Innovative Technologies, Creative Solutions

FMC Technologies

World Proven Reciprocating Pumps

Performance and Value Leader

OIL & GAS

REVERSE OSMOSIS

MINING

INDUSTRIAL

FMC Technologies Pumps are manufactured to ISO-9001 standards at its state-of-the-art facility in Stephenville, Texas.

FMC Technologies reciprocating pumps have provided exceptional performance and value since their introduction in 1884. Backed by over a century of experience on thousands of projects worldwide, FMC Technologies produces a complete range of Piston and Plunger Pumps for many varied markets, including the general industrial market.

Many factors contribute to the ability of FMC Technologies to satisfy customer needs – a broad, high-pressure pump offering – advanced technology and materials – integrated engineering, manufacturing, fabrication, and testing capabilities – worldwide technical assistance – and a proven track record of success in a complete range of applications. Most importantly, FMC Technologies possesses a company-wide commitment to performance and value.

As the pioneer and world leader in Piston and Plunger Pump technology, FMC Technologies delivers pumps in sizes, designs, and materials to meet all customer and industry requirements. FMC Technologies Pumps are setting new standards for low cost of ownership, long service life, and ease of maintenance.

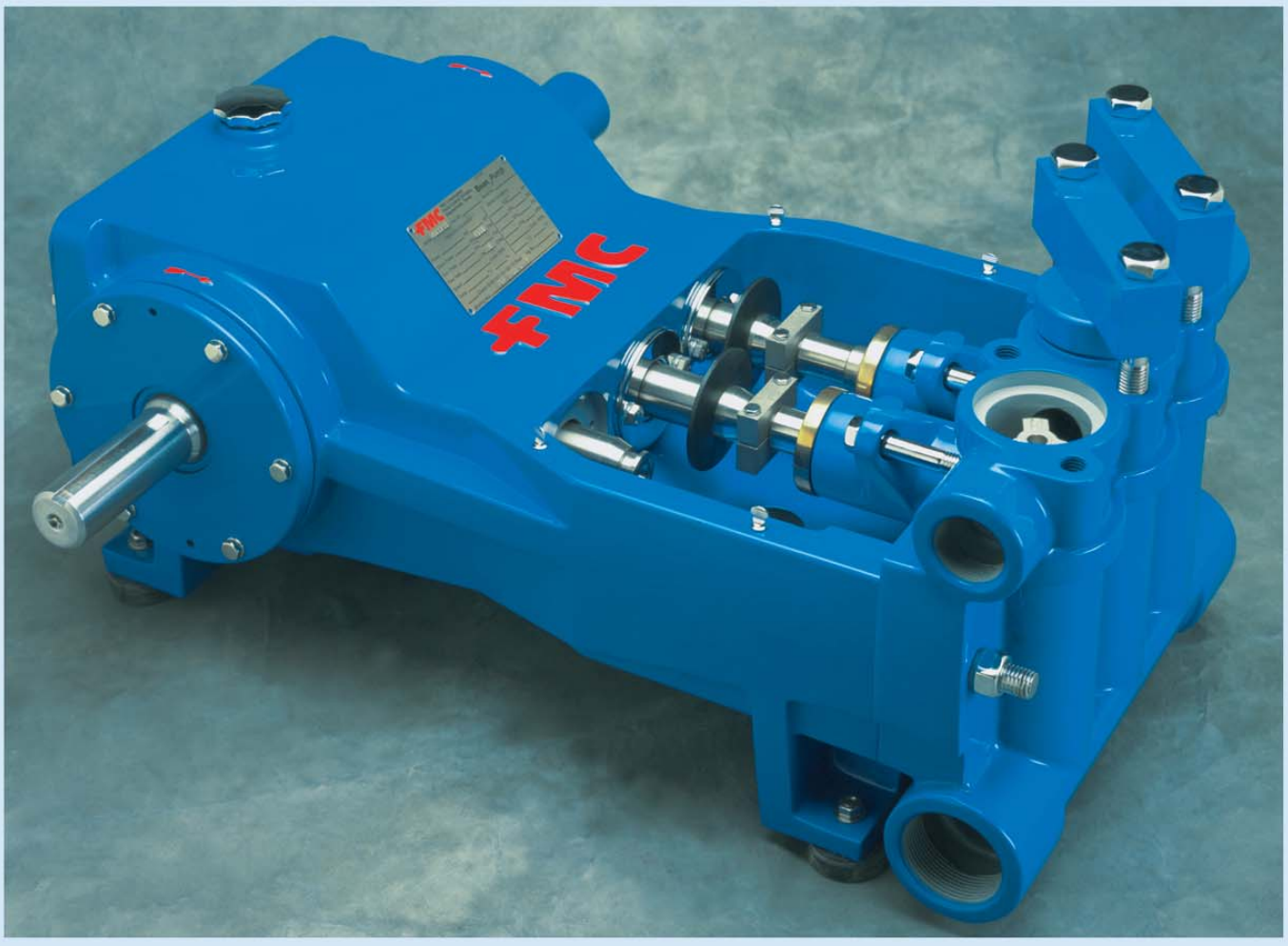
Markets

- Agricultural
- Chemical
- Drilling
- Food processing
- Insulation / fiberglass
- Manufacturing
- Mining
- Oil and gas
- Pulp and paper
- Reverse osmosis
- Rubber / plastic molding
- Steel

Manufacturing

FMC Technologies manufactures its family of Piston and Plunger Pumps at its state-of-the-art facility utilizing the latest in CNC machining centers, production planning systems, CAD/CAM systems, and order and distribution systems. Like other FMC Technologies products, the pump line is manufactured to ISO-9001 quality standards. Every pump is tested prior to shipment to insure that it meets rigorous industry and customer requirements. All tests can be witnessed and certified.

All FMC Technologies Pumps are tested at rated speed and pressure prior to shipment. FMC Technologies also provides a complete range of research and development testing using drilling mud, seawater, and other fluids.



As the performance and value leader in Piston and Plunger Pumps, FMC Technologies provides individual pumps for a complete range of applications and service conditions. (Cutaway of MO8 Series Plunger Pump shown above.)

Pump Packaging

FMC Technologies and its distributors have the resources to deliver turnkey pump packages on a global basis. By combining systems design, engineering, manufacturing, and project management capabilities, FMC Technologies offers proven pump packages for a complete range of applications. From a simple pump package with motor and skid to a complete pumping system with multiple pumps, controls, valves and piping, FMC Technologies delivers.

Research and Development

As the pump industry's performance and value leader, FMC Technologies is investing more capital and manpower in research and development than at any time in its history. Dedicated R&D personnel – using state-of-the-art facilities – are working to refine existing products and to create new pumps designed to satisfy specific customer requirements.

Global Customer Commitment

All pumps and consumable parts are manufactured to precise specifications using advanced materials of construction, specialized machining processes, and rigid quality control measures. As part of its commitment to continuous improvement, FMC Technologies provides comprehensive technical assistance, custom pump designs, and global support.

