

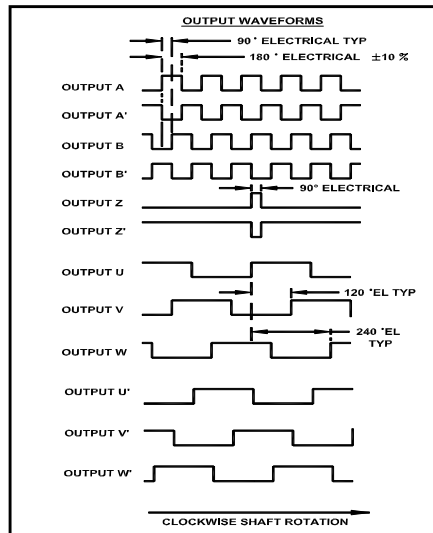
# Bearing Style, Data plus Commutation Encoder

- 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 - 150  $\mu$ oiss (.00015 oz-in-sec<sup>2</sup>)
- 1 degree (mech) accuracy of commutators
- Factory installed only

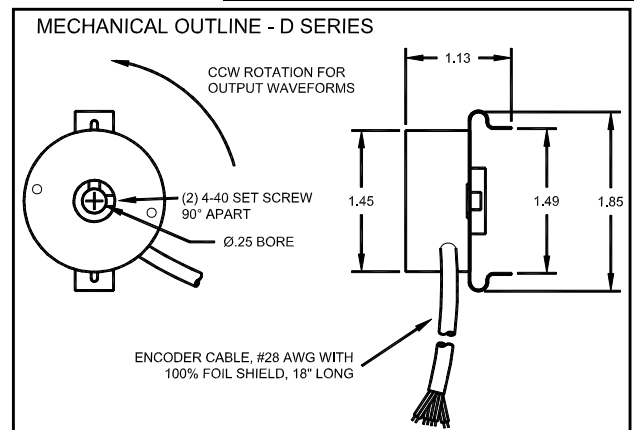
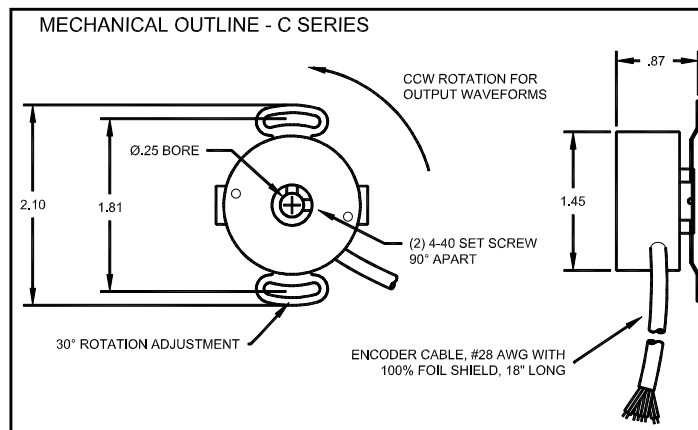


Catalog Number	Style	Line Count	Motor Poles
C1	Standard	1000	4
CA	Standard	1000	8
D1	Small Dia.	1000	4
C3	Standard	2000	4
CC	Standard	2000	8
D3	Small Dia.	2000	4
C5	Standard	2500	4
CE	Standard	2500	8
D5	Small Dia.	2500	4
C8	Standard	5000	4
CH	Standard	5000	8
D8	Small Dia.	5000	4

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.

## Applicable Motor / Encoder Combinations

MOTOR CHOICES	ENCODER SERIES		APPLICABLE BRUSHLESS MOTORS											
	Catalog #	Description	I2350	I2380	I3480	I4680	IB17000	IB23800	IB23000	IB34000	IB46000	AB23000	AB34000	AB48000
C (Number)	w/ face mount bracket, 4 Pole							X	X				X	X
C (Letter)	w/ face mount bracket, 8 Pole			X	X					X	X			
D	w/ side mount bracket, 4 Pole					X						X		



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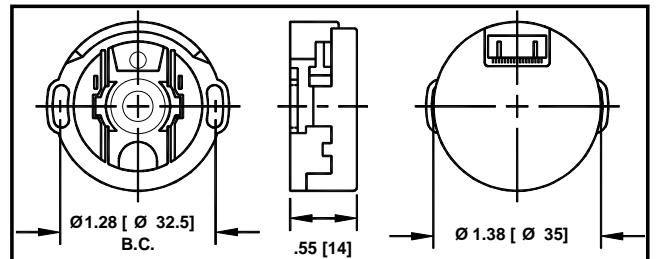
# Z Series Commutation Encoder

- 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  $\mu$ oiss (.00015 oz-in-sec<sup>2</sup>)
- RoHS Compliant to EU Directive 2002/95/EC
- Factory installed only

