


MOTOR EFFICIENCY AND POWER FACTOR RATINGS

TECHNICAL FORM RGM 608-A
 Obsoletes Form RGM 608



APPLIES TO: Blower Motors Used in Reznor Direct-Fired and Indirect-Fired Packaged Models, Blower Cabinets, and Unit Heaters

MOTOR APPLICATION: Motor efficiencies are listed for all sizes and types of motors. Motor application is determined by brake horsepower, frame size, static pressure, and model size. Consult specific model information for motor availability (not all motors are available on all models).

TERMS/DEFINITIONS: The following terms are used in this bulletin in reference to motors used on Reznor® equipment.

Enclosed Motors - Enclosed motors have a completely enclosed housing (no slots for ventilation). The enclosed motors (TEFC motors) used on Reznor® heaters have an integral fan that cools the motor bearings. **See page 3 for a listing** of TEFC motors used.

EPACT (Energy Policy Act) - Effective October 24, 1997, motors covered by EPACT for use in the U.S. must meet the energy-efficiency standards listed on **page 2**. Motors regulated by EPACT include any general purpose, T-Frame (3-digit, 143 and larger), single-speed, footmounted, polyphase, squirrel cage induction motor of NEMA Design A and B, manufactured for use in the U.S. in sizes ranging from 1 to 200 HP, operating on 230/460 volt, 60 Hz power.

Frame Size/Shaft - Frame size refers to standardized motor dimensions established by NEMA (National Electrical Manufacturer's Association). Included in this sizing are shaft diameter, mounting hole spacing, centerline shaft distance from base, and keyway information only. The NEMA designation does not restrict motor diameter or junction box size. The diameter of a motor can vary greatly between open/dripproof, totally enclosed, premium efficiency, and two-speed motor types.

Shaft ("U" in the **table below**) is the diameter measurement of the motor shaft.

Motor Efficiency - Motor efficiency percentage is defined by the motor manufacturer as how efficiently a motor turns electrical energy into mechanical energy. To the end user, motor efficiency percentage is important because it is directly related to the cost of operating the motor. The higher the motor efficiency percentage, the less power is required. Using less power conserves energy and saves money.

Open/Dripproof Motors - Open motors have ventilated housings allowing air movement to cool motor bearings. Dripproof means that the vent slots in the housing are positioned to prevent the release of any molten particles. **See page 2 for a listing** of standard efficiency open/dripproof motors used on Reznor® products.

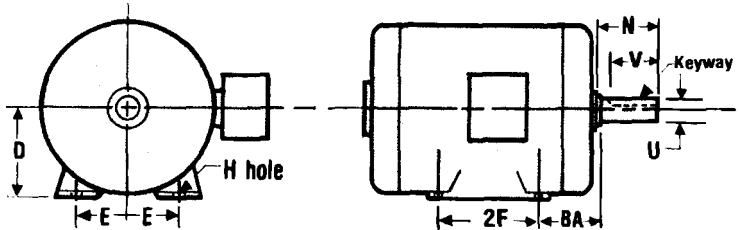
Power Factor - The motor power factor is the ratio of actual power (watts) to apparent power (volt-amps). All blower motors have a minimum power factor percentage of 50% and a maximum of 95%. A motor with a low power factor percentage increases the utility company's cost of supplying power because more current must be transmitted than is actually used to perform useful work.

Premium Efficiency Motors - Premium efficiency motors are designed to require less power to operate than standard open/dripproof motors. (See definition of motor efficiency.) Premium efficiency motors used on Reznor® heaters are of the open/dripproof type. **See page 4 for a listing** of these motors used on Reznor® products.

Two-Speed Motors - Two-speed motors are designed for two definite rates of speed. The 2-speed motors used on Reznor® equipment are open/dripproof motors and have speeds of 1800 and 1200 RPM. **See page 4 for a listing** of 2-speed motors used on Reznor® products.

