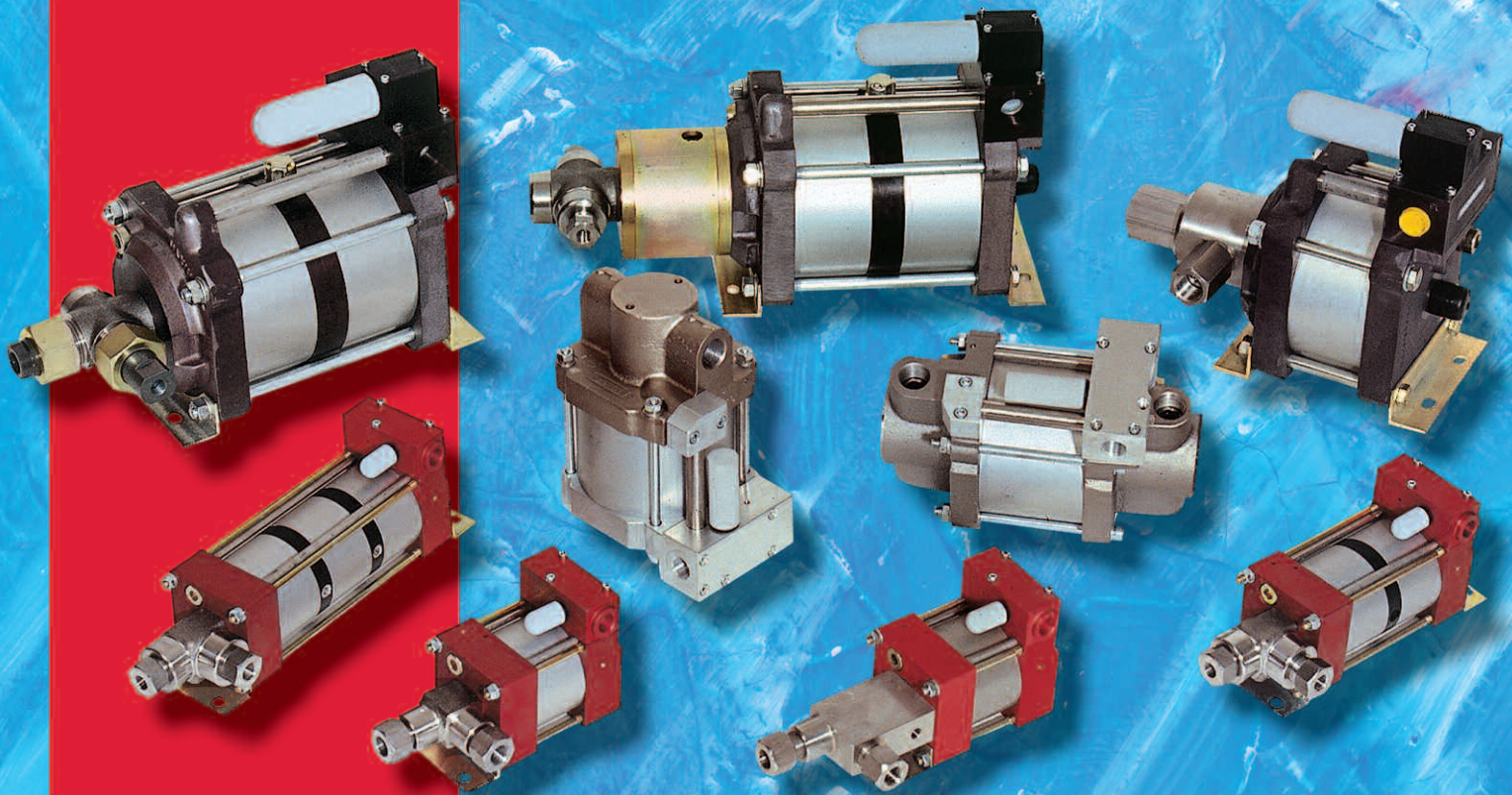


# MAXIMATOR®

HIGH PRESSURE  
TECHNOLOGY  
HYDRAULICS  
PNEUMATICS  
TESTING  
EQUIPMENT



MAXIMATOR GmbH

## Air Driven Liquid Pumps



## The MAXIMATOR Air Driven Liquid Pump Line for outlet pressures from 4 to 5,500 bar (58 to 79,750 psi)

MAXIMATOR concept	Page	2
Function scheme and advantages of the MAXIMATOR pumps	Page	3
Applications	Page	4
How to select MAXIMATOR pumps / MAXIMATOR pump questionnaire	Page	6
General suggestions how to operate MAXIMATOR pumps	Page	7
Oil service pumps to 1,000 bar (14,500 psi)		
MO series	Page	8
S series	Page	9
Water or oil service pumps to 5,500 bar (79,750 psi)		
M series	Page	10
G series	Page	12
Pumps for chemical service and special liquids up to 1,450 bar (21,040 psi)		
MSF series	Page	14
GSF series	Page	14
GX series	Page	15
Special pumps		
DPD series	Page	16
Single and two component injection pumps / pumps for mining applications	Page	16
MAXIMATOR power packs	Page	17
Available accessories for MAXIMATOR pumps	Page	18
Flow charts for MAXIMATOR pumps	Page	20
Fluid compatibility guide / Recommended pump and seal versions	Page	24
Outer dimensions and standard connections for MAXIMATOR pumps	Page	26
Wetted materials of construction for MAXIMATOR pumps	Page	27

### Advantages of the MAXIMATOR pumps

- High quality product
- Outstanding life time
- Few moving parts
- Portable design
- Easy to install and operate
- Explosion proof ... no electrical power required
- Economical source for hydraulic power
- Pressure held without energy consumption and without media heating
- Standard ratios available for pressures to 5,500 bar (79,805 psi)
- Requires no lubrication

...we offer:

- Technical advise
- Full after sales service
- Special construction and designs available

**MAXIMATOR**  
*Pump it.*



## Liquid pumps – The MAXIMATOR concept

MAXIMATOR high efficiency pumps are ideal for a broad variety of oil, water and chemical applications. MAXIMATOR pumps are air driven at a drive air pressure of 1 to 10 bar (14,5 to 145 psi). Basically the principle of operation is similar to a reciprocating amplifier where control of the piston at the end position is regulated by a pilot operated 4/2 way valve.

MAXIMATOR pumps feature a large air piston joint to a smaller diameter plunger. The pressure ratio is the difference of these two areas and is the method of determining maximum outlet pressure. Higher pressures are obtained by using higher pressure ratios. MAXIMATOR model numbers reflect the pumps' nominal pressure ratios, while the technical data indicates exact ratios. The outlet pressure is easily to set through a simple air regulator. By multiplying the pressure ratio by the available shop air pressure, the nominal liquid pressure can be calculated.

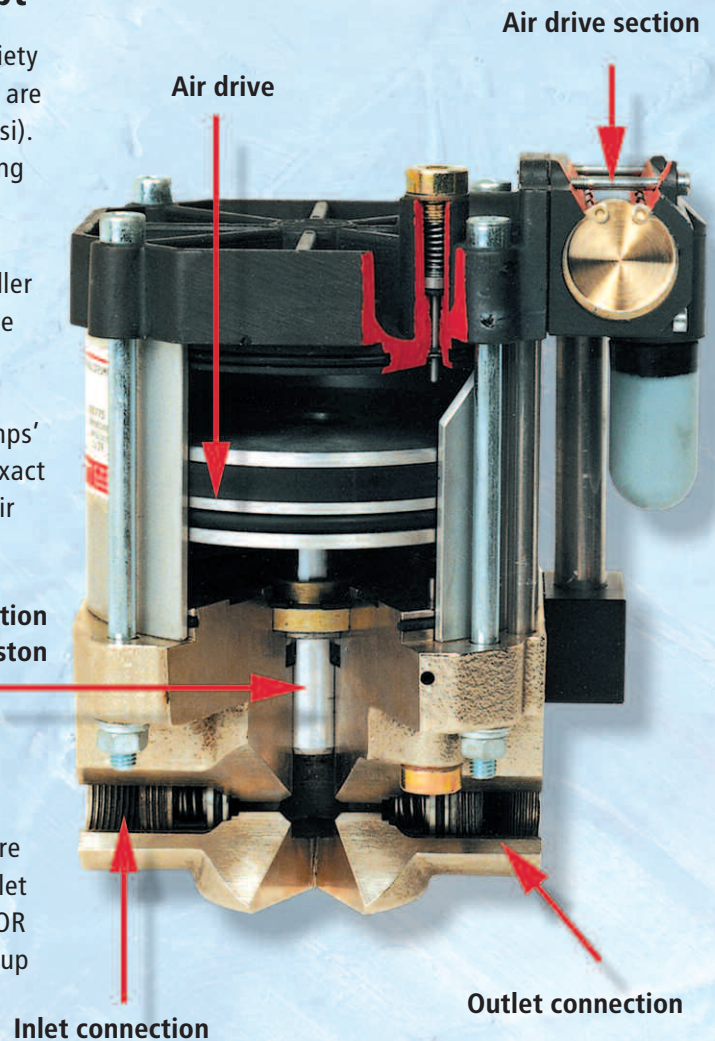
MAXIMATOR pumps are self priming.

In general it is not necessary to use an air line lubricator. The liquid to be pumped, flows into the suction chamber by the up-stroke of the drive piston. By this suction effect, the inlet check valve is opened and the outlet check valve is closed. The down-stroke generates the pressure at the liquid side. The inlet check valve is closed and the outlet check valve is opened by the generated pressure. MAXIMATOR liquid pumps cycle automatically. When the pressure is built up the numbers of cycles slow down. The pump stops automatically when the output pressure forces are equal. The pump restarts with a slight drop in the outlet pressure or an increase in the air drive pressure.

Pump performance can be effected by a number of conditions, such as freezing of muffler or pilot valves (which is caused by moisture in air lines), inadequate inlet air line sizes and dirty filters. Don't reduce the indicated port sizes and consult MAXIMATOR for exact flow conditions not shown in charts.

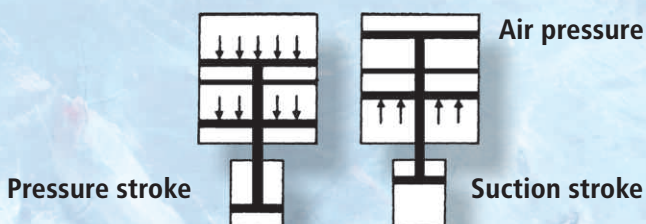
MAXIMATOR offers complete technical and service support for all MAXIMATOR pumps.

**Hydraulic section  
High pressure piston**



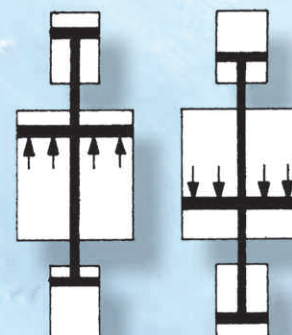
## Function scheme of the Air Driven Liquid Pumps

Working principle of a single acting pump, multiple stage.



Single acting pumps with two or three air heads can achieve the same maximum outlet pressure with 1/2 or 1/3 air drive pressure compared with a single acting pump with one air head.

Working principle of a double acting pump with one air head



Double acting pumps improve the flow capacity by approx. 50% in comparison with single acting pumps.

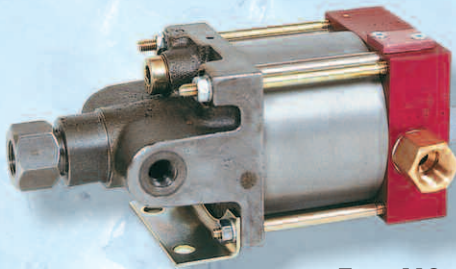


## Applications for Air Driven Liquid Pumps

### Series MO and S up to 1,000 bar (14,500 psi)

The rugged construction, light weight and wide range of pressure ratios make these series of pumps ideal for powering a variety of oil/hydraulic operations.

They are available as single or double acting models.

