



AIR MOTORS
The Power you Need in the Space you Need it.

INTRODUCTION

For more than 125 years, Ingersoll Rand has been an industry leader in engineering and manufacturing air power. Ingersoll Rand is the expert in air power.

AIR POWER

Creating sheer power from the natural environment, Ingersoll Rand air motors are flexible, efficient alternatives to electric sources—perfect for a wide range of industrial applications. Consider these advantages:

- **Infinitely variable speeds and torques** via pressure regulation or air valves—no costly controls required
- **Instant starting, stopping and reversing** eliminates the delays of motor speed-up and slow-down periods
- **Will not overheat or burn out**, even when overloaded or run to stall
- **Safe operations in hazardous conditions**, with no electrical sparks or hydraulic fluids
- **Cool running characteristics minimize** the effects of hot, wet or dusty surroundings
- **Low maintenance**, based on simplicity of design and strength of construction
- **Excellent design flexibility**—a function of compact size, light weight, and high power output
- **Temperature range**—up to 150°F with standard lubrication and up to 300°F with high temperature lubrication

FULL SPECTRUM OF SOLUTIONS

Ingersoll Rand offers well over 200 cataloged models of air motors, with an extensive range of options:

- **Reversible and non-reversible types**
- **Vane or piston configurations**
- **Geared and non-geared varieties**
- **0.10 to 30 horsepower**
- **23 rpm to 26,000 rpm speed ratings**
- **0.10 ft-lb to 1090 ft-lb torque ratings**

In addition, Ingersoll Rand maintains data on hundreds of special application air motors that have solved problems for design engineers around the world over the years. You can access this invaluable resource by contacting your Ingersoll Rand representative or distributor with details of your situation.

With over 125 years of engineering and manufacturing leadership, Ingersoll Rand is the expert in air power.



REPAIRS DONE RIGHT.

SERVICE MADE SIMPLE.

Proper service of Ingersoll Rand® air motors with quality-authorized parts will help prevent wear and tear, eliminate downtime and extend a product's life. That's why Ingersoll Rand (IR) has created a program that provides service and repairs to the end user through the use of Authorized Service Agents.

This newly developed program ensures that Ingersoll Rand maintenance and repair standards are met, through the use of genuine parts and service. Whether it's serious technical difficulties or just routine maintenance, products can be taken directly to any specified Authorized Service Agent. From there, the program has been set up to make certain that the air motor is put into the hands of reliable, fully trained IR service technicians. This process ensures that you have access to the expertise and resources of a full service center, regardless of geographic location.

PROGRAM FEATURES

- One Face to the End User
- Quality repairs using genuine IR parts
- Access to an IR owned service center
- Fully trained service technicians using IR specified testing equipment
- Receive your quote in 48 hours or less
- 90 day repair warranty



4800 Series Air Motor

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AIR MOTOR PERFORMANCE CURVES

The performance curves shown throughout this catalog can assist you in matching specific air motor models to requirements. Performance data within one series may vary slightly, depending on gear ratios. When this occurs, median performance for that series is indicated. Follow these guidelines for interpreting the performance curves:

HORSEPOWER

1. Locate operating speed on the correct horizontal axis of the bottom chart
2. Read Horsepower from the correct curve in the bottom chart

TORQUE

1. Locate operating speed on the correct horizontal axis of the bottom chart
2. Read Torque from the correct curve in the bottom chart

AIR CONSUMPTION

1. Locate operating speed on the correct horizontal axis on the bottom chart
2. Read Air Consumption from the correct curve in the top chart

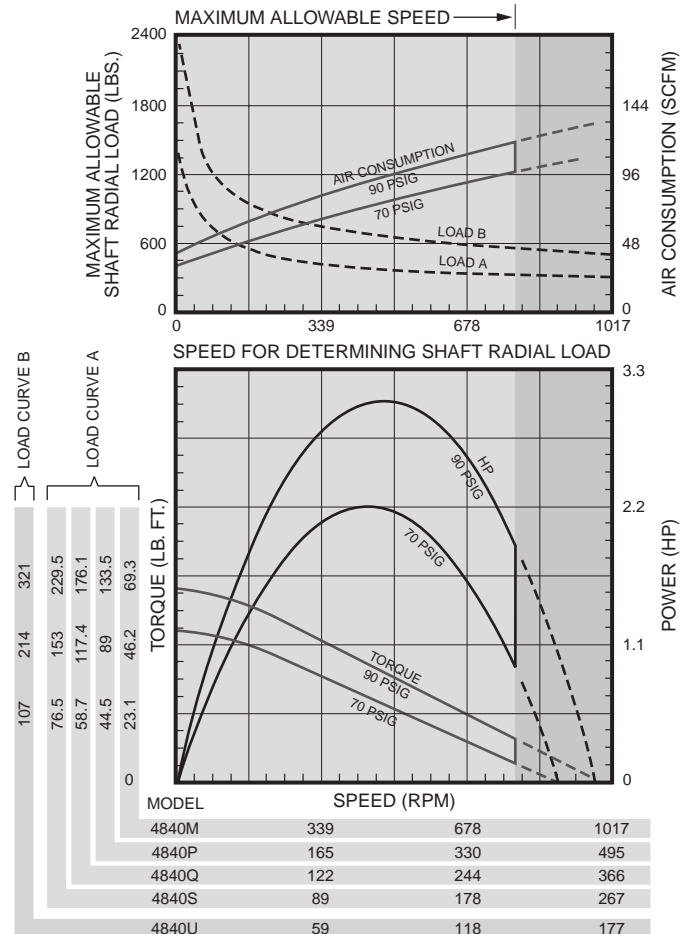
MAXIMUM ALLOWABLE SHAFT RADIAL LOAD

On applications where Shaft Radial Load is a factor:

1. Locate operating speed on the horizontal axis of the top chart
2. Read Shaft Radial Load on the correct Load Curve in the top chart

TWO 1/3 HORSEPOWER MOTORS

The Ingersoll Rand reversible Series M004 Air Motor shown weighs only $2\frac{3}{8}$ lbs. It has integral gear reduction of 33 to 1 and a free speed of 450 rpm. The comparable horsepower 110 volt electric motor, with a free speed of 1,725 rpm, weighs $15\frac{1}{2}$ lbs.



AIR MOTOR SELECTION AND CHARACTERISTICS

Ingersoll Rand offers two basic types of Air Motors:

VANE MOTORS

Are smaller, lighter and less expensive than piston motors of similar power. Simple in design and construction, they can be operated in most any position. Vane motors are available in a broad range of speeds, torques and power and are the most widely used type of air motor.

RADIAL PISTON MOTORS

Operate at lower speeds than vane motors. Have excellent starting and speed control. Especially good for “lugging” heavy loads at slow speed. Standard operational position is horizontal.

REVERSIBLE/NON-REVERSIBLE AIR MOTORS

Non-reversible air motors are rated at slightly higher speeds, torques, and horsepowers than reversible motors of the same family.

AIR PRESSURE

When selecting air motors, remember that the specification listings show only one set of performance figures, at a particular pressure—90 psig. Air motors are designed to produce optimum performance at this pressure.

Many other speeds, torques and power can be obtained from the same motor by regulating the pressure, air supply or exhaust. While they will operate at pressures below 40 psig, their performance may not be consistent. They can also be operated above 100 psig, but often at the expense of increased maintenance.

A good rule to follow is to size an air motor based on approximately 70% of the lowest available air pressure. This will allow additional power for starting and possible overloading. See page 8 for performance characteristics at various air pressures.

MAXIMUM POWER

Ungoverned air motors develop maximum horsepower at approximately 50% of free (unloaded) speed while governed motors reach their peak horsepower at about 80% of free speed. The only governed motors in this catalog are the 22 and 55 Series.

DESIRED OPERATING SPEED

The desired operating speed, not the free and unloaded speed should be considered when selecting air motors.

Ungoverned air motors should not be run unloaded. The performance curves in this catalog indicate the maximum speeds at which the motor should be operated. The nameplate stamped speed is present for identification only.

REQUIRED TORQUE

Equally important as the speed at which an air motor is to be run is the required torque. The combination of the two factors—speed and torque—determine the power of the desired motor. Care should be taken to differentiate between stall (maximum) and running torques when selecting air motors.

SPEED AND TORQUE

Starting torques are approximately 75% of stall torques.

Operating or running torques at any speed can be approximated from motor performance curves—or calculated using the formula:

$$\text{Torque (lb-ft)} = \frac{\text{Horsepower} \times 5,250}{\text{Speed (revolutions per minute)}}$$

$$\text{Torque (Nm)} = \frac{\text{Kilowatts} \times 9,550}{\text{Speed (revolutions per minute)}}$$

SPEED AND TORQUE

When an air motor is to be used with a pulley, sprocket, or gear on the shaft, the overhung load (perpendicular to the shaft), commonly called “shaft radial loading” must be considered. It is shown in the performance curves and is generally assumed to be applied at the mid-point of the keyway of the shaft.

AIR SYSTEM AND SUPPLY

Once an air motor has been selected, it is important to ensure that the desired air pressure is available at the motor, *while the motor is operating*. A pressure reading at the compressor does not mean that the same pressure will be available to an operating air motor, because of possible restrictions and friction losses in the air system. Exhaust restrictions can also affect air motor operation, and are often the cause of performance problems.

INLET CONTROLS

When installing reversible air motors, a four-way valve or two three-way valves should be used to prevent blockage of the secondary Exhaust Port. This is the opposite Rotation Port to that which is being pressurized.

REPLACING ELECTRIC MOTORS WITH AIR MOTORS

Electric motors, with the exception of series wound direct current motors, have entirely different performance characteristics than air motors. Therefore, their torque and speed curves will not match. Many electric motors are oversized to allow for overloading and lower power air motors can be used as replacements.

INGERSOLL RAND ASSISTANCE

Your Ingersoll Rand Air Motor distributor and factory representative are anxious to help with motor problems, applications and selections.

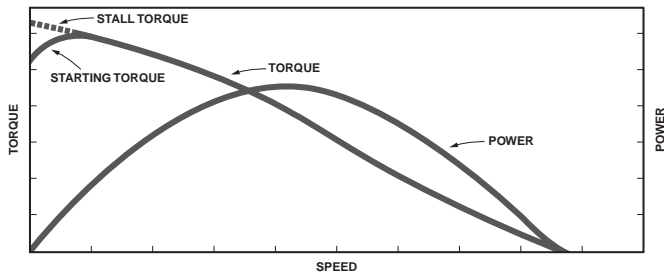


Fig. 1 Torque and power curves for a typical air motor. Torque is maximum at zero speed and zero at free speed. Any loading will slow the motor. As the load increases, the speed decreases and the torque increases until the motor stalls. If the load is decreased, the motor speed increases and its torque output decreases to match the applied load.

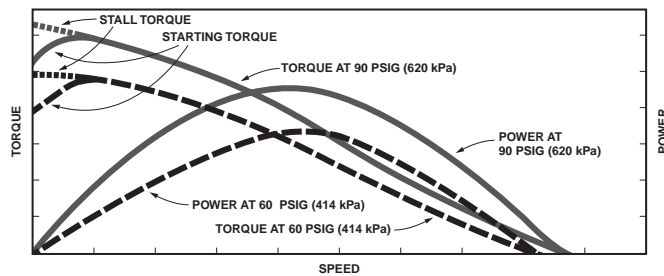


Fig. 2 Typical Air Motor torque and power curves at two different air pressures. Note that speed, torque and power decrease as the air pressure decreases.

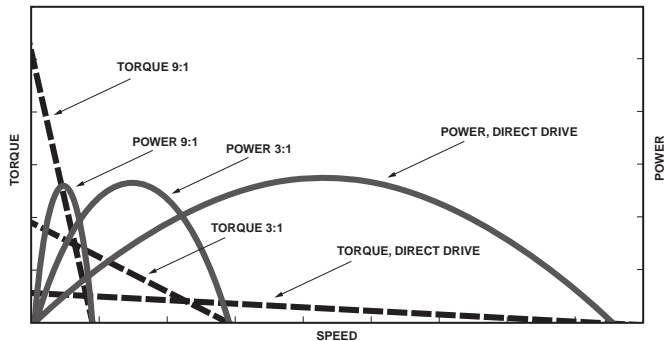


Fig. 3 Torque and power curves for geared and nongear motors. Note that reducing rpm by gearing steepens the torque curve while maintaining power. Gearing is often used to reduce the speed and increase the torque of air motors. The greater the gear reduction, the steeper will be the torque curve; thus, the higher speed motor will be more susceptible to a drop in speed as a load is applied than the slower speed motor with additional gearing.

VARYING AIR PRESSURE

How to Determine Performance Characteristics at Air Pressures Other than 90 psig

As air pressure changes, the performance characteristics will change by the percentages given below.

UNGOVERNED AIR MOTORS

Air Pressure (psig)	Free Speed (rpm)	Air Consumption at Free Speed (scfm)	Maximum Power (hp)	Speed at Maximum Horsepower (rpm)	Torque at Maximum Horsepower (lb-ft)	Air Consumption at Max. Power (scfm)	Stall or Starting Torque (lb-ft)
40	80%	45%	30%	80%	37.5%	45%	45%
50	84%	56%	44%	84%	52.4%	56%	56%
60	88%	67%	58%	88%	65.9%	67%	67%
70	92%	78%	72%	92%	78.3%	78%	78%
80	96%	89%	86%	96%	89.6%	89%	89%
90	100%	100%	100%	100%	100.0%	100%	100%
100	104%	111%	114%	104%	109.6%	111%	111%

Example: Knowing the performance characteristics of a Model 3840P reversible uncontrolled Air Motor at 90 psig (620 kPa) it is a simple matter to determine its characteristics at another air pressure. Using the percentages from the table for 60 psig (414 kPa), the performance becomes:

CHARACTERISTICS

	Performance at 90 psig		Percentage Reduction		Performance at 60 psig
Maximum Power (hp)	1.35	x	58%	=	0.78
Free Speed (rpm)	440	x	88%	=	387
Speed at Max Power (rpm)	215	x	88%	=	189
Max (Stall) Torque (lb-ft)	53.5	x	67%	=	35.8
Torque at Max Power (lb-ft)	33	x	65.9%	=	21.7
Starting Torque (lb-ft)	40	x	67%	=	26.8
Air Consumption at Free Speed (scfm)	54	x	67%	=	36.2
Air Consumption at Max HP (scfm)	44	x	67%	=	29.5

Air Supply or Exhaust Regulation

Reducing or restricting the amount of air supplied to the motor has a similar effect to reducing the air pressure.

Choking or restricting the exhaust has a somewhat different effect, with the speed decreasing much more than the torque.

The effects of changes in pressure, air supply and exhaust regulation are summarized in the table at the right:

Exact variations in performance with "choked" motors are not tabulated; however, "on the job" tests will usually produce the desired results; sometimes from a combination of pressure adjustments and inlet and exhaust restrictions.

AIR REGULATION

	Speed	Torque
Reduced air pressure, or restricting volume of air to motor	Reduced	Greatly Reduced
Choking or restricting exhaust	Greatly Reduced	Reduced

IN-LINE PLANETARY GEAR, MULTI-VANE MOTORS

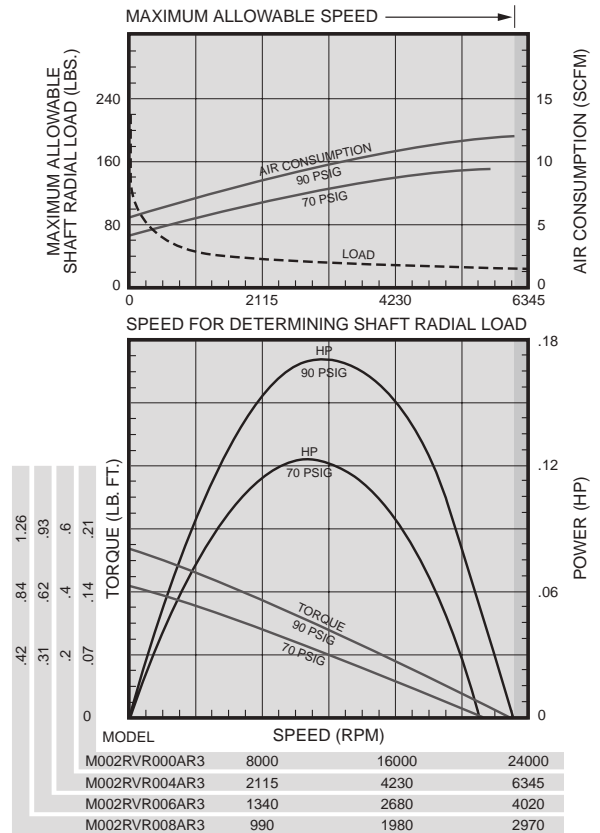
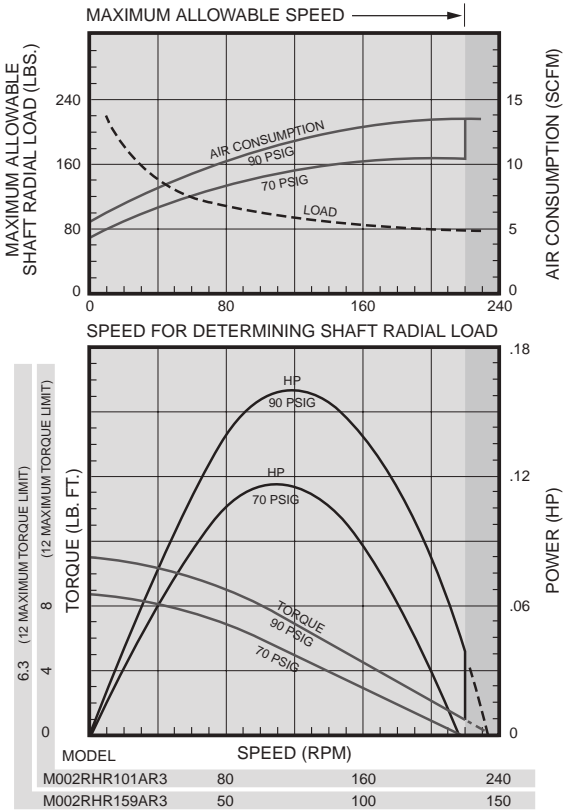
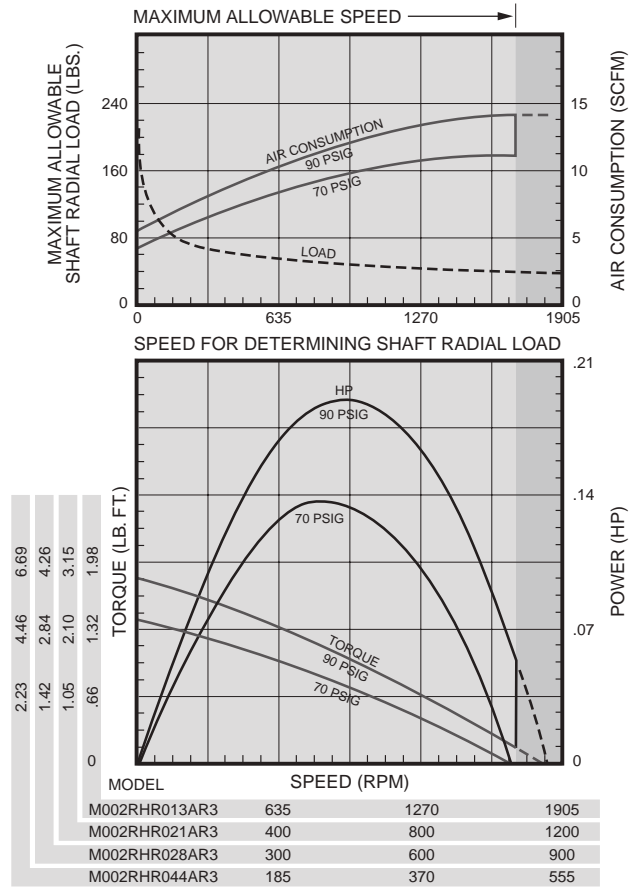
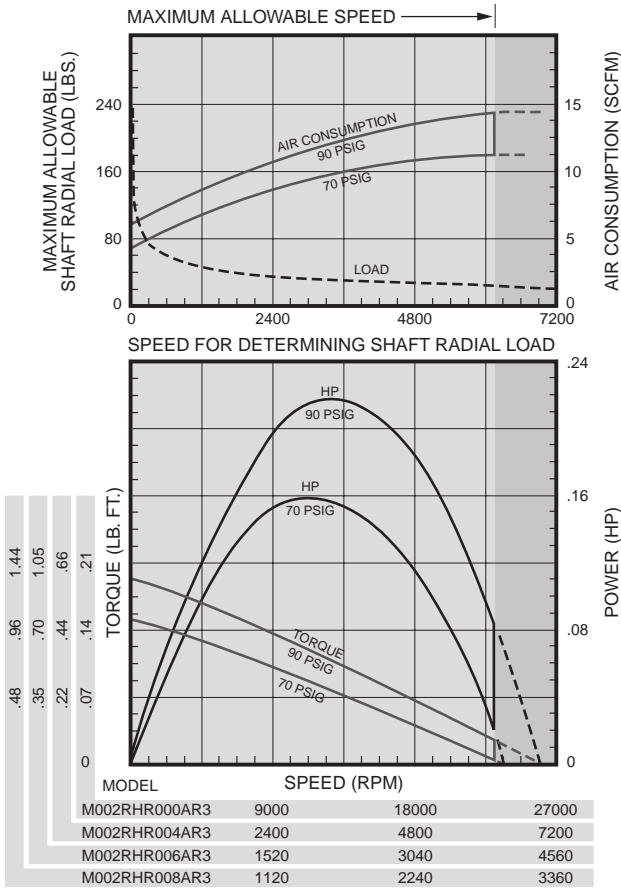
SERIES M002 MULTI-VANE AIR MOTORS SPECIFICATIONS

Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
NON-REVERSIBLE Direction of rotation is counterclockwise when facing the shaft												
M002RHR000AR3	0.25	0.19	12,250	26,000	0.15	0.20	0.20	0.27	12.0	0.34	1	0.46
M002RHR004AR3	0.22	0.16	3,250	6,920	0.45	0.61	0.61	0.83	11.9	0.34	1	0.46
M002RHR006AR3	0.22	0.16	2,060	4,385	0.72	0.98	0.96	1.30	11.9	0.34	1 ¹ / ₈	0.49
M002RHR008AR3	0.22	0.16	1,520	3,240	0.98	1.33	1.31	1.78	11.9	0.34	1	0.46
M002RHR013AR3	0.19	0.14	880	1,840	1.36	2.50	1.82	2.47	11.8	0.33	1 ¹ / ₈	0.50
M002RHR021AR3	0.19	0.14	555	1,165	2.16	2.93	2.88	3.90	11.8	0.33	1 ¹ / ₈	0.50
M002RHR028AR3	0.19	0.14	410	860	2.92	3.96	3.90	5.29	11.8	0.33	1 ¹ / ₈	0.50
M002RHR044AR3	0.19	0.14	262	545	4.61	6.25	6.15	8.34	11.8	0.33	1 ¹ / ₈	0.50
M002RHR101AR3	0.16	0.12	112	228	*8.32	*11.2	*11.1	*15.0	11.7	0.33	1 ³ / ₁₆	0.54
M002RHR159AR3	0.16	0.12	71	145	*13.1	*17.7	*17.5	*23.7	11.7	0.33	1 ³ / ₁₆	0.54
REVERSIBLE												
M002RVR000AR3	0.20	0.15	11,500	23,000	0.13	0.18	0.18	0.24	9.8	0.28	1	0.46
M002RVR004AR3	0.17	0.13	3,045	6,090	0.40	0.54	0.54	0.73	9.7	0.27	1	0.46
M002RVR006AR3	0.17	0.13	1,930	3,860	0.64	0.87	0.86	1.17	9.7	0.27	1 ¹ / ₈	0.49
M002RVR008AR3	0.17	0.13	1,425	2,850	0.87	1.18	1.16	1.57	9.7	0.27	1	0.46
M002RVR013AR3	0.14	0.10	820	1,645	1.17	1.58	1.56	2.11	9.6	0.27	1 ¹ / ₈	0.50
M002RVR021AR3	0.14	0.10	520	1,045	1.85	2.51	2.47	3.35	9.6	0.27	1 ¹ / ₈	0.50
M002RVR028AR3	0.14	0.10	385	770	2.50	3.39	3.34	4.53	9.6	0.27	1 ¹ / ₈	0.50
M002RVR044AR3	0.14	0.10	240	485	3.96	5.37	5.28	7.16	9.6	0.27	1 ¹ / ₈	0.50
M002RVR101AR3	0.11	0.08	104	209	*6.78	*9.19	*9.05	*12.2	9.5	0.27	1 ³ / ₁₆	0.54
M002RVR159AR3	0.11	0.08	66	132	*10.7	*14.5	*14.2	*19.3	9.5	0.27	1 ³ / ₁₆	0.54

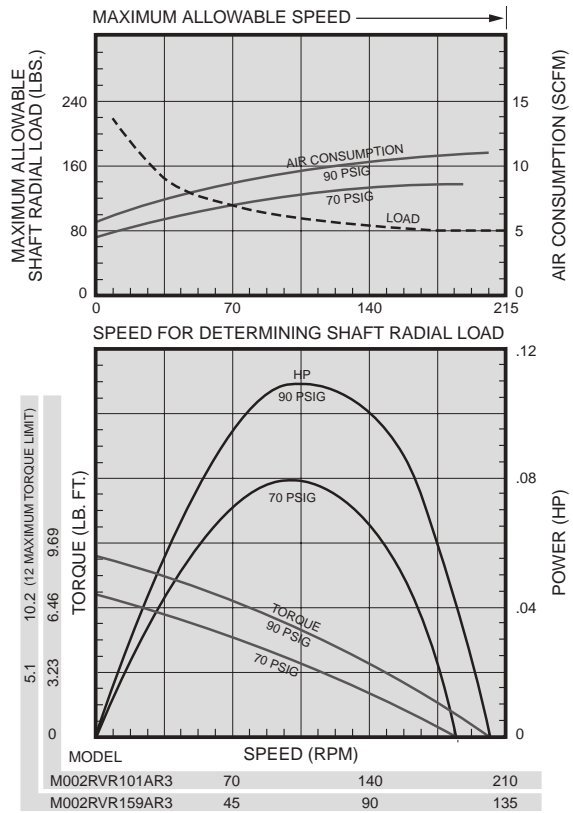
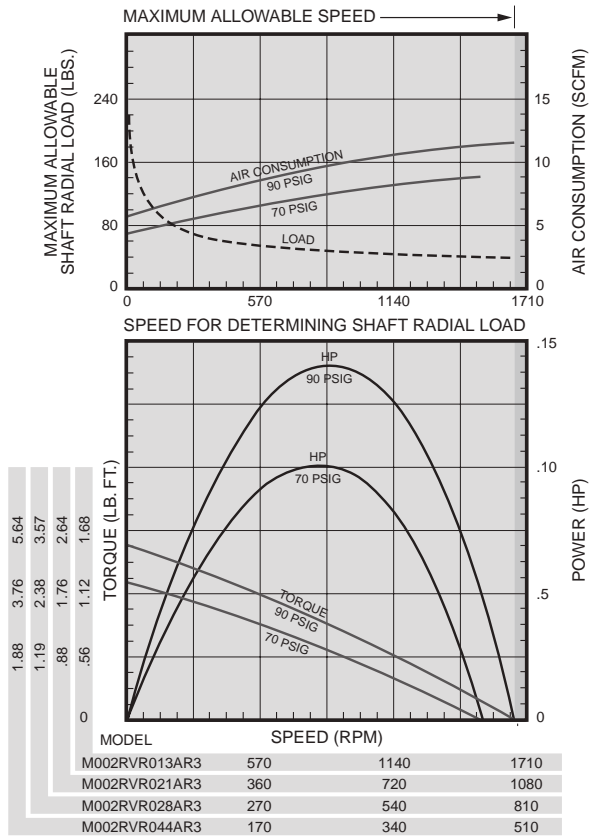
▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve.

* Applications with these models must be limited to 12 lb-ft (16.3 Nm) torque.
Performance figures are at 90 psig (620 kPa) air pressure.

SERIES M002 MULTI-VANE AIR MOTORS

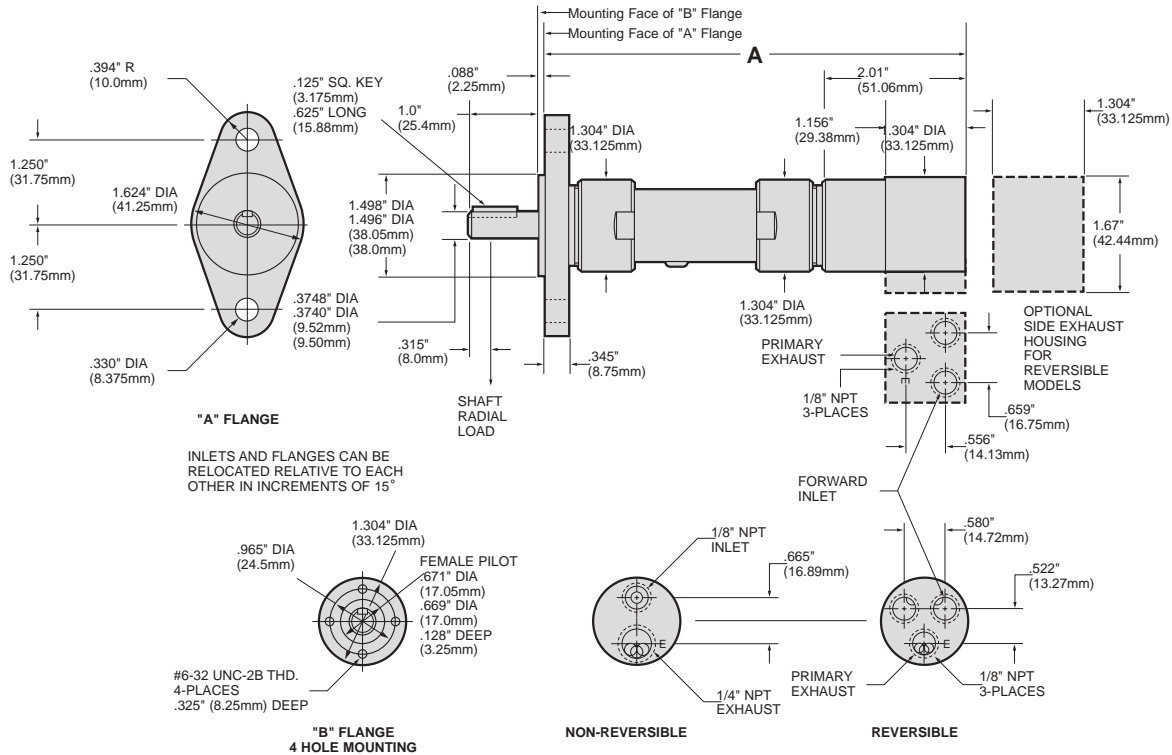


SERIES M002 MULTI-VANE AIR MOTORS



SERIES M002 MULTI-VANE AIR MOTORS

DIMENSIONS



SERIES M002 MODEL NUMBER SYMBOLIZATION



HP = Approximate horsepower range (.11 to .25)

- Rotation = RV Reversible
 RH Non-Reversible, Right Hand from Rear of Motor (CCW facing shaft)
 LH Non-Reversible, Left Hand from Rear of Motor (CW facing shaft)

Air Inlet & Exhaust = R Rear, S Side (Side Inlet and Exhaust available on Reversible Models only)

Gear Ratio = 028 is 1 to 28, 044 is 1 to 44, etc.

Flange = A 2 Hole Flange, B 4 Hole Face Mounting

- Shaft = R3 3/8" Round Keyed
 T3 3/8"-24 UNF-2A Threaded
 Threaded Shaft Extension is 1" (25.4 mm) with Threaded Length from Shaft End of .87" (22 mm)
 Threaded Shaft Pilot at End is .315" (8 mm) Dia. Max. by .374" (9.5 mm) Long
 S3 3/8" Square Drive
 Square Shaft Extension is 1.791" (45.5 mm)

DIMENSIONS

Gear Ratios (Refer to Model No.)	A	
	in	mm
000, 004, 008	4.989	126.73
006, 013, 021, 028, 044	5.510	139.93
101, 159	6.020	152.91

EQUIPMENT OPTIONS

Furnished with Cataloged Models	Standard Options	Extra Options
2 Hole Flange Mounting	4 Hole Face Mounting	R1440-212-1 3/8" Square Drive Adapter, 1" long with 3/8"-24 Female threads for use with Threaded Shaft
3/8" Round Keyed Shaft	3/8"-24 Threaded Shaft	Required for 3/8" Adapter (2) 4UA9-561 set screws (1) 8U-722 Bail
	Side Inlet and Exhaust Housing (for Reversible Models only)	

Note: On all Series M002, M004, and M007 Air Motors, performance is the same for both directions of rotation. On Non-Reversible models, direction of rotation may be easily changed without the need of additional parts by inverting cylinder.

000-SERIES POWER MOTORS

SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		dB(A)	lbs	
				lb-ft	Nm	lb-ft	Nm						

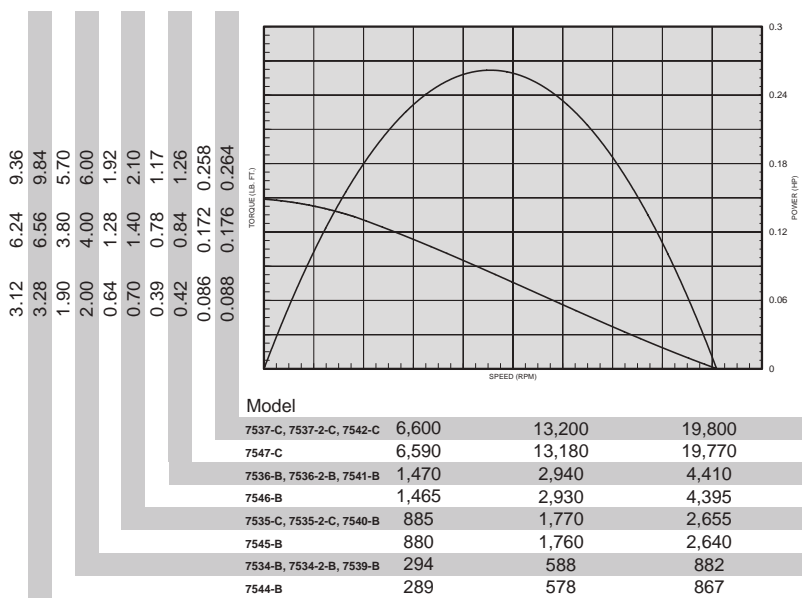
NON-REVERSIBLE - 0.25 HP

7538-B	3/8" Keyed	550	325	8.2	11.1	4.0	5.4	18.1	8.5	75	1.82	0.82	Double
7539-B	3/8" Keyed	900	550	5.0	6.7	2.4	3.2	18.1	8.5	75	1.82	0.82	Double
7540-B	3/8" Keyed	2,700	1,600	1.75	2.3	0.82	1.1	18.1	8.5	75	1.52	0.68	Single
7541-B	3/8" Keyed	4,500	2,700	1.05	1.4	0.49	0.66	18.1	8.5	75	1.52	0.68	Single
7542-C	3/8" Keyed	20,000	12,000	0.22	0.3	0.11	0.14	18.1	8.5	75	1.52	0.68	Single
7533-B	3/8"-24 Th'd.	550	325	8.2	11.1	4.0	5.4	18.1	8.5	75	1.82	0.82	Double
7534-B	3/8"-24 Th'd.	900	550	5.0	6.7	2.4	3.2	18.1	8.5	75	1.82	0.82	Double
7535-C	3/8"-24 Th'd.	2,700	1,600	1.75	2.3	0.82	1.1	18.1	8.5	75	1.52	0.68	Single
7536-B	3/8"-24 Th'd.	4,500	2,700	1.05	1.4	0.49	0.66	18.1	8.5	75	1.52	0.68	Single
7537-C	3/8"-24 Th'd.	20,000	12,000	0.22	0.3	0.11	0.14	18.1	8.5	75	1.52	0.68	Single

REVERSIBLE - 0.25 HP

7543-B	3/8" Keyed	550	300	7.80	10.6	4.37	5.9	20.0	9.4	75*	1.82	0.82	Double
7544-B	3/8" Keyed	900	550	4.75	6.4	2.62	3.5	20.0	9.4	75*	1.82	0.82	Double
7545-B	3/8" Keyed	2,700	1,500	1.60	2.2	0.87	1.1	20.0	9.4	75*	1.52	0.68	Single
7546-B	3/8" Keyed	4,500	2,400	0.98	1.3	0.55	0.7	20.0	9.4	75*	1.52	0.68	Single
7547-C	3/8" Keyed	20,000	11,000	0.22	0.3	0.12	0.16	20.0	9.4	75*	1.52	0.68	Single

*Requires installation for reversible motors - shown on page 92.

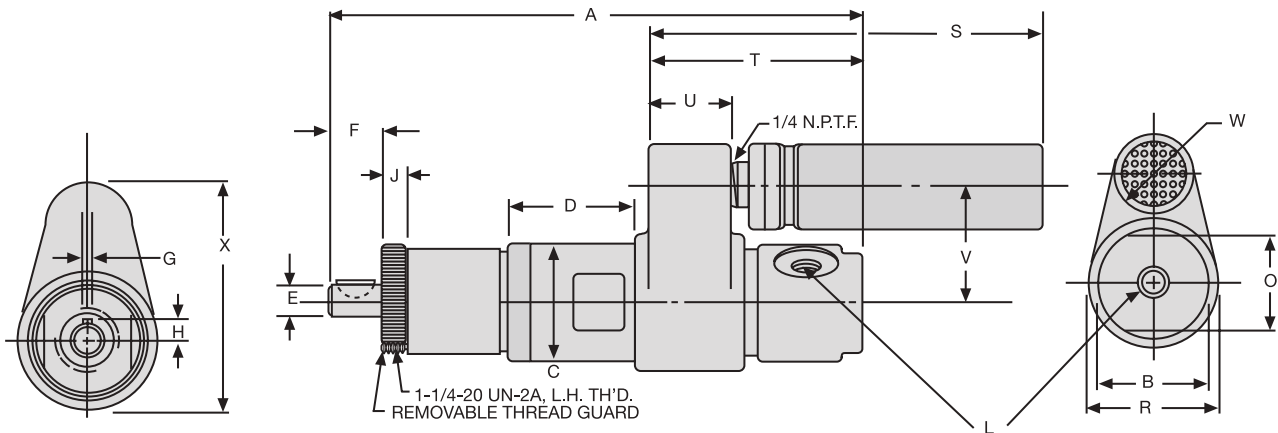


STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold and muffler.

