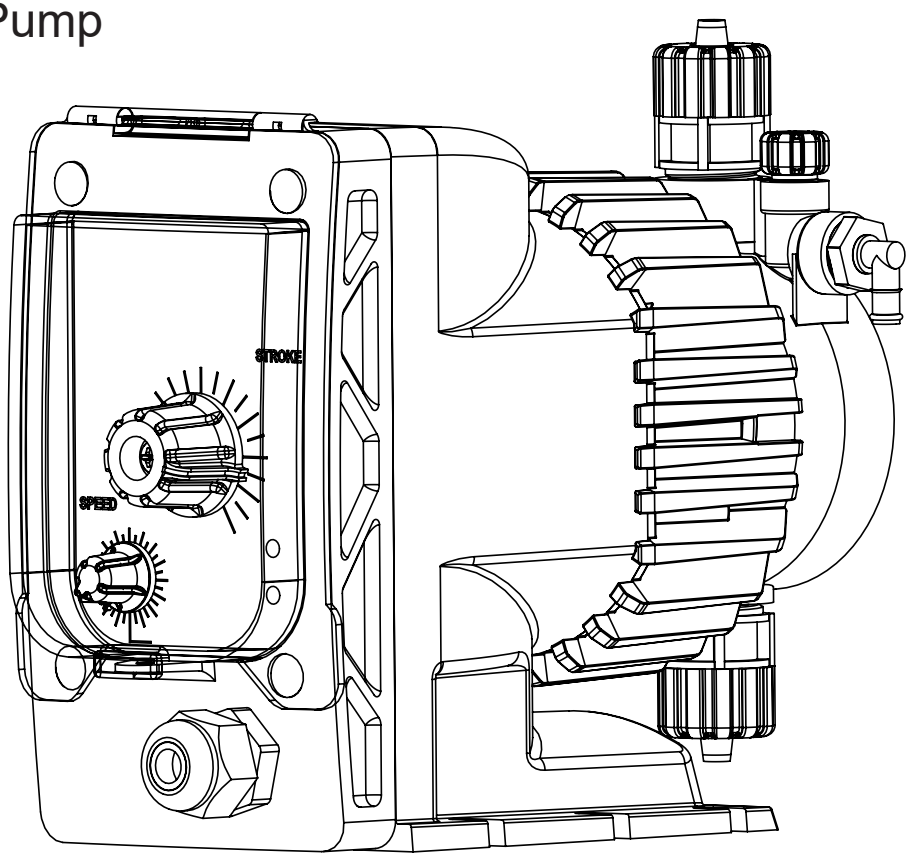
Advantage Pumps — Manual

MicroTron
Series B

Chemical Metering Pump

Installation
Maintenance
Repair
Manual



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Intertek

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Advantage Pumps

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

Model Numbering

MicroTron™ Series B 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 **B 1 30 X 1 – K F C 1 - S**

Pressure Rating
- **1** = 110 150 and or 75 PSI
- **2** = 250 PSI

Gallon Per Day Rating

Control Options
- **X** = Stroke Length Adjust
- **E** = External Pacing
- **D** = Dual output 10-50 GPH or 0-125 SPM
- **F** = Hall effect meter input ÷ by 9
- **L** = Limit Timer

Voltage
- **1** = 120 volt - 50/60 Hz - .35A with USA plug
- **2** = 240 volt - 50/60 Hz - .65A no plug
- **3** = 240 volt - 50/60 Hz - .65A with specified plug
- **4** = 12 volt dc
- **5** = 240 volt USA plug

Pump Head Material
- **K** = Kynar
- **S** = 316 Stainless

Seat Material
- **V** = Viton
- **F** = Teflon
- **H** = Hypalon

Check Ball
- **C** = Ceramic
- **D** = Ceramic/single on discharge (pressure relief)
- **S** = Stainless

Tubing Connections
- **1** = ⅜" tubing rated to 200 PSI
- **2** = ¼" tubing rated to 300 PSI
- **P** = ¼" MNPT
- **U** = ⅜" black UV tubing rated to 200 PSI
- **V** = ⅜" tubing rated to 200 PSI, clear suction.

NOTE: Tubing selection may impact pump rating.

