

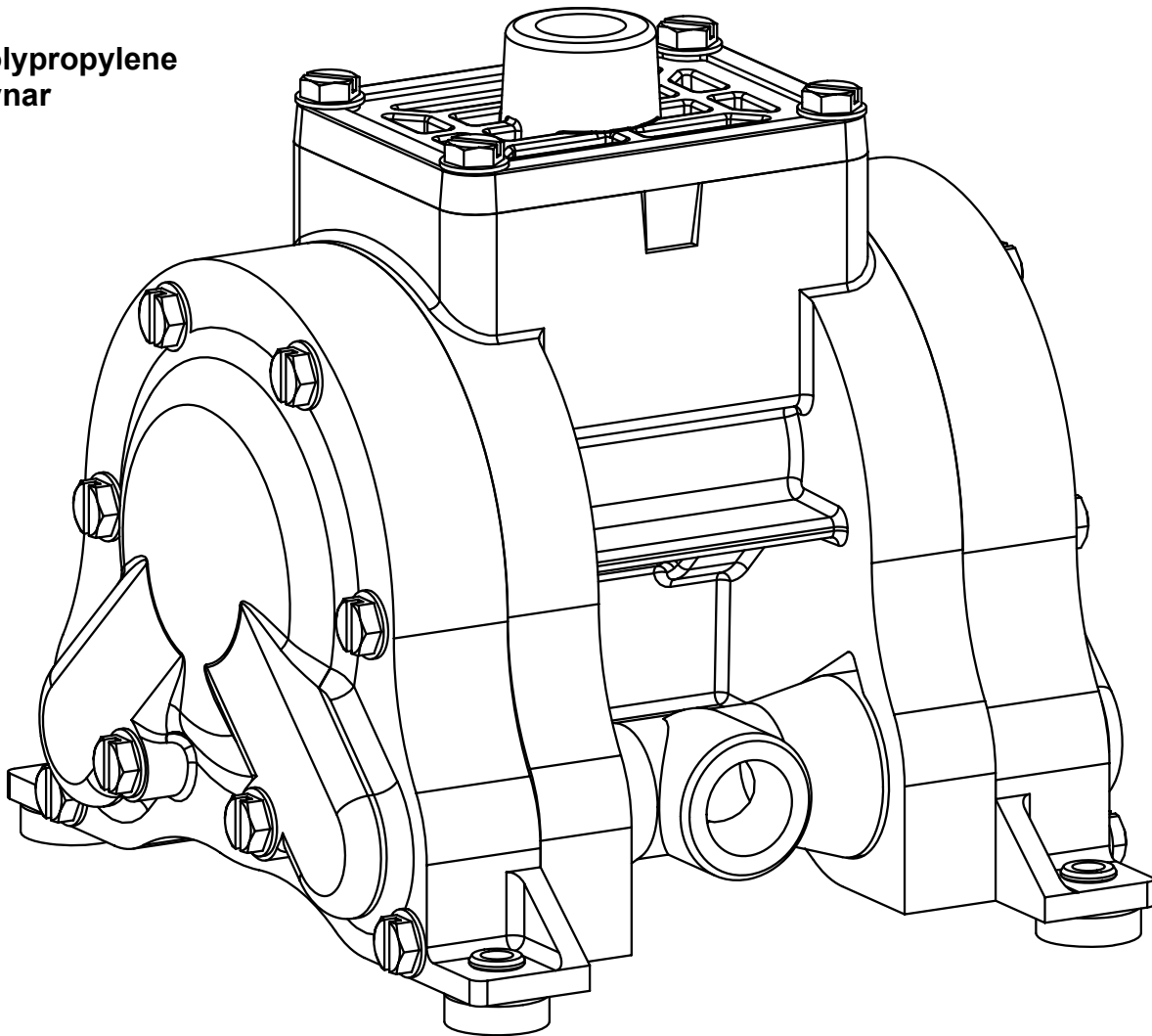
WR10 3/8"

Bolted Plastic Pumps

Operating Instructions

**WARREN
RUPP, INC.**

- Polypropylene
- Kynar



Warren Rupp, Inc. • A Unit of IDEX Corporation • 800 N. Main St., Mansfield, Ohio 44902 USA
Telephone (419) 524-8388 • Fax (419) 522-7867 • warrenrupp.com