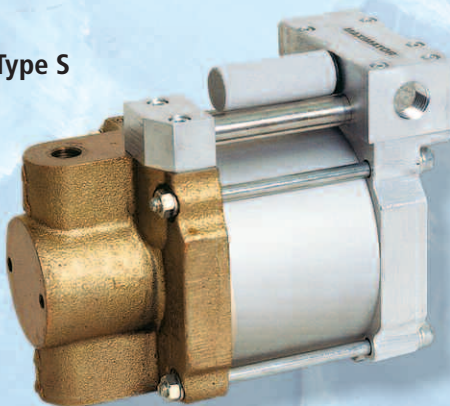


Type MO

### Oil Service Pumps

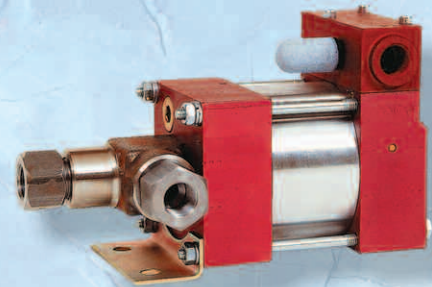
- **Lifting and Jacking** – lifting tables, scissor jack lifts, beam jacking and aircraft jacking
- **Hydraulic Operation** – clamping devices, punches and pin presses, chucks, valve actuation
- **Presses** – cold isostatic presses, filter presses, hydraulic presses, hydraulic press actuation and system overload
- **Tooling and Tightening** – actuating cropping, crimping, cable shears and pipe bending tools, roller tensioning and torque wrenches
- **Testing** – tensile test machines and pressure testing
- **Miscellaneous** – lubrication systems

Type S



### Series M and G up to 5,500 bar (79,750 psi)

The M and G series pumps are available in single or double acting models with single, double (M and G series or triple (only M series) air drive heads and wetted materials of stainless steel, making them an excellent choice for water application.

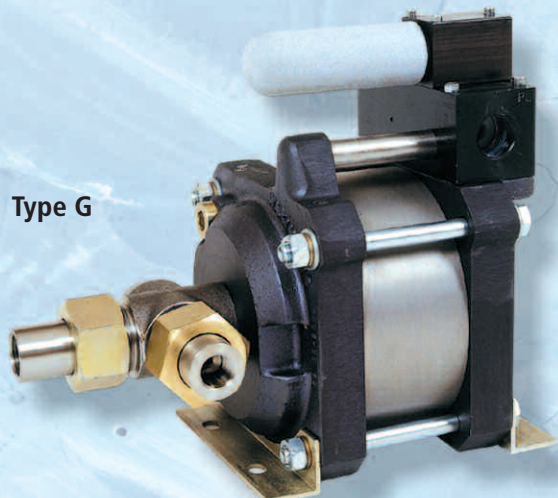


Type M

### Water or Oil Service Pumps

- **Hydrostatic Testing** – valves, tanks, pressure vessels, pressure switches, hoses, pipes and tubing, pressure gauges, cylinders, transducers, well casings, BOPs, gas bottles and air craft components
- **Burst and Cycle fatigue testing** of above components
- **Calibration** of pressure gauges and transducers
- **Water Blasting**
- **Leak Testing**
- **Emergency** shutdown systems for oil and gas wells
- **Pressurization** of pressure vessels for testing various components
- **Operation and Control** of well service and well head equipment

Type G



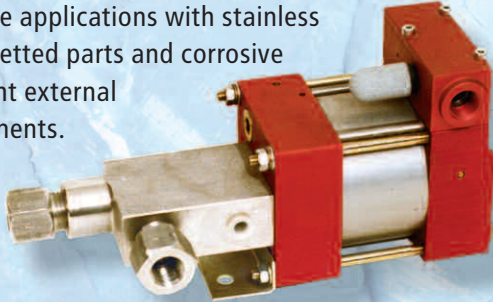


## Applications for Air Driven Liquid Pumps

### Series MSF, GSF and GX up to 1,450 bar (21,025 psi)

These two series of pumps are similar to the M and G series described before. MSF and GSF pumps feature a distance piece and PTFE seals to address the specific requirements of chemical service.

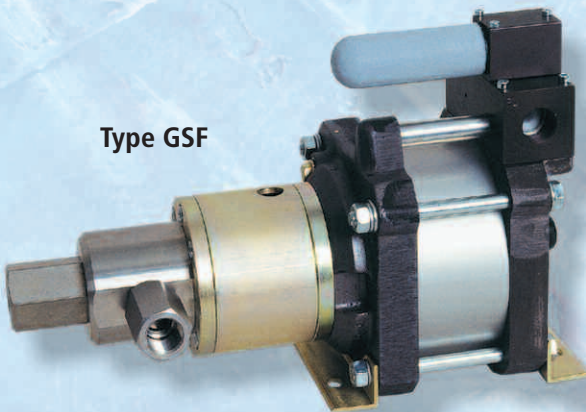
GX series are high flow pumps designed for rugged installations and built with environmental resistant external components. They are ideal for offshore applications with stainless steel wetted parts and corrosive resistant external components.



Type MSF

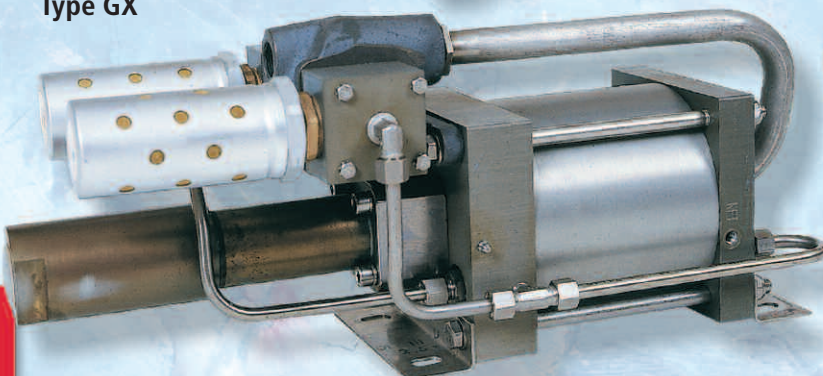
### Pumps for Chemical and Offshore service

- Inhibitor Injection of methanol and glycol in wells
- Coolant Injection
- Aviation and Automotive Testing – brake fluid, skydrol, transmission fluid and power steering fluid
- Chemical Fluid Transfer and Pressurization



Type GSF

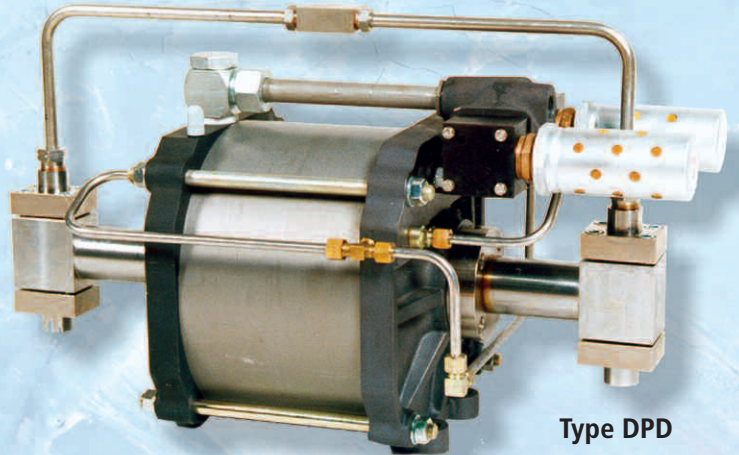
Type GX



### MAXIMATOR pumps for special applications

**DPD series** are large double acting pumps that deliver a high flow rate at high pressure up to 2,100 bar (30,450 psi).

- Test pressure generation for Mandrel Extraction Machines
- Waterjet cutting in intermittent service

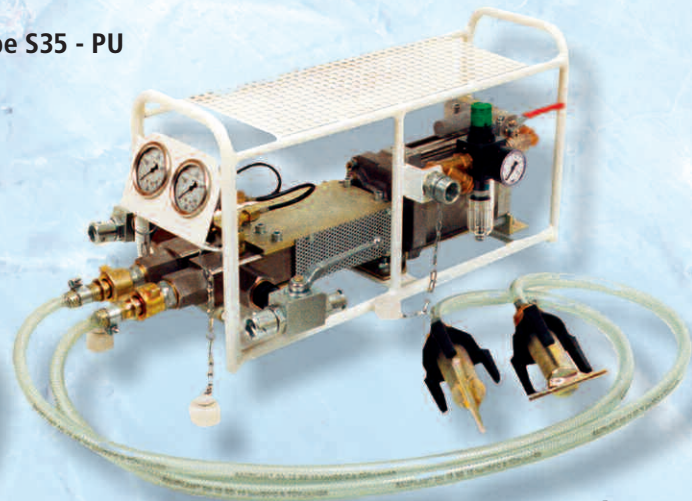


Type DPD

### Single and Two Component Injection Pumps Grouting Pumps Infusion Pumps

- Underground Mining Industry
- Rock and Coal Consolidation
- Tunnel and Bridge Construction
- Concrete Restoration

Type S35 - PU



**MAXIMATOR**  
*Pump it.*



## How to select Air Driven Liquid Pumps

MAXIMATOR pumps are suitable for liquid applications. To select and order a hydraulic pump that is suitable the best for your applications, the following parameters have to be observed:

### 1. Liquid to be handled

The type of liquid is essential to select a MAXIMATOR pump hence the wetted material of construction and compound of the seals are determined by the specific fluid. MAXIMATOR pumps are available for several services. The two most important we are offering standard pumps are for oil or water use, see also ordering codes.

### 2. Available Air Drive pressure

MAXIMATOR pumps are designed for an air drive pressure of  $p_L = 1$  to 10 bar (14,5 to 145 psi) maximum.

### 3. Required hydraulic outlet pressure and flow capacity

The outlet pressures given in the technical pump tables are based upon a maximum air drive pressure of  $p_L = 10$  bar. The real outlet pressure in your specific case is determined by air drive pressure multiplied by pressure ratio,  $p_L * i$ . The indicated flow capacities  $Q_{max}$  is the maximum value which can be reached at an outlet pressure of 0 bar and an air drive of  $p_L = 6$  bar. The real flow capacities at a specified outlet pressure are listed in the flow charts, page 20 to 23.

### 4. Size and weight

For some applications the size and weight are also important to select a pump.

**The following questionnaire shall help you to select the right pump for your application. On request we would also submit a quotation. Please return the filled questionnaire to us (fax no. ++49 5586 803 40).**

Customer reference:

---

---

Fax no.:

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## MAXIMATOR Air Driven Liquid Pump Questionnaire

Medium:

Type:

---

Chart No.:

---

Viscosity:

mm<sup>2</sup>/s

---

Available Shop Air Pressure (1 to 10 bar [14,5 to 145 psi]):

bar

---

Outlet Pressure:

bar

---

Maximum Outlet Pressure:

bar

---

Flow Rate, required at Outlet Pressure

l/min

---

Working Temperature (max. 80°C permitted):

°C

---

Suction Altitude:

mm

---

Application:



## Further general suggestions to operate the Air Driven Liquid Pumps properly

### Assembly positions

MAXIMATOR pumps can, in principle, be installed in any position, but a maximum service life of the seals is achieved in a vertical one.

### Port sizes Important!

Please observe that **only screws and tubing** are fitted that are **suitable for the pressure range of the pump**.

To ensure an optimum operation (pressure and flow) of the pumps, the port sizes of the pumps shall not be reduced.

### Drive air connection and initial operation

The air drive connection is located at the spool valve housing.

**A second air drive connection as unregulated pilot port on S...D and G(SF) series** that has to be connected too, not only provides better pressure control but is also the ideal place to install control instrumentation because of its small size.

In any event a compressed air filter and water separator has to be fitted to the pump. Filters with water separator, pressure regulator, control pressure gauge and shut-off valve are optionally available under "Air control unit C....", depending on the pump line.

No air lubricator is required since the pump received Barium grease treatment. Has a lubricator been used once, it is strongly recommended to continue. If there is only very dry air available, an air lubricator is needed.

### Operating temperatures for MAXIMATOR pumps

are in general between  $-20^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$  (standard). The pumps with  $-VE$  seal version can be operated up to max.  $+60^{\circ}\text{C}$ , at short term up to  $+80^{\circ}$  would be acceptable.

For outdoor service at temperatures of  $0^{\circ}\text{C}$  and below, special versions are available on request.

### Recommended hydraulic oils

Proper operation and efficiency of the pumps is mainly depending on the quality of the used hydraulic liquid.

We recommend hydraulic oils with a viscosity between 46 – 68 cst, i. e.

Manufacturer Hydraulic oil to DIN 51524 T2; DIN 51519; ISO VG 46

ARAL VITAM GF 46

BP ENERGOL HLP 46

ESSO NUTO H 46

SHELL TELLUS Oil 46

HYDROL DO 46

HYDROL HV 46

DEA ASTRON HLP 46

### Recommended quality of drive air

The drive air should have a quality class of 3 to 4 (solids/water/oil) according to the recommendation no. 611/1984 by PNEUROP (European Committee of Manufacturers of boosters, vacuum pumps and air driven tools).

Solids: maximum particle size  $5\mu$   
maximum particle concentration  $5\text{ mg/m}^3$

Dew point:  $+10^{\circ} =$  water content of  $9.4\text{ g/m}^3$  to  $+2^{\circ}\text{C} =$  water content of  $5.6\text{ g/m}^3$

Oil content:  $1.0$  to  $5\text{ mg/m}^3$

Please note that by using humid air of high humidity in continuous operation the problem of icing could occur. We suggest to install a water separator and a dryer in the drive air line.

