

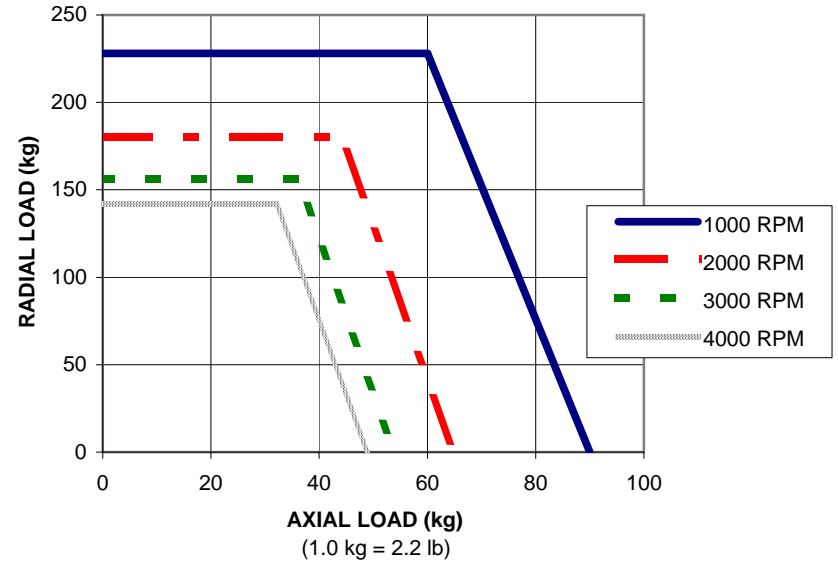
PHASE - NEUTRAL BACK EMF, ENCODER ABSOLUTE POSITION



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 .....	3800 RPM
4. Base speed (max speed at peak torque), Ref: .....	3100 RPM
5. Operating voltage at base speed: .....	440 VAC RMS
6. Continuous stall torque, max, at max winding temperature in a 40C ambient: .....	45 Nm (398 lb-in)
7. Winding temperature, max, in a 40C ambient: .....	140 degrees C
8. Continuous stall current, max: .....	43.86 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: .....	99 Nm (876 lb-in)
11. Peak stall current, max: .....	98.43 Amps 0 to peak
12. Rated Speed (Speed at max continuous power) .....	2000
13. Continuous output rating, max at rated speed: .....	7.20 kW (9.65 hp)
14. Continuous torque, max, at rated speed: .....	34.5 Nm (305 lb-in)
15. Continuous current, Ref, at rated speed: .....	31.3 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: .....	148 V/kRPM 0 to peak
20. Kt (sine), Ref, at 25C +/- 5C: .....	1.22 Nm/Amp (10.83 lb-in/Amp) 0 to peak
21. Winding resistance, +/- 10%, phase to phase at 25C +/- 5C: .....	0.163 ohms
22. Winding inductance, Ref, phase to phase: .....	5.08 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%: .....	0.02254 kg-m <sup>2</sup> (0.19949 lb-in-sec <sup>2</sup> )
26. Rotor balancing quality grade: .....	G-6.3
27. Friction torque, Ref: .....	0.67 Nm (5.9 lb-in)
28. Friction torque, Ref, with shaft seal option installed: .....	1.0 Nm (8.85 lb-in)
29. Cogging torque, Ref: .....	0.46 Nm (4.13 lb-in) peak to peak
30. Thermal resistance, Ref, winding to ambient: .....	0.37 degrees C/watt
31. Thermal time constant, Ref, winding to ambient: .....	83 minutes
32. Product weight, Ref: .....	52.6 kg (115.8 lb)
33. Shipping weight, Ref: .....	57.16 kg (125.9 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, ± 10%: ..... 1.0 VAC peak to peak
- 3. SIN -, COS - voltage offset with respect to ECOM ±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:**

