



**TSA** TECNOLOGIE  
SPECIALI  
APPLICATE

N°4 Fori M8 profondi 12mm

65

87

PNEUMATIC MOTORS



**AIR MOTORS  
WITH BLADES**

Vista A

51

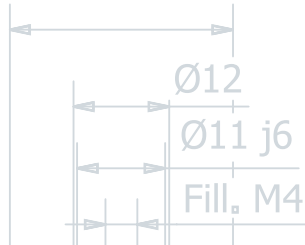
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Linguetta 4X4X18



2,5

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## TSA

### SPECIAL APPLIED TECHNOLOGIES

**TSA** founded in 1984, for over 30 years has been designing, manufacturing and distributing pneumatic motors, articulated arms for torque reaction, assembling systems and special equipment.

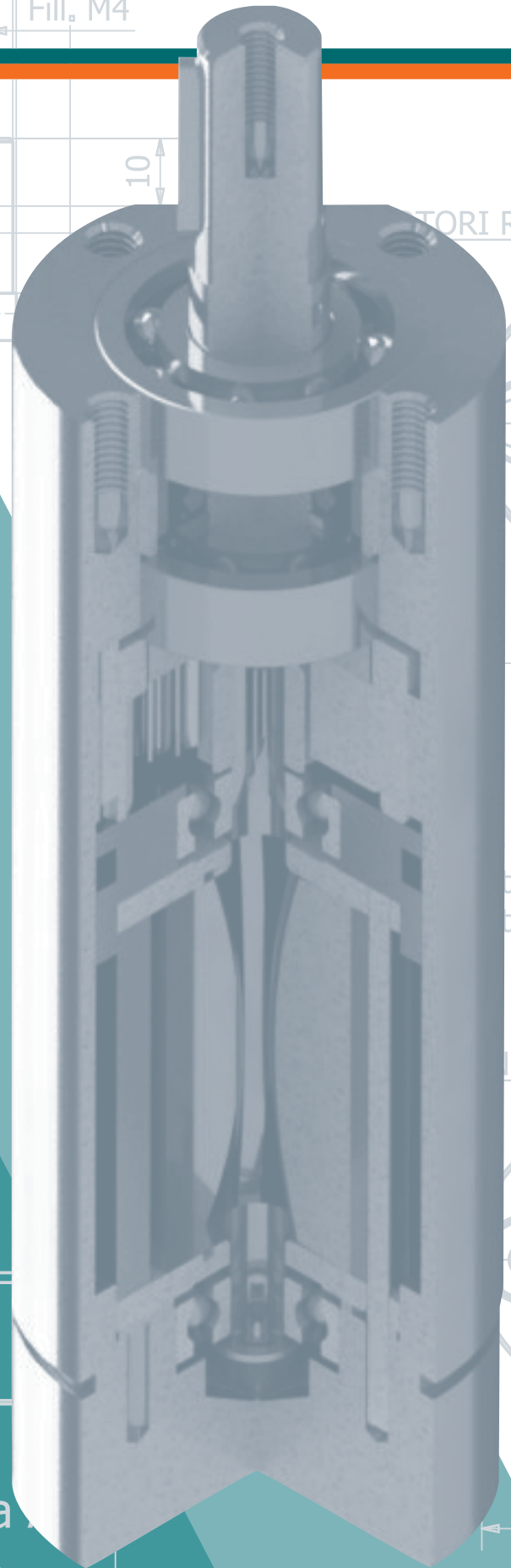
Its technical design office is in charge of studying all of the required characteristics to guarantee maximum reliability and high productivity, according to modern ergonomic principles. Product quality and safety are now a consolidated standard for TSA.

Just-in-time deliveries, a wide, flexible range of products, including diversified motors and arms, an efficient spare parts warehouse and effective before- and after sales: these are the services offered by TSA to its customers. Thanks to its constant commitment and to the professionalism of its technicians,

**TSA** has gained the trust of major companies on the market. Its aim is to meet customer requirements in all respects: **QUALITY, PERFORMANCE AND COST EFFECTIVENESS.**

Vista

$\text{Ø}42$



TORI REVERSI

1/

$\text{Ø} 2$

tazione p  
tazione p

ION REV

1/4

20

## CHARACTERISTICS OF PNEUMATIC MOTORS

The outlet power of a pneumatic motor varies depending on its speed and torque. The performance levels of a pneumatic motor depend on the inlet air pressure level measured at the entry point in the motor; this means that it is sufficient to regulate the incoming air to substantially change the torque and speed values in a pneumatic motor.

The choice of a pneumatic motor is based on three fundamental parameters: POWER, SPEED and TORQUE.

### POWER

Pneumatic motors produce a characteristic power curve whose maximum value is obtained at approximately 50% of idle speed. The resulting torque is known as maximum power torque.

### SPEED

By idle speed in a pneumatic motor reference is made to a moment when there is no load on the outlet shaft, therefore no torque is produced (moment of force). If the load on the shaft is increased, the speed is reduced in a way which is inversely proportional to the torque.

### SPEED

The speed at maximum power is reached when the motor reaches its torque at maximum power.

### TORQUE AT MAXIMUM SPEED

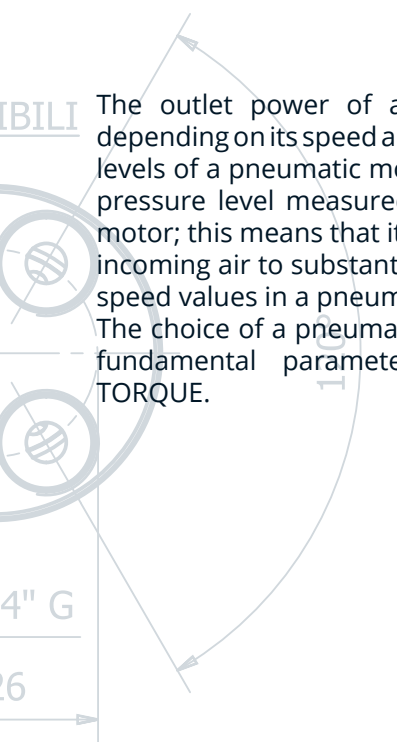
The maximum speed torque is reached at approximately 50% of the idle speed of the motor, which equals its maximum power.

### STARTING TORQUE

The starting torque is the torque provided by a motor to the loaded shaft when it is started with the maximum air inlet.

### STALL TORQUE

The stall torque is the torque provided by a motor to the shaft during its rotation until it stops completely.



per rotazione destrorsa  
per rotazione sinistrorsa

VERSIBILI

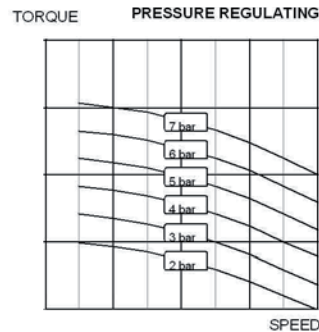


## WAYS OF CHANGING THE MOTOR'S PERFORMANCE

The speed and torque in a pneumatic motor can be adjusted by regulating the pressure or throttling the air flow.

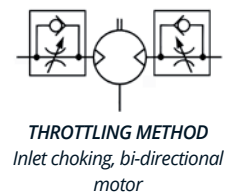
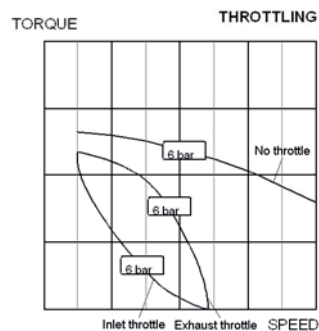
### PRESSURE REGULATING

The speed and power can also be reduced by installing a pressure regulator. A pressure regulator, always connected on the entry hole, keeps the inlet air pressure to the motor in check. A pressure regulating system affects the output torque on the shaft, thus making it easier to control the starting torque. If the speed and torque need to be controlled, the best configuration consists in a pressure regulator to the motor inlet and a check valve for the exhaust flow. This means that each point in the speed-torque diagram can be established in a precise way.



### FLOW REGULATING

A flow regulator allows adjustment of both the inlet and exhaust flow. It is advisable to work on the exhaust flow in order to achieve a slightly higher starting torque. The diagram shows the difference between these two options.



## INLET AIR CONDITIONS

### CONSUMPTION

The air consumption in a pneumatic motor is proportional to the speed, therefore it reaches its peak at idle speed.

Air consumption is measured in NI/s, however the conventional unit is l/s.

### AIR QUALITY

In order to ensure optimal working conditions for pneumatic motors it is necessary to guarantee the appropriate air inlet and exhaust at all times. In order to ensure its proper operation it is advisable to install an air treatment unit (5-micron filter, regulator and lubricator, unless the motor requires no lubrication), as appropriate for the specific motor.

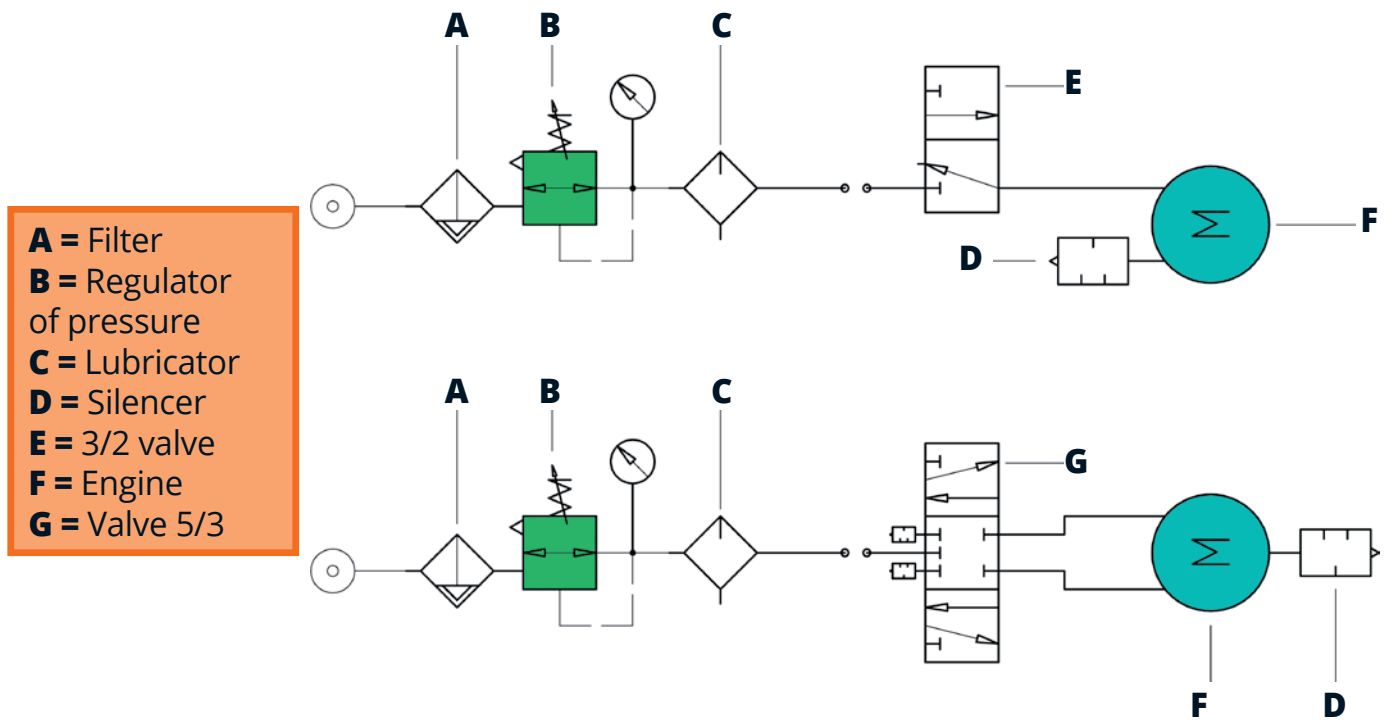
## AIR PIPELINE LIMITATIONS

Any limitations in the air inlet line on the motor are bound to reduce its performance levels. Therefore it is especially important to make sure that the required air pressure is available to the motor at all times while it is being operated. Always check the air inlet because if the pipeline is too narrow this might

cause a pressure drop. The air exhaust pipe needs to be larger than the inlet pipe. It is advisable to connect the exhaust pipes to a suitable oil separator filter with an incorporated silencer, in order to allow for appropriate lubrication without the room becoming saturated with polluted air.

**PNEUMATIC DIAGRAM (POWER - MOTOR CONTROL)**

**Non-reversible motor operation with 3/2 valve**



**Non-reversible motor operation with 5/3 closed-center valve**



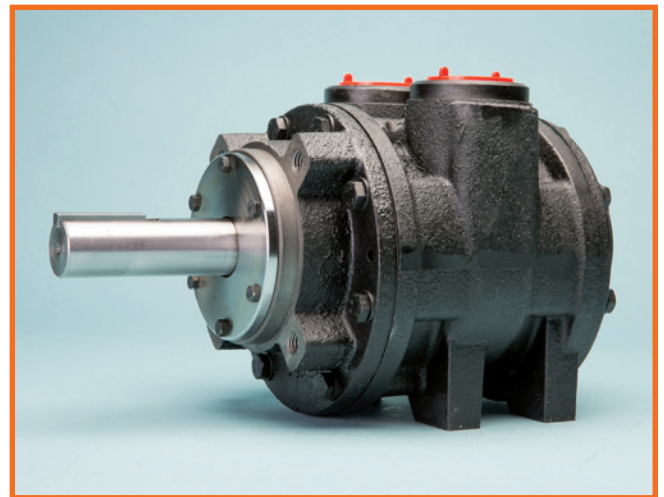
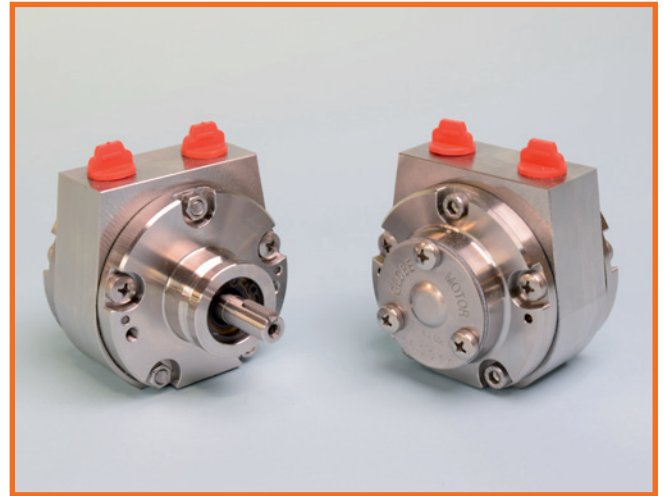
## AIR MOTORS WITH BLADES

The use of compressed air in many companies allows the use of pneumatic motors, presenting innumerable advantages such as:

- Complete line with power ranging from 0.43HP to 18HP.
- All pneumatic motors are certified according to the European Directive ATEX II cat. 2 G & D T5 and ATEX I M2.
- Infinite speeds and variable torques obtainable just by adding a pressure regulator or tap.
- Safety system against injuries.
- They may be loaded and used indefinitely without suffering any damage.
- Instantaneous powering, arrests and reversals.
- Resistant to dirt and humidity.
- Designed to last for a long time.
- Suitable for use with natural gases.
- Ready for assembling flanges, brakes and foot supports.

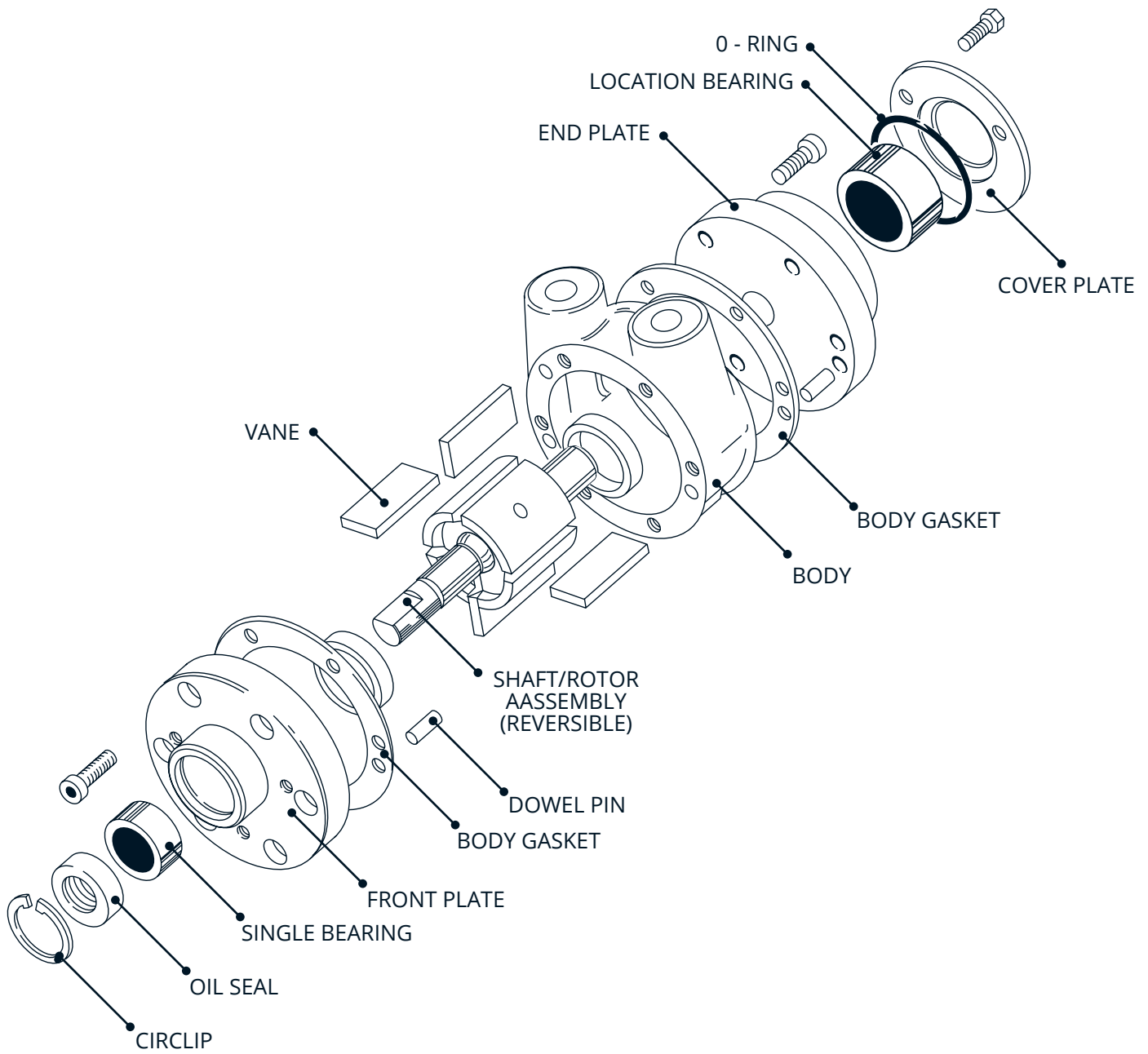
Applications are often required which involve specific design and construction procedures. Pertanto T.S.A. mette a disposizione dei propri clienti un ufficio tecnico in grado di realizzare applicazioni speciali sviluppati sulle specifiche del cliente.

