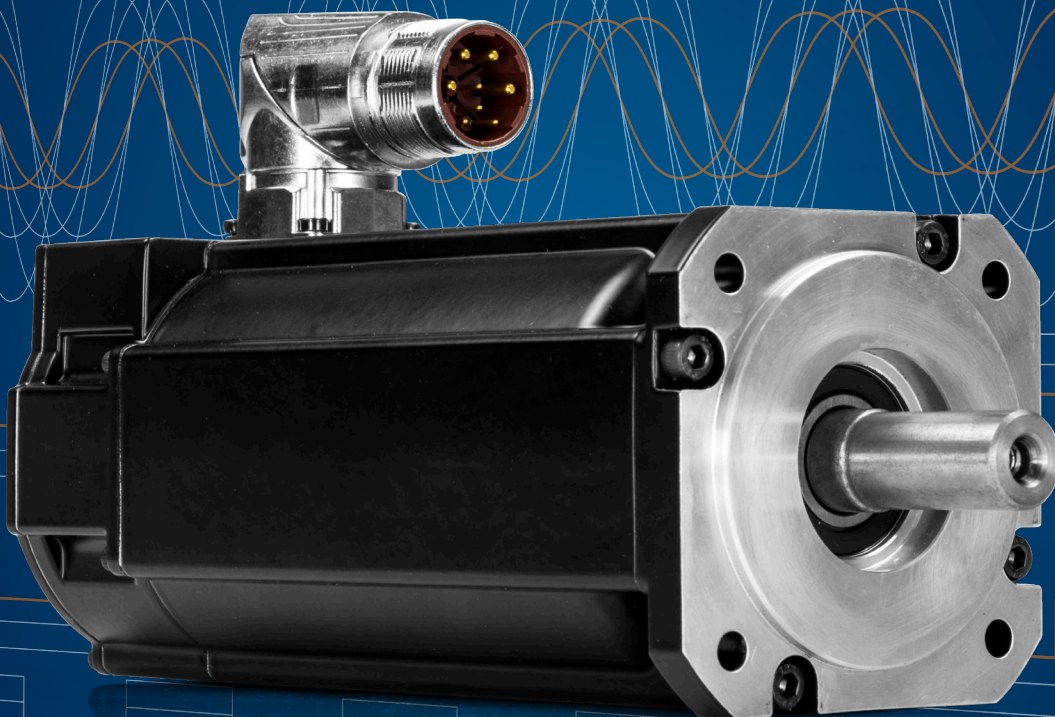


AKM[®] 2G Low Voltage Servo Motor

Selection Guide



KOLLMORGEN

A REGAL REYNORD BRAND

Kollmorgen: Your Partner, In Motion.

Every solution comes from a real understanding of the challenges facing machine designers and users.

Innovators consistently rate Kollmorgen as one of their best motion systems manufacturing partners. Whether you are looking for classic servo motors, direct-drive servo motors, stepper motors, drives & amplifiers, gearing, actuation, or multi-axis motion controllers, Kollmorgen is one of the few companies in the world that actually designs and manufactures all of these products.

Our customers are leaders in many industries such as Aerospace & Defense, Printing, Packaging & Converting, Food & Beverage Processing, Medical Imaging, In Vitro Diagnostics & Laboratory Automation, Pharmaceutical Manufacturing, Material Forming and Cutting, Oil & Gas, and Robotics. Kollmorgen is also a leader in Warehouse Automation, including complete AGV systems, software, awareness and autonomy.

Our Automation Solutions can be found on Mars and in space, ships and submarines, O&G drilling and metrology, surgical robots and laser eye surgery, even inside artificial hearts. These are just a few applications that demand high-performance and high-quality while satisfying their specific needs.

Because motion matters, it's our focus: Motion can distinctly differentiate a specific machine and deliver a marketplace advantage by increasing its performance and dramatically improving Overall Equipment Effectiveness (OEE).

High-performance motion can make your customer's machine more reliable and energy-efficient, enhance accuracy and improve operator safety. Motion also represents endless possibilities for innovation.

We've always understood this potential, and thus have kept motion at our core and in our Vision, Mission & Values, relentlessly developing products that offer precise control of torque, velocity and position accuracy in machines that rely on complex motion.

Removing the Barriers of Design, Sourcing, and Time

At Kollmorgen, we know that OEM engineers can achieve a lot more when obstacles aren't in the way. So, we clear obstacles in three important ways:

Integrating Standard and Custom Products

The optimal solution is often not clear-cut. Our application expertise allows us to modify standard products or develop totally custom solutions across our whole product portfolio so that designs can take flight.

Providing Motion Solutions, Not Just Components

As companies reduce their supplier base and focus their engineering manpower on the product design, they need a total system supplier with a wide range of integrated solutions. Kollmorgen offers complete solutions as well as motion subsystems that combine programming software, engineering services and best-in-class motion components.

Global Footprint

With direct sales, engineering support, manufacturing facilities, and distributors spanning the Americas, Europe, the Middle East, and Asia, we're close to OEMs worldwide. Our proximity helps speed delivery and lend support where and when they're needed.

Financial and Operational Stability

Kollmorgen is part of Regal Rexnord. A key driver in the growth of all Regal Rexnord segments is the Regal Rexnord Business System, which relies on the principle of "kaizen" – or continuous improvement. Using world-class tools, cross-disciplinary teams of exceptional people evaluate processes and develop plans that result in superior performance.

Kollmorgen: Your partner. In Motion.

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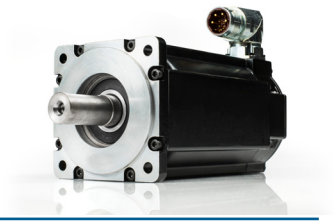
AKM[®] Servo Motor Family

Kollmorgen's AKM family of servo motors gives you unprecedented choice and flexibility from a wide range of standard products so you can select the best servo motor for your application.

From the Low Voltage (LV) motors in this Selection Guide to the broad range of AKM and AKM2G motors that support voltages up to 480 Vac, washdown, food grade, and the AKMH stainless steel hygienic motor for the toughest environments- Kollmorgen has a standard motor solution that can meet your needs right from the catalog.

Still need more? For your truly unique motion control applications, work with our engineering team to customize a solution for your machine design. Either way, standard product or customized, we can help you choose the motion control solution that meets your exact requirements.





The Benefits of AKM2G Low Voltage (LV) Servo Motors

- Smaller footprint reduces machine space**
- » For equivalent power it is possible to use a smaller size motor than competitive motors.
 - » Use of the smaller motor saves space achieving equivalent performance in a smaller footprint machine or saving space for other machine elements.
- Voltage options to match application needs**
- » Standard voltage selections of 24, 48, 72 and 96 Vdc meet most available power sources
 - » Kollmorgen can work with you to meet your specific requirements for the exact solution you need.
-
- Wider speed range provides faster operation**
- » For many AKM2G sizes the maximum speeds are higher than competitive motors.
 - » Higher speeds ⇒ operate machines faster ⇒ greater throughput.
-
- Greater flexibility provides more options to match needs**
- » AKM2G is designed to support a wider array of feedback, brake, thermal sensor and shaft seal options – this greater flexibility means a higher probability of meeting application requirements with a standard product.
 - » The AKM2G design has the potential for greater CoEngineering (modification) thanks to the new housing design. With a more flexible design for CoEngineering addressing applications not covered by catalog standards is increased.
-
- Higher efficiency reduces energy consumption**
- » AKM2G has lower equivalent resistance than competitive solutions. For equivalent motor frame sizes AKM2G will typically be more energy efficient (2-5%).
 - » Energy consumption is reduced with AKM2G compared to competitors.
 - » When weight and space are critical such as on portable, mobile or battery power applications higher efficiency translates to a smaller motor with lower energy demand.

AKM[®] 2G Servo Motor Frame Sizes

AKM2G Low Voltage Motors are a part of the AKM2G Servo Motor family - the next generation of motion for more ambitious machines built on more capable performance and more confident engineering.



AKM2G-2x

Flange: 58 mm
Power: 0.206 - 1.16 kW
Max Speed: 8000 RPM
Stacks: 4

Available with Low Voltage Windings.



AKM2G-3x

Flange: 72 mm
Power: 0.175 - 1.77 kW
Max Speed: 8000 RPM
Stacks: 3

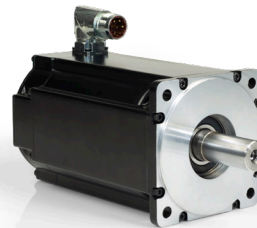
Available with Low Voltage Windings.



AKM2G-4x

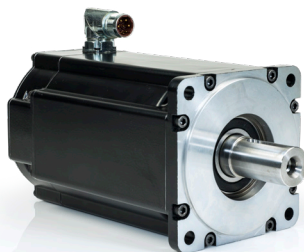
Flange: 88 mm
Power: 0.267 - 2.85 kW
Max Speed: 6000 RPM
Stacks: 4

Available with Low Voltage Windings.



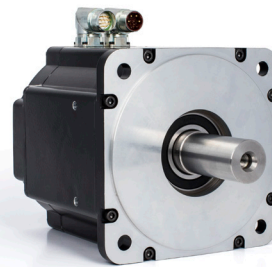
AKM2G-5x

Flange: 114 mm
Power: 0.78 - 5.28 kW
Max Speed: 6000 RPM
Stacks: 4



AKM2G-6x

Flange: 142 mm
Power: 1.56 - 7.79 kW
Max Speed: 6000 RPM
Stacks: 4



AKM2G-7x

Flange: 192 mm
Power: 2.42 - 11.8 kW
Max Speed: 6000 RPM
Stacks: 4



Looking for Traditional AC Voltage windings? To find performance specifications, outline drawings, 3D models and performance curves for AKM2G standard windings designed for 120 Vac to 480 Vac operation, please visit the AKM2G product page: kollmorgen.com/akm2g.

AKM2G Tested with AKD Servo Drives

The AKM2G performance data and curves in this guide were acquired using Kollmorgen's AKD family of servo drives. Please go to <https://www.kollmorgen.com/en-us/products/drives/servo/servo-drives> or contact Kollmorgen Customer Support for detailed specifications and to learn how pairing them with the AKM2G servo motor can optimized system performance.



Parameter	AKD2G	AKD	AKD BASIC	AKD PDMM	AKD-N/AKD-C
Base I/O	12 digital 2 analog	11 digital 2 analog	11 digital 2 analog	17 digital 2 analog	5 digital
Expansion I/O ¹	8 digital 2 analog *Drive size is the same	No	20 digital 2 analog *adds 30 mm to the drive width for drives up to 12A	Up to 1000+ remote I/O via EtherCAT	No
Safe I/O	2 digital inputs for Safey option 1 4 digital inputs for SafeMotion options	No	No	No	No
SafeMotion ²	Yes	STO only	STO only	STO only	STO only
Optimized for single cable ³	Yes	No	No	No	Yes
Continuous current limit ⁴	24A	48A	48A	48A	12A
Connectivity ⁵	Analog, EtherCAT, CANopen, Profinet IRT, Ethernet/IP, TCP/IP, Modbus/TCP	Analog, EtherCAT, CANopen, Profinet RT, Ethernet/IP, TCP/IP, Modbus/TCP	Analog	EtherCAT, CANopen, Profinet RT, Ethernet/ IP, TCP/IP, Modbus/TCP	EtherCAT
Axis Configuration	single or dual	single	single	single	single
Drive-resident controller	No	No	No	Yes	No
Programmability	parameterized, 2 axes control loops, action table	parameterized	parameterized, BASIC programmable	parameterized, IEC 61131-3 via PLCo- pen or Pipe Network	parameterized
Graphical Display	160x128-pixel display	2 digit LED	2 digit LED	3 digit LED	Status LED
Removeable Memory ⁶	Yes	No	Yes	Yes	No
System Architecture	Centralized	Centralized	Centralized	Centralized	Decentralized
IP Rating	IP20	IP20	IP20	IP20	IP67

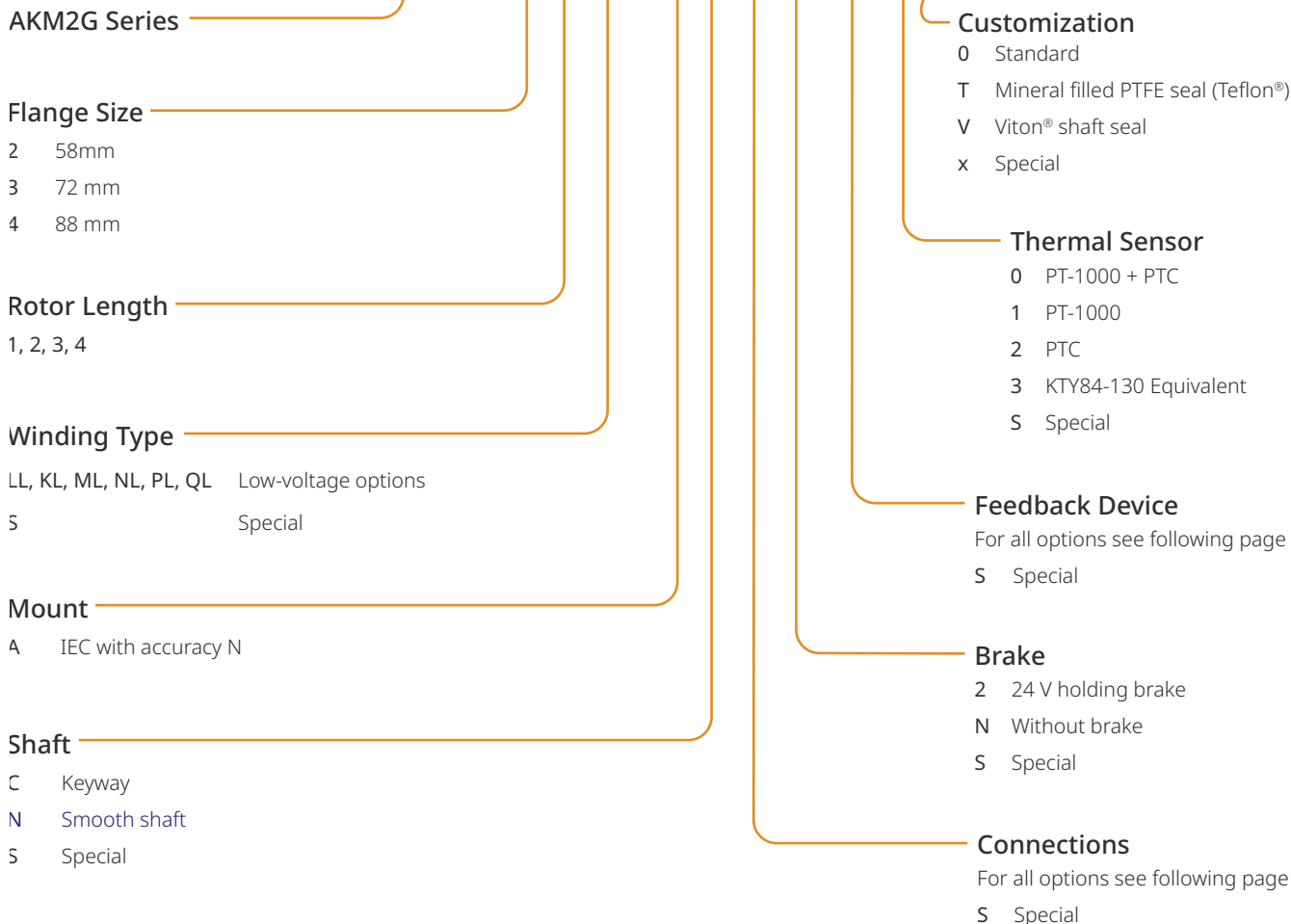
Notes:

- 1: Add EtherCAT multi-axis master, PCMM, to the AKD drive family to enable remote I/O expansion via EtherCAT. PCMM controller functionality is built into the PDMM
- 2: SafeMotion includes FSoE, STO, SS1, SS2, SOS, SDB, SBC/SBT, SLS, SSR, SSM, SDI, SAR, SLA, SLI, SLP, SCA up to SIL3 / PLe
- 3: Single cable optimized means one single cable for power & motor feedback with 1 connector at motor end and 1 connector at drive end
- 4: Higher power variants under development in some models. Consult factory for availability.
- 5: Consult factory on connectivity options for AKD2G. Profinet and Ethernet/IP will be added in 2021
- 6: Optional integrated SD card for easy backup and drive cloning

AKM2G Low Voltage (LV) Servo Motors

AKM[®]2G LV Brushless Servo Motor Nomenclature

AKM2G - 6 2 ML - A N C N DA 1 0



Note: Options shown in blue text are considered standard.

AKM®2G LV Brushless Servo Motor Nomenclature (continued)

Feedback Unit Options

Code ³	Description	AKM2Gx ⁵	Connector	Single- or Multi-turn	Feedback Type/Size	Feedback Resolution			Data Channel Resolution				
						Device Resolution (Sin/Cos per Rev., Bits or Lines/Rev.)	Max. Resolution after AKD Interpolation	Max. Resolution after AKD2G Interpolation	Accuracy ^{1,2} (arc-sec)	Resolution	Absolute revs.		
2-	Commutating Encoder	3, 4	A _D , C	Single-turn	15	2048 Lines	8,192	8,192	±218.2"	12 bits	None		
AA	BiSS B Sine Encoder Optical	2	Y	Single-turn	AD34	2048 Sin/Cos	27-Bits	32-Bits	±36"	32 bits	1		
		3, 4	A _D , C		AD58								
AB		2	Y	Multi-turn	AD34								
		3, 4	A _D , C		AD58							4096	
CA	SFD3 Capacitive	2-4	A _H , D	Single-turn	15	24-Bits	24-Bits	24-Bits	±585"	24 bits	1		
GU	HIPERFACE DSL® Capacitive	2-4	D	Multi-turn	EEM37	18-Bits	18-Bits	18-Bits	±240"	17 bits	4096		
DA	EnDat® 2.1 Optical	2	Y	Single-turn	ECN1113	512 Sin/Cos	25-Bits	32-Bits	±120"	13 bits	1		
		3, 4	A _D , C										
DB		2	Y	Multi-turn	EQN1125	512 Sin/Cos	25-Bits				±120"	13 bits	4096
		3, 4	A _D , C										
LD	EnDat® 2.2 Inductive	2-4	D	Multi-turn	EQI 1131	16 Sin/Cos	20-Bits	28-Bits	±120"	19 bits	4096		
R-	Resolver Inductive	2	Y	Single-turn	15	1 pole pair (16-Bits)	16-Bits	16-Bits	±600"	24 bits for AKD/AKD2G	1		
		3-4	A _D , C										

A_H = M23 Hybrid power/SFD3 connector pinned for use with legacy AKM performance cables – not compatible with AKM2G cables.

A_D = M23 Dual connectors with power connector pinned for use with legacy AKM performance cables – not compatible with AKM2G cables.

- AKD drives have a resolver measurement accuracy of ±45", for a drive w/ motor accuracy of ±585" and RMS Noise of ±9.9" Accuracy & RMS Noise data when used with other drives may be different.
- Accuracy refers to overall system accuracy once installed in the motor. Noise refers to the RMS position noise when at stand-still.
- All feedback options, except R- and 2-, have Motor ID support with embedded electronic motor nameplate data included for easy plug-and-play commissioning with Kollmorgen servo drives.
- AKM2G-LV Size 2 models are only available in single-connector configurations.

With AKD drives, all received positions are interpolated to a 32-bit resolution per revolution. When using a drive other than AKD consult the drive manufacturer for this information.

AKM2G Low Voltage (LV) Servo Motors

AKM[®]2G LV Brushless Servo Motor Nomenclature (continued)

Connector Options

Model Designation	Connection	Compatible AKM2Gx	Position of connection
A* (Hybrid)	1 SpeedTec [®] M23 (AKM cable pinned)	AKM2G3 - AKM2G7 ≤ 20 Amps	Angular, rotatable, motor mounted
A (Dual)	2 SpeedTec [®] M23 (AKM cable pinned)	AKM2G3 - AKM2G7 ≤ 20 Amps	Angular, rotatable, motor mounted
C	2 SpeedTec [®] M23	AKM2G3 - AKM2G7 ≤ 20 Amps	Angular, rotatable, motor mounted
D*	1 htec [®] M23	AKM2G2 - AKM2G7 ≤ 20 Amps	Angular, rotatable, motor mounted
Y	1 ytec [®] Connector	AKM2G2 (non LV)	Rotatable, motor mounted

* Hybrid connectors valid for SFD3, DSL, and EnDat 2.2 Feedback only.

