

# **Blue-White<sup>®</sup>**

**Industries, Ltd.**

## **FLEXFLO<sup>®</sup>**



### **MODEL A-1600**

**Peristaltic Injection Pump  
Operating Manual**

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**Website:** www.Blue-White.com

**Thank You** for purchasing the A-1600 Peristaltic Injector Pump. It is our policy to Produce, market and provide service on our products to ensure your safety and complete satisfaction. When installed and used in accordance with the following instructions, the A-1600 will provide years of safe, reliable service.

**For your safety** the A-1600 was designed to be safe and easy to use. However, there are limits to its operation. This instruction manual contains safety precautions, which if ignored could result in personal injury and/or property damage.

**Read these instructions** carefully **before** installing the injector. If you are not satisfied that the unit can be safely operated, call the place of purchase for assistance.

Thank You  
**Blue White Industries**  
 (714)893-8529.

**LEAVE THIS INSTRUCTION MANUAL WITH INSTALLED METER!**

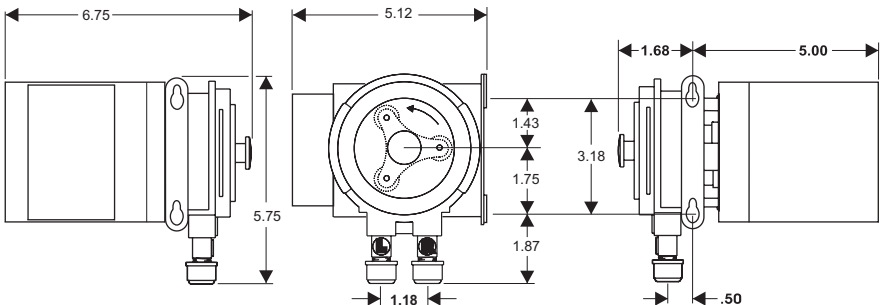
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**SPECIFICATIONS**

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| MODEL NO: | MAXIMUM P.S.I | MAXIMUM FEED RATE |        |       |       |
|-----------|---------------|-------------------|--------|-------|-------|
|           |               | ML/MIN            | OZ/MIN | G.P.H | G.P.D |
| A-1614-3N | 25            | 3                 | .1     | .04   | 1     |
| A-1614-4  | 25            | 17                | .5     | .26   | 6     |
| A-1614-6  | 25            | 60                | 2.0    | .95   | 22    |
| A-1614-7  | 25            | 75                | 2.5    | 1.18  | 28    |
| A-1630-3N | 25            | 11                | .3     | .17   | 4     |
| A-1630-4  | 25            | 40                | 1.3    | .63   | 15    |
| A-1630-6  | 25            | 130               | 4.4    | 2.05  | 49    |
| A-1630-7  | 25            | 195               | 6.5    | 3.08  | 74    |
| A-1645-3n | 25            | 14                | .4     | .22   | 5     |
| A-1645-4  | 25            | 54                | 1.8    | .85   | 20    |
| A-1645-6  | 25            | 195               | 6.5    | 3.08  | 74    |
| A-1645-7  | 25            | 295               | 9.9    | 4.67  | 112   |

NOTE:-N Norprene tubing same feed rate as tygon



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# INSTALLATION INSTRUCTIONS

## 1. UNPACKING

Your Flexflo package includes one injector pump, 10ft. Of clear vinyl tubing, threadless injector fitting, combinations foot valve/strainer, flow indicator, foot valve weight, two pump tube assemblies and mounting hardware.

On receipt, immediately inspect the contents of the shipping carton. Notify the shipping carrier if there are any signs of damage.

## 2. LOCATION AND MOUNTING

### CAUTION

ALWAYS WEAR EYE PROTECTION AND PROTECTIVE CLOTHING WHEN WORKING AROUND CORROSIVE MATERIAL.

- A. Choosing a well ventilated area located near the supply tank, Electrical supply and injection points.
- B. The injector may be shelf or wall mounted. Use the inclosed hardware for wall mounting.
- C. When using wall corrosive chemicals, avoid mounting the injector directly above the supply tank. Although the pump housing is designed to withstand corrosion, some chemical fumes may damage the unit.
- D. Your solution tank should be sturdy plastic and chemically resistant to the chemicals you are using to protect from fume, a tight fitting cover should be in place at all times. A variety of tanks are available from the factory.