Frame Size Chart

Standardized motor dimensions as established by the National Electrical Manufacturers Association (NEMA)



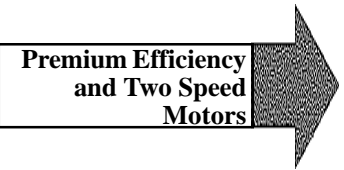
Frame	D	2E	2F	BA	H	N	U	V	Keyway	Frame	D	2E	2F	BA	H	N	U	V	Keyway
48	3	4-1/4	2-3/4	2-1/2	11/32	1-1/2	1/2	--	29/64 Flat	284T	7	11	9-1/2	4-3/4	17/32	4-7/8	1-7/8	4-5/8	1/2 x 1/4
56	3-1/2	4-7/8	3	2-3/4	11/32	1-7/8	5/8	--	3/16 x 3/16	284TS	7	11	9-1/2	4-3/4	17/32	4-7/8	1-7/8	4-5/8	3/8 x 3/16
56H	3-1/2	4-7/8	3	2-3/4	11/32	1-7/8	5/8	--	3/16 x 3/16	286T	7	11	11	4-3/4	17/32	4-7/8	1-7/8	4-5/8	1/2 x 1/4
56HZ	3-1/2	4-7/8	3	2-3/4	11/32	1-7/8	7/8	--	3/16 x 3/16	286TS	7	11	11	4-3/4	17/32	4-7/8	1-7/8	4-5/8	3/8 x 3/16
143T	3-1/2	5-1/2	4	2-1/4	11/32	2-1/4	7/8	2	3/16 x 3/32	324T	8	12-1/2	10-1/2	5-1/4	21/32	5-1/2	2-1/8	5-1/4	1/2 x 1/4
145T	3-1/2	5-1/2	5	2-1/4	11/32	2-1/4	7/8	2	3/16 x 3/32	324TS	8	12-1/2	10-1/2	5-1/4	21/32	5-1/2	2-1/8	5-1/4	3/8 x 3/16
182T	4-1/2	7-1/2	4-1/2	2-3/4	13/32	2-3/4	1-1/8	2-1/2	1/4 x 1/8	326T	8	12-1/2	12	5-1/4	21/32	5-1/2	2-1/8	5-1/4	1/2 x 1/4
184T	4-1/2	7-1/2	5-1/2	2-3/4	13/32	2-3/4	1-1/8	2-1/2	1/4 x 1/8	326TS	8	12-1/2	12	5-1/4	21/32	5-1/2	2-1/8	5-1/4	3/8 x 3/16
213T	5-1/4	8-1/2	5-1/2	3-1/2	13/32	3-3/8	1-3/8	3-1/8	5/16 x 5/32	364T	9	14	11-1/4	5-7/8	21/32	6-1/4	2-3/8	5-7/8	5/8 x 5/16
215T	5-1/4	8-1/2	7	3-1/2	13/32	3-3/8	1-3/8	3-1/8	5/16 x 5/32	364TS	9	14	11-1/4	5-7/8	21/32	6-1/4	2-3/8	5-7/8	1/2 x 1/4
254T	6-1/4	10	8-1/4	4-1/4	17/32	4	1-5/8	3-3/4	3/8 x 3/16	365T	9	14	12-1/4	5-7/8	21/32	6-1/4	2-3/8	5-7/8	5/8 x 5/16
256T	6-1/4	10	10	4-1/4	17/32	4	1-5/8	3-3/4	3/8 x 3/16	365TS	9	14	12-1/4	5-7/8	21/32	6-1/4	2-3/8	5-7/8	1/2 x 1/4

