



*Improved technology.  
Extreme reliability.*

We took previous designs and improved on them to develop our MAX2000® Progressing Cavity Pumps. The MAX2000® Progressing Cavity Pumps feature highly reliable pumping characteristics that allow the user to monitor fluid rates with precision.

This extremely reliable piece of equipment is integral in various industrial uses from environmental remediation to food service industries.



**New Features**

• The MAX2000® Progressing Cavity Pump features the only double-seal pin joint in the industry. With improved technology, the “donut” style joint seal has been enhanced. By providing a “boot”, the joint is sealed with amazing reliability. When installed correctly, the boot clamps compress the boot to seal each joint with more than one inch of linear sealed surfaces. This greatly minimizes the potential for contamination of the joint.



• As with centrifugal pumps, we have created a modular design in the MAX2000® Progressing Cavity Pump. This modular design minimizes the need for customers to stock a wide variety of components. In doing so, it is now very easy to change the pumping elements, and alter the pumping characteristic of the MAX2000® Progressing Cavity Pump.

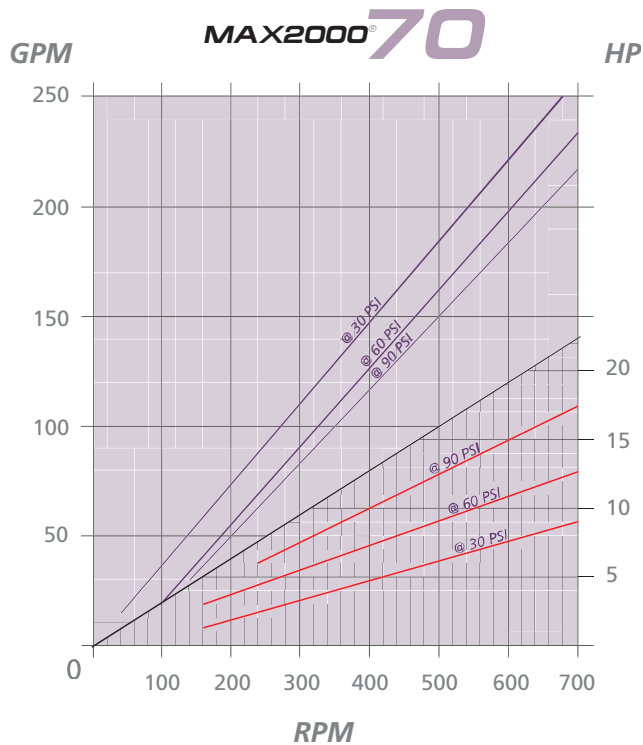
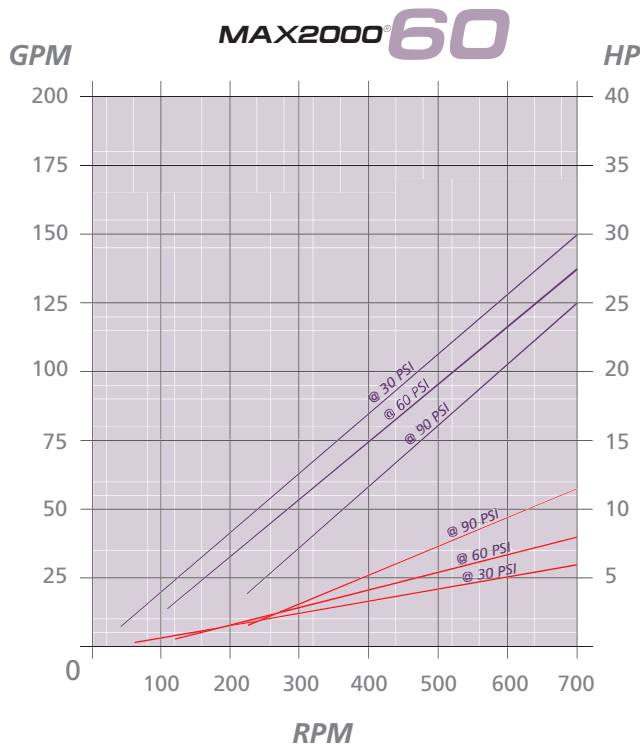


• Unlike most progressive cavity pumps sold in the United States, approximately 98% of the components in our MAX2000® Progressing Cavity Pumps are manufactured in the United States by craftsmen who take great pride in their workmanship.

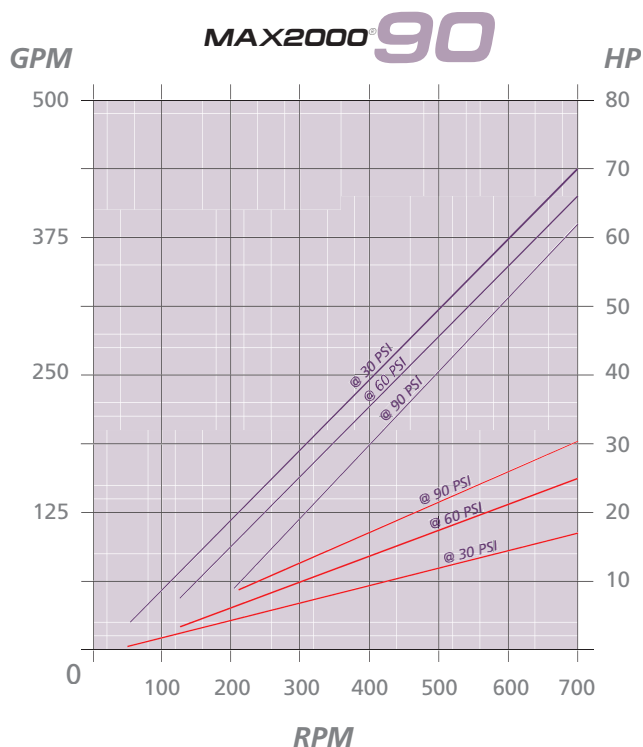
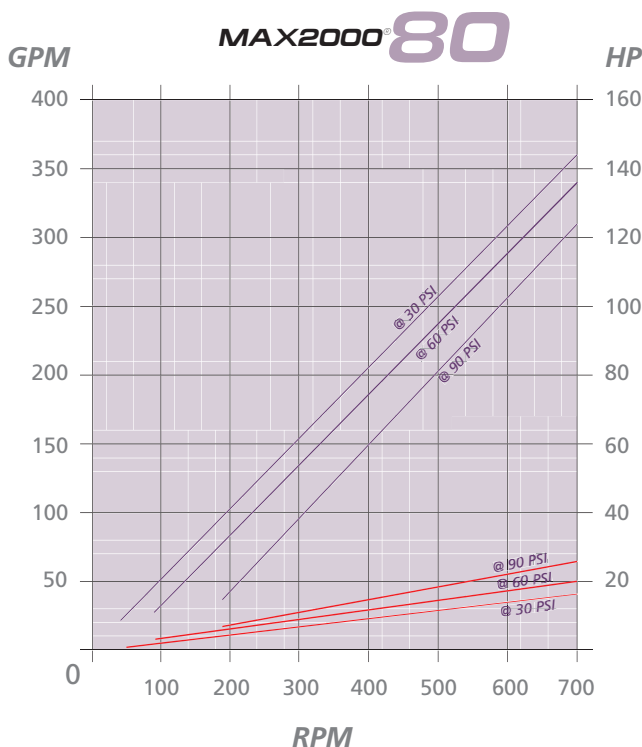




