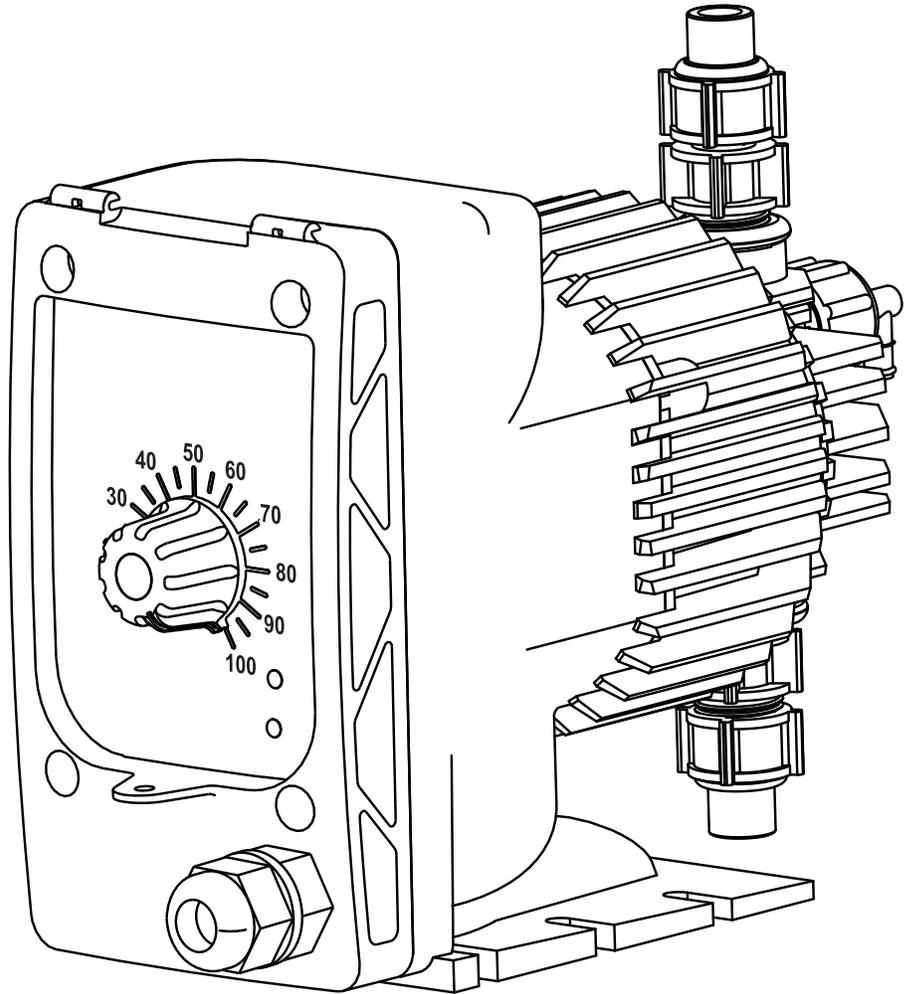


MicroTron Series C

Chemical Metering Pump

***Installation
Maintenance
Repair
Manual***



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Table of Contents

I.	Introduction	3
	Model Numbering.....	3
II.	Unpacking	4
III.	Safety Considerations	4
IV.	Installation	
	A. Location.....	4
	B. Electrical.....	4
	C. Plumbing	5
V.	Start-Up.....	7
	A. Priming the Pump.....	7
	B. Output Information.....	7
	C. Adjusting Stroke Length	7
	D. Optional Features.....	7
VI.	Maintenance.....	8
	A. Diaphragm Replacement.....	8
	B. Suction & Discharge Check Valve Replacement	8
	C. Liquid End Diagram.....	9
	D. Replacement Parts.....	10
VII.	Trouble Shooting Guide	11

Manufacturer's Product Warranty

Advantage Controls warrants units of its manufacture to be free of defects in material or workmanship. Liability under this policy extends for 24 months from date of installation. Liability is limited to repair or replacement of any failed equipment or part proven defective in material or workmanship upon manufacturer's examination. Removal and installation costs are not included under this warranty. Manufacturer's liability shall never exceed the selling price of equipment or part in question. Advantage disclaims all liability for damage caused by its products by improper installation, maintenance, use or attempts to operate products beyond their intended functionality, intentionally or otherwise, or any unauthorized repair. Advantage is not responsible for damages, injuries or expense incurred through the use of its products.