Totally Enclosed Blower Motors Used on Reznor® Heating/Makeup Air Equipment

HP	Totally Enclosed Motors							
	Voltage/Ph	120/1	208/1	230/1	208/3	230/3	460/3	575/3
1/4	P/N	105566	16074	16074	16075	16075	16075	--
	Power Factor	69.5	66.7	66.7	65.2	65.2	65.2	--
	Efficiency	63.8	64.1	64.1	61.0	61.0	61.0	--
	Frame Size	M48	J56	J56	B56	B56	B56	--
	Shaft	1/2"	5/8"	5/8"	5/8"	5/8"	5/8"	--
	FLA	3.6	2.2	1.9	1.6	1.4	0.7	--
1/3	P/N	115861	159501	159501	105567	105567	105567	--
	Power Factor	68.5	67.2	67.2	80.0	80.0	80.0	--
	Efficiency	71.7	69.5	69.5	79.7	79.7	79.7	--
	Frame Size	N48	N48	N48	L48	L48	L48	--
	Shaft	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	--
	FLA	4.6	2.3	2.4	1.2	1.2	0.6	--
1/2	P/N	159184	159184	159184	16077	16077	16077	105568
	Power Factor	71.9	71.9	71.9	76.8	76.8	76.8	73.5
	Efficiency	63.6	63.6	63.6	77.4	77.4	77.4	78.8
	Frame Size	J56	J56	J56	H56	H56	H56	J56
	Shaft	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"
	FLA	7.2	3.5	3.6	2.3	2.0	1.0	0.7
3/4	P/N	115860	115860	115860	20371	20371	20371	105569
	Power Factor	69.3	69.3	69.3	73.5	73.5	73.5	78.3
	Efficiency	68.0	68.0	68.0	81.0	81.0	81.0	82.0
	Frame Size	F56	F56	F56	KA56	KA56	KA56	L56
	Shaft	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"
	FLA	11.0	5.4	5.5	2.0	2.2	1.1	0.8
1	P/N	43270	--	43270	16080	16080	16080	105570
	Power Factor	74.2	--	74.2	75.6	75.6	75.6	71.6
	Efficiency	71.9	--	71.9	79.0	79.0	79.0	80.3
	Frame Size	L56	--	L56	J56	J56	J56	H56
	Shaft	5/8"	--	5/8"	5/8"	5/8"	5/8"	5/8"
	FLA	13.0	--	6.5	3.3	3.4	1.7	1.4
1-1/2	P/N	94347	94347	94347	101286	101286	101286	105665
	Power Factor	89.0	80.0	89.0	79.7	79.7	79.7	86.3
	Efficiency	77.0	70.0	77.0	82.3	82.3	82.3	84.0
	Frame Size	TK56H	TK56H	TK56H	L56H	L56H	L56H	M145T
	Shaft	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	7/8"
	FLA	16.4	9.5	8.2	4.3	4.4	2.2	1.6
2	P/N	105572	--	105572	158165	158165	158165	158166
	Power Factor	73.0	--	73.0	82.0	82.0	82.0	82.1
	Efficiency	72.5	--	72.5	84.0	84.0	84.0	84.0
	Frame Size	F182T	--	F182T	145T	145T	145T	145T
	Shaft	1-1/8"	--	1-1/8"	7/8"	7/8"	7/8"	7/8"
	FLA	24.0	--	12.0	6.5	5.8	2.9	2.3
3	P/N	111564	--	111564	159330	159330	159330	158168
	Power Factor	74.0	--	74.0	74.0	74.0	74.0	87.1
	Efficiency	88.5	--	88.5	88.5	88.5	88.5	85.5
	Frame Size	F184T	--	F184T	145T	145T	145T	182T
	Shaft	1-1/8"	--	1-1/8"	7/8"	7/8"	7/8"	7/8"
	FLA	30.0	--	15.0	8.5	8.2	4.1	3.0
5	P/N	--	--	111567	155048	155048	155048	158170
	Power Factor	--	--	78.4	89.7	89.7	89.7	89.7
	Efficiency	--	--	90.8	86.1	87.5	87.5	87.5
	Frame Size	--	--	F184T	F184T	F184T	F184T	F184T
	Shaft	--	--	1-1/8"	1-1/8"	1-1/8"	1-1/8"	1-1/8"
	FLA	--	--	13.2	12.0	6.0	4.8	22.8
7-1/2	P/N	--	--	105842	158171	158171	158171	158172
	Power Factor	--	--	86.5	91.4	91.4	91.4	83.0
	Efficiency	--	--	84.0	86.1	89.5	89.5	89.5
	Frame Size	--	--	F215T	213T	213T	213T	213T
	Shaft	--	--	1-3/8"	1-3/8"	1-3/8"	1-3/8"	1-3/8"
	FLA	--	--	34.0	23.0	19.0	9.5	7.6
HP	Totally Enclosed Motors							