Special Options
- **S** = 3-function injection valve

NOTE: 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 MicroTron™ pump has been shipped as a complete package, ready for installation. If the 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 the following items are present:

1. Metering pump
2. Suction, discharge and priming tubing
3. Foot valve and weight
4. Injection fitting
5. Instruction manual

III. Safety Considerations

NOTE: All MicroTron™ pumps are primed with water before leaving the factory. If the solution to be pumped is not compatible with water, disassemble the pump 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 service department at 1-800-743-7431.

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 spillage 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 as well as a source of 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 MicroTron™ 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 use ultra-violet resistant tubing, consult your distributor or the factory. Accessory item R00225 (plastic mounting bracket) is recommend for a secure installation.

B. Electrical

1. The **Standard** MicroTron™ pump has a voltage regulated internal power supply capable of operating in the range of approximately 95 to 135 VAC and will draw 0.6 amp typically using .066 kw. 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.

2. With a 240-volt option, the MicroTron™ pump has a voltage regulated internal power supply capable of operating in the range of approximately 195 to 260 VAC and will draw 0.3 amp typically using .066 kw. Use a supply voltage of 210 to 250 VAC for best results.

CAUTION: Never remove ground wire from plug!

C. Plumbing

1. Tubing 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 connections should be double checked to insure against leakage. If hazardous chemicals are being pumped, use shielding around discharge tubing.

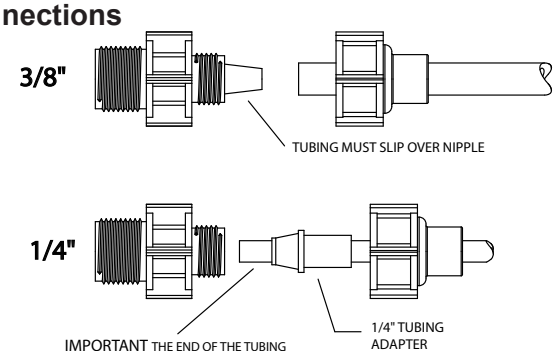
NOTES:
1. **Clear flexible tubing is not intended for pressurized use.**
2. **When cutting lengths of tubing for your installation, ensure a clean, square cut. Use short lengths of tubing and as few connections as possible.**
3. **There is an approximate 2.5 PSI capability lost for every 1 foot of vertical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

2. Tubing Nuts

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.**

WARNING: Clear flexible tubing is not intended for pressurized use.

3. Tubing Connections

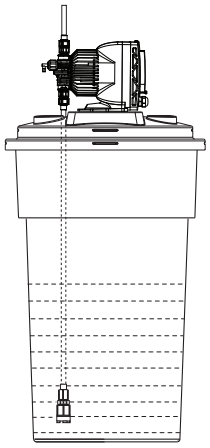


4. Suction Lift vs Flooded Suction Applications

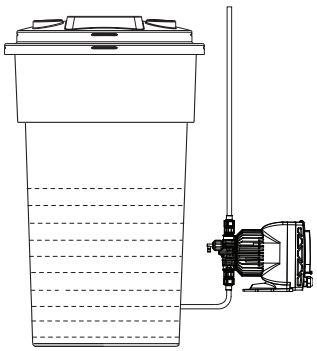
Suction Lift Installation
Mount the MicroTron™ pump around the top of the solution tank, not to exceed 5 feet from pump to bottom of tank.

Flooded Suction
This installation is recommended for very low outputs, solutions that gasify and/or high viscosity solutions. Priming is easier and loss of prime is reduced. Failure of the pump diaphragm or rupture of the solution tubing can cause loss of solution in the tank.

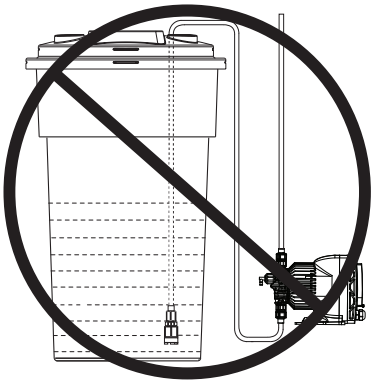
Suction lift



Flooded Suction



Not recommended



5. 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.