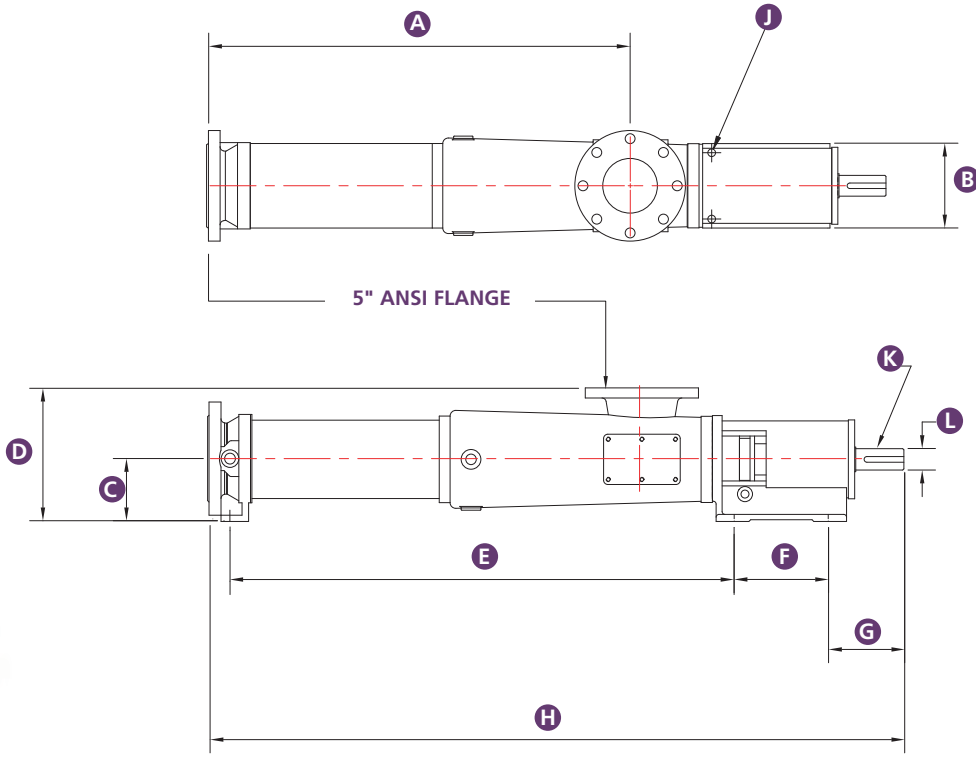
MAX2000® Progressing Cavity Pump Performance Charts



The information contained herein is based on a theoretical calculation of rotor/stator geometry. Based on water at 70°F.



# MAX2000® PC PUMPS



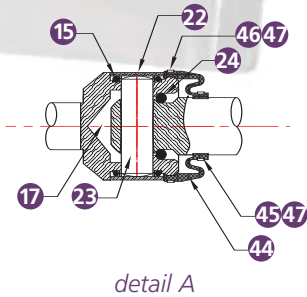
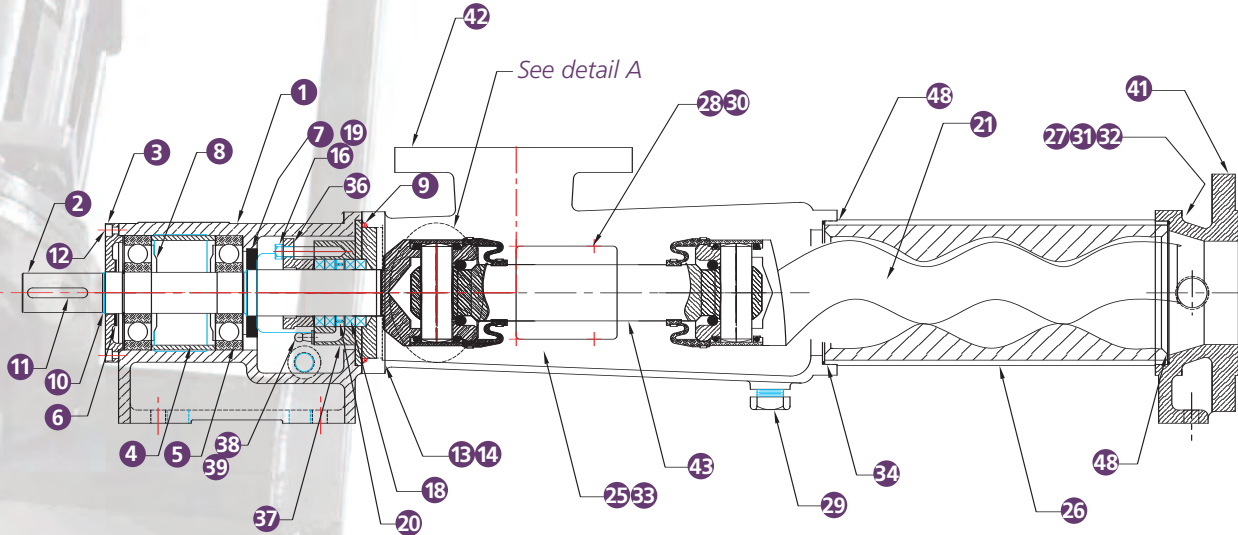
For more information about how PSI can create a customized pump package that is tailored to your needs,

