User's Guide

FPU2000 and FPUVS2000 Series

FPU2000 - One Minute Cycle Timer
FPUVS2000 - Variable Speed Percentage Controlled
Operating Manual

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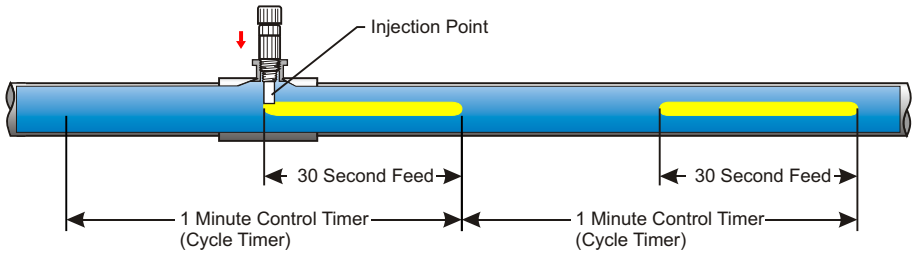
1.0 Introduction

Congratulations on purchasing the Peristaltic Metering Pump. The pump is designed to inject chemicals into piping systems.

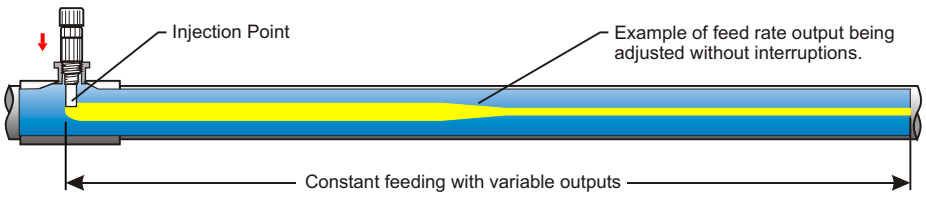
Fixed Cycle Timer - The fixed speed pumping mechanism is turned on and off by an electronic timer. The total cycle time is factory set. The cycle is 1 minute. The on-time cycle is adjustable from 5% through 100% of the total cycle time (1 minute).

Graphical Representation:
1 minute cycle timer
Feed time has been adjusted to 30 seconds



Variable Speed Controller - The speed of the pumping mechanism is adjustable from 5% through 100%.

Graphical Representation:
Continuous pumping, even while adjusting the percentage of output.



Fixed Feed Rate - No adjustment control.

2.0 Specifications

Maximum Working Pressure	100 psig / 6.9 bar*
Maximum Fluid Temperature	130° F / 54°C
Ambient Temperature Range	14 to 110°F / -10 to 43°C
Enclosure	NEMA 3R (acceptable for outdoor use)
Duty Cycle	Continuous
Maximum Solids	50% by volume
Maximum Viscosity	5,000 Centipoise
Maximum Suction Lift	up to 30 ft. water
Power Requirements	115V60Hz 80 Watts
	220V50Hz 40 Watts
	230V60Hz 45 Watts
Dimensions	6-1/8” high x 10-1/8” wide x 9” deep
Weight	8 lb.

3.0 Features

- Peristaltic Pump Tube does not require valves.
- High outlet pressure capability of 100 psig.*
- High inlet suction lift capability of 30 feet.
- Quick-Disconnect inlet and outlet fittings available.
- Digital electronic feed rate control available.
- Pump Tube failure warning timer (digital models).
- 200:1 adjustment turn down ratio (digital models).
- Acceptable for outdoor use.
- Corrosion proof Valox housing.
- Tamper resistant electronic control panel cover.
- Easy servicing.
- Includes suction tube strainer, tube weight, suction tubing, discharge tubing and injection fitting with internal back-flow check valve and mounting hardware.

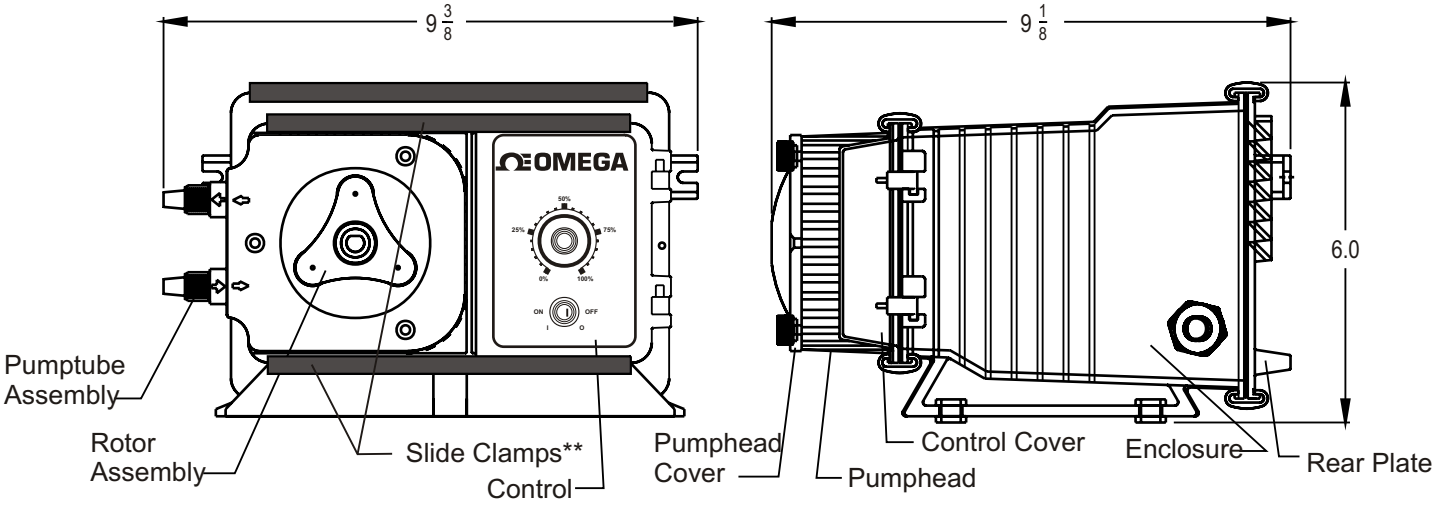


FIG. 3.0 PARTS LOCATOR DRAWING

* Most models.

