Air motor unit for Winches

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APPLICATION

TSA has developed specially for winch and hoist applications a braked air motor set. The unit has a robust vane motor with an fail safe BN brake and a proportional directional control valve.
The vane motor is of ridged design and very good for harsh conditions. The BN brake is a spring loaded, air release failsafe brake. The holding torque is 1,5 to 2 time the maximum torque of the motor.
On top of the motor a proportional control valve is mounted. It can be a proportional remote control valve of a proportional hand control valve. The proportional valve controls the direction and speed of the motor.
The brake is released with pipelines from the proportional control valve. The unit is designed that the motor is first under pressure before the brake is released.
As standard the proportional valves can be supplied with either Equal Power of Biased Power spools, the latter is suitable for hoisting applications. The motor will have maximum power in lifting and reduced power in lowering. Because of the biased valve the load will not pull the motor in over speed in lowering direction.

The air motor unit confirms to European Standard NEN-EN 13463-1 for non-electrical equipment for explosive atmospheres ATEX GROUP II cat 2 GDc T4.
The specifications of the three main components, vane motor, brake, proportional valve, are:

Air motor

Advantages of the vane air motors include:

- No pins or springs
- Guaranteed positive start-up
- Simple adjustable torque and output speed
- Can be stalled under load without harm
- High life span en low cost price due the simple design
- Instantly reversible
- Oil-less operation possible

Freni BN

The advantages of the BN brakes include:

- Brake can be used in static applications;
- Field serviceable;
- Easy flange connection according to IEC standards;
- Low maintenance because very few parts are exposed to wear;
- Compact design;
- Easy interchangeable because of independent brake module;
- Cast-iron or steel housing and excellent thermal capacity for use in harsh environments;
- Long life-time;

Proportional Remote Controlled Valve (RCV) or Hand Control Valve (HCV):

The advantages of the valves are:

- Robust cast steel body;
- High flow design for low back pressure;
- Frictionless matched spool and sleeve;
- Very accurate proportional control;
- Available in equal power or reduced power

As standard the proportional valves can be supplied with either Equal Power of Biased Power spools, the latter is suitable for hoisting applications. The motor will have maximum power in lifting and reduced power in lowering. Because of the biased valve the load will not pull the motor in over speed in lowering direction. The direction of reduced power must be stated when ordering clockwise

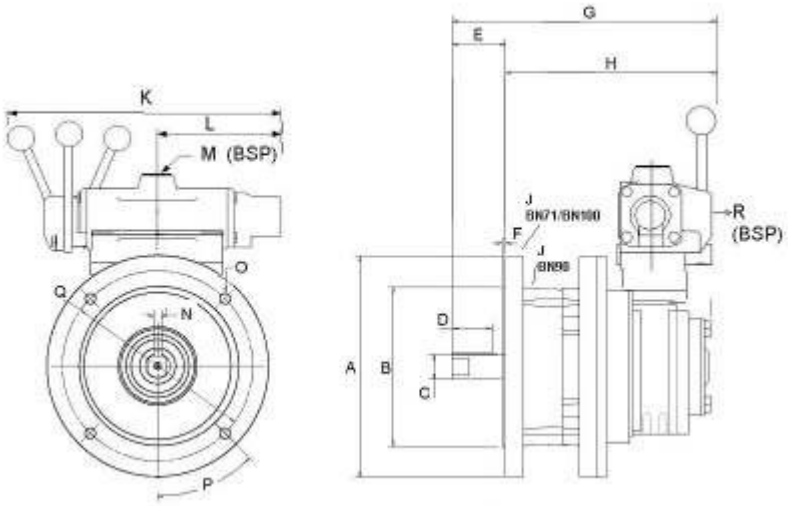
Remote controlled (RCV)
This option is usually controlled from a from a remote position by one of the PC series or LC2 remote controllers. A variable air pilot signal is applied to either end of the valve spool, depending on the required direction of motor rotation. The pilot pressure range is between 1.4 bar (20 psi) and 4.8 bar (70 psi), increased pilot pressure gives increased speed. The valve is spring centred to neutral.

Hand Controlled Valve (HCV):
The control valve spool is operated directly by a lever mechanism. Speed increase is obtained as the lever is moved in either direction from the central (neutral) position.

