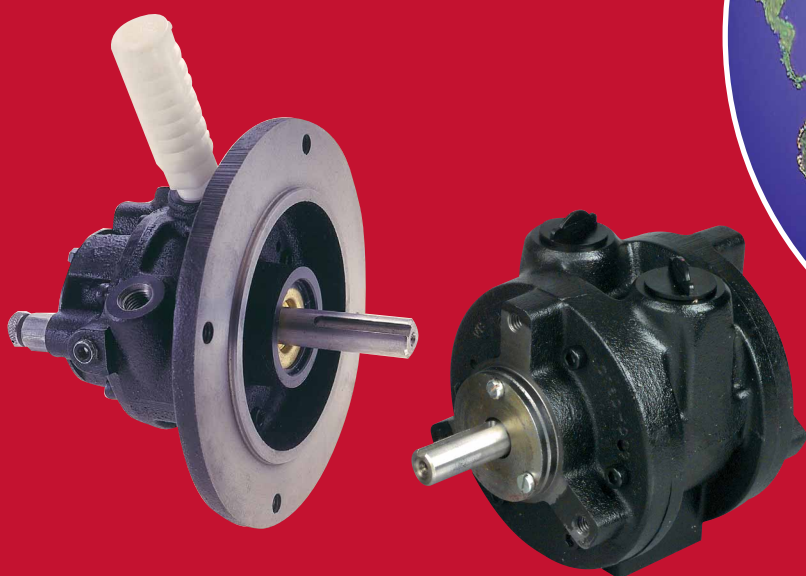




GLOBE

PNEUMATIC VANE MOTORS



Your Global Force In Air Power



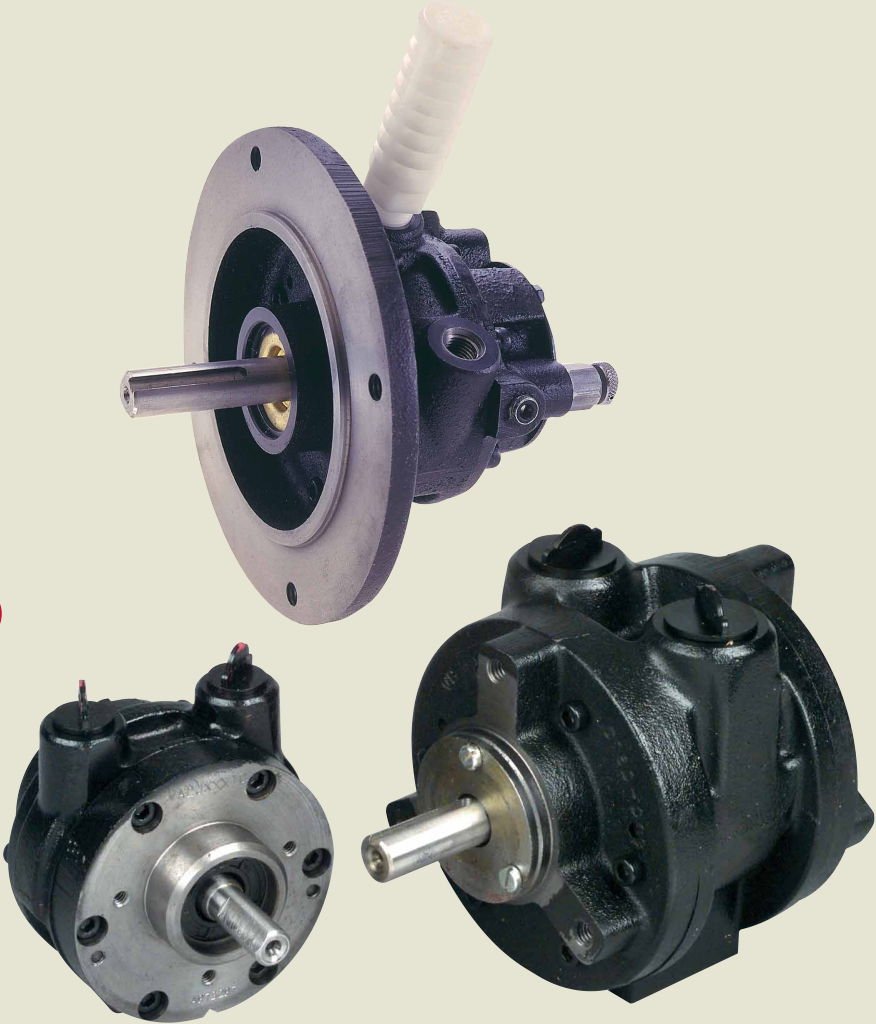
GLOBE AIR POWER

Vane Air Motors

ATEX

Ex II-2-GDc-T5

Ex I-M2



CONTENTS

PAGE

ADVANTAGES/WHY CHOOSE A GLOBE
VANE AIR MOTOR?

3

APPLICATIONS/CHARACTERISTICS

4

CONTROLLING AIR MOTORS

5/6

GEARED VANE AIR MOTORS

6

OILLESS OPERATION

7

MOTOR SELECTION

8

V1 0.6 HP REVERSIBLE

9

V2 1.1 HP REVERSIBLE

10

V4 2.8 HP REVERSIBLE

12

V6 4.6 HP REVERSIBLE

14

V8 7.2 HP REVERSIBLE

16

V10 12.8 HP REVERSIBLE

18

Photos on the front cover on courtesy of:

BPL, Haelen (NL) – Manipulator

Duits Engineering, Zutphen (NL) – Turning device

Gritco Equipment BV, Ridderkerk (NL) – Sand blasting equipment

Aerofilm Systems BV, Eindhoven (NL) – Lifting table

EMCE, Voorhout (NL) – Winch

ADVANTAGES

Vane air motors offer a unique form of drive and incorporate advantages not found in other prime movers. These advantages include:

- Simple and inexpensive variable speed and torque control with a flow control valve and/or pressure regulator.
- Intrinsically safe for explosion proof environments. All GLOBE vane air motors are certified according to the European Explosion Directive ATEX II cat. 2 G&D T5 and ATEX I M2.
- Air motors can be stalled indefinitely under load. They will not over heat or burn out.
- Instantly reversible, operated with a simple control valve.
- Controllable over a wide speed range.
- Resistant to warm, dirty and damp conditions.
- Cool running caused by the expanding air. GLOBE vane air motors can be used in ambient temperatures up to 80 °C.
- Minimal maintenance because of simple design which results in less downtime.
- Air motors are compact and light weight compared to equivalent electric motors.
- High reliability and little wear thanks to the low number of moving parts.
- No shock start up which improves the life span of your equipment.
- Variety of mountings which include foot, face, NEMA flanges and IEC flanges.

WHY CHOOSE A GLOBE VANE AIR MOTOR?

NO PINS OR SPRINGS.

The GLOBE blade ejection system consists of an ejection ring which maintains a constant positive blade contact with the motor body. This guarantees the blade position on start up, preventing free air flow from port to port and ensuring the motor produces its rated starting torque. The ejection ring design removes the requirement for pins or springs, the result is low vane wear and a high motor reliability.

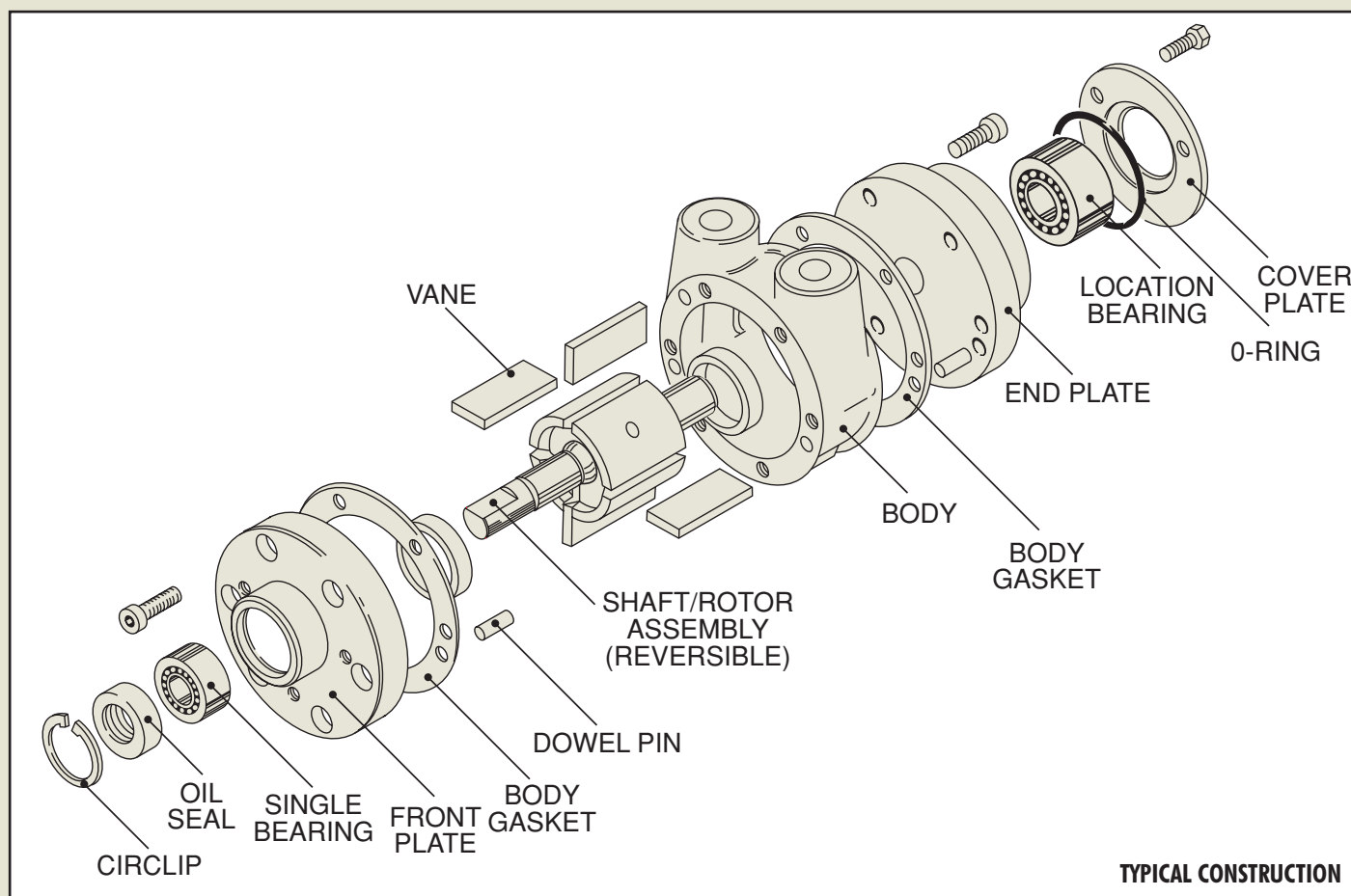
The GLOBE vane air motors can be supplied directly coupled to a wide range of gearboxes such as planetary, helical, bevel helical and worm gears.

Suitable for running on natural sweet gas and other gasses.

Oil-less function possible under certain operating conditions.

Robust design for operation in harsh environments.

Available in a variety of motor interfaces including foot, face, NEMA and IEC flanges. Special adaptations are available on request, consult GLOBE Airmotors BV or your local distributor for more information.



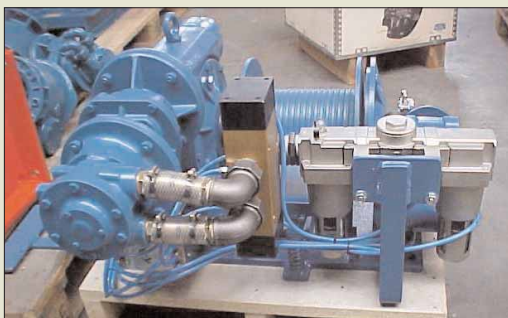
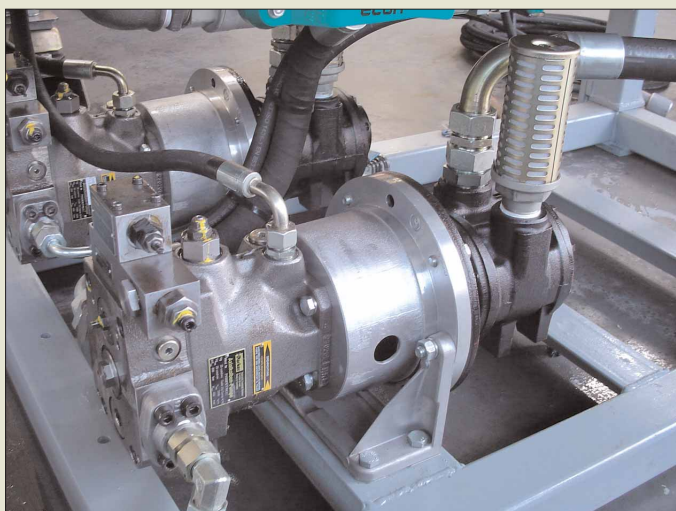
APPLICATIONS

Vane air motors are used in numerous applications, most suitable for light to medium duty operation at higher direct shaft speeds.

For lower speed operation with a high torque requirement a large variety of gearboxes and GLOBE or combinations are available.

