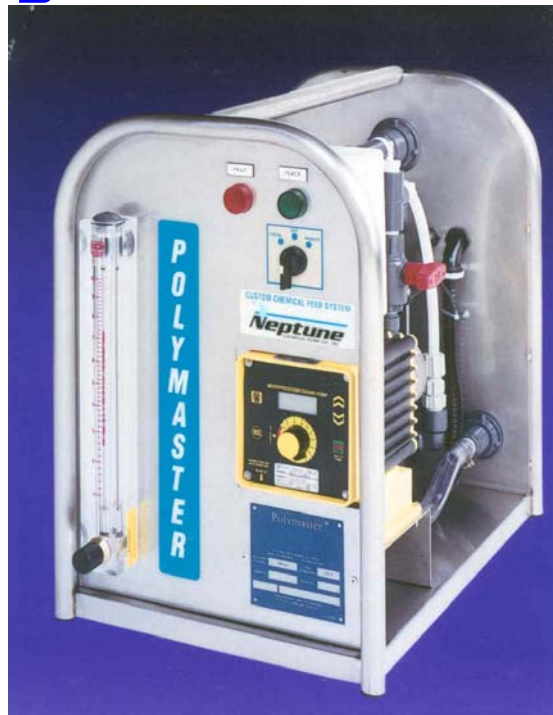


# INSTALLATION, OPERATION AND MAINTENANCE MANUAL

***Polymaster™***

***Liquid Polymer Blend & Feed System***



  
**Neptune**  
A **DOVER** COMPANY

204, Dekalb Pike,  
Lansdale, PA 19446



Tel.: 215-699-8700 • FAX: 215-699-0370

ZL107874  
Revised 12-8-2009

# WARNING

LOCKOUTS ARE REQUIRED BEFORE  
SERVICING THIS EQUIPMENT.

## SAFETY INSTRUCTIONS:

Shut off/Lockout pump Power before Servicing.  
Be certain pump isolation valves are  
Closed and chemical is shut off.  
Bleed pressure before servicing.

## SAFETY INSTRUCTIONS:

Shut off/Lockout Polymaster Power before Servicing.  
Be certain Polymaster isolation valves are  
Closed and chemical is shut off.  
Bleed pressure before servicing.

# WARNING

**Please read thoroughly before installation, operation or maintenance of any Polymaster Machine**

## **EQUIPMENT MISUSE HAZARD**

Equipment misuse can cause the equipment to rupture, malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended use.
- Do not alter or modify this equipment.
- Be certain all operators of this equipment have been trained for safe working practices, understand it's limitations, and wear safety goggles and or equipment when required.
- Do not exceed the maximum working pressure of the system as mentioned on the Polymaster tag.
- Do not use any piping to transport the equipment.
- Comply with all applicable local, state and national safety regulations.
- Do not allow Polymaster to run dry for long periods of time.

## **PRESSURIZED EQUIPMENT HAZARD**

Spray from leaks or ruptured components can splash fluid in the eyes or on the skin and cause serious injury.

- Shut off the Polymaster and depressurize before performing any maintenance.
- Do not tamper with or perform unspecified alteration of this device .
- Always wear protective clothing, face shield, safety glasses and gloves when working on or near your Polymaster Machine.
- Additional precautions should be taken depending on the solution being pumped. Refer to MSDS precautions from your solution supplier.
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Check all fluid connections before operating the equipment.
- Replace worn, damaged, or loose parts immediately.
- Before performing any maintenance, be sure to relieve pressure from the piping system and the equipment.
- Wear protective clothing and use proper tools as appropriate to avoid any injury.

## **FIRE AND EXPLOSION HAZARD**

Improper grounding, poor air ventilation, open flames, or sparks can cause a hazardous condition and result in fire or explosion and serious injury.

- Ground the equipment. See installation instruction for grounding procedure.
- Static electricity may generate by fluid moving through pipes and hoses. A static spark could be produced by high fluid flow rate. Earthing is a must.
- Provide fresh air ventilation.
- Keep the Polymaster area free of debris, including cleaning agent, rags, and any flammable material.

