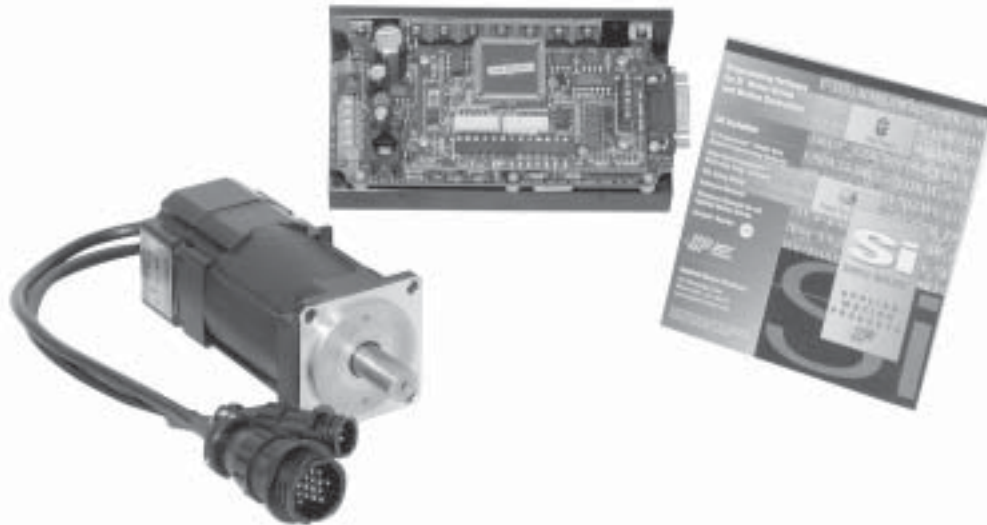


## BL7080i Servo Amplifier



### Features:

- BL7080i can be programmed for stand-alone operation with the easy to use Si Programmer™ Windows software (software and programming cable included).
- BL7080i can be operated in real time from a host PC or PLC using the Si Command Language (SCL), via RS232.
- Requires 24-80 VDC power supply.
- Continuous current of 7A, peak currents to 14A
- Speeds to 6000 rpm. Motor and load dependent.
- 20 kHz precision PWM amplifier.
- Compatible motors and extension cables available from stock.
- Compact size (2 x 3 x 6 inches).
- Screw terminal connectors for power, motor phases and I/O.
- Pluggable, industry standard D connector for encoder and commutation signals.

### Options:

- Eight Applied Motion Alpha series servo motors specifically designed for optimized performance with the BL7080i amplifier. These motors feature low profile right angle strain relief, shielded motor and encoder cables and mil style connectors.
- Standard or custom length extension cables for the motor and encoder that allow for quick, plug and play system set up.
- Regeneration clamp circuit (recommended).
- Recommended power supplies: PS430, PS1050 and PS1070.

### Description

The BL7080i programmable servo amplifier is suitable for a wide range of motion applications and is designed around a precise, powerful and efficient PWM amplifier. BL7080i is an intelligent servo amplifier that includes a sophisticated motion controller integrated with a PID control loop.

The BL7080i includes Applied Motion's easy to use Si Programmer™ Windows software for the rapid development of stand-alone motion control programs. BL7080i can also be commanded in real time from a host PC or PLC, using the Si Command Language™ (SCL).

Tuning the PID loop on the BL7080i is easy with our Quick Tuner™ software, featuring a built-in oscilloscope. Software selection of encoder line count and commutation sequence allows the motor to be configured without swapping wires.

For multi-axis applications, up to eight BL7080i drives can be networked using the SiNet Hub. The hub also allows BL7080i to be mixed with other Si™ drive models, stepper and servo.

The BL7080i includes 8 programmable optical isolated inputs for triggering, branching, position sensing and end of travel detection. 3 programmable optical isolated outputs can send signals to other electronic devices and activate relays.