The above warranty is in lieu of other warranties, either expressed or implied. No agent of ours is authorized to provide any warranty other than the above.

30 Day Billing Memo Policy

Advantage Controls maintains a unique factory exchange program to ensure uninterrupted service with minimum downtime. If your unit malfunctions, call 1-800-743-7431, and provide our technician with Model and Serial Number information. If we are unable to diagnose and solve your problem over the phone, a fully warranted replacement unit will be shipped, usually within 48 hours, on a 30 Day Billing Memo.

This service requires a purchase order and the replacement unit is billed to your regular account for payment. The replacement unit will be billed at current list price for that model less any applicable resale discount. Upon return of your old unit, credit will be issued to your account if the unit is in warranty. If the unit is out of warranty or the damage not covered, a partial credit will be applied based upon a prorated replacement price schedule dependent on the age of the unit. Any exchange covers only the controller or pump. Electrodes, liquid end components and other external accessories are not covered.

I. Introduction

This instruction manual covers all facets of operation of the Advantage Controls MicroTron™ electronic solenoid metering pump, including unpacking, mounting, electrical and plumbing connection, and start-up. Safety, maintenance, repair, warranty, and factory information are also provided. Please read this manual completely before proceeding. Observe safety protocols and heed all warnings and precautions.

Model Numbering

MicroTron Series C pump model numbers define the output, pressure and control functions present on a particular pump. Your pump may be supplied with one or more of the options described in this manual. To determine what features apply to your pump, check the model number label located on the pump.

Model Number Example

C 1 20 X 1 - P V C 1 - S

Pressure Rating

- 1 = 110 psi
- 2 = 250 psi

Gallon Per Day Rating

Control Options

- X = Stroke Length Adjust (standard)
- E = External Pacing
- F = Hall effect meter input ÷ by 9

Voltage

- 1 = 120 volt - 50/60 Hz - .35A with USA plug (standard)
- 2 = 240 volt - 50/60 Hz - .65A no plug
- 3 = 240 volt - 50/60 Hz - .65A with specified plug

Pump Head Material

- P = Glass-Filled Polypropylene (standard)
- K = Kynar
- V = PVC
- S = Stainless

Seat Material

- V = Viton (standard)
- F = Teflon
- H = Hypalon

Check Ball

- C = Ceramic (standard)
- D = Ceramic/single on discharge (pressure relief)
- S = Stainless

Tubing Connections

- 1 = 3/8" tubing rated to 200 PSI
- 2 = 1/4" tubing rated to 300 PSI
- P = 1/4" MNPT
- U = 3/8" black UV tubing rated to 200 PSI
- V = 3/8" tubing rated to 200 PSI, clear suction

NOTE: Tubing selection may impact pump rating.

Special Options

- C = Dust Cover
- E = External stop
- S = 3-function injection valve
- R = No stroke length adjustment knob

NOTES: This list represents our most popular options. If you have an option not covered, contact the factory or your dealer for more details.

II. Unpacking

The Advantage MicroTron™ pump has been shipped to you as a complete metering package, ready for installation. If shipping carton shows any signs of damage, notify the shipping company immediately upon receipt. Advantage Controls cannot be held responsible for damage from shipping. Unpack the carton and insure that the following items are present:

1. Metering pump
2. Suction & discharge tubing
3. Foot valve
4. Instruction manual
5. Foot valve weight
6. Priming/Bleed valve and drain tubing
7. Injector fitting

III. Safety Considerations

NOTE: All pumps are primed with water before leaving the factory. If the solution to be pumped is not compatible with water, disassemble the fluid end before use. After disassembly, thoroughly dry the pump head, valves, and seals before pump is reassembled and used.

