



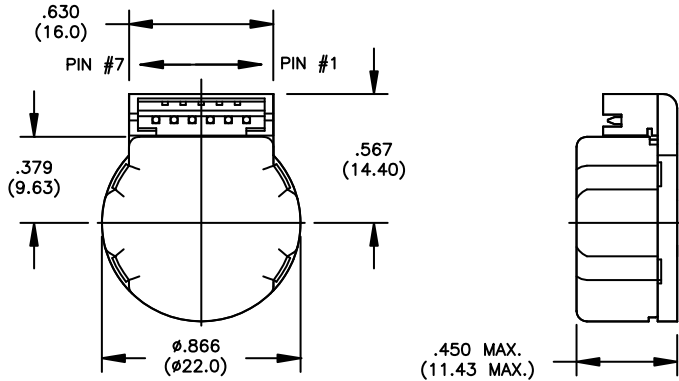
## Encoders

AMETEK offers cost effective feedback devices for positioning applications with different technologies in the incremental encoders' format such as reflective optical technology, transmissive optical technology with and without differential line drives and multitude of line counts in compact low profile sizes. These incremental encoders are offered in both modular and bearing construction. The bearing style encoders provide significant performance upgrades in demanding applications.

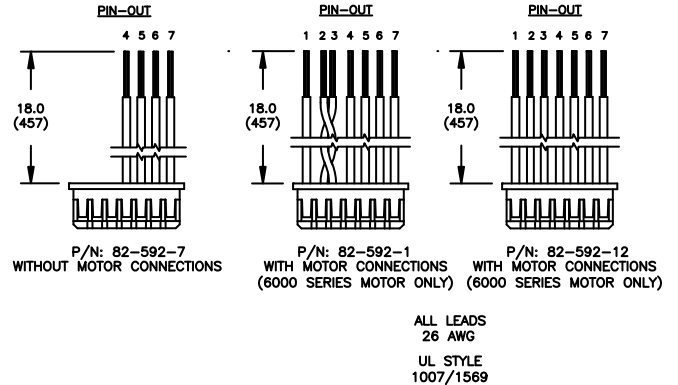
To insure a reliable, quick, and hassle-free startup AMETEK offers a selection of factory installed feedback devices, brakes and gearboxes at no extra cost to you.



# PITTMAN<sup>®</sup>



**Optional Leadwire Assemblies**



E22A Encoder Data	Symbol	Units	Value
Available Resolutions	-	-	128, 256
Output	-	-	2-Channel Quadrature Output
Output Interface	-	-	TTL Compatible
Supply Voltage	V <sub>CC</sub>	VDC	4.5 to 5.5
Supply Current	I <sub>CC</sub>	mA	20 max
High Level Output Voltage	V <sub>OH</sub>	V	2.4 min
Low Level Output Voltage	V <sub>OL</sub>	V	0.4 max
Maximum Operating Frequency	f <sub>max</sub>	kHz	40
Maximum Operating Temperature	θ <sub>max</sub>	°C	-20 to +85
Encoder Weight (Mass)	W <sub>E</sub>	oz g	0.13 3.7

E22A Connection Chart		
Pin	Color	Function
1	Green	Motor Ground*
2	Black	Motor (-)**
3	Red	Motor (+)**
4	Grey	Encoder Ground
5	White	V <sub>CC</sub>
6	Blue	Channel A
7	Violet	Channel B

Differential Line Drive Options		
Pin	Color	Function
1	Green	Motor Ground *
2	Grey	Encoder Ground
3	White	V <sub>CC</sub>
4	Blue/White	Channel $\bar{A}$
5	Blue	Channel A
6	Violet/White	Channel $\bar{B}$
7	Violet	Channel B

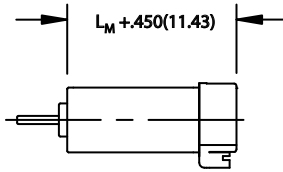
- | Options   |
|---|
| <ul style="list-style-type: none"> <li>• Integral pull-up resistors.</li> <li>• Alternate leadwire assemblies.</li> <li>• Differential line driver with complementary output.</li> <li>• Right angle connector option.</li> </ul> |

Notes:  
 \* No connection with 8690 series motors.  
 \*\* 6000 series motor only.

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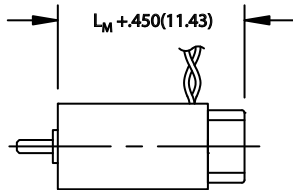
For use with the following motor series

6210 Series Motor with E22A



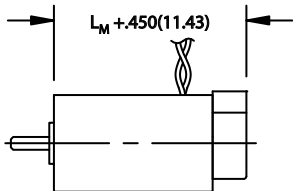
Motor	Length L <sub>M</sub> max in (mm)
6212	1.256 (31.90)
6213	1.556 (39.52)
6214	1.901 (48.29)

8690 Series Motor with E22A



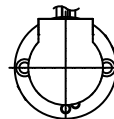
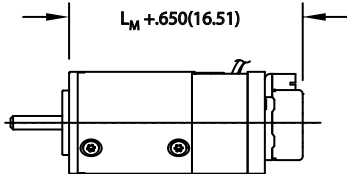
Motor	Length L <sub>M</sub> max in (mm)
8691	1.798 (45.67)
8692	1.923 (48.84)
8693	2.173 (55.19)

8220 Series Motor with E22A



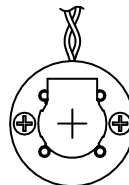
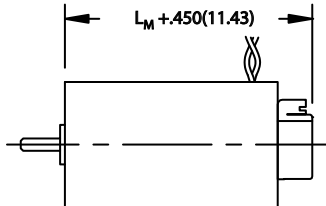
Motor	Length L <sub>M</sub> max in (mm)
8222	2.070 (52.58)
8223	2.195 (55.75)
8224	2.445 (62.10)

8540 Series Motor with E22A



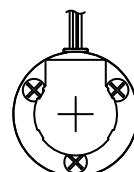
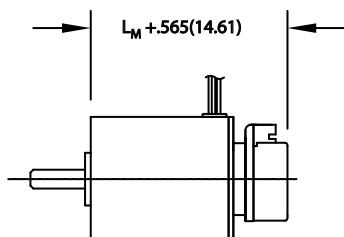
Motor	Length L <sub>M</sub> max in (mm)
8541	2.114 (53.69)
8542	2.585 (65.66)
8543	3.057 (77.65)

9230 Series Motor with E22A



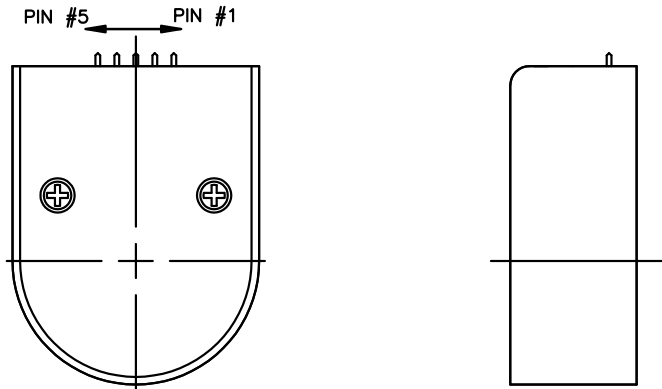
Motor	Length L <sub>M</sub> max in (mm)
9232	1.828 (46.43)
9233	2.203 (55.96)
9234	2.403 (61.04)
9235	2.703 (68.66)
9236	3.053 (77.55)
9237	3.353 (85.17)

1300 Series Motor with E22A

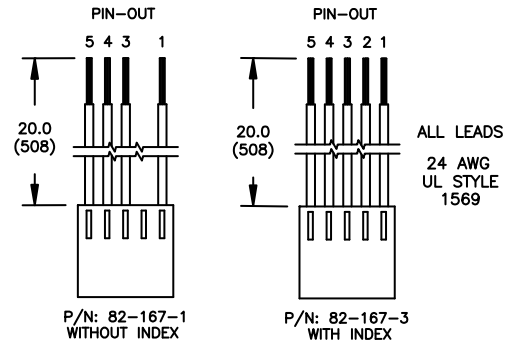


Motor	Length L <sub>M</sub> max in (mm)
1301	1.500 (38.10)
1302	2.000 (50.80)
1303	2.500 (63.50)

