

HEAVY DUTY HARD CORE PUMPING

PTM
S E R I E S
Diaphragm Pumps



RamParts[®]
Pumps

an ANDRONACO INDUSTRIES company



RamParts pumps is a strategic business unit of ANDRONACO INDUSTRIES located in Kentwood, Michigan. Pictured above is our state of the art 200,000 sq. foot manufacturing facility.

ANDRONACO INDUSTRIES is a group of global manufacturing companies specializing in innovative engineered products, speciality systems, and value added services for the pharmaceutical, chemical, steel, waste water, mining and energy markets. We support autonomous operating companies focused on meeting the demands of their customers requirements in ultrapure and industrial fluid management. Our companies pride themselves on exhibiting the highest ethical, moral and legal stands in the conduct of its business.



RamParts® Pumps

Hard Core Pumping

A super heavy duty, sealless Diaphragm pump designed for continuous operation of the most demanding fluids. Whether it be sludge, abrasives, corrosives, or any combination of the three, RamParts pumps are built to take the punishment.

- Size range from 1-1/2" to 6"
- Flows to 380 GPM
- Pressures to 125 psig
- Temperatures to 300 °F
- Materials of construction
 - Unlined ductile iron
 - Elastomer lined
 - ETFE Lined

RamParts pumps will transfer anything that can flow in a pipeline such as:

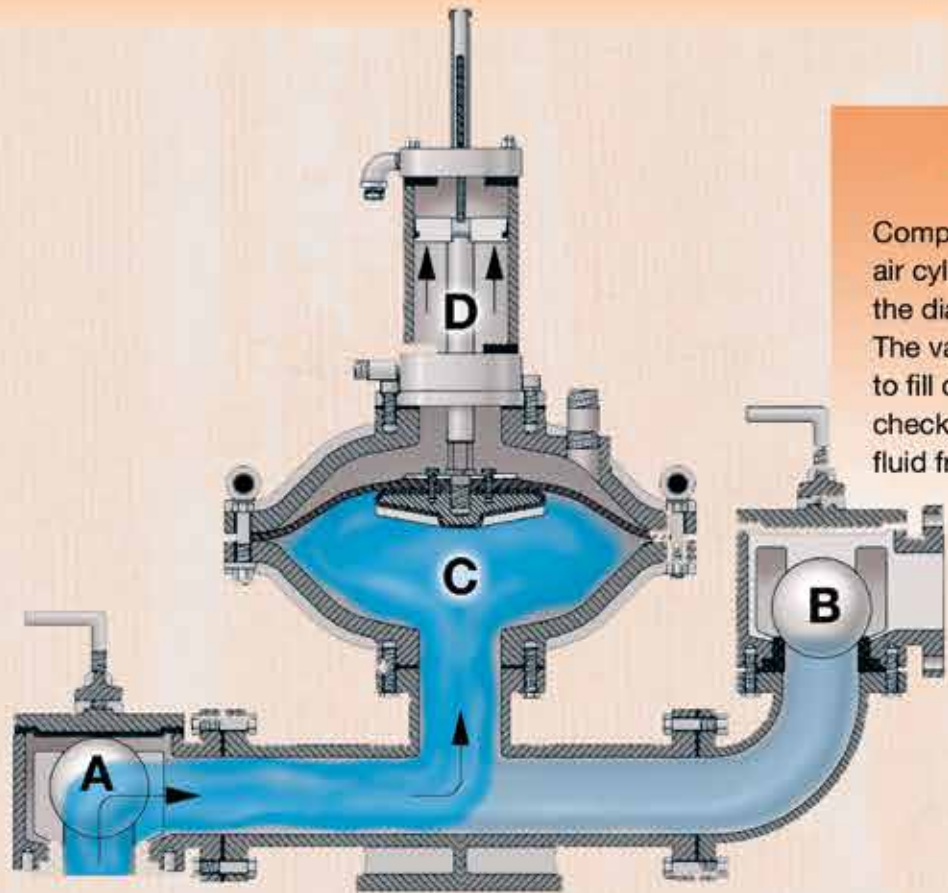
- Viscous slurries / sludge
- Abrasive slurries
- Corrosive slurries
- Shear sensitive slurries
- Delicate crystal slurries
- Slurries with 75% solids



Features

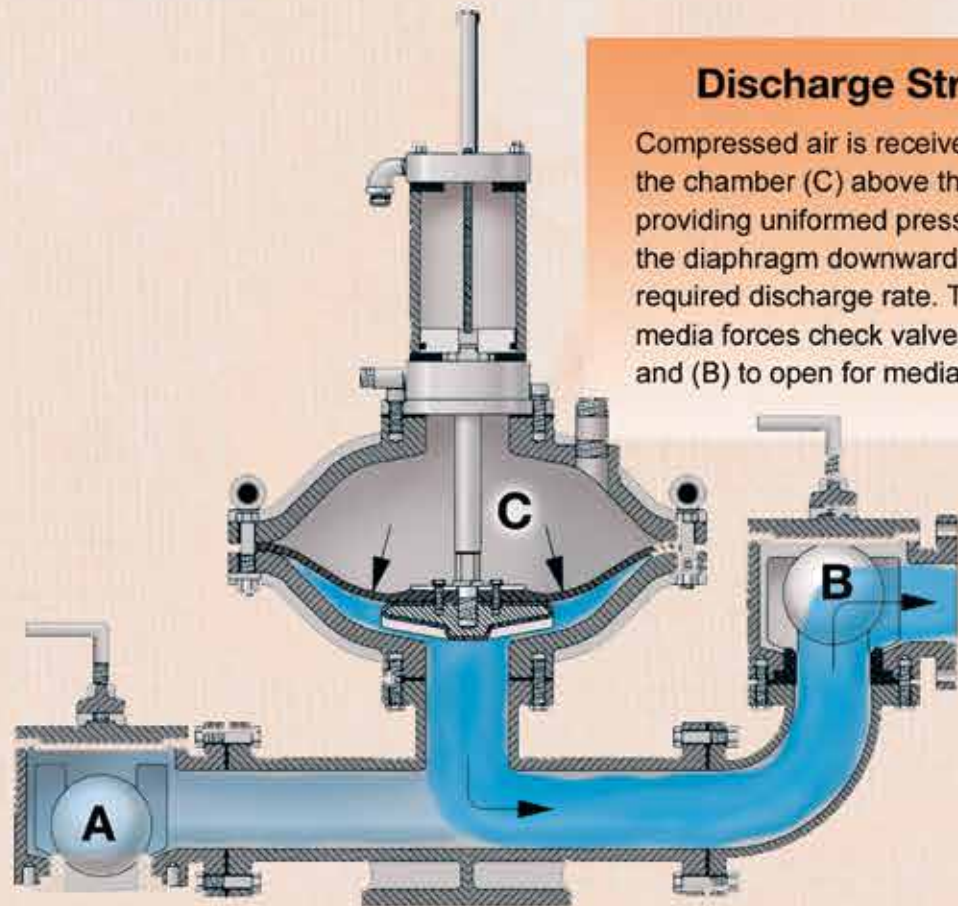
- Both suction and discharge pressures are adjustable
- Sealless design
- Solids handling up to 5" Diameter
- Run dry indefinitely
- Self-priming to 20 feet
- Deadhead without damage
- Minimizes particle degradation
- In-line reparability
- Flow-through design