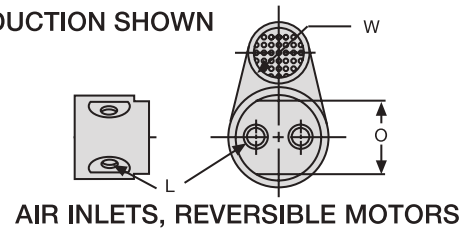
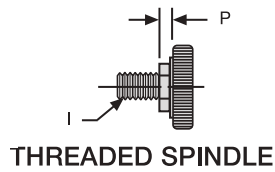
000-SERIES POWER MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



FORWARD ROTATION, DOUBLE REDUCTION SHOWN

Gear Reduction	Dimension A
Single	4 ¹⁵ / ₁₆ 125 mm
Double	6 152 mm



Scale	B	C	D	E	F	G	H	I	J	L
in	1 ³ / ₈	1.373 1.375	1 ⁹ / ₃₂	0.3748 0.3751	0.592 0.643	0.0938 0.0948	0.228 0.238	3/8"-24 UNF-3A Thread	0.251 0.276	1/8" NPTF Air Inlet
mm	35	34.87 34.93	32	9.52 9.53	15.04 16.33	2.38 2.41	5.79 6.05		6.38 7.01	
Scale	O	P	R	S	T	U	V	W	X	
in	1 ¹ / ₈ Rev. 1 ³ / ₁₆	0.086 0.139	1 ⁵ / ₈	4 ⁹ / ₁₆	2 ¹⁵ / ₃₂	31/32	1 ³ / ₈	1	2 ¹¹ / ₁₆	
mm	28 Rev. 30	2.18 3.53	41	116	63	25	35	25	68	

SERIES M004 MULTI-VANE AIR MOTORS

SPECIFICATIONS

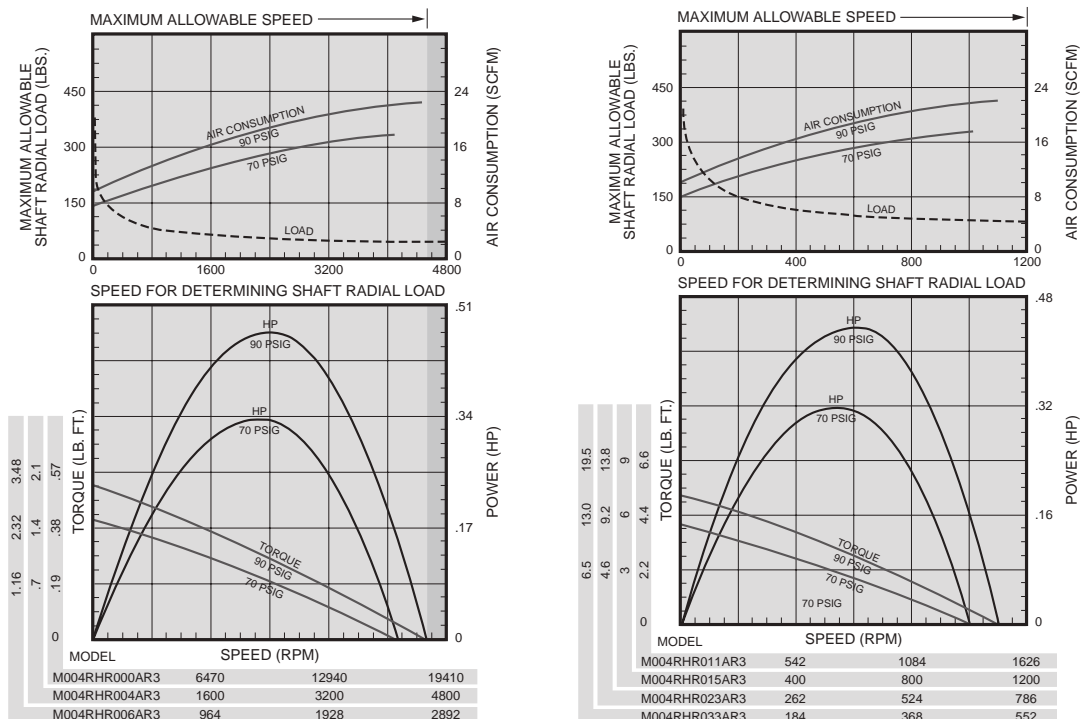


Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
NON-REVERSIBLE Direction of rotation is counterclockwise when facing the shaft												
M004RHR000AR3	0.50	0.37	10,000	18,000	0.40	0.54	0.53	0.72	20.0	0.57	2 ¹ / ₁₆	0.95
M004RHR004AR3	0.47	0.35	2,470	4,450	1.46	1.98	1.94	2.63	19.5	0.55	2 ³ / ₁₆	1.00
M004RHR006AR3	0.47	0.35	1,490	2,680	2.42	3.28	3.22	4.37	19.5	0.55	2 ³ / ₁₆	1.00
M004RHR011AR3	0.44	0.33	825	1,490	3.92	5.32	5.22	7.08	19.0	0.54	2 ³ / ₈	1.09
M004RHR015AR3	0.44	0.33	610	1,095	5.32	7.21	7.10	9.63	19.0	0.54	2 ³ / ₈	1.09
M004RHR023AR3	0.44	0.33	395	715	8.10	11.0	10.8	14.6	19.0	0.54	2 ³ / ₈	1.09
M004RHR033AR3	0.44	0.33	280	505	11.5	15.6	15.4	20.8	19.0	0.54	2 ³ / ₈	1.09
M004RHR050AR3	0.41	0.31	175	315	*16.5	*22.4	*22.1	*30.0	18.5	0.52	2 ¹¹ / ₁₆	1.22
M004RHR083AR3	0.41	0.31	106	190	*27.5	*37.3	*36.7	*49.7	18.5	0.52	2 ¹¹ / ₁₆	1.22
M004RHR167AR3	0.41	0.31	53	95	*55.0	*74.5	*73.3	*99.4	18.5	0.52	2 ¹¹ / ₁₆	1.22
REVERSIBLE												
M004RVR000AR3	0.40	0.30	8,000	16,000	0.32	0.43	0.42	0.57	19.0	0.54	2 ¹ / ₁₆	0.95
M004RVR004AR3	0.37	0.28	1,975	3,955	1.13	1.53	1.51	2.05	18.5	0.52	2 ³ / ₁₆	1.00
M004RVR006AR3	0.37	0.28	1,190	2,380	1.88	2.55	2.51	3.40	18.5	0.52	2 ³ / ₁₆	1.00
M004RVR011AR3	0.34	0.25	660	1,325	3.00	4.07	4.00	5.42	18.0	0.51	2 ³ / ₈	1.09
M004RVR015AR3	0.34	0.25	485	975	4.07	5.52	5.43	7.36	18.0	0.51	2 ³ / ₈	1.09
M004RVR023AR3	0.34	0.25	315	635	6.23	8.45	8.30	11.2	18.0	0.51	2 ³ / ₈	1.09
M004RVR033AR3	0.34	0.25	225	450	8.85	12.0	11.8	16.0	18.0	0.51	2 ³ / ₈	1.09
M004RVR050AR3	0.31	0.23	140	280	*12.3	*16.7	*16.5	*22.4	17.5	0.50	2 ¹¹ / ₁₆	1.22
M004RVR083AR3	0.31	0.23	84	169	*20.6	*27.9	*27.5	*37.3	17.5	0.50	2 ¹¹ / ₁₆	1.22
M004RVR167AR3	0.31	0.23	42	85	*41.3	*56.0	*55.0	*74.5	17.5	0.50	2 ¹¹ / ₁₆	1.22

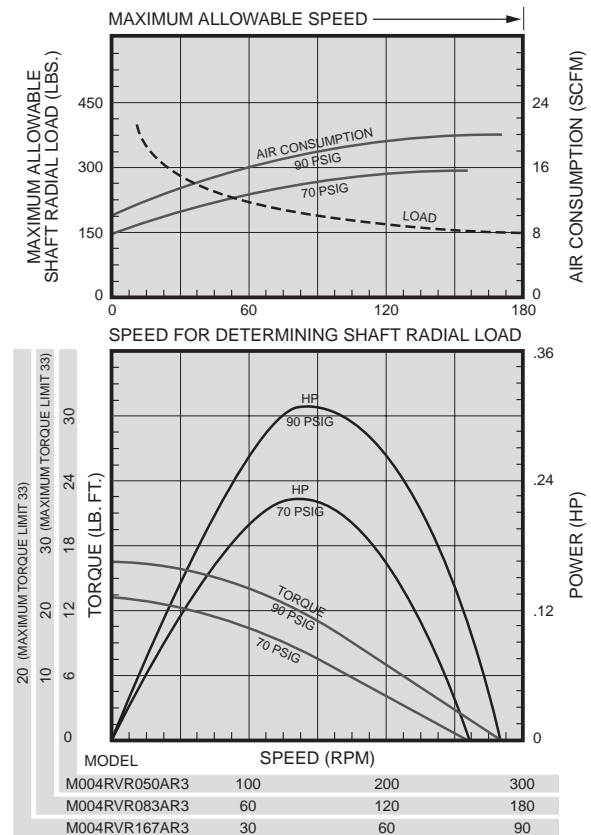
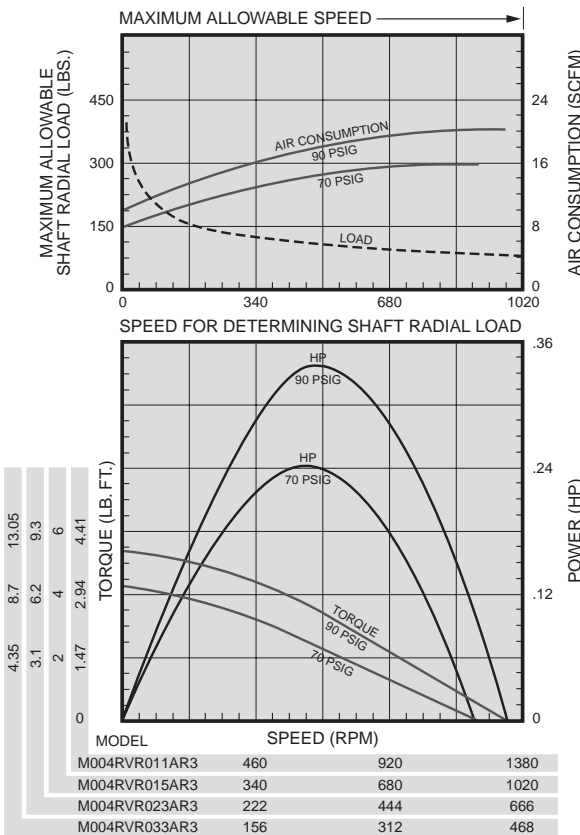
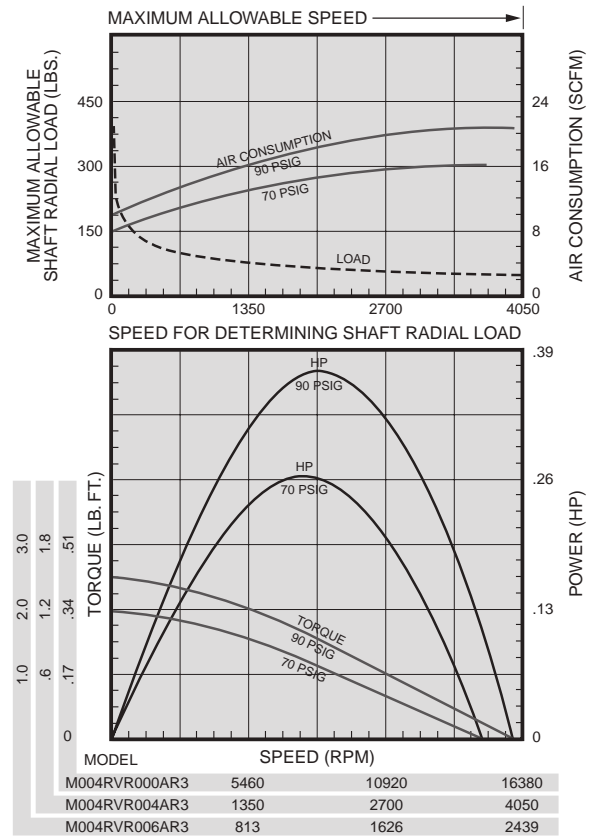
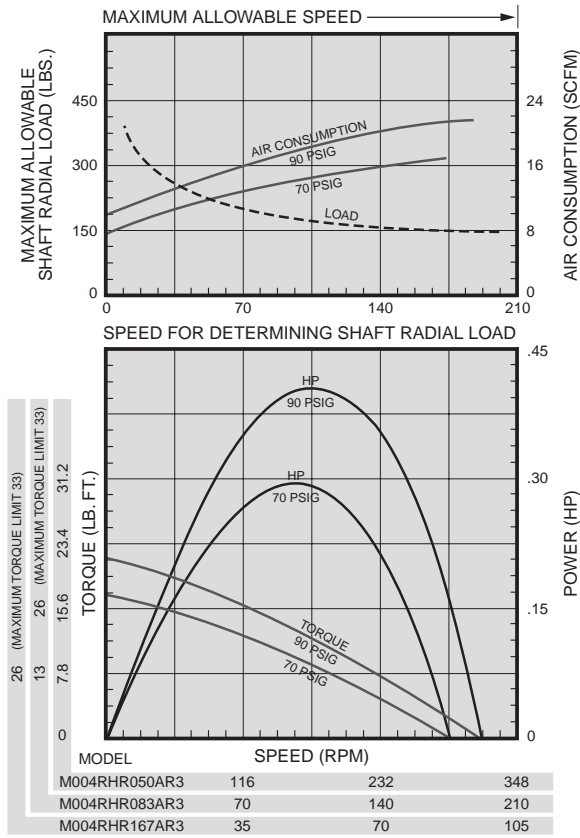
▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve.

* Applications with these models must be limited to 33 lb-ft (44.7 Nm) torque.

Performance figures are at 90 psig (620 kPa) air pressure.

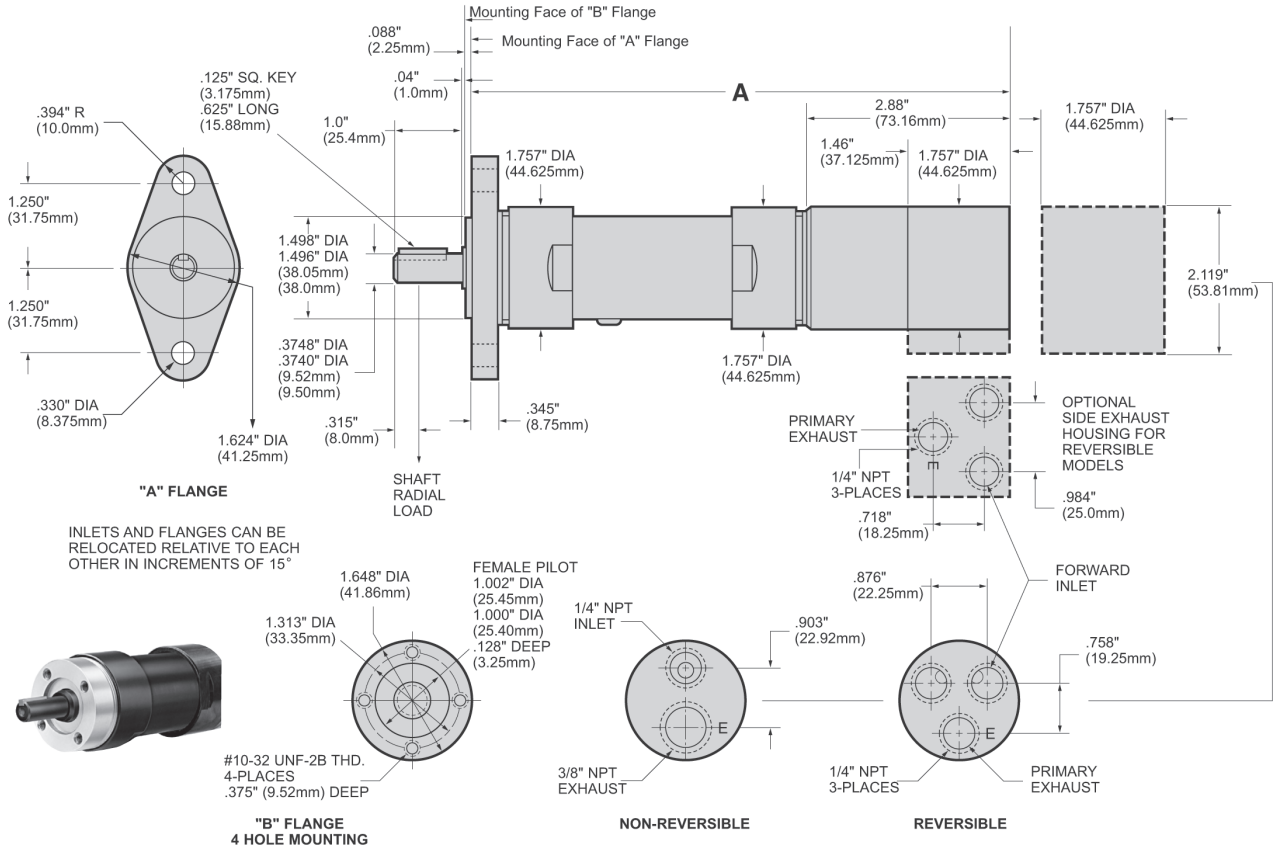


SERIES M004 MULTI-VANE AIR MOTORS



SERIES M004 MULTI-VANE AIR MOTORS

DIMENSIONS



SERIES M004 MODEL NUMBER SYMBOLIZATION



HP = Approximate horsepower range (.31 to .50)

- Rotation = RV Reversible
- RH Non-Reversible, Right Hand from Rear of Motor (CCW facing shaft)
- LH Non-Reversible, Left Hand from Rear of Motor (CW facing shaft)

Air Inlet & Exhaust = R Rear, S Side (Side Inlet and Exhaust available on Reversible Models only)

Gear Ratio = 023 is 1 to 23, 033 is 1 to 33, etc.

Flange = A 2 Hole Flange, B 4 Hole Face Mounting

- Shaft = R3 3/8" Round Keyed
- T3 3/8"-24 UNF-2A Threaded
Threaded Shaft Extension is .512" (13 mm)
Full Thread Length is .424" (10.75 mm)
- S3 3/8" Square Drive
Square Shaft Extension is 1.791" (45.5 mm)

DIMENSIONS

Gear Ratios (Refer to Model No.)	A	
	in	mm
000, 004, 006	6.248	158.69
011, 015, 023, 033	6.984	177.38
050, 083, 167	7.745	196.73

EQUIPMENT OPTIONS

Furnished with Cataloged Models	Standard Options	Extra Options
2 Hole Flange Mounting	4 Hole Face Mounting	R1440-212-1 3/8" Square Drive Adapter, 1" long with 3/8"-24 Female threads for use with Threaded Shaft
3/8" Round Keyed Shaft	3/8"-24 Threaded Shaft	Required for 3/8" Adapter (2) 4UA9-561 set screws
	Side Inlet and Exhaust Housing (for Reversible Models only)	

Note: On all Series M002, M004, and M007 Air Motors, performance is the same for both directions of rotation. On Non-Reversible models, direction of rotation may be easily changed without the need of additional parts by inverting cylinder. See Assembly Instruction form number listed in price sheet.

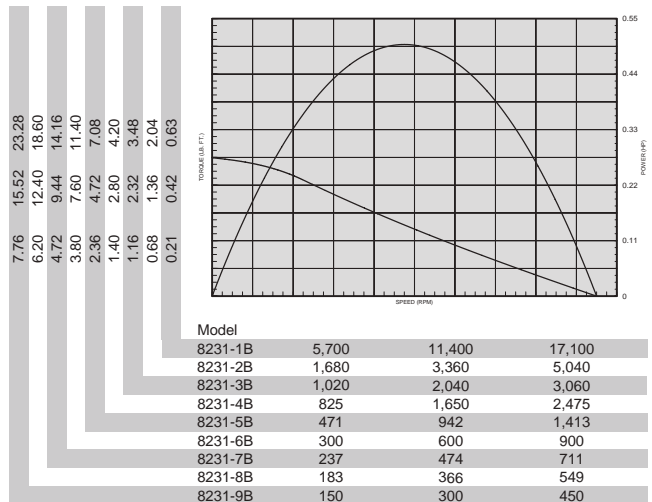
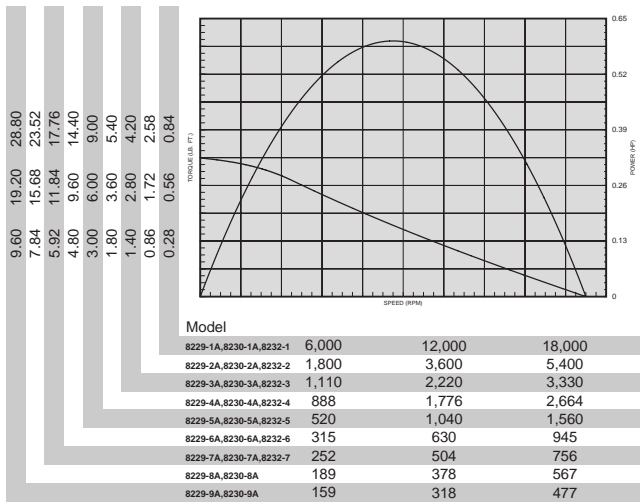
0-SERIES POWER MOTORS (WITH 0-SERIES GEARING) SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		lbs	kg	
				lb-ft	Nm	lb-ft	Nm						
NON-REVERSIBLE - 0.60 HP													
8230-1A	3/8" Keyed	19,000	9,800	0.70	0.9	0.32	0.4	41	19.3	80	2.45	1.10	Single
8230-2A	3/8" Keyed	5,700	2,900	2.5	2.9	1.10	1.5	41	19.3	80	2.45	1.10	Single
8230-3A	3/8" Keyed	3,500	1,750	3.50	4.7	1.80	2.4	41	19.3	80	2.45	1.10	Single
8230-4A	3/8" Keyed	2,800	1,400	4.50	6.1	2.20	3.0	41	19.3	80	2.45	1.10	Single
8230-5A	3/8" Keyed	1,650	840	7.50	10.2	3.80	5.1	41	19.3	80	2.98	1.34	Double
8230-6A	3/8" Keyed	1,000	500	12.00	16.3	6.20	8.4	41	19.3	80	2.98	1.34	Double
8230-7A	3/8" Keyed	800	390	14.80	20.0	8.00	10.8	41	19.3	80	2.98	1.34	Double
8230-8A	3/8" Keyed	600	315	19.60	26.5	10.00	13.5	41	19.3	80	2.98	1.34	Double
8230-9A	3/8" Keyed	500	250	24.00	32.5	12.50	16.9	41	19.3	80	2.98	1.34	Double
8229-1A	3/8"-24 Th'd.	19,000	9,800	.70	0.9	0.32	0.4	41	19.3	80	2.45	1.10	Single
8229-2A	3/8"-24 Th'd.	5,700	2,900	2.15	2.9	1.10	1.5	41	19.3	80	2.45	1.10	Single
8229-3A	3/8"-24 Th'd.	3,500	1,750	3.50	4.7	1.80	2.4	41	19.3	80	2.45	1.10	Single
8229-4A	3/8"-24 Th'd.	2,800	1,400	4.50	6.1	2.20	3.0	41	19.3	80	2.45	1.10	Single
8229-5A	3/8"-24 Th'd.	1,650	840	7.50	10.2	3.80	5.1	41	19.3	80	2.98	1.34	Double
8229-6A	3/8"-24 Th'd.	1,000	500	12.00	16.3	6.20	8.4	41	19.3	80	2.98	1.34	Double
8229-7A	3/8"-24 Th'd.	800	390	14.80	20.0	8.00	10.8	41	19.3	80	2.98	1.34	Double
8229-8A	3/8"-24 Th'd.	600	315	19.60	26.5	10.00	13.5	41	19.3	80	2.98	1.34	Double
8229-9A	3/8"-24 Th'd.	500	250	24.00	32.5	12.50	16.9	41	19.3	80	2.98	1.34	Double
REVERSIBLE - 0.50 HP													
8231-1B	3/8" Keyed	18,000	9,200	0.52	0.7	0.28	0.4	32	15.1	80*	2.45	1.10	Single
8231-2B	3/8" Keyed	5,300	2,600	1.70	2.3	1.00	1.3	32	15.1	80*	2.45	1.10	Single
8231-3B	3/8" Keyed	3,200	1,550	2.90	3.9	1.70	2.3	32	15.1	80*	2.45	1.10	Single
8231-4B	3/8" Keyed	2,600	1,300	3.50	4.7	2.00	2.7	32	15.1	80*	2.45	1.10	Single
8231-5B	3/8" Keyed	1,500	780	5.90	8.0	3.50	4.7	32	15.1	80*	2.98	1.34	Double
8231-6B	3/8" Keyed	950	480	9.50	12.9	5.50	7.4	32	15.1	80*	2.98	1.34	Double
8231-7B	3/8" Keyed	750	380	11.80	16.0	7.00	9.5	32	15.1	80*	2.98	1.34	Double
8231-8B	3/8" Keyed	575	290	15.50	21.0	9.00	12.2	32	15.1	80*	2.98	1.34	Double
8231-9B	3/8" Keyed	475	240	19.40	26.2	11.00	14.9	32	15.1	80*	2.98	1.34	Double

* Requires installation for reversible motors - shown on page 92.

0-SERIES POWER MOTORS (WITH 0-SERIES GEARING)

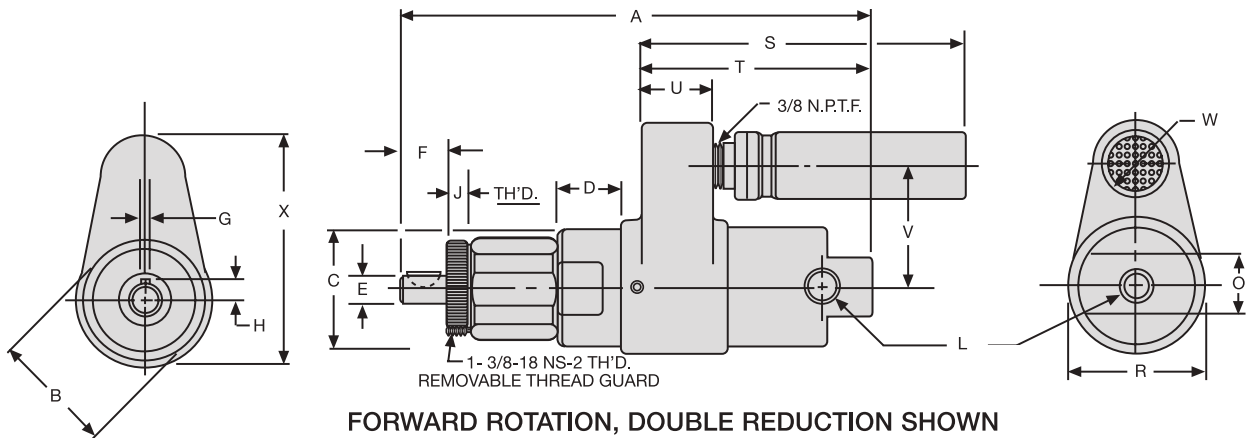


STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, and muffler.

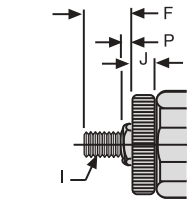
0-SERIES POWER MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS

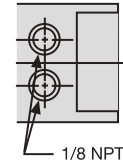


FORWARD ROTATION, DOUBLE REDUCTION SHOWN

Gear Reduction	Dimension A	
	Series 8231	Series 8229-8230
Double	5 ⁵ / ₈ 143 mm	5 ³ / ₄ 146 mm
Triple	6 ¹⁵ / ₁₆ 176 mm	7 ¹ / ₁₆ 179 mm



THREADED SPINDLE



AIR INLETS, REVERSIBLE MOTORS

Scale	B	C	D	E	F	G	H	I	J	L
in	1 ³ / ₄	1.730 1.740	0.960 0.980	0.3748 0.3751	0.688 0.740	0.0938 0.0948	0.228 0.238	3/8"-24 UNF-3A Thread	0.270 0.292	1/4" Female NPTF Air Inlet
mm	44	43.94 44.20	24.38 24.89	9.52 9.53	17.48 18.80	2.38 2.41	5.79 6.05		6.86 7.42	
Scale	O	P	R	S	T - Forw.	T	U	V	W	X
in	7/8	0.163- 0.203	2	4 ⁷ / ₈	3 ¹³ / ₃₂	3 ⁹ / ₃₂	1 ¹ / ₁₆	1 ¹³ / ₁₆	1	3 ⁷ / ₁₆
mm	22	4.14 5.16	51	124	86	83	27	46	25	87

0-SERIES POWER MOTORS (WITH 2200 SERIES GEARING)

SPECIFICATIONS

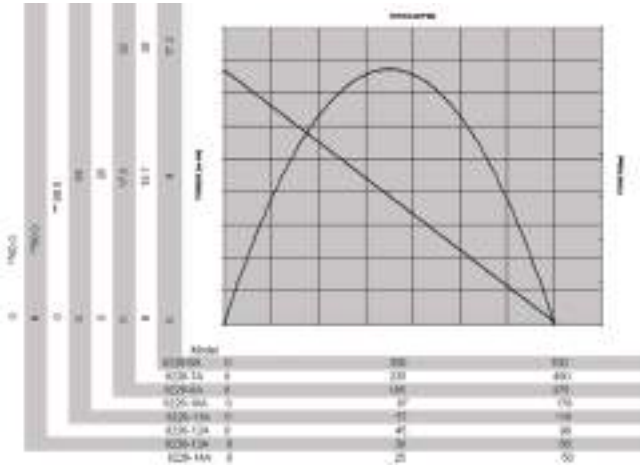


Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		lbs	kg	
				lb-ft	Nm	lb-ft	Nm						
NON-REVERSIBLE - 0.60 HP													
8226-6A	1/2" Keyed	700	350	17.20	23.3	9.00	12.2	40.5	19.1	80	4.25	1.91	Double
8226-7A	1/2" Keyed	450	225	26.00	35.2	13.70	18.6	40.5	19.1	80	4.25	1.91	Double
8226-8A	1/2" Keyed	375	185	32.00	43.4	17.00	23.0	40.5	19.1	80	4.25	1.91	Double
8226-10A	1/2" Keyed	170	87	60.00**	88.1	36.00	48.8	40.5	19.1	80	5.56	2.50	Triple
8226-11A**	1/2" Keyed	110	57	60.00**	134.1	55.00	74.5	40.5	19.1	80	5.56	2.50	Triple
8226-12A**	1/2" Keyed	90	45	60.00**	165.3	60.00**	94.8	40.5	19.1	80	5.56	2.50	Triple
8226-13A**	1/2" Keyed	60	30	60.00**	249.3	60.00**	139.6	40.5	19.1	80	5.56	2.50	Triple
8226-14A**	1/2" Keyed	50	25	60.00**	306.2	60.00**	169.4	40.5	19.1	80	5.56	2.50	Triple
REVERSIBLE - 0.50 HP													
8228-2B	1/2" Keyed	3,200	1,550	2.90	3.9	1.70	2.3	30	14	80*	4.25	1.91	Double
8228-3B	1/2" Keyed	2,600	1,300	3.50	4.7	2.00	2.7	30	14	80*	4.25	1.91	Double
8228-5B	1/2" Keyed	800	420	11.20	15.2	6.30	8.5	30	14	80*	4.25	1.91	Double
8228-6B	1/2" Keyed	650	330	13.80	18.7	8.00	10.8	30	14	80*	4.25	1.91	Double
8228-7B	1/2" Keyed	425	220	20.00	27.1	12.00	16.3	30	14	80*	4.25	1.91	Double
8228-8B	1/2" Keyed	350	185	25.00	33.9	14.00	19.0	30	14	80*	4.25	1.91	Double
8228-9B	1/2" Keyed	200	105	45.00	61.0	25.00	33.9	30	14	80*	5.56	2.50	Triple
8228-10B	1/2" Keyed	160	80	55.00	74.5	33.00	44.7	30	14	80*	5.56	2.50	Triple
8228-11B**	1/2" Keyed	100	54	60.00**	81.3	48.00	65.0	30	14	80*	5.56	2.50	Triple
8228-12B**	1/2" Keyed	85	43	60.00**	81.3	60.00**	81.3	30	14	80*	5.56	2.50	Triple
8228-13B**	1/2" Keyed	50	28	60.00**	81.3	60.00**	81.3	30	14	80*	5.56	2.50	Triple
8228-14B**	1/2" Keyed	40	22	60.00**	81.3	60.00**	81.3	30	14	80*	5.56	2.50	Triple

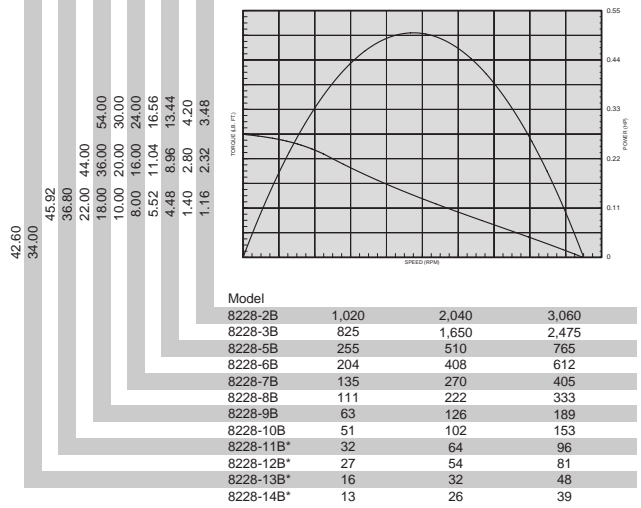
* Requires installation for reversible motors - shown on page 92.

** NOTE: Maximum torque recommended for planetary gear system on these models requires shear key with 60 ft/lbs. shear strength.

0-SERIES POWER MOTORS (WITH 2200 SERIES GEARING)



*Note: Maximum torque recommended for planetary gear system on these models is 60 ft/lbs



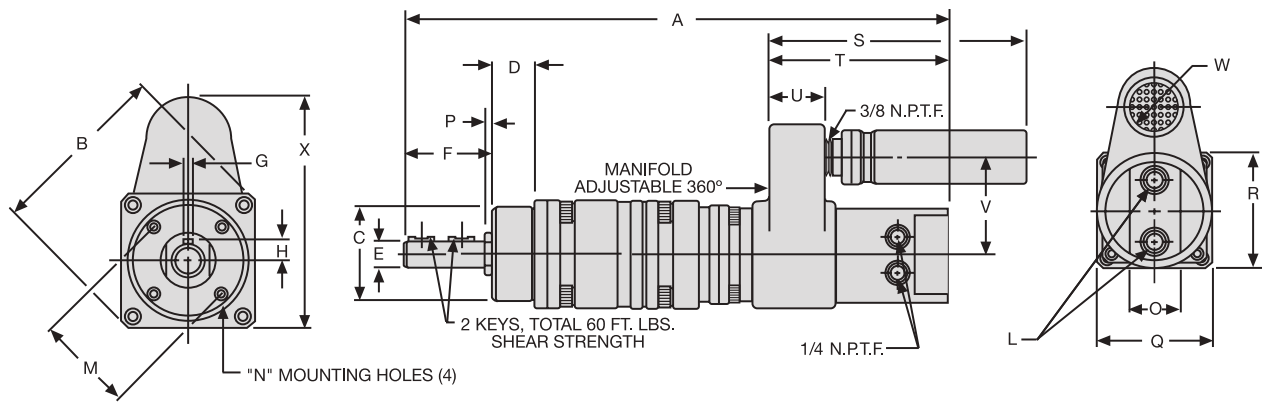
*Note: Maximum torque recommended for planetary gear system on these models requires shear key with 60 ft/lbs shear strength.

STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, and muffler.

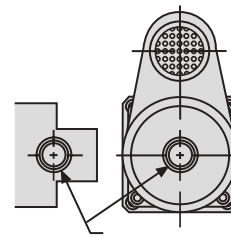
0/2200 SERIES POWER MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



REVERSIBLE ROTATION, TRIPLE REDUCTION SHOWN

Gear Reduction	Dimension A	
	Series 8226	Series 8228
Double	8 ¹¹ / ₁₆ 221 mm	8 ⁹ / ₁₆ 217 mm
Triple	10 ¹ / ₂ 267 mm	10 ³ / ₈ 264 mm



AIR INLETS, SINGLE-DIRECTION MOTORS

Scale	B	C	D	E	F	G	H	I	J	L
in	2 ¹ / ₁₆	1.7490 1.7495	0.774 0.818	0.4990 0.4995	1.604 1.655	0.125 0.126	0.299 0.309	1/4 NPTF Air Inlet	1.432 1.442	10-24 UNC-2B Thread
mm	68	44.42 44.44	19.66 20.78	12.67 12.69	40.74 42.04	3.18 3.20	7.72 7.98		36.37 36.63	

Scale	O	P	Q	R	S	T - Forw. Rotation	T Reversible	U	V	W	X
in	7/8	0.098 0.164	2	2	4 ⁷ / ₈	3 ¹³ / ₃₂	3 ⁹ / ₃₂	1 ¹ / ₁₆	1 ¹³ / ₁₆	1	3 ⁷ / ₁₆
mm	22	2.49 4.17	51	51	124	86	83	27	46	25	87

SERIES M007 MULTI-VANE AIR MOTORS

SPECIFICATIONS



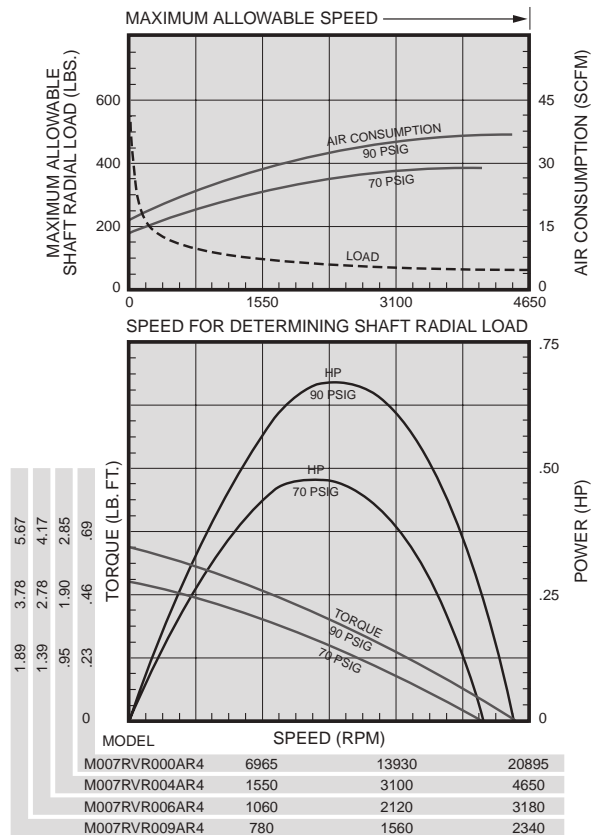
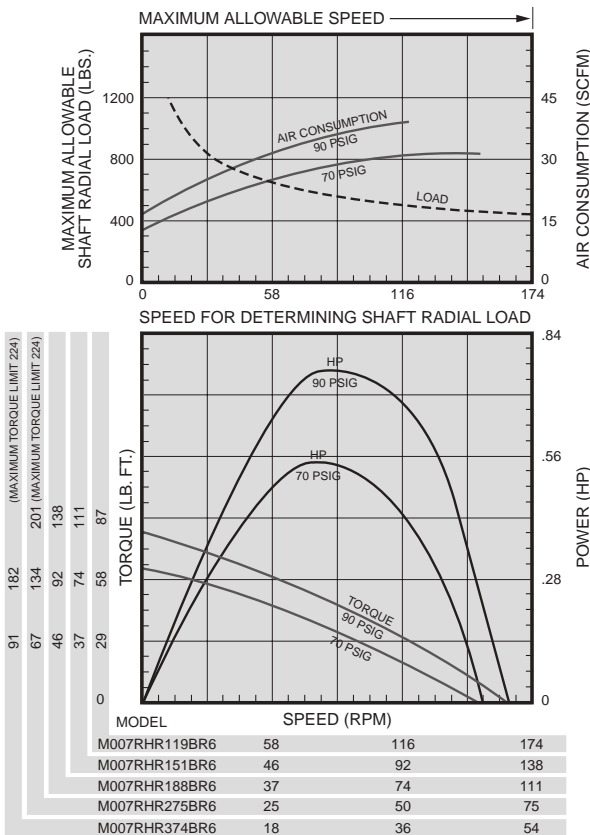
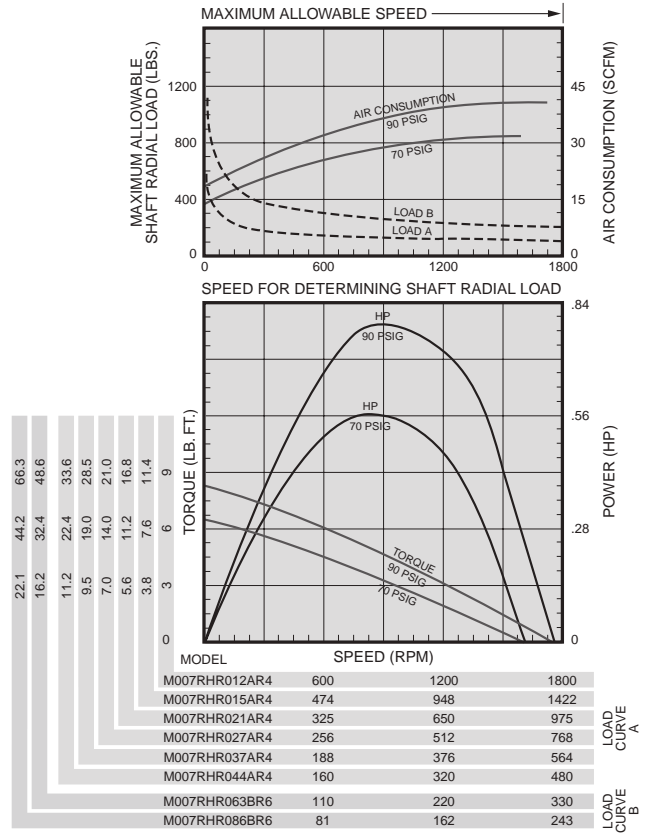
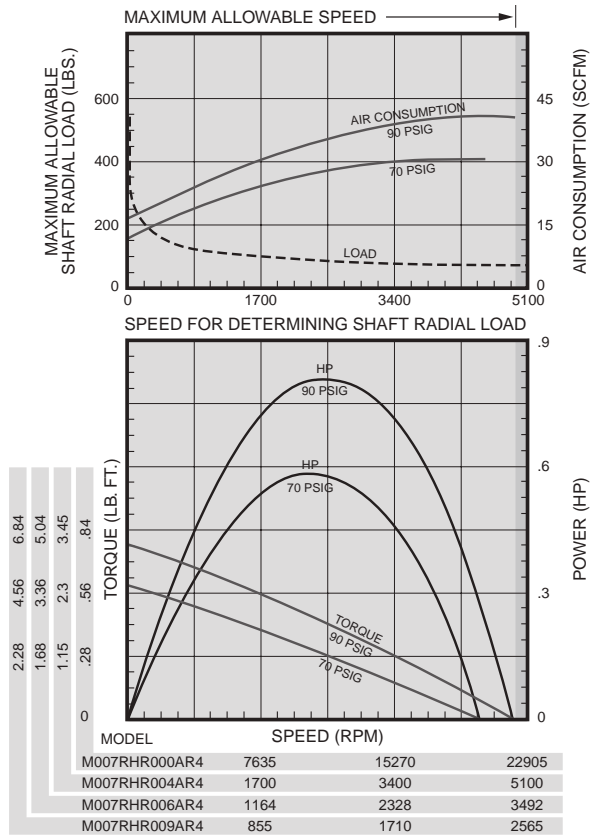
Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
NON-REVERSIBLE Direction of rotation is counterclockwise when facing the shaft												
M007RHR000AR4	0.85	0.63	11,000	22,000	0.58	0.79	0.77	1.04	36	1.02	3 ¹ / ₁₆	1.4
M007RHR004AR4	0.82	0.61	2,445	4,890	2.39	3.24	3.19	4.33	36	1.02	3 ¹ / ₁₆	1.4
M007RHR006AR4	0.82	0.61	1,675	3,350	3.50	4.75	4.66	6.32	36	1.02	3 ¹ / ₁₆	1.4
M007RHR009AR4	0.82	0.61	1,230	2,460	4.76	6.45	6.34	8.60	36	1.02	3 ¹ / ₁₆	1.4
M007RHR012AR4	0.79	0.59	870	1,740	6.19	8.39	8.25	11.2	36	1.02	3 ¹ / ₂	1.6
M007RHR015AR4	0.79	0.59	685	1,370	7.80	10.6	10.4	14.1	36	1.02	3 ¹ / ₂	1.6
M007RHR021AR4	0.79	0.59	470	940	11.5	15.6	15.3	20.7	36	1.02	3 ¹ / ₂	1.6
M007RHR027AR4	0.79	0.59	370	740	14.5	19.7	19.3	26.2	36	1.02	3 ¹ / ₂	1.6
M007RHR037AR4	0.79	0.59	270	540	19.7	26.7	26.3	35.7	36	1.02	3 ¹ / ₂	1.6
M007RHR044AR4	0.79	0.59	232	465	23.2	31.5	30.9	41.9	36	1.02	3 ¹ / ₂	1.6
M007RHR063BR6	0.79	0.59	161	321	33.5	45.4	44.7	60.6	36	1.02	7 ¹ / ₈	3.2
M007RHR086BR6	0.79	0.59	118	236	45.7	62.0	60.9	82.6	36	1.02	7 ¹ / ₈	3.2
M007RHR119BR6	0.76	0.57	82	163	60.5	82.0	80.7	109.0	36	1.02	7 ³ / ₈	3.4
M007RHR151BR6	0.76	0.57	65	129	76.5	104.0	102.0	138.0	36	1.02	7 ³ / ₈	3.4
M007RHR188BR6	0.76	0.57	52	103	96.0	130.0	128.0	174.0	36	1.02	7 ³ / ₈	3.4
M007RHR275BR6	0.76	0.57	35	70	*140.0	*190.0	*187.0	*254.0	36	1.02	7 ³ / ₈	3.4
M007RHR374BR6	0.76	0.57	26	52	*191.0	*259.0	*254.0	*344.0	36	1.02	7 ³ / ₈	3.4
REVERSIBLE												
M007RVR000AR4	0.70	0.52	10,000	20,000	0.47	0.64	0.63	0.85	33	0.93	3 ¹ / ₁₆	1.4
M007RVR004AR4	0.67	0.50	2,225	4,450	1.94	2.63	2.59	3.51	33	0.93	3 ¹ / ₁₆	1.4
M007RVR006AR4	0.67	0.50	1,520	3,045	2.84	3.85	3.78	5.13	33	0.93	3 ¹ / ₁₆	1.4
M007RVR009AR4	0.67	0.50	1,120	2,240	3.86	5.23	5.14	6.97	33	0.93	3 ¹ / ₁₆	1.4
M007RVR012AR4	0.64	0.48	790	1,580	4.97	6.74	6.63	8.99	33	0.93	3 ¹ / ₂	1.6
M007RVR015AR4	0.64	0.48	625	1,250	6.29	8.53	8.38	11.4	33	0.93	3 ¹ / ₂	1.6
M007RVR021AR4	0.64	0.48	425	855	9.2	12.5	12.2	16.5	33	0.93	3 ¹ / ₂	1.6
M007RVR027AR4	0.64	0.48	335	675	11.6	15.7	15.5	20.1	33	0.93	3 ¹ / ₂	1.6
M007RVR037AR4	0.64	0.48	245	495	15.8	21.4	21.1	28.6	33	0.93	3 ¹ / ₂	1.6
M007RVR044AR4	0.64	0.48	210	420	18.6	25.2	24.8	33.6	33	0.93	3 ¹ / ₂	1.6
M007RVR063BR6	0.64	0.48	146	292	26.9	36.5	35.9	48.7	33	0.93	7 ¹ / ₈	3.2
M007RVR086BR6	0.64	0.48	107	215	36.7	49.8	48.9	66.3	33	0.93	7 ¹ / ₈	3.2
M007RVR119BR6	0.61	0.46	74	148	48.1	65.3	64.1	87.0	33	0.93	7 ³ / ₈	3.4
M007RVR151BR6	0.61	0.46	58	117	61.0	82.7	81.3	110.0	33	0.93	7 ³ / ₈	3.4
M007RVR188BR6	0.61	0.46	47	94	76.5	104.0	102.0	138.0	33	0.93	7 ³ / ₈	3.4
M007RVR275BR6	0.61	0.46	32	64	*111.0	*151.0	*148.0	*201.0	33	0.93	7 ³ / ₈	3.4
M007RVR374BR6	0.61	0.46	23	47	*152.0	*206.0	*202.0	*274.0	33	0.93	7 ³ / ₈	3.4

▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve.

