

PART NUMBER

**BL23E33-02-HP50-ED1000**

**MOTOR SPECIFICATIONS**

|                          |                               |
|--------------------------|-------------------------------|
| Part Number              | <b>BL23E33-02</b>             |
| Dimension "A"            | 3.29 in   83.5 mm             |
| Rated Voltage            | 48 VDC                        |
| Rated Torque             | 41.07 oz-in   0.29 N-m        |
| Rated Speed              | 4000 RPM                      |
| Rated Power              | 120 Watts                     |
| Rated Current            | 3 Amps                        |
| Peak Torque              | 82.13 oz-in   0.58 N-m        |
| Peak Current             | 6 Amps                        |
| Torque Constant (kt)     | 13.74 oz-in/Amp               |
| Back EMF Constant (Ke)   | 9.02 Vp/KRPM                  |
| Motor Constant (Km)      | 15.76 oz-in/√W   0.111 N-m/√W |
| Resistance               | 0.76 Ohms                     |
| Inductance               | 84 mH                         |
| Rotor Inertia            | 0.153 oz-in <sup>2</sup>      |
| Weight                   | 2.38 lb   1.08 kg             |
| Electrical Time Constant | 1.1 ms                        |
| Mechanical Time Constant | 2.5 ms                        |

**GEARBOX SPECIFICATIONS**

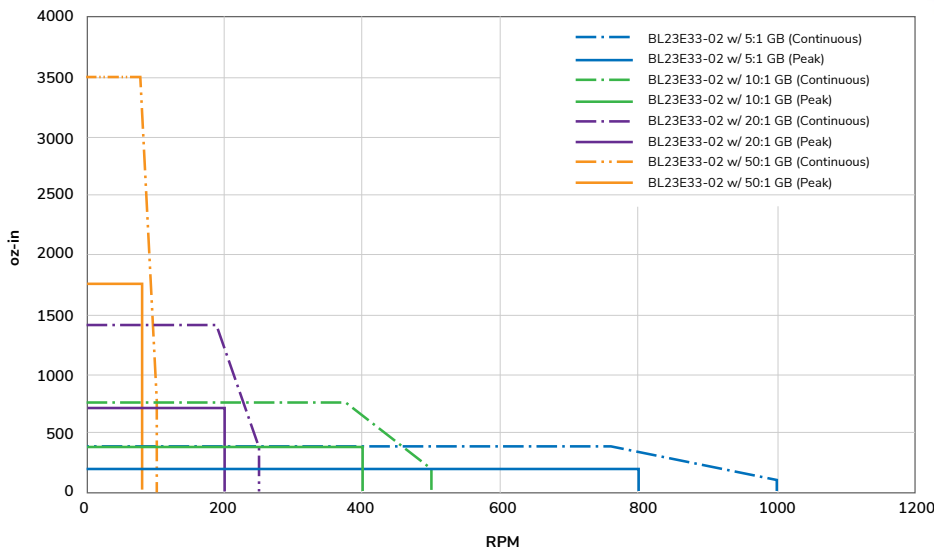
|  |                               |
|--|-------------------------------|
| Part Number                                    | <b>HP50</b>                   |
| Ratio  | 50:1                          |
| Nominal Output Torque (Nm)                     | 60                            |
| Emergency Stop Torque (Nm)                     | 3 times nominal output torque |
| Nominal Input Speed (RPM)                      | 5000                          |
| Max Input Speed (RPM)                          | 10000                         |
| Max Radial Load (N)                            | 1377                          |
| Max Axial Load (N)                             | 765                           |
| Efficiency η (%)                               | 85                            |
| Backlash (arcmin)                              | <7                            |
| Protection Class                               | IP65 (gearbox), IP40 (motor)  |
| Service Life (hr)                              | 20000                         |
| Weight (kg)                                    | 1.6                           |
| Operating Temperature (°C)                     | -20 to 90                     |
| Lubrication                                    | Grease                        |
| Noise (n=3000 rpm) dB(A)                       | 55                            |
| Mass Movement of Inertia (kg-cm <sup>2</sup> ) | 0.03                          |