## BL7080i Technical Specifications

### POWER AMPLIFIER:

AMPLIFIER TYPE .....	3 phase MOSFET.
CURRENT CONTROL .....	4 quadrant, pulse width modulated, switching at 20 KHz.
OUTPUT CURRENT .....	7.0 amps continuous. 14 amps peak current, 2 seconds max.
DC BUS VOLTAGE .....	24 to 80 VDC. 7 amps typical maximum load.
MAXIMUM CONTINUOUS OUTPUT POWER	560 Watts.
PROTECTION CIRCUITS .....	Drive over temperature.
POSITION RESOLUTION .....	Set via software to match encoder resolutions from a minimum of 25 lines to a maximum of 12,500 lines per revolution producing a minimum of 100 counts to a maximum of 50,000 counts per revolution in quadrature.
MOTION UPDATE .....	12800 Hz.
SERVO UPDATE .....	4266 Hz.

### CONTROLLER SECTION:

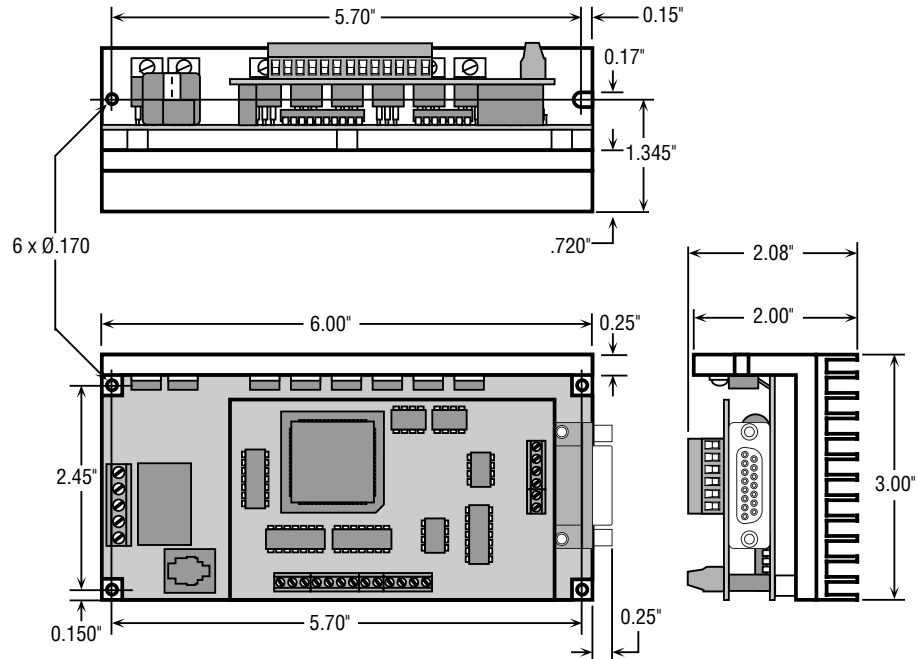
SERIAL COMMUNICATION .....	RS-232 programming port.
STATUS LED'S .....	DC power (red), Overtemp (yellow).
INPUTS .....	8 user programmable inputs: 2 dedicated, optically isolated limit switch inputs, 5 – 24 VDC. 4 general purpose, filtered inputs. The <i>Feed to Sensor</i> instruction can use these inputs for homing or other sensing needs. The <i>Wait Input</i> instruction can wait for one of the inputs to see a given voltage state or signal edge. The <i>If Input</i> instruction can branch based on the state of an input. 2 jog inputs (cw and ccw) that can also be used as general purpose inputs.
OUTPUTS .....	4 user outputs: Drive fault (activated by overcurrent or overtemperature condition). 3 general purpose, optically isolated outputs for interfacing to other equipment. Can be set, opened or closed, or programmed to send a pulse by the <i>Set Output</i> instruction.
PARAMETER RANGES .....	Distance: 1 to 16,000,000 (CW or CCW), absolute position $\pm 2$ billion. Speed: .025 to 100 revolutions per second. Acceleration: 1 to 3,000 rev/sec/sec. Deceleration: 1 to 3,000 rev/sec/sec (set independently from acceleration). Time Delays: .01 to 300 seconds. Output Pulse Widths: 2 to 500 milliseconds. Iterations per loop: 1 to 65,535.
OPTIONAL OPERATOR INTERFACE (MMI)	NEMA 4X rated (splash proof & dust proof). 4 x 20 characters liquid crystal display (LCD) standard or backlit. 20 key membrane keypad. Overall size: 4.9 x 4.9 x 1.42 inches. Optional backlit display.