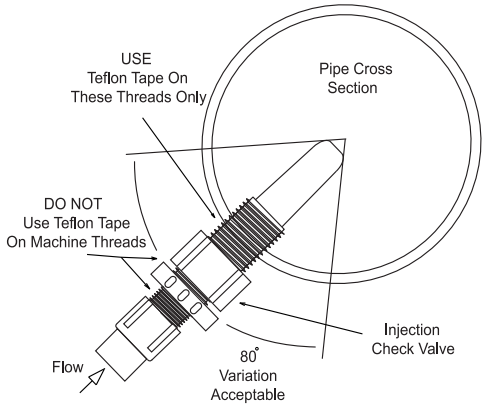
6. Foot valve installation

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.

7. 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 (see drawing). 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. Do not use Teflon tape or joint compound on this fitting. Connect tubing between this fitting and the pump discharge fitting at the pump head.

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



8. 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 “downhill” 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 overpumping.

Line check permits removal of discharge tubing without release of system fluid.

9. 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. Standard head configurations include a priming valve built into the head. Clear poly tubing should be connected to the outlet of this valve, the other end of the tube should be placed in the chemical container above the fluid level.

V. Start-Up

A. Priming the pump

Plug in pump, set stroke to 100% and strokes per minute to maximum speed. While pump is operating, if fluid begins moving, no further priming is required. If fluid is not moving, open bleed valve approximately one turn until fluid begins to move. When suction line fills, close bleed valve. Do not over tighten bleed valve. Damage may occur.

B. Adjusting feed rate

The standard Model B allows for the exact setting of the pumps stroking rate (speed) on the pump’s control panel. Standard strokes per minute settings available are: 1, 2, 3, 4, 5, 6, 7, 10, 15 and increase by 5 thereafter up to the maximum of 125 (B-155 models have a max speed of 160 strokes/minutes).

C. Stroke length

The stroke length can be adjusted on all 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. Calculating Output

A pump’s output per minute can be determined by dividing the maximum rated gallons per day by 1440 (minutes per day). For example, a 30 gallons per day (gpd) pump at a maximum stroke length and speed setting of 125 strokes per minute (spm) will pump 0.000167 gallons per stroke (gps).

30 ÷ 1440 = 0.0208 gpm ÷ 125 spm = 0.000167

With this value and the pump’s speed setting (strokes per minute) you can calculate your pump’s output at it’s rated pressure. A 30 gpd pump set at 50 strokes per minute:

50spm x .000167gps x 1440 (minutes per day) = 12.02 gallons per day

Reducing the stroke length will reduce the pump's output again. If the example pump above had it's stroke length reduced to 50% the 12.02 gallons per day output is reduced to 6.01. (example: 12.02 gpd x 0.50 = 6.01 gpd)

A higher product viscosity will reduce the output. Pressures lower than the pump's rating can increase the output.

E. Optional Features

A pump's output per minute can be determined by dividing the maximum rated gallons per day by 1440 (minutes per day). For example, a 30 gallons per day (gpd) pump at a maximum stroke length and speed setting of 125 strokes per minute (spm) will pump 0.000167 gallons

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 its maximum strokes per minute rate.

2. Hall Effect Meter Pacing

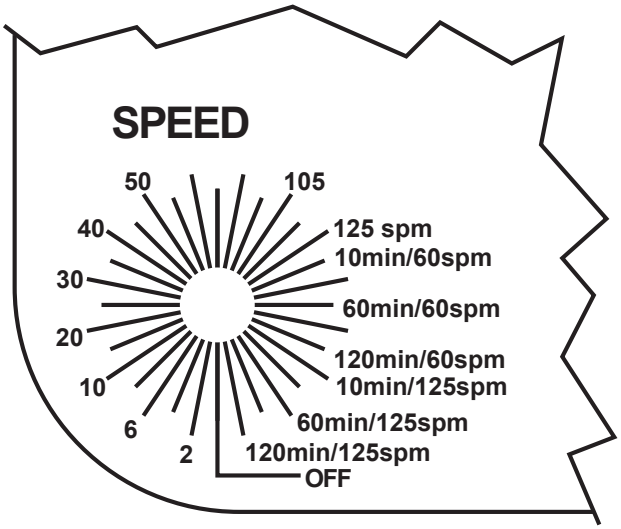
This option is like the external pacing only the pump divides the incoming switch closures by 9 before stroking on time. This is a three wire connection: D.C. voltage, signal and ground.

