

Brushless DC (ECM) 34B/FV INTEGRAmotor™

Product Information and Application Notes: 24V Brushless DC motor with built-in voltage mode PWM controller. Featuring amplifier enable, direction and dynamic braking inputs. Outputs: 1024 PPR, two channel quadrature optical encoder, and fault signal.

TABLE 1: MOTOR SPECIFICATIONS

		34B4BEBL/FV
Continuous Stall Torque	oz-in	100
Peak Stall Torque	oz-in	150
Thermal Resistance	°C/W	2.0
Torque Constant	oz-in/A	9.6
Voltage Constant	V/kRPM	7.1
Current @ Cont. Stall Torque	Amp	11.5
Current @ Peak Torque	Amp	16.3
Resistance (L-L)	Ohms	0.18
Inductance (L-L)	mH	0.43
Rated Terminal Voltage	Vdc	24
Rated Speed @ Terminal Vdc	RPM	2500
Minimum Speed	RPM	60
Maximum Speed	RPM	4000
Rotor Inertia (with encoder)	oz-in-sec ²	.0154
Feedback (Built-in)	Encoder	1024 PPR, 2 Ch/Index
Length	Inches	5.70
Weight	LB	7.2
Rated Ambient Temp.	°C	25
Environmental Protection	IP	IP-44
Third Party Markings	Yes.	cURus, RoHS
Number of Poles		4
Bodine Model (Item) Number		3708

All data subject to change without notice. Bodine Electric Company 06/2012©.
 Cable kit, model/item no. 3981, also available from stock (all three required cables).

Type 34B/FV Motor



Type 34B/FV-F Gearmotor



APPLICATION NOTES:

The Bodine type **34B/FV INTEGRAmotor™** utilizes a 24VDC, open loop voltage mode PWM controller with inputs for PWM voltage control, amplifier enable, direction and dynamic braking.

- 1024 P.P.R. two channel quadrature optical encoder with index and line drivers terminated via separate cable. The encoder is not used for motor commutation.
- Provided with a built-in power supply monitor for both the motor and logic power supplies. All inputs and outputs are TTL compatible. Outputs are open collector which are factory terminated to the 5V supply through a 1.0K resistor (other values are available for OEM's).
- Four-Quadrant operation with an internal shunt regulator and 10 Ohm 25W resistor.
- The intended use of this system is with electronic systems that have enough processing capability to provide the PWM and direction command signals and monitor motor velocity and/or position while closing the velocity or position loop in software.
- A power supply monitor will automatically disable the drive stage if the 5V supply falls below 4.5VDC.

- The PWM pin (Pin# 3) should be driven between 15 and 20KHz. It can be run at lower frequencies, but this might result in audible noise. We don't recommend running it above 20KHz due to increasing switch losses in the FET's.
- The dynamic brake input will turn off the high side MOSFET's and turn on all of the low side MOSFET's causing the motor to produce retarding torque that's proportional to motor speed. This feature would normally not be used in a servo application, except as an emergency stop.
- Retarding torque can also be produced by bringing the duty cycle to zero, reversing the direction input and ramping up the PWM duty cycle to increase torque. If too much voltage is applied in the reverse direction, the current limit will kick in. The supply voltage will "pump up" as the motor regenerates energy in this mode. The user must keep the supply voltage below about 28V in this mode. The "FV" stock controls have an integral shunt regulator capable of handling up to 25 Watts of returned power. For application or connection questions, please call our application support team at 773-478-3515 (USA), or e-mail us to: info@bodine-electric.com.
- The Fault output is open collector and has an internal pull up resistor.
- The PWM input is active high. OEM customers can choose active high or low for this input but it's always pulled up to the 5V supply.
- This motor is rated for a +25°C ambient. Enclosure: IP-44.

TABLE 2: ELECTRICAL CONNECTIONS (motor/gearmotor & control)

See brochure 07481079A or online CAD dwg for encoder connection details. Please visit www.bodine-electric.com.



[1]HOUSING AMPHENOL PART# MB1LLN0900
[3]TERMINALS AMPHENOL PART# SC000036

POWER CONNECTOR PIN ASSIGNMENTS	
PIN	FUNCTION
A	NO CONNECTION
B	+24V
C	COMMON
D	GROUND
E-L	NO CONNECTION

MATING POWER CONNECTOR PARTS:
MANUFACTURER: AMPHENOL
CONNECTOR: MB1CKN0900
TERMINAL: SC000045 / SC000014

[1]HOUSING AMPHENOL PART# MA1LAE1200
[8]TERMINALS AMPHENOL PART# SC000035

SIGNAL CONNECTOR PIN ASSIGNMENTS	
PIN	FUNCTION
1	TACH
2	F/R
3	PWM
4	ENABLE
5	COMMON
6	+5V
7	FAULT
8	BRAKE
9-12	NO CONNECTION

