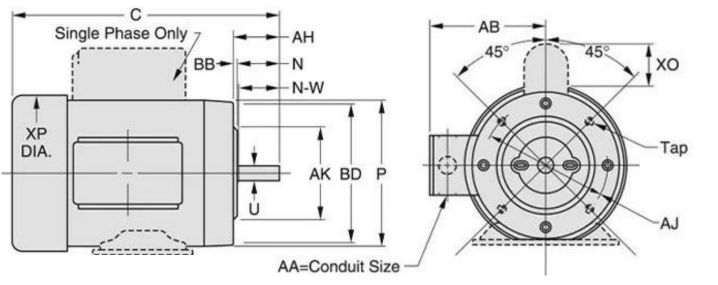
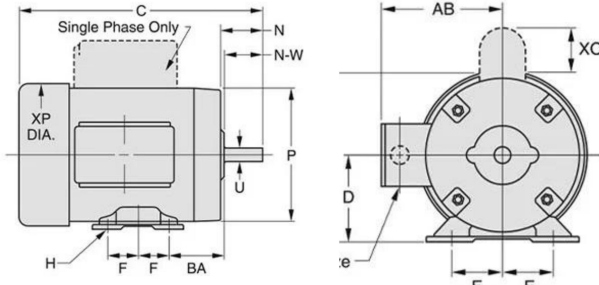




Replacement Motor And Blower Specialist

NEMA Quick Reference Motor Data



NEMA Frame Dimensions

NEMA* Frame	D	E	F	H	U	N-W	AH	AJ	AK	BA	BD	XO	TAP	KEY Size Sq.
42	2 5/8	1 3/4	27/32	9/32 SLOT	3/8	1 1/8	1 5/16	3 3/4	3	2 1/16	4 7/8	1 5/8	1/4-20(4)	3/64 FLAT
48	3	2 1/8	1 3/8	1 1/32 SLOT	1/2	1 1/2	1 11/16	3 3/4	3	2 1/2	5 1/2	2 1/4	1/4-20(4)	3/64 FLAT
56	3 1/2	2 7/16	1 1/2	1 1/32 SLOT	5/8	1 7/8	2 1/16	5 7/8	4 1/2	2 3/4	6 1/2	2 1/4	3/8-16(4)	3/16
56H			2 1/2											
143T	3 1/2	2 3/4		11/32	7/8	2 1/4	2 1/8	5 7/8	4 1/2	2 1/4	6 1/2	2 1/4	3/8-16(4)	3/16
145T			2 1/2											
182T	4 1/2	3 3/4	2 1/4	13/32	1 1/8	2 3/4	2 5/8	7 1/4	8 1/2	2 3/4	8 1/2	2 1/4	1/2-13(4)	1/4
184T			2 3/4											
213T	5 1/4	4 1/4	2 3/4	13/32	1 3/8	3 3/8	3 1/8	7 1/4	8 1/2	3 1/2	9	2 1/4	1/2-13(4)	5/16
215T			3 1/2											
254T	6 1/4	5	4 1/8	17/32	1 5/8	4	3 3/4	7 1/4	8 1/2	4 1/4	10		1/2-13(4)	3/8
256T			5											
284T			4 3/4		1 7/8	4 5/8	4 3/8						1/2-13(4)	1/2
284TS	7	5 1/2		17/32				9	10 1/2	4 3/4	11 1/4			3/8
286T			5 1/2		1 7/8	4 5/8	4 3/8							1/2
286TS					1 5/8	3 1/4	3							3/8
324T			5 1/4		2 1/8	5 1/4	5							
324TS	8	6 1/4		21/32	1 7/8	3 3/4	3 1/2	11	12 1/2	5 1/4	14			1/2
326T			6		2 1/8	5 1/4	5							
326TS					2 3/8	5 7/8	5 5/8							
364T			5 5/8		2 3/8	5 7/8	5 5/8						5/8-11(8)	5/8
364TS	9	7		21/32	1 7/8	3 3/4	3 1/2		12 1/2	5 7/8	14			1/2
365T			6 1/8		2 3/8	5 7/8	5 5/8							5/8
365TS					1 7/8	3 3/4	3 1/2							1/2
404T			6 1/8		2 7/8	7 1/4	7						5/8-11(8)	3/4
404TS	10	8		13/16	2 1/8	4 1/4	4	11	12 1/2	6 5/8	15 1/2			1/2
405T			6 7/8		2 7/8	7 1/4	7							3/4
405TS					2 1/8	4 1/4	4							1/2
444T			7 1/4		3 3/8	8 1/2	8 1/4	14	16	7 1/2	18			7/8
444TS	11	9		13/16	2 3/8	4 3/4	4 1/2							5/8
445T			8 1/4		3 3/8	8 1/2	8 1/4							7/8
445TS			10		3 3/8	8 1/2	8 1/4							7/8
447TS			10		2 3/8	4 3/4	4 1/2						5/8-11(8)	5/8
449T	11	9		13/16	2 3/8	8 1/2	8 1/4	14	16	7 1/2	18			7/8
449TS			12 1/2		3 3/8	8 1/2	8 1/4							7/8
449TS			12 1/2		2 3/8	4 3/4	4 1/2							5/8