IDEX
FLUID & METERING

Operating and Service Manual
Model WR10 3/8" Bolted Plastic Pumps

Table of Contents

Warnings, Cautions & Notices1
Specifications & Performance2
Installation, Operation & Maintenance3
Troubleshooting4
Parts List5
Pump Drawing, Exploded View6
Materials, Temperature Limits & Compatibility7
Declaration of Conformity8
Notes9


WARNINGS, CAUTIONS & NOTICES

Please read all cautions, warnings and notes completely before installation and start-up. It is the responsibility of the purchaser to retain this


manual for reference. Failure to comply with the recommendations stated in this manual may damage the pump and void the factory warranty.


WARNINGS


 To prevent static sparking the pump, piping, valves, and containers must be grounded.


 Pump exhaust may contain contaminants that can cause serious injury. Take precautions to pipe exhaust away from work area if pumping chemicals, hazardous or flammable materials.


CAUTIONS


 You must check the tightness of all hardware prior to installation.


 Do not exceed the maximum inlet air pressure as stated on the pump model tag.


 Maximum temperature limits are based on mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures. For chemical compatibility and temperature limits please refer to the Chemical Resistance Guide.


 Disconnect the compressed air line to the pump and allow all air pressure to bleed from pump prior to performing any maintenance on the pump. Disconnect all intake, discharge and air lines. Drain the pump and dispose of fluid into a suitable container.


 Check temperature limits for all wetted components when choosing pump materials. Temperature limits may vary depending on the material.

 All operators of the equipment should be properly trained to ensure safe working practices.


 The process fluid and cleaning fluids must be chemically compatible with all wetted pump components. Please refer to the Chemical Resistance Guide for additional information.


 Never allow the piping system to be supported by the pump manifolds or valve housing. These components are not designed to support structural weight and pump failure may result.


 Thoroughly flush pump before installing into process lines. FDA and sanitary approved pumps should be cleaned or sanitized before use.


 Noise levels can exceed 85 dBA. Always wear ear and eye protection when operating or repairing pumps.


NOTICES


 Blow out air line for at least 15 seconds before attaching to pump to make sure that all debris is removed. Use an in-line air filter.

 Compressed air should not be applied to the exhaust port. If this happens the pump will not function.

 Clamp style pumps fitted with PTFE or XLTPPE come standard from the factory with expanded PTFE liquid chamber gaskets. PTFE gaskets cannot be reused.

 Before disassembly of clamp band pumps, mark a line from each liquid chamber to its corresponding air chamber. This will ensure proper alignment when reassembling.

 Tighten both outer pistons at the same time to ensure a tight fit when installing PTFE diaphragms. See torque settings for additional details.

 The pump does not require continuous lubrication.