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. Limit Timer

Pumps with the limit timer options have a different speed setting scale where a portion of the settings are for just various speeds with no limit. It also has a portion that is at 60 spm or 125 spm speed and five different limit times (10, 30, 60, 90 and 120 minutes). If the speed is set with a particular limit time the pump will stop pumping after it has been powered on for the defined limit time. After a power cycle the pump will be allowed to run up to the limit time again.



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

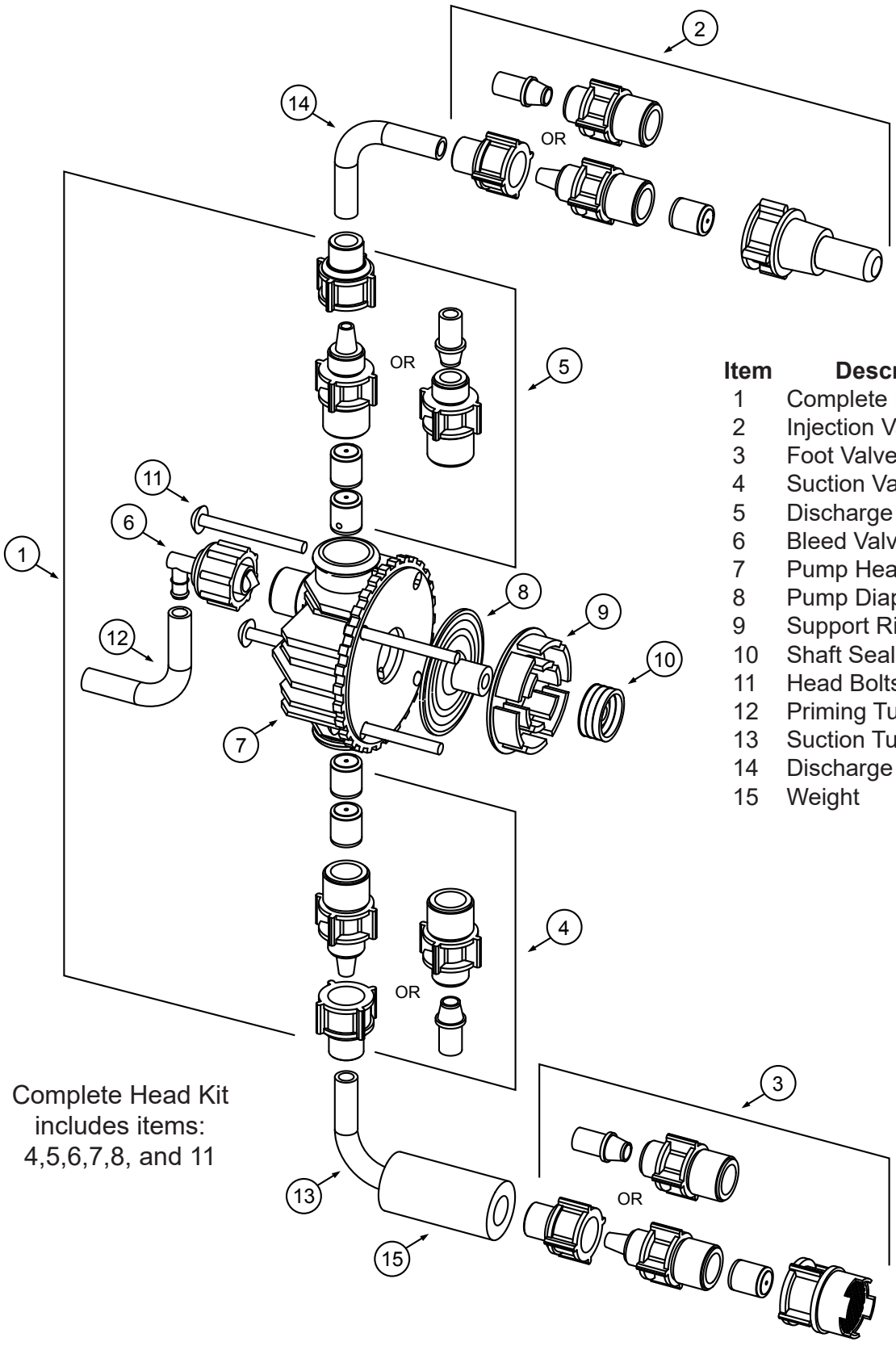
1. Remove fluid end cover by lightly prying it loose from the fluid end.
2. Remove the four screws attaching the fluid end to pump body.
3. Remove the fluid end from the pump body.
4. Unscrew the diaphragm from the pump shaft in a counter-clockwise direction. Be careful that diaphragm support ring does not fall out.
5. Do not allow sharp or abrasive objects to come in contact with pump parts.
6. Inspect end of shaft to assure that threads are in good condition. Replace shaft bellows if necessary. No further disassembly is recommended.
7. Screw new diaphragm onto pump shaft until it bottoms out on shoulder of shaft. It is not necessary to tighten further.
8. Replace fluid end. Make sure that screws are evenly tightened.
9. 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 pump and replace.
6 Install new O-ring in cavity of fluid end.
7. Replace valve 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