** Slide both top & bottom clamps to the left only far enough to open the control cover.

4.0 How To Install the Pump

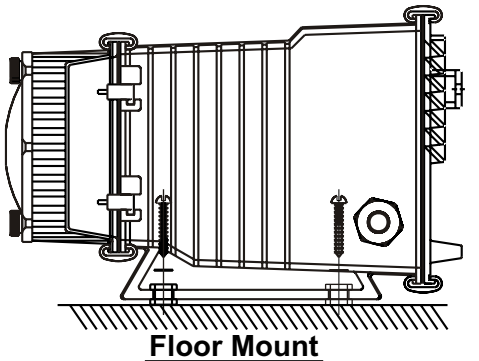
CAUTION: PROPER EYE AND SKIN PROTECTION MUST BE WORN WHEN INSTALLING AND SERVICING THE FPU2000

Note: *All diagrams are strictly for guideline purposes only. Always consult an expert before installing the Pump into specialized systems.*
The pump should be ***serviced by qualified persons only.***

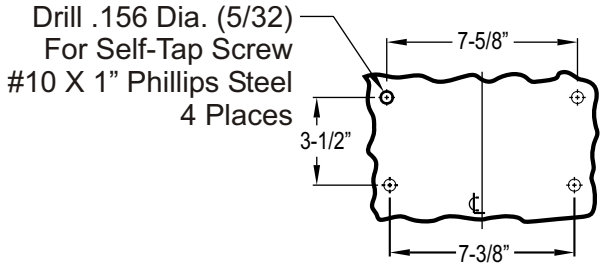
4.1 Mounting Location

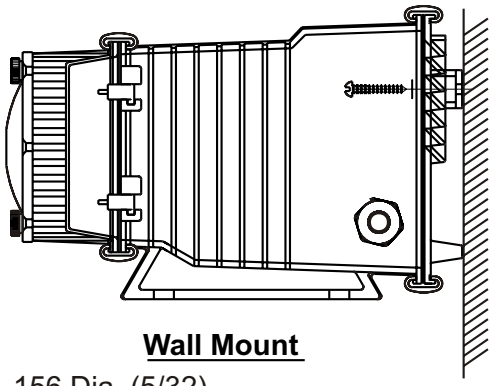
Choose an area located near the chemical supply tank, chemical injection point and electrical supply. Although the pump is designed to withstand outdoor conditions, a cool, dry, well ventilated location is recommended. Install the pump where it can be easily serviced.

- Mount the pump to a secure surface or wall using the enclosed hardware. Wall mount to a solid surface only. Mounting to drywall with anchors is not recommended.
- Keep the outlet (discharge) tubing as short as possible. Longer tubing increases the back pressure at the pump tube.
- Do not mount the pump directly over your chemical container. Chemical fumes may damage the unit. Mount the pump off to the side or at a lower level than the chemical container.
- Mounting the pump lower than the chemical container will gravity feed the chemical into the pump. This “flooded suction” installation can reduce the time required to prime the pump. Install a shut-off valve, pinch clamp or other means to halt the gravity feed to the pump during servicing.
- Your solution tank should be sturdy. Keep the tank covered to reduce fumes.
- Be sure your installation does not constitute a cross connection with the drinking water supply. Check your local plumbing codes.

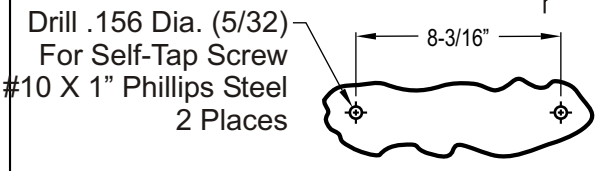


Floor Mount



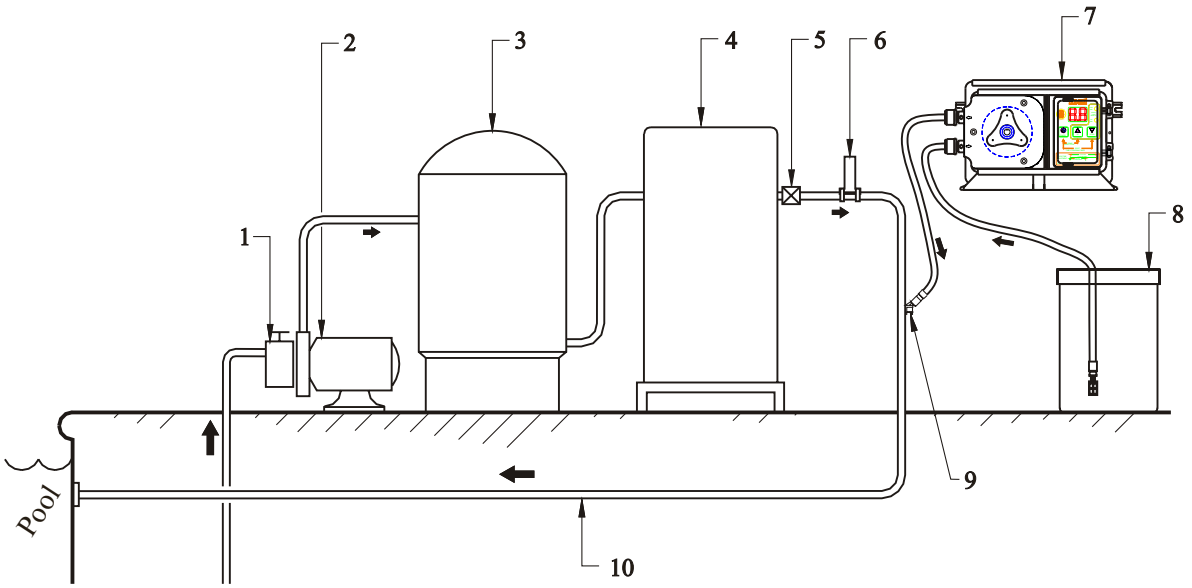


Wall Mount



Note: For wall-mounting, recommend drill & thread into solid wood only.