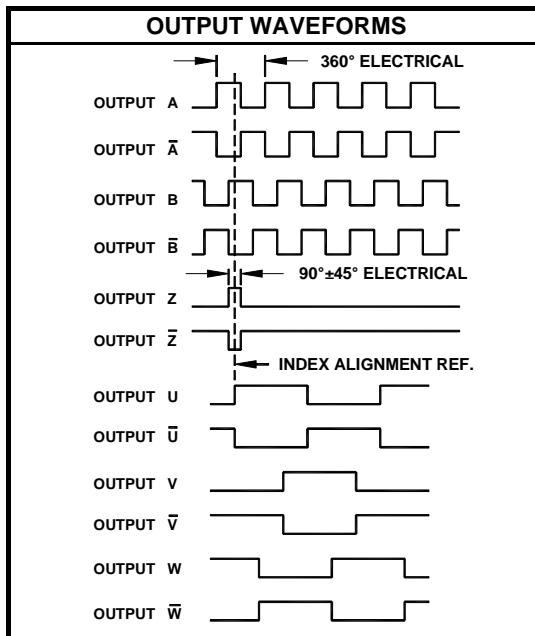


The Z Series of incremental encoders represents state of the art in ASIC sensor technology. This technology requires fewer components thereby increasing product quality while providing improved precision from a smaller package. Additionally, the precision of the commutation channels is superior to that typically achieved with Hall signals resulting in improved system performance. These units are factory mounted on MCG 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 motors 16 pin connector referenced below.

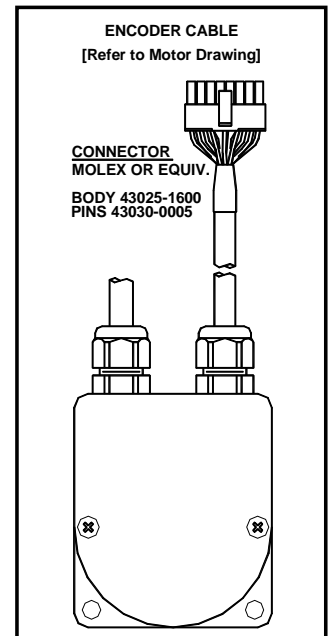
Catalog Number	Line Count	Data Outputs	Pole Count	Disk Material	Operating Temp.
Z1	1000	A, B, Index	4	Metal	-30 to 115C
Z3	2000	A, B, Index	4	Metal	-30 to 115C
ZA	1000	A, B, Index	8	Metal	-30 to 115C
ZC	2000	A, B, Index	8	Metal	-30 to 115C



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



## Applicable Motor / Encoder Combinations

MOTOR CHOICES	ENCODER SERIES		APPLICABLE BRUSHLESS MOTORS											
	Catalog #	Description	I2350	I2380	I3480	I4680	IB17000	IB23800	IB23000	IB34000	IB46000	AB23000	AB34000	AB48000
	Z1 & Z3	w/ 4 Pole Commutation	X	X										
	ZA & ZC	w/ 8 Pole Commutation			X	X								



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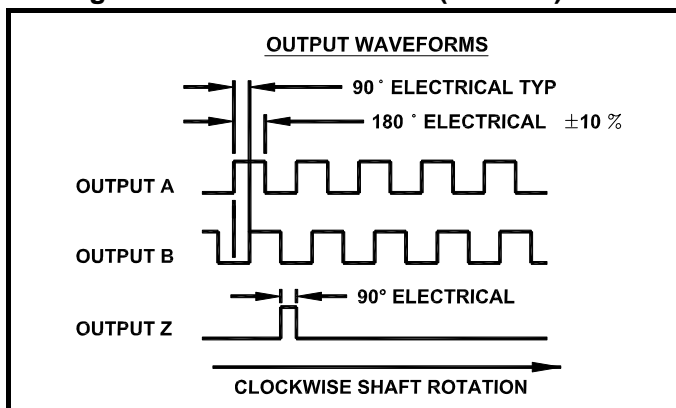
# Modular Encoders

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

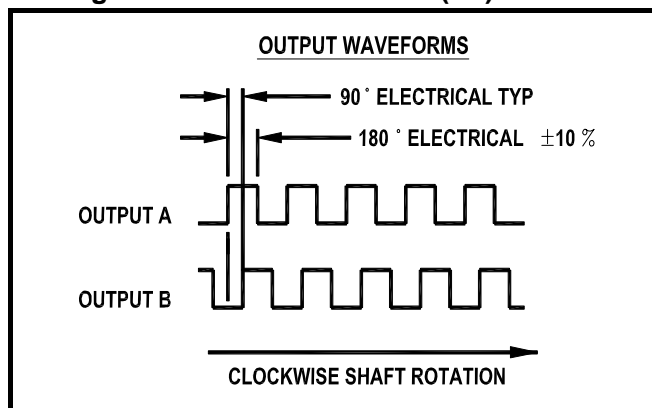


Catalog Number	Line Count	Output Channels	Line Driver	Power Requirement	Inertia oz-in-s <sup>2</sup>	Max. Freq.	Hub I.D. (inches)
E6	500	A, B, Z	No	85 mA @ 5VDC	$8 \times 10^{-6}$	100 kHz	0.1875
H1	500	A, B, Z	No	85 mA @ 5VDC	$8 \times 10^{-6}$	100 kHz	0.250
H2	1000	A, B	No	85 mA @ 5VDC	$8 \times 10^{-6}$	100 kHz	0.250