Most typical vane air motor applications:

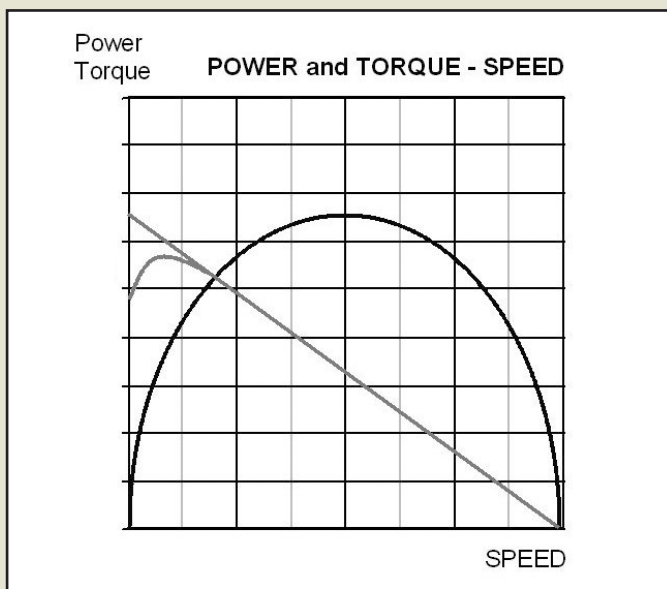
- Mixing equipment
- Ventilators
- Hoists
- Winches
- Pump drives
- Conveyor belts
- Turntables
- Packing machines
- After coolers



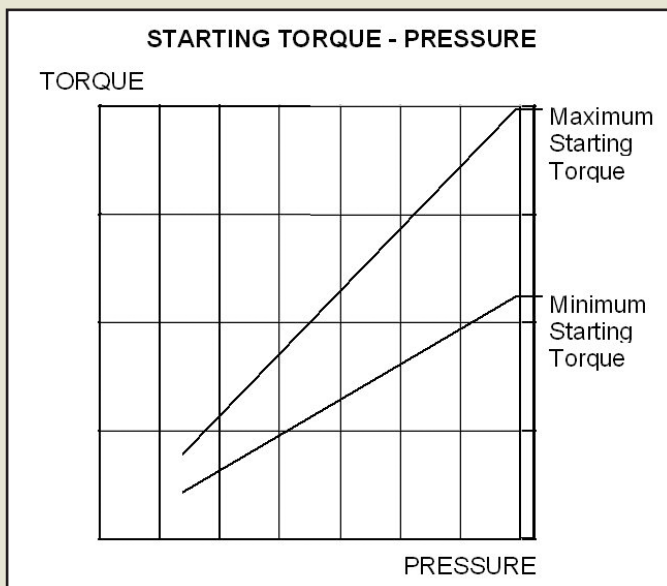
CHARACTERISTICS OF VANE AIR MOTORS

Vane air motors are the most widely used design of air motors. They are available in a broad range of power and can operate in any position. Offering a lighter and more compact motor solution when compared with piston air motor of similar power.

The output power of a vane motor varies as a function of speed and torque. The relationship when the air supply is not externally regulated is shown in the graphs below.



A typical characteristic of vane air motors is the variable starting torque for a given input pressure; a result of the varying vane position at start up. For applications with starting load, the minimum starting torque produced as indicated in the graph should be used in calculations.



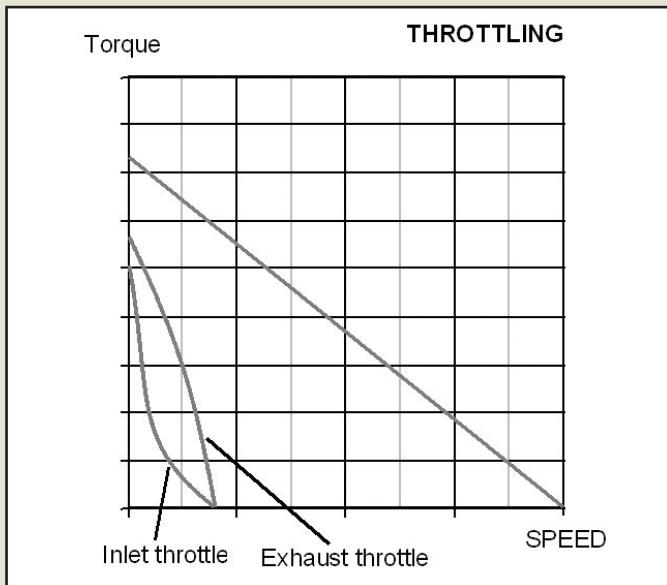
CONTROLLING AIR MOTORS

Speed regulation

Controlling the speed and torque of an air motor is achieved by regulating the air supply; a relatively cheap and simple operation. Two methods are available, throttling and pressure regulation.

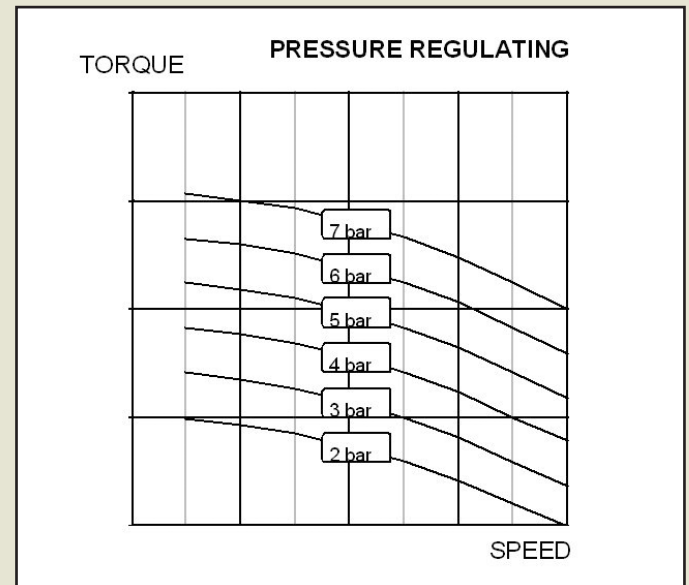
Throttling

The air flow is controlled by placing a flow control valve at the inlet port or the outlet port of the air motor. Throttling will reduce the maximum speed of the motor but will not affect the starting performance; the air pressure is unaffected at low flow conditions i.e. starting. Note the difference in the graph between throttling on the inlet port and outlet port.

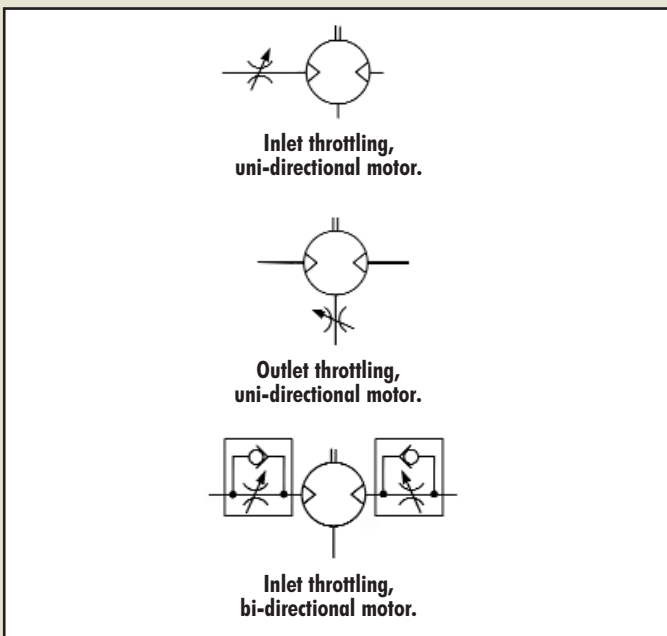


Pressure regulator

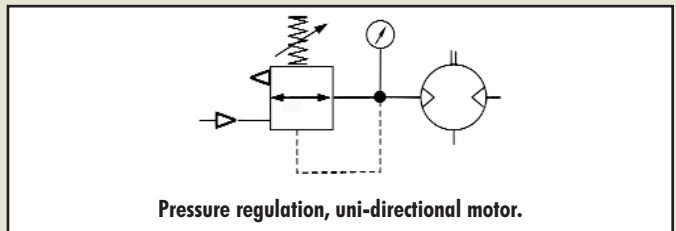
The speed and power can also be reduced by installing a pressure regulator on the incoming air supply. The pressure regulator reduces the air pressure to the motor. A pressure regulator is always fitted on the inlet port. By using a pressure regulator the torque on the output shaft will be affected, starting torque is best controlled with this method.



Throttling methods



Pressure regulating method

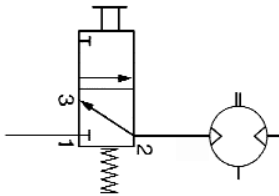


When both the speed and the torque are to be controlled the best configuration is to use a pressure regulator in the line to the motor and a flow control valve on the outlet port. This way every point in the torque-speed graph can be set accurately.

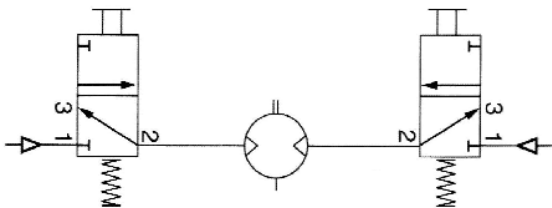
CONTROLLING AIR MOTORS

Directions of rotation

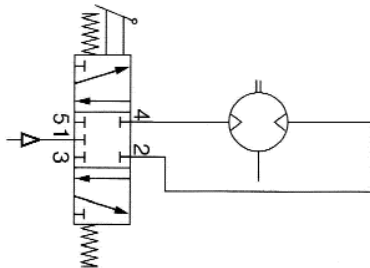
The GLOBE vane air motors can be used both as a uni-directional and as a bi-directional air motor. When the air motor is used in a non-reversible application, it is sufficient to use a 2/2 or a 3/2 valve. For the reversible motor you can use either a 5/3 or two 3/2 valve to gain directional control.



Uni-directional motor with 3/2 valve.



Bi-directional motor with two 3/2 valves.



Bi-directional motor with 5/3 valve.

Air supply

Air quality

To insure optimal working conditions for the GLOBE vane air motors, the air supply must be dry, filtered and lubricated. A 64 micron filter or better is recommended. The GLOBE vane air motors should be lubricated sufficiently. Oilless operations are possible in certain applications.

Air line restrictions

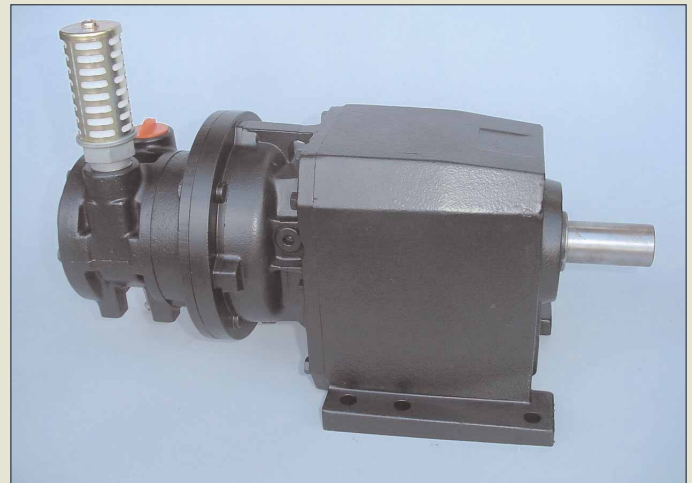
Air line restrictions on the inlet side of the motor will result in performance loss. Therefore it is important to make sure that the desired air pressure is available at the motor during operation. The pressure reading at the compressor or pressure regulator may be different than the pressure available at the motor.

Performance loss can also occur by an exhaust restriction generating back pressure on the outlet side of the motor. An insufficiently sized silencer, valve or coupling is usually the cause.

GEARED VANE AIR MOTORS

Although air motors can be adjusted over a wide range of speed and torque, the output characteristics may not always be suitable for the application. For lower speed applications a gearbox can be coupled directly to the air motor.

GLOBE Airmotors BV has a wide range of gear units available including planetary, helical, bevel helical and worm gears in their program. Consult GLOBE Airmotors BV or your local distributor for more detailed information.



OILLESS OPERATION

Advantages of non lubricated operation are:

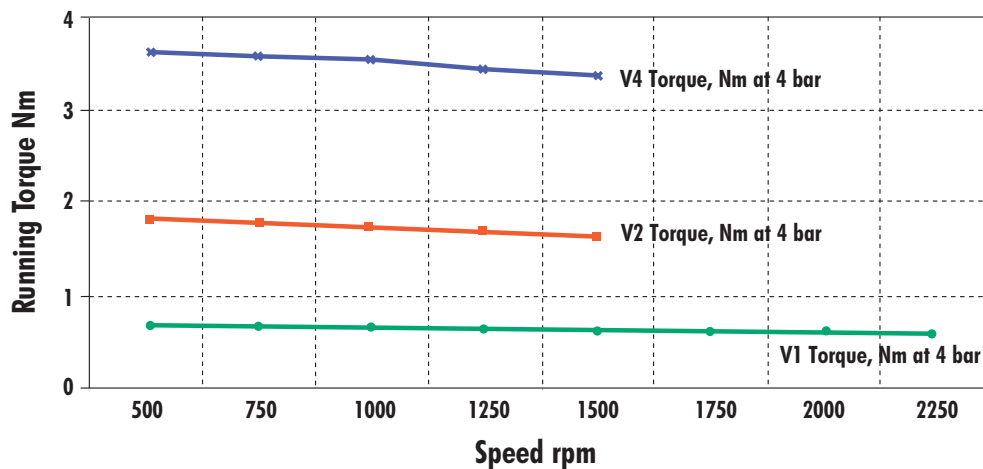
- No lubricator necessary – save on installation costs.
- No oil and inspection of the lubricator oil level necessary – save on annual running costs
- No oil-contaminated air from the exhaust – protects products and workforce
- Same standard interface as the regular GLOBE vane air motors.

All the GLOBE vane air motors can run without lubrication under certain operation conditions. For dry running blades, a filtration to a minimum of 25 microns is recommended.

