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MODEL FPU1600

Peristaltic Injector Pump
Operating Manual



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U.S.A.:
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Servicing North America:
One Omega Drive, P.O. Box 4047
Stamford, CT 06907-0047
TEL: (203) 359-1660 FAX: (203) 359-7700
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976 Bergar
Laval (Quebec) H7L5A1, Canada
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Benelux:

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Toll Free in Benelux: 0800 0993344
E-mail: sales@omega.fr

Czech Republic:

Frystatska 184, 733 01 Karvina, Czech Republic
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Toll Free: 0800-1-66342 e-mail: info@omegashop.cz

France:

11, rue Jacques Cartier, 78280 Guyancourt, France
TEL: +33 (0)1 61 37 2900 FAX: +33 (0)1 30 57 5427
Toll Free in France: 0800 466 342
E-mail: sales@omega.fr

Germany/Austria:

Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
TEL: +49 (0)7056 9398-0 FAX: +49 (0)7056 9398-29
Toll Free in Germany: 0800 639 7678
E-mail: info@omega.de

United Kingdom:
ISO 9002 Certified

One Omega Drive, River Bend Technology Centre
Northbank, Irlam, Manchester
M44 5BD United Kingdom
TEL: +44 (0)161 777 6611 FAX: +44 (0)161 777 6622
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Thank You for purchasing the FPU1600 Peristaltic Injection 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 FPU1600 will provide years of safe, reliable service.

For your safety the FPU1600 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.

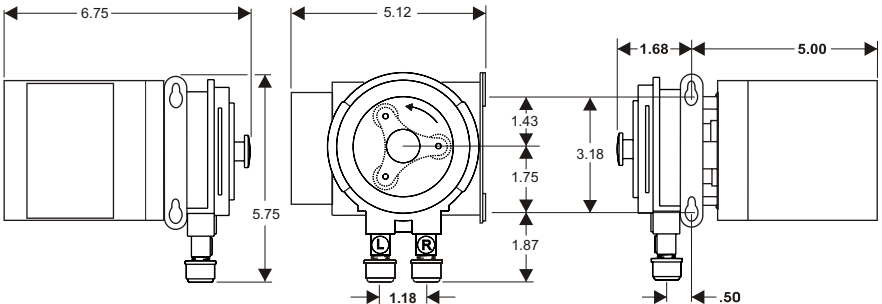
Read these instructions carefully before installing the injector.

LEAVE THIS INSTRUCTION MANUAL WITH INSTALLED METER!

***** SPECIFICATIONS *****

MODEL NO:	MAXIMUM P.S.I	MAXIMUM FEED RATE			
		ML/MIN	OZ/MIN	G.P.H	G.P.D
FPU1601-N	25	3	.1	.04	1
FPU1604-N	25	17	.5	.26	6
FPU1606	25	60	2.0	.95	22
FPU1607	25	75	2.5	1.18	28
FPU1602-N	25	11	.3	.17	4
FPU1605	25	40	1.3	.63	15
FPU1608	25	130	4.4	2.05	49
FPU1603-N	25	14	.4	.22	5
FPU1609	25	195	6.5	3.08	74
FPU1610	25	295	9.9	4.67	112

NOTE:-N Norprene tubing same feed rate as tygon



INSTALLATION INSTRUCTIONS

1. UNPACKING

The 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. Choose 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 enclosed hardware for wall mounting.
- C. When using corrosive chemicals with a wall mounted pump, 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. Solution tank should be sturdy plastic and chemically resistant to the chemicals being used. To protect from fumes, a tight fitting cover should be in place at all times.

3. ELECTRICAL CONNECTIONS

WARNING - RISK OF ELECTRIC SHOCK

Be certain to 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.

FPU1600 MODELS

FPU1600 Model Injector is 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.

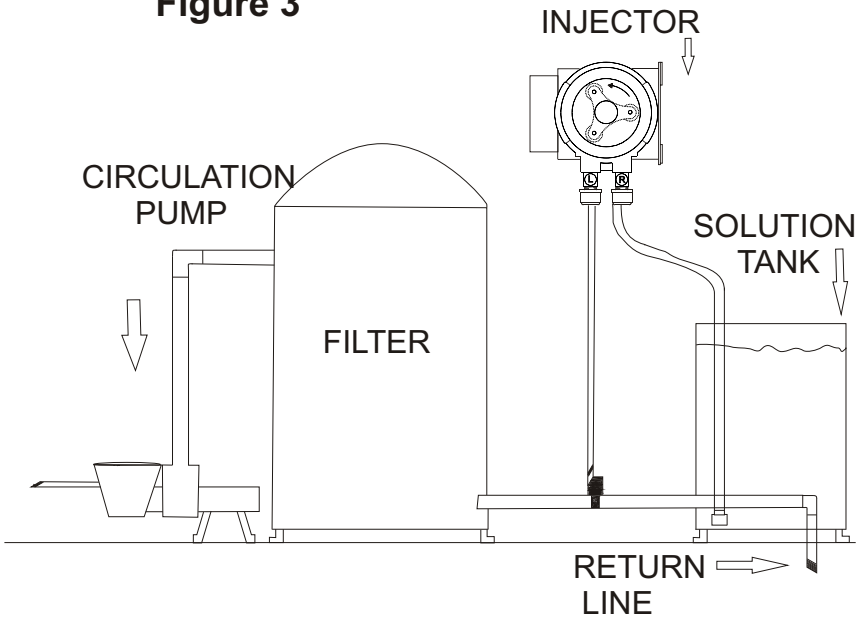
FPU1600T MODELS (Timer Equipped Model)

115V Model Injector is 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 Model Injector is 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.