Applications

Oil & Gas Production

As one of the world's top suppliers of solutions for the global oil and gas industry, FMC Technologies delivers pumps for a complete range of hydrocarbon production, transportation, and refining applications. These world-proven pumps are built to thrive in the most demanding services while providing a safe, effective method of pumping hot , corrosive, and/or hazardous fluids at pressures up to 10,000 psi. Typical applications include:

- Water disposal
- Secondary recovery
- Glycol dewatering
- CO^2 injection
- Amine sweetening
- Chemical injection
- Crude Transfer
- BOP Charging

General Industrial

Reciprocating pumps from FMC Technologies are ideally suited for a wide variety of industrial services where durability, high efficiency, and versatility are paramount. FMC Technologies Pumps are setting new standards for low cost of ownership, long service life, and ease of maintenance in the world's toughest industrial applications. Typical applications in this market include:

- Machine tool coolant
- Mine-dust suppression
- Mine dewatering
- Steam boiler feed
- High-pressure washdown
- Descaling
- Fire protection
- Hydrostatic testing
- Water jet cutting
- Slurries

Reverse Osmosis Water Purification

The high mechanical efficiency of FMC Technologies reciprocating pumps makes them the ideal choice for reverse osmosis systems. The world leader in both commercial and military RO pump technology, FMC Technologies delivers triplex and quintuplex pump solutions for smooth, reliable performance with minimal maintenance requirements. FMC Technologies provides aluminum bronze or stainless steel construction for most RO services, however duplex stainless or exotic materials such as Hastelloy are available for critical, high salinity requirements.

FMC Technologies patented Aqua Pump is the solution for critical RO services where it is necessary to minimize equipment weight and overall dimensions. This pump features a unique composite material construction, oil free drive end, and produces minimal pulsations that could damage membranes.

Other Markets

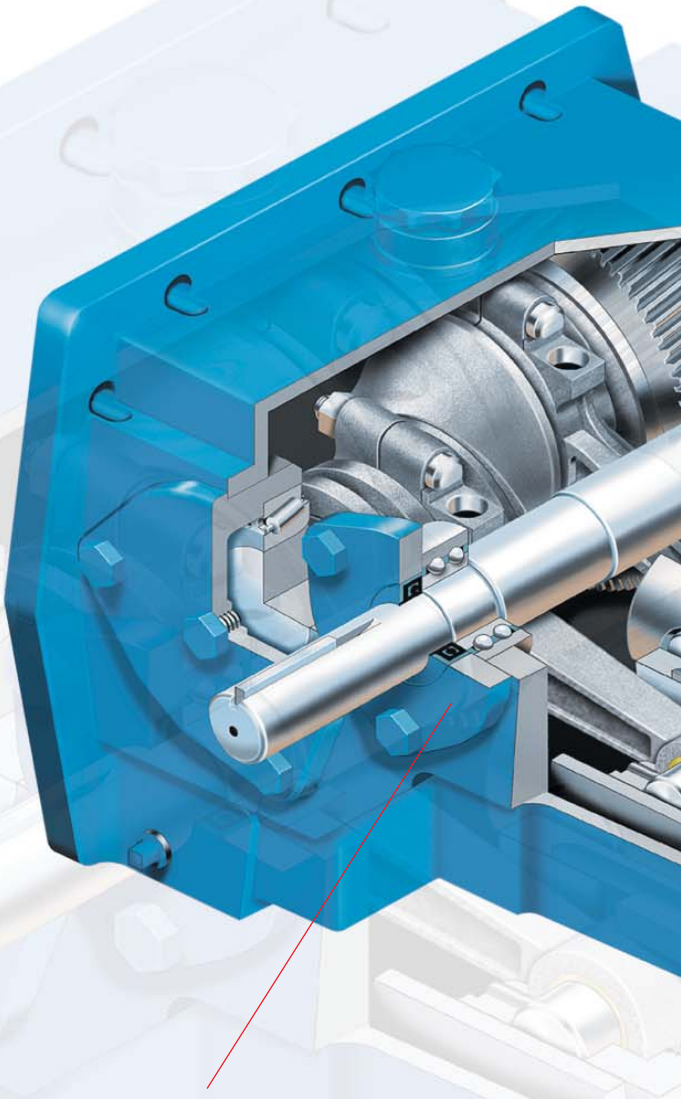
In addition to the services already listed, FMC Technologies is a leading provider of pumping solutions designed for mobile equipment. These pumps feature lightweight, high-performance construction and special designs to allow then to efficiently integrate into the overall equipment package. Consult industry specific product catalogs and data sheets for details about FMC Technologies pumps in the following services:

- Agricultural spraying
- Municipal jetting
- Directional drilling

Piston Pumps

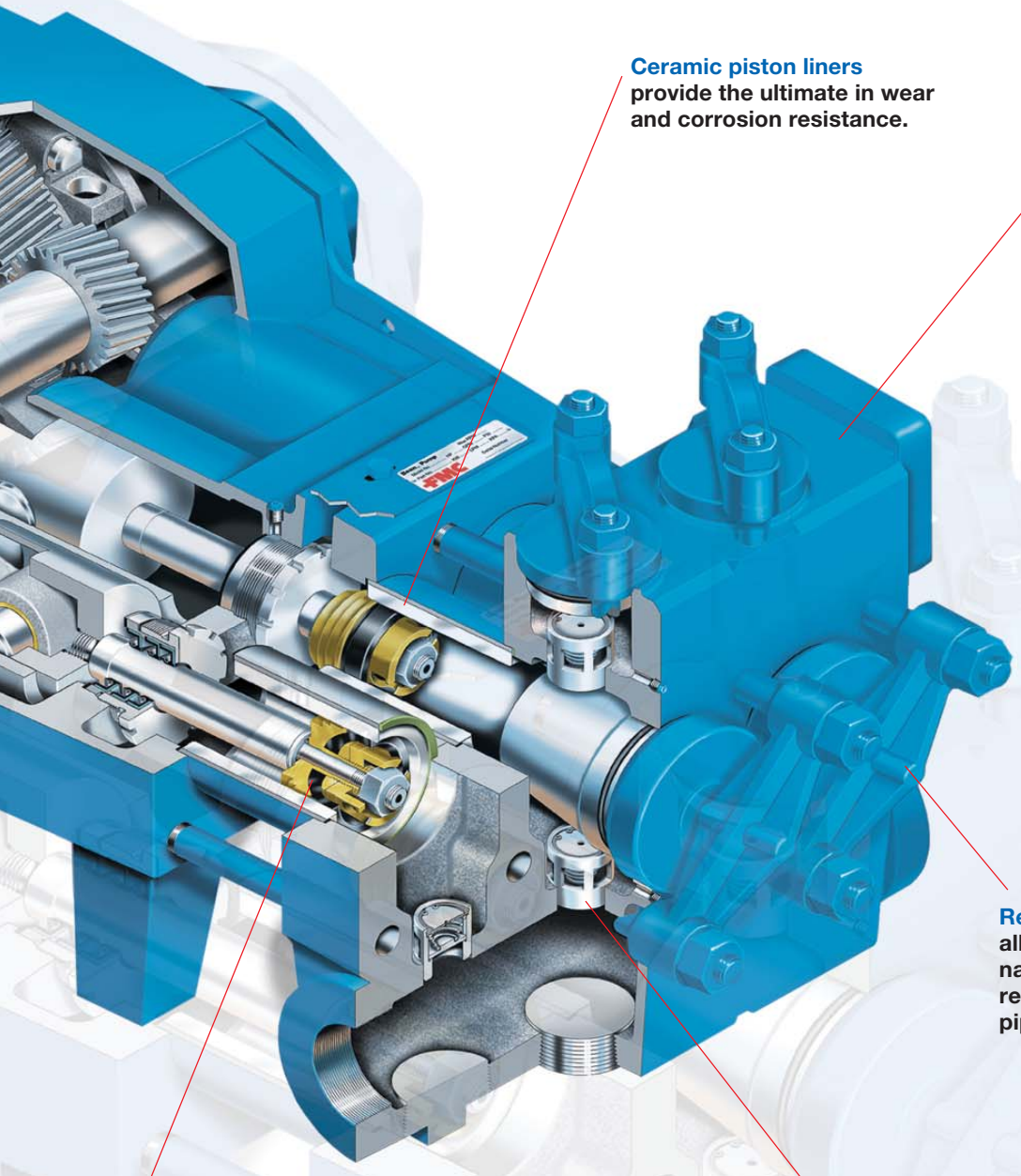
FMC Technologies Piston Pumps provide unsurpassed value for many low to medium pressure applications. Although not recommended for highly corrosive, hazardous, or hot fluids, they are often the most economical choice for pumping a wide variety of fluids. FMC Technologies offers a complete line of Piston Pumps in sizes ranging from 3 to 87 HP (2 to 65 kW); achieving pressures to 2,500 psi (172 bar) and flows to 114 gpm (430 lpm).

