

WAVEFORMS PER CW SHAFT ROTATION VIEWING MOTOR MOUNTING FACE

Notes: Print or enlarge waveforms for improved clarity. For additional specifications see TLA410MBJ34AAESM.



|                      |         |    |   |                 |           |
|----------------------|---------|----|---|-----------------|-----------|
|                      |         |    |   |                 |           |
| 02                   | 1008735 | SJ | CHANGE CONTINUOUS OUTPUT & STALL, ROTOR INERTIA |                 |           |
| 01                   | 1007016 | JH | RELEASED  | JH              | 5/4/2004  |
| REV                  | ECN     | BY | REVISION DESCRIPTION                            | CHKR            | DATE      |
| PREPARED BY          |         |    | DATE  | DESIGN ENGINEER | DATE      |
| JH                   |         |    | 4/15/2004                                       | JH              | 4/30/2004 |
| TITLE                |         |    |   |                 |           |
| TL-A410M-BJ34AA, ESE |         |    |   |                 |           |
| Allen-Bradley        |         |    | PART NO.  |                 |           |
|                      |         |    | TLA410MBJ34AAESE                                |                 |           |
| A SIZE               |         |    |   | SHEET 1 OF 4    |           |

Specifications:

1. Motor type: 8 pole, 3 phase, wye winding, permanent magnet rotor, totally enclosed, non-ventilated.
2. Operating speed: 4500 RPM max.
3. Continuous stall torque: 4.86 Nm (43 lb-in) max at 155C winding temperature in a 40C ambient, when mounted on a 12 inch sq x 1/2 inch thick aluminum heatsink.
4. Peak stall torque: 13 Nm (115 lb-in) max.
5. Continuous output rating: 1.8 kW (2.4 hp) max at continuous rated operating point: 4500 RPM, 3.84 Nm (34 lb-in), 11.7 Amps 0 to peak max.
6. Operating voltage: 230 VAC RMS Ref. (Not for direct connection to AC line).
7. Continuous stall current: 14.0 Amps 0 to peak max.
8. Peak stall current: 43.4 Amps 0 to peak max.
9. Insulation class: 155C (Class F).
10. Housing temperature: 125C (257F) max.
11. Ke: 42.3 to 51.7 (47 nom) V/kRPM 0 to peak, phase to phase at 20C to 30C.
12. Kt: (sine) 0.388 Nm/Amp 0 to peak (3.44 lb-in/Amp 0 to peak) Ref at 20C to 30C.
13. Winding resistance: 0.711 to 0.869 Ohms, phase to phase at 20C to 30C.
14. Winding inductance: 3.1 mH, phase to phase Ref.
15. Dielectric rating of motor power connections (U,V,W) to ground: 1800 VAC RMS 50/60 Hz for 1 second.
16. Rotor inertia: 0.00041 kg-m<sup>2</sup> (0.0036 lb-in-sec<sup>2</sup>) Ref.
17. Rotor balancing: Quality grade G-6.3.
18. Friction torque: 0.051 Nm (0.45 lb-in) Ref.
19. Friction torque with shaft seal option installed: 0.080 Nm (0.71 lb-in) Ref.
20. Cogging torque: 0.080 Nm (0.71 lb-in) peak to peak Ref.
21. Damping: 0.020 Nm/kRPM (0.18 lb-in/kRPM) Ref.
22. Thermal resistance, winding to ambient: 0.37 degrees C/watt Ref.
23. Thermal time constant, winding to ambient: 21 minutes Ref.
24. Product weight: 6.8 kg (15 lb) Ref.
25. Shipping weight: 7.7 kg (17 lb) Ref.
26. Operating ambient temperature: 0C to 40C (32F to 104F).
27. Storage ambient temperature: -10C to 85C (14F to 185F).
28. Relative humidity: 20% to 85% non-condensing.
29. Liquid / dust protection: IP65 when optional shaft seal is installed, excluding flying lead connectors (connectors rating: IP30).
30. Shock: 20 g peak max, 6 msec duration (18 occurrences tested).
31. Vibration: 2.5 g peak max, 30 to 2000 Hz.
32. Bearing arrangement: Outer diameter of rear bearing is trapped axially.
33. Shaft material: Steel, grade S45C.

