

How To Get The Most From Your Electric Motors

**Table 7. NEMA Frame Assignments
Three-Phase Open Motors—General Purpose**

HP NEMA Program	3600 RPM			1800 RPM			1200 RPM			900 RPM		
	Orig.	1952 Rerate	1964 Rerate	Orig.	1952 Rerate	1964 Rerate	Orig.	1952 Rerate	1964 Rerate	Orig.	1952 Rerate	1964 Rerate
1	—	—	—	203	182	143T	204	184	145T	225	213	182T
1.5	203	182	143T	204	184	145T	224	184	182T	254	213	184T
2	204	184	145T	224	184	145T	225	213	184T	254	215	213T
3	224	184	145T	225	213	182T	254	215	213T	284	254U	215T
5	225	213	182T	254	215	184T	284	254U	215T	324	256U	254T
7.5	254	215	184T	284	254U	213T	324	256U	254T	326	284U	256T
10	284	254U	213T	324	256U	215T	326	284U	256T	364	286U	284T
15	324	256U	215T	326	284U	254T	364	324U	284T	365	326U	286T
20	326	284U	254T	364	286U	256T	365	326U	286T	404	364U	324T
25	364S	286U	256T	364	324U	284T	404	364U	324T	405	365U	326T
30	364S	324S	284TS	365	326U	286T	405	365U	326T	444	404U	364T
40	365S	326S	286TS	404	364U	324T	444	404U	364T	445	405U	365T
50	404S	364US	324TS	405S	365US	326T	445	405U	365T	504U	444U	404T
60	405S	365US	326TS	444S	404US	364TS [†]	504U	444U	404T	505	445U	405T
75	444S	404US	364TS	445S	405US	365TS [†]	505	445U	405T	—	—	444T
100	445S	405US	365TS	504S	444US	404TS [†]	—	—	444T	—	—	445T
125	504S	444US	404TS	505S	445US	405TS [†]	—	—	445T	—	—	—
150	505S	445US	405TS	—	—	444TS [†]	—	—	—	—	—	—
200	—	—	444TS	—	—	445TS [†]	—	—	—	—	—	—
250	—	—	445TS	—	—	—	—	—	—	—	—	—

† When motors are to be used with V-belt or chain drives, the correct frame size is the one shown but with the suffix letter S omitted. For the corresponding shaft extension dimensions, see Pages 18-19.

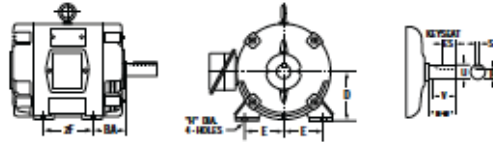
**Table 8. NEMA Frame Assignments
Three-Phase TEFC Motors—General Purpose**

HP NEMA Program	3600 RPM			1800 RPM			1200 RPM			900 RPM		
	Orig.	1952 Rerate	1964 Rerate	Orig.	1952 Rerate	1964 Rerate	Orig.	1952 Rerate	1964 Rerate	Orig.	1952 Rerate	1964 Rerate
1	—	—	—	203	182	143T	204	184	145T	225	213	182T
1.5	203	182	143T	204	184	145T	224	184	182T	254	213	184T
2	204	184	145T	224	184	145T	225	213	184T	254	215	213T
3	224	184	182T	225	213	182T	254	215	213T	284	254U	215T
5	225	213	184T	254	215	184T	284	254U	215T	324	256U	254T
7.5	254	215	213T	284	254U	213T	324	256U	254T	326	284U	256T
10	284	254U	215T	324	256U	215T	326	284U	256T	364	286U	284T
15	324	256U	254T	326	284U	254T	364	324U	284T	365	326U	286T
20	326	286U	256T	364	286U	256T	365	326U	286T	404	364U	324T
25	365S	324U	284TS	365	324U	284T	404	364U	324T	405	365U	326T
30	404S	326S	286TS	404	326U	286T	405	365U	326T	444	404U	364T
40	405S	364US	324TS	405	364U	324T	444	404U	364T	445	405U	365T
50	444S	365US	326TS	444S	365US	326T	445	405U	365T	504U	444U	404T
60	445S	405US	364TS	445S	405US	364TS [†]	504U	444U	404T	505	445U	405T
75	504S	444US	365TS	504S	444US	365TS [†]	505	445U	405T	—	—	444T
100	505S	445US	405TS	505S	445US	405TS [†]	—	—	444T	—	—	445T
125	—	—	444TS	—	—	444TS [†]	—	—	445T	—	—	—
150	—	—	445TS	—	—	445TS [†]	—	—	—	—	—	—