## 3. ELECTRICAL CONNECTIONS

### WARNING - RISK OF ELECTRIC SHOCK

Be certain you connect the unit to the proper supply voltage. Using the incorrect voltage will damage the injector and may result in injury. The units voltage requirements is printed on the name plate.

#### A-1600 MODELS

A-1600 Model Injector are supplied with a junction box and cover. To reduce the risk of electric shock when field wiring, be certain that the grounding conductor is attached to the green ground screw, located inside the junction box.

#### A-1600T MODELS

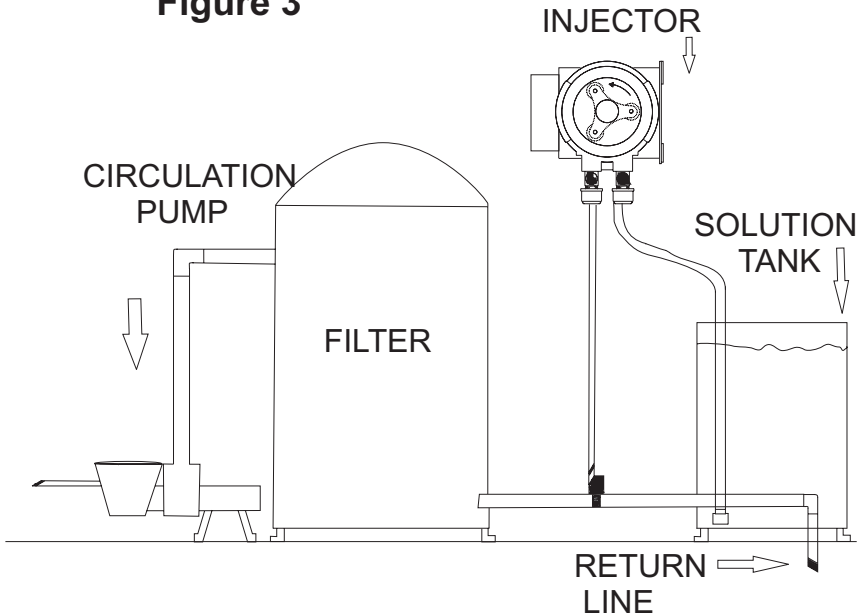
##### (Timer Equipped Model)

115V Model Injector are supplied with a ground wire conductor and a grounding type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to the properly grounded, grounding type receptacle. A ground fault interrupter (GFI) receptacle is recommended for use in wet locations.

24V/230V Models Injectors are supplied with a ground wire conductor. To reduce the risk of electric shock, be certain that the green grounding conductor is connected only to a properly grounded field wiring box.