Notes: "Ref" denotes untoleranced specifications, provided for reference only.  
Speed, torque and current specifications are for motor operation with Allen Bradley drives.

34. Paint: Black. Shaft, key (if provided), front mounting surface, and flying lead cables are not painted.

Brake Specifications:

1. Type: Spring-set holding brake, releases when voltage applied.
2. Holding torque: 9.3 Nm (82 lb-in) max.
3. Voltage input: 21.6 to 26.4 VDC, may be applied either polarity.
4. Current input: 0.648 to 0.792 ADC at 24 VDC, at 20C to 30C.
5. Coil resistance: 29.7 to 36.3 Ohms at 20C to 30C.
6. Coil resistance: 40.5 to 49.5 Ohms with motor operating at max continuous stall torque rating in a 40C ambient.
7. Release time delay (when voltage applied): 69 msec Ref.
8. Engage time delay (when voltage removed): 84 msec Ref with diode (or 20 msec Ref with MOV) used as arc suppression device in external control circuit.
9. Rotational backlash: 1.0 degrees Ref with brake engaged.
10. Dielectric rating of brake connections (BR+,BR-) to ground: 1200 VAC RMS 50/60 Hz for 1 second.

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Feedback Specifications:

Encoder Function:

1. 17 bit single turn absolute position data is provided, via serial output, with or without an external battery connected.
2. 16 bit multi-turn absolute position data is provided, along with the 17 bit single turn absolute position data, via serial output, when an external battery is connected.

Electrical Hardware:

1. SD+, SD- (serial data) output / input: RS 485 differential line driver / receiver.
2. EPWR (encoder power) voltage input: 4.75 to 5.25 VDC.
3. EPWR current input: 60 mA DC nominal, 110 mA DC max continuous. 1.3 ADC max inrush.
4. BAT+ (battery) voltage input: 3.6 VDC nominal.
5. BAT+ current input, with +5VDC applied to EPWR input: 3.6 uA nominal.
6. BAT+ current input, with no EPWR input applied: 110 uA max.
7. Battery alarm fault (battery change required) voltage level: 3.1 VDC Ref.
8. Battery error fault (absolute multi-turn position not saved at power loss) voltage level: 2.5 VDC Ref.

Serial Communication:

