



Air Motors

Products and Solutions for Assembly



| About ASG

We are personally committed to understanding and exceeding our customers' requirements. We are committed to continuously improving our products and processes.

We are dedicated to delivering products, services, and solutions on time and at a competitive value.

ASG, Division of Jergens, Inc. is an ISO 9001:2008 certified manufacturer, distributor and service center for products and solutions focused around threaded assembly. Since the 1970s, we have developed a first-class reputation unrivaled in the industry offering a wide range of world class products.

We offer a wide selection of ASG brand products including torque control, error-proofing and process control products, digital calibration equipment, X-PAQ™ precision fastening systems, production aides and assembly workstation accessories. ASG is proud to be a long-time U.S. Premier Distributor of HIOS® electric torque control screwdrivers and accessories, and the exclusive North American Master Distributor of Fiam® air tools.

ASG also offers a selection of value-added products and solutions including engineering and consulting services, financing, and extended protection and maintenance plans.

Industry Commitment

ASG is committed to the highest quality standards, ensuring that all processes and procedures are followed to produce the best products for our customers. We maintain ISO 9001:2008 certification for the manufacture, distribution, and service of assembly tools. Maintaining membership in key industry organizations in order to stay abreast of the most current industry trends and information is vital to serving our customers.



About FIAM

Fiam is a leading European company and Italy's foremost designer and manufacturer of industrial air tools and systems. Since 1949, Fiam has been on the cutting-edge of perceiving and interpreting industry demands, transforming them into innovative premier quality assembly solutions for customers worldwide. Fiam's extensive product line is world renowned for unsurpassed reliability, productivity, and ergonomic designs. As a company, Fiam is ecologically responsible, designing and manufacturing products with an eye towards environmental conservation.

Fiam is based in Vicenza, Italy and operates a division located in Saint-Priest, France. A global distribution network serves thousands of customers worldwide who count on Fiam products to offer premier quality, productivity and the latest technology. Fiam's commitment to quality in products, service and the environment is evidenced by being certified both ISO 9001 and ISO 14001.

Industrial Product Group

Durable Performance



ASG Industrial Products are designed for durable performance in industrial environments requiring high duty cycles. From under 1 N.m up to 2,000 N.m of controlled torque output, ASG offers wide choices of powered and manual assembly products.

ASG is committed to providing exceptional value to its customers with industry leading products and service.

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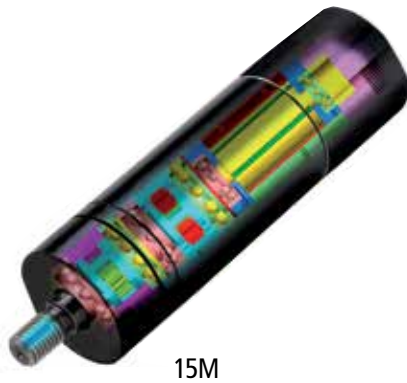
About Air Motors

Fiam air motors are compact, reliable and light weight; the ideal solution for many applications.

Fiam air motors are available in non-reversible and reversible models. They are very versatile and can be used for mixing liquid substances, moving, drilling, milling, grinding, sawing, amongst other things. Therefore, the air motors can be used with conveyor belts, machine tools, automatic feed devices and on bottling machines. They can also be used with food processing, packing, manufacturing of buttons and glass objects, textile machines, bookbinding, plastics, spray paint, assembly, drilling, threading, grinding, and stud driving. Power range of Fiam air motors is 0.20-1.1 HP (150-800 watts).

Reliability

Fiam air motors are designed to provide long life and performance in the toughest applications. This results in reliable performance and low maintenance cost.



- Innovative design ensures reliable motor starting even at low air pressure
- The air motors provide low vibration levels regardless of the application
- High quality gears and double bearings on the drive shaft allow for elevated radial and axial loading
- Small sizes and low weight optimize use in limited space applications
- Models manufactured from different materials for special applications are available

Ergonomics

Optimization of the tool performances in regard to ergonomics and operator safety.



- Oil separator filters can be used to convey air exhaust reducing oil contamination in the work environment
- Maximum operator safety is ensured where flammable or explosive substances are present as well as in damp or high temperature environments
- They do not overheat in difficult, heavy duty conditions, repetitive stops/starts or repetitive reversing
- MM, MN, MO air motor models are equipped with a silencing system that reduces the noise levels

| About Air Motors

Productivity

Highly effective due to compact size, high power output and low air consumption.



28M

- The materials and the heat treatments on the reduction gears guarantee maximum output, a long life and reduced noise levels
- The motors are completely modular for faster maintenance and replacement of the spare parts in case of wear
- The use of many common components makes the supply and management of spare parts easy
- The following customized models are available upon request: with different output shafts (example: tapered, morse taper, threaded, different diameters, with gear), with different external materials and dimensions. A wide range of accessories are available for these models as well
- These motors allow an easy adjustment of the torque, speed and rotation direction through simple control methods
- The reverse rotation in reversible motors takes place in milliseconds
- The air motor ensures high performances at low air pressure
- They are also available in models with low speed, particularly useful for different applications: mixing, positioning, moving, etc

Ecology

Designed using materials and processes that minimize the effect on the environment.

- The advanced technological design of the air motor permits very low compressed air consumption without affecting motor performance
- Built using recyclable materials, all the components are easy to dispose of; therefore they do not inflict any danger for environmental pollution
- The use of oil separator filters for conveying the air exhaust guarantees the absence of oil fog into the working environment
- All Fiam products are supplied with eco-friendly packaging

Features and Performance

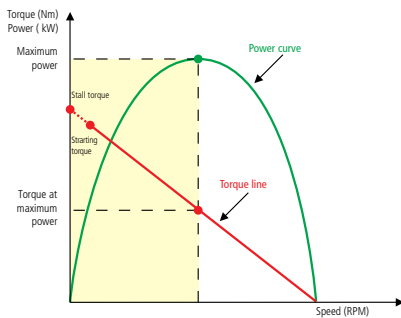
The performance of an air motor depends on the dynamic air inlet pressure measured at the intake of the air motor; therefore by simply adjusting the air supply and using the techniques of throttling or pressure regulation, we can obtain the characteristic linear output torque/speed relationship. The performance data of the motors is valid for an air supply pressure of 6.3 bar (90 PSIG) (ISO 2787).

The main features of an air motor are:

- Power: Watt, HP
- Speed at maximum power: RPM
- Torque at maximum power: lbf.in, N.m
- Static torque: lbf.in, N.m
- Idle speed: RPM
- Air consumption at maximum power: CFM

The **power**: that an air motor produces is simply the end product of torque and speed. Every motor produces a characteristic power curve, with maximum power occurring at around 50% of the idle speed. The torque produced at this point is referred to as torque at maximum power. The power of an air motor is obtained with the following formula: $(\pi \times L \times S) \div 30 = P$

$$\begin{array}{c} \text{Torque in N.m} \\ | \\ \text{Speed in RPM} \\ | \\ \text{Power in Watts} \end{array} = P$$



The speed: Every air motor has an idle speed which is obtained by inserting one or more reduction gears, depending on the reduction ratio, between the driving unit and the output shaft. Maximum speed occurs at no load; while as load is applied, the speed will decrease inversely proportional to the torque.

The torque at maximum power, starting and stall torque: The torque at maximum power is obtained at around 50% of idle speed that corresponds to maximum power of the motor; see chart to left. The starting torque is the torque that the motor applies to the output shaft under load and when one feeds full air pressure into it. The stall torque is the torque that the motor applies to the output shaft when it is blocked during its rotation. The stall torque is approximately double in respect to the torque at maximum power.

Features and Performance

Air Feed and Its Consumption

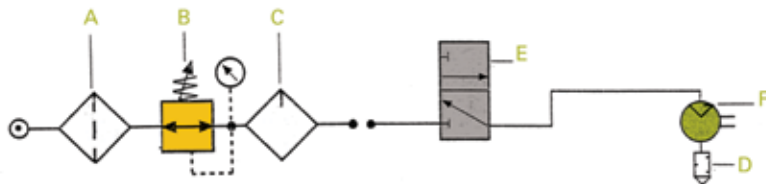
Air consumption of the air motor is at maximum when the motor turns at no load speed.

To obtain the performances in this catalog it is necessary to guarantee a correct air feeding, air exhaust and to follow these recommendations:

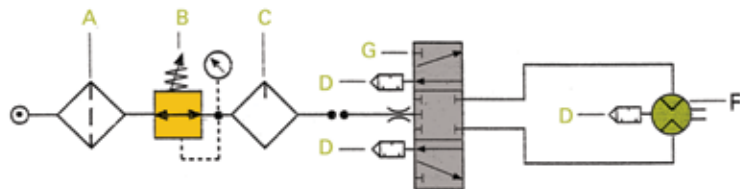
- Always use the recommended air hose bore for air feed and exhaust hoses
- It is advisable that the diameter of the exhaust hose is greater than that of the air supply hose. In the case of a reversible motor, two inlets alternate the entrance and the exhaust of the air, i.e. the inlet that is not used is left free so that the exhaust air can flow
- Minimize connections in supply line; they can cause flow restrictions thus reducing the air flow
- It is always advisable to use a FRL group (filter, pressure regulator, lubricator) appropriate to motor consumption
- It is advisable to plum the exhaust away to reduce noise and oil contamination

Pneumatic Circuit Scheme (feed - control of the motor)

Non-Reversible Motor



Reversible Motor



A = Filter

B = Pressure regulator

C = Lubricator

D = Silencer

E = Valve 3/2

F = Air motor

G = Valve 5/3

Features and Performance

How to Choose an Air Motor

Step 1: Determine the product performance requirement

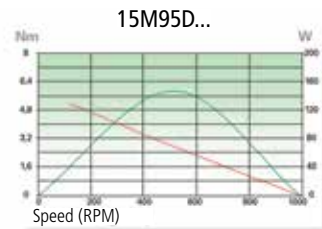
Example: Need approximately 500 RPM at 2.5 N.m load

Step 2: Calculate the size of the air motor needed (use formula below)

$$(\pi \times L \times S) \div 30 = P$$

Torque in N.m
Speed in RPM
Power in Watts

Example: Need approximately 500 RPM at 2.5 N.m load
 $(3.14 \times 2.5 \times 500) \div 30 = 130.8 \text{ Watts}$



Step 3: Determine if non-reversible or reversible is needed

Example: Need Non-Reversible

Step 4: Find the motor series for non-reversible air motors that have power ratings closest to 130.8 Watts (P) from the charts in section 5 of this catalog

Example: 15M models

The 15M model that has the peak power closest to 500 RPM and 2.5 N.m is the 15M95D

Step 5: Determine the type of spindle (smooth, threaded or collet) needed

Example: Need Threaded Spindle

Step 6: Then find the model from the charts for the threaded spindle on page 17

Example: Model 15M95D-5/16x24UNF

Power = 150 Watts

Load Speed = 500 RPM

Torque at Load = 2.6 N.m

Step 7: Determine if you need a mounting flange shown on page 29

Example: Need Mounting Flange 6F0651



Features and Performance

Regulating the Performance of an Air Motor

The performance features can be modified by means of a pressure or throttling regulator that increase or decrease the air pressure to the motor. Consequently, there is an increase or decrease of the power, torque and speed values. To calculate these values, the chart below must be used. Examples listed below.