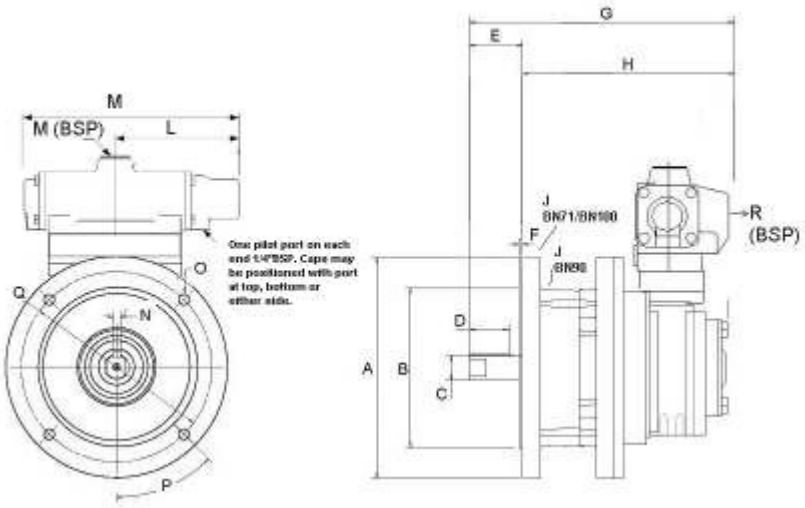
Pressure Drop:
Minimal pressure drop will be experienced through the valves, having the effect of maintaining the output torque whilst reducing the motor output speed by approximately 10-15% at 6 bar (90 psi) at maximum power. The starting torque remains unaffected.

DIMENSION

Motor with Brake with Hand Control, including valve and piping to control brake (not displayed)

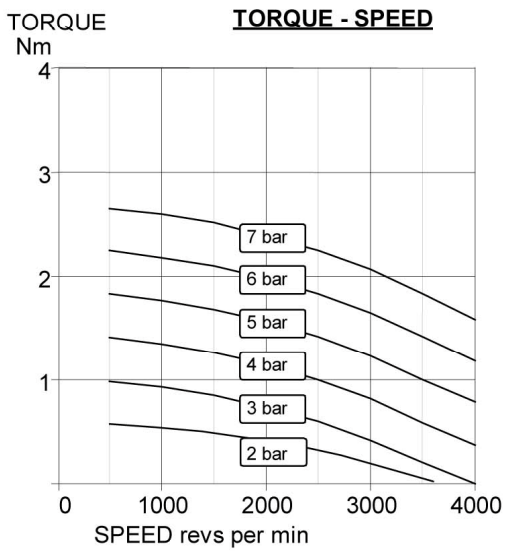


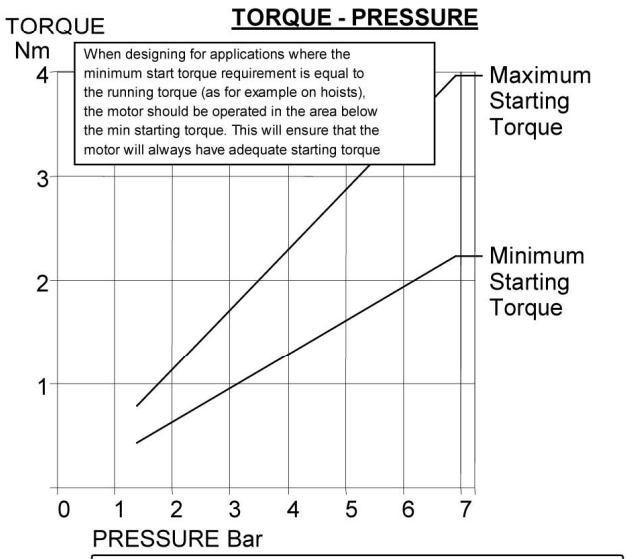
Motor with Brake with Remote Control, including valve and piping to control brake (not displayed)