*call 866-866-4PSI (4774)*

## MAX2000® Progressing Cavity Pumps Dimensions

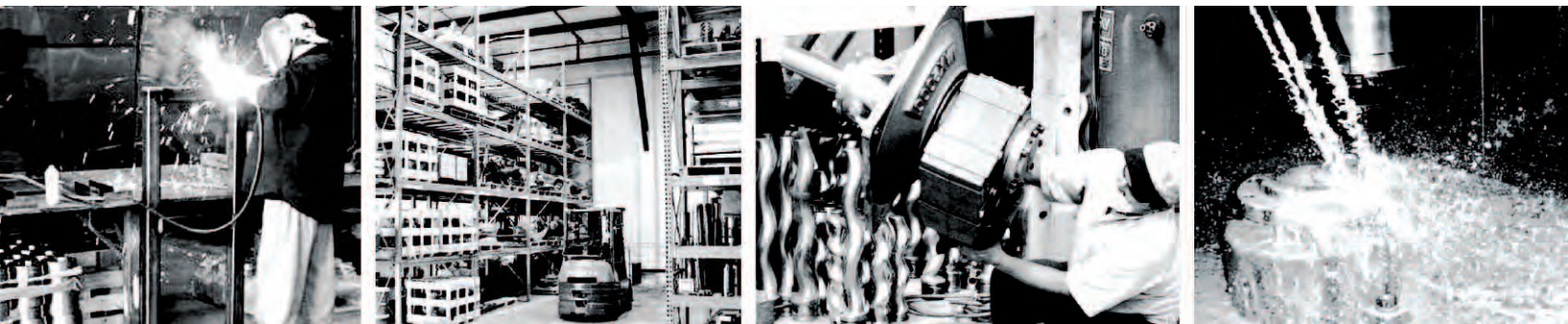
MODELS	A	B	C	D	E	F	G	H	J	K	L
<b>MAX2000 60</b>	33.86"	7.48"	5.51"	11.81"	40.00"	8.27"	6.65"	56.89"	0.71"	1/2"X2-3/8"	1-7/8"
<b>MAX2000 70</b>	42.52"	7.48"	5.51"	11.81"	48.66"	8.27"	6.65"	65.55"	0.71"	1/2"X2-3/8"	1-7/8"
<b>MAX2000 80</b>	38.19"	7.48"	5.51"	11.81"	44.33"	8.27"	6.65"	61.22"	0.71"	1/2"X2-3/8"	1-7/8"
<b>MAX2000 90</b>	42.52"	7.48"	5.51"	11.81"	48.66"	8.27"	6.65"	65.55"	0.71"	1/2"X2-3/8"	1-7/8"

Bill of Material Description Chart



MAX2000® Progressive Cavity Pump Part Number's

DWG#	Description	QTY	DWG#	Description	QTY
0001	Bearing housing	1	0024	Con-Rod Seal	2
0002	Drive Shaft	1	0025	Clean-Out Cover Plate	2
0003	Bolt Style Bearing Cover	1	0026	Stator	1
0004	Bearing Spacer	1	0027	Through Bolt	4
0005	Ball Bearing	2	0028	Hex Head Cap Screw	12
0006	Snap Ring	1	0029	Drain Plug	4
0007	Grease Seal	1	0030	Lock Washer	12
0008	Internal Bearing Cover	3	0031	Lock Washer	4
0009	Casting Seal	1	0032	Hex head Nut	4
0010	Felt Shaft Seal	1	0033	Clean-Out Port Gasket	2
0011	Drive Shaft Key	1	0034	Stator O-ring	2
0012	Bearing Cover Bolt	8	0036	Packing Gland	1
0013	Hex Head Cap Screw	4	0037	Gland Housing	1
0014	Lock Washer	4	0038	Grease Zerk	1
0015	Pin Joint O-ring	4	0039	Drain Plug	1
0016	Hex Head Cap Screw	2	0041	Discharge Flange 5" ANSI	1
0017	Joint Lubrication	2	0042	Suction Housing	1
0018	Packing Ring	4	0043	Connecting Rod	1
0019	Flat Washer	2	0044	Pin Joint Boot	2
0020	Lantern Ring (split)	1	0045	Boot Clamp (con-rod side)	2
0021	Rotor	1	0046	Boot Clamp (head side)	2
0022	Pin Retaining Sleeve	2	0047	Boot Clamp Bolts	16
0023	Pin	2	0048	Stator Adapter	2



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[WWW.PSIMAX2000.COM](http://WWW.PSIMAX2000.COM)



# PROCESS SOLUTIONS INTERNATIONAL

A DIVISION OF KELBRO, INC.

5119 Hiltonview Drive, Houston, TX 77086

281-893-4774, FAX 281-893-1027



## PC Pump Operation and Maintenance Manual

**“Pumping to the MAX in the New Millennium”**



***Safety First!  
Cautions and General Safety Rules***

This manual contains important information concerning installation, operation, and proper maintenance of the MAX2000<sup>®</sup> PC Pump. To prevent injury to personnel or equipment damage, this manual should be read by those responsible for the installation and operation of the PC Pump. In addition, the safety precautions below should be followed at all times.

