# The New 34B/FV *INTEGRAmotor*™

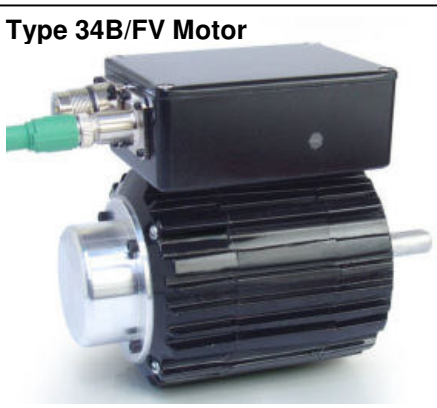
**New Standard Product from Bodine:** 24V Brushless DC Motor with Built-In Voltage Mode PWM Controller. Featuring amplifier enable, direction and dynamic braking inputs. Outputs: 1024 PPR, two channel quadrature optical encoder, and fault signal. Open loop.

Lit. No. 07481078.rev.2c -web-

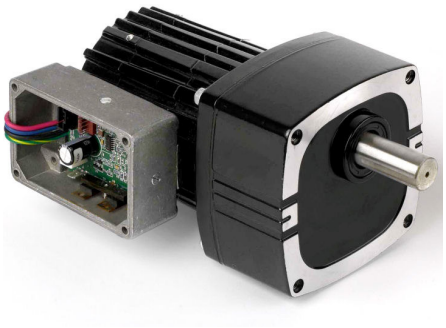
## TABLE 1: MOTOR SPECIFICATIONS

| | | 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-sec² | .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 | (pending) | cURus, CE** |
| Number of Poles | | 4 |
| Bodine Model Number | | **3708*** |

**Type 34B/FV Motor**



**Type 34B/FV-E Gearmotor**



***In stock, November 2008.** All data subject to change without notice.
Bodine Electric Company ©. Last update: 11/18/2008. EHG/mbm
Cable kit N-model # N3981, now available (all three required cables).

[FV = **F**our quadrant **V**elocity amplifier]
**UL (cURus) and CE project in process.

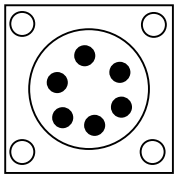
## TABLE 2: ELECTRICAL CONNECTIONS (motor/gearmotor control)

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

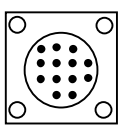
| Pin Number | Description |
|---|---|
| P1 | No Connection |
| P2 | +24VDC input |
| P3 | Ground |
| P4 | Common |
| P5 | No Connection |
| P6 | No Connection |
| S1 | Tach Output (12 PPR – motor shaft) |
| S2 | Forward/Reverse Input (direction) |
| S3 | PWM Input (voltage control, duty) |
| S4 | Enable (on/off) |
| S5 | Common |
| S6 | +5VDC Input (required) |
| S7 | Fault Output (indicates various fault conditions) |
| S8 | Brake Input (dynamic braking) |

Motor Connectors

Power/Ground 1



Signals 2



## TECH AND APPLICATION NOTES / FEATURES:

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

•1024 P.P.R. two channel quadrature optical encoder with index and line drivers terminated via separate cable. Do **not** connect the U, V and W signals (pins 7 to 12) of the encoder 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. Sometimes it is necessary to add a shunt regulator to the supply to control this voltage during regenerative operation.

•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.

Connectors: The 34B/FV control is similar to that on our stock "22B/FV" INTEGRAmotors, However the pin out and connectors are different. We use a Phoenix Contact M12 series 8-pin connector for signal connections and a Pluscon type 5 pin connector for power on this control. The encoder is terminated with a plug-in ready connector from JAE. The required mating parts are as follows:

| Function | Connector P/N | Description |
|---|---|---|
| Power | 5F-5ES1N8A80DU / 1605532 | Phoenix Contact Free hanging 6 pin receptacle with strain relief |
| Signals | SAC-8P-M12FS/PUR/3.0 / 1522875 | Phoenix Contact 3m 8 pin receptacle and shielded cable assembly |
| Encoder | JAE F1-W15S | JAE connector housing (requires F1-C3-A1-15000 terminals) |

*More parts information for related terminals and housings can be found on the **Phoenix Contact** web site at* http://www.phoenixcontact.com/usa_home *and at the **JAE** connector web site at* http://jae-connector.com/en/index.cfm