

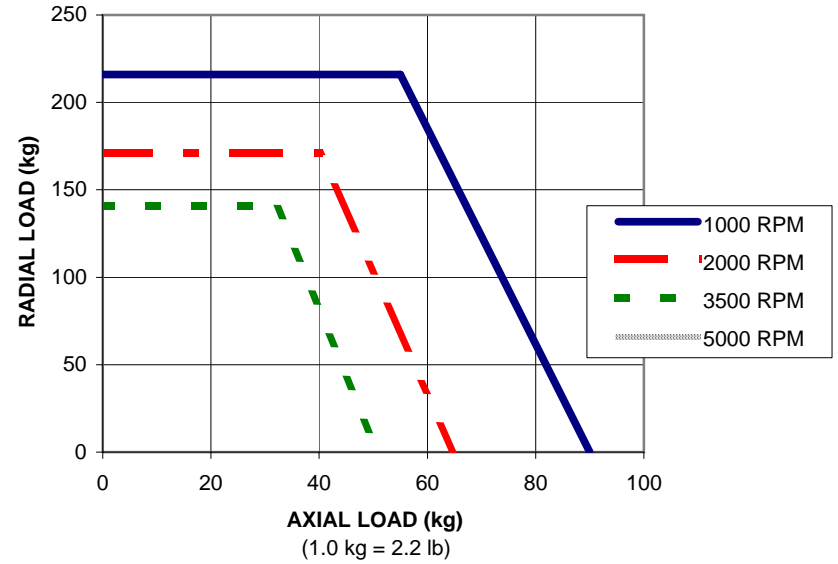
PHASE - NEUTRAL BACK EMF, ENCODER ABSOLUTE POSITION



SIN+, SIN-, COS+, COS- ENCODER OUTPUT WAVEFORMS



SHAFT LOAD RATING for 20,000 hour L10 bearing life and RADIAL LOAD applied mid-way along shaft extension




NOTES:

**General Specifications:**

1. Motor type: 3 phase, wye winding, permanent magnet rotor, totally enclosed, non-ventilated.	
2. Motor poles: .....	8
3. Operating Speed, max .....	5000 RPM
4. Base speed (max speed at peak torque), Ref: .....	4300 RPM
5. Operating voltage at base speed: .....	440 VAC RMS
6. Continuous stall torque, max, at max winding temperature in a 40C ambient: .....	30 Nm (266 lb-in)
7. Winding temperature, max, in a 40C ambient: .....	140 degrees C
8. Continuous stall current, max: .....	44.58 Amps 0 to peak
9. Heatsink size, aluminum, attached to front mounting flange for continuous torque specifications: .....	305 x 305 x 25.4mm (12 x 12 x 1.0 inch)
10. Peak stall torque, max: .....	50 Nm (443 lb-in)
11. Peak stall current, max: .....	76.37 Amps 0 to peak
12. Rated Speed (Speed at max continuous power) .....	2500
13. Continuous output rating, max at rated speed: .....	5.90 kW (7.91 hp)
14. Continuous torque, max, at rated speed: .....	22.8 Nm (202 lb-in)
15. Continuous current, Ref, at rated speed: .....	29.7 Amps 0 to peak
16. Operating voltage, Ref (Not for direct connection to AC line): .....	480 VAC RMS
17. Insulation class: .....	155C (Class F)
18. Housing temperature, max: .....	125C (257F)
19. Ke, +/-10%, phase to phase at 25C +/- 5C: .....	103 V/kRPM 0 to peak
20. Kt (sine), Ref, at 25C +/- 5C: .....	0.85 Nm/Amp (7.54 lb-in/Amp) 0 to peak
21. Winding resistance, +/- 10%, phase to phase at 25C +/- 5C: .....	0.129 ohms
22. Winding inductance, Ref, phase to phase: .....	4.16 mH
23. Dielectric rating of motor power connections (U,V,W), to ground for 1 second: .....	1800 VAC RMS 50/60 Hz
24. Audible noise, Ref, at 1 meter distance: .....	XX dBA
25. Rotor inertia, +/- 10%: .....	0.02059 kg-m <sup>2</sup> (0.18224 lb-in-sec <sup>2</sup> )
26. Rotor balancing quality grade: .....	G-6.3
27. Friction torque, Ref: .....	0.366 Nm (3.23 lb-in)
28. Friction torque, Ref, with shaft seal option installed: .....	0.46 Nm (4.06 lb-in)
29. Cogging torque, Ref: .....	0.256 Nm (2.27 lb-in) peak to peak
30. Thermal resistance, Ref, winding to ambient: .....	0.49 degrees C/watt
31. Thermal time constant, Ref, winding to ambient: .....	76 minutes
32. Product weight, Ref: .....	43.8 kg (96.5 lb)
33. Shipping weight, Ref: .....	49.26 kg (108.5 lb)
34. Operating ambient temperature: .....	0C to 40C (32F to 104F)

