Data Publication

Kollmorgen GOLDLINE™ XT Brushless Series Motors

50 Frame Size

The new, performance driven Kollmorgen **GOLD**LINE XT servomotor extends the traditional Kollmorgen **GOLD**LINE series' application capabilities. Kollmorgen's patented buried magnet design provides the lowest cogging/torque ripple system on the market. A high resolution encoder (8192 pulses per rev) provides resolution and accuracy not available from standard encoder or resolver based systems. Increased thermal time constants allow longer overloads on machines. The XT also sets a new standard in precision machining of mechanical mountings. Tolerances nearly half of NEMA standards help to reduce vibration and noise and increase the life of customer assemblies. Shaft runout, perpendicularity, and concentricity are all improved over industry standards.

The Kollmorgen **GOLD**LINE XT is fully compatible with Kollmorgen's SERVO**STAR** digital amplifiers.

KOLLMORGEN

Kollmorgen GOLDLINE XT

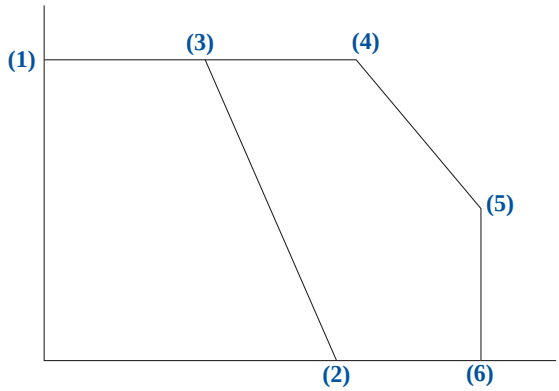
50X PERFORMANCE DATA

Parameters	Symbols	Units	MT502A1	MT502B1	MT504A1
Horsepower	HP Rated	HP	0.8	1.5	1.8
Kilowatts	kW Rated	kW	0.6	1.1	1.3
Speed at Rated Power	N Rated	RPM	2200	3300	2200
(1) Max Operating Speed	N Max	RPM	2200	3300	2200
(2) Continuous Torque (Stall)	Tc	lb-ft	2.3	2.7	4.7
at 40ºC		N-m	3.1	3.6	6.3
Continuous Torque (Stall)	Tc	lb-ft	2.45	2.87	5.0
at 25ºC		N-m	3.3	3.83	6.7
Continuous Line Current	Ic	Amps RMS	2.4	5.5	5.1
Peak Torque	Tp	lb-ft	7.4	7.5	15.4
		N-m	10.0	10.1	20.8
Peak Line Current	Ip	Amps RMS	10.4	20.4	20.8
Max Theoretical Acceleration	Z	rad / sec^2	19827	20021	22303
Torque Sensitivity (Stall) ±10%	Kt	lb-ft / Amp RMS	0.94	0.48	0.91
		N-m / Amp RMS	1.27	0.65	1.24
Back EMF (Line-to-Line) ±10%	Kb	VRMS / kRPM	76.7	39.5	74.9
Max Line-to-Line Volts	VMax	Volts RMS	250	250	250
DC Res at 25ºC (Line-to-Line) ±10%	Rm	Ohms	12.33	3.46	3.69
Inductance (Line-to-Line) ±30%	Lm	mh	58.0	15.5	29.0
Rotor Inertia	Jm	lb-ft-sec^2	0.00037	0.00037	0.00069
		kg-m^2	0.00051	0.00051	0.00093
Weight (without brake)	Wt	lb	12.9	12.9	17.6
		kg	5.9	5.9	8.0
Static Friction	Tf	lb-ft	0.059	0.059	0.085
		N-m	0.080	0.080	0.115
Thermal Time Constant	TCT	Min.	34	34	40
Viscous Damping Z Source	Fi	lb-ft / kRPM	0.035	0.035	0.037
		N-m / kRPM	0.047	0.047	0.050
Motor Constant at 25ºC	Km	lb-ft / $\sqrt{\text{Watts}}$	0.283	0.275	0.506
		N-m / $\sqrt{\text{Watts}}$	0.384	0.373	0.686
Thermal Resistance at Stall	Rth	°C / Watt	0.649	0.451	0.497
Number of Poles			8	8	8

How to Determine Your Speed/Torque Performance Curve

The performance curve is made up of six points:

Point	Key	Units
(1)	Max operating speed	RPM
(2)	Continuous stall torque	N-m
(3)	Rated torque	N-m
(4)	Max peak torque at max speed	N-m
(5)	Peak torque break point speed	RPM
(6)	Peak torque from drive/motor comibination	N-m