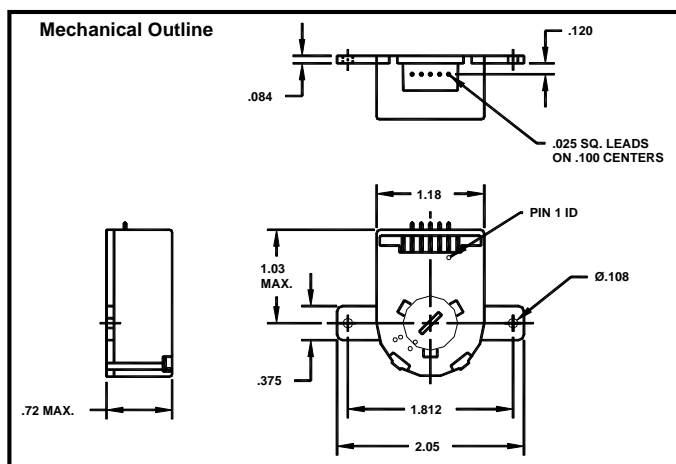
## Timing for 3 Channel Encoders (E6 & H1)



## Timing for 2 Channel Encoders (H2)



## Dimensions



## Connection (E6 & 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

### Application Note:

E6 Encoders have the mounting ears removed and use internal mounting screws not shown.

### Optional Cable Assembly:

18" Cable Assembly for H1 & H2 Encoders

Catalog #

8100073

## Applicable Motor / Encoder Combinations

MOTOR CHOICES	ENCODER SERIES		APPLICABLE BRUSH & BRUSHLESS MOTORS													
	Catalog #	Description	ID15000	ID23000	ID23900	ID33000	I3480	I4680	IB17000	IB23800	IB23000	IB34000	IB46000	AB23000	AB34000	AB48000
	E6	w/ face mount bracket, 4 Pole	X													
	H1 & H2	w/ face mount bracket, 8 Pole		X	X	X				X	X	X				



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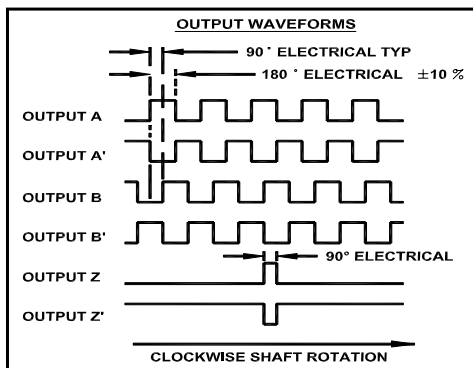
# Bearing Style, 3-Channel Encoder

- Output Channels - A, B, Z
- Differential Line Drivers
- IP 40 Rated
- Power Requirement - 125 mA @ 5VDC
- 500 kHz Maximum Operating Frequency
- Inertia - 150  $\mu$ oiss (.00015 oz-in-sec<sup>2</sup>)
- Factory or user mountable

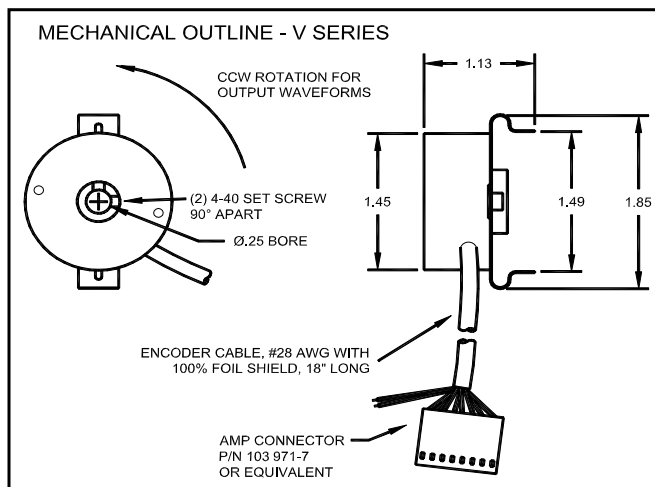
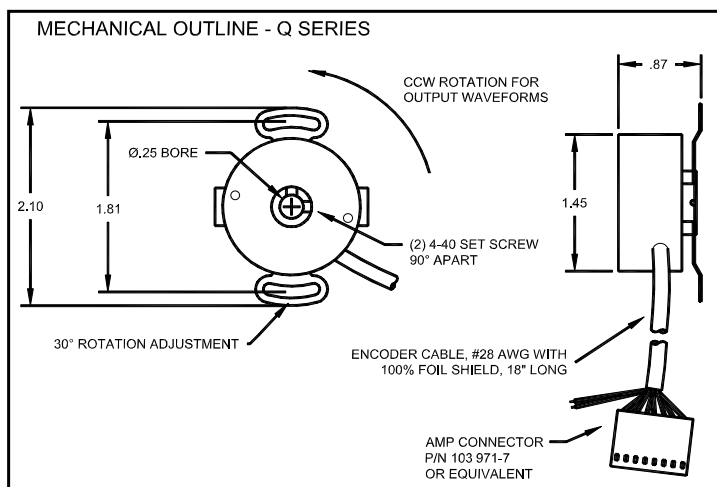


Catalog Number	Style	Line Count
Q1	Standard	1000
V1	Small Dia.	1000
Q3	Standard	2000
V3	Small Dia.	2000
Q5	Standard	2500
V5	Small Dia.	2500
Q8	Standard	5000
V8	Small Dia.	5000

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.

