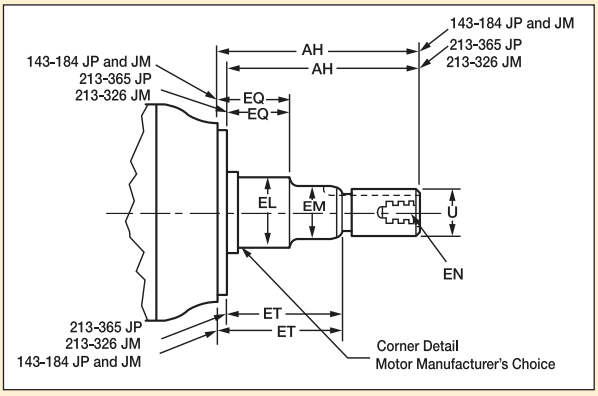
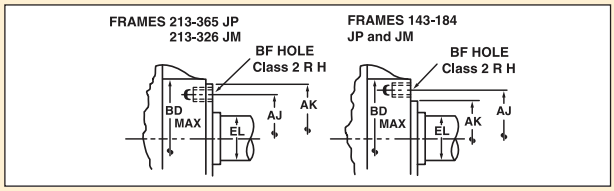
CLOSE-COUPLED PUMP SHAFT DIMENSIONS





Frame Designations	Dimensions (in.) U	EL	EM	EN	EQ	ET	AH	AJ	AK	BD	BF
143JM/145JM	⅞	1 3/32	1	⅜-16 x ¾	⅝	2⅞	4¼	5⅞	4½	6⅝	⅜-16
143JP/145JP	⅞	1 3/32	1	⅜-16 x ¾	1 9/16	5 15/16	7 5/16	5⅞	4½	6⅝	⅜-16
182JM/184JM	⅞	1¼	1	⅜-16 x ¾	⅝	2⅞	4¼	5⅞	4½	6⅝	⅜-16
182JP/184JP	⅞	1¼	1	⅜-16 x ¾	1 9/16	5 15/16	7 5/16	5⅞	4½	6⅝	⅜-16
213JM/215JM	⅞	1¼	1	⅜-16 x ¾	⅝	2⅞	4¼	7¼	8½	9	½-13
213JP/215JP	1¼	1¾	1⅜	½-13 x 1	2⅜	5⅛	8⅛	7¼	8½	9	½-13
254JM/256JM	1¼	1¾	1⅜	½-13 x 1	⅝	3	5¼	7¼	8½	9¼	½-13
254JP/256JP	1¼	1¾	1⅜	½-13 x 1	2⅜	5⅛	8⅛	7¼	8½	9	½-13
284JM/286JM	1¼	1¾	1⅜	½-13 x 1	⅝	3	5¼	11	12½	13⅞	⅝-11
284JP/286JP	1¼	1¾	1⅜	½-13 x 1	2⅜	5⅛	8⅛	11	12½	13⅞	⅝-11

IEC (International Electrotechnical Commission)

ENCLOSURES

- IEC uses numbers to denote a particular enclosure type
- The numbers follow the letters IP (Ingress Protection) in the motor description
- The first digit signifies, on a rating scale, how well-protected the motor is against entry of solid objects such as dust, wire, tools, or fingers
- The second digit signifies, on a rating scale, the motor's ability to protect against water entry

Common Enclosure Ratings

IP 22 - Open Dripproof Motors

IP 44 or 54 - Totally Enclosed (NEMA 12)

IP 45 - Weatherproof Motors

IP 55 - Washdown-Duty Motors

Common Motor Applications

IC 01 - NEMA Standard Open Motors

IC 40 (IC 410) - Totally Enclosed, Nonvented

IC 41 (IC 411) - Totally Enclosed, Fan-cooled

IC 48 (IC 418) - Totally Enclosed, Air Over

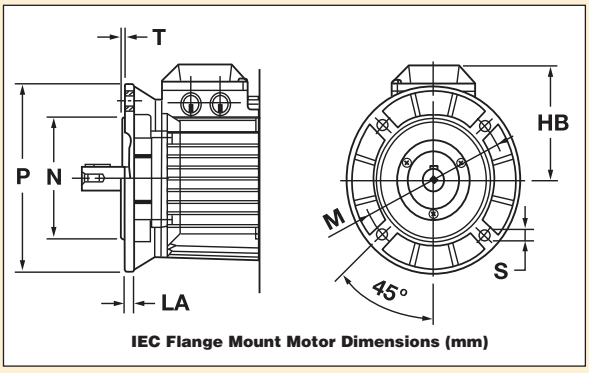
Efficiency Ratings

IEC uses the following ratings to designate motor efficiencies:

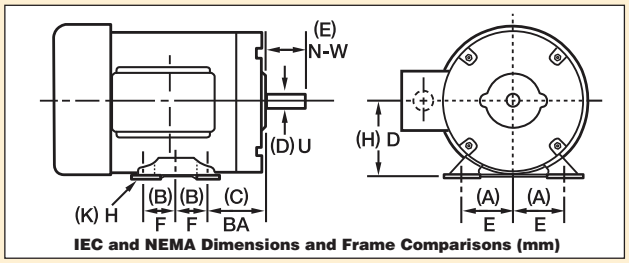
IE2 = Meets Epact levels

IE3 = Meets NEMA Premium

IE4 = Exceeds NEMA Premium



IEC Flange Mount Motor Dimensions (mm)



IEC and NEMA Dimensions and Frame Comparisons (mm)