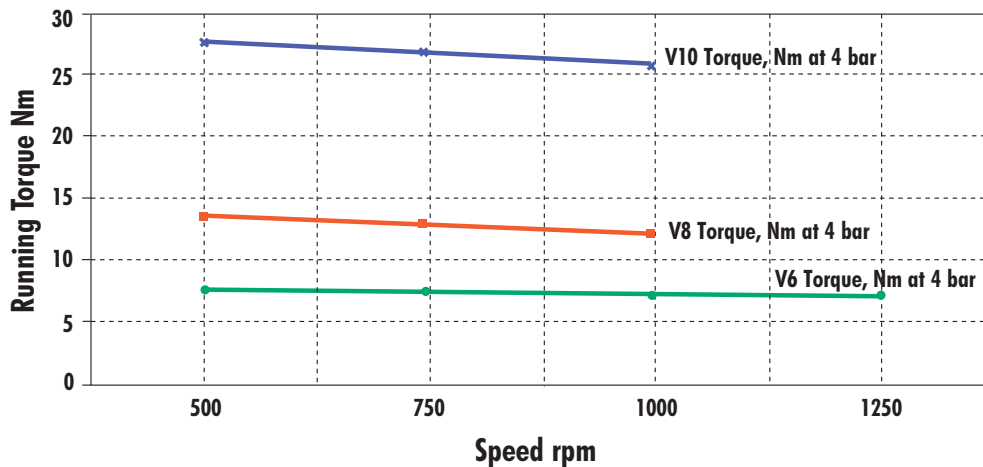
The maximum air pressure must not exceed 4 bar and motor speed must not exceed the figures stated in the graphs below. The maximum motor speed must never be exceeded when the motor is running off load. As prevention a flow restriction should be fitted on the outlet when the load can vary greatly.

Continuous duty is best suited to non lubricated operation. Moisture in the air can cause corrosion problems during rest periods.

Non Lubricated Vane Motors Speed and Torque Curves, V1, V2 and V4 with Air at 4 bar

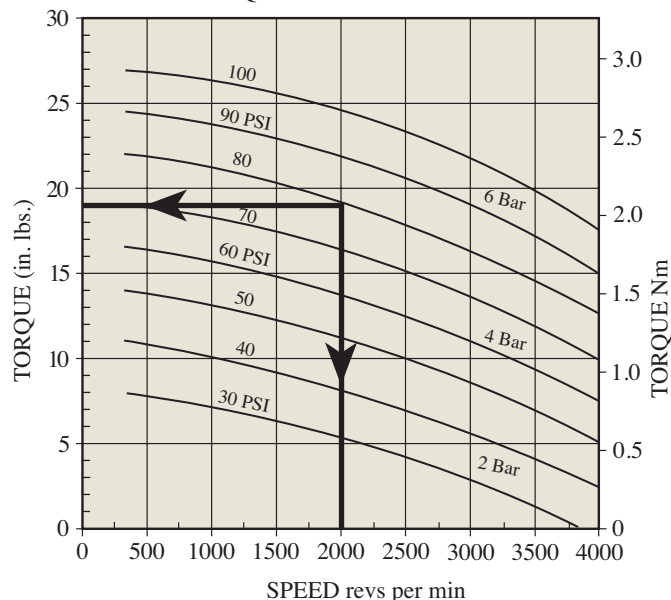


Non Lubricated Vane Motors Speed and Torque Curves, V6, V8 and V10 with Air at 4 bar

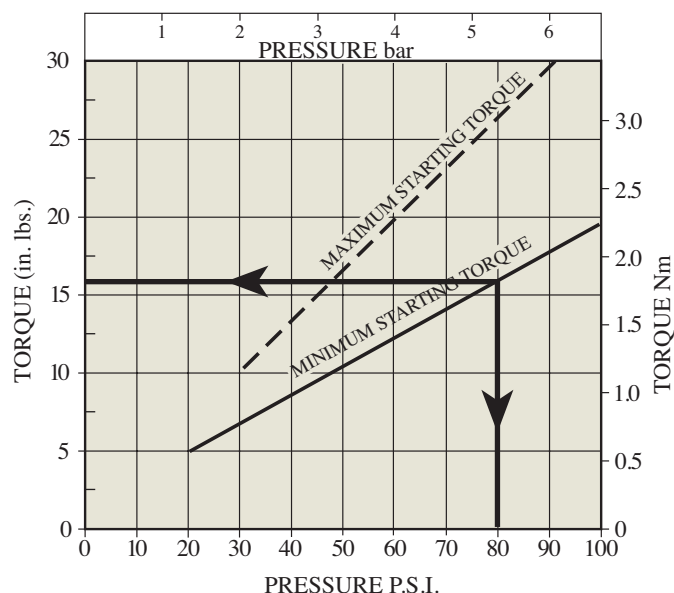


MOTOR SELECTION (EXAMPLE BASED ON V2)

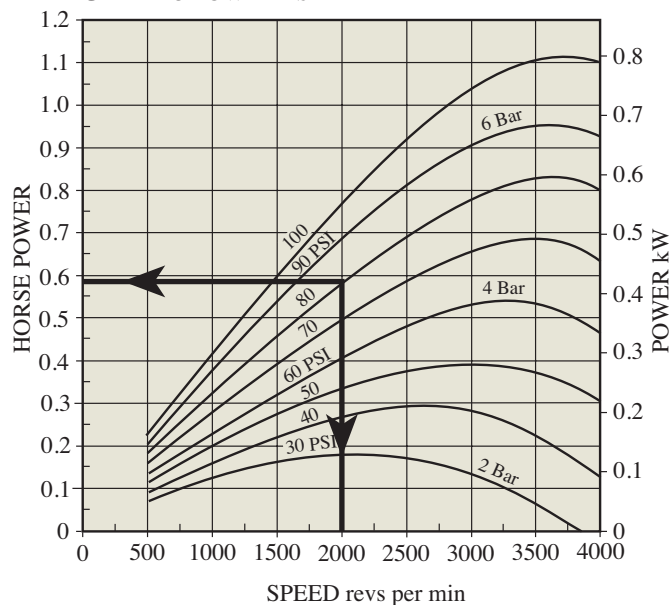
GRAPH 1 TORQUE - SPEED



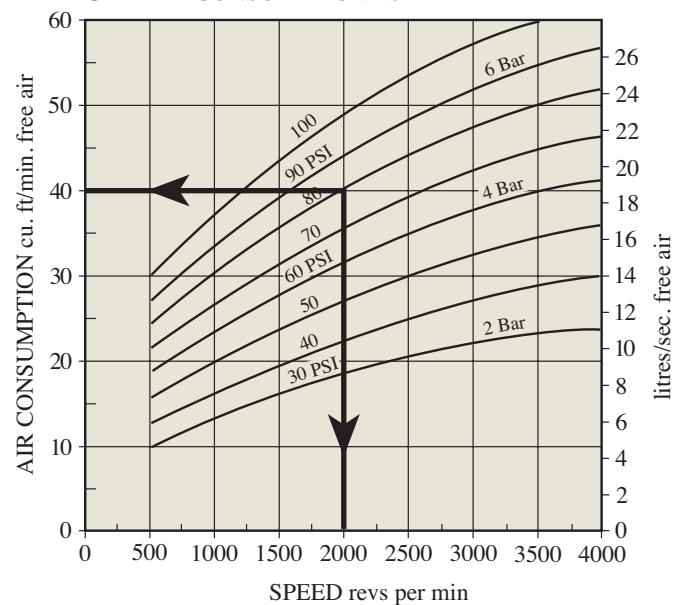
GRAPH 2 STARTING TORQUE - PRESSURE



GRAPH 3 POWER - SPEED



GRAPH 4 CONSUMPTION - SPEED



MOTOR SELECTION

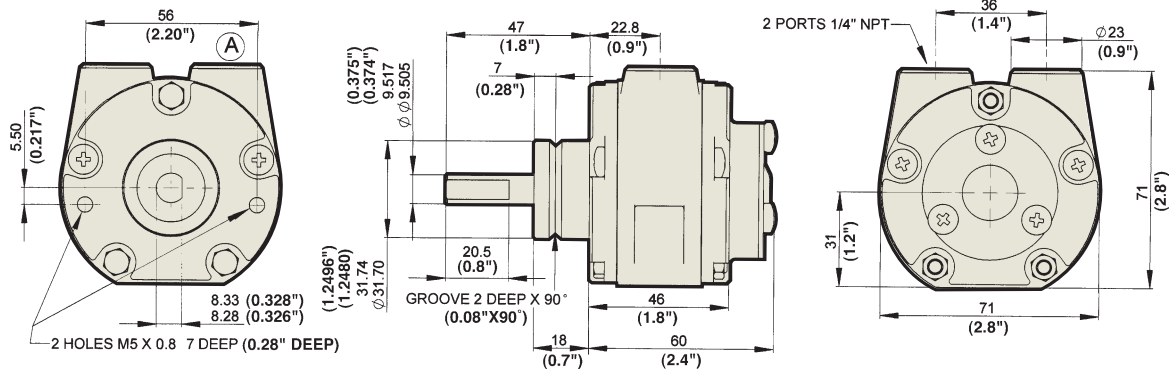
Motor performance can be derived from the above graphs as in the examples shown.

Where motors are not required to start under load, such as fan drives, selection may be made using either Graph 1 or Graph 3 using the required running torque or power only.

For applications where the motor starts under load, such as hoists, winches or track drives, the starting torque in Graph 2 must also be considered.

1. Running torque example: V2 at 80 psi gives 19 lbf.ins. torque at 2000 rpm.
2. Starting torque example: V2 at 80 psi gives 16 lbf.ins.
3. Output power example: V2 at 80 psi gives 0.6 hp at 2000 rpm.
4. Air consumption example: V2 at 80 psi and 2000 rpm requires 40 cu.ft./min. free air.

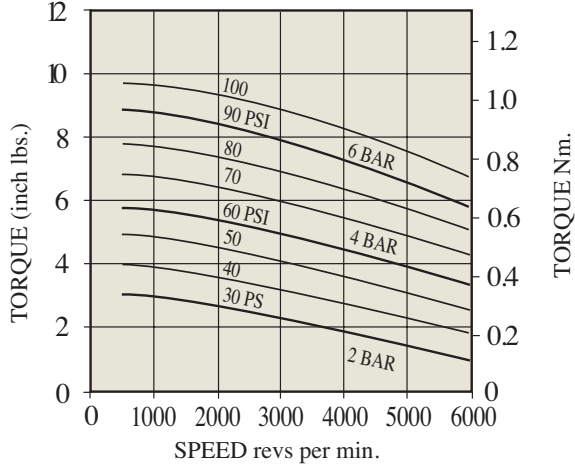
DIMENSIONS V1



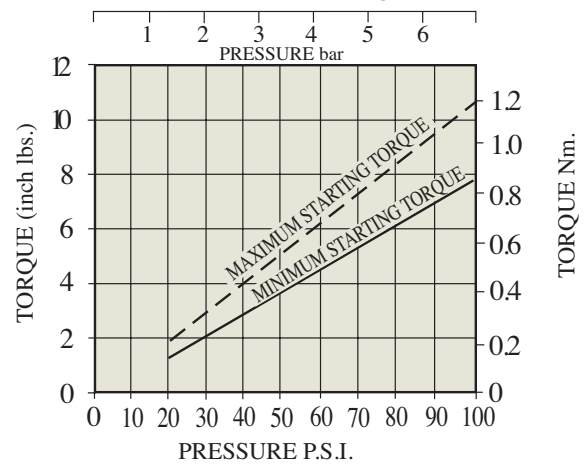
NOTE: WITH INLET AT PORT (A), SHAFT ROTATION IS CLOCKWISE LOOKING ON SHAFT. FOR OPPOSITE ROTATION REVERSE PORTS.

PERFORMANCE V1 0 - 0.6 HP/0.44 kW REVERSIBLE

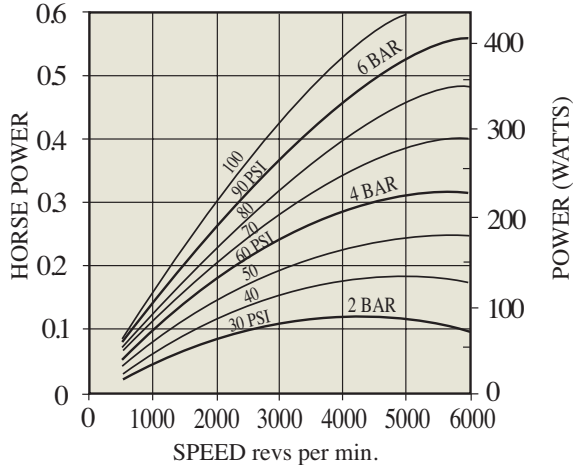
GRAPH 1 TORQUE - SPEED



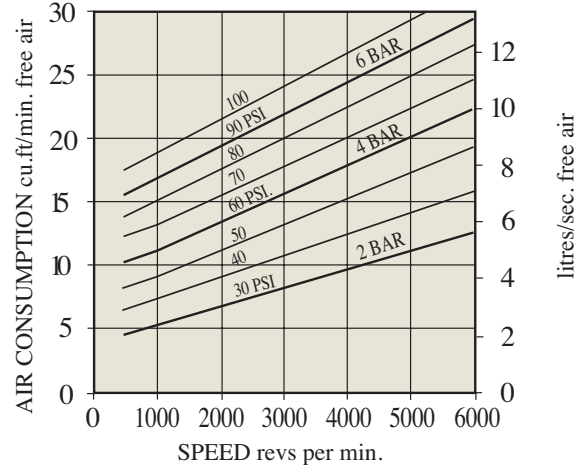
GRAPH 2 STARTING TORQUE - PRESSURE



GRAPH 3 POWER - SPEED



GRAPH 4 CONSUMPTION - SPEED



Attitude:

The motor can be operated in all positions.

Airline filtration and lubrication:

Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to start up, inject oil into the inlet port.