If the drive air is too dry and has got a dew point lower than  $-40^{\circ}\text{C}$ , we suggest to use an oiler.

**By observing this drive air quality, an optimum life time of the seals and packings will be achieved.**



## Oil Service – MO series: Pressures to 1,000 bar (14,500 psi)

MAXIMATOR pumps MO series are available as single or double acting with single air drive head.

### MO pumps

single acting, single air drive head



#### Pressures to 1,000 bar (14,500 psi)

MO pumps are single acting types with single air drive head. They are light-weight, rugged and are available in several pressure ratios.

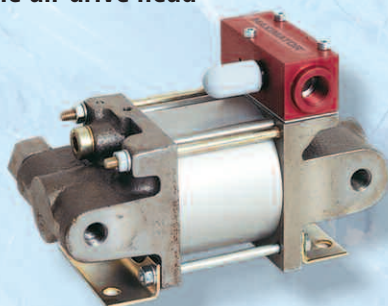
- Cast iron bodies, tool steel plungers and polyurethane seals.
- Pumps come standard with **bottom inlet**
- Ideal for portable power packs
- For air drive pressure from 1 bar (14.5 psi) to 10 bar (145 psi) maximum.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight
		cm <sup>3</sup>	cu.inch	bar	psi	l/min	Inlet A	Outlet B	kg
MO4	1:4	30.5	1.86	40	580	14.81	3/4 BSP	1/2 BSP	2.5
MO8	1:9	14.7	0.90	90	1305	7.07	3/4 BSP	1/2 BSP	2.5
MO12	1:14	9.4	0.57	140	2030	4.55	3/4 BSP	1/2 BSP	2.5
MO22	1:29	4.6	0.28	290	4205	2.22	3/8 BSP	1/4 BSP	3.0
MO37	1:47	2.8	0.17	470	6815	1.36	3/8 BSP	1/4 BSP	3.0
MO72	1:88	1.5	0.09	880	12760	0.72	3/8 BSP	1/4 BSP	3.0
MO111	1:133	1.0	0.06	1000	14500	0.48	3/8 BSP	1/4 BSP	3.0
MO189	1:225	0.6	0.04	1000	14500	0.28	3/8 BSP	1/4 BSP	3.0

### MO...D pumps

double acting, single air drive head



#### Pressures to 1,000 bar (14,500 psi)

MO...D pumps are double acting, single air drive head type. They are characterized by the same features as the MO series, but

- Pumps come standard with **side inlet**
- They have less pulsations and deliver approx. 50% more flow than the single acting MO pumps.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight
		cm <sup>3</sup>	cu.inch	bar	psi	l/min	Inlet A	Outlet B	kg
MO22D	1:28	9.2	0.56	280	4060	3.91	3/8 BSP	1/4 BSP	4.5
MO37D	1:46	5.6	0.34	460	6670	2.35	3/8 BSP	1/4 BSP	4.5
MO72D	1:86	3.0	0.18	860	12470	1.24	3/8 BSP	1/4 BSP	4.5
MO111D	1:130	2.0	0.12	1000	14500	0.82	3/8 BSP	1/4 BSP	4.5
MO189D	1:220	1.2	0.07	1000	14500	0.49	3/8 BSP	1/4 BSP	4.5

See also flow charts at page 20

\* Displacement volume per double stroke (calculated) • \*\* Ratio – driving surface / driven surface (calculated)

\*\*\* Static outlet pressure (calculated and maximum allowed) at an air drive pressure of 10 bar / 145 psi

\*\*\*\* Approximate flow at an air drive of 6 bar / 87 psi and an outlet pressure of 0 bar/psi.

The minimum air drive pressure to start the pump is 1 bar / 14.5 psi. • Depending on the pressure ratio a special outlet pressure can be reached.

#### Options for MO series:

- Side inlet (for single acting, single air drive head models):
- External Pilot Port Modification (for single acting MO22 – MO189): (Pump can be started and stopped by a small magnetic valve)
- Special inlet and outlet ports (i. e. NPT):
- Special seal material to handle special fluids:
- Air control unit for MO series with filter pressure regulator, control pressure gauge and shut-off valve:

#### Order code:

MO37 – **S**

MO37 – **DIR**

MO37(D) – **NPT**

See fluid compatibility guide, page 24

MO37(D) **with C1** \_\_\_\_\_ Other options available on request.

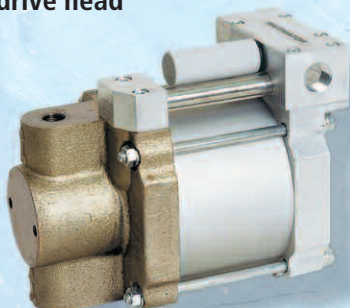


## Oil Service – S series: Pressures to 1,000 bar (14,500 psi)

MAXIMATOR pumps S series are available as single or double acting with single air drive head.

### S pumps

single acting, single air drive head



#### Pressures to 1,000 bar (14,500 psi)

S pumps are single acting types with single air drive head. They are compact and lightweight for simple installation in both static and portable applications. They will operate at an air pressure as low as 1 bar (14.5 psi) due to minimal internal friction.

S pumps are ideal for applications demanding fast response time

- Cast iron bodies, tool steel plungers and polyurethane seals.
- Pumps come standard with side inlet only
- Ideal for portable power packs
- For air drive pressure from 1 bar (14.5 psi) to 10 bar (145 psi) maximum.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Discharge ***		Flow ****	Connections		Weight kg
		cm <sup>3</sup>	cu.inch	bar	psi	l/min	Inlet A	Outlet B	
S15	1:17	28.3	1.73	170	2465	9.38	3/4 BSP	3/4 BSP	9.1
S25	1:25	19.6	1.20	250	3625	6.72	3/4 BSP	3/4 BSP	9.1
S35	1:39	12.6	0.77	390	5655	4.31	3/4 BSP	3/4 BSP	9.1
S60	1:61	8.0	0.49	610	8845	2.75	1/2 BSP	3/8 BSP	9.1
S100	1:108	4.5	0.27	1000	14500	1.55	1/2 BSP	3/8 BSP	9.1
S150	1:156	3.1	0.19	1000	14500	1.08	1/2 BSP	3/8 BSP	9.1

### S...D pumps

double acting, single air drive head



#### Pressures to 1,000 bar (14,500 psi)

S...D pumps are double acting, single air drive head type. They are characterized by the same features as the S series, but

- Pumps come standard with side inlet, bottom inlet not available
- They have less pulsations and deliver approx. 50% more flow than the single acting S pumps.
- Maximum air drive pressure 10 bar (145 psi)
- The unregulated pilot port on all S...D pumps not only provides better pressure control but is also the ideal place to install control instrumentation because of its small size, BSP 1/8".

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Discharge ***		Flow ****	Connections		Weight kg
		cm <sup>3</sup>	cu.inch	bar	psi	l/min	Inlet A	Outlet B	
S15D	1:16	56.6	3.45	160	2320	17.56	3/4 BSP	3/4 BSP	14.5
S25D	1:24	39.2	2.39	240	3480	12.00	3/4 BSP	3/4 BSP	14.5
S35D	1:38	25.2	1.54	380	5510	7.58	3/4 BSP	3/4 BSP	14.5
S60D	1:60	16.0	0.98	600	8700	4.80	1/2 BSP	3/8 BSP	14.5
S100D	1:107	9.0	0.55	1000	14500	2.68	1/2 BSP	3/8 BSP	14.5
S150D	1:155	6.2	0.38	1000	14500	1.85	1/2 BSP	3/8 BSP	14.5

See also flow charts at page 21

\* Displacement volume per double stroke (calculated) • \*\* Ratio – driving surface / driven surface (calculated)

\*\*\* Static outlet pressure (calculated and maximum allowed) at an air drive pressure of 10 bar / 145 psi

\*\*\*\* Approximate flow at an air drive of 6 bar / 87 psi and an outlet pressure of 0 bar/psi.

The minimum air drive pressure to start the pump is 1 bar / 14.5 psi. • Depending on the pressure ratio a special outlet pressure can be reached.

#### Options for S series:

- Special inlet and outlet ports (i. e. NPT):
- Special seal material to handle special fluids:
- Air control unit for S series with filter pressure regulator, control pressure gauge and shut-off valve:

#### Order code:

S35(D) – NPT

See fluid compatibility guide, page 24

S35(D) with C1.5 Other options available on request.

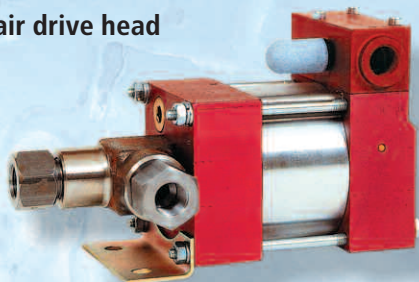


## Water or Oil Service – M series: Pressures to 4,000 bar (58,000 psi)

MAXIMATOR pumps M series are available as single or double acting with either a single, double or triple air drive head. For air drive pressures from 1 bar (14.5 psi) minimum to 10 bar (145 psi) maximum.

### M pumps

single acting, single air drive head



#### Pressures to 2,200 bar (31,900 psi)

M pumps are single acting types with single air drive head. They are compact lightweight and feature rugged construction.

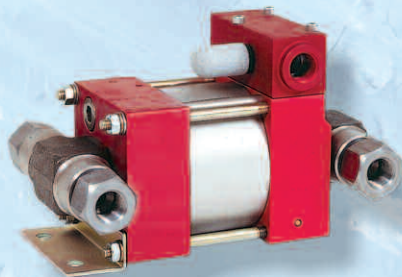
- M4 to M12 pumps have aluminium bodies and stainless steel plungers. M22 to M189 have stainless steel bodies and plungers. All M pumps have polyurethane seals with Buna "N" O-rings, UHMWPE package and Viton O-rings for water service is available as option.
- All M pumps are standard with **bottom inlet**, side inlet is available as option.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet***		Flow ****	Connections		Weight kg
		cm3	cu.inch	bar	psi	l/min	Inlet A	Outlet B	
M4	1:4	30.5	1.86	40	580	14.81	1 BSP	1/2 BSP	3.0
M8	1:9	14.7	0.90	90	1305	7.07	3/4 BSP	1/2 BSP	3.0
M12	1:14	9.4	0.57	140	2030	4.55	3/4 BSP	1/2 BSP	3.0
M22	1:28	4.6	0.28	280	4060	2.22	3/8 BSP	3/8 BSP	2.8
M37	1:46	2.8	0.17	460	6670	1.36	3/8 BSP	3/8 BSP	2.8
M72	1:86	1.5	0.09	860	12470	0.72	3/8 BSP	3/8 BSP	2.8
M111	1:130	1.0	0.06	1300	18850	0.48	3/8 BSP	3/8 BSP	2.8
M189	1:220	0.6	0.04	2200	31900	0.28	3/8 BSP	3/8 BSP	2.8

### M...D pumps

double acting,  
single air drive head



#### Pressures to 2,200 bar (31,900 psi)

M...D pumps are double acting, single air drive head type. They are characterized by the same features as the M series, but

- they have less pulsations and deliver approx. 50% more flow than the single acting M pumps
- All M...D pumps come standard with **side inlet**, bottom inlet not available

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet***		Flow ****	Connections		Weight kg
		cm3	cu.inch	bar	psi	l/min	Inlet A	Outlet B	
M22D	1:28	9.2	0.56	280	4060	3.91	3/8 BSP	3/8 BSP	3.7
M37D	1:46	5.6	0.34	460	6670	2.35	3/8 BSP	3/8 BSP	3.7
M72D	1:86	3.0	0.18	860	12470	1.24	3/8 BSP	3/8 BSP	3.7
M111D	1:130	2.0	0.12	1300	18850	0.82	3/8 BSP	3/8 BSP	3.7
M189D	1:220	1.2	0.07	2200	31900	0.49	3/8 BSP	3/8 BSP	3.7

See also flow charts at page 20

\* Displacement volume per double stroke (calculated) • \*\* Ratio – driving surface / driven surface (calculated)

\*\*\* Static outlet pressure (calculated and maximum allowed) at an air drive pressure of 10 bar / 145 psi

\*\*\*\* Approximate flow at an air drive of 6 bar / 87 psi and an outlet pressure of 0 bar/psi.

The minimum air drive pressure to start the pump is 1 bar / 14.5 psi. • Depending on the pressure ratio a special outlet pressure can be reached.