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Optional Leadwire Assemblies



\*See individual motor series outline drawings for applicable encoder dimensions

E30A Encoder Data	Symbol	Units	Value
Available Resolutions	-	-	100, 200, 256, 360, 500, 512, 1000, 1024
Output	-	-	2-Channel Quadrature Output
Output Interface	-	-	TTL Compatible
Supply Voltage	$V_{CC}$	VDC	4.5 to 5.5
Supply Current	$I_{CC}$	mA	40 max
High Level Output Voltage	$V_{OH}$	V	2.4 min
Low Level Output Voltage	$V_{OL}$	V	0.4 max
Maximum Operating Frequency	$f_{max}$	kHz	100
Maximum Operating Temperature	$\theta_{max}$	°C	-40 to +100
Encoder Weight (Mass)	$w_E$	oz g	2.0 57

E30A Connection Chart		
Pin	Color	Function
1	Black	Ground
2	-	No Connection
3	Yellow	Channel A
4	Red	Vcc
5	Blue	Channel B

Options
<ul style="list-style-type: none"> <li>Differential line drive with complementary outputs.</li> <li>Alternate leadwire assemblies.</li> </ul>

Notes:

<sup>1</sup> Motor ball bearings are required for optimal performance.

E30B

E30B Encoder Data	Symbol	Units	Value
Available Resolutions	-	-	256, 360, 500, 512
Output	-	-	3-Channel Quadrature Output with Index Pulse
Output Interface	-	-	TTL Compatible
Supply Voltage	$V_{CC}$	V	4.5 to 5.5
Supply Current	$I_{CC}$	mA	85 max
High Level Output Voltage	$V_{OH}$	V	2.4 min
Low Level Output Voltage	$V_{OL}$	V	0.4 max
Maximum Operating Frequency	$f_{max}$	kHz	100
Maximum Operating Temperature	$\theta_{max}$	°C	-40 to +100
Encoder Weight (Mass)	$w_E$	oz g	2.0 57

E30B Connection Chart		
Pin	Color	Function
1	Black	Ground
2	Green	Index
3	Yellow	Channel A
4	Red	Vcc
5	Blue	Channel B

Options
<ul style="list-style-type: none"> <li>Differential line drive with complementary outputs.</li> <li>Alternate leadwire assemblies.</li> </ul>

Notes:

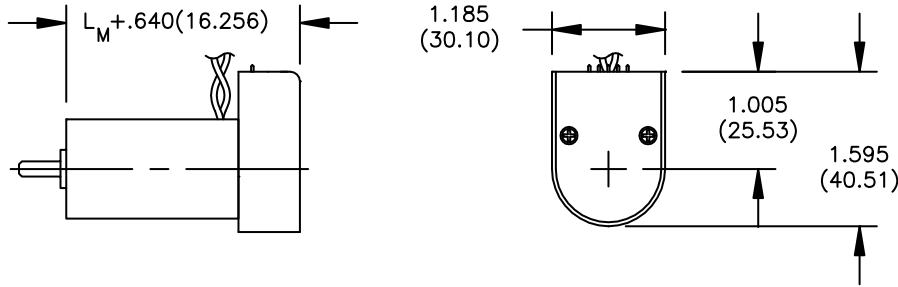
<sup>1</sup> Motor ball bearings are required for optimal performance.

<sup>2</sup> 2.7k Ohm pull-up resistors recommended for E30B.

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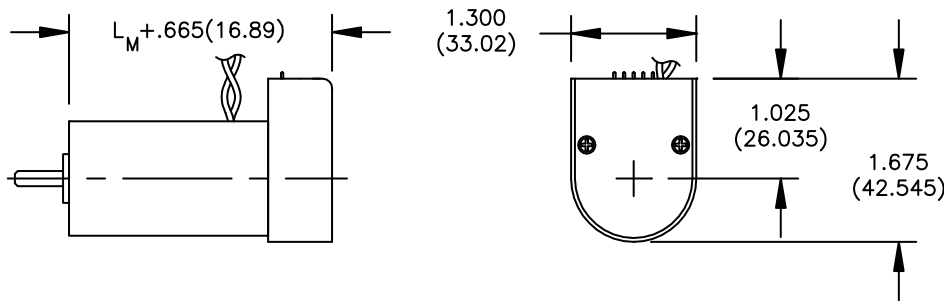
For use with the following motor series

**8690 Series Motor with E30**



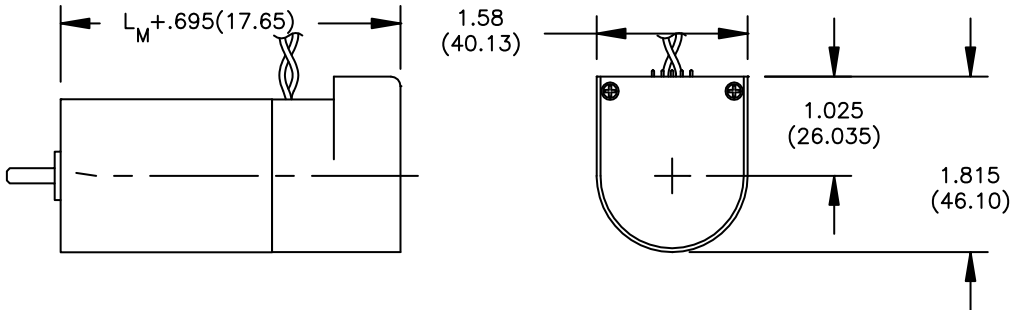
Motor	Length L <sub>M</sub> max in (mm)
8691	1.798 (45.67)
8692	1.923 (48.84)
8693	2.173 (55.19)

**8220 Series Motor with E30**



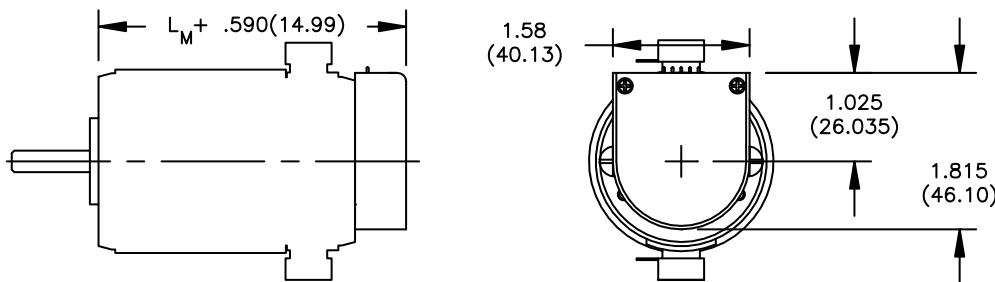
Motor	Length L <sub>M</sub> max in (mm)
8222	2.070 (52.58)
8223	2.195 (55.75)
8224	2.445 (62.10)

**9230 Series Motor with E30**



Motor	Length L <sub>M</sub> max in (mm)
9232	1.828 (46.43)
9233	2.203 (55.96)
9234	2.403 (61.04)
9235	2.703 (68.66)
9236	3.053 (77.55)
9237	3.353 (85.17)

**14200 Series Motor with E30**

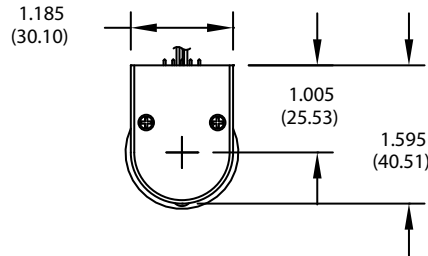
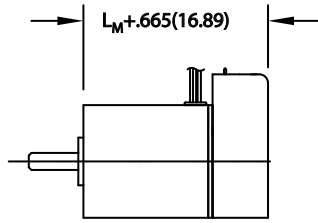