Item	Description
1	Complete Head Kit
2	Injection Valve
3	Foot Valve
4	Suction Valve
5	Discharge Valve
6	Bleed Valve Assembly
7	Pump Head
8	Pump Diaphragm
9	Support Ring
10	Shaft Seal
11	Head Bolts
12	Priming Tube
13	Suction Tubing
14	Discharge Tubing
15	Weight

Complete Head Kit includes items: 4,5,6,7,8, and 11

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: B130X1-**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	**Seat**	**Ball**	**Connection**
K- Kynar	**V**- Viton	**C**- Ceramic	**1**- ⅜" Tube
S- 316 Stainless	**F**- Teflon	**D**- Single	**2**- ¼" Tube
	H- Hypalon	**S**- Stainless	**3**- ⅜" Tube
			K- ⅜" Tube
			P- ¼" Pipe
			U- ⅜" UV
			V- ⅜" Clear Suction

Single Parts

12	Priming Tubing	**R00255**
13	Suction Tubing ⅜" Clear	**R00255**
	Suction Tubing ⅜" PE	**R00122**
	Suction Tubing ¼" PE	**R00097**
14	Discharge Tubing ⅜" PE	**R00122**
	Discharge Tubing ¼" PE	**R00267**
15	Weight, Suction Tubing	**R00139**