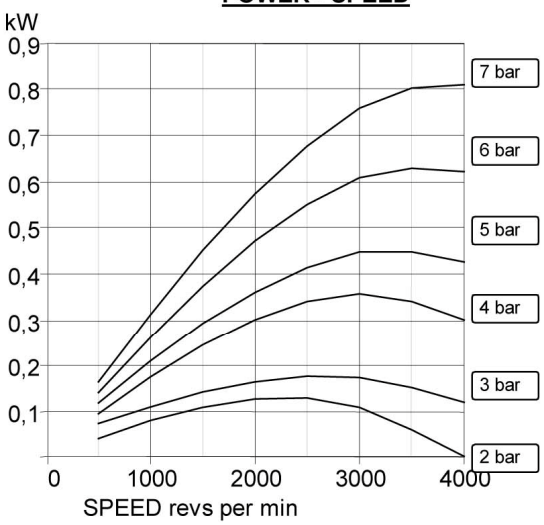
	A	B	C	D	E	F	G	H	J	K	L	M	N	O Ø	P	Q	R
M250BN71H2 M250BN71R2	160	110	14	20	30	3.5	240	210	1/8"	270	118	¾"	5	10	45°	110h7	¾"
M410BN90H2 M410BN90R2	200	130	24	30	50	3.5	347	297	1/8"	270	118	¾"	8	12	45°	130h7	¾"
M410BN90H3 M410BN90R3	200	130	24	30	50	3.5	350	300	1/8"	365	160	1"	8	12	45°	130h7	1"
M1100BN100H4 M1100BN100R4	250	180	28	50	60	4	459	399	1/8"	365	160	1 ¼"	10	14	45°	180h7	1 ¼"

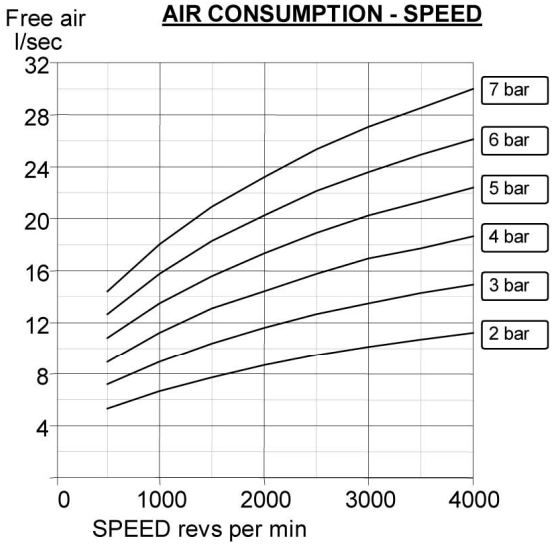
Performances





A pressure regulator should be used to control the air pressure to the motor, to limit the maximum output torque applied to the driven assembly.





Muffler supplied with motor.
Motor is reversible.

Attitude: The motor can be operated in all positions.
Maximum temperature -20°C to +80°C (-4°F to +176°F).

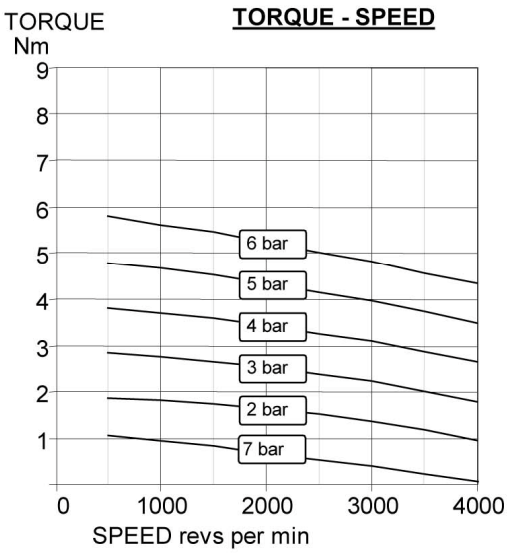
Max. Overhung Force on motor shaft 400 N (90 lbf.).
Axial loads should be kept to a minimum.

