

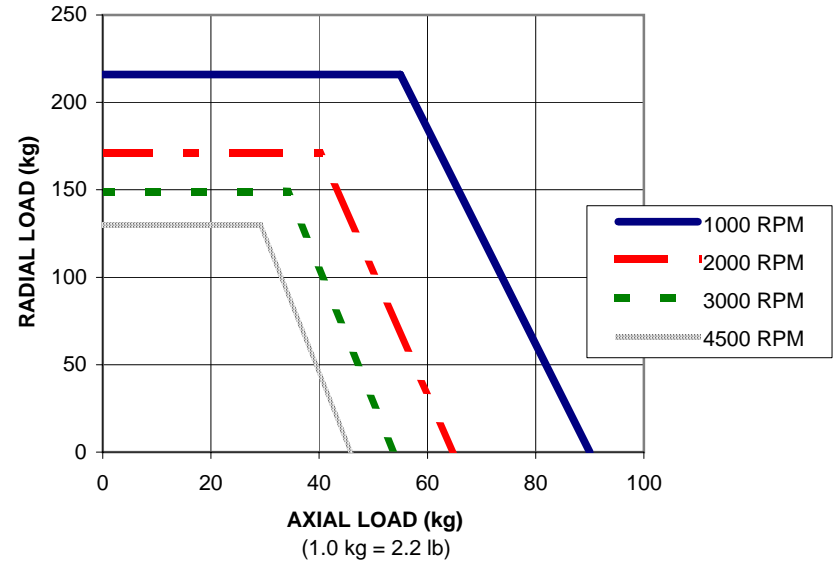
PHASE - NEUTRAL BACK EMF, ENCODER ABSOLUTE POSITION



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	4000 RPM
4. Base speed (max speed at peak torque), Ref:	3000 RPM
5. Operating voltage at base speed:	220 VAC RMS
6. Continuous stall torque, max, at max winding temperature in a 40C ambient:	27 Nm (239 lb-in)
7. Winding temperature, max, in a 40C ambient:	140 degrees C
8. Continuous stall current, max:	59.04 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:	56 Nm (496 lb-in)
11. Peak stall current, max:	125.86 Amps 0 to peak
12. Rated Speed (Speed at max continuous power)	2000
13. Continuous output rating, max at rated speed:	5.20 kW (6.97 hp)
14. Continuous torque, max, at rated speed:	24.8 Nm (219 lb-in)
15. Continuous current, Ref, at rated speed:	47.6 Amps 0 to peak
16. Operating voltage, Ref (Not for direct connection to AC line):	240 VAC RMS
17. Insulation class:	155C (Class F)
18. Housing temperature, max:	125C (257F)
19. Ke, +/-10%, phase to phase at 25C +/- 5C:	70 V/kRPM 0 to peak
20. Kt (sine), Ref, at 25C +/- 5C:	0.58 Nm/Amp (5.12 lb-in/Amp) 0 to peak
21. Winding resistance, +/- 10%, phase to phase at 25C +/- 5C:	0.066 ohms
22. Winding inductance, Ref, phase to phase:	1.92 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 ² (0.18223 lb-in-sec ²)
26. Rotor balancing quality grade:	G-6.3
27. Friction torque, Ref:	0.44 Nm (3.93 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 2 of 5	
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		Dr. Scott Johnson	Date 08-26-09		Ver 01

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 ± 0.3 VDC: 2.5 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.

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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:

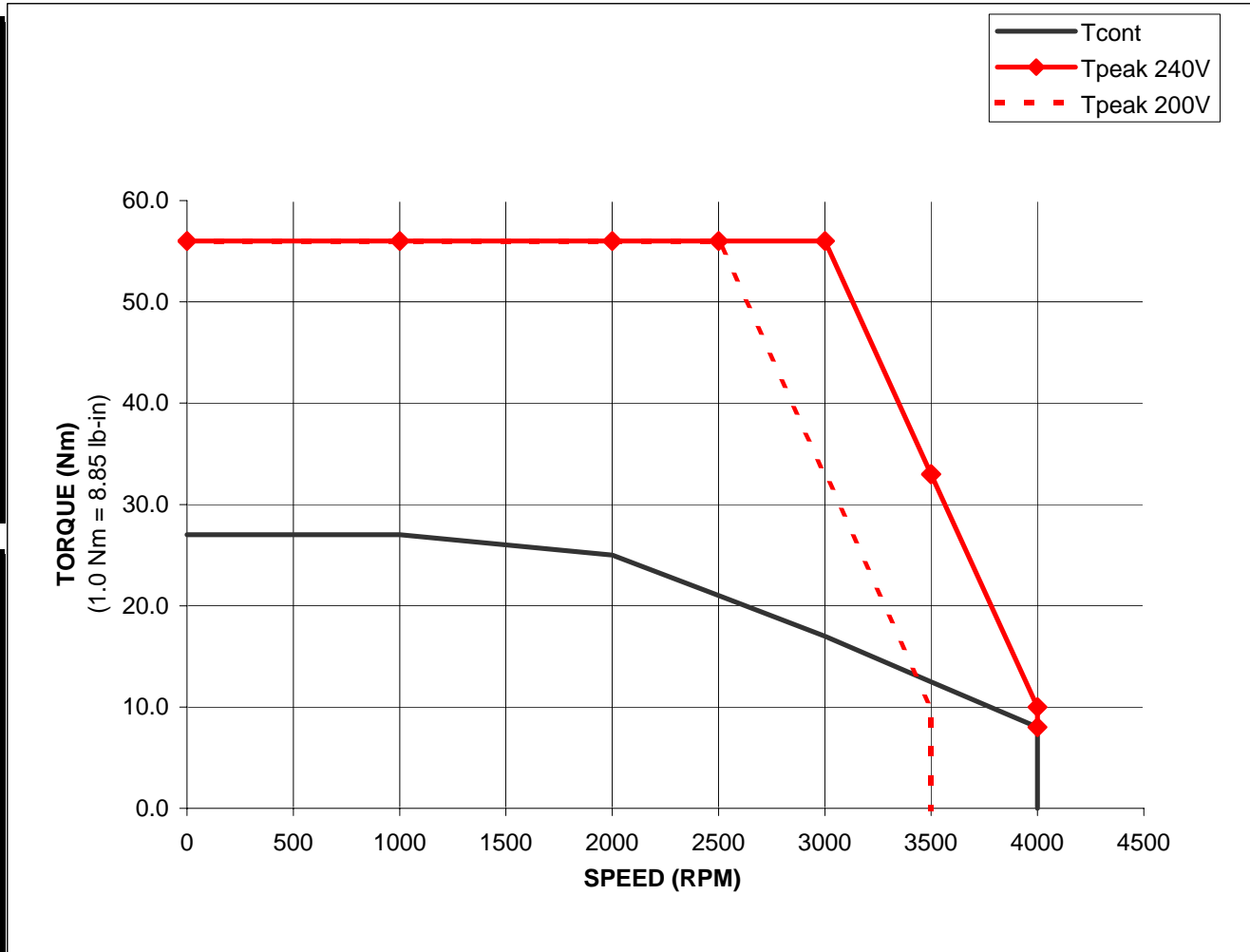
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**MPM-A2152F-Mxx4xx Performance with 2098-DSD-150,
3 Phase at 240 VAC Drive Input, 40C Motor Ambient**

SPEED RPM	TORQUE		
	Tcont	Tpeak 240V	Tpeak 200V
	Nm	Nm	Nm
0	27	56	56
1000	27	56	56
2000	25	56	56
2500	21	56	56
3000	17	56	33
3500	12.5	33	10
3500	12.5	33	0
4000	8	10	#N/A
4000	0	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 240V	Tpeak 200V
	lb-in	lb-in	lb-in
0	239.0	495.6	495.6
1000	239.0	495.6	495.6
2000	221.3	495.6	495.6
2500	185.9	495.6	495.6
3000	150.5	495.6	292.1
3500	110.6	292.1	88.5
3500	110.6	292.1	0.0
4000	70.8	88.5	#N/A
4000	0.0	70.8	#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



Notes:

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