How It Works *Only 3 wetted moving parts*



Suction / Fill Stroke

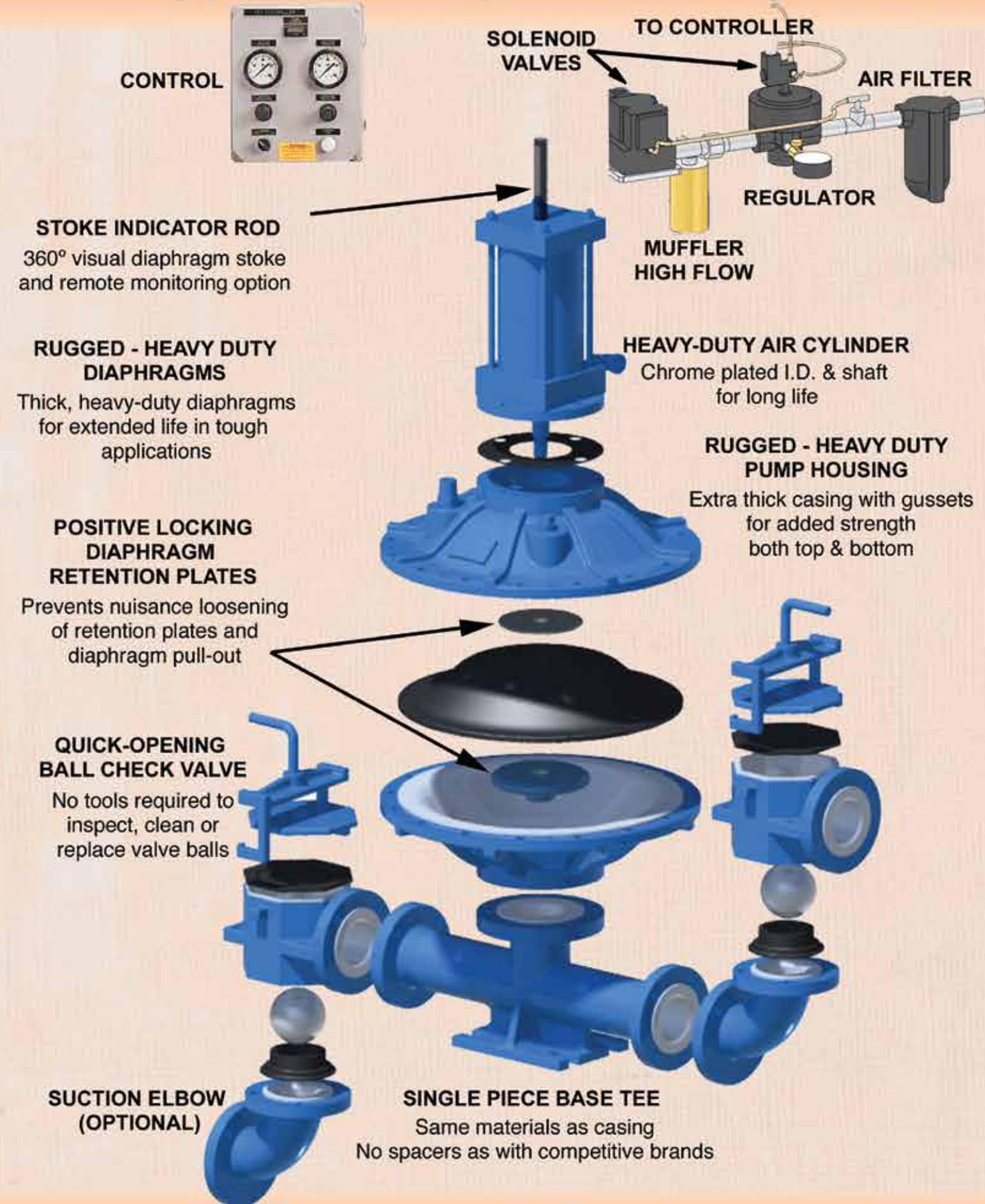
Compressed air energizes the bottom of air cylinder Piston (D) mechanically lifting the diaphragm by the air cylinder shaft. The vacuum created opens check valve (A) to fill chamber (C) and simultaneously closes check valve (B) preventing down stream fluid from returning to pump.



Discharge Stroke

Compressed air is received into the chamber (C) above the diaphragm providing uniformed pressure to push the diaphragm downward at the required discharge rate. The displaced media forces check valve (A) to close and (B) to open for media discharge.

Typical Pump Assembly



STROKE INDICATOR ROD
360° visual diaphragm stroke and remote monitoring option

RUGGED - HEAVY DUTY DIAPHRAGMS
Thick, heavy-duty diaphragms for extended life in tough applications

POSITIVE LOCKING DIAPHRAGM RETENTION PLATES
Prevents nuisance loosening of retention plates and diaphragm pull-out

QUICK-OPENING BALL CHECK VALVE
No tools required to inspect, clean or replace valve balls

SUCTION ELBOW (OPTIONAL)

SINGLE PIECE BASE TEE
Same materials as casing
No spacers as with competitive brands

HEAVY-DUTY AIR CYLINDER
Chrome plated I.D. & shaft for long life

RUGGED - HEAVY DUTY PUMP HOUSING
Extra thick casing with gussets for added strength both top & bottom

Lined and Unlined

Wetted Surfaces Pump Casing, Base Tee, Check Valves



Unlined
Super thick ductile iron wetted surfaces are unlined. Good for mild services such as waste water and fluids with low abrasion characteristics. Stainless available for 2" size.



Lined - Elastomer
Super thick ductile iron castings lined with either Nordel, Neoprene Nitrile or Viton. Better for abrasion resistance and mild corrosive services.



Lined - ETFE Fluoropolymer
Super thick ductile iron casting lined with ETFE fluoropolymer (aka - Tefzel®). Best for chemical resistance and acid slurries.