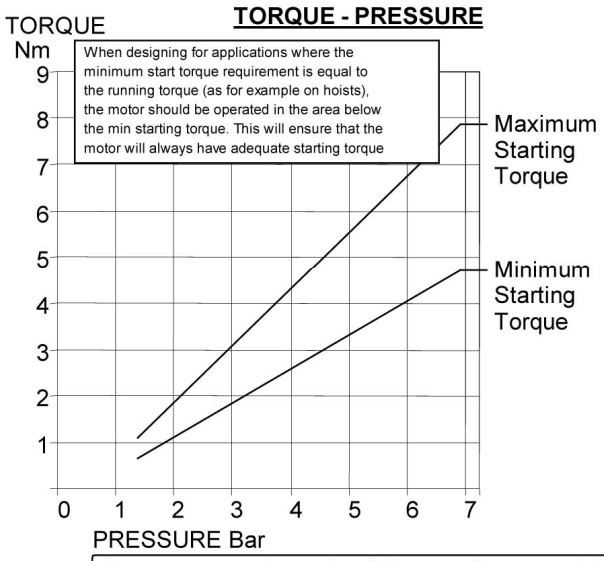
AIRLINE FILTRATION AND LUBRICATION
Use 64 micron filtration or better. Choose a lubricator. suitable for the flow required. Prior to initial start-up, inject oil into the inlet port.
Lubricator drop rate 4-5 drops/minute continuous
Lubricator drop rate 9-12 drops/minute intermittent operation

Maximum continuous speed 4000 rpm

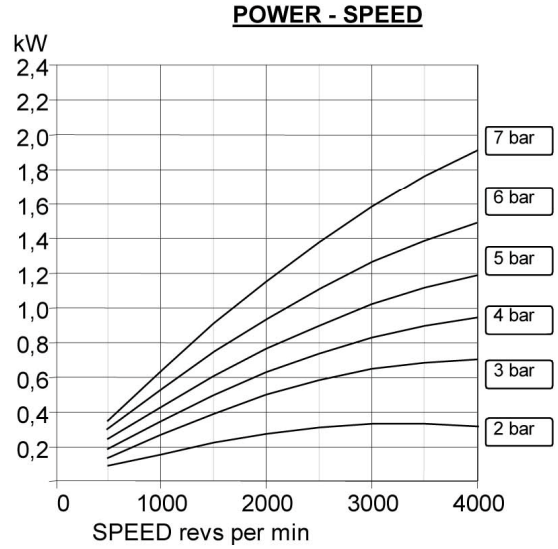
M250BN71H2/R2

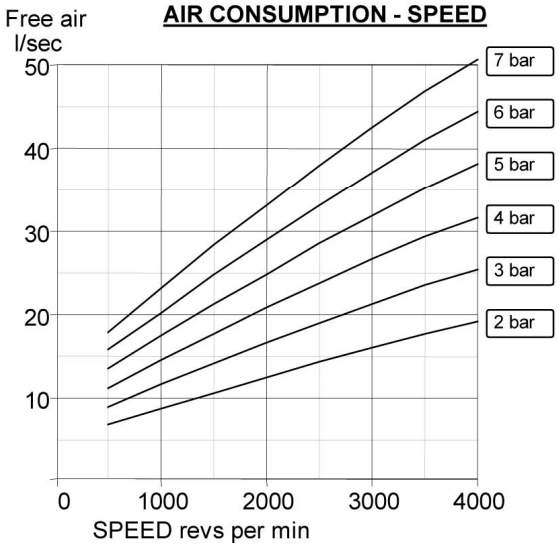
Performances





A pressure regulator should be used to control the air pressure to the motor, to limit the maximum output torque applied to the driven assembly.





Muffler supplied with motor.
Motor is reversible.

Attitude: The motor can be operated in all positions.
Maximum temperature -20°C to +80°C (-4°F to +176°F).

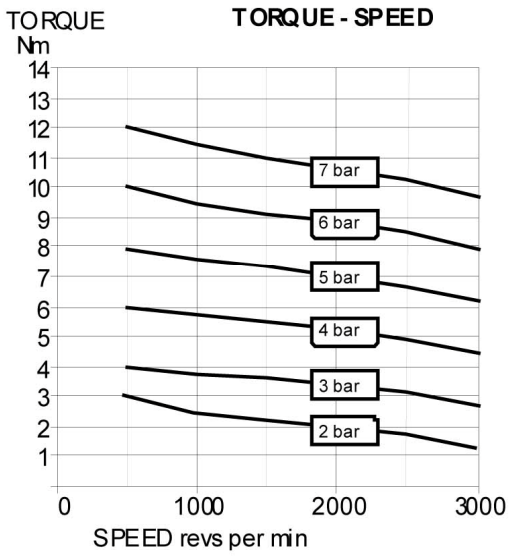
Max. Overhung Force on motor shaft 170 N (40 lbf.).
Axial loads should be kept to a minimum.

