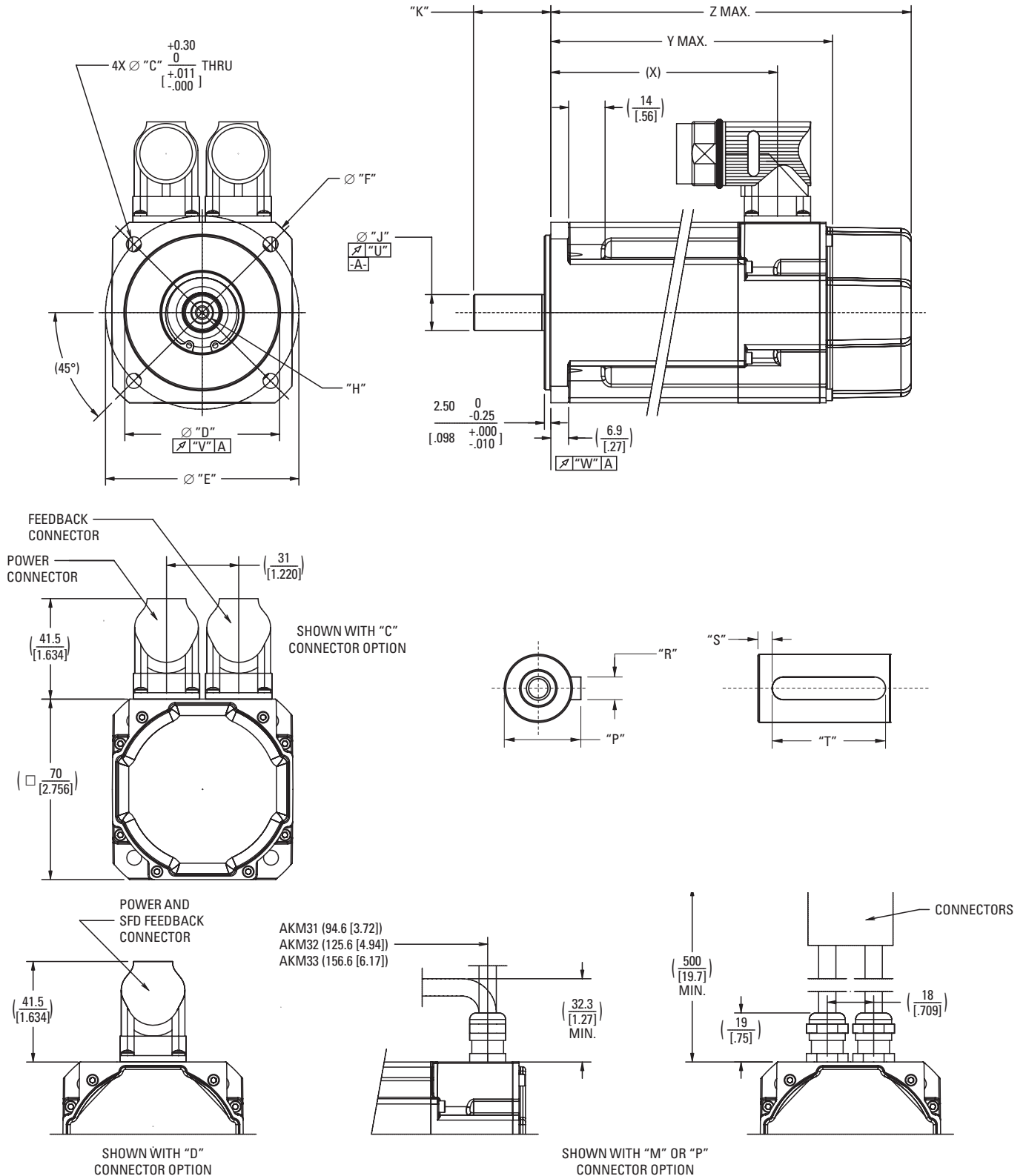


# AKM3x Outline Drawings

## AKM3x Frame



# AKM3x Dimension Data

## AKM3x Dimension Data

Mounting Code	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"P"
AC	5.80 [.228]	60 <sup>+0.012</sup> -0.007 +0.004 -0.002 j6 [2.3622]	75 [2.953]	90 [3.543]	D M5 DIN 332	14 <sup>+0.012</sup> +0.001 +0.005 +0.000 k6 [.5512]	30.0 [1.181]	16 <sup>0</sup> -0.13 +0.00 -0.005 [.630]
AN	5.80 [.228]	60 <sup>+0.012</sup> -0.007 +0.004 -0.002 j6 [2.3622]	75 [2.953]	90 [3.543]	D M5 DIN 332	14 <sup>+0.012</sup> +0.001 +0.005 +0.000 k6 [.5512]	30.0 [1.181]	-
CC	5.80 [.228]	60 <sup>+0.012</sup> -0.007 +0.004 -0.002 j6 [2.3622]	85 [3.346]	-	D M5 DIN 332	14 <sup>+0.012</sup> +0.001 +0.005 +0.000 k6 [.5512]	30.0 [1.181]	16 <sup>0</sup> -0.13 +0.00 -0.005 [.630]
CN	5.80 [.228]	60 <sup>+0.012</sup> -0.007 +0.004 -0.002 j6 [2.3622]	85 [3.346]	-	D M5 DIN 332	14 <sup>+0.012</sup> +0.001 +0.005 +0.000 k6 [.5512]	30.0 [1.181]	-
GC	5.80 [.228]	60 <sup>+0.012</sup> -0.007 +0.004 -0.002 j6 [2.3622]	75 [2.953]	90 [3.543]	D M5 DIN 332	11 <sup>+0.012</sup> +0.001 +0.005 +0.000 k6 [.4331]	23 [.906]	12.5 <sup>0</sup> -0.13 +0.00 -0.005 [.492]
GN	5.80 [.228]	60 <sup>+0.012</sup> -0.007 +0.004 -0.002 j6 [2.3622]	75 [2.953]	90 [3.543]	D M5 DIN 332	11 <sup>+0.012</sup> +0.001 +0.005 +0.000 k6 [.4331]	23 [.906]	-

Mounting Code	"R"	"S"	"T"	"U"	"V"	"W"
AC	5 <sup>0</sup> -0.03 +0.00 -0.01 N9 [.197]	5.00 [1.97]	20 <sup>0</sup> -0.20 +0.00 -0.08 [.787]	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
AN	-	-	-	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
CC	5 <sup>0</sup> -0.03 +0.00 -0.01 N9 [.197]	5.00 [1.97]	20 <sup>0</sup> -0.20 +0.00 -0.08 [.787]	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
CN	-	-	-	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
GC	4 <sup>0</sup> -0.03 +0.00 -0.01 N9 [.157]	3.5 [1.38]	16 <sup>0</sup> -0.20 +0.00 -0.08 [.630]	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
GN	-	-	-	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
CN	-	-	-	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]

MODEL	(X)	Y MAX	Z MAX (W/ BRAKE)
AKM31	87.9 [3.46]	109.8 [4.32]	141.3 [5.56]
AKM32	118.9 [4.68]	140.8 [5.54]	172.3 [6.78]
AKM33	149.9 [5.90]	171.8 [6.76]	203.3 [8.00]

Note 1: Dimensions are in mm [inches].

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

# AKM3x Performance Data

## AKM3x Performance Data – Up to 640 Vdc

Parameters	Tol	Symbol	Units	AKM31			AKM32			AKM33		
				C	E	H	C	E	H	C	E	H