Motor	L <sub>M</sub> max in (mm)
14201	2.953 (75.01)
14202	3.203 (81.36)
14203	3.703 (94.06)
14204	4.078 (103.6)
14205	4.453 (113.1)
14206	4.953 (125.8)
14207	5.703 (144.9)

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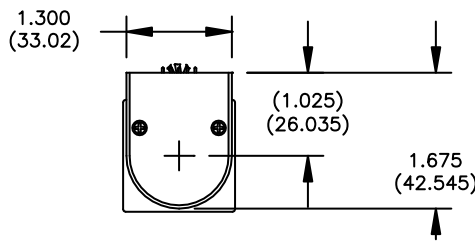
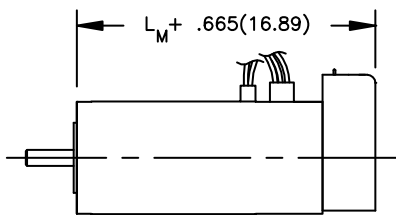
**For use with the following motor series**

**1300 Series Motor with E30**



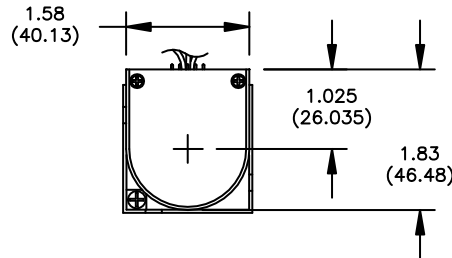
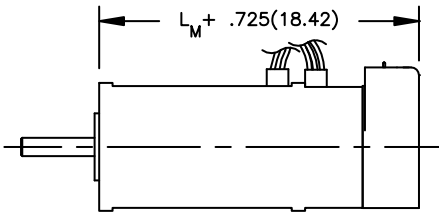
Motor	Length L <sub>M</sub> max in (mm)
1301	1.500 (38.10)
1302	2.000 (50.80)
1303	2.500 (63.50)

**3400 Series Motor with E30**



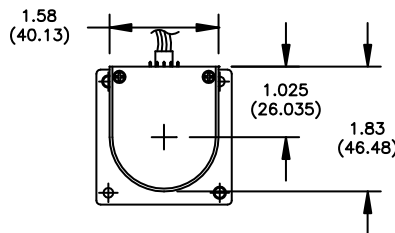
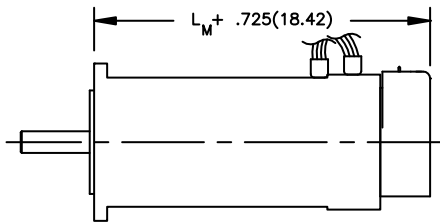
Motor	Length L <sub>M</sub> max in (mm)
3411	2.322 (58.98)
3412	2.722 (69.14)

**4400 Series Motor with E30**



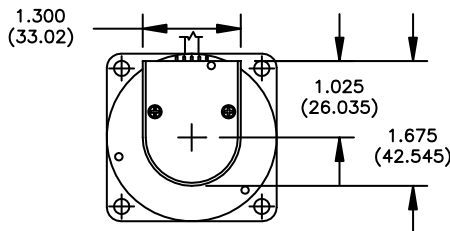
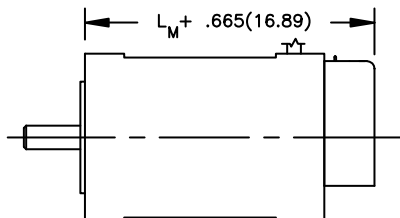
Motor	Length L <sub>M</sub> max in (mm)
4411	2.655 (67.44)
4412	2.955 (75.06)
4413	3.255 (82.68)

**5400 Series Motor with E30**



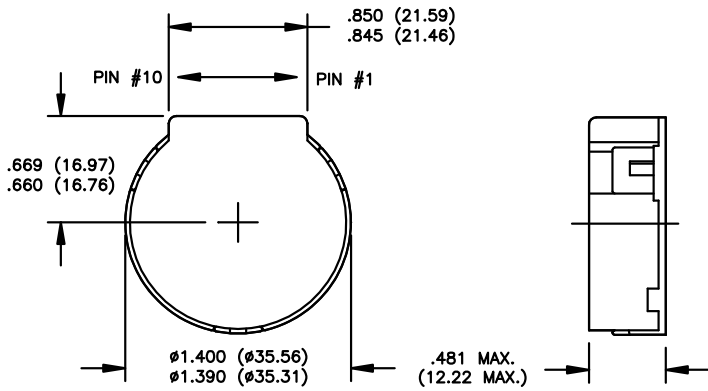
Motor	Length L <sub>M</sub> max in (mm)
5411	3.165 (80.39)
5412	3.665 (93.09)
5413	4.165 (105.79)

**N2300 Series Motor with E30**

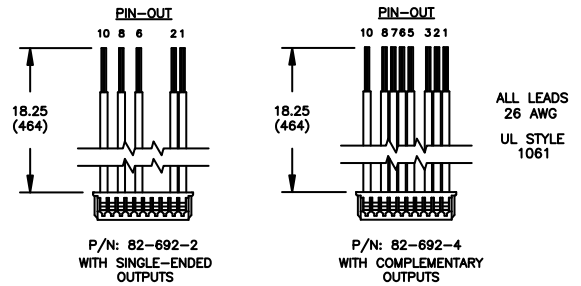


Motor	Length L <sub>M</sub> max in (mm)
N2311	1.532 (38.91)
N2312	1.982 (50.34)
N2313	2.482 (63.04)
N2314	2.982 (75.74)

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**Optional Leadwire Assemblies**



E35A Encoder Data	Symbol	Units	Value
Available Resolutions	-	-	192, 200, 250, 256, 360, 400, 500, 512
Output	-	-	2-Channel Quadrature Output
Output Interface	-	-	TTL Compatible
Supply Voltage	V <sub>CC</sub>	VDC	4.5 to 5.5
Supply Current	I <sub>CC</sub>	mA	20 max
High Level Output Voltage	V <sub>OH</sub>	V	2.4 min
Low Level Output Voltage	V <sub>OL</sub>	V	0.4 max
Maximum Operating Frequency	f <sub>max</sub>	kHz	40
Maximum Operating Temperature	θ <sub>max</sub>	°C	-20 to +85
Encoder Weight (Mass)	W <sub>E</sub>	oz g	0.35 10

E35A Connection Chart		
Pin	Color	Function
1	Green	Encoder Ground
2	White	V <sub>CC</sub>
3	Green	Encoder Ground
4	-	No Connection
5	Blue/White	Channel A*
6	Blue	Channel A
7	Violet	Channel B
8	Violet/White	Channel B*
9	-	No Connection
10	Green/Yellow	Motor Ground **

Options
<ul style="list-style-type: none"> <li>Differential line drive with complementary outputs</li> <li>Alternate leadwire assemblies</li> </ul>

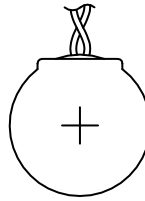
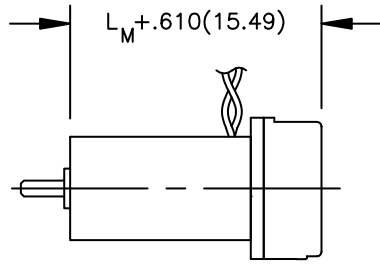
Notes:

- \* With differential line driver option only.
- \*\* No connection with 8690 series motors.