- **Lift the pump/pump package only at lift points** that support the unit safely. Use properly rated slings capable of handling the equipment weight.
- The structure on which the pump/pump package is to be installed must be capable of supporting both the static weight and dynamic loads listed in this manual.
- **TURN OFF, LOCK OUT, AND TAG OUT** the electrical power supply to the unit before working on the pump.
- Inspect the unit regularly, and replace damaged or worn components only with parts supplied by the original equipment manufacturer.
- The gearbox on a package has a pre-selected gear ratio or speed range to maximize the output of the pump. The gearing ratio provides a great increase in torque that is transmitted to the pump. **\*\*\*NO ATTEMPT SHOULD BE MADE TO STOP A ROPE OR HOSE OR ANY OTHER OBJECT ONCE IT HAS BEEN WRAPPED AROUND A MOVING SHAFT!!!**
- Before working on the unit for any reason, the unit should be locked out and tagged out.

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## MAX2000<sup>®</sup> Technical Bulletin

*In an effort to provide you with a product of the highest quality, the following is a brief layout of changes to the MAX2000<sup>®</sup> PC pumps.*

*\*\*\*Please note that the MAX2000<sup>®</sup> pump is being manufactured by PSI and should not be associated with other PC pump manufacturers, hence the new name.*

### **NEW FEATURES**

- 1) The only double seal pin joint in the industry. Improving upon previous technology, the "donut" style joint seal has been enhanced. By providing a "boot", the joint is sealed with amazing reliability. When installed correctly, the boot clamps provide compression of the boot to seal each joint with over 1 full inch of linear sealed surfaces. This greatly minimizes the potential for contamination of the joint.
- 2) Joint lubrication is now being provided by and extreme pressure, molybdenum fortified grease that can withstand temperature of -10° to 350° F. This grease is also resistant to "wash out", in the event of seal failure, it allows for a constant layer of lubrication.
- 3) The materials of construction have been engineered to provide components that are well suited for industrial applications. The pump internals have been machined to tolerances that assure accuracy of assembly and exceptional performance in the field. Each component has been designed to provide reliable operation of the pump. The methods and procedures performed to manufacture the pump components maximize their uniformity and compatibility to each other.
- 4) As with centrifugal pumps, we have created a modular design, this minimizes the need for customers to stock a wide variety of components. In doing so, it is now very easy to change the pumping elements and alter the pumping characteristic of the MAX2000<sup>®</sup>. The MAX2000<sup>®</sup> drive shaft now has a diameter of 1-7/8", the same diameter for couplings as the 178 and 250 or Magnum series of centrifugal pumps.
- 5) With the "modular" design, the bearing sizes of several pumps have increased, this will enhance the bearing life in these MAX2000<sup>®</sup> PC Pump.
- 6) To maximize the joint integrity and longevity, the angularity required in the connecting rod has been reduced. This decreases the amount of surface area contact (movement) required to achieve a complete revolution of the pump.
- 7) Unlike most progressive cavity pumps being sold in the United States, ~98% of the components in the MAX2000<sup>®</sup> pumps are manufactured in the United States by Americans who take great pride in their workmanship.

PSI has incorporated numerous changes into the MAX2000<sup>®</sup> PC Pump. Some of these changes are subtle and some are very obvious. Each of these changes has provided the MAX2000<sup>®</sup> PC Pump with the potential to provide an unparalleled reliability. As with all equipment, if abused or misused, the life expectancy is greatly diminished. We at PSI are very proud of our exciting new product line and hope that you, too, will **"PUMP TO THE MAX IN THE NEW MILLENNIUM"**.

# Process Solutions International

5119 Hiltonview Road

Houston, TX 77086

Phone 281-893-4774; Fax 281-893-1027

## **MAX2000<sup>®</sup> Pump: Start Up and Running Procedures**

1. When you receive your new pumping unit, please do some preliminary inspections.
2. Check to see that all bolts and nuts are tightened to secure the equipment to the skid and that all safety equipment is installed correctly.
3. If the gearbox has a sight glass, check the oil level, with the unit sitting level to the ground.
4. Before starting the pump, make sure the packing gland is filled with grease. If grease is needed, remove the grease plug from the gland housing. Opposite of the grease zerk. Water resistant/marine grade synthetic grease is a recommendation. The bolts on the packing gland should be loose. They need only to be finger tight once the grease has been applied and the grease plug replaced. Please take care when filling with grease. Over greasing can cause a breakage of the packing gland, due to pressure build up. (Most grease guns can generate 10,000 psi)
5. The packing gland is designed to leak. It is very important to understand that this is acceptable. An attempt to prevent a slight leakage of the packing will cause a premature wearing of the drive shaft and facilitate the wearing of the pump internals.
6. When flanging up the unit on the discharge and suction, make sure that all connections ensure a good seal. The progressive cavity pump will form suction when in operation and will pull air through any avenue that it can find.
7. For three phase motors, check rotation of the motor. On an inline skid design, from the drive end looking toward the discharge end of pump, the pump is designed to turn in a counter clockwise rotation.
8. Prior to energizing the unit, fill the suction housing and the suction line with water or the product that is to be pumped. This will ensure a flooded suction and minimize the wear of the stator at start up.  
\*\*\*If the pump is test run with water and then is not utilized for an extended period of time, the metal rotor and rubber stator can form a very strong seal line, causing the pump to require extra torque to "break" this seal at start up.
9. Once the pump is placed into motion, it is important to monitor the operation of the pump. Frequently checking the discharge of the pump for pressure and volume will aid in providing longevity.
10. Now that the pump is running, the packing gland should be tightened with a wrench to minimize the leakage of the packing. Overly tightening the bolts on the packing gland can cause the gland to break. A ½ turn of the nut per side, alternating sides, is the acceptable manner in which to tighten the gland.

If you are not using any safety measures or control devices on this pump, the pumping unit is a dumb animal. All it knows and wants to do is pump and will in most instances continue attempting to pump if a blockage occurs in the feed line or if it is fed a particle size that is too large for it to pass. If you run the risk of feeding the pump a particle too large to pass, we recommend placing a filter screen on the suction line to prevent these particles from entering the pump. The service life of this unit is very dependent on how well you take care of the unit and its exposure to harmful scenarios.