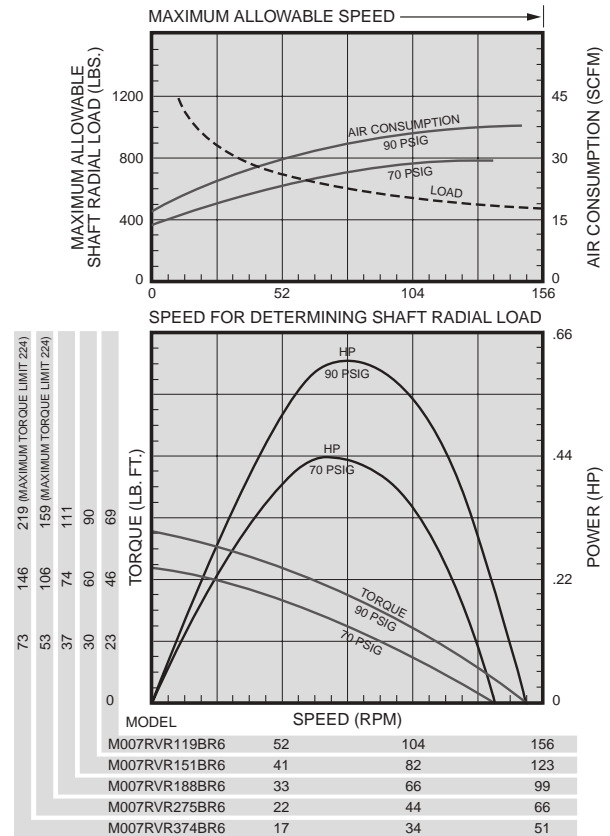
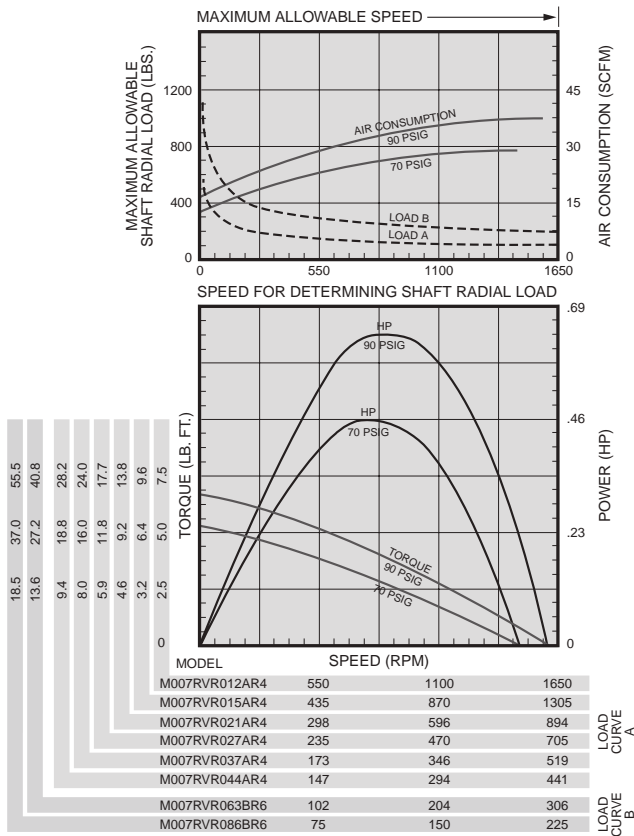
* Applications with these models must be limited to 224 lb-ft (304 Nm) torque.

Performance figures are at 90 psig (620 kPa) air pressure.

SERIES M007 MULTI-VANE AIR MOTORS



SERIES M007 MULTI-VANE AIR MOTORS

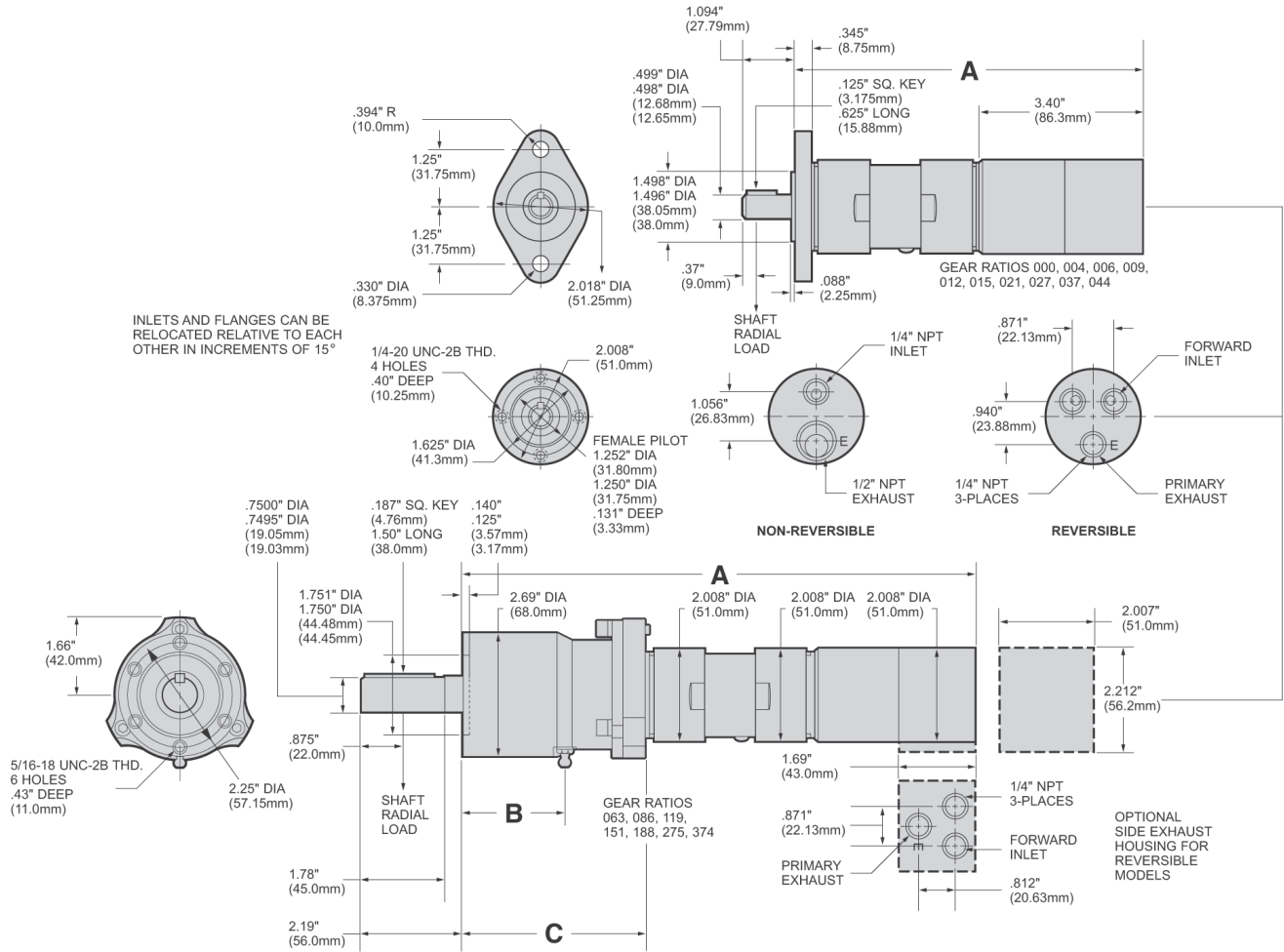


EQUIPMENT OPTIONS

Furnished with Cataloged Models	Standard Options	Extra Options
2 Hole Flange Mounting on Gear Ratios: 000, 004, 006, 009, 012, 15, 021, 027, 037, 044	4 Hole Flange Mounting on Gear Ratios: 000, 004, 006, 009, 012, 015, 021, 027, 037, 044	1/2" Square Drive Shaft on Gear Ratios: 000, 004, 006, 009, 012, 015, 021, 027, 037, 044
6 Hole Face Mounting on Gear Ratios: 063, 086, 119, 151, 188, 275, 374	Side Inlet and Exhaust Housing (for Reversible Models only)	5/8" Square Drive Shaft on Gear Ratios: 063, 086, 119, 151, 188, 275, 374
1/2" Round Keyed Shaft on Gear Ratios: 000, 004, 006, 009, 012, 015, 021, 027, 037, 044	3/8"—24 or 1/2"—20 Threaded Shaft on Gear Ratios: 000, 004, 006, 009, 012, 015, 021, 027, 037, 044	
3/4" Round Keyed Shaft on Gear Ratios: 063, 086, 119, 151, 188, 275, 374		

SERIES M007 MULTI-VANE MOTORS

DIMENSIONS



DIMENSIONS

Gear Ratios (Refer to Model No.)	A		B		C	
	in	mm	in	mm	in	mm
000, 004, 006, 009	7.362	187.0				
012, 015, 021, 027, 037, 044	8.133	206.56				
063, 086	9.343	237.3	0.41	10.0	2.3	58.4
119, 188, 275, 374, 151	10.937	277.8	2.19	56.0	3.9	99.0

SERIES M007 MODEL NUMBER SYMBOLIZATION



HP = Approximate horsepower range (.61 to .85)

Rotation = RV Reversible
 RH Non-Reversible, Right Hand from Rear of Motor (CCW facing shaft)
 LH Non-Reversible, Left Hand from Rear of Motor (CW facing shaft)

Air Inlet & Exhaust = R Rear, S Side (Side Inlet and Exhaust available on Reversible Models only)

Gear Ratio = 028 is 1 to 28, 044 is 1 to 44, etc.

Flange = A 2 Hole Flange
 B 4 Hole Face Mounting (on 000, 004, 006, 009, 012, 015, 021, 027, 037, 044 gear ratios)
 B 6 Hole Face Mounting (on 063, 086, 119, 151, 188, 275, 374 gear ratios)

Shaft = R4 1/2" Round Keyed (on 000, 004, 006, 009, 012, 015, 021, 027, 037, 044 gear ratios)
 R6 3/4" Round Keyed (on 063, 086, 119, 151, 188, 275, 374 gear ratios)
 S4 1/2" Square Drive (on 000, 004, 006, 009, 012, 015, 021, 027, 037, 044 gear ratios) Shaft Extension 1.31" (33.27 mm)
 S5 5/8" Square Drive (on 063, 086, 119, 151, 188, 275, 374 gear ratios) Shaft Extension 1.25" (31.75 mm)
 T3 3/8"-24 UNF-2A Threaded (on 000, 004, 006, 009, 012, 015, 021, 027, 037, 044 gear ratios) Shaft Extension .512" (13 mm)
 T4 1/2"-20 UNF-2A Threaded (on 000, 004, 006, 009, 012, 015, 021, 027, 037, 044 gear ratios) Shaft Extension .512" (13 mm)

2200-SERIES POWER MOTORS (WITH THREAD-ON GEARING)

SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall	Output		SCFM	L/s	lbs		kg		
				lb-ft	Nm	lb-ft	Nm						

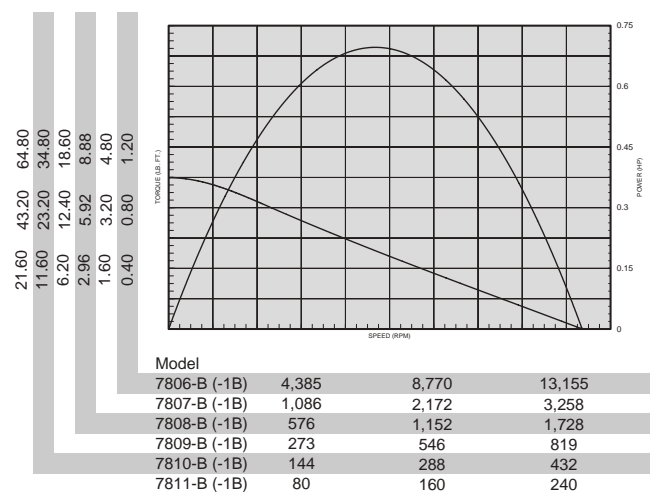
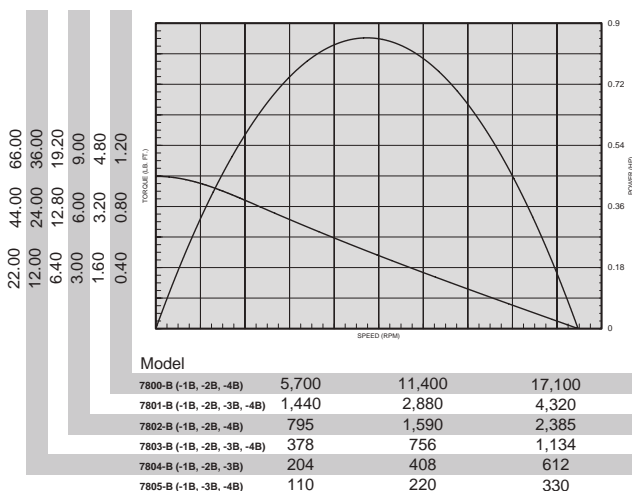
NON-REVERSIBLE - 0.85 HP

7800-B	1/2" Keyed	18,000	9,000	1.00	1.4	0.50	0.68	41.7	19.7	78	4.24	1.91	Single
7801-B	1/2" Keyed	4,600	2,400	4.00	5.5	1.86	2.5	41.7	19.7	78	4.24	1.91	Single
7802-B	1/2" Keyed	2,500	1,300	7.50	10.3	3.43	4.7	41.7	19.7	78	4.24	1.91	Single
7803-B	1/2" Keyed	1,200	600	16.00	21.9	7.44	10.2	41.7	19.7	78	5.17	2.33	Double
7804-B	1/2" Keyed	650	320	30.00	41.2	13.95	19.1	41.7	19.7	78	5.17	2.33	Double
7805-B	1/2" Keyed	350	170	55.00	75.5	26.25	36.0	41.7	19.7	78	5.17	2.33	Double
7812-B	1/2"-20 Th'd.	350	170	55.00	75.5	26.25	36.0	41.7	19.7	78	5.17	2.33	Double
7813-B	1/2"-20 Th'd.	650	320	30.00	41.2	13.95	19.1	41.7	19.7	78	5.17	2.33	Double
7814-B	1/2"-20 Th'd.	18,000	9,000	1.00	1.4	0.50	0.68	41.7	19.7	78	4.24	1.91	Single
7815-B	1/2"-20 Th'd.	1,200	600	16.00	21.9	7.44	10.2	41.7	19.7	78	5.17	2.33	Double
7816-B	1/2"-20 Th'd.	4,600	2,400	4.00	5.5	1.86	2.5	41.7	19.7	78	4.24	1.91	Single
7817-B	1/2"-20 Th'd.	2,500	1,300	7.50	10.3	3.43	4.7	41.7	19.7	78	4.24	1.91	Single

REVERSIBLE - 0.70 HP

7806-B	1/2" Keyed	13,500	7,000	1.00	1.4	0.52	0.71	37.3	17.6	85*	4.24	1.91	Single
7807-B	1/2" Keyed	3,400	1,800	4.00	5.5	2.04	2.8	37.3	17.6	85*	4.24	1.91	Single
7808-B	1/2" Keyed	1,800	1,000	7.40	10.2	3.67	5.0	37.3	17.6	85*	4.24	1.91	Single
7809-B	1/2" Keyed	850	450	15.50	21.3	8.16	11.2	37.3	17.6	85*	5.17	2.33	Double
7810-B	1/2" Keyed	450	240	29.00	39.8	15.30	21.0	37.3	17.6	85*	5.17	2.33	Double
7811-B	1/2" Keyed	250	130	54.00	74.0	28.20	38.7	37.3	17.6	85*	5.17	2.33	Double

* Requires installation for reversible motors - shown on page 92.

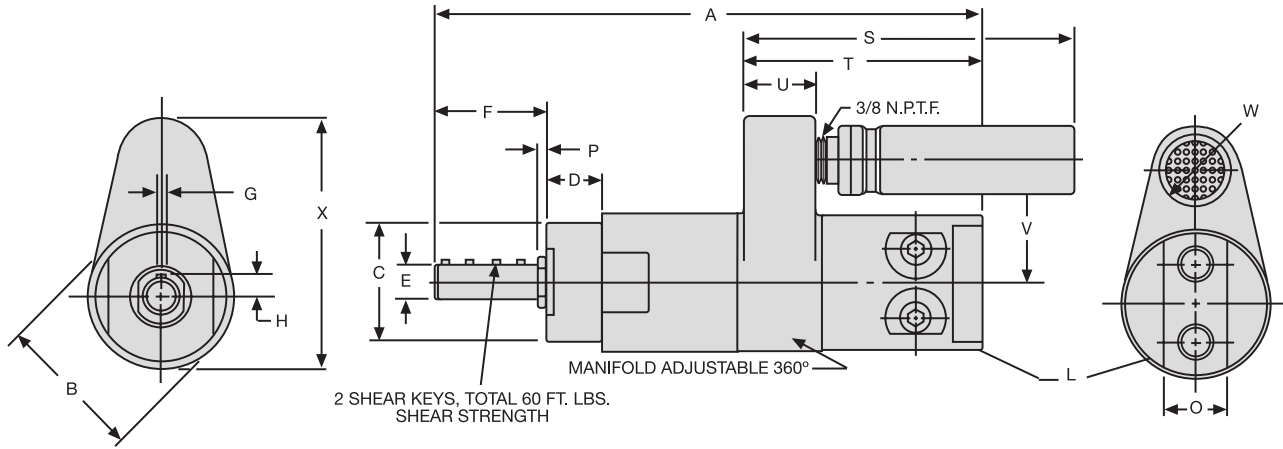


STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, and muffler.

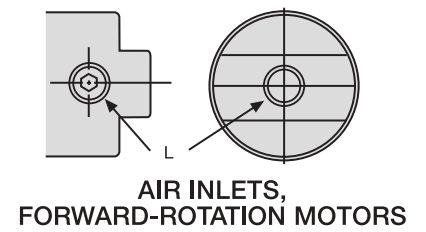
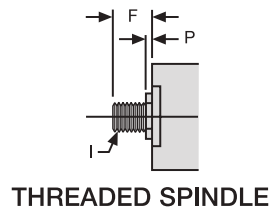
2200-SERIES POWER MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



REVERSIBLE ROTATION, SINGLE REDUCTION SHOWN

Gear Reduction	Dimension A	
	Threaded Spindle	Keyed Spindle
Single	7 178 mm	8 203 mm
Double	8 ⁷ / ₈ 225 mm	9 ³ / ₄ 248 mm



Scale	B	C	D	E	F-Keyed Spindle	F-Th'd. Spindle	G	H	I	L
in	2	1.740 1.760	0.818 0.838	0.4990 0.4995	1.588 1.646	0.619 0.677	0.125 0.126	0.299 0.309	1/2"-20 UNF-2A Thread	1/4" NPTF Air Inlet
mm	51	44.20 44.70	20.78 21.29	12.67 12.69	40.34 41.81	15.72 17.20	3.18 3.20	7.59 7.85		
Scale	O	P	S	T	U	V	W-Fwd. Rotation	W Reversible	W-Fwd. Rotation	X Reversible
in	7/8	0.046 0.158	4 ⁷ / ₈	3 ¹ / ₂	1 ¹ / ₁₆	1 ¹³ / ₁₆	1 ³ / ₈	1	3 ¹ / ₂	3 ⁷ / ₁₆
mm	22	1.17 4.01	124	89	27	46	35	25	89	87

2200-SERIES POWER MOTORS (WITH BOLT-ON GEARING)

SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output		SCFM	L/s		lbs	kg	
				lb-ft	Nm	lb-ft	Nm						

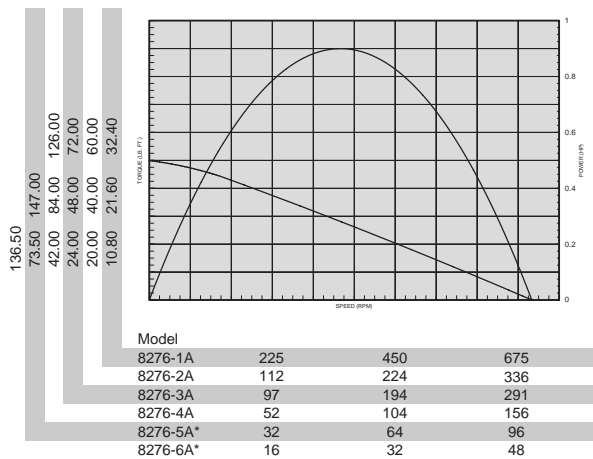
NON-REVERSIBLE - 0.85 HP

7800-1B	1/2" Keyed	18,000	9,000	1.00	1.4	0.50	0.68	41.7	19.7	78	4.24	1.91	Single
7801-1B	1/2" Keyed	4,600	2,400	4.00	5.5	1.86	2.5	41.7	19.7	78	4.24	1.91	Single
7802-1B	1/2" Keyed	2,500	1,300	7.50	10.3	3.43	4.7	41.7	19.7	78	4.24	1.91	Single
7803-1B	1/2" Keyed	1,200	600	16.00	21.9	7.44	10.2	41.7	19.7	78	5.17	2.33	Double
7804-1B	1/2" Keyed	650	320	30.00	41.2	13.95	19.1	41.7	19.7	78	5.17	2.33	Double
7805-1B	1/2" Keyed	350	170	55.00	75.5	26.25	36.0	41.7	19.7	78	5.17	2.33	Double
7812-1B	1/2"-20 Th'd.	350	170	55.00	75.5	26.25	36.0	41.7	19.7	78	5.17	2.33	Double
7813-1B	1/2"-20 Th'd.	650	320	30.00	41.2	13.95	19.1	41.7	19.7	78	5.17	2.33	Double
7814-1B	1/2"-20 Th'd.	18,000	9,000	1.00	1.4	0.50	0.68	41.7	19.7	78	4.24	1.91	Single
7815-1B	1/2"-20 Th'd.	1,200	600	16.00	21.9	7.44	10.2	41.7	19.7	78	5.17	2.33	Double
7816-1B	1/2"-20 Th'd.	4,600	2,400	4.00	5.5	1.86	2.5	41.7	19.7	78	4.24	1.91	Single
7817-1B	1/2"-20 Th'd.	2,500	1,300	7.50	10.3	3.43	4.7	41.7	19.7	78	4.24	1.91	Single

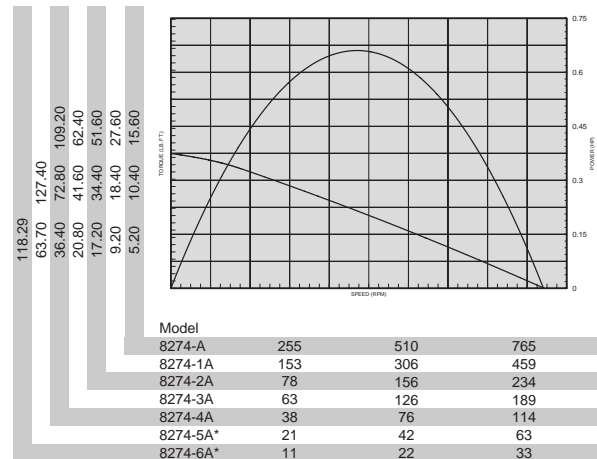
REVERSIBLE - 0.70 HP

7806-1B	1/2" Keyed	13,500	7,000	1.00	1.4	0.52	0.71	37.3	17.6	85*	4.36	1.96	Single
7807-1B	1/2" Keyed	3,400	1,800	4.00	5.5	2.04	2.8	37.3	17.6	85*	4.36	1.96	Single
7808-1B	1/2" Keyed	1,800	1,000	7.40	10.2	3.67	5.0	37.3	17.6	85*	4.36	1.96	Single
7809-1B	1/2" Keyed	850	450	15.50	21.3	8.16	11.2	37.3	17.6	85*	5.67	2.55	Double
7810-1B	1/2" Keyed	450	240	29.00	39.8	15.30	21.0	37.3	17.6	85*	5.67	2.55	Double
7811-1B	1/2" Keyed	250	130	54.00	74.0	28.20	38.7	37.3	17.6	85*	5.67	2.55	Double

* Requires installation for reversible motors - shown on page 92



*Note: Maximum torque recommended for planetary gear system on these models requires shear key with 150 ft/lbs shear strength.



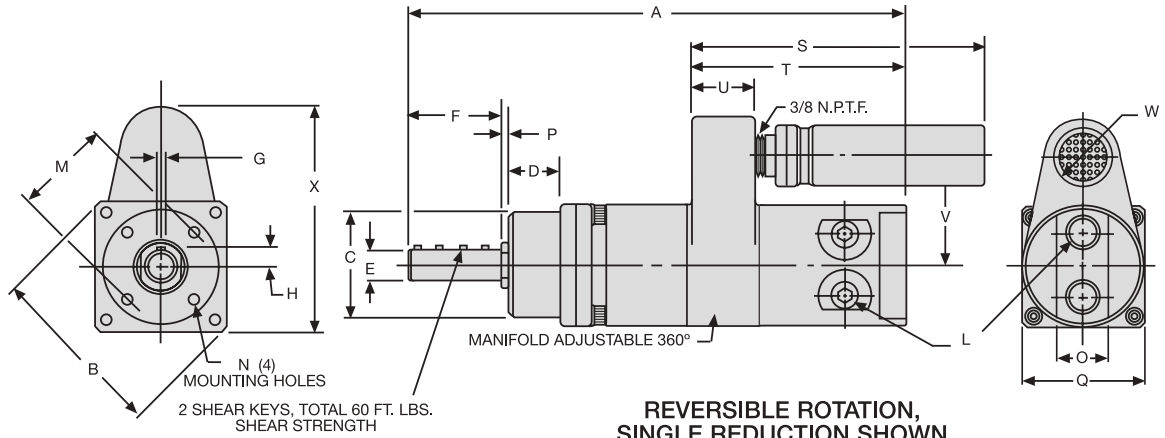
*Note: Maximum torque recommended for planetary gear system on these models requires shear key with 150 ft/lbs shear strength.

STANDARD EQUIPMENT

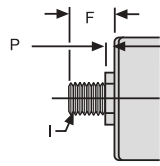
Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, and muffler.

2200-SERIES POWER MOTORS AND MOUNTING ACCESSORIES

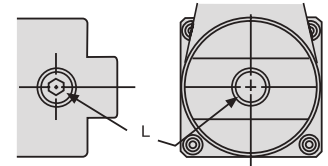
DIMENSIONS



REVERSIBLE ROTATION,
SINGLE REDUCTION SHOWN



THREADED
SPINDLE



AIR INLETS,
SINGLE DIRECTION MOTORS

Models	Gear Reduction	Dimension A
7800-1B 7801-1B 7802-1B 7806-1B 7807-1B 7808-1B	Single	8 ¹ / ₈ 206 mm
7803-1B 7804-1B 7805-1B 7809-1B 7810-1B 7811-1B	Double	9 ²⁹ / ₃₂ 252 mm
7814-1B 7816-1B 7817-1B	Single	7 ⁵ / ₃₂ 182 mm
7812-1B 7813-1B 7815-1B	Double	8 ¹⁵ / ₁₆ 227 mm

Scale	B	C	D	E	F-Keyed Spindle	F-Th'd. Spindle	G	H	I	L	M	N
in	2 ¹¹ / ₁₆	1.7490 1.7495	0.781 0.812	0.4990 0.4995	1.615 1.653	0.646 0.684	0.125 0.126	0.299 0.309	1/2"-20 UNF-2A Thread	1/4 NPTF Air Inlet	1.432 1.442	10-24 UNC-2B Thread
mm	68	44.42 44.44	19.84 20.62	12.67 12.69	41.02 41.99	16.41 17.37	3.18 3.20	7.59 7.85			36.37 36.63	

Scale	O	P	Q	S	T	U	V	W-Fwd. Rotation	W Reversible	X-Fwd. Rotation	X Reversible
in	7/8	0.113 0.165	2	4 ⁷ / ₈	3 ¹ / ₂	1 ¹ / ₁₆	1 ¹³ / ₁₆	1 ³ / ₈	1	3 ¹ / ₂	3 ⁷ / ₁₆
mm	22	2.87 4.19	51	124	89	27	46	35	25	89	87

2200-SERIES POWER MOTORS (WITH 44-SERIES GEARING)

SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output		SCFM	L/s		lbs	kg	
				lb-ft	Nm	lb-ft	Nm						

NON-REVERSIBLE - 0.90 HP

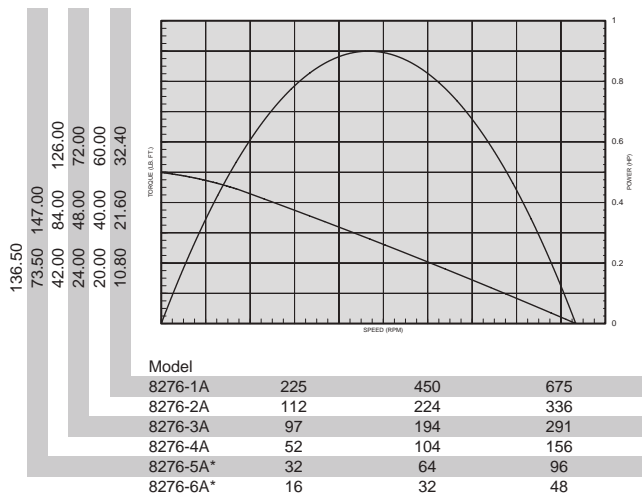
8276-1A	7/8" Keyed	700	350	27.0	37.0	13.5	18.5	41.6	19.6	78	10.10	4.55	2
8276-2A	7/8" Keyed	350	180	50.0	68.0	26.0	36.0	41.6	19.6	78	10.10	4.55	2
8276-3A	7/8" Keyed	300	150	60.0	82.0	32.0	43.0	41.6	19.6	78	14.50	6.52	3
8276-4A	7/8" Keyed	160	90	105.0	143.0	53.0	72.0	41.6	19.6	78	14.50	6.52	3
8276-5A**	7/8" Keyed	100	50	150.0**	206.0	95.0	130.0	41.6	19.6	78	14.50	6.52	3
8276-6A**	7/8" Keyed	50	25	150.0**	206.0	150.0**	206.0	41.6	19.6	78	14.50	6.52	3

REVERSIBLE - 0.65 HP

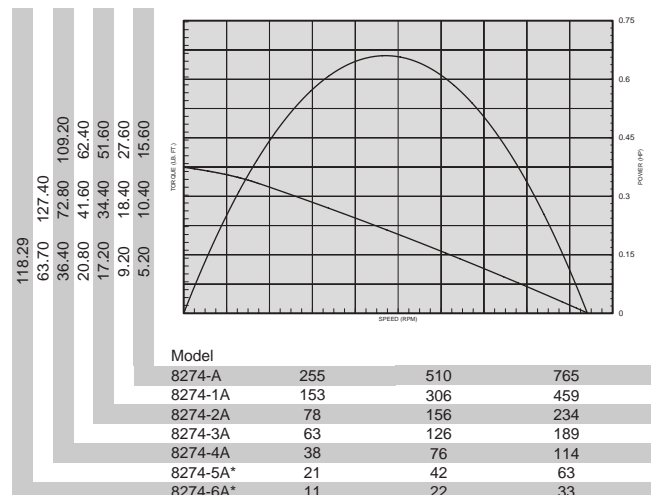
8274-A	7/8" Keyed	800	450	13.0	18.0	7.6	10.5	35.0	16.5	83*	10.10	4.55	2
8274-1A	7/8" Keyed	475	250	23.0	32.0	14.0	19.0	35.0	16.5	83*	10.10	4.55	2
8274-2A	7/8" Keyed	250	130	43.0	59.0	26.0	36.0	35.0	16.5	83*	10.10	4.55	2
8274-3A	7/8" Keyed	200	110	52.0	71.0	31.0	42.0	35.0	16.5	83*	14.50	6.52	3
8274-4A	7/8" Keyed	120	60	91.0	125.0	57.0	78.0	35.0	16.5	83*	14.50	6.52	3
8274-5A**	7/8" Keyed	65	35	150.0**	206.0	98.0	134.0	35.0	16.5	83*	14.50	6.52	3
8274-6A**	7/8" Keyed	35	18	150.0**	206.0	150.0**	206.0	35.0	16.5	83*	14.50	6.52	3

* Requires installation for reversible motors - shown on page 92

** NOTE: Maximum torque recommended for planetary gear system on these models requires shear key with 150 ft./lbs. shear strength.



*NOTE: Maximum torque recommended for planetary gear system on these models requires shear key with 150 ft./lbs. shear strength.



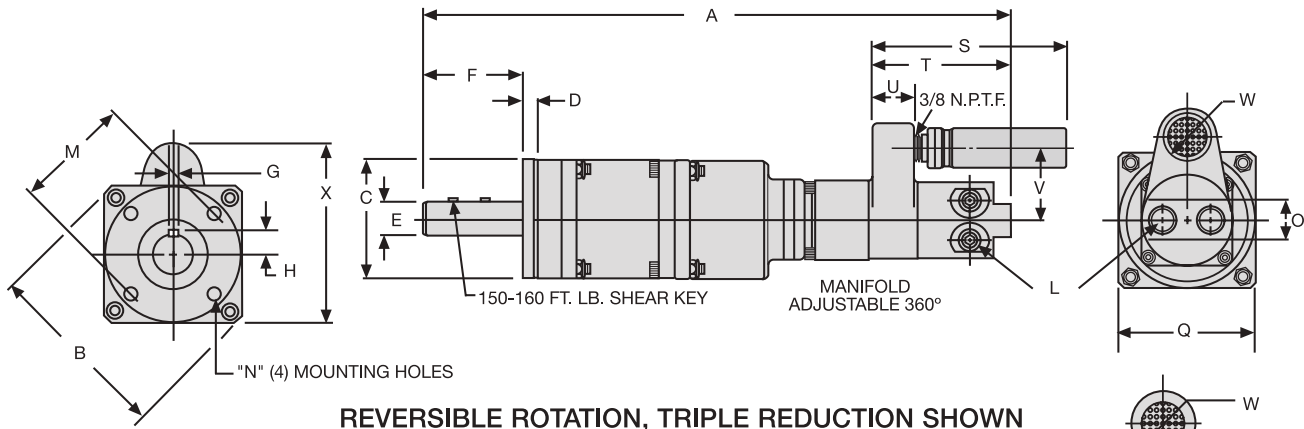
*NOTE: Maximum torque recommended for planetary gear system on these models requires shear key with 150 ft./lbs. shear strength.

STANDARD EQUIPMENT

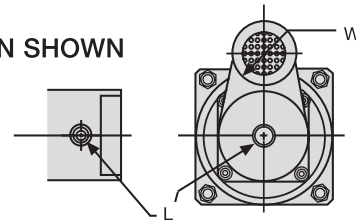
Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, and muffler.