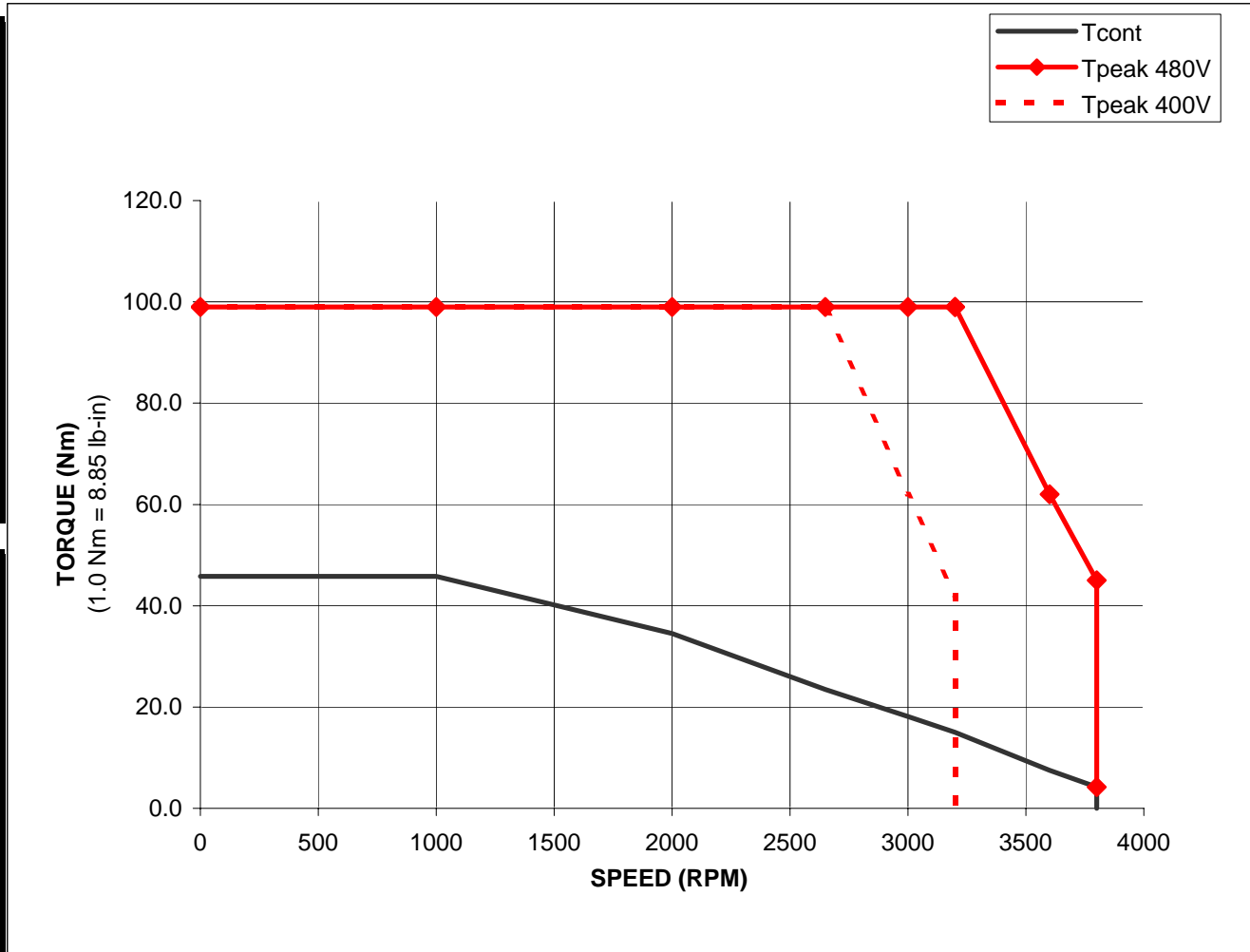
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		Dr. Scott Johnson	Date 08-26-09	<b>A</b>	Ver <b>01</b>

**MPM-B2153F-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	45.8	99	99
1000	45.8	99	99
2000	34.5	99	99
2650	23.5	99	99
3000	18.1	99	62
3200	15	99	42
3200	15	99	0
3600	7.5	62	#N/A
3800	4.2	45	#N/A
3800	0	4.2	#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	405.4	876.2	876.2
1000	405.4	876.2	876.2
2000	305.4	876.2	876.2
2650	208.0	876.2	876.2
3000	160.2	876.2	548.7
3200	132.8	876.2	371.7
3200	132.8	876.2	0.0
3600	66.4	548.7	#N/A
3800	37.2	398.3	#N/A
3800	0.0	37.2	#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.