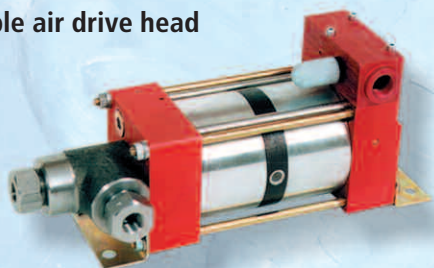
**MAXIMATOR**  
*Pump it.*



## Water or Oil Service – M series: Pressures to 4,000 bar (58,000 psi)

### M...-2 pumps

single acting, double air drive head



#### Pressures to 4,000 bar (58,000 psi)

M...-2 pumps are single acting double air drive head pumps. Compared with the single acting single stage M series they reach double pressure at the same air drive pressure.

M...-2 pumps are available with polyurethane seals.

They come standard with **bottom inlet**, side inlet is available as option.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight kg
		cm3	cu.inch	bar	psi		Inlet A	Outlet B	
M111-2	1:261	1.0	0.06	2500	36250	0.35	1/4 BSP	9/16-18 UNF	3.9
M189-2	1:440	0.6	0.04	4000	58000	0.21	1/4 BSP	9/16-18 UNF	3.9

### M...-3 pumps

single acting, triple air drive head



#### Pressures to 4,000 bar (58,000 psi)

M...-3 pumps are single acting triple air drive head pumps. Compared with the single acting single stage M pumps they reach triple pressure at the same air drive pressure.

M...-3 pumps are available with polyurethane seals.

They come standard with **bottom inlet**, side inlet is available as option.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight kg
		cm3	cu.inch	bar	psi		Inlet A	Outlet B	
M111-3	1:391	1.0	0.06	2500	36250	0.24	1/4 BSP	9/16-18 UNF	4.6
M189-3	1:660	0.6	0.04	4000	58000	0.14	1/4 BSP	9/16-18 UNF	4.6

See also flow charts at page 20

\* Displacement volume per double stroke (calculated) • \*\* Ratio – driving surface / driven surface (calculated)

\*\*\* Static outlet pressure (calculated and maximum allowed) at an air drive pressure of 10 bar / 145 psi

\*\*\*\* Approximate flow at an air drive of 6 bar / 87 psi and an outlet pressure of 0 bar/psi.

The minimum air drive pressure to start the pump is 1 bar / 14.5 psi. • Depending on the pressure ratio a special outlet pressure can be reached.

#### Options for M0 series:

- Seal material for oil use (standard pump):
- Seal material for water use:  
(not available for M ...-2/M...-3 and M ...-01H types)
- Special seal material to handle special fluids:
- Side inlet for single acting versions:
- External pilot port modification:  
(only available for M22 to M189 single acting, single air drive head types)
- Spring return and hand lever attachment:  
(modification only available for M22 to M189 single acting, single air drive head types)
- Special inlet and outlet ports (i. e. NPT):
- Air control unit for M series with filter pressure regulator, control pressure gauge and shut-off valve:
- To protect the pump against excessive outlet pressures, an air safety valve can be fitted to the air control unit

#### Order code:

M37 – (L)

M37 – (L)VE / M37D – VE

See fluid compatibility guide, page 24

M37(L) – S / M37(L)VE – S

M37 – DIR

M37 – 01H

M37 – NPT

M37 with C1

M37 with C1/Svair

(The outlet pressure has to be indicated.)

Other options available on request.



## Water or Oil Service – G series: Pressures to 5,500 bar (79,750 psi)

MAXIMATOR pumps G series are available as single or double acting with either a single or double air drive head. For air drive pressures of 1 bar (14.5 psi) minimum to 10 bar (145 psi) maximum. The unregulated pilot port on all G pumps not only provides better pressure control but is also the ideal place to install control instrumentation because of its small size, 1/8 BSP.

### G pumps

single acting,  
single air drive head



#### Pressures to 4,500 bar (65,295 psi)

G pumps have stainless steel bodies and plungers.

All G pumps have polyurethane seals. For strictly water service, UHMWPE seal option is recommended. This seal is an option because the standard polyurethane seal provides significantly better service life in non-straight water applications.

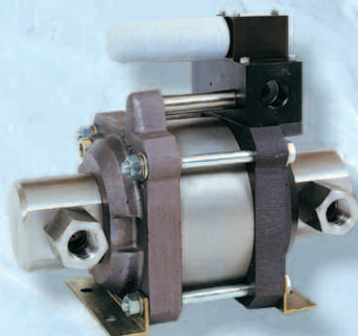
G pumps come standard with **bottom inlet**. Side inlet is available as option. Model G500(S) is only available with side inlet.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight kg
		cm3	cu.inch	bar	psi		Inlet A	Outlet B	
G10	1:11	90.0	5.49	110	1595	18.53	1 BSP	3/4 BSP	16.0
G15	1:16	62.0	3.78	160	2320	12.86	1 BSP	3/4 BSP	16.0
G25	1:28	35.3	2.15	280	4060	7.24	3/4 BSP	3/4 BSP	14.5
G35	1:40	24.5	1.49	400	5800	5.02	3/4 BSP	3/4 BSP	14.5
G60	1:63	15.4	0.94	630	9135	3.21	3/4 BSP	1/2 BSP	13.5
G100	1:113	8.8	0.54	1050	15225	1.81	3/4 BSP	1/2 BSP	13.5
G150	1:151	6.6	0.40	1450	21025	1.36	3/4 BSP	1/2 BSP	13.5
G250	1:265	3.8	0.23	2650	38425	0.77	1/2 BSP	9/16-18 UNF	13.5
G300	1:314	3.2	0.20	3140	45530	0.65	1/2 BSP	9/16-18 UNF	13.5
G400	1:398	2.5	0.15	3980	57710	0.51	1/2 BSP	9/16-18 UNF	13.5
G500S	1:519	1.9	0.12	4500	65295	0.39	1/4 BSP	9/16-18 UNF	13.5

### G...D pumps

double acting,  
single air drive head



#### Pressures to 1,450 bar (21,025 psi)

G...D pumps are double acting, single air drive head.

They are characterized by the same features as the G pumps single acting, single air drive head types, but they have less pulsations and deliver approx. 50 % more flow.

G...D pumps are available with polyurethane seals, UHMWPE seals with Viton O-ring for water use are available as option.

Models G10D – G35D come standard with bottom inlet, side inlet is available as option. Models G60D(S) – G150D(S) are only available with **side inlet**.

For air drive pressures of 1 bar (14.5 psi) minimum to 10 bar (145 psi) maximum.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight kg
		cm3	cu.inch	bar	psi		Inlet A	Outlet B	
G10D	1:10	180.0	10.98	110	1450	28.85	1 BSP	3/4 BSP	22.0
G15D	1:15	124.0	7.56	150	2175	19.84	1 BSP	3/4 BSP	22.0
G25D	1:27	70.6	4.31	270	3915	11.34	3/4 BSP	3/4 BSP	19.0
G35D	1:40	49.0	2.99	400	5800	7.74	3/4 BSP	3/4 BSP	19.0
G60DS	1:63	31.4	1.92	630	9135	5.04	3/4 BSP	1/2 BSP	17.0
G100DS	1:113	17.6	1.07	1050	15225	2.78	3/4 BSP	1/2 BSP	17.0
G150DS	1:151	7.6	0.46	1450	21025	2.10	3/4 BSP	1/2 BSP	17.0

See also flow charts at page 22

\* Displacement volume per double stroke (calculated) • \*\* Ratio – driving surface / driven surface (calculated)

\*\*\* Static outlet pressure (calculated and maximum allowed) at an air drive pressure of 10 bar / 145 psi

\*\*\*\* Approximate flow at an air drive of 6 bar / 87 psi and an outlet pressure of 0 bar/psi.

The minimum air drive pressure to start the pump is 1 bar / 14.5 psi. • Depending on the pressure ratio a special outlet pressure can be reached.



## Water and Oil Service – G series: Pressures to 5,500 bar (79,750 psi)

### G...-2 pumps

single acting, double air drive head



#### Pressures to 5,500 bar (79,750 psi)

G...-2 pumps are single acting double air drive head pumps.

Compared with the single acting single air drive head G pumps they reach double pressure at the same air drive pressure.

G...-2 pumps are available with polyurethane seals, UHMWPE seals with Viton O-ring for water use are available as option.

They come standard with **bottom inlet**, side inlet is available as option.

For air drive pressures from 1 bar (14.5 psi) minimum to 10 bar (145 psi) maximum.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight kg
		cm3	cu.inch	bar	psi		Inlet A	Outlet B	
G10-2	1:22	90.0	5.49	220	3190	15.89	1 BSP	3/4 BSP	20.5
G15-2	1:32	62.0	3.78	320	4640	11.02	1 BSP	3/4 BSP	20.5
G25-2	1:56	35.3	2.15	690	8120	6.19	3/4 BSP	3/4 BSP	19.0
G35-2	1:80	24.5	1.49	800	11600	4.30	3/4 BSP	3/4 BSP	19.0
G60-2	1:126	15.4	0.94	1260	18270	2.70	3/4 BSP	1/2 BSP	18.0
G100-2	1:226	8.8	0.54	2100	30450	1.55	1/2 BSP	9/16-18 UNF	18.0
G150-2	1:300	6.6	0.40	2900	42050	1.16	1/2 BSP	9/16-18 UNF	18.0
G250-2	1:530	3.8	0.23	4500	65250	0.66	1/4 BSP	9/16-18 UNF	22.0
G300-2	1:628	3.2	0.20	4500	65250	0.56	1/4 BSP	9/16-18 UNF	22.0
G400-2	1:796	2.5	0.15	5500	79750	0.44	1/4 BSP	9/16-18 UNF	22.0
G500-2	1:1038	1.4	0.09	5500	79750	0.34	1/4 BSP	5/8-18 UNF	22.0

See also flow charts at page 23

\* Displacement volume per double stroke (calculated) • \*\* Ratio – driving surface / driven surface (calculated)

\*\*\* Static outlet pressure (calculated and maximum allowed) at an air drive pressure of 10 bar / 145 psi

\*\*\*\* Approximate flow at an air drive of 6 bar / 87 psi and an outlet pressure of 0 bar/psi.

The minimum air drive pressure to start the pump is 1 bar / 14.5 psi. • Depending on the pressure ratio a special outlet pressure can be reached.

#### Options for G series:

- Seal material for oil use (standard pump):
- Seal material for water use:  
(not available for G500 and G500-2)
- Special seal material to handle special fluids:
- Side inlet (G500, G500-2 and G60 – G150 come standard with side inlet)
- Special inlet and outlet ports (i. e. NPT):
- Air control unit for G series with filter pressure regulator, control pressure gauge and shut-off valve:
- To protect the pump against excessive outlet pressures, an air safety valve can be fitted to the air control unit

Other options available on request.

#### Order code:

G35 – (L)

G35 – (L)VE / G37D – VE

See fluid compatibility guide, page 24

G35(L) – S / G35(D)VE – S

G35 – NPT

G35(L) with C2

G35(L) with C2/SVair

(The outlet pressure has to be indicated.)

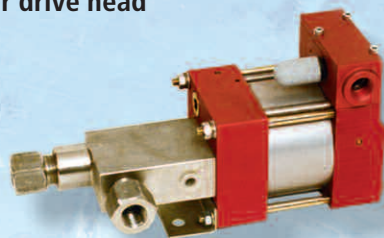
**MAXIMATOR**  
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## Chemical Service – MSF and GSF series: Pressures to 1,450 bar (21,025 psi)

### MSF pumps

single acting, single air drive head  
and distance piece



#### Pressures to 1,450 bar (21,025 psi)

MSF and GSF series pumps are rugged and designed for chemical service applications. These pumps are available as single acting types with single air drive head and distance piece.

- For air drive pressures from 1 bar (14.5 psi) minimum to 10 bar (145 psi) maximum MSF and GSF pumps have stainless steel bodies and plungers.
- MSF and GSF pumps have PTFE seals with Viton O-rings.
- Pumps come standard with **bottom inlet**.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight kg
		cm <sup>3</sup>	cu.inch	bar	psi	l/min	Inlet A	Outlet B	
MSF4	1:4	30.5	1.86	40	580	14.81	1 BSP	1/2 BSP	6.7
MSF8	1:9	14.7	0.90	90	1305	7.07	3/4 BSP	1/2 BSP	6.7
MSF12	1:14	9.4	0.57	140	2030	4.55	3/4 BSP	1/2 BSP	6.7
MSF22	1:28	4.6	0.28	280	4060	2.22	3/8 BSP	3/8 BSP	3.5
MSF37	1:46	2.8	0.17	460	6670	1.36	3/8 BSP	3/8 BSP	3.5
MSF72	1:86	1.5	0.09	860	12470	0.48	3/8 BSP	3/8 BSP	3.5
MSF111	1:130	1.0	0.06	1000	14500	0.28	3/8 BSP	3/8 BSP	3.5

### GSF pumps

single acting, single air drive head  
and distance piece



#### Pressures to 1,450 bar (21,025 psi)

MSF and GSF series pumps are rugged and designed for chemical service applications. These pumps are available as single acting types with single air drive head and distance piece.