This is why TSA makes available for its customers a technical office which can provide individual applications designed according to customer specifications.





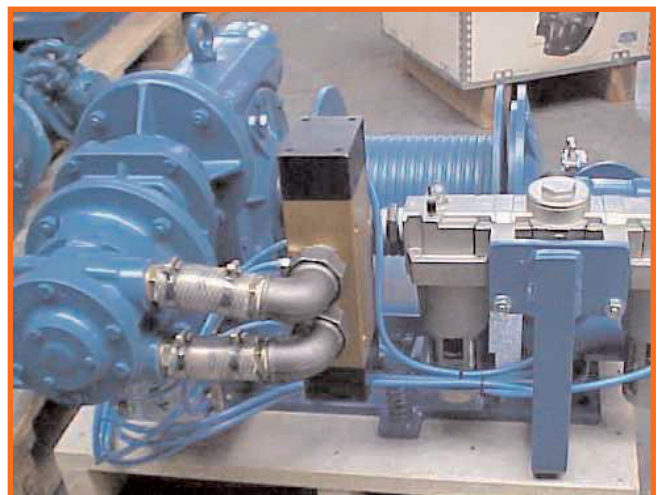
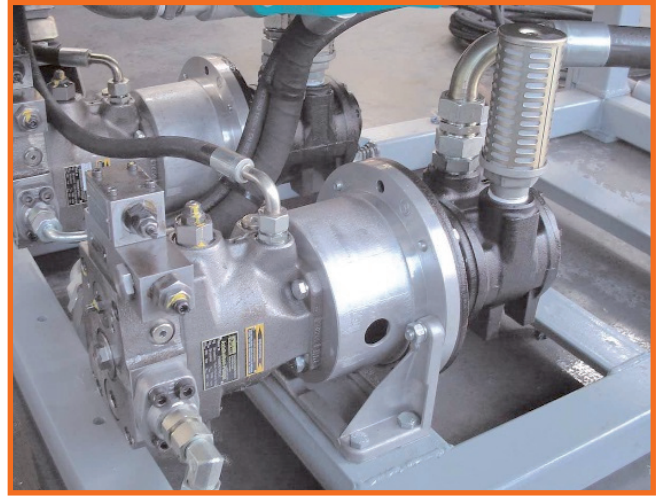
**TYPICAL CONSTRUCTION OF REVERSIBLE AND IRREVERSIBLE MOTORS**



## APPLICATIONS

TSA Air motors with blades are ideal for a large number of applications; the most suitable ones are medium and lightweight options at normal speeds directed on the shaft. For operation at lower speeds and with higher torques there are several combinations with gearboxes available. Typical applications of Air motors with blades include:

- Mixing equipment
- Fans
- Lifting equipment
- Hoists
- Pump operating
- Conveyor belts
- Turntables
- Packing machines



## NO LUBE OPERATING

The advantages of operating without lubrication are as follows:

- No lubricant necessary – saving on installation costs.
- No need for oil or checking of the lubricant level – this results in saving on annual operating costs
- No contamination of the air due to exhaust oil – in this way products and operators are safeguarded.

All TSA Air motors with blades can work without lubrication only under specific operating conditions. For dry blades a minimum filtration of 25 micron is recommended. The maximum air pressure should not exceed 4 bar and the motor speed must not exceed the figures shown in the table below. The maximum motor speed shall never be exceeded, even when there is no load on the motor. As a prevention measure, a flow regulator should be applied on the exhaust when the load might vary substantially.

Continuous operation is most suitable for non-lubricated working because air humidity might cause corrosion problems during stand-by periods.

MODEL	2250 Speed-RPM	1200 Speed-RPM	1000 Speed-RPM	1500 Speed-RPM	500 Speed-RPM
	Nm torque at 4 bar	Nm torque at 4 bar	Nm torque at 4 bar	Nm torque at 4 bar	Nm torque at 4 bar
M55	0,51	-	-	-	0,60
M95	-	-	-	1,30	1,60
M150	-	-	-	2,40	2,60
M250	-	-	-	3,20	3,60
M350	-	-	-	6,00	6,80
M410	-	6,80	-	-	7,41
M500	-	-	9,70	-	10,20
M620	-	-	11,60	-	12,50
M1100	-	-	24,20	-	26,00

## ORDER CODE

**55** – 0,46 KW / 0,6 hp  
**95** – 0,73 KW / 1,06 hp  
**150** – 1,2 KW / 1,67 hp  
**250** – 1,9 KW / 2,72 hp  
**350** – 3,2 KW / 4,07 hp  
**410** – 3,4 KW / 4,6 hp  
**500** – 3,9 KW / 5,42 hp  
**620** – 5,1 KW / 6,94 hp  
**1100** – 9,2 KW / 12,53 hp  
**1400** – 14 KW / 19,1 hp

**BN71** – Brake 14 Nm for 55-95-250  
**BN90** – Brake 29 Nm for 95-250-410-620  
**BN100** – Brake 75 Nm for 620-1100  
**BN132** – Brake 125 Nm for 620-1100  
**BN160** – Brake 600 Nm for 1400

**N**  
No Lube Standard

**N - M - 55 - F - BN**

**M**  
Pneumatic motors

**F** - Without base

**P** - With base

**C56** - Nema flange for 150-350

**C145** - Nema flange for 500-620-1100

**C213** - Nema flange for 1400

**B14D63** - Metric flange for 55

**B14D71** - Metric flange for 55-95-250

**B14D80** - Metric flange for 95-250-410

**B14D90** - Metric flange for 95-250-410-620-1100

**B14D100** - Metric flange for 620-1100

**B5D63** - Metric flange for 55

**B5D71** - Metric flange for 55-95-250

**B5D80** - Metric flange for 95-250-410

**B5D90** - Metric flange for 95-250-410-620-1100

**B5D100** - Metric flange for 620-1100-1400

## VERSIONS



**F**



**P**



**C - B14 - B5**



## AIR MOTORS WITH BLADES

Features, dimensions and performance



## SERIES M55 - 0,46 KW / 0,6 hp



### PERFORMANCES AND DIMENSIONS

	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	0,86	1,17	1,08	0,73	0,99	0,93	0,60	0,82	0,77	0,47	0,64	0,61	0,34	0,47	0,46	0,21	0,31	0,31
Speed-RPM	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
6000	0,63	0,74	14,7	0,52	0,61	13,5	0,41	0,48	11,6	0,30	0,35	9,6	0,19	0,23	7,7	0,08	0,10	5,7
5500	0,60	0,76	14,1	0,50	0,64	12,9	0,40	0,51	11,0	0,29	0,37	9,1	0,19	0,25	7,3	0,09	0,12	5,4
5000	0,57	0,79	13,5	0,47	0,67	12,3	0,38	0,53	10,5	0,28	0,40	8,7	0,19	0,26	6,9	0,09	0,14	5,0
4500	0,53	0,82	12,9	0,44	0,69	11,7	0,36	0,56	10,0	0,27	0,42	8,2	0,18	0,28	6,5	0,10	0,15	4,7
4000	0,49	0,85	12,3	0,41	0,72	11,1	0,33	0,58	9,4	0,25	0,44	7,8	0,17	0,30	6,1	0,10	0,17	4,4
3500	0,44	0,88	11,7	0,37	0,74	10,6	0,30	0,61	8,9	0,23	0,46	7,3	0,16	0,32	5,7	0,09	0,19	4,1
3000	0,39	0,91	11,1	0,33	0,77	10,0	0,27	0,63	8,4	0,21	0,49	6,8	0,15	0,34	5,3	0,09	0,21	3,7
2500	0,34	0,94	10,4	0,28	0,79	9,4	0,23	0,66	7,9	0,18	0,51	6,4	0,13	0,36	4,9	0,08	0,23	3,4
2000	0,28	0,97	9,8	0,23	0,82	8,8	0,19	0,68	7,3	0,15	0,53	5,9	0,11	0,38	4,5	0,07	0,24	3,1
1500	0,21	1,00	9,2	0,18	0,85	8,2	0,15	0,71	6,8	0,12	0,56	5,5	0,09	0,40	4,1	0,05	0,25	2,7
1000	0,15	1,03	8,6	0,13	0,88	7,6	0,10	0,73	6,3	0,08	0,58	5,0	0,06	0,42	3,7	0,04	0,27	2,4
500	0,08	1,06	8,0	0,06	0,90	7,0	0,05	0,75	5,8	0,04	0,60	4,5	0,03	0,44	3,3	0,02	0,29	2,1

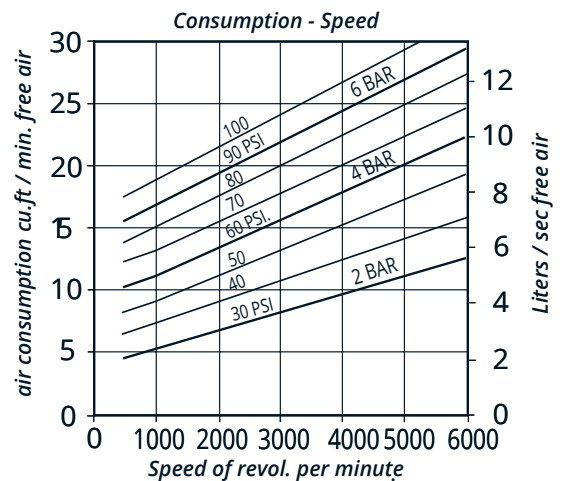
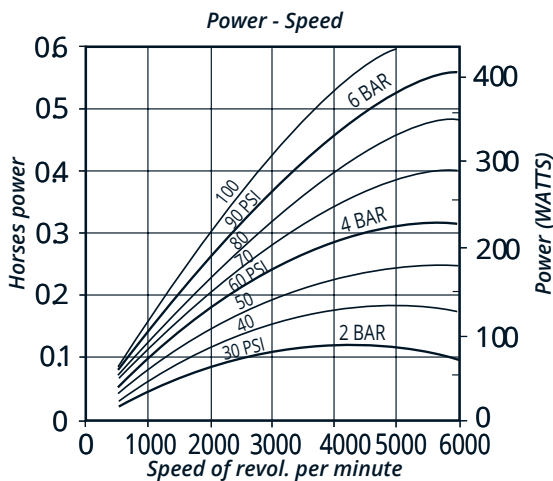
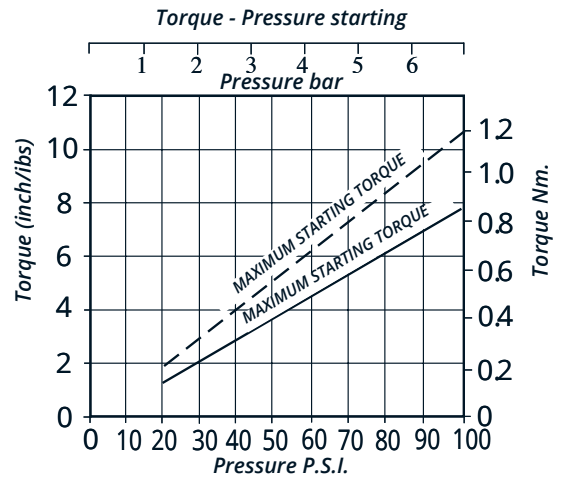
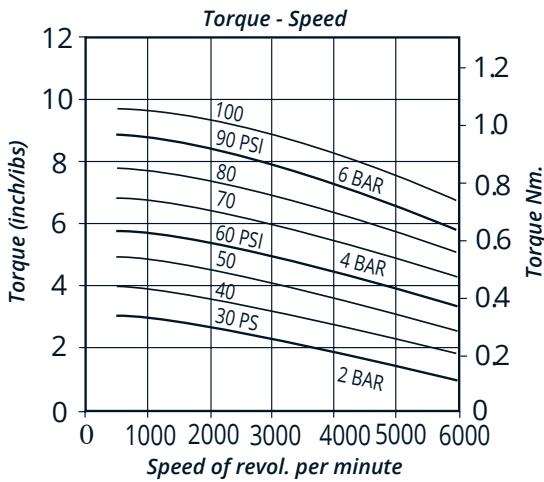
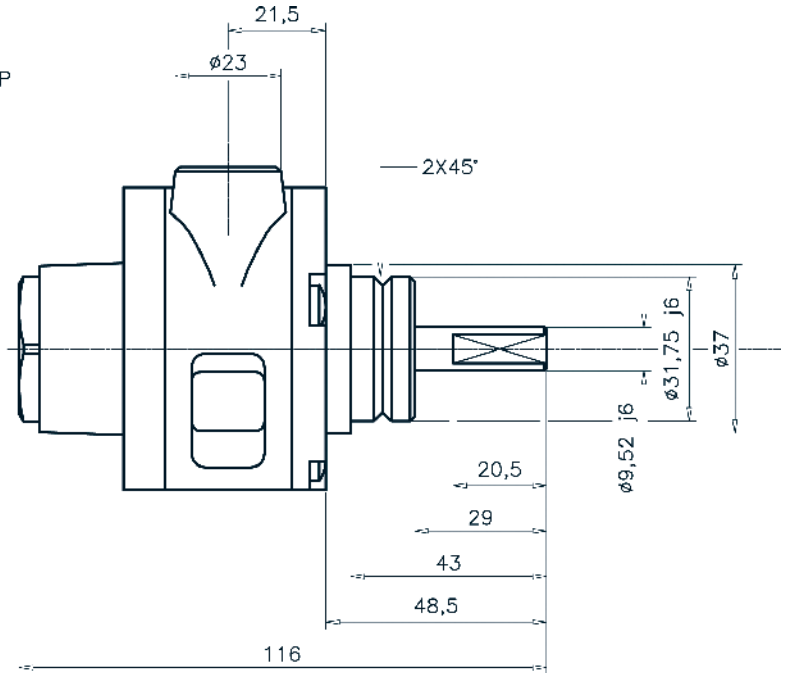
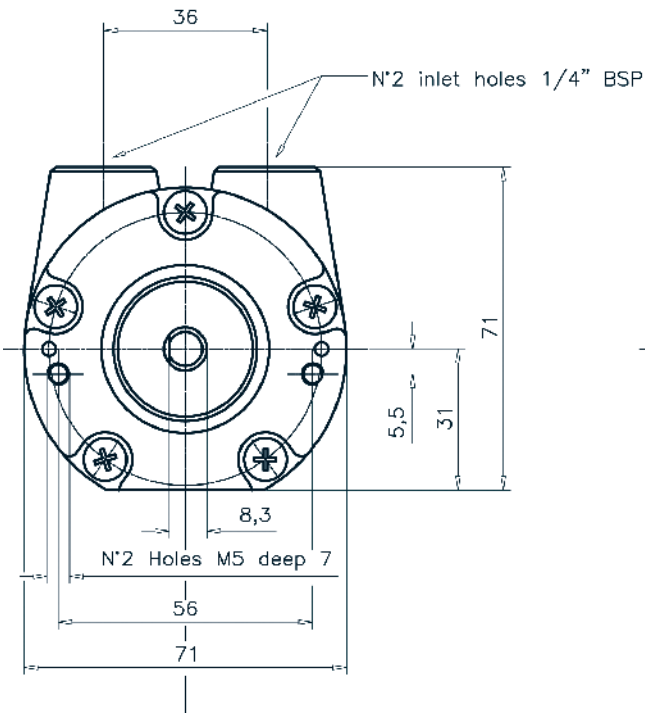
#### AVAILABLE VERSIONS

**M55F** as shown in the drawing without a foot  
**M55B14D63** flange B14 ø 90mm - shaft ø 11mm  
**M55B14D71** flange B14 ø 105mm - shaft ø 14mm  
**M55B5D71BN** engine with pneumatic brake BN71  
**M55B5D63** flange B5 ø 140mm - shaft ø 11mm  
**M55B5D71** flange B5 ø 160mm - shaft ø 14mm

**Lubrication** 4-5 gocce/1' in continuous service  
 9-12 gocce/1'in intermittent service  
**Filtration:** Use 64 micron Filtration or better  
**Radial load:** 18 N max  
**Axial load:** Not admitted  
**Operative temperature:** da -20°C a +80°C  
**Noise:** 86dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.