Material	Temperature Limits	Suitable Applications
ETFE / PTFE	(-) 40 °F TO (+) 300 °F	Outstanding chemical resistance, best for corrosive slurries
DURA - S	(-) 20 °F TO (+) 220 °F	Excellent abrasion resistance, FDA Material, for general purpose
DURA - XL	(-) 40 °F TO (+) 225 °F	Excellent chemical & abrasion resistance
NEOPRENE	(-) 10 °F TO (+) 200 °F	Moderate chemical resistance, good for fats, grease and solvents
NITRILE	(-) 10 °F TO (+) 190 °F	General purpose for oils, water and hydraulic fluids
NORDEL	(-) 40 °F TO (+) 280 °F	Excellent low temperature for dilute acids
VITON	(-) 40 °F TO (+) 300 °F	Excellent chemical resistance, not known for its mechanical flex strength

Diaphragms

The Heart Of the P-Series Pump

At RamParts, we recognize that increase diaphragm life will reduce downtime and reduce maintenance cost. We fine-tune diaphragm design through destructive testing, and critical analysis to provide the longest running pumping action in demanding services.

RamParts diaphragms are available in Nordel, Nitrile, Neoprene Viton, Dura XL (Santoprene) Dura-S (Hytrel) and PTFE.



Check Valve Choices



Quick Opening Ball Check
A quick open yoke style 90 degree configuration ball check valve is designed for easy clean out and inspection without disconnecting any piping. Available lined and unlined in same materials as pump.



(4) Bolt High Pressure Ball Check
(4) bolt top entry style 90 degree check valve is designed for higher pressure applications where better check valve lid sealing is desired. Can be cleaned or inspected without disconnecting any piping. Available lined or unlined in same material as pump.



In-line Ball Check
A vertically mounted, highly efficient ball check valve that provides positive seating quickly. Designed for those applications where large solids are not present and maintenance is infrequent. Available lined only in same materials as pump.



Swing Check
Designed for larger solids without clogging. Removable lid for inspection and cleaning without disconnecting any piping. Available in lined with elastomers and unlined ductile iron.

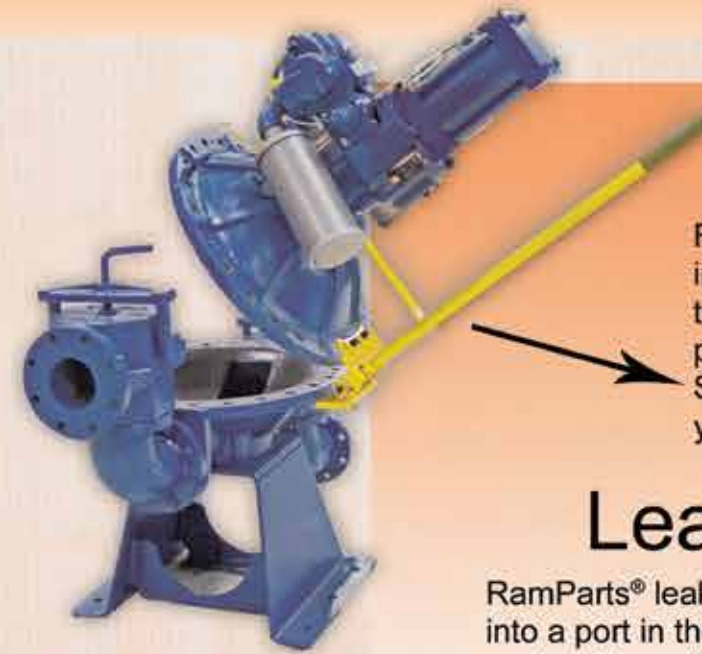
State of the Art Controllers



The Ramparts pump controllers energize the P-series pump's solenoid valves and set the appropriate air pressures applied to the top of the diaphragm (discharge pressure) and to the bottom of the air cylinder (suction pressure). The controller manages the stroke rate, discharge time as set by the user. Ramparts offers several controller options to suit every application, from our base DRC model to our advanced PLC driven models.



Optional Add-Ons



SideKick™

RamParts® SideKick™ was developed to make pump inspection quick and easy. It enables the pump top works to safely hinge from the bottom bowl assembly providing unobstructed full view and access to pump interior. SideKick™ will assist in fast diaphragm replacement to get you back up and running in minutes not hours.

Leak Detector

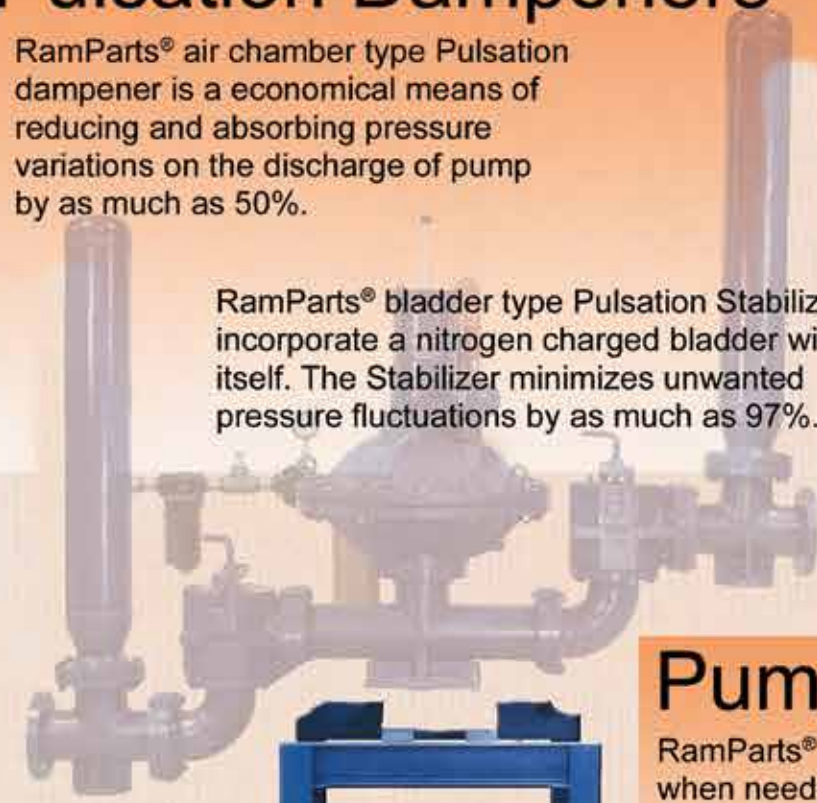
RamParts® leak detector is designed to simple screw into a port in the upper chamber of the pump and works in conjunction with the pump controller to shut the pump down electrically in case of diaphragm rupture.



Pulsation Dampeners

RamParts® air chamber type Pulsation dampener is a economical means of reducing and absorbing pressure variations on the discharge of pump by as much as 50%.