**Notes:**

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

	CONFIDENTIAL AND PROPRIETARY INFORMATION	Engineering Specification Electrical		Sheet <b>2</b> of <b>5</b>	
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	Dr. Scott Johnson	Date	08-26-09	<b>A</b>	<b>01</b>

**General Specifications, continued:**


- 35. Storage ambient temperature: ..... -30C to 70C (-22F to 158F)
- 36. Relative humidity, non-condensing: ..... 5% to 95%
- 37. Liquid / dust protection: ..... IP66
- 38. Shock, max, 6 msec duration: ..... 20 g peak
- 39. Vibration, max, 30 to 2000 Hz: ..... 2.5 g peak
- 40. Shaft material: ..... Steel, 1144
- 41. Paint, color: ..... Black
- 42. Shaft, key (if provided), front mounting surface, and connector mating surfaces are not painted.

**Feedback Specifications:**

- 1. SIN, COS waveform output: ..... 1024 sinusoids/rev
- 2. SIN, COS waveform amplitude,  $\pm 10\%$ : ..... 1.0 VAC peak to peak
- 3. SIN -, COS - voltage offset with respect to ECOM  $\pm 0.3$  VDC: ..... 2.2 to 2.8 VDC
- 4. EPWR 5V (encoder power) input voltage: ..... N/A
- 5. EPWR 5V continuous input current,max, at 5.0 VDC: ..... N/A
- 6. EPWR 5V inrush input current, max, when connected to Kinetix6000 drive: ..... N/A
- 7. EPWR 9V (encoder power) input voltage: ..... 7.0 to 12.0 VDC
- 8. EPWR 9V continuous input current,max, at 9.0 VDC: ..... 80 mADC
- 9. EPWR 9V inrush input current, max, when connected to Kinetix6000 drive: ..... 3.9 ADC
- 10. TS+, TS- thermostat operating voltage, max: ..... 250 Volts
- 11. TS+, TS- thermostat continuous current, max, at 0.6 power factor: ..... 1.6 Amps
- 12. TS+, TS- thermostat continuous current, max, at 1.0 power factor: ..... 2.5 Amps
- 13. DATA+, DATA- signal type, rate, asynchronous: ..... RS 485, 9600 baud
- 14. Communication hierarchy: Encoder is slave, communication is externally initiated.
- 15. Single turn absolute position value range: ..... 0 to 32,767 (15 bit)
- 16. Absolute position data: Binary, value increases with CW shaft rotation viewing motor mounting face.
- 17. Data (byte) format: Start bit, 8 data bits, parity bit, stop bit.
- 18. Memory storage capacity, EEPROM: ..... 128 bytes
- 19. Encoder temperature data: Binary value of encoder temperature in degrees C.

**Notes:**

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**Brake Specifications:**

1. Type: Spring-set holding brake, releases when voltage applied.
2. Holding torque, max: ..... 70 Nm (619 lb-in)
3. Voltage input, +15/-10%, may be applied either polarity: ..... 24 VDC
4. Current input, +/- 10%, at 24 VDC, at 25C +/- 5C: ..... 2.05 ADC
5. Coil resistance, +/-10%, at 25C +/- 5C: ..... 11.76 Ohms
6. Coil resistance, +/-10%, with motor operating at max continuous stall torque rating in a 40C ambient: ..... 16.46 Ohms
7. Release time delay (when voltage applied), Ref: ..... 200 msec
8. Engage time delay, (when voltage removed), Ref, with diode used as arc suppression device  
in external control circuit: ..... 900 msec
9. Engage time delay, (when voltage removed), Ref, with MOV used as arc suppression device  
in external control circuit: ..... 120 msec
10. Rotational backlash, Ref, with brake engaged: ..... 25 arc minutes
11. Dielectric rating of brake connections (MBRK+, MBRK-) to ground for 1 second: ..... 1200 VAC RMS 50/60 Hz