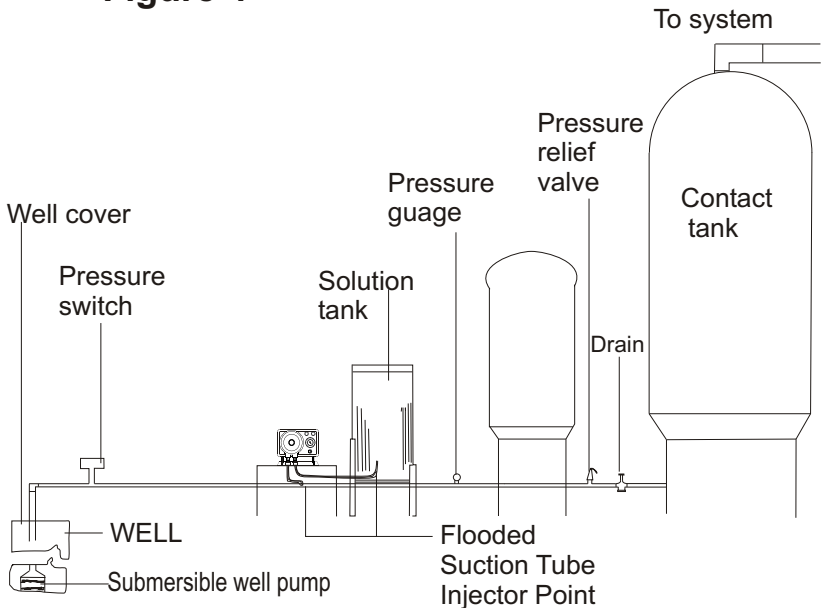
SWIMMING POOLS

Figure 3



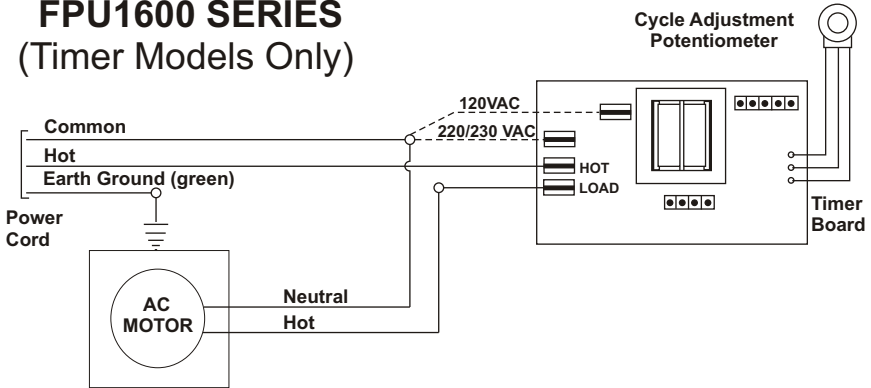
WATER WELLS

Figure 4



WIRING DIAGRAM Figure 5

WIRING DIAGRAM FPU1600 SERIES (Timer Models Only)



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*******

FPU1600-T (TIMER MODELS ONLY)

Voltage	HOT (Load and Input)	COMMON (Input)	LOAD (Load)
115v	Black	White	Red
230v	Black	White	Red

OPERATING INSTRUCTIONS

1. ATTACH THE TUBING AND FITTINGS

CAUTION: Be sure the installation does not constitute a cross connection. Check 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-siphon 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.

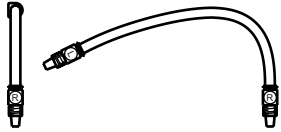
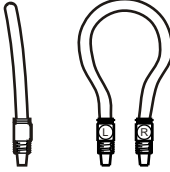
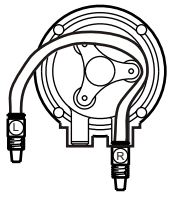
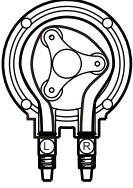
D. When the fluid nears the injection end of the tubing, turn OFF the injector and attach the tube to the T.I. Fitting. (Threadless Injector).

E. Check all connections for leaks.

DO NOT OVER TIGHTEN!

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

Tube Replacement

<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.</p>	<p>2.</p>  <p>Hold the tube with your thumbs over the "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.</p>
<p>3.</p>  <p>Attach the plastic tube fitting (marked "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").</p>	<p>4.</p>  <p>At the same time, use your right thumb 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>

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.