RamParts® bladder type Pulsation Stabilizers incorporate a nitrogen charged bladder within itself. The Stabilizer minimizes unwanted pressure fluctuations by as much as 97%.



Pump Stands

RamParts® also offers custom pump stands when needed. The stands make pump installation quicker and cost less than cement foundation systems. The Pump stands are standard carbon steel construction or optional stainless steel.



FEATURES	DRC	The 500 Series SMART Controller	The 600 Series SMART Controller
Nema 4X Enclosure	X	X	X
Stroke Counter	X	DIGITAL	DIGITAL
Liquid Filled Suction and Discharge Panel Mounted Pressure Gauges	X	X	DIGITAL
Suction and Discharge Pressure Regulators	X	X	DIGITAL
Power On-Off with Power Indicator Light	X	X	X
Operate Multiple Pumps	1 TO 2	1 TO 2	1 TO 4
HMI Touch Display		X	X
Ultrasonic Probe for Diaphragm Position Measurement		X	X
Warnings Displayed when the System Requires a Change in Pumping Conditions		WARNING & MANUAL ADJUSTMENTS TO PRESSURE	WARNING FOLLOWED WITH AUTOMATIC PRESSURE ADJUSTMENTS
Pressure adjustments based on System Requirements for Changing Viscosity and Density	MANUAL	MANUAL	AUTOMATIC PRESSURE ADJUSTMENTS
Ethernet Port for Control System Integration			X
Remote HMI Access for Remote Control			X
Displays Functions Locally or Transmits to Centralized Control Room			X
Remote Start/Stop	OPTIONAL	STANDARD	STANDARD
ADDITIONAL CONTROLLER OPTIONS			
Diaphragm Failure Alarm/Shutdown	OPTIONAL	OPTIONAL	OPTIONAL
Stainless Steel Enclosures (304 or 316)		OPTIONAL	OPTIONAL
Filter Press Application Special Features	STEP-UP AND RAMP-UP MODELS AVAILABLE	BUILT IN FILTER PRESS MODE	AUTOMATIC PRESSURE ADJUSTMENTS