**Notes:**

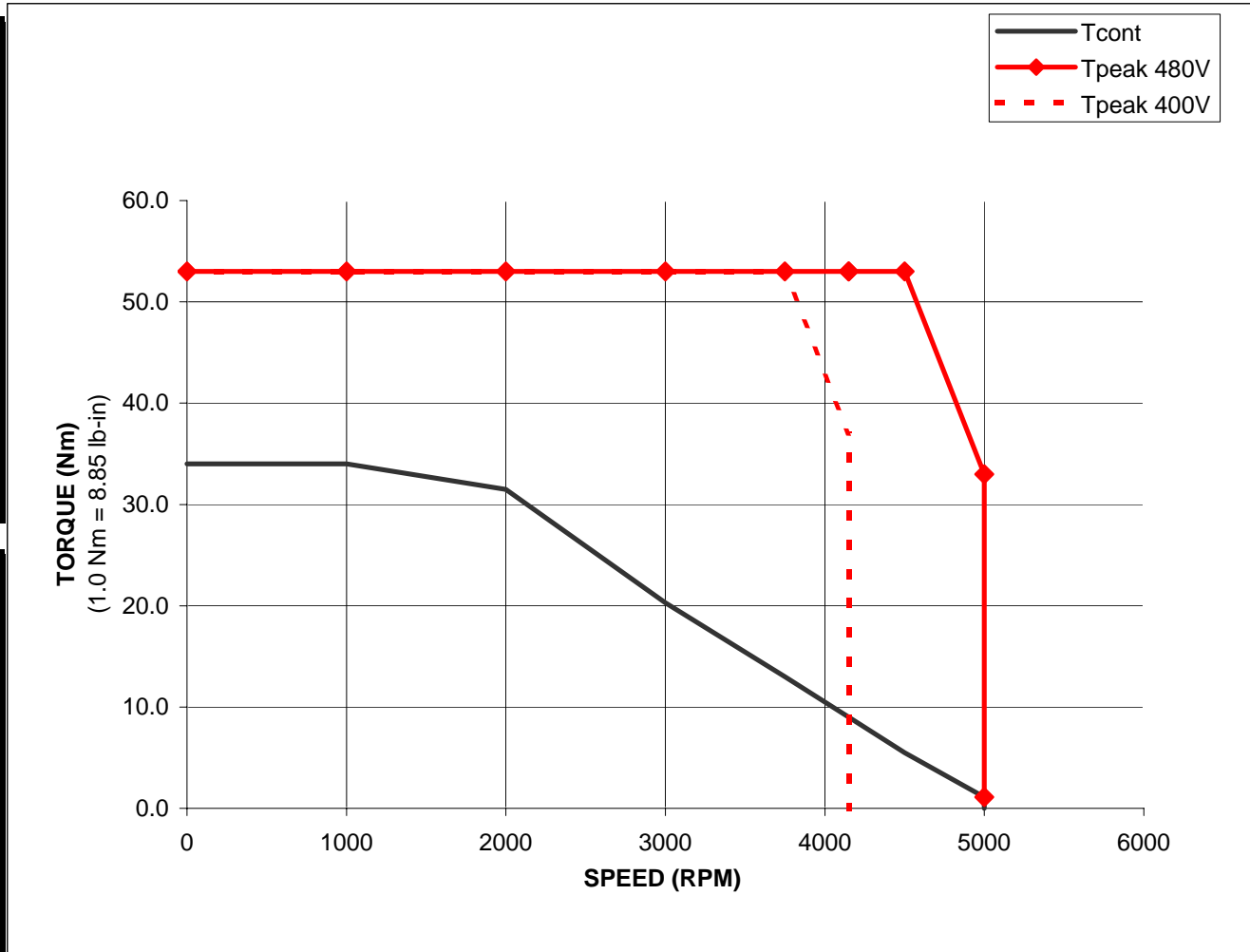
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**MPM-B2152M-Sxx4xx Performance with 2094-BC07-M05,  
3 Phase at 480 VAC Drive Input, 40C Motor Ambient**

SPEED RPM	TORQUE		
	Tcont	Tpeak 480V	Tpeak 400V
	Nm	Nm	Nm
0	34	53	53
1000	34	53	53
2000	31.5	53	53
3000	20.3	53	53
3750	13	53	53
4150	9	53	37
4150	9	53	0
4500	5.5	53	#N/A
5000	1.1	33	#N/A
5000	0	1.1	#N/A
#N/A	#N/A	#N/A	#N/A
#N/A	#N/A	#N/A	#N/A

SPEED RPM	TORQUE		
	Tcont	Tpeak 480V	Tpeak 400V
	lb-in	lb-in	lb-in
0	300.9	469.1	469.1
1000	300.9	469.1	469.1
2000	278.8	469.1	469.1
3000	179.7	469.1	469.1
3750	115.1	469.1	469.1
4150	79.7	469.1	327.5
4150	79.7	469.1	0.0
4500	48.7	469.1	#N/A
5000	9.7	292.1	#N/A
5000	0.0	9.7	#N/A
#N/A	#N/A	#N/A	#N/A
#N/A	#N/A	#N/A	#N/A



**Notes:**

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



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