† When motors are to be used with V-belt or chain drives, the correct frame size is the one shown but with the suffix letter S omitted. For the corresponding shaft extension dimensions, see Pages 18-19.

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Table 9. NEMA Frame Dimensions* Foot-Mounted AC Machines



* Dimensions in inches

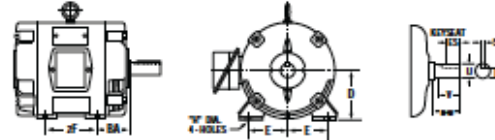
Frame Number	D	E	2F	BA	H**	U	N-W	V Min.	Keyseat		
									R	ES Min.	S
42	2.62	1.75	1.69	2.06	0.28	0.3750	1.12		0.328		Flat
48	3.00	2.12	2.75	2.50	0.34	0.5000	1.50		0.453		Flat
48H	3.00	2.12	4.75	2.50	0.34	0.5000	1.50		0.453		Flat
56	3.50	2.44	3.00	2.75	0.34	0.6250	1.88		0.517	1.41	0.188
56H	3.50	2.44	5.00	2.75	0.34	0.6250	1.88		0.517	1.41	0.188
66	4.12	2.94	5.00	3.12	0.41	0.7500	2.25		0.644	1.91	0.188
143	3.50	2.75	4.00	2.25	0.34	0.7500	2.00	1.75	0.644	1.41	0.188
143T	3.50	2.75	4.00	2.25	0.34	0.8750	2.25	2.00	0.771	1.41	0.188
145	3.50	2.75	5.00	2.25	0.34	0.7500	2.00	1.75	0.644	1.41	0.188
145T	3.50	2.75	5.00	2.25	0.34	0.8750	2.25	2.00	0.771	1.41	0.188
182	4.50	3.75	4.50	2.75	0.41	0.8750	2.25	2.00	0.771	1.41	0.188
182T	4.50	3.75	4.50	2.75	0.41	1.1250	2.75	2.50	0.986	1.78	0.250
184	4.50	3.75	5.50	2.75	0.41	0.8750	2.25	2.00	0.771	1.41	0.188
184T	4.50	3.75	5.50	2.75	0.41	1.1250	2.75	2.50	0.986	1.78	0.250
203	5.00	4.00	5.50	3.12	0.41	0.7500	2.25	2.00	0.644	1.53	0.188
204	5.00	4.00	6.50	3.12	0.41	0.7500	2.25	2.00	0.644	1.53	0.188
213	5.25	4.25	5.50	3.50	0.41	1.1250	3.00	2.75	0.986	2.03	0.250
213T	5.25	4.25	5.50	3.50	0.41	1.3750	3.38	3.12	1.201	2.41	0.312
215	5.25	4.25	7.00	3.50	0.41	1.1250	3.00	2.75	0.986	2.03	0.250
215T	5.25	4.25	7.00	3.50	0.41	1.3750	3.38	3.12	1.201	2.41	0.312
224	5.50	4.50	6.75	3.50	0.41	1.0000	3.00	2.75	0.859	2.03	0.250
225	5.50	4.50	7.50	3.50	0.41	1.0000	3.00	2.75	0.859	2.03	0.250
254	6.25	5.00	8.25	4.25	0.53	1.1250	3.38	3.12	0.986	2.03	0.250
254U	6.25	5.00	8.25	4.25	0.53	1.3750	3.75	3.50	1.201	2.78	0.312
254T	6.25	5.00	8.25	4.25	0.53	1.625	4.00	3.75	1.416	2.91	0.375
256U	6.25	5.00	10.00	4.25	0.53	1.3750	3.75	3.50	1.201	2.78	0.312
256T	6.25	5.00	10.00	4.25	0.53	1.625	4.00	3.75	1.416	2.91	0.375
284	7.00	5.50	9.50	4.75	0.53	1.2500	3.75	3.50	1.112	2.03	0.250
284U	7.00	5.50	9.50	4.75	0.53	1.625	4.88	4.62	1.416	3.78	0.375
284T	7.00	5.50	9.50	4.75	0.53	1.875	4.62	4.38	1.591	3.28	0.500
284TS	7.00	5.50	9.50	4.75	0.53	1.625	3.25	3.00	1.416	1.91	0.375
286U	7.00	5.50	11.00	4.75	0.53	1.625	4.88	4.62	1.416	3.78	0.375
286T	7.00	5.50	11.00	4.75	0.53	1.875	4.62	4.38	1.591	3.28	0.500
286TS	7.00	5.50	11.00	4.75	0.53	1.625	3.25	3.00	1.416	1.91	0.375
324	8.00	6.25	10.50	5.25	0.66	1.625	4.88	4.62	1.416	3.78	0.375
324U	8.00	6.25	10.50	5.25	0.66	1.875	5.62	5.38	1.591	4.28	0.500
324S	8.00	6.25	10.50	5.25	0.66	1.625	3.25	3.00	1.416	1.91	0.375
324T	8.00	6.25	10.50	5.25	0.66	2.125	5.25	5.00	1.845	3.91	0.500
324TS	8.00	6.25	10.50	5.25	0.66	1.875	3.75	3.50	1.591	2.03	0.500
326	8.00	6.25	12.00	5.25	0.66	1.625	4.88	4.62	1.416	3.78	0.375
326U	8.00	6.25	12.00	5.25	0.66	1.875	5.62	5.38	1.591	4.28	0.500
326S	8.00	6.25	12.00	5.25	0.66	1.625	3.25	3.00	1.416	1.91	0.375
326T	8.00	6.25	12.00	5.25	0.66	2.125	5.25	5.00	1.845	3.91	0.500
326TS	8.00	6.25	12.00	5.25	0.66	1.875	3.75	3.50	1.591	2.03	0.500