Connector Description

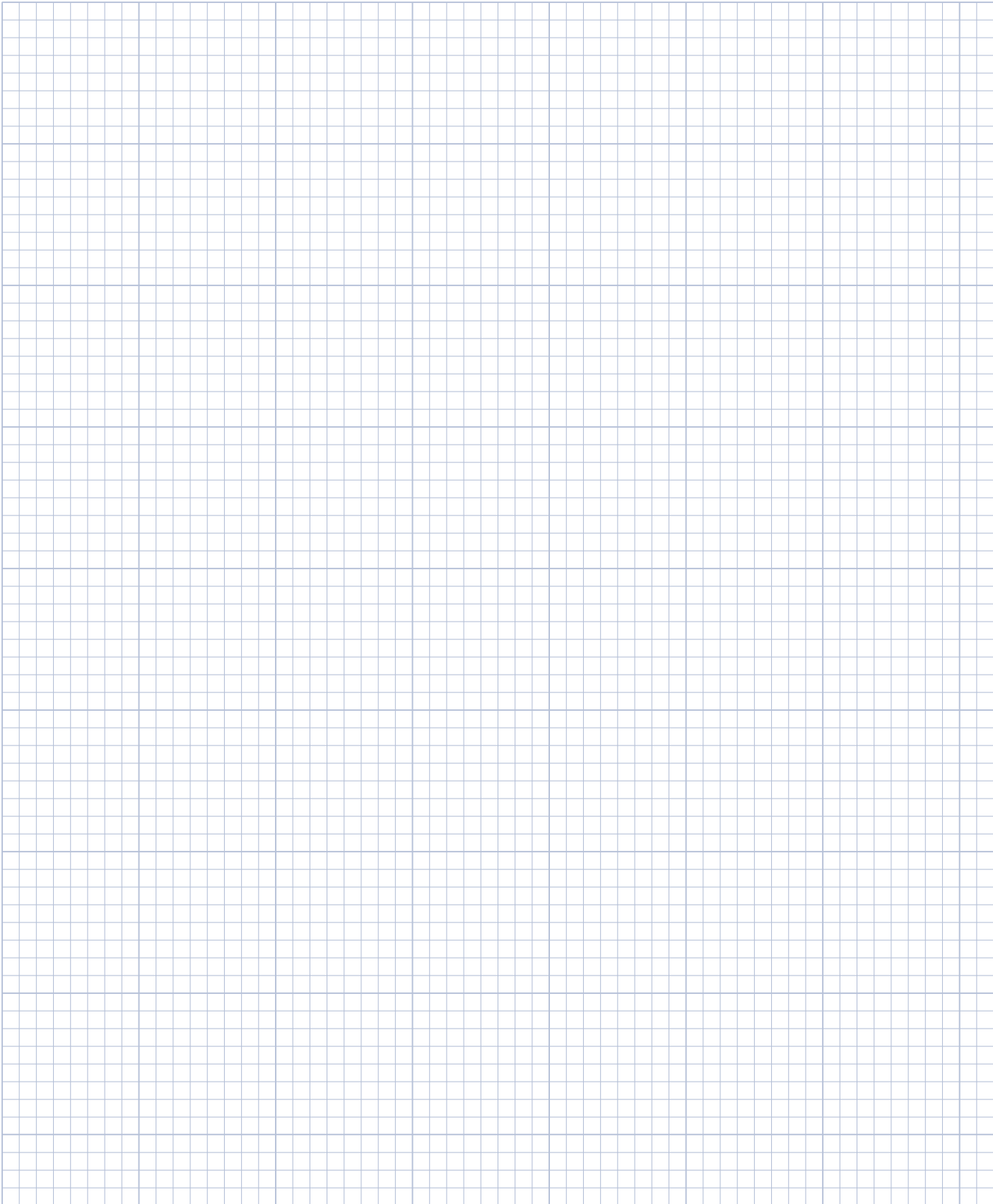
Connector	Usage	Contacts - Pins Power/Signal	Max. Current [A] Power/Signal	Max. Cross Section [mm ²] Power/Signal	Protection Class
M23 SpeedTec [®] right angle connectors (Size 1)	Power & Brake	4 / 5	20 / 10	4 / 1.5	IP65
	Comcoder	- / 15	- / 10	4 / 1.5	IP65
	Resolver	- / 12	- / 10	- / 0.5	IP65
	DSL	5 / 2 / 2	20 / 10	4 / 1.5	IP65
	SFD3	4 / 5	20 / 10	4 / 1.5	IP65
	EnDat 2.2	5 / 4 / 6	20 / 10	4 / 1.5	IP65
	EnDat 2.1 / BiSS B	- / 12	- / 10	4 / 1.5	IP65
ytec [®]	Power & Brake	4 / 5	14 / 3.6	1.5 / 0.75	IP65
	Resolver	- / 12	- / 5	- / 0.75	IP65
	EnDat 2.1 / BiSS B	- / 12	- / 5	- / 0.75	IP65

Feedback and Connector Availability

AKM2G-2x				AKM2G-3x -4x			
Connector Code	A	D	Y	Connector Code	A	C	D
Feedback Code	Ax		•	2-	•	•	
	CA	•	•	Ax	•	•	
	GU		•	CA	•		•
	Dx			GU			•
	LD		•	Dx	•	•	
	R-			LD			•
			•	R-	•	•	

- = Hybrid (power + feedback) single connector
- = Dual power and feedback connectors

Notes



0.125 inch divisions

AKM[®] 2G-2x Series LV Servo Motors

AKM2G-2x Low Voltage Servo Motor Performance Data – Up to 96 Vdc

Parameters	Tol	Symbol	Units	AKM2G-21			AKM2G-22			AKM2G-23			AKM2G-24		
				KL	ML	PL	KL	NL	PL	KL	ML	PL	KL	ML	PL
Max Rated Equivalent Line Voltage	Max	V _{bus}	Vdc	170	170	170	170	170	170	170	170	170	170	170	170
Max Continuous Torque for ΔT winding = 100°C ①②③	Nom	T _{cs}	Nm	0.640	0.642	0.642	1.10	1.11	1.12	1.48	1.49	1.50	1.79	1.79	1.82
			lb-in	5.66	5.68	5.68	9.76	9.85	9.92	13.1	13.2	13.3	15.9	15.9	16.1
Continuous Current for ΔT winding = 100°C ①②③	Nom	I _{cs}	A _{rms}	9.87	14.2	19.7	9.83	15.2	18.9	9.82	13.5	19.2	9.92	13.7	19.1
Max Continuous Torque for ΔT winding = 60°C ②③	Nom	T _{cs}	Nm	0.497	0.498	0.498	0.855	0.863	0.871	1.15	1.15	1.17	1.39	1.39	1.41
			lb-in	4.39	4.41	4.41	7.57	7.64	7.70	10.1	10.2	10.3	12.3	12.3	12.5
Max Mechanical Speed ④	Nom	N _{max}	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Peak Torque ①②③	Nom	T _p	Nm	1.78	1.79	1.79	3.32	3.34	3.35	4.69	4.70	4.73	5.92	5.92	5.97
			lb-in	15.8	15.8	15.8	29.4	29.5	29.6	41.5	41.6	41.9	52.4	52.3	52.8
Peak Current	Nom	I _p	A _{rms}	39.5	56.8	78.6	39.3	60.8	75.6	39.3	54.0	76.9	39.7	54.9	76.4
Rated Torque (speed) ①②③		T _{rtd}	Nm	-	0.605	0.587	-	1.08	1.08	-	-	1.46	-	-	1.77
			lb-in	-	5.35	5.20	-	9.59	9.55	-	-	12.9	-	-	15.7
Rated Speed		N _{rtd}	rpm	-	3400	4700	-	2200	2900	-	-	1900	-	-	1600
Rated Power (speed) ①②③		P _{rtd}	kW	-	0.215	0.289	-	0.250	0.328	-	-	0.291	-	-	0.297
			Hp	-	0.289	0.388	-	0.335	0.439	-	-	0.390	-	-	0.399
Rated Torque (speed) ①②③		T _{rtd}	Nm	0.574	0.539	0.534	1.05	1.02	0.997	1.42	1.40	1.35	1.73	1.69	1.65
			lb-in	5.08	4.77	4.73	9.31	9.02	8.82	12.6	12.4	12.0	15.3	15.0	14.6
Rated Speed		N _{rtd}	rpm	5600	8000	8000	3300	5200	6400	2400	3400	4900	2000	2900	4000
Rated Power (speed) ①②③		P _{rtd}	kW	0.337	0.452	0.45	0.363	0.555	0.67	0.358	0.498	0.694	0.363	0.514	0.692
			Hp	0.451	0.606	0.600	0.487	0.744	0.896	0.480	0.668	0.930	0.487	0.689	0.928
Rated Torque (speed) ①②③		T _{rtd}	Nm	0.537	-	-	1.01	0.944	0.942	1.37	1.31	1.18	1.67	1.58	1.46
			lb-in	4.76	-	-	8.92	8.35	8.33	12.1	11.6	10.4	14.8	14.0	12.9
Rated Speed		N _{rtd}	rpm	8000	-	-	5300	8000	8000	4000	5500	8000	3300	4700	6500
Rated Power (speed) ①②③		P _{rtd}	kW	0.450	-	-	0.559	0.791	0.789	0.574	0.755	0.989	0.578	0.779	0.994
			Hp	0.604	-	-	0.750	1.06	1.06	0.770	1.01	1.33	0.775	1.05	1.33
Rated Torque (speed) ①②③		T _{rtd}	Nm	0.533	-	-	0.956	-	-	1.30	1.19	-	1.59	1.44	1.30
			lb-in	4.71	-	-	8.46	-	-	11.5	10.6	-	14.1	12.8	11.5
Rated Speed		N _{rtd}	rpm	8000	-	-	7300	-	-	5500	7600	-	4600	6500	8000
Rated Power (speed) ①②③		P _{rtd}	kW	0.446	-	-	0.731	-	-	0.751	0.951	-	0.766	0.982	1.085
			Hp	0.598	-	-	0.980	-	-	1.01	1.27	-	1.03	1.32	1.46

Notes:

- ① Motor winding temperature rise, ΔT = 100° C, at 40° C ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Motor with standard feedback and standard heat sink.
- ④ May be limited at some values of V_{bus}.

AKM2G-2x Low Voltage Servo Motor Performance Data – Up to 96 Vdc (continued)

Parameters	Tol	Symbol	Units	AKM2G-21			AKM2G-22			AKM2G-23			AKM2G-24		
				KL	ML	PL	KL	NL	PL	KL	ML	PL	KL	ML	PL
Torque Constant ①	±10%	K _t	Nm/A _{rms}	0.0655	0.0457	0.0330	0.113	0.0740	0.0599	0.152	0.111	0.0789	0.183	0.132	0.0962
			lb-in/A _{rms}	0.580	0.405	0.292	1.00	0.655	0.530	1.35	0.985	0.698	1.62	1.169	0.852
Back EMF Constant ②	±10%	K _e	V _{rms} /k _r rpm	4.31	3.01	2.17	7.41	4.84	3.92	9.88	7.23	5.12	11.81	8.52	6.21
Motor Constant ⑥	Nom	K _m	N-m/√W	0.0899	0.0902	0.0902	0.143	0.145	0.146	0.186	0.188	0.190	0.223	0.224	0.227
			lb-in/√W	0.796	0.798	0.798	1.27	1.28	1.29	1.65	1.66	1.68	1.98	1.98	2.01
Resistance (line-line) ②	±10%	R _m	Ohm	0.354	0.171	0.089	0.416	0.174	0.112	0.444	0.234	0.115	0.448	0.233	0.120
Inductance Q-Axis (line-line)		L _{qll}	mH	0.79	0.39	0.20	1.06	0.45	0.30	1.22	0.65	0.33	1.28	0.66	0.35
Inductance D-Axis (line-line)		L _{dll}	mH	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Inductance Saturation Current		Lisat	Arms	69	99	137	79	121	150	89	121	171	99	137	188
Maximum Demagnetization Current		Midpeak	Arms	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Inertia (includes feedback) ③	±10%	J _m	kg-cm ²	0.093			0.155			0.217			0.279		
			lb-in-s ²	8.23E-05			1.37E-04			1.92E-04			2.47E-04		
Optional Brake Inertia (additional)	±10%	J _m	kg-cm ²	0.040			0.040			0.040			0.040		
			lb-in-s ²	3.54E-05			3.54E-05			3.54E-05			3.54E-05		
Weight without brake ④		W	kg	1.1			1.4			1.7			2.0		
			lb	2.4			3.1			3.7			4.4		
Static Friction ①⑤		T _f	Nm	0.006			0.011			0.015			0.019		
			lb-in	0.05			0.10			0.13			0.17		
Viscous Damping ①		K _{dv}	Nm/k _r rpm	0.0015			0.0030			0.0045			0.0060		
			lb-in/k _r rpm	0.013			0.027			0.040			0.053		
Thermal Time Constant		TCT	minutes	9.6			10.8			11.9			13.0		
Coil Thermal Time Constant		MCT _{f0}		TBD			TBD			TBD			TBD		
Thermal Resistance ①		R _{thw-a}	K/W	1.33			1.14			1.07			1.04		
Pole Pairs		PP		3			3			3			3		
Heat Sink Size				10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate		

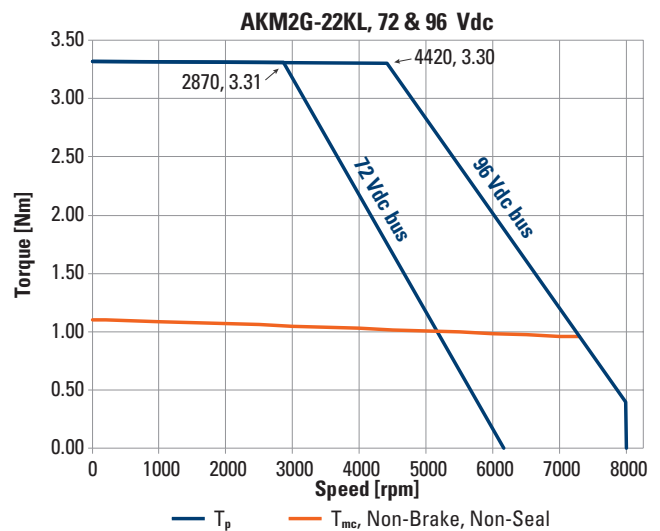
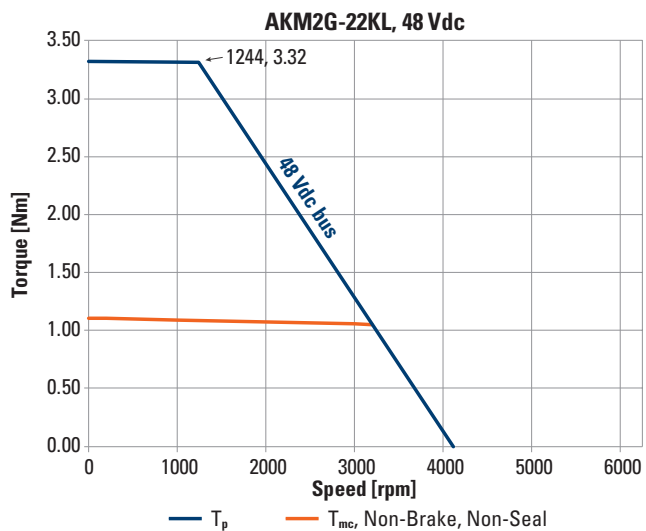
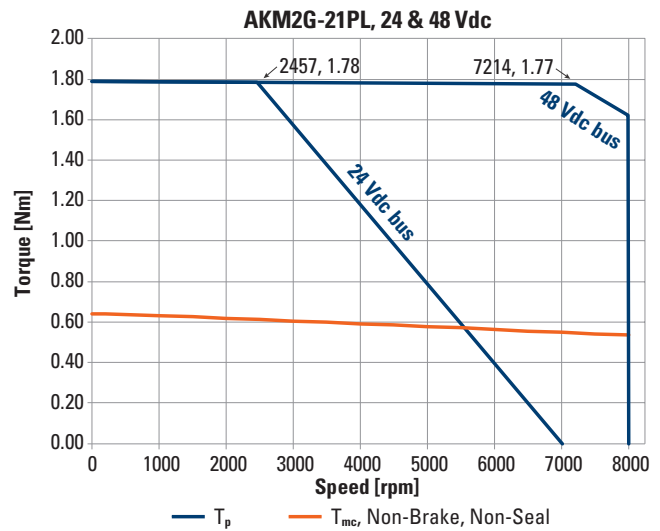
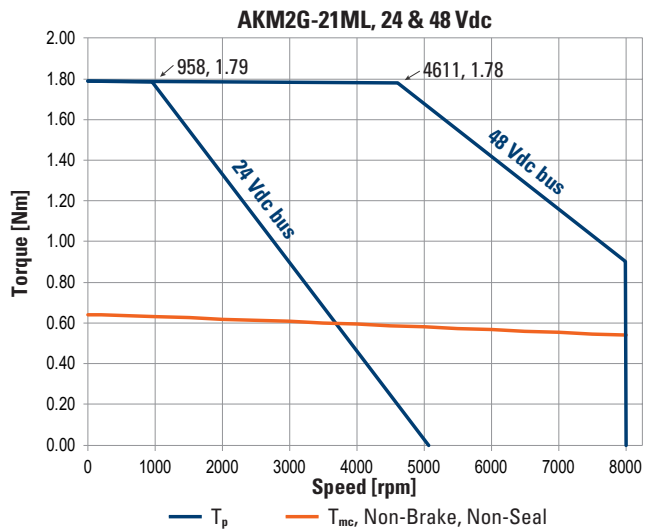
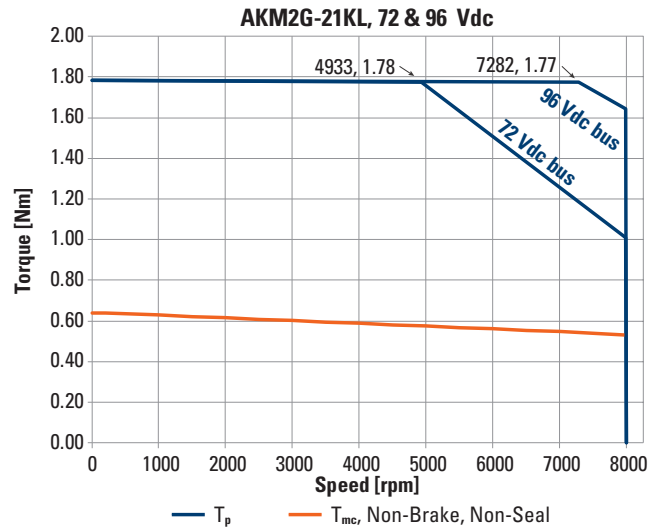
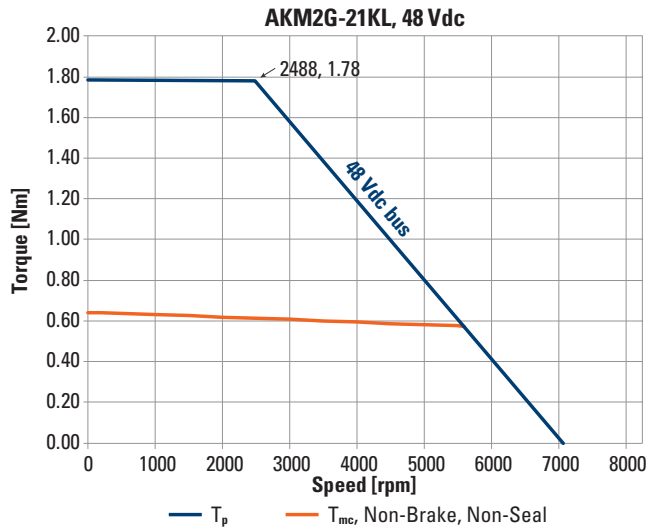
Notes:

- ① Motor winding temperature rise, ΔT = 100° C, at 40° C ambient.
- ② Measured at 25° C.
- ③ Add parking brake if applicable for total inertia.
- ④ Brake motor adds 0.45 kg [1.0 lbs]
- ⑤ Shaft seal increases Static Friction by 0.020 Nm [0.18 lb-in]
- ⑥ This value is calculated from the Torque Constant and Resistance. Refer to those values and notes ① & ② for additional details.

*Complete AKM2G-2 low voltage servo motor series model nomenclature can be found on page 41.

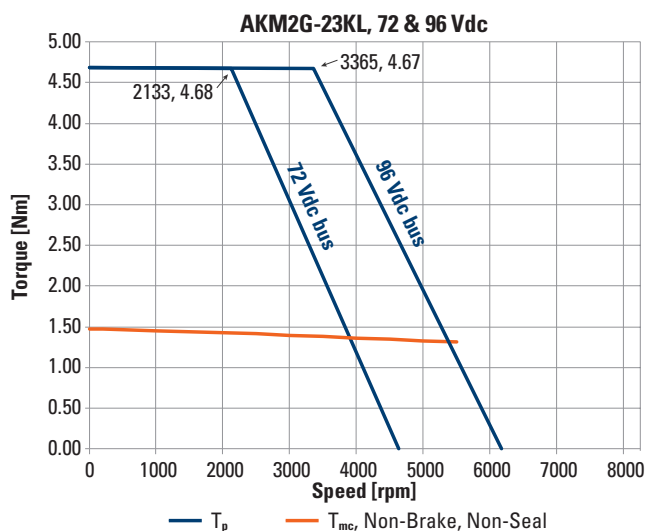
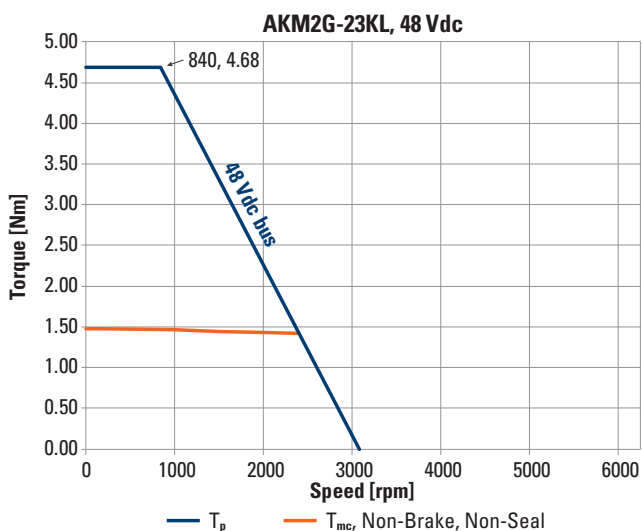
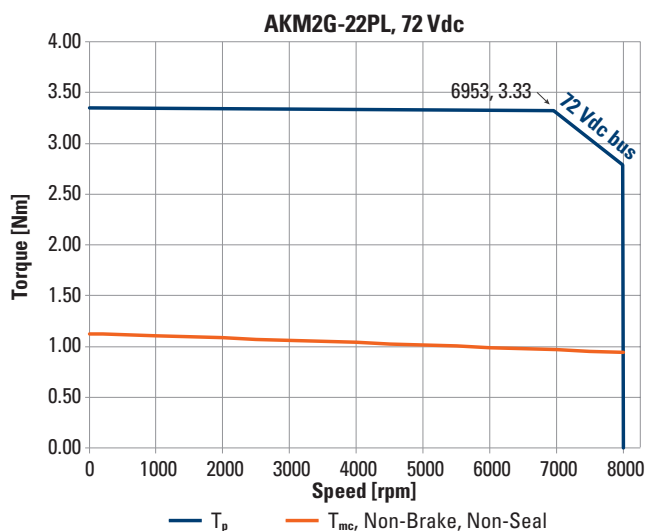
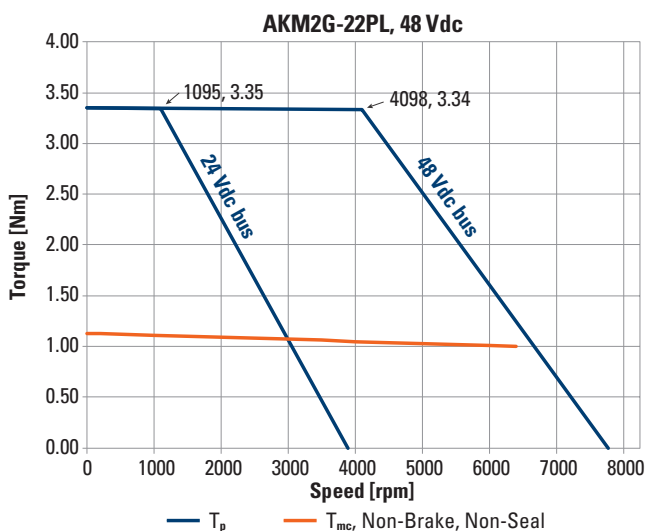
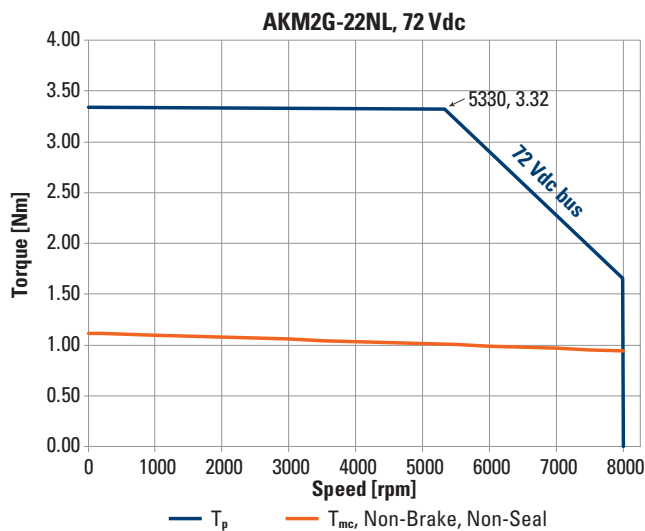
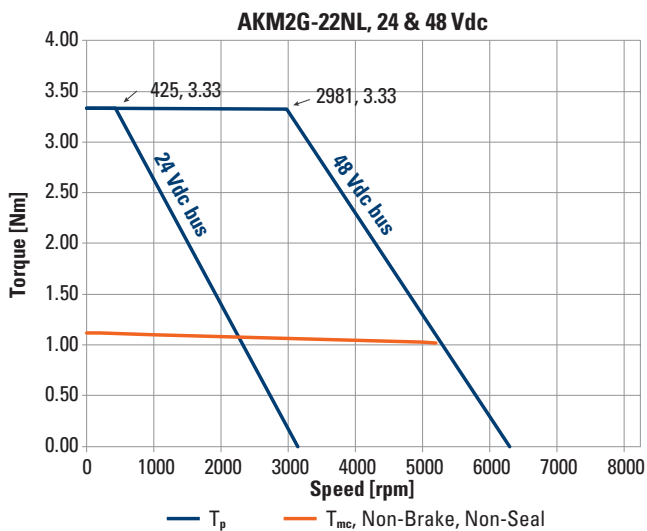
AKM[®] 2G-2x Series LV Servo Motors

