

# **Blue-White<sup>®</sup>**

**Industries, Ltd.**

## **FLEXFLO<sup>®</sup>**



## **MODEL A-1600**

**Peristaltic Injection Pump  
Operating Manual**

5300 Business Drive  
Huntington Beach, CA 92649, USA

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**Website:** [www.Blue-White.com](http://www.Blue-White.com)

**Thank You** for purchasing the A-1600 Peristaltic Metering 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 pump. If you are not satisfied that the unit can be safely operated, call the place of purchase for

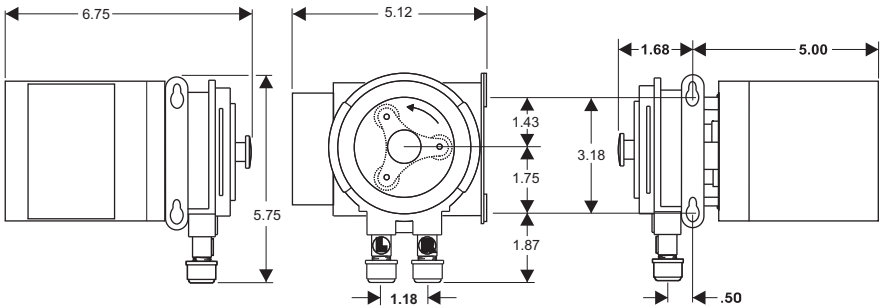
Thank You  
**Blue White Industries**  
 (714)893-8529.

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

\*\*\*\*\* **SPECIFICATIONS** \*\*\*\*\*

MODEL NO:	MAXIMUM	MAXIMUM FEED RATE			
	P.S.I	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: Norprene tubing same feed rate as Tygon



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# INSTALLATION INSTRUCTIONS

## UNPACKING INFORMATION

Verify that you have received all of the following equipment:

- One A-1600 series pump
- 10 ft. 3/8" O.D. Clear vinyl tubing with flow indicator
- One threadless injector (T.I.) Fitting
- One suction tube strainer
- One ceramic weight
- Two pump head tube assemblies (with fittings)
- Two mounting screws

## 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.

## 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.

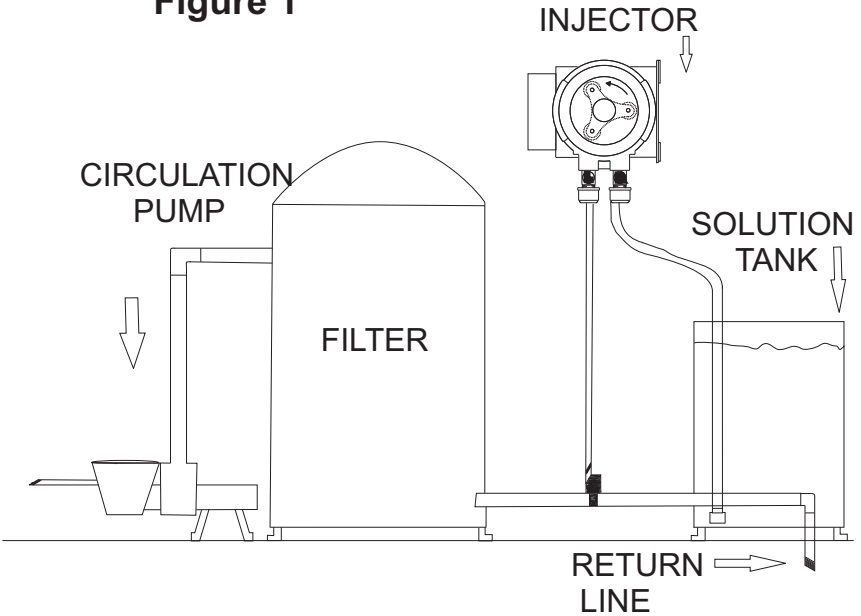
#### A-1600T MODELS (Timer Equipped Model)

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.