Pressure (bar)	PSIG	Correction Factors			
		Power	Torque	Speed	Air Consumption
7	100	1.21	1.17	1.03	1.15
* 6	90	1.00	1.00	1.00	1.00
5	75	0.77	0.83	0.95	0.82
4	60	0.55	0.67	0.87	0.65
3	45	0.37	0.50	0.74	0.47

In the example on the previous page, the model needed is 15M95D-5/16x24UNF. The product specifications for this model are below:

Model Number	Reversibility	Power		Speed at Max. Power	Torque at Max. Power		Static Torque		No Load Speed	Air Consumption at Max. Power	Weight	
		Watt	HP	RPM	lbf.in	N.m	lbf.in	N.m	RPM	CFM	lb.	kg
15M95D-5/16x24UNF	↻	150	0.20	500	23.01	2.60	35.40	4.00	950	9.3	0.95	0.43

To figure out the performance at each bar, take the power in watts, the torque in N.m and the speed in RPM from the product specifications table and multiply each value by the correction factor listed in the appropriate column in the chart above.

* At 6 Bar

Power: $150 \text{ W} \times 1.00 = 150 \text{ Watts}$

Torque: $2.6 \text{ N.m} \times 1.00 = 2.6 \text{ N.m}$

Speed: $500 \text{ RPM} \times 1.00 = 500 \text{ RPM}$

Air Consumption: $9.3 \text{ CFM} \times 1.00 = 9.3 \text{ CFM}$

If you increase to 7 Bar:

Power: $150 \text{ W} \times 1.21 = 181.5 \text{ Watts}$

Torque: $2.6 \text{ N.m} \times 1.17 = 3.0 \text{ N.m}$

Speed: $500 \text{ RPM} \times 1.03 = 515 \text{ RPM}$

Air Consumption: $9.3 \text{ CFM} \times 1.15 = 10.7 \text{ CFM}$

If you decrease to 5 Bar:

Power: $150 \text{ W} \times 0.77 = 115.5 \text{ Watts}$

Torque: $2.6 \text{ N.m} \times 0.83 = 2.2 \text{ N.m}$

Speed: $500 \text{ RPM} \times 0.95 = 475 \text{ RPM}$

Air Consumption: $9.3 \text{ CFM} \times 0.82 = 7.63 \text{ CFM}$

Section 1: Smooth Output Shaft Product Specifications

Drive Shaft Diameter: all drive shafts include a UNI 6604 Form A key slot

- Ø 6 mm for 15M
- Ø 10 mm for 20M and 28M
- Ø 13 mm for MM
- Ø 14 mm for MN
- Ø 24 mm for MO

15M



20M



Model Number	Reversibility	Power		Speed at Max. Power	Torque at Max. Power		Static Torque		No Load Speed	Air Consumption at Max. Power	Weight	
		Watt	HP	RPM	lbf.in	N.m	lbf.in	N.m	RPM	CFM	lb.	kg
15M1900D-D6	↻	150	0.20	9000	1.33	0.15	2.66	0.30	19000	9.3	0.70	0.32
15M550D-D6	↻	150	0.20	2500	5.31	0.60	8.41	0.95	5500	9.3	0.70	0.32
15M375D-D6	↻	150	0.20	1650	7.08	0.80	10.62	1.20	3750	9.3	0.70	0.32
15M260D-D6	↻	150	0.20	1250	9.74	1.10	14.16	1.60	2600	9.3	0.70	0.32
15M140D-D6	↻	150	0.20	600	19.47	2.20	25.67	2.90	1400	9.3	0.95	0.43
15M95D-D6	↻	150	0.20	500	23.01	2.60	35.40	4.00	950	9.3	0.95	0.43
15M70D-D6	↻	150	0.20	350	37.17*	4.20*	57.53*	6.50*	700	9.3	0.95	0.43
20M2000D-D10	↻	200	0.27	11000	1.77	0.20	2.66	0.30	20000	11.2	0.88	0.40
20M430D-D10	↻	200	0.27	2030	7.08	0.80	11.95	1.35	4300	11.2	0.88	0.40
20M260D-D10	↻	200	0.27	1350	11.06	1.25	18.59	2.10	2600	11.2	0.88	0.40
20M105D-D10	↻	200	0.27	530	27.44	3.10	47.79	5.40	1050	11.2	1.19	0.54
20M60D-D10	↻	200	0.27	305	46.91*	5.30*	77.88*	8.80*	600	11.2	1.19	0.54

Legend

↻ Non-Reversible

↻ Reversible

* The maximum torque permitted for continuous use is 4 N.m for 15M70D-D6, from 4-5 N.m for 20M60D-D10 and 8 N.m for 28M55D-D10

** The torque indicated is the maximum at which the motor can be used in order to guarantee the life endurance of the internal gears



Smooth Output Shaft Product Specifications

Model Number	Reversibility	Power		Speed at Max. Power	Torque at Max. Power		Static Torque		No Load Speed	Air Consumption at Max. Power	Weight	
		Watt	HP	RPM	lbf.in	N.m	lbf.in	N.m	RPM	CFM	lb.	kg
28M1700D-D10	↻	280	0.38	8390	2.74	0.31	4.06	0.46	17000	13.3	1.28	0.58
28M600D-D10	↻	280	0.38	2900	8.83	1.0	13.25	1.5	6000	13.3	1.28	0.58
28M480D-D10	↻	280	0.38	2040	11.57	1.31	17.66	2.0	4800	13.3	1.28	0.58
28M330D-D10	↻	280	0.38	1510	17.66	2.0	25.61	2.9	3300	13.3	1.28	0.58
28M265D-D10	↻	280	0.38	1180	22.08	2.5	31.79	3.6	2650	13.3	1.28	0.58
28M155D-D10	↻	280	0.38	750	36.64	4.15	52.98	6.0	1550	13.3	1.72	0.78
28M120D-D10	↻	280	0.38	535	42.38	4.8	69.76	7.9	1200	13.3	1.72	0.78
28M100D-D10	↻	280	0.38	425	55.63	6.3	79.47	9.0	1000	13.3	1.72	0.78
28M55D-D10	↻	280	0.38	255	103.54*	11.70*	154.87*	17.50*	560	13.3	1.72	0.78
MM45	↻	260	0.35	220	98.24	11.1	196.47	22.2	440	14.8	2.64	1.2
MM32	↻	260	0.35	150	144.26	16.3	288.51	32.6	300	14.8	2.64	1.2
MM25	↻	260	0.35	110	196.47	22.2	392.94	44.4	220	14.8	2.64	1.2
MM13	↻	260	0.35	65	330.99	37.4	398.25	45.0**	130	14.8	3.26	1.48
MM9	↻	260	0.35	35	398.25	45.0**	398.25	45.0**	70	14.8	3.26	1.48
MM5	↻	260	0.35	25	398.25	45.0**	398.25	45.0**	50	14.8	3.26	1.48
MN1600	↻	375	0.50	8000	4.43	0.5	7.97	0.9	16000	21.2	3.19	1.45
MN480	↻	375	0.50	2400	14.16	1.6	27.44	3.1	4800	21.2	3.19	1.45
MN270	↻	375	0.50	1350	24.78	2.8	50.45	5.7	2700	21.2	3.19	1.45
MN190	↻	375	0.50	950	33.63	3.8	66.38	7.5	1900	21.2	3.19	1.45
MN140	↻	375	0.50	700	44.25	5.0	88.5	10.0	1400	21.2	4.07	1.85
MN85	↻	375	0.50	425	77.88	8.8	154.88	17.5	850	21.2	4.07	1.85
MN45	↻	375	0.50	225	153.11	17.3	305.33	34.5	450	21.2	4.07	1.85
MN32	↻	375	0.50	160	194.7	22.0	393.83	44.5	320	21.2	4.07	1.85
MN22	↻	375	0.50	110	256.65	29.0	398.25	45.0**	220	21.2	4.07	1.85
MO1550	↻	800	1.1	7750	14.16	1.6	26.55	3.0	15500	38.1	7.26	3.3
MO450	↻	800	1.1	2250	46.02	5.2	88.5	10.0	4500	38.1	7.48	3.4
MO280	↻	800	1.1	1400	82.31	9.3	159.3	18.0	2800	38.1	7.48	3.4
MO130	↻	800	1.1	650	141.6	16.0	274.35	31.0	1300	38.1	9.02	4.1
MO85	↻	800	1.1	425	234.53	26.5	460.2	52.0	850	38.1	9.02	4.1
MO40	↻	800	1.1	200	442.5	50.0	796.5	90.0**	400	38.1	10.56	4.8
MO25	↻	800	1.1	125	708.0	80.0	796.5	90.0**	250	38.1	10.56	4.8

Legend	
↻ Non-Reversible	↻ Reversible

* The maximum torque permitted for continuous use is 4 N.m for 15M70D-D6, from 4-5 N.m for 20M60D-D10 and 8 N.m for 28M55D-D10
 ** The torque indicated is the maximum at which the motor can be used in order to guarantee the life endurance of the internal gears