By following this short list of procedures, you can feel confident, that you have set your pumping unit up in a manner that will provide you with a very reliable service.

## MAX2000® PC PUMP

### *Applications*

The MAX2000® PC Pump has been designed to provide you with reliable service and is ideal for a multitude of applications. Drilling mud, waste water, sludge, slurries and polymerized fluids are just a few of the items that are included in the wide variety of products that are successfully pumped with the MAX2000® PC Pump. Each of these products has unique physical properties that should be noted: high viscosity, abrasive and shear sensitive. Through the use of different elastomers, a MAX2000® PC Pump can be tailored to fit your application. Buna-N (Nitrile) is the standard elastomer provided on a MAX2000® PC Pump. An "Application Data Sheet", should be submitted for review, for all applications. Most importantly, when there are process changes or when alternative products are to be introduced into the system, the components and size of your MAX2000® PC Pump must be checked for compatibility. An Application Data Sheet has been provided, the last page in this IOM Manual, for this purpose and for all future applications.

### *Characteristics*

#### Pump Sizes

Maximum Particle size in inches				
<u>M2-601</u>	<u>M2-701</u>	<u>M2-801</u>	<u>M2-901</u>	<u>M2-1001</u>
.83	1.0	1.1	1.25	1.39

Particle size can be reduced by a screen or filter on the suction side of the pump. However, the screen or filter must be monitored constantly to prevent blocking product flow. A blockage will cause the pump to run dry and destroy the pumping elements. The MAX2000® PC Pump requires a flooded suction.

#### Flow Rate

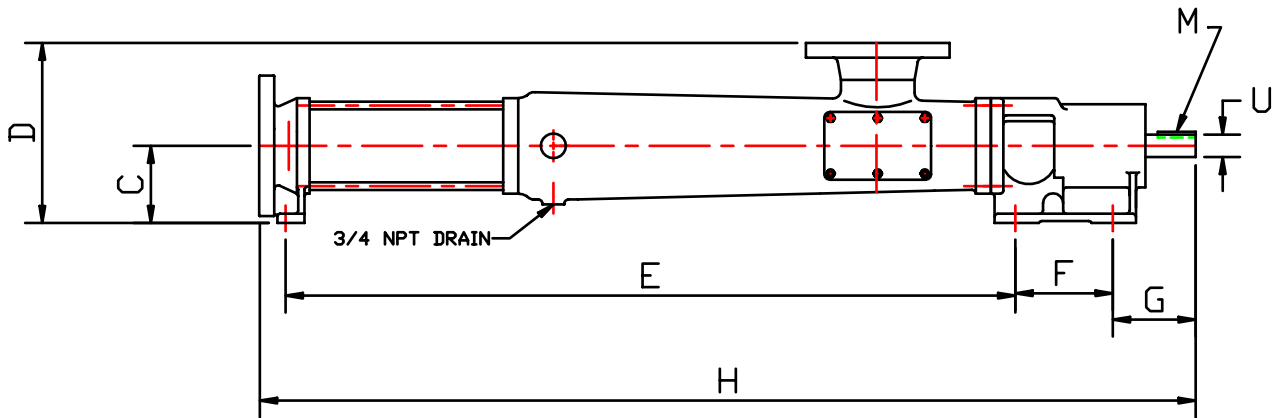
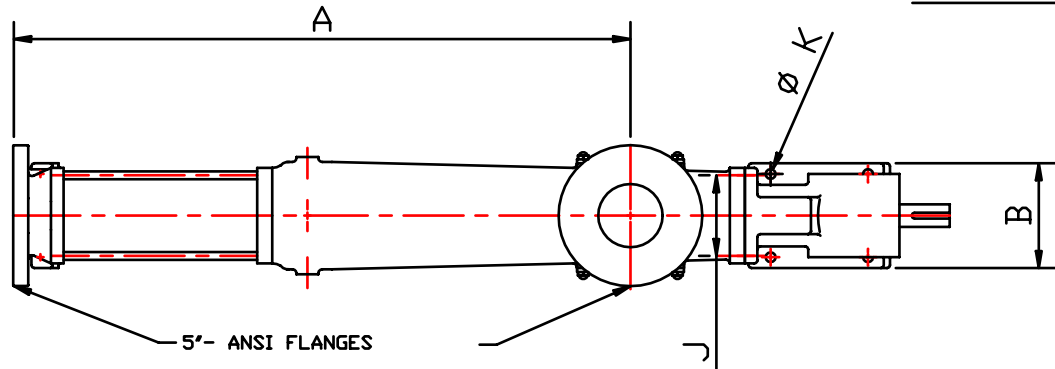
In US gallons				
<u>M2-601</u>	<u>M2-701</u>	<u>M2-801</u>	<u>M2-901</u>	<u>M2-1001</u>
22	37	54	68	105

The listed flow rates are based on 100 RPM and at a zero discharge differential pressure. A zero discharge differential pressure does not suggest an "open ended" discharge. The product discharge line size, viscosity, specific gravity and elevation change must be evaluated to determine discharge pressure. As the discharge pressure increases, a decrease in flow rate will be seen, unless pump rpm is increased. Pump curves are available, upon request only.

From the above information, it is easy to understand that all information relating to a process should be provided to ensure the accuracy in sizing of a MAX2000® PC Pump.