## Applicable Motor / Encoder Combinations

MOTOR CHOICES	ENCODER SERIES		APPLICABLE BRUSH & BRUSHLESS MOTORS													
	Catalog #	Description	ID23000	ID23900	ID33000	I2380	I3480	I4680	IB17000	IB23800	IB23000	IB34000	IB46000	AB23000	AB34000	AB48000
	Q1, Q3, Q5 & Q8	w/ face mounting bracket	X	X	X					X	X	X	X		X	X
	V1, V3, V5 & V8	w/ side mounting bracket							X					X		



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# G3000 Planetary Gear Reducer

- 2.25 Inch NEMA 23
- Continuous Torques up to 60 lb-in
- Peak Torques up to 90 lb-in
- Ratios 5, 10, 15, 25, 50 & 100 Standard
- "Clamp On" Pinion
- Low Cost Powder Metal Gearing Assembly
- 75 Lb Radial and Axial Load Capacity
- "Bolt On" to NEMA 23 Motors
- Compatible with MCG - ID23, IH23 & I23 Motors

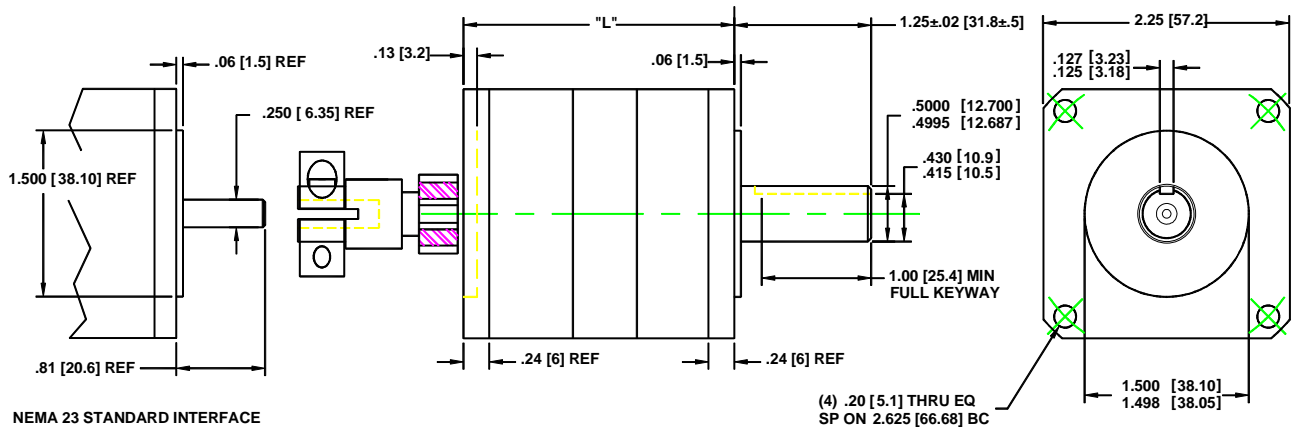


Catalog Number	Ratio n : 1	Torque		Speed Output Max. rpm	Speed Input Max. rpm	Stage No.	Efficiency %	Gearbox Max. Length L mm / in	Weight kg / lb
		Cont. Tcs Nm / lb-in	Peak Tps Nm / lb-in						
G3005	5	6.78 / 60	10.2 / 90	800	4000	1	90%	75.4 / 2.97	0.4 / 0.9
G3010	10	6.78 / 60	10.2 / 90	400	4000	2	80%	90.2 / 3.55	0.6 / 1.3
G3015	15	6.78 / 60	10.2 / 90	267	4000	2	80%	98.3 / 3.87	0.8 / 1.8
G3025	25	6.78 / 60	10.2 / 90	160.0	4000	2	80%	98.3 / 3.87	0.8 / 1.8
G3050	50	6.78 / 60	10.2 / 90	80.0	4000	3	70%	113 / 4.45	1 / 2.2
G3100	100	6.78 / 60	10.2 / 90	40.0	4000	4	60%	128.3 / 5.05	1.2 / 2.6

Notes: 1) Backlash accuracy will be typically less than 3 Deg., 2) Add gear length to motor length

Typical Combinations		Voltage Vdc bus	Motor Length mm / in	Perform	Units	Gear Ratios					
Gear #	Motor #					5	10	15	25	50	100
<b>Brushless Gearmotor Combinations</b>											
G3xxx -	I2352048NC	20	90.4 / 3.56	Speed	rpm	800	400	267	160.0	80.0	40.0
				Tc	Nm / lb-in	0.89 / 7.9	1.58 / 14	2.37 / 21	4 / 35	6.8 / 60	6.8 / 60
				Ic	amps dc	5.1	5.1	5.1	5.1	5.0	2.90
G3xxx -	I2381088NC	36	80 / 3.15	Speed	rpm	800	400	267	160.0	80.0	40.0
				Tc	Nm / lb-in	0.64 / 5.6	1.13 / 10	1.69 / 15	2.8 / 25	4.9 / 44	6.8 / 60
				Ic	amps dc	2.0	2.0	2.0	2.0	2.0	1.58
G3xxx -	I2383092NC	40	119.9 / 4.72	Speed	rpm	800	400	267	160.0	80.0	40.0
				Tc	Nm / lb-in	1.85 / 16.3	3.28 / 29	4.92 / 44	6.8 / 60	6.8 / 60	6.8 / 60
				Ic	amps dc	5.5	5.5	5.5	4.5	2.6	1.51
G3xxx -	I2383214NC	80	119.9 / 4.72	Speed	rpm	748	374	249	149.5	74.8	37.4
				Tc	Nm / lb-in	1.85 / 16.3	3.28 / 29	4.92 / 44	6.8 / 60	6.8 / 60	6.8 / 60
				Ic	amps dc	2.4	2.4	2.4	2.0	1.1	0.65
G3xxx -	I2384124NC	50	140 / 5.51	Speed	rpm	800	400	267	160.0	80.0	40.0
				Tc	Nm / lb-in	2.64 / 23.4	4.69 / 42	6.78 / 60	6.8 / 60	6.8 / 60	6.8 / 60
				Ic	amps dc	5.8	5.8	5.6	3.4	1.9	1.12