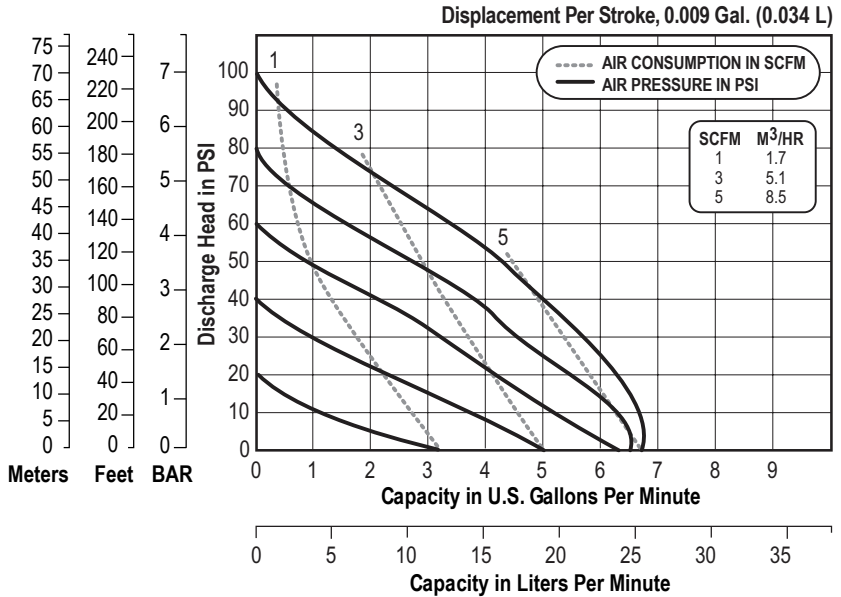
WR10 SPECIFICATIONS & PERFORMANCE

Specifications

Flow Rate adjustable to . 0-6.8 gpm (261 lpm)
Port Size
 Inlet and Discharge 3/8" Female NPT (BSP)
Air Inlet 0.25" Female NPT
Air Exhaust 0.25" Female NPT
Suction Lift 8' (2.44 m) Dry
Max. Particle Size (Diameter) 0.10"(2.25 mm)
 dB(A) Reading 78 dB(A)
Shipping Weights
 Polypropylene 3 lbs (1.40 kg)
 Kynar 4.5 lbs. (2.04 kg)



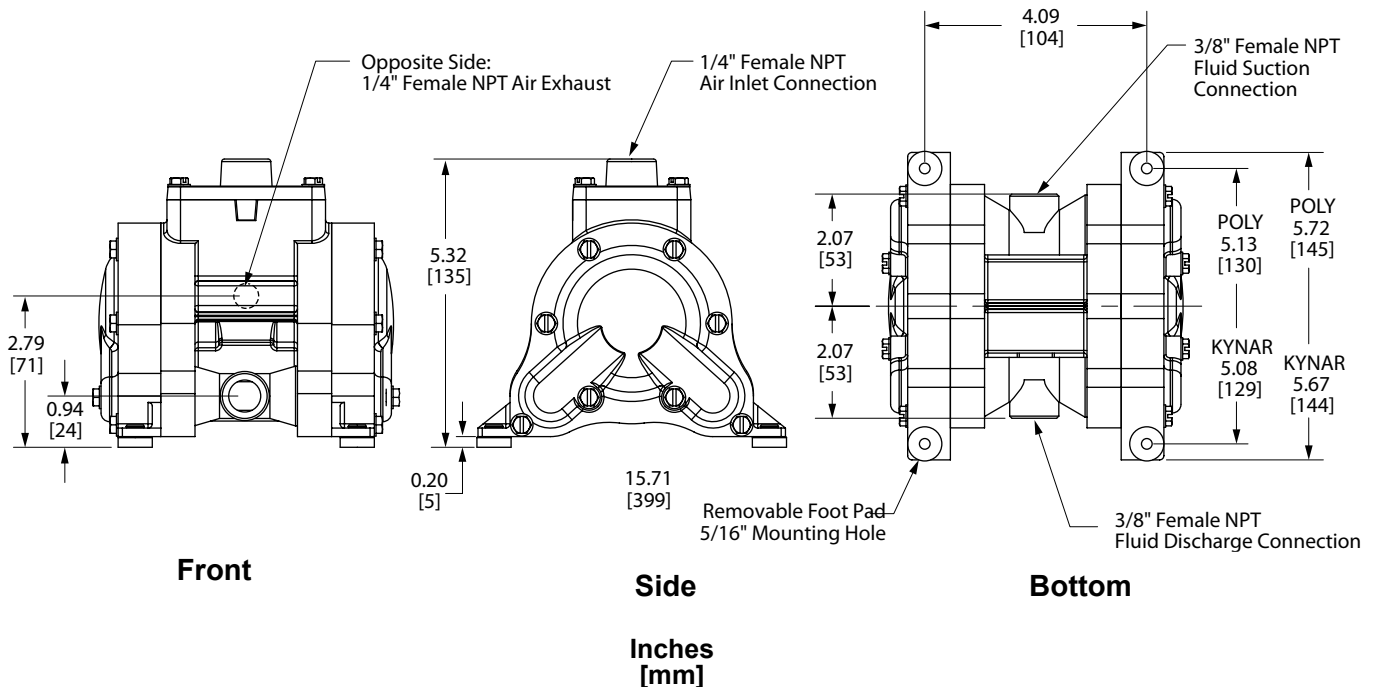
Performance



CAUTION: Do not exceed 100 psig (6.8 bars) air supply or liquid pressure.