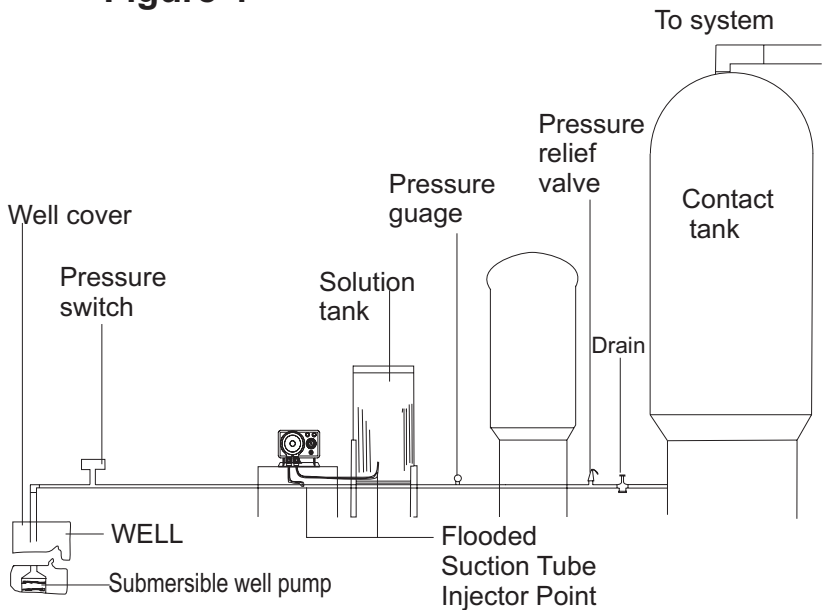
## SWIMMING POOLS

Figure 3

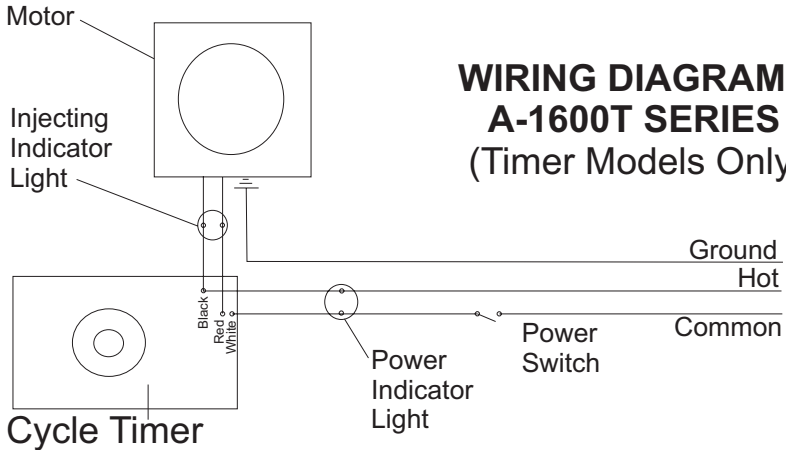


## WATER WELLS

Figure 4



**WIRING DIAGRAM**  
**Figure 5**



**WIRING DIAGRAM**  
**A-1600T SERIES**  
 (Timer Models Only)

**A- 1600 SERIES**  
**WIRING COLOR CODES**  
 Figure 6

\*\*\*\*\***MOTOR**\*\*\*\*\*

| VOLTAGE | HOT             | COMMON | GROUND |
|---------|-----------------|--------|--------|
| 115v    | Black or Yellow | Blue   | Green  |
| 230v    | Black or Yellow | Red    | Green  |
| 24v     | Blue            | White  | Green  |

\*\*\*\*\* **CIRCUIT BOARD**\*\*\*\*\*  
 (TIMER MODELS ONLY)

| HOT              | COMMON  | LOAD   |
|------------------|---------|--------|
| (Load and Input) | (Input) | (Load) |
| Black            | White   | Red    |

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## OPERATING INSTRUCTIONS

### 1. ATTACH THE TUBING AND FITTINGS

**CAUTION:** Be sure your installation does not constitute a cross Connection. Check your local plumbing codes.

- A. Install the pump tube assembly into the pump head. (Fig.7)
- B. Install the threadless injector (T.I. Fitting), or optional threaded anti-syphon valve. (Fig.8 or 10)
- C. Connect the flow indicator side of the suction tubing to the pump fitting marked "R". The flow indicator must be installed in a vertical position.
- D. Trim the other end of the suction tubing so the foot valve assembly will rest 2 inches from the bottom of the solution tank. This is to prevent sediment from clogging the strainer.
- E. Slide the ceramic weight over the suction tubing and attach the foot valve assembly.
- F. Connect the remaining tubing to the pump tube marked "L". Trim the other end of the tubing leaving only enough slack to connect it to the injector fitting. **NOTE:** for best results, the discharged tubing should be installed in a continual up slope.

### 2. PRIMING

**CAUTION - THE USE OF PROTECTIVE CLOTHING AND GOGGLES IS RECOMMENDED.**

- A. To aid in priming and to reduce vapor lock, hold the discharge tubing in a continual upward slope **AWAY FROM YOUR FACE AND BODY**, and above the injector.
- B. Turn the percentage timer to ON or MAX. (Timer Models)
- C. Turn on the injector.
- D. When the fluid nears the injection end of the tubing, turn OFF the injector and attach the tube to the T.I. Fitting. (Threadless Injector).
- E. Check all connections for leaks.