Notes 1) Many other gearmotor combinations exist - consult factory, 2) Add Gear & Motor length 3) Add ratio value to G3 Model number as in chart above



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- NEMA 17, 23 and 34 Sizes
- "Fail-Safe" Type (Apply power to release)
- 24 Vdc Supply Voltage
- Clamp On Collar Requires no motor modifications
- Simplifies Stocking - Not requiring custom Brake Motor
- Available with Heavy Duty shaft inputs
- Nema Output Flanges couple to Nema Gear reducers



Catalog Number	Input Flange	Output Flange	Holding Torque lb-in (Nm)	Input Diameter inch (mm)	Output Diameter inch (mm)	Max. Motor Shaft Length inch (mm)	Voltage (Vdc)	Current (Amps)	Resistance (Ohms)	Inertia oz-in-s2 (kg-cm2)	Weight lb (kg)
B7	N17	N17	1.00 (0.113)	0.197 (5.00)	0.197 (5.00)	0.97 (24.638)	24	0.220	117	0.00010 (0.0070)	0.44 (0.198)
B3	N23	N23	3.00 (0.339)	1/4 (6.35)	1/4 (6.35)	0.94 (23.87)	24	0.181	132	0.00051 (0.03596)	1.06 (0.482)
B6	HD Shaft	HD Shaft	3.00 (0.339)	1/2 (12.70)	1/2 (12.70)	1.60 (40.64)	24	0.181	132	0.00051 (0.03596)	1.06 (0.482)
B5	HD Shaft	HD Shaft	15.00 (1.695)	1/2 (12.70)	1/2 (12.70)	1.30 (33.02)	24	0.369	65	0.0045 (0.318)	2.88 (1.304)

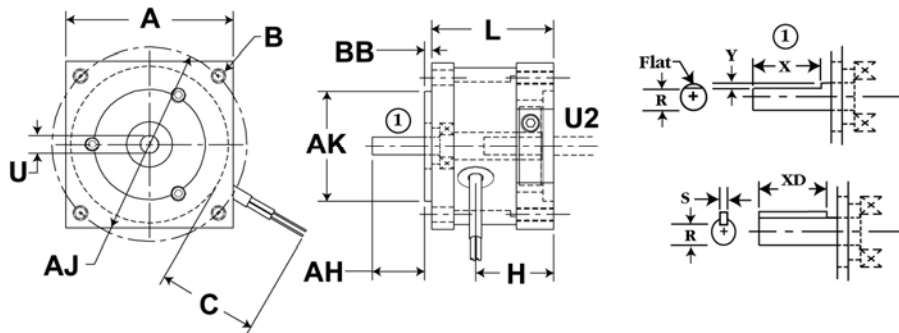
All Brake Data is at 20 degrees C

### DIMENSIONS - inches (mm)

Model	B7	B3	B6	B5
A (3)	1.650 (41.91)	2.250 (57.15)	2.250 (57.15)	3.250 (82.55)
B (4x)	#4-40 UNC-2B	0.205 (5.21)	0.205 (5.21)	0.222 (5.64)
C (2)	11.5 (292.0)	16.75 (425.0)	16.75 (425.0)	18.0 (457.0)
H (3)	0.82 (20.83)	1.18 (29.97)	1.18 (29.97)	1.58 (40.13)
L (1)	1.51 (38.35)	1.78 (45.2)	3.031 (76.99)	2.58 (65.53)
U (1)	0.197 (5.00)	0.250 (6.35)	0.4997 (12.69)	0.4997 (12.69)
U2 (3)	0.100 (2.54)	0.145 (3.68)	0.145 (3.68)	0.145 (3.68)
AH (3)	0.71 (18.03)	0.70 (17.78)	0.70 (17.78)	1.16 (29.46)
AJ (3)	1.725 (43.82)	2.625 (66.68)	2.625 (66.68)	3.875 (98.43)
AK (1)	0.8662 (22.00)	1.500 (38.1)	1.500 (38.1)	2.875 (73.03)
BB (3)	0.08 (2.03)	0.10 (2.54)	0.10 (2.54)	0.10 (2.54)

(1) Maximum Values (2) Minimum Values (3) Nominal (4x) 4 places

Note: These brakes are not IP65 rated and should not be used in an environment that could affect brake performance.



