



Always the Right Solution™

Section:  
METERING/DOSING PUMP

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Date: May 1, 1998

SERVICE MANUAL

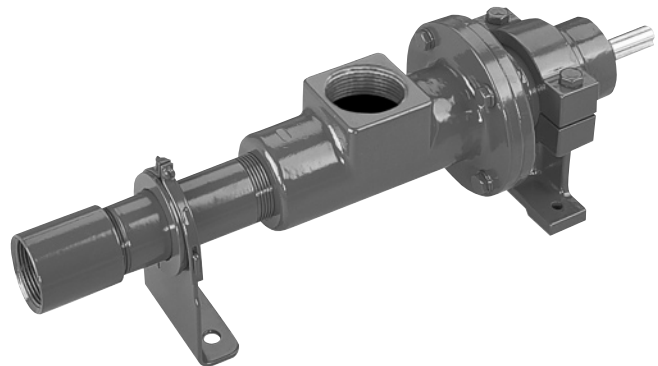
# METERING/DOSING PUMP

## BARE SHAFT

### A4015A, A4100A, AND A4190A MODELS

### DESIGN FEATURES

- Housings:** Cast iron/stainless steel
- Pump Rotor:** Chrome plated 416 and 316 stainless steel
- Pump Stator:** Nitrile, Natural Rubber, EPDM, Fluoroelastomer
- Shaft:** 416 SS/316 SS
- Bearings:** Prelubricated, fully sealed ball bearings
- Seal:** Single or double mechanical seals, packing
- Flexible Joint:** Prelubricated and sealed



### INSTALLATION

**Mounting.** Provide the proper alignment between the pump and drive by mounting both to a common flat base. Pump may be mounted in any position. When mounting vertically, it is necessary to keep bearings above seals to prevent possible seal leakage into bearings. Loosen screws on body support and stator support to rotate pump to desired position.

**Pre-Wetting.** Prior to connecting pump, wet pump elements and mechanical seal or packing by adding fluid to be pumped into suction port. Turn shaft over several times in a clockwise direction when viewed from the shaft end to work fluid into pump elements.

**Piping.** Piping to pump should be self-supporting to avoid excessive strain on pump housings. The suction port is 1-1/2" NPT and the discharge port is 1-1/4" NPT. Use pipe "dope" or tape to facilitate disassembly and to provide seal.

**Drive.** On belt driven units, adjust belt tension to point of non-slip. Do not overtighten.

On direct drive units, coupling components should be aligned and spaced at least 1/16" apart.

- Pump rotation must be clockwise when facing shaft.
- Check direction of rotation before startup.
- Maximum speed is 1750 rpm.

### OPERATION

**Self-Priming.** With wetted pumping elements, the mechanical seal model pump is capable of 15 feet of suction lift when operating at 1750 rpm with pipe size equal to port size.

**DO NOT RUN DRY.** Unit depends on liquid pumped for lubrication. For proper lubrication, flow rate should be at least 10% of rated capacity.

**Storage.** Always drain pump for extended storage periods using pipe plug in suction housing.

**Pressure Limits.** See Table 1 for maximum discharge pressure of each model.

Table 1

Models 4015	Max. pressure 300 PSI, 20 bar
Models 4100	Max. pressure 300 PSI, 20 bar
Models 4190	Max. pressure 175 PSI, 12 bar

**Temperature Limits.** Unit is capable for service at 10°F to 210°F with nitrile, and to 260°F with EPDM, 185°F with natural rubber, and 350°F with fluoroelastomer. Note, an undersize rotor may be required for elevated temperature applications.

### TROUBLESHOOTING

**WARNING: Before making adjustments, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.**

#### Failure to Pump.

1. Belt or coupling slip: Adjust belt tension or tighten set screw on coupling.
2. Wrong rotation: Rotation must be clockwise when facing shaft.
3. Excessive suction lift, vacuum or obstruction in suction piping.
4. Flexible joint broken; possible excessive pressure: Replace joint, check pressure at discharge port.

#### Will Not Start.

1. Insufficient horsepower: Check motor starting torque for minimum model starting torque given on performance curves.
2. Low voltage: Check power supply.