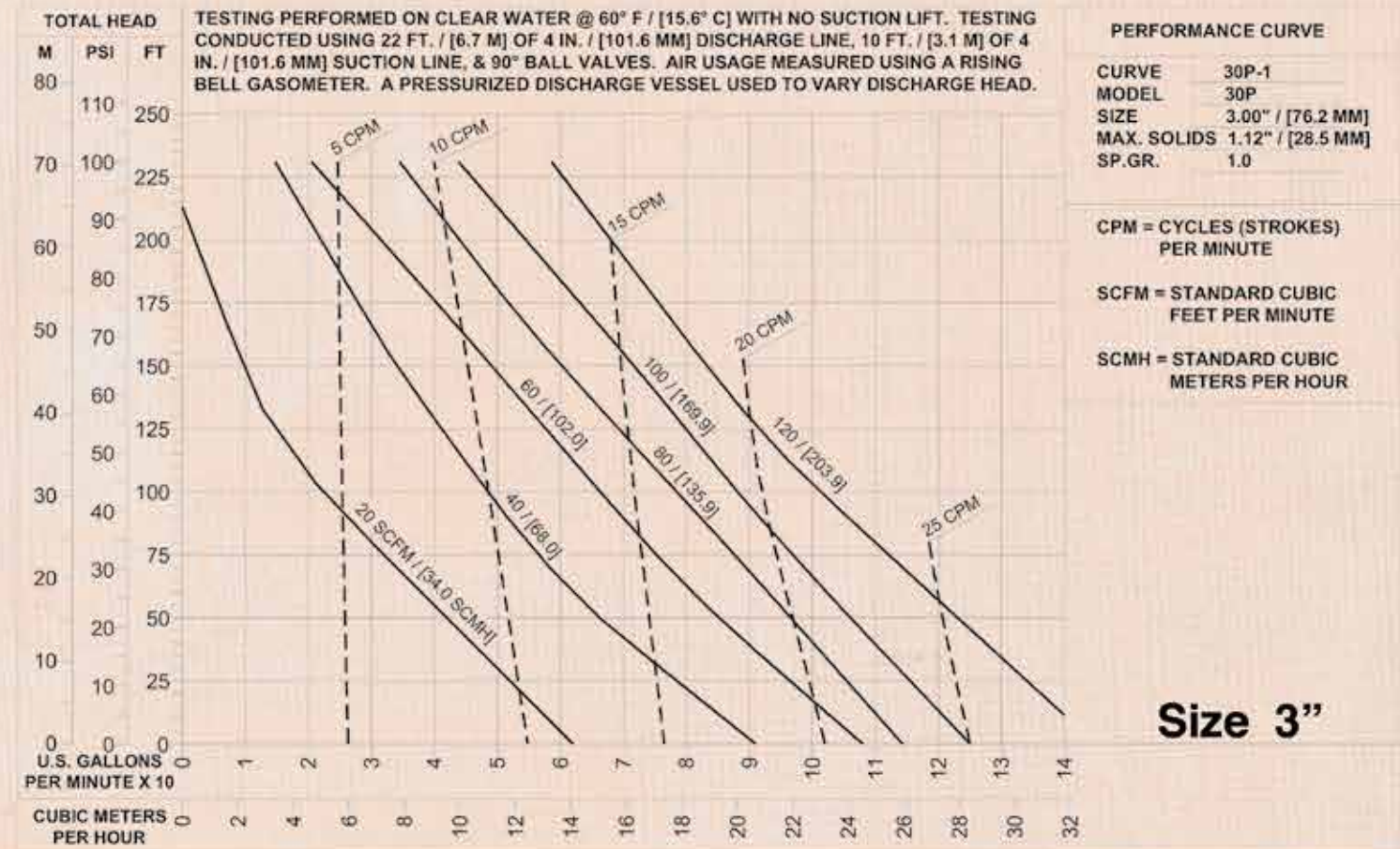
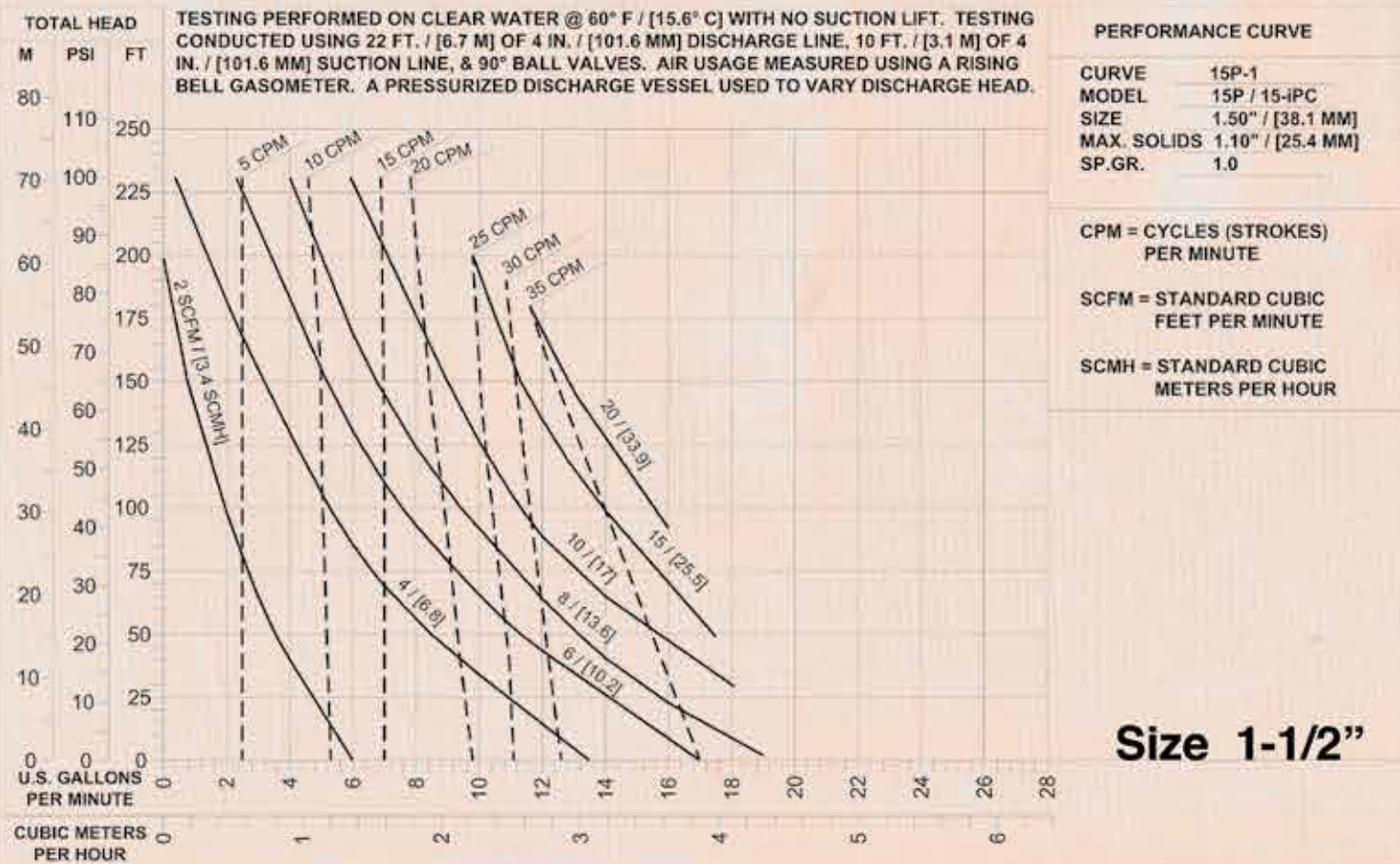
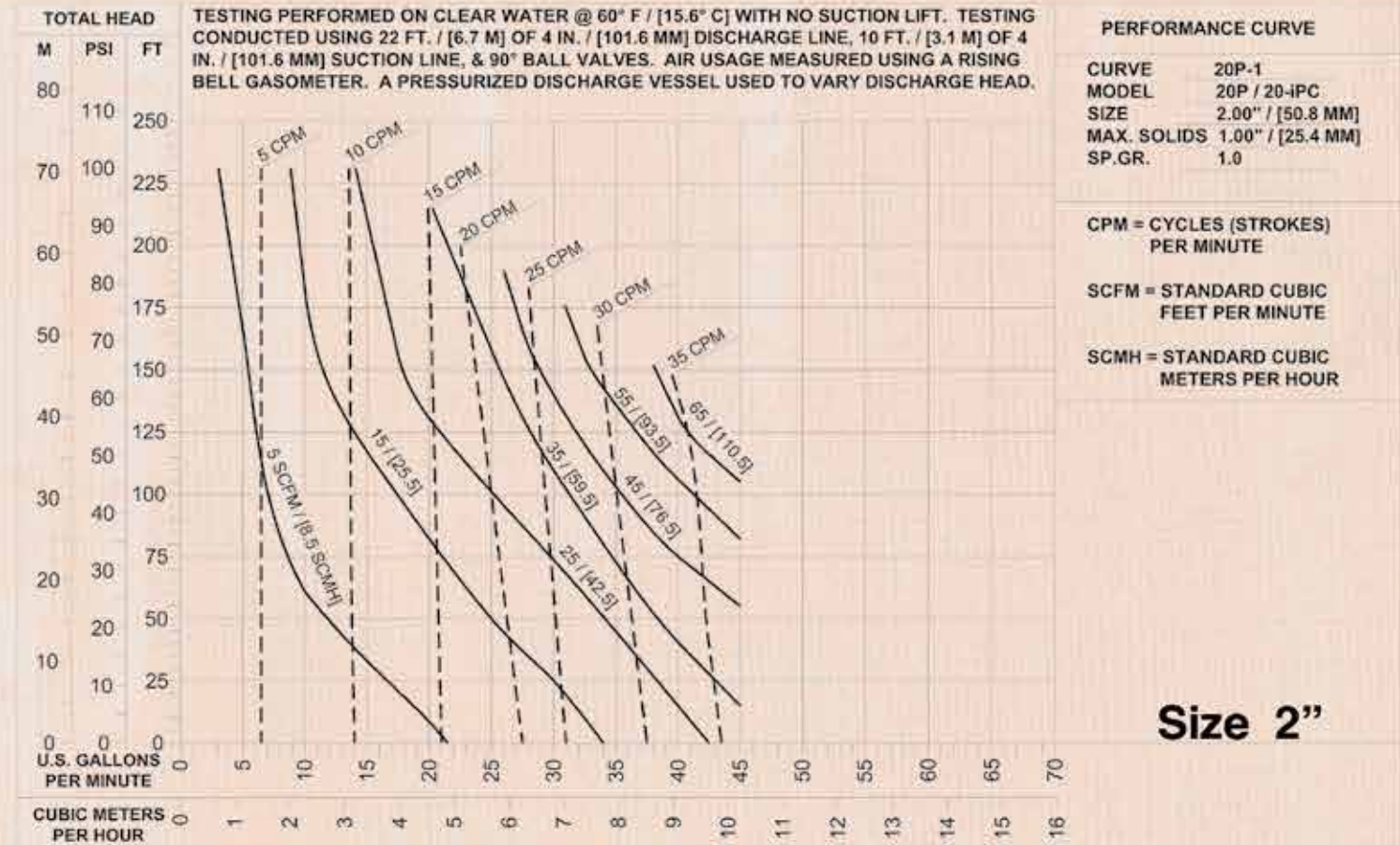
Performance Curves

