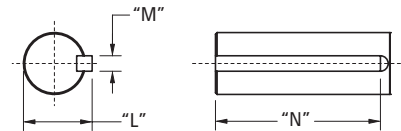
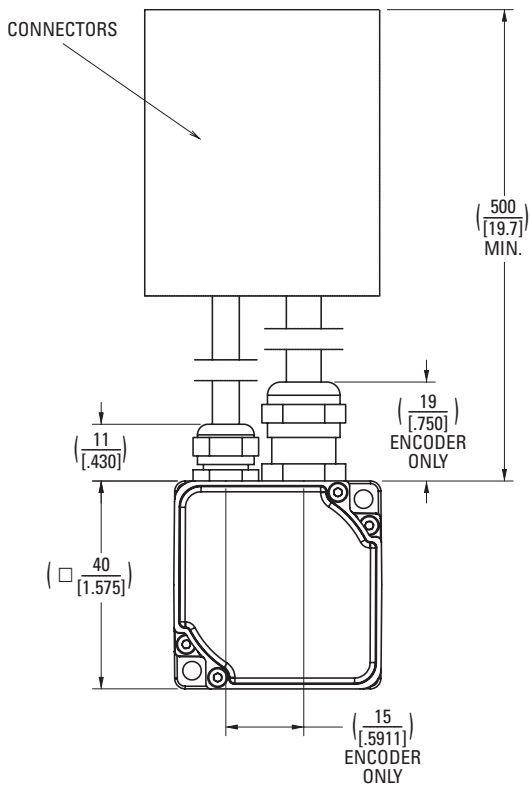
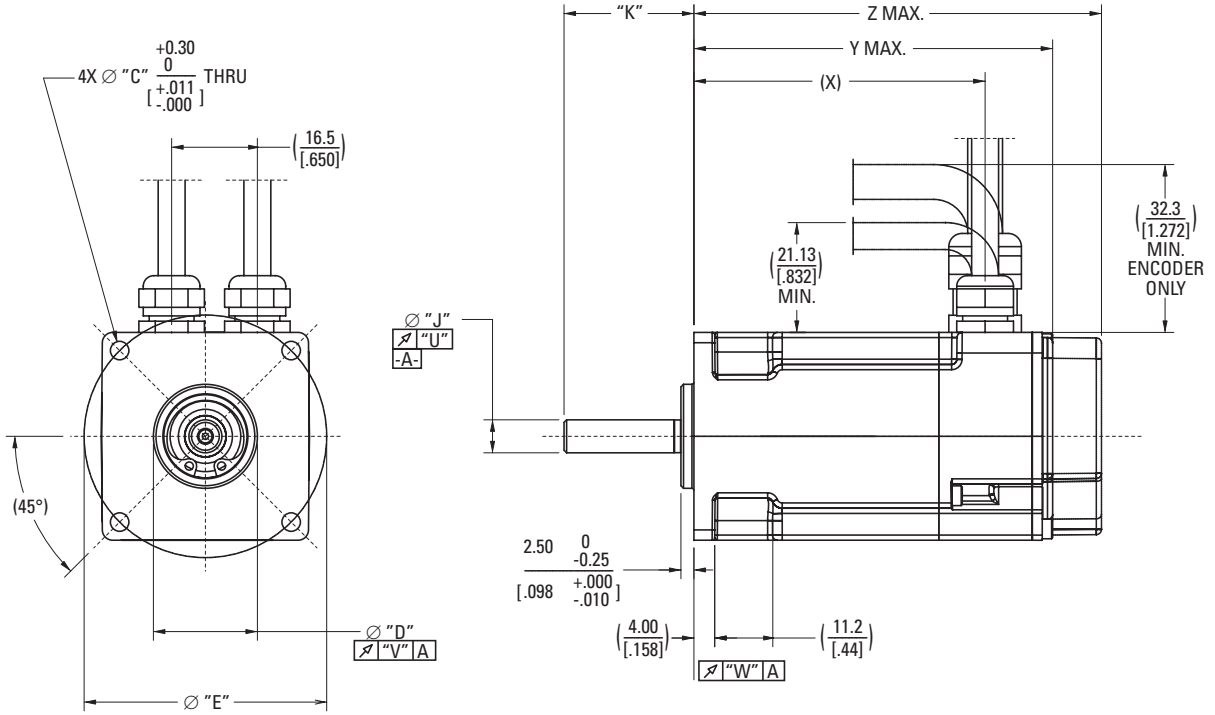