Smooth Output Shaft Product Specifications

28M



MN



Model Number	Reversibility	Power		Speed at Max. Power	Torque at Max. Power		Static Torque		No Load Speed	Air Consumption at Max. Power	Weight	
		Watt	HP	RPM	lbf.in	N.m	lbf.in	N.m	RPM	CFM	lb.	kg
15M1600R-D6	↻	120	0.16	8300	1.33	0.15	1.77	0.20	16000	9.1	0.70	0.32
15M440R-D6	↻	120	0.16	2200	5.31	0.60	7.08	0.80	4400	9.1	0.70	0.32
15M300R-D6	↻	120	0.16	1490	6.64	0.75	8.85	1.00	3000	9.1	0.70	0.32
15M220R-D6	↻	120	0.16	1100	9.29	1.05	13.28	1.50	2200	9.1	0.70	0.32
15M120R-D6	↻	120	0.16	590	16.82	1.90	23.01	2.60	1200	9.1	0.95	0.43
15M80R-D6	↻	120	0.16	410	22.13	2.50	31.86	3.60	800	9.1	0.95	0.43
15M58R-D6	↻	120	0.16	300	35.40*	4.00*	48.68*	5.50*	580	9.1	0.95	0.43
20M1650R-D10	↻	160	0.21	9000	1.33	0.15	2.21	0.25	16500	10.6	0.88	0.40
20M400R-D10	↻	160	0.21	1950	7.08	0.80	10.62	1.20	4000	10.6	0.88	0.40
20M250R-D10	↻	160	0.21	1330	12.39	1.40	19.47	2.20	2500	10.6	0.88	0.40
20M100R-D10	↻	160	0.21	550	26.99	3.05	42.48	4.80	1000	10.6	1.19	0.54
20M58R-D10	↻	160	0.21	300	50.45*	5.70*	66.38*	7.50*	580	10.6	1.19	0.54
28M1300R-D10	↻	210	0.28	6200	2.38	0.27	3.97	0.45	13000	12.3	1.28	0.58
28M415R-D10	↻	210	0.28	2075	7.51	0.85	10.60	1.2	4150	12.3	1.28	0.58
28M345R-D10	↻	210	0.28	1675	11.04	1.25	14.57	1.65	3450	12.3	1.28	0.58
28M235R-D10	↻	210	0.28	1230	15.89	1.8	21.19	2.4	2350	12.3	1.28	0.58
28M190R-D10	↻	210	0.28	855	20.31	2.3	25.61	2.9	1850	12.3	1.28	0.58
28M110R-D10	↻	210	0.28	500	34.44	3.9	45.03	5.1	1100	12.3	1.72	0.78
28M90R-D10	↻	210	0.28	410	41.50	4.7	60.04	6.8	900	12.3	1.72	0.78
28M70R-D10	↻	210	0.28	330	54.87	6.2	70.64	8.0	700	12.3	1.72	0.78
28M40R-D10	↻	210	0.28	190	101.77*	11.50*	137.17*	15.50*	395	12.3	1.72	0.78

Legend



Non-Reversible



Reversible

* The maximum torque permitted for continuous use is 4 N.m for 15M58R-D6, from 4-5 N.m for 20M58R-D10 and 8 N.m for 28M40R-D10
 ** The torque indicated is the maximum at which the motor can be used in order to guarantee the life endurance of the internal gears

Smooth Output Shaft Product Specifications

MO



MM



Model Number	Reversibility	Power		Speed at Max. Power	Torque at Max. Power		Static Torque		No Load Speed	Air Consumption at Max. Power	Weight	
		Watt	HP	RPM	lbf.in	N.m	lbf.in	N.m	RPM	CFM	lb.	kg
MM45R/2E	↻	240	0.32	210	92.93	10.5	185.85	21.0	420	14.8	2.68	1.22
MM32R/2E	↻	240	0.32	145	134.52	15.2	269.04	30.4	290	14.8	2.68	1.22
MM25R/2E	↻	240	0.32	105	184.97	20.9	369.93	41.8	210	14.8	2.68	1.22
MM13R/2E	↻	240	0.32	60	321.26	36.3	398.25	45.0**	120	14.8	3.3	1.50
MM9R/2E	↻	240	0.32	32	398.25	45.0**	398.25	45.0**	64	14.8	3.3	1.50
MM5R/2E	↻	240	0.32	22	398.25	45.0**	398.25	45.0**	44	14.8	3.3	1.50
MN1500R	↻	375	0.50	7500	4.43	0.5	7.97	0.9	15000	21.2	3.19	1.45
MN450R	↻	375	0.50	2250	14.16	1.6	27.44	3.1	4500	21.2	3.19	1.45
MN250R	↻	375	0.50	1250	24.78	2.8	50.45	5.7	2500	21.2	3.19	1.45
MN170R	↻	375	0.50	850	33.63	3.8	66.38	7.5	1700	21.2	3.19	1.45
MN130R	↻	375	0.50	650	44.25	5.0	88.5	10.0	1300	21.2	4.07	1.85
MN80R	↻	375	0.50	400	75.23	8.5	150.45	17.0	800	21.2	4.07	1.85
MN40R	↻	375	0.50	200	141.6	16.0	283.2	32.0	400	21.2	4.07	1.85
MN28R	↻	375	0.50	140	185.85	21.0	331.7	42.0	280	21.2	4.07	1.85
MN20R	↻	375	0.50	100	247.8	28.0	398.25	45.0**	200	21.2	4.07	1.85
MO1200R	↻	645	0.86	6000	11.51	1.3	22.13	2.5	12000	38.1	7.26	3.3
MO360R	↻	645	0.86	1800	37.17	4.2	70.8	8.0	3600	38.1	7.48	3.4
MO220R	↻	645	0.86	1100	68.15	7.7	132.75	15.0	2200	38.1	7.48	3.4
MO110R	↻	645	0.86	550	126.56	14.3	247.8	28.0	1100	38.1	9.02	4.1
MO70R	↻	645	0.86	350	221.25	25.0	433.65	49.0	700	38.1	9.02	4.1
MO32R	↻	645	0.86	160	424.8	48.0	796.5	90.0**	320	38.1	10.56	4.8
MO20R	↻	645	0.86	100	681.45	77.0	796.5	90.0**	200	38.1	10.56	4.8

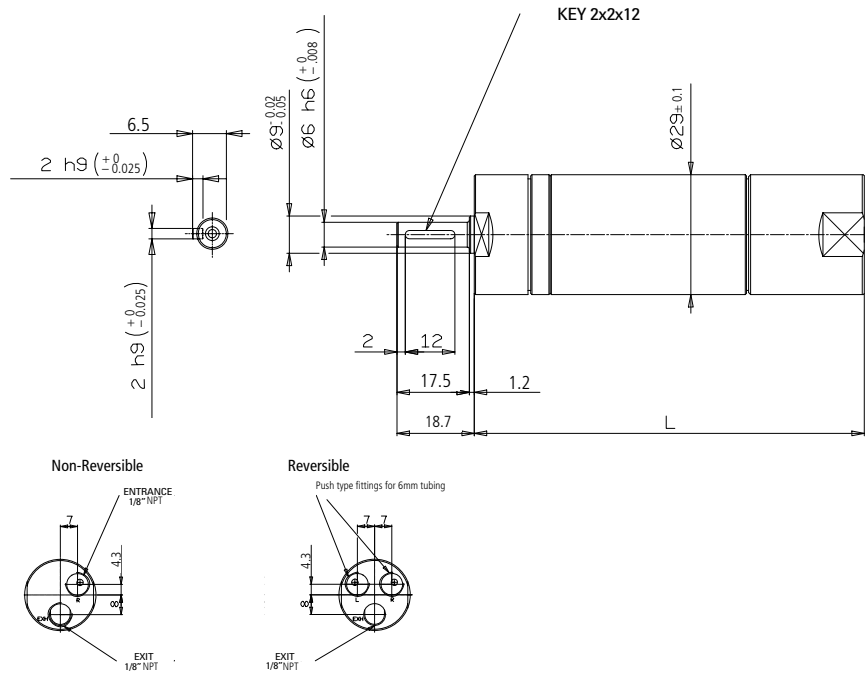
Legend	
↻ Non-Reversible	↻ Reversible

* The maximum torque permitted for continuous use is 4 N.m for 15M58R-D6, from 4-5 N.m for 20M58R-D10 and 8 N.m for 28M40R-D10
 ** The torque indicated is the maximum at which the motor can be used in order to guarantee the life endurance of the internal gears

Smooth Output Shaft Dimensional Drawings

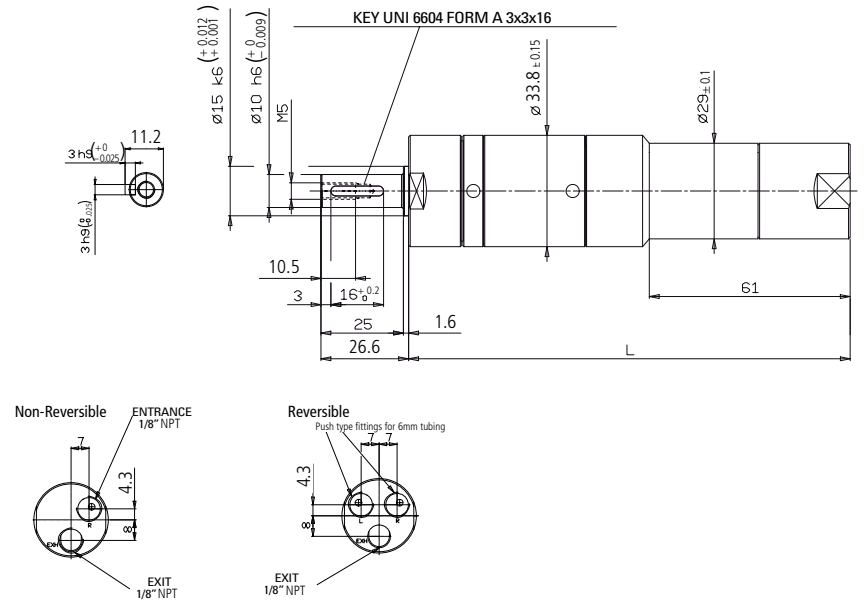
15M Models

Model Number	L
15M1900D-D6	94.5
15M550D-D6	94.5
15M375D-D6	94.5
15M260D-D6	94.5
15M140D-D6	120
15M95D-D6	120
15M70D-D6	120
15M1600R-D6	94.5
15M440R-D6	94.5
15M300R-D6	94.5
15M220R-D6	94.5
15M120R-D6	120
15M80R-D6	120
15M58R-D6	120



20M Models

Model Number	L
20M2000D-D10	103
20M430D-D10	103
20M260D-D10	103
20M105D-D10	134
20M60D-D10	134
20M1650R-D10	103
20M400R-D10	103
20M250R-D10	103
20M100R-D10	134
20M58R-D10	134