Fraction/Decimal/Millimeter Conversions

Fraction	Decimal	Millimeter	Fraction	Decimal	Millimeter	MM	Inch
1/64	0.015625	0.397	33/64	0.515625	13.097	1	0.039
1/32	0.03125	0.794	17/32	0.53125	13.494	2	0.079
3/64	0.046875	1.191	35/64	0.546875	13.891	3	0.119
1/16	0.0625	1.588	9/16	0.5625	14.288	4	0.1575
5/64	0.078125	1.984	37/64	0.578125	14.684	5	0.1969
3/32	0.09375	2.381	19/32	0.59375	15.081	6	0.2362
7/64	0.109375	2.778	39/64	0.609375	15.478	7	0.2756
1/8	0.125	3.175	5/8	0.625	15.875	8	0.315
9/64	0.140625	3.572	41/64	0.640625	16.272	9	0.3543
5/32	0.15625	3.969	21/32	0.65625	16.669	10	0.3937
11/64	0.171875	4.366	43/64	0.671875	17.066	11	0.4331
3/16	0.1875	4.762	11/16	0.6875	17.462	12	0.4724
13/64	0.203125	5.159	45/64	0.703125	17.859	13	0.5119
7/32	0.21875	5.556	23/32	0.71875	18.256	14	0.5519
15/64	0.234375	5.953	47/64	0.734375	18.653	15	0.5966
1/4	0.25	6.350	3/4	0.75	19.050	16	0.63
17/64	0.265625	6.747	49/64	0.765625	19.447	17	0.6693
9/32	0.28125	7.144	25/32	0.78125	19.844	18	0.7087
19/64	0.296875	7.541	51/64	0.796875	20.241	19	0.748
5/16	0.3125	7.938	13/16	0.8125	20.638	20	0.7874
21/64	0.328125	8.334	53/64	0.828125	21.034	21	0.8268
11/32	0.34375	8.731	27/32	0.84375	21.431	22	0.8661
23/64	0.359375	9.128	55/64	0.859375	21.828	23	0.9055
3/8	0.375	9.525	7/8	0.875	22.225	24	0.9449
25/64	0.390625	9.921	57/64	0.890625	22.622	25	0.9843
13/32	0.40625	10.319	29/32	0.90625	23.019		
27/64	0.421875	10.716	59/64	0.921875	23.416		
7/16	0.4375	11.112	11/16	0.9375	23.812		
29/64	0.453125	11.509	61/64	0.953125	24.209		
15/32	0.46875	11.906	31/32	0.96875	24.606		
31/64	0.484375	12.303	63/64	0.984375	25.003		
1/2	0.50	12.700	1	1.00	25.400		