Piston Pumps have fewer parts that require maintenance, and they are designed for quick, easy service. These features translate into low cost of ownership and high value for the customer.



Lightweight, compact power frames (many with built-in gear reduction) simplify installation in mobile or space-constrained applications.

Piston Pumps deliver outstanding value and performance in a variety of applications, including abrasive services such as directional drilling using bentonite mud mixtures.



Ceramic piston liners provide the ultimate in wear and corrosion resistance.

Cast ductile iron fluid ends are cost effective and extremely durable. Other alloys are available to meet application requirements.

Removable cylinder covers allow for fast, easy maintenance of the packing without removal of the fluid end or piping.

Piston cup incorporates a unique geometry with composite rubber and fabric construction for reliable, leak-tight performance. The wiping action of the piston cleans the surface of the liner on each suction stroke and provides excellent durability, even in abrasive fluids.

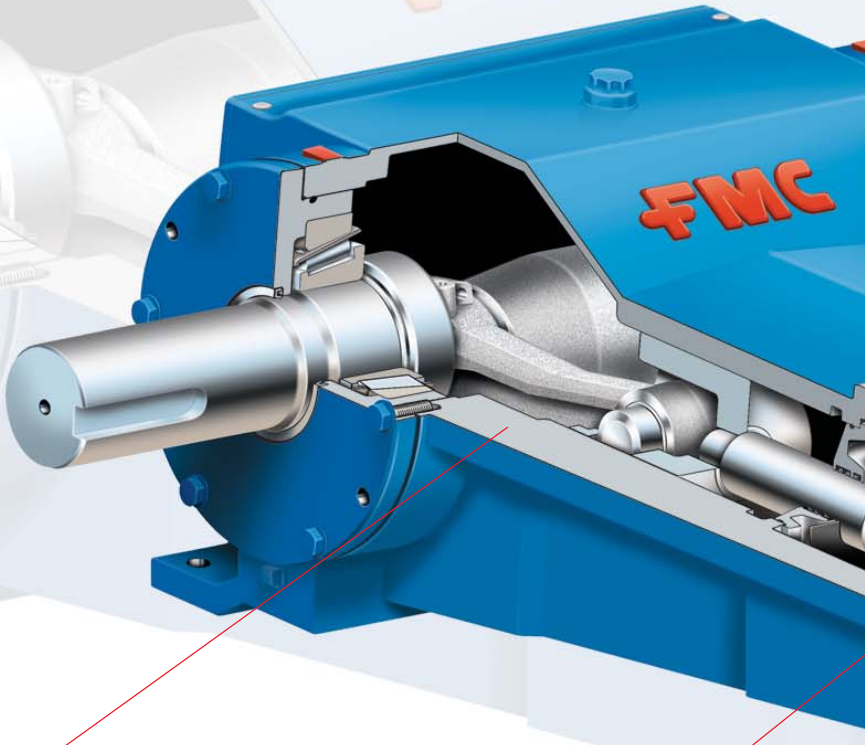
Standard disc valves provide quiet, efficient performance in most applications. Abrasion-resistant and ball-style valves are available to suit high-performance applications.

Plunger Pumps

FMC Technologies Plunger Pumps are an excellent choice for the most demanding applications. Extremely versatile, FMC Technologies Plunger Pumps can be readily adapted for optimum performance in a wide range of service conditions. When properly configured, these pumps can operate at pressures in excess of 10,000 psi (690 bar), flows to 585 gpm (2,215 lpm), and temperatures to 300°F (149°C). Pumps are available in ductile iron, carbon steel, aluminum bronze, duplex stainless steel, and other materials as required.

All pumps have been carefully designed to provide years of operational life. Heavy-duty designs with oversize bearings insure these pumps will deliver value and performance in real world operating conditions. When maintenance is required, FMC Technologies Pumps feature easy access to typical service areas.