**DO NOT OVER TIGHTEN!**

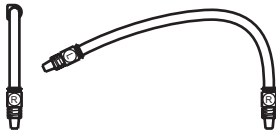
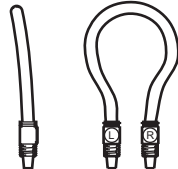
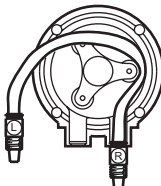
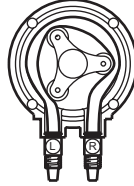
TUBE THREADING INSTRUCTIONS

CAUTION: Keep fingers out of pump head!



Video Instructions: <http://www.blue-white.com/Video.htm>

We offer free training on this over the web.

|  |  |
|--|--|
| <p>1.</p>  <p>Hold the tube in your right hand with the fitting marked "R" facing you. Note that the fitting marked "L" is facing downward and away from you to the left. The tube is purposely twisted to allow for the difference between the inside length and the outside length of the tube when installed in the pump head.<br/>Hold the tube with your thumbs over the</p> | <p>2.</p>  <p>"R" and the "L." The tube will naturally curve toward the rear of the pump head. The curve in the tubing is a patented feature which prevents the pump tube from running outward and against the cover.<br/>Attach the plastic tube fitting (marked</p> |
| <p>3.</p>  <p>"R") into the right side of the pump head. Push the groove of the fitting straight into the slot. With the pump running, hold the fitting marked "L" with your left hand (your thumb should be covering the "L").<br/>At the same time, use your right thumb</p>   | <p>4.</p>  <p>to guide the tube into the pump head. With the tubing riding well between the rollers, push the fitting marked "L" into the chamber lock. Be sure both fittings are pushed all the way in place.</p>   |

TUBE CONNECTIONS INSTRUCTIONS

1. Connect the flow indicator end of the suction tube to pump fitting marked "R." Indicator to be vertical.
  2. Trim the other end so strainer assembly will hang about one or two inches above bottom of solution tank (sediment space).
  3. Slide the ceramic weight over the end and attach the foot strainer assembly.
  4. Connect the discharge tube to the "L" fitting then to the injector fitting.
- NOTE: An injector to fit 1/4" and/or 1/2" threaded hole is available. Call your supplier.

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## OPERATING INSTRUCTIONS (Con't)

### 3. ADJUSTING THE OUTPUT

- A. The pause control knob adjusts the cycle timer's time on. The model A-1600T standard cycle timer set at one minute. (+-10%) Other cycle lengths are available.
- B. To adjust the amount of time on, turn the pause control knob to the correct setting.  $\frac{1}{2}$  equals approximately 30 seconds on.  $\frac{3}{4}$  equals approximately 45 seconds on, etc.

### 4. MEASURING THE OUTPUT

This volumetric test will take into account installation factors such as line pressures, fluid viscosity, specific gravity, etc. This test is the most accurate for measuring the injector's output individual installation.

- A. With the injector installed under normal operating conditions, place the foot valve/ strainer in a large graduated container.
- B. Fill the container with the chemical to be injected and run the unit until all air is removed from the suction line.
- C. Refill the container if necessary, and with the foot valve in the solution, note the amount of chemical in the container.
- D. Run the injector for a measured amount of time and note the amount of chemical injected. The longer the testing time, the more accurate the measurement.

## MAINTENANCE PROCEDURES

### 1. ROUTINE MAINTENANCE

- A. The A-1600 injector is designed to require very little maintenance. However, inspections should be performed regularly. An **inspection log** should be kept to note any changes in performance. This is particularly important when injecting fluids other than water.

When injecting water only inspect the injector **once every month** for signs of leaks, cracks, crazing (shattered look), corrosion or discoloration of the pump head and tubing. Note all changes in the log.

When injecting fluids other than water, inspect the injector at leased **once every day** for the first week of operation, inspect **once every week** thereafter. Look for evidence of chemical attack in the pumphead, O-ring, tubing and accessory valves and fittings. Inspect all parts for leaks, swelling, cracking, crazing, corrosion, or discoloration. Also inspect the tubing for elasticity. Note all changes in log.