IEC FLANGE MOUNT MOTOR DIMENSIONS (mm)

Frame	Large Flange (B5) D-Flange HB	LA	M	N	P	S	T	Small Flange (B14) C-Face HB	LA	M	N	P	S	T
63 *	108	7	115	95	140	10	3	68	7	75	60	90	M5	2.5
63	108	7	130	110	160	10	3.5	—	—	—	—	—	—	—
71	120	7	130	110	160	10	3.5	120	9	85	70	105	M6	2.5
80	126	12	165	130	200	12	3.5	126	9	100	80	120	M6	3
90S	139	12	165	130	200	12	3.5	139	9	115	95	140	M8	3
90L	139	12	165	130	200	12	3.5	139	9	115	95	140	M8	3
100L	170	11	215	180	250	15	4	170	14	130	110	160	M8	3.5
112	188	12	215	180	250	15	4	188	14	130	110	160	M8	3.5
132	213	12	265	230	300	15	4	215	14	165	130	200	M10	3.5

* M2AA63 can be supplied with shaft extension D=11, E=23, F=4, and GA=125mm, and DB=M4, if flange M=115mm.

IEC and NEMA DIMENSIONS AND FRAME COMPARISONS (mm)

(IEC) NEMA	(H) D	(A) E	(B) F	(K) H	(D) U	(C) BA	(E) N-W
(56) †	56	45	35.5	5.8	9	36	20
63	63	50	40	7	11	40	23
42	66.7	44.5	44.5	7.1	9.5	52.4	28.6
(71)	71	56	45	7	14	45	30
48	76.2	54	34.9	8.7	12.7	63.5	38.1
(80)	80	62.5	50	10	19	50	40
56	88.9	61.9	38.1	8.7	15.9	69.9	47.6
(90S)	90	70	50	10	24	56	50
143T	88.9	69.8	50.8	8.7	22.2	57.2	57.2
(90L)	90	70	62.5	10	24	56	50
145T	88.9	69.8	63.5	8.7	22.2	57.2	57.2
(100L) †	100	80	70	12	28	63	60
(112S)	112	95	57	12	28	70	60
182T	114.3	95.2	57.2	10.7	28	70	69.9
(112M)	112	95	70	12	28	70	60
184T	114.3	95.2	68.2	10.7	28	70	69.9

IEC and NEMA DIMENSIONS AND FRAME COMPARISONS (mm)

(IEC) NEMA	(H) D	(A) E	(B) F	(K) H	(D) U	(C) BA	(E) N-W
(132S)	132	108	70	12	38	89	80
213T	133.4	108	69.8	10.7	34.9	89	85.7
(132M)	132	108	89	12	38	89	80
215T	133.4	108	88.8	10.7	34.9	89	85.7
(160M)*	160	127	105	15	42	108	110
254T	158.8	127	104.8	13.5	41.3	108	101.6
(160L)*	160	127	127	15	42	108	110
256T	158.8	127	127	13.5	41.3	108	101.6
(180M)*	180	139.5	120.5	15	48	121	110
284T	177.8	139.8	120.2	13.5	47.6	121	117.5
(180L)*	180	139.5	139.5	15	48	121	110
286T	177.8	139.8	139.8	13.5	47.6	121	117.5
(200M)*	180	159	133.5	19	55	133	110
324T	203.3	158.8	133.4	16.7	54	133	133.4
(200L)*	200	159	152.5	19	55	133	110
326T	203.2	158.8	152.4	16.7	54	133	133.4

* Shaft dimensions of these motors may vary among manufacturers. † No NEMA equal.

2015 Energy Conservation Standards For Small Electric Motors

2015 SMALL MOTOR LEGISLATION

Energy efficiency is becoming more important for electric motors used in industrial, commercial, and residential applications. The U.S. Department of Energy (DOE) has established new standards for certain types of small electric motors that will become effective on March 9th, 2015 (March 9th, 2017 for motors that require listing or certification). The motors governed under the small motor ruling include NEMA General Purpose two digit frames 42, 48, and 56, open construction, continuous duty, 1/4 horsepower up through 3 horsepower in 3-phase, capacitor start induction run and capacitor start capacitor run designs. The small motor rule also includes metric designs built in IEC frames 63, 71, or 80, and kilowatt ranges from .18 kW to 2.2 kW. See tables for standard efficiency levels.

Table I.1—Standard Levels for 3-Phase Small Electric Motors

HP/kW	6-Pole (1200 RPM)	4-Pole (1800 RPM)	2-Pole (3600 RPM)
0.25/0.18	67.5	69.5	65.6
0.33/0.25	71.4	73.4	69.5
0.5/0.37	75.3	78.2	73.4
0.75/0.55	81.7	81.1	76.8
1/0.75	82.5	83.5	77.0
1.5/1.1	83.8	86.5	84.0
2/1.5	—	86.5	85.5
3/2.2	—	86.9	85.5

Table I.2—Standard Levels for Capacitor-Start Induction-Run and Capacitor-Start Capacitor-Run Small Electric Motors

HP/kW	6-Pole (1200 RPM)	4-Pole (1800 RPM)	2-Pole (3600 RPM)
0.25/0.18	62.2	68.5	66.6
0.33/0.25	66.6	72.4	70.5
0.5/0.37	76.2	76.2	72.4
0.75/0.55	80.2	81.8	76.2
1/0.75	81.1	82.6	80.4
1.5/1.1	—	83.8	81.5
2/1.5	—	84.5	82.9
3/2.2	—	—	84.1