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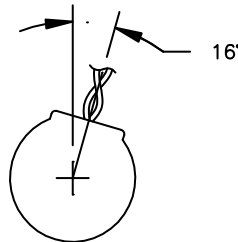
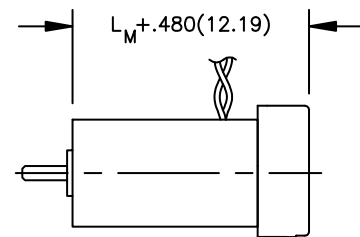
For use with the following motor series:

**8690 Series Motor with E35**



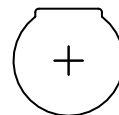
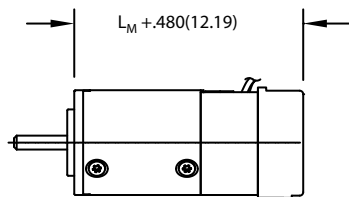
Motor	Length $L_M$ max in (mm)
8691	1.798 (45.67)
8692	1.923 (48.84)
8693	2.173 (55.19)

**8220 Series Motor with E35**



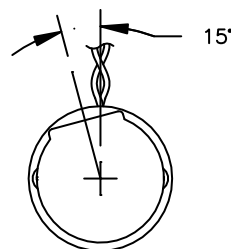
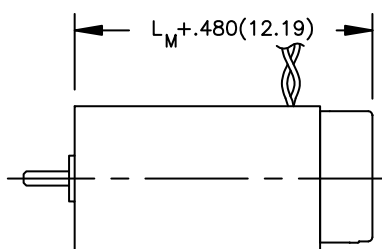
Motor	Length $L_M$ max in (mm)
8222	2.070 (52.58)
8223	2.195 (55.75)
8224	2.445 (62.10)

**8540 Series Motor with E35**



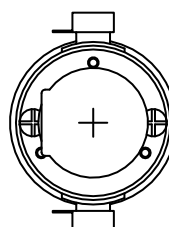
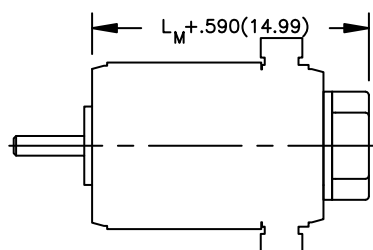
Motor	Length $L_M$ max in (mm)
8541	2.114 (53.69)
8542	2.585 (65.66)
8543	3.057 (77.65)

**9230 Series Motor with E35**



Motor	Length $L_M$ max in (mm)
9232	1.828 (46.43)
9233	2.203 (55.96)
9234	2.403 (61.04)
9235	2.703 (68.66)
9236	3.053 (77.55)
9237	3.353 (85.17)

**14200 Series Motor with E35**



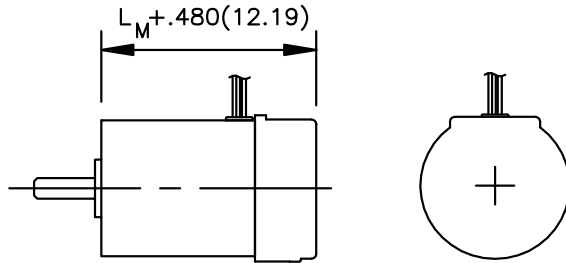
Motor	Length $L_M$ max in (mm)
14201	2.953 (75.01)
14202	3.203 (81.36)
14203	3.703 (94.06)
14204	4.078 (103.6)
14205	4.453 (113.1)
14206	4.953 (125.8)
14207	5.703 (144.9)

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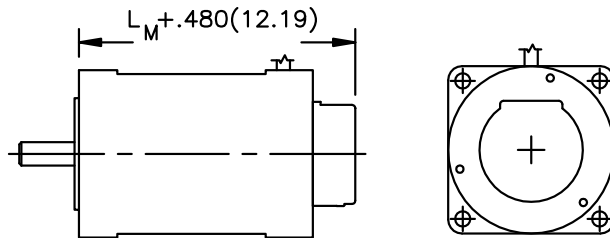
For use with the following motor series:

**1300 Series Motor with E35**



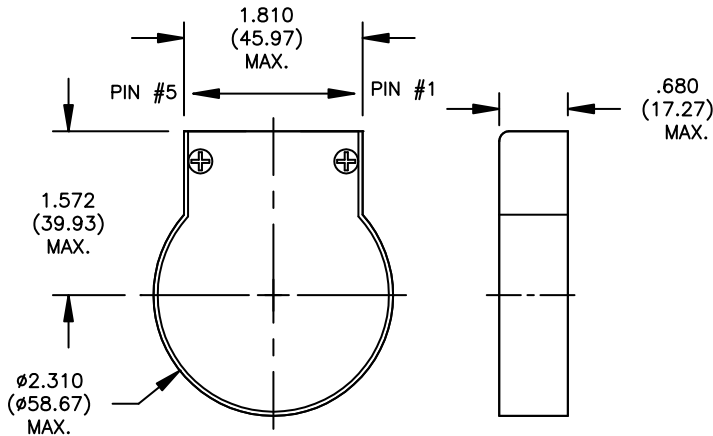
Motor	Length L <sub>M</sub> max in (mm)
1301	1.500 (38.10)
1302	2.000 (50.80)
1303	2.500 (63.50)

**N2300 Series Motor with E35**

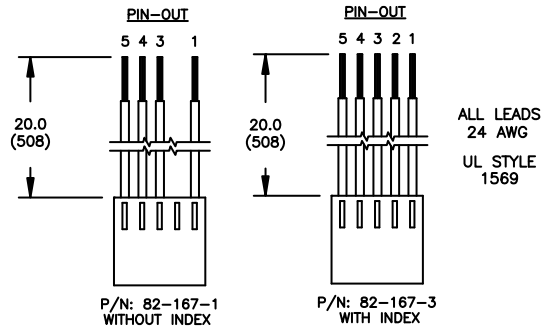


Motor	Length L <sub>M</sub> max in (mm)
N2311	1.532 (38.91)
N2312	1.982 (50.34)
N2313	2.482 (63.04)
N2314	2.982 (75.74)

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Optional Leadwire Assemblies



E60A Encoder Data	Symbol	Units	Value
Available Resolutions	-	-	2048
Outputs	-	-	2-Channel Quadrature Output
Output Interface	-	-	TTL Compatible
Supply Voltage	$V_{CC}$	VDC	4.5 to 5.5
Supply Current	$I_{CC}$	mA	85 max
High Level Output Voltage	$V_{OH}$	V	2.4 min
Low Level Output Voltage	$V_{OL}$	V	0.4 max
Maximum Operating Frequency	$f_{max}$	kHz	100
Maximum Operating Temperature	$\theta_{max}$	°C	-40 to +70
Encoder Weight (Mass)	$W_E$	oz g	3.7 105

E60A Connection Chart		
Pin	Color	Function
1	Black	Ground
2	-	No Connection
3	Yellow	Channel A
4	Red	$V_{CC}$
5	Blue	Channel B

Options
<ul style="list-style-type: none"> <li>Differential line driver with complementary outputs</li> <li>Alternate leadwire assemblies</li> </ul>

Notes:

<sup>1</sup> Motor ball bearings are required for optimal performance.

E60B

E60B Encoder Data	Symbol	Units	Value
Available Resolutions	-	-	1000, 1024
Outputs	-	-	3-Channel Quadrature Output with Index Pulse
Output Interface	-	-	TTL Compatible
Supply Voltage	$V_{CC}$	VDC	4.5 to 5.5
Supply Current	$I_{CC}$	mA	85 max
High Level Output Voltage	$V_{OH}$	V	2.4 min
Low Level Output Voltage	$V_{OL}$	V	0.4 max
Maximum Operating Frequency	$f_{max}$	kHz	100
Maximum Operating Temperature	$\theta_{max}$	°C	-40 to +100
Encoder Weight (Mass)	$W_E$	oz g	3.7 105

E60B Connection Chart		
Pin	Color	Function
1	Black	Ground
2	Green	Index
3	Yellow	Channel A
4	Red	$V_{CC}$
5	Blue	Channel B

Options
<ul style="list-style-type: none"> <li>Differential line driver with complementary outputs</li> <li>Alternate leadwire assemblies</li> </ul>

Notes:

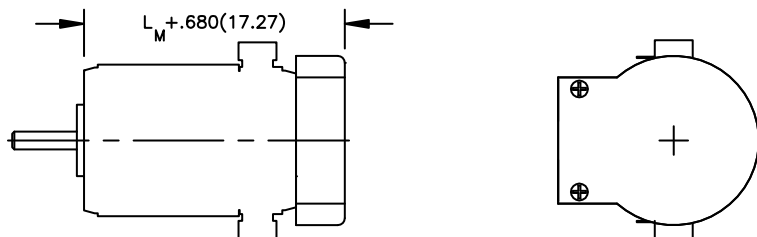
<sup>1</sup> Motor ball bearings are required for optimal performance.