HP	Totally Enclosed Motors							
	Voltage/Ph	120/1	208/1	230/1	208/3	230/3	460/3	575/3
10	P/N	--	--	105846	158173	158173	158173	158174
	Power Factor	--	--	94.5	84.9	84.9	84.9	85.0
	Efficiency	--	--	87.5	89.5	89.5	89.5	89.5
	Frame Size	--	--	215T	215T	215T	215T	215T
	Shaft	--	--	1-3/8"	1-3/8"	1-3/8"	1-3/8"	1-3/8"
	FLA	--	--	39.0	30.0	26.0	13.0	10.4
15	P/N	--	--	--	--	142443	142443	142444
	Power Factor	--	--	--	--	82.0	82.0	82.0
	Efficiency	--	--	--	--	90.2	90.2	90.2
	Frame Size	--	--	--	--	254T	254T	254T
	Shaft	--	--	--	--	1-5/8"	1-5/8"	1-5/8"
	FLA	--	--	--	--	38.0	19.0	15.0
20	P/N	--	--	--	--	142301	142301	142302
	Power Factor	--	--	--	--	81.0	81.0	81.0
	Efficiency	--	--	--	--	89.5	89.5	89.5
	Frame Size	--	--	--	--	256T	256T	256T
	Shaft	--	--	--	--	1-5/8"	1-5/8"	1-5/8"
	FLA	--	--	--	--	52.0	26.0	20.6
25	P/N	--	--	--	165321	165321	165321	165322
	Power Factor	--	--	--	75.8	88.9	88.9	88.9
	Efficiency	--	--	--	92.4	92.4	92.4	92.4
	Frame Size	--	--	--	284T	284T	284T	284T
	Shaft	--	--	--	1-7/8"	1-7/8"	1-7/8"	1-7/8"
	FLA	--	--	--	74.0	57.0	28.5	22.8
30	P/N	--	--	--	165323	165323	165323	165324
	Power Factor	--	--	--	82.0	88.2	88.2	88.2
	Efficiency	--	--	--	92.4	92.4	92.4	92.4
	Frame Size	--	--	--	286T	286T	286T	286T
	Shaft	--	--	--	1-7/8"	1-7/8"	1-7/8"	1-7/8"
	FLA	--	--	--	82.0	69.0	34.5	27.6
40	P/N	--	--	--	165325	165325	165325	165326
	Power Factor	--	--	--	77.5	88.6	88.6	88.8
	Efficiency	--	--	--	93.0	93.0	93.0	93.0
	Frame Size	--	--	--	324T	324T	324T	324T
	Shaft	--	--	--	2-1/8"	2-1/8"	2-1/8"	2-1/8"
	FLA	--	--	--	115.0	91.0	45.0	36.3
50	P/N	--	--	--	165327	165327	165327	165328
	Power Factor	--	--	--	78.5	85.4	85.4	86.5
	Efficiency	--	--	--	93.0	93.0	93.0	93.0
	Frame Size	--	--	--	326T	326T	326T	326T
	Shaft	--	--	--	2-1/8"	2-1/8"	2-1/8"	2-1/8"
	FLA	--	--	--	142.0	118.0	59.0	46.0
60	P/N	--	--	--	--	165329	165329	165330
	Power Factor	--	--	--	--	85.8	85.8	88.5
	Efficiency	--	--	--	--	93.6	93.6	94.1
	Frame Size	--	--	--	--	364T	364T	364T
	Shaft	--	--	--	--	2-3/8"	2-3/8"	2-3/8"
	FLA	--	--	--	--	140.0	70.0	54.0
75	P/N	--	--	--	--	165331	165331	165332
	Power Factor	--	--	--	--	86.8	86.8	90.1
	Efficiency	--	--	--	--	94.1	94.1	94.5
	Frame Size	--	--	--	--	365T	365T	365T
	Shaft	--	--	--	--	2-3/8"	2-3/8"	2-3/8"
	FLA	--	--	--	--	172.0	86.0	66.0
HP	Totally Enclosed Motors							

NOTE: All totally enclosed motors listed here are 1800 RPM except 3 and 5 HP which are 3600 RPM.



Premium Efficiency, Open/Dripproof Blower Motors Used on Reznor® Heating/Makeup Air Equipment