**Noisy Operation.**

1. Starved suction: Check fluid supply, length of suction line, and obstructions in pipe.
2. Bearings worn: Replace parts; check alignment, belt tension, pressure at discharge port.
3. Broken flexible joint: Replace part; check pressure at discharge port.
4. Insufficient mounting: Mount to firm base. Vibration-induced noise can be reduced by using mount pads and hose on suction and discharge ports.

**Pump Overloads.**

1. Excessive discharge pressure: Check discharge pressure for maximum rating given in Table 1. Check for obstruction in discharge pipe.
2. Excessive temperature.
3. Belt or coupling slip: Check pressure at discharge port.
4. Loose bond in stator: High temperature and caustics will cause bond between rubber and tube to fail. Replace stator. Check fluid temperature and pressure at discharge port.
5. Fluid viscosity too high: See chart below for recommended maximum RPM.

Viscosity CP	Limit RPM
1-1,000	1750
1,000-2,500	1200
2,500-5,000	600
5,000-10,000	300
10,000-20,000	175
20,000-50,000	80

Based on 60% min. volumetric efficiency. See PEC449 for exact values.

6. Motor connected incorrectly: Motor wired for 230 VAC, connected to 115 VAC service.

**Poor Performance.**

1. Low pressure; worn stator: Replace stator: Check for excessive abrasive material in fluid. Check for run dry condition.

**Mechanical Seal Leakage.**

1. Leakage at startup: If leakage is slight, allow pump to run several hours to let faces run in.
2. Persistent seal leakage: Faces may be cracked from freezing or thermal shock. Replace seal.

**Pump Will Not Prime.**

1. Air leak on suction side: Check pipe connections. Suction lift over 15 ft. will cause seal faces to open.
2. Defective mechanical seal: Inspect and repair as necessary.

**MAINTENANCE**

**General.** These pumps have been designed for a minimum of maintenance. The pump is one of the easiest to work on in that the main elements are very accessible and require few tools to disassemble.

**Bearing Lubrication.** The prelubricated, fully sealed bearings do not require additional lubrication.

**PUMP DISASSEMBLY**

**WARNING:** Before disassembling pump, disconnect power source and thoroughly bleed pressure from system. Failure to do so could result in electric shock or serious bodily harm.

1. Disconnect power source.
2. Remove suction and discharge piping.
3. Discharge coupling (9) may be removed from stator (21) by unscrewing in a counter-clockwise direction (RH thread).
4. Remove stator support clamp screw and remove top half of stator support (38).
5. Stator (21) may be removed from suction housing (2) by unscrewing in a counter-clockwise direction (RH thread). Use a strap wrench on stator to avoid crushing with a pipe wrench. Pull stator (21) from rotor (22). To assist removal of stator, hold drive shaft (26) from turning and turn stator clockwise when facing suction housing after disengaging thread.
6. Remove screws (112) holding suction housing (2) to bearing housing (1) or adapter (74). Remove suction housing and suction housing gasket (83). Gaskets on cast iron models only. Remove O-Ring (270) on other models.
7. The rotor (22) and flexible joint (24) may be removed using the following procedure (do not bend joint more than 15 degrees).
  - a. Remove rotor (22) from flexible joint (24) by using a punch to remove rotor shaft pin (46). Support joint while removing pin.
  - b. Remove joint (24) from shaft (26) by using a punch to remove shaft pin (46).
8. **Single Mechanical Seal Models.** Carefully slide mechanical seal (69) off shaft (26). Carefully pry seal out of bearing housing (1), or seal housing (3). Remove seal housing if pump is a stainless model.

**Double Mechanical Seal Models.** Carefully slide seal housing (71) from the drive shaft. Remove rotational part of mechanical seal from the shaft. Carefully remove seal gland (73) from adapter. Remove stationary seal faces if required.

If any parts of mechanical seal are worn out or broken, the complete assembly should be replaced. Seal components are matched parts and are not interchangeable.

**Packing Models.** Slide stuffing box assembly from the shaft. Remove packing gland halves and replace packing.

9. The bearings (29) and shaft (26) assembly can be removed from bearing housing (1) after snap ring (66) has been removed. To remove the shaft assembly, lightly tap the shaft at the flexible joint connection end using a block of wood to protect the shaft. The bearings may be pressed off the shaft.