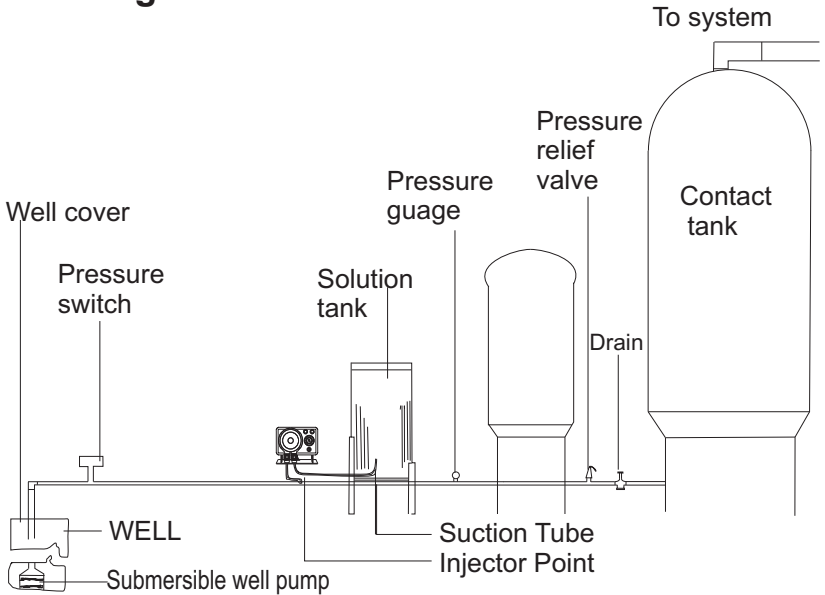
# SWIMMING POOLS

## Figure 1

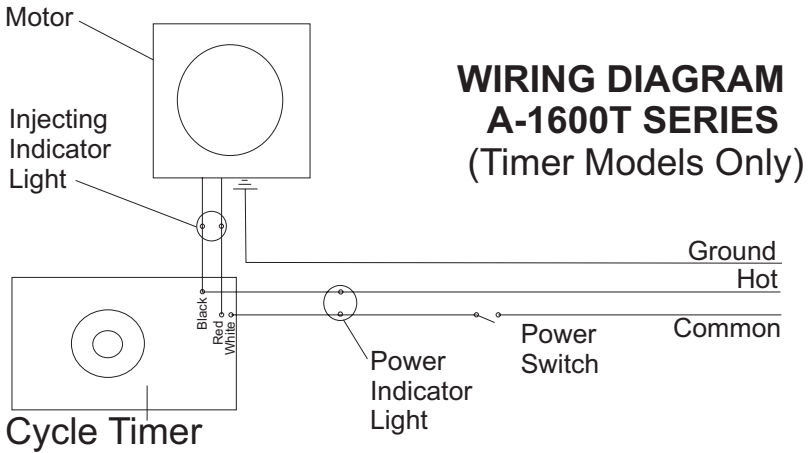


# WATER WELLS

## Figure 2



## WIRING DIAGRAM Figure 3



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

## A- 1600 SERIES WIRING COLOR CODES Figure 4

### \*\*\*\*\*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

### SUPPLY TANK FOR CHEMICALS

Plastic containers must be designed and manufactured for this purpose. Your container must be designed for whatever chemical you are using. Do not place the container in direct sunlight. Ultraviolet (UV) rays attack many materials which can cause them to become brittle.

### OPERATION - MAINTENANCE

Once every week inspect tubing, and accessory valves and fittings. Inspect all parts for signs of leaks, swelling, cracking, corrosion or discoloration. Also, inspect the tubing for elasticity.

Cracking, crazing, discoloration, etc., during the first week of operation are signs of severe chemical attack. If this occurs, immediately remove the fluid from the injector. Determine which parts are being attacked and replace with parts that have been manufactured using more suitable material.