A. Chemical Compatibility

MicroTron™ metering pumps are designed to work with most liquid chemicals depending upon your pump's liquid end materials of construction. A chemical resistance chart is available for determining specific compatibility with a wide variety of chemicals. If you have further compatibility questions, contact Advantage Controls at 1-800-743-7431 or via email at support@advantagecontrols.com.

B. Safety and Preparation

Always wear the proper protective clothing and gear when working around chemicals and chemical metering pumps. Safety glasses, gloves, and aprons are critical in preventing accidental exposure to dangerous chemicals. Liquids under pressure can present a special hazard when a line or seal is punctured resulting in the spraying of chemical many yards away. If a chemical spill occurs, consult the Material Safety Data Sheet (MSDS) for specific instructions regarding the chemical being used.

IV. Installation

A. Location

Select a mounting location convenient to the chemical supply and power for the pump. Do not install the pump in a location where the ambient temperature exceeds 120 degrees F (50°C). Higher temperatures will affect the output as well as the useful life of the pump. While the pump is suitable for most outdoor installations, do not use the standard poly tubing in direct sunlight. If you must mount pump in direct sunlight or under bright fluorescent lights, consult your distributor or the factory. Under these circumstances use ultra-violet resistant tubing (*Part # RO0151 3/8" or RO0167 1/4" available).

B. Electrical

1. Standard MicroTron™ pumps have a voltage regulated internal power supply capable of operating in the range of approximately 95 to 135 VAC. Use a supply voltage of 100 to 120 VAC for best results. The 3-wire grounded plug must be used in a 3-wire wall plug.

CAUTION: Never remove ground wire from plug!

2. With a 220 volt option, the MicroTron™ pump has a voltage regulated internal power supply capable of operating in the range of approximately 195 to 260 VAC. Use a supply voltage of 210 to 250 VAC for best results. Pump is supplied without a country specific plug unless otherwise specified.

C. Plumbing

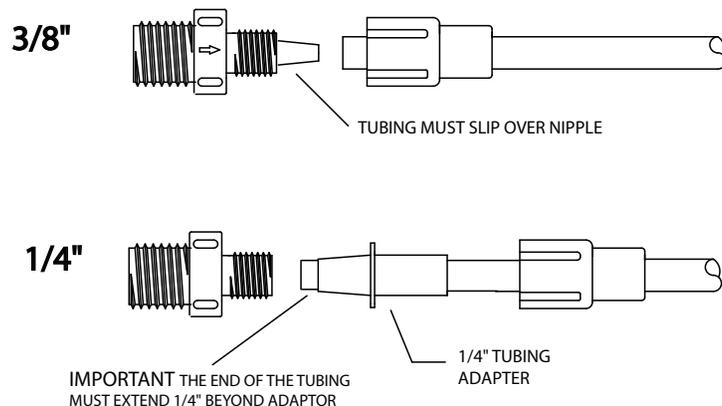
1. Connections

The MicroTron™ pump uses carefully matched components to achieve a predictable metering output. This predictability can only be maintained if all fitting sizes remain unaltered. **Do not** attempt to reduce tubing size. All tubing connection should be double checked to insure against leakage. If hazardous chemicals are being pumped, use shielding around discharge tubing.

Do not overtighten the tubing connectors. Tighten the fittings no more than 1/4 turn after the fitting contacts the seal. Hand tighten only. **Do not use a wrench or pliers** as they may damage the fittings. Do not use Teflon tape except on NPT fittings. **Be sure to observe applicable local plumbing codes.**

- NOTES:**
1. **Clear flexible tubing is not intended for pressurized use.**
 2. **When cutting lengths of tubing for your installation, ensure a clean, square cut. Use short lengths of tubing and as few connections as possible.**
 3. **There is an approximate 2.5 psi capability lost for ever 1 foot of vertical rise of the discharge tubing to the injection point.**

Tubing Connections



2. Suction Lift vs Flooded Suction Applications

Suction Lift Installation

Mount the pump on the top of a molded tank, not to exceed 5 feet from pump to bottom of tank.