# MAX2000<sup>®</sup> DIMENSIONS

MAX 2000



## MAX2000 DIMENSIONS

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<i>M2 601</i>	33.86"	7.48"	5.51"	11.81"	40.00"	8.27"
<i>M2 701</i>	42.52"	7.48"	5.51"	11.81"	48.66"	8.27"
<i>M2 801</i>	38.19"	7.48"	5.51"	11.81"	44.33"	8.27"
<i>M2 901</i>	42.52"	7.48"	5.51"	11.81"	48.66"	8.27"
<i>M2 1001</i>	55.04"	7.48"	7.50"	15.31"	64.58"	8.27"
	<b>G</b>	<b>H</b>	<b>J</b>	<b>K</b>	<b>M</b>	<b>U</b>
<i>M2 601</i>	6.65"	56.89"	6.10"	0.71"	1/2" X 2-3/8"L	1-7/8"
<i>M2 701</i>	6.65"	65.55"	6.10"	0.71"	1/2" X 2-3/8"L	1-7/8"
<i>M2 801</i>	6.65"	61.22"	6.10"	0.71"	1/2" X 2-3/8"L	1-7/8"
<i>M2 901</i>	6.65"	65.55"	6.10"	0.71"	1/2" X 2-3/8"L	1-7/8"
<i>M2 1001</i>	6.65"	84.00"	6.10"	0.71"	1/2" X 2-3/8"L	1-7/8"

# MAX2000<sup>®</sup> PC PUMP

## Parts List

Replacement parts for the MAX2000<sup>®</sup> PC Pumps can be ordered from Process Solutions International or any of their agents, worldwide. The Drawing labeled "Assembly", page 9, provides you with a drawing number for the parts you can order. A list of the part numbers and description for the drawing numbers is located on subsequent pages. When ordering, provide the part number and description of the part you need. Please include the model number if possible. If you desire a parts list with the "list prices" of replacement parts, contact Process Solutions International using the information listed below.

To order parts, schedule field service or to receive technical support, contact Process Solutions International using the information listed below.



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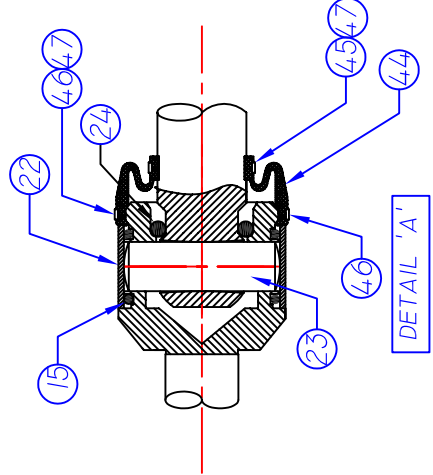
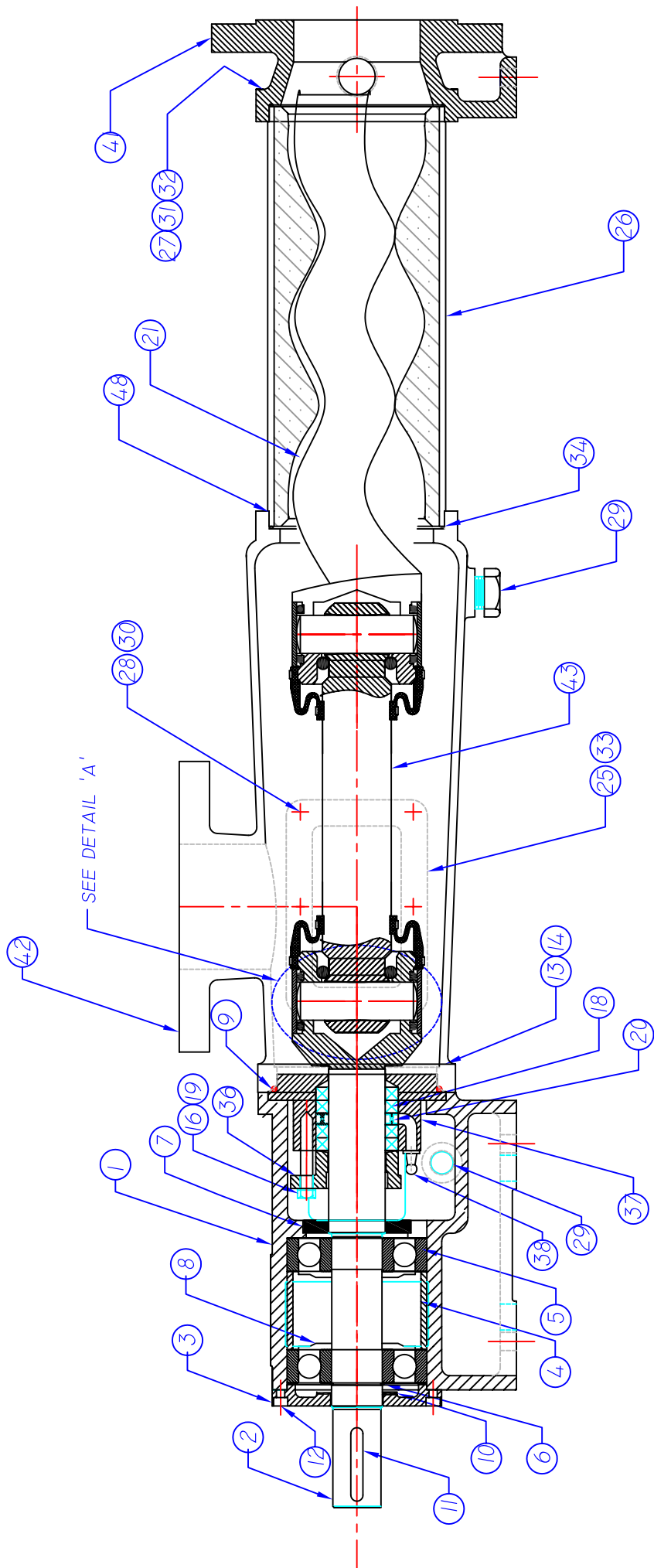
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PROCESS SOLUTIONS INTERNATIONAL  
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TITLE: MAX2000 PUMP - ASSEMBLY

TOLERANCES: (UNLESS OTHERWISE SPECIFIED)	DRAWN BY:	DATE:	MATERIAL:
	TM	02-17-00	
.X = ± .030	APPROVED:	DATE:	FINISH:
.XX = ± .010			
.XXX = ± .005	SCALE:		PART NUMBER:
ANGLES = ± 1/2°	FULL	125	M2 ASSY
			FIT