CAUTION: Nonmetallic pumps and plastic components are not UV stabilized. Ultraviolet radiation can damage these parts and negatively affect material properties. Do not expose to UV light for extended periods of time.

Dimensions



Consult factory for certified drawings.

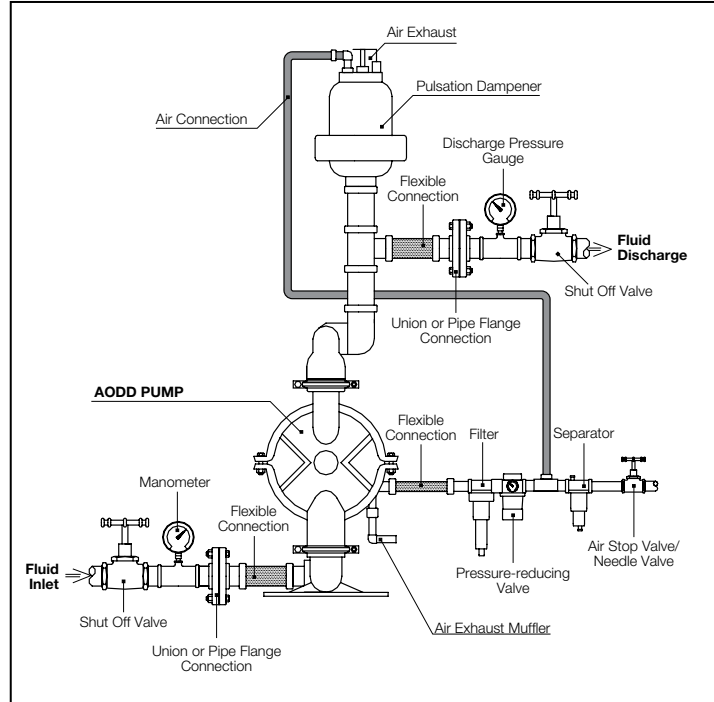
INSTALLATION, OPERATION & MAINTENANCE

Installation

The pump should be mounted in a vertical position. In permanent installations, the pump should be attached to plant piping using a flexible coupling on both the intake and discharge connections to reduce vibration to the pump and piping. To further reduce vibration, a surge suppressor next to the pump may be used.

Suction pipe size should be at least the same diameter as the inlet connection size, even larger if highly viscous fluid is to be pumped. If suction hose is used, it must be of a non-collapsible reinforced type. Discharge piping should be of at least the same diameter as the discharge connection. It is critical, especially on the suction side of the pump, that all fittings and connections are air tight or pumping efficiency will be reduced and priming will be difficult.

Make certain the air supply line and connections and compressor are capable of supplying the required pressure and volume of air to operate the pump at the desired flow rate. The quality of the compressed air source should be considered. Air that is contaminated with moisture and dirt may result in erratic pump performance and increased maintenance cost as well as frequent process "down time" when the pump fails to operate properly. The pump is powered by compressed air. Compressed air is directed to the pump air chamber by the main air valve. The compressed air is sepa-



rated from the fluid by a membrane called a diaphragm. The diaphragm in turn applies pressure on

the fluid and forces it out of the pump discharge. While this is occurring, the opposite air chamber is depressurized and exhausted to atmosphere and fluid is drawn into the pump suction. The cycle again repeats, thus creating a constant reciprocating action which maintains flow through the pump. The flow is always in through the bottom suction connection and out through the top discharge connection. Since the air pressure acts directly on the diaphragms, the pressure applied to the fluid

roughly approximates the air supply pressure supplied to the main air valve.

Recommended Piping Connections

| Pump Size | Minimum Air Line Size | Minimum Suction Line Size |
|-----------|-----------------------|---------------------------|
| 1/4" | 1/4" | 1/4" |
| 3/8" | 1/4" | 3/8" |
| 1/2" | 1/2" | 1/2" |
| 1" | 1/2" | 1" |
| 1-1/2" | 1/2" | 1-1/2" |
| 2" | 1/2" | 2" |
| 3" | 3/4" | 3" |