FIG. 4.1 INJECTOR MOUNTING



1. Strainer
2. Circulation Pump
3. Filter
4. Heater
5. Check Valve
6. Flowmeter
7. Injector
8. Solution Tank
9. Injection Fitting
10. Return Line

FIG. 4.2 SWIMMING POOL INSTALLATION

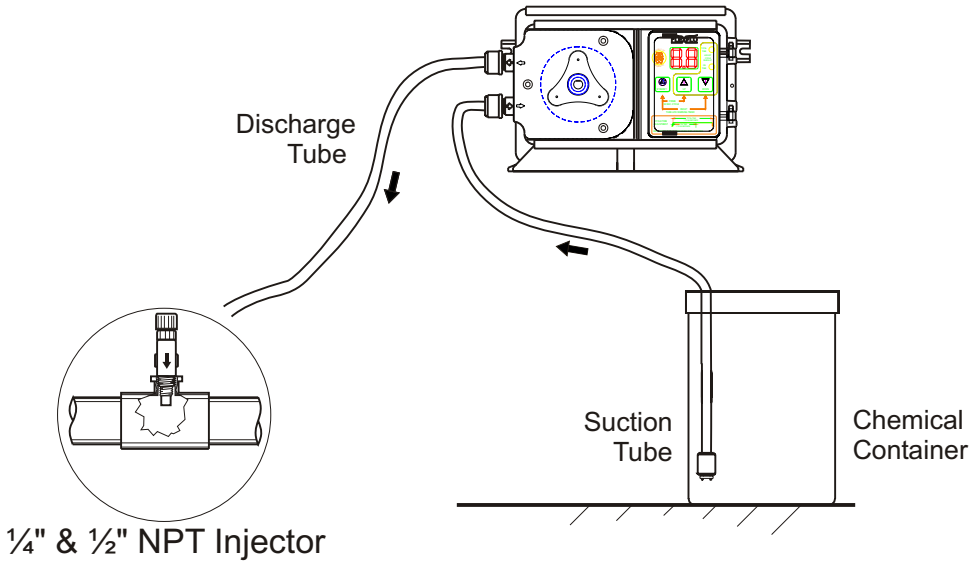


FIG. 4.3 TYPICAL INSTALLATION

4.2 Electrical Connections

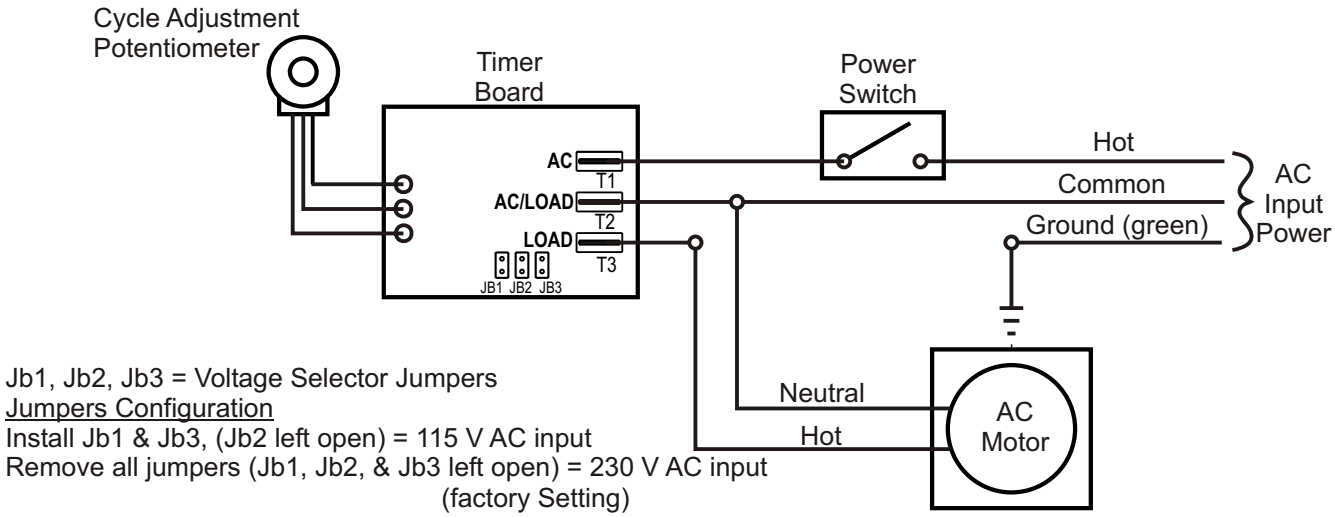
Be certain to connect the pump to the proper supply voltage. Using the incorrect voltage will damage the pump and may result in injury. The voltage requirement is printed on the pump serial label.

WARNING-RISK OF ELECTRICAL SHOCK

Note: *When in doubt regarding your electrical installation, contact a licensed electrician.*

The pump is supplied with either a ground wire conductor and a grounding type attachment plug (power cord) or a junction box for field wiring.

POWER CORD MODELS -To reduce the risk of electric shock, be certain that the power cord is connected only to a properly grounded, grounding type receptacle.