## **TOXIC FLUID HAZARD**

Hazardous fluids or toxic fumes can cause serious injury or death if splashed in eyes or on the skin, swallowed, or inhaled.

- Know the specific hazards of the fluid you are using. Read the fluid manufactures warnings.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Wear the appropriate protective clothing, gloves, eyewear and respirator.

## **SOUND HAZARD**

The sound pressure level seldom exceeds 80dBA.

- Observe all safety precautions when operating the Equipment within close proximity for extended periods by wearing hearing protectors, if needed.
- Extended exposure to elevated sound levels may result in permanent loss of hearing acuteness, tinnitus, tiredness, stress, and other effects such as loss of balance and awareness.

## **MECHANICAL HAZARD**

The Unit may shake or vibrate during operation.

# **Polymaster™**

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## **DRAWINGS**

**Parts Drawing Gatlin Mixer**

**Parts Drawing Model PA/PM-60 and PA/PM-100**

**Parts Drawing Model PA/PM-200**

**Parts Drawing Model PA/PM-300**

**Parts Drawing Model PA/PM-600**

**Parts Drawing Model PA/PM-1200**

**Parts Drawing Model PA/PM-1200R**

**Parts Drawing Model PA/PM-3000**

**Parts Drawing Model PA/PM-3000R**

**Standard Polymaster electrical diagram (\*refer to project specific electrical diagrams if applicable)**

## **NEPTUNE CHEMICAL PUMP COMPANY LIMITED WARRANTY**

All Neptune Polymaster units are tested at the factory prior to shipment. Each part used in their construction has been carefully checked for workmanship.

If the Polymaster is installed properly, Neptune Chemical Pump Company warrants to the purchaser of this product for a period of twelve months from the date of first use or eighteen months from shipment, whichever occurs first, this product shall be free of defects in material and/or workmanship, as follows:

1. Neptune Chemical Pump Company will replace, at no charge, any part that fails due to a defect in material and/or workmanship during the warranty period, FOB our factory, Lansdale, Pennsylvania. To obtain warranty service, you must forward the defective parts to the factory for examination, freight pre-paid.<sup>1</sup>
2. This warranty period does not cover any product or product part, which has been subject to accident, misuse, abuse or negligence. Neptune Chemical Pump Company shall only be liable under this warranty if the product is used in the manner intended by the manufacturer as specified in the written instructions furnished with this product.

Any express warranty not provided in this warranty document, and any remedy for breach of contract that, but for this provision, might arise by implication or operation of law, is hereby excluded and disclaimed. Under no circumstances shall Neptune Chemical Pump Company be liable to purchaser or any other person for any charge for labor, repairs, or parts, performed or furnished by others, nor for any incidental consequential damages, whether arising out of breach of warranty, express or implied, a breach of contract or otherwise. Except to the extent prohibited by applicable law, any implied warranty of merchantability and fitness for a particular purpose are expressly limited in duration to the duration of this limited warranty.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long any implied warranty lasts, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may have other rights, which may vary from state to state.