- For air drive pressures from 1 bar (14.5 psi) minimum to 10 bar (145 psi) maximum MSF and GSF pumps have stainless steel bodies and plungers.
- MSF and GSF pumps have PTFE seals with viton O-rings.
- Pumps come standard with **bottom inlet**.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet ***		Flow ****	Connections		Weight kg
		cm <sup>3</sup>	cu.inch	bar	psi	l/min	Inlet A	Outlet B	
GSF10	1:11	90.0	5.49	110	1595	18.53	1 BSP	3/3 BSP	20.0
GSF15	1:16	62.0	3.78	160	2320	12.86	1 BSP	3/4 BSP	20.0
GSF25	1:28	35.3	2.15	280	4060	7.24	3/4 BSP	3/4 BSP	19.0
GSF35	1:40	24.5	1.49	400	5800	5.02	3/4 BSP	3/4 BSP	19.0
GSF60	1:63	15.7	0.96	630	9135	3.21	3/4 BSP	1/2 BSP	18.0
GSF100	1:113	8.8	0.54	1050	15225	1.81	3/4 BSP	1/2 BSP	18.0
GSF150	1:151	6.6	0.40	1450	21025	1.36	3/4 BSP	1/2 BSP	18.0

See also flow charts at page 20 and 22

\* Displacement volume per double stroke (calculated) • \*\* Ratio – driving surface / driven surface (calculated)

\*\*\* Static outlet pressure (calculated and maximum allowed) at an air drive pressure of 10 bar / 145 psi

\*\*\*\* Approximate flow at an air drive of 6 bar / 87 psi and an outlet pressure of 0 bar/psi.

The minimum air drive pressure to start the pump is 1 bar / 14.5 psi. • Depending on the pressure ratio a special outlet pressure can be reached.

#### Options for MSF and GSF series:

- Special seal material, i. e. PTFE compound, to handle special fluids:
- Side inlet:
- Special inlet and outlet ports (i. e. NPT):
- Air control unit for MSF / GSF series with filter pressure regulator, control pressure gauge and shut-off valve:
- To protect the pump against excessive outlet pressures, an air safety valve can be fitted to the air control unit

Other options available on request.

#### Order code:

See fluid compatibility guide, page 24

MSF37 / GSF35 – S

MSF37 / GSF35 – NPT

MSF37 with C1 / GSF35 with C2

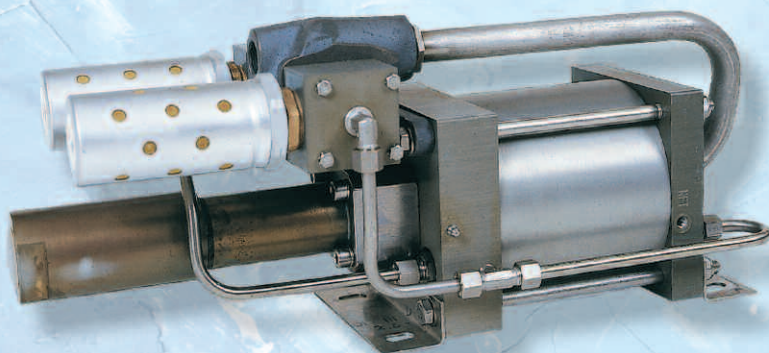
MSF37 with C1/SVair / GSF35 with C2/SVair

(The outlet pressure has to be indicated.)



## Chemical Service – GX series: Pressures to 1,000 bar (14,500 psi)

### GX pumps



#### Pressures to 1,000 bar (14,500 psi)

GX pumps are high flow capacity pumps designed for rugged installations and built with environmental resistant materials. They are ideal for offshore applications with stainless steel wetted parts and corrosive resistant external components.

All GX series pumps have stainless bodies and plungers, UHMWPE (ultra high molecular weight polyethylene) seals and Viton O-rings as standard.

### Technical Data

Type	Pressure ratio **	Displ. Volume *		Outlet pressure***		Flow ****	Connections		Air drive	Weight kg
		cm3	cu.inch	bar	psi		Inlet	Outlet		
GX35	1:36	110	6.71	360	5220	24.50	1 FNPT	3/8 FNPT	3/4 BSP female	24.0
GX60	1:66	65	3.97	600	8700	23.00	1 FNPT	3/8 FNPT	3/4 BSP female	24.0
GX100	1:117	36	2.20	1000	14500	9.00	1 FNPT	3/8 FNPT	3/4 BSP female	24.0

See also flow charts at page 23

\* Displacement volume per double stroke (calculated) • \*\* Ratio – driving surface / driven surface (calculated)

\*\*\* Static outlet pressure (calculated and maximum allowed) at an air drive pressure of 10 bar / 145 psi

\*\*\*\* Approximate flow at an air drive of 6 bar / 87 psi and an outlet pressure of 0 bar/psi.

The minimum air drive pressure to start the pump is 1 bar / 14.5 psi. • Depending on the pressure ratio a special outlet pressure can be reached.

#### Options for GX series:

• Seal package UHMWPE seals and depending on the fluid:

- Viton O-rings as standard
- NBR O-rings as option
- EPDM O-rings as option

• Air control unit for GX series with filter pressure regulator, control pressure gauge and shut-off valve:

• To protect the pump against excessive outlet pressures, an air safety valve can be fitted to the air control unit

Other options available on request.

#### Order code:

GX35 – V

GX35 – N

GX35 – E

See fluid compatibility guide, page 24

GX35 with C2

GX with C2/SVair

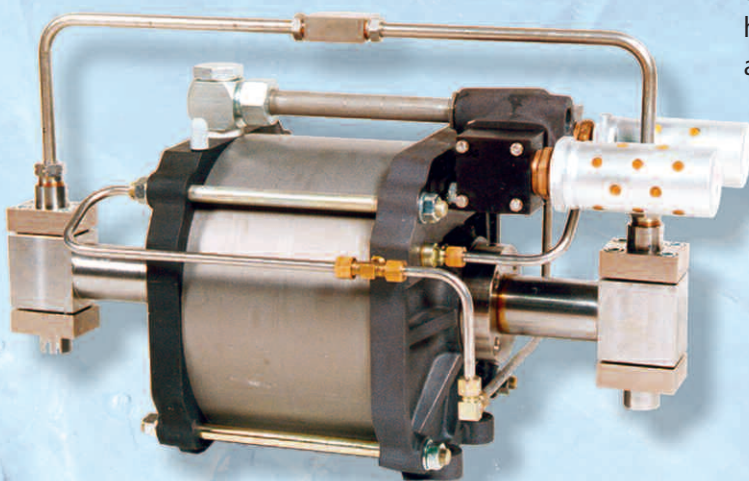
(The outlet pressure has to be indicated.)

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*Pump it.*



## Pumps for special applications – DPD series: Pressures to 2,100 bar (30,450 psi)

### DPD pumps



#### Pressures to 2,100 bar (30,450 psi)

Special advantage of DPD series is a high flow capacity at high pressure. They are double acting pumps and available in two pressure ratios.

### Technical Data

Type	Pressure ratio **	Displ. Volume * cm <sup>3</sup> cu.inch	Outlet pressure*** bar psi	Flow **** l/min	Connections Inlet	Outlet	Air drive	Weight kg
DPD150	1:185	72 4.4	1500 21.750	8.0	3/8 BSP female	1 1/18-12 UNF (F562C)	3/4 BSP	49.0
DPD200	1:268	72 4.4	2100 30.450	5.6	3/8 BSP female	1 1/18-12 UNF (F562C)	3/4 BSP	49.0

Please consult MAXIMATOR.

### Options for DPD series:

- Air control unit for DPD series with filter pressure regulator, control pressure gauge and shut-off valve:

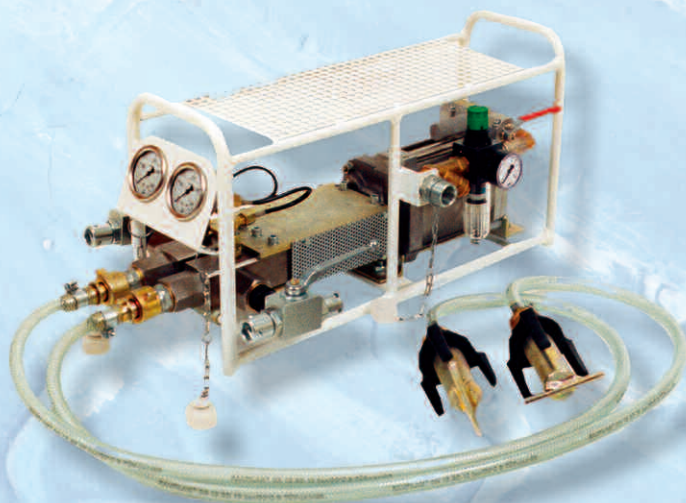
### Order code:

DPD150 with C3

### Single and Two Component Injection Pumps

MAXIMATOR does also supply a line of special pumps for mining applications:

- Underground Mining Industry
- Rock and Coal Consolidation
- Tunnel and Bridge Construction
- Concrete Restoration



Please ask for our catalogue "Single and Two Component Injection Pumps".

**MAXIMATOR**  
*Pump it.*



## Accessories for MAXIMATOR Liquid Pumps

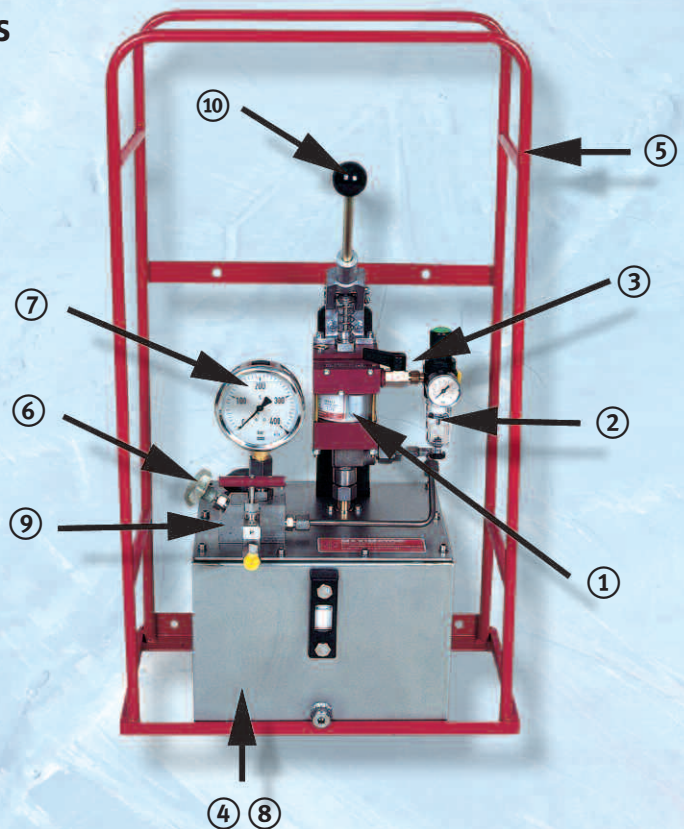
To help you complete the installation of your MAXIMATOR liquid pump, we offer a wide variety of accessories. These ancillary products are available as prepackaged modules or as individual components.

Please consult MAXIMATOR or ask for our catalogue "MAXIMATOR Packaged Pump Systems".