<sup>2</sup> 2.7k Ohm pull-up resistors recommended for E60B.

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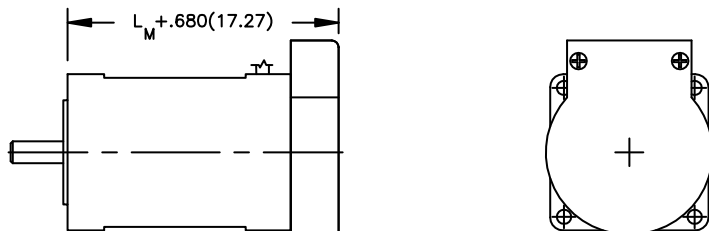
**For use with the following motor series:**

**14200 Series Motor with E60**



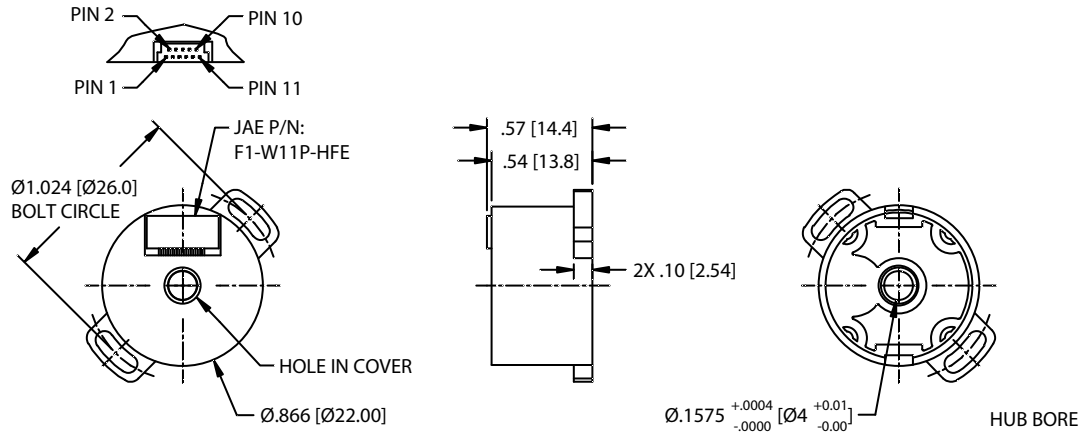
Motor	Length $L_M$ max in (mm)
14201	2.953 (75.01)
14202	3.203 (81.36)
14203	3.703 (94.06)
14204	4.078 (103.6)
14205	4.453 (113.1)
14206	4.953 (125.8)
14207	5.703 (144.9)

**N2300 Series Motor with E60**



Motor	Length $L_M$ max in (mm)
N2311	1.532 (38.91)
N2312	1.982 (50.34)
N2313	2.482 (63.04)
N2314	2.982 (75.74)

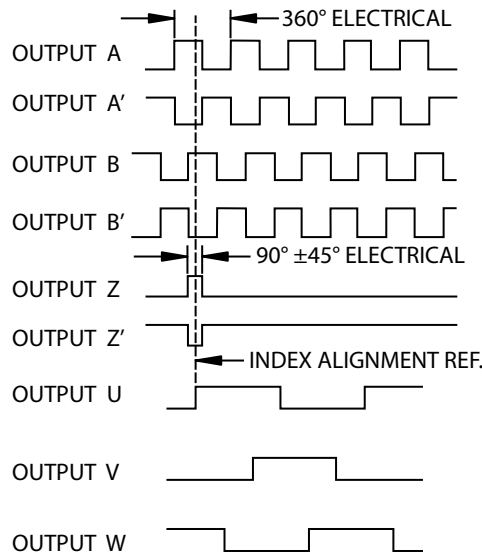
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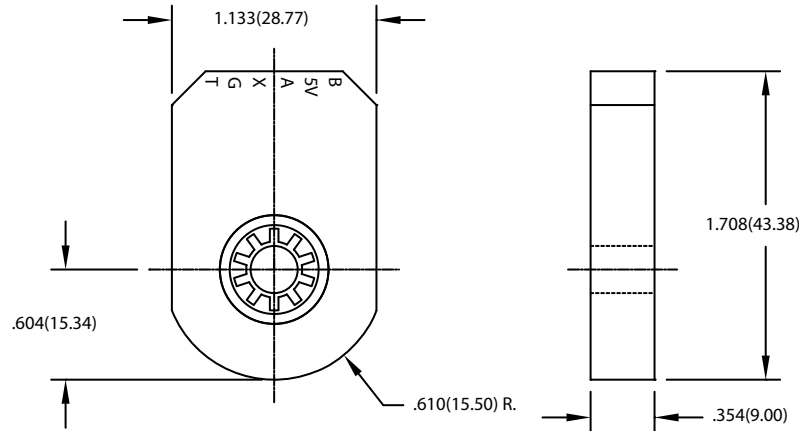
E35A Encoder Data	Symbol	Units	Value
Standard Resolutions	-	-	1000
Available Resolutions	-	-	100, 200, 250, 256, 400, 500, 512, 800, 1024
Output	-	-	2-Channel Quadrature Incremental Encoder with Commutation and index pulse
Output Interface	-	-	TTL Compatible
Supply Voltage	$V_{CC}$	VDC	4.6 to 5.5
Supply Current	$I_{CC}$	mA	116
High Level Output Voltage	$V_{OH}$	V	2.5 min
Low Level Output Voltage	$V_{OL}$	V	0.5 max
Maximum Operating Frequency	$f_{max}$	kHz	300
Maximum Operating Temperature	$\theta_{max}$	°C	-30 to 115
Encoder Weight (Mass)	$W_E$	oz g	TBD TBD

Encoder CABLE CONNECTION		
Pin	Color	Function
1	-	Output U
2	-	Output V
3	-	Output W
4	-	Output A
5	-	Output A *
6	-	Output B
7	-	Output B *
8	-	Output Z
9	-	Output Z'
10	-	VDC (+5V)
11	-	Ground

Options
<ul style="list-style-type: none"> <li>Differential line drive</li> <li>Leadwire assemblies</li> </ul>



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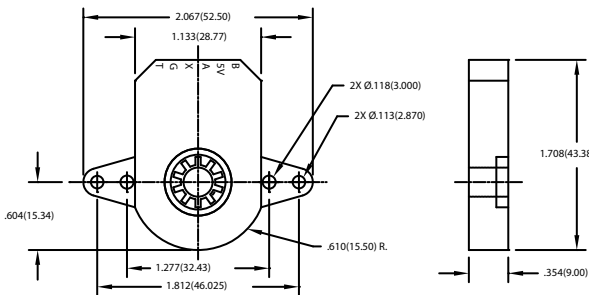


U Series Encoder Data	Symbol	Units	Value
Available Resolutions	-	-	48, 96, 100, 125, 196, 200, 250, 256, 384, 400, 500, 512, 800, 1000, 1024, 2048
Output	-	-	2-Channel Quadrature Output
Output Interface	-	-	TTL Compatible
Supply Voltage	$V_{CC}$	VDC	3.6 to 5.5
Supply Current	$I_{CC}$	mA	10 max
High Level Output Voltage	$V_{OH}$	V	2.4 min
Low Level Output Voltage	$V_{OL}$	V	0.4 max
Maximum Operating Frequency	$f_{max}$	kHz	250
Maximum Operating Temperature	$\theta_{max}$	°C	-40 to +100
Encoder Weight (Mass)	W E	oz g	0.74 21