# AKM1x Outline Drawings

## AKM1x Frame



# AKM1x Dimension Data

## AKM1x Dimension Data

Mounting Code	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"
AK	4.30 [.169]	$30 \begin{matrix} 0 \\ -0.021 \\ +0.000 \\ -0.008 \end{matrix} h7$ [1.1811]	46 [1.811]	-	-	$8 \begin{matrix} 0 \\ -0.015 \\ +0.000 \\ -0.006 \end{matrix} h7$ [.3150]	25 [.984]	$9.20 \begin{matrix} 0 \\ -0.13 \\ +0.00 \\ -0.05 \end{matrix}$ [.362]
AN	4.30 [.169]	$30 \begin{matrix} 0 \\ -0.021 \\ +0.000 \\ -0.008 \end{matrix} h7$ [1.1811]	46 [1.811]	-	-	$8 \begin{matrix} 0 \\ -0.015 \\ +0.000 \\ -0.006 \end{matrix} h7$ [.3150]	25 [.984]	-
BN	356 [1.140]	20.02 ± 0.02 [.788 ± .001]	46.69 [1.838]	-	-	$6.350 \begin{matrix} 0 \\ -0.012 \\ +0.000 \\ -0.005 \end{matrix}$ [.2500]	25 [.984]	-
CK	3.40 [.134]	$30 \begin{matrix} 0 \\ -0.021 \\ +0.000 \\ -0.008 \end{matrix} h7$ [1.1811]	45 [1.772]	-	-	$8 \begin{matrix} 0 \\ -0.015 \\ +0.000 \\ -0.006 \end{matrix} h7$ [.3150]	25 [.984]	$9.20 \begin{matrix} 0 \\ -0.13 \\ +0.00 \\ -0.05 \end{matrix}$ [.362]
CN	3.40 [.134]	$30 \begin{matrix} 0 \\ -0.021 \\ +0.000 \\ -0.008 \end{matrix} h7$ [1.1811]	45 [1.772]	-	-	$8 \begin{matrix} 0 \\ -0.015 \\ +0.000 \\ -0.006 \end{matrix} h7$ [.3150]	25 [.984]	-

Mounting Code	"M"	"N"
AK	$3 \begin{matrix} 0 \\ -0.025 \\ +0.000 \\ -0.010 \end{matrix}$ [.1181]	$14 \begin{matrix} 0 \\ -0.2 \\ +0.00 \\ -0.08 \end{matrix}$ [.551]
AN	-	-
BN	-	-
CK	$3 \begin{matrix} 0 \\ -0.025 \\ +0.000 \\ -0.010 \end{matrix}$ [.1181]	$14 \begin{matrix} 0 \\ -0.2 \\ +0.00 \\ -0.08 \end{matrix}$ [.551]
CN	-	-

MODEL	(X)	Y MAX (W/ RESOLVER)	Z MAX (W/ SFD OR ENCODER)
AKM11	56.1 [2.21]	69.6 [2.74]	79.0 [3.11]
AKM12	75.1 [2.96]	88.6 [3.49]	98.0 [3.86]
AKM13	94.1 [3.70]	107.6 [4.24]	117.0 [4.61]

Note 1: Dimensions are in mm [inches].

Note 2: Product designed in metric. English conversions provided for reference only.