## MAXIMATOR Packaged Pump System (Example)

### Components in Modular Design

- 1 **Pump model** all M, S and G series
- 2 **Air control unit**, comprising combined filter pressure regulator, control pressure gauge and shut-off valve  
C1 for M series  
C1.5 for S series  
C2 for G series
- 3 **Air safety valve**  
SV mounted in the air line
- 4 **Tank sizes** 6.5 liter, 13 liter, 30 liter, 70 liter, standard of aluminium, stainless steel on request
- 5 **Mobility of the packaged pump system**  
F mobile (with wheels)  
T portable (with handles)  
R frame
- 6 **Relief valve**  
EV with return line to the tank
- 7 **Pressure gauge**  
Pressure range / Diameter of the housing (cl. 1.6/1.0/0.6, glycerine damped)
- 8 **Operating liquid**  
O Oil (tank of aluminium, components galvanized)  
W Water (tank of aluminium, components of SS)  
VA Stainless steel (tank of 1.4571 or 1.4305)
- 9 **Manifold block with pressure outlet(s)**  
A1 1 pressure outlet to  
A6 6 pressure outlets  
V Option: Shut-off valve vor pressure outlet (AV1-AV6)
- 10 **Hand lever**  
H only available for M22 to M189, single acting, single stage
- 11 **Other options:**  
SCHW Float valve for automatic filling of the tank, i. e. from the water line  
SCHL HP hose, model SK  
ZR Additional return connection
- 12 **Specials on request**



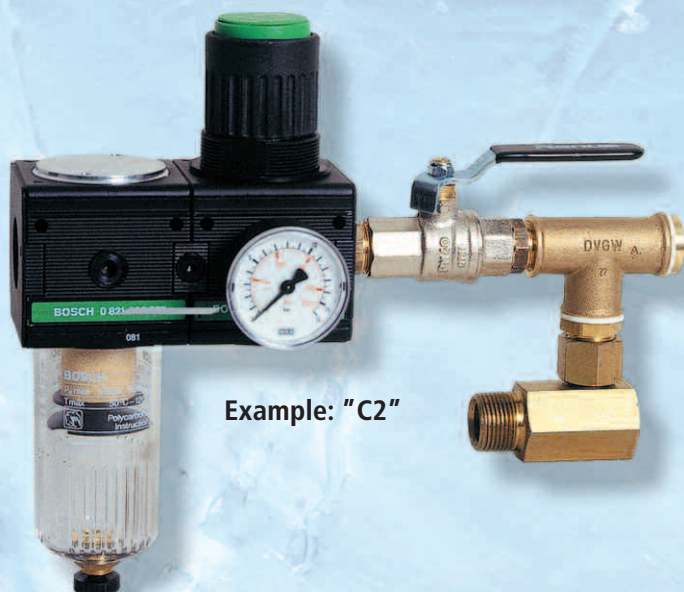
## Coding example:

**M72-01H/C1/SV/13/R/EV/0-400(100)/W/AV1/VA (Special) comprising:**

- M72-01H MAXIMATOR air driven liquid pump, model M72-01H (with hand lever)
- C1 Air control unit "C1", comprising
  - combined filter pressure regulator
  - control pressure gauge 0 – 10 bar, diameter 40 mm
  - shut-off valve
- 13 Tank volume 13 liter (9 liter useable)
- R Portable frame
- EV Manually operated relief valve
- 0 – 400 (100) Pressure gauge 0 to 400 bar, diameter 100 mm, oil damped, (only 2/3 of scale range useable)
- W for water service
- AV1 Manifold block with one pressure outlet and shut-off valve
- VA Tank of Stainless Steel
- Special: Colour: Frame in MAXIMATOR design (red)



## Individual components



Example: "C2"

### Air Control Units

with combined filter pressure regulator, control pressure gauge and shut-off valve, available in different versions depending on the pump series:

"C1" for MO and M series

"C1.5" for S series

"C2" for G and GX series

Regulating range: 0.5 to 10 bar

Filter accuracy: 50 µ

Available as option:

Safety relief valves to limit the outlet pressure

### Pressure Gauges

available in different ranges

0 – 10 bar to 0 – 2,500 bar, dia. 100 mm

0 – 25 bar to 0 – 7,000 bar, dia. 160 mm



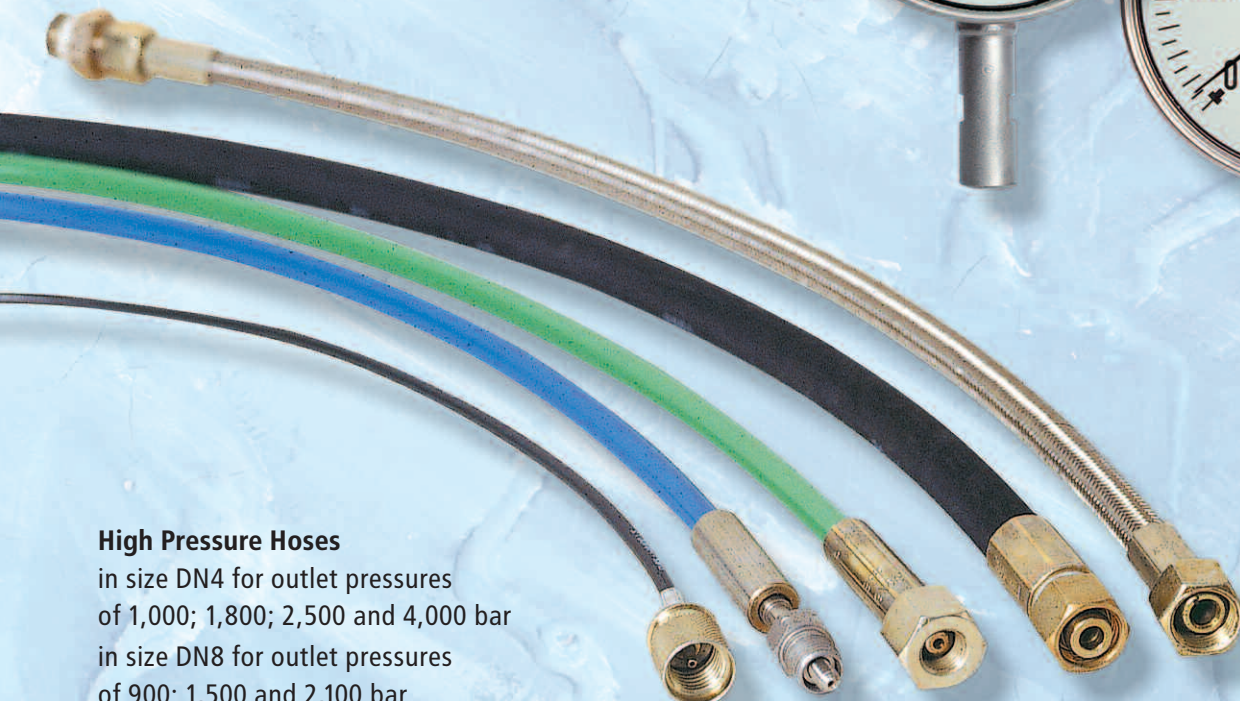
### High Pressure Hoses

in size DN4 for outlet pressures

of 1,000; 1,800; 2,500 and 4,000 bar

in size DN8 for outlet pressures

of 900; 1,500 and 2,100 bar





## Individual components

### High Pressure Valves and Fittings

Taper Seal Valves, Glands, Sleeves, Plugs, Elbows, Tees, Crosses, Couplings, Filters, Rupture Discs, Safety Heads, Anti-Vibration Gland Assemblies for outlet pressures from 700 to 4,200 bar 10,150 – 60,900 psi).

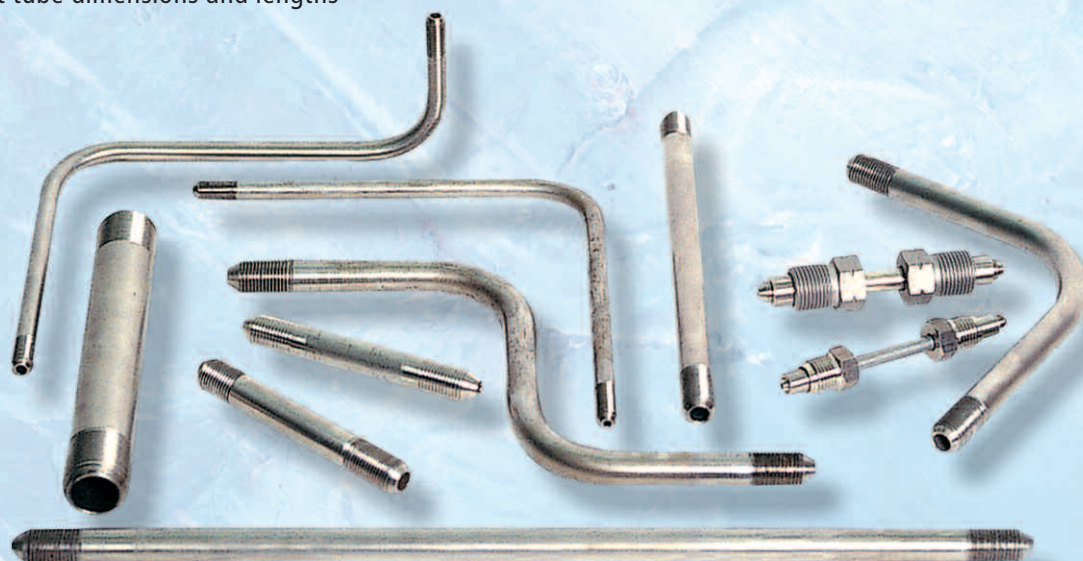
Ultra High Pressure Valves and Fittings to 10,000 bar (145,000 psi).



Please ask for our catalogue  
"MAXIMATOR Valves • Fittings • Tubing"

### High pressure tubing

Available for different outlet pressures in ranges from 700 bar to 10,500 bar (from 10,150 to 152,500 psi) and in different tube dimensions and lengths



Other accessories like safety relief valves, accumulators, adapters, stroke counters, etc. available on request.



Pump Type	Sample Air Drive Pressure in bar	Outlet Pressure in bar								
		0/Atm.	50	100	500	1000	1500	2000	3000	4000
M[(O)(SF)]4	4	14.51								
	6	14.81								
	8	14.93								
M[(O)(SF)]8	4	6.93								
	6	7.07	0.89							
	8	7.13	3.39							
M[(O)(SF)]12	4	4.46	0.71							
	6	4.55	2.64							
	8	4.59	3.43	0.84						
M[(O)(SF)]22	4	2.17	1.58	0.44						
	6	2.22	1.92	1.33						
	8	2.24	2.05	1.70						
M[(O)(SF)]37	4	1.34	1.15	0.84						
	6	1.36	1.27	1.11						
	8	1.38	1.32	1.22						
M[(O)(SF)]72	4	0.71	0.67	0.60						
	6	0.72	0.70	0.67	0.06					
	8	0.73	0.72	0.70	0.33					
M[(O)(SF)]111	4	0.47	0.45	0.43	0.05					
	6	0.48	0.47	0.46	0.26					
	8	0.48	0.48	0.47	0.35	0.05				
M[(O)(SF)]189	4	0.28	0.27	0.26	0.17					
	6	0.28	0.28	0.28	0.23	0.11				
	8	0.28	0.28	0.28	0.25	0.18	0.08			
M111-2	4	0.35	0.34	0.33	0.24	0.03				
	6	0.35	0.35	0.35	0.30	0.19	0.04			
	8	0.36	0.35	0.35	0.32	0.26	0.16	0.04		
M189-2	4	0.20	0.20	0.20	0.18	0.12	0.05			
	6	0.21	0.21	0.21	0.19	0.17	0.13	0.08		
	8	0.21	0.21	0.21	0.20	0.19	0.16	0.14	0.06	
M111-3	4	0.23	0.23	0.23	0.19	0.12	0.02			
	6	0.24	0.23	0.23	0.22	0.18	0.13	0.06		
	8	0.24	0.24	0.24	0.23	0.20	0.17	0.13	0.03	
M189-3	4	0.14	0.14	0.14	0.13	0.12	0.10	0.06	0.00	
	6	0.14	0.14	0.14	0.13	0.12	0.12	0.10	0.07	0.02
	8	0.14	0.14	0.14	0.14	0.13	0.12	0.11	0.09	0.06
M(O)22D	4	3.83	2.75	0.66						
	6	3.91	3.36	2.29						
	8	3.94	3.61	2.96						
M(O)37D	4	2.31	1.99	1.45						
	6	2.35	2.20	1.92						
	8	2.37	2.28	2.11						
M(O)72D	4	1.22	1.15	1.04						
	6	1.24	1.21	1.15	0.11					
	8	1.26	1.23	1.20	0.57					
M(O)111D	4	0.81	0.78	0.74	0.08					
	6	0.82	0.81	0.79	0.45					
	8	0.83	0.82	0.81	0.60	0.09				
M(O)189D	4	0.48	0.47	0.45	0.29					
	6	0.49	0.48	0.48	0.39	0.20	0.06			
	8	0.49	0.49	0.48	0.43	0.32	0.14			

Flow in l/min



Pump Type	Sample Air Drive Pressure in bar	Outlet Pressure in bar									
		0/Atm.	50	100	200	300	400	500	600	700	008
S15	4	9.11	3.82								
	6	9.38	6.60	0.91							
	8	9.50	7.78	4.28							
S25	4	6.59	4.39	0.00							
	6	6.72	5.60	3.36							
	8	6.78	6.10	4.74	0.00						
S35	4	4.22	3.48	2.16							
	6	4.31	3.93	3.26	1.03						
	8	4.34	4.12	3.71	2.36	0.30					
S60	4	2.70	2.44	2.03	0.75						
	6	2.75	2.62	2.41	1.76	0.80					
	8	2.78	2.70	2.57	2.18	1.60	0.83				
S100	4	1.52	1.45	1.35	1.07	0.68	0.19				
	6	1.55	1.51	1.46	1.32	1.12	0.87	0.57	0.20		
	8	1.56	1.54	1.51	1.42	1.30	1.15	0.97	0.75	0.50	0.21
S150	4	1.05	1.02	0.98	0.80	0.64	0.44	0.20			
	6	1.08	1.06	1.04	0.98	0.91	0.81	0.70	0.57	0.42	0.26
	8	1.08	1.07	1.06	1.03	0.98	0.93	0.86	0.78	0.69	0.59
S15D	4	17.21	6.17								
	6	17.56	11.93								
	8	17.71	14.30	6.78							
S25D	4	11.76	7.59								
	6	12.00	9.87	5.58							
	8	12.10	10.81	8.21							
S35D	4	7.43	6.08	3.66							
	6	7.58	6.89	5.65	1.54						
	8	7.64	7.22	6.48	3.99	0.18					
S60D	4	4.70	4.24	3.51	1.22						
	6	4.80	4.56	4.20	3.02	1.30					
	8	4.84	4.70	4.47	3.28	2.07	0.53				
S100D	4	2.62	2.50	2.33	1.84	1.16	0.30				
	6	2.68	2.62	2.53	2.28	1.93	1.49	0.95	0.32		
	8	2.70	2.66	2.61	2.46	2.25	1.98	1.66	1.27	0.83	0.33
S150D	4	1.82	1.76	1.69	1.50	1.24	0.92	0.54	0.10		
	6	1.85	1.83	1.79	1.69	1.56	1.40	1.20	0.98	0.72	0.43
	8	1.87	1.85	1.83	1.77	1.69	1.59	1.48	1.34	1.18	0.91

Flow in l/min

**Important!**

The flow rates as indicated in the charts have been measured with optimum cross sections of the pipes, depending on each individual pump model.