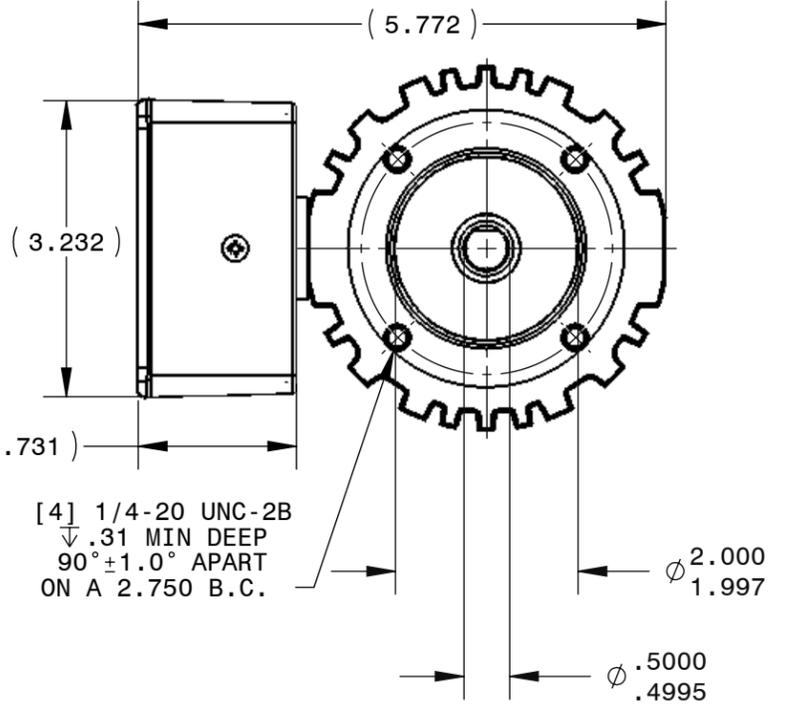
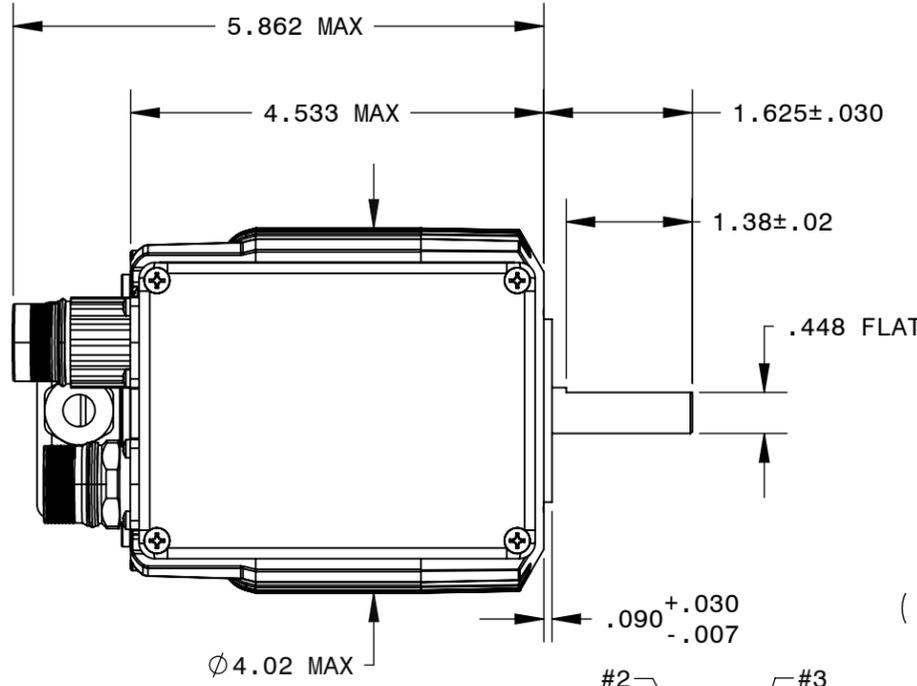
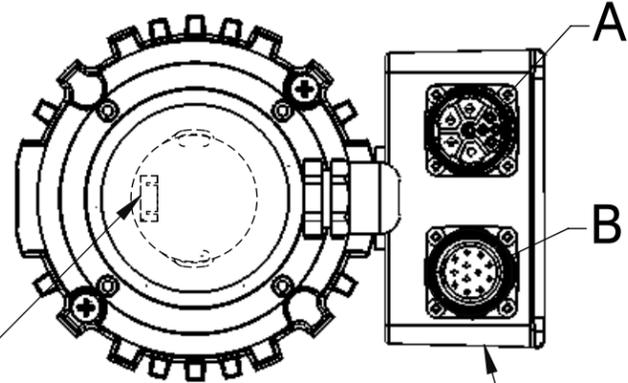
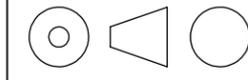
MATING SIGNAL CONNECTOR PARTS:
MANUFACTURER: AMPHENOL
CONNECTOR: MA1CAP1200
TERMINAL: SC000044 / SC000013

Connectors: The 34B/FV control is similar to that on our stock type 22B/FV INTEGRAMotors. However, the pin-out and connectors are different. See our dimensional CAD dwg (INFS0709) for 34B/FV details and encoder connections (not shown above). Available online at bodine-electric.com.