### SYSTEM SPECIFICATIONS:

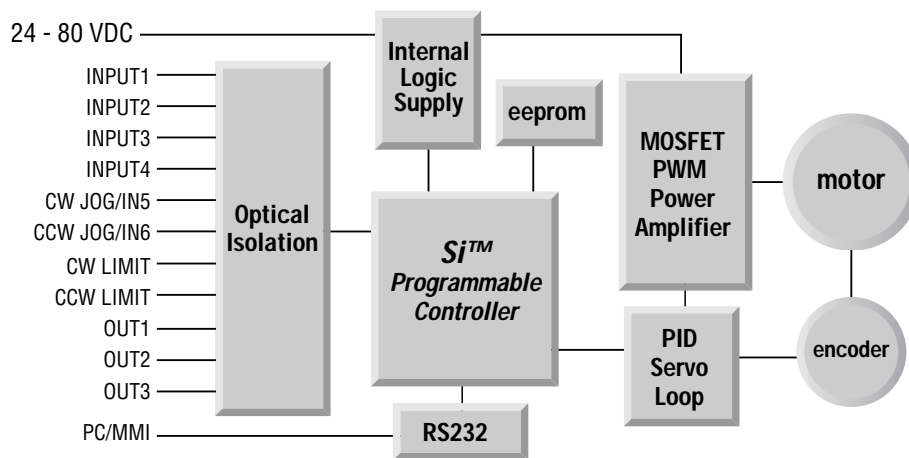
OVERALL SIZE .....	2 x 3 x 6 inches.
CHASSIS MATERIAL .....	Aluminum, black anodized with integral heat sink.
WEIGHT .....	1 Lb.
AMBIENT TEMPERATURE .....	0° to 70°C (32° to 50°F).
HUMIDITY .....	Maximum of 90% non-condensing.
CONNECTORS .....	Screw terminal connectors for input power, I/O signals and motor, DB-15 for encoder/Hall signals.
RECOMMENDED MOTORS .....	Can drive 30W to 400W BLDC motor.