To ensure a proper operation (pressure and flow) the standard port sizes of the pump shall not be reduced.

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Pump Type	Sample Air Drive Pressure in bar	Outlet Pressure in bar			500	1000	1500	2000	3000	4000
		0/Atm.	50	100						
G(SF)10	4	18.16								
	6	18.53	7.22							
	8	18.68	11.84							
G(SF)15	4	12.60	4.19							
	6	12.86	8.57							
	8	12.96	10.37	4.61						
G(SF)25	4	7.10	5.14	1.35						
	6	7.24	6.24	4.31						
	8	7.30	6.70	5.53						
G(SF)35	4	4.92	4.11	2.70						
	6	5.02	4.61	3.89						
	8	5.06	4.82	4.38						
G(SF)60	4	3.15	2.86	2.41						
	6	3.21	3.07	2.84						
	8	3.24	3.15	3.01	0.14					
G(SF)100	4	1.77	1.69	1.58						
	6	1.81	1.77	1.71	0.75					
	8	0.99	0.97	0.96	0.64					
G(SF)150	4	1.33	1.29	1.00						
	6	1.36	1.34	1.19	0.38					
	8	1.37	1.36	1.34	1.07	0.40				
G250	4	0.76	0.74	0.73	0.53	0.08				
	6	0.77	0.76	0.76	0.66	0.42	0.08			
	8	0.78	0.77	0.77	0.70	0.57	0.36	0.08		
G300	4	0.64	0.63	0.62	0.49	0.02				
	6	0.65	0.65	0.64	0.57	0.43	0.22			
	8	0.66	0.65	0.65	0.61	0.52	0.39	0.22		
G400	4	0.50	0.50	0.49	0.42	0.27	0.05			
	6	0.51	0.51	0.50	0.47	0.39	0.28	0.14		
	8	0.52	0.52	0.51	0.49	0.44	0.38	0.29	0.06	
G500	4	0.39	0.38	0.38	0.34	0.27	0.16	0.03		
	6	0.39	0.39	0.39	0.37	0.33	0.28	0.21	0.03	
	8	0.40	0.40	0.39	0.38	0.36	0.33	0.29	0.18	0.03

Flow in l/min

Pump Type	Sample Air Drive Pressure in bar	Outlet Pressure in bar			100	250	500	750	1000
		0/Atm.	25	50					
G10D	4	28.28	16.84						
	6	28.85	23.02	10.97					
	8	29.09	25.56	18.27					
G15D	4	19.44	14.93	6.47					
	6	19.84	17.54	13.22					
	8	20.00	18.61	16.00	7.11				
G25D	4	10.11	9.91	7.98	1.90				
	6	11.34	10.73	9.74	6.64				
	8	11.43	11.06	10.46	8.59				
G35D	4	7.59	7.08	6.35	4.16				
	6	7.74	7.48	7.11	6.00				
	8	7.80	7.65	7.42	6.75	2.99			
G60D	4	4.94	4.74	4.48	3.77	0.07			
	6	5.04	4.94	4.81	4.44	2.55			
	8	5.08	5.02	4.94	4.72	3.58	0.07		
G100D	4	2.73	2.67	2.61	2.44	1.68			
	6	2.78	2.76	2.72	2.64	2.25	1.16		
	8	2.79	2.77	2.72	2.48	1.82	0.83		
G150D	4	2.06	2.03	1.99	1.91	1.54	0.55		
	6	2.10	2.09	2.07	2.02	1.84	1.33	0.59	
	8	2.12	2.11	2.10	2.07	1.96	1.65	1.20	0.61

Flow in l/min



## Flow Charts G(SF) Series

Pump Type	Sample Air Drive Pressure in bar	Outlet Pressure in bar			500	1000	1500	2000	3000	4000
		0/Atm.	50	100						
G10-2	4	15.57	9.36							
	6	15.89	12.72	6.19						
	8	16.02	14.10	10.15						
G15-2	4	10.08	8.30	3.59						
	6	11.02	9.74	7.34						
	8	11.11	10.34	8.89						
G25-2	4	6.06	5.43	4.40						
	6	6.19	5.86	5.34						
	8	6.24	6.04	5.72						
G35-2	4	4.21	3.94	3.53						
	6	4.30	4.16	3.95						
	8	4.34	4.25	4.12	1.66					
G60-2	4	2.70	2.59	2.46	0.10					
	6	2.76	2.70	2.63	1.43					
	8	2.78	2.75	2.70	1.98	0.12				
G100-2	4	1.52	1.49	1.45	0.94					
	6	1.55	1.53	1.51	1.25	0.64				
	8	1.56	1.55	1.54	0.38	1.01	0.46			
G150-2	4	1.14	1.12	1.10	0.85	0.31				
	6	1.16	1.16	1.15	1.02	0.74	0.33			
	8	1.17	1.17	1.16	1.09	0.92	0.67	0.34		
G250-2	4	0.65	0.64	0.64	0.57	0.45	0.28	0.07		
	6	0.66	0.66	0.66	0.62	0.56	0.47	0.36	0.07	
	8	0.67	0.67	0.66	0.64	0.61	0.55	0.49	0.31	0.07
G300-2	4	0.55	0.54	0.54	0.50	0.42	0.31	0.17		
	6	0.56	0.56	0.55	0.53	0.49	0.44	0.37	0.19	
	8	0.56	0.56	0.56	0.55	0.52	0.49	0.45	0.34	0.19
G400-2	4	0.43	0.43	0.42	0.38	0.33	0.27	0.19		
	6	0.44	0.44	0.44	0.42	0.39	0.36	0.32	0.21	0.08
	8	0.44	0.44	0.44	0.44	0.42	0.40	0.38	0.32	0.25
G500-2	4	0.33	0.33	0.33	0.31	0.29	0.26	0.23	0.16	0.05
	6	0.34	0.34	0.34	0.33	0.32	0.30	0.28	0.24	0.18
	8	0.34	0.34	0.34	0.34	0.33	0.32	0.31	0.28	0.25

Flow in l/min

## Flow Charts GX

Pump Type	Sample Air Drive Pressure in bar	Outlet Pressure in bar			200	300	400	500	600	700	008
		0/Atm.	50	100							
GX35	4	25.00	16.67	8.44							
	6	24.50	20.00	14.58							
	8	23.00	21.72	17.67	9.45						
GX60	4	22.00	16.59	13.60	6.45						
	6	23.00	19.06	15.77	10.00	5.21					
	8	21.50	19.92	17.95	13.10	8.24	2.65				
GX100	4	8.50	7.71	7.11	6.13	4.71	1.88				
	6	9.00	8.47	7.97	7.15	6.49	5.81	4.90	2.96		
	8	9.00	8.47	7.97	7.15	6.49	5.84	5.09	3.99	2.35	

Flow in l/min

### Important!

The flow rates as indicated in the charts have been measured with optimum cross sections of the pipes, depending on each individual pump model.

To ensure a proper operation (pressure and flow) the standard port sizes of the pump shall not be reduced.

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## Seal Versions for MAXIMATOR Air Driven Liquid Pumps

Seal version	Seal material	Remarks
without indication or "L"	Polyurethane (PU) Nitrile (NBR)	Standard
VE	Polyethylene (UHMWPE) Fluorcarbon (V)	Standard
VE / NBR	Polyethylene (UHMWPE) Nitrile (NBR)	Special
VE / EPR	Polyethylene (UHMWPE) Ethylene Propylen	Special
VE / CRL	Polyethylene (UHMWPE) Chloropren (CRL)	Special
VE / KAL	Polyethylene (UHMWPE) Kalrez (KAL)	Special
SF	Filled Teflon (PTFE) Fluorcarbon (V)	Standard

## MAXIMATOR Fluid Compatibility Guide

Liquid	Recommended Seal versions						Pump Series MSF and GSF
	Standard L	Standard VE	Special VE / NBR	Special VE / EPR	Special VE / CRL	Special VE / KAL	
<b>A</b> Acetone				X		X	X
Ammonia				X	X		X
Ammonium Chloride	X	X	X	X	X		X
Ammonium Hydroxide			X	X	X	X	X
Ammonium Nitrate			X	X	X		X
Ammonium Sulfate			X	X	X		X
ASTM Oil No. 1	X	X	X		X		X
ASTM Oil No. 2		X	X				X
ASTM Oil No. 3		X					X
ASTM Oil No. 4		X					X
<b>B</b> Barium Chloride	X	X	X	X	X	X	X
Barium Hydroxide		X	X	X	X		X
Barium Sulfide	X	X	X	X	X		X
Benzol		X				X	X
Bleaching Lye		X		X			X
Borax	X	X		X			X
Boric Acid	X	X	X	X	X	X	X
Brake Fluid				X			X
Bromine Water		X					X
Bromobenzene		X					X
Bunker Fuel		X	X				X
Butadiene		X					X
Butanol		X	X		X	X	X
Butyl Acetate						X	X
<b>C</b> Calcium Carbonate		X	X	X	X		X
Calcium Chloride	X	X	X	X	X	X	X
Calcium Hydroxide		X	X	X	X		X
Calcium Hypochloride		X		X			X
Calcium Phosphate	X	X	X	X			
Calcium Silicate		X	X	X			X
Calcium Sulfide		X	X	X	X		X
Carbon Dioxide			X				X
Celluguard		X	X	X	X		X
Cetane		X	X				X
Chloracetone				X			X
Chromic Alum.		X	X	X	X		X
Copper Chloride	X	X	X	X			X
Cotton Oil		X	X				X
<b>D</b> Diacetone Alcohol				X			X
Diethylene Glycol		X	X	X	X		X
Drilling Oil	X	X	X				X
<b>E</b> Etheric Oils							X
Ethyl Acetate						X	X
Ethyl Alcohol			X	X	X		X
Ethyl Benzol							X
Ethyl Chloride							X
Ethyl Glycol		X	X	X	X	X	X
<b>F</b> Fatty Acids	X	X					X
Ferric Chloride	X	X	X	X		X	X
Floussilic Acid		X		X			X
Freon					X		X