### **IMPORTANT**

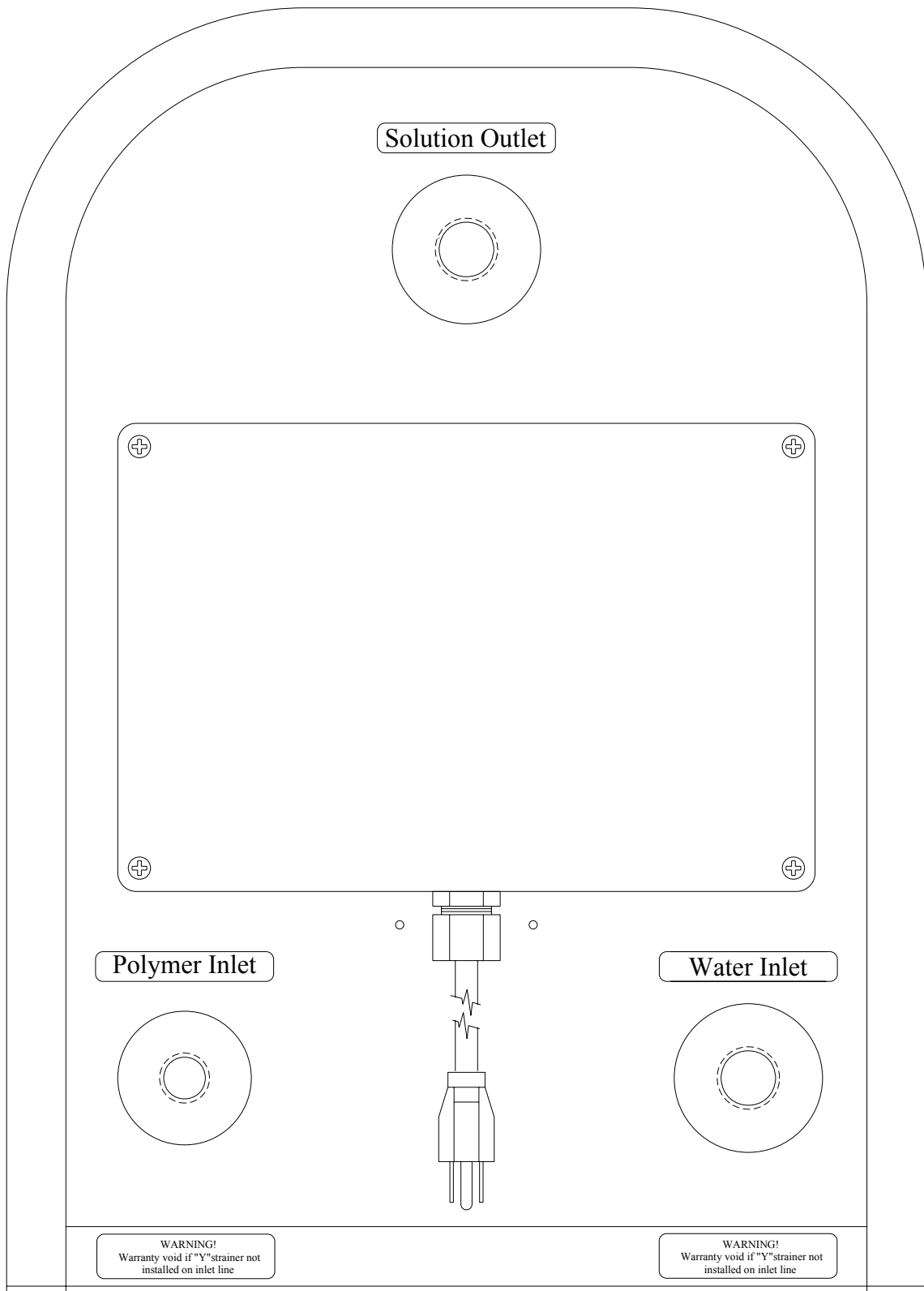
SHOULD IT BE NECESSARY TO SEND THE POLYMASTER TO THE FACTORY FOR REPAIR OR MAINTENANCE REBUILDING, PURGE ALL POLYMER FROM THE POLYMASTER BEFORE SHIPPING. FAILURE TO DO SO CAN CAUSE THE POLYMER TO SET-UP IN THE PUMP.

<sup>1</sup>SEE IMPORTANT NOTICE - RETURN MATERIALS AUTHORIZATION

### **IMPORTANT NOTICE RETURN MATERIALS AUTHORIZATION**

- (1) All equipment returned to Neptune Chemical Pump Company requires proper Returned Materials Authorization Number (RMA) and tags.
- (2) All equipment returned to the factory for repair or service must first be thoroughly flushed and have all chemical contact areas neutralized.
- (3) All equipment, which has been in contact with chemicals, must be accompanied by a copy of the Chemical Product Material Safety Data Sheet (MSDS).
- (4) Failure to comply with the above instructions will result in equipment being returned to sender, freight collect, without service.