AKM2G-2x Low Voltage Servo Motor Performance Curves – Up to 96 Vdc



T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

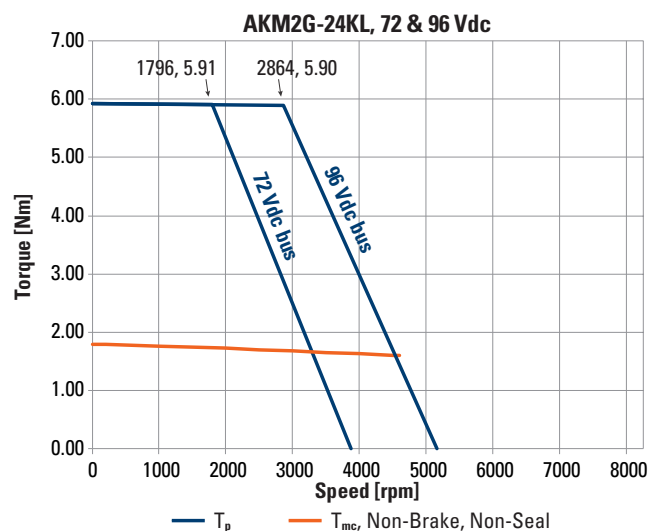
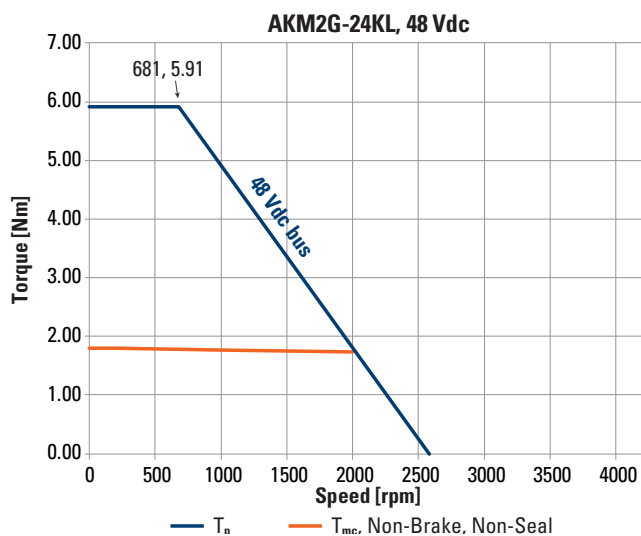
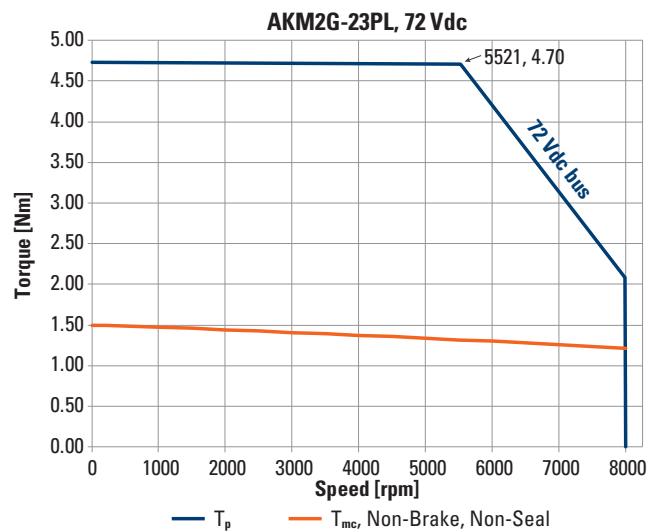
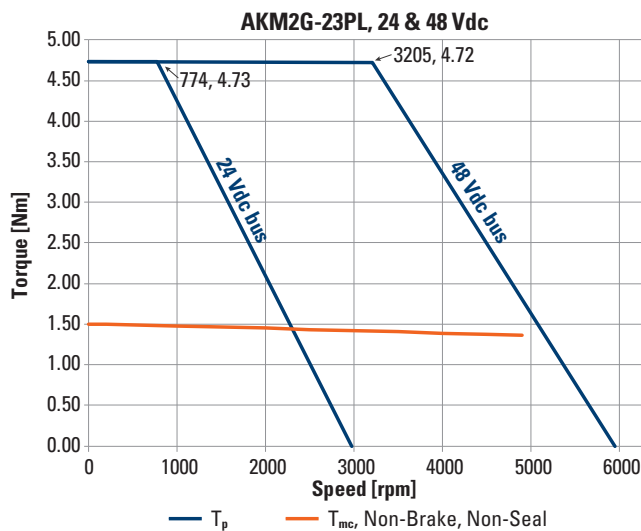
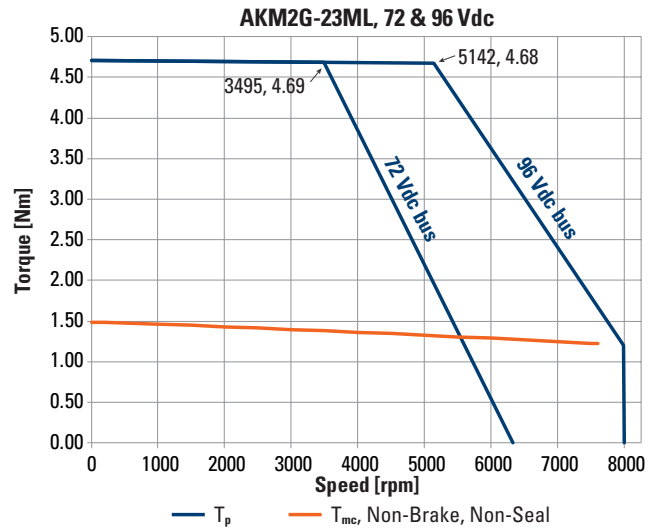
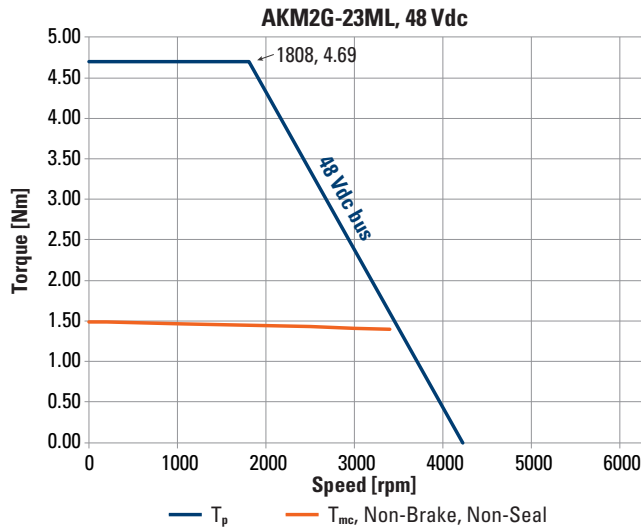
AKM2G-2x Low Voltage Servo Motor Performance Curves – Up to 96 Vdc (continued)



T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

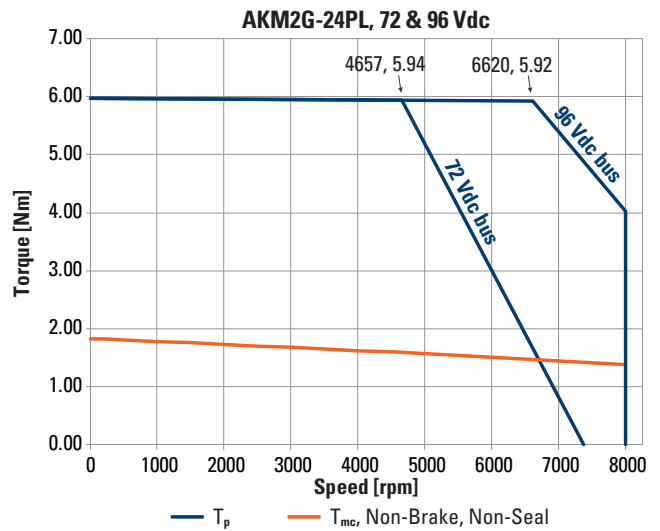
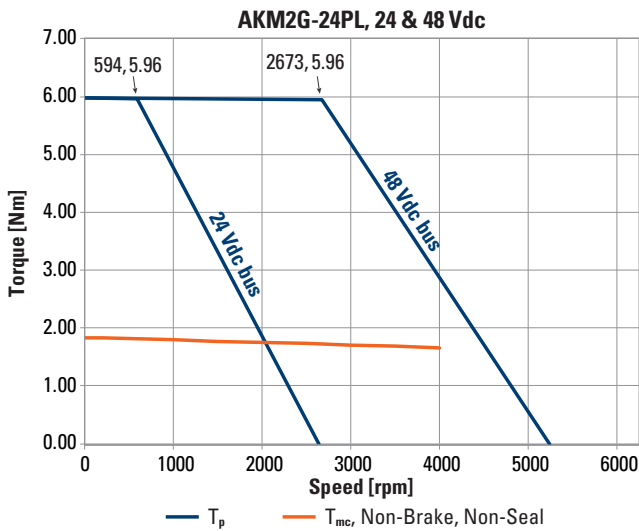
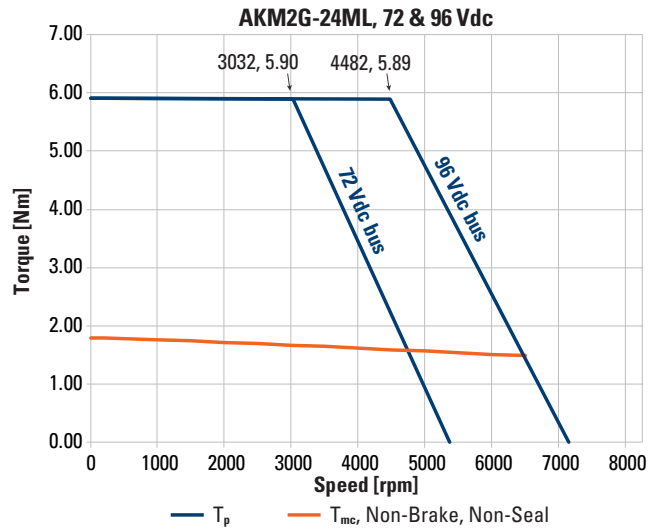
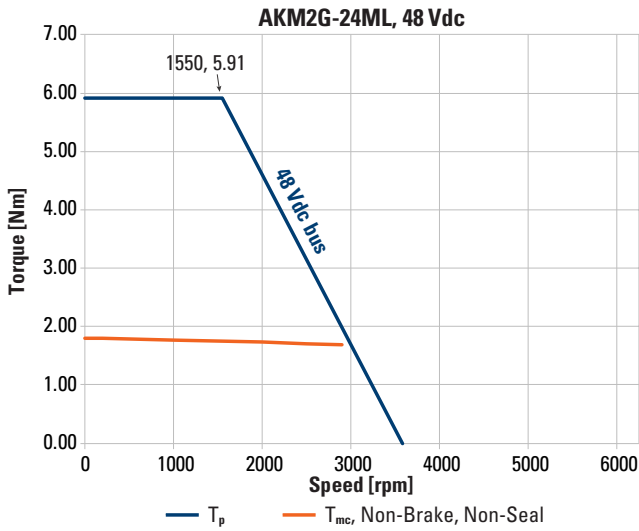
AKM[®] 2G-2x Series LV Servo Motors

AKM2G-2x Low Voltage Servo Motor Performance Curves – Up to 96 Vdc (continued)



T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

AKM2G-2x Low Voltage Servo Motor Performance Curves – Up to 96 Vdc (continued)

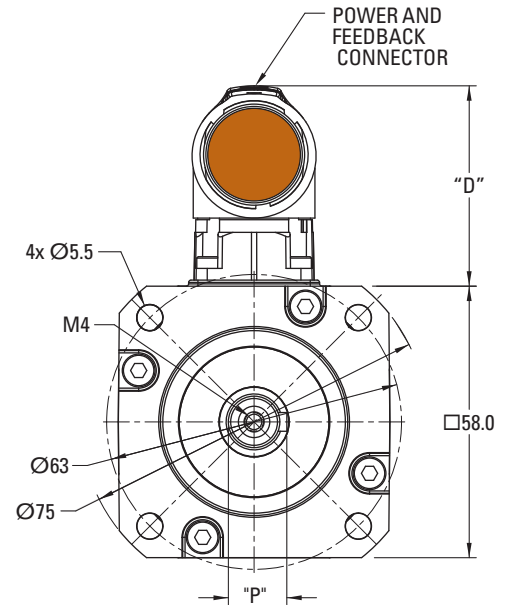
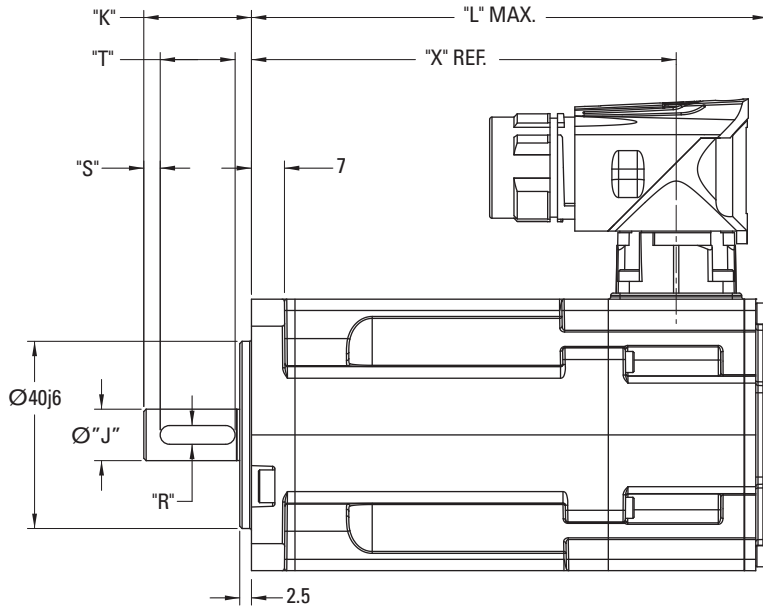


T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

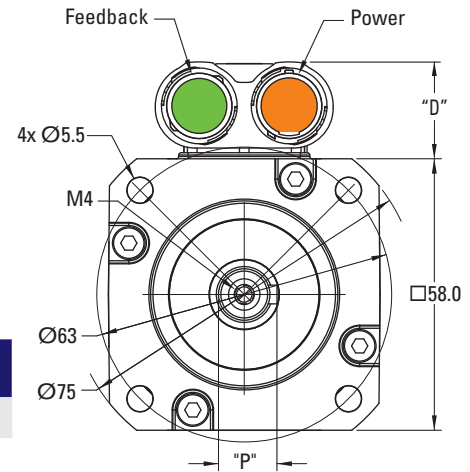
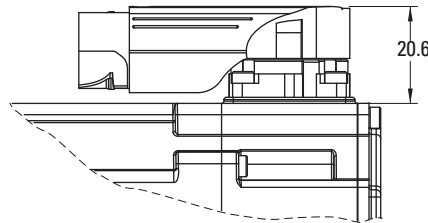
AKM[®] 2G-2x Series LV Servo Motors

AKM2G-2x Dimensional Drawings and Data

AKM2G-2x Single A-, D- Connector Frame



AKM2G-2x ytec- Dual Connector Option



AKM2G-2x Mounting Flange-Shaft Dimensional Data

Mounting Flange-Shaft	Shaft Diameter "J"	Shaft Length "K"	Shaft Dia. w/ Key "P"	Key Width "R"	- "S"	Key Length "T"
AC	11k6	23	12.5	4	3.5	16
AN	11k6	23	-	-	-	-

All dimensions in mm

AKM2G-2x "X" and "L" Dimensions

Connector	No Brake (N)		
	"L" MAX		"X" REF
	A-, D-, Y-	D-, Y-	A-, D-, Y-
Feedback Option	CA, 2-, Ax, R-	Dx, GU, LD	CA, 2-, Ax, Dx, GU, LD, R-
AKM2G-21	111.15	118.15	90.75
AKM2G-22	130.40	137.40	110.00
AKM2G-23	149.65	156.65	149.65
AKM2G-24	168.90	175.90	148.50
+ Brake ("2" option)	All AKM2G-2x: Add +39.00 mm to both "L" and "X" dimensions		

All dimensions in mm

AKM2G-2x Connector Height

Connector Feedback	"D"
SFD3 (CA),	42.8
DSL (GU) & EnDat 2.2/22 (LD)	44.1
2-, Ax, Dx, R-	20.6

Notes

AKM2G - 2 1 ML AN D N LD 10*
Motor Series Rotor Length Winding Shaft Flange Connection Brake Feedback Thermal Sensor Customization

0.125 inch divisions

AKM[®] 2G-3x Series Servo Motors

AKM2G-3x Low Voltage Servo Motor Performance Data – Up to 96 Vdc

Parameters	Tol	Symbol	Units	AKM2G-31		AKM2G-32		AKM2G-33	
				ML	PL	ML	PL	ML	PL
Max Rated Equivalent Line Voltage	Max	Vbus	Vdc	170	170	170	170	170	170
Max Continuous Torque for ΔT winding = 100°C ①②③	Nom	T _{CS}	Nm	1.73	1.69	2.89	2.77	3.82	3.83
			Ib-in	15.3	15.0	25.6	24.6	33.8	33.9
Continuous Current for ΔT winding = 100°C ①②③	Nom	I _{CS}	A _{RMS}	14.2	20.0	14.8	20.0	14.8	20.0
Max Continuous Torque for ΔT winding = 60°C ②③	Nom	T _{CS}	Nm	1.34	1.33	2.25	2.23	2.97	3.01
			Ib-in	11.9	11.8	19.9	19.7	26.3	26.7
Max Mechanical Speed ④	Nom	N _{max}	rpm	8000	8000	8000	8000	8000	8000
Peak Torque ①②③	Nom	T _p	Nm	6.14	6.09	10.7	10.6	14.5	14.6
			Ib-in	54.3	53.9	94.6	93.7	128	130
Peak Current	Nom	I _p	A _{RMS}	56.8	80.7	59.1	82.4	59.0	80.8
Rated Torque (speed) ①②③		T _{rtd}	Nm	-	1.67	-	2.79	-	3.82
			Ib-in	-	14.8	-	24.7	-	33.8
Rated Speed		N _{rtd}	rpm	-	2200	-	1300	-	800
Rated Power (speed) ①②③		P _{rtd}	kW	-	0.385	-	0.379	-	0.320
			Hp	-	0.517	-	0.509	-	0.430
Rated Torque (speed) ①②③		T _{rtd}	Nm	1.65	1.57	2.81	2.70	3.69	3.64
			Ib-in	14.6	13.9	24.9	23.9	32.6	32.2
Rated Speed		N _{rtd}	rpm	3300	4900	2000	3000	1500	2100
Rated Power (speed) ①②③		P _{rtd}	kW	0.570	0.804	0.589	0.849	0.579	0.801
			Hp	0.764	1.08	0.790	1.138	0.777	1.07
Rated Torque (speed) ①②③		T _{rtd}	Nm	1.57	1.41	2.70	2.51	3.54	3.38
			Ib-in	13.9	12.4	23.9	22.2	31.3	30.0
Rated Speed		N _{rtd}	rpm	5200	7800	3200	4700	2400	3400
Rated Power (speed) ①②③		P _{rtd}	kW	0.853	1.15	0.906	1.23	0.890	1.21
			Hp	1.14	1.54	1.215	1.66	1.19	1.62
Rated Torque (speed) ①②③		T _{rtd}	Nm	1.46	-	2.57	2.26	3.34	3.06
			Ib-in	12.9	-	22.7	20.0	29.6	27.1
Rated Speed		N _{rtd}	rpm	7200	-	4400	6400	3400	4700
Rated Power (speed) ①②③		P _{rtd}	kW	1.10	-	1.18	1.51	1.19	1.50
			Hp	1.47	-	1.59	2.03	1.60	2.02

Notes:

- ① Motor winding temperature rise, $\Delta T = 100^\circ \text{C}$, at 40°C ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Motor with resolver feedback and standard heat sink.
- ④ May be limited at some values of Vbus.