## SERIES M95 - 0,73 KW / 1,06 hp



PERFORMANCES AND DIMENSIONS																		
	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	2,21	3,61	3,03	1,91	3,1	2,61	1,60	2,60	2,18	1,31	2,10	1,76	0,92	1,60	1,33	0,71	1,10	0,98
Speed-RPM	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
4000	1,06	1,86	29,3	0,83	1,45	25,7	0,59	1,04	22,1	0,36	0,63	18,5	0,12	0,22	14,9	-	-	-
3700	1,03	1,95	28,0	0,81	1,54	24,5	0,59	1,13	21,1	0,38	0,72	17,6	0,16	0,30	14,2	0,01	0,03	10,7
3400	0,99	2,04	26,7	0,79	1,63	23,4	0,59	1,22	20,1	0,39	0,79	16,8	0,19	0,38	13,5	0,05	0,11	10,2
3100	0,94	2,13	25,3	0,76	1,72	22,2	0,57	1,29	19,0	0,39	0,88	15,9	0,21	0,47	12,7	0,08	0,18	9,6
2800	0,88	2,21	24,0	0,72	1,80	21,0	0,55	1,38	18,0	0,39	0,97	15,0	0,22	0,55	12,0	0,10	0,25	9,0
2500	0,82	2,30	22,6	0,67	1,88	19,8	0,52	1,47	17,0	0,37	1,05	14,1	0,23	0,64	11,3	0,12	0,33	8,5
2200	0,75	2,39	21,3	0,62	1,97	18,6	0,49	1,56	15,9	0,36	1,14	13,3	0,23	0,72	10,6	0,13	0,41	7,9
1900	0,67	2,48	19,9	0,56	2,06	17,4	0,44	1,64	14,9	0,33	1,23	12,4	0,22	0,80	9,9	0,13	0,49	7,4
1600	0,59	2,57	18,6	0,49	2,15	16,2	0,39	1,72	13,9	0,30	1,30	11,5	0,20	0,89	9,1	0,13	0,57	6,8
1300	0,49	2,66	17,2	0,41	2,23	15,0	0,34	1,81	12,8	0,26	1,39	10,6	0,18	0,97	8,4	0,12	0,65	6,2
1000	0,39	2,74	15,9	0,33	2,32	13,8	0,27	1,90	11,8	0,21	1,48	9,7	0,15	1,06	7,7	0,10	0,73	5,7
700	0,28	2,83	14,5	0,24	2,41	12,7	0,20	1,99	10,8	0,16	1,56	8,9	0,11	1,14	7,0	0,08	0,80	5,1
400	0,17	2,92	13,2	0,14	2,50	11,5	0,12	2,06	9,7	0,09	1,64	8,0	0,07	1,22	6,3	0,05	0,88	4,5

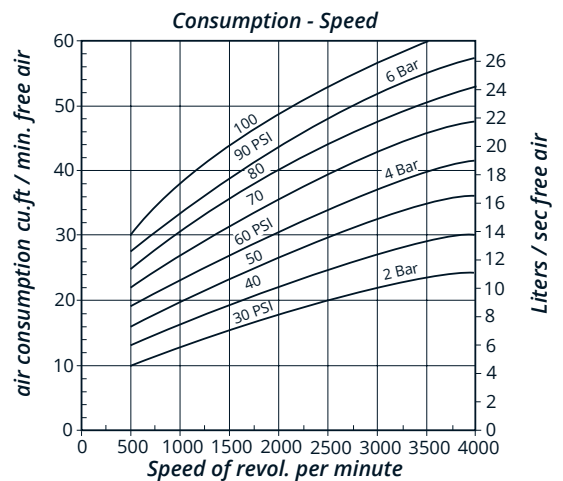
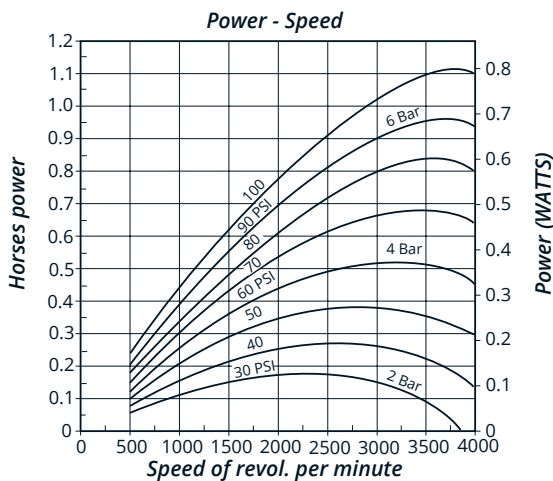
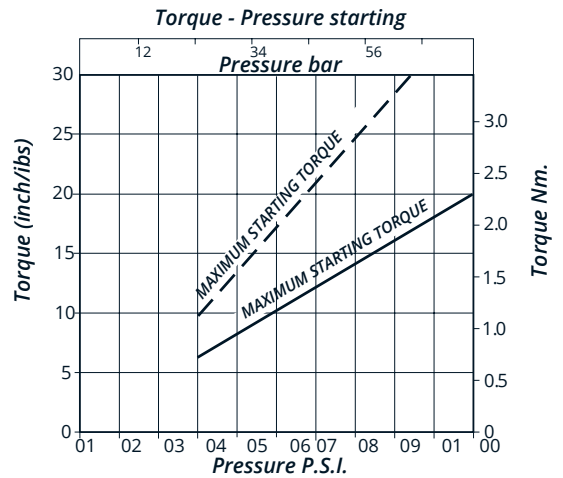
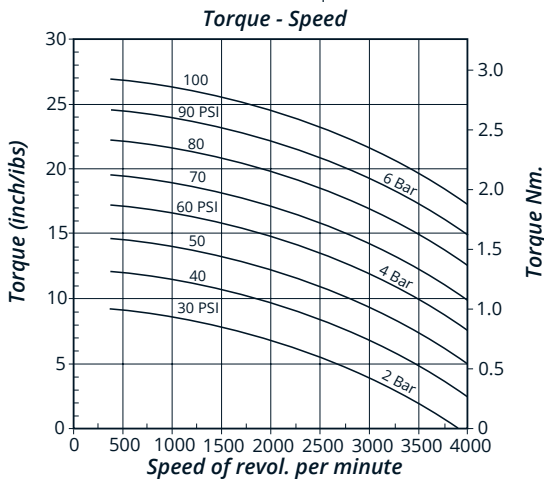
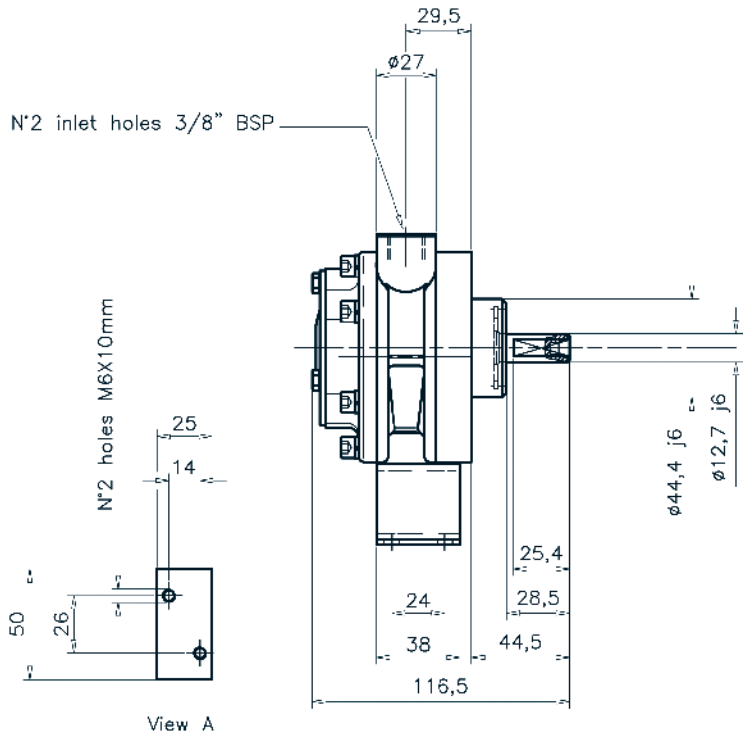
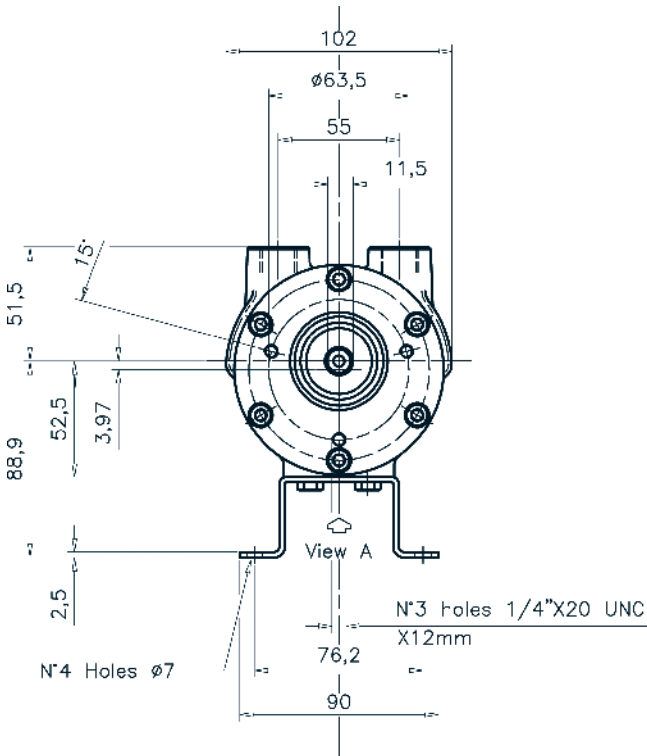
### AVAILABLE VERSIONS

**M95F** as shown in the drawing without a foot  
**M95P** as per drawing with foot  
**M95C** flange NEMA 56C  $\varnothing$  6.1 / 2 " - shaft  $\varnothing$  5/8"  
**M95B5D71BN** engine with pneumatic brake BN71  
**M95B5D90BN** engine with pneumatic brake BN90  
**M95B14D71** flange B14  $\varnothing$  105mm - shaft  $\varnothing$  14mm  
**M95B14D80** flange B14  $\varnothing$  120mm - shaft  $\varnothing$  19mm  
**M95B14D90** flange B14  $\varnothing$  140mm - shaft  $\varnothing$  24mm  
**M95B5D71** flange B5  $\varnothing$  160mm - shaft  $\varnothing$  14mm  
**M95B5D80** flange B5  $\varnothing$  200mm - shaft  $\varnothing$  19mm  
**M95B5D90** flange B5  $\varnothing$  200mm - shaft  $\varnothing$  24mm



**Lubrication** 4-5 gocce/1' in continuous service  
 9-12 gocce/1'in intermittent service  
**Filtration:** Use 64 micron Filtration or better  
**Radial load:** 400 N max  
**Axial load:** Not admitted  
**Operative temperature:** da -20°C a +80°C  
**Noise:** 83dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.



## SERIES M150 – 1,2 KW / 1,67 HP



PERFORMANCES AND DIMENSIONS																		
	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	3,41	5,77	4,88	2,89	4,93	4,19	2,38	4,09	3,51	1,87	3,23	2,82	1,36	2,39	2,13	0,86	1,54	1,45
Speed-RPM	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
3000	1,67	3,90	29,3	1,42	3,31	25,5	1,17	2,73	21,7	0,92	2,15	17,8	0,67	1,57	14,0	0,42	0,98	10,1
2800	1,58	3,96	28,0	1,35	3,37	24,4	1,11	2,78	20,7	0,88	2,20	17,0	0,64	1,61	13,3	0,40	1,02	9,7
2600	1,49	4,03	26,7	1,27	3,43	23,2	1,05	2,83	19,7	0,83	2,23	16,2	0,61	1,65	12,7	0,39	1,05	9,2
2400	1,45	4,06	26,1	1,23	3,46	22,7	1,02	2,86	19,3	0,81	2,26	15,8	0,59	1,66	12,4	0,38	1,06	9,0
2200	1,40	4,10	25,4	1,19	3,49	22,1	0,99	2,89	18,8	0,78	2,28	15,4	0,57	1,68	12,1	0,37	1,08	8,7
2000	1,30	4,16	24,2	1,11	3,55	21,0	0,92	2,94	17,8	0,73	2,33	14,6	0,54	1,72	11,4	0,35	1,11	8,3
1800	1,20	4,22	22,9	1,03	3,61	19,8	0,85	2,99	16,8	0,68	2,37	13,8	0,50	1,75	10,8	0,32	1,14	7,8
1600	1,10	4,29	21,6	0,94	3,67	18,7	0,78	3,04	15,9	0,62	2,42	13,0	0,46	1,79	10,2	0,30	1,17	7,3
1400	0,99	4,35	20,3	0,85	3,72	17,6	0,71	3,10	14,9	0,56	2,46	12,2	0,42	1,83	9,6	0,27	1,20	6,9
1200	0,88	4,42	19,0	0,75	3,78	16,5	0,63	3,15	13,9	0,50	2,51	11,4	0,37	1,87	8,9	0,25	1,23	6,4
1000	0,77	4,49	17,7	0,66	3,84	15,3	0,55	3,19	13,0	0,44	2,55	10,6	0,33	1,91	8,3	0,22	1,26	5,9
800	0,65	4,55	16,4	0,56	3,90	14,2	0,46	3,24	12,0	0,37	2,60	9,8	0,28	1,94	7,7	0,18	1,29	5,5
600	0,53	4,6	15,1	0,45	3,95	13,1	0,38	3,30	11,1	0,30	2,63	9,0	0,23	1,97	7,0	0,15	1,32	5,0

### AVAILABLE VERSIONS

**M150F** as shown in the drawing without a foot

**M150P** as shown in the drawing

**M150C** NEMA 56C flange  $\varnothing$  6.1 / 2 " - shaft  $\varnothing$  5/8"

**Lubrication** 4-5 gocce/1' in continuous service  
9-12 gocce/1'in intermittent service

**Filtration:** Use 64 micron Filtration or better

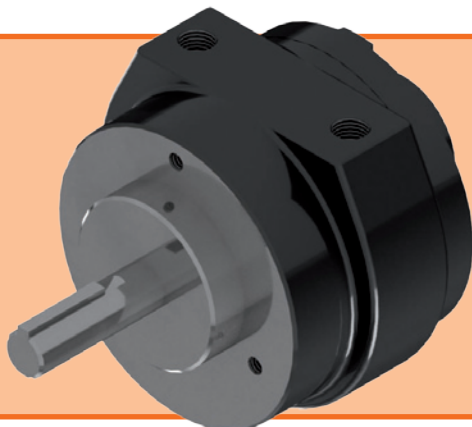
**Radial load:** 400 N max

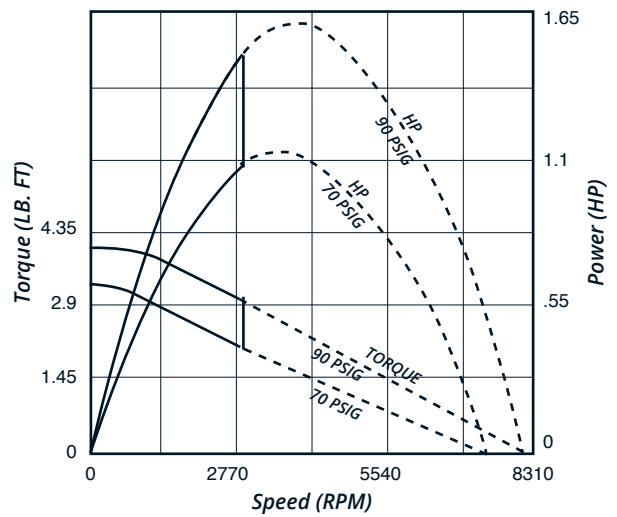
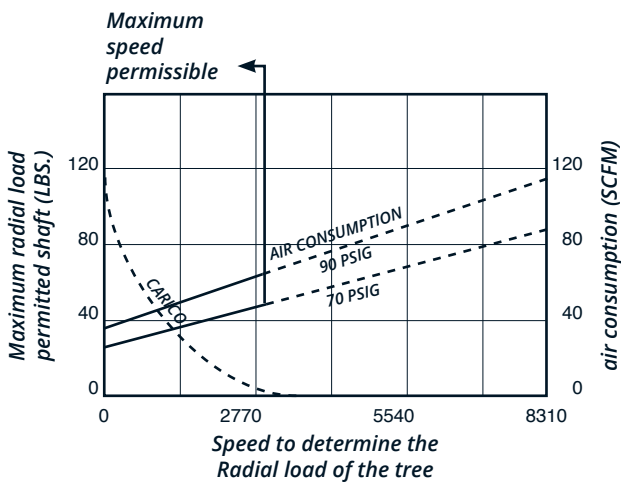
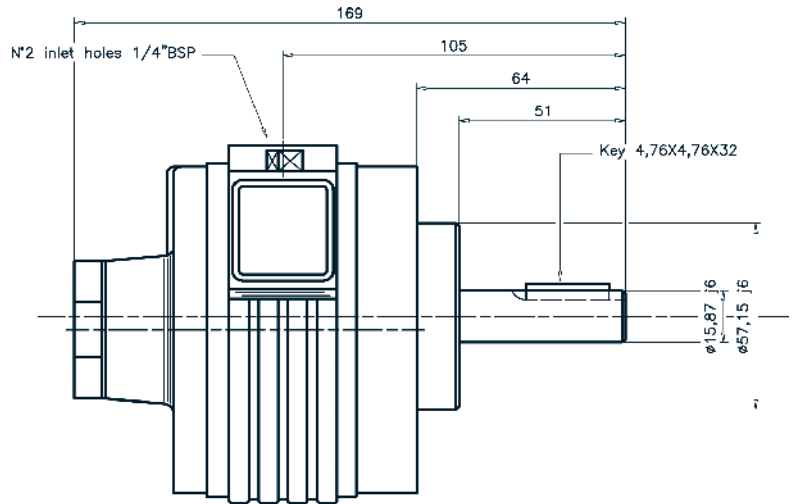
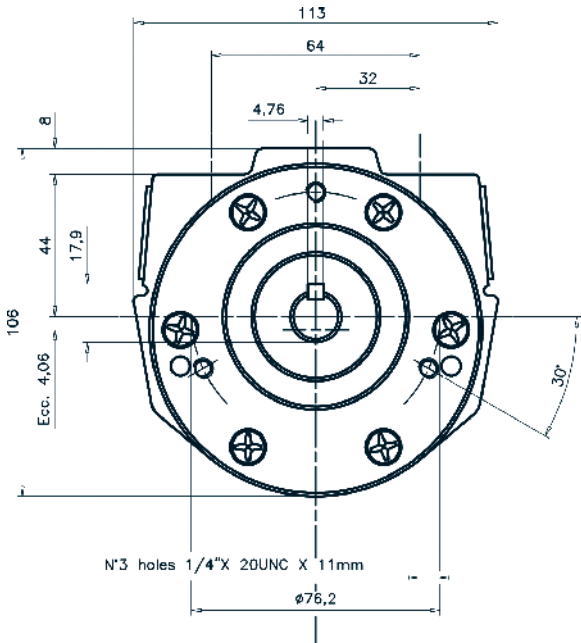
**Axial load:** Not admitted

