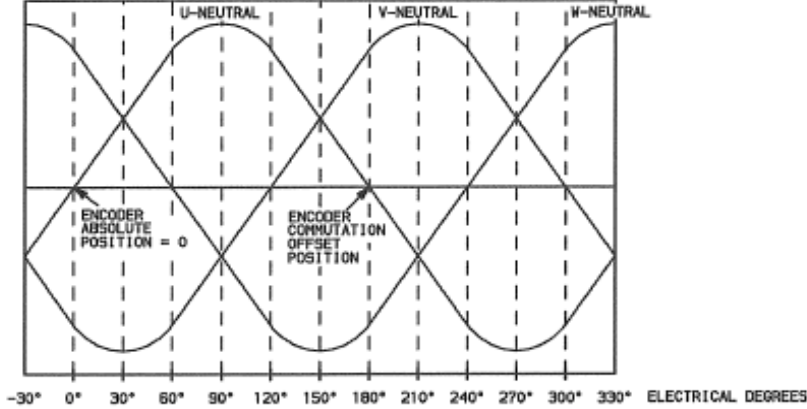
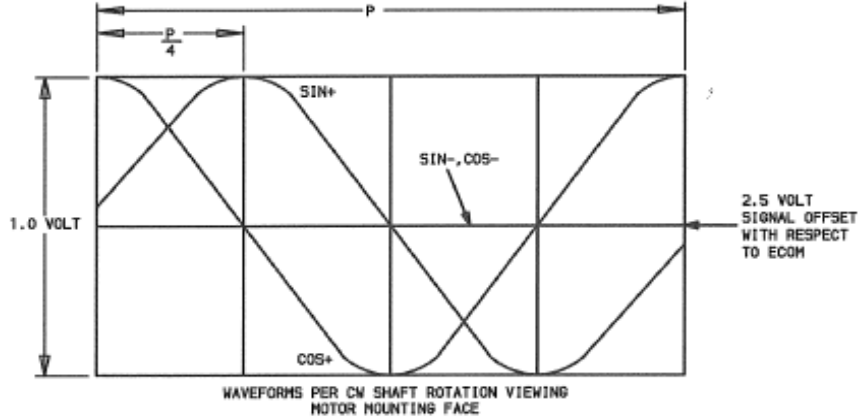