AKM2G-3x Low Voltage Servo Motor Performance Data – Up to 96 Vdc (continued)

Parameters	Tol	Symbol	Units	AKM2G-31		AKM2G-32		AKM2G-33	
				ML	PL	ML	PL	ML	PL
Torque Constant ①	±10%	K _t	Nm/A _{rms}	0.124	0.087	0.201	0.142	0.265	0.196
			lb-in/A _{rms}	1.10	0.766	1.78	1.261	2.34	1.731
Back EMF Constant ②	±10%	K _e	V _{rms} /k _r rpm	8.09	5.64	13.09	9.28	17.2	12.7
Motor Constant ⑥	Nom	K _m	N-m/√W	0.211	0.210	0.335	0.332	0.422	0.428
			lb-in/√W	1.87	1.85	2.97	2.94	3.74	3.79
Resistance (line-line) ②	±10%	R _m	Ohm	0.230	0.114	0.240	0.122	0.262	0.139
Inductance Q-Axis (line-line)		L _{qll}	mH	0.54	0.26	0.57	0.29	0.61	0.33
Inductance D-Axis (line-line)		L _{dll}	mH	TBD	TBD	TBD	TBD	TBD	TBD
Inductance Saturation Current		L _{isat}	Arms	188	270	236	333	270	366
Maximum Demagnetization Current		Midpeak	Arms	TBD	TBD	TBD	TBD	TBD	TBD
Inertia (includes Resolver feedback) ③	±10%	J _m	kg-cm ²	0.426		0.813		1.200	
			lb-in-s ²	3.77E-04		7.20E-04		1.06E-03	
Optional Brake Inertia (additional)	±10%	J _m	kg-cm ²	0.120		0.120		0.120	
			lb-in-s ²	1.06E-04		1.06E-04		1.06E-04	
Weight without brake ④		W	kg	1.8		2.5		3.3	
			lb	4.0		5.6		7.2	
Static Friction ①⑤		T _f	Nm	0.013		0.023		0.031	
			lb-in	0.12		0.20		0.27	
Viscous Damping ①		K _{dv}	Nm/k _r rpm	0.0039		0.0078		0.0117	
			lb-in/k _r rpm	0.035		0.069		0.104	
Thermal Time Constant		TCT	minutes	17		21		25	
Coil Thermal Time Constant		MCT _{f0}		TBD		TBD		TBD	
Thermal Resistance ①		R _{thw-a}	K/W	0.980		0.868		0.795	
Pole Pairs		PP		4		4		4	
Heat Sink Size				10"x10"x1/4" Aluminum Plate		10"x10"x1/4" Aluminum Plate		10"x10"x1/4" Aluminum Plate	

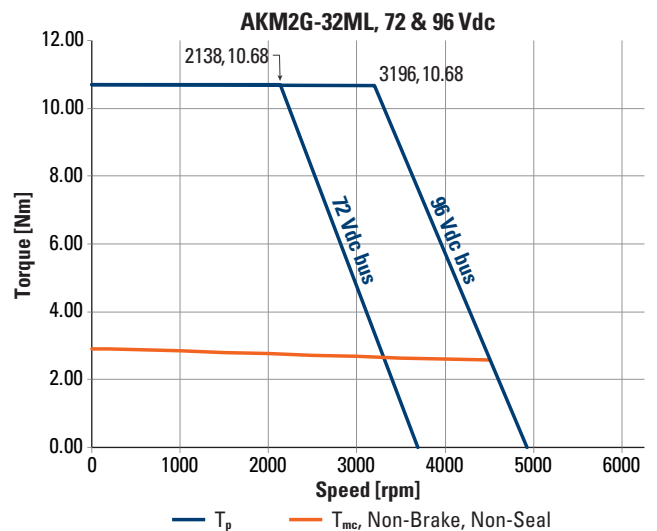
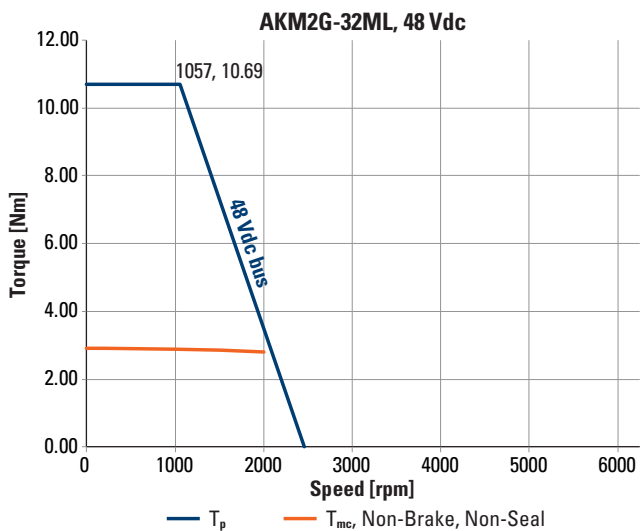
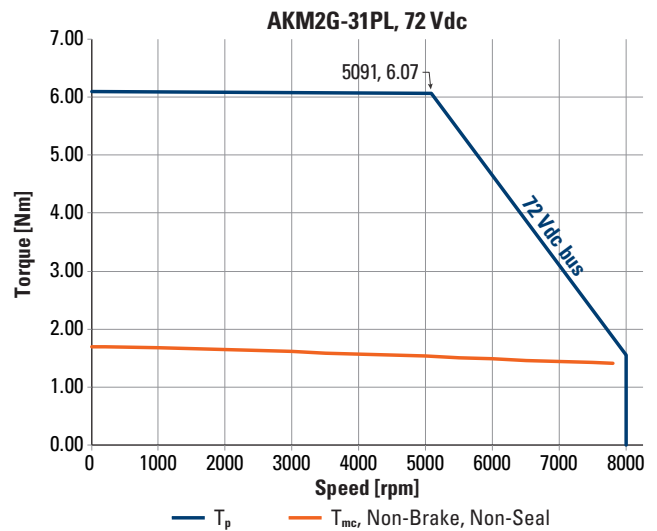
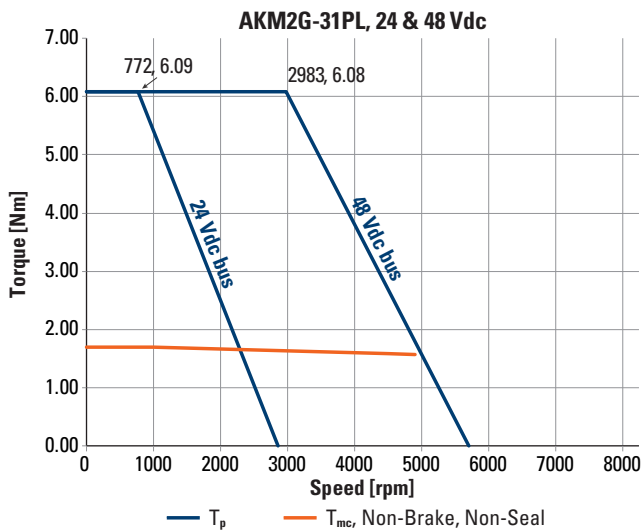
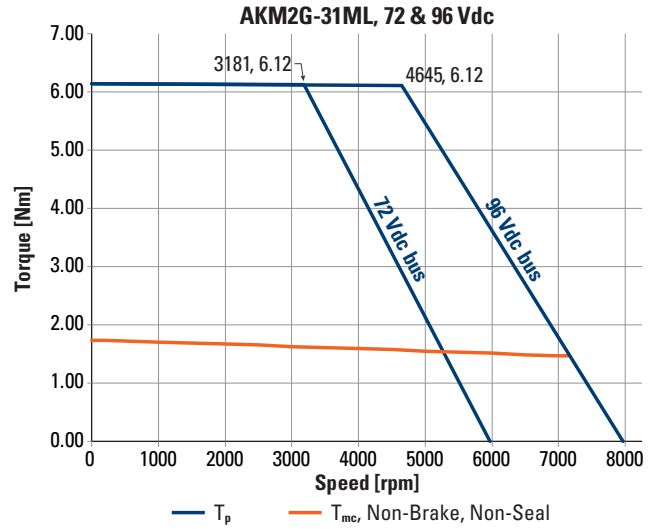
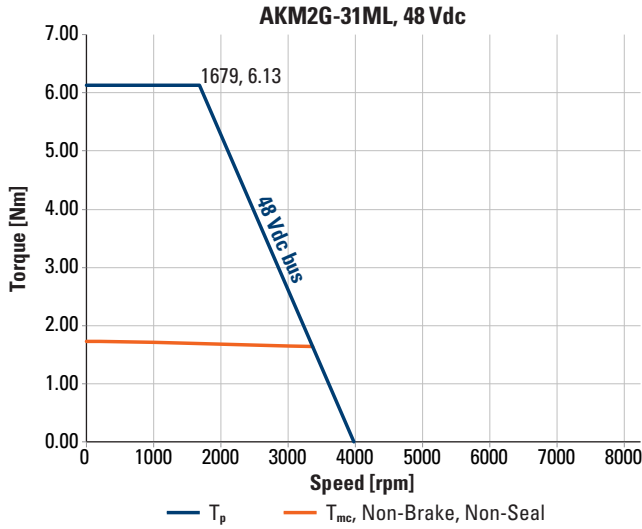
Notes:

- ① Motor winding temperature rise, ΔT = 100° C, at 40° C ambient.
- ② Measured at 25° C.
- ③ Add parking brake if applicable for total inertia.
- ④ Brake motor adds 0.72 kg [1.6 lbs]
- ⑤ Shaft seal increases Static Friction by 0.017 Nm [0.15 lb-in]
- ⑥ This value is calculated from the Torque Constant and Resistance. Refer to those values and notes ① & ② for additional details.

*Complete AKM2G-3 low voltage servo motor series model nomenclature can be found on page 41.

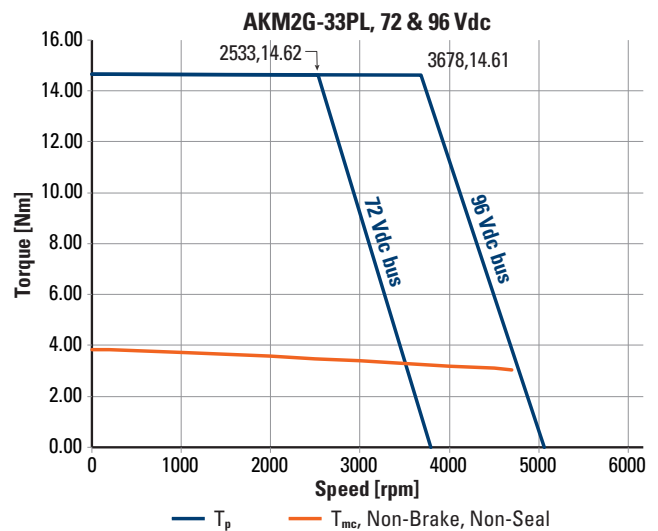
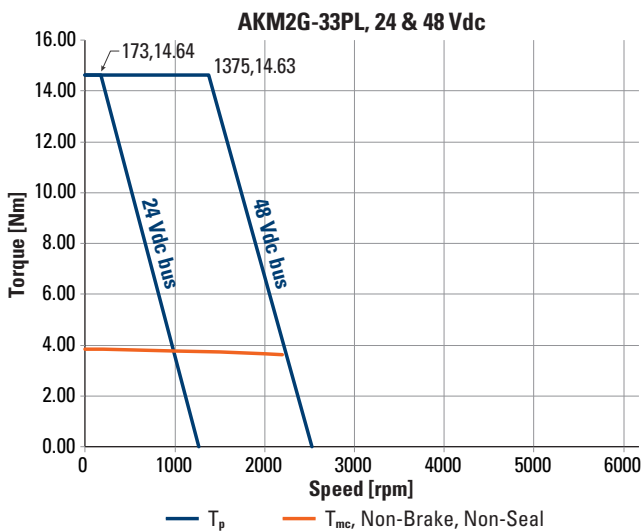
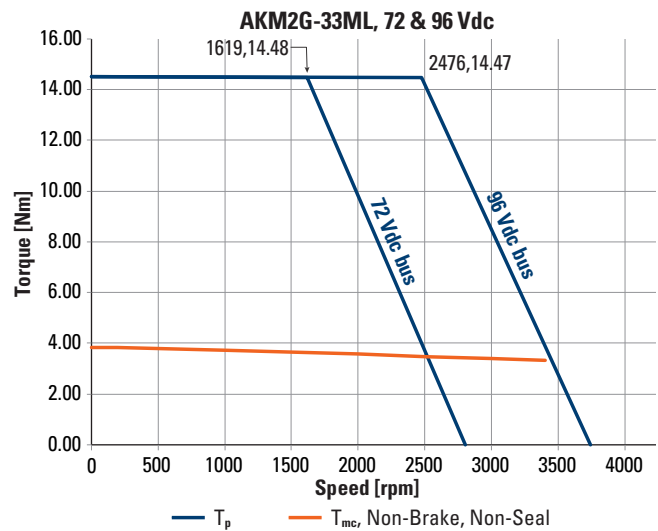
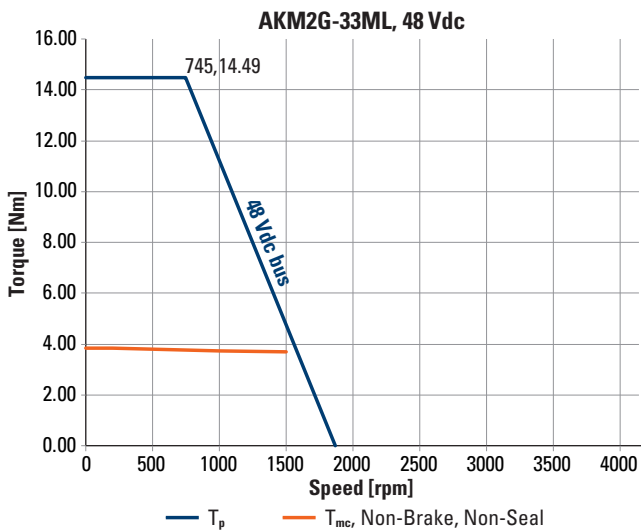
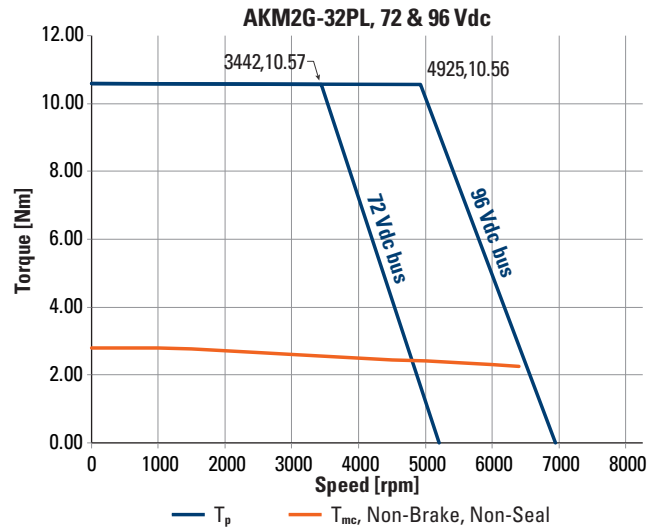
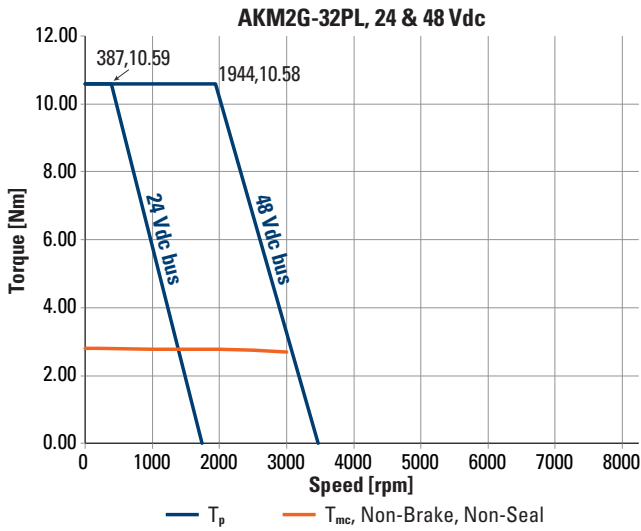
AKM[®] 2G-3x Series Servo Motors

AKM2G-3x Torque-Speed Performance Curves – Up to 96 Vdc



T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

AKM2G-3x Torque-Speed Performance Curves – Up to 96 Vdc (continued)

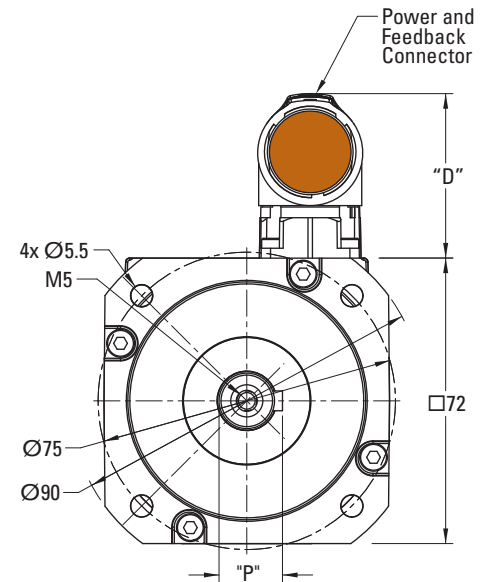
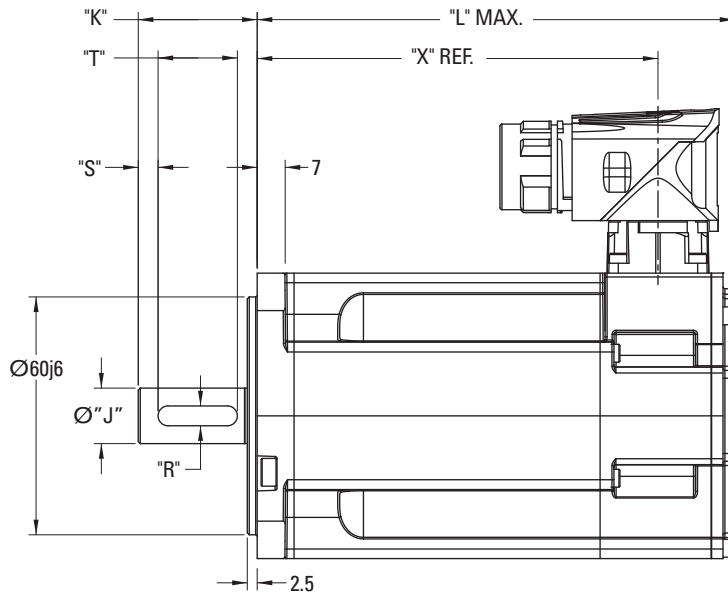


T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

AKM[®] 2G-3x Series Servo Motors

AKM2G-3x Dimensional Drawings

AKM2G-3x A-, D- Single Connector Frame



AKM2G-3x Mounting Flange-Shaft Dimensional Data

Mounting Flange-Shaft	Shaft Diameter	Shaft Length	Shaft Dia. w/ Key	Key Width	-	Key Length
	"J"	"K"	"P"	"R"	"S"	"T"
AC	14k6	30	16	5	5	20
AN	14k6	30	-	-	-	-
GC	11k6	23	12.5	4	3.5	16
GN	11k6	23	-	-	-	-

All dimensions in mm

AKM2G-3x Connector Height

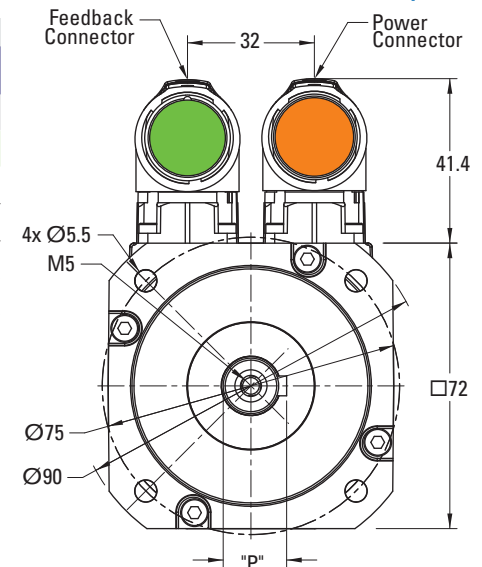
Connector Feedback	"D"
SFD3 (CA),	42.8
DSL (GU) & EnDat 2.2/22 (LD)	44.1

AKM2G-3x "X" and "L" Dimensions

Connector	No Brake (N)		
	"L" MAX		"X" REF
	A-, C-, D-	A-, C-, D-	A-, D-, Y-
Feedback Option	CA, 2-, Ax, R-	Dx, GU, LD	CA, 2-, Ax, Dx, GU, LD, R-
AKM2G-31	121.4	129.4	101.10
AKM2G-32	152.55	160.55	132.25
AKM2G-33	183.7	191.7	163.4
+ Brake ("2" option)	All AKM2G-3x: Add +41.20 mm to both "L" and "X" dimensions		

All dimensions in mm

AKM2G-3x A-, C- Dual Connector Option



Notes

AKM2G - **3** **2** **ML** **AN** **C** **N** **2-** **10***
Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Customization Thermal Sensor

0.125 inch divisions

AKM[®] 2G-4x Series Servo Motors

AKM2G-4x Low Voltage Servo Motor Performance Data – Up to 96 Vdc

Parameters	Tol	Symbol	Units	AKM2G-41		AKM2G-42			AKM2G-43			AKM2G-44		
				ML	PL	ML	NL	PL	LL	ML	NL	LL	ML	NL
Max Rated Equivalent Line Voltage	Max	V _{bus}	Vdc	170	170	170	170	170	170	170	170	170	170	170
Max Continuous Torque for ΔT winding = 100°C ①②③	Nom	T _{CS}	Nm	2.91	2.91	5.17	5.17	5.16	7.07	7.06	7.06	8.59	8.60	8.59
			Ib-in	25.7	25.8	45.7	45.7	45.7	62.6	62.5	62.5	76.0	76.1	76.0
Continuous Current for ΔT winding = 100°C ①②③	Nom	I _{CS}	A _{RMS}	14.1	19.9	13.8	17.4	19.7	12.5	14.0	18.0	12.8	14.5	16.4
Max Continuous Torque for ΔT winding = 60°C ②③	Nom	T _{CS}	Nm	2.26	2.27	4.03	4.03	4.02	5.51	5.50	5.51	6.70	6.71	6.70
			Ib-in	20.0	20.1	35.6	35.7	35.6	48.7	48.7	48.7	59.3	59.4	59.3
Max Mechanical Speed ④	Nom	N _{max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Peak Torque ①②③	Nom	T _p	Nm	7.28	7.28	14.5	14.5	14.5	21.2	21.2	21.2	27.1	27.1	27.1
			Ib-in	64.4	64.4	128	128	128	188	188	188	240	240	240
Peak Current	Nom	I _p	A _{RMS}	56.2	79.7	55.1	69.8	78.8	50.2	56.0	71.8	51.3	58.2	65.7
Rated Torque (speed) ①②③		T _{rtd}	Nm	-	2.89	-	-	-	-	-	-	-	-	-
			Ib-in	-	25.6	-	-	-	-	-	-	-	-	-
Rated Speed		N _{rtd}	rpm	-	1000	-	-	-	-	-	-	-	-	-
Rated Power (speed) ①②③		P _{rtd}	kW	-	0.303	-	-	-	-	-	-	-	-	-
			Hp	-	0.406	-	-	-	-	-	-	-	-	-
Rated Torque (speed) ①②③		T _{rtd}	Nm	-	-	-	5.12	5.10	-	-	7.01	-	-	-
			Ib-in	-	-	-	45.3	45.1	-	-	62.0	-	-	-
Rated Speed		N _{rtd}	rpm	-	-	-	800	900	-	-	600	-	-	-
Rated Power (speed) ①②③		P _{rtd}	kW	-	-	-	0.429	0.480	-	-	0.440	-	-	-
			Hp	-	-	-	0.575	0.64	-	-	0.590	-	-	-
Rated Torque (speed) ①②③		T _{rtd}	Nm	2.85	2.80	5.10	5.08	5.04	-	7.00	6.96	-	8.54	8.50
			Ib-in	25.2	24.8	45.1	44.9	44.6	-	62.0	61.6	-	75.6	75.2
Rated Speed		N _{rtd}	rpm	1600	2300	900	1100	1300	-	600	800	-	500	600
Rated Power (speed) ①②③		P _{rtd}	kW	0.477	0.674	0.481	0.585	0.686	-	0.440	0.58	-	0.447	0.534
			Hp	0.639	0.904	0.645	0.78	0.92	-	0.59	0.78	-	0.600	0.716
Rated Torque (speed) ①②③		T _{rtd}	Nm	2.78	2.68	5.02	4.96	4.89	6.94	6.91	6.83	8.46	8.41	8.36
			Ib-in	24.6	23.7	44.5	43.9	43.3	61.4	61.1	60.4	74.9	74.4	74.0
Rated Speed		N _{rtd}	rpm	2500	3600	1400	1800	2100	900	1000	1300	700	900	1000
Rated Power (speed) ①②③		P _{rtd}	kW	0.727	1.01	0.736	0.93	1.08	0.654	0.724	0.93	0.620	0.793	0.875
			Hp	0.97	1.35	0.988	1.25	1.44	0.88	0.97	1.25	0.832	1.06	1.17
Rated Torque (speed) ①②③		T _{rtd}	Nm	2.69	2.51	4.93	4.81	4.73	6.86	6.80	6.65	8.35	8.29	8.20
			Ib-in	23.8	22.2	43.6	42.6	41.8	60.7	60.2	58.8	73.9	73.4	72.5
Rated Speed		N _{rtd}	rpm	3400	5000	1900	2500	2800	1200	1400	1900	1000	1200	1400
Rated Power (speed) ①②③		P _{rtd}	kW	0.96	1.31	0.98	1.26	1.39	0.86	1.00	1.32	0.874	1.04	1.20
			Hp	1.28	1.76	1.32	1.69	1.86	1.16	1.34	1.77	1.17	1.40	1.61
Rated Torque (speed) ①②③		T _{rtd}	Nm	-	-	-	-	-	-	-	-	8.28	8.21	8.11
			Ib-in	-	-	-	-	-	-	-	-	-	73.2	72.6
Rated Speed		N _{rtd}	rpm	-	-	-	-	-	-	-	-	1200	1400	1600
Rated Power (speed) ①②③		P _{rtd}	kW	-	-	-	-	-	-	-	-	1.040	1.20	1.36
			Hp	-	-	-	-	-	-	-	-	-	1.39	1.61

Notes:

- ① Motor winding temperature rise, ΔT = 100° C, at 40° C ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Motor with resolver feedback and standard heat sink.
- ④ May be limited at some values of V_{bus}.