Effect of Voltage on Performance of Induction Motors

Characteristic:	Voltage 120%	Voltage 90%
Starting Torque	Up 21%	Down 18%
Maximum Torque	Up 11%	Down 18%
Efficiency - Full Load	Down 0.2%	Down 0.2%
Efficiency - 1/2 Load	Down 0.1%	Down 0.1%
Power Factor - Full Load	Down 0.1%	Down 0.1%
Full Load	Down 0.1%	Down 0.1%
Full Load Current	Down 10.2%	Up 3.3%
Starting Current	Up 10.2%	Down 10.2%
Full Load Temperature Rise	Up 10.2%	Down 10.2%
Maximum Overload Capacity	Up 21%	Down 18%
Magnetic Noise	Up Slightly	Down Slightly

IEC/NEMA Comparison

Dimensions in Millimeter														kW/HP** Frame Assignments				
IEC	A	H	B	K	D	C	E	3 Pole		3 Phase – TEFC								
56	NEMA	25	56	71	5.8	9	36	20										
	NA	56	90	71	5.8	9	36	20										
63	48	63	100	80	7	11	40	23	25kW	18kW	-	-	-					
		47	88.9	42.7	7.3	15.5	52.4	28.6	1 1/2 HP	1 1/4 HP	-	-	-					
71	71	71	112	90	7	14	45	30	35	37	-	-	-					
		42	76.2	108	69.9	8.7	12.7	63.5	38.1	3/4	1/2	-	-					
		80	125	100	10	19	50	40	1.1	75	55	35	kW					
	56	90	125	76.2	8.7	15.9	69.9	47.8	1 1/2	1	3/4	HP						
90S		90	140	100	10	24	56	50	1.5	1.1	75	-	-					
	143T	88.9	139.7	101.6	8.7	22.2	57.2	57.2	2	1 1/2	1	-	-					
		80	140	125	10	24	56	50	2.2	1.5	1.1	75	-					
90L		88.9	139.7	101.6	8.7	22.2	57.2	57.2	2	1 1/2	1	75	-					
100L	145T	100	160	140	12	28	63	60	3	2.2	1.5	3	2					
		112	190	144	12	28	70	60	4	3	2	2	2					
112L		112	190	144	12	28	70	60	5	3	3	2	2					
112M	182T	114.3	190.5	144.3	10.4	28.6	69.9	69.9	5	3	3	2	2					
		112	190	140	12	28	70	60	3.7	4	1.5	-	-					
	213T	132	215	190.5	13.97	30.4	28.6	69.9	69.9	5	5.4/5	-	-					
132S		132	216	140	12	28	60	3.7	2.2	1.5	5.5	3	-					
	184T	133.4	215.9	139.7	10.4	28.4	88.9	88.9	5	7.1/2	-	-	-					
132M		132	216	178	12	38	89	80	-	-	7.5	5.5	-					
160M	215T	134	215.9	177.8	10.4	34.9	88.9	85.9	-	-	10	7.1/2	-					
		160	254	160	12	48	108	110	15	11	-	-	-					
	254T	158.8	254	209.6	13.5	41.3	108	101.6	20	15	10	-	-					
160M*		160	254	254	15	42	108	110	18.5	15	11	-	-					
	256T	158.8	254	254	15.5	41.3	108	101.6	25	20	15	-	-					
180M*		180	279	241	15	48	121	110	22	18.5	-	-	-					
	284T	177.8	279.4	241.3	13.5	47.6	120.7	117.4	22	25	-	-	-					
180M*		180	279	241	15	48	121	110	22	22	15	-	-					
	286T	177.8	279.4	239.4	15.5	47.6	120.7	117.4	30	30	20	-	-					
200M*		200	318	267	19	55	133	110	30	30	-	-	-					
	324T	200	317.3	266.7	16.7	54	133.4	133.4	40	40	-	-	-					
200L		200	318	305	19	55	133	110	37	37	22	-	-					
	326T	202.3	317.5	304.8	16.7	54	133.4	133.4	50	50	30	-	-					
225M*		225	356	308	19	60	149	140	45	45	37	-	-					
	364T	228.6	355.5	285.8	16.7	60.3	149.4	149.4	-	50/75	40	-	-					
225M*		225	356	311	19	60	149	140	45	45	37	-	-					
	365T	225	355.6	311.2	19	60	149	140	45	45	37	-	-					
250M*		250	406	349	24	65	168	140	55	55	-	-	-					
	405T	254	406.4	349.3	20.6	73	168.4	184.2	75/100	75/100	-	-	-					
280S*		280	457	368	24	75	190	140	-	-	-	-	-					
	444T	279.4	457.2	368.3	20.6	85.7	190.5	215.9	-	-	-	-	-					
280M*		280	457	419	24	75	190	140	-	-	-	-	-					
	445T	279.4	457.2	419.1	20.6	85.7	190.5	215.9	-	-	-	-	-					