- B. Cracking, crazing, discoloration, etc., During the first week of operation, are signs of severe chemical attack. If this occurs, immediately remove the injector from the fluid. Determine which parts are being attacked and replace with parts that have been manufactured using a more suitable material. Contact the place of purchase if you need assistance.

- C. The A-1600 injector is designed to perform in a variety of installations.

However, the service life of **each part** in the injector will vary depending on many factors such as fluid, temperature, pressure, etc. Because of the wide variety of installations, the A-1600 has been factory tested for pressure and performance using water only.\* **Do not** use chemical other than water unless you are satisfied they are compatible with the injectors construction. Contact the place of purchase if you need assistance.

\*NOTE: NSF international has tested the A-1600T injector using two different fluids, 12 1/2% Sodium Hypochlorite and has found that the A-1600T conforms to the requirements of NSF Standard 50.

## **2. THE PUMP TUBE ASSEMBLY**

A. The A-1600 Pump Tube Assemblies are designed for a service life of at least 800 hours. However, the service life can be adversely affected by the chemicals used, the amount of back pressure, the motor RPM, and temperature. The service life of 800 hours is based on the A-002-6 tube tested with water at 70F. (21C), 0PSI, 45 RPM gearbox.

B. The pump tube assembly should be inspected frequently. Replace the tube if any cracking, leaking or loss of feed rate occurs.

**NOTE:** Place 1 or 2 drops of silicone oil on each roller to lubricate new pump tubes or when required.

## **3. CLEANING**

A. The most common problems occur from deposits that can build up in the foot valve, injection fitting and pump tube assembly, (wetted parts. Keeping these parts clean will dramatically increase the life of the injector.

B. For simple maintenance cleaning, remove the injection fitting and footvalve / strainer. Disassemble and clean the individual parts with clean water. (Fig. 8 or 9) With these fittings removed, set the pause control to ON and run the injector using clean water.

C. For removing harsh deposits that can build in the wetted parts.....

1. Flush the system by pumping clean water to remove any chemicals that may be present.

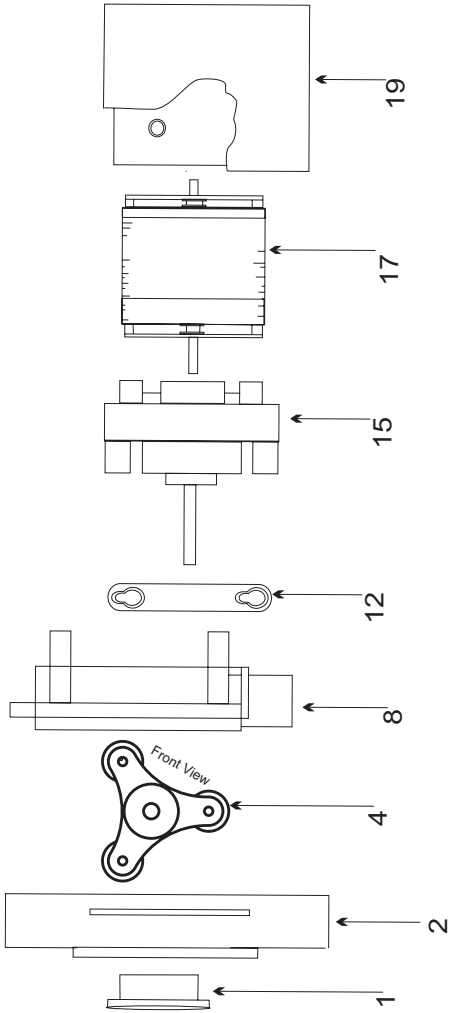
2. Run a weak solutions of muriatic acid (5%) through the wetted parts.

3. Again flush the system with clean water.

### **CAUTION**

MURIATIC ACID WHEN MIXED WITH OTHER CHEMICALS CAN BE EXTREMELY DANGEROUS. ALWAYS FLUSH THE SYSTEM WITH CLEAN WATER BEFORE AND AFTER YOU ACID WASH.

D. When changing the pump tube assemble, always wipe the pumphead to remove any debris. Clean with soap and water if necessary.