**Operative temperature:** da -20°C a +80°C

**Noise:** 83dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.





## SERIES M250 – 1,9 KW / 2,72 HP



PERFORMANCES AND DIMENSIONS																		
	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	4,55	7,72	6,51	3,87	6,59	5,60	3,18	5,45	4,68	2,49	4,33	3,77	1,81	3,19	2,85	1,15	2,00	1,94
Speed-RPM	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
4000	2,72	4,77	47,9	2,30	4,04	41,6	1,89	3,31	35,4	1,47	2,58	29,1	1,05	1,84	22,9	0,63	0,113	16,7
3700	2,59	4,91	45,3	2,19	4,16	39,4	1,80	3,41	33,5	1,40	2,67	27,5	1,01	1,92	21,6	0,62	0,119	15,7
3400	2,44	5,04	42,7	2,07	4,27	37,1	1,70	3,52	31,5	1,33	2,75	25,9	0,97	1,99	20,4	0,60	0,126	14,8
3100	2,28	5,16	40,1	1,94	4,39	34,8	1,60	3,62	29,6	1,26	2,84	24,3	0,91	2,07	19,1	0,57	0,132	13,9
2800	2,11	5,30	37,5	1,80	4,51	32,6	1,48	3,72	27,7	1,17	2,93	22,7	0,86	2,15	17,8	0,54	0,138	12,9
2500	1,93	5,43	34,9	1,65	4,63	30,3	1,36	3,82	25,7	1,08	3,02	21,1	0,79	2,22	16,6	0,51	0,145	12,0
2200	1,74	5,56	32,3	1,49	4,74	28,0	1,23	3,93	23,8	0,98	3,12	19,5	0,72	2,29	15,3	0,46	0,151	11,1
1900	1,54	5,69	29,7	1,32	4,86	25,8	1,09	4,03	21,9	0,87	3,20	17,9	0,64	2,37	14,0	0,42	0,157	10,1
1600	1,33	5,82	27,1	1,13	4,98	23,5	0,94	4,14	19,9	0,75	3,29	16,3	0,56	2,45	12,8	0,37	0,164	9,2
1300	1,10	5,95	24,5	0,94	5,10	21,2	0,78	4,23	18,0	0,63	3,38	14,7	0,47	2,53	11,5	0,31	0,170	8,3
1000	0,87	6,09	21,9	0,74	5,21	19,0	0,62	4,34	16,1	0,49	3,47	13,1	0,37	2,60	10,2	0,25	0,176	7,3
700	0,62	6,21	19,3	0,53	5,33	16,7	0,44	4,45	14,1	0,36	3,56	11,5	0,27	2,68	9,0	0,18	0,183	6,4
400	0,36	6,34	16,7	0,31	5,44	14,5	0,26	4,54	12,2	0,21	3,64	9,9	0,16	2,75	7,7	0,11	1,85	5,4

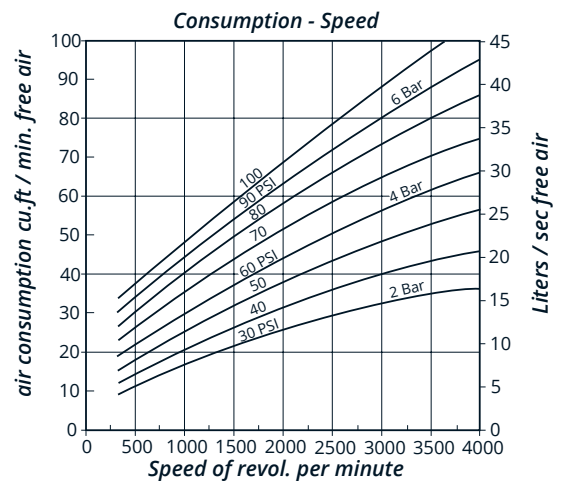
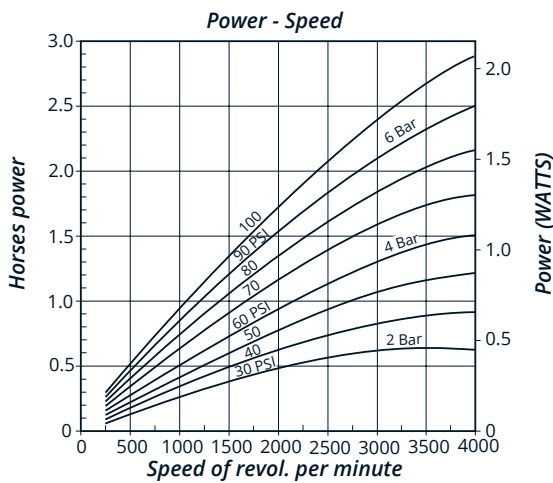
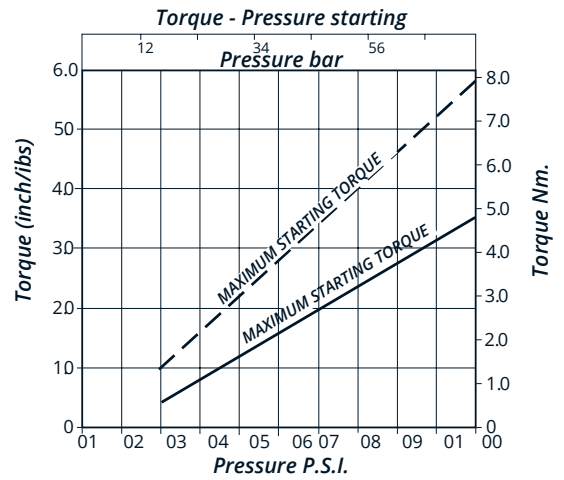
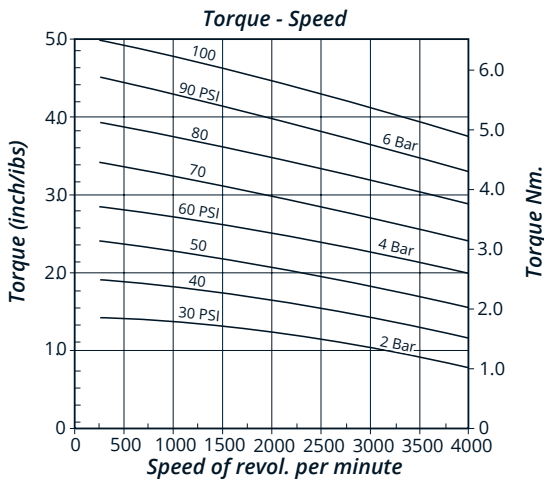
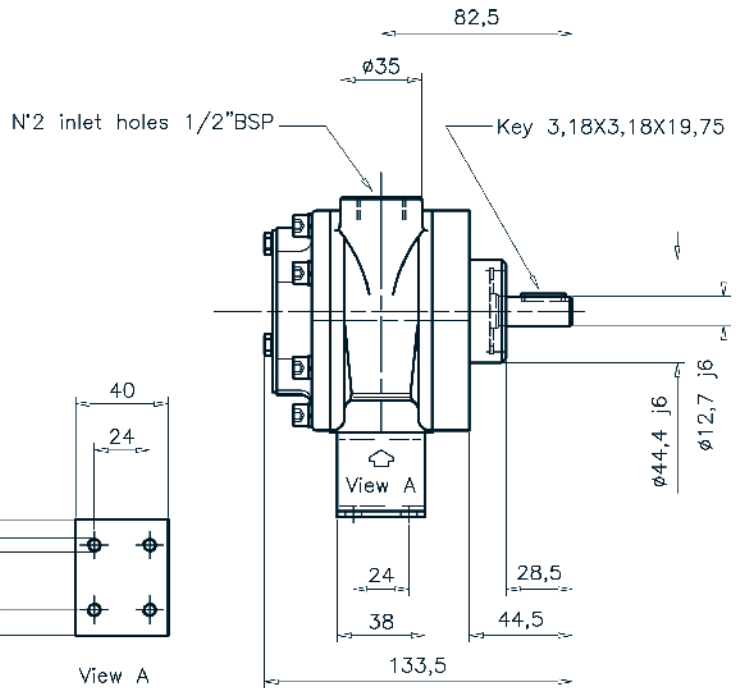
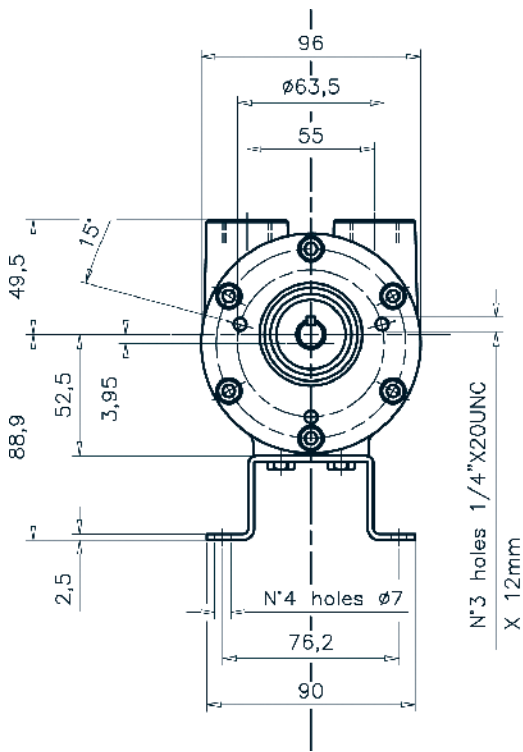
### AVAILABLE VERSIONS

- M250F** as shown in the drawing without a foot
- M250P** as per drawing with foot
- M250C** flange NEMA 56C  $\varnothing$  6.1 / 2" - shaft  $\varnothing$  5/8"
- M250B5D71BN** engine with pneumatic brake BN71
- M250B5D90BN** engine with pneumatic brake BN90
- M250B14D71** flange B14  $\varnothing$  105mm - shaft  $\varnothing$  14mm
- M250B14D80** flange B14  $\varnothing$  120mm - shaft  $\varnothing$  19mm
- M250B14D90** flange B14  $\varnothing$  140mm - shaft  $\varnothing$  24mm
- M250B5D71** flange B5  $\varnothing$  160mm - shaft  $\varnothing$  14mm
- M250B5D80** flange B5  $\varnothing$  200mm - shaft  $\varnothing$  19mm
- M250B5D90** flange B5  $\varnothing$  200mm - shaft  $\varnothing$  24mm



- Lubrication** 4-5 gocce/1' in continuous service  
9-12 gocce/1'in intermittent service
- Filtration:** Use 64 micron Filtration or better
- Radial load:** 170 N max
- Axial load:** Not admitted
- Operative temperature:** da -20°C a +80°C
- Noise:** 84dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.



## SERIES M350 – 3,2 KW / 4,07 HP



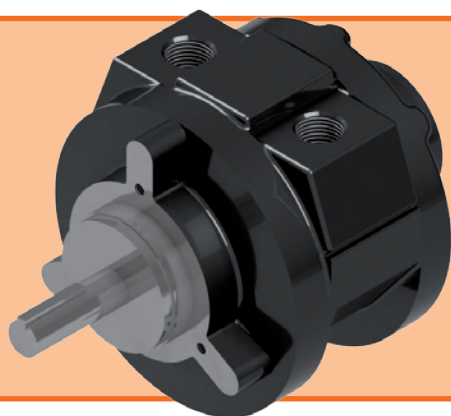
PERFORMANCES AND DIMENSIONS																		
Speed-RPM	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	7,70	15,12	12,38	6,57	12,88	10,60	5,43	10,64	8,82	4,30	8,40	7,00	3,16	6,16	5,28	2,00	3,92	3,50
	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
3000	4,07	9,53	64,6	3,46	8,09	57,2	2,85	6,66	49,8	2,24	5,24	42,4	1,63	3,81	35,0	1,02	2,38	27,6
2800	3,88	9,72	61,9	3,30	8,26	54,7	2,72	6,81	47,6	2,14	5,36	40,5	1,56	3,91	33,4	0,98	2,46	26,3
2600	3,67	9,91	59,1	3,12	8,43	52,3	2,58	6,96	45,5	2,03	5,48	38,7	1,48	4,01	31,9	0,94	2,53	25,1
2400	3,45	10,09	56,4	2,94	8,59	49,9	2,43	7,11	43,4	1,92	5,61	36,8	1,40	4,11	30,3	0,89	2,61	23,8
2200	3,22	10,29	53,7	2,75	8,77	47,4	2,27	7,24	41,2	1,79	5,72	35,0	1,32	4,20	28,8	0,84	2,68	22,6
2000	2,99	10,48	51,0	2,55	8,94	45,0	2,11	7,39	39,1	1,67	5,84	33,2	1,23	4,30	27,2	0,79	2,75	21,3
1800	2,74	10,67	48,2	2,33	9,10	42,6	1,93	7,54	37,0	1,53	5,97	31,3	1,13	4,40	25,7	0,73	2,83	20,0
1600	2,48	10,86	45,5	2,11	9,27	40,2	1,75	7,67	34,8	1,39	6,09	29,5	1,02	4,50	24,1	0,66	2,90	18,8
1400	2,20	11,05	42,8	1,88	9,44	37,7	1,56	7,82	32,7	1,24	6,20	27,6	0,92	4,60	22,6	0,59	2,98	17,5
1200	1,92	11,24	40,1	1,64	9,60	35,3	1,36	7,97	30,5	1,08	6,33	25,8	0,80	4,69	21,0	0,52	3,06	16,2
1000	1,63	11,43	37,3	1,39	9,77	32,9	1,16	8,11	28,4	0,92	6,45	23,9	0,68	4,79	19,5	0,45	3,13	15,0
800	1,32	11,62	34,6	1,13	9,94	30,4	0,94	8,25	26,3	0,75	6,58	22,1	0,56	4,89	17,9	0,37	3,20	13,7
600	1,01	11,81	31,9	0,86	10,10	28,0	0,72	8,40	24,1	0,57	6,69	20,2	0,43	4,99	16,3	0,28	3,28	12,5
400	0,68	12,01	29,2	0,59	10,27	25,6	0,49	8,55	22,0	0,39	6,81	18,4	0,29	5,09	14,8	0,19	3,35	11,2

### AVAILABLE VERSIONS

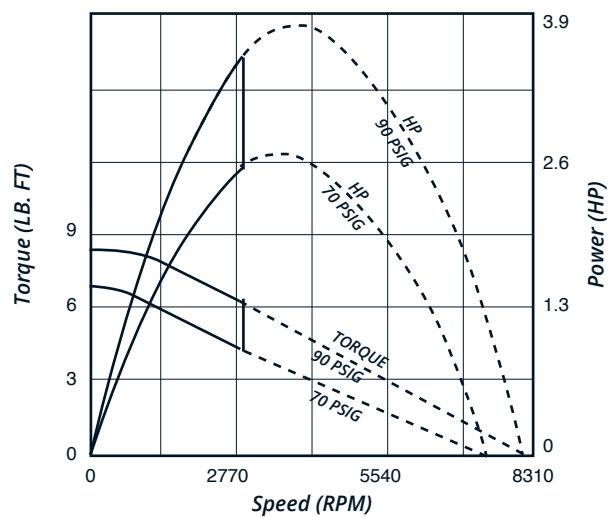
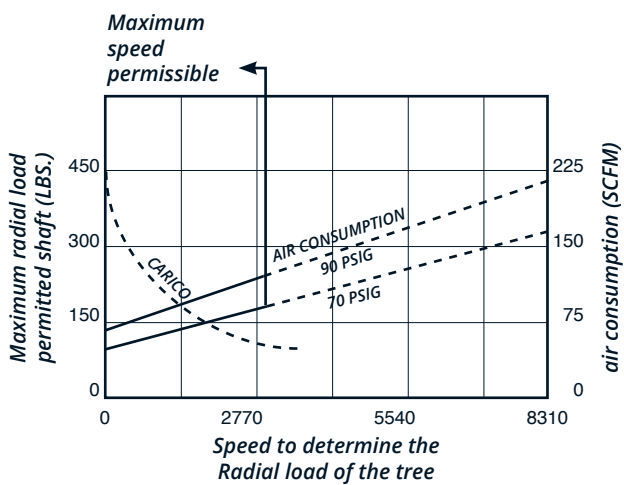
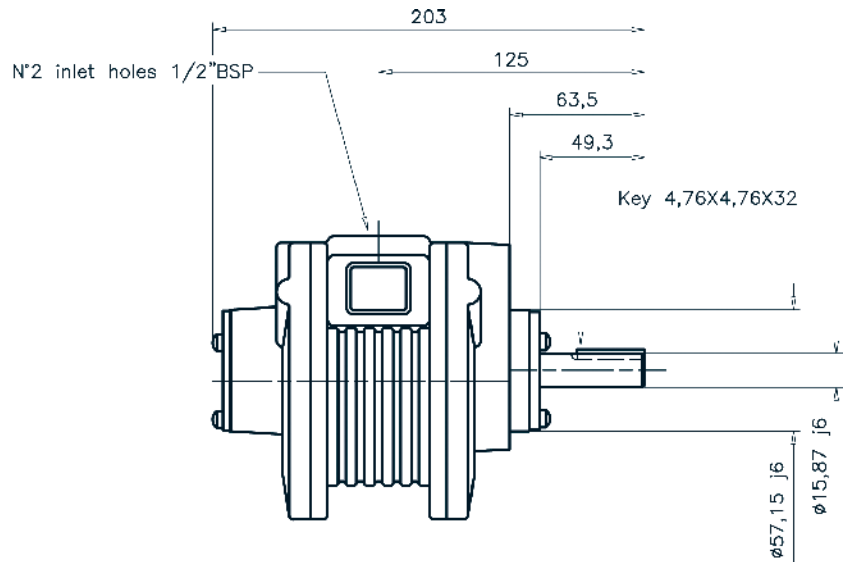
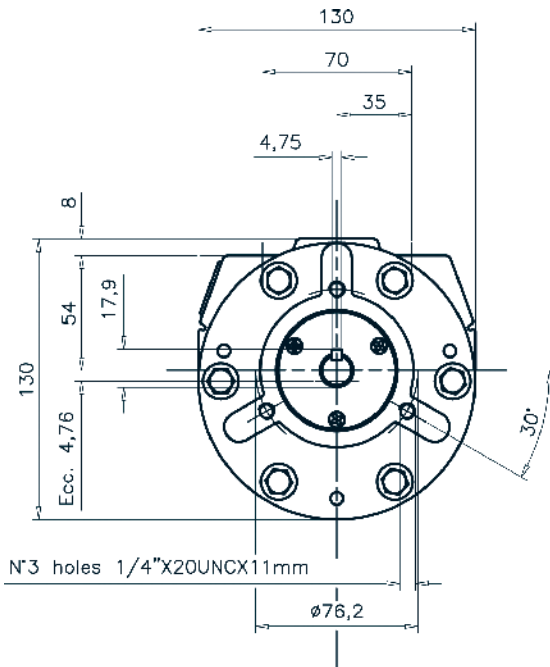
**M350F** as shown in the drawing without a foot  
**M350P** as shown in the drawing  
**M350C** NEMA 56C flange  $\varnothing 6.1 / 2'' - \varnothing 5/8''$  shaft

**Lubrication** 5-6 gocce/1' in continuous service  
 10-12 gocce/1'in intermittent service  
**Filtration:** Use 64 micron Filtration or better  
**Radial load:** 250 N max  
**Axial load:** Not admitted  
**Operative temperature:** da -20°C a +80°C  
**Noise:** 84dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.