Lubricator drop rate:

4-5 drops per minute continuous operation.

9-12 drops per minute intermittent operation.

Polar Moment of Inertia:

0.16 lb.ins² (460 g.cm²).

Maximum overhung force on shaft:

4 lbf (18N) Axial loads should be kept to a minimum. Consult your Globe Distributor.

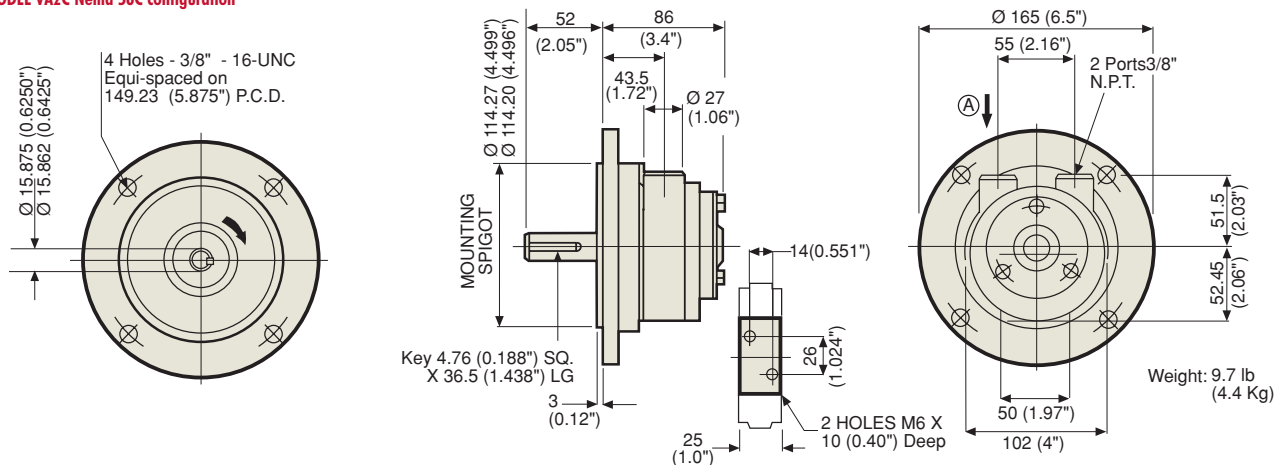
Maximum temperatures:

-4° to +176° Fahrenheit. (-20° to +80°C)

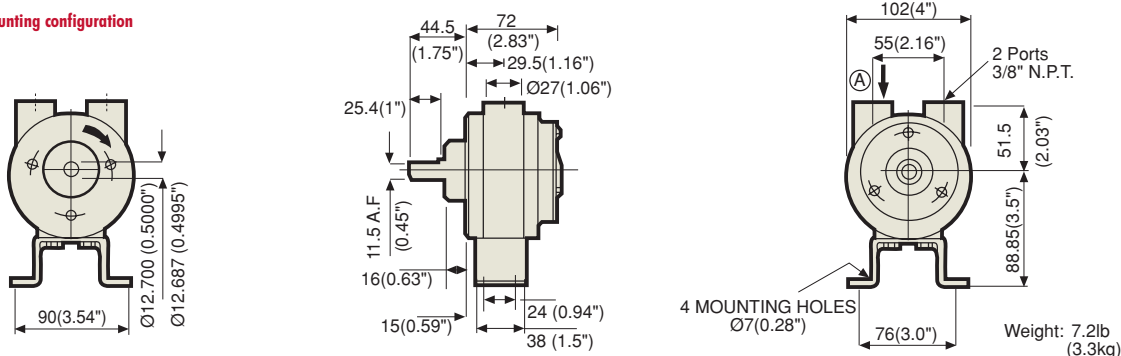
Muffler supplied with motor.

DIMENSIONS V2

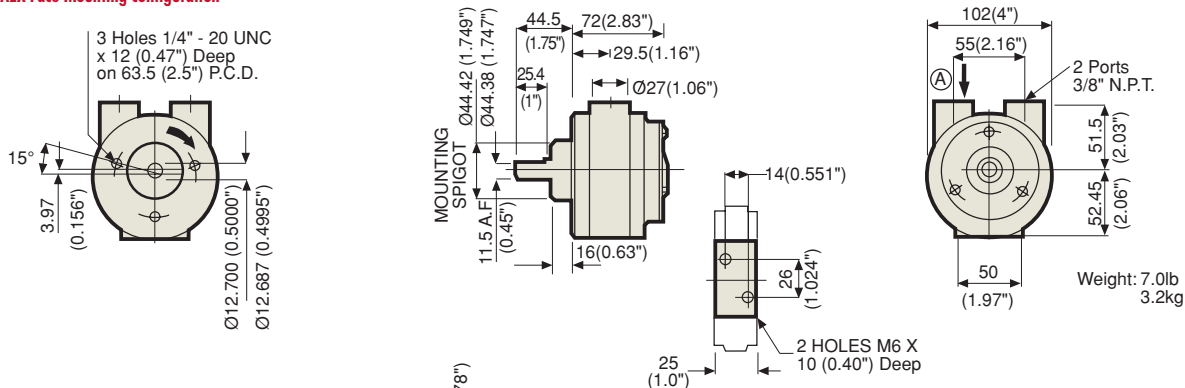
MODEL VA2C Nema 56C configuration



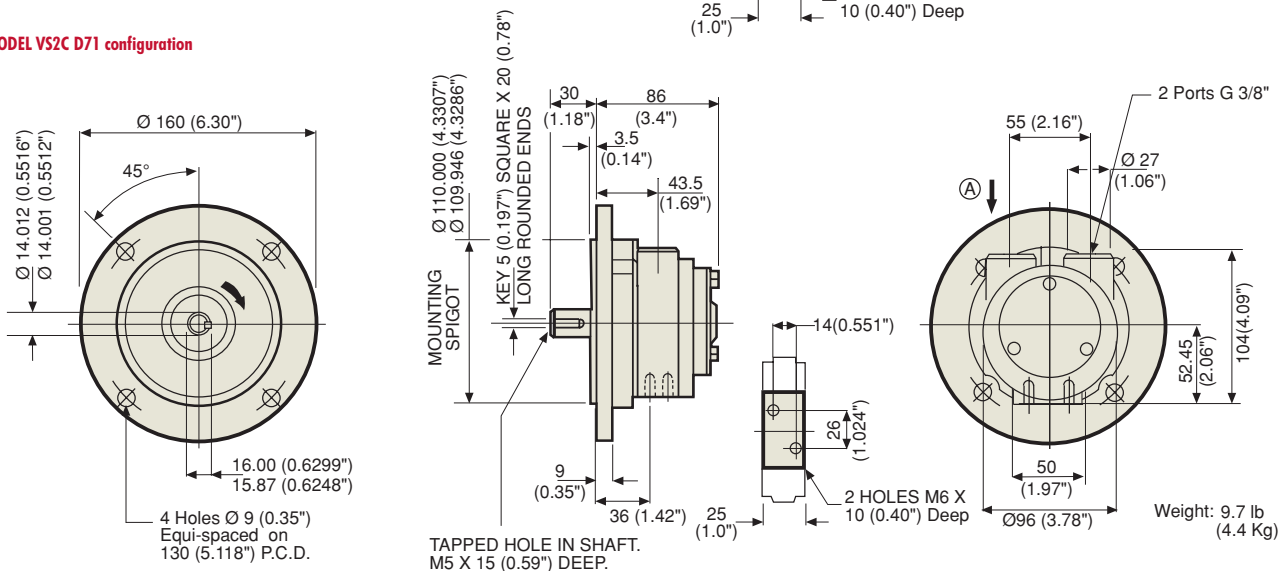
MODEL VA2J Foot Mounting configuration



MODEL VA2X Face Mounting configuration

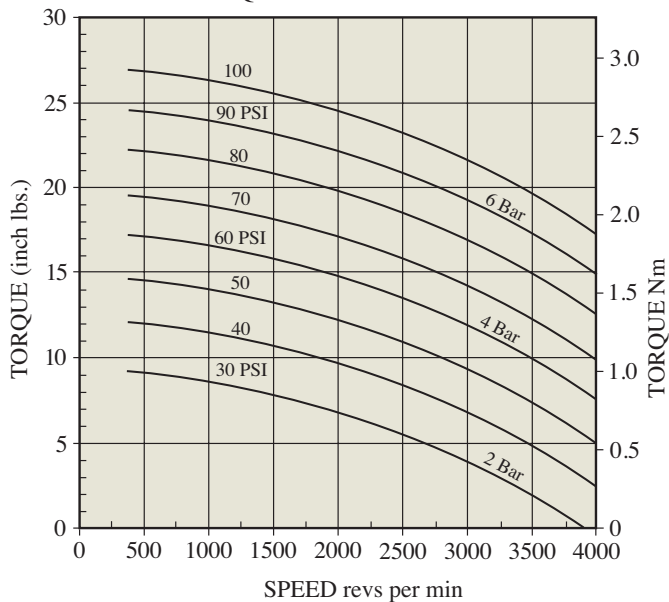


MODEL VS2C D71 configuration

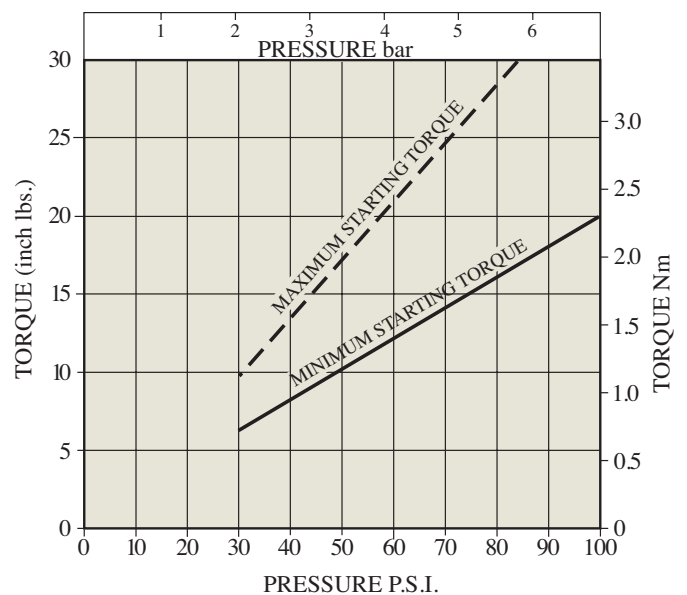


PERFORMANCE V2 1.1 HP/0.82kW REVERSIBLE

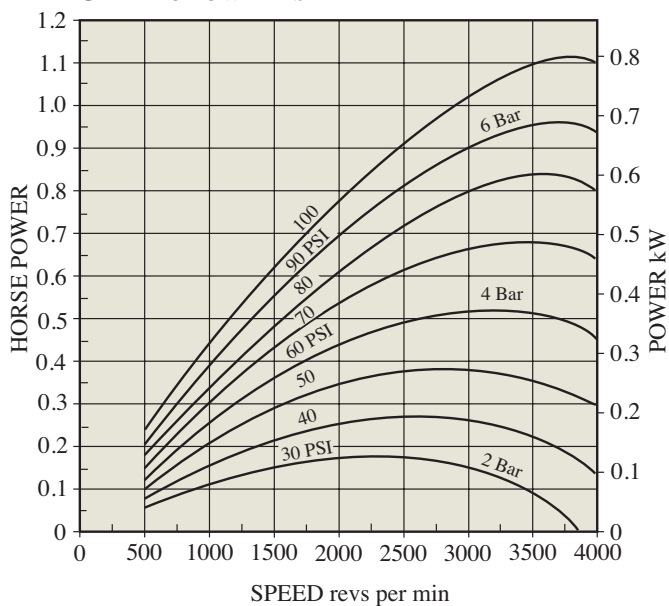
GRAPH 1 TORQUE - SPEED



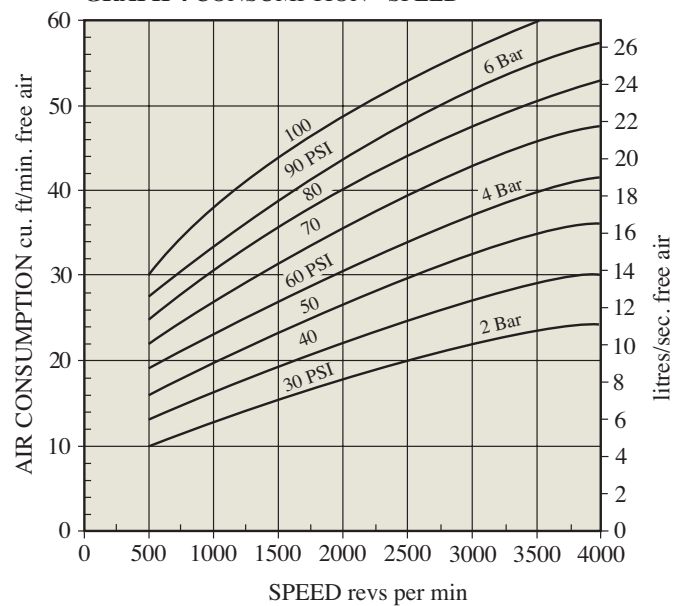
GRAPH 2 STARTING TORQUE - PRESSURE



GRAPH 3 POWER - SPEED



GRAPH 4 CONSUMPTION - SPEED



Attitude:

The motor can be operated in all positions.

Airline filtration and lubrication:

Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to start up, inject oil into the inlet port.

Lubricator drop rate:

4-5 drops per minute continuous operation.

9-12 drops per minute intermittent operation.

Polar Moment of Inertia:

0.47 lb.ins² (0.139 g.m²).

Maximum overhung force on shaft:

90 lbf (400N) In certain circumstances this may be extended. Consult your Globe Distributor. Axial loads should be kept to a minimum.