AKM2G-4x Low Voltage Servo Motor Performance Data – Up to 96 Vdc (continued)

Parameters	Tol	Symbol	Units	AKM2G-41		AKM2G-42			AKM2G-43			AKM2G-44		
				ML	PL	ML	NL	PL	LL	ML	NL	LL	ML	NL
Torque Constant ①	±10%	K_t	Nm/A _{rms}	0.209	0.147	0.378	0.298	0.263	0.567	0.507	0.395	0.674	0.595	0.525
			lb-in/A _{rms}	1.85	1.30	3.34	2.64	2.33	5.02	4.49	3.50	5.97	5.26	4.65
Back EMF Constant ②	±10%	K_e	V _{rms} /k _r rpm	13.8	9.75	25.2	19.9	17.6	38.0	34.0	26.5	45.5	40.1	35.5
Motor Constant ⑥	Nom	K_m	N-m/√W	0.333	0.334	0.536	0.536	0.536	0.687	0.686	0.687	0.809	0.810	0.809
			lb-in/√W	2.95	2.96	4.74	4.75	4.74	6.08	6.07	6.08	7.16	7.17	7.16
Resistance (line-line) ②	±10%	R_m	Ohm	0.262	0.130	0.331	0.206	0.161	0.454	0.364	0.221	0.463	0.359	0.281
Inductance Q-Axis (line-line)		L_{qll}	mH	1.6	0.80	2.3	1.5	1.1	3.4	2.7	1.6	3.6	2.8	2.2
Inductance D-Axis (line-line)		L_{dll}	mH	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Inductance Saturation Current		I_{sat}	Arms	71	101	80	101	114	80	89	114	89	101	114
Maximum Demagnetization Current		Midpeak	Arms	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Inertia (includes Resolver feedback) ③	±10%	J_m	kg-cm ²	0.774		1.36			1.95			2.53		
			lb-in-s ²	6.85E-04		1.20E-03			1.72E-03			2.24E-03		
Optional Brake Inertia (additional)	±10%	J_m	kg-cm ²	0.360		0.36			0.36			0.360		
			lb-in-s ²	3.19E-04		3.19E-04			3.19E-04			3.19E-04		
Weight without brake ④		W	kg	2.90		3.86			4.81			5.76		
			lb	6.39		8.5			10.6			12.7		
Static Friction ①⑤		T_f	Nm	0.0230		0.030			0.0380			0.0450		
			lb-in	0.2036		0.27			0.336			0.398		
Viscous Damping ①		K_{dv}	Nm/k _r rpm	0.00450		0.009			0.0125			0.0163		
			lb-in/k _r rpm	0.0398		0.08			0.111			0.144		
Thermal Time Constant		TCT	minutes	17		22			27			32		
Coil Thermal Time Constant		MCT _{f0}		TBD		TBD			TBD			TBD		
Thermal Resistance ①		R_{thw-a}	K/W	0.880		0.725			0.637			0.598		
Pole Pairs		PP		5		5			5			5		
Heat Sink Size				10"x10"x1/4" Aluminum Plate		10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate		

Notes:

① Motor winding temperature rise, ΔT = 100° C, at 40° C ambient.

② Measured at 25° C.

③ Add parking brake if applicable for total inertia.

④ Brake motor adds 1.36 kg [3.0 lbs]

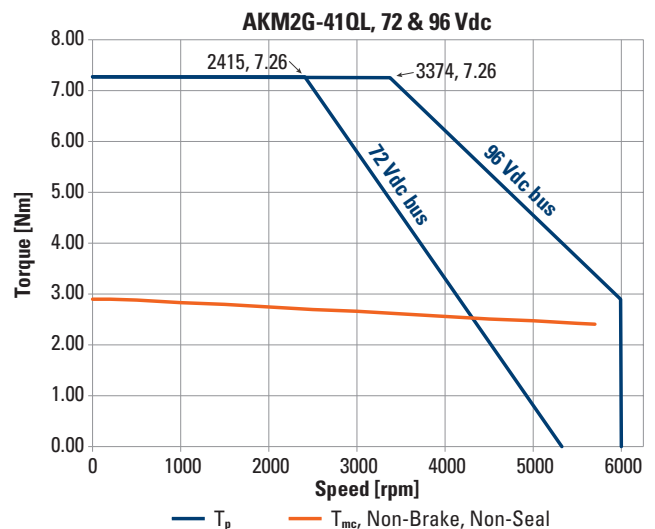
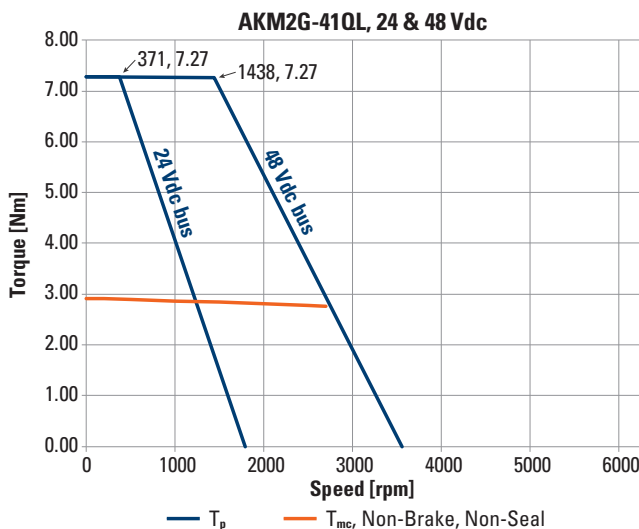
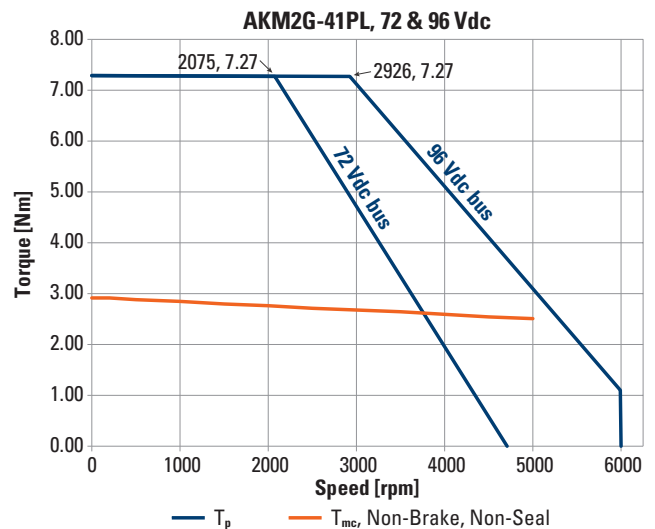
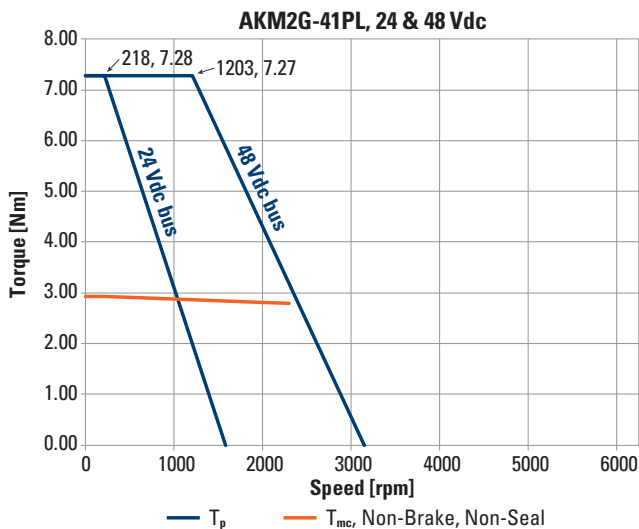
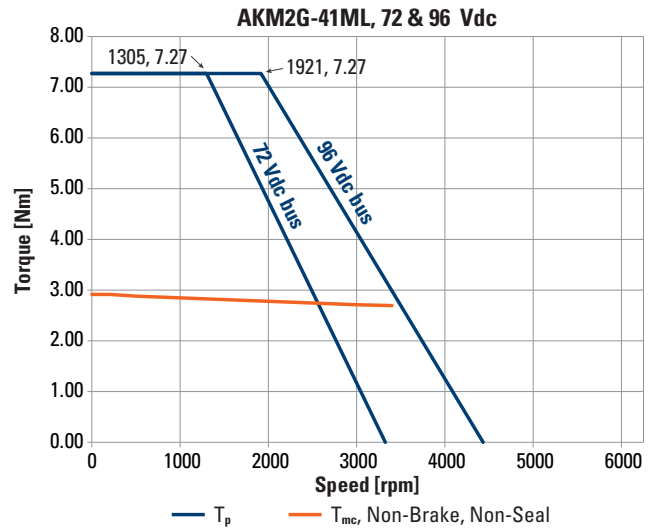
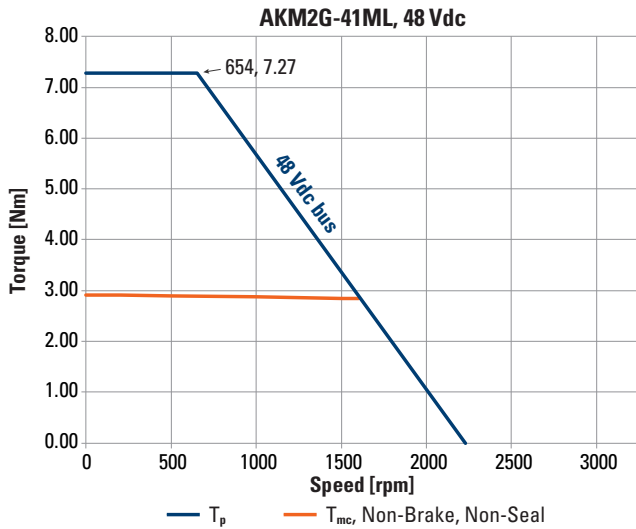
⑤ Shaft seal increases Static Friction by 0.023 Nm [0.20 lb-in]

⑥ This value is calculated from the Torque Constant and Resistance. Refer to those values and notes ① & ② for additional details.

*Complete AKM2G-4 low voltage servo motor series model nomenclature can be found on page 41.

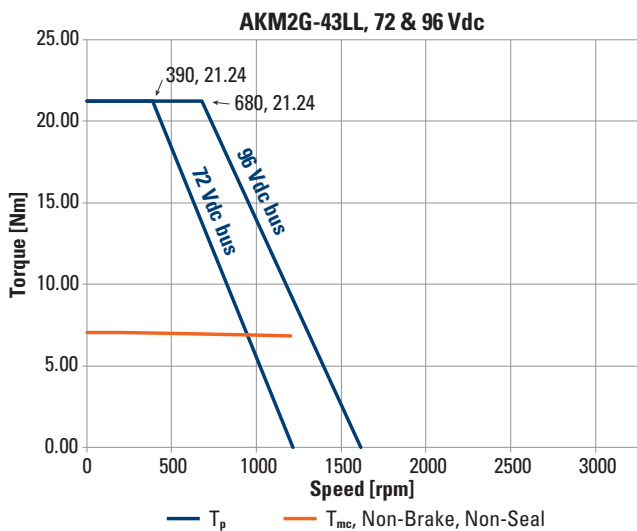
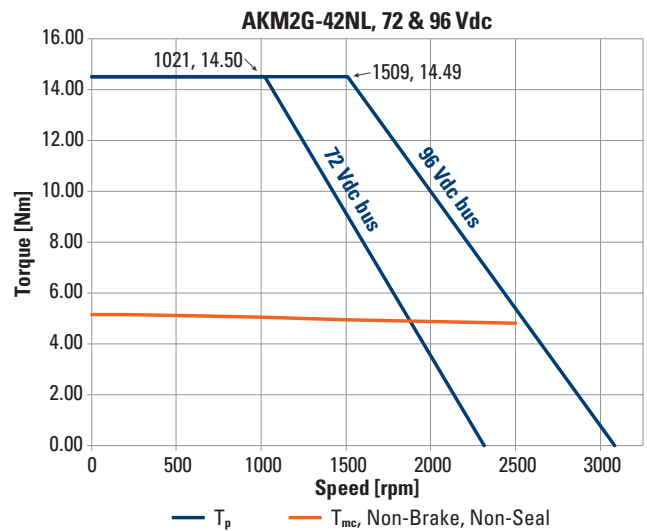
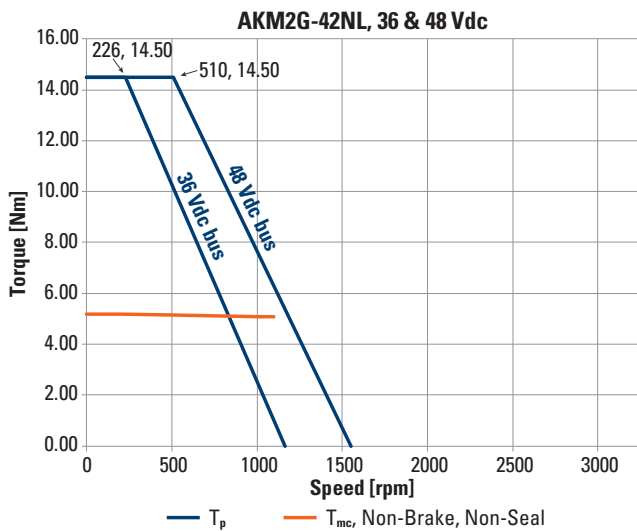
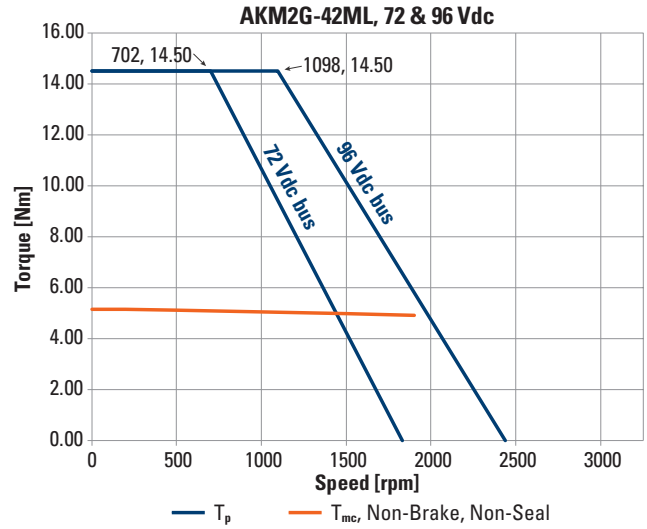
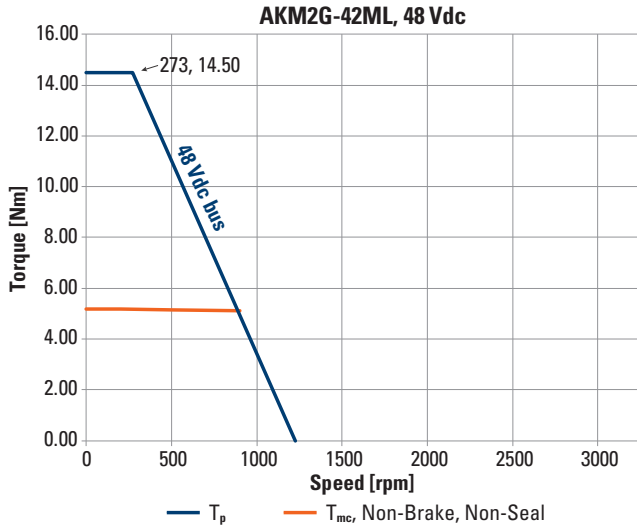
AKM[®] 2G-4x Series Servo Motors

AKM2G-4x Low Voltage Servo Motor Performance Curves – Up to 96 Vdc



T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

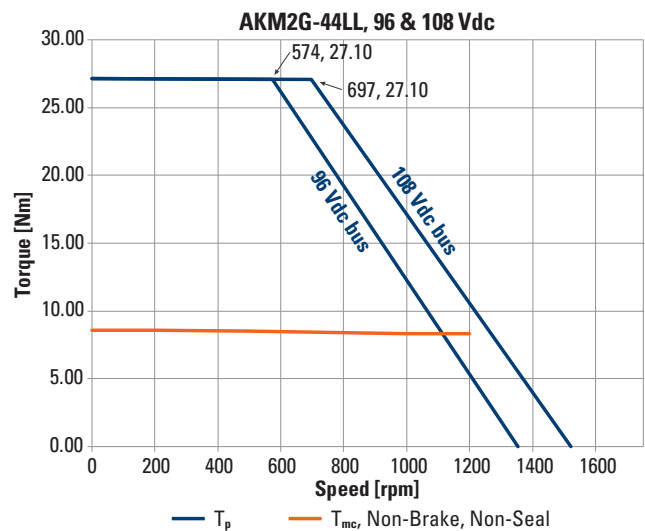
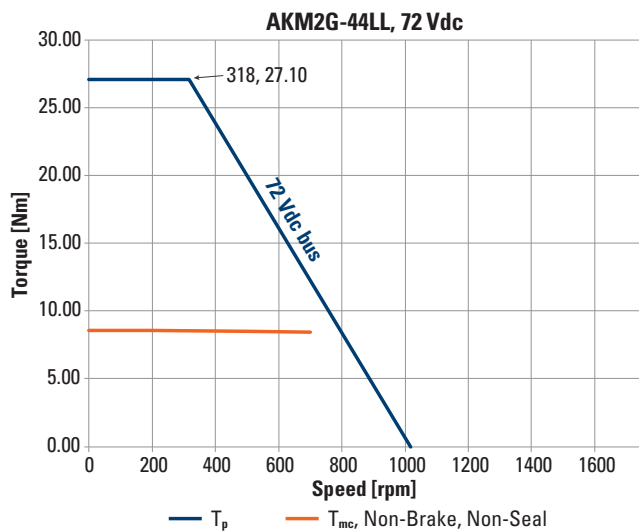
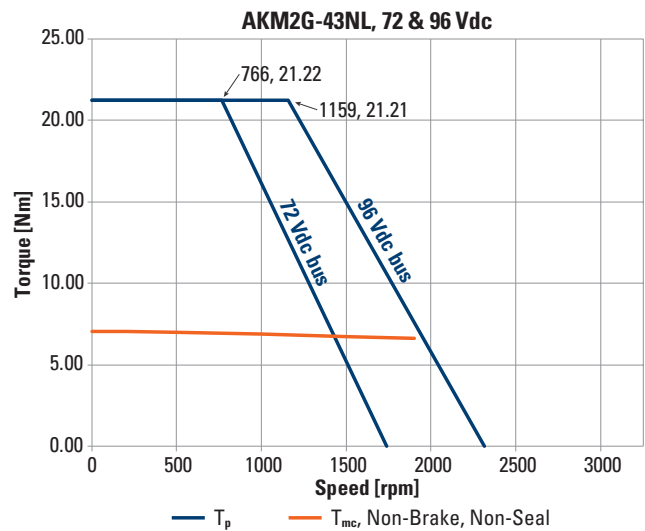
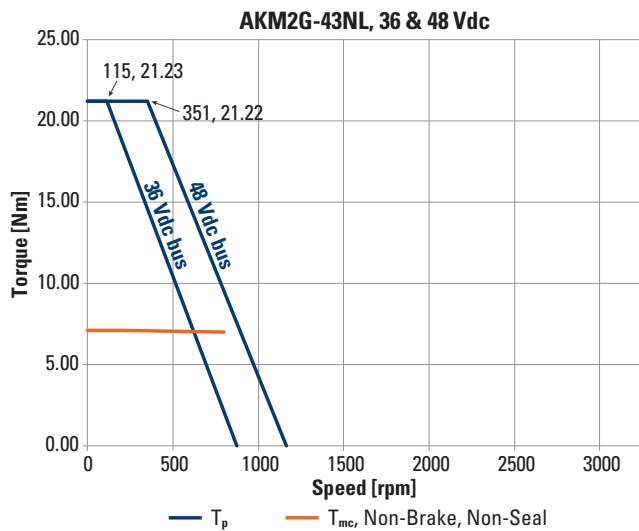
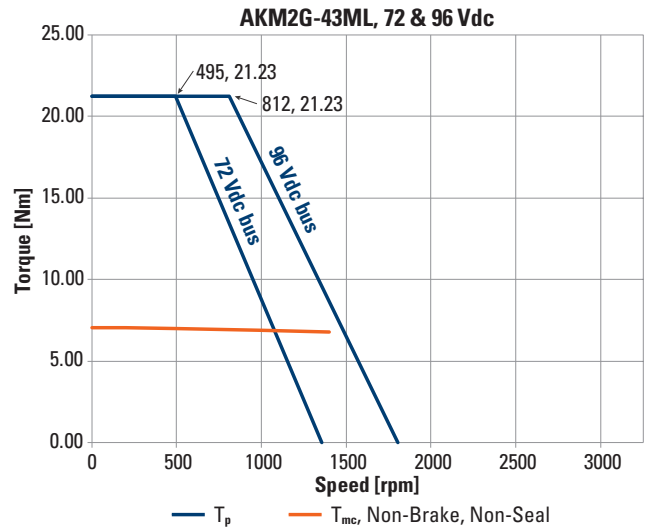
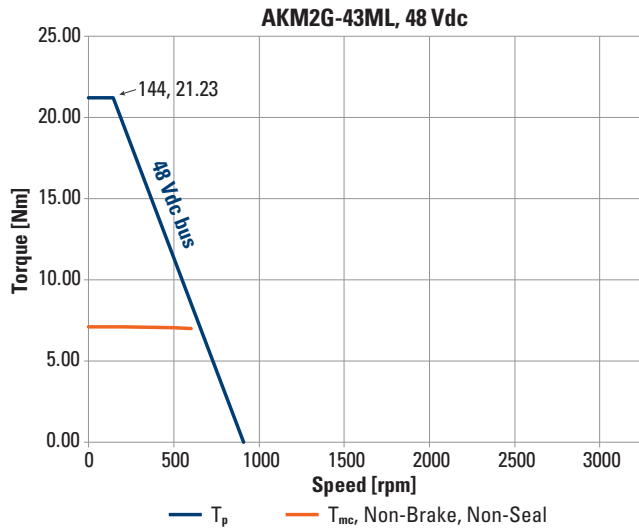
AKM2G-4x Low Voltage Servo Motor Performance Curves – Up to 96 Vdc (continued)