HP	Premium Efficiency Motors					HP	Premium Efficiency Motors					HP	Premium Efficiency Motors				
	Voltage/Ph	208/3	230/3	460/3	575/3		Voltage/Ph	208/3	230/3	460/3	575/3		Voltage/Ph	208/3	230/3	460/3	575/3
1	P/N	105659	159328	159328	158175	7-1/2	P/N	159331	159332	159332	158164	30	P/N	159032	159034	159034	159026
	Power Factor	81.0	73.4	73.4	84.1		Power Factor	79.2	82.4	82.4	81.4		Power Factor	79.7	83.0	83.0	81.1
	Efficiency	82.5	85.4	85.4	82.5		Efficiency	91.7	91.7	91.7	88.5		Efficiency	93.6	93.6	93.6	92.4
	Frame Size	N143T	143T	143T	N143T		Frame Size	D213T	D213T	D213T	S213T		Frame Size	S286T	S286T	S286T	S286T
	Shaft	7/8"	7/8"	7/8"	7/8"		Shaft	1-3/8"	1-3/8"	1-3/8"	1-3/8"		Shaft	1-7/8"	1-7/8"	1-7/8"	1-7/8"
	FLA	3.1	2.7	1.35	1.1		FLA	21.4	18.6	9.3	7.8		FLA	83.3	72.4	36.2	30
1-1/2	P/N	105662	159329	159329	158162	10	P/N	159333	159334	159334	158163	40	P/N	165185	163836	163836	165186
	Power Factor	82.2	74.7	74.7	85.8		Power Factor	81.9	85.1	85.1	81.3		Power Factor	81.0	84.0	84.0	83.7
	Efficiency	84.0	85.7	85.7	84.0		Efficiency	91.0	91.0	91.0	89.5		Efficiency	93.0	93.0	93.0	93.0
	Frame Size	P145T	145T	145T	R145T		Frame Size	H215T	H215T	H215T	S215T		Frame Size	S324T	S324T	S324T	S324T
	Shaft	7/8"	7/8"	7/8"	7/8"		Shaft	1-3/8"	1-3/8"	1-3/8"	1-3/8"		Shaft	2-1/8"	2-1/8"	2-1/8"	2-1/8"
	FLA	4.5	3.9	1.95	1.6		FLA	27.8	24.2	12.1	10.3		FLA	110.0	96.0	48.0	38.5
2	P/N	105664	159027	159024	158176	15	P/N	142440	142441	142441	142442	50	P/N	165724	165725	165725	--
	Power Factor	82.5	78.6	77.8	85.8		Power Factor	84.1	84.5	84.5	84.0		Power Factor	80.0	82.6	82.6	--
	Efficiency	84.0	85.6	92.4	84.0		Efficiency	92.4	92.4	92.4	92.4		Efficiency	94.5	94.5	94.5	--
	Frame Size	P145T	145T	145T	P145T		Frame Size	254T	254T	254T	254T		Frame Size	S326T	S326T	S326T	--
	Shaft	7/8"	7/8"	7/8"	7/8"		Shaft	1-5/8"	1-5/8"	1-5/8"	1-5/8"		Shaft	2-1/8"	2-1/8"	2-1/8"	--
	FLA	6.0	5.8	2.9	2.1		FLA	40.0	36.0	18.0	14.5		FLA	137.0	120.0	60.0	--
3	P/N	159186	159028	159028	159030	20	P/N	159187	142299	142299	142300	60	P/N	165191	165192	165192	165193
	Power Factor	89.0	86.8	86.8	89.0		Power Factor	77.7	84.0	84.0	84.0		Power Factor	84.6	85.8	85.8	87.4
	Efficiency	87.5	87.5	87.5	87.5		Efficiency	93.6	93.0	93.0	93.0		Efficiency	93.6	93.6	93.6	93.6
	Frame Size	145T	145T	145T	145T		Frame Size	S256T	256T	256T	256T		Frame Size	S364T	S364T	S364T	S364T
	Shaft	7/8"	7/8"	7/8"	7/8"		Shaft	1-5/8"	1-5/8"	1-5/8"	1-5/8"		Shaft	2-3/8"	2-3/8"	2-3/8"	2-3/8"
	FLA	8.3	7.4	3.7	3.0		FLA	57.0	48.0	24.0	19.2		FLA	157.0	140.0	70.0	55.0
5	P/N	159029	159029	159029	111602	25	P/N	159031	159033	159033	159023	75	P/N	165194	165195	165195	165196
	Power Factor	88.8	88.8	88.8	89.2		Power Factor	79.1	82.1	82.1	84.1		Power Factor	86.5	90.0	90.0	90.5
	Efficiency	91.0	91.0	91.0	87.5		Efficiency	93.6	93.6	93.6	91.7		Efficiency	94.1	94.1	94.1	94.1
	Frame Size	H182T	H182T	H182T	184T		Frame Size	S284T	S284T	S284T	S284T		Frame Size	S365T	S365T	S365T	S365T
	Shaft	1-1/8"	1-1/8"	1-1/8"	1-1/8"		Shaft	1-7/8"	1-7/8"	1-7/8"	1-7/8"		Shaft	2-3/8"	2-3/8"	2-3/8"	2-3/8"
	FLA	13.9	11.6	5.8	4.8		FLA	70.0	61.0	30.5	24.3		FLA	191.0	166.0	83.0	66.0

NOTE: All open dripproof premium efficiency motors listed here are 1800 RPM except 3 and 5 HP which are 3600 RPM. Some premium efficiency motors are the same as the open dripproof motor.