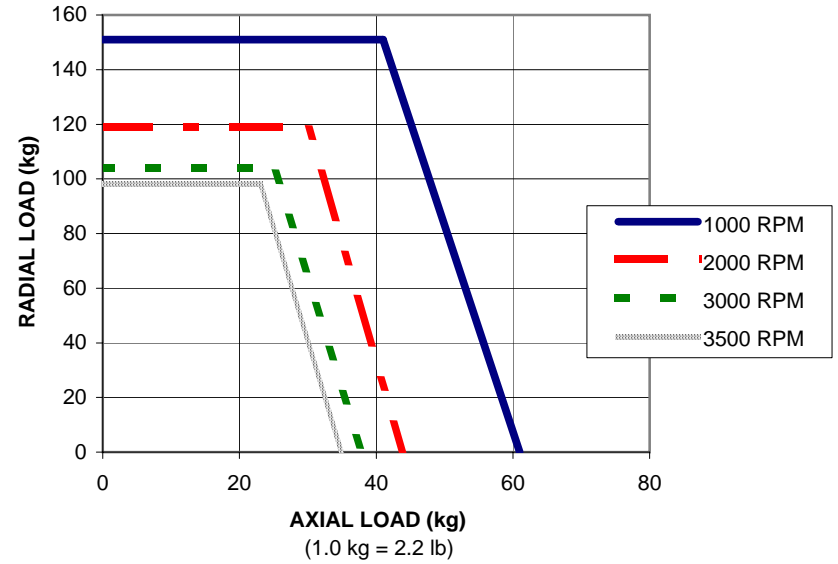
PHASE - NEUTRAL BACK EMF, ENCODER ABSOLUTE POSITION



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 .....	3500 RPM
4. Base speed (max speed at peak torque), Ref: .....	2250 RPM
5. Operating voltage at base speed: .....	440 VAC RMS
6. Continuous stall torque, max, at max winding temperature in a 40C ambient: .....	19.4 Nm (172 lb-in)
7. Winding temperature, max, in a 40C ambient: .....	140 degrees C
8. Continuous stall current, max: .....	20.94 Amps 0 to peak
9. Heatsink size, aluminum, attached to front mounting flange for continuous torque specifications: .....	305 x 305 x 12.7mm (12 x 12 x 0.5 inch)
10. Peak stall torque, max: .....	48 Nm (425 lb-in)
11. Peak stall current, max: .....	60.53 Amps 0 to peak
12. Rated Speed (Speed at max continuous power) .....	3500
13. Continuous output rating, max at rated speed: .....	4.30 kW (5.76 hp)
14. Continuous torque, max, at rated speed: .....	11.8 Nm (104 lb-in)
15. Continuous current, Ref, at rated speed: .....	11.3 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: .....	140 V/kRPM 0 to peak
20. Kt (sine), Ref, at 25C +/- 5C: .....	1.16 Nm/Amp (10.25 lb-in/Amp) 0 to peak
21. Winding resistance, +/- 10%, phase to phase at 25C +/- 5C: .....	0.627 ohms
22. Winding inductance, Ref, phase to phase: .....	12.46 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%: .....	0.007405 kg-m <sup>2</sup> (0.06554 lb-in-sec <sup>2</sup> )
26. Rotor balancing quality grade: .....	G-6.3
27. Friction torque, Ref: .....	0.267 Nm (2.36 lb-in)
28. Friction torque, Ref, with shaft seal option installed: .....	0.37 Nm (3.27 lb-in)
29. Cogging torque, Ref: .....	0.16 Nm (1.41 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: .....	50 minutes
32. Product weight, Ref: .....	23.2 kg (51.1 lb)
33. Shipping weight, Ref: .....	26.47 kg (58.3 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>	

**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: ..... 28.3 Nm (250 lb-in)
3. Voltage input, +15/-10%, may be applied either polarity: ..... 24 VDC
4. Current input, +/- 10%, at 24 VDC, at 25C +/- 5C: ..... 1.17 ADC
5. Coil resistance, +/-10%, at 25C +/- 5C: ..... 20.5 Ohms
6. Coil resistance, +/-10%, with motor operating at max continuous stall torque rating in a 40C ambient: ..... 26.7 Ohms
7. Release time delay (when voltage applied), Ref: ..... 70 msec
8. Engage time delay, (when voltage removed), Ref, with diode used as arc suppression device  
in external control circuit: ..... 250 msec
9. Engage time delay, (when voltage removed), Ref, with MOV used as arc suppression device  
in external control circuit: ..... 50 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:**