The pump is designed to perform in a wide variety of installations. However, the service life of the pump will vary, depending on many factors such as; fluid, temperature, pressure, etc. Because of the wide variety of installations, the pump has been factory tested for pressure and performance using water only. Do not use chemicals if you are not satisfied they are compatible with the pumps construction.

The pump tube assemblies are designed for maximum service life. However, the service life can be adversely affected by the chemicals used, the amount of back pressure, the motor RPM, and temperature.

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

### THREADLESS AND THREADED INJECTORS

The most common problem is calcium and/or lime build up inside the injector, foot valve and tubing. This is basic material and can easily be removed by running a weak solution of muriatic acid through it. After flushing the pump with clear water, place the injection fitting and foot valve with the tubing attached in a container of weak (1-5) solution of commercial grade muriatic, then run the pump for a few minutes. After flushing out the wetted parts with clear water again, return pump to service. CAUTION do not allow acid and chlorine products to come together. This is VERY DANGEROUS to your health!

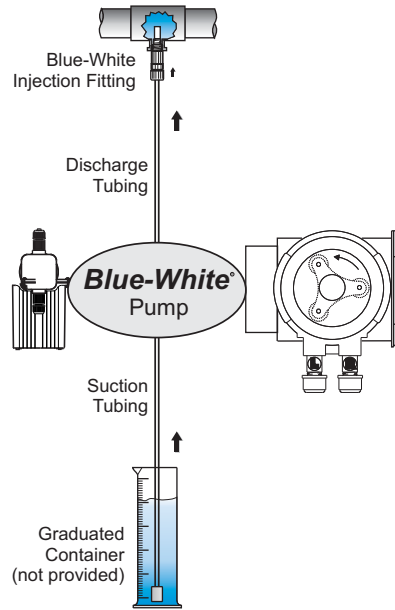
## OPERATING INSTRUCTIONS

### MEASURING THE OUTPUT

**FIGURE 5**

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

1. With the injector installed under normal operating conditions, place the foot valve/strainer in a large graduated container.
2. Fill the container with the chemical to be injected and run the unit until all air is removed from the suction line.
3. Refill the container, if necessary, and with the foot valve in the solution, note the amount of chemical in the container.
4. Run the injector for a measured amount of time and note the amount of chemical injected.

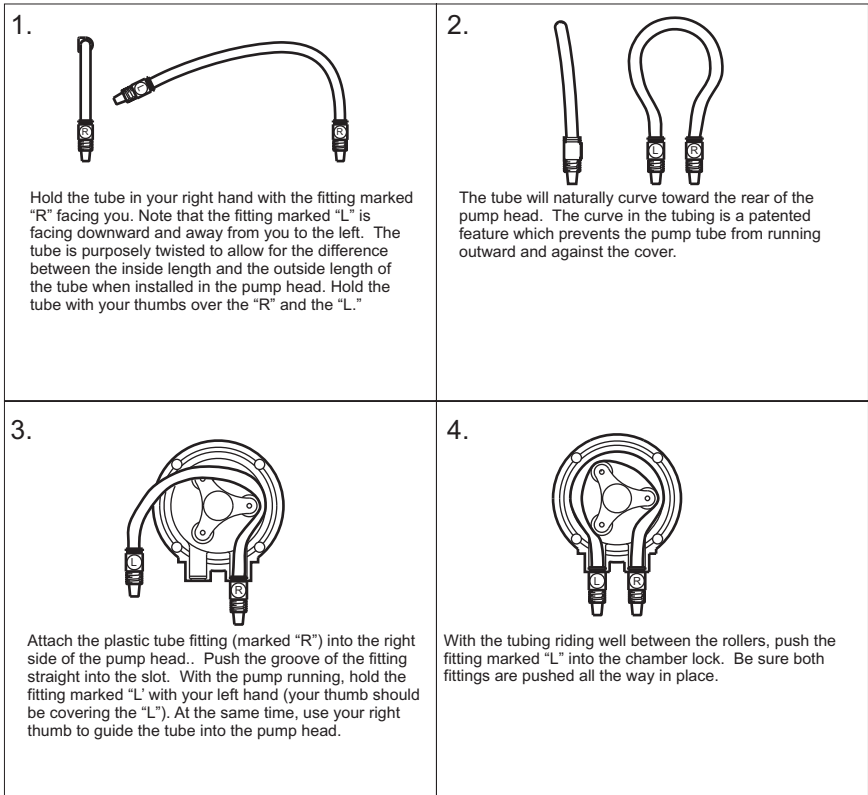


### ADJUSTING THE OUTPUT

- 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.