Output Shaft Dimensions			
Model	X	Y	R
B7	0.59	0.02	0.177
B3	0.63	0.015	0.235

Model	S	XD	R
B6	1/8 sq.	0.63	0.375
B5	1/8 sq.	1.00	0.375

### MOTOR / BRAKE COMBINATIONS

Model	I2350	I2380	I3480	I4680	I17000	IB23000	IB23800	IB34000	AB23000	AB34000	ID23000	ID23900	ID33000
B7					X								
B3	X	X				X	X				X	X	
B6									X				
B5			X					X		X			X



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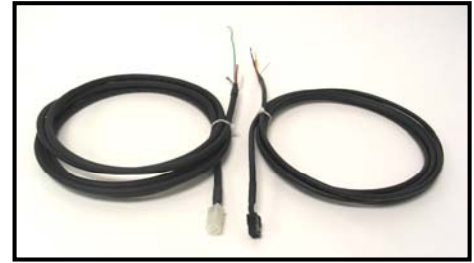
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ZS1DB00B07-1



# Cables for Instrument Grade ( I and IB Series) Motors

- Very Low Cost
- Power, Commutation and Encoder cable assemblies
- Power Cables available for I23, I34, IB23, IB34 Series
- Latching Connectors for Positive Retention
- Double Shielded for Maximum Noise Immunity
- Cable material is UL recognized
- NOT for Continuous Flex applications
- 10 ft and 25 ft lengths available
- "Make 'em Yourself" components also available



POWER	Application	Motor Frame Size	Catalog Number 10 ft	Catalog Number 25 ft	Notes	Pinout Chart
	"Generic" (flying leads)	2 inch	P2-10	P2-25	16 AWG, 3 conductor, 80 Deg.C, 300V, Foil & Braid Shielded, UL2464	1
	3 inch	P3-10	P3-25	14 AWG, 3 conductor, 80 Deg.C, 600V, Foil & Braid Shielded, UL2463	1	

FEEDBACK	Application	Function (All Sizes)	Catalog Number 10 ft	Catalog Number 25 ft	Notes	Pinout Chart
	Generic (flying leads)	Hall Commutation	FH-10	FH-25	24 AWG, 5 conductor, 80 Deg.C, 300V, Foil & Braid Shield, UL2464	2
Std. Encoder		FE-10	FE-25	24 AWG, 4 1/2 pair, 80 Deg.C, 300V, Foil & Braid Shield, UL2464	3	
Commutation Encoder		FC-10	FC-25	28 AWG, 7 1/2 pair, 105 Deg.C, 300V, Foil & Braid Shield, UL2103	4	

COMPONENTS	Parts to "Make Your Own" Cables		Notes
	Cat.Number	Description	
	9700527	Mating Connector Kit for 2" Motor Power	Contains 4-Position Connector Body and Crimp Contacts (2 spare)
	9700528	Mating Connector Kit for 3" Motor Power	Contains 4-Position Connector Body and Crimp Contacts (2 spare)
	9700526	Mating Conn. Kit - Commutation (IB 23x, IB320, IB340 & IB460 sizes)	Contains 6-Position Connector Body and Crimp Contacts (2 spare)
	9700522	Mating Connector Kit for Std. Encoder (3-chan. w/ complements)	Contains 8-Pos.Conn.Body, Crimp Contacts (2 spare) and Latching adapter
	8100127	"Raw" cable for 2" Motor Power	16 AWG, 3 conductor, 80 Deg.C, 300V, Foil & Braid Shielded, UL2464
	8100128	"Raw" cable for 3" Motor Power	14 AWG, 3 conductor, 80 Deg.C, 600V, Foil & Braid Shielded, UL2463
	8100133	"Raw" Cable for Commutators	24 AWG, 5 conductor, 80 Deg.C, 300V, Foil & Braid Shield, UL2464
	8100134	"Raw" Cable for Std. Encoder (3-chan. w/ complements)	24 AWG, 4 1/2 pair, 80 Deg.C, 300V, Foil & Braid Shield, UL2464

### Application Notes:

**High Flex Applications** - All cables listed above are not intended for continuous flexing or twisting (High Flex) applications. MCG cables are intended for stationary cable tray or fixed harness environments. MCG does not offer "High Flex" motor cables at this time.

**Minimum Bending Radius** - Excessive bending of cables can cause insulation or conductor failure. MCG specifies that the minimum bend radius of a fixed cable is no less than eight times (8X) the cable diameter.

### Connection Information:

Pinout Chart #2 (FH Cable)		
FUNCTION	COLOR	Pin #
Vcc	Red	1
Gnd	Black	2
Comm A	Brown (1)	3
Comm B	Orange	4
Comm C	Yellow (2)	5
Cable Shield	Shield	6

Pinout Chart #3 (FE Cable)		
FUNCTION	COLOR	Pin #
Vcc (+5V)	Red	1
Common	Black	2
A	Brown	3
/A	White	4
B	Blue	5
/B	Green	6
Z	Orange	7
/Z	Yellow	8
Case Gnd	Wht/Blk	NC
Cable Shield	bare	NC

Pinout Chart #1 (Px Cable)		
FUNCTION	COLOR	Pin #
Phase R	Red	1
Phase S	Wht	2
Phase T	Blk	3
Case Gnd	Shield	4

Pinout Chart #4 (FC Cable)		
FUNCTION	COLOR	Pin #
Vcc (+5V)	Red	1
Output A	Brown	2
Output B	Blue	3
Output Z	Orange	4
Output U	Violet	5
Output V	White / Brown	6
Output W	White / Orange	7
Case Ground	Black / White	8
Common	Black	9
Output A'	White	10
Output B'	Green	11
Output Z'	Yellow	12
Output U'	Gray	13
Output V'	White / Red	14
Output W'	White / Yellow	15
Cable Shield	Drain Wire	16