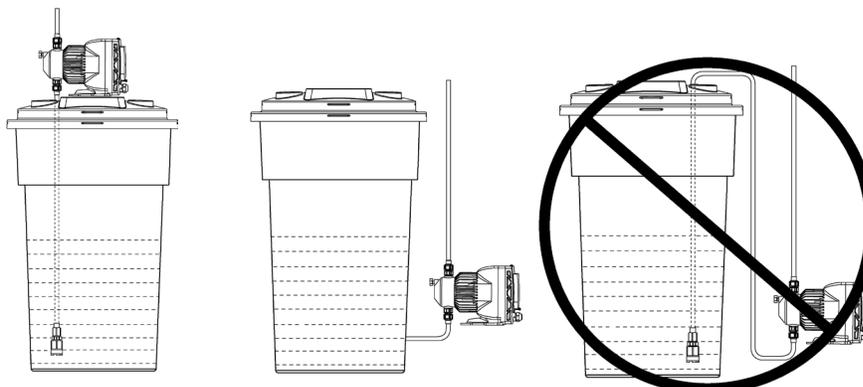
Flooded Suction

This installation is recommended for very low outputs and solutions that off gas. Priming is easier and loss of prime is reduced. Failure of solution tubing can cause loss of solution in the tank.

Suction lift

Flooded Suction

Not recommended



3. Foot Valve Installation

A weight is provided to hold the tubing and foot valve in a vertical position at the bottom of the tank. **Do not allow the foot valve to lay horizontally in the chemical container.** This defeats the action of the valve and causes the pump to lose prime. Keep suction tubing reasonably short and avoid high spots or bends.

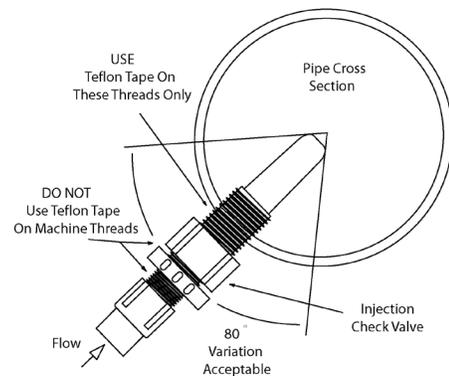
4. Wall Mounting

The fluid end portion (head assembly) of the pump is set up to accommodate mounting of the pump to the chemical container, either as a flooded suction, or a suction lift. The pump head must be kept in a vertical position for proper operation. The head can be removed and rotated 90° if needed to keep the inlet and outlet valves in a vertical position.

5. Injection Valve Installation

The injection valve is designed to prevent a back flow and to inject chemical into the line. To work properly, this valve must be mounted within 45 degrees of vertical. One end of the injection valve is 1/2" MNPT. Install this end into the piping system. Use Teflon tape on this fitting only. Connect the pump's discharge tubing to the opposite end of the injector.

NOTE: When installation is made into a line with zero pressure or when pumping into an open vessel, use our optional three function valve for positive back pressure and anti-syphon injection valve.



6. Optional Three Function Valve

The optional 3-function valve injection assembly provides three functions in one injection valve assembly.

Anti-siphon feature allows metering of liquids "down hill" or into the suction side of a circulating pump. It provides protection against an accidental application of suction pressure at the fluid injection point. Its Teflon coated diaphragm provides a positive anti-siphon action.

Back pressure function permits metering into atmospheric discharge (open container) without over pumping.

Line check to permit the removal of discharge tubing without release of system fluid from the pipe that the injection valve is threaded into.

7. Priming/Degassing Valve Connection

Connect the clear poly tubing to the outlet of the bleed or priming valve. Position the free end of this tube in the chemical container, above the fluid level. This unique valve allows for the release of trapped air from the pump head when opened. Open valve all the way to quickly prime the pump, close it when primed. The valve can work as a degassing valve when the valve is left open approximately 1 turn.