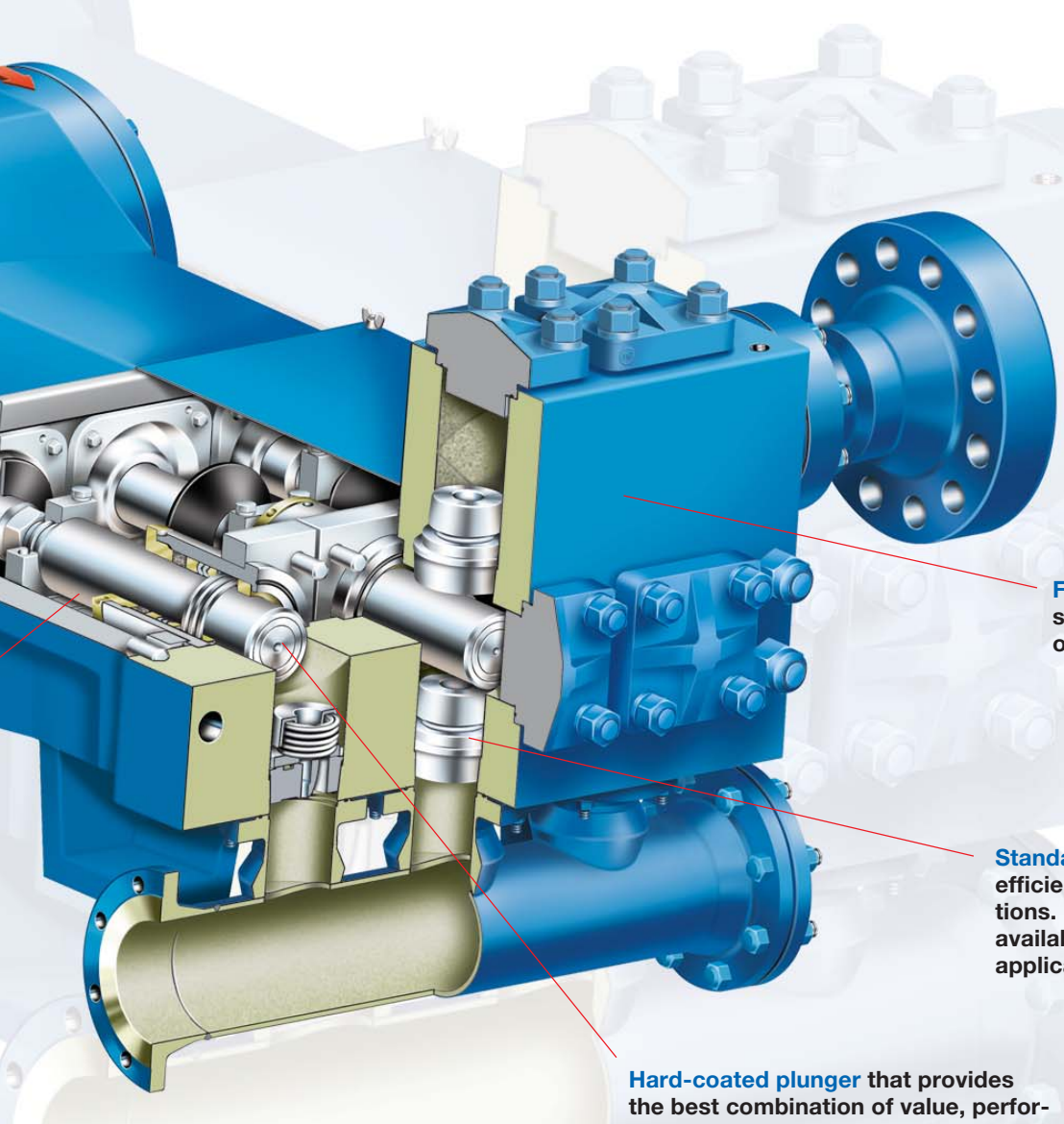
FMC Technologies Plunger Pumps have an outstanding record of dependable service in thousands of installations around the world. This success stems from the ability to combine sound engineering, reliable craftsmanship, and years of pumping experience.



Durable power ends **are designed to provide years of service life. Heavy-duty design features include oversize bearings, precision crafted components, and a reliable splash lubrication system. Pressure oil lube or oil cooling can be added as an option.**

Braided compression packing **made from aramid and PTFE fibers provides excellent overall performance. External lubrication is not required but can be added as an option to extend packing life in many applications. Numerous additional packing styles or materials can be supplied to provide optimal performance in any service.**

Here, a Plunger Pump is packaged in a 10,000 psi (690 bar) blowout preventer control skid for offshore application.



Fluid end wetted parts can be supplied in a wide variety of cast or forged materials.

Standard disc valves provide quiet, efficient performance in most applications. Abrasion-resistant valves are available to suit high-performance applications.

Hard-coated plunger that provides the best combination of value, performance, and corrosion resistance for most applications. Ceramic, tungsten carbide, or other styles are also available.

Pump Specifications 0–61 HP

Pump Selection Procedure

1. Determine your HP requirement using the following equation:

$$HP = \frac{GPM \times PSI}{1714 \times \text{Mechanical Efficiency}}$$

For preliminary sizing, use 85% for the mechanical efficiency, then adjust based on actual efficiency of pump selected.

2. Determine the duty cycle of your application. Intermittent duty applications may operate up to 8 hours a day. All other services should be considered continuous duty.

3. Find the Pump Series under the first column with a HP rating that meets or exceeds the conditions of your application. Continuous HP is listed first. Intermittent HP is listed second.

4. Scan down the Rated Pressure column in the Pump Series selected until you find a model whose maximum pressure rating exceeds the maximum pressure required by your application.

5. Check the appropriate capacity column (Continuous Duty Capacity or Intermittent Duty Capacity) to determine if the pump you selected meets the flow requirements of your application. If not, go to the next larger pump series and repeat Steps 4 and 5.

6. Determine the speed at which the pump will need to operate to produce the desired flow.

$$RPM = \frac{\text{Desired Flow (GPM)}}{\text{Displacement}}$$

Notes:
1. Ratings are based on nominal speeds and pressures and may vary on FMC written approval.
2. Capacities and speeds indicated are based on 100% volumetric efficiency.
3. Intermittent duty is defined as 0-8 operational hours per day. Any service that falls outside of this range should use continuous duty ratings.
4. Dimensions are approximate and based on standard pump models with cast fluid cylinders. Width is measured parallel to the axis of the drive shaft and does not include the shaft extension.