# AKM1x Performance Data

AKM1X PERFORMANCE DATA

## AKM1x Performance Data – Up to 320 Vdc

Parameters	Tol	Symbol	Units	AKM11			AKM12		AKM13	
				B	C	E	C	E	C	D
Max Rated DC Bus Voltage	Max	V <sub>bus</sub>	Vdc	320	160	75	320	160	320	160
Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧	Nom	T <sub>cs</sub>	Nm	0.183	0.185	0.185	0.310	0.310	0.409	0.401
			lb-in	1.62	1.64	1.64	2.74	2.74	3.62	3.55
Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧	Nom	I <sub>cs</sub>	A <sub>rms</sub>	1.16	1.45	2.91	1.51	2.72	1.48	2.40
Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T <sub>cs</sub>	Nm	0.146	0.148	0.148	0.248	0.248	0.327	0.320
			lb-in	1.29	1.31	1.31	2.19	2.19	2.89	2.83
Max Mechanical Speed ⑤	Nom	N <sub>max</sub>	rpm	8000	8000	8000	8000	8000	8000	8000
Peak Torque ①②	Nom	T <sub>p</sub>	Nm	0.609	0.614	0.611	1.08	1.08	1.46	1.44
			lb-in	5.39	5.43	5.41	9.6	9.6	12.9	12.7
Peak Current	Nom	I <sub>p</sub>	A <sub>rms</sub>	4.65	5.79	11.6	6.06	10.9	5.93	9.6
Rated Torque (speed) ①②⑦⑧⑨		T <sub>rtd</sub>	Nm	-	-	0.176	-	0.309	-	0.401
			lb-in	-	-	1.56	-	2.73	-	3.55
Rated Speed		N <sub>rtd</sub>	rpm	-	-	600	-	3000	-	2000
Rated Power (speed) ①②⑦⑧		P <sub>rtd</sub>	kW	-	-	0.11	-	0.10	-	0.08
			Hp	-	-	0.15	-	0.13	-	0.11
Rated Torque (speed) ①②⑦⑧⑨		T <sub>rtd</sub>	Nm	0.180	0.176	-	0.304	0.279	0.407	0.365
			lb-in	1.59	1.56	-	2.69	2.47	3.60	3.23
Rated Speed		N <sub>rtd</sub>	rpm	4000	6000	-	4000	8000	3000	7000
Rated Power (speed) ①②⑦⑧		P <sub>rtd</sub>	kW	0.08	0.11	-	0.13	0.23	0.13	0.27
			Hp	0.10	0.15	-	0.17	0.31	0.17	0.36
Rated Torque (speed) ①②⑦⑧⑨		T <sub>rtd</sub>	Nm	0.167	-	-	0.279	-	0.364	-
			lb-in	1.48	-	-	2.47	-	3.22	-
Rated Speed		N <sub>rtd</sub>	rpm	8000	-	-	8000	-	8000	-
Rated Power (speed) ①②⑦⑧		P <sub>rtd</sub>	kW	0.14	-	-	0.23	-	0.30	-
			Hp	0.19	-	-	0.31	-	0.41	-
Rated Torque (speed) ①②⑦⑧⑨		T <sub>rtd</sub>	Nm	-	-	-	-	-	-	-
			lb-in	-	-	-	-	-	-	-
Rated Speed		N <sub>rtd</sub>	rpm	-	-	-	-	-	-	-
Rated Power (speed) ①②⑦⑧		P <sub>rtd</sub>	kW	-	-	-	-	-	-	-
			Hp	-	-	-	-	-	-	-
Rated Torque (speed) ①②⑦⑧⑨		T <sub>rtd</sub>	Nm	-	-	-	-	-	-	-
			lb-in	-	-	-	-	-	-	-
Rated Speed		N <sub>rtd</sub>	rpm	-	-	-	-	-	-	-
Rated Power (speed) ①②⑦⑧		P <sub>rtd</sub>	kW	-	-	-	-	-	-	-
			Hp	-	-	-	-	-	-	-

See following page for notes.

## AKM1x Performance Data – Up to 320 Vdc (Continued)

Parameters	Tol	Symbol	Units	AKM11			AKM12		AKM13	
				B	C	E	C	E	C	D
Torque Constant ①	±10%	$K_t$	Nm/Arms	0.158	0.129	0.064	0.207	0.112	0.278	0.169
			lb-in/Arms	1.40	1.14	0.57	1.83	0.99	2.46	1.50
Back EMF Constant ⑥	±10%	$K_e$	V/krpm	10.2	8.3	4.1	13.3	7.2	17.9	10.9
Motor Constant	Nom	$K_m$	N-m/√W	0.0302	0.0303	0.0296	0.0480	0.0463	0.0618	0.0593
			lb-in/√W	0.267	0.268	0.262	0.425	0.410	0.547	0.525
Resistance (line-line) ⑥	±10%	$R_m$	ohm	18.23	12.11	3.11	12.4	3.9	13.5	5.41
Inductance (line-line)		L	mH	12.5	8.3	2.04	9.1	2.7	10.3	3.8
Inertia (includes Resolver feedback) ③	±10%	$J_m$	kg-cm <sup>2</sup>	0.017			0.031		0.045	
			lb-in-s <sup>2</sup>	1.5E-05			2.7E-05		4.0E-05	
Optional Brake Inertia (additional)	±10%	$J_m$	kg-cm <sup>2</sup>	-			-		-	
			lb-in-s <sup>2</sup>	-			-		-	
Weight		W	kg	0.35			0.49		0.63	
			lb	0.8			1.1		1.4	
Static Friction ①⑨		$T_f$	Nm	0.0011			0.0021		0.0031	
			lb-in	0.01			0.02		0.03	
Viscous Damping ①		$K_{dv}$	Nm/krpm	0.0005			0.001		0.0015	
			lb-in/krpm	0.004			0.009		0.013	
Thermal Time Constant		TCT	minutes	4			6		7	
Thermal Resistance		$R_{thw-a}$	°C/W	1.83			1.63		1.53	
Pole Pairs				3			3		3	
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,  $\Delta T=100^\circ\text{C}$ , at  $40^\circ\text{C}$  ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Add parking brake if applicable for total inertia.
- ④ Motor with standard heat sink.
- ⑤ May be limited at some values of  $V_{bus}$ .
- ⑥ Measured at  $25^\circ\text{C}$ .
- ⑦ No brake motor option on AKM1.
- ⑧ For non-resolver feedback options: no continuous torque reduction.
- ⑨ For motors with optional shaft seal, reduce torque shown by 0.021 Nm (0.19 lb-in), and increase  $T_f$  by the same amount.

Additional Notes: See system data beginning on page 14 for typical torque/speed performance.

Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.