V. Start-Up

A. Priming the pump

Plug in pump. While pump is operating, watch suction line. If fluid begins moving, no further priming is required. If fluid is not moving, open bleed valve until fluid begins to move. When suction line fills, close bleed valve. **Do not over tighten bleed valve, damage may occur.** Thumb and forefinger are all that are required to tighten valve. Further tightening will cause damage to bleed valve which will result in flow loss.

B. Output Information

Pump Model	Strokes per Minute	Gallons Per Day		Liters Per Hour		Milliliter Per Stroke	
		Min	Max	Min	Max	Min	Max
C-105	20	1	5	0.16	0.8	0.125	0.63
C-110	45	2	10	0.31	1.6	0.125	0.63
C-115	65	3	15	0.47	2.37	0.125	0.63
C-120	85	4	20	0.63	3.15	0.125	0.63
C-130	125	6	30	0.94	4.7	0.125	0.63
C-202	15	0.5	2	0.06	0.31	0.07	0.35
C-205	35	1	5	0.16	0.8	0.07	0.35
C-210	75	2	10	0.31	1.6	0.07	0.35
C-215	110	3	15	0.47	2.4	0.07	0.35
C-217	125	3.5	17	0.54	2.6	0.07	0.35

C. Adjusting Stroke Length

The stroke length can be adjusted on most MicroTron™ pumps. This adjustment is a mechanical adjustment made using the large knob on the control panel. To avoid damage to the pump, this adjustment should only be made while the pump is running at a high stroking rate.

D. Optional Features

1. External Pacing

The external pacing option allows the speed of the pump to be controlled by an external device like a flow meter that gives dry contact switch closures. The pump sends out a 5 volt D.C. current to read a switch closure. Each time the pump sees the switch closure it strokes once, up to it's maximum strokes per minute rate.

2. Hall Effect Meter Pacing

This option is like the external pacing only the pump divides the incoming switch closures by 9 before stroking on time. This is a three wire connection: D.C. voltage, signal and ground.

3. External Stop

Pumps with this option are allowed to stroke as long as they see a closed condition from a dry contact source like a flow switch or drum level wand. When an open condition is seen the pump is not allowed to stroke.

4. No Stroke Length Adjustment

Pumps with this option have no stroke length adjustment and no turn down capability. Their output is fixed at the maximum.

VI. Maintenance

The Advantage MicroTron™ pump is designed for long service life with minimum maintenance. If for any reason, maintenance is necessary or desirable, the MicroTron™ pump is easily maintained.

Before any maintenance or service is performed, observe the following precautions:

1. Disconnect the MicroTron™ pump from power source.
2. Drain chemical from discharge tubing.
3. Disconnect discharge tubing from pump.
4. If the MicroTron™ pump is used in a flooded suction application, remove foot valve from chemical container.
5. Observe relevant safety protocols when handling parts which have been in contact with hazardous chemicals.

A. Diaphragm Replacement

1. Remove fluid end cover by lightly prying it loose from the fluid end.
2. Remove the four screws attaching the fluid end to pump body and remove fluid end.
3. Unscrew the diaphragm from the pump shaft in a counterclockwise direction. Be careful that the diaphragm support ring does not fall out. (See liquid end diagram on page 9.)
4. Replace shaft seal if necessary.
5. Screw new diaphragm onto pump shaft until it bottoms out on shoulder of shaft. It is not necessary to tighten further.
6. Replace fluid end. Make sure that screws are evenly tightened.
7. Replace fluid end cover.
8. Reconnect plumbing and power. Prime the pump.