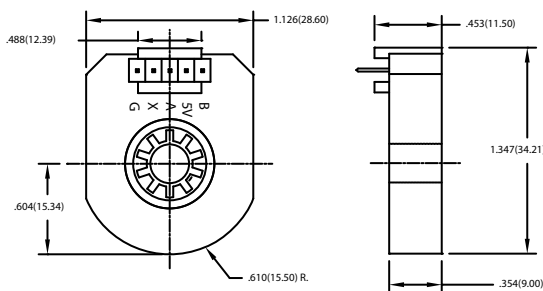
U Series Connection Chart		
Pin	Color	Description
B	-	B Channel
5V	-	+ 5 Vdc Power
A	-	A Channel
X	-	Index Output
G	-	Ground
T	-	No Connection

Options
• Differential line driver cable with complementary outputs. (-40°C to 85°C)

**"U" ENCODER VERTICAL PINS & MOUNTING EARS**

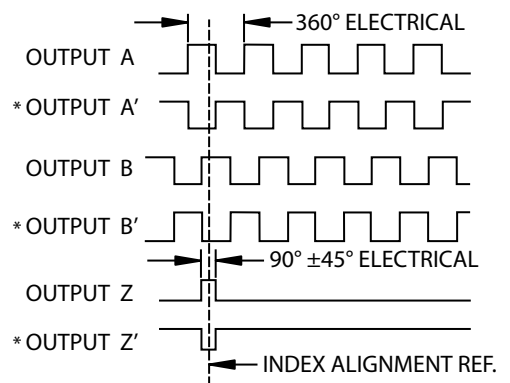


**"U" ENCODER HORIZONTAL PINS**



Notes:

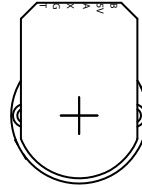
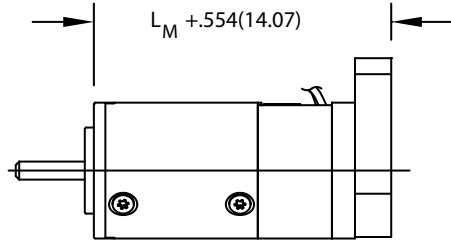
\* With differential line driver option only.



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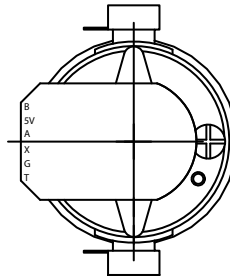
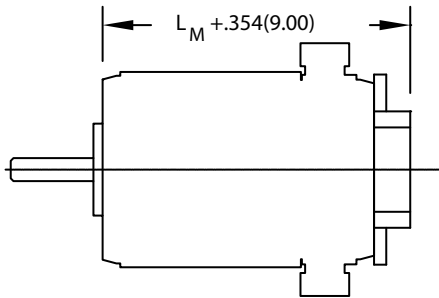
For use with the following motor series

**8540 Series Motor with U Series**



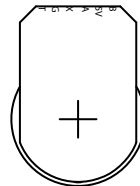
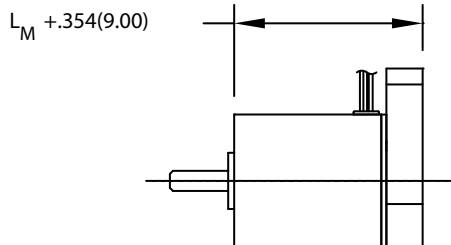
Motor	Length L <sub>M</sub> max in (mm)
8541	2.114 (53.69)
8542	2.585 (65.66)
8543	3.057 (77.65)

**14200 Series Motor with U Series**



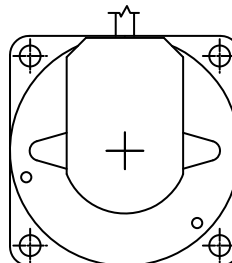
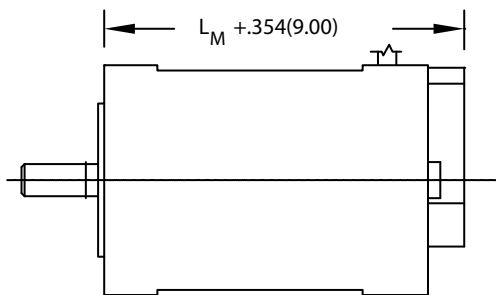
Motor	Length L <sub>M</sub> max in (mm)
14201	2.953 (75.01)
14202	3.203 (81.36)
14203	3.703 (94.06)
14204	4.078 (103.6)
14205	4.453 (113.1)
14206	4.953 (125.8)
14207	5.703 (144.9)

**1300 Series Motor with U Series**



Motor	Length L <sub>M</sub> max in (mm)
1301	1.500 (38.10)
1302	2.000 (50.80)
1303	2.500 (63.50)

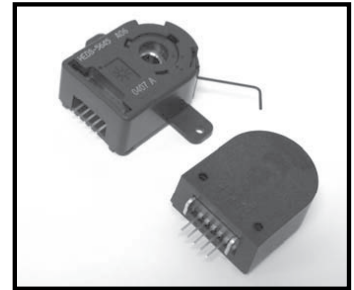
**N2300 Series Motor with U Series**



Motor	Length L <sub>M</sub> max in (mm)
N2311	1.532 (38.91)
N2312	1.982 (50.34)
N2313	2.482 (63.04)
N2314	2.982 (75.74)

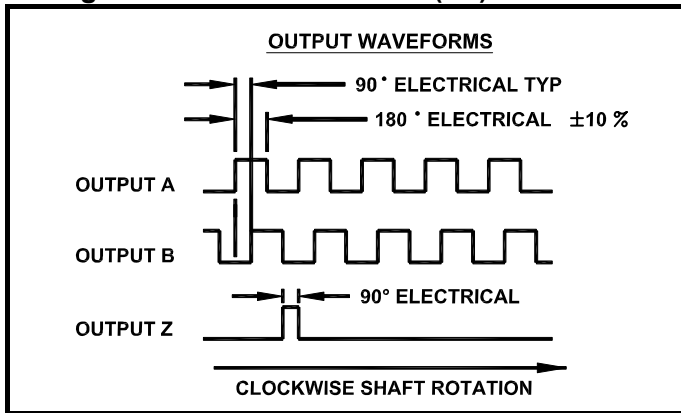
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- Most Economical Encoder Choices
- 500 Line, 3 Channel Versions
- 1000 Line 2 Channel Versions
- IP 40 Rated
- Factory Installed Only

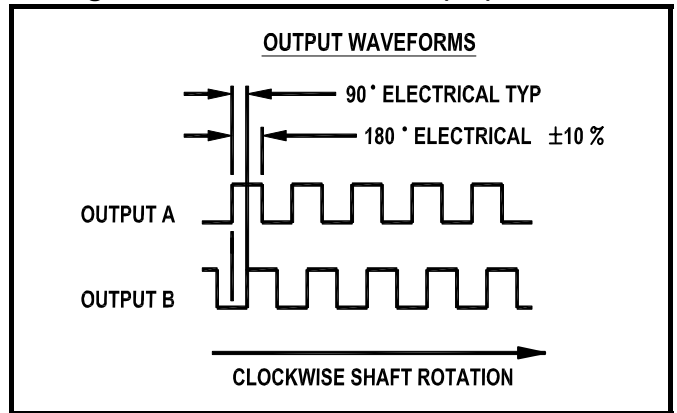


Catalog Number	Line Resolution	Output Channels	Line Driver	Power Requirement	Inertia oz-in-s <sup>2</sup>	Max. Freq.	Hub I.D. inch (mm)
H1	500	A, B, Z	No	85 mA @ 5VDC	$8 \times 10^{-6}$	100 kHz	0.250 (6.35)
H2	1000	A, B	No	85 mA @ 5VDC	$8 \times 10^{-6}$	100 kHz	0.250 (6.35)