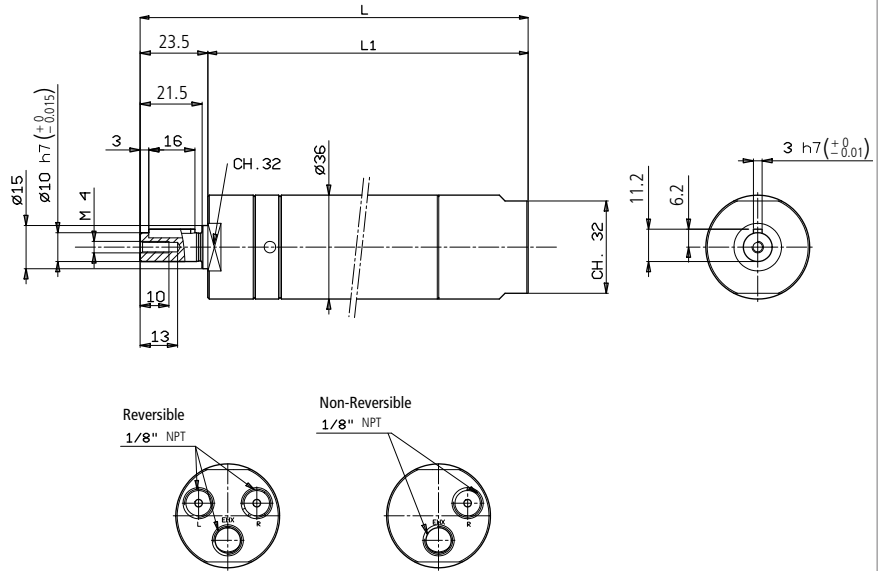


Dimensional drawings in mm

Smooth Output Shaft Dimensional Drawings

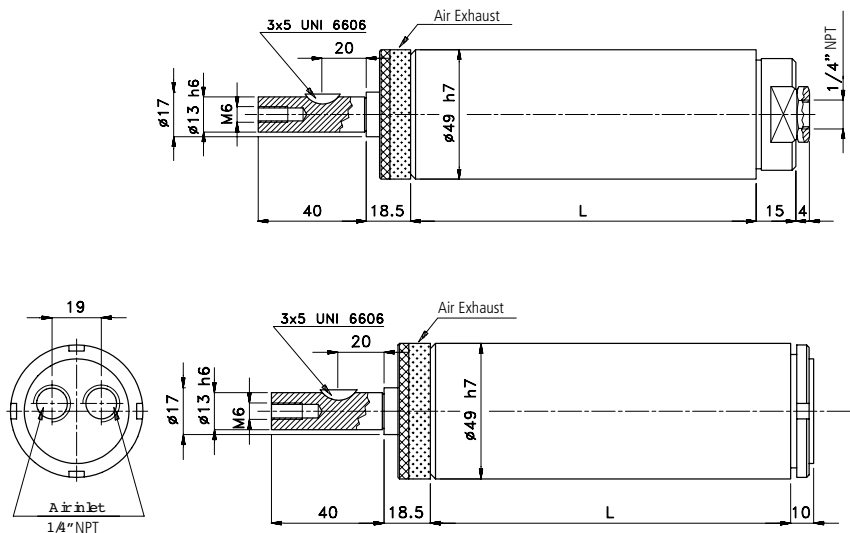
28M Models

Model Number	L	L1
28M1700D-D10	134.5	111
28M600D-D10	134.5	111
28M480D-D10	134.5	111
28M330D-D10	134.5	111
28M265D-D10	134.5	111
28M155D-D10	165.5	142
28M120D-D10	165.5	142
28M100D-D10	165.5	142
28M55D-D10	165.5	142
28M1300R-D10	134.5	111
28M415R-D10	134.5	111
28M345R-D10	134.5	111
28M235R-D10	134.5	111
28M190R-D10	134.5	111
28M110R-D10	165.5	142
28M90R-D10	165.5	142
28M70R-D10	165.5	142
28M40R-D10	165.5	142



MM Models

Model Number	L
MM45 - MM45R/2E	133.5
MM32 - MM32R/2E	133.5
MM25 - MM25R/2E	133.5
MM13 - MM13R/2E	167.5
MM9 - MM9R/2E	167.5
MM5 - MM5R/2E	167.5



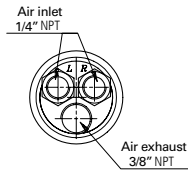
Dimensional drawings in mm

Smooth Output Shaft Dimensional Drawings

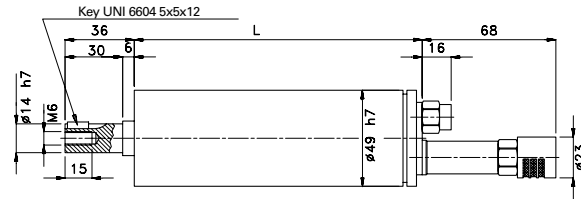
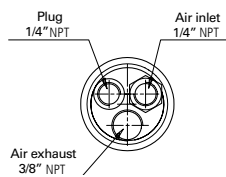
MN Models

Model Number	L
MN1600 - MN1500R	149
MN480 - MN450R	149
MN270 - MN250R	149
MN190 - MN170R	149
MN140 - MN130R	183
MN85 - MN80R	183
MN45 - MN40R	183
MN32 - MN28R	183
MN22 - MN20R	183

Reversible



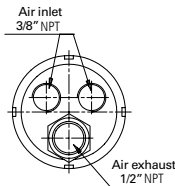
Non-Reversible



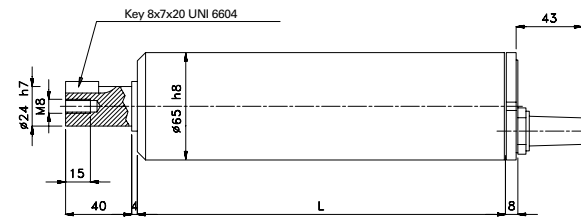
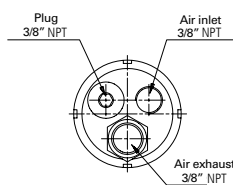
MO Models

Model Number	L
MO1550 - MO1200R	177.5
MO450 - MO360R	187
MO280 - MO220R	187
MO130 - MO110R	222
MO85 - MO70R	222
MO40 - MO32R	257
MO25 - MO20R	257

Reversible



Non-Reversible



Dimensional drawings in mm

Section 2: Threaded Output Shaft Product Specifications

- 5/16x24UNF for 15M; 3/8x24UNF for 20M and 28M
- Ideal to use the motors in drilling, deburring, and other operations
- MM, MN, MO air models available, consult ASG for additional information

15M



20M



28M



Model Number	Reversibility	Power		Speed at Max. Power	Torque at Max. Power		Static Torque		No Load Speed	Air Consumption at Max. Power	Weight	
		Watt	HP	RPM	lbf.in	N.m	lbf.in	N.m	RPM	CFM	lb.	kg
15M1900D-5/16x24UNF	↻	150	0.20	9000	1.33	0.15	2.66	0.30	19000	9.3	0.70	0.32
15M550D-5/16x24UNF	↻	150	0.20	2500	5.31	0.60	8.41	0.95	5500	9.3	0.70	0.32
15M375D-5/16x24UNF	↻	150	0.20	1650	7.08	0.80	10.62	1.20	3750	9.3	0.70	0.32
15M260D-5/16x24UNF	↻	150	0.20	1250	9.74	1.10	14.16	1.60	2600	9.3	0.70	0.32
15M140D-5/16x24UNF	↻	150	0.20	600	19.47	2.20	25.67	2.90	1400	9.3	0.95	0.43
15M95D-5/16x24UNF	↻	150	0.20	500	23.01	2.60	35.40	4.0	950	9.3	0.95	0.43
15M70D-5/16x24UNF	↻	150	0.20	350	37.17*	4.20*	57.53*	6.50*	700	9.3	0.95	0.43
20M2000D-3/8x24UNF	↻	200	0.27	11000	1.77	0.20	2.66	0.30	20000	11.2	0.88	0.40
20M430D-3/8x24UNF	↻	200	0.27	2030	7.08	0.80	11.95	1.35	4300	11.2	0.88	0.40
20M260D-3/8x24UNF	↻	200	0.27	1350	11.06	1.25	18.59	2.10	2600	11.2	0.88	0.40
20M105D-3/8x24UNF	↻	200	0.27	530	27.44	3.10	47.79	5.40	1050	11.2	1.19	0.54
20M60D-3/8x24UNF	↻	200	0.27	305	46.91*	5.30*	77.88*	8.80*	600	11.2	1.19	0.54
28M1700D-3/8x24UNF	↻	280	0.38	8390	2.74	0.31	4.06	0.46	17000	13.3	1.28	0.58
28M600D-3/8x24UNF	↻	280	0.38	2900	8.83	1.0	13.25	1.5	6000	13.3	1.28	0.58
28M480D-3/8x24UNF	↻	280	0.38	2040	11.57	1.31	17.66	2.0	4800	13.3	1.28	0.58
28M330D-3/8x24UNF	↻	280	0.38	1510	17.66	2.0	25.61	2.9	3300	13.3	1.28	0.58
28M265D-3/8x24UNF	↻	280	0.38	1180	22.08	2.5	31.79	3.6	2650	13.3	1.28	0.58
28M155D-3/8x24UNF	↻	280	0.38	750	36.64	4.15	52.98	6.0	1550	13.3	1.72	0.78
28M120D-3/8x24UNF	↻	280	0.38	535	42.38	4.8	69.76	7.9	1200	13.3	1.72	0.78
28M100D-3/8x24UNF	↻	280	0.38	425	55.63	6.3	79.47	9.0	1000	13.3	1.72	0.78
28M55D-3/8x24UNF	↻	280	0.38	255	103.54*	11.70*	154.87*	17.50*	560	13.3	1.72	0.78

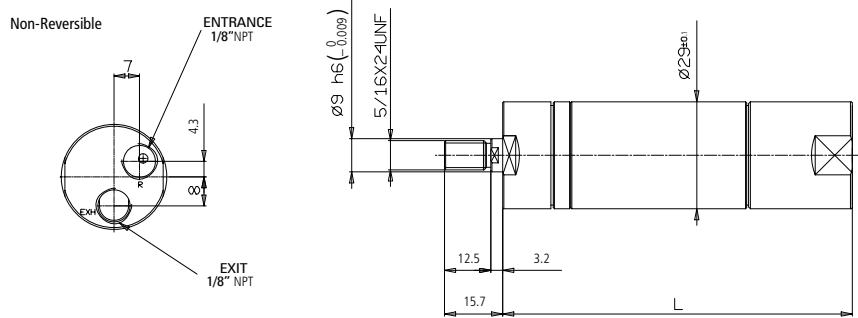
Legend	
↻ Non-Reversible	↻ Reversible

* The maximum torque permitted for continuous use is 4 N.m for 15M70D-5/16x24UNF, from 4 to 5 N.m for 20M60D-3/8x24UNF and 8 N.m for 28M55D-3/8x24UNF