## OPERATING INSTRUCTIONS (Con't)

### FIGURE 6



### 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:** A threaded injection fitting is available. Fitting is equipped with 1/4" and 1/2" NPT threads.

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

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## OPERATING INSTRUCTIONS (Con't)

### 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.

### 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. 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 up in the wetted parts.....

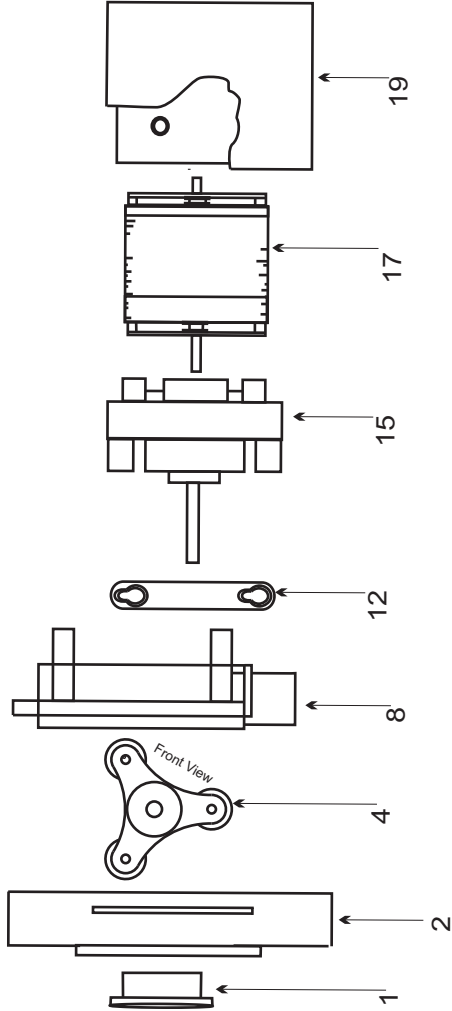
1. Flush the system by pumping clean water to remove any chemicals that may be present.
2. Run a weak solutions of muriatic acid (5%) through the wetted parts.
3. Again flush the system with clean water.