## BL7080i Technical Drawings

### MECHANICAL OUTLINE



### BLOCK DIAGRAM



## Recommended Motors for the BL7080i

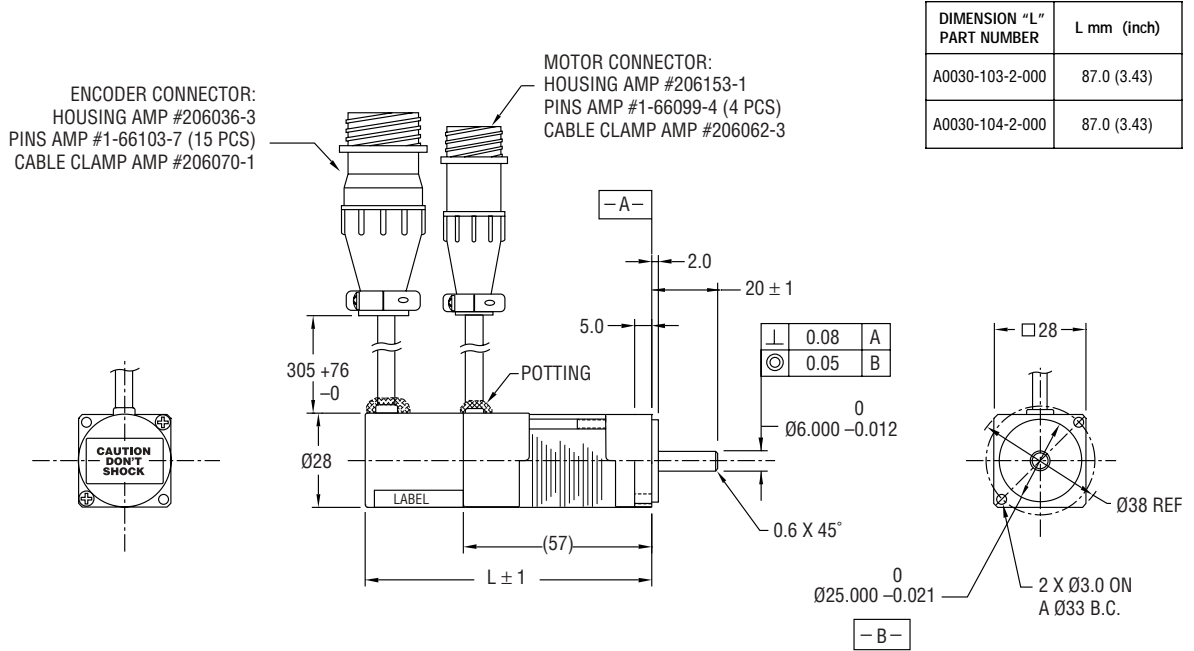
Mounting Flange inches (mm)		■ 1.10 (28 mm)		■ 1.57 (40 mm)				■ 2.36 (60 mm)	
Part Number		A0030-103-2-000	A0030-104-2-000	A0050-103-3-000	A0050-104-3-000	A0100-103-3-000	A0100-104-3-000	A0200-104-4-000	A0400-105-4-000
Voltage	V	24	48	24	48	24	48	48	60
Output Power	W	30	30	50	50	100	100	200	400
Maximum Operating Speed	rpm	5,000	5,000	5,000	5,000	4,000	5,000	5,000	3,600
Continuous Operating Speed	rpm	3,000							
Continuous Stall Torque	N.m. lb-in	0.095 0.84	0.095 0.84	0.159 1.41	0.159 1.41	0.318 2.81	0.318 2.81	0.64 5.66	1.27 11.24
Peak Torque (@ 3X rated current)	N.m. lb-in	0.286 2.53	0.286 2.53	0.48 4.25	0.48 4.25	0.95 8.41	0.95 8.41	1.91 16.9	3.82 33.8
K <sub>T</sub> Torque Constant	N.m./A lb-in/A	0.03 0.33	0.06 0.64	0.03 0.27	0.08 0.71	0.07 0.63	0.11 0.97	0.095 0.84	0.19 1.68
K <sub>E</sub> Voltage Constant	V/krpm	3.40	6.60	5.40	8.40	7.40	11.7	10.0	20.4
Winding Resistance	Ohm	0.78	2.80	1.11	2.60	0.79	2.00	0.37	0.63
Winding Inductance	mH	0.480	1.80	1.27	3.10	1.17	2.60	1.10	2.00
Continuous Stall Current	amps	2.9	1.5	3.1	2	4.5	3	6.7	6.5
Rotor Inertia	g-cm <sup>2</sup> oz-in-sec <sup>2</sup>	10 1.42 x 10 <sup>-4</sup>	10 1.42 x 10 <sup>-4</sup>	23 3.26 x 10 <sup>-4</sup>	23 3.26 x 10 <sup>-4</sup>	42 5.95 x 10 <sup>-4</sup>	42 5.95 x 10 <sup>-4</sup>	200 2.83 x 10 <sup>-3</sup>	360 5.10 x 10 <sup>-3</sup>
Maximum Winding Temp		Class B (130° C)							
Friction Torque (max)	N.m. lb-in	0.02 0.18	0.02 0.18	0.03 0.27	0.03 0.27	0.03 0.27	0.03 0.27	0.04 0.35	0.04 0.35
Weight (lbs)		.077		0.88		1.10		2.42	3.52
Phases		3							
Poles		8							

Note: All electrical specs are phase to phase.  
BL7080i amplifier uses 2X peak current limit.