TROUBLESHOOTING

| Symptom | Potential Cause(s) | Recommendation(s) |
|---|--|---|
| Pump cycles once | <ol style="list-style-type: none"> 1 Incorrect pilot o-ring placement 2 Inner diaphragm plate installed backwards 3 Deadhead (system pressure meets or exceeds air supply pressure) 4 Air valve or center block gaskets installed incorrectly | <ol style="list-style-type: none"> 1 Reinstall pilot o-rings in correct positions 2 Reinstall inner diaphragm plate correctly 3 Check system for pressure ratio to pump 4 Install gaskets with holes properly aligned |
| Pump will not operate | <ol style="list-style-type: none"> 1 Pump is over lubricated 2 Lack of air (line size, PSI, CFM) 3 Worn o-rings 4 Wrong type of lubrication (attack on o-rings) 5 Debris in air valve 6 Clogged manifolds 7 Incorrect o-ring placement 8 Deadhead (system pressure meets or exceeds air supply pressure) | <ol style="list-style-type: none"> 1 Set lubricator on lowest possible setting or remove <ul style="list-style-type: none"> • Elima-Matic is designed for lube free operation 2 Check the air line size and length, compressor capacity (HP vs. cfm required) 3 Replace o-rings 4 Check compatibility of o-rings with lubrication 5 Clean air valve/filter 6 Clean suction or discharge manifolds/piping 7 Reinstall o-rings in correct position 8 Increase air supply pressure |
| Pump cycles and will not prime or flow | <ol style="list-style-type: none"> 1 Cavitation on suction side 2 Valve ball(s) not seating properly or sticking 3 Valve ball(s) missing (pushed into chamber) 4 Valve ball(s)/seat(s) damaged or attacked by product 5 Clogged suction line | <ol style="list-style-type: none"> 1 Check suction condition (move pump closer to product) 2 Clean out around valve ball cage and valve seat area <ul style="list-style-type: none"> • Replace valve ball or valve seat if damaged • Use heavier valve ball material 3 Worn valve ball or valve seat <ul style="list-style-type: none"> • Worn fingers in valve ball cage (replace part) 4 Check Chemical Resistance Guide for compatibility 5 Clean suction manifold and/or piping |
| Pump running sluggish/stalling | <ol style="list-style-type: none"> 1 Over lubrication 2 Icing 3 Clogged manifolds 4 Deadhead (system pressure meets or exceeds air supply pressure) 5 Cavitation on suction side 6 Lack of air (line size, PSI, CFM) | <ol style="list-style-type: none"> 1 Set lubricator on lowest possible setting or remove <ul style="list-style-type: none"> • Elima-Matic is designed for lube free operation 2 Clean or replace exhaust muffler 3 Clean manifolds to allow proper air flow 4 Check system to locate deadhead (equilibrium) <ul style="list-style-type: none"> • Increase air supply pressure 5 Check suction (move pump closer to product) 6 Check the air line size, length, compressor capacity |
| Product leaking through exhaust | <ol style="list-style-type: none"> 1 Diaphragm failure, or diaphragm plates loose 2 Diaphragm stretched around center hole or bolt holes 3 Excessive air supply pressure | <ol style="list-style-type: none"> 1 Replace diaphragms, check for damage and ensure diaphragm plates are tight 2 Check for excessive inlet pressure or air pressure <ul style="list-style-type: none"> • Tighten bolts to recommended torque 3 Check Operating Manual for recommendations |
| Premature diaphragm failure | <ol style="list-style-type: none"> 1 Cavitation 2 Excessive flooded suction pressure 3 Misapplication (chemical/physical incompatibility) 4 Wrong type of lubrication (attack on air side) 5 Incorrect diaphragm plates or plates on backwards 6 Incorrect shaft with corresponding elastomer 7 Start up at full air pressure | <ol style="list-style-type: none"> 1 Enlarge pipe diameter on suction side of pump 1,2 Move pump closer to product <ul style="list-style-type: none"> • Raise pump/place pump on top of tank to reduce inlet pressure 2 Add accumulation tank or pulsation dampener as close to the pump as possible 3,4 Consult Chemical Resistance Chart for compatibility with products, cleaners, temperature limitations and lubrication 5,6 Check Operating Manual to check for correct part and installation 7 Start up pump slowly (manually or with Smart Start) |
| Breaking and bending shafts | <ol style="list-style-type: none"> 1 Build up of solids in water chamber 2 Loose diaphragm plates | <ol style="list-style-type: none"> 1 Flush pump, start pump slow 2 Tighten diaphragm plates when replacing diaphragms |