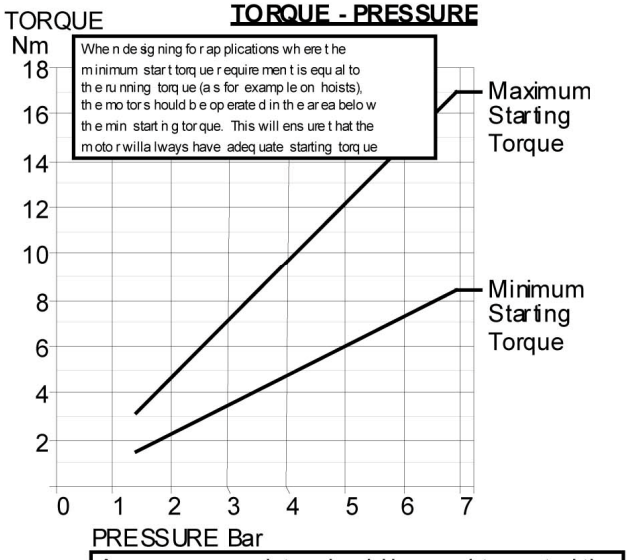
AIRLINE FILTRATION AND LUBRICATION
Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to initial start-up, inject oil into the inlet port.
Lubricator drop rate 4-5 drops/minute continuous operation.
Lubricator drop rate 9-12 drops/minute intermittent operation.

Maximum continuous speed 4000 rpm

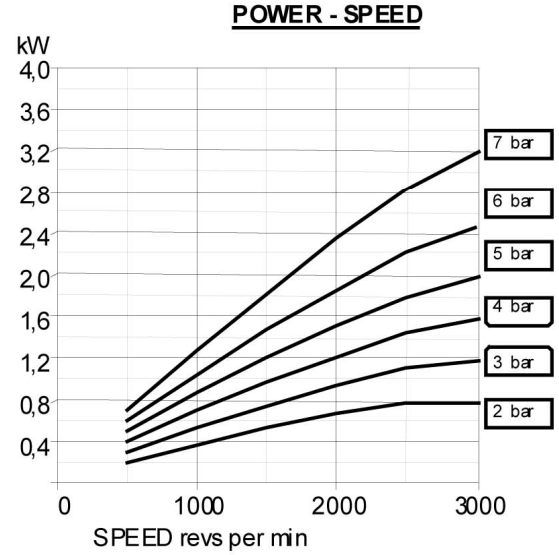
M410BN90H2/R2

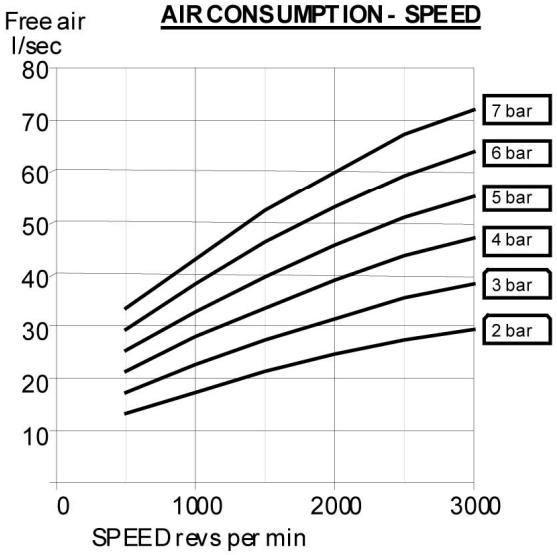
Performances





A pressure regulator should be used to control the air pressure to the motor, to limit the maximum output torque applied to the driven assembly.





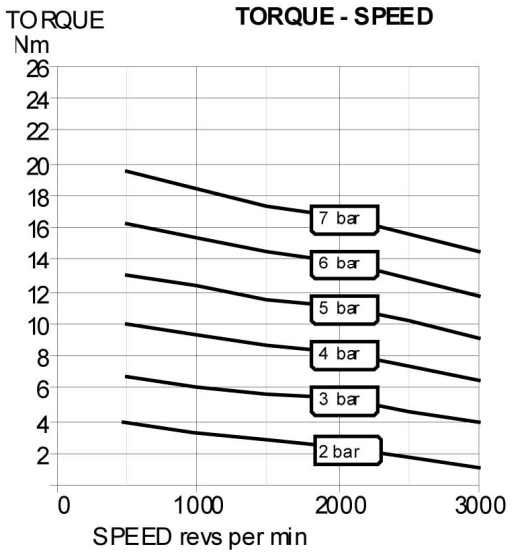
Muffler supplied with motor.
Motor is reversible.
Attitude: The motor can be operated in all positions.
Maximum temperature -20°C to +80°C (-4°F to +176°F).