MAX2000-60  
BILL OF MATERIALS

DWG. #	Description	Part Number	Quantity per Pump
0001	BEARING HOUSING	M2-80001	1
0002	DRIVE SHAFT	M2-80002	1
0003	BOLT STYLE END CAP	M2-80003	1
0004	BEARING SPACER	M2-80004	1
0005	BALL BEARING	M2-80005	2
0006	SNAP RING	M2-80006	1
0007	GREASE SEAL	M2-80007	1
0008	NYLOS RINGS	M2-80008	3
0009	CASTING SEAL	M2-80040	1
0010	SHAFT SEAL	M2-80010	1
0011	DRIVE KEY	M2-80011	1
0012	ALLEN HEAD BOLT	M2-80012	8
0013	HEX HEAD CAP SCREW	M2-80013	4
0014	LOCK WASHER	M2-80014	4
0015	PIN JOINT O-RING	M2-60090	4
0016	PACKING GLAND BOLT	M2-80016	2
0017	GREASE(joint, bearing & packing)	M2-80017	5
0018	PACKING RING	M2-80095	4
0019	FLAT WASHER	M2-80019	2
0020	LANTERN RING	M2-80098	1
0021	ROTOR	M2-60021	1
0022	PIN RETAINER SLEEVE	M2-60121	2
0023	PIN	M2-60023	2
0024	CON ROD SEAL	M2-60024	2
0025	COVER PLATE	M2-80171	2
0026	STATOR	M2-60175	1
0027	THROUGH BOLT	M2-60027	4
0028	HEX HEAD CAP SCREW	M2-80028	12
0029	DRAIN PLUG	M2-80029	4
0030	LOCK WASHER	M2-80030	12
0031	LOCK WASHER	M2-80031	4
0032	HEX HEAD NUT	M2-80032	4
0033	CLEANOUT PORT GASKET	M2-80193	2
0034	STATOR O-RING	M2-80034 & M2-60034	2 & 2
0035	PIPE THREAD TAPE	M2-80035	4
0036	PACKING GLAND SPLIT	M2-80036	1
0037	GLAND HOUSING	M2-80037	1
0038	ZERK	M2-80038	1
0039	DRAIN PLUG	M2-80400	1
0040	PIPE THREAD TAPE	M2-80035	2
0041	DISCHARGE FLANGE	M2-80041	1
0042	SUCTION HOUSING	M2-80042	1
0043	CONNECTING ROD	M2-80043	1
0044	PIN JOINT BOOT	M2-60044	2
0045	BOOT CLAMP (con-rod side)	M2-60045	2
0046	BOOT CLAMP (head side)	M2-60046	2
0047	ALLEN HEAD BOLT (clamp)	M2-60047	16
0048	STATOR ADAPTER	M2-60048	2



MAX2000-70  
BILL OF MATERIALS

DWG. #	Description	Part Number	Quantity per Pump
0001	BEARING HOUSING	M2-80001	1
0002	DRIVE SHAFT	M2-80002	1
0003	BOLT STYLE END CAP	M2-80003	1
0004	BEARING SPACER	M2-80004	1
0005	BALL BEARING	M2-80005	2
0006	SNAP RING	M2-80006	1
0007	GREASE SEAL	M2-80007	1
0008	NYLOS RINGS	M2-80008	3
0009	CASTING SEAL	M2-80040	1
0010	SHAFT SEAL	M2-80010	1
0011	DRIVE KEY	M2-80011	1
0012	ALLEN HEAD BOLT	M2-80012	8
0013	HEX HEAD CAP SCREW	M2-80013	4
0014	LOCK WASHER	M2-80014	4
0015	PIN JOINT O-RING	M2-60090	4
0016	PACKING GLAND BOLT	M2-80016	2
0017	GREASE(joint, bearing & packing)	M2-80017	5
0018	PACKING RING	M2-80095	4
0019	FLAT WASHER	M2-80019	2
0020	LANTERN RING	M2-80098	1
0021	ROTOR	M2-70021	1
0022	PIN RETAINER SLEEVE	M2-60121	2
0023	PIN	M2-60023	2
0024	CON ROD SEAL	M2-60024	2
0025	COVER PLATE	M2-80171	2
0026	STATOR	M2-70175	1
0027	THROUGH BOLT	M2-70027	4
0028	HEX HEAD CAP SCREW	M2-80028	12
0029	DRAIN PLUG	M2-80029	4
0030	LOCK WASHER	M2-80030	12
0031	LOCK WASHER	M2-80031	4
0032	HEX HEAD NUT	M2-80032	4
0033	CLEANOUT PORT GASKET	M2-80193	2
0034	STATOR O-RING	M2-80034 & M2-60034	2 & 2
0035	PIPE THREAD TAPE	M2-80035	4
0036	PACKING GLAND SPLIT	M2-80036	1
0037	GLAND HOUSING	M2-80037	1
0038	ZERK	M2-80038	1
0039	DRAIN PLUG	M2-80400	1
0040	PIPE THREAD TAPE	M2-80035	2
0041	DISCHARGE FLANGE	M2-80041	1
0042	SUCTION HOUSING	M2-80042	1
0043	CONNECTING ROD	M2-80043	1
0044	PIN JOINT BOOT	M2-60044	2
0045	BOOT CLAMP (head side)	M2-60045	2
0046	BOOT CLAMP (con-rod side)	M2-60046	2
0047	ALLEN HEAD BOLT (clamp)	M2-60047	16
0048	STATOR ADAPTER	M2-60048	2