OPERATING INSTRUCTIONS (Con't)

3. ADJUSTING THE OUTPUT(Timer Equipped Models Only)

The pause control knob adjusts the cycle timer's time on. The model FPU1600 standard cycle timer is set at one minute. (+-10%) Other cycle lengths are available. To adjust the amount of time on, turn the pause control knob to the correct setting. 1/2 equals approximately 30 seconds on. 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

The FPU1600 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.

C. The FPU1600 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 FPU1600 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.

*NOTE: NSF international has tested the FPU1600 injector using two different fluids, 12 1/2% Sodium Hypochlorite and has found that the FPU1600T conforms to the requirements of NSF Standard 50.

2. THE PUMP TUBE ASSEMBLY

A. The FPU1600 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.

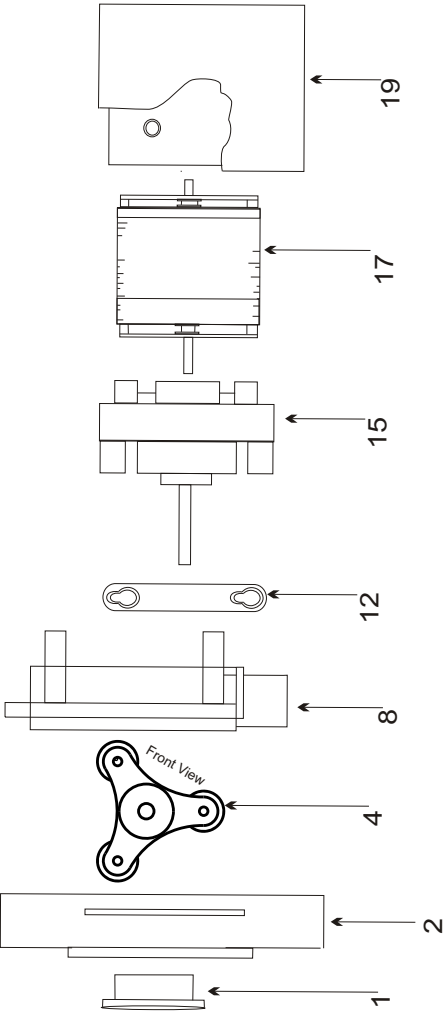
C. For removing harsh deposits that can build in the wetted parts.....

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.



FPU1600 PARTS LIST

1. A-011	Pumphead Cover Retaining Knob		Motor Housing
2. A-001	Pumphead Cover		Screw 6-32x2-3/4 Phill RD
3. A-002-3N	Pump Tube Assy. 3/16" OD Norprene		Junction box assembly
A-002-4	Pump Tube Assy. 1/4" OD Tygon		Tube Nut 1/4 OD Tubing
A-002-4n	Pump Tube Assy. 1/4" OD Norprene		Tube Nut 3/8" OD Tubing
A-002-6	Pump Tube Assy. 3/8" OD Tygon		Tubing 1/4" OD x 10'
A-002-6n	Pump Tube Assy. 3/8" OD Norprene		Tubing 3/8" OD x10'
A-002-7	Pump Tube Assy. 7/16" OD Tygon		T.I. Fitting 1/4" OD Tube Viton W/ Clamp
A-002-7N	Pump Tube Assy. 7/16" OD Norprene		T.I. Fitting 3/8" OD Tube Viton W/ Clamp
4. A-003	Roller Assy. 3 Lobe		Clamp Fits 1" Thru 2-1/2" Pipe
A-003-1	Roller Assy. 2 Lube		Ceramic Foot Valve Weight
5. A-004	Pumphead Mounting screw 10-32 x 3/4"		Foot Valve/Strainer 1/4" OD Viton
6. A-031	Pumphead Spacer		Foot valve/Strainer 3/8" OD Viton
7. 2-010E	Motor Shaft Seal		Electronic Timer Assy. 1 Min. 115v
8. A-005	Pumphead		Electronic Timer Assy. 1 Min. 230v
9. A-006	Motor Mount Screw 10-32 x 1/2		Electronic Timer Assy. 1 Min. 24v
12. C-302	Motor Mount		Electronic Timer Assy. 2 Min. 220v
14. C-649	Bushing .50-20x.31Alum. Hex		Electronic Timer Assy. 6 Sec. 115v
15. A-008-1	Gear Box Assembly 14 RPM		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		

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TROUBLE SHOOTING GUIDE

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

NOTES



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OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is void if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture, or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs. OMEGA is glad to offer suggestions on the use of its various products. Nevertheless, OMEGA only warrants that the parts manufactured by it will be as specified and free of defects.

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2. Model and serial number of the product under warranty, and
3. Repair Instructions and/or specific Problems relative to the Product.

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1. P.O. Number to cover the COAST of the repair/ calibration.
2. Model and serial number of product, and
3. Repair instructions and/or specific Problems relative to the product

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