Reference: NEMA Standards MG 1-1998, 4.4.1.

**Frames 42 to 66, Inclusive: the H dimension is Width of Slot. Frames 143 to 505S, Inclusive: the H dimension is Diameter of Hole.

How To Get The Most From Your Electric Motors

Table 9. NEMA Frame Dimensions* Foot-Mounted AC Machines—Continued



* Dimensions in Inches

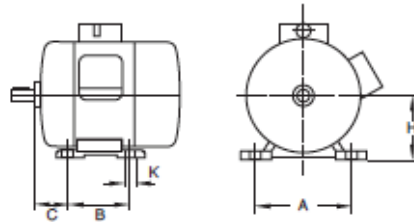
Frame Number	D	E	2F	BA	H**	U	N-W	V Min.	Keyseat		
									R	ES Min.	S
364	9.00	7.00	11.25	5.88	0.66	1.875	5.62	5.38	1.591	4.28	0.500
364S	9.00	7.00	11.25	5.88	0.66	1.625	3.25	3.00	1.416	1.91	0.375
364U	9.00	7.00	11.25	5.88	0.66	2.125	6.38	6.12	1.845	5.03	0.500
364US	9.00	7.00	11.25	5.88	0.66	1.875	3.75	3.50	1.591	2.03	0.500
364T	9.00	7.00	11.25	5.88	0.66	2.375	5.88	5.62	2.021	4.28	0.625
364TS	9.00	7.00	11.25	5.88	0.66	1.875	3.75	3.50	1.591	2.03	0.500
365	9.00	7.00	12.25	5.88	0.66	1.875	5.62	5.38	1.591	4.28	0.500
365S	9.00	7.00	12.25	5.88	0.66	1.625	3.25	3.00	1.416	1.91	0.375
365U	9.00	7.00	12.25	5.88	0.66	2.125	6.38	6.12	1.845	5.03	0.500
365US	9.00	7.00	12.25	5.88	0.66	1.875	3.75	3.50	1.591	2.03	0.500
365T	9.00	7.00	12.25	5.88	0.66	2.375	5.88	5.62	2.021	4.28	0.625
365TS	9.00	7.00	12.25	5.88	0.66	1.875	3.75	3.50	1.591	2.03	0.500
404	10.00	8.00	12.25	6.62	0.81	2.125	6.38	6.12	1.845	5.03	0.500
404S	10.00	8.00	12.25	6.62	0.81	1.875	3.75	3.50	1.591	2.03	0.500
404U	10.00	8.00	12.25	6.62	0.81	2.375	7.12	6.88	2.021	5.53	0.625
404US	10.00	8.00	12.25	6.62	0.81	2.125	4.25	4.00	1.845	2.78	0.500
404T	10.00	8.00	12.25	6.62	0.81	2.875	7.25	7.00	2.450	5.65	0.750
404TS	10.00	8.00	12.25	6.62	0.81	2.125	4.25	4.00	1.845	2.78	0.500
405	10.00	8.00	13.75	6.62	0.81	2.125	6.38	6.12	1.845	5.03	0.500