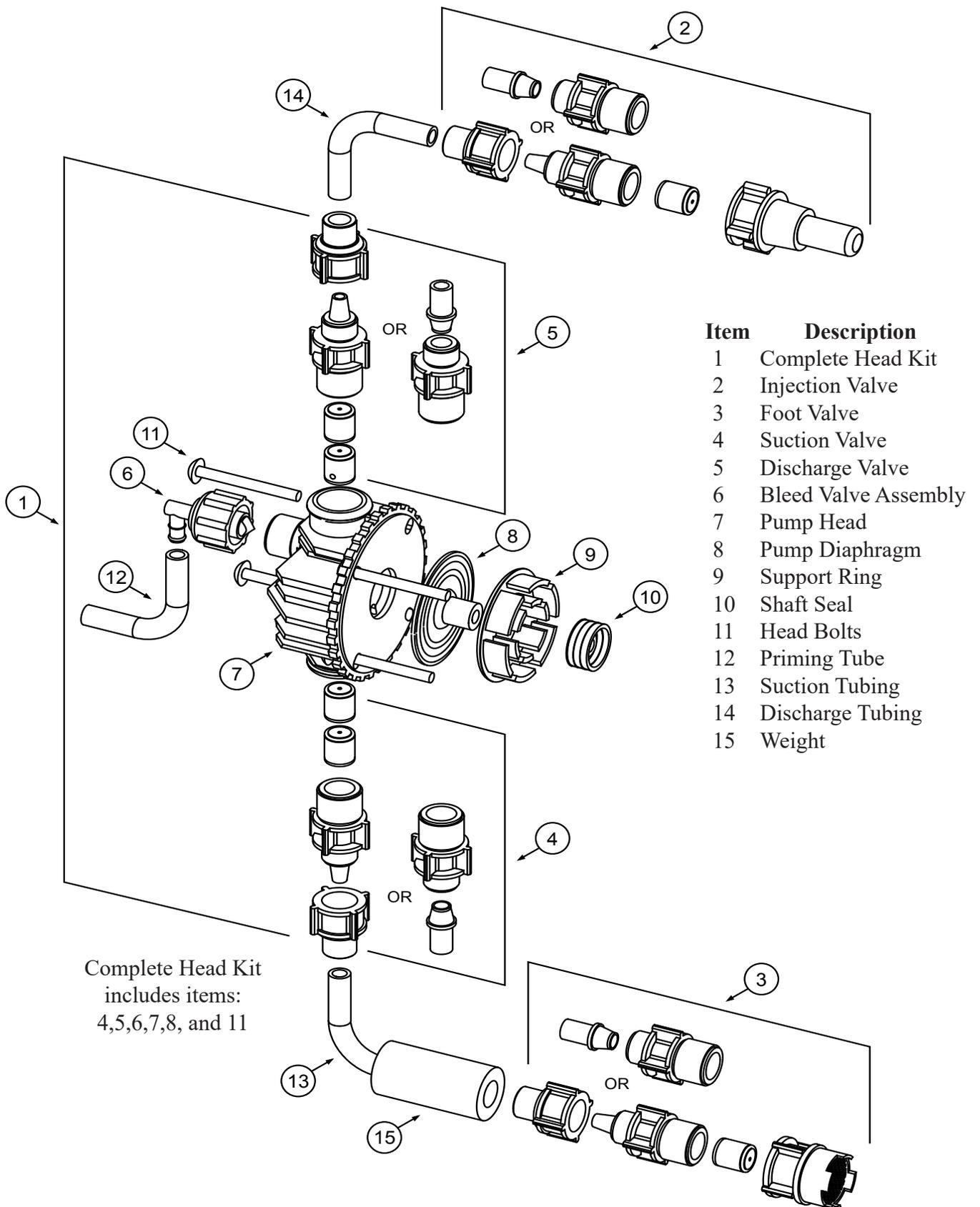
B. Suction and Discharge Check Valve Replacement

1. Disconnect suction tubing from pump.
2. Unscrew fitting from pump head.
3. Remove check valve from suction fitting and replace.
4. Remove O-ring from cavity in fluid end.
5. Remove check valve from suction side of pump and replace.
6. Install new O-ring in suction cavity of fluid end.
7. Replace suction fitting with check valve in fluid end.
8. Replace fluid end. Make sure that screws are evenly tightened.
9. Reconnect plumbing and power. Prime the pump.

NOTES:

1. **Tighten pump head screws after pump's initial week of operation.**
2. **When installing check valves, remember that the seats are always installed at the bottom.**

C. Liquid End Diagram



D. Replacement Parts

Getting the right materials of construction for your spare parts is easy. Using positions 7-10 of the pump model number, example: C130X1-**KFCV**. Find the assembly needed and add the codes of your pump's liquid end after the standard prefix part number for the assembly.