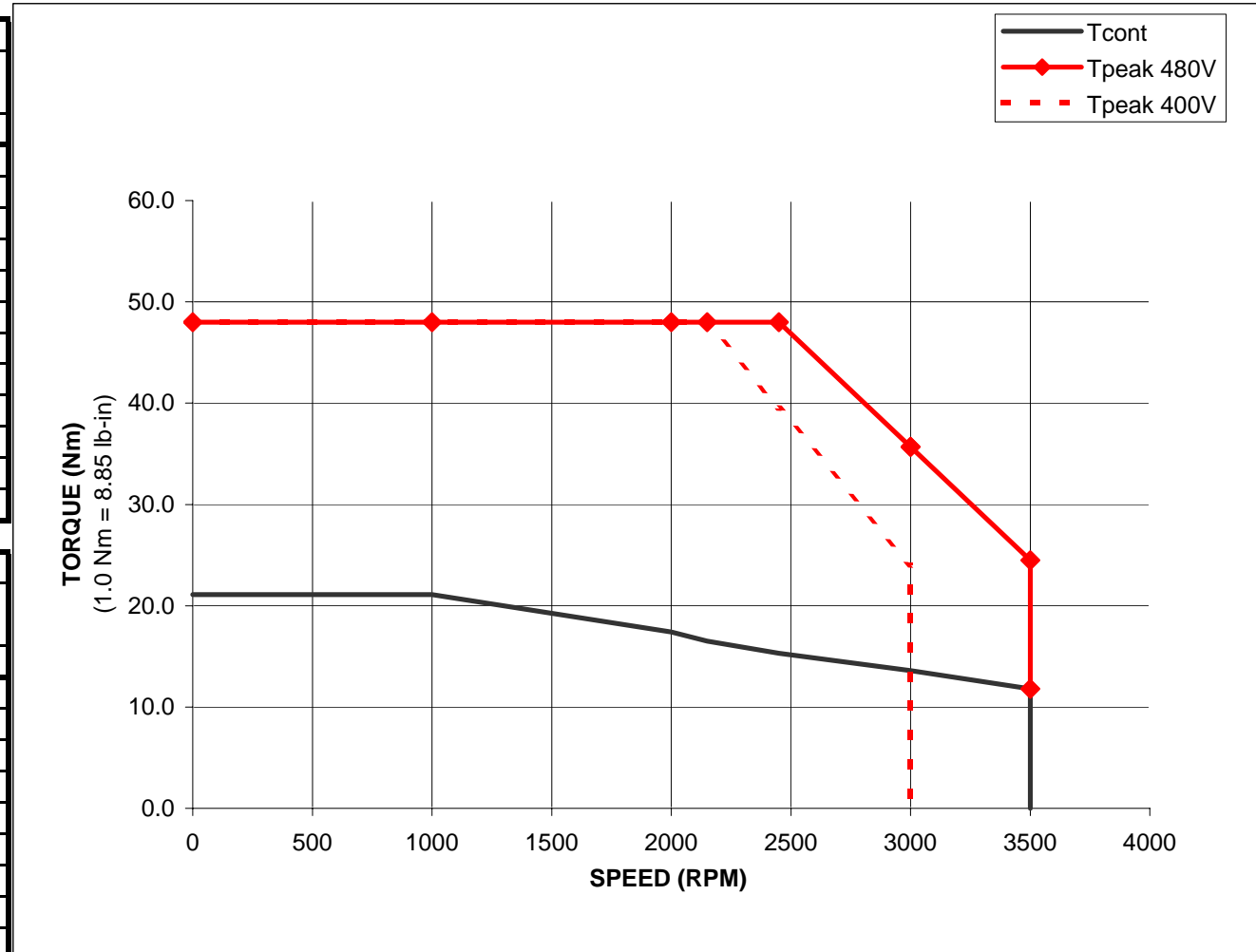
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	Dr. Scott Johnson	Date	08-26-09	<b>A</b>	Ver <b>01</b>

**MPM-B1652E-Sxx4xx Performance with 2094-BC04-M03,  
3 Phase at 480 VAC Drive Input, 40C Motor Ambient**

SPEED RPM	TORQUE		
	Tcont	Tpeak 480V	Tpeak 400V
	Nm	Nm	Nm
0	21.1	48	48
1000	21.1	48	48
2000	17.4	48	48
2150	16.5	48	48
2450	15.3	48	39.5
3000	13.6	35.7	24
3000	13.6	35.7	0
3500	11.8	24.5	#N/A
3500	0	11.8	#N/A
#N/A	#N/A	#N/A	#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	186.8	424.8	424.8
1000	186.8	424.8	424.8
2000	154.0	424.8	424.8
2150	146.0	424.8	424.8
2450	135.4	424.8	349.6
3000	120.4	316.0	212.4
3000	120.4	316.0	0.0
3500	104.4	216.8	#N/A
3500	0.0	104.4	#N/A
#N/A	#N/A	#N/A	#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.