Threaded Output Shaft Dimensional Drawings

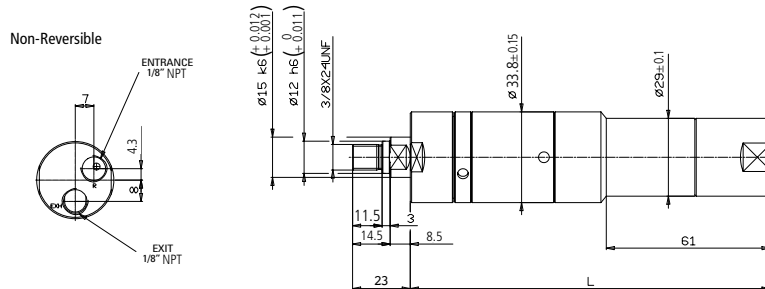
15M Models

Model Number	L
15M1900D-5/16x24UNF	94.5
15M550D-5/16x24UNF	94.5
15M375D-5/16x24UNF	94.5
15M260D-5/16x24UNF	94.5
15M140D-5/16x24UNF	120
15M95D-5/16x24UNF	120
15M75D-5/16x24UNF	120



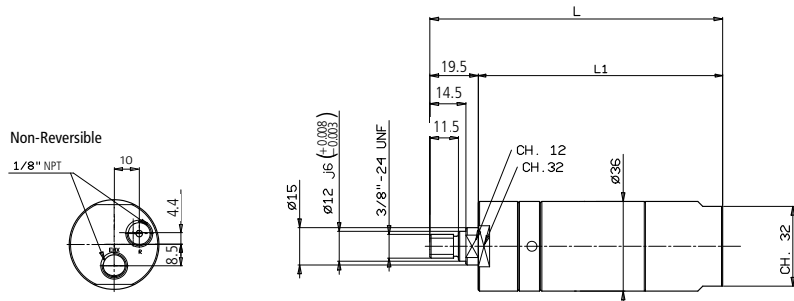
20M Models

Model Number	L
20M2000D-3/8x24UNF	103
20M430D-3/8x24UNF	103
20M260D-3/8x24UNF	103
20M105D-3/8x24UNF	134
20M60D-3/8x24UNF	134



28M Models

Model Number	L	L1
28M1700D-3/8x24UNF	126.5	107
28M600D-3/8x24UNF	126.5	107
28M480D-3/8x24UNF	126.5	107
28M330D-3/8x24UNF	126.5	107
28M265D-3/8x24UNF	126.5	107
28M155D-3/8x24UNF	157.5	138
28M120D-3/8x24UNF	157.5	138
28M100D-3/8x24UNF	157.5	138
28M55D-3/8x24UNF	157.5	138



Dimensional drawings in mm

Section 3: Collet Shaft Product Specifications

- Collet chuck included: ER11 for 20M; ER16 for 28M
- The collet is not included
- MM, MN, MO air versions available, consult ASG for additional information

20M



28M



Model Number	Reversibility	Power		Speed at Max. Power	Torque at Max. Power		Static Torque		No Load Speed	Air Consumption at Max. Power	Weight	
		Watt	HP	RPM	lbf.in	N.m	lbf.in	N.m	RPM	CFM	lb.	kg
20M2000D-ER11	↻	200	0.27	11000	1.77	0.20	2.66	0.30	20000	11.2	0.88	0.40
20M430D-ER11	↻	200	0.27	2030	7.08	0.80	11.95	1.35	4300	11.2	0.88	0.40
20M260D-ER11	↻	200	0.27	1350	11.06	1.25	18.59	2.10	2600	11.2	0.88	0.40
20M105D-ER11	↻	200	0.27	530	27.44	3.10	47.79	5.40	1050	11.2	1.19	0.54
20M60D-ER11	↻	200	0.27	305	46.91*	5.30*	77.88*	8.80*	600	11.2	1.19	0.54
28M1700D-ER16	↻	280	0.38	8390	2.74	0.31	4.06	0.46	17000	13.3	1.47	0.67
28M600D-ER16	↻	280	0.38	2900	8.83	1.0	13.25	1.5	6000	13.3	1.47	0.67
28M480D-ER16	↻	280	0.38	2040	11.57	1.31	17.66	2.0	4800	13.3	1.47	0.67
28M330D-ER16	↻	280	0.38	1510	17.66	2.0	25.61	2.9	3300	13.3	1.47	0.67
28M265D-ER16	↻	280	0.38	1180	22.08	2.5	31.79	3.6	2650	13.3	1.47	0.67
28M155D-ER16	↻	280	0.38	750	36.64	4.15	52.98	6.0	1550	13.3	1.91	0.87
28M120D-ER16	↻	280	0.38	535	42.38	4.8	69.76	7.9	1200	13.3	1.91	0.87
28M100D-ER16	↻	280	0.38	425	55.63	6.3	79.47	9.0	1000	13.3	1.91	0.87
28M55D-ER16	↻	280	0.38	255	103.54*	11.70*	154.87*	17.50*	560	13.3	1.91	0.87

Legend	
↻ Non-Reversible	↻ Reversible

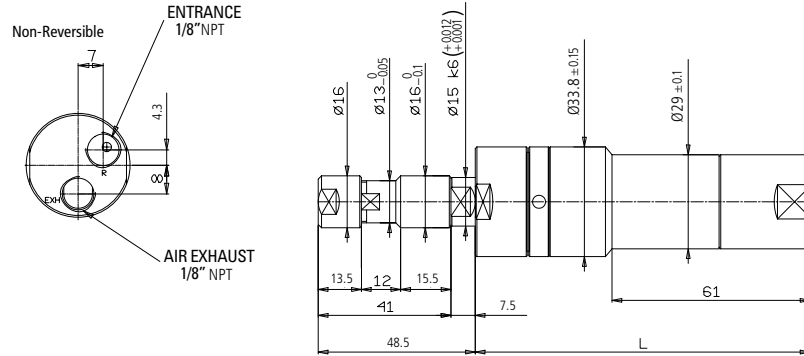
* The maximum torque permitted for continuous use is 4 to 5 N.m for 20M60D-ER11 and 8 N.m for 28M55D-ER16



Collet Shaft Dimensional Drawings

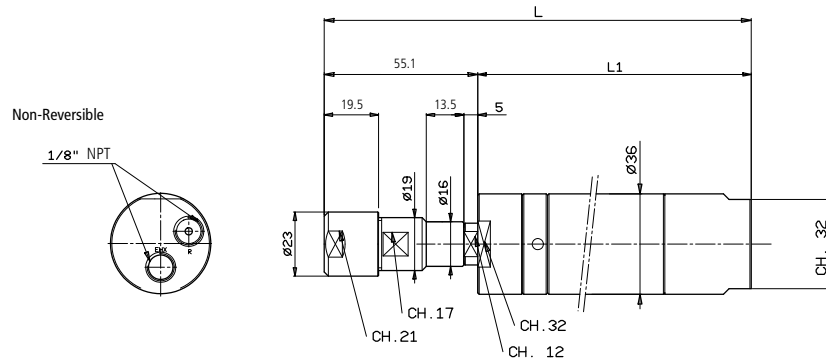
20M Models

Model Number	L
20M2000D-ER11	103
20M430D-ER11	103
20M260D-ER11	103
20M105D-ER11	134
20M60D-ER11	134



28M Models

Model Number	L	L1
28M1700D-ER16	162	107
28M600D-ER16	162	107
28M480D-ER16	162	107
28M330D-ER16	162	107
28M265D-ER16	162	107
28M155D-ER16	193	138
28M120D-ER16	193	138
28M100D-ER16	193	138
28M55D-ER16	193	138



Dimensional drawings in mm



Section 4: Low Rotation Smooth Output Shaft Product Specifications

These motors are suitable for many applications: mixing, moving, components positioning, various movements, etc. They are used in many industrial applications. The motors are capable of very high torque, therefore, the load must be regulated in such way that the torque does not exceed the 4-5 N.m for 20M and 8 N.m for 28M.

- Smooth shaft Ø 10 mm with UNI 6604 Form A key slot
- Maximum torque permitted: 4-5 N.m for 20M and 8 N.m for 28M

20M



28M



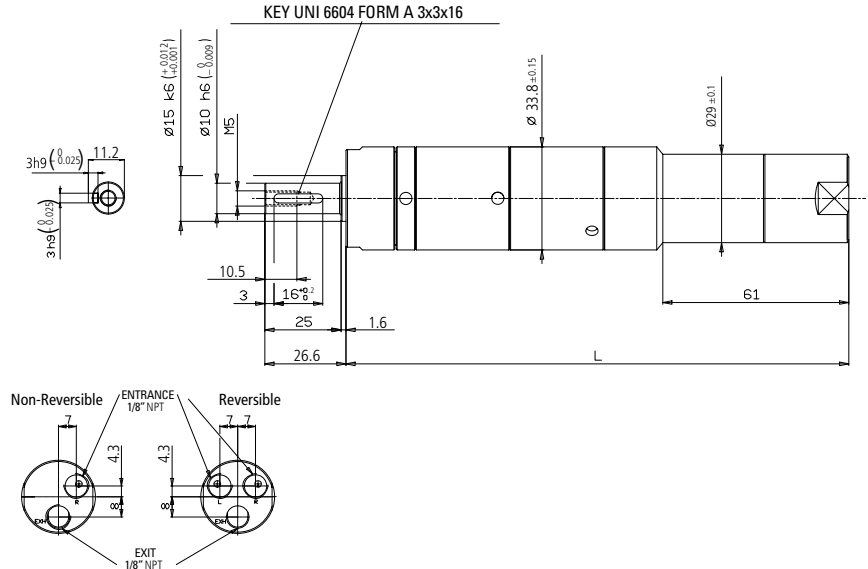
Model Number	Reversibility	Power		No Load Speed	Air Consumption at Max. Power	Weight	
		Watt	HP	RPM	CFM	lb.	kg
20M35D-D10	↻	200	0.27	350	11.2	1.19	0.54
20M14D-D10	↻	200	0.27	140	11.2	1.54	0.70
20M8D-D10	↻	200	0.27	80	11.2	1.54	0.70
20M5D-D10	↻	200	0.27	50	11.2	1.54	0.70
28M20D-D10	↻	280	0.38	215	12.7	2.13	0.97
28M10D-D10	↻	280	0.38	100	12.7	2.13	0.97
20M30R-D10	↻	160	0.21	300	10.6	1.19	0.54
20M13R-D10	↻	160	0.21	130	10.6	1.54	0.70
20M7R-D10	↻	160	0.21	70	10.6	1.54	0.70
20M4R-D10	↻	160	0.21	40	10.6	1.54	0.70
28M15R-D10	↻	210	0.28	150	12.3	2.13	0.97
28M8R-D10	↻	210	0.28	75	12.3	2.13	0.97