T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

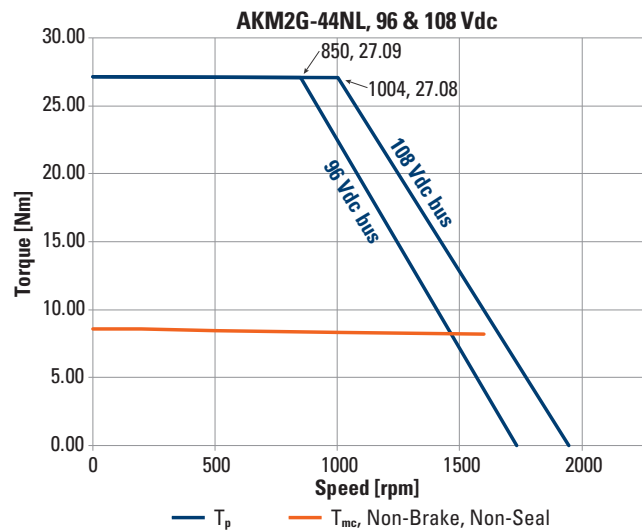
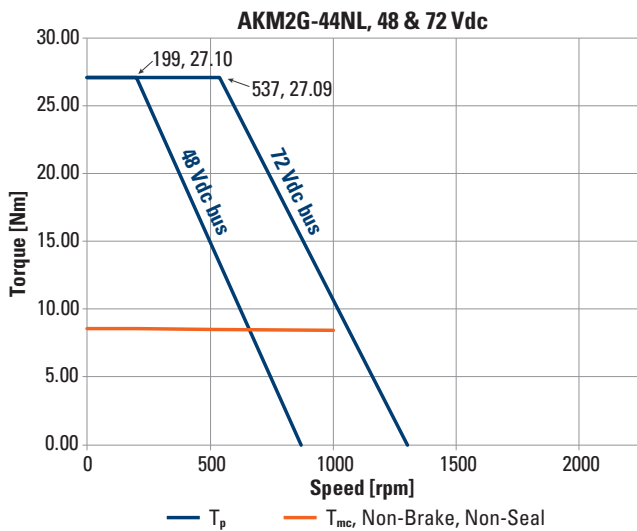
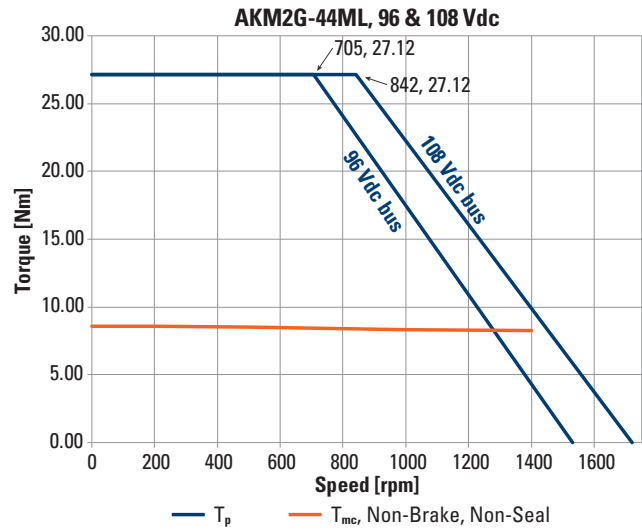
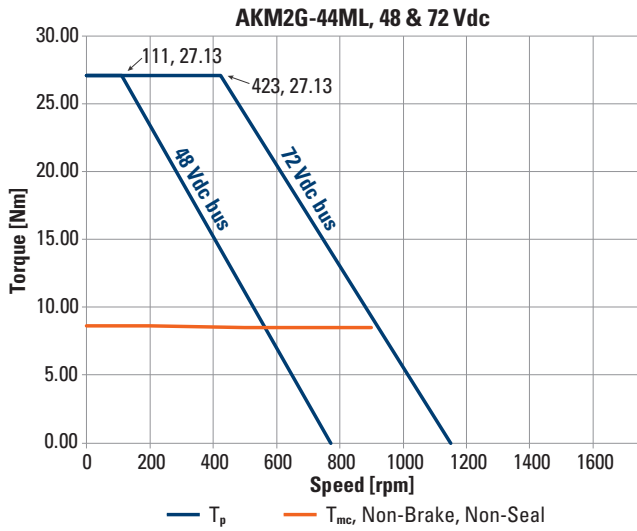
AKM[®] 2G-4x Series Servo Motors

AKM2G-4x Low Voltage Servo Motor Performance Curves – Up to 96 Vdc (continued)



T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

AKM2G-4x Low Voltage Servo Motor Performance Curves – Up to 96 Vdc (continued)

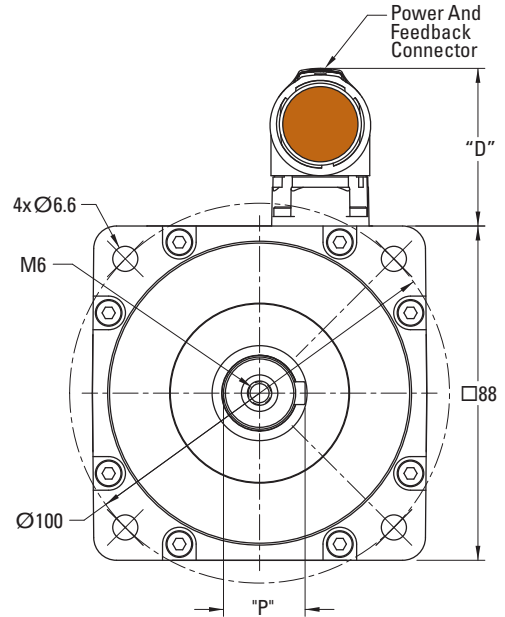
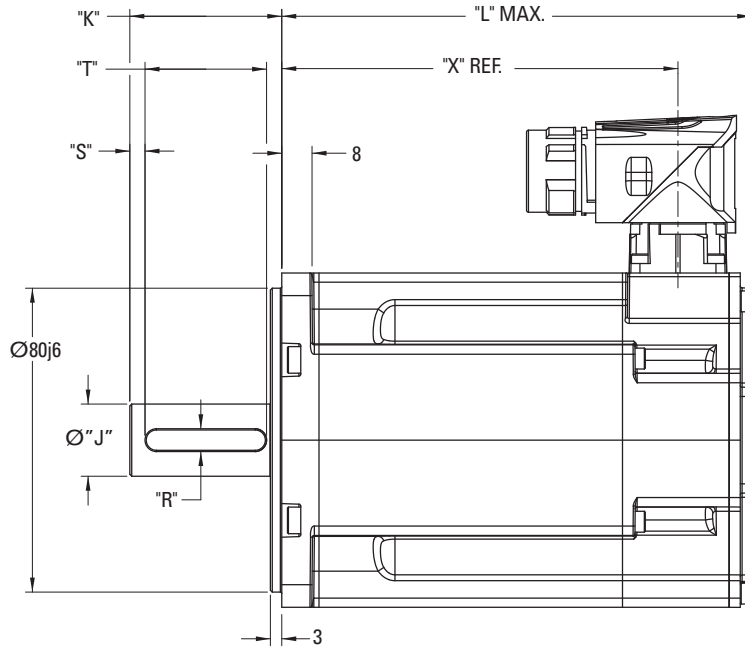


T_p = Peak torque
 T_{mc} = Maximum continuous torque
 Refer to page 40 for torque-speed curve properties.

AKM[®] 2G-4x Series Servo Motors

AKM2G-4x Dimensional Drawings and Data

AKM2G-4x A-, D- Single Connector Frame



AKM2G-4x Mounting Flange-Shaft Dimensional Data

Mounting Flange-Shaft	Shaft Diameter	Shaft Length	Shaft Dia. w/ Key	Key Width	-	Key Length
	"J"	"K"	"P"	"R"	"S"	"T"
AC	19k6	40	21.5	6	4	32
AN	19k6	40	-	-	-	-
GC	14k6	30	16	5	5	20
GN	14k6	30	-	-	-	-

All dimensions in mm

AKM2G-4x Connector Height

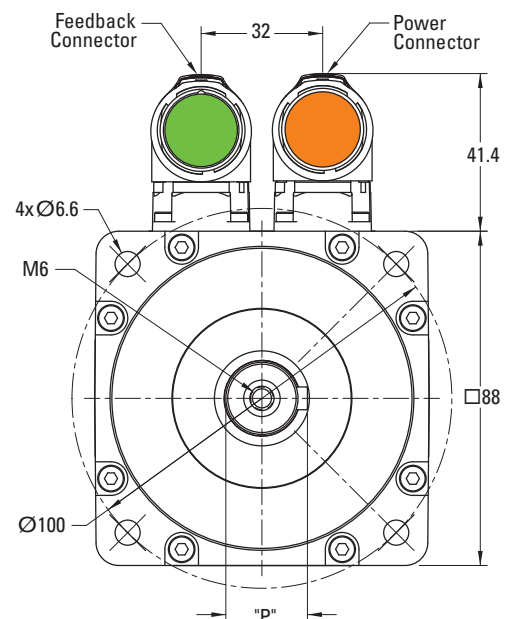
Connector Feedback	"D"
SFD3 (CA),	42.8
DSL (GU) & EnDat 2.2/22 (LD)	44.1

AKM2G-4x "X" and "L" Dimensions

Connector	No Brake (N)		
	"L" MAX		"X" REF
	A-, C-, D-	A-, C-, D-	A-, D-
Feedback Option	CA, 2-, Ax, R-	Dx, GU, LD	CA, 2-, Ax, Dx, GU, LD, R-
AKM2G-41	124.60	132.60	104.30
AKM2G-42	150.85	158.85	130.55
AKM2G-43	177.10	185.10	156.80
AKM2G-43	203.35	211.35	183.05
+ Brake ("2" option)	All AKM2G-4x: Add +47.80 mm to both "L" and "X" dimensions		

All dimensions in mm

AKM2G-4x A-, C- Dual Connector Option



Notes

AKM2G - **4** **2** **ML** **AN** **C** **N** **2-** **10***
Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Thermal Sensor Customization

0.125 inch divisions

Brake Option

Failsafe, Holding Brake

The holding brake is designed to provide static holding torque to the motor shaft with the brake coil de-energized. The brake must first be released (coil energized) prior to commanding motor rotation as determined by its drop-out time. The brake is intended for holding or “parking” of a stationary motor. It is not intended for dynamic braking. There should be absolutely no motion of the rotor when power is removed from the brake coil.

AKM2G Motor Brake Specifications

Motor Family	Minimum Static Torque @120°C		Weight Adder		Power Consumption Nominal	Current ¹ @24 V, 20°C	Inertia Adder		Closing Time (engage)	Opening Time (release)	Backlash ²	
	Nm	lb-in	Kg	lb			Watts ±7%	ADC			kg-cm ²	lb-in-sec ²
AKM2G-2	2	17.7	0.45	1.0	11.4	0.47	0.04	3.5E-05	10	40	1	0.32
AKM2G-3	3.3	29.205	0.72	1.6	12.6	0.53	0.12	1.1E-04	17	55	1	0.6
AKM2G-4	7	62.0	1.36	3.0	14.7	0.61	0.36	3.2E-04	20	85	1	0.55

Contamination of the motor internal compartment by oil or other foreign materials will result in failure of the brake. Check the suitability of motor sealing for the working environment.

Note 1: Operating Voltage: 24 Vdc ± 10%.

Note 2: Maximum backlash is calculated using worst-case tolerancing, and typical backlash is calculated using statistical tolerancing.

AKM2G Motor Feedback Options

AKM2G LV Servo Motor Feedback Summary

Code ³	Description	AKM2Gx ⁵	Connector	Single- or Multi-turn	Feedback Type/Size	Feedback Resolution			Data Channel Resolution		
						Device Resolution (Sin/Cos per Rev., Bits or Lines/Rev.)	Max. Resolution after AKD Interpolation	Max. Resolution after AKD2G Interpolation	Accuracy ^{1,2} (arc-sec)	Resolution	Absolute revs.
2-	Commutating Encoder	3, 4	A _D , C	Single-turn	15	2048 Lines	8,192	8,192	±218.2"	12 bits	None
AA	BiSS B Sine Encoder Optical	2	Y	Single-turn	AD34	2048 Sin/Cos	27-Bits	32-Bits	±36"	32 bits	1
AB		3, 4	A _D , C		AD58						
		AB	2	Y	Multi-turn						AD34
3, 4			A _D , C	AD58							4096
CA	SFD3 Capacitive	2-4	A _H , D	Single-turn	15	24-Bits	24-Bits	24-Bits	±585"	24 bits	1
GU	HIPERFACE DSL [®] Capacitive	2-4	D	Multi-turn	EEM37	18-Bits	18-Bits	18-Bits	±240"	17 bits	4096
DA	EnDat [®] 2.1 Optical	2	Y	Single-turn	ECN1113	512 Sin/Cos	25-Bits	32-Bits	±120"	13 bits	1
DB		3, 4	A _D , C		Multi-turn	EQN1125	512 Sin/Cos				
		DB	2	Y		Multi-turn	EQN1125				512 Sin/Cos
3, 4			A _D , C	EQN1125	512 Sin/Cos		25-Bits				±120"
LD	EnDat [®] 2.2 Inductive	2-4	D	Multi-turn	EQI 1131	16 Sin/Cos	20-Bits	28-Bits	±120"	19 bits	4096
R-	Resolver Inductive	2	Y	Single-turn	15	1 pole pair (16-Bits)	16-Bits	16-Bits	±600"	24 bits for AKD/AKD2G	1
		3-4	A _D , C								

A_H = M23 Hybrid power/SFD3 connector pinned for use with legacy AKM performance cables – not compatible with AKM2G cables.

A_D = M23 Dual connectors with power connector pinned for use with legacy AKM performance cables – not compatible with AKM2G cables.

- AKD drives have a resolver measurement accuracy of ±45", for a drive w/ motor accuracy of ±585" and RMS Noise of ±9.9" Accuracy & RMS Noise data when used with other drives may be different.
- Accuracy refers to overall system accuracy once installed in the motor. Noise refers to the RMS position noise when at stand-still.
- All feedback options, except R- and 2-, have Motor ID support with embedded electronic motor nameplate data included for easy plug-and-play commissioning with Kollmorgen servo drives.
- AKM2G-LV Size 2 models are only available in single-connector configurations.

With AKD drives, all received positions are interpolated to a 32-bit resolution per revolution. When using a drive other than AKD consult the drive manufacturer for this information.

Feedback and Connector Availability

AKM2G-2x				AKM2G-3x -4x			
Connector Code	A	D	Y	Connector Code	A	C	D
Feedback Code	Ax		•	2-	•	•	
	CA	•	•	Ax	•	•	
	GU		•	CA	•		•
	Dx			GU			•
	LD		•	Dx	•	•	
	R-			•	LD		
				R-	•	•	

- = Hybrid (power + feedback) single connector
- = Dual power and feedback connectors

AKM2G Motor Feedback Specifications

Absolute Digital Encoder Options

Kollmorgen Smart Feedback Device, Gen 3 (SFD3) (CA)

Kollmorgen's proprietary SFD3 Feedback uses a single motor cable, requiring just one cable between the drive and motor. The feedback has both power and communication on a single wire pair, reducing overall wiring costs. In addition, the device includes onboard memory for an electronic motor datasheet.

Angle Measurement:

Resolution: 24 bits
 Accuracy: $< \pm 75$ arc-min electrical + sensor error
 Size 15 sensor ± 9 arc-min net (AKM2G 2,3,4)
 Size 21 sensor ± 9 arc-min net (AKM2G 5,6,7)
 Electrical noise: $< 2^{-17}$ Rev rms at full bandwidth
 Bandwidth: > 2000 Hz at -3 dB
 > 1000 Hz at -45° phase lag
 Max tracking rate: $> 50,000$ RPM
 Velocity ripple: $< 0.2\%$ p-p electronics only
 Size 15 sensor $< 1.5\%$ p-p net (AKM2G 2,3,4)
 Size 21 sensor $< 1.5\%$ p-p net (AKM2G 5,6,7)
 Velocity noise: < 4 RPM rms at full bandwidth

Digital Communications:

Baud rate: 2.5 Mbaud
 Signaling: RS-485 differential using differential Manchester encoding
 Update period: New position sample every 51.28 μ s
 Error detection: 5 bit CRC and running parity check

Power Supply:

Supply at drive: any between 7 V - 12 V accepted
 Nominal supply current: 120 mA
 Worst case supply: 150 mA

Environmental:

Operating ambient: -20 to 120° C
 Humidity: 10% to 90% non-condensing
 Storage temperature: -40 to 135° C

HIPERFACE DSL® (GU)

Type		Multi-Turn "GU"
Frame Size		AKM2G 2-7
Number of Absolute Ascertainable Revolutions		4096
Supply Voltage Range		7 to 12
Current Consumption	mA MAX.	150
Operating Temperature	°C MIN/MAX	-40/115
Inertia	g-cm ²	1
Output Interface		SICK HIPERFACE DSL®
Vibration Resistance – EN 60068-2-6	g [m/s ²]	50 g [490 m/s ²] – 10 to 2000 Hz
Shock Resistance – EN 60068-2-27	g [m/s ²]	≤ 100 g [981 m/s ²] – 6 ms
Manufacturer Product Type		EEM37

Absolute Digital Encoder Options

EnDat Inductive (LD)

Type		Multi-Turn "LD"
Frame Size		AKM2G 2, 3, 4
Revolutions		4096
Input Voltage	Vdc	3.6 to 14
Current Consumption	mA Typical	5 V: 115 (without load)
Operating Temperature	°C MIN/MAX	-40/115
Inertia	kg·m ²	0.3x10 ⁻⁶
Output Interface		HEIDENHAIN EnDat 2.2/22
Vibration Resistance – EN 60068-2-6	g [m/s ²]	Stator ≤41 g [400 m/s ²] – Rotor ≤61 g [600 m/s ²] – 55 to 2000 Hz
Shock Resistance – EN 60068-2-27	g [m/s ²]	≤100 g [981 m/s ²] – 6 ms
Manufacturer Product Type		EQI 1131

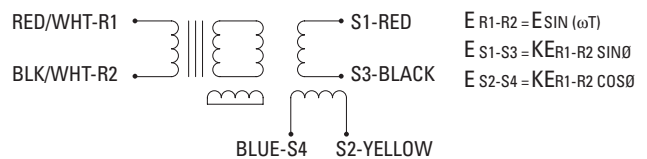
Resolver (R-)

Type		R- 1 Speed
Frame Size		AKM2G 2, 3, 4
Input Voltage	V _{RMS}	7.0
	k Hz	10
Input Current Max.	mA	50
Transformation Ratio	N/A	0.5 ±10%
Null Voltage	mV _{RMS}	30
Max. Error (pk-pk)	MINS.	18
Phase Shift	Degrees	0
Operating Temperature	°C	-55° to 155°
Rotor Inertia Max.	kg·cm ²	0.046
Vibration and Shock Resistance		High Vibration and Shock Resistance Please contact Kollmorgen Customer Support

Resolver Alignment

With positive DC current into phase W and out of phase V (U floats) the resolver is aligned to electrical ±5 counts. ie. Voltage S1-S3 set to null voltage S2-S4 max in phase with reference (R1-R2).

Resolver Winding Configuration



AKM2G Motor Feedback Specifications

Absolute Sine Encoder Options

Encoder Alignment

With positive DC current into phase W and out of phase V (U floats) the encoder is aligned to ± 1 electrical degree¹.