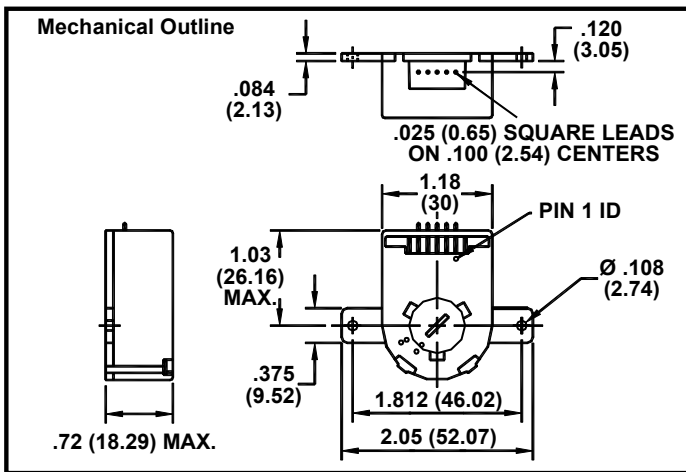
**Timing for 3 Channel Encoders (H1)**



**Timing for 2 Channel Encoders (H2)**



**Dimensions**



**Connection (H1)**

Encoder Connections	
PIN	FUNCTION
1	Ground
2	Index
3	Output A
4	VDC (+5V)
5	Output B

**Connection (H2)**

Encoder Connections	
PIN	FUNCTION
1	Ground
2	N/C
3	Output A
4	VDC (+5V)
5	Output B

**Optional Cable Assembly:**

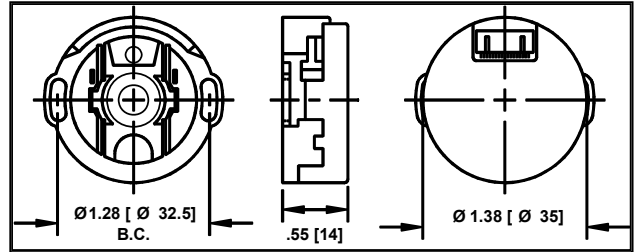
18" Cable Assembly for H1 & H2 Encoders

Catalog #

8100073

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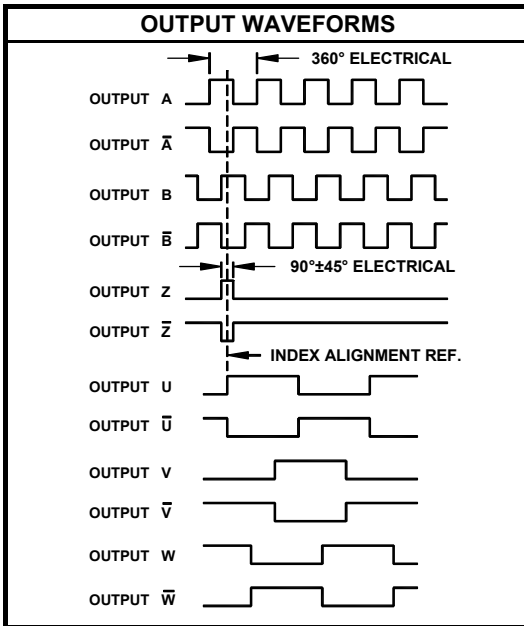
- Output Channels - Incremental A, B, Z, & Commutation U, V, W
- Differential Line Drivers - all 6 channels
- Commutation for 4 & 8 Pole Motors
- Power Requirement - 200 mA @ 5VDC
- 500 kHz Operating Frequency - all channels
- Inertia - 150  $\mu$ miss (.00015 oz-in-sec<sup>2</sup>)
- RoHS Compliant to EU Directive 2002/95/EC
- Factory installed only



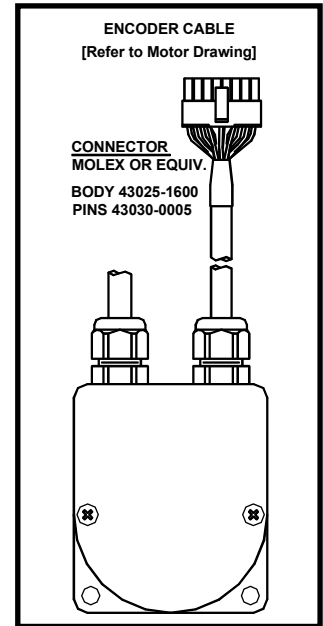
The Z Series of incremental encoders represents state of the art in ASIC sensor technology. This technology requires fewer components thereby increasing product quality while providing improved precision from a smaller package. Additionally, the precision of the commutation channels is superior to that typically achieved with Hall signals resulting in improved system performance. These units are factory mounted on PITTMAN motors and aligned to the motor's electrical properties which allows "drop-in" replaceability without the need to "initialize" each new motor. Connections to the encoder are made through the motor's 16 pin connector referenced below.

Catalog Number	Resolution	Data Outputs	Pole Count	Disk Material	Operating Temp.
Z1	1000	A, B, Index	4	Metal	-30 to 115C
Z3	2000	A, B, Index	4	Metal	-30 to 115C
ZA	1000	A, B, Index	8	Metal	-30 to 115C
ZC	2000	A, B, Index	8	Metal	-30 to 115C

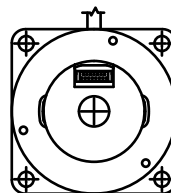
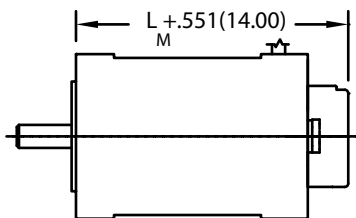
Note: Other line counts are available on a special order basis



MOTOR CABLE CONNECTION	
CONNECTOR PIN	FUNCTION
1	VDC (+5V)
2	Output A
3	Output B
4	Output Z
5	Output U
6	Output V
7	Output W
8	Case Ground
9	Common
10	Output A-bar
11	Output B-bar
12	Output Z-bar
13	Output U-bar
14	Output V-bar
15	Output W-bar
16	Cable Shield



**N 2300 Series Motor with Z Encoder**



Motor	Length L <sub>M</sub> max in (mm)
N2311	1.532 (38.91)
N2312	1.982 (50.34)
N2313	2.482 (63.04)
N2314	2.982 (75.74)

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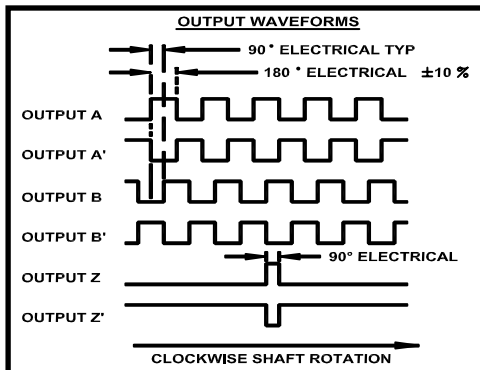


- Output Channels - A, B, Z
- Differential Line Drivers
- IP 40 Rated
- Power Requirement - 125 mA @ 5VDC
- 500 kHz Maximum Operating Frequency
- Inertia - .00015 oz-in-sec<sup>2</sup> ( .0159233 kg-cm<sup>2</sup>)
- Factory or user mountable