Jb1, Jb2, Jb3 = Voltage Selector Jumpers
Jumpers Configuration
Install Jb1 & Jb3, (Jb2 left open) = 115 V AC input
Remove all jumpers (Jb1, Jb2, & Jb3 left open) = 230 V AC input
(factory Setting)

FIG. 4.6 WIRING DIAGRAM - FIXED TIMERS

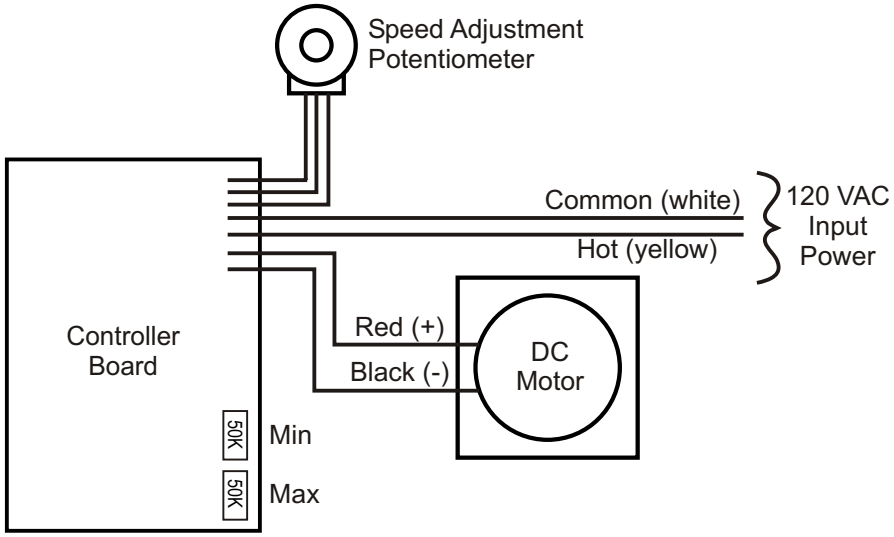


FIG. 4.7 WIRING DIAGRAM - VARIABLE SPEED CONTROLLER

4.3 How To Install the Tubing and Fittings

CAUTION: PROPER EYE AND SKIN PROTECTION MUST BE WORN WHEN INSTALLING AND SERVICING THE FPU2000

4.3.1 Inlet Tubing - (Compression tube models) -Locate the inlet fitting of the Pump Tube, see fig 6.1. Remove the tube nut. Push the clear PVC suction tubing onto the compression barb of the fitting. Use the tube nut to secure the tube. Hand tighten only.

Inlet Tubing - (Quick-Connect models) - Locate the black, 90° elbow, low pressure Quick-Connect inlet fitting, see fig 6.1. Connect the clear suction tubing to the hose barb. Check that the O-ring is in place on the Pump Tube fitting and press the Quick-Connect fitting onto the Pump Tube. The fitting should securely click in place.

4.3.2 Strainer -Trim the inlet end of the suction tubing so that the strainer will rest approximately two inches from the bottom of the solution tank. This will prevent sediment from clogging the strainer. Slip the ceramic weight over the end of the suction tube. Press the strainer into the end of the tube. Secure the ceramic weight to the strainer. Drop the strainer into the solution tank.

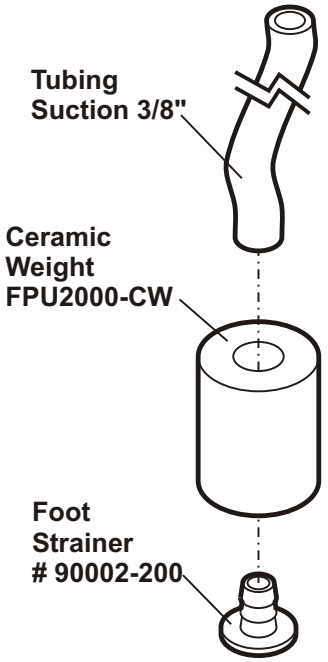


FIG. 4.8

4.3.3 Outlet Tubing - (Compression tube models) - Locate the outlet fitting of the Pump Tube, see fig 6.1. Remove the tube nut. Push the opaque outlet (discharge) tubing onto the compression barb of the fitting. Use the tube nut to secure the tube. Hand tighten only.

Outlet Tubing - (Quick-Connect models) - Locate the beige, high pressure Quick-Connect outlet fitting, see fig 6.1. Remove the metal tube retaining nut from the Quick-Connect fitting and slip it over the end of the opaque outlet (discharge) tubing. Connect the tubing to the hose barb located on the fitting. Secure the tube to the fitting with the metal nut. Check that the O-ring is in place on the outlet end of the Pump Tube and press the Quick-Connect fitting onto the Pump Tube. The fitting should securely click into place.

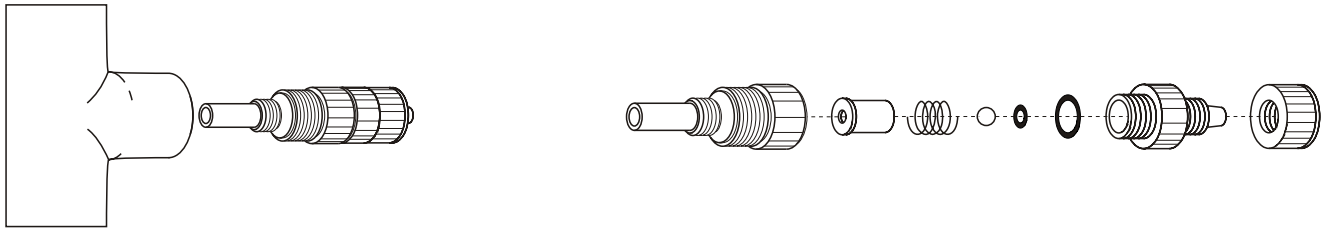
Trim the other end of the outlet tube leaving only enough slack to connect it to the injection/check valve fitting. Increasing the outlet tube length increases the pressure at the pump tube, particularly with viscous fluids.