BiSS Optical (AA / AB)

Type		Single-Turn "AA"	Multi-Turn "AB"
Frame Size		AKM2G 2-4	AKM2G 2-4
Cycles per Revolution	-	2048	2048
Input Voltage	Vdc (tolerance)	5 (-5%/+10%)	5 (-5%/+10%)
Current Consumption	mA Typical	100 (without load)	150 (without load)
Feedback Operating Temperature	°C MIN./MAX.	-15/120	-15/120
Inertia	kg-cm ²	0.025	0.025
Output Interface		BiSS B	
Manufacturer Product Type		AD34	AD34

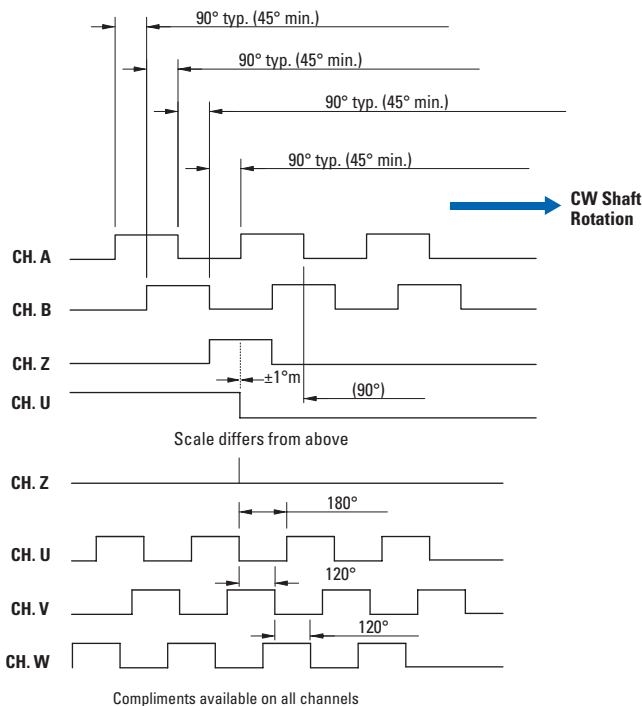
EnDat Optical (DA / DB)

Type		Single-Turn "DA"	Multi-Turn "DB"
Frame Size		AKM2G 2-4	AKM2G 2-4
Cycles per Revolution	-	512	512
Input Voltage	Vdc	3.6 to 14	3.6 to 14
Current Consumption	mA Typical	85 (no load)	105 (no load)
Feedback Operating Temperature	°C MIN./MAX.	-40/115	-40/115
Inertia	kg-cm ²	0.04	0.04
Output Interface		HEIDENHAIN EnDat 2.2/01	
Manufacturer Product Type		ECN1113	EQN1125

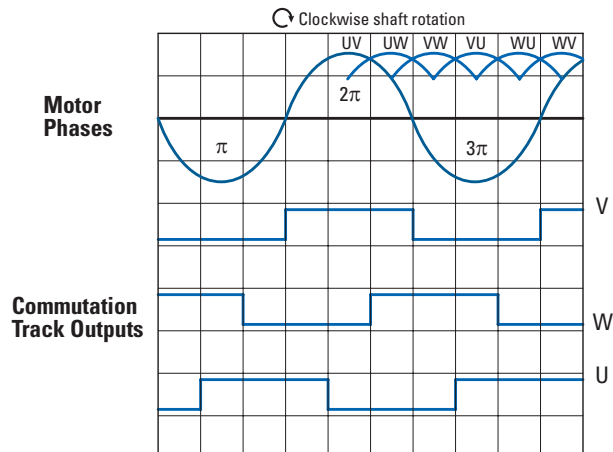
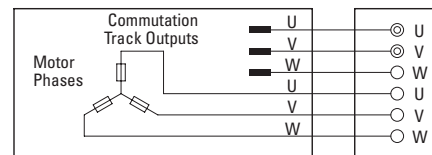
Commutating Encoder Option

Commutating Encoder (2-)

Parameter		2-
Frame Size		AKM2G-3x, -4x LV
Input Voltage	Vdc ±10%	5
Output Data	-	26LS31 Diff. Line Driver. Sink/Source 40mA Max
Line Count per revolution	-	2,048
Frequency Response	KHz	200
Max. Speed	RPM	8,000
Min. Edge Separation of Incremental Channel	°e MIN.	45
Index to U Comm Channel	-	±1°m Index Center to U Falling Edge
Index Pulse Width	-	Gated With B Low
Incremental Channel Accuracy	-	±1 Arc Min. Max. Edge to Edge
Max. Acceleration	Rad/s ²	100,000
Feedback Operating Temperature	°C	0 to 120
Storage Temperature	°C	-40 to 120
Vibration Resistance - EN 60068-2-6	g [m/s ²]	10 g [98 m/s ²] - 58 to 500 Hz
Shock Resistance - EN 60068-2-27	g [m/s ²]	80 g [785 m/s ²] - 11 ms
Commutating Channel	-	8 Pole, 45°m
Moment of Inertia	kg-cm ²	0.0048



Motor Connections



Max. Misalignment between rising edge of commutation track V & zero crossing of back EMF UV ≤ 5° electrical.

AKM2G Motor Connector Options

Connector Options

Model Designation	Connection	Compatible AKM2Gx	Position of connection
A* (Hybrid)	1 SpeedTec® M23 (AKM cable pinned)	AKM2G3 - AKM2G7 ≤ 20 Amps	Angular, rotatable, motor mounted
A (Dual)	2 SpeedTec® M23 (AKM cable pinned)	AKM2G3 - AKM2G7 ≤ 20 Amps	Angular, rotatable, motor mounted
C	2 SpeedTec® M23	AKM2G3 - AKM2G7 ≤ 20 Amps	Angular, rotatable, motor mounted
D*	1 htec® M23	AKM2G2 - AKM2G7 ≤ 20 Amps	Angular, rotatable, motor mounted
Y	1 ytec® Connector	AKM2G2 (non LV)	Rotatable, motor mounted

* Hybrid connectors valid for SFD3, DSL, and EnDat 2.2 Feedback only.

Connector Description

Connector	Usage	Contacts - Pins Power/Signal	Max. Current [A] Power/Signal	Max. Cross Section [mm ²] Power/Signal	Protection Class
M23 SpeedTec® right angle connectors (Size 1)	Power & Brake	4 / 5	20 / 10	4 / 1.5	IP65
	Comcoder	- / 15	- / 10	4 / 1.5	IP65
	Resolver	- / 12	- / 10	- / 0.5	IP65
	DSL	5 / 2 / 2	20 / 10	4 / 1.5	IP65
	SFD3	4 / 5	20 / 10	4 / 1.5	IP65
	EnDat 2.2	5 / 4 / 6	20 / 10	4 / 1.5	IP65
	EnDat 2.1 / BiSS B	- / 12	- / 10	4 / 1.5	IP65
ytec®	Power & Brake	4 / 5	14 / 3.6	1.5 / 0.75	IP65
	Resolver	- / 12	- / 5	- / 0.75	IP65
	EnDat 2.1 / BiSS B	- / 12	- / 5	- / 0.75	IP65

Feedback and Connector Availability

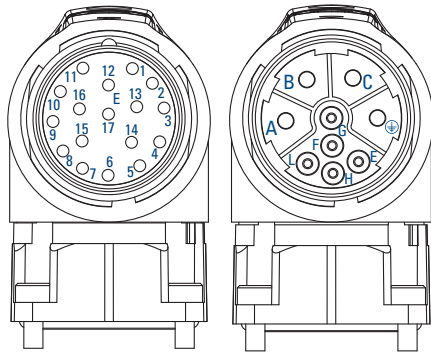
AKM2G-2x				AKM2G-3x -4x			
Connector Code	A	D	Y	Connector Code	A	C	D
Feedback Code	Ax		•	2-	•	•	
	CA	•	•	Ax	•	•	
	GU		•	CA	•		•
	Dx			GU			•
	LD		•	Dx	•	•	
	R-			LD			•
			•	R-	•	•	

- = Hybrid (power + feedback) single connector
- = Dual power and feedback connectors

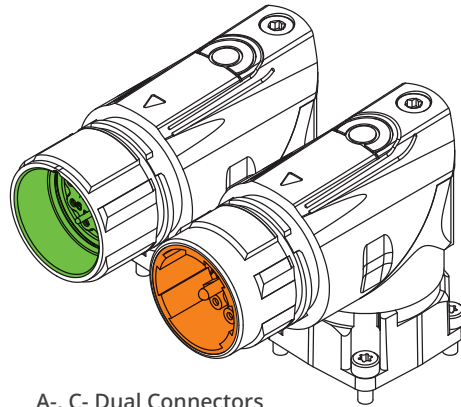
AKM2G Servo Motor Connector Pinouts

Dual Cable Options – Power & Feedback

A-, C- Dual Connector Pinouts – AKM2G 3-7 ≤ 20 Amps Continuous

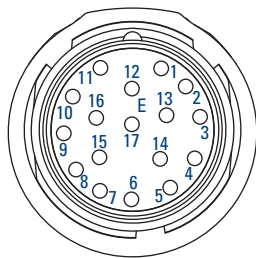


A-, C- Dual Connectors
C- Power Pinout Shown



A-, C- Dual Connectors

A-, C- Feedback Connector Pinouts



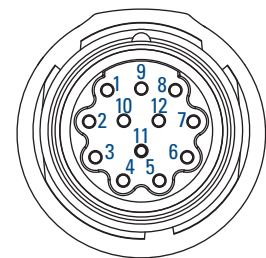
A-, C- Connector

Commutating Encoder Feedback

Pin	Function
1	B
2	B
3	A
4	A
5	Z
6	Z
7	GND
8	Thermal Sensor +
9	Thermal Sensor -
10	Vcc
11	N/C
12	N/C
13	N/C
14	N/C
15	U
16	V
17	W

Resolver Connector

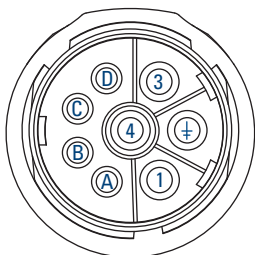
Pin	Function
1	N/C
2	Thermal Sensor +
3	S4, COS-
4	S3, SIN-
5	R2, REF-
6	Thermal Sensor -
7	S2, COS+
8	S1, SIN+
9	R1, REF+
10	N/C
11	N/C
12	N/C



A-, C- Connector

Shield is Not Connected at Motor End.
On motor mounted connectors, the thermal sensor lead colors are (+) Blue, (-) Black.

A- Power Connector Pinout



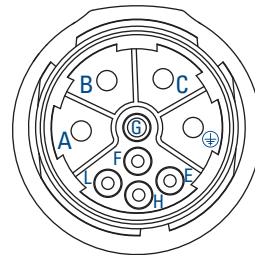
A- Connector

Power Connector

Pin	Function
1	U
2	PE
3	W
4	V
A	Brake +
B	Brake -
C	N/C
D	N/C

Note: Only for use with legacy AKM cables - not compatible with 2G Cables

C- Power Connector Pinout



C- Connector

Power Connector

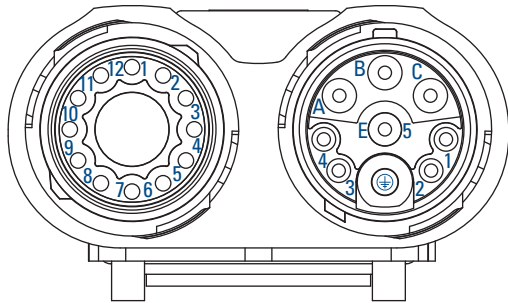
Pin	Function
A	U
⊕	PE
C	W
B	V
F	Brake +
G	Brake -
E	N/C
H	N/C
L	N/C

Shield Connected to Motor Ground Internal to Motor

AKM2G Servo Motor Connector Pinouts

Dual Cable Options – Power & Feedback

ytec®- Connector Pinout – AKM2G2 only

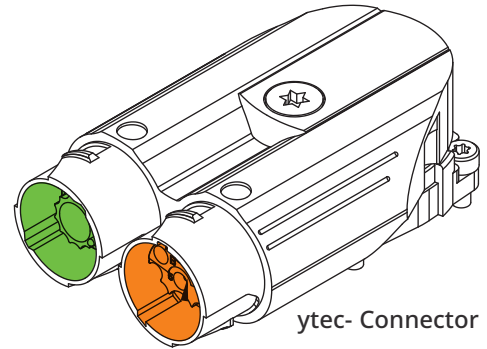


Feedback

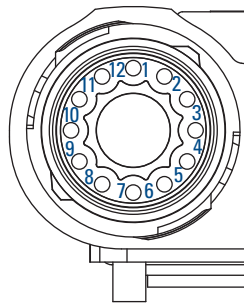
Power + Brake

Power Connector

Pin	Function
1	BR+
2	BR-
3	N/C
4	N/C
5	N/C
A	U
B	W
C	V
E	N/C
G	PE



ytec- Connector



Resolver Connector

ytec-Resolver Connector

Connector Part Number:
EEDA-101-NN-00-00-0001-000

Resolver

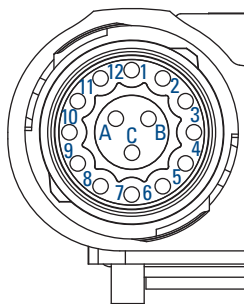
Pin	Function
1	N/C
2	TH+
3	S4, cos-
4	S3, sin-
5	R2, ref-
6	TH-
7	S2, cos+
8	S1, sin+
9	R1, ref+
10	N/C
11	N/C
12	N/C

ytec-EnDat/BiSS Connector

Connector Part Number:
EEDA-103-NN-00-00-0001-000

EnDat®/BiSS

Pin	Function
1	B-
2	GND
3	A-
4	Vcc
5	DATA+
6	N/C
7	Thermal Sensor +
8	Clock
9	B+
10	Un Sense (Common)
11	A+
12	Up Sense (VCC)
A	DATA-
B	Thermal Sensor -
C	Clock-

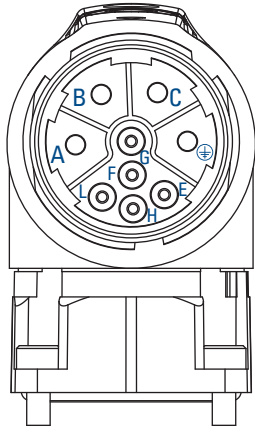


EnDat/BiSS, Comcoder

Single Cable Options – Power & Feedback

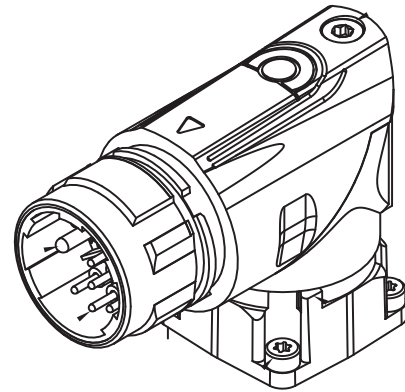
D- Connector Pinouts – Hybrid combined power and feedback for SFD3, DSL, and EnDat for all AKM2G < 20 Amps Continuous

D- Hybrid Power + SFD3 Connector Option

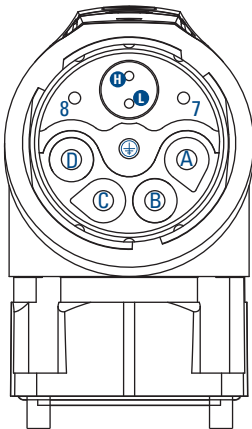


Power + SFD3

Pin	Function
A	Phase U
B	Phase V
C	Phase W
⊕	PE
E	N/C
F	Brake +
G	Brake -
H	SFD +
L	SFD -

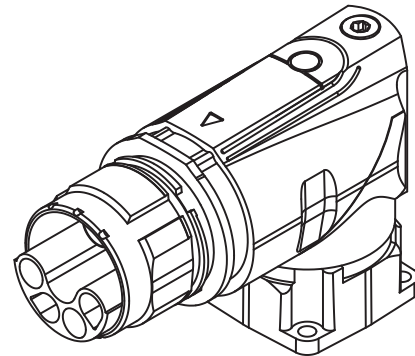


D- Hybrid Power + HIPERFACE DSL® Connector Option

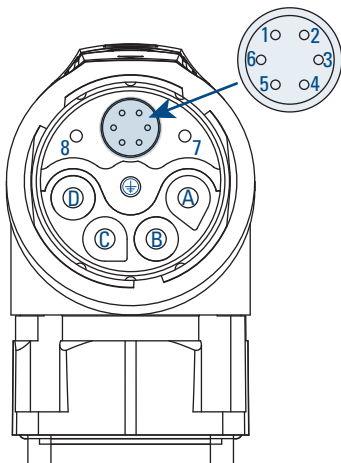


Power + DSL

Pin	Function
A	Phase U
B	Phase V
C	Phase W
D	N/C
⊕	PE
8	Brake +
7	Brake -
L	DSL -
H	DSL +



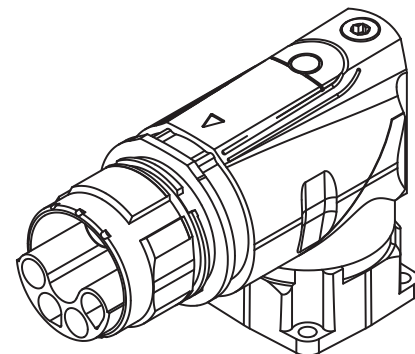
D- Hybrid Power + EnDat® Connector Option



Power + EnDat

Pin	Function
A	Phase U
B	Phase V
C	Phase W
D	N/C
⊕	PE
8	Brake +
7	Brake -
1	Up
2	0 V
3	Data +
4	Data -
5	Clock +
6	Clock -