50X PERFORMANCE DATA

MT504B1	MT506A1	MT506B1	Units	Symbols	Parameters
2.5	2.9	3.7	HP	HP Rated	**Horsepower**
1.9	2.1	2.8	kW	kW Rated	**Kilowatts**
3300	2200	3300	RPM	N Rated	**Speed at Rated Power**
3300	2200	3300	RPM	N Max	**Max Operating Speed (1)**
4.9	8.0	8.4	lb-ft	Tc	**Continuous Torque (Stall) (2)**
6.6	10.9	11.4	N-m		**at 40°C**
5.2	8.5	8.9	lb-ft	Tc	**Continuous Torque (Stall)**
7.0	11.6	12.1	N-m		**at 25°C**
8.7	8.0	16.7	Amps RMS	Ic	**Continuous Line Current**
15.7	33.0	33.2	lb-ft	Tp	**Peak Torque**
21.2	44.8	45.0	N-m		
34.7	37.2	74.4	Amps RMS	Ip	**Peak Line Current**
22733	24719	24839	rad / sec^2	Z	**Max Theoretical Acceleration**
0.56	1.00	0.50	lb-ft / Amp RMS	Kt	**Torque Sensitivity (Stall) ±10%**
0.76	1.36	0.68	N-m / Amp RMS		
45.8	82.4	41.4	VRMS / kRPM	Kb	**Back EMF (Line-to-Line) ±10%**
250	250	250	Volts RMS	VMax	**Max Line-to-Line Volts**
1.18	1.46	0.371	Ohms	Rm	**DC Res at 25°C (Line-to-Line) ±30%**
10.5	14.6	3.8	mh	Lm	**Inductance (Line-to-Line) ±30%**
0.00069	0.00134	0.00134	lb-ft-sec^2	Jm	**Rotor Inertia**
0.00093	0.00181	0.00181	kg-m^2		
17.6	24.2	24.2	lb	Wt	**Weight (without brake)**
8.0	11.0	11.0	kg		
0.085	0.2	0.2	lb-ft	Tf	**Static Friction**
0.115	0.27	0.27	N-m		
40	47	47	Min	TCT	**Thermal Time Constant**
0.037	0.079	0.079	lb-ft / kRPM	Fi	**Viscous Damping Z Source**
0.050	0.107	0.107	N-m / kRPM		
0.547	0.885	0.882	lb-ft / $\sqrt{\text{Watts}}$	Km	**Motor Constant at 25°C**
0.742	1.2	1.2	N-m / $\sqrt{\text{Watts}}$		
0.530	0.513	0.462	°C / Watt	Rth	**Thermal Resistance at Stall**
8	8	8			**Number of Poles**

Follow these steps to calculate your speed/torque curve:

Step 1: Select max speed **(1)** from performance data

Step 2: Select continuous torque **(2)** from performance data

Step 3: Calculate rated torque **(3)** by using this formula:

$$\text{rated torque (N-m)} = \frac{\text{kW rated (from performance data)} \times 9550}{\text{N rated (from performance data)}}$$

Step 4: Calculate point four **(4)** by using this formula:

max peak torque at max speed = rated torque (step 3) x 1.5

Step 5: Calculate point five **(5)** by using this formula:

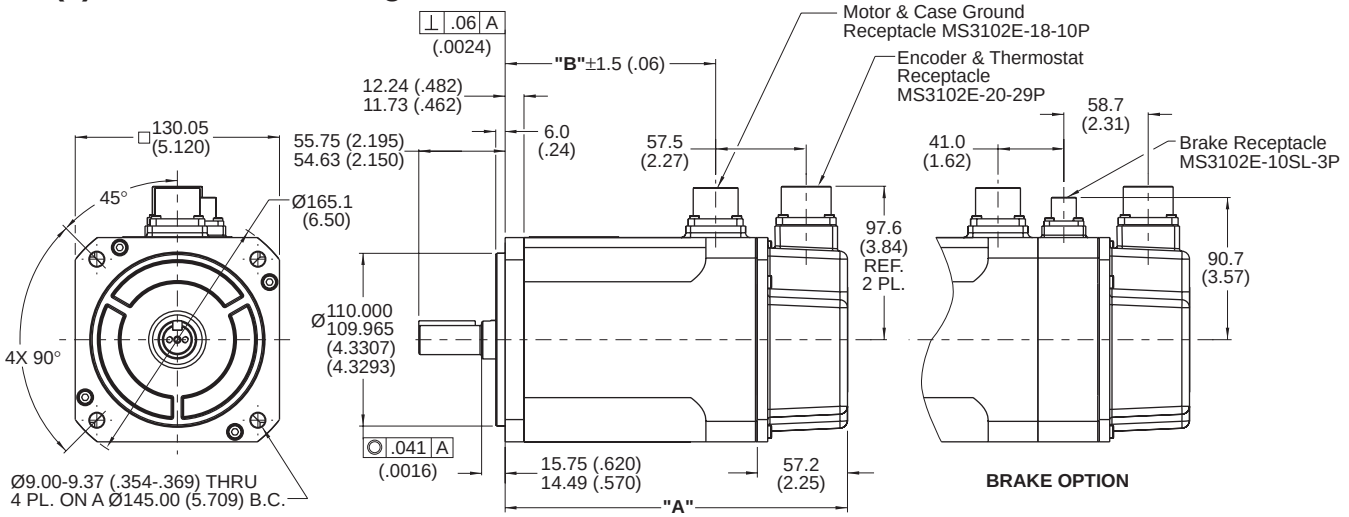
peak torque break point speed = max operating speed (step 1) x 0.4

Step 6: System peak torque is a function of the amplifier used with the motor winding. Calculate system peak torque by using the following formula:

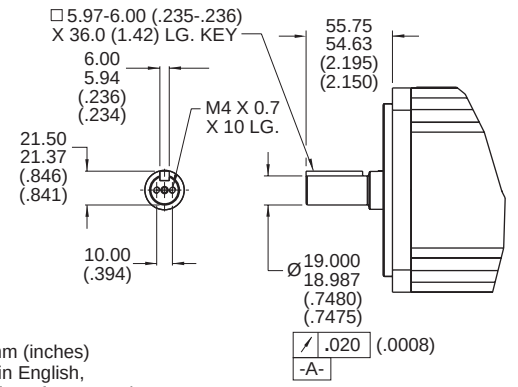
$$\text{system peak torque} = \frac{\text{Ip of drive*} \times \text{Tp of motor (from performance data)}}{\text{Ip of motor (from performance data)}}$$

*Not to exceed Ip of motor

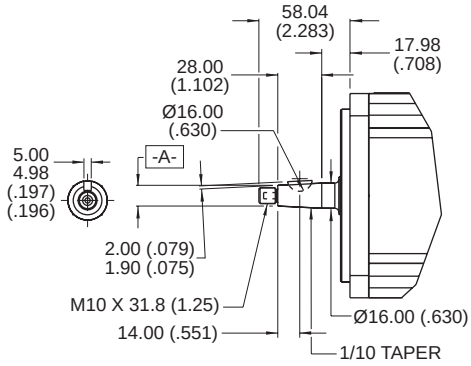
MT(x)50x Outline Drawing



STRAIGHT SHAFT KEYWAY OPTION



TAPERED SHAFT OPTION



Dimensions in mm (inches)
Motor designed in English,
Metric provided for reference only.
Tolerances, unless otherwise specified:
metric: X decimal place ±.4, XX decimal places ±.13
inches: XX decimal places ±.015, XXX decimal places ±.005

Model	"A" Max		"B"
	with brake	without brake	
MT(x)502	218.8 (8.615)	180.6 (7.110)	98 (3.84)
MT(x)504	255.3 (10.05)	217.1 (8.547)	134 (5.28)
MT(x)506	300.5 (11.83)	262.3 (10.327)	179 (7.06)

Ordering Information

MT B 5 0 2 A 1 - F 1 A 1 - xxx

Brake Option
Blank - No brake option
B = 90 VDC brake

Frame Size
5 = 130 mm

Stack Length, Number

Winding Letter

Rotor Inertia Option
1 = Minimum Inertia

Feedback Option
F = 8192 PPR incremental encoder

Sequential number for specials
Blank = established standards

Shaft Seal Option
1 = Standard w/ shaft seal
3 = No shaft seal

Connector Option
A = MS Screw Type Recep
B = MS Screw Type Recep w/ CE mating plugs

Mounting Option
1 = 19 mm std shaft w/ 6 mm sq key, 130 mm sq flange
3 = Tapered shaft w/key, 130 mm sq flange

Kollmorgen enjoys a reputation of excellence based on constant endeavors to update products. Information in this brochure is subject to change.

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