Keep the outlet tube as short as possible.

4.3.4 Injection/Check Valve Fitting Installation - The Injection/Check valve fitting is designed to install directly into either 1/4” or 1/2” female pipe threads. This fitting will require periodic cleaning, especially when injecting fluids that calcify such as sodium hypochlorite. These lime deposits and other build ups can clog the fitting increasing the back pressure and interfering with the check valve operation. See section 6.0.

Install the Injection/Check valve directly into the piping system. Do not use a pipe stud with a tee for insertion of the injection valve. The solution must inject directly into the flow stream.

Use Teflon thread sealing tape on the pipe threads. Push the opaque outlet (discharge) tubing onto the compression barb of the Injection/Check valve fitting. Use the tube nut to secure the tube. Hand tighten only.



TEE INSTALLATION **EXPLODED VIEW**

FIG. 4.9 TEE INSTALLATION AND EXPLODED VIEW

5.0 How to Operate the Pump

5.1 How to Adjust The Output -Fixed Cycle Timers (fig. 5.1)

5.1.1 Fixed Cycle Timer Models -The pumping mechanism is turned on and off by an electronic cycle timer. The total-time cycle is factory preset and is not user adjustable. The on-time cycle is adjustable from 5% to 100% of the total cycle time. Example: If the total-time cycle is 60 seconds (1 minute) and the on-time cycle is adjusted for 25 percent, the pump will run for 15 seconds and turn off for 45 seconds (60 second total cycle). This cycle is repeated until either the power switch is turned off, the cycle time is changed or the input power is disconnected from the pump.

Note: When the input power is disconnected from the pump, the unit will maintain the last adjusted settings. When power is restored to the pump, the pump will either automatically begin to pump using the last time cycle setting, or maintain power-off status, depending on the power switch status when the input power was disconnected.

5.1.2 Fixed Cycle Timer Adjustment - Slide the slide clamps to the left only far enough to open the control panel door.

- To **adjust the On-Time**, turn the adjustment knob.
- To **Stop The Pump,** switch off the power switch. *Note:* low feed spa timers must be unplugged.

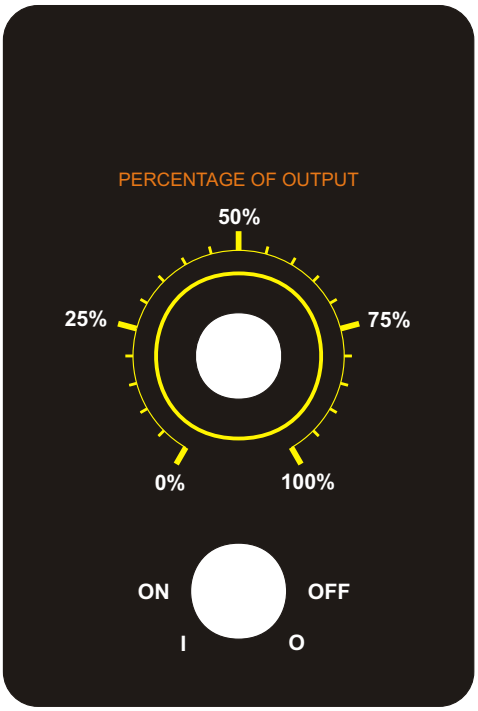


FIG. 5.1

5.2 How to Adjust The Output -Variable Speed Control

5.2.1 Variable Speed Models (FPUVS2000) -The speed of the pumping mechanism is adjustable from 5 % through 100%.

***Note:* When the input power is disconnected from the pump, the unit will maintain the last adjusted settings. When power is restored to the pump, the pump will either automatically begin to pump using the last speed setting, or maintain power-off status, depending on the power switch status when the input power was disconnected.**

5.2.2 Variable Speed Controller Adjustment - Slide the slide clamps to the left only far enough to open the control panel door**.**

- To **adjust the Pump Speed**, turn the adjustment knob.
- To **Stop The Pump,** switch off the power switch.

6.0 How to Maintain the Pump

CAUTION: PROPER EYE AND SKIN PROTECTION MUST BE WORN WHEN INSTALLING AND SERVICING THE FPU2000

6.1 Routine Inspection and Maintenance

The pump requires very little maintenance. However, the pump and all accessories should be checked weekly. This is especially important when pumping chemicals. Inspect all components for signs of leaking, swelling, cracking, discoloration or corrosion. Replace worn or damaged components immediately.

Cracking, crazing, discoloration and the like during the first week of operation are signs of severe chemical attack. If this occurs, immediately remove the chemical from the pump. Determine which parts are being attacked and replace them with parts that have been manufactured using more suitable materials. The manufacturer does not assume responsibility for damage to the pump that has been caused by chemical attack.

6.2 How to Clean and Lubricate the Pump

The pump will require occasional cleaning and lubricating. The amount will depend on the severity of service.

- ☑ When changing the pump tube assembly, the pump head chamber, roller assembly and pump head cover should be wiped free of any dirt and debris.
- ☑ The pump head cover bearing may require grease periodically. Apply a small amount of grease (Aeroshell aviation grease #5 or equivalent) when necessary.
- ☑ Do not apply lubrication of any kind to the roller assembly or tube assembly.
- ☑ Periodically clean the injection/check valve assembly, especially when injecting fluids that calcify such as sodium hypochlorite. These lime deposits and other build ups can clog the fitting, increase the back pressure and interfere with the check valve operation. See section 4.3.4. Fig. 4.10.
- ☑ Periodically clean the suction strainer. Fig.4.9
- ☑ Periodically inspect the air vents located under the motor compartment and on the rear panel. Clean if necessary.

6.3 How to Replace the Pump Tube

The pump tube assembly will eventually break if not replaced. The tube has been designed for a minimum service life of 500 hours. However, the life of the tube is affected by many factors such as the type of chemical being pumped, the amount of back pressure, the motor RPM, temperature and others. The pump tube assembly must be inspected and replaced regularly.