# MAXIMATOR Fluid Compatibility Guide

Liquid	Recommended Seal versions						Pump Series MSF and GSF
	Standard L	Standard VE	Special VE / NBR	Special VE / EPR	Special VE / CRL	Special VE / KAL	
<b>F</b> Fuel	X	X	X				X
Fuel Oil		X	X				X
<b>G</b> Gelatin		X	X	X			X
Glucose		X	X	X			X
Glycerine		X	X	X		X	X
Glycol		X	X	X			X
<b>H</b> Halon	X		X				X
Hexyl Alcohol		X	X				X
Hydraulic Oils (Petroleum)	X	X	X				X
Hydrazine				X			X
Hydrogen Peroxide		X				X	X
Hydrolube		X	X	X			X
Hydrozanic Acid		X		X			X
<b>I</b> Iso-Butyl Alcohol		X		X	X	X	X
Isopropanol		X		X		X	X
Isopropyl Alcohol		X		X			X
<b>K</b> Kerosene	X	X	X				X
<b>L</b> Lead Nitrate			X	X	X		X
Lead Sulphate		X		X	X		X
Light Crude Oil		X	X				X
Lindol (hydraulic fluids)				X			X
Linseed Oil		X	X				X
Liquid Gas (Propane/Butane)	X	X				X	
<b>M</b> Methane		X	X				X
Methyl Alcohol			X	X			X
Methyl Carbonate		X					X
Methyl Chloride		X					X
Mineral Oils	X	X	X				X
Mobil Oil SAE 20	X	X	X				X
<b>N</b> Natural Oil		X					X
<b>P</b> Paraffin Oil		X	X		X		X
Pentane		X	X		X		X
Petrol			X			X	X
Petrol "Super"		X	X				X
Phenol						X	X
Phosphate Esters		X		X			X
Potassium Acetate				X			X
Potassium Chloride	X	X	X	X	X		X
Potassium Nitrate	X	X	X	X	X		X
Potassium Sulfate	X	X	X	X	X		X
Propane		X	X				X
Propyl Alcohol		X	X	X	X		X
<b>S</b> Salt Water			X	X			X
Silicone Oils	X	X	X	X	X		X
Skydrol				X			X
Soap Water		X	X	X			X
Sodium Acetate				X			X
Sodium Bisulfate	X	X	X	X	X		X
Sodium Carbonate		X	X	X	X		X
Sodium Chloride	X	X	X	X	X		X
Sodium Peroxide		X		X			X
Sodium Sulfide	X	X	X	X	X		X
Sugar Liquids		X	X	X	X		X
<b>T</b> Tartaric Acid		X	X				X
Tetrachlorethylene		X				X	X
Tetralin		X				X	X
Toluol		X					X
Trichlorethylene		X				X	X
Turbine Oil	X	X	X				X
Turpentine		X	X				X
Turpentine Oil		X					X
<b>V</b> Vegetable Oils		X	X				X
Vinegar		X		X	X		X
<b>W</b> Water		X		X			X
<b>Z</b> Zinc Acetate				X			X
Zinc Chloride		X	X	X	X		X



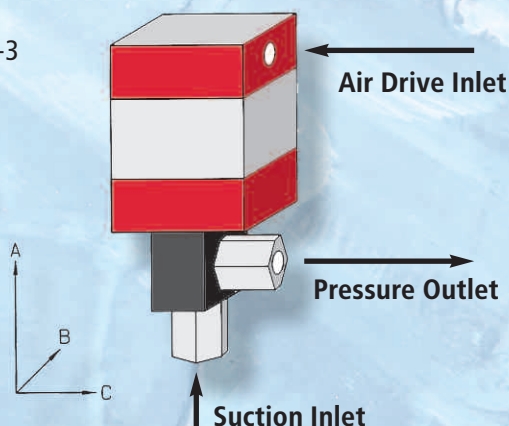
## Outer Dimensions and Standard Connections

Pump Model	Air Drive	Inlet Inlet	Outlet	A Height	B Depth	C Width
MO4, MO8, MO12	3/8 BSP	3/4 BSP	1/2 BSP	190	102	80
MO22, MO37, MO72, MO111, MO189	3/8 BSP	3/8 BSP	1/4 BSP	228	102	80
MO22D, MO37D, MO72D, MO111D, MO189D	3/8 BSP	3/8 BSP	1/4 BSP	186	108	86
S15, S25, S35	1/2 BSP	3/4 BSP	3/4 BSP	221	135	175.5
S60, S100, S150	1/2 BSP	1/2 BSP	3/8 BSP	221	135	175.5
S15D, S25D, S35D	1/2 BSP	3/4 BSP	3/4 BSP	260	135	175.5
S60D, S100D, S150D	1/2 BSP	1/2 BSP	3/8 BSP	260	135	175.5
M4	3/8 BSP	1 BSP	1/2 BSP	216	120	112
M8, M12	3/8 BSP	3/4 BSP	1/2 BSP	209	120	112
M22, M37, M72, M111, M189	3/8 BSP	3/8 BSP	3/8 BSP	195	104	112
M22D, M37D, M72D, M111D, M189D	3/8 BSP	3/8 BSP	3/8 BSP	184	124	112
M111-2, M189-2	3/8 BSP	1/4 BSP	9/16-18UNF	255	100	112
M111-3, M189-3	3/8 BSP	1/4 BSP	9/16-18UNF	316	100	112
G10, G15	3/4 BSP	1 BSP	3/4 BSP	311	190.5	272
G25, G35	3/4 BSP	3/4 BSP	3/4 BSP	296	181	272
G60, G100, G150	3/4 BSP	3/4 BSP	1/2 BSP	321	184.5	272
G250, G300, G400	3/4 BSP	1/2 BSP	9/16-18UNF	300	193.5	272
G500S	3/4 BSP	1/4 BSP	9/16-18UNF	362	181	272
G10D, G15D	3/4 BSP	1 BSP	3/4 BSP	442	190.5	272
G25D, G35D	3/4 BSP	3/4 BSP	3/4 BSP	412	181	272
G60D, G100D, G150D	3/4 BSP	3/4 BSP	3/4 BSP	344	184.5	272
G10-2, G15-2	3/4 BSP	1 BSP	3/4 BSP	411	211	272
G25-2, G35-2	3/4 BSP	3/4 BSP	3/4 BSP	396	211	272
G60-2	3/4 BSP	3/4 BSP	1/2 BSP	421	211	272
G100-2, G150-2	3/4 BSP	1/2 BSP	9/16-18UNF	400	211	272
G250-2, G300-2, G400-2	3/4 BSP	1/4 BSP	9/16-18UNF	483	211	272
G500-2S	3/4 BSP	1/4 BSP	5/8-18UNF	462	211	272
MSF4	3/8 BSP	1 BSP	1/2 BSP	248	112	120
MSF8, MSF12	3/8 BSP	3/4 BSP	1/2 BSP	241	112	120
MSF22, MSF37, MSF72, MSF111	3/8 BSP	3/8 BSP	3/8 BSP	247	112	108
GSF10, GSF15	3/4 BSP	1 BSP	3/4 BSP	411	190.5	272
GSF25, GSF35	3/4 BSP	3/4 BSP	3/4 BSP	400	181	272
GSF60, GSF100, GSF150	3/4 BSP	3/4 BSP	1/2 BSP	412	181	272
GX35, GX60, GX100	3/4 BSP	1 NPT	3/8 NPT	632	237	244
DPD100, DPD150, DPD200	3/4 BSP	3/8 BSP	9/16-18UNF	762	346	460

All connections listed are female unless otherwise noted. • Other connections available on request.

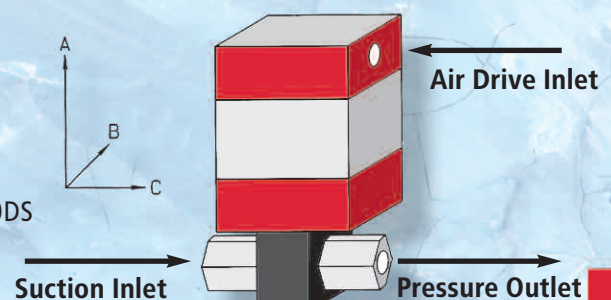
### Standard pump versions with bottom inlet:

MO  
M / M...-2 / M...-3  
G10 – 400  
G10D – G35D  
G10-2 – G400-2  
MSF  
GSF



### Standard pump versions with side inlet:

MO...D  
S / S...D  
M...D  
G500S  
G60DS  
– G150DS  
G500-2S





## Wetted Materials of Construction for MAXIMATOR Air Driven Liquid Pumps in Standard Design and their relating double acting or double and triple air head versions

Pump Model	Seal Package	Pump Body	Piston	Fittings	Inlet and Outlet Check Valves Balls Discs Springs	Sealing cones
M04 – M012	Polyurethane, Buna N	AlCuMgPbF34 "anodized"	1.4112 (hardened)	AlCuMgPbF34 "anodized"	n/a 1.4301 1.4310	n/a
M022 – M0189	Polyurethane, Buna N	GGG50	1.4112 (hardened)	1.4104	1.3541 n/a X 12 CrNi 17 7	n/a
S15 – S150	Polyurethane, Buna N	GGG50	1.4112 (hardened)	n/a	n/a 1.4301 1.4310	n/a
M4(L) – M12(L)	Polyurethane, Buna N	AlMgSiPb "anodized"	1.4112 (hardened)	Inlet: 1.4305 / Outlet: AlMgPbCu "anodized"	1.3541 n/a 1.4310	n/a
M4VE – M12VE	UHMWPE, Viton	AlMgSiPb "anodized"	1.4112 (hardened)	Inlet: 1.4305 / Outlet: AlMgPbCu "anodized"	1.3541 n/a 1.4310	n/a
M22(L) – M189(L)	Polyurethane, Buna N	1.4305	1.4112 (hardened)	1.4104	1.3541 n/a X 12 CrNi 17 7	n/a
M22VE – M189VE	UHMWPE, Viton	1.4305	1.4112 (hardened)	1.4104	1.3541 n/a X 12 CrNi 17 7	n/a
MSF4(L) – MSF12(L)	PTFE, Viton	1.4571	1.4571	1.4305	Al203 n/a 1.4571	n/a
MSFAVE – MSF12VE	Reinforced PTFE, Viton	1.4571	1.4571	Inlet: 1.4305 / Outlet: 1.4104	Al203 n/a 1.4571	n/a
MSF22(L) – MSF111(L)	Reinforced PTFE, Viton	1.4305	1.4112 (hardened)	1.4571	Al203 n/a 1.4571	n/a
G10(L) – G35(L)	Polyurethane, Buna N	1.4305 303 (X 10 CrNiS 18 9)	1.4112 (hardened)	1.4571	1.3541 1.4568 1.4310	n/a
G10VE – G35VE	UHMWPE, Viton	1.4305 303 (X 10 CrNiS 18 9)	1.4112 (hardened)	1.4571	Al203 1.4568 1.4571	n/a
G60(L) – G150(L)	Polyurethane, Buna N	1.4305 303 (X 10 CrNiS 18 9)	1.4112 (hardened)	1.4571	1.3541 n/a 1.4310	17-4-PH
G60VE – G150VE	UHMWPE, Viton	1.4305 303 (X 10 CrNiS 18 9)	1.4112 (hardened)	1.4571	Al203 n/a 1.4571	17-4-PH
G250(L) – G400(L)	Polyurethane, Buna N	1.4313 (X 5 CrMoV 18)	1.4112 (hardened)	1.4122	1.3541 n/a 1.4310	17-4-PH
G250VE – G400VE	UHMWPE, Viton	1.4313 (X 5 CrMoV 18)	1.4112 (hardened)	1.4122	Al203 n/a 1.4571	17-4-PH
G500(L)	Polyurethane, Buna N	1.4313 (X 5 CrMoV 18)	Piston: Hard metal / Bracket: 1.4112	17-4-PH	1.3541 n/a 1.4571	17-4-PH
GSF10(L) – GSF35(L)	PTFE, Viton	1.4305 303 (X 10 CrNiS 18 9)	1.4112 (hardened)	1.4571	Al203 1.4568 1.4571	n/a
GSF10VE – GSF35VE	UHMWPE, Viton	1.4305 303 (X 10 CrNiS 18 9)	1.4112 (hardened)	1.4571	Al203 1.4568 1.4571	n/a
GSF60(L) – GSF150(L)	PTFE, Viton	1.4305 303 (X 10 CrNiS 18 9)	1.4112 (hardened)	1.4571	Al203 1.4568 1.4571	n/a
GSF60VE – GSF150VE	UHMWPE, Viton	1.4305 303 (X 10 CrNiS 18 9)	1.4112 (hardened)	1.4571	Al203 1.4568 1.4571	n/a



# MAXIMATOR®



## Compressed Air Amplifiers

- For increasing air pressure
- Specific air pressure amplification to suit your requirements
- Connection to electrical supply not necessary
- Operating pressure max. 40 bar



## High Pressure Compressors

- For pressurizing gases (nitrogen, oxygen, inert gases)
- Simple handling
- Intrinsically safe and explosion proof i.e. not electromotive, but pneumatically powered
- Operating pressure max. 1,500 bar



## Gas Assist Injection Systems

- Compressor stations with pneumatic, electric or hydraulic drive
- Control modules with 2, 4 or 8 valves
- Control modules with integrated booster station
- External core pull control systems



## Special Test Benches

- Static compression resistance test
- Bursting pressure test
- Impulse pressure test
- Hoses, pipes, valves, hydraulic components can be tested



## High Pressure Valves, Fittings, Tubing

- Stainless steel design
- Temperatures from -250° C to +650° C for liquids and gases
- Maximum outlet pressures up to 10,500 bar

Your Representative:



MAXIMATOR GmbH

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