**PUMP ASSEMBLY**

1. Press bearings (29) on shaft (26), and locate slinger ring (77) on the shaft near the radial bearing.

**NOTE:** When replacing bearings, always press on the inner race when assembling to shaft, and on the outer race when pressing bearings into the housings.

2. Press shaft assembly into bearing housing (1) securing with snap ring (66).
3. On stainless steel models install seal housing (3) in bearing housing with O-Ring (270) installed in the O-Ring groove, on cast iron pumps.

On packing models install stuffing box assembly (stuffing box, packing, and packing gland) on shaft with O-ring (270) installed in the O-ring groove.

4. Install mechanical seal (69) or (70) using the following procedure:
  - a. Clean and oil sealing faces using a clean light oil (not grease).

**CAUTION: Do not use oil on EPDM parts. Substitute glycerin or soap and water.**

- b. Oil the outer surface of the seal seat, and push the assembly into the seal bore in the bearing housing (1), or seal gland and housing, seating it firmly and squarely. On double seal models install seal gland on shaft.
  - c. After cleaning and oiling shaft, slide the seal body along the shaft until it meets the seal seat.
  - d. Install seal spring and spring retainer or seal housing with O-rings (72 and 270) on shaft.
5. The flexible joint (24) and rotor (22) may be installed using the following procedure (do not bend joint more than 15 degrees):
  - a. Pin flexible joint (24) to shaft (26) using the shaft pin (46).
  - b. Pin rotor (22) to joint using rotor pin (46). Support joint while installing pin.

6. Secure suction housing gasket (83) (cast iron pumps only) and suction housing (2) to bearing housing (1) using lockwashers (215) and screws (112).
7. Slide stator support retainer (39) on stator (21).
8. Screw coupling (9) on stator (21) in a clockwise direction (RH thread).

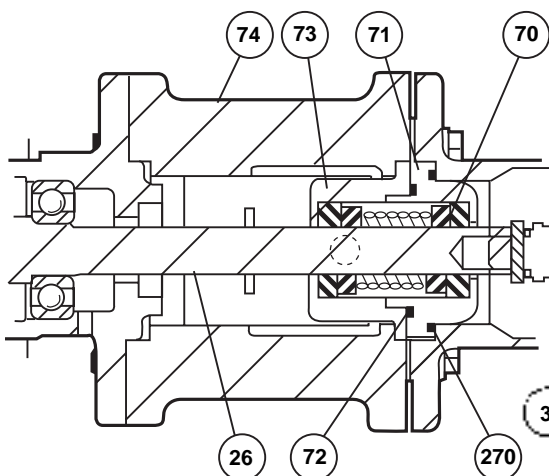
**NOTE:** Apply pipe "dope" on all pipe threads before assembly.

9. Lubricate rotor (22) surface to assist installation of stator (21). Slide stator on rotor, and screw into suction housing (2) by turning clockwise (RH threads). An additional assist in installing stator is to lock the shaft from turning and rotate the stator counter-clockwise while pushing towards suction housing.
10. Secure clamp assembly (40) to the stator support (38) and the support retainer (39) using the clamp assembly (40) screw.
11. Proceed as in installation instructions.

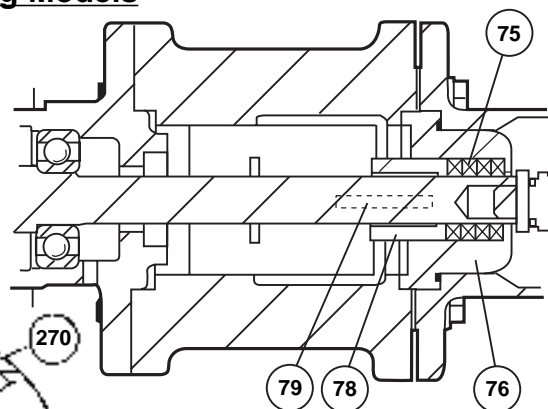
**WARNING: Replace belt or coupling guards before reconnecting power.**

**When ordering parts,** please specify pump model number, pump serial number, part number, part description and quantity:

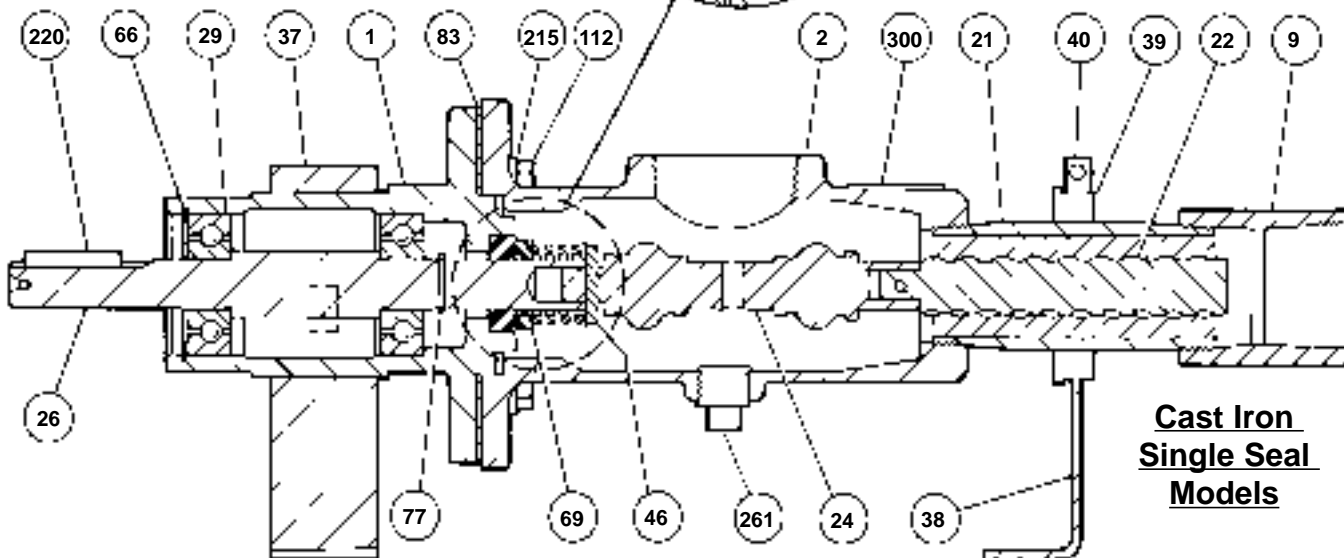
**Double Seal Models**



**Packing Models**



**Stainless Steel Single Seal Models**



**Cast Iron Single Seal Models**

## BARE SHAFT MODELS PARTS LIST

Item	Type	Description	Req.	PUMP MODELS		
				A4015A	A4100A	A4190A
1	CD	Bearing Housing	1		3303550000	
1	SS	Bearing Housing	1		3308813000	
2	CD	Suction Housing	1		3403932001	
2	SS	Suction Housing	1		3403932007	
3	SS	Seal Housing, Single	1		3403930007	
9	CD	Discharge Coupling	1		3205341020	
9	SS	Discharge Coupling	1		3205342020	
21	Q	Stator	1	3403923104	3403924104	3403925104
21	R	Stator	1	3403923204	3403924204	3403925204
21	B	Stator	1	3403923304	3403924304	3403925304
21	F	Stator	1	3403923504	3403924504	3403925504
22	CD	Rotor	1	3403927007	3403928007	3403929007
22	SS	Rotor	1	3403927015	3403928015	3403929015
24	Q, R	Flexible Joint	1		3308811001	
24	B	Flexible Joint	1		3308811003	
24	F	Flexible Joint	1		3308811005	
26	CD	Drive Shaft	1		3303577001	
26	SS	Drive Shaft	1		3303577002	
26	CD	Extended Drive Shaft	1		3311004001	
26	SS	Extended Drive Shaft	1		3311004002	
29	CD/SS	Bearing	2		6300503031	
37	CD/SS	Body Support	1		3403947001	
38	CD/SS	Stator Support	1		3403945001	
39	CD/SS	Sta. Sup. Retainer	1		3201733000	
40	CD/SS	Clamp Assembly	1		3204277000 and 3201734000	
46	CD/SS	Rotor/Shaft Pin	2		3204069001	
66	CD/SS	Snap Ring	1		3205162000	
69	Q, R	Mechanical Seal Std.	1		3202424000	
69	B	Mechanical Seal Std.	1		3206379000	
69	F	Mechanical Seal Std.	1		3206501000	
69	Q, R	Mechanical Seal AR	1		3206460000	
69	B	Mechanical Seal AR	1		3206502000	
69	F	Mechanical Seal AR	1		3206503000	
70	Q, R	Double Mechanical Seal	1		3208652000	
70	B	Double Mechanical Seal	1		3208652001	
70	F	Double Mechanical Seal	1		3208652002	
71	CD/SS	Seal Housing, Double	1		3403986015	
72	Q, R, B, F	O-Ring	1		3207902128	
73	CD/SS	Seal Gland, Double	1		3403985015	
74	CD/SS	Adapter	1		3501688004	
75	CD/SS	Packing Set	1		3403396002	
76	CD/SS	Stuffing Box	1		3403934007	
77	CD/SS	Slinger Ring	1		3206382000	
78	CD/SS	Packing Gland Half	2		3403933007	
79	CD/SS	Stud	2		3208591000	
83	Q, R	Housing Gasket	1		3203028001	
83	B	Housing Gasket	1		3203028003	
83	F	Housing Gasket	1		3203028005	
112	CD/SS	Screw	4 (8)		6191520141	
215	CD/SS	Lock Washer	4 (8)		6230010401	
220	CD/SS	Shaft Key	1		6110030180	