WR10 PARTS LIST

AIR VALVE ASSEMBLY

| <i>Item</i> | <i>Description</i> | <i>Qty.</i> | <i>Standard: Polypropylene</i> |
|-------------|--|-------------|-----------------------------------|
| | Air Valve Assembly (Includes items 1-10) | 1 | E800 |
| 1 | Valve Body | 1 | 10-048 |
| 2 | Valve Spool | 1 | E500B ASY (Includes (2) P98-104A) |
| 3 | Valve Spool U-Cup | 2 | P98-104A |
| 4 | End Cap | 2 | E800D (Includes (1) E800D ASY) |
| 5 | End Cap O-Ring | 2 | E500E |
| 8 | Air Diverter | 1 | 10-075 |
| 9 | Valve Insert | 1 | E500H |
| 10 | Valve Gasket | 1 | E800J |
| 11 | Valve Screw | 4 | 10-050 |

AIR END ASSEMBLY

| <i>Item</i> | <i>Description</i> | <i>Qty.</i> | <i>Standard: Polypropylene</i> |
|-------------|-----------------------|-------------|--------------------------------|
| 12 | Center Section | 1 | E801A |
| 18 | Pilot Shaft | 1 | E803A |
| 19 | Pilot Shaft Spacer | 5 | E503C |
| 20 | Pilot Shaft O-Ring | 6 | E503B |
| 21 | Pilot Shaft Snap Ring | 2 | E503D |
| 22 | Shaft Retainer | 2 | E801B |
| 25 | Shaft Retainer Screw | 4 | E501C |
| 33 | Muffler | 1 | 06-034 |

DIAPHRAGM ASSEMBLY

| <i>Item</i> | <i>Description</i> | <i>Qty.</i> | <i>TPE</i> | <i>PTFE</i> |
|-------------|-----------------------|-------------|-------------------------------|-------------------------------|
| 34 | Main Shaft O-Ring | 2 | E503B | E503B |
| 35 | Main Shaft | 1 | 10-028 | 10-028 |
| 37 | Inner Diaphragm Plate | 2 | C126 | C126 |
| 38 | Outer Diaphragm Plate | 2 | 10-023 (Poly), 10-040 (Kynar) | 10-023 (Poly), 10-040 (Kynar) |
| 40 | Diaphragm | 2 | 10-032 (XL), 10-033 (Geolast) | 10-044 (PTFE) |