Ethernet



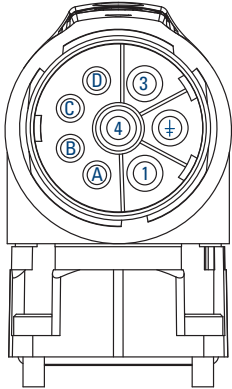
AKM2G Servo Motor Connector Pinouts

Single Cable Options – Power & Feedback

A- Connector Pinout – AKM2G 2-7 ≤ 20 Amps Continuous SFD3 motors

Note: Only for use with legacy AKM cables - not compatible with 2G Cables

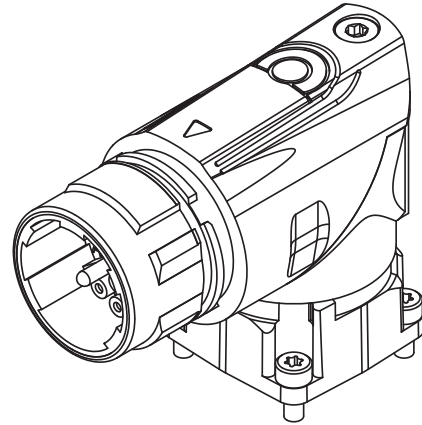
A- Hybrid Power + SFD3 Connector Option



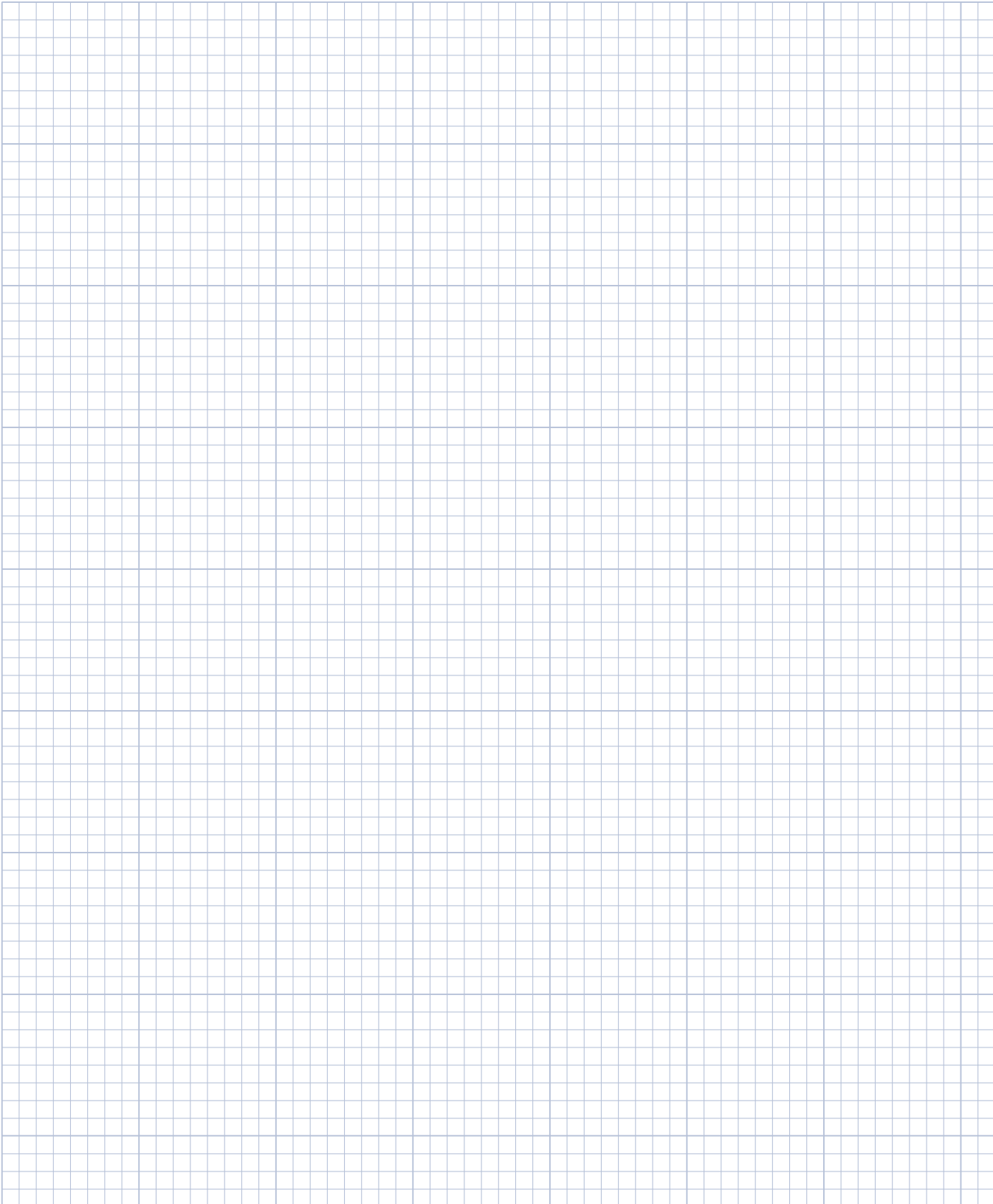
Hybrid Connector

Pin	Function
1	U
⊕	PE
3	W
4	V
A	Brake +
B	Brake -
C	SFD3 +
D	SFD3 -

Connector Part Number:
BEDC-110-NN-00-00-1216-000



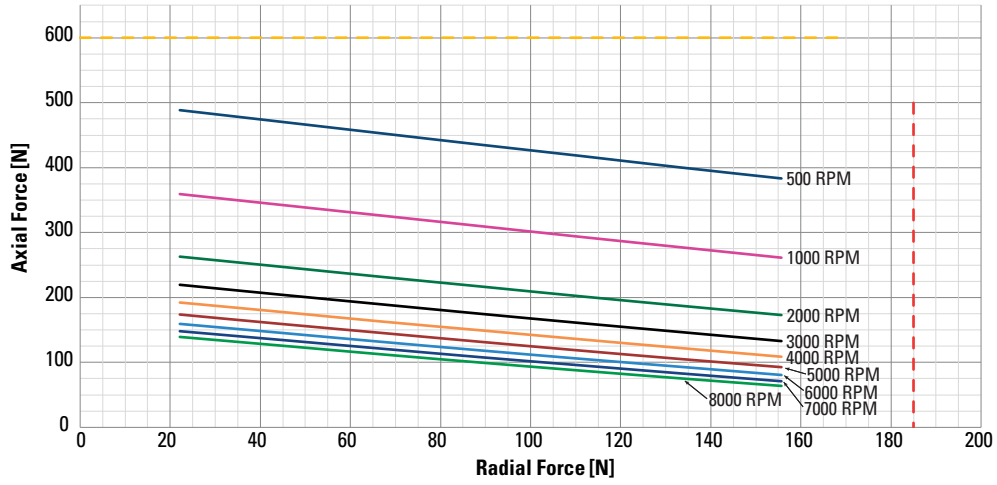
Notes



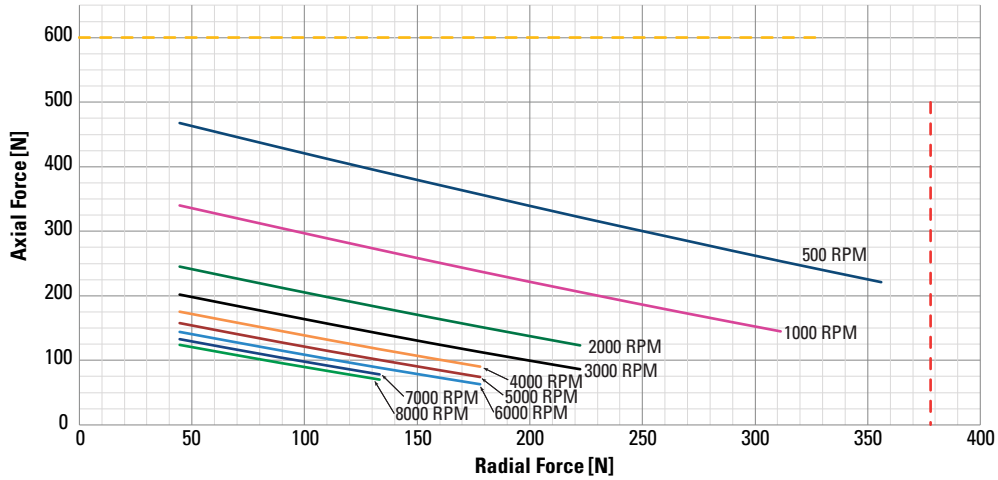
0.125 inch divisions

I. L10 Bearing Fatigue

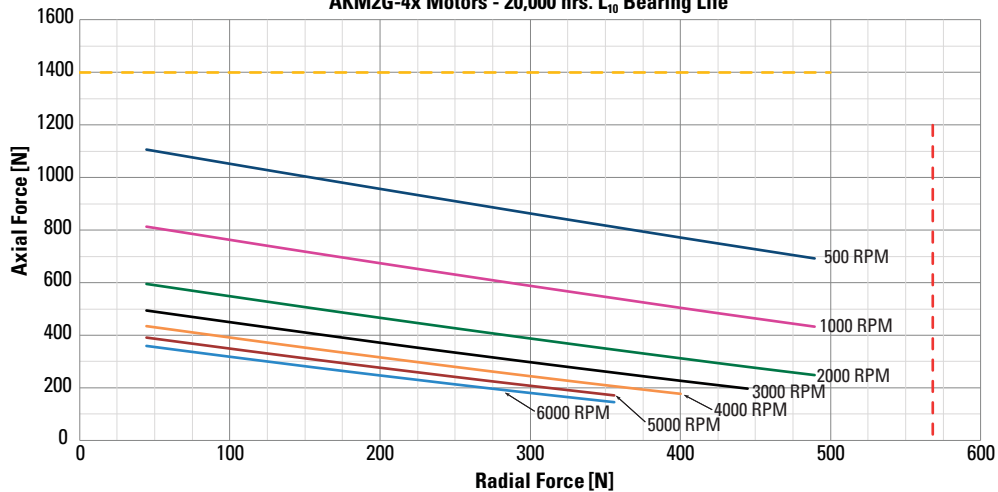
AKM2G-2x Motors - 20,000 hrs. L₁₀ Bearing Life



AKM2G-3x Motors - 20,000 hrs. L₁₀ Bearing Life



AKM2G-4x Motors - 20,000 hrs. L₁₀ Bearing Life



II. Shaft Loading

Motor	Max. Radial Force (N)	Max. Axial Force (N)
AKM2G-2	195	600
AKM2G-3	340	600
AKM2G-4	560	1400
AKM2G-5	890	1740
AKM2G-6	2000	2200
AKM2G-7	2670	3000

The maximum radial load ratings reflect the following assumptions:

1. Motors are operated with peak torque of the longest member of the frame size.
2. Fully reversed load applied to the end of the smallest diameter standard mounting shaft extension.
3. Infinite life with 99% reliability.
4. Safety factor = 2.

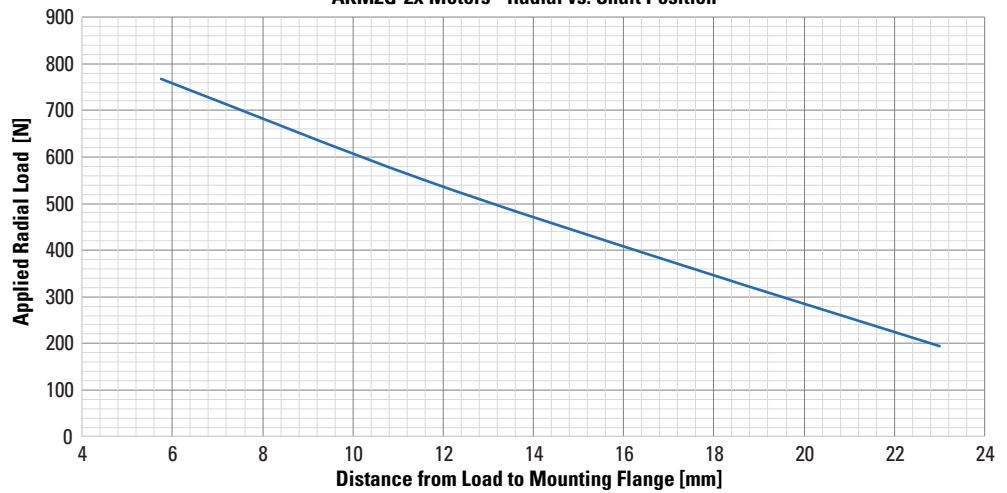
III. Mineral-filled PTFE Teflon® Shaft Seals

There is a normal break-in period for our Mineral-filled PTFE Teflon® shaft seals. Best conditions during the break-in period would be at the operational temperature and speed that would be typical for the application.

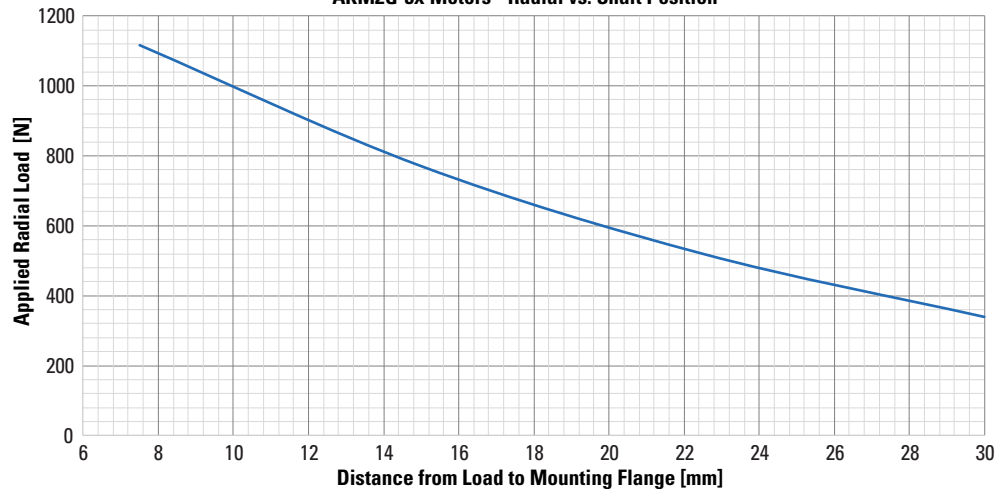
During the break-in period, some “shedding” of mineral-filled PTFE Teflon material is normal. The debris is not a sign of seal deterioration or failure. The material “shed” should be reduced with usage.

Typically, a few hours at operational speed is enough to break-in the shaft seal.

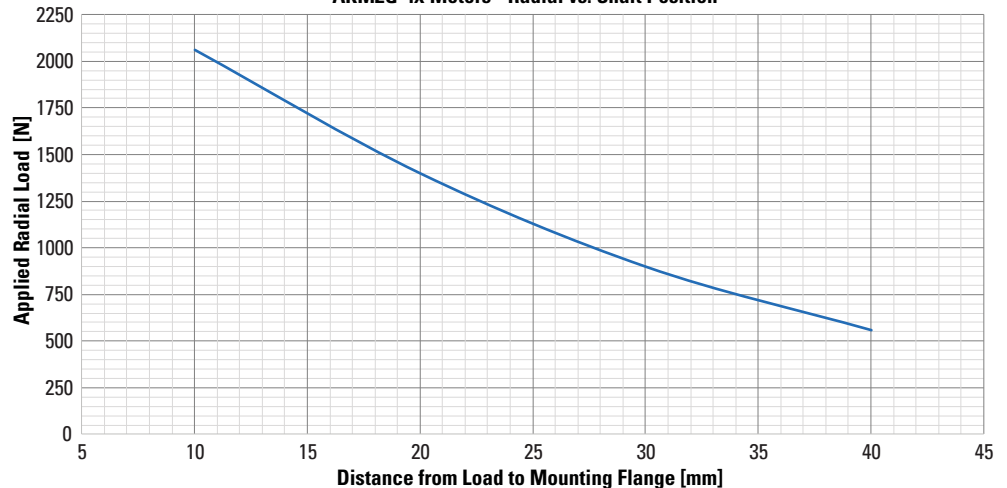
AKM2G-2x Motors - Radial vs. Shaft Position



AKM2G-3x Motors - Radial vs. Shaft Position



AKM2G-4x Motors - Radial vs. Shaft Position



IV. Thermal Sensor Protective Devices

The standard version of each motor is fitted with an electrically isolated PT-1000. The thermal sensors do not provide any protection against short, heavy overloading.

The motor can be delivered with a PT-1000 + PTC, PTC, or KTY 84-130 equivalent sensors optionally (see Thermal Sensor options 2, 3, 0).

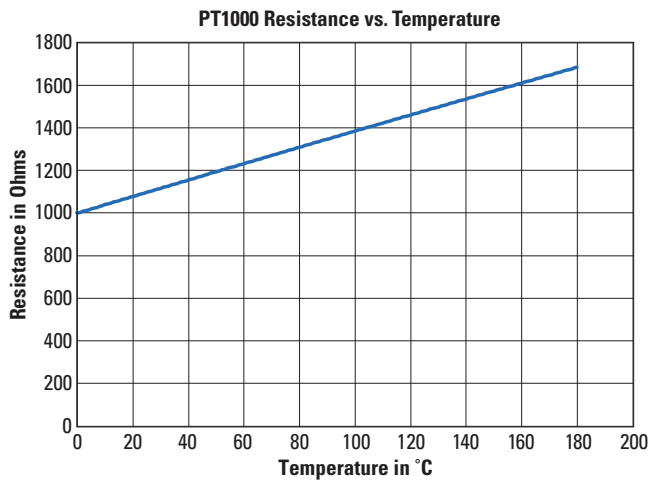
With digital feedback systems SFD3 (CA), Hiperface DSL (GU) and EnDat 2.2 (LD) the temperature sensor status is transmitted digitally and evaluated in the drive.

Provided that our configured feedback cables are used, the sensor is integrated into the monitoring system of the digital servo amplifiers.

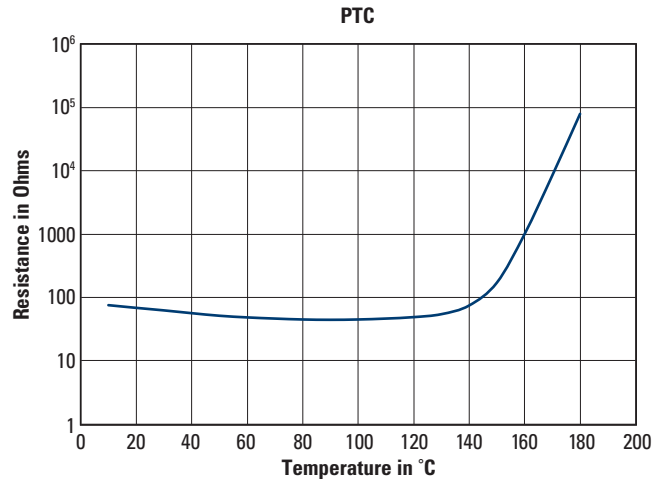
Thermal Device Options: Resistance vs. Temperature Graphs

Kollmorgen AKD drives can directly interpret information from the motor thermal sensors to properly reflect the motor winding temperature. For other drives please refer to the graph Delta Between Motor Winding and Thermal Device on the following page.

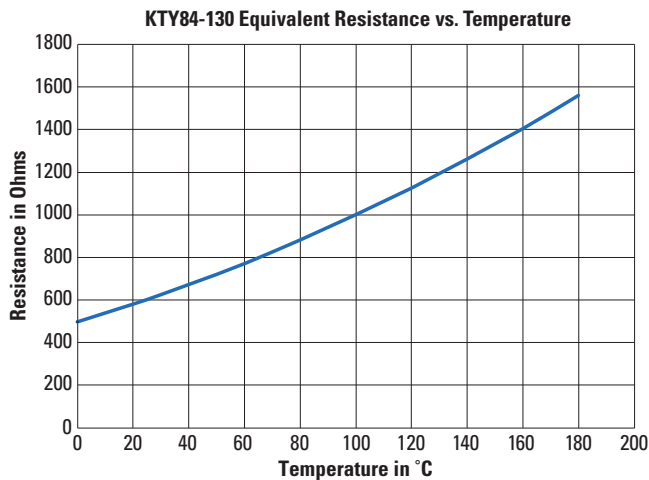
Standard 1



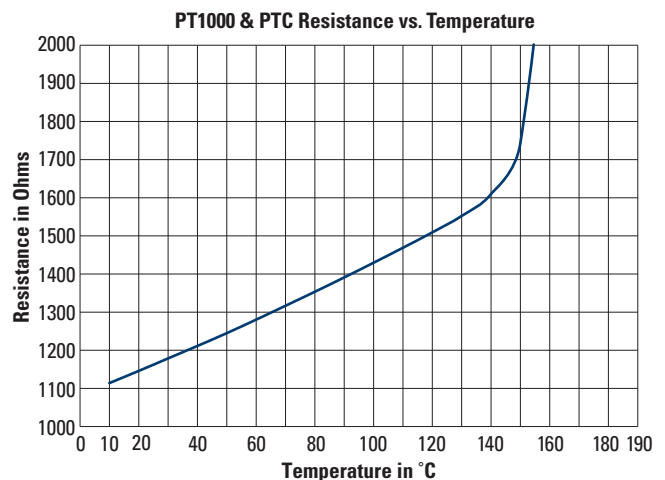
Option 2



Option 3



Option 0



V. Delta Between Motor Winding and Thermal Device

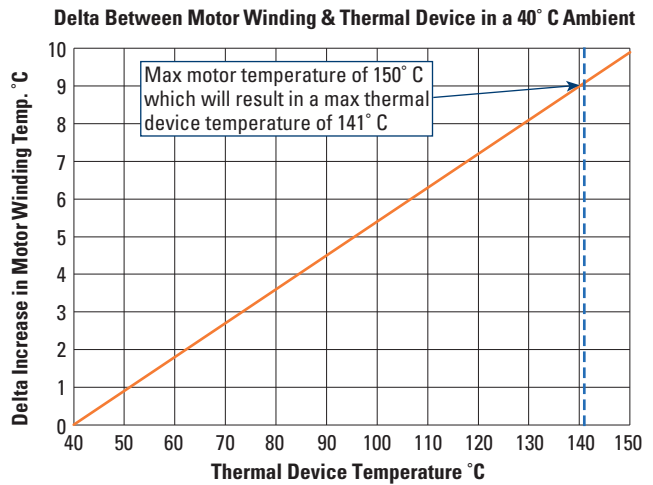
When using a drive other than the Kollmorgen AKD you will need to account for the difference (Delta) in temperature between the value reported by the thermal sensor and the actual motor winding temperature. This is necessary to insure proper operation and protection of the motor.

The provided graph shows the delta between the reported device temperature on the x axis and the motor winding temperature on the y axis and should be used to adjust the response of the system for the difference between the thermal sensors reported temperature and the actual motor winding temperature.

Examples:

At 60°C on thermal device temperature the winding temperature will be 1.8°C higher (61.8°C).

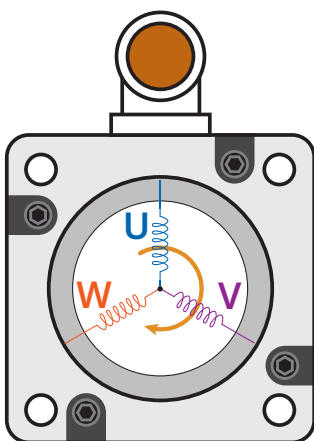
At 130°C on thermal device temperature the winding temperature will be 8.1°C higher (138.1°C).



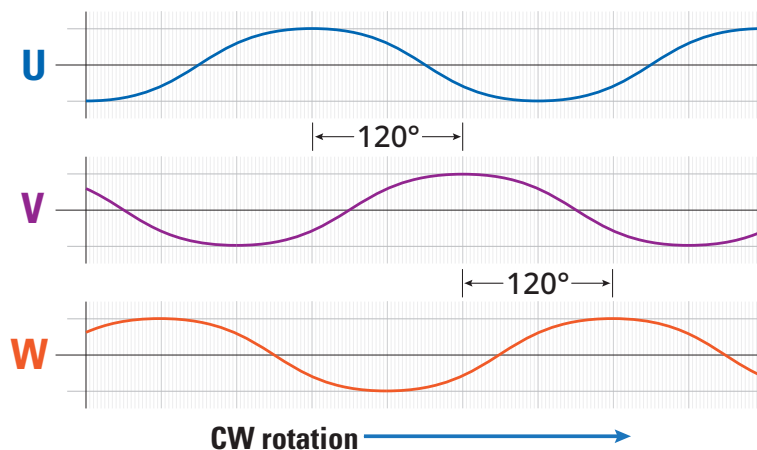
VI. Motor Phasing Diagram

When the motor is rotated C.W. (viewed from drive shaft end), the following BEMF voltage waveforms result:

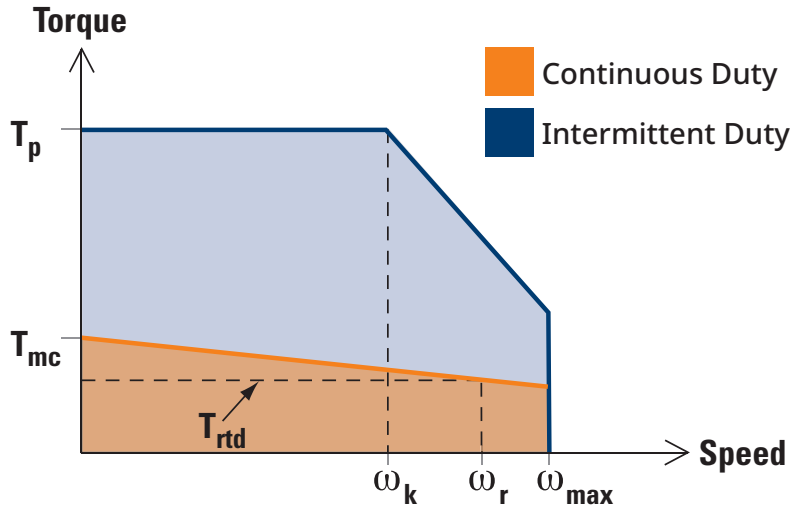
- » Voltage phase-U, leads Voltage phase-V, by 120-degrees
- » Voltage phase-V, leads Voltage phase-W, by 120-degrees
- » Voltage phase-W, leads Voltage phase-U, by 120-degrees



BEMF Waveforms



Servo Motor Performance Curve Overview



Definitions	
T_p	- Peak torque
T_{mc}	- Maximum continuous torque
T_{rtd}	- Continuous rated torque (torque at rated power)
ω_{max}	- Maximum speed
ω_r	- Rated speed (speed at rated power)
ω_k	- Speed at knee in peak envelope (intersection of system peak torque with voltage limit line)

Curves shown on the Performance Curves pages are calculated based on resolver/non-brake/non-seal motors only. For other motor curves please refer to Kollmorgen's Motioneering Application Sizing programs, the Kollmorgen website Performance Curve Generator or contact Kollmorgen customer support for assistance.

How to Build a Servo Drive and Motor System

Performance data provided in this document is designed to help you select the optimum brushless servo motor.

Drive and Motor Performance Curves

The performance characteristics of a brushless servo system (motor/drives combination) are described by a torque/speed operating envelope. As shown above, the shaded areas of the curve indicate the continuous duty and intermittent duty zones of the system.

Continuous Duty Zone

The continuous duty zone is bordered by the maximum continuous torque line up to the intersection with the intermittent duty line. The continuous torque line is set by either the motor's maximum rated temperature, or the drives' rated continuous current output, whichever is less. The system voltage limit line is set by the voltage rating of the drives, the line voltage supplied, and the motor winding. The system can operate on a continuous basis anywhere within this area, assuming the ambient temperature is 40°C or less.

Intermittent Duty Zone

The intermittent duty zone is bordered by the peak torque line and the system voltage limit line. The peak torque line is set by either the drives' peak current rating, which the drive can produce for a limited time, or the maximum rated peak current for the motor, whichever is less. Refer to the Performance Data pages for each frame size. Note: Higher torque levels may be achievable at higher power levels.

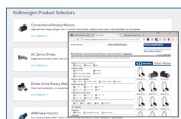
Consult Kollmorgen Customer Support for more details. The system voltage limit line is set by the voltage rating of the drive, the line voltage applied and the motor winding. Operation in the intermittent zone must be limited to a duty cycle that will produce an RMS system torque falling within the continuous duty area. The RMS torque value is a function of the magnitude of the intermittent torque and the percentage of the time spent at that torque.

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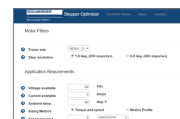
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Our global engineering, service and support network provides deep knowledge of all the major industries that rely on advanced motion control and automation technology. We offer world-class engineering expertise, self-service design tools, personalized field service, and easy access to our design, application and manufacturing centers in strategic locations across the globe.

About Kollmorgen

Kollmorgen, a Regal Rexnord brand, has more than 100 years of motion experience, proven in the industry's highest-performing, most reliable motors, drives, linear actuators, AGV (Automated Guided Vehicle) control solutions, and automation control platforms. We deliver breakthrough solutions that combine exceptional performance, reliability and ease of use, giving machine builders an irrefutable marketplace advantage.

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