261	CD	Drain Plug	1		6100120031	
261	SS	Drain Plug	1		6100420030	
270	Q, R	O-Ring	1		3207902134	
270	B	O-Ring	1		3207904134	
270	F	O-Ring	1		3207905134	
300	CD/SS	Name Plate	1		3208597000	

( ) Packing and Double Seal Models

**Note: For further information, call 800-845-1310 (Western USA)  
800-325-1331 (Central & Eastern USA), or 937-327-3553 (Ohio)**

# Double The Length Of Your Moyno Pump Warranty For FREE!

For your *free* pump warranty extension, choose from one of the three options below:

1. Go to [www.moyno.com](http://www.moyno.com) and fill out the registration form online
2. Mail this form by placing it in an envelope and sending it to: **Moyno, Inc.**  
Attn: Tish Wilson  
P. O. Box 960  
Springfield, OH 45501-0960  
U.S.A.
3. Fax this form to 937-327-3177

*Thank you for choosing a Moyno Pump. Please take the time to complete this warranty registration form.* Upon receipt of your form, your standard limited warranty on defective material and workmanship will be extended to twice the standard period of time at no additional cost to you. We appreciate your business and look forward to serving you in the future.



***Always Insist on Genuine Moyno Replacement Parts!***

## ***Moyno® Pump Warranty Registration***

Pump Model # \_\_\_\_\_ Pump Serial # \_\_\_\_\_  
 Purchased From \_\_\_\_\_ Date Purchased \_\_\_\_\_  
 Your Name \_\_\_\_\_ Your Title \_\_\_\_\_  
 Your Company Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City/State (Province)/Zip Code \_\_\_\_\_  
 Phone Number \_\_\_\_\_ Fax Number \_\_\_\_\_  
 E-mail \_\_\_\_\_

### **Application for Which This Pump Was Purchased**

Material \_\_\_\_\_ Flow Rate \_\_\_\_\_ Process Temperature \_\_\_\_\_  
 Operating Speed \_\_\_\_\_ Viscosity \_\_\_\_\_ pH Value \_\_\_\_\_  
 Hours Operated per Day \_\_\_\_\_ Continuous \_\_\_\_\_ Intermittent \_\_\_\_\_  
 Discharge Pressure \_\_\_\_\_ Suction Pressure \_\_\_\_\_ NPSH Available \_\_\_\_\_  
 Percent of Solids \_\_\_\_\_ Particle Size \_\_\_\_\_ Abrasion Rating \_\_\_\_\_

### **How Did You First Hear of Moyno Pumps?**

- Advertisement     
  Postcard     
  Trade Show     
  Referral  
 Distributor Salesperson     
  Previous Experience With Moyno Pumps     
  Other – Explain Below

*Thank You!*