Performance Overview With Ball Check Valves

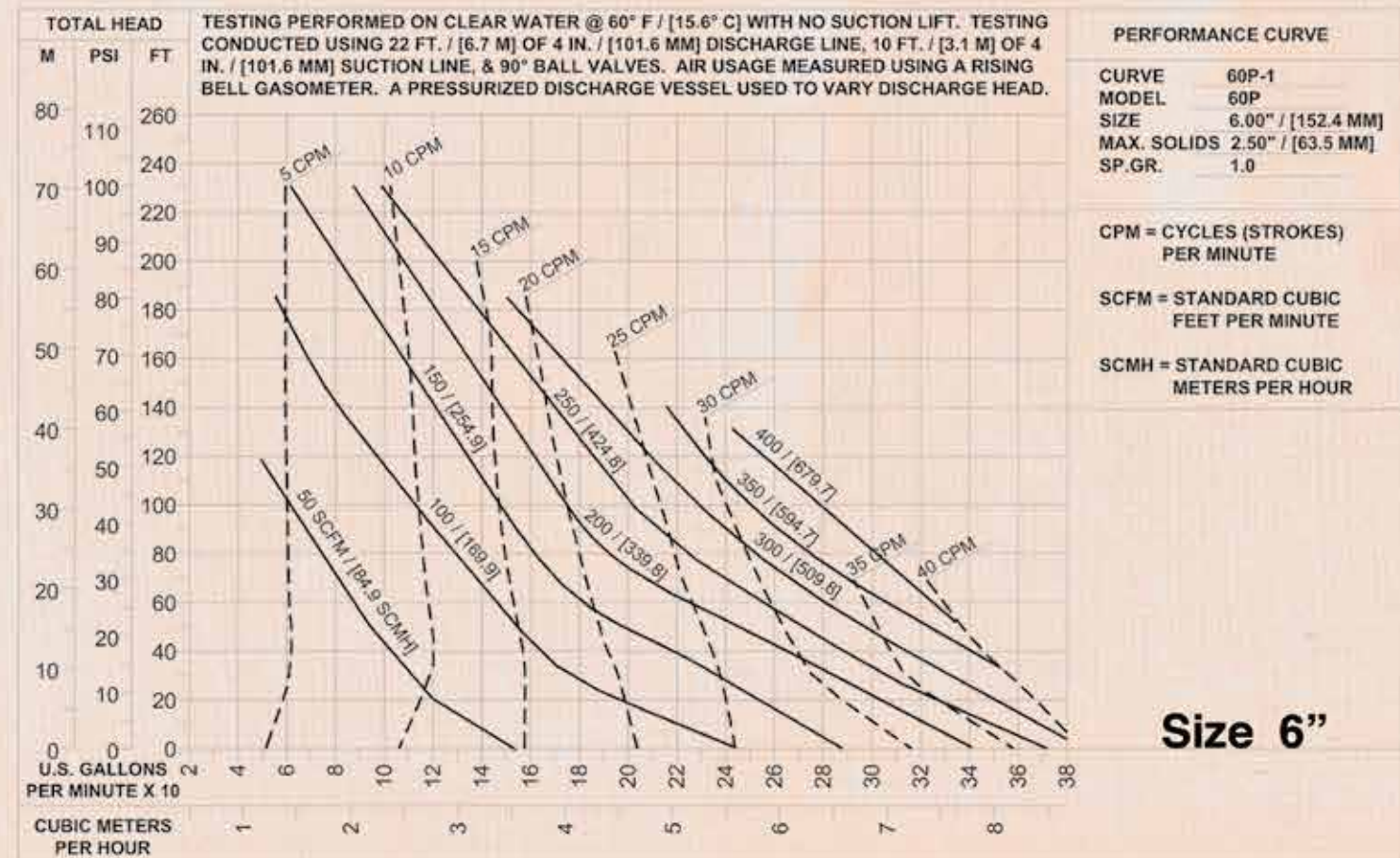
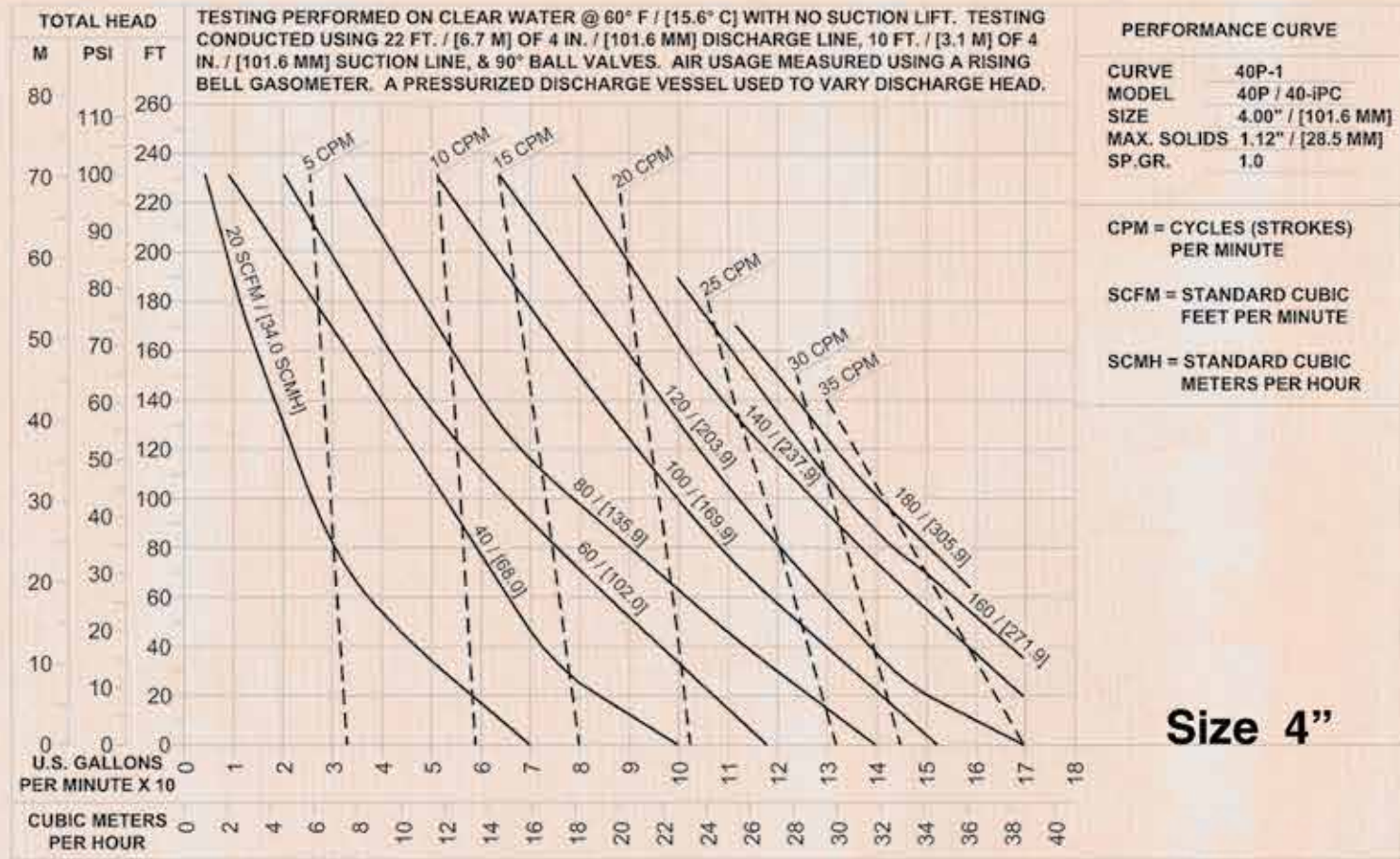
MODEL	DISCHARGE SIZE	TYPICAL FLOW RANGE*	TYPICAL DISCHARGE HEAD*	TYPICAL STROKES PER MINUTE*	BALL CHECK MAX SOLIDS
15P	1 1/2" (40 mm)	1-15 gpm (0.06-0.95 lps)	20'-150' (6 m-40 m)	2-30	1" (25.4 mm)
20P	2" (50 mm)	3-37 gpm (0.19-2.3 lps)	20'-150' (6 m-40 m)	2-30	1" (25.4 mm)
30P	3" (75 mm)	10-125 gpm (0.63-7.9 lps)	20'-150' (6 m-40 m)	2-30	1 1/8" (28.6 mm)
40P	4" (100 mm)	15-145 gpm (0.95-9.1 lps)	20'-150' (6 m-40 m)	2-30	1 1/8" (28.6 mm)
60P	6" (150 mm)	20-315 gpm (1.26-19.9 lps)	20'-150' (6 m-40 m)	2-30	2 1/2" (63.5 mm)