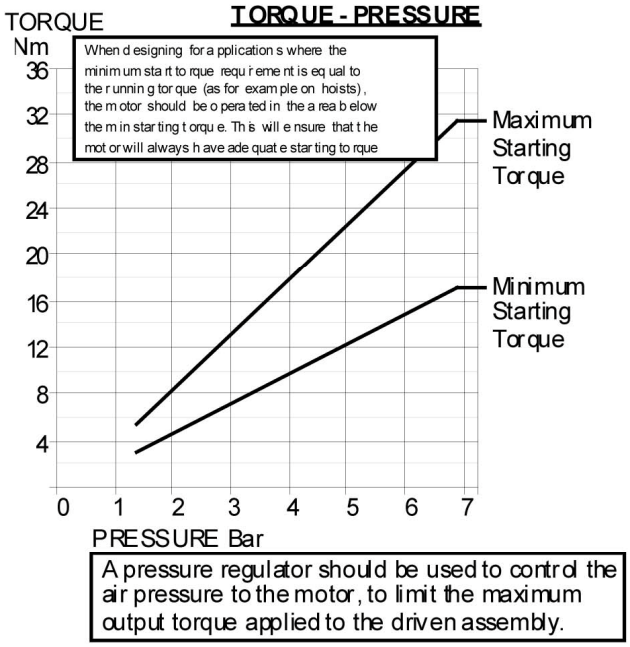
Max. Overhung Force on motor shaft 300 N (70 lbf.).
Axial loads should be kept to a minimum.

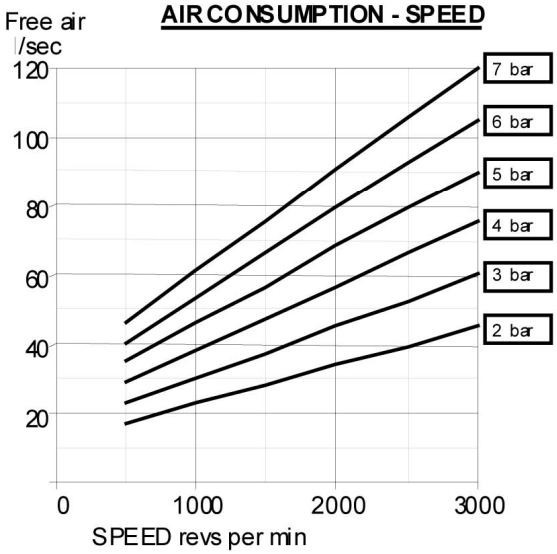
AIRLINE FILTRATION AND LUBRICATION
Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to initial start-up, inject oil into the inlet port.
Lubricator drop rate 5-6 drops/minute continuous operation.
Lubricator drop rate 10-12 drops/minute intermittent operation.

Maximum continuous speed 3000 rpm

Performances







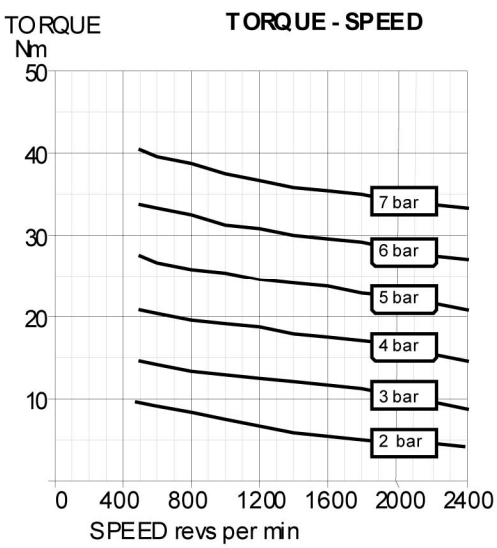
Muffler supplied with motor.
Motor is reversible.
Attitude: The motor can be operated in all positions.
Maximum temperature -20°C to +80°C (-4°F to +176°F).