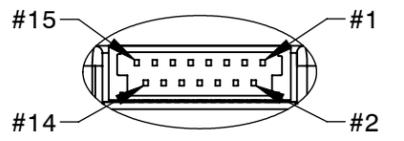
BODINE ELECTRIC COMPANY

PART NO./REV:	INFS0709	F
DESCRIPTION:	MOTOR 34B4FEBL-FV	
SHEET:	1/1	UNLESS OTHERWISE SPECIFIED:
SCALE:	1:2	UNITS ARE IN INCHES [mm]
B		TOLERANCES: .XX:±.01 .XXX:±.005
		ANGLES: X°:±3° X.X°:±0.5°

NOTE:
BODINE CABLE KIT PART #N3981 CONTAINS THE MATING
CABLES FOR THE POWER, SIGNAL, AND ENCODER CONNECTORS.



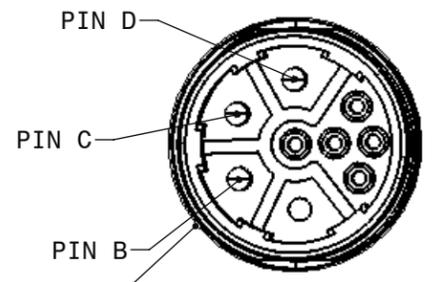
[4] 1/4-20 UNC-2B
↓.31 MIN DEEP
90°±1.0° APART
ON A 2.750 B.C.



[1] HOUSING JAE PART# FI-W15P-HF
[15] TERMINALS JAE PART# FI-C3-A1-15000

PIN	FUNCTION
1	CHANNEL A
2	CHANNEL A-
3	CHANNEL B
4	CHANNEL B-
5	CHANNEL Z
6	CHANNEL Z-
7	CHANNEL U
8	CHANNEL U-
9	CHANNEL V
10	CHANNEL V-
11	CHANNEL W
12	CHANNEL W-
13	VCC
14	GROUND
15	NO CONNECTION

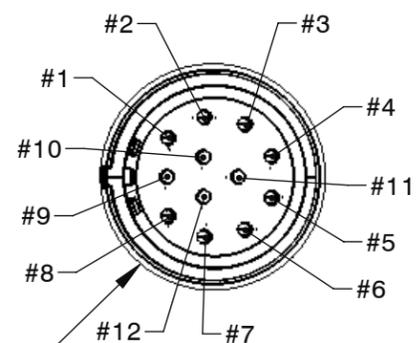
ENCODER CONNECTOR MATING PARTS:
MANUFACTURER: JAE
CONNECTOR: FI-W15S
TERMINAL: FI-C3-A1-15000



DETAIL A
SCALE 3 : 2
[1] HOUSING AMPHENOL PART# MB1LLN0900
[3] TERMINALS AMPHENOL PART# SC000036

PIN	FUNCTION
A	NO CONNECTION
B	+24V
C	COMMON
D	GROUND
E	NO CONNECTION
F	NO CONNECTION
G	NO CONNECTION
H	NO CONNECTION
L	NO CONNECTION

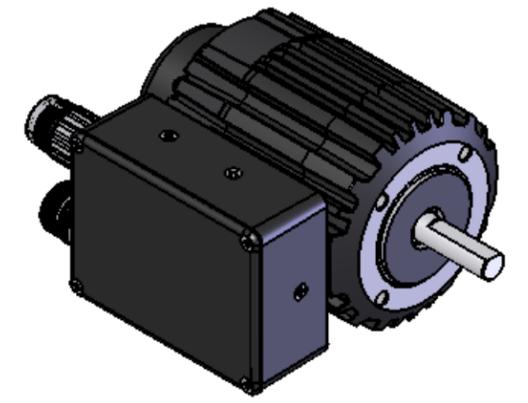
POWER CONNECTOR MATING PARTS:
MANUFACTURER: AMPHENOL
CONNECTOR: MB1CKN0900
TERMINAL: SC000045 / SC000014



DETAIL B
SCALE 3 : 2
[1] HOUSING AMPHENOL PART# MA1LAE1200
[8] TERMINALS AMPHENOL PART# SC000035

PIN	FUNCTION
1	TACH
2	F/R
3	PWM
4	ENABLE
5	COMMON
6	+5V
7	FAULT
8	BRAKE
9	NO CONNECTION
10	NO CONNECTION
11	NO CONNECTION
12	NO CONNECTION

SIGNAL CONNECTOR MATING PARTS:
MANUFACTURER: AMPHENOL
CONNECTOR: MA1CAP1200
TERMINAL: SC000044 / SC000013



REPRESENTATIVE OF MODEL NUMBER(S):
3708