2200/44-SERIES POWER MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



Gear Reduction	Dimension A
Double	1 11 ¹⁵ / ₁₆ 303 mm
Triple	1 14 ³ / ₄ 375 mm



Scale	B	C	D	E	F	G	H	L	M	N
in	4.090	2.996	0.369	0.8743	2.483	0.1872	0.528	1/4 NPTF Air Inlet	2.495	5/16-24 UNF-2B Thread
	4.110	2.998	0.374	0.8748	2.559	0.1875	0.531		2.505	
mm	103.89	76.10	9.37	22.21	63.07	4.75	13.41	1/4 NPTF Air Inlet	63.37	5/16-24 UNF-2B Thread
	104.39	76.15	9.50	22.22	65.00	4.76	13.48		63.63	

Scale	O	Q	S	T	U	V	W-Fwd. Rotation	W Reversible	X Reversible	X Single
in	7/8	3	4 ⁷ / ₈	3 ¹ / ₂	1 ¹ / ₆	1 ¹³ / ₁₆	1 ³ / ₈	1	3 ¹⁵ / ₁₆	4
mm	22	76	124	89	27	46	35	25	100	102

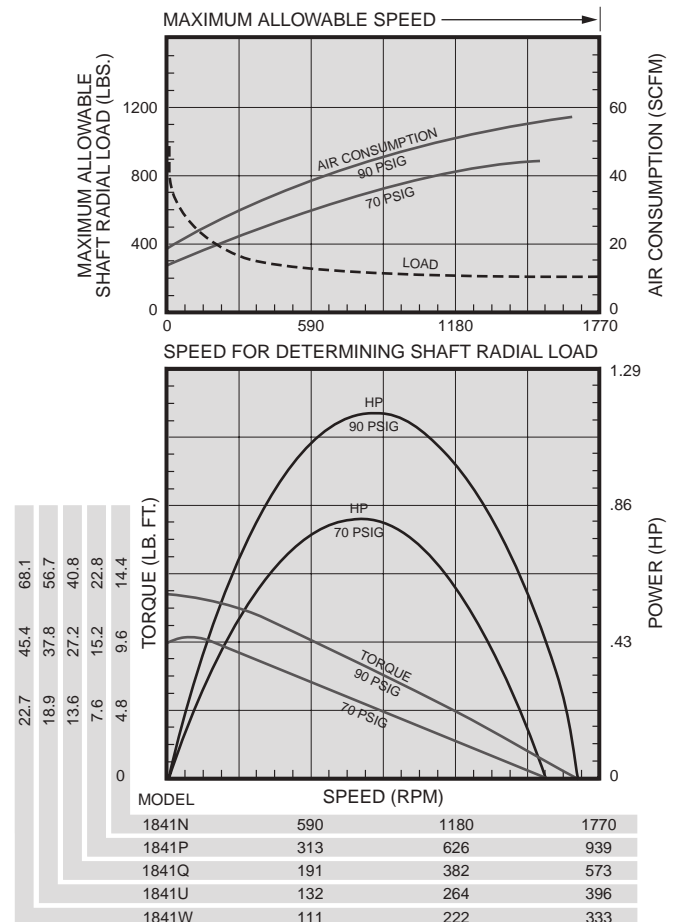
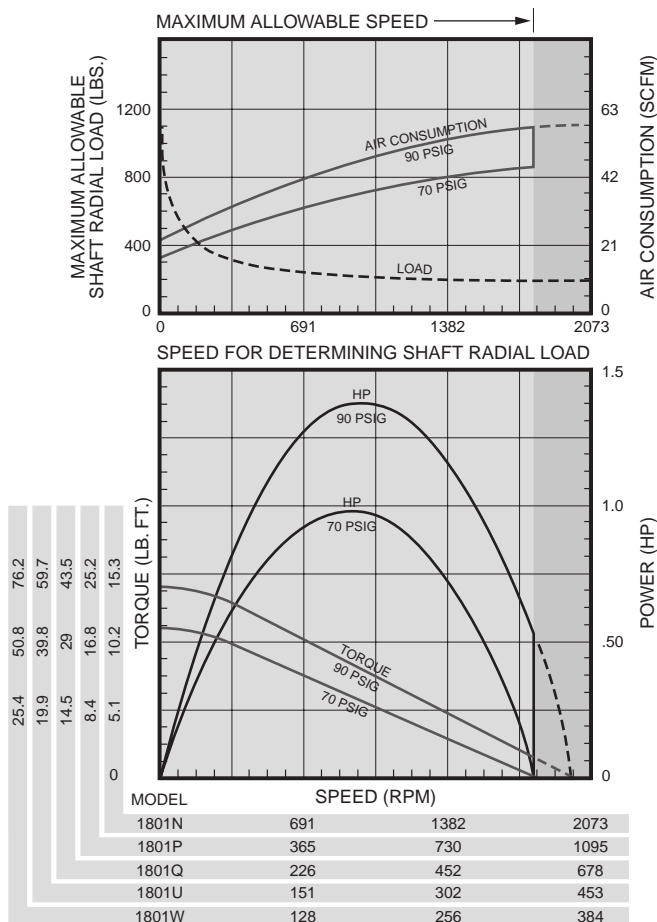
SERIES 1801 AND 1841 MULTI-VANE AIR MOTORS

SPECIFICATIONS

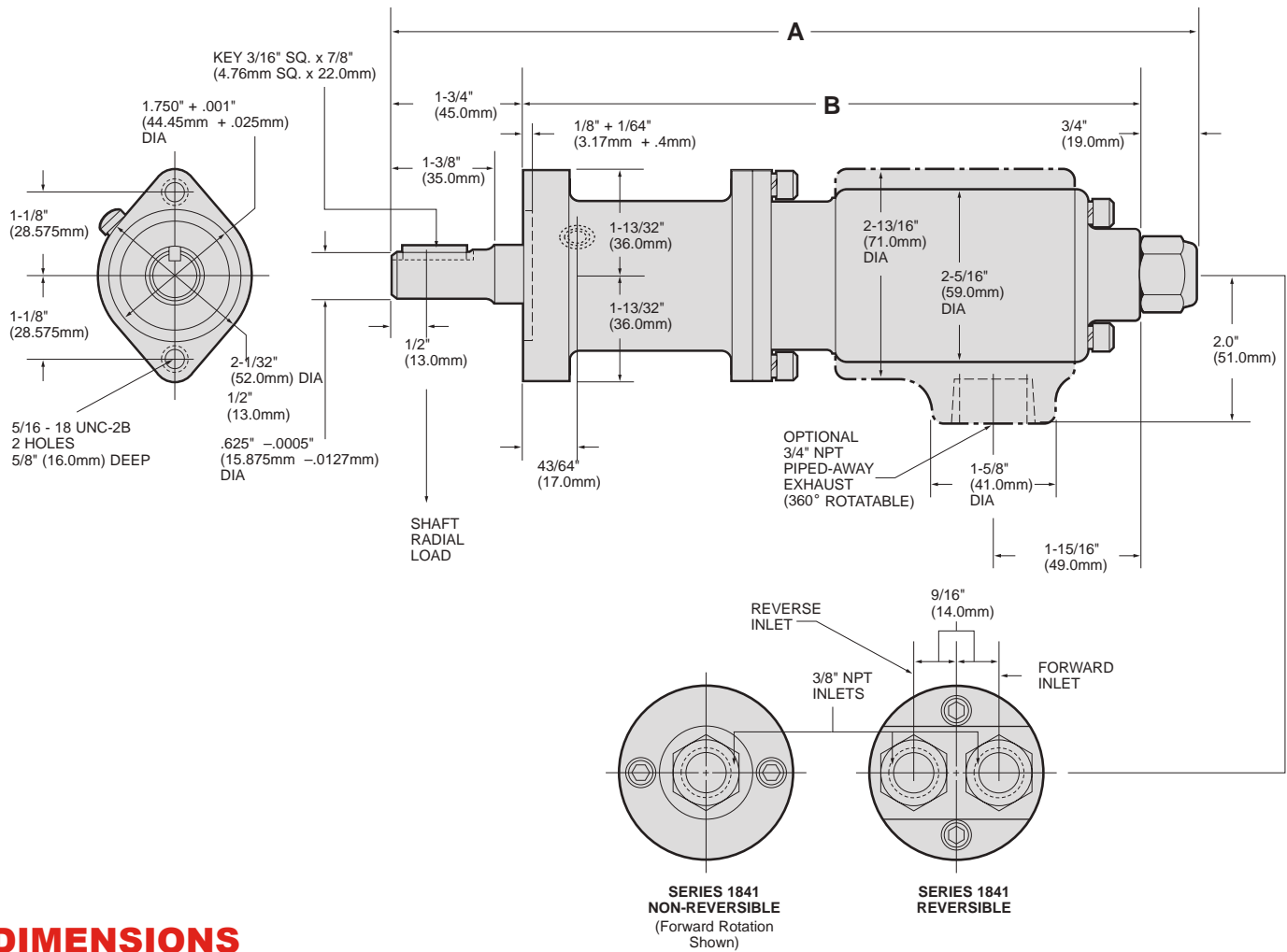


Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
NON-REVERSIBLE Direction of rotation is counterclockwise when facing the shaft.												
1801N	1.40	1.04	918	1990	10.5	14.2	14	19.0	46	1.3	5 ³ / ₈	2.44
1801P	1.35	1.01	500	1050	17.2	23.3	23	31.2	46	1.3	5 ³ / ₄	2.61
1801Q	1.35	1.01	300	650	30.0	40.7	40	54.2	46	1.3	5 ³ / ₄	2.61
1801U	1.35	1.01	205	435	41.0	55.6	55	74.6	46	1.3	5 ³ / ₄	2.61
1801W	1.35	1.01	175	370	52.0	70.5	70	94.9	46	1.3	5 ³ / ₄	2.61
REVERSIBLE Direction of rotation is counterclockwise when facing the shaft.												
1841N	1.2	0.89	800	1,700	9.3	12.6	12.5	17.0	43	1.22	5 ¹ / ₂	2.50
1841P	1.1	0.82	430	900	15.0	20.3	20.0	27.1	43	1.22	5 ⁷ / ₈	2.67
1841Q	1.1	0.82	260	550	27.0	36.6	36.0	48.8	43	1.22	5 ⁷ / ₈	2.67
1841U	1.1	0.82	175	380	37.0	50.2	50.0	67.8	43	1.22	5 ⁷ / ₈	2.67
1841W	1.1	0.82	150	320	45.0	61.0	60.0	81.4	43	1.22	5 ⁷ / ₈	2.67

▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.



SERIES 1801 AND 1841 MULTI-VANE AIR MOTORS



DIMENSIONS

Models	A		B	
	in	mm	in	mm
1801N, 1841N	9 ⁷ / ₁₆	240	6 ¹⁵ / ₁₆	176
1801P, 1801Q, 1801U, 1801W, 1841P, 1841Q, 1841U, 1841W	10 ¹³ / ₁₆	275	8 ⁵ / ₁₆	211

EQUIPMENT OPTIONS

Furnished with Cataloged Models	Extra Options
2 Hole Face Mounting	R1801-A123 Exhaust Deflector Assembly with 3/4" Pipe Tap
	1/2" Square Drive Shaft on Gear Ratios: P, Q, U Shaft Extension 1.19" (30.23mm)*

* To order Motor with Square Drive Shaft, add the suffix "2" to the Model Number. Example: 1841Q2.

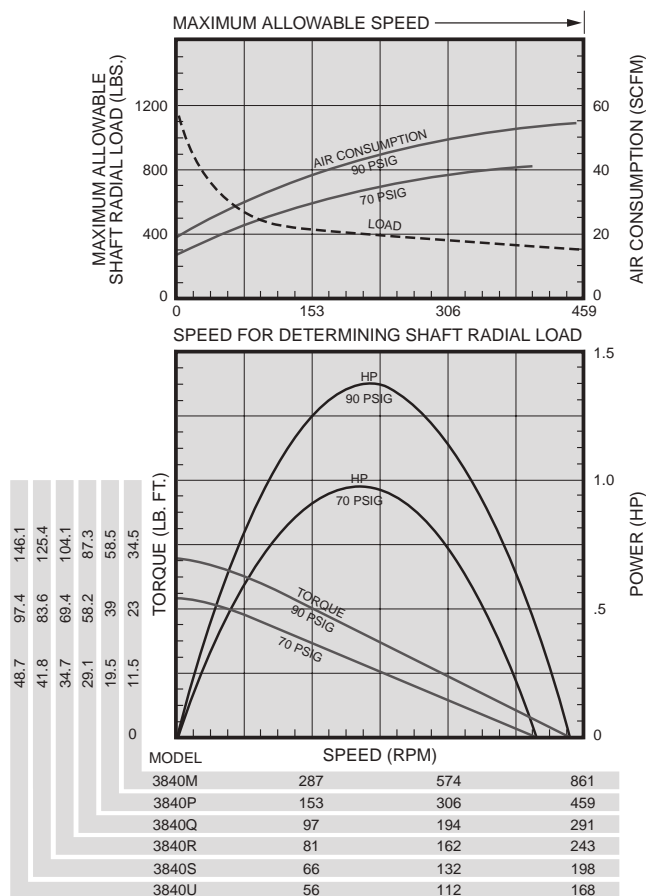
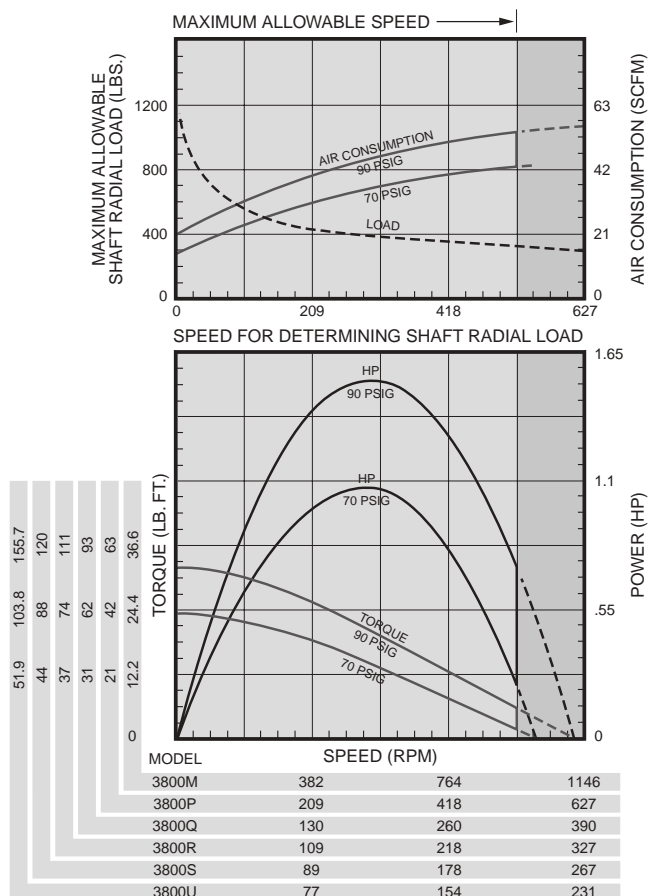
SERIES 3800 AND 3840 MULTI-VANE AIR MOTORS

SPECIFICATIONS



Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m³/m	lb	kg
NON-REVERSIBLE Direction of rotation is counterclockwise when facing the shaft												
3800M	1.55	1.16	520	1,100	24	32.5	33	44.8	48	1.36	7 ¹ / ₈	3.23
3800P	1.45	1.08	285	600	42	57	56.5	76.6	48	1.36	8 ¹ / ₂	3.86
3800Q	1.45	1.08	180	375	62	84	83.5	113	48	1.36	8 ¹ / ₂	3.86
3800R	1.45	1.08	150	320	72	98	96	130	48	1.36	8 ¹ / ₂	3.86
3800S	1.45	1.08	120	255	88	119	118	160	48	1.36	8 ¹ / ₂	3.86
3800U	1.45	1.08	105	220	105	142	140	189	48	1.36	8 ¹ / ₂	3.86
REVERSIBLE												
3840M	1.40	1.04	390	825	23	31.2	31.5	42.7	44	1.25	7 ³ / ₈	3.35
3840P	1.35	1.01	215	440	40	54.2	53.5	72.6	44	1.25	8 ³ / ₄	3.97
3840Q	1.35	1.01	130	280	60	81.4	80	106	44	1.25	8 ³ / ₄	3.97
3840R	1.35	1.01	122	238	69	93	92	125	44	1.25	8 ³ / ₄	3.97
3840S	1.35	1.01	100	190	86	116	115	156	44	1.25	8 ³ / ₄	3.97
3840U	1.35	1.01	83	162	100	135	134	181	44	1.25	8 ³ / ₄	3.97

▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.

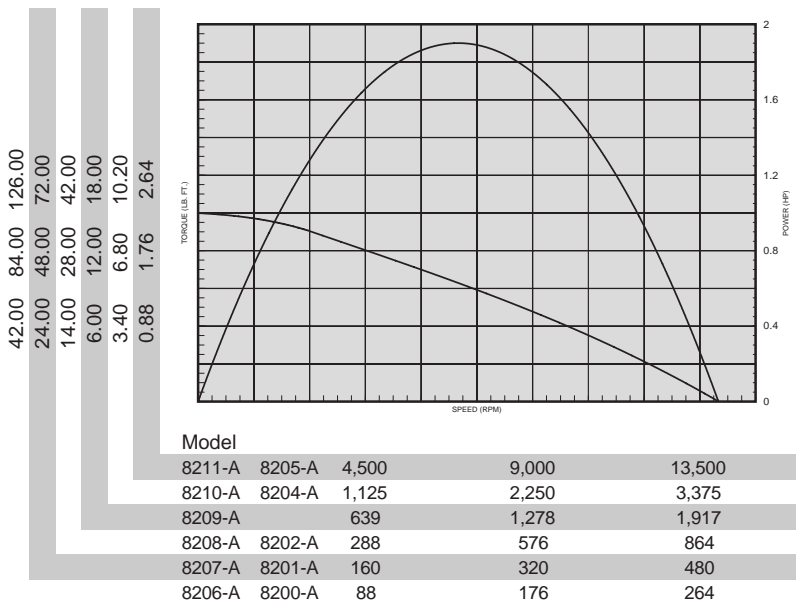


44-SERIES POWER MOTORS

SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		lbs	kg	
				lb-ft	Nm	lb-ft	Nm						
NON-REVERSIBLE - 2.0 HP													
8200-A	7/8" Keyed	275	140	124.00	168.0	75.00	101.6	95.0	44.8	80	18.24	8.20	Double
8201-A	7/8" Keyed	500	255	70.50	95.5	41.00	55.5	95.0	44.8	80	18.24	8.20	Double
8202-A	7/8" Keyed	900	445	40.50	54.9	24.00	32.5	95.0	44.8	80	18.24	8.20	Double
8204-A	7/8" Keyed	3,500	1,740	10.20	13.8	6.00	8.1	95.0	44.8	80	13.82	5.21	Single
8205-A	7/8" Keyed	14,000	7,000	2.85	3.9	1.50	2.0	95.0	44.8	80	13.82	5.21	Single
REVERSIBLE - 1.9 HP													
8206-A	7/8" Keyed	275	150	105.00	142.3	66.5	90.1	93.5	44.1	95*	18.24	8.20	Double
8207-A	7/8" Keyed	500	250	60.00	81.3	39.9	54.1	93.5	44.1	95*	18.24	8.20	Double
8208-A	7/8" Keyed	900	450	35.00	47.4	22.2	30.1	93.5	44.1	95*	18.24	8.20	Double
8209-A	7/8" Keyed	2,000	1,000	15.0	20.3	9.97	13.5	93.5	44.1	95*	13.82	5.21	Single
8210-A	7/8" Keyed	3,500	1,800	8.5	11.5	5.54	7.5	93.5	44.1	95*	13.82	5.21	Single
8211-A	7/8" Keyed	14,000	7,000	2.2	3.0	1.43	1.9	93.5	44.1	95*	13.82	5.21	Single

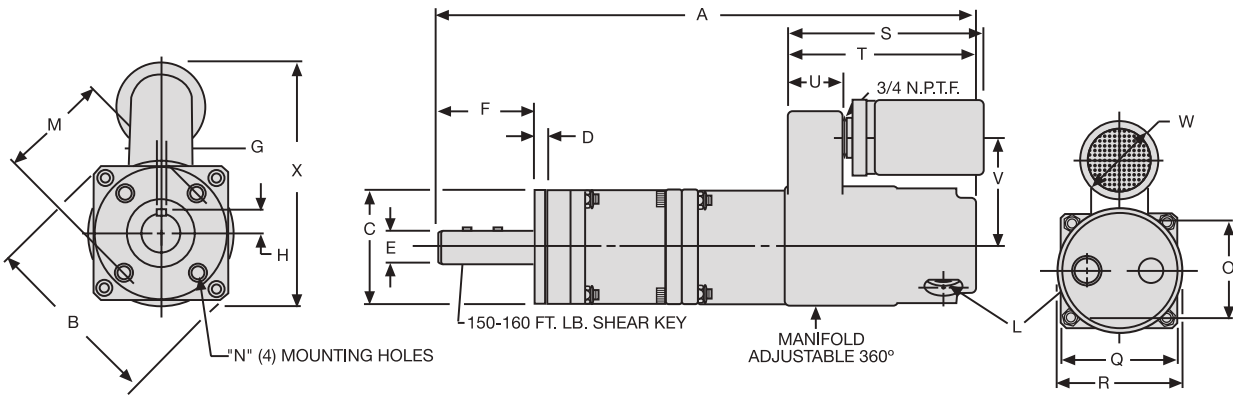


STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, and muffler.

44-SERIES POWER MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



REVERSIBLE ROTATION, DOUBLE REDUCTION SHOWN

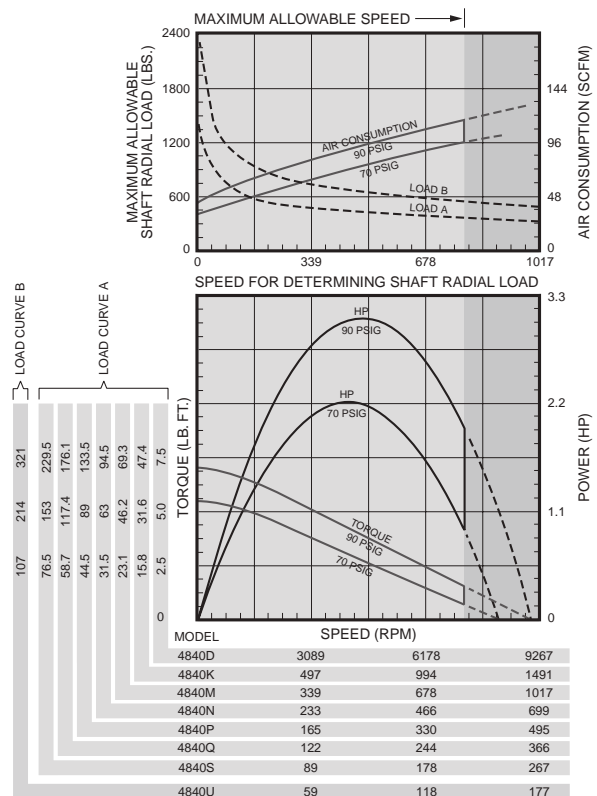
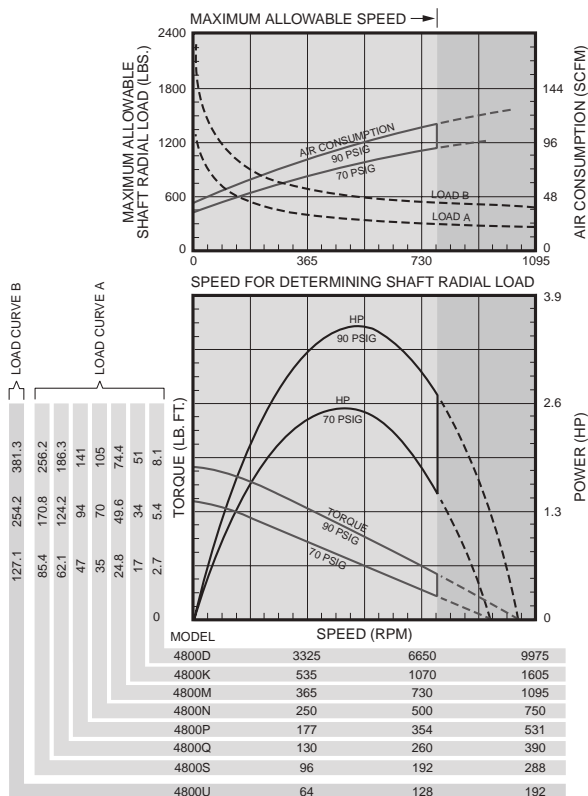
Models	Gear Reduction	Dimension A
8203-A 8204-A 8205-A 8209-A 8210-A 8211-A	Single	11 ¹⁷ / ₆₄ 286 mm
8206-A 8207-A 8208-A 8200-A 8201-A 8202-A	Double	14 ¹ / ₁₆ 373 mm

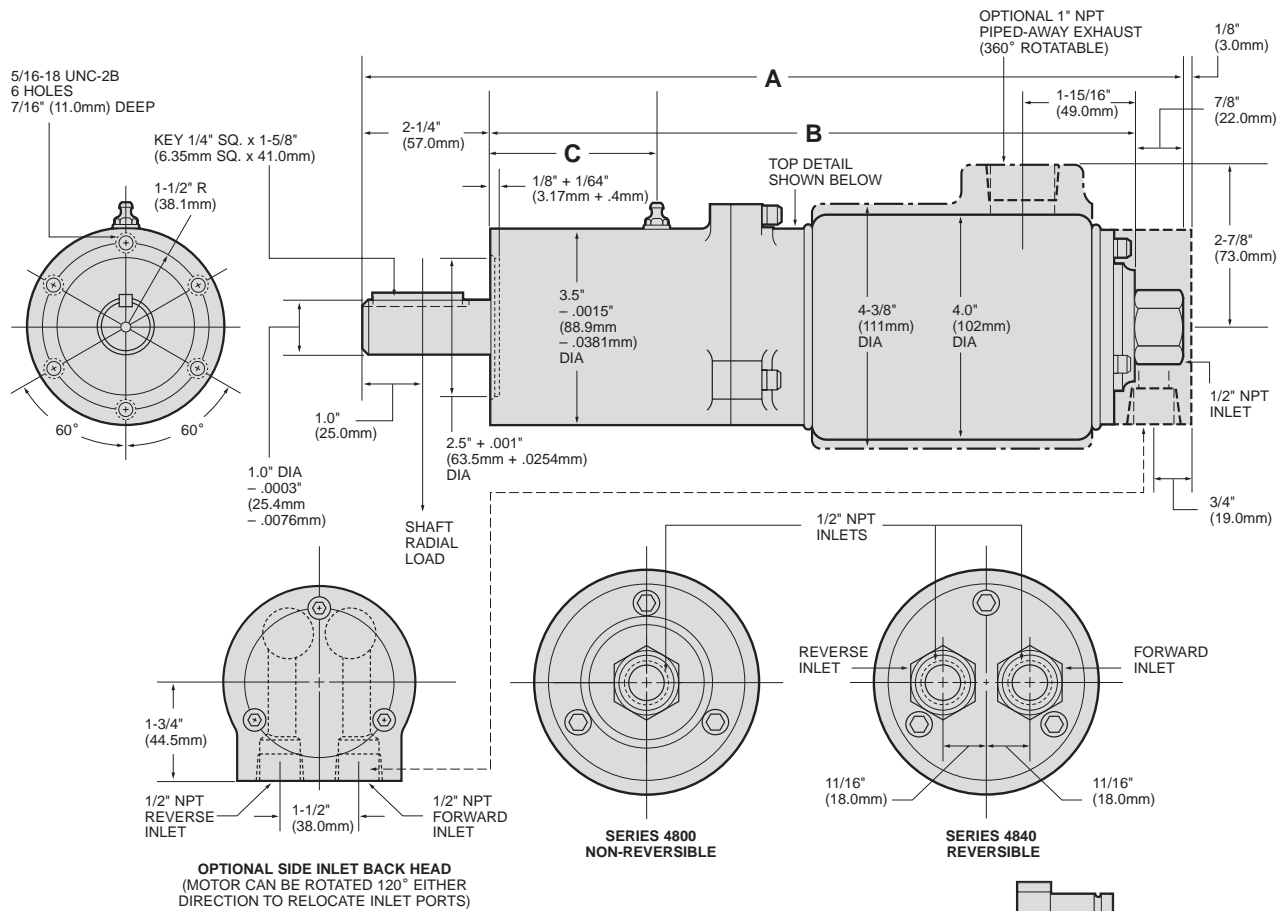
Scale	B	C	D	E	F	G	H	L	M	N
in	4.090 4.110	2.996 2.998	0.369 0.374	0.8743 0.8748	2.483 2.559	0.1872 0.1875	0.528 0.531	3/8 NPTF Air Inlet	2.498 2.502	5/1624 UNF-2B Thread
mm	103.89 104.39	76.10 76.15	9.37 9.50	22.21 22.22	63.07 65.00	4.75 4.76	13.41 13.49		63.45 63.55	
Scale	O	G	R	S	T	U	V	W	X	
in	2 ¹ / ₂	3	3 ³ / ₁₆	5 ³ / ₁₆	5	1 ⁷ / ₁₆	2 ²⁷ / ₃₂	2	5 ⁷ / ₁₆	
mm	63	76	81	132	127	36	72	51	138	

SERIES 4800 AND 4840 MULTI-VANE AIR MOTORS SPECIFICATIONS



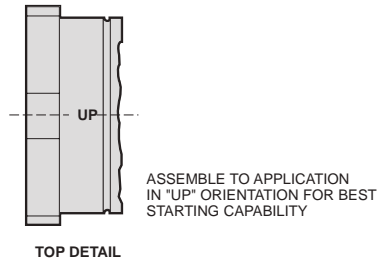
Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
NON-REVERSIBLE Direction of rotation is counterclockwise when facing the shaft.												
4800D	3.8	2.83	5,250	9,850	5.8	7.8	7.7	10.4	98	2.77	15 ³ / ₄	6.92
4800K	3.7	2.76	821	1,538	35.3	47.8	47.0	63.7	95	2.69	15 ¹ / ₄	6.92
4800M	3.7	2.76	560	1,050	51.0	69.2	69.0	93.6	95	2.69	15 ¹ / ₄	6.92
4800N	3.7	2.76	387	726	75.0	102.0	100.0	136.0	95	2.69	15 ¹ / ₄	6.92
4800P	3.5	2.61	260	510	98.0	133.0	131.0	178.0	95	2.69	19 ³ / ₄	8.96
4800Q	3.5	2.61	194	375	129.0	175.0	173.0	235.0	95	2.69	19 ³ / ₄	8.96
4800S	3.5	2.61	146	275	178.0	241.0	238.0	323.0	95	2.69	19 ³ / ₄	8.96
4800U	3.5	2.61	97	185	265.0	359.0	354.0	480.0	95	2.69	19 ³ / ₄	8.96
REVERSIBLE												
4840D	3.3	2.46	4,550	9,100	5.2	7.0	6.9	9.4	95	2.69	15 ¹ / ₄	6.92
4840K	3.2	2.39	711	1,429	32.0	43.4	42.7	57.9	95	2.69	15 ¹ / ₄	6.92
4840M	3.2	2.39	485	975	47.3	64.0	63.0	85.4	95	2.69	15 ¹ / ₄	6.92
4840N	3.2	2.39	336	675	67.7	91.7	90.2	122.0	95	2.69	15 ¹ / ₄	6.92
4840P	3.0	2.24	228	475	93.0	126.0	125.0	170.0	95	2.69	20 ¹ / ₈	9.13
4840Q	3.0	2.24	167	350	123.0	167.0	165.0	224.0	95	2.69	20 ¹ / ₈	9.13
4840S	3.0	2.24	125	255	161.0	218.0	215.0	292.0	95	2.69	20 ¹ / ₈	9.13
4840U	3.0	2.24	83	170	225.0	305.0	300.0	407.0	95	2.69	20 ¹ / ₈	9.13





DIMENSIONS

Model	A		B		C	
	in	mm	in	mm	in	mm
4800D, 4800K, 4800M, 4800N 4840D, 4840K, 4840M, 4840N	12 ¹ / ₈	308	9	229	2 ⁹ / ₃₂	23
4800P, 4800Q, 4800S, 4800U 4840P, 4840Q, 4840S, 4840U	14 ¹ / ₂	368	11 ³ / ₈	289	2 ⁷ / ₈	73



EQUIPMENT OPTIONS

Furnished with Cataloged Models	Extra Options
6 Hole Face Mounting	R4800-A123 Exhaust Deflector Assembly with 1" Pipe Tap ** R4901-102 Side Inlet Backhead Requires (3) 518-104 Screws * 5/8" Square Drive Shaft on Gear Ratio: M Shaft Extension 1.38" (35.5mm) * 3/4" Square Drive Shaft on Gear Ratios: P, Q, S, U Shaft Extension 1.47" (37.44mm)

*To order Motor with Square Drive Shaft, add the suffix "2" to the Model Number. Example: 4840Q2.

**Contact Ingersoll Rand for Model Number with these options.

SPUR GEAR, MULTI-VANE MOTORS

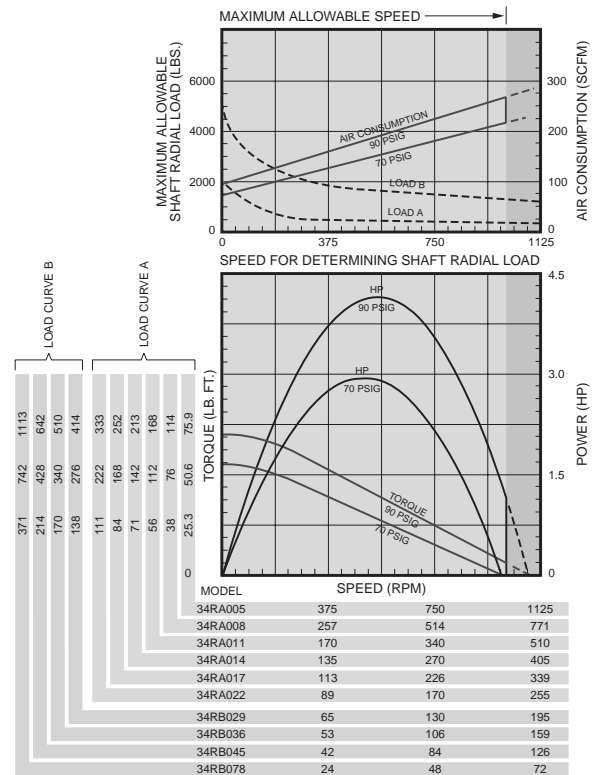
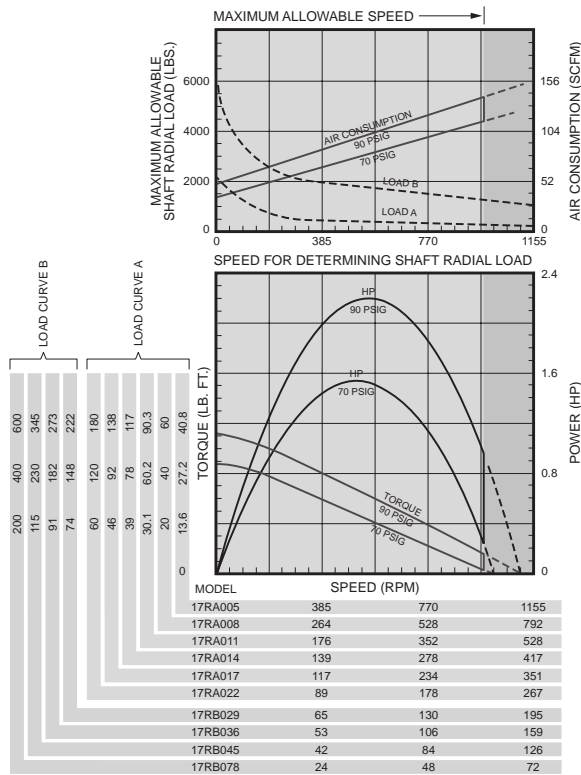


SERIES 17RA, 17RB, 34RA AND 34RB SPECIFICATIONS

Model	Max. Power		Speed at Max. Power rpm	Free Speed ▲ rpm	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw			lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
REVERSIBLE												
17RA005	2.3	1.72	562	1,110	24	32.5	37.0	50.2	103	2.92	40	18.1
17RA008	2.3	1.72	383	760	35	47.5	54.5	73.9	103	2.92	40	18.1
17RA011	2.3	1.72	254	505	53	71.9	82.0	111.0	103	2.92	40	18.1
17RA014	2.3	1.72	201	400	67	91.0	104.0	141.0	103	2.92	40	18.1
17RA017	2.3	1.72	169	335	80	109.0	124.0	168.0	103	2.92	40	18.1
17RA022	2.3	1.72	129	255	105	142.0	163.0	221.0	103	2.92	40	18.1
17RB029	2.2	1.64	97	187	120	163.0	201.0	273.0	100	2.83	72	32.7
17RB036	2.2	1.64	79	152	148	201.0	248.0	336.0	100	2.83	72	32.7
17RB045	2.2	1.64	62	121	187	254.0	312.0	423.0	100	2.83	72	32.7
17RB078	2.2	1.64	36	69	327	443.0	545.0	739.0	100	2.83	72	32.7
34RA005	4.1	3.06	560	1,080	41	60.0	69.0	93.6	183	5.18	43	19.5
34RA008	4.1	3.06	385	740	65	88.0	101.0	137.0	183	5.18	43	19.5
34RA011	4.1	3.06	255	490	98	133.0	152.0	206.0	183	5.18	43	19.5
34RA014	4.1	3.06	201	390	124	168.0	192.0	260.0	183	5.18	43	19.5
34RA017	4.1	3.06	168	325	148	201.0	229.0	311.0	183	5.18	43	19.5
34RA022	4.1	3.06	128	245	195	264.0	301.0	408.0	183	5.18	43	19.5
34RB029	4.0	2.98	99	187	224	304.0	374.0	507.0	180	5.1	75	34
34RB036	4.0	2.98	80	152	277	376.0	462.0	627.0	180	5.1	75	34
34RB045	4.0	2.98	63	121	348	472.0	581.0	788.0	180	5.1	75	34
34RB078	4.0	2.98	36	69	606	822.0	1,010.0	1,370.0	180	5.1	75	34

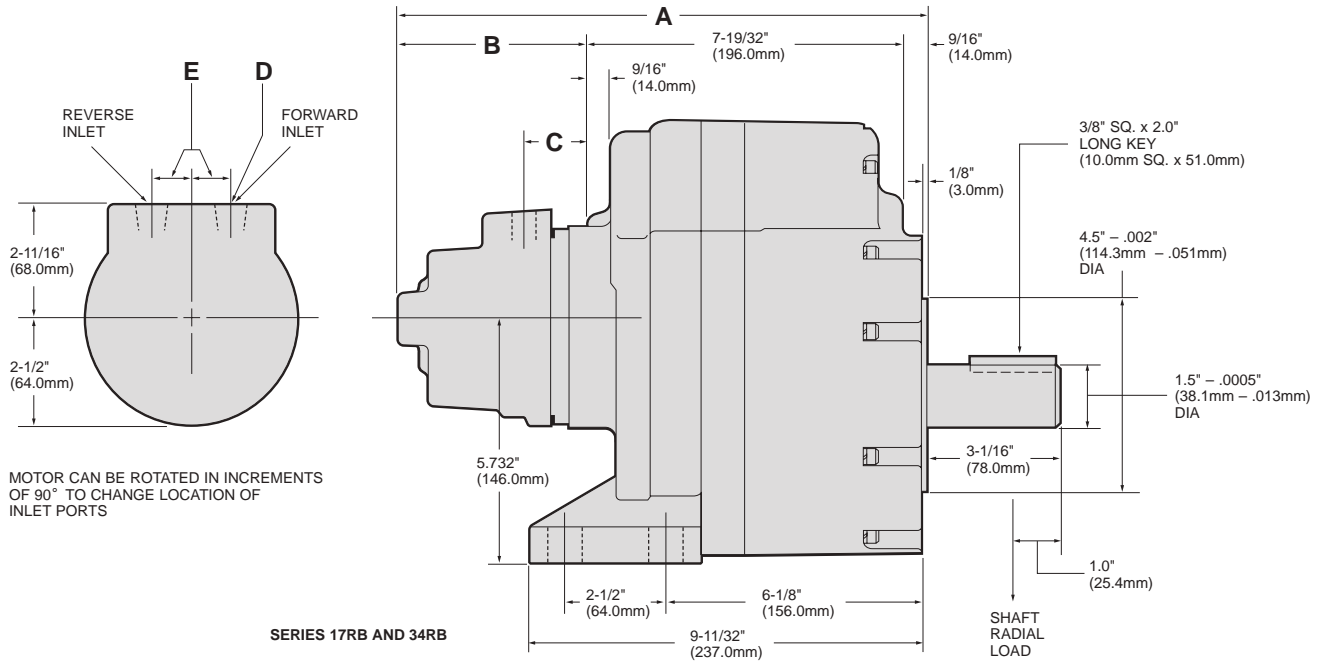
▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.

SERIES 17RA, 17RB, 34RA AND 34RB



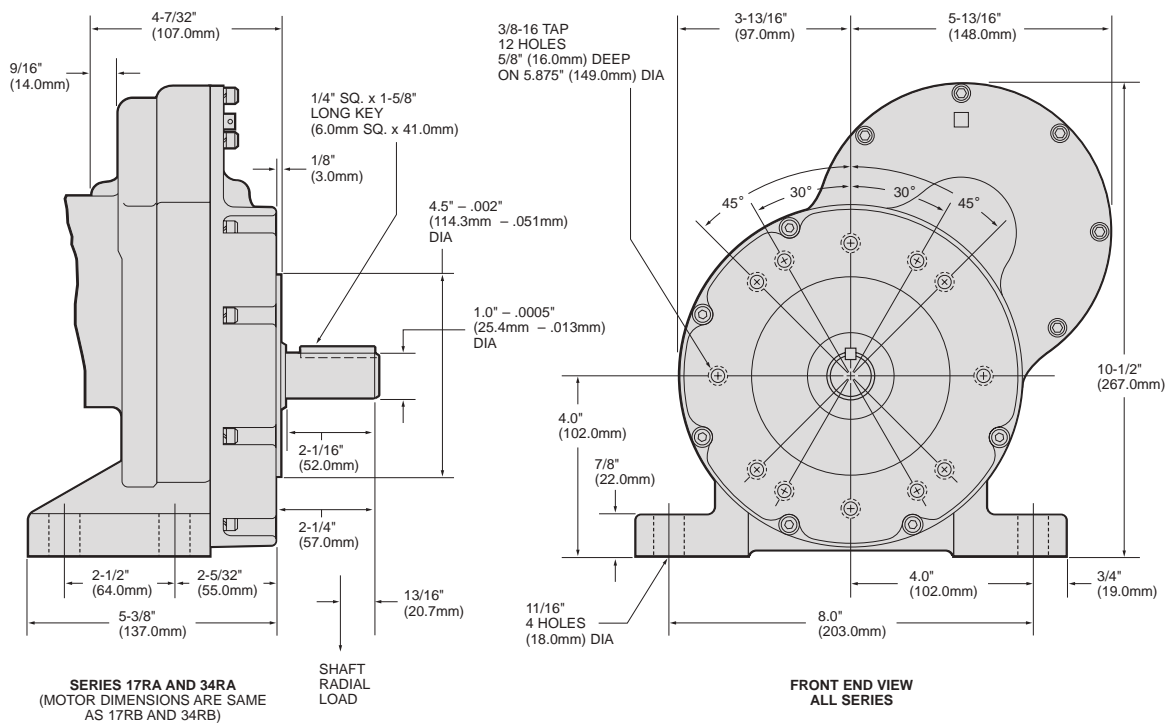
SERIES 17RA, 17RB, 34RA AND 34RB MULTI-VANE AIR MOTORS

DIMENSIONS



DIMENSIONS

Series	A		B		C		D NPT	E	
	in	mm	in	mm	in	mm		in	mm
17RB	13 ¹ / ₁₆	332	4 ²⁹ / ₃₂	125	2 ³ / ₁₆	56	3/8	7/8	22
34RB	14 ¹³ / ₁₆	376	6 ²¹ / ₃₂	169	2 ⁹ / ₃₂	58	1/2	1 ³ / ₁₆	30

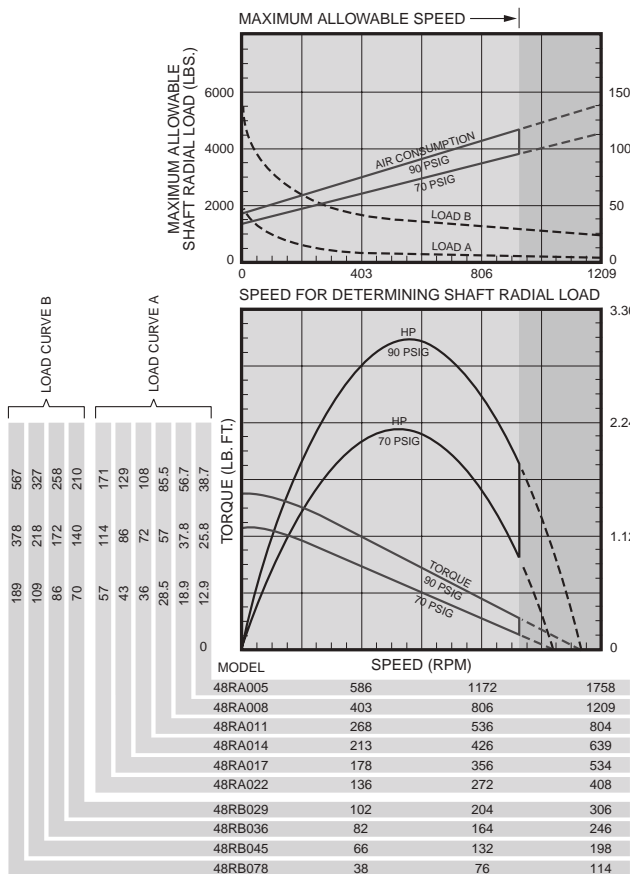


SERIES 48RA AND 48RB MULTI-VANE AIR MOTORS

SPECIFICATIONS

Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m³/m	lb	kg
REVERSIBLE												
48RA005	3.1	2.31	930	1,690	26	35.3	35	47.5	95	2.69	44	20
48RA008	3.1	2.31	638	1,160	38	51.5	51.5	69.8	95	2.69	44	20
48RA011	3.1	2.31	423	772	57	77.3	77.3	105	95	2.69	44	20
48RA014	3.1	2.31	332	612	72	97.6	97.6	133	95	2.69	44	20
48RA017	3.1	2.31	278	511	86	117	117	159	95	2.69	44	20
48RA022	3.1	2.31	213	390	113	153	154	209	95	2.69	44	20
48RB029	3	2.24	162	292	135	183	189	256	90	2.55	75	34
48RB036	3	2.24	131	236	167	227	234	317	90	2.55	75	34
48RB045	3	2.24	105	188	209	283	295	400	90	2.55	75	34
48RB078	3	2.24	60	108	364	494	513	696	90	2.55	75	34

▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.