## SERIES M410 – 3,4 KW / 4,6 HP



PERFORMANCES AND DIMENSIONS																		
Speed-RPM	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	8,37	16,43	13,46	7,14	14,00	11,53	5,90	11,57	9,60	4,67	9,13	7,67	3,44	6,70	5,74	2,21	4,27	3,81
	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
3000	4,43	10,36	70,2	3,76	8,80	62,2	3,10	7,25	54,1	2,43	5,69	46,1	1,77	4,15	38,0	1,11	0,264	30
2800	4,21	10,56	67,2	3,58	8,99	59,5	2,95	7,41	51,8	2,32	5,82	44,1	1,69	4,24	36,3	1,06	0,272	28,6
2600	3,99	10,77	64,3	3,40	9,16	56,9	2,80	7,57	49,5	2,21	5,96	42,1	1,61	4,35	34,7	1,02	0,281	27,3
2400	3,75	10,98	61,3	3,20	9,35	54,2	2,64	7,72	47,1	2,08	6,09	40,1	1,53	4,46	33,0	0,97	0,289	25,9
2200	3,51	11,18	58,3	2,99	9,53	51,6	2,47	7,88	44,8	1,95	6,22	38,0	1,43	4,57	31,3	0,91	0,297	24,5
2000	3,25	11,39	55,4	2,77	9,71	48,9	2,29	8,04	42,5	1,81	6,35	36,0	1,33	4,67	29,6	0,85	0,306	23,1
1800	2,97	11,59	52,4	2,54	9,89	46,3	2,10	8,19	40,2	1,66	6,49	34,0	1,23	4,78	27,9	0,79	0,314	21,8
1600	2,69	11,80	49,5	2,30	10,07	43,6	1,90	8,35	37,8	1,51	6,62	32,0	1,11	4,89	26,2	0,72	0,322	20,4
1400	2,40	12,01	46,5	2,05	10,26	41,0	1,70	8,51	35,5	1,35	6,75	30,0	1,00	5,00	24,5	0,65	0,330	19,0
1200	2,09	12,22	43,5	1,78	10,44	38,4	1,48	8,66	33,2	1,18	6,88	28,0	0,87	5,10	22,8	0,57	0,339	17,7
1000	1,77	12,43	40,6	1,51	10,62	35,7	1,26	8,82	30,9	1,00	7,01	26,0	0,74	5,20	21,1	0,48	0,347	16,3
800	1,44	12,63	37,6	1,23	10,80	33,1	1,02	8,98	28,5	0,81	7,14	24,0	0,61	5,31	19,5	0,40	0,355	14,9
600	1,10	12,84	34,7	0,94	10,99	30,4	0,78	9,13	26,2	0,62	7,27	22,0	0,46	5,42	17,8	0,30	0,364	13,5
400	0,74	13,04	31,7	0,64	11,16	27,8	0,53	9,29	23,9	0,42	7,41	20,0	0,31	7,41	16,1	0,21	0,372	12,2

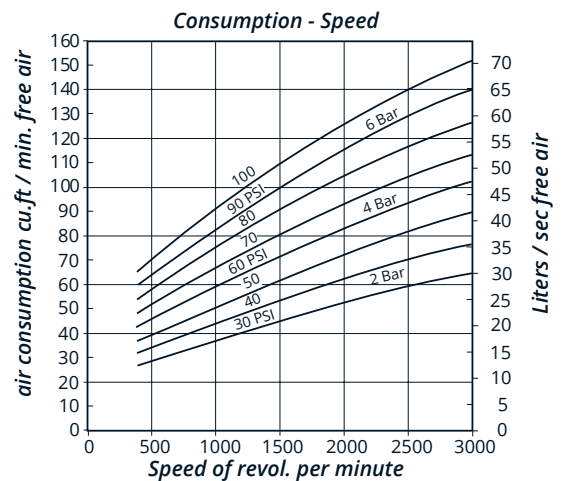
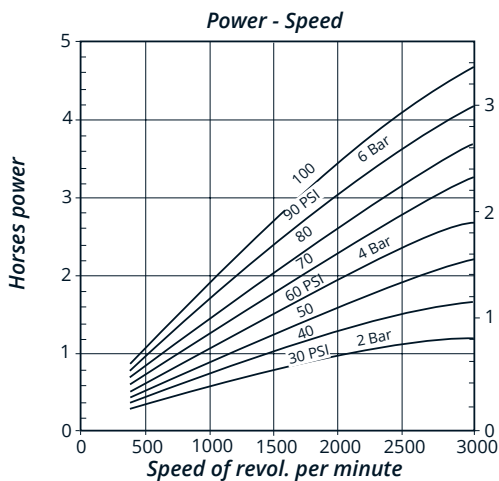
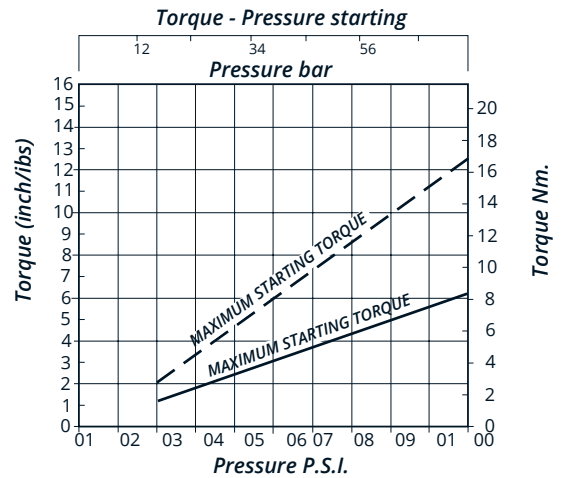
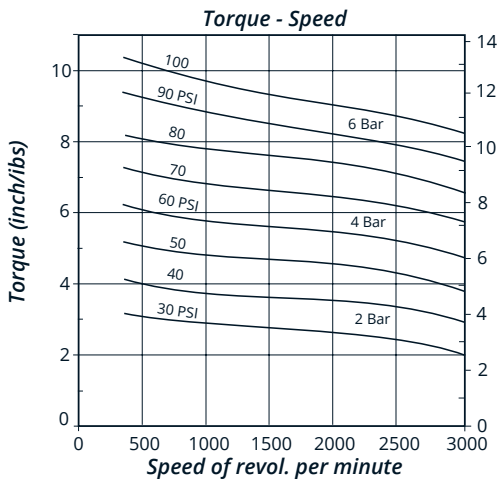
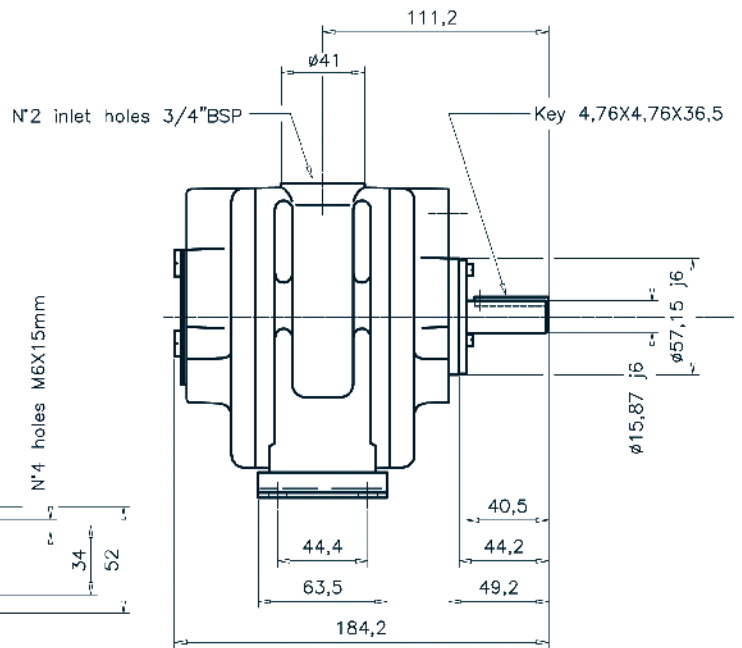
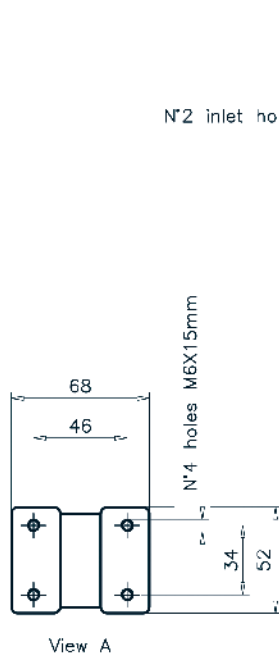
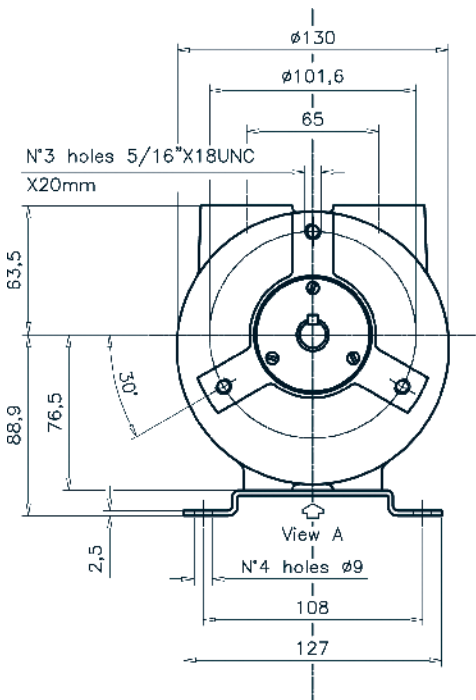
### AVAILABLE VERSIONS

- M410F** as shown in the drawing without a foot
- M410P** as per drawing with foot
- M410C** flange NEMA 56C  $\varnothing$  6.1 / 2 " - shaft  $\varnothing$  5/8"
- M410B5D90BN** engine with pneumatic brake BN90
- M410B14D80** flange B14  $\varnothing$  120mm - shaft  $\varnothing$  19mm
- M410B14D90** flange B14  $\varnothing$  140mm - shaft  $\varnothing$  24mm
- M410B5D80** flange B5  $\varnothing$  200mm - shaft  $\varnothing$  19mm
- M410B5D90** flange B5  $\varnothing$  200mm - shaft  $\varnothing$  24mm



- Lubrication** 5-6 gocce/1' in continuous service  
10-12 gocce/1'in intermittent service
- Filtration:** Use 64 micron Filtration or better
- Radial load:** 300 N max
- Axial load:** Not admitted
- Operative temperature:** da -20°C a +80°C
- Noise:** 84dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.



## SERIES M500 – 3,9 KW / 5,42 HP



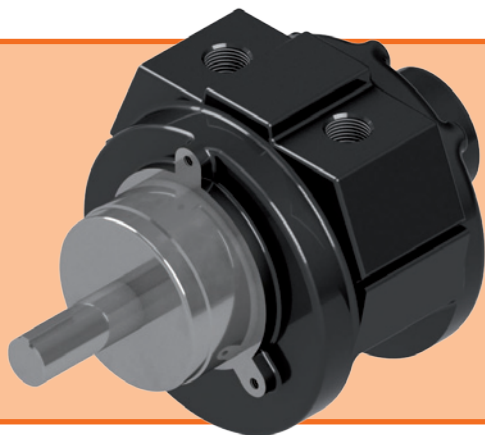
PERFORMANCES AND DIMENSIONS																		
	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	11,73	23,01	18,85	10,01	19,61	16,14	8,27	16,20	13,44	6,55	12,79	10,74	4,82	9,38	8,04	3,10	5,98	5,33
Speed-RPM	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
2500	5,42	15,22	87,9	4,62	12,96	77,8	3,81	10,69	67,6	3,00	8,43	57,5	2,20	6,17	47,3	1,39	3,91	37,2
2300	5,08	15,51	83,8	4,33	13,21	74,1	3,58	10,92	64,4	2,82	8,61	54,7	2,07	6,32	45,0	1,32	4,02	35,3
2100	4,73	15,80	79,6	4,03	13,47	70,4	3,33	11,13	61,1	2,63	8,80	51,9	1,94	6,47	42,6	1,24	4,14	33,4
1900	4,36	16,09	75,5	3,71	13,72	66,7	3,07	11,36	57,9	2,43	8,99	49,0	1,79	6,62	40,2	1,15	4,25	31,4
1700	3,97	16,39	71,3	3,39	13,97	63,0	2,80	11,57	54,6	2,22	9,17	46,2	1,64	6,77	37,9	1,06	4,36	29,5
1500	3,56	16,67	67,2	3,04	14,23	59,3	2,52	11,79	51,3	2,00	9,36	43,4	1,48	6,92	35,5	0,96	4,48	27,6
1300	3,14	16,96	63,0	2,68	14,48	55,5	2,22	12,01	48,1	1,77	9,54	40,6	1,31	7,07	33,1	0,85	4,60	25,7
1100	2,70	17,25	58,9	2,31	14,74	51,8	1,92	12,23	44,8	1,52	9,72	37,8	1,13	7,21	30,8	0,74	4,70	23,8
900	2,25	17,54	54,7	1,92	14,99	48,1	1,60	12,46	41,6	1,27	9,91	35,0	0,94	7,36	28,4	0,62	4,82	21,8
700	1,78	17,83	50,6	1,52	15,25	44,4	1,26	12,67	38,3	1,01	10,09	32,2	0,75	7,52	26,1	0,49	4,93	19,9
500	1,29	18,12	46,4	1,10	15,50	40,7	0,92	12,89	35,1	0,73	10,28	29,4	0,55	7,66	23,7	0,36	5,05	18,0
300	0,79	18,41	42,3	0,67	15,76	37,0	0,56	13,11	31,8	0,45	10,46	26,6	0,33	7,81	21,3	0,22	5,16	16,1

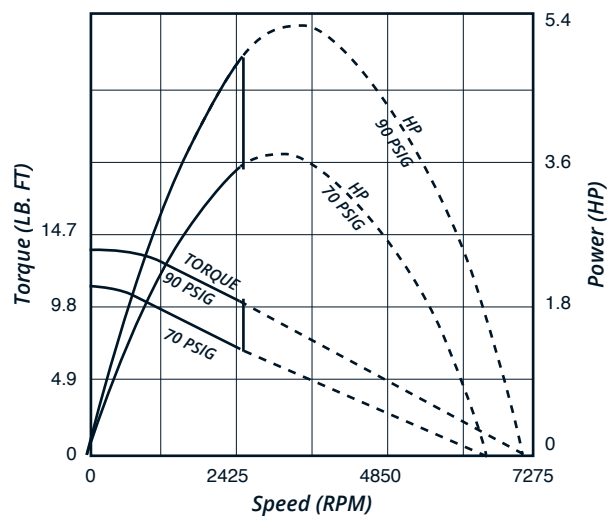
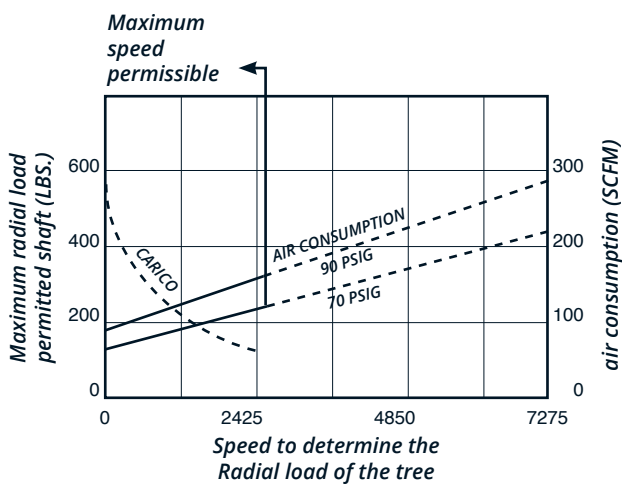
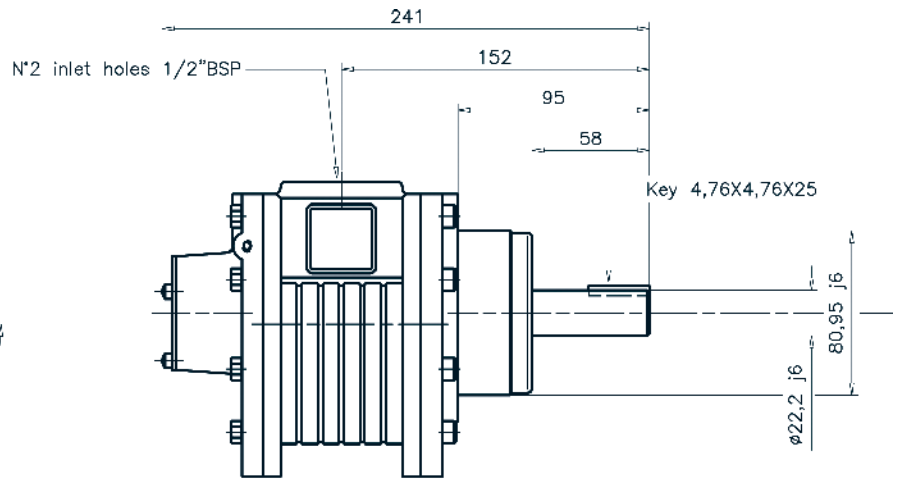
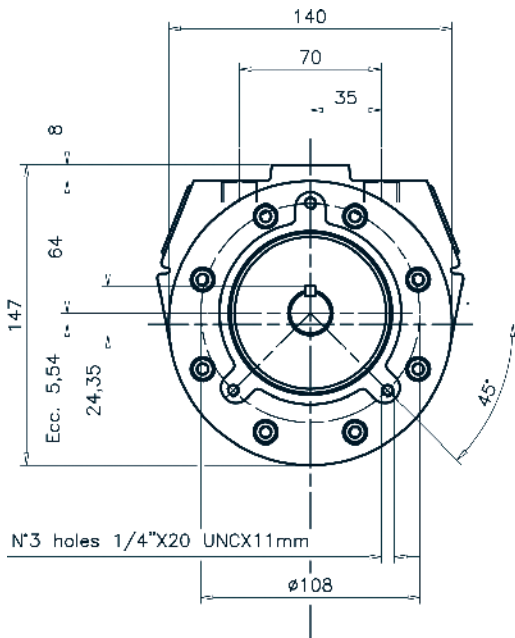
### AVAILABLE VERSIONS

**M500F** as shown in the drawing without a foot  
**M500P** as shown in the drawing  
**M500C** flange NEMA 145TC  $\varnothing$  6.1 / 2 " - shaft  $\varnothing$  7/8"

**Lubrication** 6-7 gocce/1' in continuous service  
 12-15 gocce/1'in intermittent service  
**Filtration:** Use 64 micron Filtration or better  
**Radial load:** 550 N max  
**Axial load:** Not admitted  
**Operative temperature:** da -20°C a +80°C  
**Noise:** 84dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.