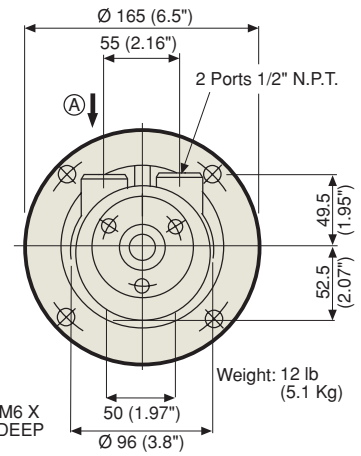
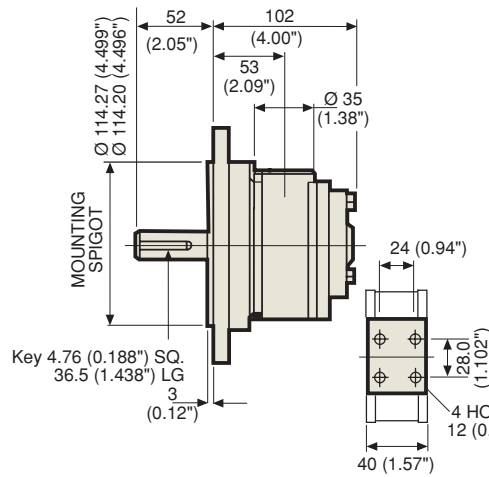
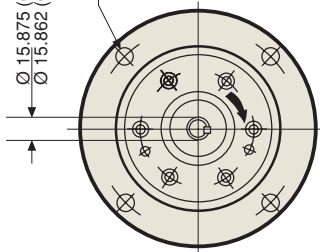
Maximum temperatures:

-4° to +176° Farenheit. (-20° to +80°C)

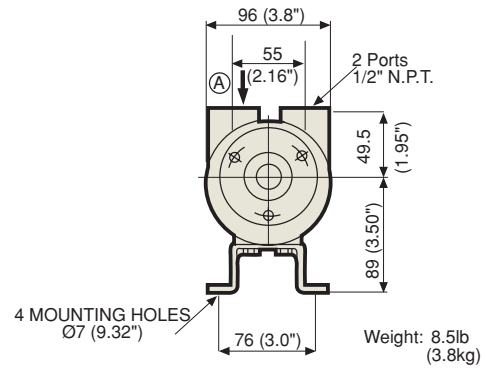
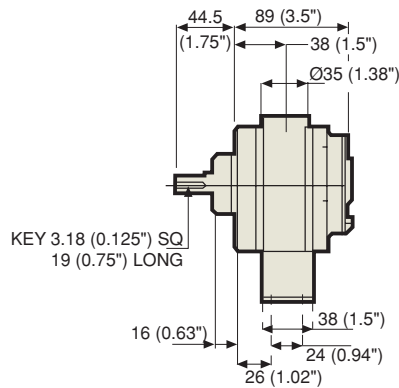
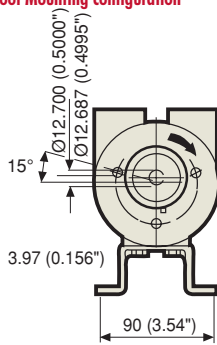
DIMENSIONS V4

MODEL VA4C Nema 56C configuration

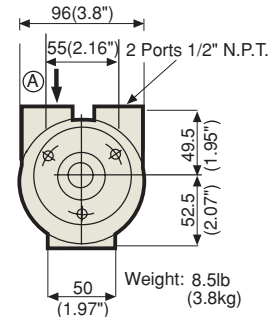
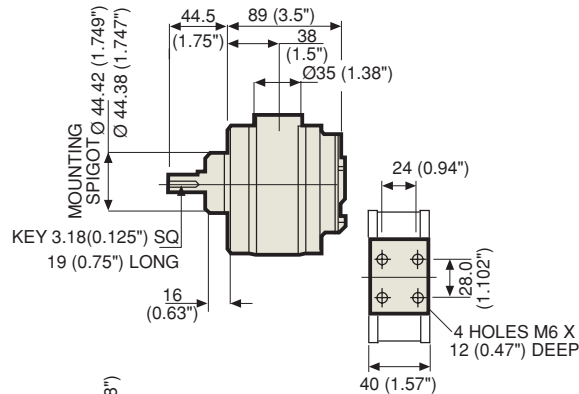
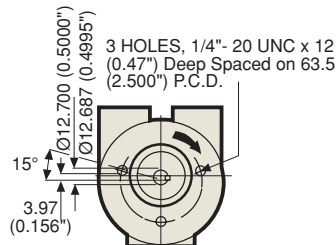
4 Holes - 3/8" - 16-UNC
Equi-spaced on
149.23 (5.875") P.C.D.



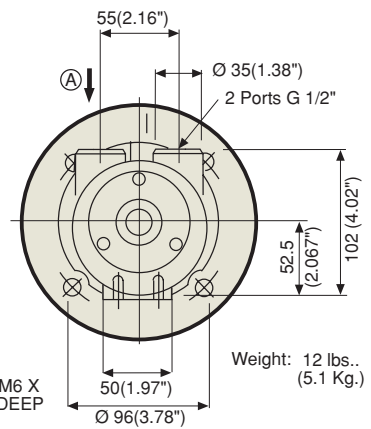
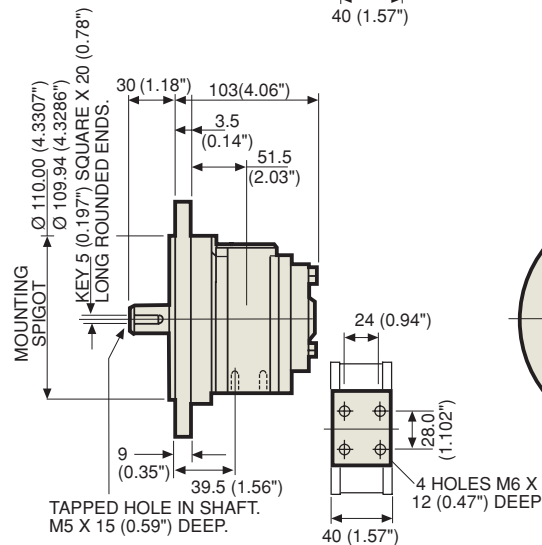
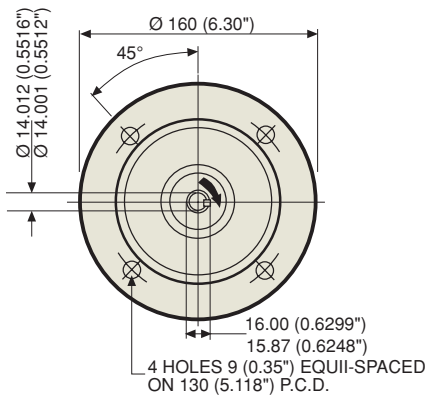
MODEL VA4J Foot Mounting configuration



MODEL VA4X Face Mounting configuration

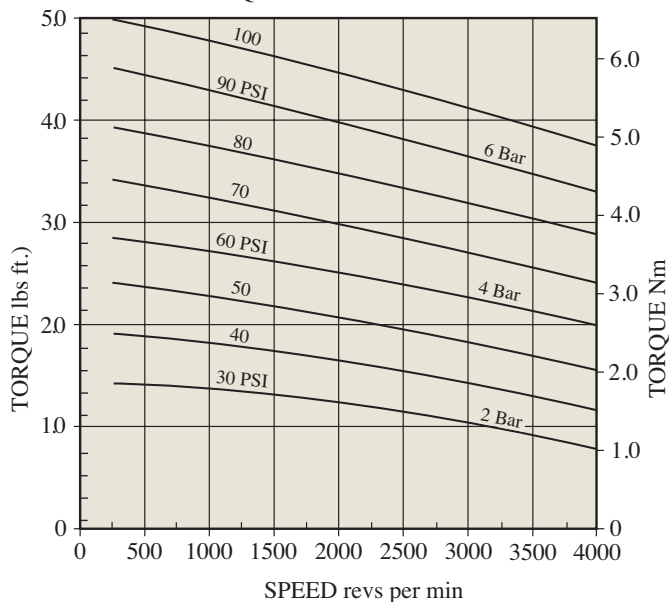


MODEL VS4C D71 configuration

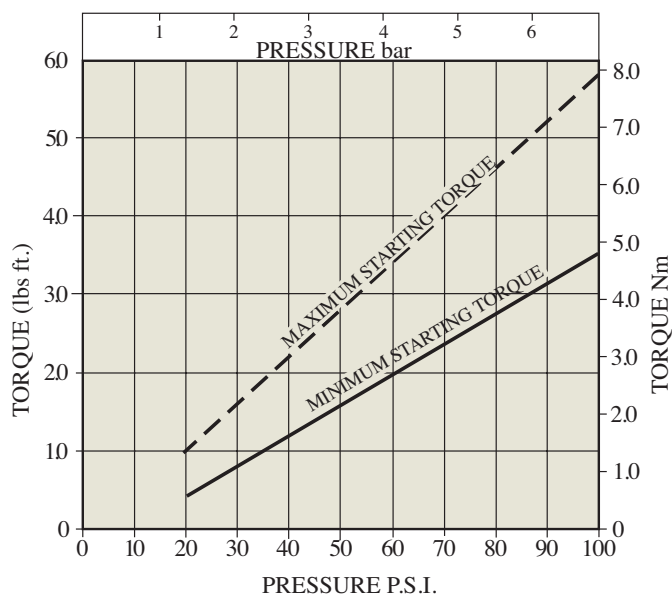


PERFORMANCE V4 2.8 HP/2.1 kW REVERSIBLE

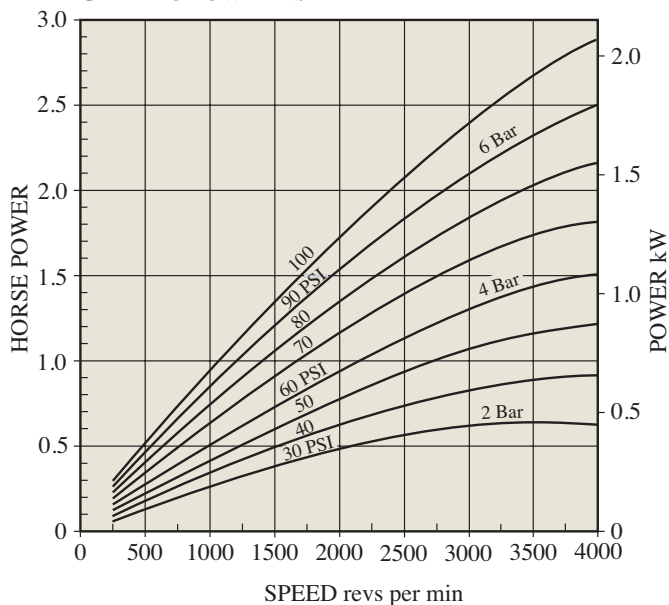
GRAPH 1 TORQUE - SPEED



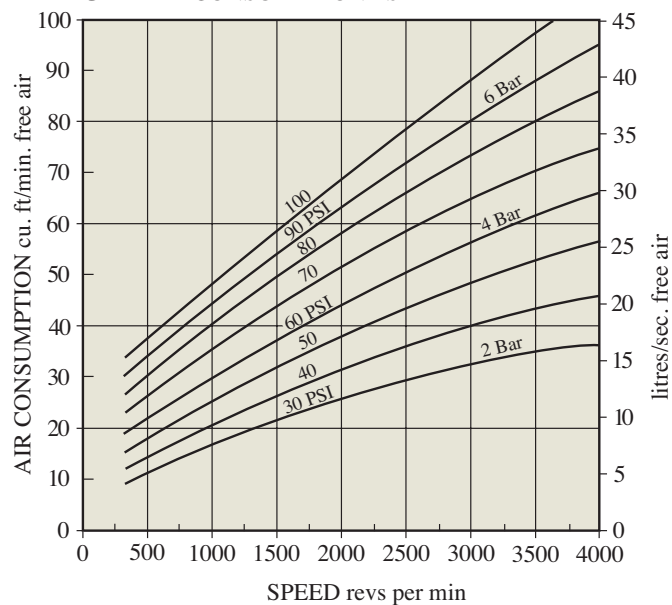
GRAPH 2 STARTING TORQUE - PRESSURE



GRAPH 3 POWER - SPEED



GRAPH 4 CONSUMPTION - SPEED



Attitude:

The motor can be operated in all positions.

Airline filtration and lubrication:

Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to start up, inject oil into the inlet port.

Lubricator drop rate:

4-5 drops per minute continuous operation.
9-12 drops per minute intermittent operation.

Polar Moment of Inertia:

0.77 lb.ins² (0.226 g.m²).

Maximum overhung force on shaft:

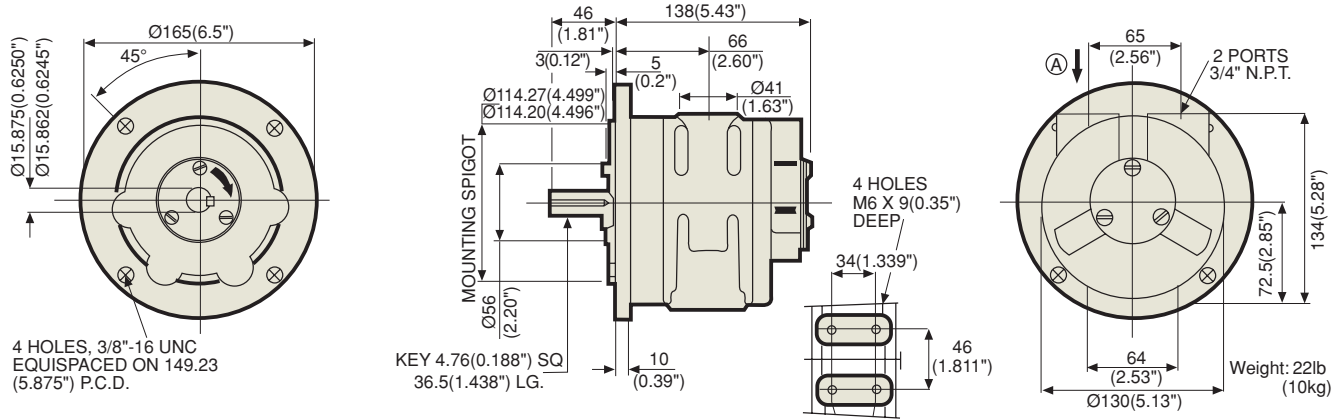
40 lbf (170N) In certain circumstances this may be extended. Consult your Globe Distributor. Axial loads should be kept down to a minimum.