Legend	
↻ Non-Reversible	↻ Reversible

Low Rotation Smooth Output Shaft Dimensional Drawings

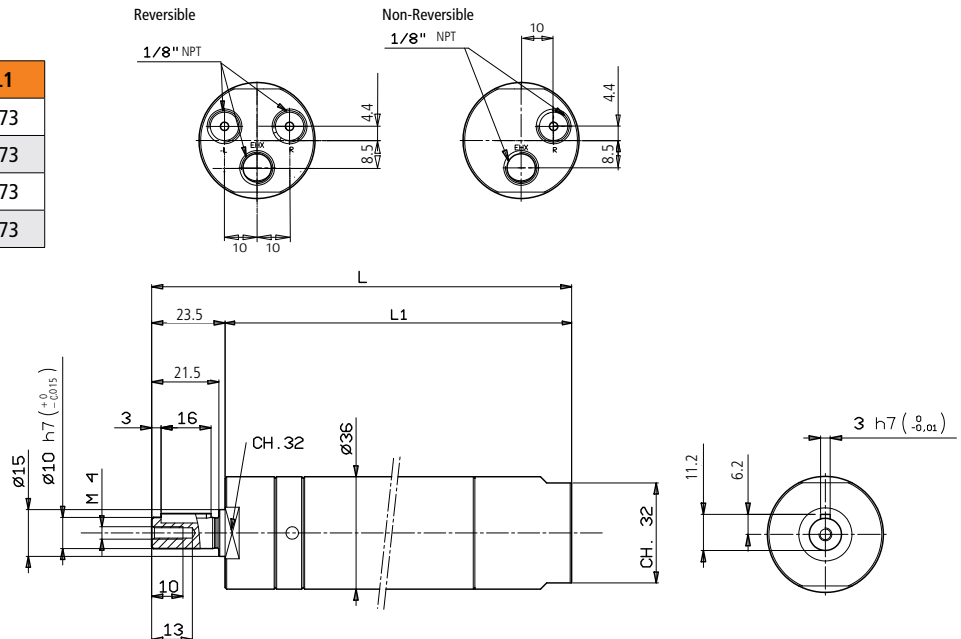
20M Models

Model Number	L
20M35D-D10	134
20M14D-D10	165
20M8D-D10	165
20M5D-D10	165
20M30R-D10	134
20M13R-D10	165
20M7R-D10	165
20M4R-D10	165



28M Models

Model Number	L	L1
28M20D	196.5	173
28M10D	196.5	173
28M15R	196.5	173
28M8R	196.5	173



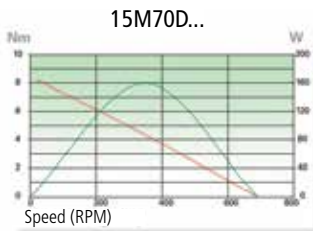
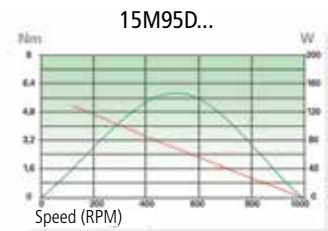
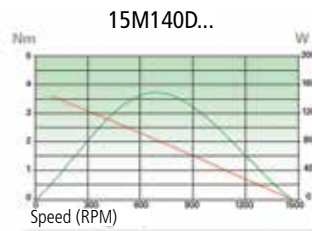
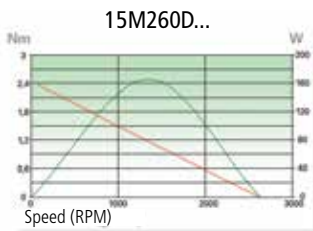
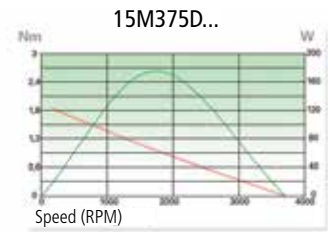
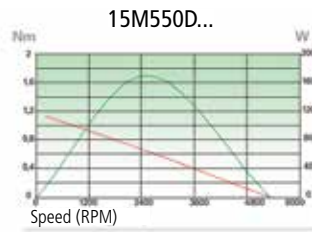
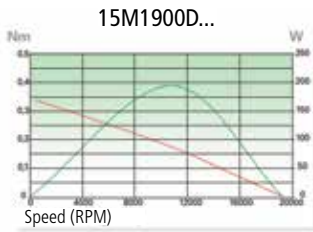
Dimensional drawings in mm

Section 5: Performance Diagrams

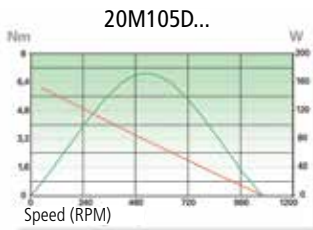
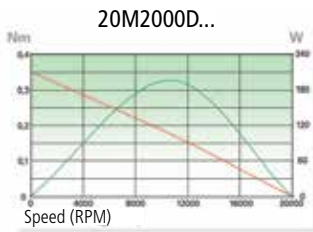
Non-Reversible Models

The diagrams below show the curves for torque, power and speed with an inlet pressure of 6.3 bar (90 PSIG).

15M Models (150 Watts, 0.20 HP)



20M Models (200 Watts, 0.27 HP)

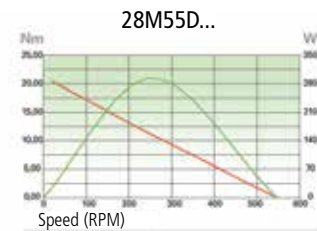
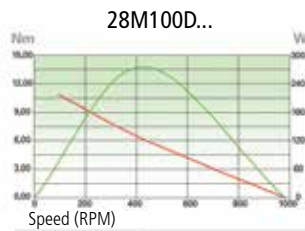
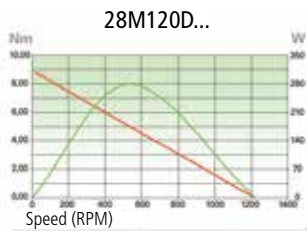
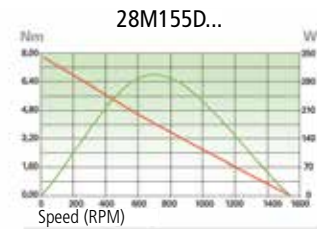
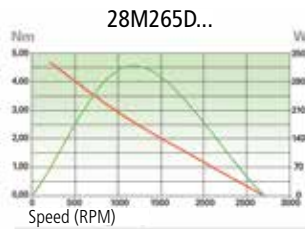
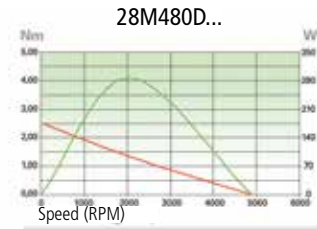


Legend	
	Torque
	Power

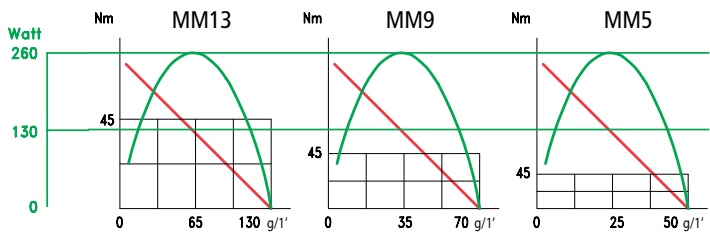
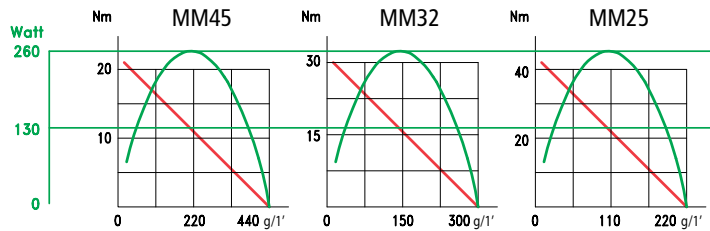
Performance Diagrams

Non-Reversible Models

28M Models (280 Watts, 0.38 HP)



MM Models (260 Watts, 0.35 HP)