### 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.

EXPLODED VIEW



## A-1600 PARTS LIST

1. A-011	Pumphead Cover Retaining Knob			
2. A-001	Pumphead Cover		19. C-608P	Motor Housing
3. A-002-3N	Pump Tube Assy. 3/16" OD Norprene		20. C-628	Screw 6-32x2-3/4 Phil RD
A-002-4	Pump Tube Assy. 1/4" OD Tygon		24. C-308J	Junction box assembly
A-002-4h	Pump Tube Assy. 1/4" OD Norprene		25. C-330-4	Tube Nut 1/4" OD Tubing
A-002-6	Pump Tube Assy. 3/8" OD Tygon		C-330-6	Tube Nut 3/8" OD Tubing
A-002-6h	Pump Tube Assy. 3/8" OD Norprene		26. C-334-4-10	Tubing 1/4" OD x 10'
A-002-7	Pump Tube Assy. 7/16" OD Tygon		C-334-6-10	Tubing 3/8" OD x 10'
A-002-7N	Pump Tube Assy. 7/16" OD Norprene		27. T140-4V	T.I. Fitting 1/4" OD Tube Viton W/ Clamp
4. A-003	Roller Assy. 3 Lobe		T140-6V	T.I. Fitting 3/8" OD Tube Viton W/ Clamp
A-003-1	Roller Assy. 2 Lube		28. CF-3040	Clamp Fits 1" Thru 2-1/2" Pipe
5. A-004	Pumphead Mounting screw 10-32 x 3/4"		29. C-346	Ceramic Foot Valve Weight
6. A-031	Pumphead Spacer		30. C-340-4V	Foot Valve/Strainer 1/4" OD Viton
7. 2-010E	Motor Shaft Seal		C-340-6V	Foot valve/Strainer 3/8" OD Viton
8. A-005	Pumphead		31. A-023-B	Electronic Timer Assy. 1 Min. 115v
9. A-006	Motor Mount Screw 10-32 x 1/2		A-023-C	Electronic Timer Assy. 1 Min. 230v
12. C-302	Motor Mount		A-023-D	Electronic Timer Assy. 1 Min. 24v
14. C-649	Bushing .50-20x.31 Alum. Hex		A-023-E	Electronic Timer Assy. 2 Min. 220v
15. A-008-1	Gear Box Assembly 14 RPM		A-023F	Electronic Timer Assy. 6 Sec. 115v
A-008-2	Gear Box Assembly 30 RPM		A-023-G	Electronic Timer Assy. 6 Sec. 230v
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 not flushed</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace with compatible O-Rings.</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>

# REPAIR CENTERS

## ARKANSAS

**BT Environmental, Inc**  
Bill Thomason  
225 Castleberry Street  
Hot Springs, AR 71901  
501-624-3837

## CALIFORNIA (NORTHERN)

**Howard E. Hutching  
company**

**(Repair Center)**  
7190 Penryn Plaza  
Penryn, CA 95663  
800-568-3958

## Swimco Electric Co.

753 Camden Avenue  
Campbell, CA 95008  
408-378-2607

## CALIFORNIA (SOUTHERN)

**Blue-White Industries  
(Repair Center)**

5300 Business Drive  
Huntington Bch. CA 92649  
714-893-8529

## COLORADO

**Denver Winpump**

5754 Lamer ave  
.Arvada, CO 80002  
303-424-3551

## CONNECTICUT

**Cronin-Cook & Associates**

24 West Road  
Vernon, CT 06029  
860-875-0544

## FLORIDA

**Rice Pump & Motor Repair**

5740 Powerline Road  
Ft. Lauderdale FL 33309  
954-776-6049

## American Pump

7580-A W. Tennessee St.  
Tallahassee, FL 32304  
850-575-9618

## Jerry Lee Chemical Co.

3407 W. Old Fairfield Drive  
Pensacola, FL 32505  
904-432-9929

## Picard Chemical

1670 S. Congress Avenue  
W. Palm Beach, FL 33406  
561-965-3434

## ILLINOIS

**Mullarkey Associates  
(Repair Center)**

12346 S. Keeler Ave.  
Alsip, IL 60658  
708-597-5558

## MARYLAND

**Century Pool Service, Inc**

5020 Nicholson Court, #201  
Kensington, MD 20895  
301-231-8999

## NORTH CAROLINA

**Southern Industrial Sales**

1903 Herring Avenue  
Wilson, NC 27893  
800-872-7665

## SOUTH DAKOTA

**Son-Aqua Distributing**

Jim Robinson  
2447 W. Main Street  
Rapid City, SD 57702  
605-343-7716

## TENNESSEE

**Rock City Machine**

307 3rd Avenue South  
Nashville, TN 37201  
615-244-1371

## TEXAS

**Alamo Water Refiners**

13700 Hwy. 90 West  
San Antonio, TX 78245  
210-677-8400

**Shelter's Water Refining**

Robert Shelton  
2708 E. Randol Mill Rd.  
Arlington, TX 76011  
817-640-6188

## 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 pumps 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 it's 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 hazard 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, included the foot valve and injection fitting. Enclose a brief description or 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 preformed by the factory, or an authorized service center. Damage caused by improper packaging is the responsibility of the sender.