Maximum temperatures:

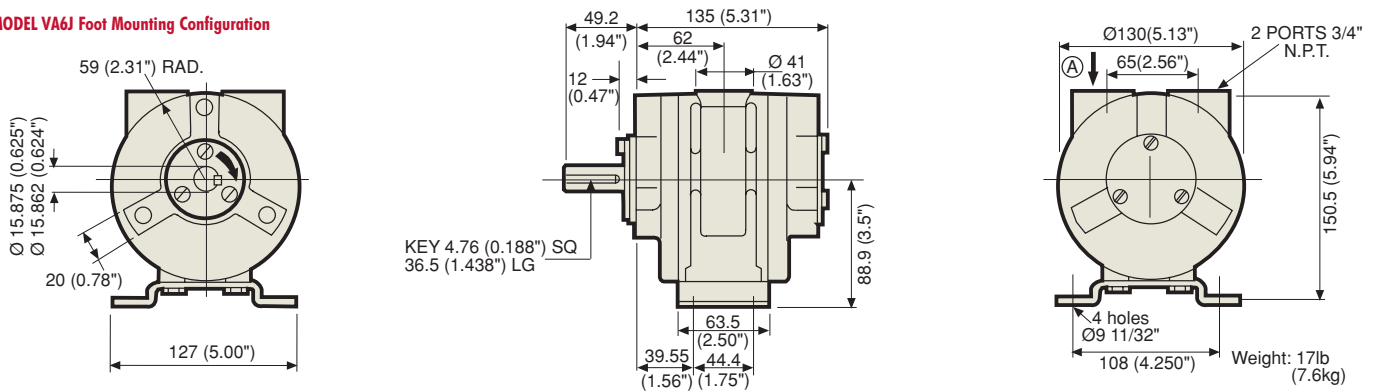
-4° to +176° Farenheit. (-20° to +80°C)

DIMENSIONS V6

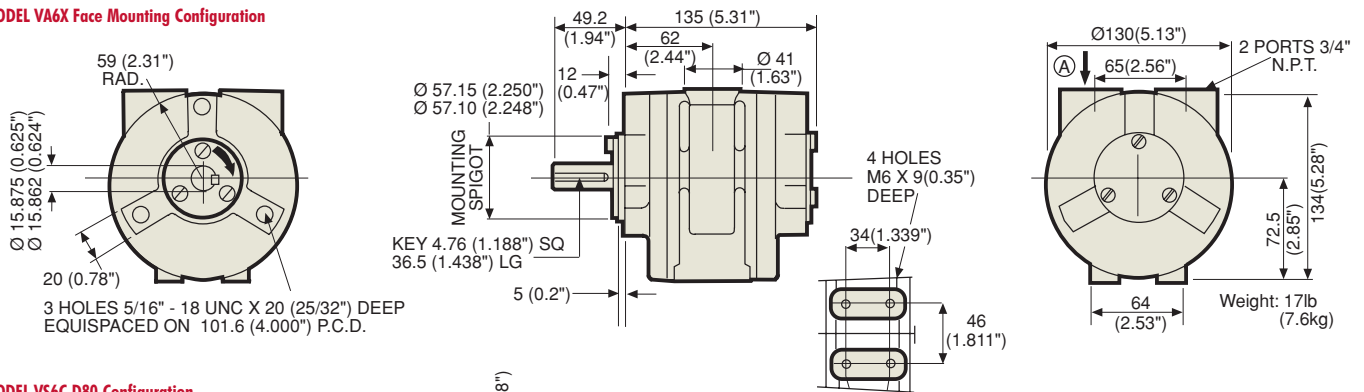
MODEL VA6C Nema 56C Configuration



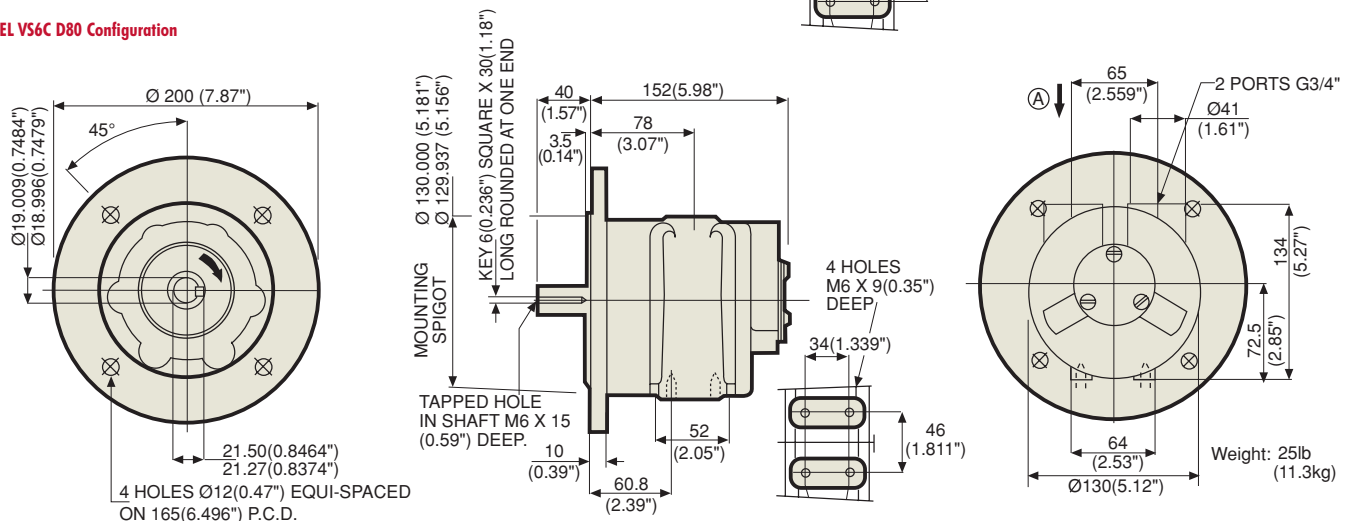
MODEL VA6J Foot Mounting Configuration



MODEL VA6X Face Mounting Configuration

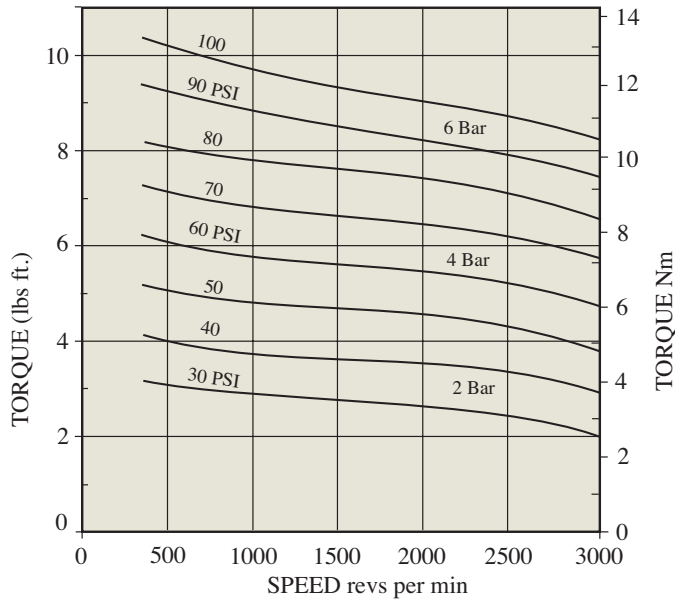


MODEL VS6C D80 Configuration

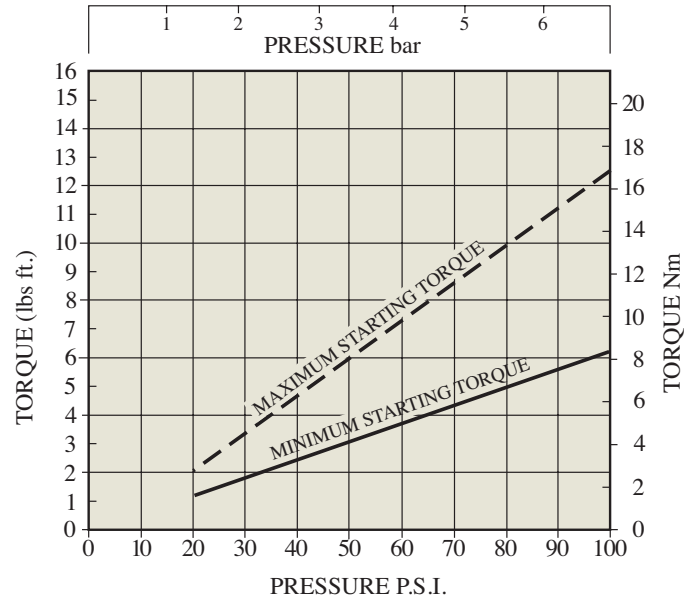


PERFORMANCE V6 4.6 PEAK HP/3.4 kW REVERSIBLE

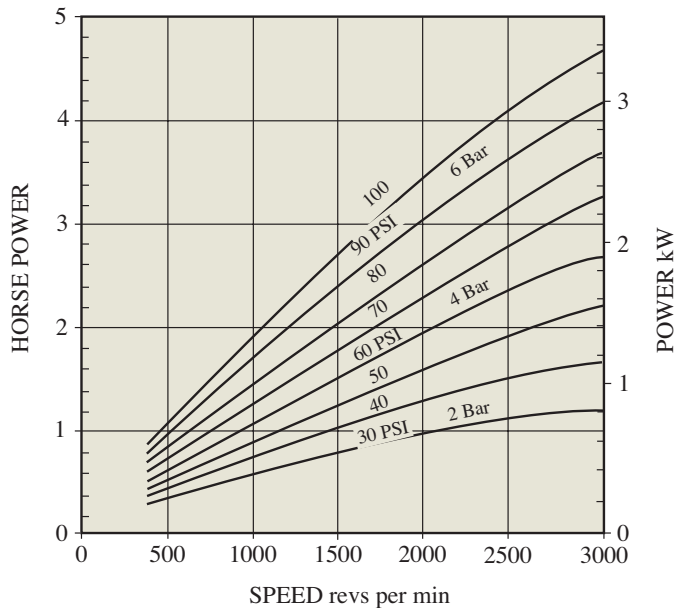
GRAPH 1 TORQUE - SPEED



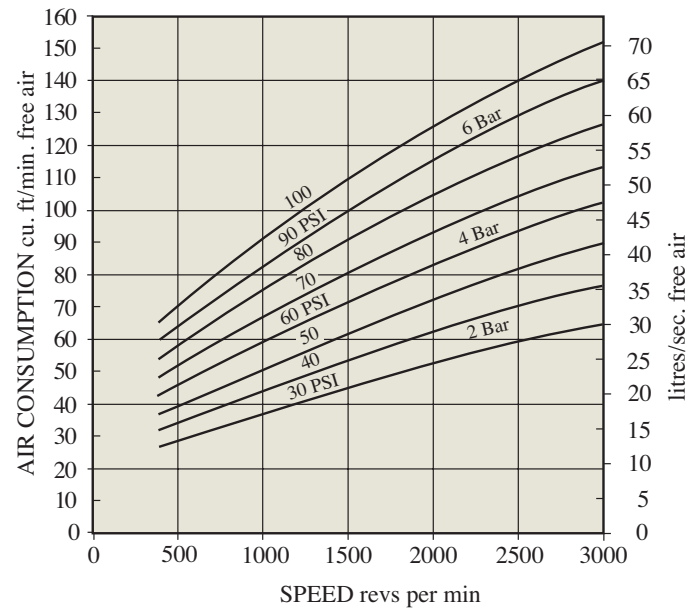
GRAPH 2 STARTING TORQUE - PRESSURE



GRAPH 3 POWER - SPEED



GRAPH 4 CONSUMPTION - SPEED



Attitude:

The motor can be operated in all positions.

Airline filtration and lubrication:

Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to start up, inject oil into the inlet port.

Lubricator drop rate:

5-6 drops per minute continuous operation.
10-12 drops per minute intermittent operation.

Polar Moment of Inertia:

1.56 lb.ins² (0.45 g.m²).