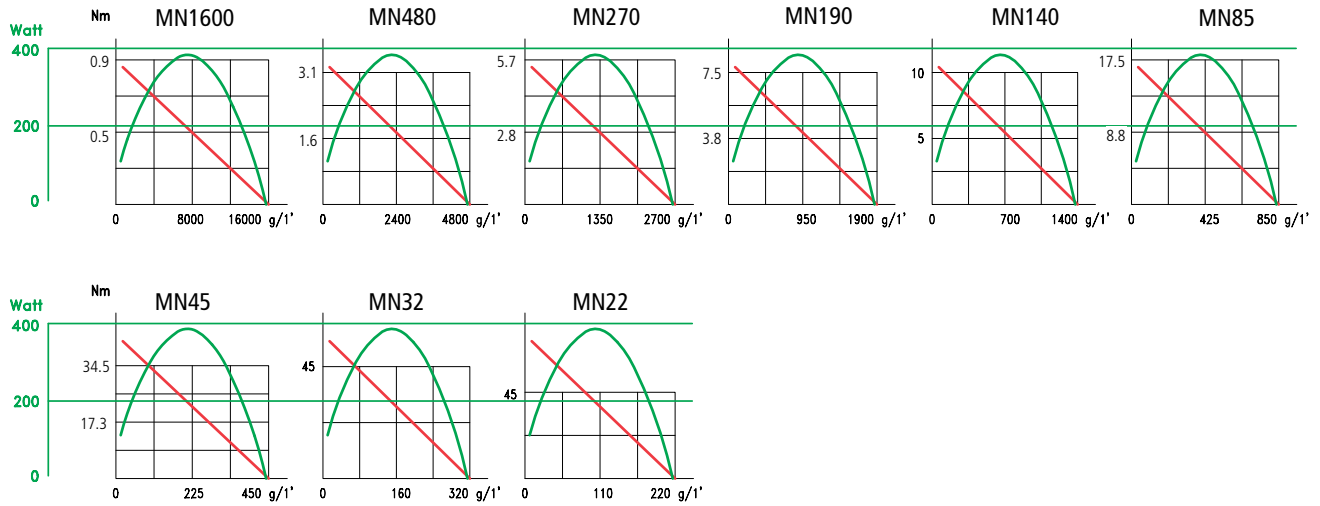
Legend

— Torque — Power

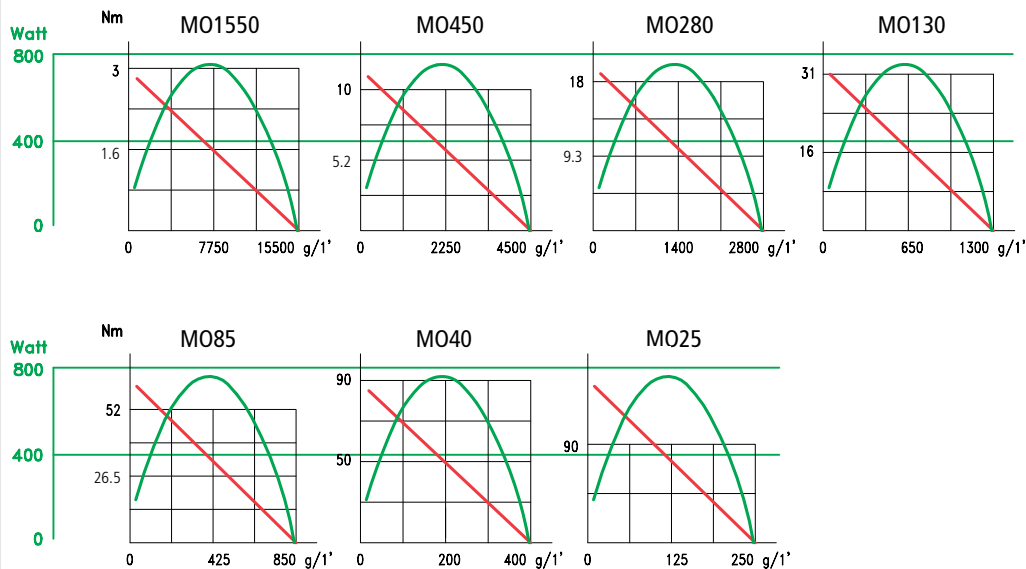
Performance Diagrams

Non-Reversible Models

MN Models (375 Watts, 0.50 HP)



MO Models (800 Watts, 1.1 HP)

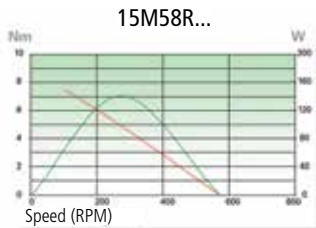
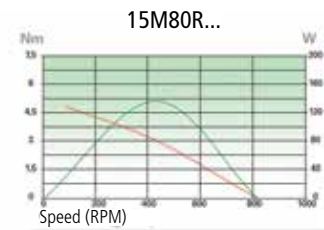
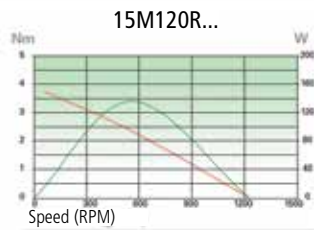
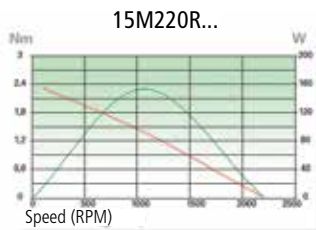
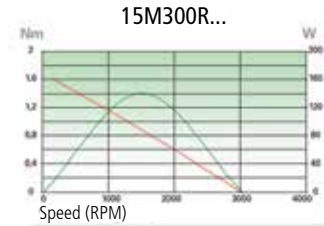
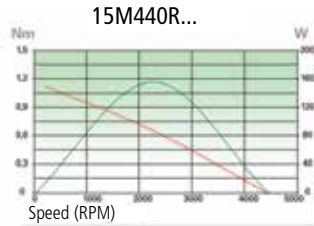
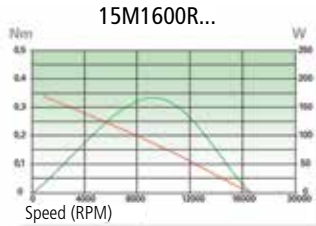


Legend	
	Torque
	Power

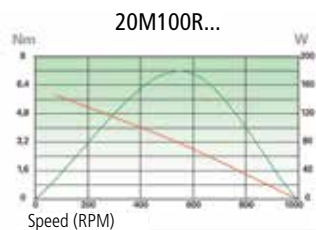
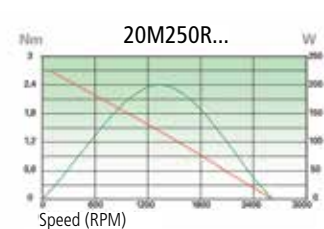
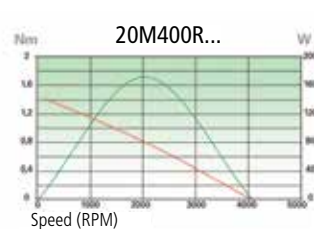
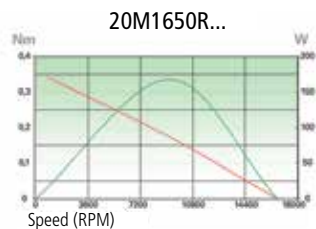
Performance Diagrams

Reversible Models

15M Models (120 Watts, 0.16 HP)



20M Models (160 Watts, 0.21 HP)



Legend

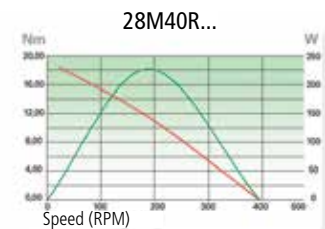
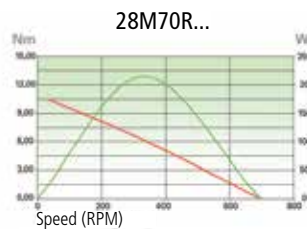
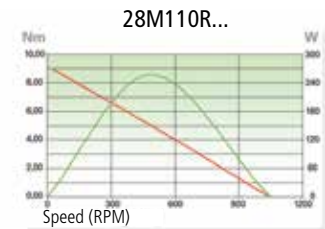
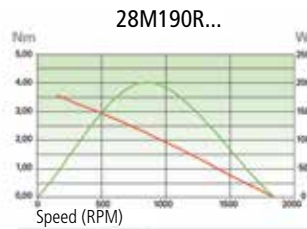
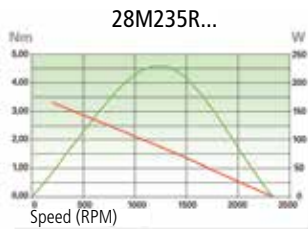
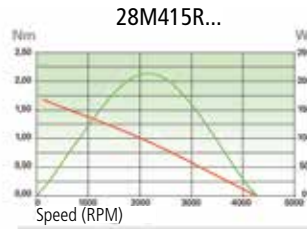
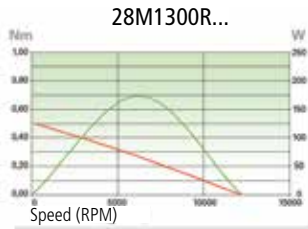
— Torque

— Power

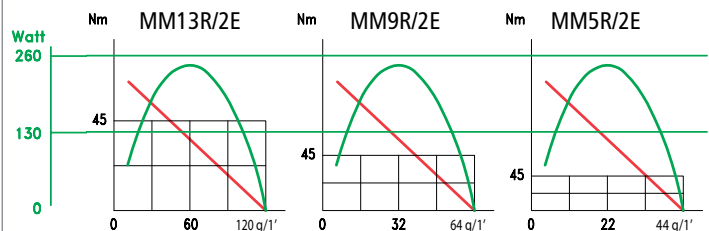
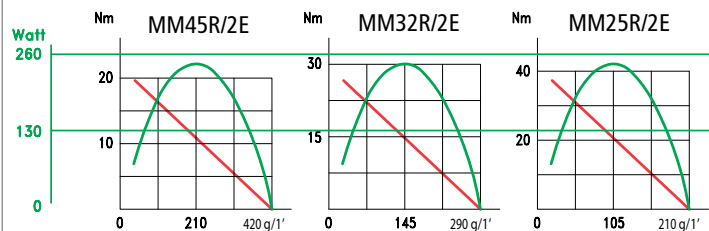
Performance Diagrams

Reversible Models

28M Models (210 Watts, 0.28 HP)



MM Models (240 Watts, 0.32 HP)