CAUTION: PINCHING HAZARD, KEEP YOUR FINGERS OUT OF THE PUMP HEAD WHILE CHANGING THE PUMP TUBE

6.3.1 How to Remove the Old Pump Tube

The pump roller assembly spins in a counter clockwise direction. The pump head inlet (suction) side is located at the bottom of the pump and the outlet (discharge) is located at the top of the pump head.

6.3.1.1 Release any pressure that may be in the discharge tubing.

6.3.1.2 Disconnect the suction and discharge tubes from the pump tube.

6.3.1.3 Remove the pump head cover.

6.3.1.4 With the pump running, pull the inlet fitting out of the pumphead. Guide the tube counter clockwise away from the rollers. Pull the outlet fitting out of the pump head.

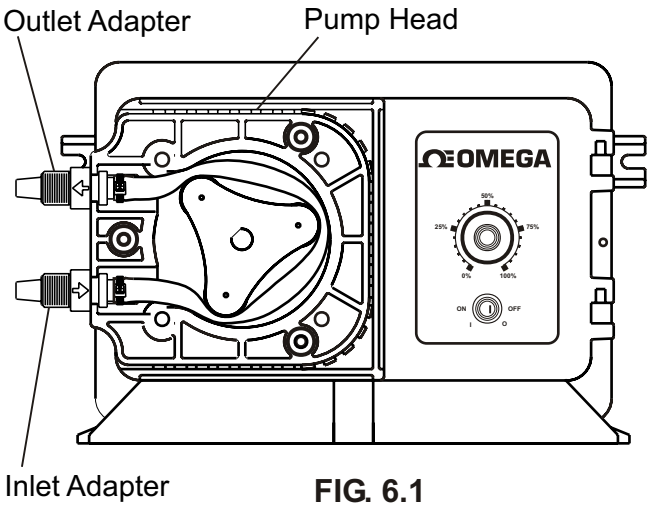


FIG. 6.1

6.3.2 How to Install a New Pump Tube

Be sure the pump head chamber is clean and free of any debris. Remove and inspect the roller assembly. Be sure the rollers spin freely. If required, apply a small amount of grease to the pump head cover bearing. See section 6.2.

6.3.2.1 With the pump running, insert the inlet (suction) side of the Pump Tube fitting into the lower retaining slot in the pump head. Fig. 6.2.

6.3.2.2 **Carefully** guide the Pump Tube into the pump head. Stretch the tube slightly and insert the outlet (discharge) fitting into the upper retaining slot in the pump head. Fig. 6.3.