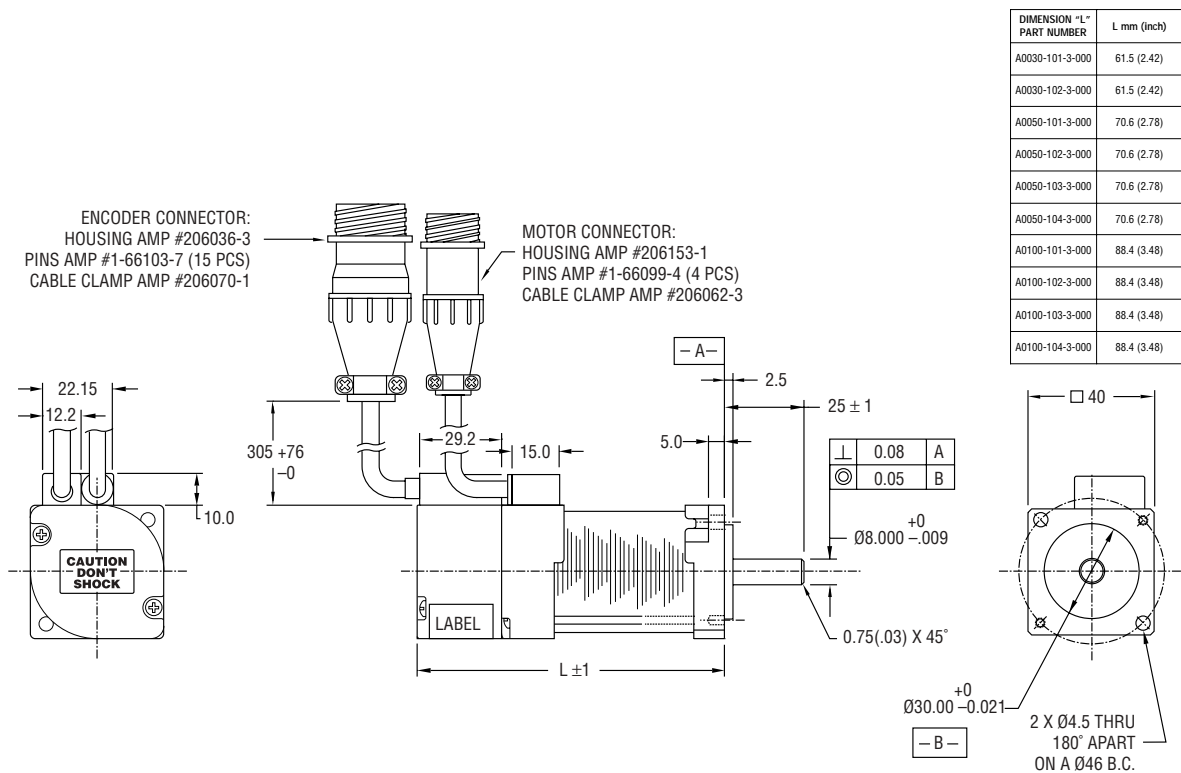
## Recommended Extension Cables

MOTOR TO AMPLIFIER CABLES		ENCODER TO AMPLIFIER CABLES	
PART NUMBER	LENGTH	PART NUMBER	LENGTH
BLMTR-CA-04	4 ft	BLENC-CA-04	4 ft
BLMTR-CA-10	10 ft	BLENC-CA-10	10 ft
BLMTR-CA-20	20 ft	BLENC-CA-20	20 ft
BLMTR-CA-XX	custom length	BLENC-CA-XX	custom length

## Recommended 28 mm Alpha Motor for the BL7080i

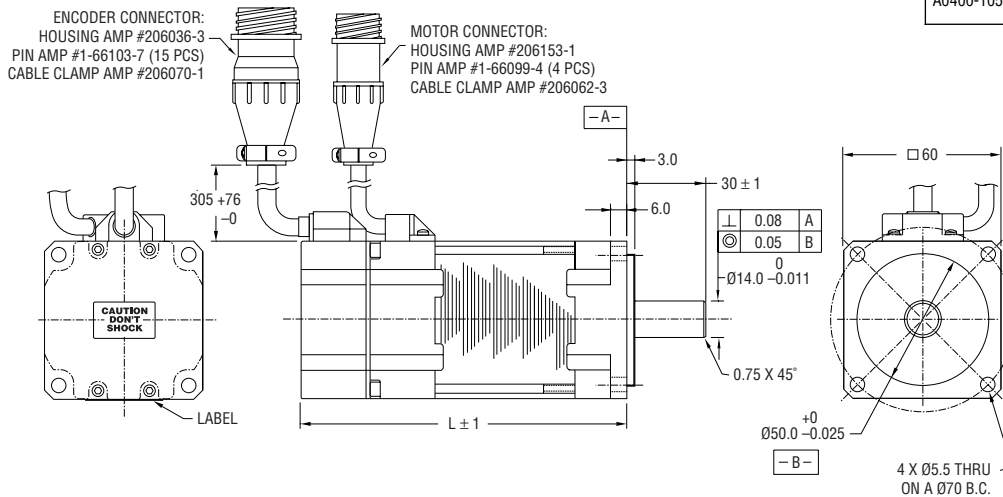


## Recommended 40 mm Alpha Motor for the BL7080i



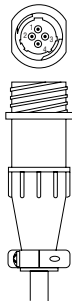
## Recommended 60 mm Alpha Motor for the BL7080i