## A-1600 PARTS LIST

|             |                                       |                |  |
|-------------|---------------------------------------|----------------|--|
| 1. A-011    | Pumphead Cover Retaining Knob         | 19. C-608P     | Motor Housing                            |
| 2. A-001    | Pumphead Cover                        | 20. C-628      | Screw 6-32x2-3/4 Phil RD                 |
| 3. A-002-3N | Pump Tube Assy. 3/16" OD Norprene     | 24. C-308J     | Junction box assembly                    |
| A-002-4     | Pump Tube Assy. 1/4" OD Tygon         | 25. C-330-4    | Tube Nut 1/4 OD Tubing                   |
| A-002-4n    | Pump Tube Assy. 1/4" OD Norprene      | C-330-6        | Tube Nut 3/8" OD Tubing                  |
| A-002-6     | Pump Tube Assy. 3/8" OD Tygon         | 26. C-334-4-10 | Tubing 1/4" OD x 10'                     |
| A-002-6n    | Pump Tube Assy. 3/8" OD Norprene      | C-334-6-10     | Tubing 3/8" OD x 10'                     |
| A-002-7     | Pump Tube Assy. 7/16" OD Tygon        | 27. T140-4V    | T.I. Fitting 1/4" OD Tube Viton W/ Clamp |
| A-002-7N    | Pump Tube Assy. 7/16" OD Norprene     | T140-6V        | T.I. Fitting 3/8" OD Tube Viton W/ Clamp |
| 4. A-003    | Roller Assy. 3 Lobe                   | 28. CF-3040    | Clamp Fits 1" Thru 2-1/2" Pipe           |
| A-003-1     | Roller Assy. 2 Lobe                   | 29. C-346      | Ceramic Foot Valve Weight                |
| 5. A-004    | Pumphead Mounting screw 10-32 x 3/4"  | 30. C-340-4V   | Foot Valve/Strainer 1/4" OD Viton        |
| 6. A-031    | Pumphead Spacer                       | C-340-6V       | Foot valve/Strainer 3/8" OD Viton        |
| 7. 2-010E   | Motor Shaft Seal                      | 31. A-023-B    | Electronic Timer Assy. 1 Min. 115v       |
| 8. A-005    | Pumphead                              | A-023-C        | Electronic Timer Assy. 1 Min. 230v       |
| 9. A-006    | Motor Mount Screw 10-32 x 1/2         | A-023-D        | Electronic Timer Assy. 1 Min. 24v        |
| 12. C-302   | Motor Mount                           | A-023-E        | Electronic Timer Assy. 2 Min. 220v       |
| 14. C-649   | Bushing .50-20x.31Alum. Hex           | A-023F         | Electronic Timer Assy. 6 Sec. 115v       |
| 15. A-008-1 | Gear Box Assembly 14 RPM              | A-023-G        | Electronic Timer Assy. 6 Sec. 230v       |
| A-008-2     | Gear Box Assembly 30 RPM              |                |  |
| A-008-3     | Gear Box Assembly 45 RPM              |                |  |
| 17. A-149-1 | Motor Assy. 24v/60HZ For 14 RPM       |                |  |
| A-309-1     | Motor Assy. 24v/60HZ For 30 & 45 RPM  |                |  |
| A-149-2     | Motor Assy. 115v/60HZ for 14 RPM      |                |  |
| A-309-2     | Motor Assy. 115v/60HZ for 30 & 45 RPM |                |  |
| A-149-4     | Motor Assy. 220v/50HZ for 14 RPM      |                |  |
| A-309-4     | Motor Assy. 220v/50HZ for 30 & 45 RPM |                |  |
| A-149-3     | Motor Assy. 230v/60HZ for 14 RPM      |                |  |
| A-309-3     | Motor Assy. 230v/60HZ for 30 & 45 RPM |                |  |