Maximum overhung force on shaft:

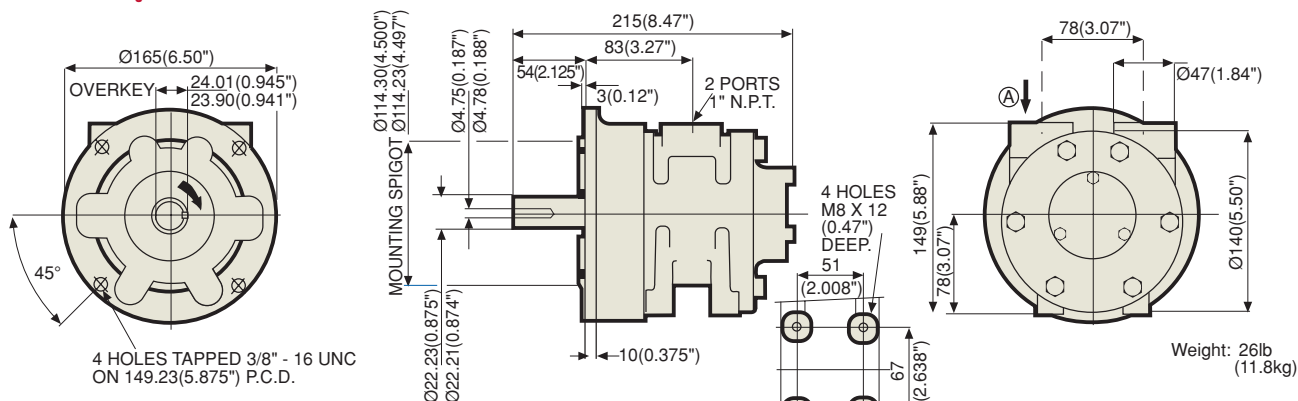
70 lbf (300N) In certain circumstances this may be extended. Consult your Globe Distributor. Axial loads should be kept down to a minimum.

Maximum temperatures:

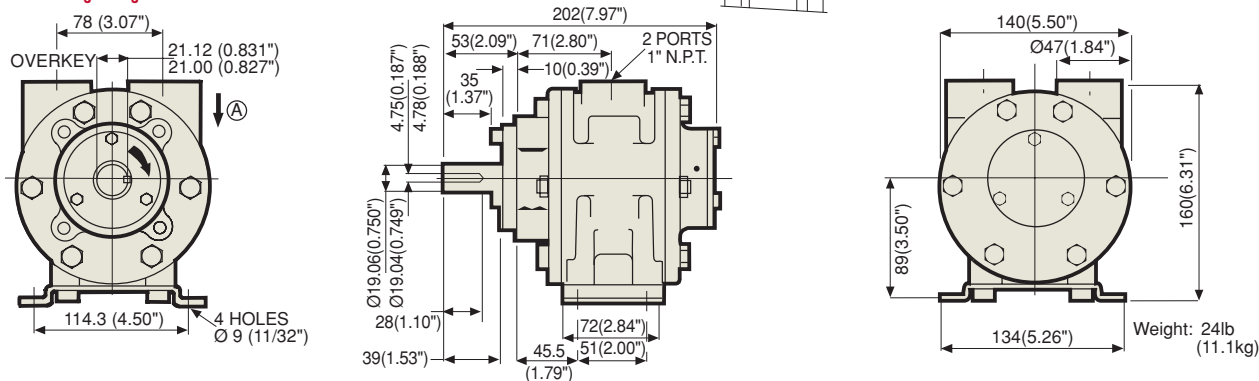
-4° to +176° Farenheit. (-20° to +80°C)

DIMENSIONS V8

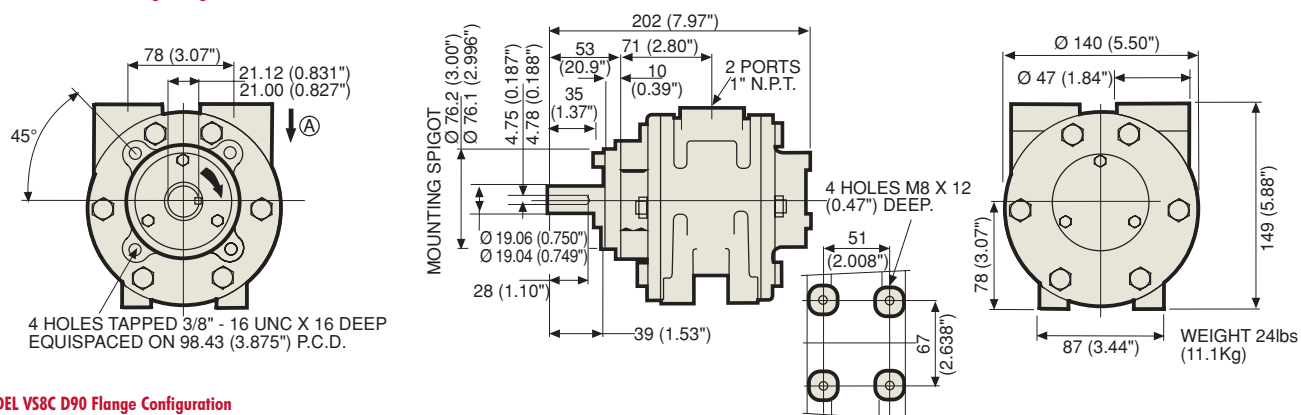
MODEL VA8C 145 TC Configuration



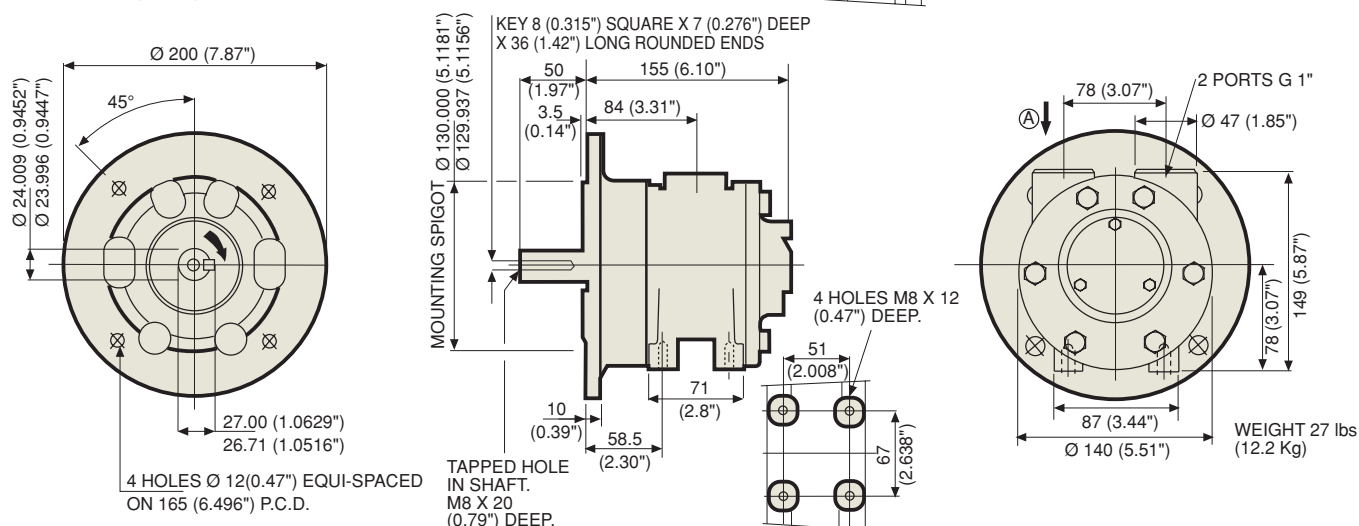
MODEL VA8J Foot Mounting Configuration



MODEL VA8X Face Mounting Configuration

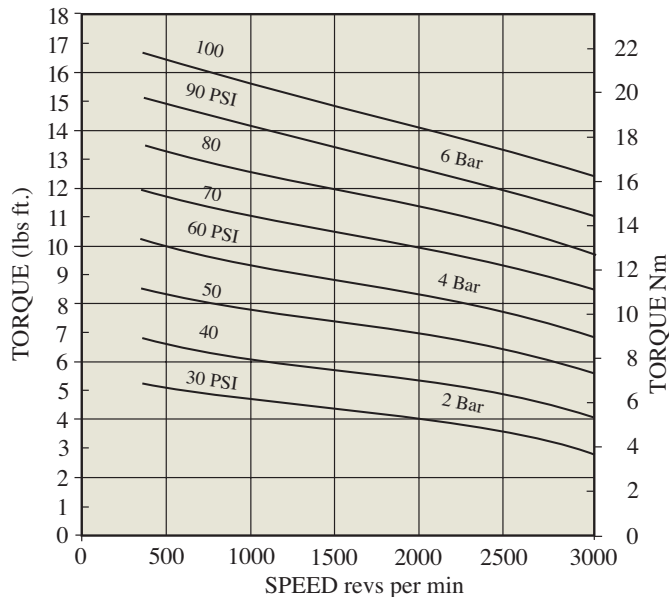


MODEL VS8C D90 Flange Configuration

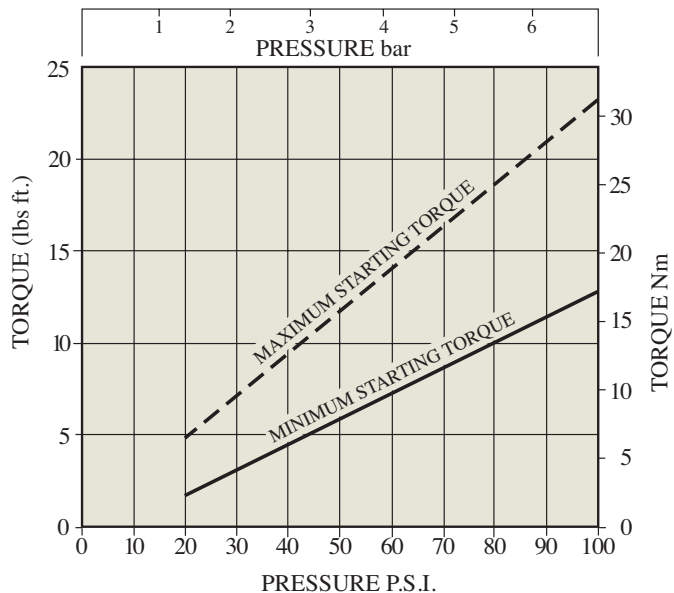


PERFORMANCE V8 7.2 HP/5.4 kW REVERSIBLE

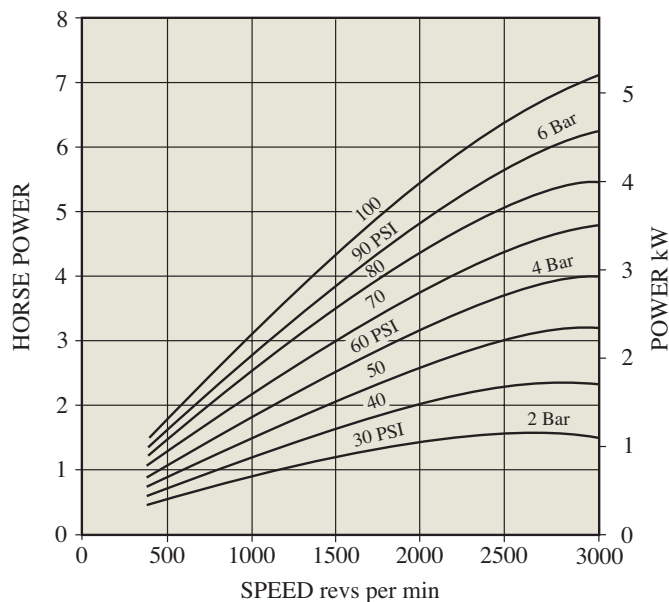
GRAPH 1 TORQUE - SPEED



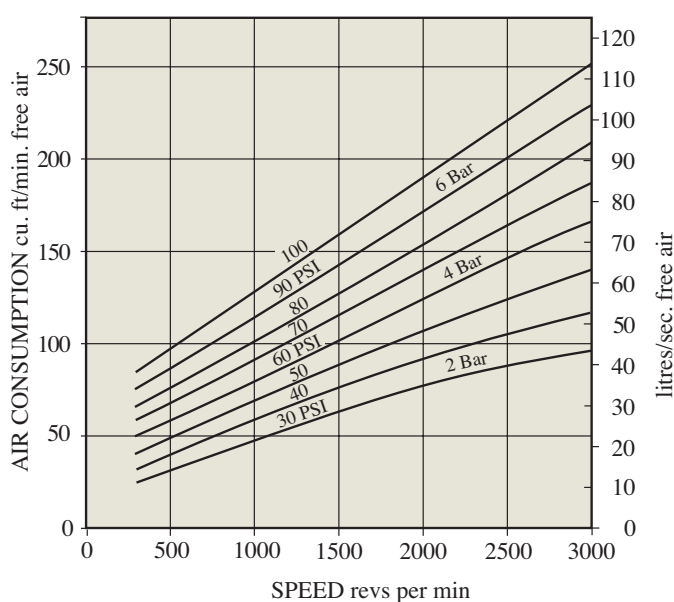
GRAPH 2 STARTING TORQUE - PRESSURE



GRAPH 3 POWER - SPEED



GRAPH 4 CONSUMPTION - SPEED



Attitude:

The motor can be operated in all positions.

Airline filtration and lubrication:

Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to start up, inject oil into the inlet port.

Lubricator drop rate:

6-7 drops per minute continuous operation.
12-15 drops per minute intermittent operation.

Polar Moment of Inertia:

3.5 lb.ins² (1.02 g.m²).

Maximum overhung force on shaft:

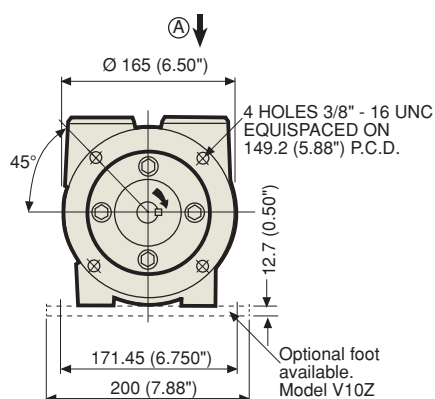
140 lbf (620N) In certain circumstances this may be extended. Consult your Globe Distributor. Axial loads should be kept down to a minimum.