VII. Trouble Shooting

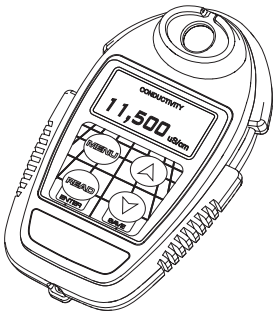
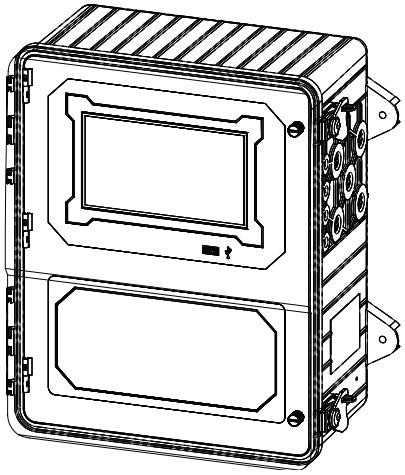
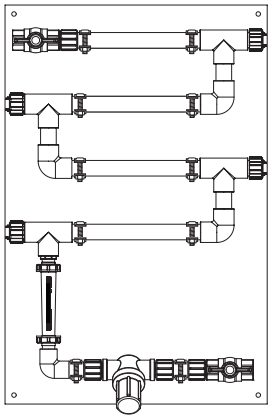
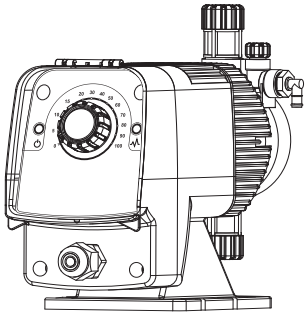
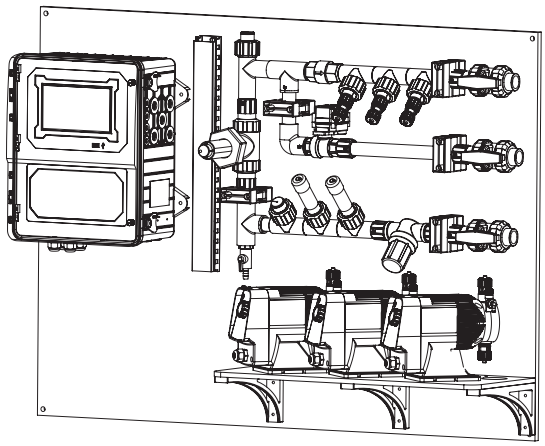
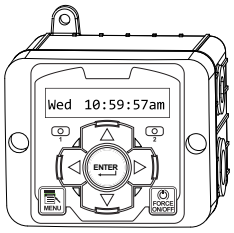
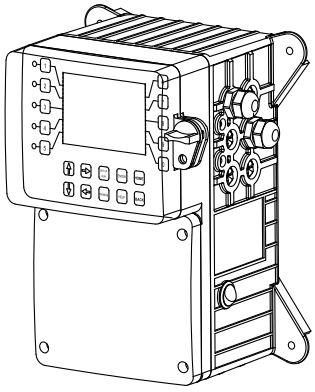
PROBLEM	CAUSE	REMEDY
Pump does not achieve or maintain prime	Air trapped in suction line	Straighten suction line so as to eliminate high spots.
	Foot valve contaminated or improperly installed	Inspect foot valve screen and assure that foot valve is in a vertical position below fluid level.
	Excessive lift	Maximum suction lift is 5 feet with water or fluids of similar specific gravity; less with heavier liquids such as acids. Mount pump in a lower position relative to the chemical container.
	Suction fittings not properly tightened	Check fittings. Overtightening may cause restriction. Conversely, if **any** leakage occurs, pump will suck air and fail to prime.
	Worn or contaminated check valves	Inspect check valves in fluid end for cleanliness. Clean or replace as necessary.
	Split or pinch in suction tube	Inspect suction tube through its full length to assure that there are no splits at the connections or other restrictions. Move any objects or equipment which impinges upon suction tube or reroute as required to assure a smooth transition from foot valve to pump.
	Low chemical level	Check fluid level in chemical supply tank.
Insufficient fluid	Stroke adjustment set too low	Check operation of stroke limiter knob. If pump delivers too low adjustable rate, check settings. Readjust as required.
	Worn or contaminated check valves	Inspect, clean or replace as necessary.
	Obstruction in suction line	Check suction line for obstructions, clogging, kinks or pinch points.
	Clogged foot valve screen	Clean or replace foot valve screen.
	Output (system) pressure too high	Relocate the injector to a lower pressure part of the system.
	Diaphragm worn or torn	Replace diaphragm, making sure that it is screwed on fully to shoulder of shaft.
	Electronic failure	Consult dealer or factory.

Excessive fluid	Failure or lack of antisiphon valve	Inspect or add anti-siphon valve. This is caused when system is in a vacuum condition or valve in delivery applications with flooded suction which feeds systems at very low pressures.
	Excessive stroke rate	Lower the stroke rate if adjustable on your pump.
	Improper stroke length	Reduce stroke length.
Pump will not pump	System pressure too high	Check system pressure to assure that it is within system rated parameters of the pressure.
	Diaphragm improperly installed	Make sure that diaphragm is screwed fully unto shaft.
	Check valves worn or clogged	Clean or replace as required.
Pump will not run not plugged in	Pump not turned on or not plugged in	Check outlet with meter to assure that correct or voltage is present, and that power supply cord is in good condition and plugged in.
	Electronic failure	Consult dealer or factory.
Excessive noise	Pump not primed	Prime pump.
	No output pressure	Add an anti-siphon valve to provide 25 PSI restriction on pump discharge.

Application Notes:

Application Notes:

Get the Advantage in Water Treatment Equipment

Advantage Controls can give you the *Advantage* in products, knowledge and support on all of your water treatment equipment needs.

- Cooling Tower Controllers
- Boiler Blow Down Controllers
- Blow Down Valve Packages
- Bleed Valves
- Water Meters
- Chemical Metering Pumps
- Corrosion Coupon Racks
- Chemical Solution Tanks
- Solid Feed Systems
- Bypass Feeders
- Filter Equipment
- Glycol Feed Systems
- Pre-Fabricated Systems