**E5 ENCODER SPECIFICATIONS**

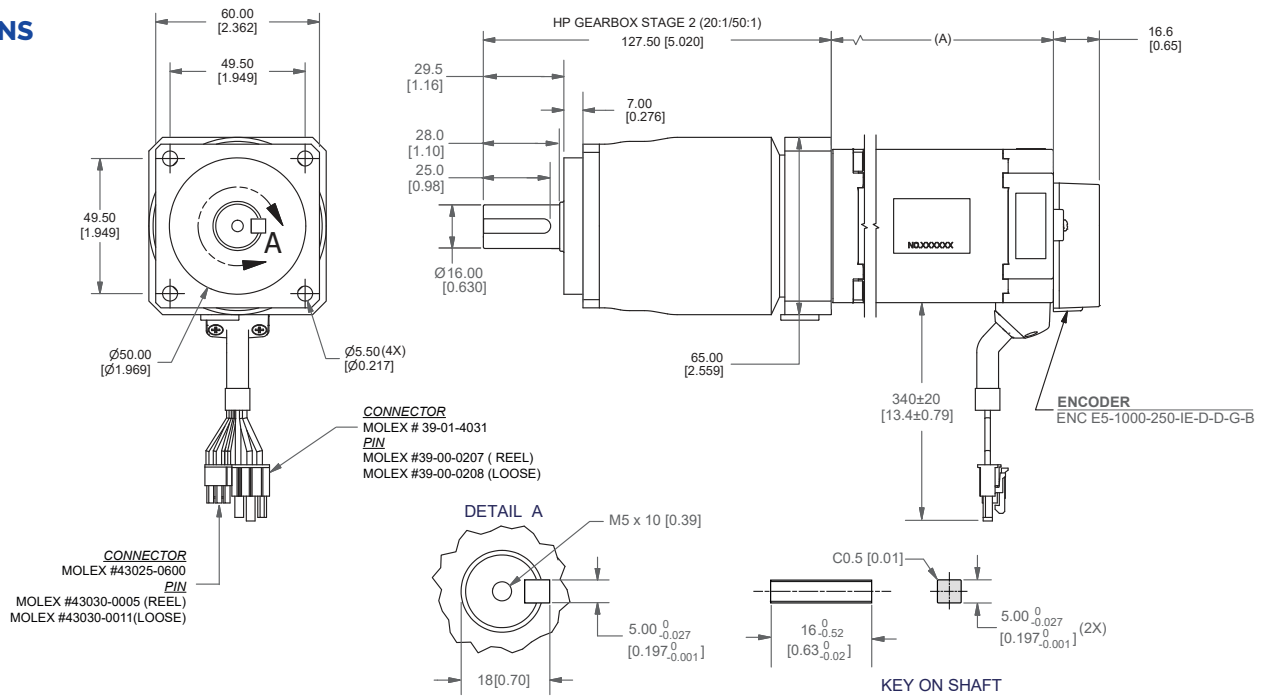
|         |               |
|---------|---------------|
| Encoder | US Digital E5 |
| Output  | Differential  |
| CPR     | 1000          |
| Index   | Included      |

**PERFORMANCE CURVE**

**BL23E33-02 GEARMOTOR TORQUE CURVES**



## DIMENSIONS



## PIN OUT CHARTS

### HALL SENSOR

| PIN # | COLOR  | PHASE     |
|-------|--------|-----------|
| 1     | RED    | VCC (+5V) |
| 2     | YELLOW | HV        |
| 3     | BLUE   | HW        |
| 4     | BLACK  | GND       |
| 5     | ORANGE | HU        |

### MOTOR PHASE

| PIN # | COLOR  | PHASE |
|-------|--------|-------|
| 1     | BLUE   | W     |
| 2     | ORANGE | U     |
| 5     | YELLOW | V     |

### ENCODER

#### 10 PIN DIFFERENTIAL -STANDARD (2)

| PIN | DESCRIPTION  |
|-----|--------------|
| 1   | Ground       |
| 2   | Ground       |
| 3   | Index -      |
| 4   | Index +      |
| 5   | A- Channel   |
| 6   | A+ Channel   |
| 7   | +5 VDC Power |
| 8   | +5 VDC Power |
| 9   | B- Channel   |
| 10  | B+ Channel   |

## RECOMMENDED PRODUCTS



BLDC DRIVER  
**BLDC50-BL23E33-02**



BLDC EXTENSION CABLE  
**4201-100/300**



E5 ENCODER CABLE  
**CA-FC10-SH-NC-10-PKG**

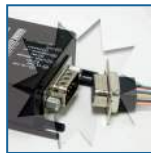
## OPERATION & USAGE TIPS



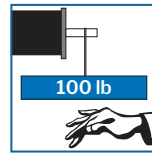
**Do not** disassemble motors; a significant reduction in motor performance will occur.



**Do not** machine shafts; this will have a negative effect on motor performance and perpendicularity.



**Do not** disconnect motor from drive while in operation.



**Do not** use holding torque/detent torque of motor as a fail safe brake.



**Do not** hold motor by lead wires.



**Do not** exceed the rated current; this will damage the motor.

FAILURE TO COMPLY WITH THESE RECOMMENDATIONS WILL VOID ALL WARRANTY TERMS

# Motion Control, Solved.

## MOTOR ENGINEERING & MANUFACTURING



Optimized  
For Your  
Application



Quick  
Prototype  
Turnaround



Small Batch  
to OEM Volume  
Production



US Based  
Support &  
Manufacturing