Maximum temperatures:

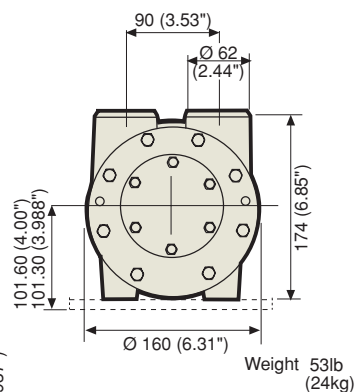
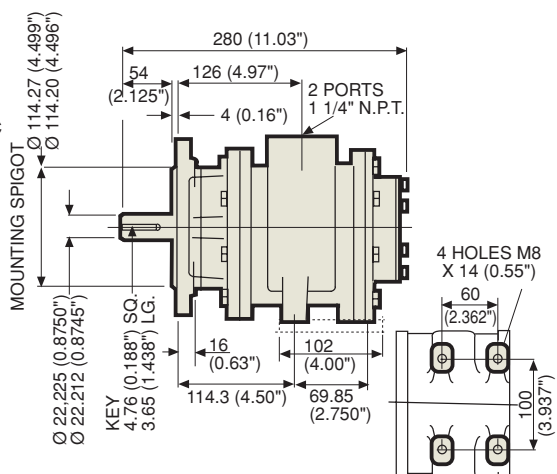
-4° to +176° Farenheit. (-20° to +80°C)

DIMENSIONS V10

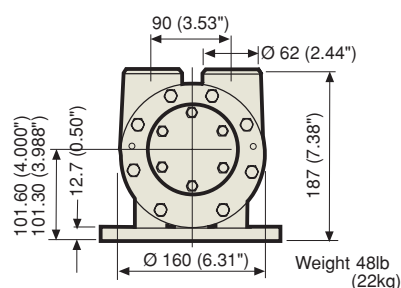
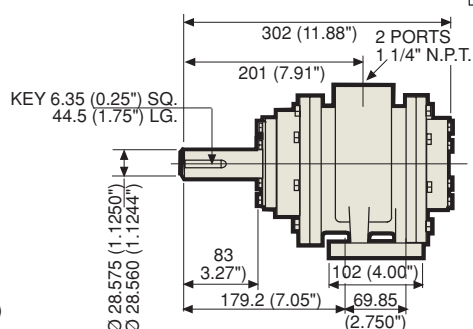
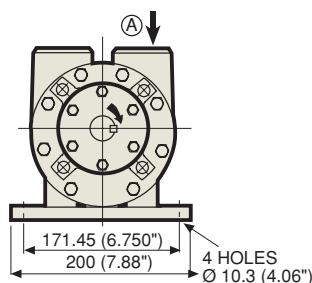
MODEL VA10C 145 TC Configuration



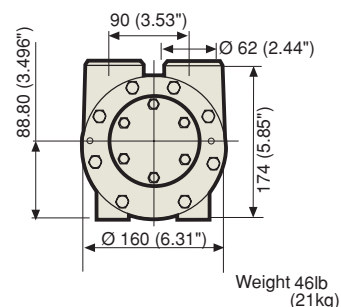
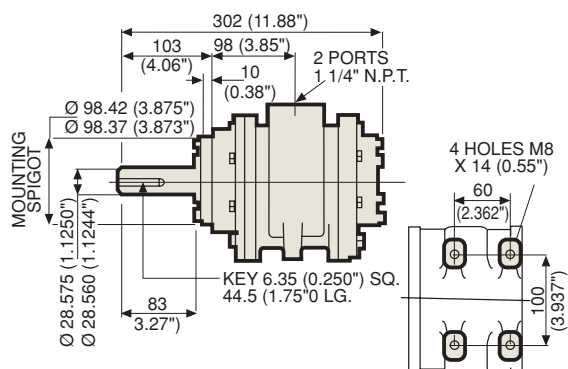
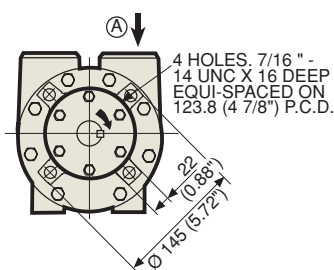
Optional foot
available.
Model V10Z



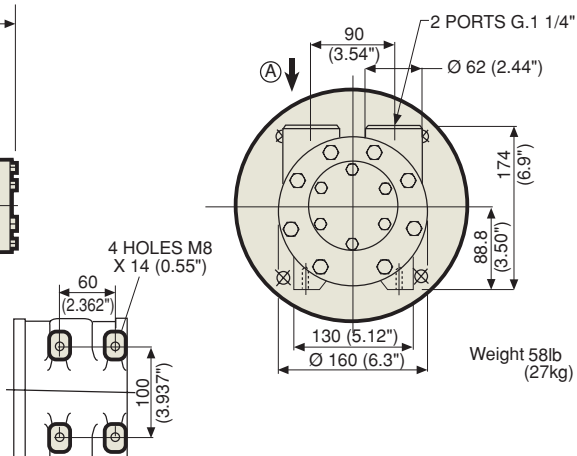
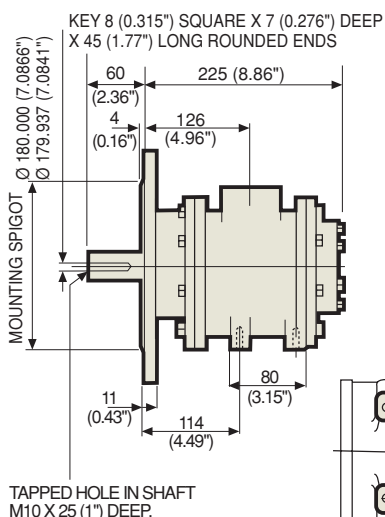
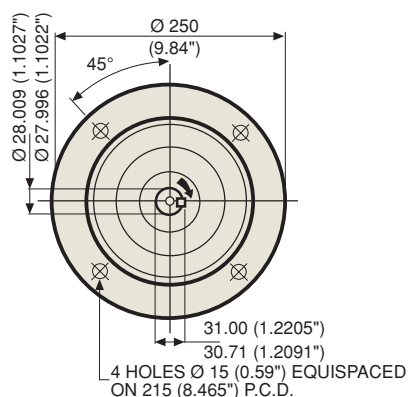
MODEL VA10J Foot Mounting Configuration



MODEL VA10X Face Mounting Configuration

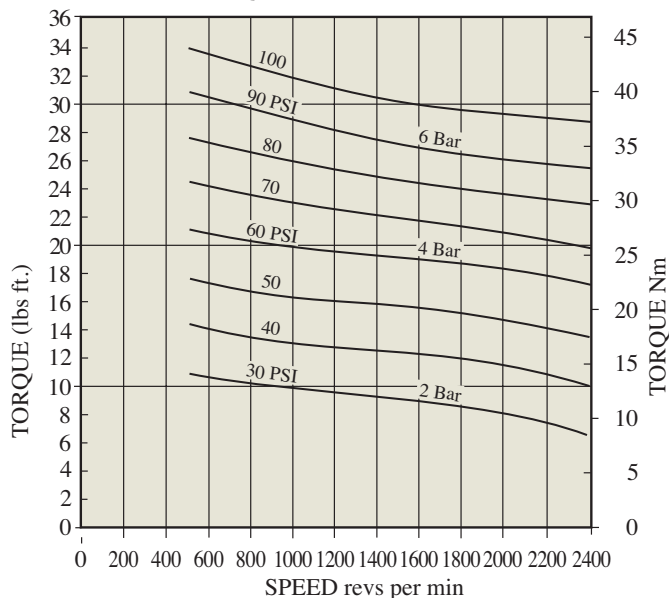


MODEL VS10C D100 Flange Configuration

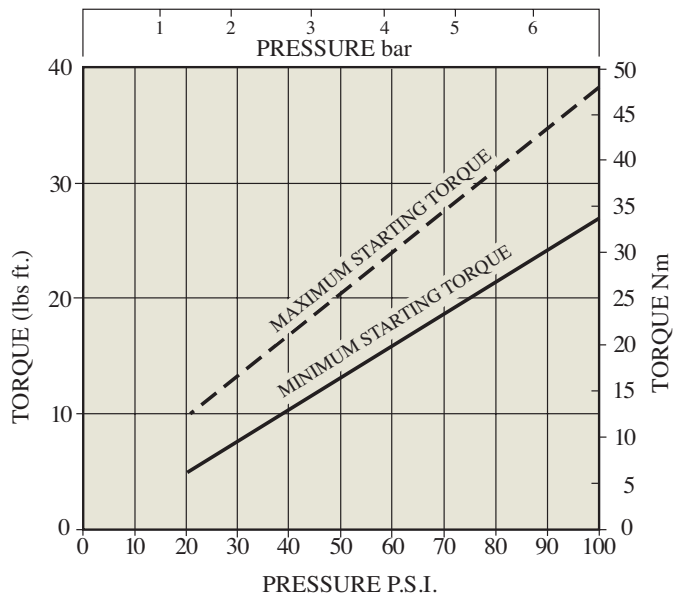


PERFORMANCE V10 12.8 HP/9.5 kW REVERSIBLE

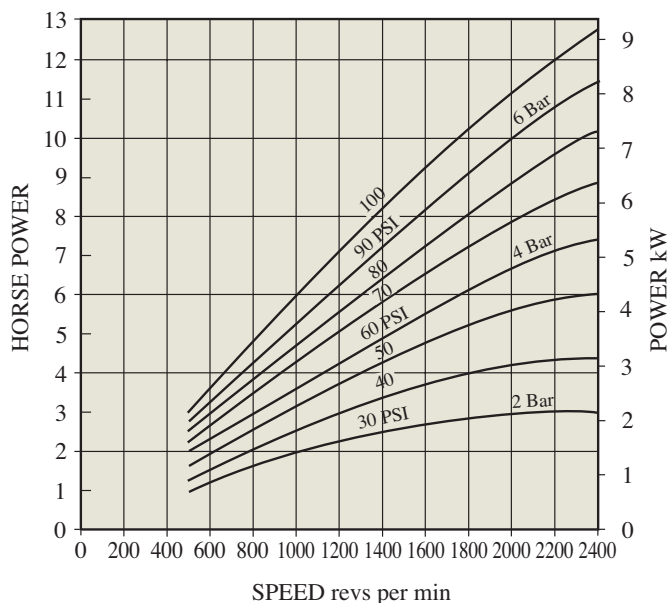
GRAPH 1 TORQUE - SPEED



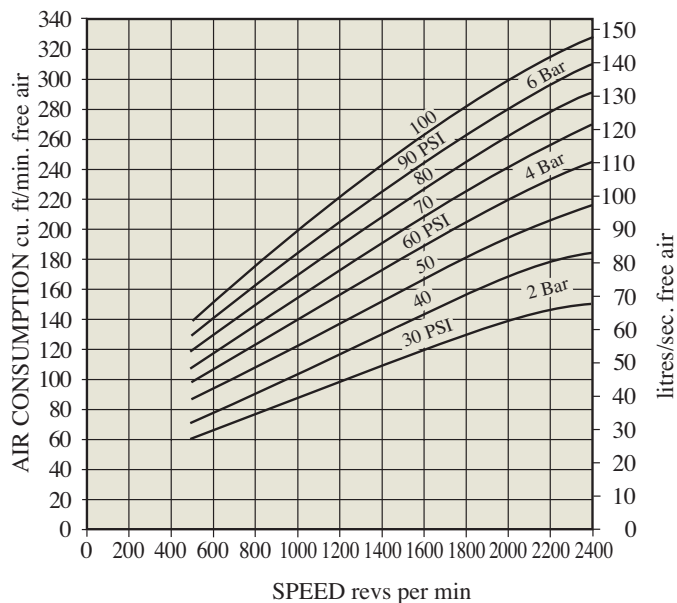
GRAPH 2 STARTING TORQUE - PRESSURE



GRAPH 3 POWER - SPEED



GRAPH 4 CONSUMPTION - SPEED



Attitude:

The motor can be operated in all positions.

Airline filtration and lubrication:

Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to start up, inject oil into the inlet port.

Lubricator drop rate:

8-10 drops per minute continuous operation.
14-16 drops per minute intermittent operation.

Polar Moment of Inertia:

30 lb.in² (8.8 g.m²).

Maximum overhung force on shaft:

400 lbf (1750N) In certain circumstances this may be extended. Consult your Globe Distributor. Axial loads should be kept down to a minimum.

Maximum temperatures:

-40° to +176° Farenheit. (-20° to +80°C)



Globe Airmotors Program



Vane Air Motor

Reversible, available in flange, foot, or face execution. Power from 0,44 to 9,5 kW.



Compact Air Motor

Reversible, compact, available with a wide range of incorporated reduction units. Power from 180 to 1000 W.



Planetary Geared Vane Air Motor

Reversible and a compact solution. Available with gear ratios from 3:1 to 1000:1. Power from 0,44 to 5,4 kW.



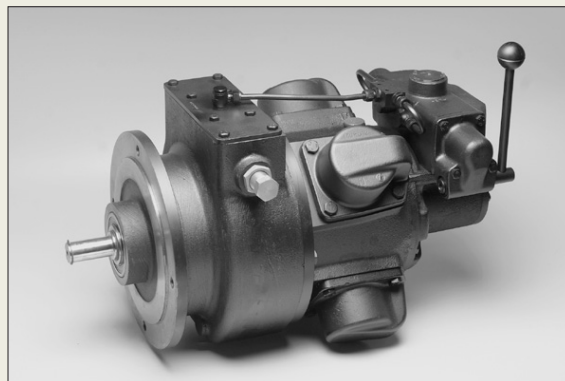
Vane Air Motor with Gearbox

Available with planetary, coaxial, or worm gearboxes. Also possible with pneumatic brake.



Compact Piston Air Motor

High torque at low speed of rotation, very low air consumption and low noise level. Power from 110 to 460 W.



Radial Piston Air Motor

Available with proportional hand or remotely controlled valve, pneumatic brake and all types of gearboxes. Power from 0,8 to 23 kW.