MAX2000-80  
BILL OF MATERIALS

DWG. #	Description	Part Number	Quantity per Pump
0001	BEARING HOUSING	M2-80001	1
0002	DRIVE SHAFT	M2-80002	1
0003	BOLT STYLE END CAP	M2-80003	1
0004	BEARING SPACER	M2-80004	1
0005	BALL BEARING	M2-80005	2
0006	SNAP RING	M2-80006	1
0007	GREASE SEAL	M2-80007	1
0008	NYLOS RINGS	M2-80008	3
0009	CASTING SEAL	M2-80040	1
0010	SHAFT SEAL	M2-80010	1
0011	DRIVE KEY	M2-80011	1
0012	ALLEN HEAD BOLT	M2-80012	8
0013	HEX HEAD CAP SCREW	M2-80013	4
0014	LOCK WASHER	M2-80014	4
0015	PIN JOINT O-RING	M2-60090	4
0016	PACKING GLAND BOLT	M2-80016	2
0017	GREASE(joint, bearing & packing)	M2-80017	5
0018	PACKING RING	M2-80095	4
0019	FLAT WASHER	M2-80019	2
0020	LANTERN RING	M2-80098	1
0021	ROTOR	M2-80021	1
0022	PIN RETAINER SLEEVE	M2-60121	2
0023	PIN	M2-60023	2
0024	CON ROD SEAL	M2-60024	2
0025	COVER PLATE	M2-80171	2
0026	STATOR	M2-80175	1
0027	THROUGH BOLT	M2-80027	4
0028	HEX HEAD CAP SCREW	M2-80028	12
0029	DRAIN PLUG	M2-80029	4
0030	LOCK WASHER	M2-80030	12
0031	LOCK WASHER	M2-80031	4
0032	HEX HEAD NUT	M2-80032	4
0033	CLEANOUT PORT GASKET	M2-80193	2
0034	STATOR O-RING	M2-80034	2
0035	PIPE THREAD TAPE	M2-80035	4
0036	PACKING GLAND SPLIT	M2-80036	1
0037	GLAND HOUSING	M2-80037	1
0038	ZERK	M2-80038	1
0039	DRAIN PLUG	M2-80400	1
0040	PIPE THREAD TAPE	M2-80035	2
0041	DISCHARGE FLANGE	M2-80041	1
0042	SUCTION HOUSING	M2-80042	1
0043	CONNECTING ROD	M2-80043	1
0044	PIN JOINT BOOT	M2-60044	2
0045	BOOT CLAMP (head side)	M2-60045	2
0046	BOOT CLAMP (con-rod side)	M2-60046	2
0047	ALLEN HEAD BOLT (clamp)	M2-60047	16

MAX2000-90  
BILL OF MATERIALS

DWG. #	Description	Part Number	Quantity per Pump
0001	BEARING HOUSING	M2-80001	1
0002	DRIVE SHAFT	M2-90002	1
0003	BOLT STYLE END CAP	M2-80021	1
0004	BEARING SPACER	M2-80004	1
0005	BALL BEARING	M2-80005	2
0006	SNAP RING	M2-80006	1
0007	GREASE SEAL	M2-80007	1
0008	NYLOS RINGS	M2-80008	3
0009	CASTING SEAL	M2-80040	1
0010	SHAFT SEAL	M2-80010	1
0011	DRIVE KEY	M2-80011	1
0012	ALLEN HEAD BOLT	M2-80012	8
0013	HEX HEAD CAP SCREW	M2-80013	4
0014	LOCK WASHER	M2-80014	4
0015	PIN JOINT O-RING	M2-80090	4
0016	PACKING GLAND BOLT	M2-80016	2
0017	GREASE(joint, bearing & packing)	M2-80017	5
0018	PACKING RING	M2-80095	4
0019	FLAT WASHER	M2-80019	2
0020	LANTERN RING	M2-80098	1
0021	ROTOR	M2-90101	1
0022	PIN RETAINER SLEEVE	M2-80121	2
0023	PIN	M2-80023	2
0024	CON ROD SEAL	M2-80024	2
0025	COVER PLATE	M2-80171	2
0026	STATOR	M2-90175	1
0027	THROUGH BOLT	M2-90027	4
0028	HEX HEAD CAP SCREW	M2-80028	12
0029	DRAIN PLUG	M2-80029	4
0030	LOCK WASHER	M2-80030	12
0031	LOCK WASHER	M2-80031	4
0032	HEX HEAD NUT	M2-80032	4
0033	CLEANOUT PORT GASKET	M2-80193	2
0034	STATOR O-RING	M2-80034	2
0035	PIPE THREAD TAPE	M2-80035	4
0036	PACKING GLAND SPLIT	M2-80036	1
0037	GLAND HOUSING	M2-80037	1
0038	ZERK	M2-80038	1
0039	DRAIN PLUG	M2-80400	1
0040	PIPE THREAD TAPE	M2-80035	2
0041	DISCHARGE FLANGE	M2-80041	1
0042	SUCTION HOUSING	M2-80042	1
0043	CONNECTING ROD	M2-80043	1
0044	PIN JOINT BOOT	M2-80044	2
0045	BOOT CLAMP (head side)	M2-80045	2
0046	BOOT CLAMP (con-rod side)	M2-80046	2
0047	ALLEN HEAD BOLT (clamp)	M2-80047	16

## Trouble Shooting Guide

Prior to starting the pump, check the following items:

- Is drive rotation correct?
- Are valves in piping open?
- Are all pipe/hose connections tight?
- Have the suction lines and pump been filled with fluid?

<b>Problem</b>	<b>Possible Cause</b>	<b>Possible Solution</b>
Pump does not start or drive is overloaded	Motor wired incorrectly	Check motor wiring
	Swollen stator	Verify stator elastomer to product being used
	Obstruction in pump	Inspect inside of pump
	Solids content of product too high	Dilute product
	Product hardened or set up in pump	Eliminate air contact in pump, rinse pump out
	Packing gland too tight	Loosen gland
	Drive speed too high	Start pump at lower speed
Lower flow rate than desired	Motor wired incorrectly	Check motor wiring
	High discharge pressure	Confirm ordering parameters
	Suction line leak	Check suction line
	Speed of pump too low	Increase drive speed
	High negative suction pressure	Excessive suction height
	Stator worn	Replace Stator
	Rotor worn	Replace Rotor
Noise during operation	Joint worn	Check joints, replace worn parts
	Ball bearing worn	Replace bearings
	Coupling worn	Replace coupling element
	Pump running dry	Check for product in pump and lines