Pump Series	Model	Rated Pressure (psi)	Continuous Duty Capacity	Intermittent Duty Capacity	Gallons per Revolution	Seal Diameter (in)	N
A04 2.6/3.2 HP	A0410	850	4.2 GPM @ 400 RPM	5.3 GPM @ 500 RPM	0.0106	1.250	2
	A0411	700	5.2 GPM @ 400 RPM	6.5 GPM @ 500 RPM	0.0129	1.375	2
	A0413	550	7.2 GPM @ 400 RPM	9.0 GPM @ 500 RPM	0.0180	1.625	2
I04 2.6/3.2 HP	I0410	850	4.2 GPM @ 400 RPM	5.3 GPM @ 500 RPM	0.0106	1.250	2
	I0411	700	5.2 GPM @ 400 RPM	6.5 GPM @ 500 RPM	0.0129	1.375	2
	I0413	550	7.2 GPM @ 400 RPM	9.0 GPM @ 500 RPM	0.0180	1.625	2
M04 2.8/4.2 HP	M0405	1,750	2.4 GPM @ 600 RPM	3.6 GPM @ 900 RPM	0.0040	0.625	3
	M0406	1,250	3.4 GPM @ 600 RPM	5.1 GPM @ 900 RPM	0.0057	0.750	3
E04 6.1/7.0 HP	E0410	850	9.5 GPM @ 450 RPM	10.9 GPM @ 515 RPM	0.0212	1.250	4
	E0411	700	11.6 GPM @ 450 RPM	13.2 GPM @ 515 RPM	0.0257	1.375	4
	E0413	550	16.2 GPM @ 450 RPM	18.5 GPM @ 515 RPM	0.0359	1.625	4
L09 11.6/13.8 HP	L0913	1,200	12.6 GPM @ 750 RPM	15.0 GPM @ 890 RPM	0.0168	1.625	3
	L0914	1,000	14.6 GPM @ 750 RPM	17.4 GPM @ 890 RPM	0.0195	1.750	3
	L0918	700	24.2 GPM @ 750 RPM	28.7 GPM @ 890 RPM	0.0323	2.250	3
L06 12.3/17.6 HP	L0614	1,000	16.4 GPM @ 350 RPM	23.5 GPM @ 500 RPM	0.0469	1.750	3
	L0618	700	27.1 GPM @ 350 RPM	38.8 GPM @ 500 RPM	0.0775	2.250	3
L06-HV 15.1/20.7 HP	L0614-HV	1,200	18.8 GPM @ 400 RPM	25.8 GPM @ 550 RPM	0.0469	1.750	3
	L0618-HV	750	31.0 GPM @ 400 RPM	42.6 GPM @ 550 RPM	0.0775	2.250	3
M06 16.6/20.9 HP	M0605	8,800	2.9 GPM @ 475 RPM	3.6 GPM @ 600 RPM	0.0060	0.625	3
	M0606	6,100	4.1 GPM @ 475 RPM	5.2 GPM @ 600 RPM	0.0086	0.750	3
	M0608	3,400	7.3 GPM @ 475 RPM	9.2 GPM @ 600 RPM	0.0153	1.000	3
	M0610	2,200	11.4 GPM @ 475 RPM	14.3 GPM @ 600 RPM	0.0239	1.250	3
	M0612	1,500	16.3 GPM @ 475 RPM	20.6 GPM @ 600 RPM	0.0344	1.500	3
	M0614	1,120	22.3 GPM @ 475 RPM	28.1 GPM @ 600 RPM	0.0469	1.750	3
	M0615	1,000	25.6 GPM @ 475 RPM	32.3 GPM @ 600 RPM	0.0538	1.875	3
L09-HV 22.6/27.1 HP	L0913-HV	1,500	22.7 GPM @ 375 RPM	27.3 GPM @ 450 RPM	0.0606	1.625	3
	L0914-HV	1,300	26.4 GPM @ 375 RPM	31.6 GPM @ 450 RPM	0.0703	1.750	3
	L0918-HV	800	43.6 GPM @ 375 RPM	52.3 GPM @ 450 RPM	0.1162	2.250	3
M09 26/33 HP	M0906	6,900	5.5 GPM @ 425 RPM	7.1 GPM @ 550 RPM	0.0129	0.750	3
	M0908	3,900	9.7 GPM @ 425 RPM	12.6 GPM @ 550 RPM	0.0229	1.000	3
	M0910	2,500	15.3 GPM @ 425 RPM	19.7 GPM @ 550 RPM	0.0359	1.250	3
	M0912	1,750	21.9 GPM @ 425 RPM	28.4 GPM @ 550 RPM	0.0516	1.500	3
	M0915	1,150	34.3 GPM @ 425 RPM	44.4 GPM @ 550 RPM	0.0807	0.750	3
M08 34/45 HP	M0807	7,400	7.0 GPM @ 450 RPM	9.4 GPM @ 600 RPM	0.0156	0.875	3
	M0808	5,650	9.2 GPM @ 450 RPM	12.2 GPM @ 600 RPM	0.0204	1.000	3
	M0810	3,620	14.4 GPM @ 450 RPM	19.1 GPM @ 600 RPM	0.0319	1.250	3
	M0812	2,520	20.7 GPM @ 450 RPM	27.5 GPM @ 600 RPM	0.0459	1.500	3
	M0814	1,850	28.1 GPM @ 450 RPM	37.5 GPM @ 600 RPM	0.0625	1.750	3
	M0816	1,420	36.7 GPM @ 450 RPM	49.0 GPM @ 600 RPM	0.0816	2.000	3
	M0818	1,120	46.5 GPM @ 450 RPM	62.0 GPM @ 600 RPM	0.1033	2.250	3
L11 37/52 HP	L1114	2,500	21.5 GPM @ 900 RPM	30.5 GPM @ 1275 RPM	0.0239	1.750	3
	L1118	1,500	35.5 GPM @ 900 RPM	50.2 GPM @ 1275 RPM	0.0394	2.250	3
	L1122	1,000	53.0 GPM @ 900 RPM	75.1 GPM @ 1275 RPM	0.0589	2.750	3
L12 49/61 HP	L1214	2,500	37.5 GPM @ 325 RPM	46.9 GPM @ 400 RPM	0.0937	1.750	3
	L1218	1,500	62.0 GPM @ 325 RPM	77.5 GPM @ 400 RPM	0.1549	2.250	3
	L1222	1,000	92.6 GPM @ 325 RPM	115.7 GPM @ 400 RPM	0.2314	2.750	3

umber of Cylinders	Stroke Length (in)	Weight (lbs)	Pump Type	Length (in)	Width (in)	Height (in)	Mechanical Efficiency	Ductile Iron	Aluminum Bronze	Stainless Steel	HP Carbon Steel	HP Stainless Steel	API Carbon Steel	API Stainless Steel
	1.00	43	Piston	7.0	8.0	20.5	90%	◆	◆					
	1.00	43	Piston	7.0	8.0	20.5	90%	◆	◆					
	1.00	43	Piston	7.0	8.0	20.5	90%	◆	◆					
	1.00	43	Piston	16.5	8.0	7.0	90%	◆	◆					
	1.00	43	Piston	16.5	8.0	7.0	90%	◆	◆					
	1.00	43	Piston	16.5	8.0	7.0	90%	◆	◆					
	1.00	43	Plunger	16.0	7.5	6.5	90%				◆	◆		
	1.00	43	Plunger	16.0	7.5	6.5	90%	◆	◆		◆	◆		
	1.00	80	Piston	10.0	6.0	18.0	85%	◆	◆					
	1.00	80	Piston	10.0	6.0	18.0	85%	◆	◆					
	1.00	80	Piston	10.0	6.0	18.0	85%	◆	◆					
	2.25	200	Piston	23.5	12.5	11.5	85%	◆						
	2.25	200	Piston	23.5	12.5	11.5	85%	◆						
	2.25	200	Piston	23.5	12.5	11.5	85%	◆						
	1.50	175	Piston	24.0	12.5	12.5	90%	◆	◆					
	1.50	175	Piston	24.0	12.5	12.5	90%	◆	◆					
	1.50	225	Piston	27.5	12.5	12.5	90%	◆	◆	◆				
	1.50	225	Piston	27.5	12.5	12.5	90%	◆	◆	◆				
	1.50	245	Plunger	27.5	12.5	12.5	90%				◆	◆	◆	◆
	1.50	245	Plunger	27.5	12.5	12.5	90%				◆	◆	◆	◆
	1.50	245	Plunger	27.5	12.5	12.5	90%	◆	◆	◆	◆	◆	◆	◆
	1.50	245	Plunger	27.5	12.5	12.5	90%	◆	◆	◆	◆	◆	◆	◆
	1.50	245	Plunger	27.5	12.5	12.5	90%	◆	◆	◆	◆	◆	◆	◆
	1.50	245	Plunger	27.5	12.5	12.5	90%	◆	◆	◆	◆	◆	◆	◆
	1.50	245	Plunger	27.5	12.5	12.5	90%	◆	◆	◆	◆	◆	◆	◆
	2.25	325	Piston	30.0	14.0	12.5	90%	◆	◆	◆				
	2.25	325	Piston	30.0	14.0	12.5	90%	◆	◆	◆				
	2.25	325	Piston	30.0	14.0	12.5	90%	◆	◆	◆				
	2.25	350	Plunger	30.0	14.0	12.5	90%				◆	◆	◆	◆
	2.25	350	Plunger	30.0	14.0	12.5	90%	◆	◆	◆	◆	◆	◆	◆
	2.25	350	Plunger	30.0	14.0	12.5	90%	◆	◆	◆	◆	◆	◆	◆
	2.25	350	Plunger	30.0	14.0	12.5	90%	◆	◆	◆	◆	◆	◆	◆
	2.00	550	Plunger	30.0	17.0	17.0	90%				◆	◆	◆	◆
	2.00	550	Plunger	33.0	17.0	17.0	90%				◆	◆	◆	◆
	2.00	550	Plunger	33.0	17.0	17.0	90%				◆	◆	◆	◆
	2.00	550	Plunger	33.0	17.0	17.0	90%	◆	◆	◆	◆	◆	◆	◆
	2.00	550	Plunger	33.0	17.0	17.0	90%	◆	◆	◆	◆	◆	◆	◆
	2.00	550	Plunger	33.0	17.0	17.0	90%	◆	◆	◆	◆	◆	◆	◆
	2.00	550	Plunger	33.0	17.0	17.0	90%	◆	◆	◆	◆	◆	◆	◆
	2.00	550	Plunger	33.0	17.0	17.0	90%	◆	◆	◆	◆	◆	◆	◆
	2.75	460	Piston	32.5	17.0	14.5	85%				◆	◆		
	2.75	460	Piston	32.5	17.0	14.5	85%	◆	◆		◆	◆		
	2.75	460	Piston	32.5	17.0	14.5	85%	◆	◆		◆	◆		
	3.00	475	Piston	34.0	20.0	13.0	90%				◆	◆		
	3.00	475	Piston	34.0	20.0	13.0	90%	◆	◆		◆	◆		
	3.00	475	Piston	34.0	20.0	13.0	90%	◆	◆		◆	◆		