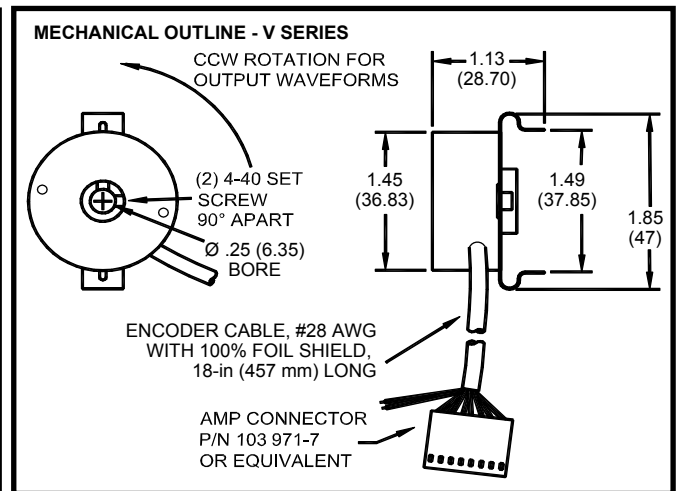
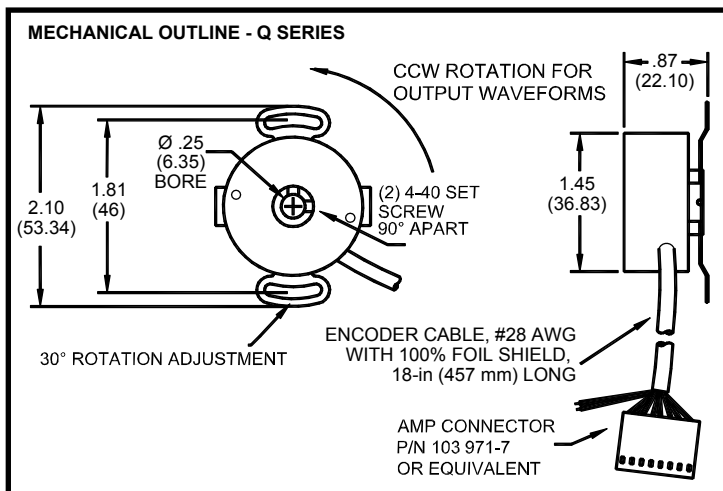


Catalog Number	Style	Resolution
Q1	Standard	1000
V1	Small Dia.	1000
Q3	Standard	2000
V3	Small Dia.	2000
Q5	Standard	2500
V5	Small Dia.	2500
Q8	Standard	5000
V8	Small Dia.	5000

Note: Other line counts are available for special order



Encoder Connections		
PIN	COLOR	FUNCTION
1	Red	VDC (+5V)
2	Black	Common
3	Brown	Output A
4	White	Output A'
5	Blue	Output B
6	Green	Output B'
7	Orange	Output Z
8	Yellow	Output Z'
N/C	Black / White	Case Ground
N/C	Drain Wire	Cable Shield

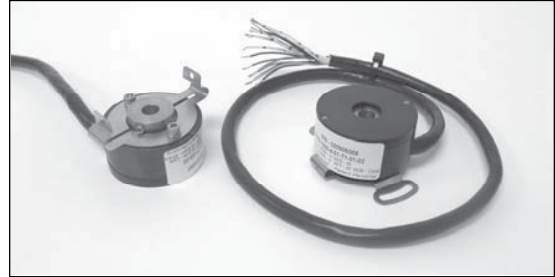


**Application Note:**

These are High Quality General Purpose Encoders for use on Brush and Brushless Motors with integral Hall Effect Commutation that are to be used with "Analog" type Drives. There is no pre-determined relationship between the encoder signals and the electrical properties of the motor to which it is mounted. (i.e., Index to Hall). For customers using Brushless Motors with "Digital" type Drives, we recommend that a Commutation Encoder be used. Cables of various lengths are also available - see Cable section.

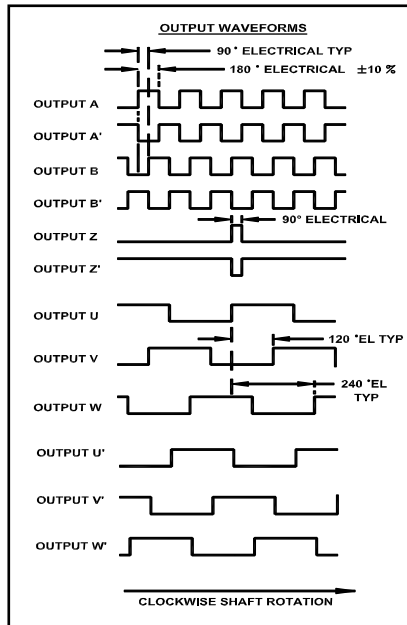
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- Output Channels - A, B, Z, U, V, W
- Differential Line Drivers, all channels
- IP 40 Rated
- Power Requirement - 200 mA @ 5VDC
- 500 kHz Maximum Operating Frequency
- Inertia - .00015 oz-in-sec<sup>2</sup> (.0159233 kg-cm<sup>2</sup>)
- 1 degree (mech) accuracy of commutators
- Factory installed only

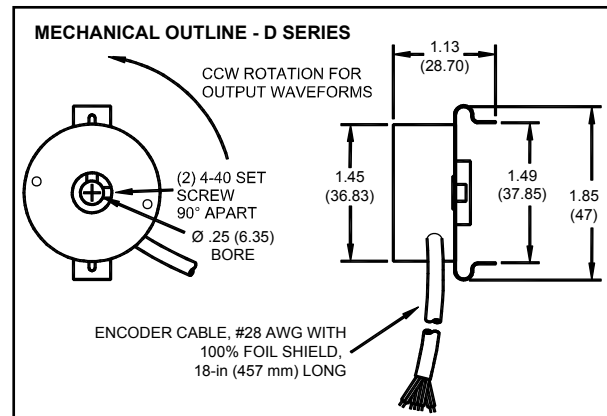
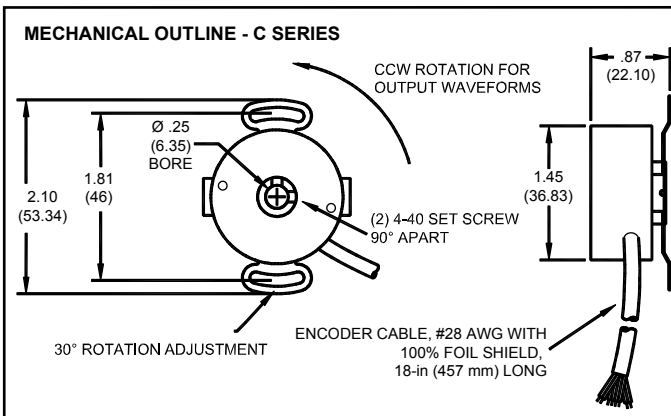


Catalog Number	Style	Resolution	Motor Poles
C1	Standard	1000	4
CA	Standard	1000	8
D1	Small Dia.	1000	4
C3	Standard	2000	4
CC	Standard	2000	8
D3	Small Dia.	2000	4
C5	Standard	2500	4
CE	Standard	2500	8
D5	Small Dia.	2500	4
C8	Standard	5000	4
CH	Standard	5000	8
D8	Small Dia.	5000	4

Note: Other line counts are available for special order



Encoder Connections	
COLOR	FUNCTION
Red	VDC (+5V)
Black	Common
Brown	Output A
White	Output A'
Blue	Output B
Green	Output B'
Orange	Output Z
Yellow	Output Z'
Violet	Output U
Gray	Output U'
White / Brown	Output V
White / Red	Output V'
White / Orange	Output W
White / Yellow	Output W'
Black / White	Case Ground
Drain Wire	Cable Shield



**Application Note:**

These are High Quality Encoders with integral bearings and flex mount which eliminate any alignment issues due to mounting. They feature the standard data channels and also precision "absolute" channels for the commutation of Brushless Motors. All outputs have differential line drivers which are commonly used by "Digital" drives and significantly reduce noise issues, especially with longer cables. These units are factory mounted on the motors and aligned to the motor's electrical properties which allows "drop-in" replaceability without the need to "initialize" each new motor.

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