DIMENSION "L" PART NUMBER	L mm (inch)
A0200-104-4-000	93 (3.66)
A0400-105-4-000	121 (4.76)



## BL7080i Motor & Encoder Connector Detail

### MOTOR POWER CONNECTOR



### MOTOR ENCODER CONNECTOR



### MOTOR CONNECTION TABLE

PIN NUMBER	FUNCTION	COLOR
1	A	RED
2	B	WHITE
3	C	BLACK
4	DRAIN	GREEN

	CONNECTOR	MATING CONNECTOR
HOUSING	AMP# 206153-1	AMP# 206060-1
PINS	AMP# 1-66099-4 (4 pcs)	AMP# 1-66101-8 (4 pcs)
CABLE CLAMP	AMP# 206062-3	AMP# 206062-3

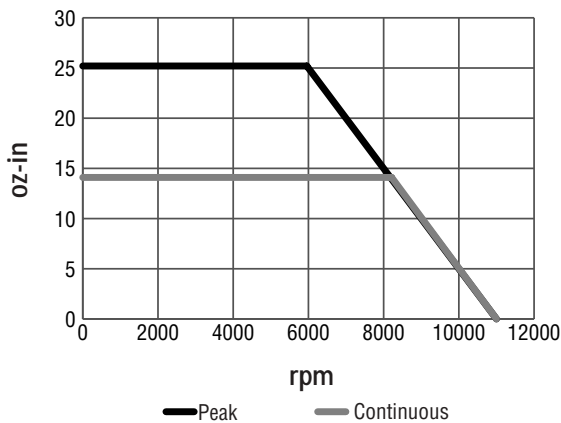
### ENCODER CONNECTION TABLE

PIN NUMBER	FUNCTION	COLOR	PIN NUMBER	FUNCTION	COLOR
1	A+	BLUE	9	Hall 2+	GREY
2	A-	BLUE/BLACK	10	Hall 2-	GREY/BLACK
3	B+	GREEN	11	Hall 3+	WHITE
4	B-	GREEN/BLACK	12	Hall 3-	WHITE/BLACK
5	Index Z+	YELLOW	13	+5V	RED
6	Index Z-	YELLOW/BLACK	14	0V	BLACK
7	Hall 1+	BROWN	15	DRAIN	W/SHRINK TUBING
8	Hall 1-	BROWN/BLACK	16	N/C	N/C

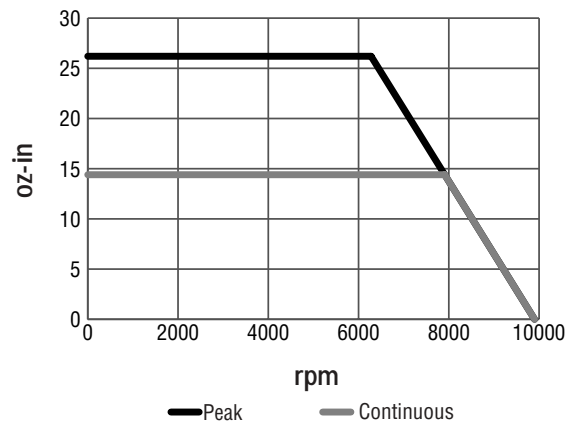
	CONNECTOR	MATING CONNECTOR
HOUSING	AMP# 206036-3	AMP# 206037-1
PINS	AMP# 1-66103-7 (15 pcs)	AMP# 1-66105-8 (15 pcs)
CABLE CLAMP	AMP# 206070-1	AMP# 206070-1

## BL7080i Torque Curves with 28 mm & 40 mm Brushless Servo Motors

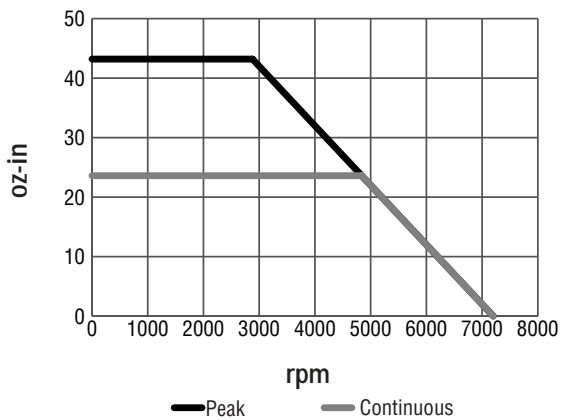
**A0030-103-2-000, Alpha Motor  
w/PS430 Power Supply (30 VDC)**  
BL7080i set at 2.9 amps (5.8 peak)