## SERIES M620 – 5,1 KW / 6,94 HP



PERFORMANCES AND DIMENSIONS																		
	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	16,56	30,10	21,93	14,14	25,67	19,01	11,71	21,24	16,10	9,29	16,80	13,18	6,86	12,37	10,27	4,43	7,94	7,35
Speed-RPM	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
3000	6,94	16,23	116,1	5,86	13,72	101,9	4,79	11,21	87,6	3,72	8,69	73,4	2,64	6,18	59,1	1,57	3,68	44,9
2800	6,63	16,61	110,3	5,61	14,07	96,8	4,60	11,53	83,3	3,59	9,00	69,7	2,58	6,46	56,2	1,56	3,92	42,7
2600	6,29	16,99	104,6	5,34	14,43	91,7	4,39	11,86	78,9	3,44	9,29	66,1	2,49	6,73	53,3	1,54	4,17	40,4
2400	5,94	17,37	98,8	5,05	14,78	86,7	4,17	12,18	74,6	3,28	9,59	62,4	2,39	7,00	50,3	1,51	4,41	38,2
2200	5,56	17,75	93,0	4,74	15,13	81,6	3,92	12,51	70,2	3,10	9,89	58,8	2,28	7,27	47,4	1,46	4,66	36,0
2000	5,17	18,13	87,3	4,41	15,48	76,6	3,66	12,84	65,9	2,90	10,19	55,1	2,15	7,55	44,4	1,40	4,90	33,7
1800	4,75	18,51	81,5	4,06	15,84	71,5	3,38	13,16	61,5	2,69	10,49	51,5	2,00	7,82	41,5	1,32	5,15	31,5
1600	4,31	18,88	75,8	3,69	16,19	66,5	3,08	13,49	57,2	2,46	10,79	47,9	1,84	8,09	38,6	1,23	5,39	29,3
1400	3,84	19,27	70,0	3,30	16,54	61,4	2,76	13,82	52,8	2,21	11,08	44,2	1,67	8,36	35,6	1,12	5,64	27,0
1200	3,36	19,65	64,2	2,89	16,90	56,3	2,42	14,14	48,5	1,95	11,39	40,6	1,48	8,63	32,7	1,01	5,88	24,8
1000	2,85	20,03	58,5	2,46	17,25	51,3	2,06	14,46	44,1	1,66	11,68	36,9	1,27	8,91	29,7	0,87	6,13	22,5
800	2,33	20,40	52,7	2,01	17,60	46,2	1,69	14,80	39,8	1,37	11,99	33,3	1,05	9,18	26,8	0,73	6,37	20,3
600	1,78	20,79	46,9	1,53	17,95	41,2	1,29	15,12	35,4	1,05	12,28	29,6	0,81	9,45	23,8	0,57	6,62	18,1
400	1,21	21,17	41,2	1,04	18,31	36,1	0,88	15,44	31,0	0,72	12,58	26,0	0,55	9,72	20,9	0,39	6,86	15,8

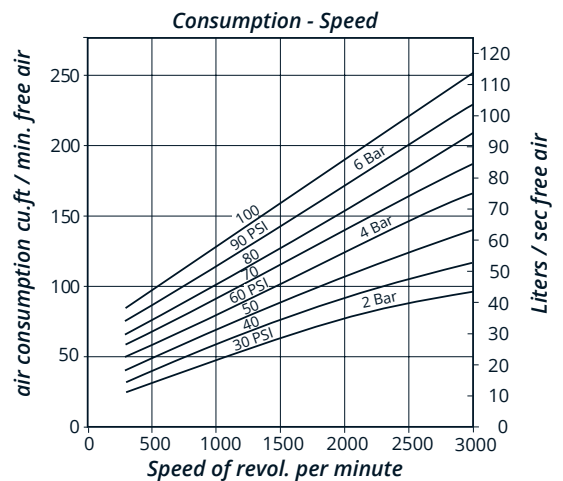
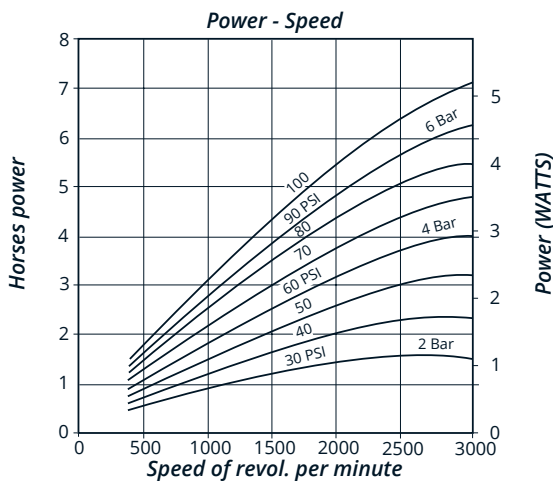
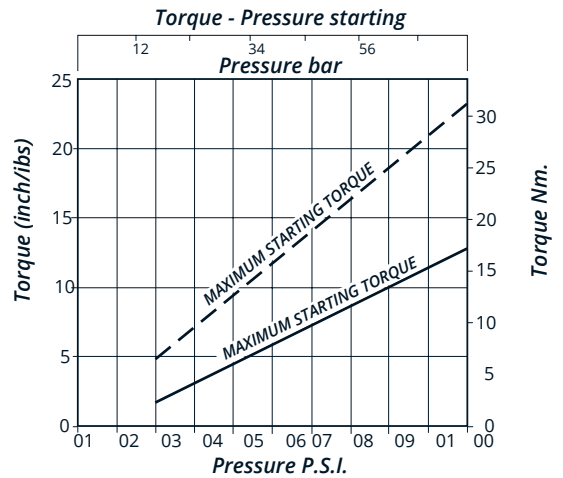
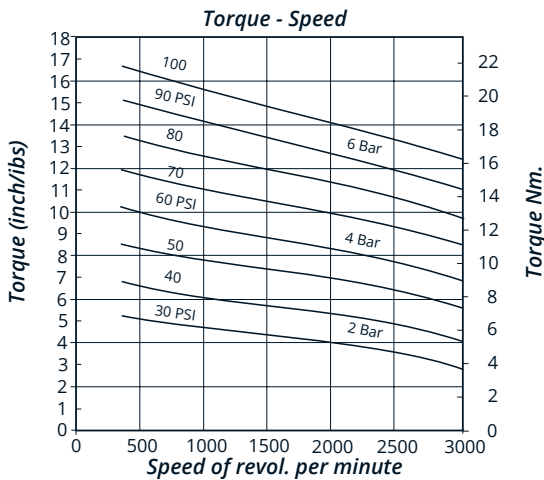
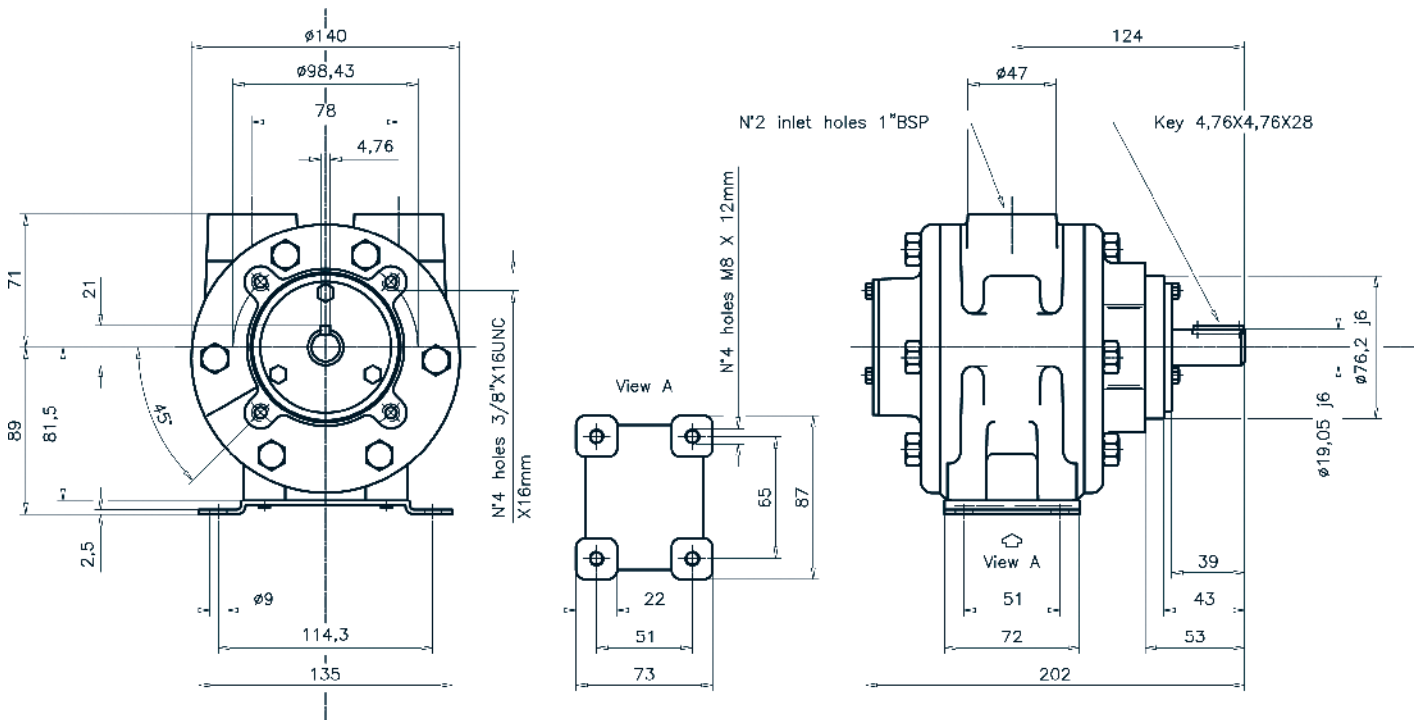
### AVAILABLE VERSIONS

**M620F** as shown in the drawing without a foot  
**M620P** as per drawing with foot  
**M620C** flange NEMA 145TC  $\varnothing$  6.1 / 2 " - shaft  $\varnothing$  7/8"  
**M620B5D90BN** engine with pneumatic brake BN90  
**M620B5D100BN** engine with pneumatic brake BN100  
**M620B14D90** flange B14  $\varnothing$  140mm - shaft  $\varnothing$  24mm  
**M620B14D100** flange B14  $\varnothing$  160mm - shaft  $\varnothing$  28mm  
**M620B5D90** flange B5  $\varnothing$  200mm - shaft  $\varnothing$  24mm  
**M620B5D100** flange B5  $\varnothing$  250mm - shaft  $\varnothing$  28mm

**Lubrication** 6-7 gocce/1' in continuous service  
 12-15 gocce/1'in intermittent service  
**Filtration:** Use 64 micron Filtration or better  
**Radial load:** 550 N max  
**Axial load:** Not admitted  
**Operative temperature:** da -20°C a +80°C  
**Noise:** 84dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.







## SERIES M1100 – 9,2 KW /12,53 HP



PERFORMANCES AND DIMENSIONS																		
	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	33,32	47,53	45,26	28,47	40,71	39,24	23,62	33,89	33,24	18,78	26,97	27,20	13,92	19,67	21,19	9,07	13,43	15,17
Speed-RPM	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
2400	12,53	36,65	149,0	10,63	31,10	132,5	8,73	25,53	116,0	6,83	19,97	99,5	4,93	14,41	83,0	3,03	8,85	66,7
2200	11,67	37,24	140,1	9,96	31,77	124,6	8,20	26,18	109,0	6,45	20,57	93,5	4,69	14,97	78,0	2,94	9,38	62,6
2000	10,72	37,62	131,2	9,25	32,45	116,6	7,64	26,81	102,1	6,03	21,18	87,5	4,43	15,54	73,0	2,82	9,91	58,5
1800	9,75	38,00	122,3	8,50	33,12	108,7	7,04	27,46	95,1	5,59	21,78	81,5	4,13	16,10	68,0	2,68	10,43	54,4
1600	8,75	38,39	113,3	7,71	33,81	100,7	6,41	28,10	88,1	5,10	22,38	75,5	3,80	16,67	62,9	2,50	10,96	50,3
1400	7,73	38,76	104,4	6,88	34,49	92,8	5,73	28,74	81,2	4,58	22,99	69,5	3,44	17,24	57,9	2,29	11,49	46,2
1200	6,69	39,14	95,5	6,01	35,16	84,9	5,02	29,39	74,2	4,03	23,59	63,6	3,04	17,80	52,9	2,05	12,01	42,1
1000	5,63	39,52	86,6	5,11	35,85	76,9	4,28	30,03	67,2	3,45	24,20	57,6	2,62	18,37	47,9	1,79	12,54	38,0
800	4,55	39,91	77,7	4,16	36,52	69,0	3,50	30,67	60,3	2,83	24,79	51,6	2,16	18,93	42,9	1,49	13,06	33,9
600	3,75	43,90	68,8	3,18	37,20	61,0	2,68	31,31	53,3	2,17	25,40	45,6	1,67	19,49	37,9	1,16	13,59	29,9
400	2,54	44,49	59,8	2,16	37,88	53,1	1,82	31,96	46,3	1,48	26,00	39,6	1,14	20,06	32,8	0,80	14,12	25,8