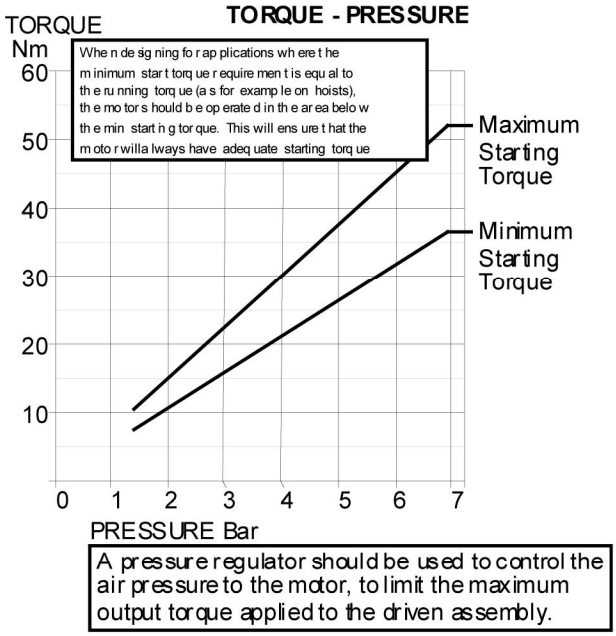
Max. Overhung Force on motor shaft 620 N (140 lbf.).
Axial loads should be kept to a minimum.

AIRLINE FILTRATION AND LUBRICATION
Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to initial start-up, inject oil into the inlet port
Lubricator drop rate 6-7 drops/minute continuous operation.
Lubricator drop rate 12-15 drops/minute intermittent operation.

Maximum continuous speed 3000 rpm

Performances





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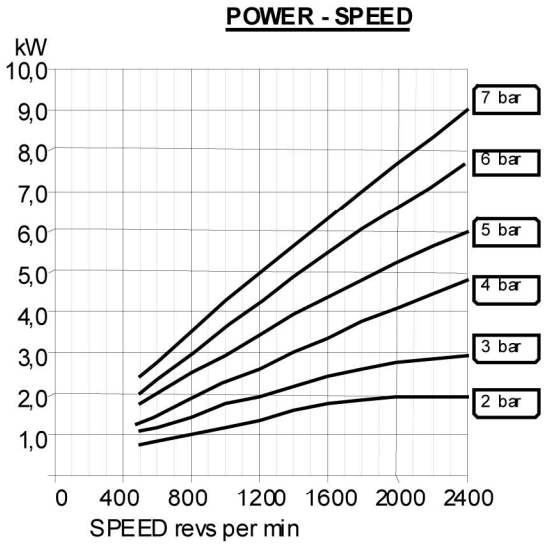

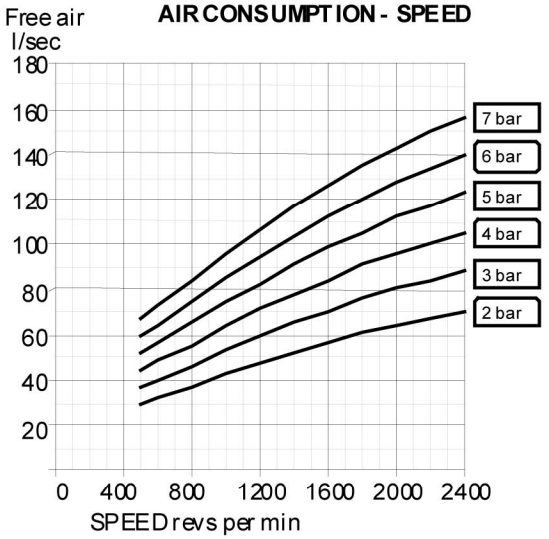

Muffler supplied with motor.
Motor is reversible.
Attitude: The motor can be operated in all positions.
Maximum temperature -20°C to +80°C (-4°F to +176°F).

Max. Overhung Force on motor shaft 1750 N (400 lbf.).
Axial loads should be kept to a minimum.

AIR LINE FILTRATION AND LUBRICATION
Use 64 micron filtration or better. Choose a lubricator suitable for the flow required. Prior to initial start-up, inject oil into the inlet port.
Lubricator drop rate 8-10 drops/minute continuous operation.
Lubricator drop rate 14-16 drops/minute intermittent operation.

Maximum continuous speed 2400 rpm