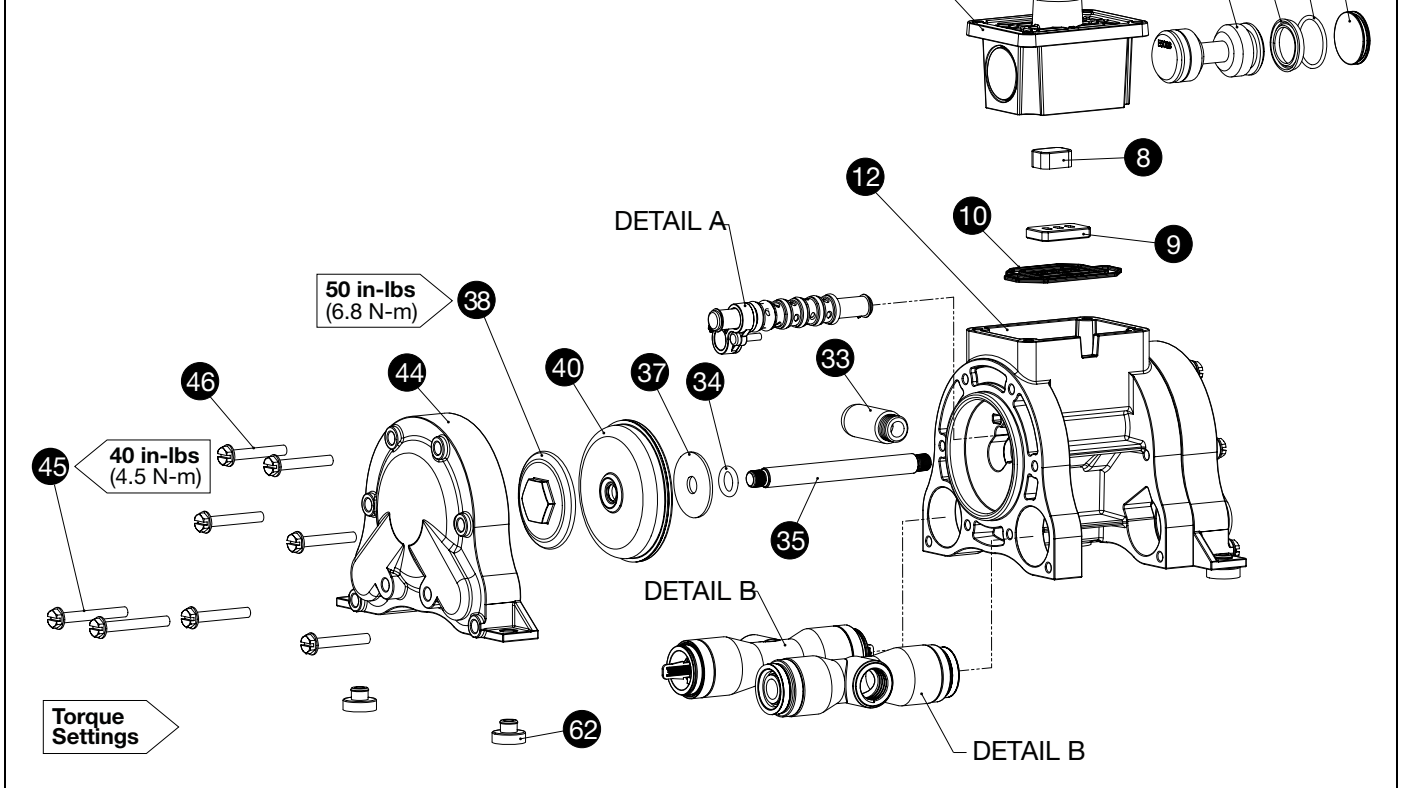
WET END ASSEMBLY

| <i>Item</i> | <i>Description</i> | <i>Qty.</i> | <i>Standard: Polypropylene</i> | <i>Option 1: Kynar</i> |
|-------------|----------------------------|-------------|--------------------------------|----------------------------|
| 44 | Water Chamber | 2 | 10-002 | 10-036 |
| 45 | Water Chamber Bolt (Long) | 4 | 10-052 | 10-052 |
| 46 | Water Chamber Bolt (Short) | 12 | 10-051 | 10-051 |
| 50 | Valve Seat | 4 | 10-022 (Poly) | 10-039 (Kynar) |
| 51 | Valve Seat Seal | 8 | 10-073 (XL), 10-045 (PTFE) | 10-073 (XL), 10-045 (PTFE) |
| 52 | Valve Stem | 4 | 10-005 | 10-038 |
| 53 | Spring | 4 | 10-030 | 10-030 |
| 60 | Manifold | 2 | 10-003 | 10-037 |
| 62 | Foot Pad | 4 | 10-035 | 10-035 |

WR10 EXPLODED VIEW

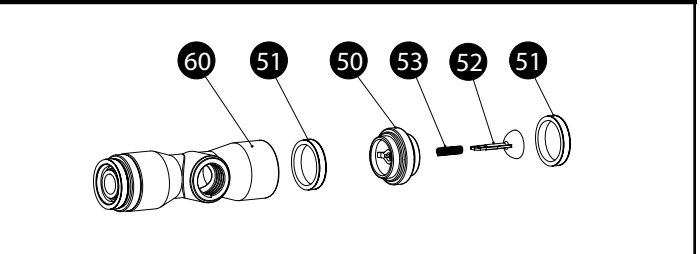
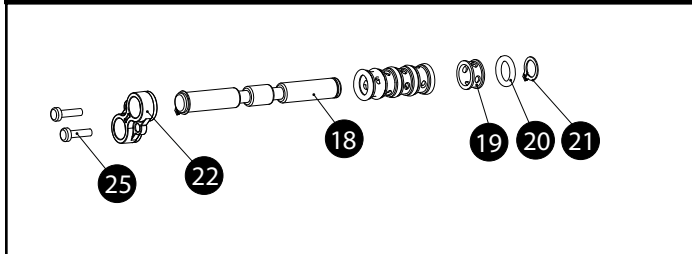
Torque Settings

| | |
|---------------------------|---------------------|
| Water Chamber Bolts | 40 in-lbs (4.5 N-m) |
| Diaphragm Plates — Rubber | 60 in-lbs (6.8 N-m) |
| Diaphragm Plates — PTFE | 60 in-lbs (6.8 N-m) |
| Air Valve Cap Screws | 25 in-lbs (2.8 N-m) |