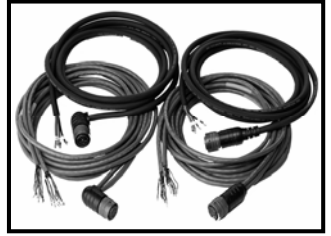
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# Cables for Automation Grade ("AB" Series) Motors

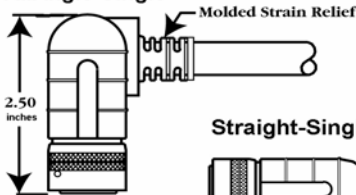
- MS Type Connectors for reliability
- Bayonet Style connectors for ease of use
- Molded Strain Relief yields durability
- Cable material is UL recognized
- NOT for Continuous Flex applications
- 10 ft and 25 ft lengths available
- "Make 'em Yourself" components also available



POWER	Application	Style	AB23002 AB23008 AB23009	All Other AB23000 Series	All AB34000 Series	All AB48000 Series	Notes
	"Generic" (flying leads)	Straight Rt. Angle	SPA23xxx RPA23xxx	(1) RPA23xxx	SPA23xxx RPA23xxx	SPA48xxx	(1) Due to motor length and connector orientation most AB23000 Series Motors will have interference issues when using straight cables (motor end), therefore MCG recommends the use of right angle connectors.

FEEDBACK	Application	Style	AB23002 AB23008 AB23009	All Other AB23000 Series	All AB34000 Series	All AB48000 Series	Notes
	"Generic" (flying leads)	Straight-Single(2) Rt. Angle-Single(2)	SFJ6DDxxx RFJ6DDxxx	(1) RFJ6DDxxx	SFJ6DDxxx RFJ6DDxxx	SFJ6DDxxx RFJ6DDxxx	(1) Due to motor length and connector orientation most AB23000 Series Motors will have interference issues when using straight cables (motor end), therefore MCG recommends the use of right angle connectors.
"Generic" (flying leads)	Straight-Dual(3) Rt.Angle-Dual(3)	SFAxxx RFAxxx	(1) RFAxxx	SFAxxx RFAxxx	SFAxxx RFAxxx	(2) Single Feedback cable (10 pair) is designed for Encoder and Commutation signals routing to a single location (including up to all 6 complementary signals).	
BMC6C or BMC7D	Straight-Dual(3) Rt.Angle-Dual(3)	SFACDxxx RFACDxxx	(1) RFACDxxx	SFACDxxx RFACDxxx	SFACDxxx RFACDxxx	(3) Dual Feedback cable is designed to provide separate cables (signals) to both drive and independent motion controller.	
BMC12	Straight-Dual(3) Rt.Angle-Dual(3)	SFAJLHxxx RFAJLHxxx	(1) RFAJLHxxx	SFAJLHxxx RFAJLHxxx	SFAJLHxxx RFAJLHxxx		

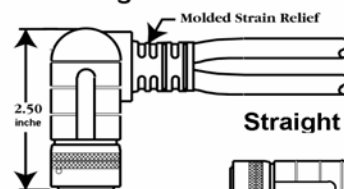
Rt.Angle-Single



Straight-Single



Rt.Angle - Dual



Straight - Dual



Full technical data including pinouts, wire colors, and information about the cable materials can be found in the "Cables" section of our website. Most drawings are available for download in both .pdf and .dwg formats.

ORDER	How to Order Cable Assemblies - Example shown below			Steps
	Cable Type	10 Ft	25 Ft	
	SPA23xxx	010	025	Pick Cable Type from Choices above Choose Length Option which meets or exceeds your length requirement Combine to form final Catalog Number to Order
	SPA23		025	
	SPA23025 (= Example)			

### Application Note:

**High Flex Applications** - All cables listed above are not intended for continuous flexing or twisting (High Flex) applications. MCG cables are intended for stationary cable tray or fixed harness environments. MCG does not offer "High Flex" motor cables at this time.

**Minimum Bending Radius** - Excessive bending of cables can cause insulation or conductor failure. MCG specifies that the minimum bend radius of a fixed cable is no less than eight times (8X) the cable diameter.

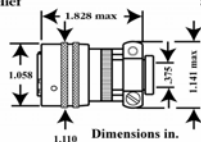
COMPONENTS	Parts to "Make Your Own" Cables		
	Cat.Number	Description	Notes
	9700226	Power Connector for AB23000 and AB34000 Series Motors	Straight Plug with Strain Relief, Shell Size 14, 8 Socket Contacts
	6900218	Power Connector for AB48000 Series Motors	Straight Plug with Strain Relief, Shell Size 20, 4 Socket Contacts
	9700227	Feedback Connector for All AB Series Motors	Straight Plug with Strain Relief, Shell Size 14, 19 Socket Contacts
	CP14	"Raw" Power Cable for AB23000 and AB34000 Series Motors	14 AWG, 15 Amps, 4 cond. Twisted with overall braided shield
	CP12	"Raw" Power Cable for AB48000 Series Motors	12 AWG, 20 Amps, 4 cond. Twisted with overall braided shield
	CF24	"Raw" Feedback Cable for All AB Series Motors	24 AWG, 1.4 Amps, 6 twisted pairs, overall polyester/foil shield with drain wire