EQUIPMENT OPTIONS

Furnished with Cataloged Models

Side Inlet Backhead

Extra Options

R4840-102 Rear Inlet Backhead

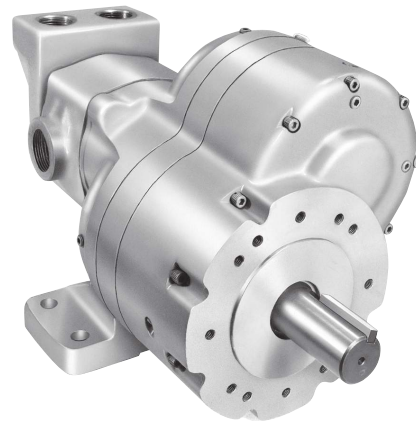
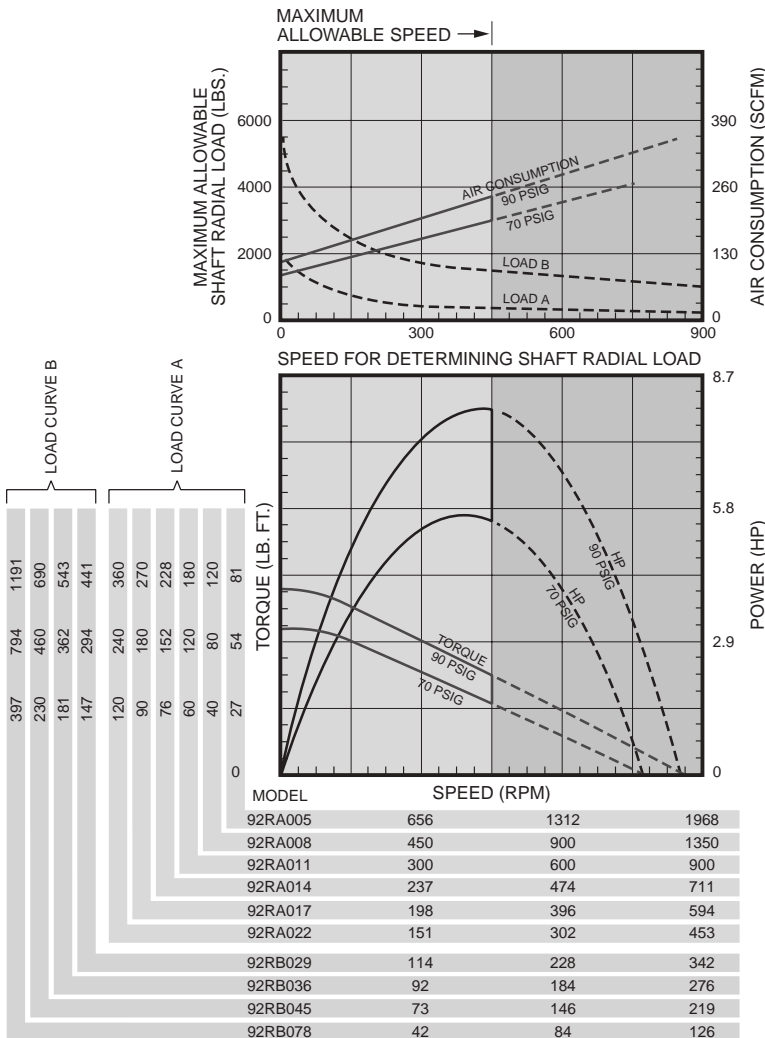


SERIES 92RA AND 92RB MULTI-VANE AIR MOTORS

SPECIFICATIONS

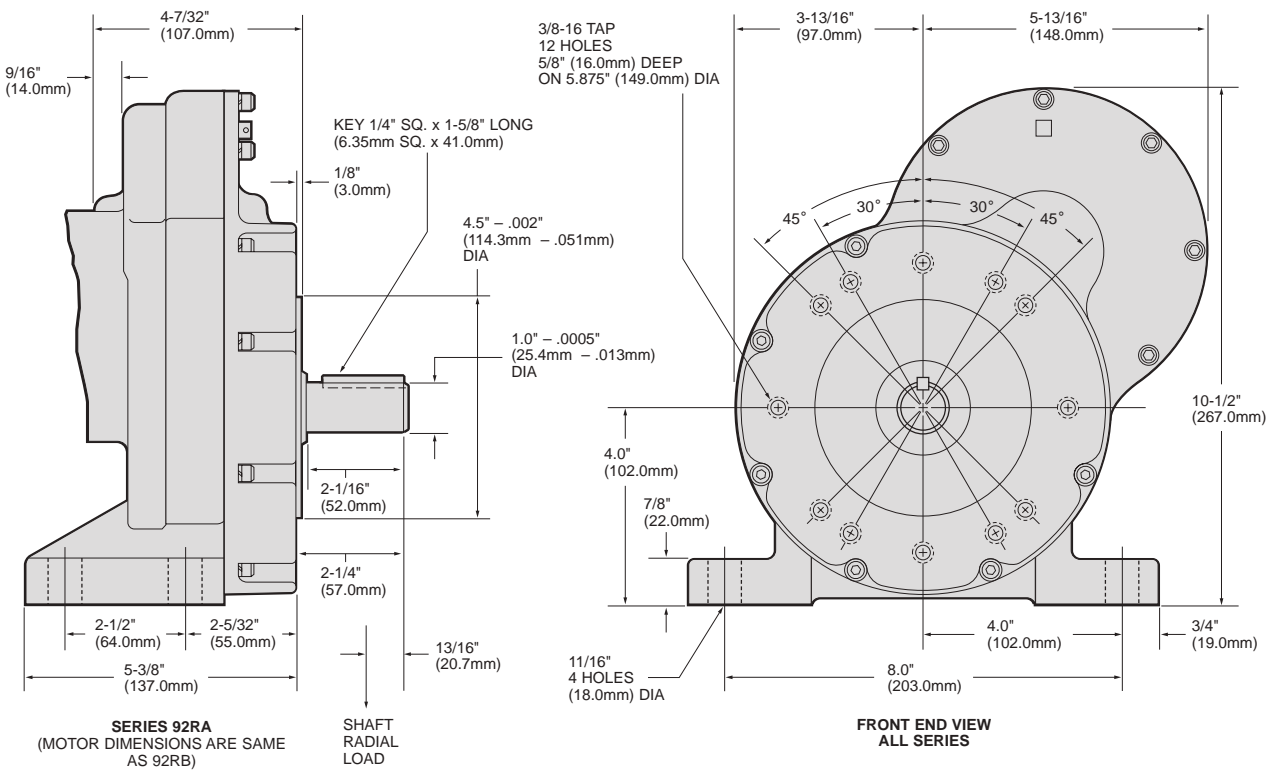
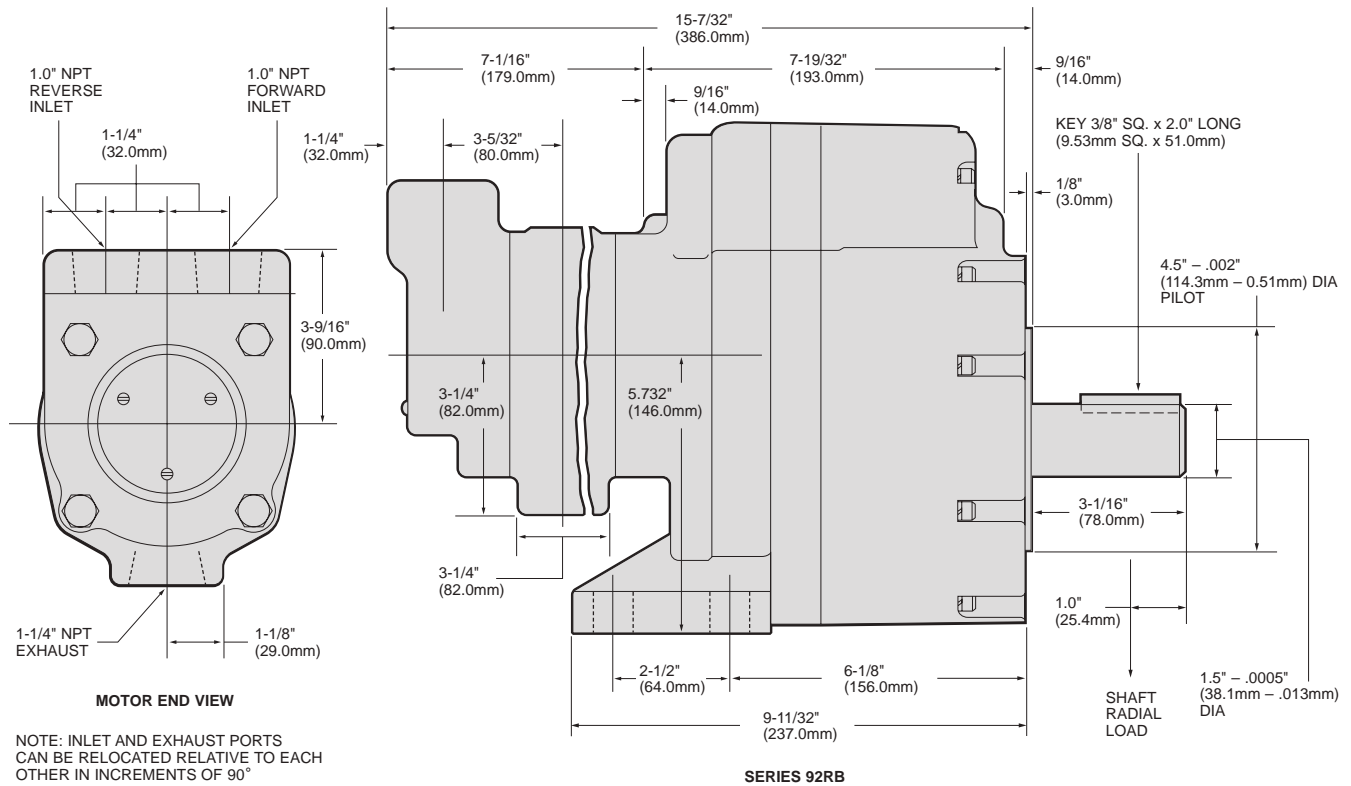
Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
REVERSIBLE												
92RA005	8.15	6.08	910	1,390	56	75.9	75	102	230	6.51	46	20.9
92RA008	8.15	6.08	620	1,296	80	109	109	148	230	6.51	46	20.9
92RA011	8.15	6.08	415	852	120	163	164.5	223	230	6.51	46	20.9
92RA014	8.15	6.08	327	682	152	206	208	282	230	6.51	46	20.9
92RA017	8.15	6.08	274	571	180	244	248	336	230	6.51	46	20.9
92RA022	8.15	6.08	209	435	235	319	326	442	230	6.51	46	20.9
92RB029	7.9	5.89	160	327	280	380	402	545	225	6.37	78	35.4
92RB036	7.9	5.89	130	264	345	468	497	674	225	6.37	78	35.4
92RB045	7.9	5.89	103	210	440	597	626	849	225	6.37	78	35.4
92RB078	7.9	5.89	59	120	770	1,044	1,090	1,478	225	6.37	78	35.4

▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.



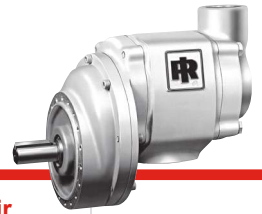
SERIES 92RA AND 92RB MULTI-VANE AIR MOTORS

DIMENSIONS



SERIES 92RM AND 992RB MULTI-VANE AIR MOTORS

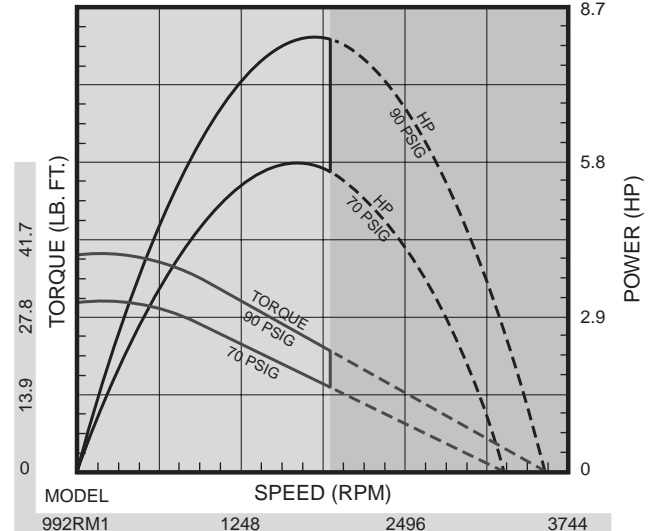
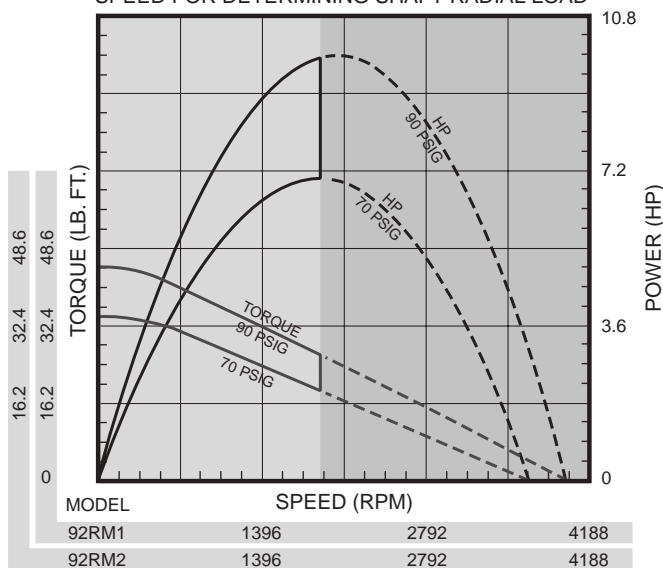
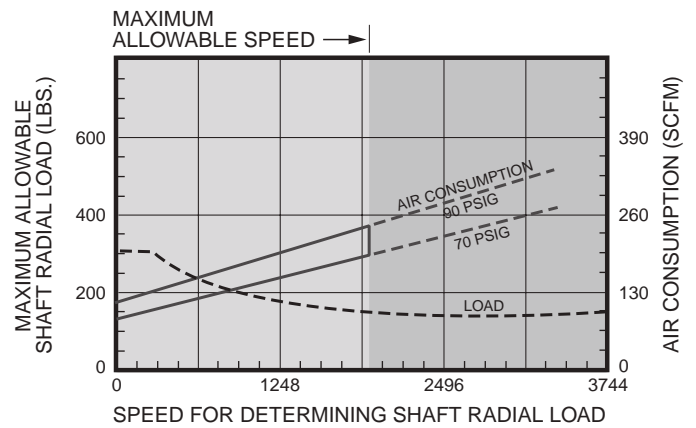
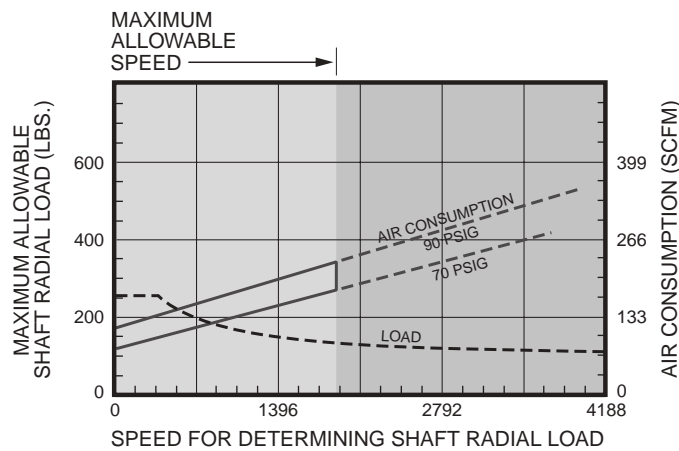
SPECIFICATIONS



Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
NON-REVERSIBLE Direction of rotation is counterclockwise when facing the shaft												
92RM1	9.9	7.38	2,095	3,980	33	44.7	45	61	240	6.79	24 ¹ / ₄	11
92RM2	9.9	7.38	2,095	3,980	33	44.7	45	61	240	6.79	24 ¹ / ₄	11
REVERSIBLE												
992RM1	8.15	6.08	1,730	3,600	28.7	38.9	39	52.9	230	6.51	25 ¹ / ₄	11.3

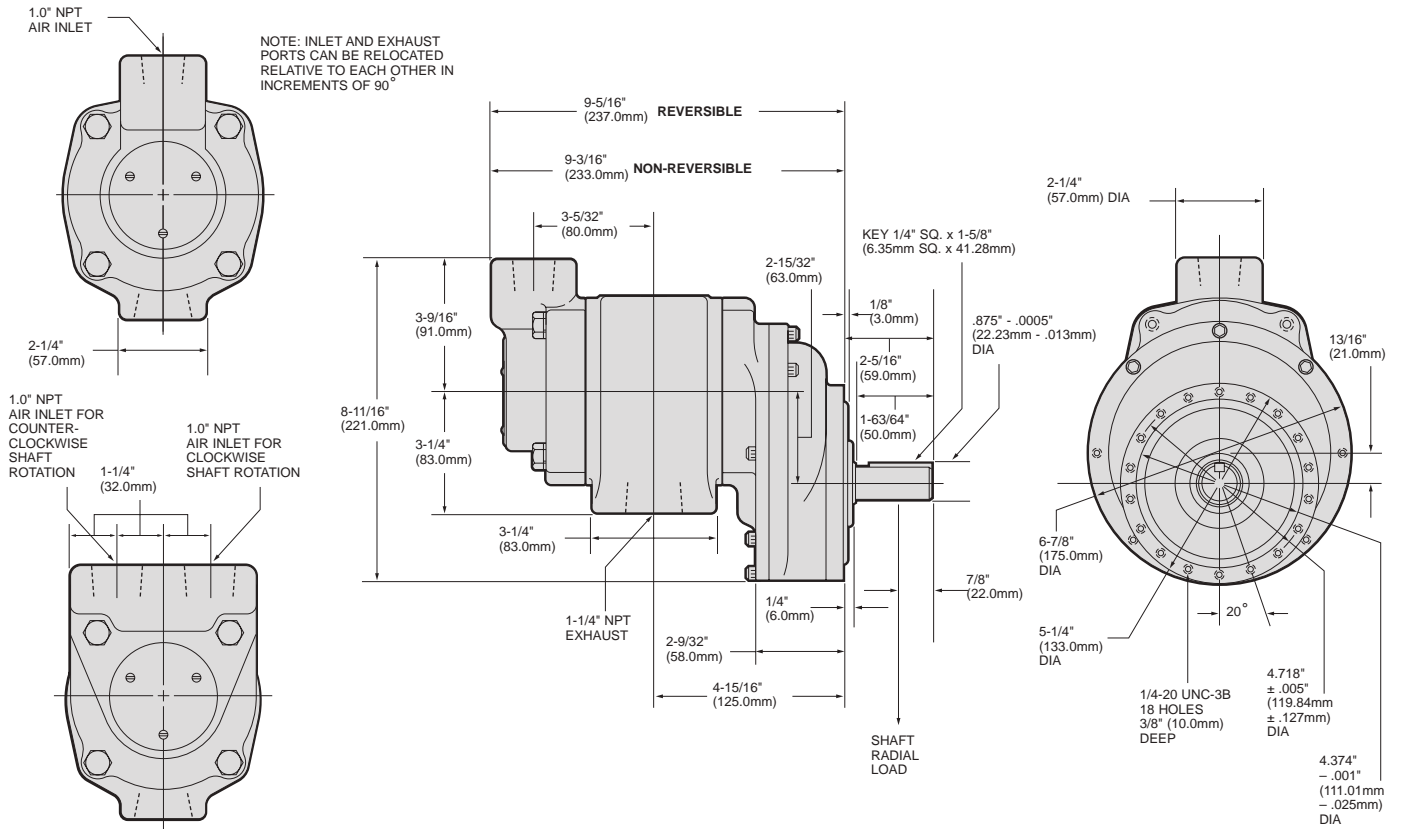
▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.

Direction of rotation of Model 92RM1 rotates clockwise and Model 92RM2 rotates counterclockwise when facing the shaft end of the motor.



SERIES 92RM AND 992RM MULTI-VANE AIR MOTORS

DIMENSIONS



DIRECT DRIVE MULTI-VANE MOTORS

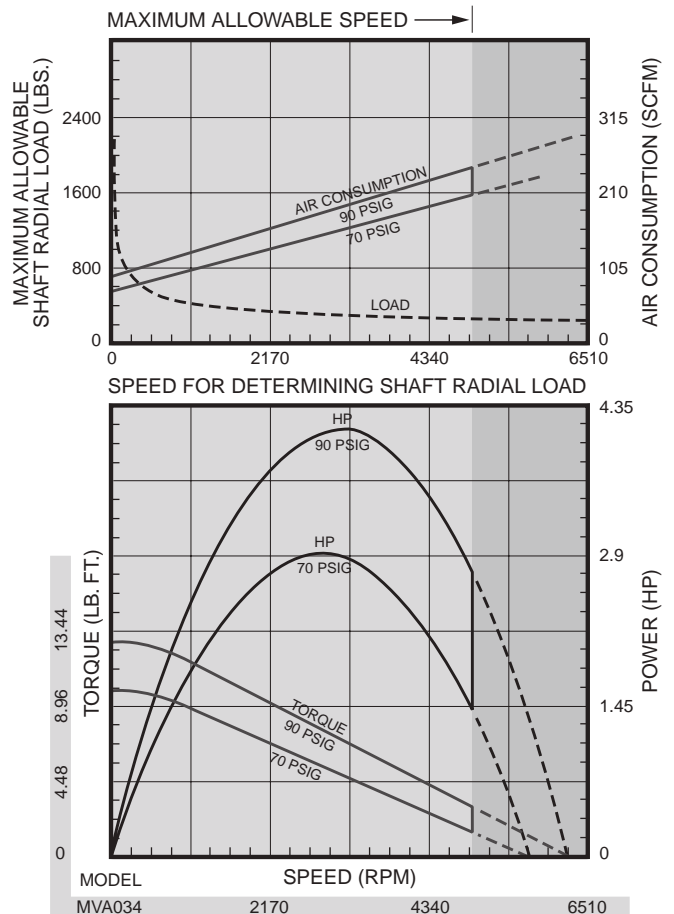
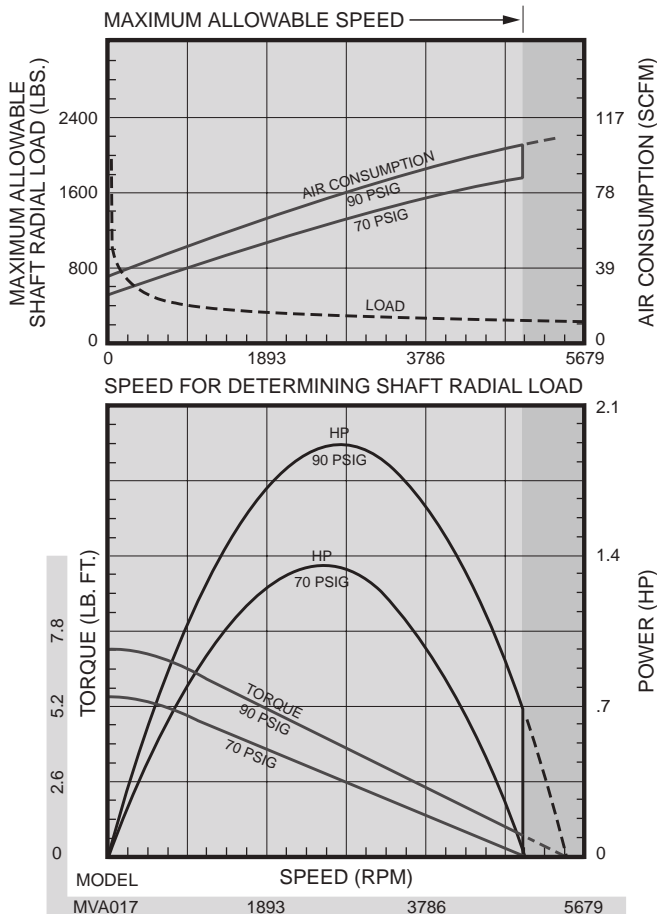


SERIES MVA AND MOV0 SPECIFICATIONS

Model*	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
REVERSIBLE												
MVA017A	1.93	1.44	2,800	5,450	4.5	6.1	7	9.5	76	2.15	12½	5.67
MVA017B	1.93	1.44	2,800	5,450	4.5	6.1	7	9.5	76	2.15	12½	5.67
MVA034A	4.15	3.09	3,000	6,250	8.3	11.3	12.8	17.4	181	5.12	16½	7.48
MVA034B	4.15	3.09	3,000	6,250	8.3	11.3	12.8	17.4	181	5.12	16½	7.48
MOV075AA	10.5	7.8	2,600	5,600	22.5	30.5	30	40.7	260	7.36	64	29

▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.

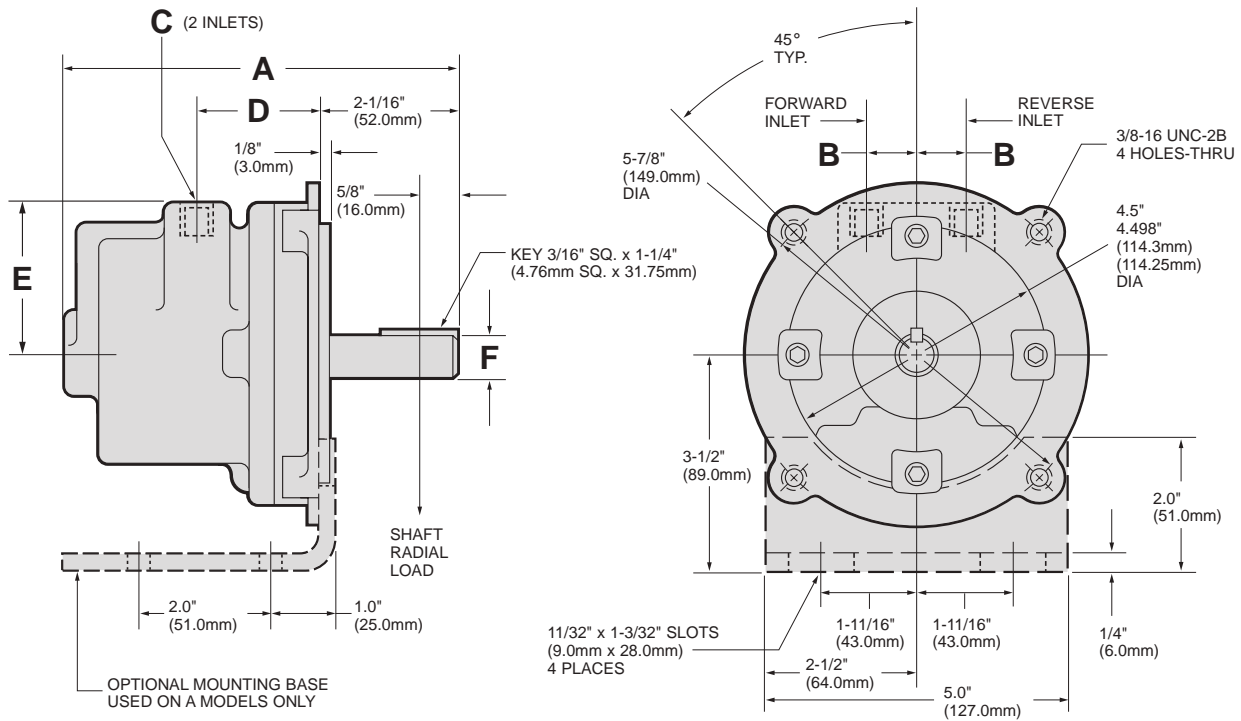
**"A" suffix denotes foot mount model, "B" suffix denotes flange mount models.



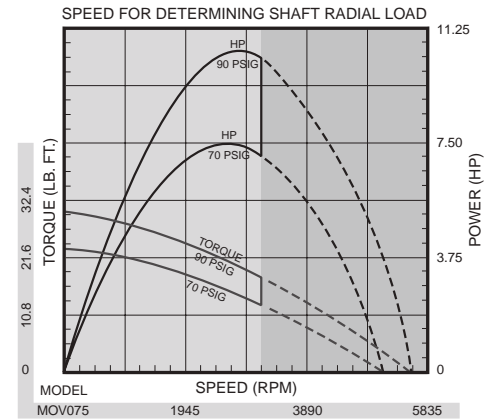
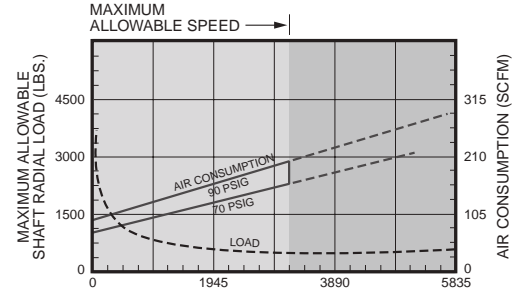
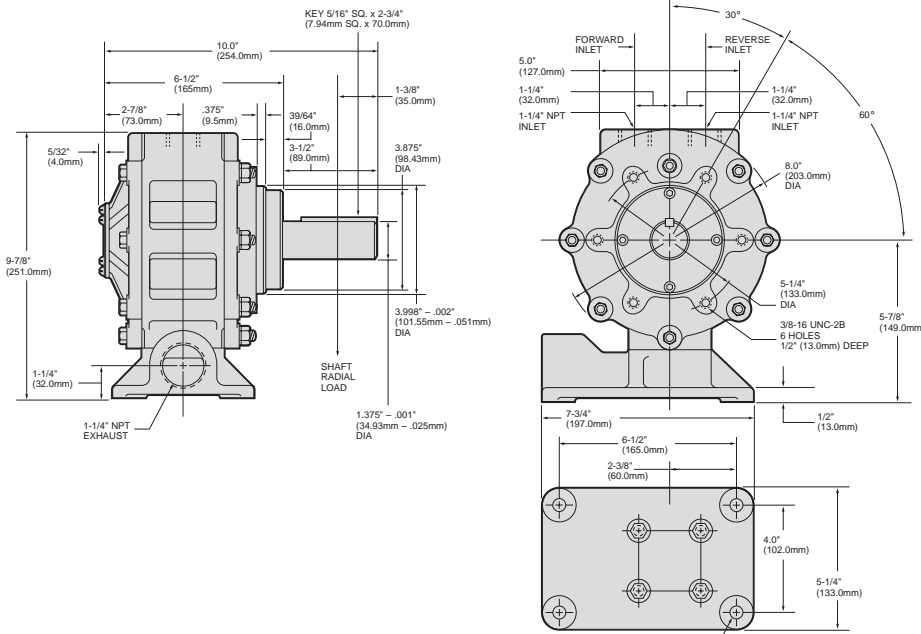
DIMENSIONS

Series	A		B		C	D		E		F DIA.	
	in	mm	in	mm	NPT	in	mm	in	mm	in	mm
MVA017	6 ¹¹ / ₁₆	170	7/8	22	3/8	1 ⁷ / ₈	48	2 ¹ / ₂	64	0.6250 0.6245	15.88 15.86
MVA034	8 ⁷ / ₁₆	214	1 ³ / ₁₆	30	1/2	1	51	2 ⁵ / ₈	67	0.8750 0.8745	22.23 22.21

SERIES MVA DIMENSIONS



MODEL MOV075AA DIMENSIONS



EQUIPMENT OPTIONS

Models	Furnished with Cataloged Models	Standard Options
MVA017A	Foot Mounting*	
MVA017B	NEMA C Face 56C Frame Size	MVA008-K4 Mounting Foot Kit
MVA034A	Foot Mounting**	MOV010AA-674 Muffler
MVA034B	NEMA C Face 182C Frame Size	MVA008-K4 Mounting Foot Kit MOV010AA-674 Muffler
MOV075AA	Foot/6 Hole Face Mounting	150BM-A674 Muffler

* Removal of Foot Mounting results in Motor having NEMA C Face Mounting, 56C Frame Size.

** Removal of Foot Mounting results in Motor having NEMA C Face Mounting, 182C Frame Size.

SERIES SELECT LUBE FREE MULTI-VANE AIR MOTOR

SPECIFICATIONS



Model	Max. Power		Speed at Max. Power*	Free Speed*	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
REVERSIBLE												
SM1AMA	0.33	0.25	7,600	15,200	0.29	0.39	0.38	0.52	17	0.5	1.5	0.7
SM1AMAL	0.33	0.25	7,600	15,200	0.29	0.39	0.38	0.52	17	0.5	1.5	0.7
SM1UPC	0.60	0.37	6,000	12,500	0.45	0.6	0.6	0.81	42	1.2	1.75	0.8
SM1UPCL	0.60	0.37	6,000	12,500	0.45	0.6	0.6	0.81	42	1.2	1.75	0.8
SM1UPCR	0.60	0.37	6,000	12,500	0.45	0.6	0.6	0.81	42	1.2	1.75	0.8
SM2AMAN	0.88	0.66	3,000	8,070	1.7	2.3	2.3	3.1	48	1.4	7.5	3.4
SM2AMC	0.88	0.66	3,000	8,070	1.7	2.3	2.3	3.1	48	1.4	7.5	3.4
SM4AMAN	1.5	1.1	3,000	7,900	2.6	3.5	4.1	5.6	67	1.9	8.25	3.7
SM4AMB	1.5	1.1	3,000	7,900	2.6	3.5	4.1	5.6	67	1.9	8.25	3.7
SM6AMA	3.6	2.7	3,000	7,900	5.3	7.2	8.7	11.8	120	3.5	16.25	7.4
SM6AMAN	3.6	2.7	3,000	7,900	5.3	7.2	8.7	11.8	120	3.4	16.25	7.4
SM8AMA	4.8	3.6	2,500	7,000	10	13.6	14	19	152	4.3	22.5	10.2
SM8AMAN	4.8	3.6	2,500	7,000	10	13.6	14	19	152	4.3	22.5	10.2

* Note: Maximum allowable rpm as shown on the power curve for each model.

MODEL DESIGNATION BREAKOUT

SM ↑ Select Series Air Motor	2AM ↑ Power Series	A ↑ Shaft/Interface	Rotation ↑	N ↑ Mounting
	1AM 1UP 2AM 4AM 6AM 8AM	A = Round shaft w/ square key (Round shaft on SM1AM series) B = Round shaft with Woodruff Key (#3) C = Round shaft with flat on the shaft	L = Left Hand Bias (CCW)* R = Right Hand Bias (CW) None = Reversible *when facing shaft	N = NEMA mount None = Face or Footmount (Footmount is an optional accessory)

EQUIPMENT OPTIONS

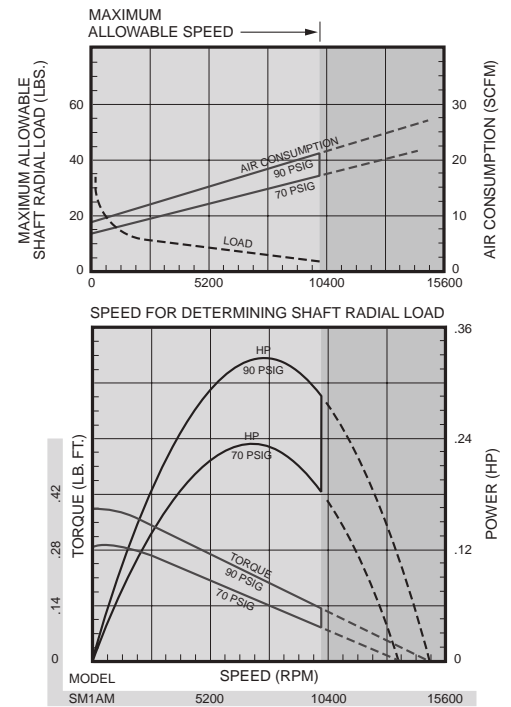
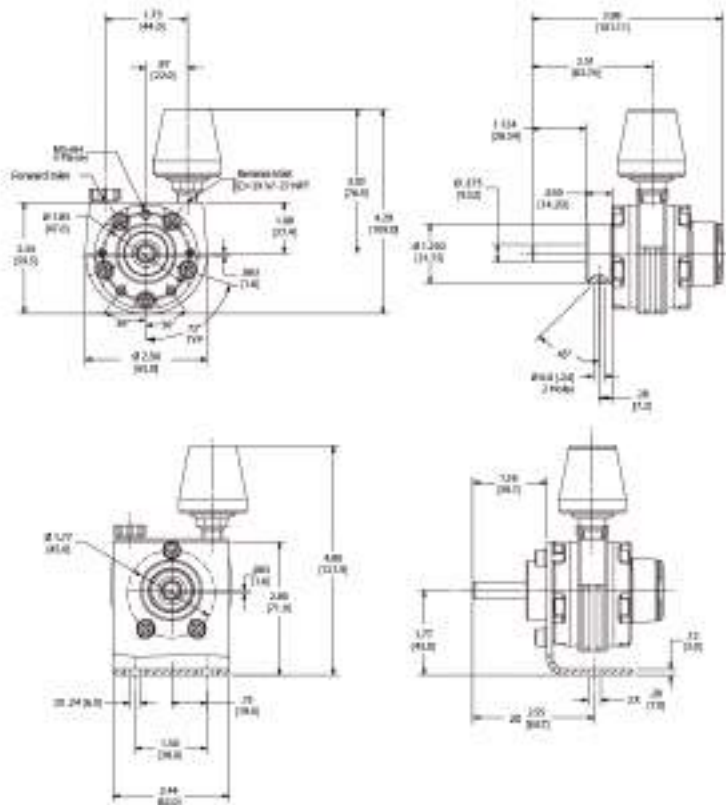
Series	Furnished with Cataloged Models	Optional Accessories
SM1AM	Hub Mounting Muffler	SM1AM-AG587 Footmount
SM1UP	Hub Mounting Muffler	SM1AM-AG587 Footmount
SM2AM	3 Hole Face Mounting Muffler NEMA 56C Flange with Model SM2AMAN	SM2AM-AH636 Footmount
SM4AM	3 Hole Face Mounting Muffler NEMA 56C Flange with Model SM4AMAN	SM4AM-AH634 Footmount
SM6AM	3 Hole Face Mounting Muffler NEMA 56C Flange with Model SM6AMAN	SM6AM-AH634 Footmount
SM8AM	4 Hole Face Mounting Muffler NEMA 182C Flange, 184C Flange Mount with Model SM8AMAN	SM8AM-AH640 Footmount

INTERCHANGE CHART

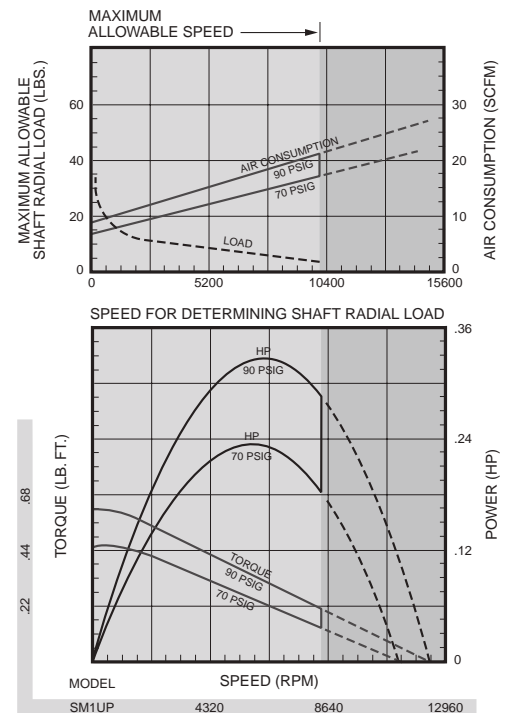
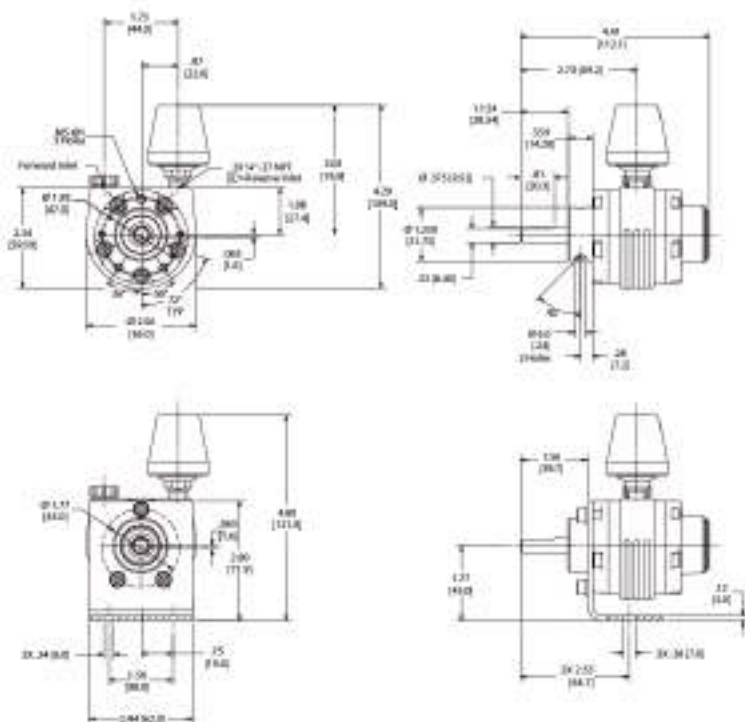
GAST Model Style	Rotation Bias	FENNER Model Style	IR SELECT Series Model (w/ Foot Bracket)	Max. Power (hp)	Max. Free Speed (rpm)	Mounting Style	
1AM-NCC-12	Left Hand (CCW)	V1X	SM1AMAL	0.33	15,200	Hub Mount	
1AM-NCW-14	Left Hand (CCW)		SM1AMA	0.33	15,200	Hub Mount	
1AM-NRV-39A	Reversible		SM1AMA	0.33	15,200	Hub Mount	
1AM-NRV-63A	Reversible		SM1AMA	0.33	15,200	Hub Mount	
1UP-NCC-1A	Left Hand (CCW)		SM1UPCL	0.60	12,500	Hub Mount	
1UP-NCW-2A	Left Hand (CCW)		SM1UPCR	0.60	12,500	Hub Mount	
1UP-NRV-3A	Reversible		SM1UPC	0.60	12,500	Hub Mount	
1UP-NRV-10	Reversible		SM1UPC	0.60	12,500	Hub Mount	
AG585	1AM Foot Mount Bracket			(SM1AM-AG587)			
2AM-NCC-16	Left Hand (CCW)		2VMX/CCW	SM2AMC	0.88	8,070	Hub or Face Mount
2AM-NCC-16F	Left Hand (CCW)		SM2AMC	0.88	8,070	Hub or Face Mount	
2AM-NCW-7A	Right Hand (CW)	2VMX/CW	SM2AMC	0.88	8,070	Hub or Face Mount	
2AM-NCW-7B	Right Hand (CW)		SM2AMC	0.88	8,070	Hub or Face Mount	
2AM-NRV-89	Reversible	VA2X	SM2AMC	0.88	8,070	Hub or Face Mount	
2AM-FCC-1	Left Hand (CCW)	2VMJ/CCW	SM2AMC (w/ SM2AM-AH636)	0.88	8,070	Foot Mount	
2AM-FCW-13	Right Hand (CW)	2VMJ/CW	SM2AMC (w/ SM2AM-AH636)	0.88	8,070	Foot Mount	
2AM-FRV-501	Reversible	VA2J	SM2AMC (w/ SM2AM-AH636)	0.88	8,070	Foot Mount	
2AM-NCC-43A	Left Hand (CCW)	2VMC/CCW	SM2AMAN	0.88	8,070	NEMA 56C Mount	
	Right Hand (CW)	2VMC/CW	SM2AMAN	0.88	8,070	NEMA 56C Mount	
2AM-NRV-90	Reversible	VA2C	SM2AMAN	0.88	8,070	NEMA 56C Mount	
	Left Hand (CCW)	4VMX/CCW	SM4AMB	1.5	7,900	Hub or Face Mount	
	Right Hand (CW)	4VMX/CCW	SM4AMB	1.5	7,900	Hub or Face Mount	
4AM-NRV-22B	Reversible	VA4X	SM4AMB	1.5	7,900	Hub or Face Mount	
4AM-NRV-22F	Reversible		SM4AMB	1.5	7,900	Hub or Face Mount	
4AM-NRV-54A	Reversible		SM4AMB	1.5	7,900	Hub or Face Mount	
	Left Hand (CCW)	4VMJ/CCW	SM4AMB (w/ SM4AM-AH634)	1.5	7,900	Foot Mount	
	Right Hand (CW)	4VMJ/CW	SM4AMB (w/ SM4AM-AH634)	1.5	7,900	Foot Mount	
4AM-FRV-13C	Foot Mount	VA4J	SM4AMB (w/ SM4AM-AH634)	1.5	7,900	Foot Mount	
4AM-FRV-13H	Foot Mount		SM4AMB (w/ SM4AM-AH634)	1.5	7,900	Foot Mount	
4AM-FRV-63A	Foot Mount		SM4AMB (w/ SM4AM-AH634)	1.5	7,900	Foot Mount	
	Left Hand (CCW)	4VMC/CCW	SM4AMAN	1.5	7,900	NEMA 56C Mount	
	Right Hand (CW)	4VMC/CW	SM4AMAN	1.5	7,900	NEMA 56C Mount	
4AM-NRV-50C	Reversible	VA4C	SM4AMAN	1.5	7,900	NEMA 56C Mount	
4AM-NRV-70C	Reversible		SM4AMAN	1.5	7,900	NEMA 56C Mount	
6AM-NRV-7A	Reversible	VA6X	SM6AMA	3.6	7,900	Face Mount	
6AM-FRV-5A	Reversible	VA6J	SM6AMA (w/ SM6AM-AH634)	3.6	7,900	Face Mount	
6AM-FRV-23A	Reversible		SM6AMA (w/ SM6AM-AH634)	3.6	7,900	Face Mount	
6AM-NRV-11A	Reversible	VA6C	SM6AMAN	3.6	7,900	NEMA 56C Mount	
6AM-NRV-22A	Reversible		SM6AMAN	3.6	7,900	NEMA 56C Mount	
8AM-NRV-5B	Reversible	VA8X	SM8AMA	4.8	7,000	Face Mount	
8AM-NRV-42A	Reversible		SM8AMA	4.8	7,000	Face Mount	
8AM-FRV-2B	Reversible	VA8J	SM8AMA (w/ SM8AM-AH640)	4.8	7,000	Foot Mount	
8AM-FRV-30A	Reversible		SM8AMA (w/ SM8AM-AH640)	4.8	7,000	Foot Mount	
8AM-NRV-28A	Reversible	VA8C	SM8AMAN	4.8	7,000	NEMA 145TC Mount	
8AM-NRV-32A	Reversible		SM8AMAN	4.8	7,000	NEMA 145TC Mount	

Note: All Select Series motors are provided in our Lube Free Four Vane design.