*Maximum flow, head and strokes per minute exceed typical ranges. Consult factory for specific information.

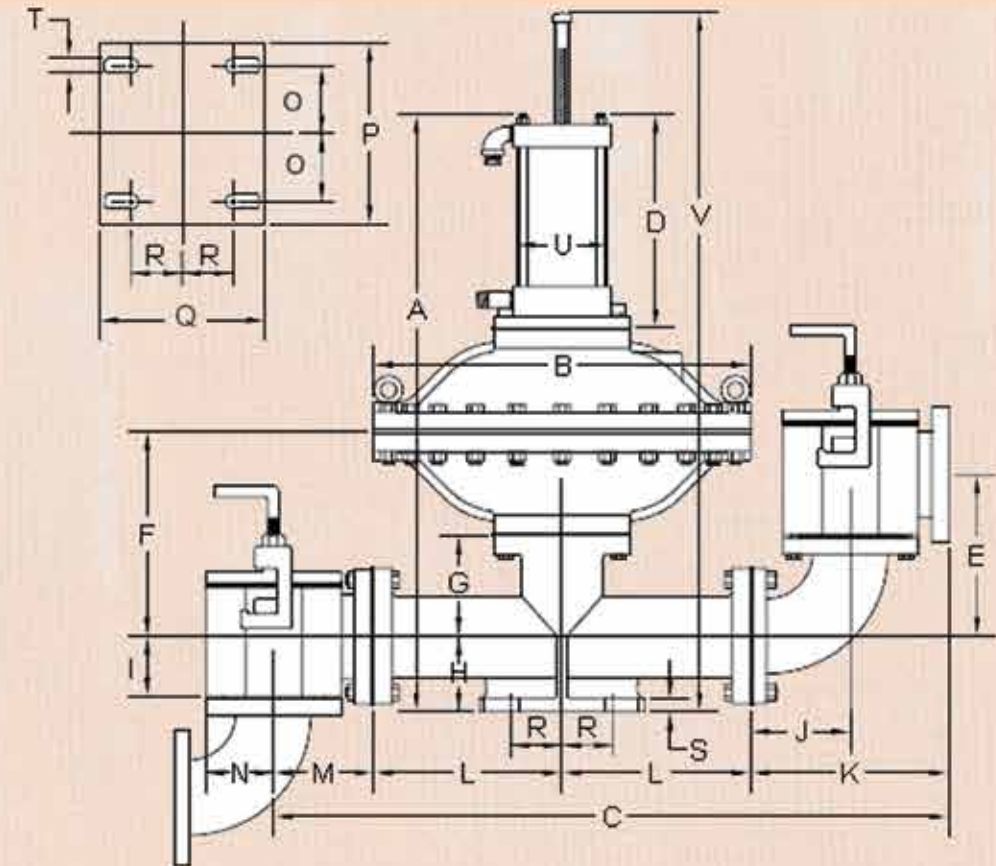
Performance Curves



Performance Curves



Dimensional Data



	15P	20P	30P	40P	60P
A	24-1/8	29	38-1/4	40	50-1/4
B	12-3/4	17	25	25	34
C	24-1/8	29-11/16	41-3/4	44-5/8	61-9/16
D	9-1/2	10-3/4	14-1/4	14-1/4	16-1/2
E	6-1/2	7	8-3/4	10-11/16	14
F	7-5/8	9-1/2	12-1/8	13-3/8	17-3/4
G	3-11/16	4-3/4	5-1/2	6-3/4	8-1/32
H	3-1/16	3-5/8	4-1/2	5	6-1/2
I	2-1/2	2-7/16	3-1/8	4-1/16	6
J	4-1/16	4-9/16	5-5/8	6-5/8	8-1/8
K	7-11/16	9-1/8	11-3/16	13-1/8	16-1/4
L	6-3/8	7-1/2	12-1/2	12-1/2	12-17/32
M	3-11/16	4-9/16	5-9/16	6-1/2	8-1/8
N	2-1/2	3	3-3/4	4-1/2	6
O	1	1-3/8	2-1/8	4-1/2	5-5/8
P	5	5-1/2	7-1/2	12	15
Q	6	8	10	11	18
R	1-1/2	2-9/16	3-1/2	3-1/2	5-3/4
S	5/8	3/4	7/8	7/8	1-1/8
T	3/4	1	1	1	1-1/4
U	3	3-3/4	6-1/2	6-1/2	8-7/16
V	28-3/8	35-1/2	45-3/4	47-1/2	59-3/4

Note: All Dimensions Given in Inches

Hard Core Pumping

3 years of pumping
and you discover something new.