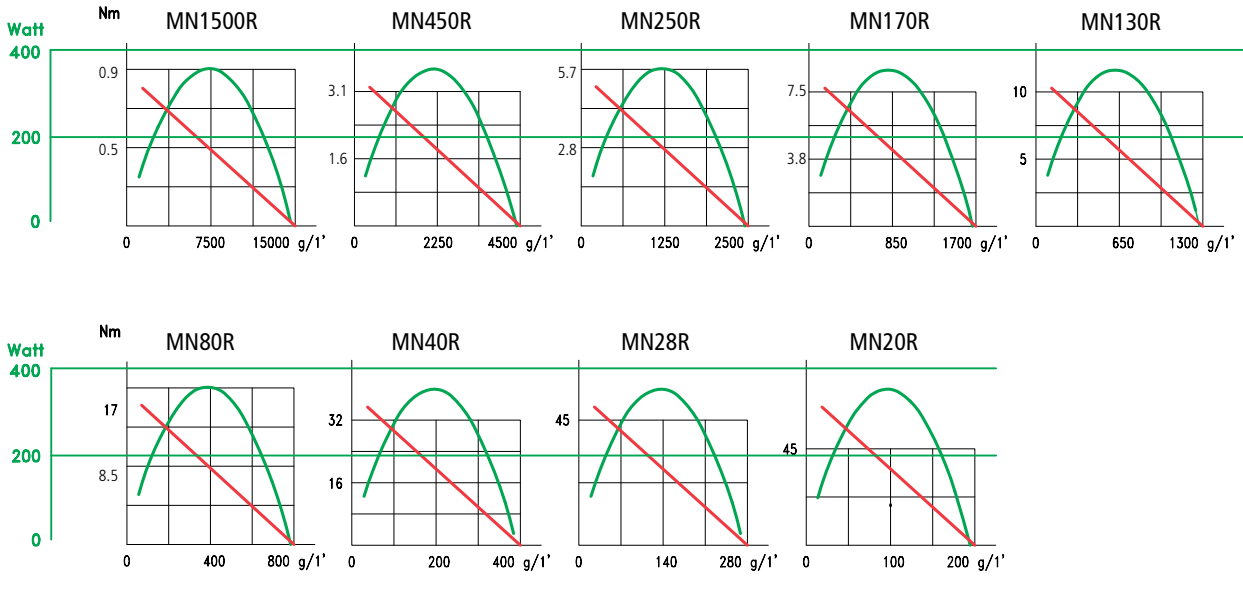


Legend	
	Torque
	Power

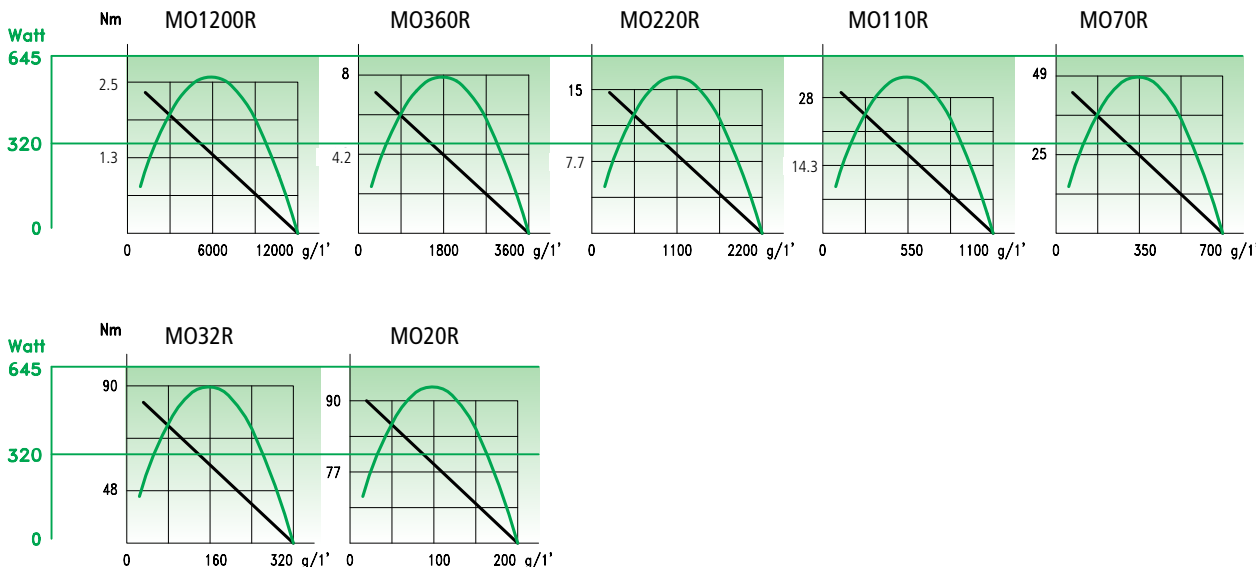
Performance Diagrams

Reversible Models

MN Models (375 Watts, 0.50 HP)



MO Models (645 Watts, 0.86 HP)

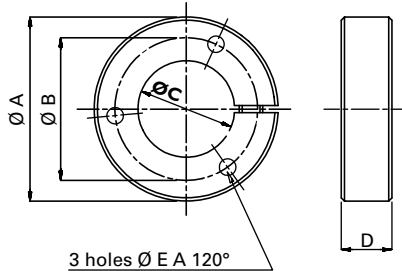


Legend

— Torque — Power

Section 6: Air Motor Accessories and Other Features

Flange Bracket

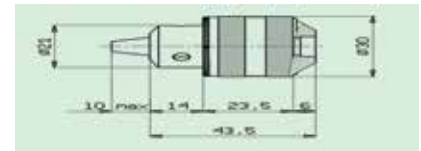


ASG Number	Motor Power	A mm	B mm	C mm	D mm	E mm
6F0651	15M...	64.5	50	29	18	5.25
6F0649	20M...	64.5	50	33.8	18	5.25
6F0649	28M...	69.5	57	36	18	6.25
6F0646	MM-MN	79.5	64	49	18	6.2
6F0647	MO	129	105	65	35	10.2

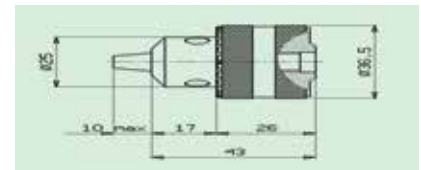
Keyed Chucks

Sturdy chucks equipped with locking key to open and close the bit of the drill. The dimensions are expressed in millimeters (mm).

ASG Number	Chuck Capacity (mm)	Drive Type
6F0419	0 - 6	3/8x24UNF
6F0420	0 - 8	3/8x24UNF



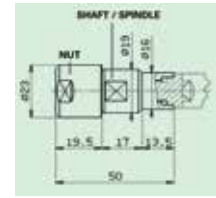
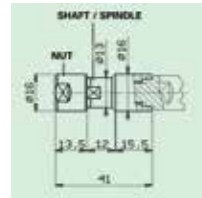
ASG Number	Chuck Capacity (mm)	Drive Type
6F0421	1 - 10	3/8x24UNF



Air Motor Accessories and Other Features

Collet Chucks

ASG Number	Collet Chuck	Drive Type
6F0563	ER 11	3/8x24UNF
6F0562	ER 16	3/8x24UNF



Collets

Collets are to be chosen according to the diameter of the bit. The locking capacity of the collet is referred to the diameter of the male shank of the bit.

Collets ER 11



ASG Number	Maximum Capacity Ø (mm)
6F0537	1
6F0538	1.5
6F0539	2
6F0540	2.5-3/32"
6F0541	3
6F0542	3.5-1/8"
6F0543	4
6F0544	4.5
6F0545	5-3/16"
6F0546	5.5
6F0547	6
6F0548	6.5-1/4"
6F0549	7

Note: The formula to obtain the minimum capacity for an ER 11 collet is:

$$\text{Max} - 0.5 \text{ mm} = \text{Minimum}$$

Collets ER 16



ASG Number	Maximum Capacity Ø (mm)
6F0550	1
6F0551	1.5
6F0552	2
6F0553	2.5-3/32"
6F0554	3
6F0555	4-1/8"
6F0556	5-3/16"
6F0557	6
6F0558	7-1/4"
6F0559	8-5/16"
6F0560	9
6F0561	10

Note: The formulas to obtain the minimum capacity for an ER 16 collet are:

1-3mm Maximum:
 $\text{Maximum} - 0.5 \text{ mm} = \text{Minimum}$

3mm+ Maximum:
 $\text{Maximum} - 1.0 \text{ mm} = \text{Minimum}$

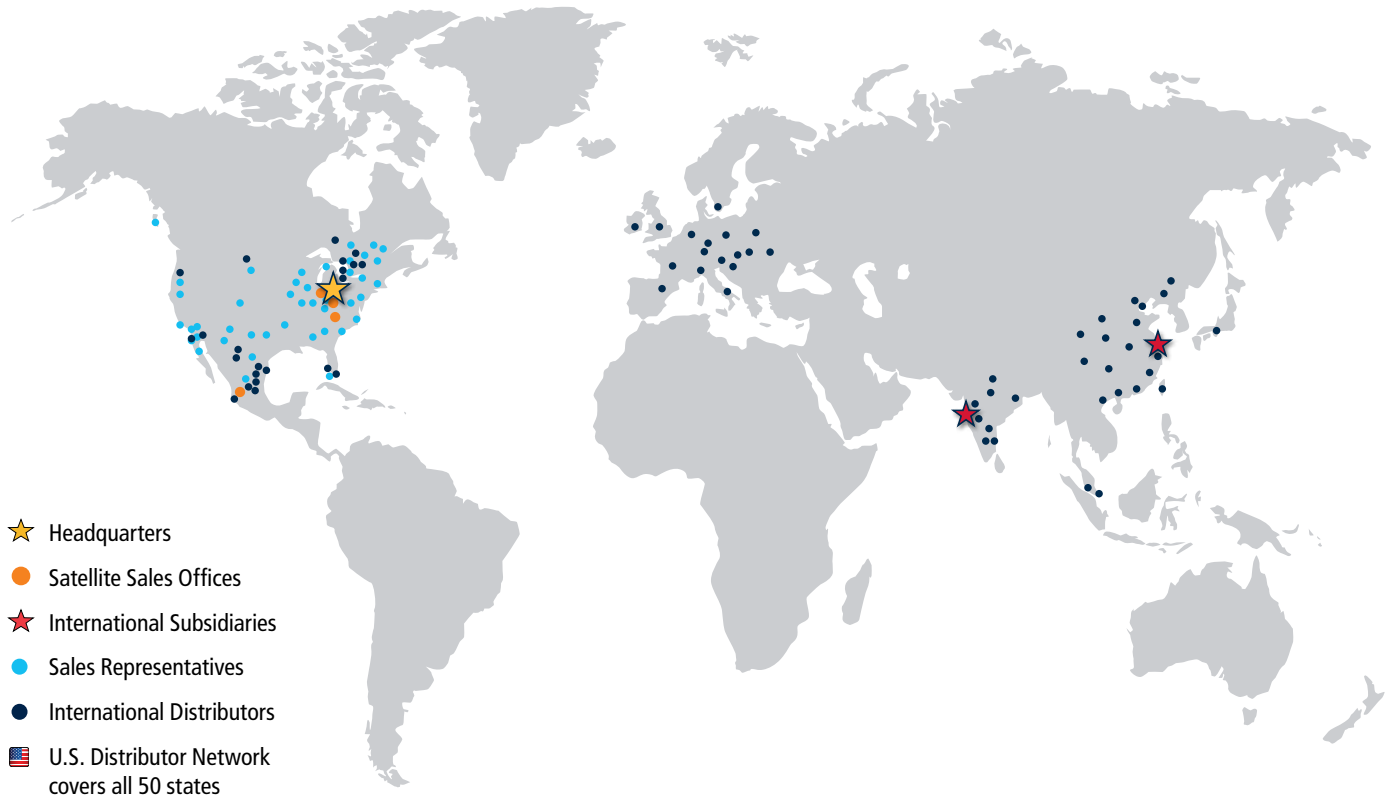
Air Motor Accessories and Other Features

Model Number	Air Inlet	Recommended Hose Bore	
MM	1/4" NPTF	Ø 6 mm	1/4 in.
MN	1/4" NPTF	Ø 8 mm	5/16 in.
MO	3/8" NPTF	Ø 13 mm	1/2 in.
28M...D/R	1/8" NPTF	Ø 6 mm	1/4 in.
20M...D/R	1/8" NPTF	Ø 6 mm	1/4 in.
15M...D/R	1/8" NPTF	Ø 6 mm	1/4 in.

Models Available Upon Request

- With special output shafts such as: tapered, morse taper, and various diameters
- Reverse models available except for threaded shaft
- With flanged sleeves
- Models made from special materials such as stainless steel and plastic
- Oil free and stainless steel models for use in the medical and food industry





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