SM1AM AND SM1AM-AG587 LUBE FREE MULTI-VANE AIR MOTORS FOOTMOUNT DIMENSIONS

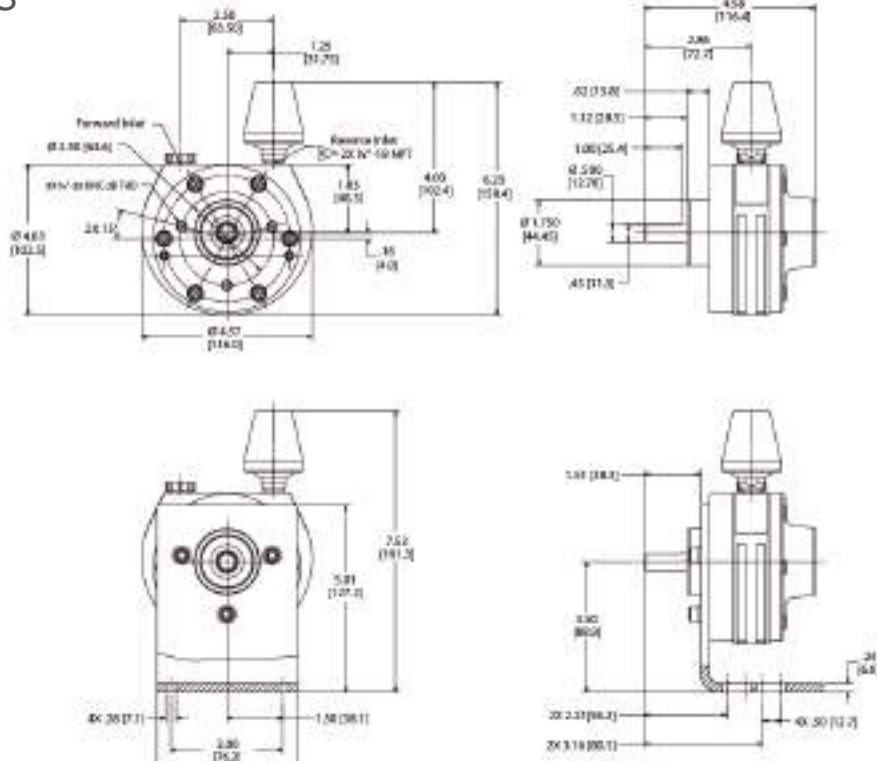


SM1UP AND SM1AM-AG587 LUBE FREE MULTI-VANE AIR MOTORS FOOTMOUNT DIMENSIONS



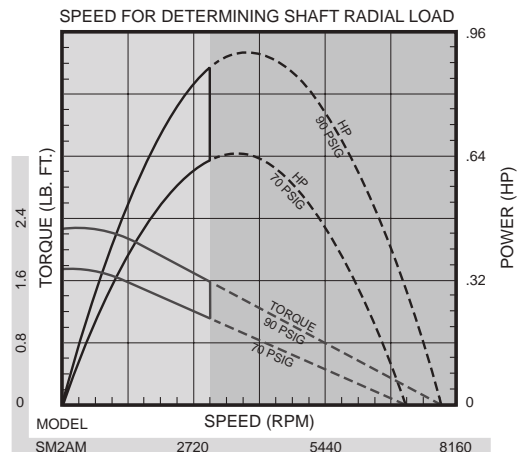
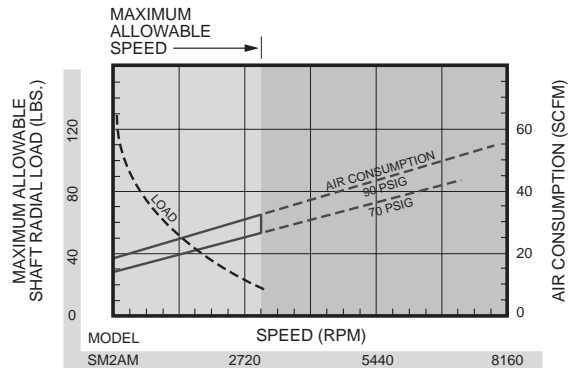
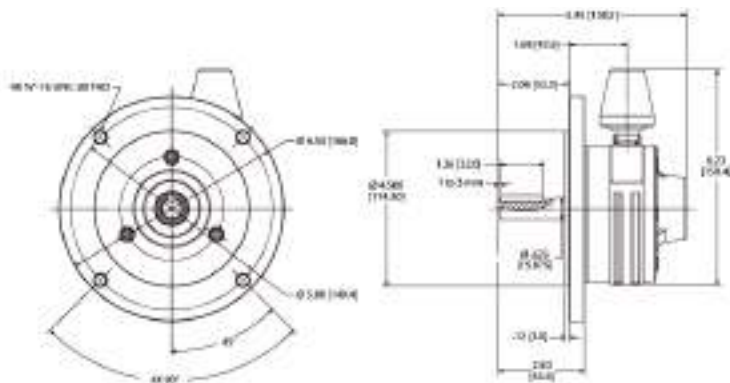
SM2AMC AND SM2AM-AH636 LUBE FREE MULTI-VANE AIR MOTORS FOOTMOUNT DIMENSIONS

DIMENSIONS



SM2AMAN LUBE FREE MULTI-VANE AIR MOTORS NEMA MOUNT DIMENSIONS

DIMENSIONS



ROTARY-VANE PNEUMATIC MILLING AND SAWING MOTORS



FIGURE 1

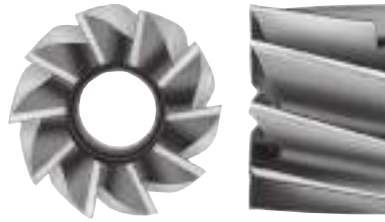


FIGURE 2



FIGURE 3



FIGURE 4



FIGURE 5



ARO milling and sawing motors have been used on such diverse applications as milling screw slots in molded fiberglass and straddle milling a 3/4" hex shape on round bar stock. For cost reduction in secondary machining, it is feasible to install a mill motor on the cross-slide of a machine to mill or spotface a slot or diameter on the outside diameter of a workpiece. ARO's mill motor range covers the majority of primary and secondary machining applications. Industrial milling cutters are available in a wide variety of kinds, sizes and shapes for specific applications. Certain basic types are normally used with ARO milling motors.

1. End Mills. These are designed for milling slots, keyways and pockets where arbor-type cutters cannot be applied. The cutting edges, as the name implies, are at the end of the mill rather than on the circumference.
2. Shell End Mills. Similar in application to standard end mills, except that they are mounted to an arbor and used whenever the diameter of a standard end mill is too small for the application.
3. Woodruff Keyslot Cutters. Used for cutting keyslots in arbors or shafts for standard Woodruff keys. Available in arbor-type or shank-type.
4. Plain Metal-Slitting Saws. These cutters are designed with teeth around the entire circumference. Sides are concave to provide clearance in cutoff operations and for slotting heads of screws and shafts.
5. Side Milling Cutters. Used for milling plain and flat surfaces.

Proper motor selection should be governed by the fact that motor load speed, or the point at which peak horsepower is reached, occurs at approximately one-half the catalogued free speed. Feed rate should be controlled to load the motor to peak horsepower for maximum efficiency. The load-speed column on each catalog page should be used for motor selection. Feed rate and cutting speed will determine the amount of horsepower required for a specific application.

Three factors determine correct milling motor selection:

1. Horsepower-Formula given below.
2. RPM-Refer to chart for correct speed according to type of material.
3. Feed rate on face mills, or per-tooth rate on slotting, side mills or end mills.

FORMULA FOR MODEL SELECTION

$$HP = \frac{\text{Width of cut} \times \text{depth of cut} \times \text{feed rate per min.}}{K \text{ factor}}$$

$$F, \text{ feed rate} = \frac{f, \text{ feed per tooth} \times t, \text{ number of teeth} \times n, \text{ RPM of cutter. Alternately, see reference chart.}}{RPM \text{ of cutter. Alternately, see reference chart.}}$$

$$RPM = \frac{4 \times \text{SFM or surface feet per minute}}{D, \text{ diameter of cutter in inches}}$$

K FACTORS FOR COMMON MATERIALS

Material	K	Material	K	Material	K	Material	K	
Magnesium	4.0	CAST IRON	1.5	To 400	0.5	220,000-260,000 p.s.i.	0.4	
Aluminum	4.0			To 500	0.4	260,000-300,000 p.s.i.	0.3	
Copper	2.0			STAINLESS STEEL	1.0	HIGH TEMPERATURE ALLOYS	0.4	Nickel Base Cobalt Base Austenitic
Brass	2.5							
Bronze	2.0			STEEL	0.8			
Malleable Iron	1.0	To 150	1.0					
		To 300	0.8					

REFERENCE CHART

Work Material	Hardness BHN	Speed R.P.M.	Feed Per Tooth		Work Material	Hardness BHN	Speed R.P.M.	Feed Per Tooth			
			Feed Per Minute Face Mills	Slotting & Side Mills				End Mills	Feed Per Minute Face Mills	Slotting & Side Mills	End Mills
Free Machining Steels, Plain Carbon, Alloy Steels, Series 400 & 500 Stainless	150-250	500-900	0.010-0.014	0.008-0.010	Magnesium Alloys	-	900-1,600	0.012-0.018	0.010-0.014	0.003-0.005	
	200	450-800	0.010-0.014	0.008-0.010							Aluminum Alloys
	250	400-700	0.008-0.010	0.006-0.008	Titanium Pure	100-275	250-350	0.004-0.006	0.004-0.006	0.002-0.003	
	300	350-600	0.008-0.010	0.006-0.008							Copper Alloys
400 & 500	300-450	300-450	0.006-0.008	0.004-0.006	0.001-0.003	0.001-0.003	0.010-0.012	0.008-0.010	0.003-0.004		
Series 200-300 Stainless Sheets	150-250	250-450	0.006-0.010	0.006-0.008	0.001-0.003	0.001-0.003	0.007-0.010	0.005-0.008	0.001-0.003	0.001-0.003	
Hot Work Tool Steels	150-250	350-450	0.010-0.012	0.006-0.010	0.001-0.003	Zinc Alloys	Cast	800-1,100	0.006-0.009	0.005-0.008	0.002-0.003
	200-250	250-350	0.008-0.010	0.005-0.008	0.001-0.002						
Cold Work Tool Steels	200-250	250-350	0.007-0.010	0.005-0.008	0.001-0.003	Brass & Bronze	To 200	600-900	0.010-0.012	0.008-0.010	0.003-0.004
High-Manganese Steel	170-220	100-200	0.007-0.010	0.005-0.008	0.002-0.003	Thermoplastics	-	500-1,100	0.006-0.010	0.005-0.008	0.003-0.005
Gray Cast Iron	110-220	300-400	0.012-0.016	0.008-0.012	0.002-0.004	Thermoplastics	-	500-1,100	0.006-0.010	0.005-0.008	0.003-0.005
	220-320	125-250	0.008-0.012	0.006-0.010	0.002-0.003						
Nodular Iron	140-250	325-450	0.012-0.016	0.008-0.012	0.002-0.004	Thermoplastics	-	500-1,100	0.006-0.010	0.005-0.008	0.003-0.005
	250-400	225-300	0.008-0.012	0.006-0.010	0.002-0.003	Plastics	-	500-1,100	0.006-0.010	0.005-0.008	0.003-0.005
Malleable Iron	110-220	250-350	0.012-0.016	0.008-0.012	0.002-0.004						
	200-280	200-300	0.008-0.012	0.006-0.010	0.002-0.003						

000-SERIES FORWARD-ROTATION MILLING MOTORS (1/4" CAPACITY) SPECIFICATIONS



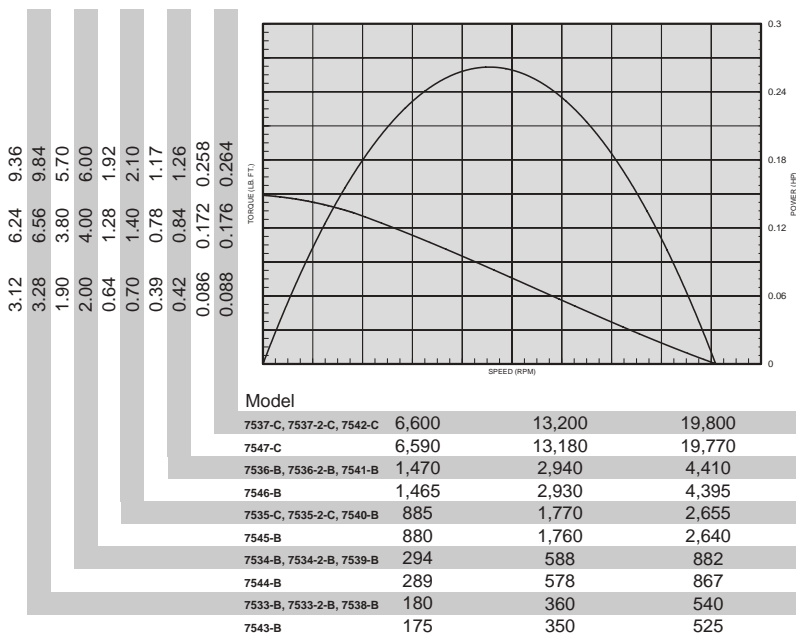
Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		lbs	kg	
				lb-ft	Nm	lb-ft	Nm			dB(A)			

NON-REVERSIBLE - 0.25 HP

7533-2-B	1/4" Maximum Collet Capacity	550	325	8.2	10.6	4.0	5.1	18.1	8.5	75	2.07	0.93	Double
7534-2-B		900	550	5.0	6.4	2.4	3.2	18.1	8.5	75	2.07	0.93	Double
7535-2-B		2,700	1,600	1.75	2.2	0.82	1.1	18.1	8.5	75	1.77	0.80	Single
7536-2-B		4,500	2,700	1.05	1.3	0.49	0.60	18.1	8.5	75	1.77	0.80	Single
7537-2-B		20,000	12,000	0.22	0.30	0.11	0.10	18.1	8.5	75	1.77	0.80	Single

Collet Insert No.	Size	Minimum Capacity		Maximum Capacity	
		in	mm	in	mm
31812-1	3/64"	1/64"	0.40	3/64"	1.19
31812-2	5/64"	3/64"	1.19	5/64"	1.98
31812-3	3/32"	1/16"	1.59	3/32"	2.38
31812-4	1/8"	3/32"	2.38	1/8"	3.18
31812-5	5/32"	1/8"	3.18	5/32"	3.97
31812-6	3/16"	5/32"	3.97	3/16"	4.76
31812-7	7/32"	3/16"	4.76	7/32"	5.56
31812-8	1/4"	7/32"	5.56	1/4"	6.35

APPROX. TOOLING PENETRATION - 1/8" (28.6 MM)

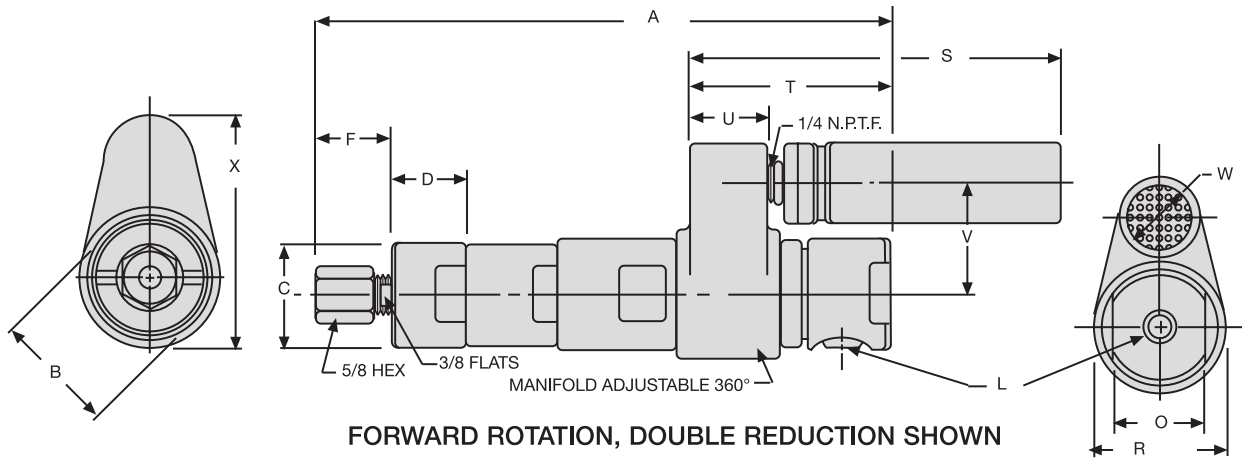


STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, muffler, integral collet spindle with 31812-8 1/4" capacity collet for end mills and Woodruff key slot cutters, duplex bearing on drive spindle for maximum radial support.

000-SERIES MILLING MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



Models	Gear Reduction	Dimension A
7535-2-C 7536-2-B 7537-2-C	Single	5 ¹⁵ / ₁₆ 151 mm
7533-2-B 7534-2-B	Double	7 178 mm

Scale	B	C	D	F	L	O	R
in	1 ³ / ₈	1.311 1.312	0.870 0.890	5/16 (Approx.)	1/8 NPTF Air Inlet	1 ¹ / ₈	1 ⁵ / ₈
mm	35	33.30 33.32	22.10 22.61	24 (Approx.)		28	41

Scale	S	T	U	V	W	X
in	4 ⁹ / ₁₆	2 ¹⁵ / ₃₂	31/32	1 ³ / ₈	1	2 ¹¹ / ₁₆
mm	116	63	25	35	25	68

0-SERIES FORWARD-ROTATION MILLING MOTORS

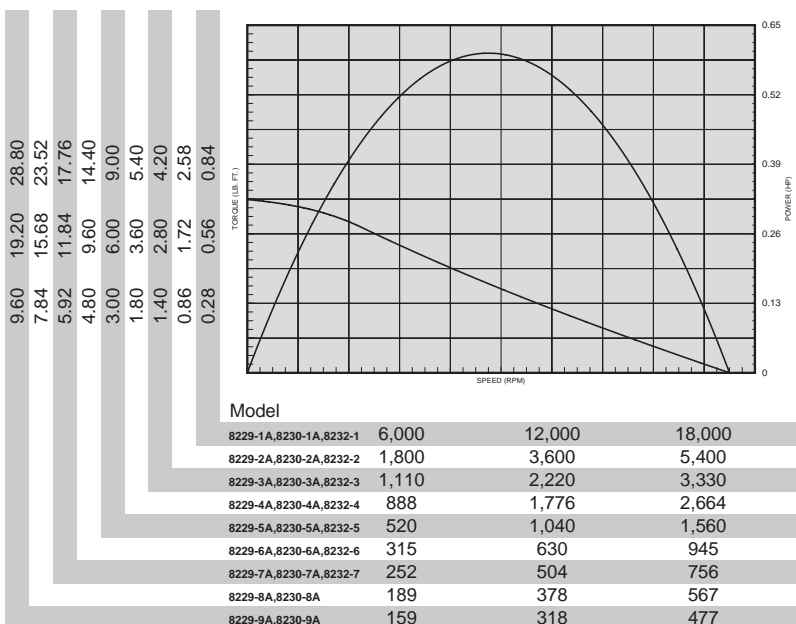
SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		dB(A)	lbs	
				lb-ft	Nm	lb-ft	Nm						
NON-REVERSIBLE - 0.60 HP													
8232-1	1/4" Maximum Collet Capacity	19,000	9,800	0.70	0.9	0.32	0.4	41.0	19.4	80	2.87	1.29	Single
8232-2		5,700	2,900	2.15	2.9	1.10	1.5	41.0	19.4	80	2.87	1.29	Single
8232-3		3,500	1,750	3.50	4.7	1.80	2.4	41.0	19.4	80	2.87	1.29	Single
8232-4		2,800	1,400	4.50	6.1	2.20	3.0	41.0	19.4	80	2.87	1.29	Single
8232-5		1,650	840	7.50	10.2	3.80	5.1	41.0	19.4	80	3.62	1.63	Double
8232-6		1,000	500	12.00	16.3	6.20	8.4	41.0	19.4	80	3.62	1.63	Double
8232-7		800	390	14.80	20.0	8.00	10.8	41.0	19.4	80	3.62	1.63	Double

Collet Insert No.	Size	Minimum Capacity		Maximum Capacity	
		in	mm	in	mm
31812-1	3/64"	1/64"	0.40	3/64"	1.19
31812-2	5/64"	3/64"	1.19	5/64"	1.98
31812-3	3/32"	1/16"	1.59	3/32"	2.38
31812-4	1/8"	3/32"	2.38	1/8"	3.18
31812-5	5/32"	1/8"	3.18	3/64"	3.97
31812-6	3/16"	5/32"	3.97	3/16"	4.76
31812-7	7/32"	3/16"	4.76	7/32"	5.56
31812-8	1/4"	7/32"	5.56	1/4"	6.35

APPROX. TOOLING PENETRATION - 1 1/4" (31.8 MM)

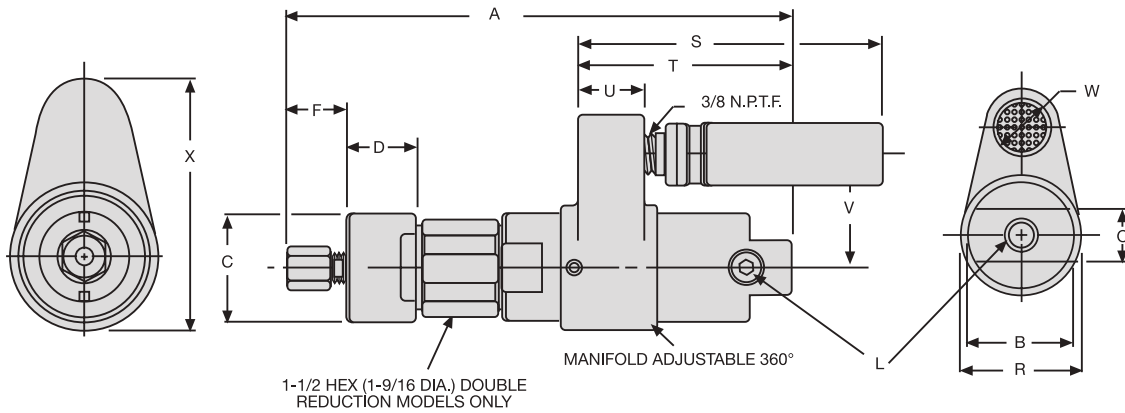


STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, muffler, integral collet spindle with 31812-8 1/4" capacity collet for end mills and Woodruff key slot cutters, duplex bearing on drive spindle for maximum radial support.

0-SERIES MILLING MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



FORWARD ROTATION, DOUBLE REDUCTION SHOWN

Models	Gear Reduction	Dimension A
8232-()	Single	$6\frac{7}{8}$ 175 mm
	Double	$8\frac{3}{16}$ 208 mm

Scale	B	C	D	F	L	O	R
in	$1\frac{3}{4}$	1.740 1.739	$1\frac{5}{32}$	$15\frac{15}{16}$ (Approx.)	1/4 NPTF Air Inlet	7/8	2
mm	44	44.20 44.17	29	24 (Approx.)		22	51

Scale	S	T	U	V	W	X
in	$4\frac{7}{8}$	$3\frac{13}{32}$	$1\frac{1}{16}$	$1\frac{13}{16}$	1	$3\frac{7}{16}$
mm	124	86	27	46	25	87

2200-SERIES FORWARD-ROTATION MILLING MOTORS SPECIFICATIONS

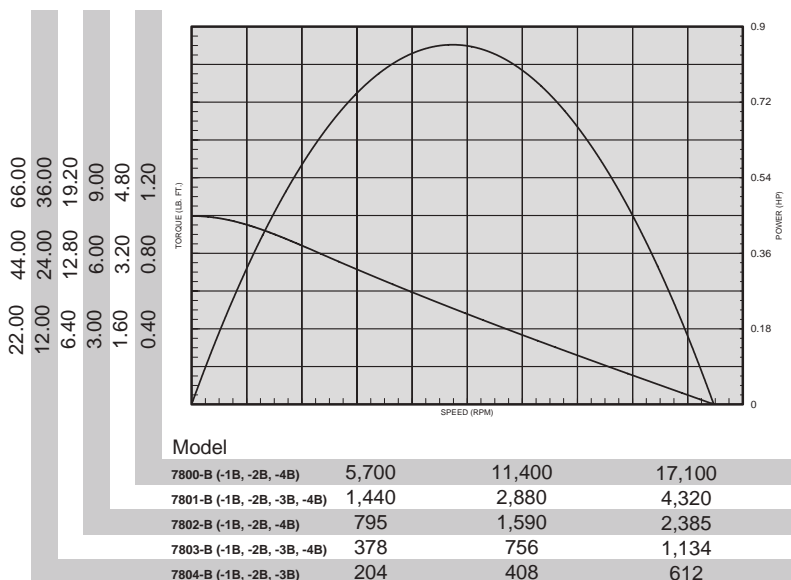


Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		lbs	kg	
				lb-ft	Nm	lb-ft	Nm						
NON-REVERSIBLE - 0.85 HP													
7800-2B	3/8" Maximum Collet Capacity	18,000	9,000	1.00	1.4	0.50	0.68	41.7	19.7	78	4.89	2.20	Single
7801-2B		4,600	2,400	4.00	5.5	1.86	2.5	41.7	19.7	78	4.89	2.20	Single
7802-2B		2,500	1,300	7.50	10.3	3.43	4.7	41.7	19.7	78	4.89	2.20	Single
7803-2B		1,200	600	16.00	21.9	7.44	10.2	41.7	19.7	78	6.39	2.86	Double
7804-2B		650	320	30.00	41.2	13.95	19.1	41.7	19.7	78	6.39	2.86	Double

COLLET SLEEVES

Collet Insert No.	Size	Minimum Capacity		Maximum Capacity	
		in	mm	in	mm
32968-1	1/8"	3/32"	2.38	1/8"	3.18
32968-2	5/32"	1/8"	3.18	5/32"	3.97
32968-3	3/16"	5/32"	3.97	3/16"	4.76
32968-4	7/32"	3/16"	4.76	7/32"	5.56
32968-5	1/4"	7/32"	5.56	1/4"	6.35
32968-6	9/32"	1/4"	6.35	9/32"	7.14
32968-7	5/16"	9/32"	7.14	5/16"	7.94
32968-8	11/32"	5/16"	7.94	11/32"	8.73
32968-9	3/8"	11/32"	8.73	3/8"	9.53

APPROX. TOOLING PENETRATION - 2" (51 MM)

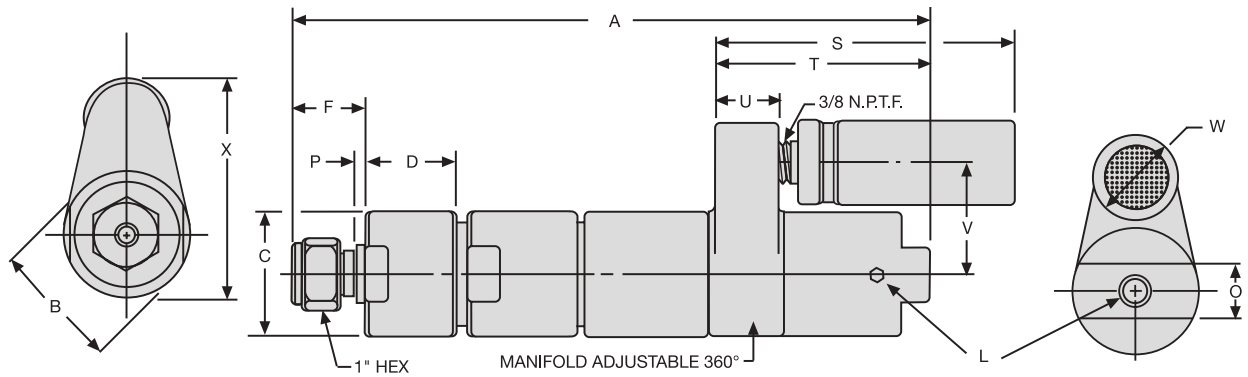


STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, muffler, integral collet spindle with 32968-9 3/8" capacity collet for end mills and Woodruff key slot cutters, duplex bearing support on drive spindle for maximum radial support.

2200-SERIES MILLING MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



FORWARD ROTATION, DOUBLE REDUCTION SHOWN

Models	Gear Reduction	Dimension A
7800-2B 7801-2B 7802-2B	Single	8 ¹¹ / ₃₂ 212 mm
7803-2B 7804-2B 7805-2B	Double	10 ¹ / ₁₆ 255 mm

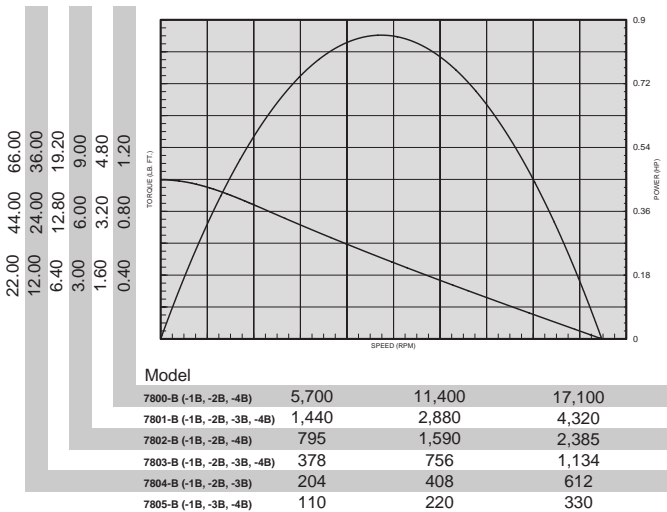
Scale	B	C	D	F	L	O	P
in	2	2.001 2.000	1.422 1.452	1 ⁵ / ₃₂ (Approx.)	1/4 NPTF Air Inlet	7/8	0.097 0.157
mm	51	50.80 50.83	36.12 36.88	29 (Approx.)		22	2.46 3.99

Scale	S	T	U	V	W	X
in	4 ⁷ / ₈	3 ¹ / ₂	1 ¹ / ₁₆	1 ¹³ / ₁₆	1 ³ / ₈	3 ¹ / ₂
mm	124	89	27	46	35	89

2200-SERIES FORWARD-ROTATION STRADDLE MOUNT MILLING MOTORS SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall	Output at Max. Hp		SCFM	L/s	lbs		kg		
					lb-ft	Nm				lb-ft		Nm	
NON-REVERSIBLE - 0.85 HP													
7801-3B	7/16"-20 UNF-3A Threaded, Plus 1/8" Sq. Key Drive	4,600	2,400	4.00	5.5	1.86	2.5	41.7	19.7	78	4.89	2.20	Single
7803-3B		1,200	600	16.00	21.9	7.44	10.2	41.7	19.7	78	6.39	2.86	Double
7804-3B		650	330	30.00	41.2	13.95	19.1	41.7	19.7	78	6.39	2.86	Double
7805-3B		350	170	55.00	75.5	26.25	36.0	41.7	19.7	78	6.39	2.86	Double



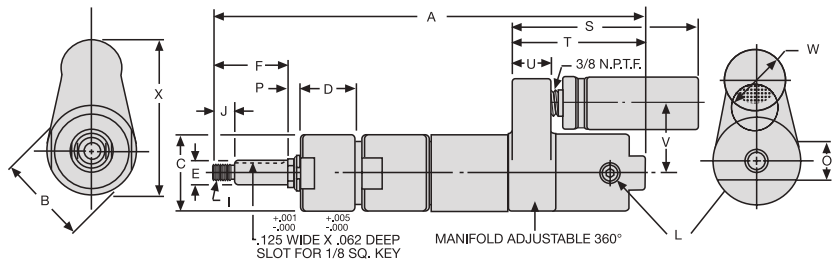
STANDARD EQUIPMENT

Keyed and threaded spindle for shell end mills, metal-slitting saws and side-mill cutters, duplex bearing on drive spindle to provide maximum radial support. Also steel motor housing, flush-type grease fittings, exhaust manifold and muffler.

Note: Key not furnished.

2200-SERIES AND MOUNTING ACCESSORY DIMENSIONS

Models	Gear Reduction	Dimension A
7800-3B 7801-3B 7802-3B	Single	9 1/2 241 mm
7803-3B 7804-3B 7805-3B	Double	11 9/32 286 mm

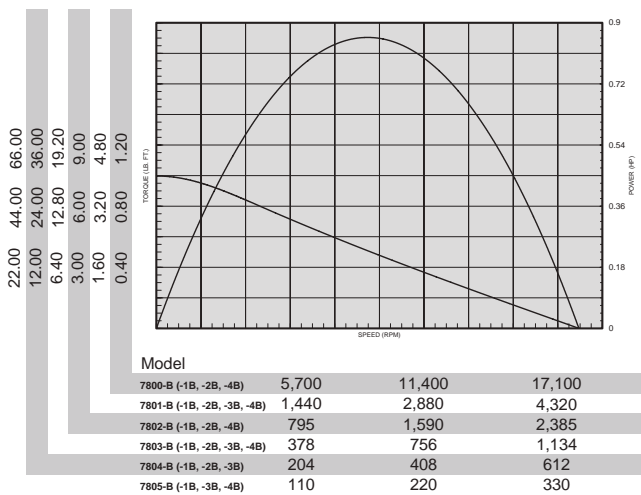


FORWARD ROTATION, DOUBLE REDUCTION SHOWN

Scale	B	C	D	E	F	I	J	L
in	2	2.000 2.001	1.422 1.452	0.6240 0.6245	1.932 1.942	7/16-20 UNF-3A Thread	0.552 0.557	1/4 NPTF Air Inlet
mm	51	50.80 50.83	36.12 36.88	15.85 15.86	49.07 49.33		14.02 14.53	
Scale	O	P	S	T	U	V	W	X
in	7/8	0.270 0.380	4 7/8	3 1/2	1 1/16	1 13/16	1 3/8	3 1/2
mm	22	6.86 9.65	124	89	27	46	35	89

2200-SERIES FORWARD-ROTATION SIDE MOUNT MILLING MOTORS SPECIFICATIONS

Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed dB(A)	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		lbs	kg	
				lb-ft	Nm	lb-ft	Nm						
NON-REVERSIBLE - 0.85 HP													
7800-4B	3/8" Maximum Collet Capacity	18,000	9,000	1.00	1.4	0.50	0.68	41.7	19.7	78	4.89	2.20	Single
7801-4B		4,600	2,400	4.00	5.5	1.86	2.5	41.7	19.7	78	4.89	2.20	Single
7802-4B		2,500	1,300	7.50	10.3	3.43	4.7	41.7	19.7	78	4.89	2.20	Single
7803-4B		1,200	600	16.00	21.9	7.44	10.2	41.7	19.7	78	6.39	2.86	Double
7805-4B		350	170	55.00	75.5	26.25	36.0	41.7	19.7	78	6.39	2.86	Double



STANDARD EQUIPMENT

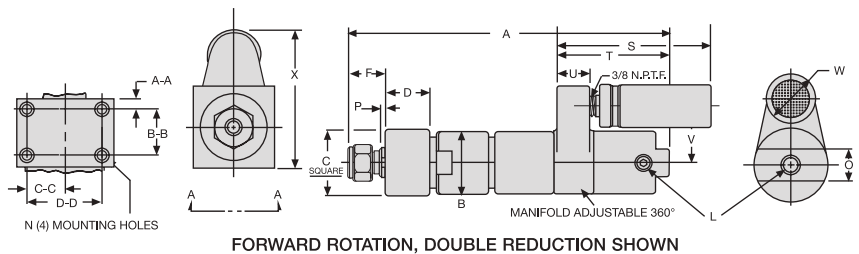
Integral collet spindle and mounting head with 4 tapped holes for close-quarter mounting. Other standard equipment same as for motors on page 68.

EQUIPMENT OPTIONS

For filter-regulator-lubricator, see listing on page 92.