6.3.2.3 Place the clear cover on the pump head and secure with three screws.

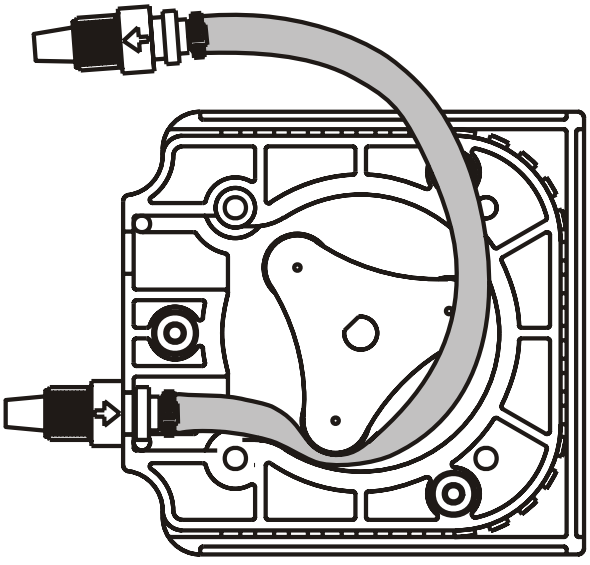


FIG. 6.2

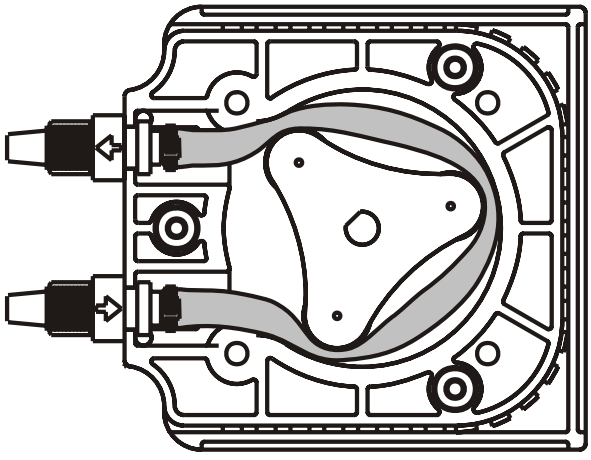
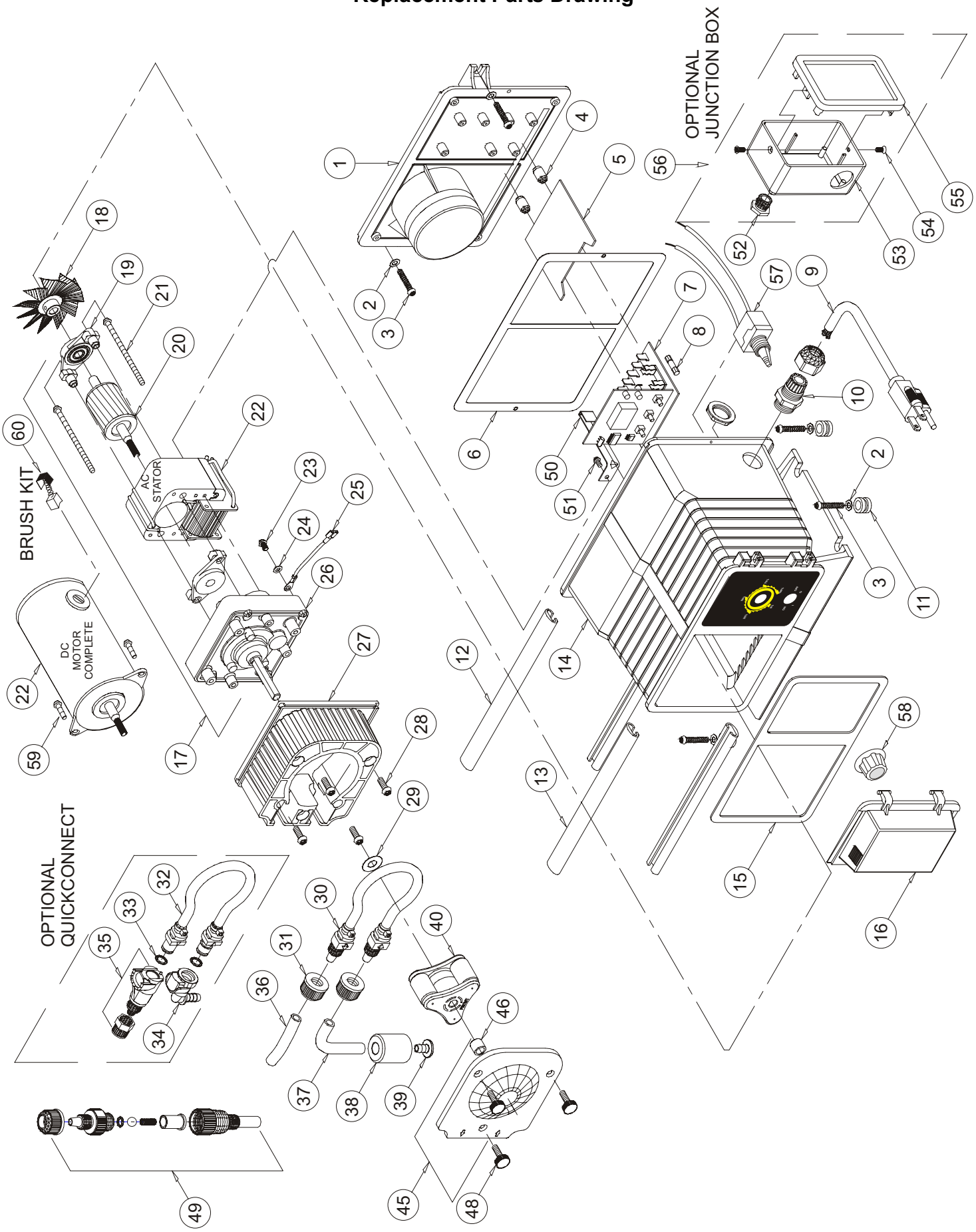


FIG. 6.3

Replacement Parts Drawing



PARTS LIST

Item	Part No	Description	Qty
1	71000-214	Enclosure Back Plate With Gasket, Valox	1
2	90011-094	Washer, Mounting, #10 Stainless	2
3	90011-091	Mounting Screw, #10 X 1.0" Phillips Steel	4
4	76001-001	Bumper, Circuit Board Spacer	2
5	90006-582	Spacer, Digital Circuit Board,	1
6	90006-580	Gasket, Enclosure Back Plate, Neoprene	1
7	A-023N-B	1 Min. Percentage Timer (Model FPU2000)	1
	C-1817N-1	Variable Speed Controller 115V (Model FPUVS2000)	1
N/s	A-022	Power Switch (standard Models)	1
N/s	A-030	Over-ride Switch (low feed spa models)	1
N/s	A-032	Knob, percentage adjustment (standard models)	1
N/s	90010-036	Wire Nut, Blue	4
N/s	90010-037	Wire Nut, Orange	1
N/s	76001-030	J-box Lead Wire, Blue/white, 115v Models	1
N/s	76001-031	J-box Lead Wire, Red/white, 230v Models	1
N/s	76001-032	J-box Lead Wire, Brown/white, 220v Model	1
N/s	76001-033	J-box Lead Wire, Yellow, 220v Models	1
N/s	76001-034	J-box Lead Wire, Black, 115v Models	1
8	90010-223	Fuse, Digital Timer, 2a 250v	1
9	71000-175	Power Cord, 115v60hz, Digital Models	1
	71000-176	Power Cord, 220v50hz, Digital Models	1
	71000-177	Power Cord, 230v60hz, Digital Models	1
	90010-110	Power Cord, 115v60hz, Standard Models	1
	90010-196	Power Cord, 220v50hz, Standard Models	1
	90010-133	Power Cord, 230v60hz, Standard Models	1
10	A-033N	Cord Inlet Bushing	1
11	90003-559	Mounting Feet, Rubber	4
12	76001-000	Slide Clamp, Enclosure Rear	1
13	76000-999	Slide Clamp, Enclosure Front	1
14	71000-186	Enclosure, Digital - Power Cord Models	1
	71000-187	Enclosure, Standard - Power Cord Models	1
	71000-188	Enclosure, Fixed feed rate - Power Cord Models	1
	71000-218	Enclosure, Digital - J-box Models	1
	71000-219	Enclosure, Standard - J-box Models	1
	71000-220	Enclosure, Fixed feed rate - J-box Models	1
15	90006-579	Gasket, Enclosure Front, Neoprene	1
16	90002-191	Door, Electronic Controls Cover	1
17	70002-146	Gearmotor, 14 Rpm, 115v60hz	1
	70002-147	Gearmotor, 30 Rpm, 115v60hz	1
	70002-156	Gearmotor, 45 Rpm, 115v60hz	1
	70002-159	Gearmotor, 60 Rpm, 115v60hz	1
	70002-148	Gearmotor, 14 Rpm, 220v50hz	1
	70002-149	Gearmotor, 30 Rpm, 220v50hz	1
	70002-157	Gearmotor, 45 Rpm, 220v50hz	1
	70002-160	Gearmotor, 60 Rpm, 220v50hz	1
	70002-150	Gearmotor, 14 Rpm, 230v60hz	1
	70002-151	Gearmotor, 30 Rpm, 230v60hz	1
	70002-158	Gearmotor, 45 Rpm, 230v60hz	1
	70002-161	Gearmotor, 60 Rpm, 230v60hz	1
	70002-241	Gearmotor, V/speed 14 Rpm, 90 VDC	1
	70002-242	Gearmotor, V/speed 30 Rpm, 90 VDC	1
	70002-243	Gearmotor, V/speed 45 Rpm, 90 VDC	1
	70002-244	Gearmotor, V/speed 60 Rpm, 90 VDC	1
18	90006-581	Fan, Motor, 2.25" Diameter, Aluminum	1
19	FPU1000-AB	Bearing Bracket With Bearing	2
20	C-616PN	Rotor Assembly 14RPM, 30RPM With Spacers	1
	C-616PN-32	Rotor Assembly 45RPM, 60RPM With Spacers	1