* Shaft dimensions of these IEC frames may vary from manufacturers.
* Horsepower listed is closest comparable rating with similar mounting dimensions. In some instances this results in greater HP rating than required. For example, 37 kW, 4 pole converts to 50 HP but nearest HP rating in the NEMA frame having comparable dimensions is 75 HP. In these instances the HP rating printed in black is the direct conversion, and HP printed in green is the HP of the dimensionally desirable frame. **OBSERVE CAUTION IF the drive frame or driven load is likely to be damaged by the greater HP.**
Equivalent HP can be calculated by multiplying the kW rating by 1.341. Multiply HP by .746 to convert HP to kW.
To convert from millimeters to inches, multiply by .03937. To convert from inches to millimeters, multiply by 25.40.

Prior NEMA Frame Mounting

	D	E	F	G	H	U	BA	N-W	KEY
66	4 1/8	2 1/16	2 1/2	13/32	3/4	2 1/4	2 1/4	3/16	
185			2 1/2						
182	4 1/2	3 3/4	2 1/4	13/32	7/8	2 3/4	2 1/4	3/16	
184			2 3/4						
203	5	4	2 3/4	13/32	3/4	3 1/8	2 1/4	3/16	
204			3						
213	5 1/4	4 1/4	3 1/2	13/32	1 1/8	3 1/2	3	1/4	
214			3 1/2						
224	5 1/2	4 1/2	3 3/8	13/32	1	3 1/2	3	1/4	
225			3 3/8						
254			4 1/8		1 1/8		3 3/8	1/4	
256	6 1/4	5	4	17/32	1 3/8	4 1/4	3 3/8	5/16	
258U			5						
264U			5 1/2						
284U	7	5 1/2	4 3/4	17/32	1 5/8	4 3/4	4 7/8	5/8	
304U			5 1/2						
324U			5 1/2		1 5/8		4 7/8	5/8	
324U	8	6 1/4	6	21/32	1 7/8	5 1/4	5 5/8	1/2	
324U			6	6	1 7/8		5 5/8	1/2	
324U			5 1/8						
324U	9	7	5 3/8	21/32	2 1/8	5 7/8	6 1/8	1/2	
324U			5 3/8						
324U			5 1/2						
404U	10	8	6 7/8	13/16	2 3/8	6 5/8	7 1/8	5/8	
404U			6 7/8						
404U			6 1/2						
404U			7 1/4						
404U			7 1/4		2 3/8		7 1/8	5/8	
404U	11	9	7 1/4	2 1/8		7 1/2	7 1/8	5/4	
404U			8 1/4	2 3/8		7 1/8	5/8		
404U			7 1/4	2 7/8					
504U	12 1/2	10	8	15/16	2 7/8	8 1/2	8 5/8	3/4	