405S	10.00	8.00	13.75	6.62	0.81	1.875	3.75	3.50	1.591	2.03	0.500
405U	10.00	8.00	13.75	6.62	0.81	2.375	7.12	6.88	2.021	5.53	0.625
405US	10.00	8.00	13.75	6.62	0.81	2.125	4.25	4.00	1.845	2.78	0.500
405T	10.00	8.00	13.75	6.62	0.81	2.875	7.25	7.00	2.450	5.65	0.750
405TS	10.00	8.00	13.75	6.62	0.81	2.125	4.25	4.00	1.845	2.78	0.500
444	11.00	9.00	14.50	7.50	0.81	2.375	7.12	6.88	2.021	5.53	0.625
444S	11.00	9.00	14.50	7.50	0.81	2.125	4.25	4.00	1.845	2.78	0.500
444U	11.00	9.00	14.50	7.50	0.81	2.875	8.62	8.38	2.450	7.03	0.750
444US	11.00	9.00	14.50	7.50	0.81	2.125	4.25	4.00	1.845	2.78	0.500
444T	11.00	9.00	14.50	7.50	0.81	3.375	8.50	8.25	2.880	6.91	0.875
444TS	11.00	9.00	14.50	7.50	0.81	2.375	4.75	4.50	2.021	3.03	0.625
445	11.00	9.00	16.50	7.50	0.81	2.375	7.12	6.88	2.021	5.53	0.625
445S	11.00	9.00	16.50	7.50	0.81	2.125	4.25	4.00	1.845	2.78	0.500
445U	11.00	9.00	16.50	7.50	0.81	2.875	8.62	8.38	2.450	7.03	0.750
445US	11.00	9.00	16.50	7.50	0.81	2.125	4.25	4.00	1.845	2.78	0.500
445T	11.00	9.00	16.50	7.50	0.81	3.375	8.50	8.25	2.880	6.91	0.875
445TS	11.00	9.00	16.50	7.50	0.81	2.375	4.75	4.50	2.021	3.03	0.625
447T	11.00	9.00	20.00	7.50	0.81	3.375	8.50	8.25	2.880	6.91	0.875
447TS	11.00	9.00	20.00	7.50	0.81	2.375	4.75	4.50	2.021	3.03	0.625
449T	11.00	9.00	25.00	7.50	0.81	3.375	8.50	8.25	2.880	6.91	0.875
449TS	11.00	9.00	25.00	7.50	0.81	2.375	4.75	4.50	2.021	3.03	0.625
504U	12.50	10.00	16.00	8.50	0.94	2.875	8.62	8.38	2.450	7.28	0.750
504S	12.50	10.00	16.00	8.50	0.94	2.125	4.25	4.00	1.845	2.78	0.500
505	12.50	10.00	18.00	8.50	0.94	2.875	8.62	8.38	2.450	7.28	0.750
505S	12.50	10.00	18.00	8.50	0.94	2.125	4.25	4.00	1.845	2.78	0.500