Item	Part No	Description	Qty
21	C-625	Screw, Motor, 14RPM, 30RPM Phillips Steel	2
	C-625	Screw, Motor, 45RPM, 30RPM Phillips Steel	2
22	71000-211	Stator 14RPM, 30RPM, 115v Blue-White/Yellow	1
	71000-213	Stator 14RPM, 30RPM, 220v Brown-White/yellow	1
	71000-212	Stator 14RPM, 30RPM, 230v Red-White/Yellow	1
	71000-466	Stator 45RPM, 60RPM, 115v Blue-White/Yellow	1
	71000-467	Stator 45RPM, 60RPM, 220v Brown-White/yellow	1
	71000-468	Stator 45RPM, 60RPM, 230v Red-White/Yellow	1
	90010-242	Motor Assembly, 90 Volts Dc, (Model FPUVS2000)	1
24	90011-078	Washer, Ground Screw, #8 Star	1
25	90010-222	Wire, Motor ground, Digital Timers, Green	1
	90010-126	Wire, Motor ground, Percent Timers, Green	1
26	A-008-1	Gearbox, 14 Rpm	1
	A-008-2	Gearbox, 30 Rpm	1
	A-008-3	Gearbox, 45 Rpm	1
	A-008-4	Gearbox, 60 Rpm	1
27	FPU2000-PH	Pumphead, A-100N Machined	1
28	C-324N	Screw, Pumphead, 10-32 X .50 Phil Pan Black	4
29	A-031	Spacer, Rotor	1
30	FPU2000-14PTA	Pump Tube, .25 O.D., Compression Barb Type	1
	FPU2000-38PTA	Pump Tube, .37 O.D., Compression Barb Type	1
	FPU2000-716PTA	Pump Tube, .43 O.D., Compression Barb Type	1
31	FPU2000-TN	Nut, Tube Compression Type, .37 O.D. Tubing	1
32	A-002N-4Q	Pump Tube, .25 O.D., Quick-connect W/ O-ring	1
	A-002N-6Q	Pump Tube, .37 O.D., Quick-connect W/ O-ring	1
33	90003-007	O-ring, Quick-connect Pump Tubes, Viton	2
34	90008-299	Adapter, Quick-connect Inlet, .37 O.D. Tube	1
35	90008-300	Adapter, Quick-connect Outlet, .37 O.D. Tube	1
36	C-335-6	Tubing, Outlet, .37 O.D. X 5ft, Polyethylene	1
37	C-334-6	Tubing, Inlet, .37 O.D. X 5ft, Clear Pvc	1
38	FPU2000-CW	Weight, Inlet Tubing, Ceramic	1
39	C-342-2	Strainer, Inlet Tube, Polypropylene	1
40	FPU2000-RA	Roller Assembly for -4, -6 tubes (white rollers)	1
	FPU2000-716RA	Roller Assembly for -7 tube (black rollers)	1
45	FPU2000-PHB	Cover, Pumphead With Sleeve Bearing	1
46	76001-003	Bearing, Sleeve, Pumphead Cover	1
48	90011-160	Screw, Pumphead Cover, 8-32 X .62 Cap	3
49	FPU1000-IF	Injection Valve Assy, .5-.25 Mpt X .37 O.D. Tube	1
50	90006-583	Motor Retaining Clip, 14RPM, 30RPM, SS	1
	90006-601	Motor Retaining Clip, 45RPM, 60RPM, SS	1
51	90011-146	Screw, Motor Clip, 8-32 X .25 Phil Pan F, Ss	1
52	90007-515	Bushing, Junction Box Connector, Alum.	1
53	76001-029	Junction Box, Valox	1
54	90011-129	Screw, Cover, 6-32 X .25 Phil Pan SS Black	2
55	71000-133	Cover, Junction Box with Gasket and Label	1
56	70000-656	Junction Box Assembly, Complete	1
57	A-022	Power Switch (Analog percentage timers & controllers)	1
58	A-032	Knob, percentage adjustment (analog models)	1
59	90011-023	Screw, Motor, 8-32 x .50 Phillips Steel	2
60	C-1814N-2	Motor brush kit (2 each), 90V DC motor	1

MADE IN USA

WARRANTY/DISCLAIMER

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.
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RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR WARRANTY RETURNS, please have The following information available
1. **P.O. Number under which the product was PURCHASED.**
2. **Model and serial number of the product under warranty, and**
3. **Repair Instructions and/or specific Problems relative to the Product.**

FOR NON WARRANTY REPAIRS OR CALIBRATION, consult OMEGA for current repair/calbration charges. Have Information before contacting OMEGA.
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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