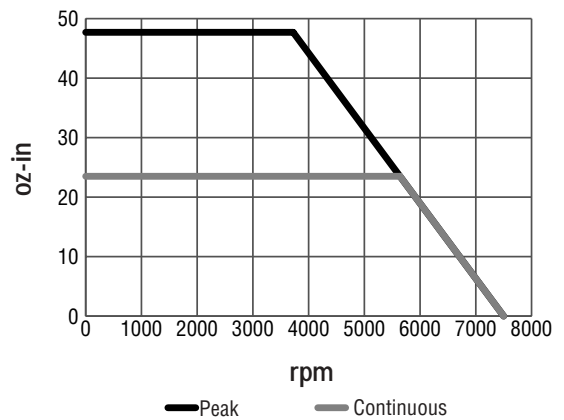
**A0030-104-2-000, Alpha Motor  
w/PS1050 Power Supply (50 VDC)**  
BL7080i set at 1.38 amps (2.76 peak)



**A0050-103-3-000, Alpha Motor  
w/PS430 Power Supply (30 VDC)**  
BL7080i set at 3.1 amps (6.2 peak)

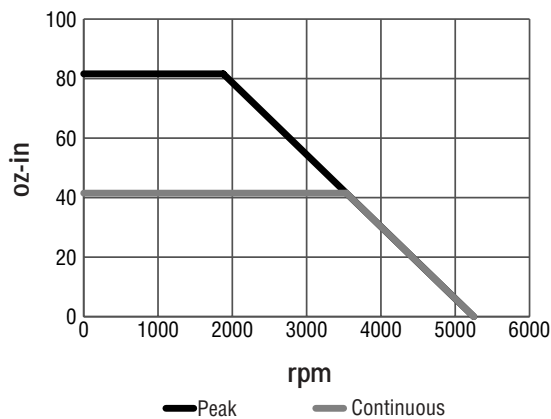


**A0050-104-3-000, Alpha Motor  
w/PS1050 Power Supply (50 VDC)**  
BL7080i set at 2.0 amps (4.0 peak)

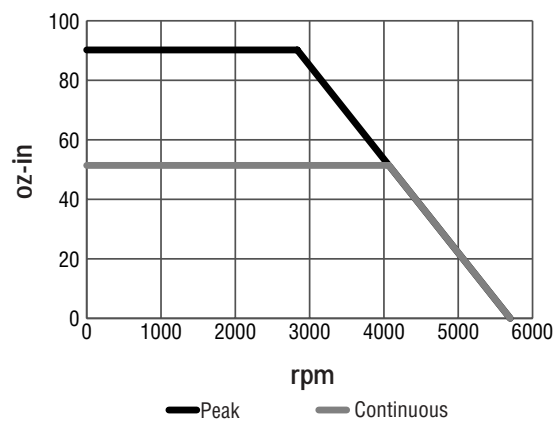


## BL7080i Torque Curves with 40 mm & 60 mm Brushless Servo Motors

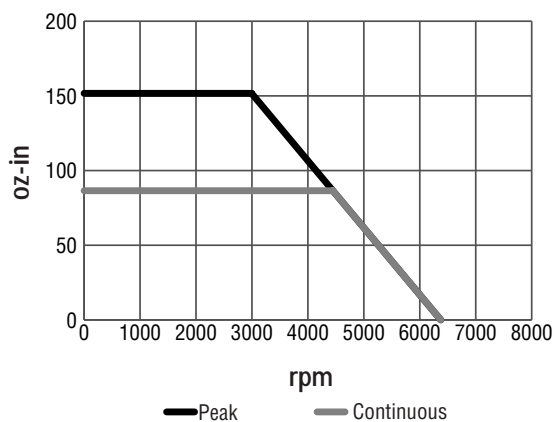
**A0100-103-3-000, Alpha Motor  
w/PS430 Power Supply (30 VDC)**  
BL7080i set at 4.75 amps (9.5 peak)