Reference: NEMA Standards MG 1-1998, 4.4.1.

**Frames 42 to 66, Inclusive: the H dimension is Width of Slot. Frames 143 to 505S, Inclusive: the H dimension is Diameter of Hole.

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**Table 10. IEC Mounting Dimensions*
Foot-Mounted AC and DC Machines**



Frame Number	H	A	B	C	K	Bolt or Screw
56 M	2.20	3.55	2.80	1.40	0.23	M5
63 M	2.48	3.95	3.15	1.55	0.28	M6
71 M	2.79	4.40	3.55	1.75	0.28	M6
80 M	3.14	4.90	3.95	1.95	0.40	M8
90 S	3.54	5.50	3.95	2.20	0.40	M8
90 L	3.54	5.50	4.90	2.20	0.40	M8
100 S	3.93	6.30	4.40	2.50	0.48	M10
100 L	3.93	6.30	5.50	2.50	0.48	M10
112 S	4.40	7.50	4.50	2.75	0.48	M10
112 M	4.40	7.50	5.50	2.75	0.48	M10
132 S	5.19	8.50	5.50	3.50	0.48	M10
132 M	5.19	8.50	7.00	3.50	0.48	M10
160 S	6.29	10.00	7.00	4.25	0.58	M12
160 M	6.29	10.00	8.25	4.25	0.58	M12
160 L	6.29	10.00	10.00	4.25	0.58	M12
180 S	7.08	11.00	8.00	4.75	0.58	M12
180 M	7.08	11.00	9.50	4.75	0.58	M12
180 L	7.08	11.00	11.00	4.75	0.58	M12
200 S	7.87	12.50	9.00	5.25	0.73	M16
200 M	7.87	12.50	10.50	5.25	0.73	M16
200 L	7.87	12.50	12.00	5.25	0.73	M16
225 S	8.85	14.00	11.25	5.85	0.73	M16
225 M	8.85	14.00	12.25	5.85	0.73	M16
250 S	9.84	16.00	12.25	6.60	0.95	M20
250 M	9.84	16.00	13.75	6.60	0.95	M20
280 S	11.02	18.00	14.50	7.50	0.95	M20
280 M	11.02	18.00	16.50	7.50	0.95	M20
315 S	12.40	20.00	16.00	8.50	1.11	M24
315 M	12.40	20.00	18.00	8.50	1.11	M24
355 S	13.97	24.00	19.70	10.00	1.11	M24
355 M	13.97	24.00	22.05	10.00	1.11	M24
355 L	13.97	24.00	24.80	10.00	1.11	M24
400 S	15.74	27.00	22.05	11.00	1.38	M30
400 M	15.74	27.00	24.80	11.00	1.38	M30
400 L	15.74	27.00	27.95	11.00	1.38	M30

Reference: IEC 72-1 Standards.

* Dimensions, except for bolt and screw sizes, are shown in inches (rounded off). Bolt and screw sizes are shown in millimeters.

For tolerances on dimensions, see IEC 72-1, 6.1, Foot-Mounted Machines, Table 1. (Note: Data in IEC tables is shown in millimeters.)