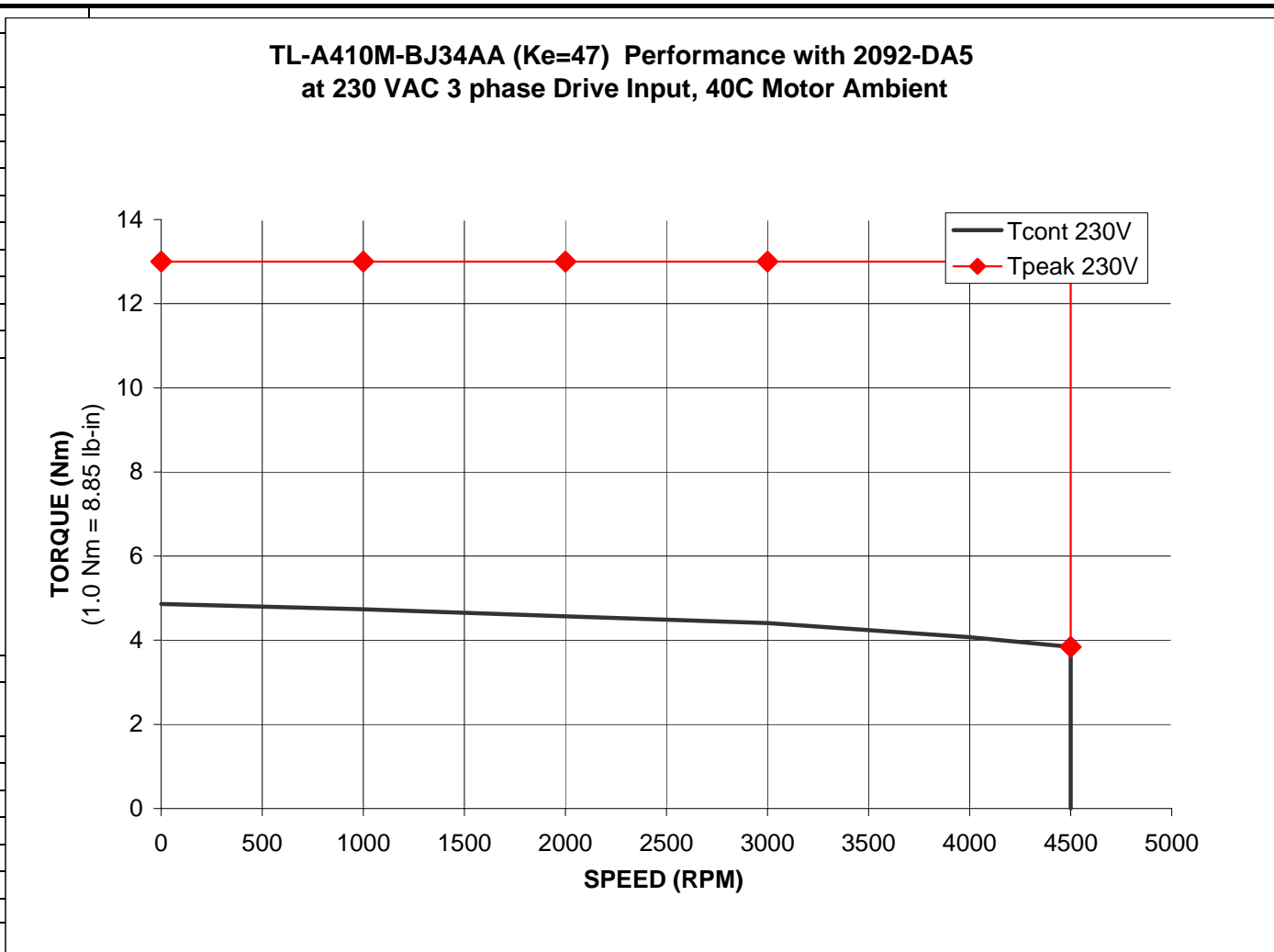
1. SD+, SD- serial data rate: 2.5 Mbps, asynchronous.
2. Communication hierarchy: Encoder is slave, communication is externally initiated.
3. Single turn absolute position value range: 0 to 131,071 (17 bit).
4. Multi-turn absolute shaft revolution value range: 0 to 65,535 revolutions (16 bit).
5. Absolute position data: Binary, value increases with CCW shaft rotation viewing motor mounting face.
6. Memory storage capacity: 80 bytes, EEPROM.

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| SPEED<br>RPM | TORQUE     |            |
|--------------|------------|------------|
|              | Tcont 230V | Tpeak 230V |
|              | Nm         | Nm         |
| 0            | 4.86       | 13         |
| 1000         | 4.74       | 13         |
| 2000         | 4.57       | 13         |
| 3000         | 4.41       | 13         |
| 4000         | 4.07       | 13         |
| 4500         | 3.84       | 13         |
| 4500         | 0          | 3.84       |
|              |            |            |
|              |            |            |

| SPEED<br>RPM | TORQUE     |            |
|--------------|------------|------------|
|              | Tcont 230V | Tpeak 230V |
|              | lb-in      | lb-in      |
| 0            | 43         | 115        |
| 1000         | 42         | 115        |
| 2000         | 40.5       | 115        |
| 3000         | 39         | 115        |
| 4000         | 36         | 115        |
| 4500         | 34         | 115        |



Note: Nm torque values shown are converted from tested lb-in data.

|               |                      |
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