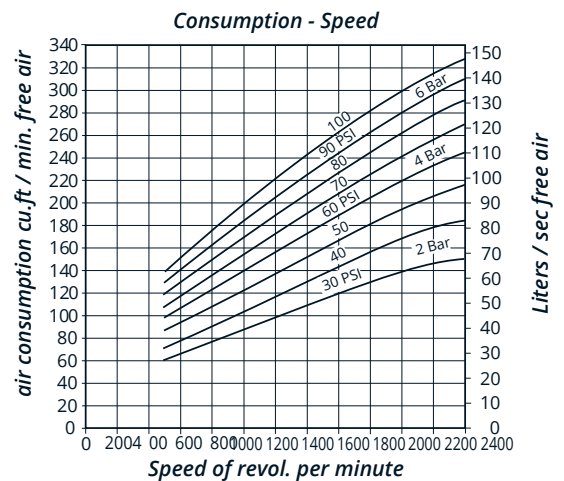
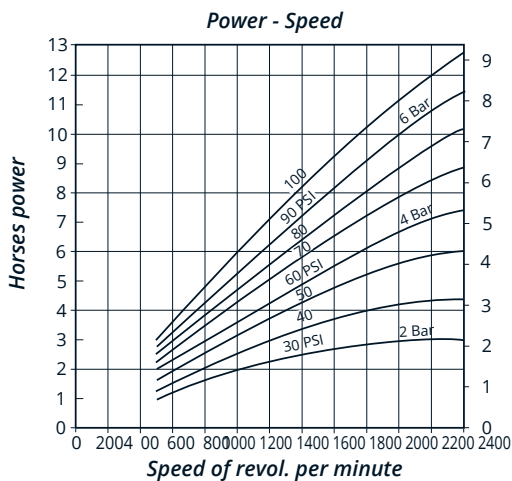
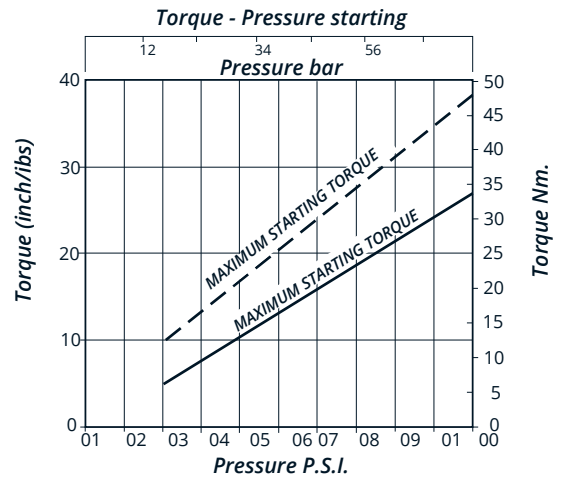
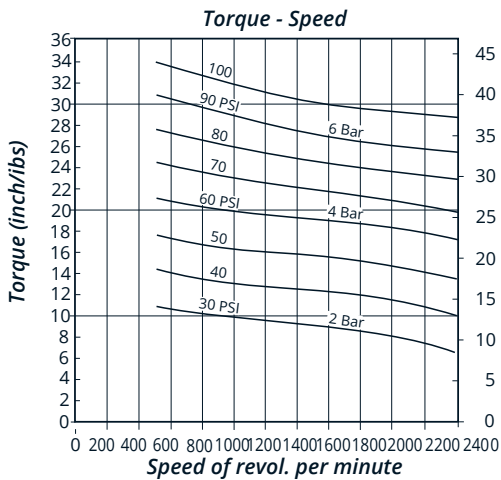
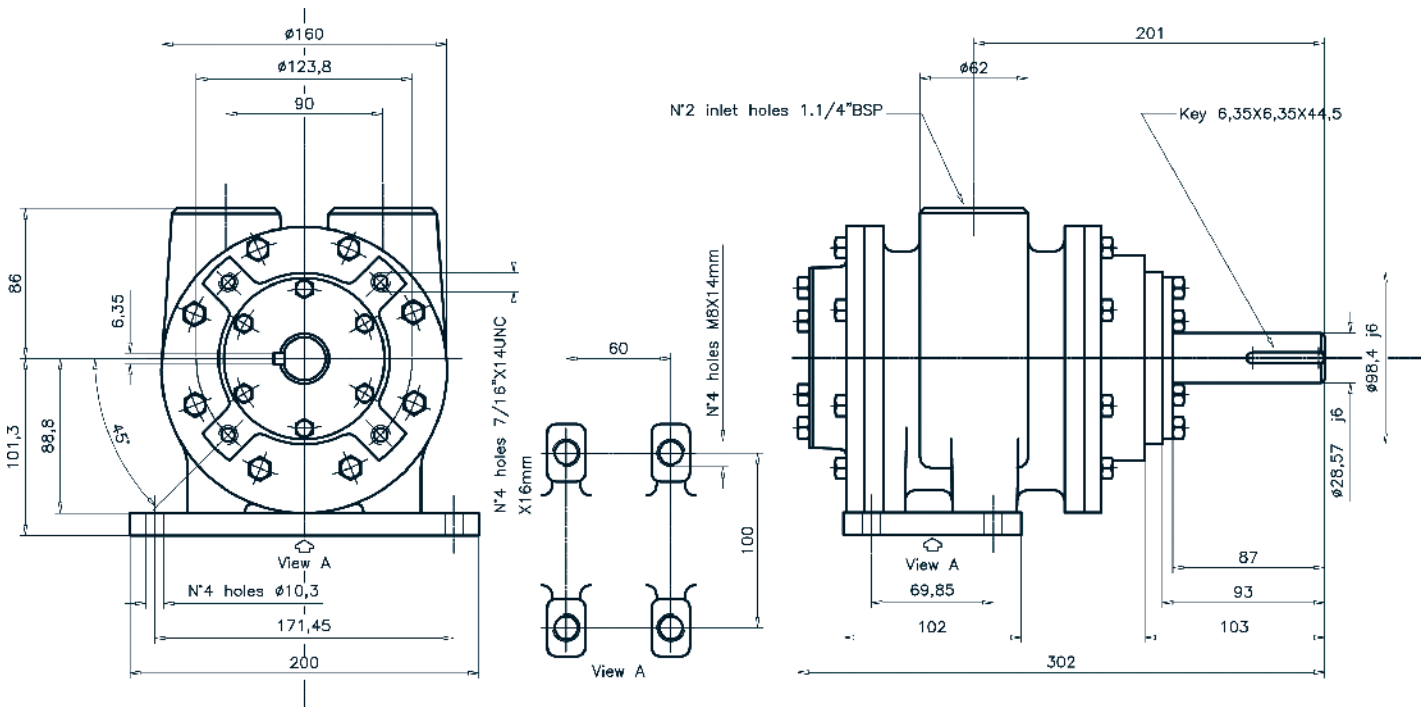
### AVAILABLE VERSIONS

**M1100F** as shown in the drawing without a foot  
**M1100P** as per drawing with foot  
**M1100C** flange NEMA 145TC  $\varnothing$  6.1 / 2" - shaft  $\varnothing$  7/8"  
**M1100B5D90BN** engine with pneumatic brake BN90  
**M1100B5D100BN** engine with pneumatic brake BN100  
**M1100B14D90** flange B14  $\varnothing$  140mm - shaft  $\varnothing$  24mm  
**M1100B14D100** flange B14  $\varnothing$  160mm - shaft  $\varnothing$  28mm  
**M1100B5D90** flange B5  $\varnothing$  200mm - shaft  $\varnothing$  24mm  
**M1100B5D100** flange B5  $\varnothing$  250mm - shaft  $\varnothing$  28mm



**Lubrication** 8-10 gocce/1' in continuous service  
 14-16 gocce/1'in intermittent service  
**Filtration:** Use 64 micron Filtration or better  
**Radial load:** 1750 N max  
**Axial load:** Not admitted  
**Operative temperature:** da -20°C a +80°C  
**Noise:** 86dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.



## SERIES M1400 - 1.4 KW / 19.1 HP



### PERFORMANCES AND DIMENSIONS

	7 bar			6 bar			5 bar			4 bar			3 bar			2 bar		
	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm	Min. starting torque Nm	Max. starting torque Nm	Torque Nm
	72	103	87,6	62	90	76	52	75	63,6	42	60	50,3	32	45	38,9	20	30	26,2
Speed-RPM	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec	Power HP	Torque at max Power Nm	Consum I/sec
1800	19	76	313	16	63,2	250	13	52,4	223	9,8	39	190	6,4	28	159	3,8	17,2	127,5
1500	16	76,8	264	13	64,1	235	11	54,2	202	8,4	42,4	176	6	30,7	145	3,7	19,9	123,5
1200	13	77,7	229	11	66,4	204	9	55,1	176	7	44,2	152	5,2	33,4	128	3,2	22,6	95,5
900	10	80,4	192	8,4	70,2	173	7	57,8	149	5,6	46	128	4	35,2	110	2,2	23,5	82
600	7	84	151	4,8	73,1	134	4,4	60,5	120	3,8	47,8	94	2,4	37	79	1,8	25,3	66,5
400	4	87,5	124	3,8	75,9	104	3	63,2	88	2	51,5	76	1,5	38,8	68	1	27,1	52,5

#### AVAILABLE VERSIONS

**M1400F** as shown in the drawing

**M1400C** NEMA flange

**M1400B5D160BN** engine with pneumatic brake BN160

**Lubrication** 12-14 gocce/1' in continuous service  
18-20 gocce/1'in intermittent service

**Filtration:** Use 64 micron filtration or better

**Radial load:** 1750 N max

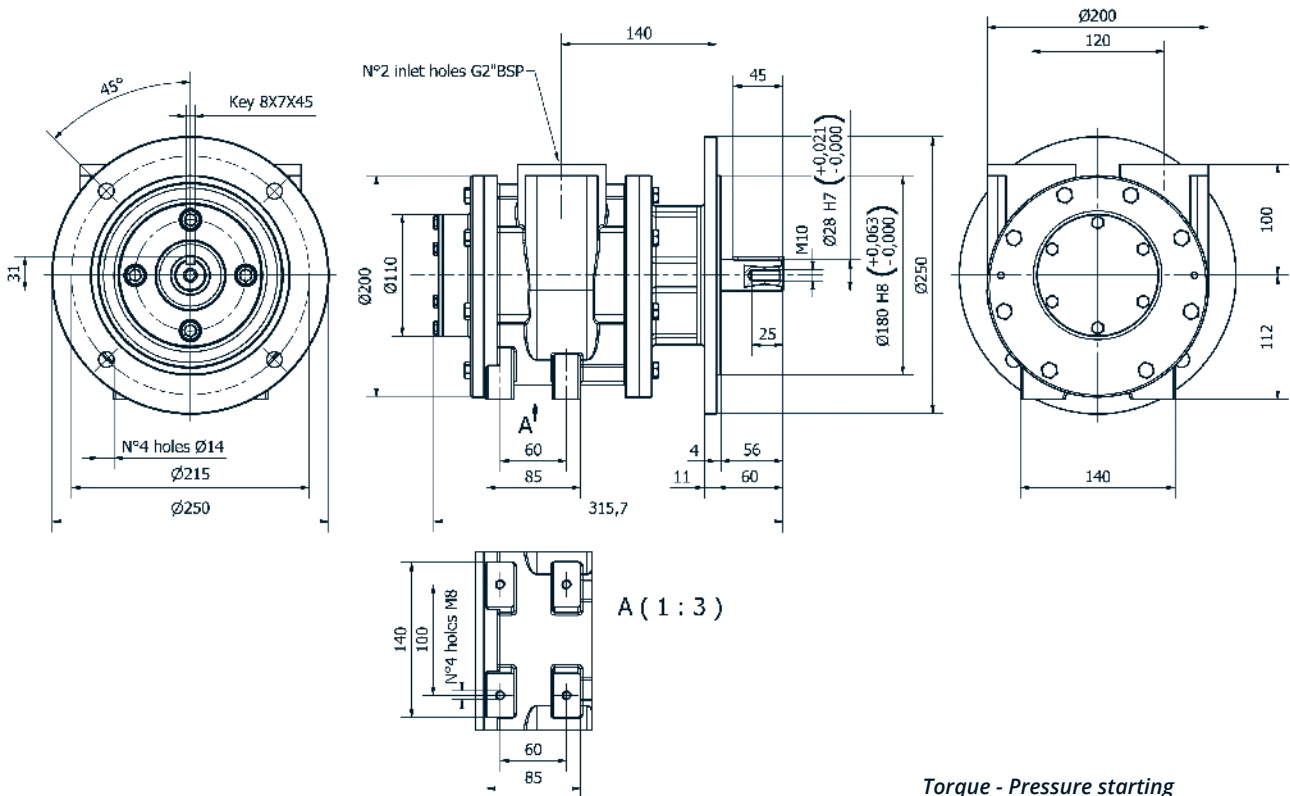
**Axial load:** Not admitted

**Operative temperature:** da -20°C a +80°C

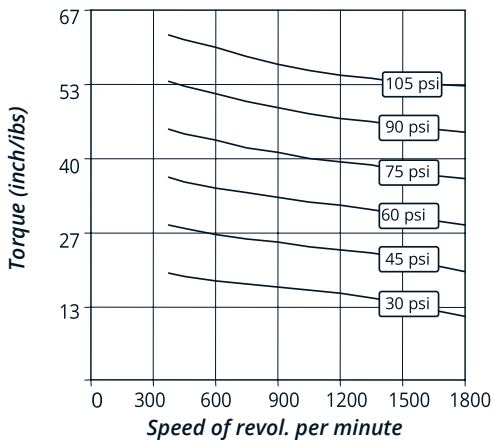
**Noise:** 86dB

Note: Sound pressure values are measured at maximum speed and power, with an operating pressure of 5.5 bar. TSA recommends to connect the exhaust pipes to a suitable oil separator filter with incorporated silencer, in order to allow for sufficient lubrication without the room becoming saturated with polluted air.