Part Assemblies

Item	Description	Part Number
1.....	Complete Head Assembly 110 psi	CKR-1- _____
	Complete Head Assembly 150 & 250 psi.....	CKR-2- _____
2.....	Injection Valve Assembly.....	INJ- _____
Optional	3-Function Injection Valve	3FV- _____
3.....	Foot Valve Assembly.....	FTV- _____
4.....	Suction Valve Assembly.....	SUC- _____
5.....	Discharge Valve Assembly.....	DIS- _____
6.....	Priming Valve Assembly.....	PRI- _____

Body

K- Kynar
S- 316 Stainless

Seat

V- Viton
F- Teflon
H- Hypalon

Ball

C- Ceramic
D- Single
S- Stainless

Connection

1- 3/8" Tube
2- 1/4" Tube
3- 3/8" Tube
K- 3/8" Tube
P- 1/4" Pipe
U- 3/8" UV
V- 3/8" Clear Suction

Single Parts

12.....	Head Bolts.....	R00045
13.....	Priming Tubing	R00255
14.....	Suction Tubing 3/8" Clear	R00255
	Suction Tubing 3/8" PE.....	R00122
	Suction Tubing 1/4" PE	R00097
15.....	Discharge Tubing 3/8" PE	R00122
	Discharge Tubing 1/4" PE	R00267
16.....	Weight, Suction Tubing	R00139
17	Priming knob extension.....	R00042

VII. Troubleshooting

PROBLEM	CAUSE	REMEDY
Pump does not achieve or maintain prime	<p>Air trapped in suction line</p> <p>Foot valve contaminated or improperly</p> <p>Excessive lift</p> <p>Worn or contaminated check valves</p> <p>Low chemical level</p>	<p>Check suction tubing at fittings for splits. Straighten suction line to eliminate high spots.</p> <p>Inspect foot valve screen and assure that foot installed valve is in a vertical position below fluid level.</p> <p>Max suction lift is 5 feet with fluids of specific gravity of water; less with heavier liquids such as acid. Mount pump in a lower position .</p> <p>Inspect check valves in fluid end for cleanliness. Clean or replace as necessary.</p> <p>Check fluid level in chemical supply tank</p>
Insufficient fluid	<p>Stroke adjustment set too low</p> <p>Worn or contaminated check valves</p> <p>Clogged foot valve screen</p> <p>Output (system) pressure too high</p> <p>Diaphragm worn or torn</p>	<p>Check operation of stroke length limiter knob.</p> <p>Inspect, clean or replace as necessary.</p> <p>Clean or replace foot valve screen.</p> <p>Inject into a lower pressure point in the the system.</p> <p>Replace diaphragm.</p>
Excessive fluid	<p>Failure or lack of anti-siphon valve</p> <p>Improper stroke length</p>	<p>Inspect or add anti-siphon valve. This is caused when system is in a vacuum condition or a flooded suction application on systems at very low pressures.</p> <p>Reduce stroke length.</p>
Pump will not pump but is stroking	<p>System pressure too high</p> <p>Diaphragm improperly installed</p> <p>Check valves worn or clogged</p>	<p>Check system pressure to assure that it is within pump rated parameters for pressure.</p> <p>Make sure that diaphragm is screwed fully onto shaft.</p> <p>Clean or replace as required.</p>
Pump will not run	<p>Pump not turned on or not plugged in</p> <p>Blown fuse</p> <p>Electronic failure</p>	<p>Check outlet with meter to assure the required voltage is present and that power supply cord is in good condition and plugged in.</p> <p>Check fuse on pump circuit board.</p> <p>Consult dealer or factory.</p>
Excessive noise	<p>Pump not primed</p> <p>No output pressure</p>	<p>Prime pump.</p> <p>Add an anti-siphon valve to provide 25 PSI restriction on pump discharge.</p>

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