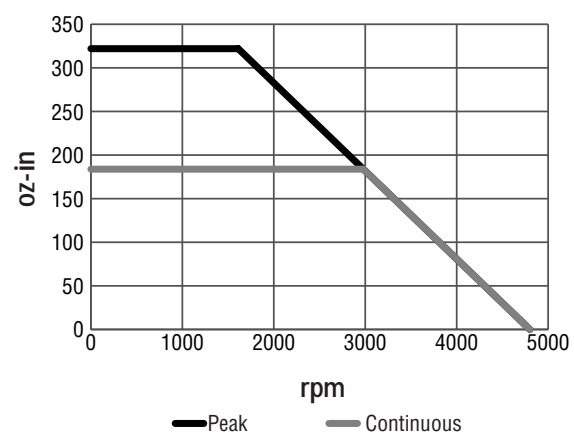
**A0100-104-3-000, Alpha Motor  
w/PS1050 Power Supply (50 VDC)**  
BL7080x set at 3.0 amps (6.0 peak)



**A0200-104-4-000, Alpha Motor  
w/PS1050 Power Supply (50 VDC)**  
BL7080i set at 7.0 amps (14.0 peak)



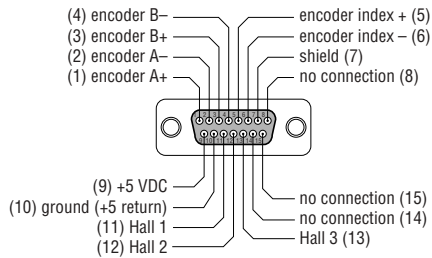
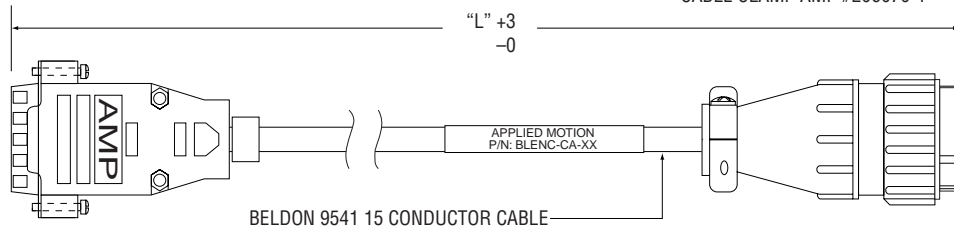
**A0400-105-4-000, Alpha Motor  
w/PS1070 Power Supply (70 VDC)**  
BL7080i set at 7.0 amps (14.0 peak)



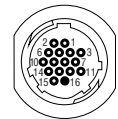
## BL7080i Motor Extension Cable Drawings

### ENCODER EXTENSION CABLE

ENCODER EXTENSION CABLE CONNECTOR:  
 HOUSING AMP #206037-1  
 PINS AMP #1-66105-8 (15 PINS)  
 CABLE CLAMP AMP #206070-1

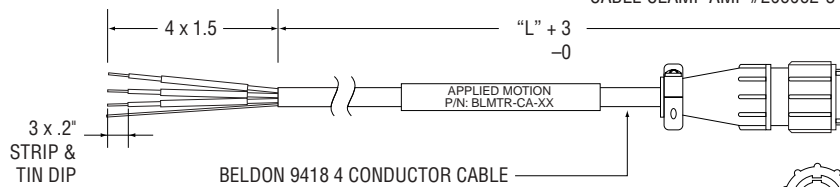


DIMENSION "L"	PART #
4 feet	BLENC-CA-04
10 feet	BLENC-CA-10
20 feet	BLENC-CA-20



### MOTOR POWER EXTENSION CABLE

MOTOR EXTENSION CABLE CONNECTOR:  
 HOUSING AMP #206060-1  
 PINS AMP #1-66101-8 (4 PINS)  
 CABLE CLAMP AMP #206062-3



DIMENSION "L"	PART #
4 feet	BLMTR-CA-04
10 feet	BLMTR-CA-10
20 feet	BLMTR-CA-20



## Motor Phase Excitation Sequence

MOTOR SHAFT CAN BE LOCKED AT "0°" BY APPLYING THE RATED CURRENT + TO TERMINAL "B" AND - TO TERMINAL "A".

ENCODER RESOLUTION 2,000 LINES/REV