Detail A

Detail B



WR10 Repair and Maintenance Kits

Air End Kit- Part #: WR10 AIR KIT

| Description | Qty | Part Number |
|--------------------|-----|-------------|
| Valve Spool U-Cup | 2 | P98-104A |
| End Cap O-Ring | 2 | E500E |
| Air Diverter | 1 | 10-075 |
| Valve Insert | 1 | E500H |
| Valve Gasket | 1 | E800J |
| Pilot Shaft O-Ring | 6 | E503B |
| Main Shaft O-Ring | 2 | E503B |

Wetted End Kits

| Part Number | Description |
|-------------|-----------------------|
| WR10 XL KIT | XL Elastomer Kit |
| WR10 G KIT | Geolast Elastomer Kit |
| WR10 TX KIT | PTFE Elastomer Kit |

MATERIALS, TEMPERATURE LIMITS & COMPATIBILITY

Materials of Construction — Pumps

| MODEL | Acetal® | Aluminum | Cast Iron | Hastelloy C | Polypropylene | PVDF | Stainless Steel |
|-------------|---------|----------|-----------|-------------|---------------|------|-----------------|
| WR10 (3/8") | | | | | ● | ● | |

Diaphragms, Valve Seats & Valve Seals

| | Aluminum | Buna-N | PVDF | Neoprene | EPDM | Polypropylene | Polyurethane | 316 Stainless Steel | PTFE | | | Encapsulated Silicone | Thermoplastics | | Fluorocarbon (FKM) | |
|--------------------|----------|--------|------|----------|------|---------------|--------------|---------------------|------------|-------------|---------|-----------------------|---------------------|-------------|--------------------|--|
| | | | | | | | | | Tef-Matic™ | Versa-Tuff™ | FUSION™ | | Santoprene (TPE XL) | FDA Hytrel® | | |
| ELASTOMERS | | | | | | | | | | | | | | | | |
| DIAPHRAGMS | | | | | | | | | | ● | | | ● | | | |
| VALVE SEATS | | | ● | | | ● | | | | | | | | | | |
| VALVE SEALS | | | | | | | | | | ● | | | ● | | | |

Temperature Limits

| | |
|---|---------------------------------|
| BUNA-N | +10°F (-12°C) to +180°F (82°C) |
| PTFE | +40°F (+4°C) to +220°F (105°C) |
| SANTOPRENE (TPE XL) | -20°F (-29°C) to +300°F (149°C) |
| PLASTIC PUMPS can operate to the following temperature limits: | |
| • POLYPROPYLENE | 32°F (0°C) to 175°F (79°C) |
| • PVDF | 10°F (-12°C) to 225°F (107°C) |

NOTE: These are average temperatures. Chemicals and solvents can have an effect on temperature limit

WARREN RUPP, INC.®

Declaration of Conformity

Manufacturer:
Warren Rupp, Inc.®, 800 N. Main Street
Mansfield, Ohio, 44902 USA

certifies that Air-Operated Double Diaphragm Pump Series: HDB, HDF, M Non-Metallic, S Non-Metallic, M Metallic, S Metallic, T Series, G Series, RS Series U Series, EH and SH High Pressure, W Series, SMA and SPA Submersibles, and Tranquilizer Surge Suppressors comply with the European Community Directive 2006/42/EC on Machinery, according to Annex VIII. This product has used Harmonized Standard EN809:1998+A1:2009, Pumps and Pump Units for Liquids - Common Safety Requirements, to verify conformance.

David Roseberry
Signature of authorized person

October 20, 2005
Date of issue

David Roseberry
Printed name of authorized person

Engineering Manager
Title

Revision Level: F

April 19, 2012
Date of revision

IDEX
FLUID & METERING



