



Shop “Tech Talk” May 2007



Q. Electric Motors have Frame Numbers. Do the Numbers, themselves have any real world significance ?

A. Yes indeed! In both NEMA and IEC (European) Frame sizes the number represents the motor shaft height. Let me explain.....

1.NEMA Frame Sizes 143 through 689 Series

The ‘D’ dimension (shaft height) in inches, of a motor or generator in these Frame Sizes above equals 1/4 the value of the first 2 digits in the frame Number.

Examples: 143 Frame, $14/4 = 3.5$ ”.....256 Frame, $25/4 = 6.25$ ”.....404 Frame , $40/4 = 10$ ”

2.***NEMA Frame Sizes 42,48,56,66 for Small machines

The “D” dimension (shaft height) in inches, of a motor or generator in these Frame Sizes equals 1/16 of the Frame Number.

Examples: 42 Frame, $42/16 = 2.625$ ”....48 Frame, $48/16 = 3.0$ ”.....56 frame, $56/16 = 3.5$ ”

3.IEC Metric Frames, All Sizes

The Metric frame Size itself is the shaft height “H” in mm.

So, 63 Frame has a shaft height of 63mm.or $63/25.4$ inches = 2.48 inches

And a 112 Frame has a shaft height of 112 mm. or $112/25.4 = 4.41$ inches

**Sometimes in a metric Frame designation you will see a Suffix after the Frame

Example: 160S or 160M or 160L

The S refers to the Frame Length, “B” dimension, and indicates Mechanical Dimension (short)

The M refers to the Frame Length, “B” dimension, and indicates Mechanical Dimension (medium)

The L refers to the Frame Length, “B” dimension, and indicates Mechanical Dimension (long)

In the above 160 Frame you can have a “B” dimension of 178 or 210 or 254 mm depending on having a Suffix of S, M or L to the basic Frame number

On the next page is a chart showing a dimensional comparison between NEMA and IEC motors. You will see that in some cases there is a close correspondence.

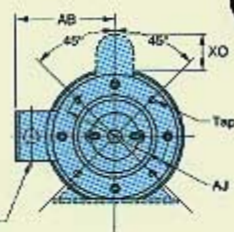
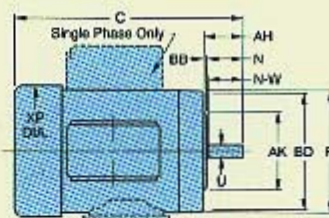
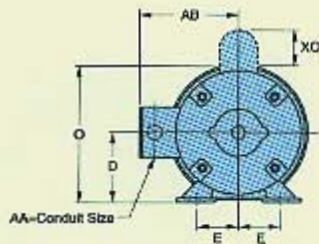
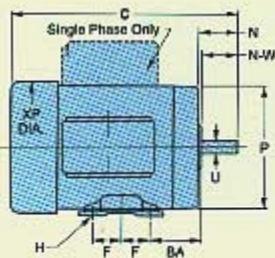
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IEC / NEMA DIMENSION COMPARISON

RIGID MOUNT

C FACE



IEC	NEMA	Dimensions in Millimeters							KW/HP** Frame Assignments 3 Phase - TEFC		
		D	E	F	H	U	BA	N-W	2 Pole	4 Pole	6 Pole
56	N/A	56	45	35,5	5,8	9	36	20	—	—	—
63	NA	63	50	40	7	11	40	23	0,25 kW 1/3 HP	0,18 kW 1/4 HP	—
71	42	71 68,7	58 44,5	45 21,4	7 7,1	14 9,5	45 52,4	30	0,55 —	0,37 3/4	— 1/2
80	48	80 78,2	62,5 54	50 34,9	10 8,7	19 12,7	50 63,5	40 38,1	1,1 1 1/2	0,75 1	0,55 kW 3/4 HP
90S	56	90 88,9	70 61,8	50 38,1	10 8,7	24 15,9	56 69,9	50 47,6	1,5 2	1,1 1 1/2	0,75 1
90L	56	90 88,9	70 69,8	62,5 50,8	10 8,7	24 22,2	56 57,2	50 57,2	2,2 3	1,5 2	1,1 1 1/2
100L	145T	100 88,9	80 69,8	70 63,5	12 8,7	28 22,2	63 57,2	60 57,2	3 4	2,2 3	1,5 2
112L	182T	112 114,3	95 95,2	67 57,2	12 10,7	28 28	70 70	60 69,9	3,7 5	2,2 3	1,5 2
112M	184T	112 114,3	95 95,2	70 68,2	12 10,7	28 28	70 70	60 69,9	3,7 5	4 5 4/5	2,2 —
132S	213T	132 133,4	108 108	70 69,8	12 10,7	38 34,9	89 89	80 85,7	7,5 10	5,5 7 1/2	3 —
132M	215T	132 133,4	108 108	89 88,8	12 10,7	38 34,9	89 89	80 85,7	— 10	7,5 10	5,5 7 1/2
160M*	254T	160 158,8	127 127	105 104,8	15 13,5	42 41,3	108 108	110 101,6	15 20	11 15	7,5 10
160L*	256T	160 158,8	127 127	127 13,5	15 13,5	42 41,3	108 108	110 101,6	18,5 25	15 20	11 15
180M*	284T	180 177,8	139,5 139,8	120,5 120,2	15 13,5	48 47,6	121 121	110 117,5	22 —	18,5 25	— —
180L*	286T	180 177,8	139,5 139,8	139,5 139,8	15 13,5	48 47,6	121 121	110 117,5	22 30	22 30	15 20
200M*	324T	180 203,3	159 158,8	133,5 133,4	19 18,7	55 54	133 133	110 133,4	30 40	30 40	— —
200L*	326T	200 203,2	159 158,8	152,5 152,4	19 16,7	55 54	133 133	110 133,4	37 50	37 50	22 30
225S*	364T	225 228,6	178 117,8	143 142,8	19 16,7	60 60,3	149 149	140 149,2	— —	37 50/75	30 40
225M*	365	225 228,6	178 177,8	155,5 155,6	19 18,7	60 60,3	149 149	140 149,2	45 60/75	45 60/75	37 50
250M*	405T	250 254	203 203,2	174,5 174,6	24 20,6	65 73	168 168	140 182,2	55 75/100	55 75/100	— —
280S*	444T	280 279,4	228,5 228,6	184 184,2	24 20,6	75 85,7	190 190	140 215,9	— —	— —	45 60/100
280M*	445T	280 279,4	228,5 228,6	209,5 209,6	24 20,6	75 85,7	190 190	140 215,9	— —	— —	55 75/125



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