Power Mating Connector for AB23000 and AB34000

Series motors Catalog Number 9700226  
Shell style - straight plug  
Service class - B, general duty with strain relief  
Shell size - 14  
Contact type - sockets



Contact arrangement number of positions: 8



Feedback Mating Connector for all AB Series motors Catalog Number 9700227

Shell style - straight plug  
Service class - B, general duty with strain relief  
Shell size - 14  
Contact type - sockets



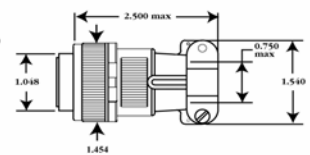
Contact arrangement number of positions: 19

Power Mating Connector for AB48000

Series motors Catalog Number 6900218  
Shell style - straight plug  
Class - E, environmental resisting  
Shell size - 20  
Contact arrangement - 4 contacts (#12)  
Contact type - sockets



Contact arrangement number of positions: 4



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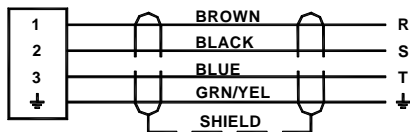


# Cables for Automation Grade ("AB" Series) Motors

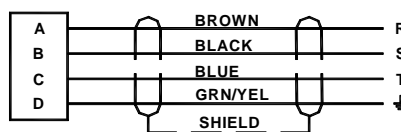
## Connection Information:

### Power Cables

AB23000 and AB34000 Series

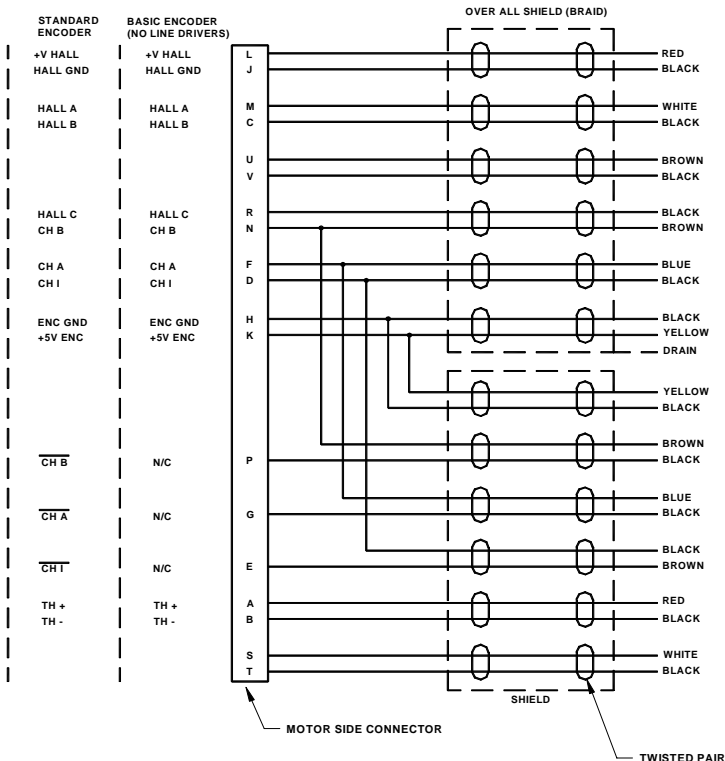


AB48000 Series

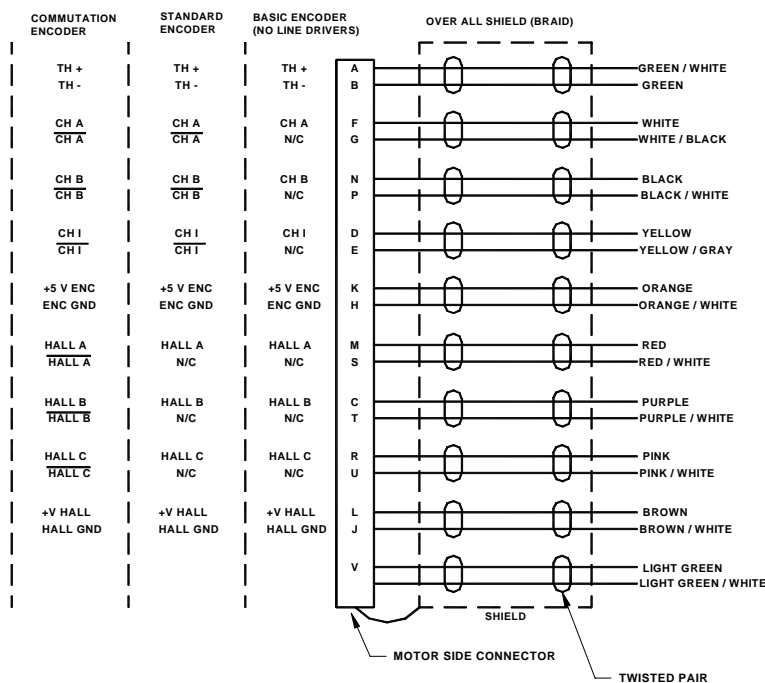


### Feedback Cables

#### "Dual" Cables



#### "Single" Cables



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