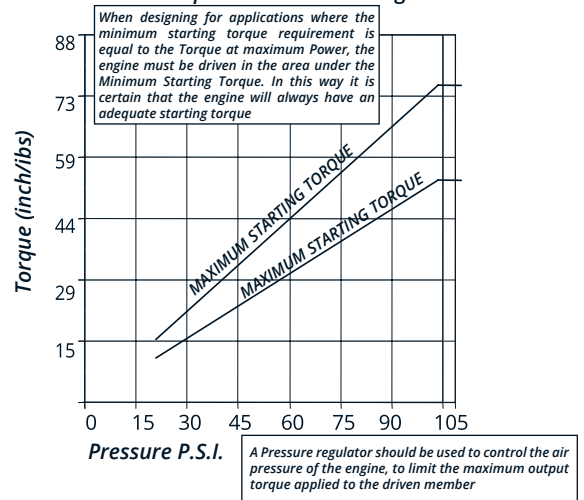




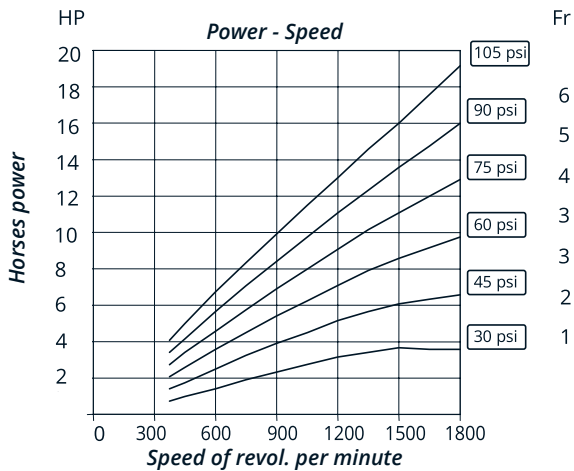
**Torque - Speed**



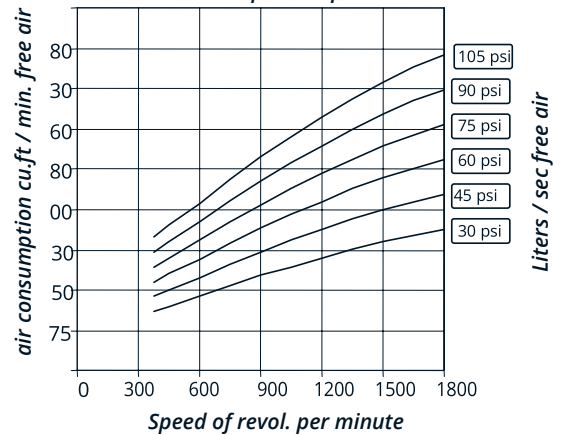
**Torque - Pressure starting**



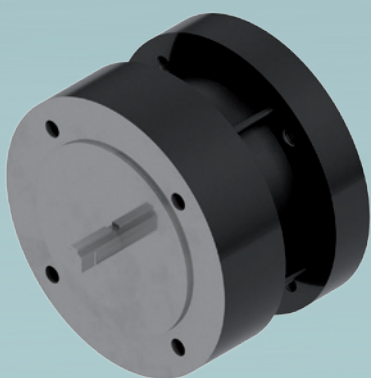
**Power - Speed**



**Consumption - Speed**



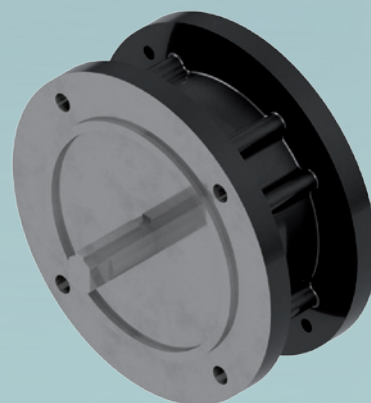
## PNEUMATIC BRAKES



**BN71**



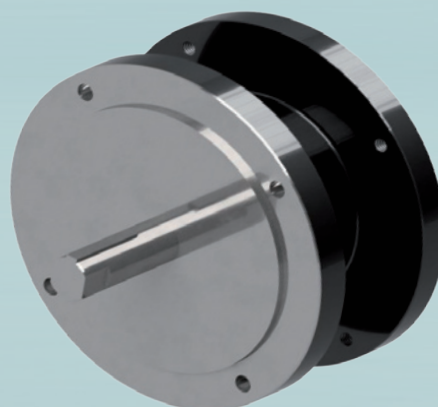
**BN90**



**BN100**



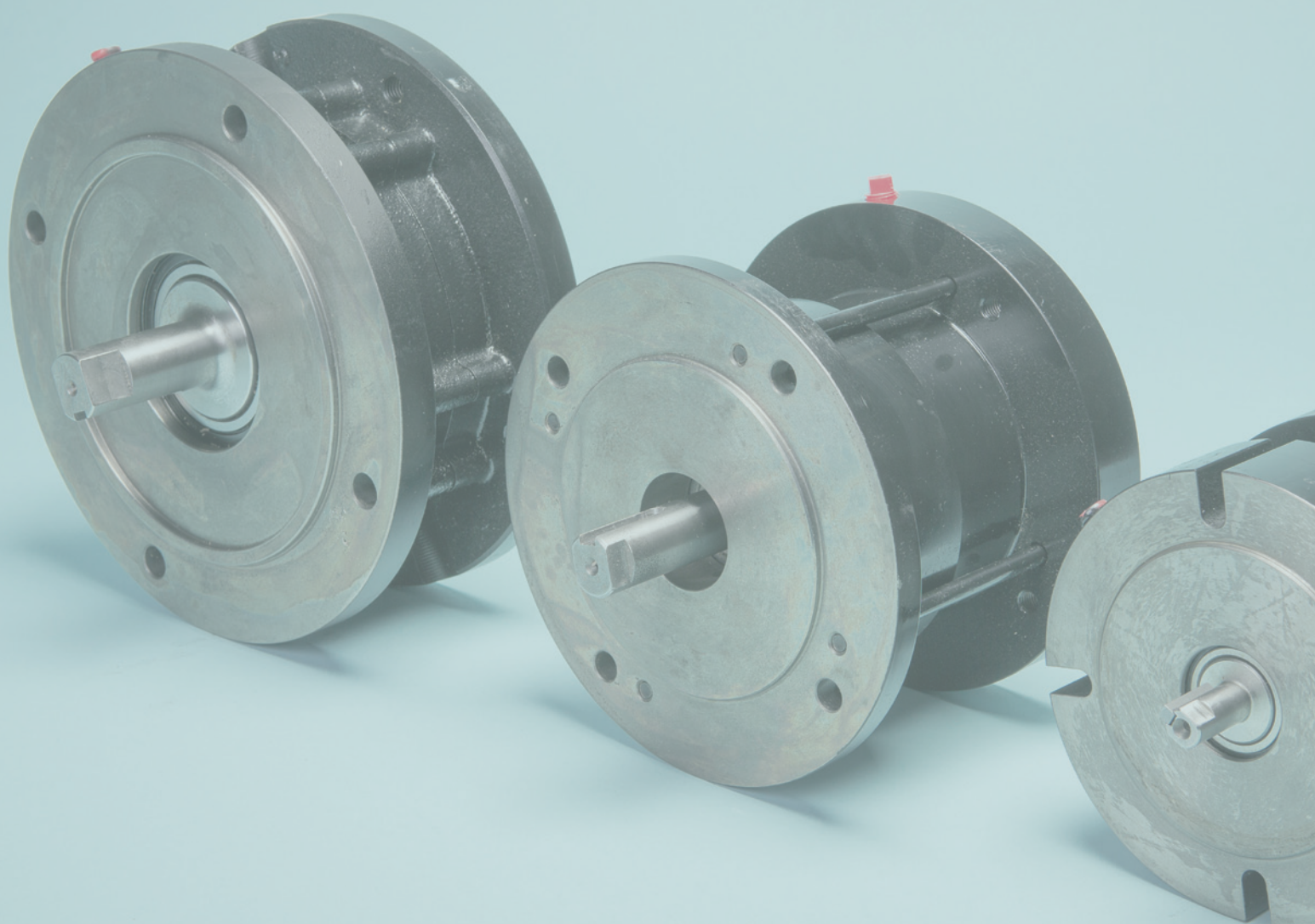
**BN132**



**BN160**





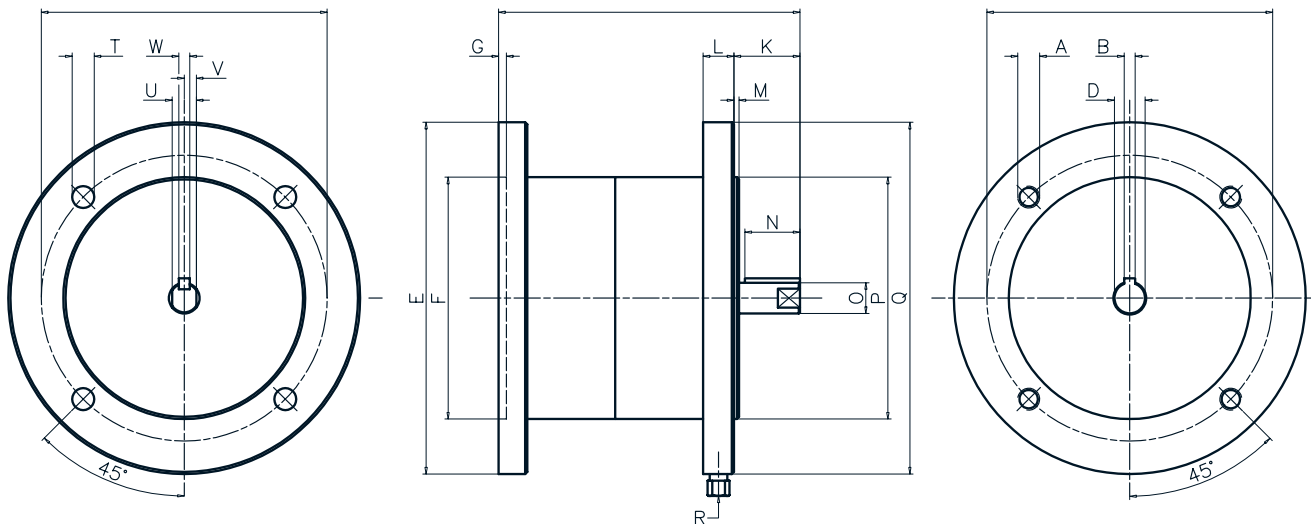


## PNEUMATIC BRAKES FOR AIR MOTORS WITH BLADES

The BN SERIESs has normally closed safety brakes (the spring brakes them and the air releases them) and can be used as static brakes and in certain applications even in dynamic conditions. The braking module is easy to mate with the motors thanks to the standard IEC or NEMA connection flanges. The pneumatic brakes are certified in accordance with the European directive on products intended for use in potentially explosive atmospheres ATEX II cat.2 G & D T3 (in static applications).

These brakes include the following advantages:

- Can be used in dynamic applications.
- Practicality in the field
- Practical connection flanges
- In accordance with IEC and NEMA standards.
- Compact dimensions.
- Steel cases with excellent thermal capacity to be used in high environments temperature range.
- Long life over time.



MOD.	AØ	B	CØ	DØ	EØ	FØ	G	H	I	L	M	N	OØ	PØ	QØ	R	SØ	TØ	U	V	W
<b>BN71</b>	M10	5	130	14H7	160	110H7	3.5	137	30	44,6	2,3	25	14H7	110H7	160	1/8NPT	130	10	11	5,5	5
<b>BN90</b>	M10	8	165	24H7	200	130H7	5	195	50	13	3,5	45	24H7	130H7	200	1/4NPT	165	12	18	9	8
<b>BN100</b>	M10	8	215	28H7	250	180H7	5	163	60	19	4	5	28H7	180H7	250	1/4NPT	215	14	20,6	10,3	8
<b>BN132</b>	M14	10	265	38H7	300	230	4.5	185	80	22.5	4	51	38h7	230H7	300	1/8NPT	265	15	30.8	15.4	10
<b>BN160</b>	-	-	-	-	385	-	-	260	110	20	5	78	42k6	250H7	350	1/8NPT	300	19	-	-	12

MODEL	FLANGE TYPE	SUPPORTABLE Torque	RELEASE PRESSURE
<b>BN71</b>	IEC 71 (B5)	14Nm	3,4 bar
<b>BN90</b>	IEC 90 (B5)	29Nm	3,4 bar
<b>BN100</b>	IEC 100 (B5)	75Nm	3,4 bar
<b>BN132</b>	IEC 132 (B5)	125Nm	3,4 bar
<b>BN160</b>	IEC 160 (B5)	600Nm	3,4 bar

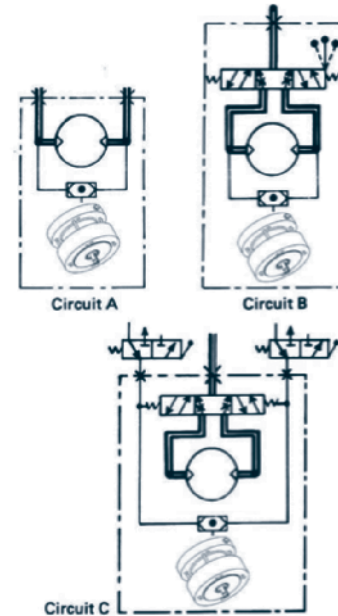


The brake is released by pneumatic pressure. If the pneumatic pressure drops below a predefined air pressure, the brake is enabled.

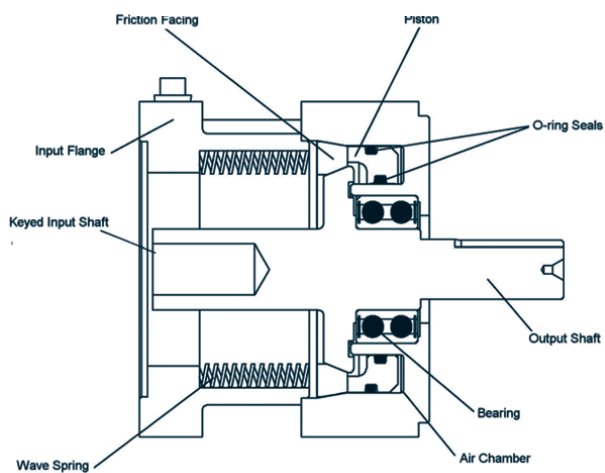
**CIRCUIT (A):** Installation without control valve.

**CIRCUIT (B):** Installation with manual control valve. The manual valve checks the rotation of the output shaft. This valve allows for brake operation in both rotation directions.

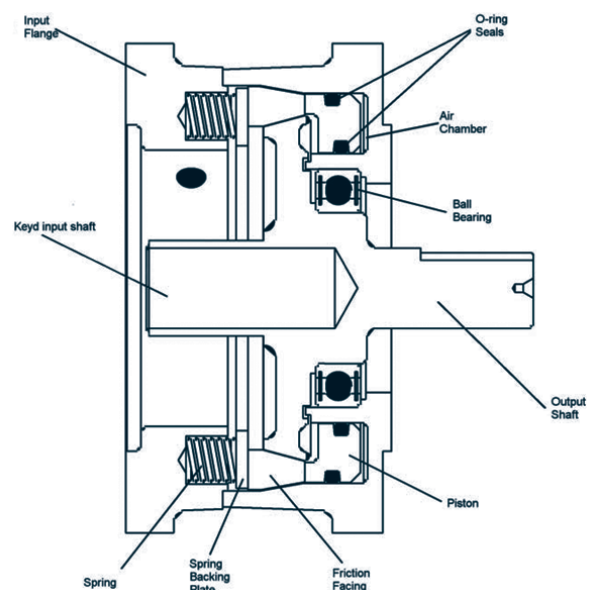
**CIRCUIT (C):** Installation with remote control valve. The remote valve allows for checking the output shaft rotation from a distance. This valve allows for brake operation in both rotation directions.



**SECTIONAL BRAKE DRAWING**



**Sectional brake drawing BN71**



**Sectional brake drawing  
BN90, BN100, BN132, BN160**

## PNEUMATIC ACCESSORIES

TSA offers a pneumatic component programme for air treatment and control of pneumatic motors on premium brands, including SMC, BOSCH, NORGREN, WILKERSON. This programme consists of air treatment units, valves and silencers. The available connections range from G1/4" to G2".

## AIR TREATMENT UNITS

All of the filters used have automated condensation discharge, the FRL units are installation-ready and fitted with a pressure gauge.

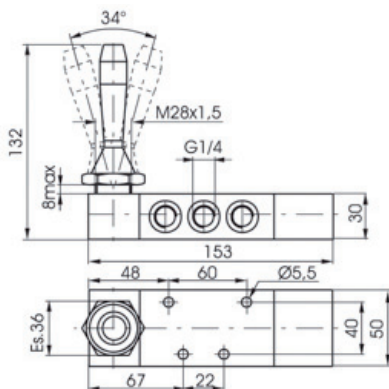
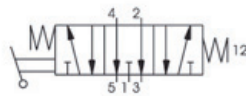
Models	TFRL3/8	TFRL1/2	TFRL3/4	TFRL1	TFRL2
Connection	3/8"	1/2"	3/4"	1"	2"
Max. operating pressure	10 Bar	10 Bar	10 Bar	10 Bar	20 Bar
Max. operating temperature	-5 a +60°C				
Standard filtration rate	8 Micron				
Flow rate in l/sec	56,6	63,2	67,5	149	660



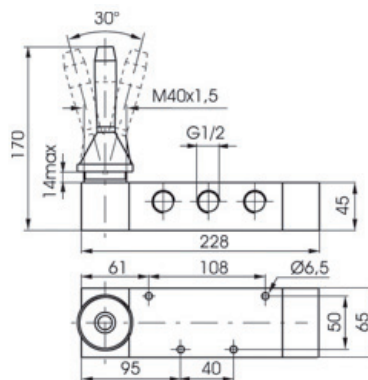
## MANUAL OR PNEUMATIC CONTROL VALVES

Easy and quick to install, the default valves fitted on TSA pneumatic motors are 5-way 3-position valves with centres open in idle position, with lever or pneumatic control.

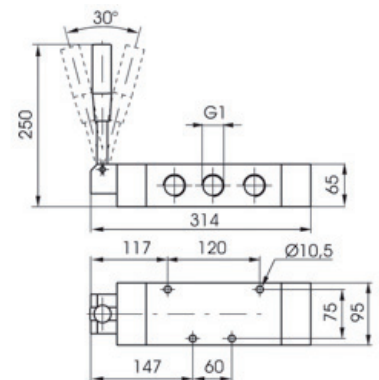
Models	VCM1/4	VCM1/2	VCM1	VCP1/4	VCP1/2	VCP1
Connection	G1/4"	G1/2"	G1"	G1/4"	G1/2"	G1"
Fluid	Filtered and lubricated air					
Max pressure operating	10 bar					
Temperature	-5°C +70°C					
Flow rate at 6 bar with $\Delta p = 1 \text{ NI} / \text{min}$	1280	3500	6500	1280	3000	6500
Ø Nominal passage	8mm	15mm	20mm	8mm	15mm	20mm
Body material	Aluminum					
Kg.	0,7	2	5	0,6	1,7	4,2
Minimum pilot pressure	-	-	-	3 bar	3 bar	3 bar
Pilot connection	-	-	-	G1/8"	G1/8"	G1/8"



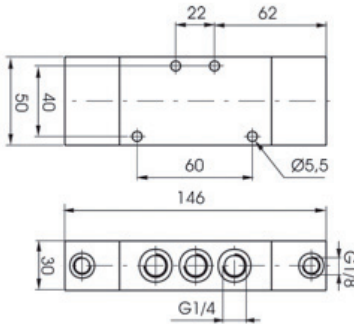
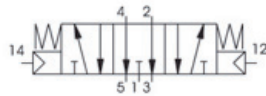
**VCM1/4**



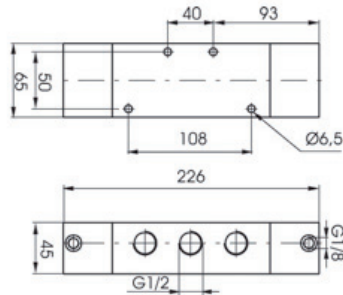
**VCM1/2**



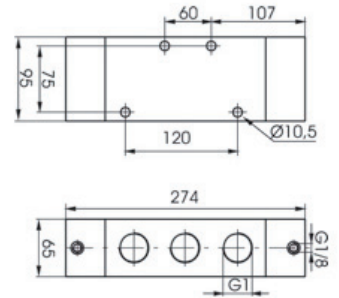
**VCM1**



**VCP1/4**



**VCP1/2**



**VCP1**

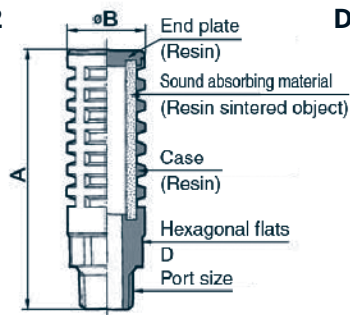
## SILENCERS

All motors are fitted with a threaded exhaust gate, which makes it possible to add a silencer in order to reduce the noise level. It is also possible to add another hose between exhaust and silencer which will further reduce the noise level.

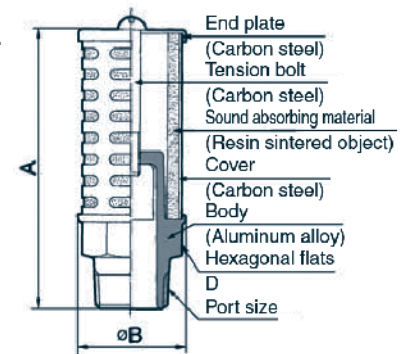


Models	S1/4	S3/8	S1/2	S3/4	S1	S1 1/4
Connection	¼ NPT	3/8 NPT	½ NPT	¾ NPT	1 NPT	1 ¼ NPT
Noise dB reduction	>30 dB(A)					
Fluid	compressed air					
Operating temperature	+5° C – 60° C					
Body	Plastic	Plastic	Plastic	Steel + Plastic	Steel + Plastic	Steel + Plastic

### Dimensions S1/4 – S1/2



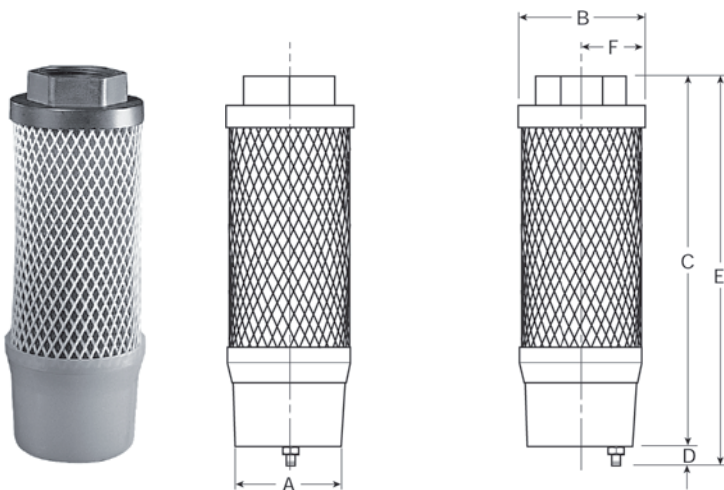
### Dimensions S3/4 – S1 1/4



Dimensions	S1/4	S3/8	S1/2	S3/4	S1	S1 1/4
A	63	84	92	107	127	186
B	22	25	30	46	50	74
D	19	22	27	36	41	50

## DISSOLATOR / SILENCER FILTER

Models	XMC-C4-000	XMC-C8-000	XMC-CB-000	S3/4	S1	S1 1/4
<b>Connection</b>	½ G	1 G	1 - 1/2 G	107	127	186
<b>Bath capacity</b>	2.2 fl. oz.	5 fl. oz.	5 fl. oz.	46	50	74
<b>Drain</b>	Manual	22	27	36	41	50
<b>oiling</b>	99.9%					
<b>Operating temperature</b>	2° C - 50° C					
<b>Sound reduction</b>	25 dB(A)					
<b>Kg.</b>	0.4					



### CONSTRUCTION MATERIALS

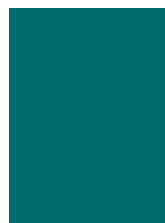
<b>Threaded cover</b>	Nylon
<b>Filter element</b>	
<b>Primary</b>	borosilicate cloth
<b>Secondary</b>	PVC fiber
<b>Oil cover of waste</b>	Plastic
<b>Sleeve support</b>	Plastic

Model	A	B	C	D	E	F
XMC-C4-000	51	60	100	10	150.9	30
XMC-C8-000	51	60	148	10	198.9	30
XMC-CB-000	76	87	208	11	284	-

## PNEUMATIC MOTORS



## GEAR-MOTORS



## TELESCOPIC BOOMS



## ARTICULATED BOOMS



## ACCESSORIES







AIR MOTORS WITH BLADES - 001 GB - 2018

Ø98,43

78

4,76

45°

M4 Fori Fill. 3/8"X16UNC

Profondi 16mm

Vista A



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