Pump Specifications 62–190 HP

Pump Selection Procedure

1. Determine your HP requirement using the following equation:

$$HP = \frac{GPM \times PSI}{1714 \times \text{Mechanical Efficiency}}$$

For preliminary sizing, use 85% for the mechanical efficiency, then adjust based on actual efficiency of pump selected.

2. Determine the duty cycle of your application. Intermittent duty applications may operate up to 8 hours a day. All other services should be considered continuous duty.

3. Find the Pump Series under the first column with a HP rating that meets or exceeds the conditions of your application. Continuous HP is listed first. Intermittent HP is listed second.

4. Scan down the Rated Pressure column in the Pump Series selected until you find a model whose maximum pressure rating exceeds the maximum pressure required by your application.

5. Check the appropriate capacity column (Continuous Duty Capacity or Intermittent Duty Capacity) to determine if the pump you selected meets the flow requirements of your application. If not, go to the next larger pump series and repeat Steps 4 and 5.

6. Determine the speed at which the pump will need to operate to produce the desired flow.

$$RPM = \frac{\text{Desired Flow (GPM)}}{\text{Displacement}}$$

Notes:
1. Ratings are based on nominal speeds and pressures and may vary on FMC written approval.
2. Capacities and speeds indicated are based on 100% volumetric efficiency.
3. Intermittent duty is defined as 0-8 operational hours per day. Any service that falls outside of this range should use continuous duty ratings.
4. Dimensions are approximate and based on standard pump models with cast fluid cylinders. Width is measured parallel to the axis of the drive shaft and does not include the shaft extension.

Pump Series	Model	Rated Pressure (psi)	Continuous Duty Capacity	Intermittent Duty Capacity	Gallons per Revolution	Seal Diameter (in)	Number of Cylinders
M12 62/77 HP	M1208	7,600	12.2 GPM @ 400 RPM	15.3 GPM @ 500 RPM	0.0306	1.000	3
	M1210	4,900	19.1 GPM @ 400 RPM	23.9 GPM @ 500 RPM	0.0478	1.250	3
	M1212	3,400	27.5 GPM @ 400 RPM	34.4 GPM @ 500 RPM	0.0688	1.500	3
	M1214	2,500	37.5 GPM @ 400 RPM	46.9 GPM @ 500 RPM	0.0937	1.750	3
	M1216	1,900	49.0 GPM @ 400 RPM	61.2 GPM @ 500 RPM	0.1224	2.000	3
	M1218	1,500	62.0 GPM @ 400 RPM	77.5 GPM @ 500 RPM	0.1549	2.250	3
	M1220	1,250	76.5 GPM @ 400 RPM	95.6 GPM @ 500 RPM	0.1912	2.500	3
	M1222	1,000	92.6 GPM @ 400 RPM	115.7 GPM @ 500 RPM	0.2314	2.750	3
	M1224	850	110.2 GPM @ 400 RPM	137.7 GPM @ 500 RPM	0.2754	3.000	3
L16 66/87 HP	L1614	2,500	34.9 GPM @ 1100 RPM	46.0 GPM @ 1450 RPM	0.0317	1.750	3
	L1616	2,100	45.5 GPM @ 1100 RPM	60.0 GPM @ 1450 RPM	0.0414	2.000	3
	L1618	1,650	57.6 GPM @ 1100 RPM	76.0 GPM @ 1450 RPM	0.0524	2.250	3
	L1622	1,100	86.1 GPM @ 1100 RPM	113.5 GPM @ 1450 RPM	0.0783	2.750	3
M14 88/104 HP	M1410	6,500	23.7 GPM @ 425 RPM	20.9 GPM @ 375 RPM	0.0558	1.250	3
	M1412	4,500	34.1 GPM @ 425 RPM	30.1 GPM @ 375 RPM	0.0803	1.500	3
	M1414	3,300	46.5 GPM @ 425 RPM	41.0 GPM @ 375 RPM	0.1093	1.750	3
	M1416	2,500	60.7 GPM @ 425 RPM	53.6 GPM @ 375 RPM	0.1428	2.000	3
	M1418	2,200	76.8 GPM @ 425 RPM	67.8 GPM @ 375 RPM	0.1807	2.250	3
	M1420	1,600	94.8 GPM @ 425 RPM	83.7 GPM @ 375 RPM	0.2231	2.500	3
	M1422	1,350	114.8 GPM @ 425 RPM	101.3 GPM @ 375 RPM	0.2700	2.750	3
	M1424	1,150	136.6 GPM @ 425 RPM	120.5 GPM @ 375 RPM	0.3213	3.000	3
	M1426	1,000	160.3 GPM @ 425 RPM	141.4 GPM @ 375 RPM	0.3771	3.250	3
	M1428	825	185.9 GPM @ 425 RPM	164.0 GPM @ 375 RPM	0.4373	3.500	3
	M1430	725	213.4 GPM @ 425 RPM	188.3 GPM @ 375 RPM	0.5020	3.750	3
M16 117/142 HP	M1610	8,000	22.3 GPM @ 350 RPM	27.1 GPM @ 425 RPM	0.0637	1.250	3
	M1612	5,500	32.1 GPM @ 350 RPM	39.0 GPM @ 425 RPM	0.0918	1.500	3
	M1614	4,065	43.7 GPM @ 350 RPM	53.1 GPM @ 425 RPM	0.1249	1.750	3
	M1616	3,115	57.1 GPM @ 350 RPM	69.4 GPM @ 425 RPM	0.1632	2.000	3
	M1618	2,460	72.3 GPM @ 350 RPM	87.8 GPM @ 425 RPM	0.2065	2.250	3
	M1620	1,990	89.3 GPM @ 350 RPM	108.4 GPM @ 425 RPM	0.2550	2.500	3
	M1622	1,650	108.0 GPM @ 350 RPM	131.1 GPM @ 425 RPM	0.3085	2.750	3
	M1624	1,385	128.5 GPM @ 350 RPM	156.1 GPM @ 425 RPM	0.3672	3.000	3
	M1626	1,180	150.8 GPM @ 350 RPM	183.1 GPM @ 425 RPM	0.4309	3.250	3
	M1628	1,015	174.9 GPM @ 350 RPM	212.4 GPM @ 425 RPM	0.4998	3.500	3
	M1630	885	200.8 GPM @ 350 RPM	243.8 GPM @ 425 RPM	0.5737	3.750	3
	M1632	775	228.5 GPM @ 350 RPM	277.4 GPM @ 425 RPM	0.6528	4.000	3
	M1634	650	257.9 GPM @ 350 RPM	313.2 GPM @ 425 RPM	0.7369	4.250	3
	M1636	570	289.2 GPM @ 350 RPM	351.1 GPM @ 425 RPM	0.8262	4.500	3
M18 150/190 HP	M1812	6,800	34.1 GPM @ 330 RPM	41.3 GPM @ 400 RPM	0.1033	1.500	3
	M1814	5,000	46.4 GPM @ 330 RPM	56.2 GPM @ 400 RPM	0.1406	1.750	3
	M1816	3,800	60.6 GPM @ 330 RPM	73.4 GPM @ 400 RPM	0.1836	2.000	3
	M1818	3,000	76.7 GPM @ 330 RPM	93.0 GPM @ 400 RPM	0.2324	2.250	3
	M1820	2,400	94.7 GPM @ 330 RPM	114.8 GPM @ 400 RPM	0.2869	2.500	3
	M1822	2,000	114.5 GPM @ 330 RPM	138.8 GPM @ 400 RPM	0.3471	2.750	3
	M1824	1,700	136.3 GPM @ 330 RPM	165.2 GPM @ 400 RPM	0.4131	3.000	3
	M1826	1,400	160.0 GPM @ 330 RPM	193.9 GPM @ 400 RPM	0.4848	3.250	3
	M1828	1,200	185.6 GPM @ 330 RPM	224.9 GPM @ 400 RPM	0.5623	3.500	3
	M1830	1,100	213.0 GPM @ 330 RPM	258.2 GPM @ 400 RPM	0.6455	3.750	3
	M1832	1,000	242.4 GPM @ 330 RPM	293.8 GPM @ 400 RPM	0.7344	4.000	3
	M1834	800	273.6 GPM @ 330 RPM	331.6 GPM @ 400 RPM	0.8291	4.250	3
	M1836	750	306.7 GPM @ 330 RPM	371.8 GPM @ 400 RPM	0.9295	4.500	3