Two-Speed, Open/Dripproof Blower Motors Used on Reznor® Heating/Makeup Air Equipment

HP	Two-Speed Motors				HP	Two-Speed Motors				HP	Two-Speed Motors			
	Voltage/Ph	208/3	230/3	460/3		Voltage/Ph	208/3	230/3	460/3		Voltage/Ph	208/3	230/3	460/3
1/44	P/N	105461	105461	105462	5/2.2	P/N	105870	105870	105871	20/8.9	P/N	165728	165728	165729
	Power Factor	87.5	74.5	74.5		Power Factor	71.3	70.3	84.6		Power Factor	83.2	82.6	87.7
	Efficiency	74.0	74.0	74.0		Efficiency	86.0	86.0	78.0		Efficiency	89.0	89.0	90.0
	Frame Size	M145T	M145T	M145T		Frame Size	S215T	S215T	S215T		Frame Size	S286T	S286T	S286T
	Shaft	7/8"	7/8"	7/8"		Shaft	1-3/8"	1-3/8"	1-3/8"		Shaft	1-7/8"	1-7/8"	1-7/8"
	FLA	3.2	3.4	1.7		FLA	16.9	15.5	7.1		FLA	56.0	51.0	24.0
1.5/68	P/N	105643	105643	105644	7.5/3.3	P/N	105872	105872	105873	25/11	P/N	-	-	165730
	Power Factor	77.7	71.7	78.1		Power Factor	79.4	81.0	80.8		Power Factor	-	-	85.8
	Efficiency	80.0	80.0	75.0		Efficiency	89.0	89.0	87.0		Efficiency	-	-	91.0
	Frame Size	N145T	N145T	N145T		Frame Size	Y182T	Y182T	D215T		Frame Size	-	-	S286T
	Shaft	7/8"	7/8"	7/8"		Shaft	1-3/8"	1-3/8"	1-3/8"		Shaft	-	-	1-7/8"
	FLA	5.0	4.9	2.4		FLA	22.0	19.5	10.0		FLA	-	-	30.0
2/88	P/N	105645	105645	105646	10/4.4	P/N	105874	105874	105875	30/13	P/N	-	-	165731
	Power Factor	83.9	78.4	78.1		Power Factor	78.5	76.1	79.8		Power Factor	-	-	81.3
	Efficiency	81.0	81.0	80.0		Efficiency	88.0	88.0	87.0		Efficiency	-	-	91.0
	Frame Size	S182T	S182T	S182T		Frame Size	S256T	S256T	S256T		Frame Size	-	-	S286T
	Shaft	1-1/8"	1-1/8"	1-1/8"		Shaft	1-5/8"	1-5/8"	1-5/8"		Shaft	-	-	1-7/8"
	FLA	6.1	5.9	3.0		FLA	30.0	28.0	13.5		FLA	-	-	38.0
3/1.3	P/N	105647	105647	105648	15/6.7	P/N	165726	165726	165727	40/18	P/N	-	-	165732
	Power Factor	83.9	82.6	74.1		Power Factor	76.9	74.3	81.7		Power Factor	-	-	71.5
	Efficiency	81.0	81.0	82.5		Efficiency	86.0	86.0	86.0		Efficiency	-	-	92.0
	Frame Size	S184T	S184T	S184T		Frame Size	S284T	S284T	S256T		Frame Size	-	-	S326T
	Shaft	1-1/8"	1-1/8"	1-1/8"		Shaft	1-7/8"	1-7/8"	1-5/8"		Shaft	-	-	2-1/8"
	FLA	9.0	8.4	4.6		FLA	47.0	44.0	20.0		FLA	-	-	57.0

NOTE: All two-speed motors listed here are 1800/1200 RPM. Efficiency and power factors are for high speed.