**CONTACT LOCAL AUTHORIZED REPAIR CENTER  
FOR PARTS AND SERVICE**



## TROUBLE SHOOTING GUIDE

| SYMPTOM  | POSSIBLE   | CORRECTIVE  |
|--|--|---|
| Tube wears out to fast                                 | <ol style="list-style-type: none"> <li>1. High back pressure</li> <li>2. Temp. above 105° F</li> <li>3. Clogged injection fitting</li> </ol>   | <ol style="list-style-type: none"> <li>1. MAX PSI = 25</li> <li>2. Do not install near a heat source</li> <li>3. Clean fittings</li> </ol>  |
| Injector runs noisy                                    | <ol style="list-style-type: none"> <li>1. Normal with 14 RPM</li> <li>2. Worn motor bearing</li> </ol>   | <ol style="list-style-type: none"> <li>1. None</li> <li>2. Replace bearing</li> </ol>   |
| Injector runs hot                                      | <ol style="list-style-type: none"> <li>1. Normal heat rise is approx. 70° F</li> </ol>   | <ol style="list-style-type: none"> <li>1. Do not install bear a heat source</li> </ol>  |
| Solution tank is filling instead of emptying           | <ol style="list-style-type: none"> <li>1. Suction &amp; Discharge tubing is reversed</li> <li>2. Rollers worn far beyond standard tolerance</li> </ol>   | <ol style="list-style-type: none"> <li>1. Connect suction tube to fitting marked "R" and Discharge to "L"</li> <li>2. Replace Roller Assembly</li> </ol>  |
| Swollen O-Rings  | <ol style="list-style-type: none"> <li>1. O-Ring material is not compatible with chemical being used.</li> <li>2. System was</li> </ol>  | <ol style="list-style-type: none"> <li>1. Replace with compatible O-Rings</li> <li>2. See page #8 Section 3 C</li> </ol>  |
| Cycle Timer is erratic or run constantly               | <ol style="list-style-type: none"> <li>1. Spikes or surges in electricity caused by "ORP" or "PH" controllers</li> <li>2. Surge protector has been overlooked</li> </ol>   | <ol style="list-style-type: none"> <li>1. Consult controller manufacturer</li> <li>2. Replace timer board</li> </ol>  |
| Pressure is below 25 PSI but chemical is not injecting | <ol style="list-style-type: none"> <li>1. Tube assembly is worn</li> <li>2. Roller Assembly is worn</li> <li>3. Injection fitting or foot / valve assembly is clogged</li> <li>4. Discharge tubing is to long creating added back pressure (especially with high viscosity chemicals)</li> </ol> | <ol style="list-style-type: none"> <li>1. Replace tube assy</li> <li>2. Replace roller</li> <li>3. Clean fittings</li> <li>4. Install injector as close to injection point as possible Trim Discharge tubing</li> </ol> |

## LIMITED WARRANTY

Your new pump is a quality product and is warranted to be free of defects as set down in this policy. All parts, including rubberized goods and labor are covered under warranty for 90 days from date of purchase. Used peristaltic tubes are not warranted. Parts (excluding rubberized goods and labor) are covered for a period of 12 months from date of purchase. Warranty coverage does not include damage to the pump that results from misuse, carelessness, abuse, or alteration. Only the repair or replacement of the pump is covered. The manufacturer does not assume responsibility for any other loss of damage. Warranty status is determined by the pump's serial number. The serial number label must be on the pump to obtain warranty coverage. Enclose your invoice or sales receipt, with date of purchase, when you return the pump for warranty repair. Warranty status will be verified by the factory or authorized service center.

Also: Please be advised, injections and metering devices are not intended as a means of treating water to render it suitable for human consumption. When used as hypochlorinators, they are meant to destroy bacteria and algae contamination, before its removal by filtration. Acid and soda injectors are used for pH control (balance). The injectors are factory tested with water only for pressure and performance. Installers and operators of these devices must be well informed and aware of the precautions to be taken when injecting various chemicals, especially those considered hazardous or dangerous. Should it be necessary to return an injector for repair or service, you must attach information regarding the chemical used as some residue may be present within the unit and could be hazardous to service personnel.

The manufacturer will not be liable for any damage that may result by the use of chemicals and injectors and its components. Thank you.

## PROCEDURE FOR IN-WARRANTY REPAIR

Carefully, pack the pump to be repaired, including the foot valve and injection fitting. Enclose a brief description of the problem, as well as original invoice or sales receipt showing date of purchase. The receipt will be returned with the unit. Prepay all shipping costs. COD shipments will not be accepted. Warranty repair service must be performed by the factory, or an authorized service center. Damage caused by improper packaging is the responsibility of the sender.