Stroke Length (in)	Weight (lbs)	Pump Type	Length (in)	Width (in)	Height (in)	Mechanical Efficiency	Ductile Iron	Aluminum Bronze	Stainless Steel	HP Carbon Steel	HP Stainless Steel	API Carbon Steel	API Stainless Steel
3.00	950	Plunger	37.5	22.0	20.5	90%				◆	◆	◆	◆
3.00	950	Plunger	37.5	22.0	20.5	90%			◆	◆	◆	◆	◆
3.00	950	Plunger	37.5	22.0	20.5	90%	◆		◆	◆	◆	◆	◆
3.00	950	Plunger	37.5	22.0	20.5	90%	◆	◆	◆	◆	◆	◆	◆
3.00	950	Plunger	37.5	22.0	20.5	90%	◆	◆	◆	◆	◆	◆	◆
3.00	950	Plunger	37.5	22.0	20.5	90%	◆	◆	◆	◆	◆	◆	◆
3.00	950	Plunger	37.5	22.0	20.5	90%	◆	◆	◆	◆	◆	◆	◆
3.00	950	Plunger	37.5	22.0	20.5	90%	◆	◆	◆	◆	◆	◆	◆
3.00	950	Plunger	37.5	22.0	20.5	90%	◆	◆		◆	◆	◆	◆
4.00	705	Piston	38.5	18.0	15.5	85%	◆			◆	◆		
4.00	705	Piston	38.5	18.0	15.5	85%	◆	◆		◆	◆		
4.00	705	Piston	38.5	18.0	15.5	85%	◆	◆		◆	◆		
4.00	705	Piston	38.5	18.0	15.5	85%	◆	◆		◆	◆		
3.50	1,800	Plunger	44.0	24.0	22.0	90%				◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%				◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆		◆	◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆	◆	◆	◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆	◆	◆	◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆	◆	◆	◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆	◆	◆	◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆	◆	◆	◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆	◆	◆	◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆	◆	◆	◆	◆	◆	◆
3.50	1,800	Plunger	44.0	24.0	22.0	90%	◆	◆	◆	◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%				◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%				◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆			◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.00	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%				◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%				◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆			◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆
4.50	2,400	Plunger	53.5	29.0	26.0	90%	◆	◆		◆	◆	◆	◆

Pump Specifications 198-400 HP

Pump Selection Procedure

1. Determine your HP requirement using the following equation:

$$HP = \frac{GPM \times PSI}{1714 \times \text{Mechanical Efficiency}}$$

For preliminary sizing, use 85% for the mechanical efficiency, then adjust based on actual efficiency of pump selected.

2. Determine the duty cycle of your application. Intermittent duty applications may operate up to 8 hours a day. All other services should be considered continuous duty.

3. Find the Pump Series under the first column with a HP rating that meets or exceeds the conditions of your application. Continuous HP is listed first. Intermittent HP is listed second.

4. Scan down the Rated Pressure column in the Pump Series selected until you find a model whose maximum pressure rating exceeds the maximum pressure required by your application.

5. Check the appropriate capacity column (Continuous Duty Capacity or Intermittent Duty Capacity) to determine if the pump you selected meets the flow requirements of your application. If not, go to the next larger pump series and repeat Steps 4 and 5.

6. Determine the speed at which the pump will need to operate to produce the desired flow.

$$RPM = \frac{\text{Desired Flow (GPM)}}{\text{Displacement}}$$

Notes:
1. Ratings are based on nominal speeds and pressures and may vary on FMC written approval.
2. Capacities and speeds indicated are based on 100% volumetric efficiency.
3. Intermittent duty is defined as 0-8 operational hours per day. Any service that falls outside of this range should use continuous duty ratings.
4. Dimensions are approximate and based on standard pump models with cast fluid cylinders. Width is measured parallel to the axis of the drive shaft and does not include the shaft extension.