2200-SERIES AND MOUNTING ACCESSORY DIMENSIONS

Models	Gear Reduction	Dimension A
7800-4B 7801-4B 7802-4B	Single	8 ³ / ₈ 213 mm
7803-4B 7804-4B 7805-4B	Double	10 ³ / ₁₆ 259 mm



Scale	B	C	D	F	L	N	O	P	S
in	2	2.115 2.135	1.422 1.452	1 ⁵ / ₃₂ (Approx.)	1/4 NPTF Air Inlet	1/4-28 UNF-2B Thread 3/8" Deep	7/8	0.097 0.157	4 ⁷ / ₈
mm	51	53.72 54.23	36.12 36.88	29 (Approx.)			22	2.46 3.99	124
Scale	T	U	V	W	X	A-A	B-B	C-C	D-D
in	3 ¹ / ₂	1 ¹ / ₁₆	1 ¹³ / ₁₆	1 ³ / ₈	3 ⁹ / ₁₆	0.213 0.223	1.000 1.005	0.807 0.817	1.62 1.63
mm	89	27	46	35	90	5.41 5.66	25.40 25.53	20.50 20.75	41.15 41.40

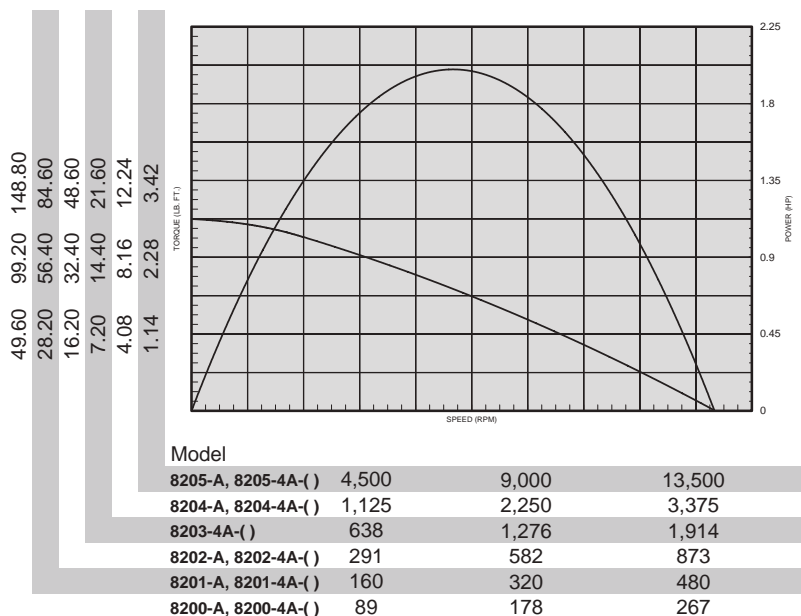
44-SERIES FORWARD-ROTATION MILLING MOTORS SPECIFICATIONS



Model	Spindle	R.P.M.		Torque				Air Consumption at Free Speed		Sound Level at Free Speed	Weight		Gear Reduction
		Free Speed	Load Speed at Max. Hp	Stall		Output at Max. Hp		SCFM	L/s		lbs	kg	
		lb-ft	Nm	lb-ft	Nm	SCFM	L/s	dB(A)					
NON-REVERSIBLE - 2.0 HP													
8200-4A	3/4" Maximum Collet Capacity	275	140	124.00	168.0	75.00	101.6	95.0	44.8	80	18.24	8.20	Double
8201-4A		500	255	70.50	95.5	41.00	55.5	95.0	44.8	80	18.24	8.20	Double
8202-4A		900	445	40.50	54.9	24.00	32.5	95.0	44.8	80	18.24	8.20	Double
8203-4A		2,000	1,050	18.00	24.4	10.00	13.5	95.0	44.8	80	13.82	5.21	Single
8204-4A		3,500	1,740	10.20	13.8	6.00	8.1	95.0	44.8	80	13.82	5.21	Single
8205-4A		14,000	7,000	2.85	3.9	1.50	2.0	95.0	44.8	80	13.82	5.21	Single

Collet Insert No.	Dash No.	Size	Minimum Capacity		Maximum Capacity		Collet Insert No.	Dash No.	Size	Minimum Capacity		Maximum Capacity	
			in	mm	in	mm				in	mm	in	mm
35264-1	-A	1/4"	0.2187	5.56	0.2500	6.35	35264-10	-K	17/32"	0.5000	12.70	0.5312	13.49
35264-2	-B	9/32"	0.2500	6.35	0.2812	7.14	35264-11	-L	9/16"	0.5312	13.49	0.5625	14.29
35264-3	-C	5/16"	0.2812	7.14	0.3125	7.94	35264-12	-M	19/32"	0.5625	14.29	0.5937	15.08
35264-4	-D	11/32"	0.3125	7.94	0.3437	8.73	35264-13	-N	5/8"	0.5937	15.08	0.6250	15.88
35264-5	-E	3/8"	0.3437	8.73	0.3750	9.53	35264-14	-P	21/32"	0.6250	15.88	0.6562	16.67
35264-6	-F	13/32"	0.3750	9.53	0.4062	10.32	35264-15	-Q	11/16"	0.6562	16.67	0.6875	17.46
35264-7	-G	7/16"	0.4062	10.32	0.4375	11.11	35264-16	-R	23/32"	0.6875	17.46	0.7187	18.26
35264-8	-H	15/32"	0.4375	11.11	0.4687	11.91	35264-17	-S	3/4"	0.7187	18.26	0.7500	19.05
35264-9	-J	1/2"	0.4687	11.91	0.5000	12.70							

APPROX. TOOLING PENETRATION - 2⁷/₁₆" (62 MM)

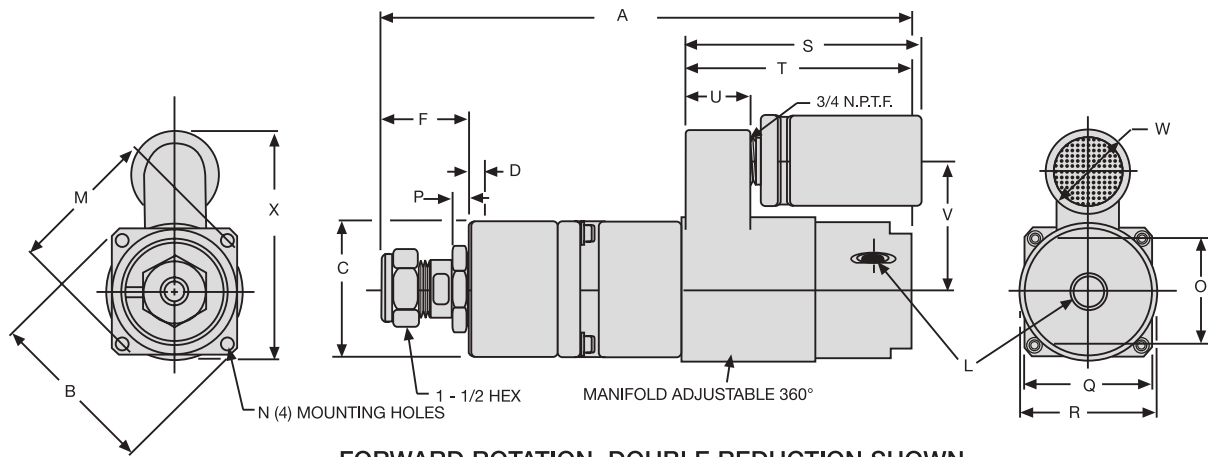


STANDARD EQUIPMENT

Steel motor housing, flush-type grease fittings at rotation points for gear and bearing lubrication, exhaust manifold rotatable within 360°, muffler, integral collet spindle with 35264-17 3/4" capacity for end mills and Woodruff key slot cutters, duplex bearing on drivespindle for maximum radial support.

44-SERIES MILLING MOTORS AND MOUNTING ACCESSORIES

DIMENSIONS



FORWARD ROTATION, DOUBLE REDUCTION SHOWN

Models	Gear Reduction	Dimension A
8203-4A 8204-4A 8205-4A	Single	11 ¹¹ / ₁₆ 297 mm
8200-4A 8201-4A 8202-4A	Double	14 ¹ / ₂ 368 mm

Scale	B	C	D	F	L	M	N	O	P
in	4.090 4.110	2.996 2.998	0.302 0.322	1 ¹⁵ / ₁₆ (Approx.)	3/8 NPTF Air Inlet	3.498 3.502	5/16-24 UNF-2B Thread	2 ¹ / ₂ 63	0.335 0.364
mm	103.89 104.39	76.10 76.15	7.67 8.18	49 (Approx.)		86.56 88.95			8.51 9.25

Scale	Q	R	S	T	U	V	W	X
in	3	3 ³ / ₁₆	5 ³ / ₁₆	5	1 ⁷ / ₁₆	2 ²⁷ / ₃₂	2	5 ⁷ / ₁₆
mm	76	81	132	127	36	72	51	138

SPECIALLY GOVERNED MOTORS

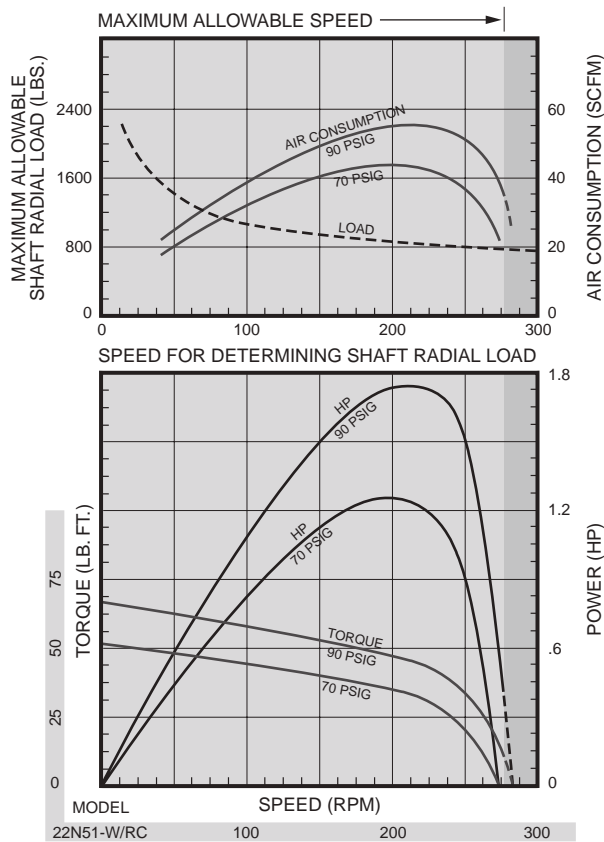
MODEL 22N51-W/RC MULTI-VANE AIR MOTORS SPECIFICATIONS



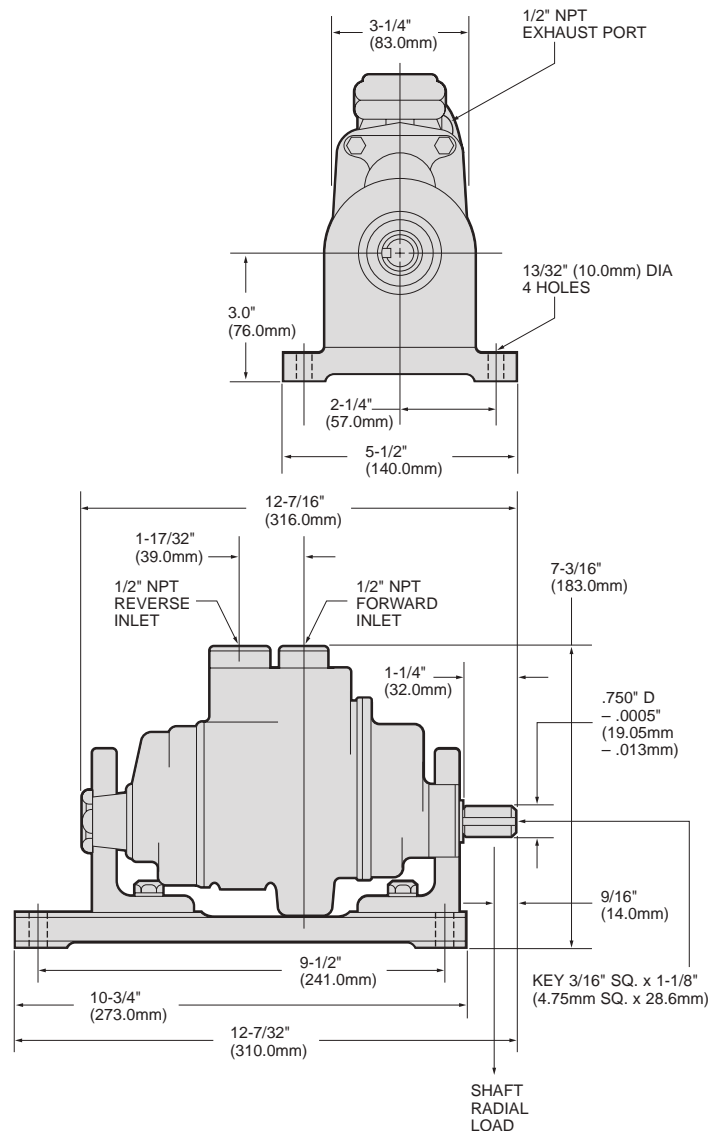
Model	Max. Power		Speed at Max. Power	Free Speed	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
REVERSIBLE												
22N51-W/RC	1.75	1.31	208	280	49	66.4	66	89.5	55	1.6	21	9.5

Performance figures are at 90 psig (620 kPa) air pressure.

SPECIFICATIONS



DIMENSIONS



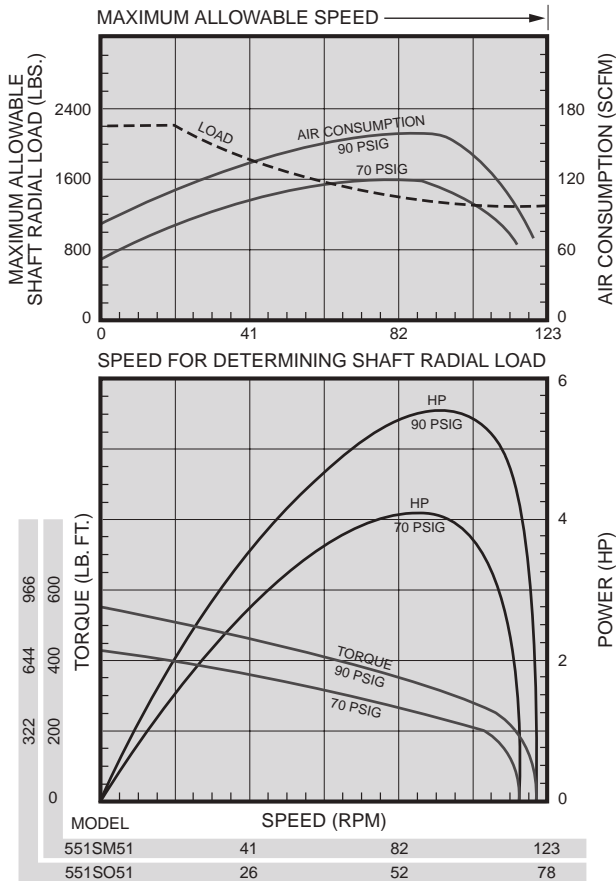
SERIES 551 MULTI-VANE AIR MOTORS

SPECIFICATIONS

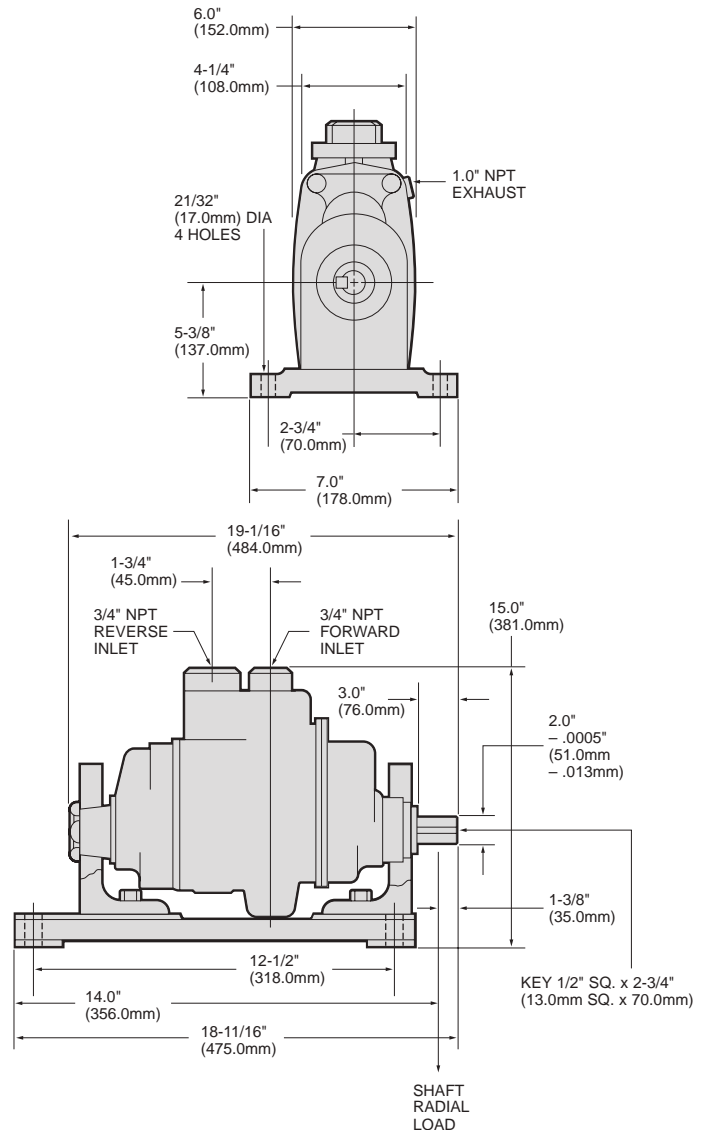
Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
REVERSIBLE												
551SM51-W/RC	5.6	4.18	95	120	400	542	545	739	160	4.53	93	42.2
551SO51-W/RC	5.6	4.18	59	77	650	881	885	1,200	160	4.53	93	42.2

▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.

SPECIFICATIONS



DIMENSIONS

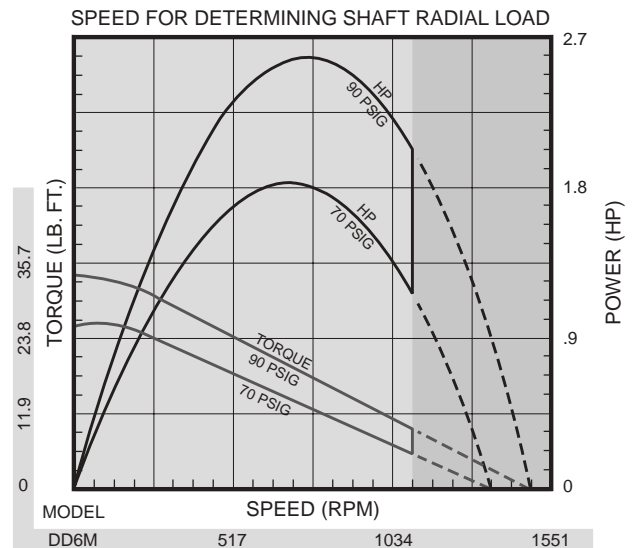
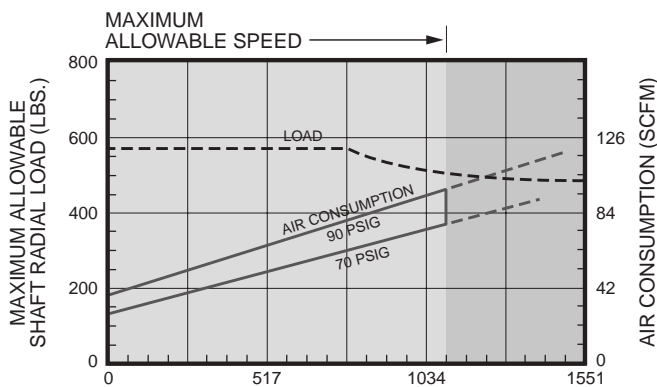


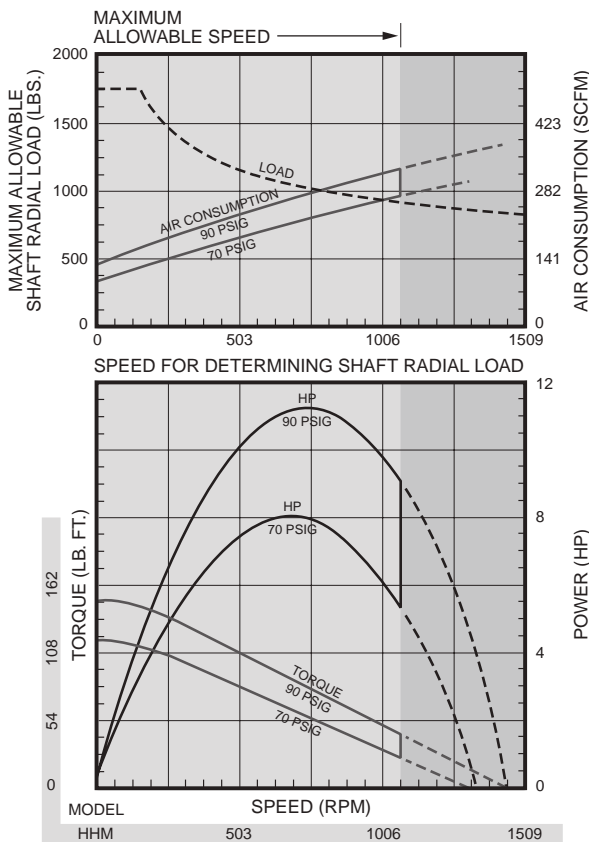
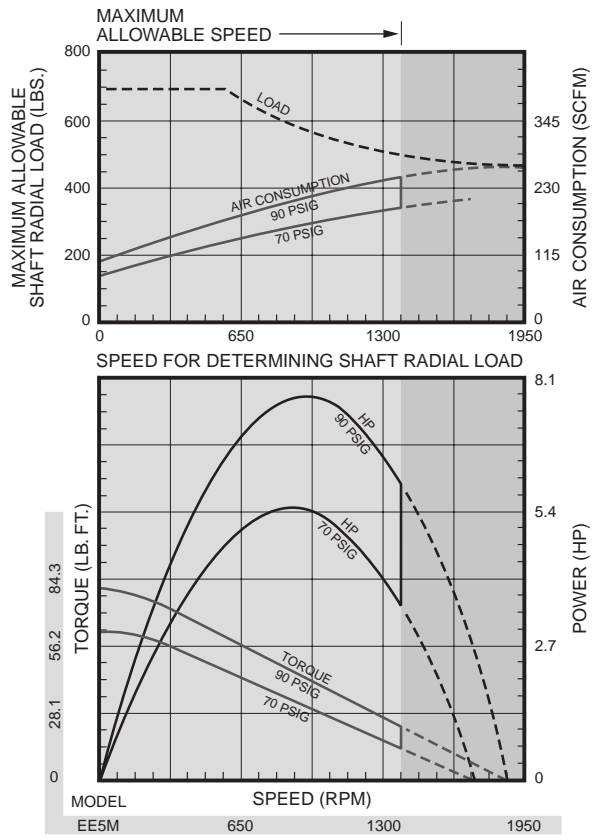
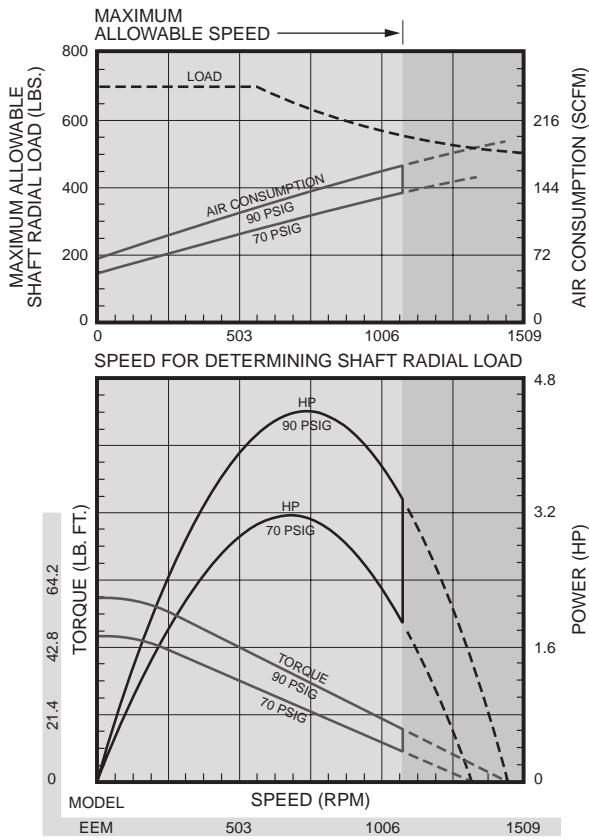
DIRECT AND GEARED DRIVE PISTON AIR MOTORS

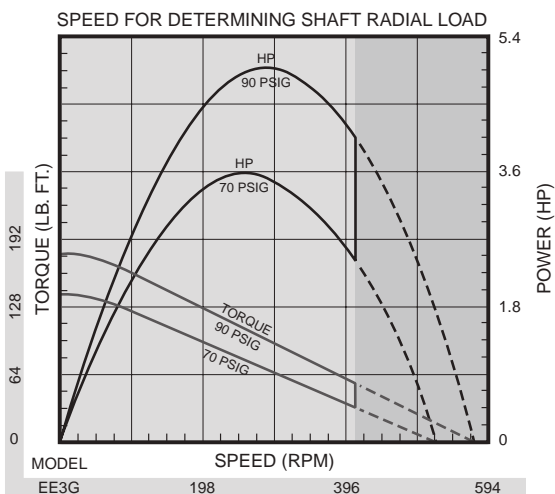
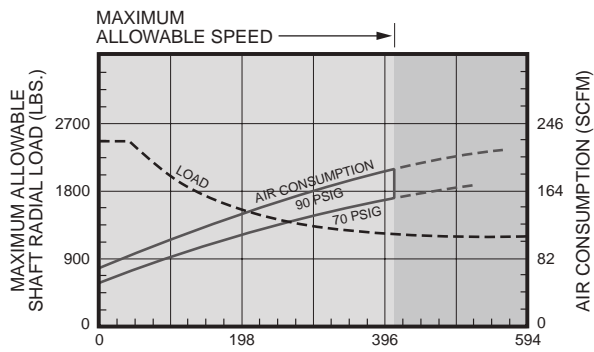
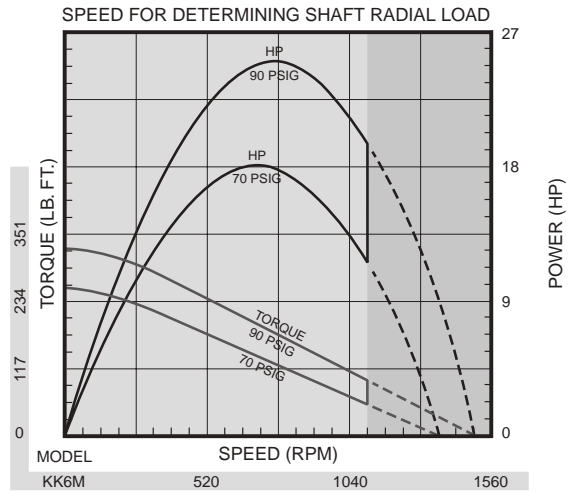
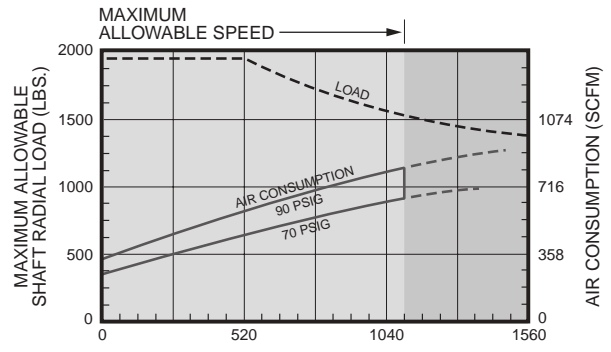
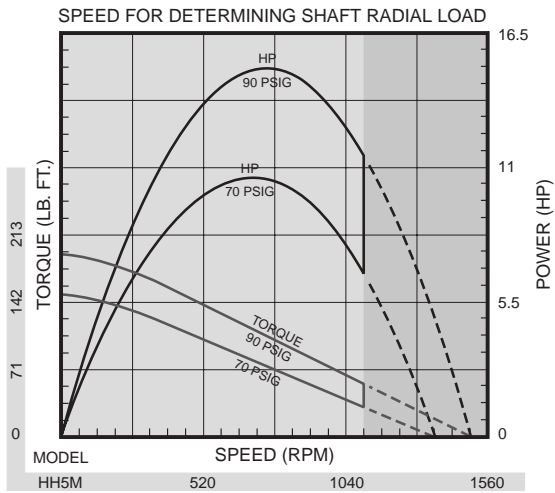
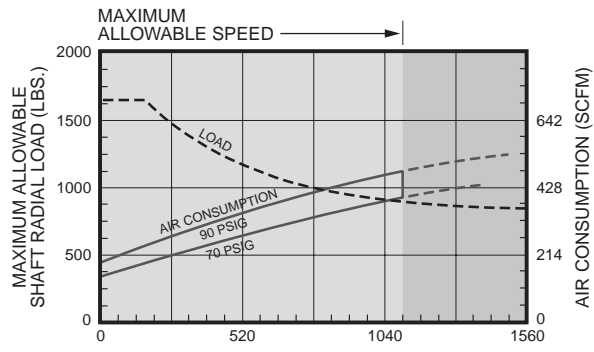
SPECIFICATIONS

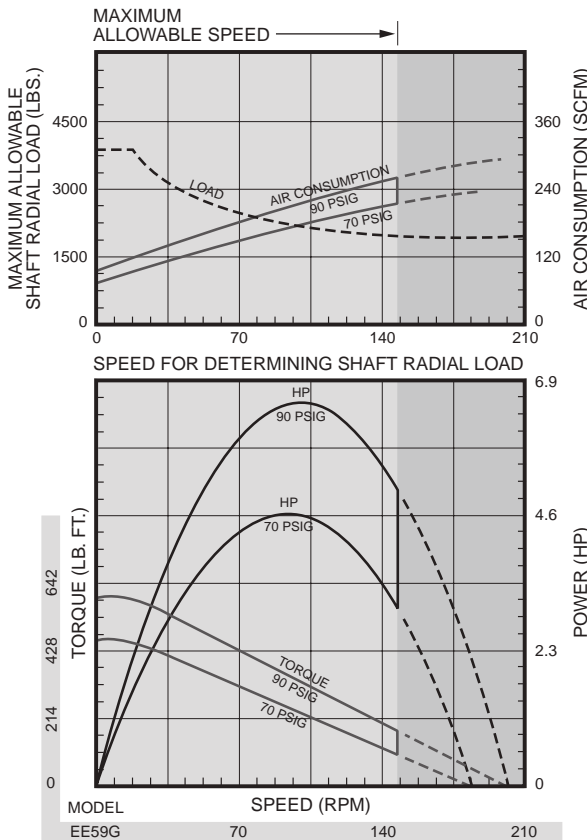
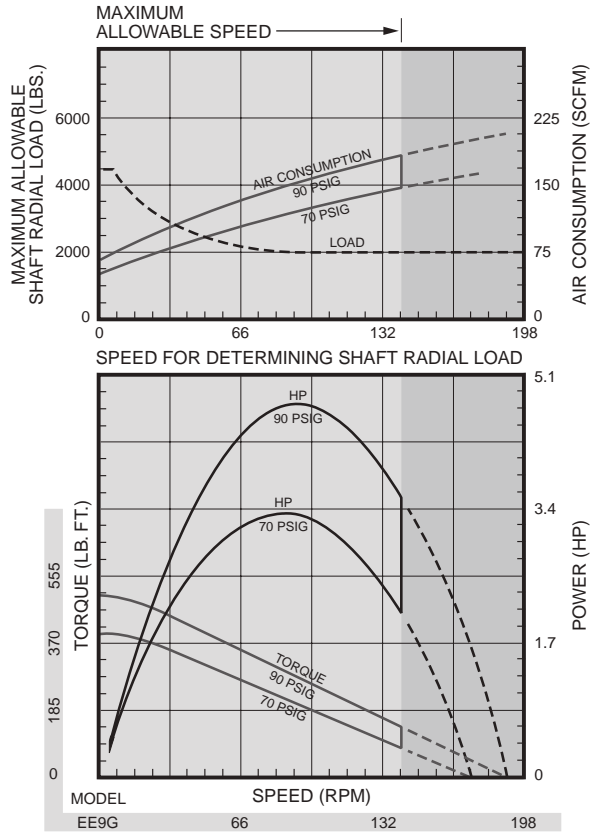
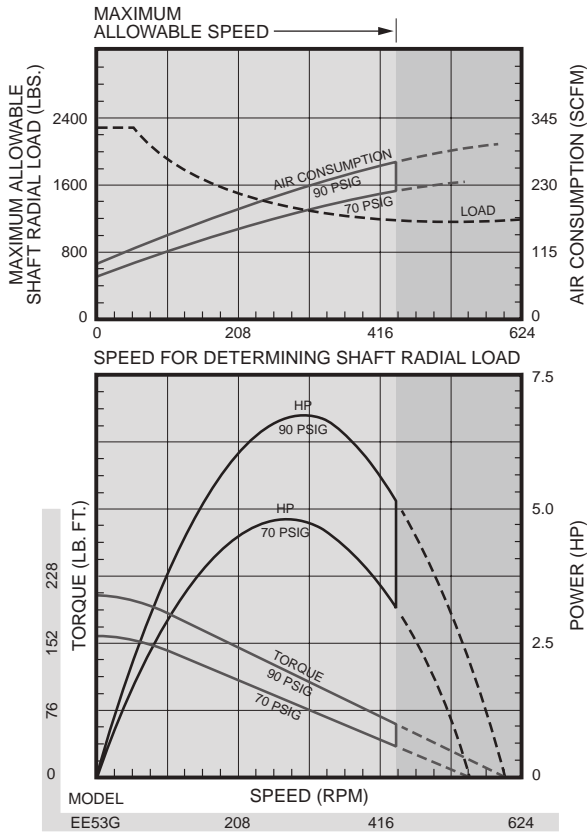
Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
DIRECT DRIVE REVERSIBLE												
DD6M	2.6	1.94	750	1,490	24	32.5	34.2	46.4	79	2.2	135	61.2
EEM	4.4	3.28	735	1,450	41	55.6	59	80	137	3.9	200	90.7
EE5M	7.8	5.82	950	1,875	60	81.4	80.5	109.2	220	6.2	210	95.3
HHM	11.3	8.43	730	1,450	106	144	152	206	270	7.6	235	107
HH5M	15.2	11.33	750	1,500	146	198	195	264	400	11.3	250	113
KK6M	25	18.64	755	1,500	260	353	325	441	680	19.3	475	216
GEARED DRIVE REVERSIBLE												
EE3G	5	3.73	275	560	122	165	175	237	155	4.4	200	90.7
EE53G	6.8	5.07	305	600	154	209	205	278	220	6.2	220	99.8
EE9G	4.7	3.51	92	190	357	484	510	692	155	4.4	210	95.3
EE59G	6.5	4.85	100	200	450	610	600	814	220	6.2	230	104

▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. All of the above motors are furnished less valve and piping as standard. Performance figures are at 90 psig (620 kPa) air pressure.



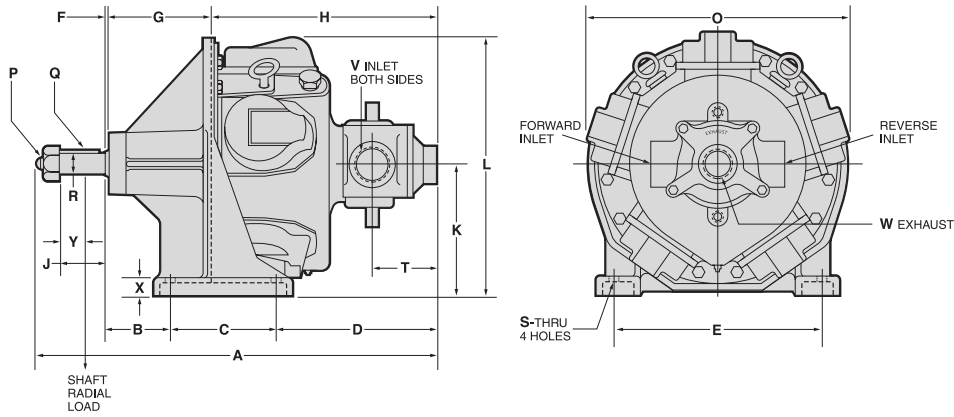






DIRECT DRIVE PISTON AIR MOTORS

DIMENSIONS



DIMENSIONS IN INCHES

Model	A	B	C	D	E	F	G	H	J	K	L	O	P** Thd.	Q Key	R*	S Dia.	T	V NPT	W NP	X	Y
CCM, DD6M	23 ³ / ₁₆	3 ³ / ₄	7 ³ / ₄	7 ⁷ / ₈	10 ¹ / ₂	25/32	7 ¹³ / ₃₂	11 ³ / ₁₆	3	8 ³ / ₄	15 ⁵ / ₈	13 ³ / ₄	1"-8	1/4 x 1/4	1.125	25/32	2 ¹¹ / ₁₆	3/4	1	7/8	2 ¹¹ / ₁₆
EEM, EE5M	27	3 ¹³ / ₁₆	9 ³ / ₄	9 ⁹ / ₃₂	12 ¹ / ₂	25/32	9 ¹⁷ / ₃₂	12 ¹⁷ / ₃₂	3	9 ⁵ / ₁₆	16 ¹³ / ₁₆	15	1"-8	1/4 x 1/4	1.125	25/32	2 ¹⁵ / ₁₆	1	1	7/8	2 ¹¹ / ₁₆
HHM	24 ³ / ₁₆	4 ⁵ / ₁₆	7	9 ⁷ / ₈	13 ¹ / ₂	3/16	7	14	3	8 ⁷ / ₈	17 ¹ / ₄	17 ¹ / ₄	+	3/8 x 3/8	1.375	2 ¹ / ₃₂	3 ¹³ / ₁₆	1	1 ¹ / ₄	1 ¹ / ₄	1 ⁵ / ₁₆
HH5M	24 ⁴ / ₁₆	4 ⁵ / ₁₆	7	9 ⁷ / ₈	13 ¹ / ₂	3/16	7	14	3	8 ⁷ / ₈	17 ¹ / ₄	17 ¹ / ₄	+	3/8 x 3/8	1.375	2 ¹ / ₃₂	3 ¹³ / ₁₆	1 ¹ / ₄	1 ¹ / ₄	1 ¹ / ₄	1 ⁵ / ₁₆
KK6M	30 ¹ / ₄	4 ³ / ₄	8 ⁵ / ₈	12 ⁵ / ₈	13 ¹ / ₂	1/8	7 ¹¹ / ₁₆	18 ³ / ₁₆	4 ¹ / ₄	12 ¹ / ₈	22 ¹ / ₄	22	+	3/8 x 3/8	1.625	2 ¹ / ₃₂	4 ⁵ / ₁₆	1 ¹ / ₄	1 ¹ / ₂	1 ³ / ₈	1 ⁷ / ₈

+ The end of the shaft is not threaded on these Motors and no nut is used. *Tolerance: +0 -.0005" **Thd.-UNC2A.

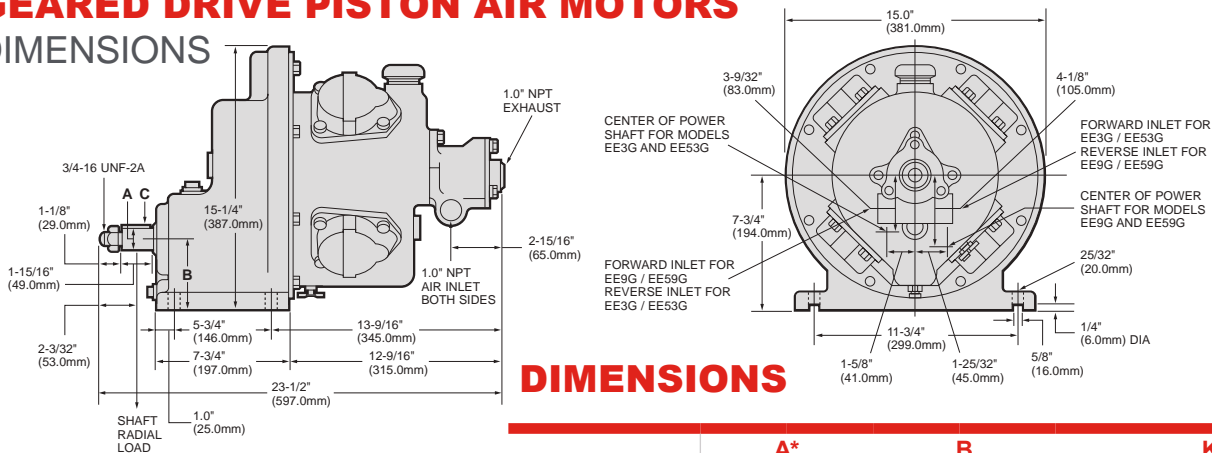
DIMENSIONS IN MILLIMETERS

Model	A	B	C	D	E	F	G	H	J	K	L	O	P** Thd.	Q Key	R*	S Dia.	T	X	Y
CCM, DD6M	599	95	197	200	267	20	188	284	76	222	397	349	1"-8	6 x 6	28	20	68	22	68
EEM, EE5M	686	97	248	236	318	20	242	318	76	237	427	381	1"-8	6 x 6	28	20	75	22	68
HHM	614	110	178	251	343	5	178	356	76	225	438	438	+	10 x 10	35	17	97	32	33
HH5M	614	110	178	251	343	5	178	356	76	225	438	438	+	10 x 10	35	17	97	32	33
KK6M	768	121	219	321	343	3	195	462	108	308	565	559	+	10 x 10	41	17	110	35	48

+ The end of the shaft is not threaded on these Motors and no nut is used. *Tolerance: +0 -0.13mm

GEARED DRIVE PISTON AIR MOTORS

DIMENSIONS



DIMENSIONS

Models	A*		B		Key C	
	in	mm	in	mm	in	mm
EE3G, EE53G	1.251	31.78	4 ¹⁵ / ₃₂	114	1/4 x 1/4 x 1 ²⁵ / ₃₂	6 x 6 x 45
EE9G, EE59G	1.501	38.13	3 ⁵ / ₈	92	3/8 x 3/8 x 1 ¹¹ / ₁₆	10 x 10 x 43

*Tolerance: +0 -.0005" (0.13mm)



MMP150 AIR MOTORS MODEL CODE EXPLANATION

Example: MMP150-A-0-B-2-A

Series: **MMP150 Air Motor**

Interface/Shaft Options:

A = **Standard Spline**

D = Keyed Shaft (Fenner RM410)

Mounting Options:

0 = **Standard**

1 = Base Mount

Control Options:

A = None

B = **Manual Valve**

C = Panel Mount Valve

D = Pendant

E = Accu-Trol™

Rotary Valve Bias Options:

1 = CCW (counter-clockwise), Standard Bias Rotation*

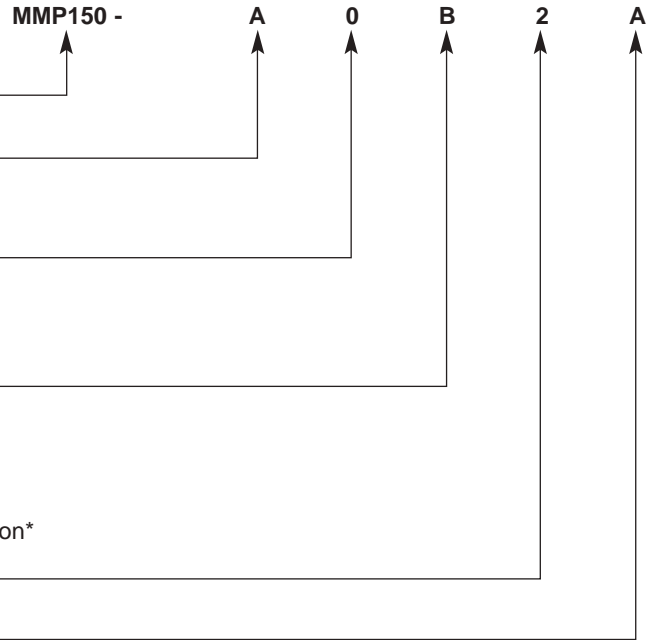
2 = **CW (clockwise), Reverse Bias Rotation***

Power Options:

A = **Air**

B = Natural Gas

*As viewed from crankshaft end of motor.