Max Rated DC Bus Voltage	Max	V <sub>bus</sub>	Vdc	640	320	160	640	640	320	640	640	320
Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	T <sub>cs</sub>	Nm	1.15	1.20	1.23	2.00	2.04	2.10	2.71	2.79	2.88
			lb-in	10.2	10.6	10.8	17.7	18.1	18.6	24.0	24.7	25.5
Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	I <sub>cs</sub>	A <sub>rms</sub>	1.37	2.99	5.85	1.44	2.82	5.50	1.47	2.58	5.62
Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T <sub>cs</sub>	Nm	0.92	0.96	0.98	1.60	1.63	1.68	2.17	2.23	2.30
			lb-in	8.1	8.5	8.7	14.2	14.4	14.9	19.2	19.7	20.4
Max Mechanical Speed ⑤	Nom	N <sub>max</sub>	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000
Peak Torque ①②	Nom	T <sub>p</sub>	Nm	3.88	4.00	4.06	6.92	7.11	7.26	9.76	9.96	10.22
			lb-in	34.3	35.4	35.9	61.2	62.9	64.3	86.4	88.1	90.5
Peak Current	Nom	I <sub>p</sub>	A <sub>rms</sub>	5.5	12.0	23.4	5.7	11.3	22.0	5.9	10.3	22.5
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	1.19	1.20	-	-	2.06	-	-	2.82
			lb-in	-	10.5	10.6	-	-	18.2	-	-	24.6
Rated Speed		N <sub>rtd</sub>	rpm	-	750	2000	-	-	1200	-	-	800
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	-	0.09	0.25	-	-	0.26	-	-	0.24
			Hp	-	0.13	0.34	-	-	0.35	-	-	0.32
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	1.17	0.97	-	2.01	1.96	-	-	2.66
			lb-in	-	10.3	8.6	-	17.7	17.4	-	-	23.5
Rated Speed		N <sub>rtd</sub>	rpm	-	2500	6000	-	1000	3000	-	-	2500
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	-	0.31	0.61	-	0.21	0.62	-	-	0.70
			Hp	-	0.41	0.82	-	0.28	0.83	-	-	0.93
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	1.12	0.95	-	1.95	1.91	1.45	2.64	2.62	2.27
			lb-in	9.9	8.4	-	17.3	16.9	12.8	23.4	23.2	20.1
Rated Speed		N <sub>rtd</sub>	rpm	2500	6000	-	1500	3000	7000	1000	2000	5500
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	0.29	0.60	-	0.31	0.6	1.06	0.28	0.55	1.31
			Hp	0.39	0.80	-	0.41	0.80	1.42	0.37	0.74	1.75
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	1.00	-	-	1.86	1.50	-	2.54	2.34	-
			lb-in	8.9	-	-	16.5	13.3	-	22.5	20.7	-
Rated Speed		N <sub>rtd</sub>	rpm	5000	-	-	3000	6500	-	2000	4500	-
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	0.52	-	-	0.58	1.02	-	0.53	1.10	-
			Hp	0.70	-	-	0.78	1.37	-	0.71	1.48	-
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	0.91	-	-	1.83	1.22	-	2.50	2.27	-
			lb-in	8.1	-	-	16.2	10.8	-	22.1	20.1	-
Rated Speed		N <sub>rtd</sub>	rpm	6000	-	-	3500	8000	-	2500	5000	-
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	0.57	-	-	0.67	1.02	-	0.65	1.19	-
			Hp	0.77	-	-	0.90	1.37	-	0.88	1.59	-