Pump Series	Model	Rated Pressure (psi)	Continuous Duty Capacity	Intermittent Duty Capacity	Gallons per Revolution	Seal Diameter (in)	Number C...
Q16 198/240 HP	Q1609	10,000	30.1 GPM @ 350 RPM	36.6 GPM @ 425 RPM	0.0861	1.125	5
	Q1610	8,150	37.2 GPM @ 350 RPM	45.1 GPM @ 425 RPM	0.1062	1.250	5
	Q1612	5,650	53.6 GPM @ 350 RPM	65.0 GPM @ 425 RPM	0.1530	1.500	5
	Q1614	4,160	72.9 GPM @ 350 RPM	88.5 GPM @ 425 RPM	0.2082	1.750	5
	Q1616	3,190	95.2 GPM @ 350 RPM	115.6 GPM @ 425 RPM	0.2720	2.000	5
	Q1618	2,520	120.5 GPM @ 350 RPM	146.3 GPM @ 425 RPM	0.3442	2.250	5
	Q1620	2,040	148.8 GPM @ 350 RPM	180.6 GPM @ 425 RPM	0.4250	2.500	5
	Q1622	1,690	180.0 GPM @ 350 RPM	218.5 GPM @ 425 RPM	0.5142	2.750	5
	Q1624	1,420	214.2 GPM @ 350 RPM	260.1 GPM @ 425 RPM	0.6120	3.000	5
	Q1626	1,210	251.4 GPM @ 350 RPM	305.2 GPM @ 425 RPM	0.7182	3.250	5
	Q1628	1,040	291.6 GPM @ 350 RPM	354.0 GPM @ 425 RPM	0.8330	3.500	5
	Q1630	910	334.7 GPM @ 350 RPM	406.4 GPM @ 425 RPM	0.9562	3.750	5
	Q1632	800	380.8 GPM @ 350 RPM	462.4 GPM @ 425 RPM	1.0880	4.000	5
	Q1634	710	429.9 GPM @ 350 RPM	522.0 GPM @ 425 RPM	1.2282	4.250	5
	Q1636	630	482.0 GPM @ 350 RPM	585.2 GPM @ 425 RPM	1.3770	4.500	5
Q18 265/325 HP	Q1811	8,400	47.7 GPM @ 330 RPM	57.8 GPM @ 400 RPM	0.1446	1.375	5
	Q1812	7,100	56.8 GPM @ 330 RPM	68.8 GPM @ 400 RPM	0.1721	1.500	5
	Q1814	5,200	77.3 GPM @ 330 RPM	93.7 GPM @ 400 RPM	0.2343	1.750	5
	Q1816	4,000	101.0 GPM @ 330 RPM	122.4 GPM @ 400 RPM	0.3060	2.000	5
	Q1818	3,100	127.8 GPM @ 330 RPM	154.9 GPM @ 400 RPM	0.3873	2.250	5
	Q1820	2,500	157.8 GPM @ 330 RPM	191.2 GPM @ 400 RPM	0.4781	2.500	5
	Q1822	2,100	190.9 GPM @ 330 RPM	231.4 GPM @ 400 RPM	0.5785	2.750	5
	Q1824	1,800	227.2 GPM @ 330 RPM	275.4 GPM @ 400 RPM	0.6885	3.000	5
	Q1826	1,500	266.6 GPM @ 330 RPM	323.2 GPM @ 400 RPM	0.8080	3.250	5
	Q1828	1,300	309.2 GPM @ 330 RPM	374.8 GPM @ 400 RPM	0.9371	3.500	5
	Q1830	1,100	355.0 GPM @ 330 RPM	430.3 GPM @ 400 RPM	1.0758	3.750	5
	Q1832	1,000	403.9 GPM @ 330 RPM	489.6 GPM @ 400 RPM	1.2240	4.000	5
	Q1834	900	456.0 GPM @ 330 RPM	552.7 GPM @ 400 RPM	1.3818	4.250	5
	Q1836	800	511.2 GPM @ 330 RPM	619.6 GPM @ 400 RPM	1.5491	4.500	5
M28 320/400 HP	M2814	9,350	52.5 GPM @ 240 RPM	65.6 GPM @ 300 RPM	0.2187	1.750	3
	M2816	7,160	68.5 GPM @ 240 RPM	85.7 GPM @ 300 RPM	0.2856	2.000	3
	M2818	5,660	86.8 GPM @ 240 RPM	108.5 GPM @ 300 RPM	0.3615	2.250	3
	M2820	4,580	107.1 GPM @ 240 RPM	133.9 GPM @ 300 RPM	0.4462	2.500	3
	M2822	3,790	129.6 GPM @ 240 RPM	162.0 GPM @ 300 RPM	0.5400	2.750	3
	M2824	3,180	154.2 GPM @ 240 RPM	192.8 GPM @ 300 RPM	0.6426	3.000	3
	M2826	2,710	181.0 GPM @ 240 RPM	226.3 GPM @ 300 RPM	0.7542	3.250	3
	M2828	2,340	209.9 GPM @ 240 RPM	262.4 GPM @ 300 RPM	0.8746	3.500	3
	M2830	2,040	241.0 GPM @ 240 RPM	301.2 GPM @ 300 RPM	1.0041	3.750	3
	M2832	1,790	274.2 GPM @ 240 RPM	342.7 GPM @ 300 RPM	1.1424	4.000	3
	M2834	1,590	309.5 GPM @ 240 RPM	386.9 GPM @ 300 RPM	1.2897	4.250	3
	M2836	1,410	347.0 GPM @ 240 RPM	433.7 GPM @ 300 RPM	1.4458	4.500	3
	M2838	1,270	386.6 GPM @ 240 RPM	483.3 GPM @ 300 RPM	1.6110	4.750	3
	M2840	1,150	428.4 GPM @ 240 RPM	535.5 GPM @ 300 RPM	1.7850	5.000	3
	M2842	1,040	472.3 GPM @ 240 RPM	590.4 GPM @ 300 RPM	1.9680	5.250	3
	M2844	950	518.4 GPM @ 240 RPM	647.9 GPM @ 300 RPM	2.1598	5.500	3
	M2846	870	566.6 GPM @ 240 RPM	708.2 GPM @ 300 RPM	2.3607	5.750	3
	M2848	800	616.9 GPM @ 240 RPM	771.1 GPM @ 300 RPM	2.5704	6.000	3
	M2850	730	669.4 GPM @ 240 RPM	836.7 GPM @ 300 RPM	2.7891	6.250	3

er of Cylinders	Stroke Length (in)	Weight (lbs)	Pump Type	Length (in)	Width (in)	Height (in)	Mechanical Efficiency	Ductile Iron	Aluminum Bronze	Stainless Steel	HP Carbon Steel	HP Stainless Steel	API Carbon Steel	API Stainless Steel
	4.00	4,500	Plunger	53.5	52.0	27.0	90%				◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%				◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%				◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%				◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%		◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%		◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.00	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%				◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%				◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%				◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%				◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%		◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%		◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	4.50	4,500	Plunger	53.5	52.0	27.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%				◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%				◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%				◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%				◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%				◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%				◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%				◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆
	7.00	5,500	Plunger	75.0	40.0	36.0	90%	◆	◆		◆	◆	◆	◆

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