Peace of Mind

The most **Powerful / Intelligent** diaphragm pump.
Smoother running, incredibly efficient,
and rock solid reliability,
year after year.



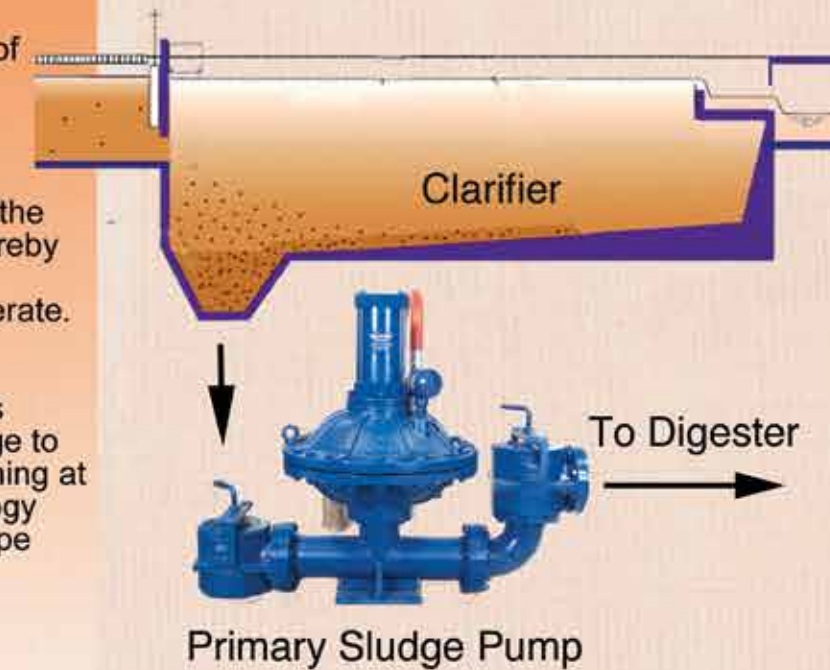
SmartPulse™ Technology

60% Greater Sludge Consistency

Wastewater treatment requires control of solids to run efficiently. With the ever increasing cost of sludge disposal, eliminating sludge dilution problems can have an immediate payback in direct savings.

RamParts SmartPulse™ Technology balances the pumping rate to sludge accumulation rates, thereby increasing sludge thickening. Smartpulse is the pulsing nature of how the Ramparts Pumps operate. Through the pump controller, the pump can be remotely managed to adjust pumping rate and pressure to match the clarifier settling rate. This function provides a continuous solids percentage to be fed to the digester. SmartPulse prevents coning at the surface of the clarifier. SmartPulse technology provides variable fluid velocities, maintaining pipe turbulence, thus keeping pipes from clogging.

- 60% increase in primary sludge consistencies
- Uniform sludge blanket
- Eliminate separate thickeners for primary sludge
- Run continuously versus batch for better control
- 40% less sludge volume needed to be handled

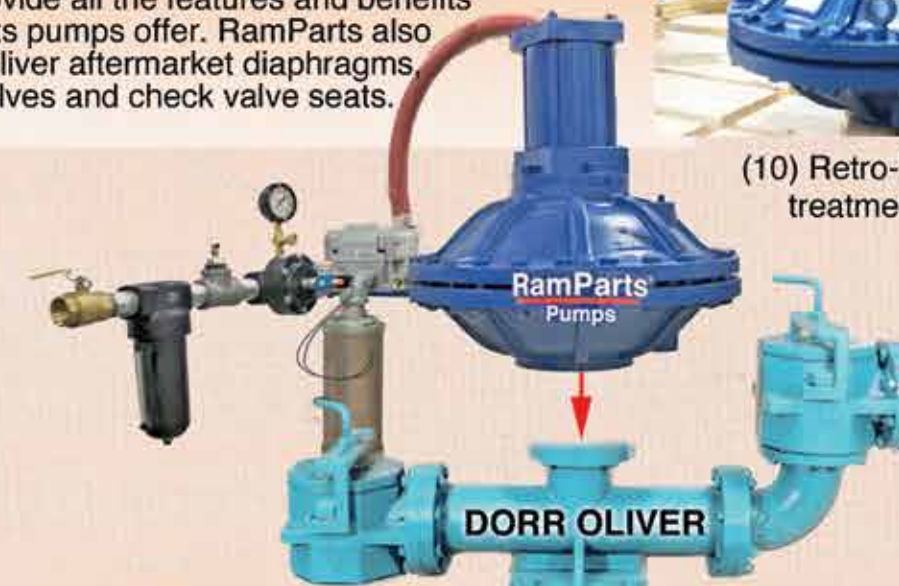


RamParts Retro-Fit Kits For Dorr-Oliver Pumps

RamParts offers retro-fit kits to convert Dorr-Oliver ODS diaphragm pumps to RamParts P-Series. The retro-kit includes everything necessary and bolts directly onto the Dorr-Oliver Base Tee. Once installed the pump will provide all the features and benefits that RamParts pumps offer. RamParts also offers Dorr-Oliver aftermarket diaphragms, ball check valves and check valve seats.



(10) Retro-Fit kits shipping to waste treatment facility in California



Composite
Ball & Butterfly Valves



Ceramic Lined Valves



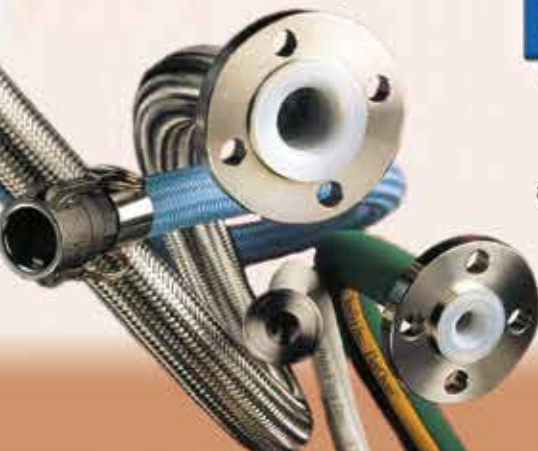
Diaphragm Valves
Lined & Unlined



Polyethylene Ball Valves



PTFE Hoses & Fittings



ETFE & PFA Fluoropolymer Lining Services & Lined Pump Repair



Ball Check &
Swing Check Valves



PTFE Expansion Joints



Strainers - Lined & Unlined



Sight Gauges
Lined & Unlined



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