See following page for notes.

## AKM3x Performance Data – Up to 640 Vdc (Continued)

Parameters	Tol	Symbol	Units	AKM31			AKM32			AKM33		
				C	E	H	C	E	H	C	E	H
Torque Constant ①	±10%	$K_t$	Nm/A <sub>rms</sub>	0.85	0.41	0.21	1.40	0.73	0.39	1.86	1.10	0.52
			lb-in/A <sub>rms</sub>	7.5	3.6	1.9	12.4	6.5	3.5	16.5	9.7	4.6
Back EMF Constant ⑥	±10%	$K_e$	V/k <sub>r</sub> rpm	54.5	26.1	13.7	89.8	47.1	24.8	120	70.6	33.4
Motor Constant	Nom	$K_m$	N-m/√W	0.150	0.154	0.151	0.235	0.237	0.245	0.295	0.299	0.303
			lb-in/√W	1.33	1.36	1.34	2.08	2.10	2.17	2.61	2.65	2.68
Resistance (line-line) ⑥	±10%	$R_m$	ohm	21.4	4.74	1.29	23.76	6.32	1.69	26.59	9.01	1.96
Inductance (line-line)		L	mH	37.5	8.6	2.4	46.5	12.8	3.55	53.6	18.5	4.1
Inertia (includes Resolver feedback) ③	±10%	$J_m$	kg-cm <sup>2</sup>	0.33			0.59			0.85		
			lb-in-s <sup>2</sup>	2.9E-04			5.2E-04			7.5E-04		
Optional Brake Inertia (additional)	±10%	$J_m$	kg-cm <sup>2</sup>	0.012			0.012			0.012		
			lb-in-s <sup>2</sup>	1.1E-05			1.1E-05			1.1E-05		
Weight		W	kg	1.55			2.23			2.9		
			lb	3.4			4.9			6.4		
Static Friction ①⑧		$T_f$	Nm	0.014			0.02			0.026		
			lb-in	0.12			0.18			0.23		
Viscous Damping ①		$K_{dv}$	Nm/k <sub>r</sub> rpm	0.002			0.003			0.004		
			lb-in/k <sub>r</sub> rpm	0.02			0.03			0.04		
Thermal Time Constant		TCT	minutes	14			17			20		
Thermal Resistance		$R_{thw-a}$	°C/W	1.11			0.92			0.78		
Pole Pairs				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,  $\Delta T=100^\circ\text{C}$ , 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 Brake motor option reduces continuous torque ratings by:  
AKM31 = 0.0 Nm   AKM32 = 0.05 Nm   AKM33 = 0.1 Nm
- ⑧ For non-resolver feedback options: no continuous torque reduction.
- ⑨ Motors with non-resolver feedback and brake option, reduce continuous torque by:  
AKM31 = 0.0 Nm   AKM32 = 0.1 Nm   AKM33 = 0.2 Nm
- ⑩ For motors with optional shaft seal, reduce torque shown by 0.047 Nm (0.41 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.