PERFORMANCE

Model	Max. Power		Speed at Max. Power	Free Speed	Starting Torque		Stall Torque		Air Consumption at Max. Power	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m
MMP 150	16.0	11.9	1,800	3,800	61.0	82.7	78.0	105.8	350	12.0

Performance figures are at 90 psig (6.2 Bar) air pressure.

Figure 1: MMP150 Air Motor Performance
425 cfm Air Supply at 90 psi

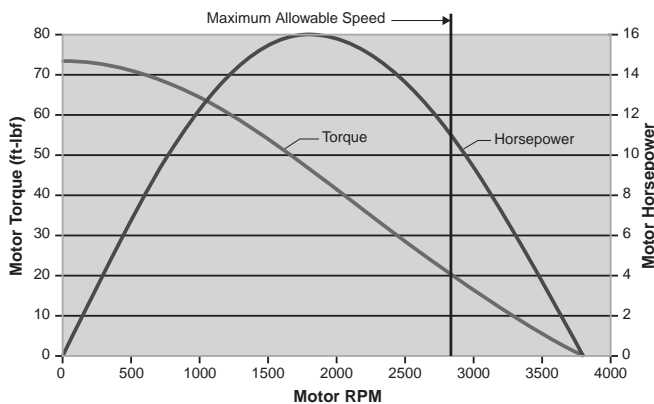
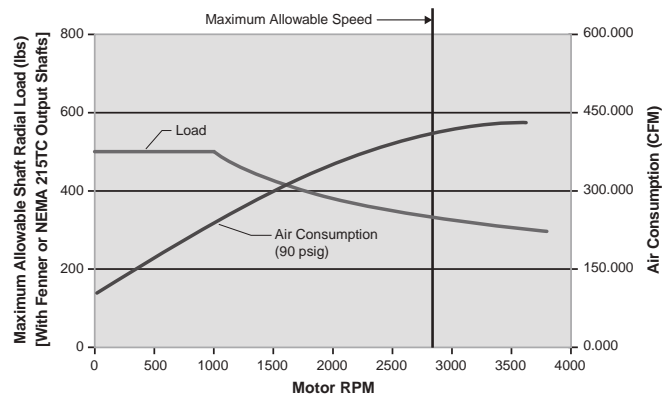
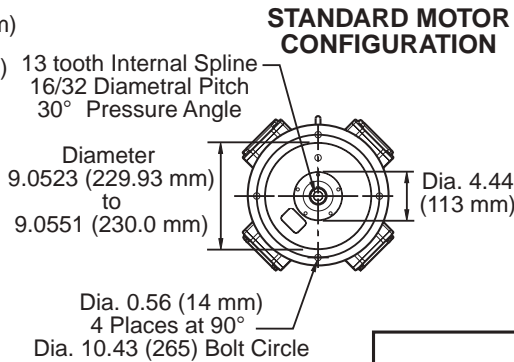
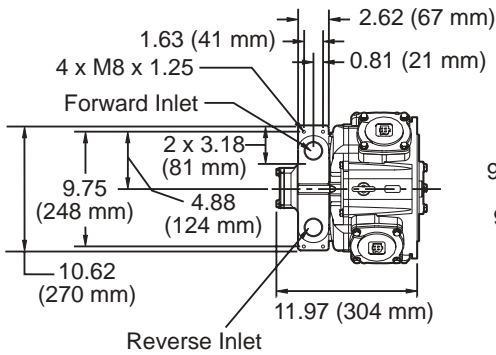
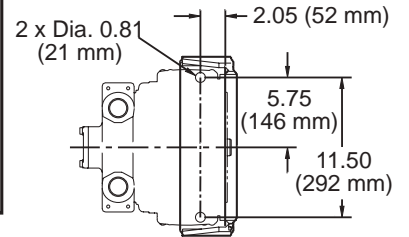


Figure 2: MMP150 Air Motor Performance

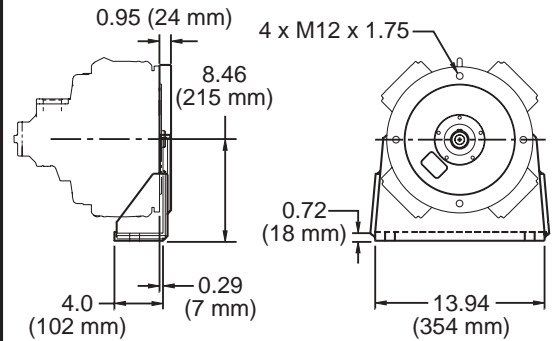
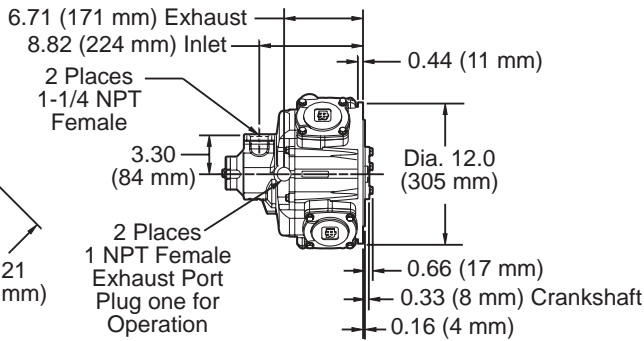
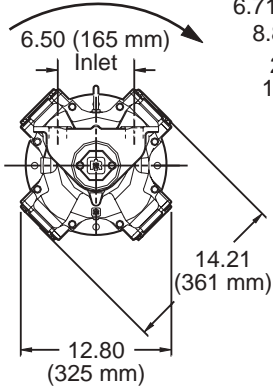




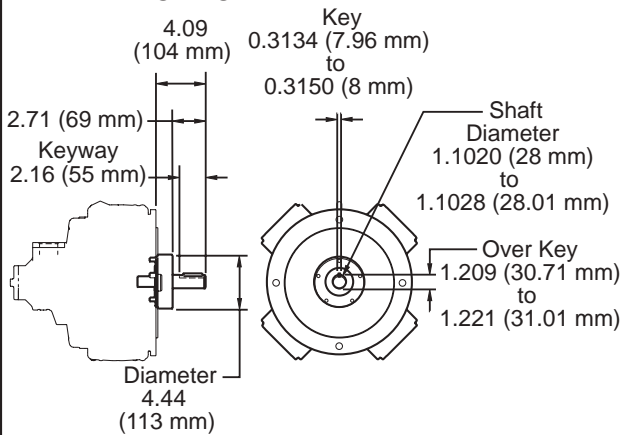
BASE MOUNT OPTION



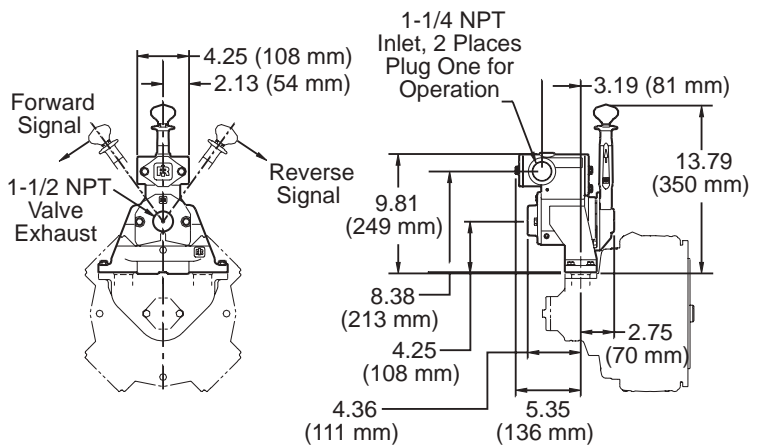
Crank Rotation at Forward Signal



FENNER OPTION

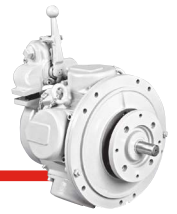


MANUAL CONTROL VALVE OPTION



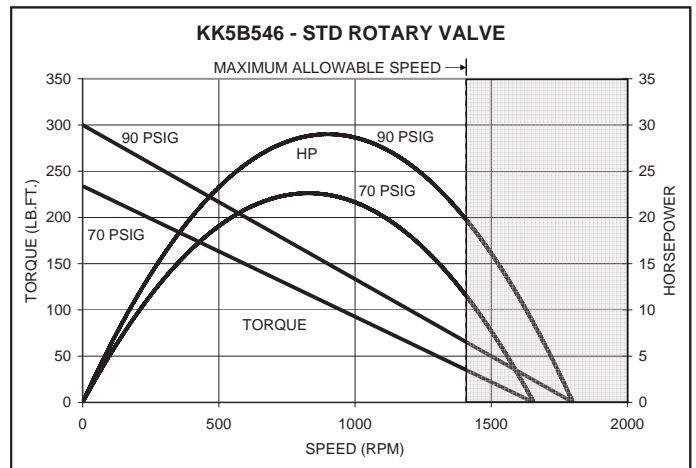
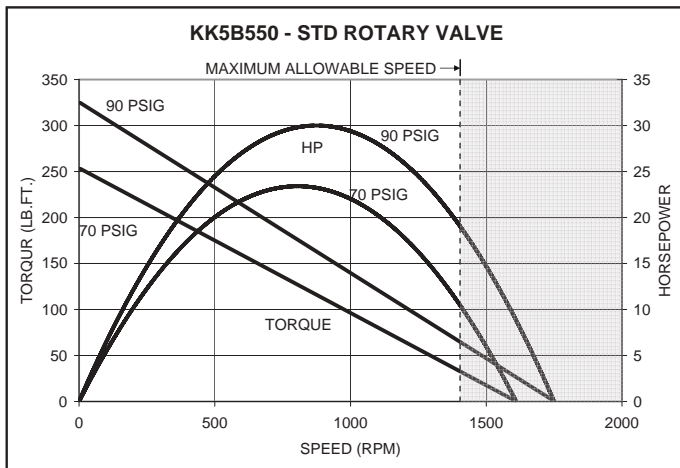
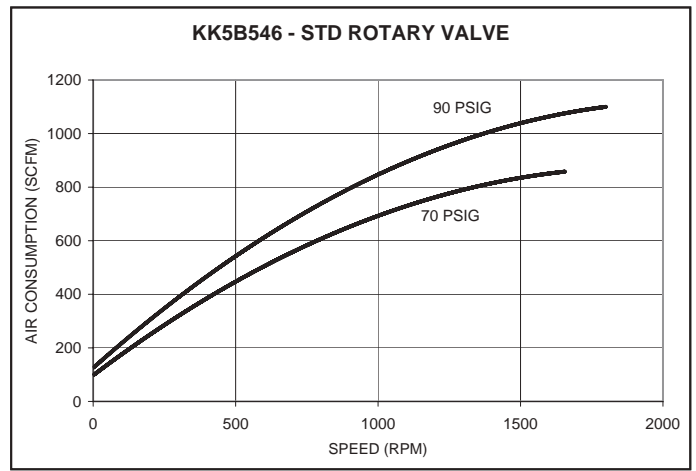
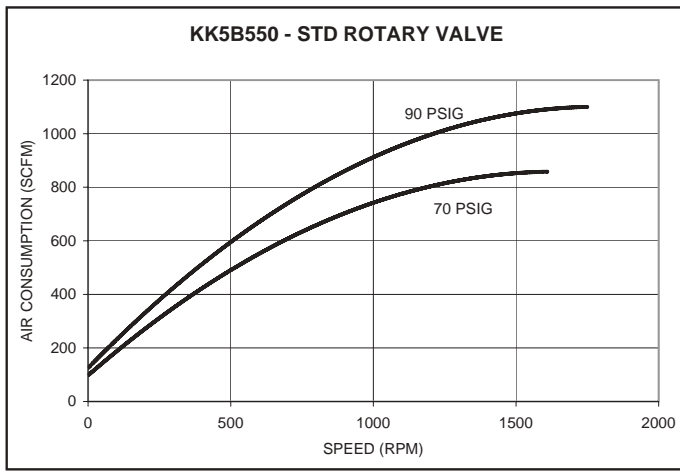
KK5B PISTON MOTORS

SPECIFICATIONS

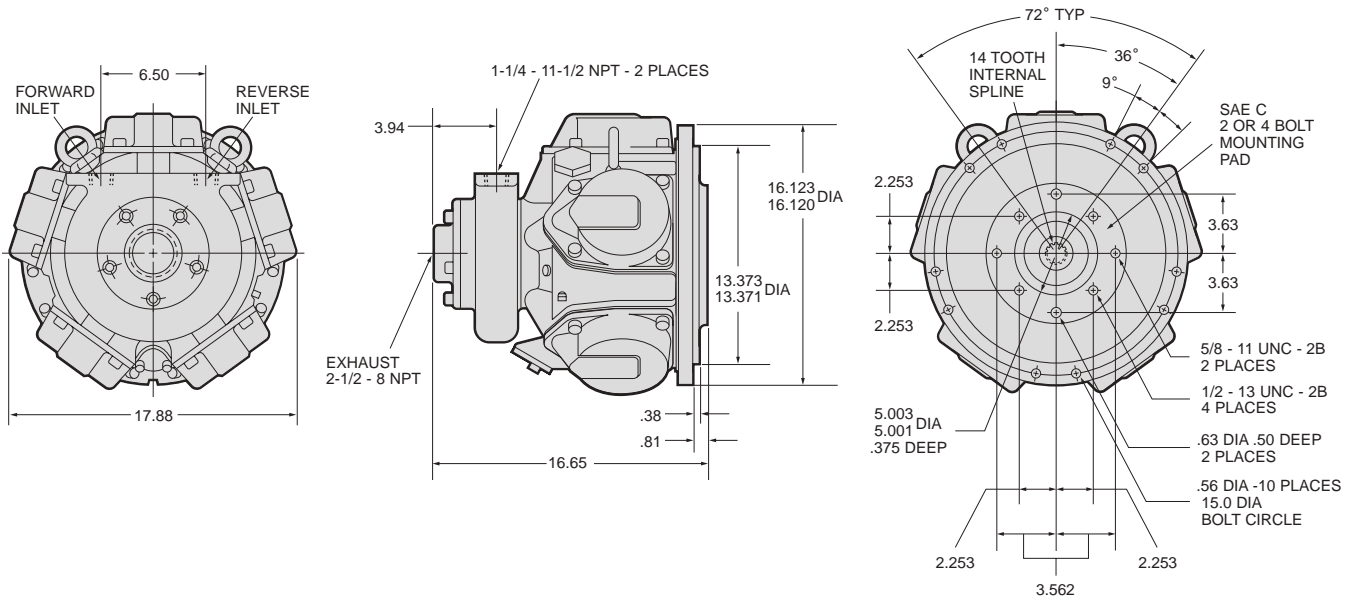


Model	Max. Power		Speed at Max. Power	Free Speed ▲	Starting Torque		Stall Torque		Air Consumption at Max. Power		Weight	
	hp	kw	rpm	rpm	lb-ft	Nm	lb-ft	Nm	scfm	m ³ /m	lb	kg
REVERSIBLE												
KK5B546	29	21.6	900	1,800	183	248	300	407	795	22.5	–	–
KK5B550	30	22.3	880	1,750	202	274	325	441	850	24.1	–	–

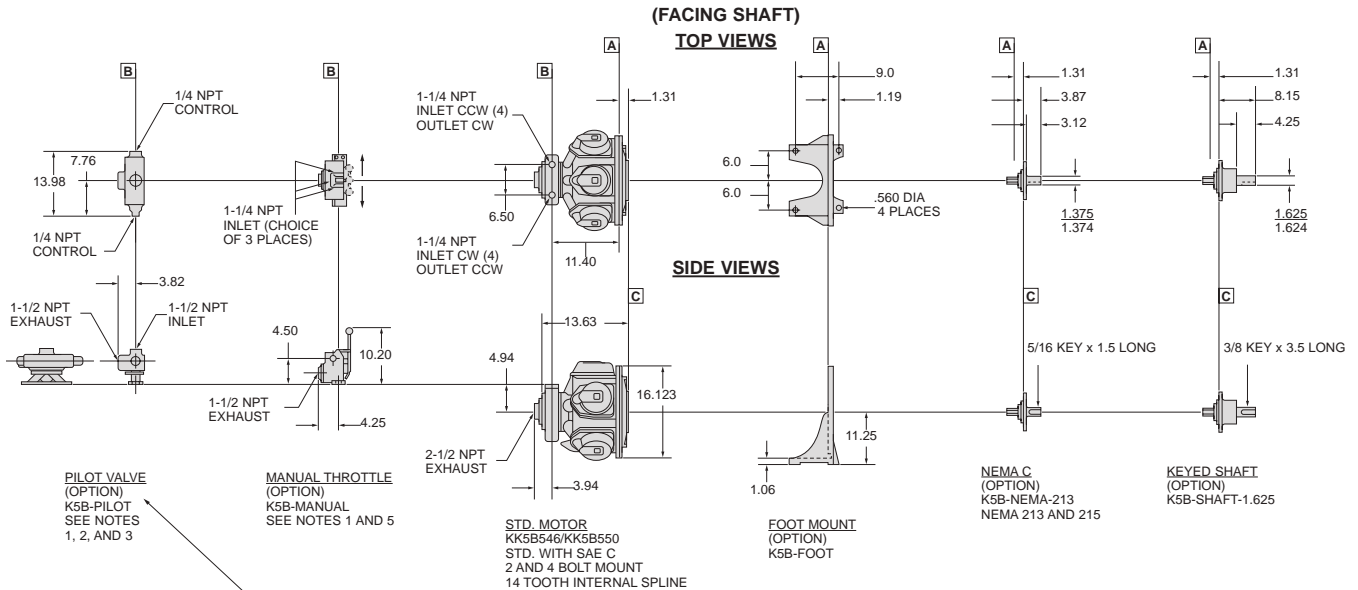
▲ ALL models must be operated with sufficient load to prevent speed from exceeding maximum allowable speed shown on performance curve. Performance figures are at 90 psig (620 kPa) air pressure.



KK5B PISTON AIR MOTOR



TOP AND SIDE VIEWS



- PILOT VALVE (OPTION) K5B-PILOT SEE NOTES 1, 2, AND 3**
- MANUAL THROTTLE (OPTION) K5B-MANUAL SEE NOTES 1 AND 5**
- PILOT CONTROL (OPTIONS)**
- PENDANT MLK-K269C (INCLUDES FITTINGS) 3/16" ID HOSE MUST BE PURCHASED SEPARATELY 50923 - SPECIFY LENGTH IN FEET 3 HOSES REQUIRED SEE NOTES 2 AND 3**
- PANEL MOUNT UWD-A686 HOSE-FITTINGS-TUBING NOT INCLUDED 3/16 TO 1/4 RECOMMENDED 3 LINES REQUIRED SEE NOTES 2 AND 3**
- 1/8 NPT SUPPLY**
- 1/8 NPT CONTROL**
- PERFORMANCE REDUCTION OF 20% - SAME STARTING AND STALL TORQUE BUT REDUCED HORSEPOWER AND FREE SPEED AS VALVING RESTRICTS MAX. AIR FLOW
 - FOR CONTROL LINE LENGTHS GREATER THAN 50 FT. AND FOR EVERY 50 FT. THEREAFTER, INSTALL TWO QUICK EXHAUST VALVES IN CONTROL LINES: MK-939-6, 1/4" ID HOSE
 - AIR PILOT CONTROLS GIVE GOOD CONTROL UP TO 100 FT. AS THE CONTROL LINES LENGTHEN, THE CONTROL RESPONSE DETERIORATES. ROUTE CONTROL LINES IN THE SHORTEST MANNER PRACTICAL
 - CW-CLOCKWISE ROTATION OF MOTOR LOOKING AT OUTPUT SHAFT OR SPLINE CCW-COUNTERCLOCKWISE ROTATION OF MOTOR LOOKING AT OUTPUT SHAFT OR SPLINE
 - THE MANUAL THROTTLE MAY BE REMOTELY MOUNTED UP TO 30 FT. AWAY USING EITHER 1-1/2" ID HOSE OR PIPE

COMPONENTS, EQUIPMENT AND ACCESSORIES FILTERS, REGULATORS AND LUBRICATORS

Ingersoll Rand and ARO filters, regulators and lubricators give increased motor performance, reduce repair costs and extend motor life.

FILTERS

Motor Series	Motor Inlet Size	Part No.	NPT Size	Flow Rate scfm	Bowl Capacity oz	Height in	Width in	Depth in
M002, SM1AM, SM1UP	1/8"	F35121-420	1/4"	49	0.7	4.30	2.00	2.00
0, 2200, M004, M007, M0V005AA, SM2AM	1/4"	F35221-410	1/4"	73	1.20	6.00	2.30	2.30
SM4AM	1/4"	F35231-410	3/8"	107	1.20	6.00	2.30	2.30
1801, 1841	3/8"	F35331-410	3/8"	150	2.40	7.00	2.80	2.80
17RA, 17RB, MVA017	3/8"	F35341-410	1/2"	190	2.40	7.00	2.80	2.80
3800, 3840, 4800, 4840, 48RA, 48RB, 22N51-W/RC, SM6AM	1/2"	F35341-410	1/2"	190	2.40	7.00	2.80	2.80
SM8AM	1/2"	F35351-410	3/4"	211	2.40	7.00	2.80	2.80
34RA, 34RB, MVA034	1/2"	F35461-410	1"	297	5.30	10.75	3.60	3.90
551, CCM, DD6M	3/4"	F35451-410	3/4"	273	5.30	10.75	3.60	3.90
92RA, 92RB, 92RM, 992RM, EEM, EE5M, HHM, EE3G, EE9G, EE53G, EE59G	1"	F35461-410	1"	297	5.30	10.75	3.60	3.90
HH5M	1"	F42-0A-000	1 1/4"	860	13.00	14.90	8.50	8.50
KK6M, MMP150, M0V075AA	1 1/4"	F42-0A-000	1 1/4"	860	13.00	14.90	8.50	8.50
KK5B546, KK5B550	1 1/4"	F35-0B-C28	1 1/2"	1,280	12.50	19.00	7.80	7.80



REGULATORS

Motor Series	Motor Inlet Size	Part No.	NPT Size	Flow Rate scfm	Adj. Pressure Range psi	Height in	Width in	Depth in
M002, SM1AM, SM1UP	1/8"	R37121-600	1/4"	55	5-250	3.50	2.90	2.00
M004, M007, M0V005AA, SM2AM	1/4"	R37221-600	1/4"	73	5-250	4.75	2.20	2.70
SM4AM	1/4"	R37231-600	3/8"	84	5-250	4.75	2.20	2.70
1801, 1841	3/8"	R37331-600	3/8"	167	5-250	5.50	3.20	2.80
17RA, 17RB, MVA017	3/8"	R37341-600	1/2"	198	5-250	5.50	3.20	2.80
3800, 3840, 4800, 4840, 48RA, 48RB, 22N51-W/RC, SM6AM	1/2"	R37341-600	1/2"	198	5-250	5.50	3.20	2.80
34RA, 34RB, MVA034, SM8AM	1/2"	R37351-600	3/4"	200	5-250	5.50	3.20	2.80
551, CCM, DD6M	3/4"	R37451-600	3/4"	290	5-250	7.00	3.50	4.00
92RA, 92RB, 92RM, 992RM, EEM, EE5M, HHM, EE3G, EE9G, EE53G, EE59G	1"	R37461-600	1"	290	5-250	7.00	3.50	4.00
HH5M	1"	R30-0A-G00	1 1/4"	800	5-125	10.30	4.30	4.30
KK6M, MMP150, M0V075AA	1 1/4"	R30-0A-G01	1 1/4"	1,200	5-125	10.30	4.30	4.30
KK5B546, KK5B550	1 1/4"	R40-0B-G00	1 1/2"	1,200	5-125	11.90	5.30	5.30



COMPONENTS, EQUIPMENT AND ACCESSORIES FILTERS, REGULATORS AND LUBRICATORS

LUBRICATORS

Motor Series	Motor Inlet Size	Part No.	NPT Size	Flow Rate	Bowl Capacity	Height	Width	Depth
				scfm	oz	in	in	in
M002, SM1AM, SM1UP	1/8"	L36121-120	1/4"	57	0.50	5.00	2.00	2.00
M004, M007, M0V005AA, SM2AM	1/4"	L36221-110	1/4"	51	1.50	6.00	2.25	2.25
SM4AM	1/4"	L36231-110	3/8"	105	1.50	6.00	2.25	2.25
1801, 1841	3/8"	L36331-110	3/8"	85	4.00	7.70	2.75	2.90
17RA, 17RB, MVA017	3/8"	L36341-110	1/2"	156	4.00	7.70	2.75	2.90
3800, 3840, 4800, 4840, 48RA, 48RB, SM6AM, 22N51-W/RC	1/2"	L36341-110	1/2"	156	4.00	7.70	2.75	2.90
SM8AM	1/2"	L36351-110	3/4"	222	4.00	7.70	2.75	2.90
34RA, 34RB, MVA034	1/2"	L36461-110	1"	332	4.00	10.00	3.60	3.90
551, CCM, DD6M	3/4"	L36451-110	3/4"	368	4.00	10.00	3.60	3.90
92RA, 92RB, 92RM, 992RM, EEM, EE5M, HHM, EE3G, EE9G, EE53G, EE59G	1"	L36461-110	1"	332	4.00	10.00	3.60	3.90
HH5M	1"	L40-0A-000	1 1/4"	927	26.00	11.61	5.50	5.00
KK6M, MMP150, M0V075AA	1 1/4"	L40-0A-000	1 1/4"	927	26.00	11.61	5.50	5.00
KK5B546, KK5B550	1 1/4"	L40-0B-000	1 1/2"	927	26.00	11.61	5.50	5.00



IR AND ARO COMBINATION FRLs (FILTER/REGULATOR/LUBRICATOR)

Motor Series	Motor Inlet Size	Part No.	NPT Size	Flow Rate scfm	Adj. Pressure Range psi	Bowl Capacity oz	Height in	Width in	Depth in
M002, SM1AM, SM1UP	1/8"	C38121-820	1/4"	46	5-250	FILTER = 0.4 LUBRICATOR = 0.4	5.20	4.75	3.20
M004, M007, M0V005AA, SM2AM	1/4"	C38221-810	1/4"	51	5-250	FILTER = 1.2 LUBRICATOR = 1.5	6.60	6.60	3.20
SM4AM	1/4"	C38231-810	3/8"	63	5-250	FILTER = 1.2 LUBRICATOR = 1.5	6.60	6.60	3.20
1801, 1841	3/8"	C38331-810	3/8"	99	5-250	FILTER = 2.4 LUBRICATOR = 3.7	7.70	8.70	3.60
17RA, 17RB, MVA017	3/8"	C38341-810	1/2"	150	5-250	FILTER = 2.4 LUBRICATOR = 3.7	7.70	8.70	3.60
3800, 3840, 22N51-W/RC	1/2"	C38341-810	1/2"	150	5-250	FILTER = 2.4 LUBRICATOR = 3.7	7.70	8.70	3.60
4800, 4840, 48RA, 48RB, SM6AM	1/2"	C38341-810	1/2"	150	5-250	FILTER = 2.4 LUBRICATOR = 3.7	7.70	8.70	3.60
SM8AM	1/2"	C38351-810	3/4"	155	5-250	FILTER = 2.4 LUBRICATOR = 3.7	7.70	8.70	3.60
34RA, 34RB, MVA034	1/2"	C38461-810	1"	215	5-250	FILTER = 5.3 LUBRICATOR = 3.2	10.75	11.10	4.30
551, CCM, DD6M	3/4"	C38451-810	3/4"	199	5-250	FILTER = 5.3 LUBRICATOR = 3.2	10.75	11.10	4.30
92RA, 92RB, 92RM, 992RM, EEM, EE5M, HHM, EE3G, EE9G, EE53G, EE59G	1"	C38461-810	1"	215	5-250	FILTER = 5.3 LUBRICATOR = 3.2	10.75	11.10	4.30
HH5M	1"	Must use individual units							
KK5B546, KK5B550, KK6M, MMP150, M0V075AA	1/4"	Must use individual units							

LIQUIDATOR FILTERS

FILTERS

Female NPT	IR Part Number	Flow Rate scfm	Female NPT	IR Part Number	Flow Rate scfm
1/4"	8842-W1-035	35	1/4"	F25221-300	40
3/8"	8843-W1-035	35	3/8"	F25231-300	51
1/2"	8844-W1-090	90	1/2"	F25241-300	53
3/4"	8846-W1-090	90	3/4"	F25452-310	50
1"	8828-W2-000*	175	1"	F25462-310	150
1 1/4"	8830-W1-000	400	1 1/4"	F25472-310	150
2"	8834-W1-000	700			

LIQUIDATOR FILTERS

You can depend on Ingersoll Rand and ARO Liquidator Filters™ when you need clean, dry air and your regulator filter can't handle high volumes of liquid contaminants. Note that a lubricator should be installed between the air motor and the liquidator.

OILS

Part Number	Oil Number	Quantity	Recommended Use
10P 10G	10 10	1 pt 1 gal	Fractional horsepower Air Motors
50P 50G	50 50	1 pt 1 gal	One horsepower and larger Air Motors

GREASE

Part Number	Grease Number	Quantity lb	Recommended Use
28 1 lb 28 8 lb	28 28	1 8	Motor gearing and bearings

FEATURES

Two stage filtration cartridges remove 99% of liquid contaminants. One micron filter element removes 99% of all dirt particles 1 micron or larger. Quick release bowls enable easy cartridge replacement. Automatic float drain with manual override. Clear polycarbonate bowl with metal guard provides for quick inspection.

BENEFITS

- Reduces liquid contaminants
- Increases air motor life
- Cuts maintenance costs

LUBRICATION

Proper lubrication of air motors is a must to prevent excessive wear of moving parts; to prevent possible rust and corrosion of bare, unprotected surfaces. Ingersoll Rand oils and greases have been tested thoroughly and are recommended without reservation. Refer to Operation Manuals and Parts Lists for lubrication instructions.

AIR SYSTEM COMPONENTS FOR PNEUMATIC MOTORS

FILTERS

Motor Series	Motor Inlet Size	Part No.	NPT Size	Flow Rate	Bowl Capacity	Height	Width	Depth
				scfm	oz			
0000	1/8"	F35111-420	1/8"	38	0.70	4.30	2.00	2.00
0	1/8"	F35121-420	1/4"	49	0.70	4.30	2.00	2.00
0, 2200	1/4"	F35221-410	1/4"	73	1.20	6.00	2.30	2.30
44	3/8"	F35331-410	3/8"	150	2.40	7.00	2.80	2.80



REGULATORS

Motor Series	Motor Inlet Size	Part No.	NPT Size	Flow Rate	Adj. Pressure Rate	Height	Width	Depth
				scfm	psi			
0000	1/8"	R37111-600	1/8"	43	5-250	3.50	2.90	2.00
0	1/8"	R37121-600	1/4"	55	5-250	3.50	2.90	2.00
0, 2200	1/4"	R37221-600	1/4"	73	5-250	4.75	2.20	2.70
SM4AM	1/4"	R37231-600	3/8"	84	5-250	4.75	2.20	2.70
44	3/8"	R37331-600	3/8"	167	5-250	5.50	3.20	2.80



LUBRICATORS

Motor Series	Motor Inlet Size	Part No.	NPT Size	Flow Rate	Bowl Capacity	Height	Width	Depth
				scfm	oz			
0000	1/8"	L36111-120	1/8"	32	0.50	5.00	2.00	2.00
0	1/8"	L36121-120	1/4"	57	0.50	5.00	2.00	2.00
0, 2200	1/4"	L36221-110	1/4"	51	1.50	6.00	2.25	2.25
SM4AM	1/4"	L36231-110	3/8"	105	1.50	6.00	2.25	2.25
44	3/8"	L36331-110	3/8"	85	4.00	7.70	2.75	2.90

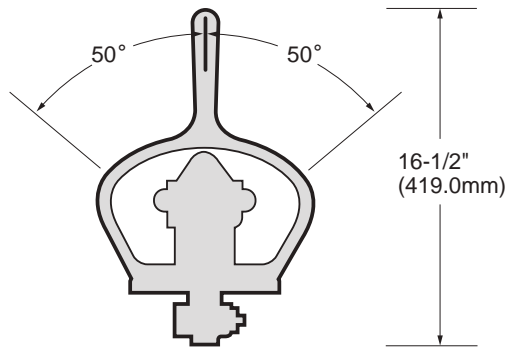


IR AND ARO COMBINATION FRLs (FILTER/REGULATOR/LUBRICATOR)

Motor Series	Motor Inlet Size	Part No.	NPT Size	Flow Rate	Adj. Pressure Range	Bowl Capacity	Height	Width	Depth
				scfm	psi	oz			
0000	1/8"	C38111-820	1/8"	34	5-250	FILTER = 0.4 LUBRICATOR = 0.4	5.20	4.75	3.20
0	1/8"	C38121-820	1/4"	46	5-250	FILTER = 0.4 LUBRICATOR = 0.4	5.20	4.75	3.20
0, 2200	1/4"	C38221-810	1/4"	51	5-250	FILTER = 1.2 LUBRICATOR = 1.5	6.60	6.60	3.20
44	3/8"	C38331-810	3/8"	99	5-250	FILTER = 2.4 LUBRICATOR = 3.7	7.70	8.70	3.60



ACCESSORIES SELF-CLOSING VALVES



ONE-STOP REPLACEMENT COMPONENT SHOPPING?



ARO® motion control and air preparation components include the Alpha® valve, Economair® cylinder and Module Air® air prep lines. Routinely used throughout industry, these lines have made their own name for their precision, durability and overall efficiency.

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NO. EU-A685

Self-Closing 4-Way Valve. Air inlet pipe tap 3/4" NPT, Motor connection pipe tap 1" NPT, exhaust pipe tap 3/4" NPT.



MUFFLERS

Part Number	MALE NPT Size
MRV003A010-RP	1/8"
MRV015A010-RP	1/4"
SRA010A1-A212	3/8"
MRV040A010-RP	1/2"
150BM-A674	1 1/4"
SS350-A674	1 1/2"
ST500-674	2"
SS800-A674	2 1/2"

TAPPED EXHAUST DEFLECTORS FOR PIPED AWAY EXHAUST

Motor Series	Part Name	Part Number	Pipe Tap NPT
1801 1841	Exhaust Deflector Assembly	R1801-A123	3/4"
3800 3840	Exhaust Deflector Assembly	R3800-A123	3/4"
4800 4840	Exhaust Deflector Assembly	R4800-A123	1"

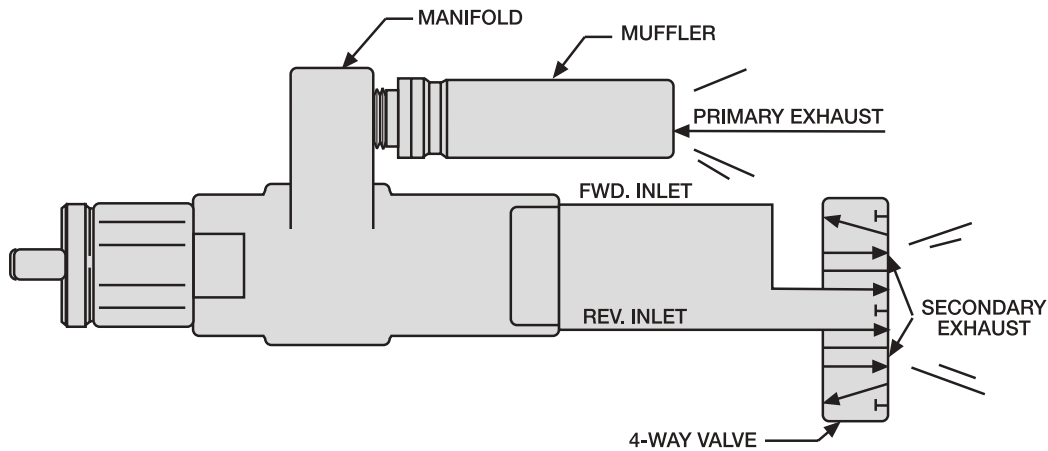
VALVES

Part Number	Female NPT Size	Flow Rate	Description
E252LM	1/4"	26 scfm	3-Way Hand Lever/Manual Return
E212LM	1/4"	26 scfm	4-Way Hand Lever/Manual Return
E312LS	1/4"	26 scfm	4-Way, 3-Position Hand Lever, Spring Return
K214LM	1/2"	90 scfm	4-Way Hand Lever/Manual Return
K314LS	1/2"	90 scfm	4-Way, 3-Position Hand Lever, Spring Return
M512LR	1/4"	41 scfm	4-Way, 3-Position Rotary Lever, Manual Return
M513LR	3/8"	65 scfm	4-Way, 3-Position Rotary Lever, Manual Return
M514LR	1/2"	85 scfm	4-Way, 3-Position Rotary Lever, Manual Return

CUSTOMIZED AIR MOTORS

While there are over 300 standard Air Motors in the complete Ingersoll Rand line, we realize that even this broad selection won't fill every need, every time. Virtually all components of our motors, from output shafts and housings to gear ratios, can be modified. We welcome the opportunity to design and build Air Motors to our customers' specifications. Generally, annual quantities of 100 plus are cost-effective. However, the opportunity to quote on lower volumes is always welcomed. Frequently, custom designed Air Motors can reduce OEM costs by easing product assembly, increasing performance and avoiding the need to make special parts to incorporate the Air Motor in a product. We have the engineering capabilities to provide you with truly "turnkey" power units.

RECOMMENDED INSTALLATION FOR REVERSIBLE MODELS



On reversible air motors there are two exhausts. The primary exhaust flows air out through the manifold and muffler as in the forward rotation motors. Depending on which direction the motor is running, the opposite inlet port becomes the secondary exhaust and must be opened to atmosphere. A four-way valve, 3-position, spring-centered is recommended for all reversible air motors. An exhaust muffler must be threaded into the exhaust port of each valve to comply with the second level regulations as outlined in the Occupational Safety and Health Act of 1970.

WARRANTY FOR PRODUCTS

Company, through its Reseller, warrants the Products to be free of defects in material and workmanship for a period of one year from the date of placing the Products in operation with the initial end customer or eighteen (18) months from the date of shipment, whichever occurs first. With respect to the sale of parts, such warranty period shall be six (6) months from the date of shipment from Company to Reseller.

Company will provide a new part or repaired part, at its election, in place of any part which is found upon Company's inspection to be defective in material and workmanship during the period described above as well as pay for reasonable, direct costs incurred by Reseller for shipping and labor related to the defective part. Such part will be repaired or replaced without charge to the initial end customer during normal working hours after evaluation by an Ingersoll Rand authorized Service Center. Initial end customer must present proof of purchase (and purchase date) at the time of exercising this warranty. Company will provide pre-paid postage and packaging if requested by the initial end customer.

This warranty does not apply to failures occurring as a result of abuse, misuse, negligent repairs, corrosion, erosion and normal wear and tear, alterations or modifications made to the Products without express written consent of Company, or failure to follow the recommended operating practices and maintenance procedures as provided in the product's operating and maintenance publications.

The warranty provided herein does not apply to Products sold by Company, through its Reseller, but not manufactured by Company. Such Products may be warranted by their respective manufacturers directly to the initial end customer.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES (EXCEPT OF TITLE), EXPRESSED OR IMPLIED, AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY

The remedies of the initial end customer set forth under the provisions of warranty outlined above are exclusive. The total liability of Company, or its Reseller, with respect to this sale or the Products and services furnished under this sale, in connection with the performance or breach of this warranty, or from the sale, delivery, installation, repair or technical direction covered by or furnished under this sale, whether based on contract, warranty, negligence, indemnity, strict liability or otherwise shall not exceed the purchase price of the unit or Products upon which such liability is based.

COMPANY AND ITS RESELLER SHALL IN NO EVENT BE LIABLE TO THE INITIAL END CUSTOMER, ANY SUCCESSORS IN INTEREST OR ANY BENEFICIARY OR ASSIGNEE RELATING TO THIS SALE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES ARISING OUT OF THIS SALE OR ANY BREACH THEREOF, OR ANY DEFECTS IN, OR FAILURE OF, OR MALFUNCTION OF THE PRODUCTS UNDER THIS SALE WHETHER BASED UPON LOSS OF USE, LOST PROFITS OR REVENUE, INTEREST, LOST GOODWILL, WORK STOPPAGE, IMPAIRMENT OF OTHER GOODS, LOSS BY REASON OF SHUTDOWN OR NON-OPERATION, INCREASED EXPENSES OF OPERATION, COST OF PURCHASE OF REPLACEMENT POWER OR CLAIMS OF USER OR CUSTOMERS OF THE USER FOR SERVICE INTERRUPTION WHETHER OR NOT SUCH LOSS OR DAMAGE IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE.

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