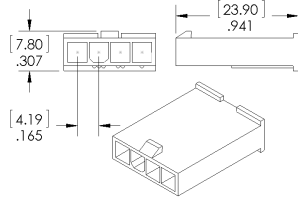
Custom lengths and insulation materials available. Contact [sales@phoenixamerica.com](mailto:sales@phoenixamerica.com).

**Connector Options** (Single ended option depicted)

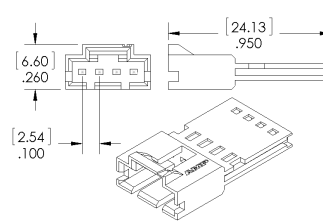
Molex Mini-Fit Jr. (Male)



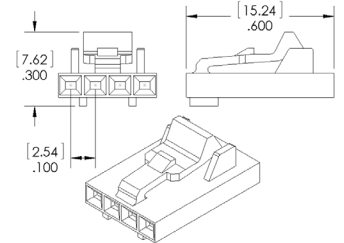
Molex Mini-Fit Jr. (Female)



TE AmpModu MTE (Male)



TE AmpModu MTE (Female)



Need a different connector? Contact [sales@phoenixamerica.com](mailto: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 5 V (default)	0079 2mm	A AB - 5V B ABZ - 5V	N None (default) Y Hole size will match Table 4.1	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		0118 3mm					
	0040	0192		0125 1/8 in					
	0045	0200		0156 5/32 in					
	0050	0240		0157 4mm					
	0056	0250		0188 3/16 in (default)					
	0060	0256		0197 5mm					
	0064	0300		0236 6mm					
	0075	0360		0250 1/4 in					
	0080	0384		0276 7mm					
	0096	0400		0313 5/16 in					
	0100	0480		0315 8mm					
	0120	0500		0000*					
	0125	0512							
	0128	0572							
	0150	0600							

\*Use for Universal Hub Option

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