# TYPICAL BACK PANEL



## INSTALLATION

1. Unpack Polymaster from shipping container. Inspect system for any shipping damage and report it to the freight company and to Neptune immediately. Save the shipping container. Identify all the parts within the container. As a minimum, there should be a strainer for the water line, a strainer for the polymer line and a priming kit with a hand pump.

**Record model number and serial number in spaces provided in front cover of this manual for future reference. Model number information is located on system nameplate.**

2. Install the Polymaster on a clean, level surface. If the system is to be wall-mounted, make sure the shelf brackets are anchored securely. Models PA-1200R and PA-300R use remote pumps which are not built into the stainless steel chassis. The remote pump can be located on a molded plastic base (purchased separately) or on the floor or other support directly adjacent to the Polymaster.
3. Install strainer (shipped loose) in the dilution water line. Connect the water first through a line strainer then to the connection marked "Water Inlet". The maximum incoming water pressure is 100 psi, it is suggested that the normal operating pressure be 80 psi or less. A water pressure reducing valve is necessary for higher water pressures and is available through Neptune. The system includes a water pressure gauge.
4. Potable water at ambient temperature is recommended. Dirty or secondary water could begin reacting with the polymer before it reaches the point of application.
5. Install strainer (shipped loose) in the chemical line. Connect the polymer feed first through the line strainer then to the connection marked "Polymer In". For remote pump models PA-1200R and PA-3000R - the polymer feed line should be fed through the line strainer, then connected directly to the suction of the remote feed pump.

**Suction line should be kept as short as possible and should be the same diameter or one size larger than the polymer inlet connection.**

6. If feeding from a drum\*, install the foot valve on the end of the polymer suction line in the polymer drum. This will prevent the polymer from draining back down into the drum when the pump is turned off. A drum wand assembly with foot valve is available from Neptune.
7. Connect the port marked "Solution Outlet" to the point of application. Dilution water inlet pressure must be 25psi. (at full flow) higher than the pressure at the point of application or a water booster pump will be required. Polymaster will not operate if water flow and pressure are insufficient.
8. Connect Polymaster to an electrical outlet using power cord and plug furnished. Be certain the electrical characteristics of the power source match the characteristics of the unit.
9. For all standard PA models, the 4-20 mA signal should be connected in the rear electrical enclosure on terminals 1 and 2. It is recommended to refer to your unit specific electrical drawings.
10. The Polymaster is delivered with the pump lines full of mineral oil. **Do not flush pump or pump suction lines with water.** See Start Up procedure, Page 9. \*

**\*(Note: A flooded suction will always give less trouble, easier priming and superior performance)**

## CAUTION

**In addition to this instruction, there is a project specific mechanical drawings, a project specific electrical drawing and a metering pump instruction manual specific for the pump furnished with this unit. Refer to the metering pump instruction manual for pump start-up information.**

Check nameplate for power requirements. Be certain power supply matches these requirements.

Electrical requirements available are: 115Y-1 phase-50/60 Hz or 220Y- 1 phase.-50/60 Hz depending on how the unit was ordered.

Standard units are furnished with a cord and plug. The plug is used as a disconnect during maintenance. A grounded receptacle must be used. The cord may be removed and the unit hardwired to the power supply. A disconnect with lockout must be provided if the unit is hardwired.

For the handling of liquid polymers or other chemicals, contact the chemical supplier.

### **IMPORTANT NOTE:**

The pump stroke length should only be adjusted while it is operating. Damage to the pump can occur if adjustments are attempted when pump is not cycling.

### **IMPORTANT NOTE:**

All Polymaster units built or shipped after October of 2001 require a minimum of 22psi. back pressure on the unit for continuous operation. \* Without sufficient back pressure, system will display fault condition.

It may not be apparent that lack of back pressure is causing the fault. The particular installation may not provide enough back pressure even when water flow is adequate. A spring loaded check valve may be required at the solution outlet.

### **Contact Neptune Chemical Pump Co. for assistance.**

Tel.: 215-699-8700  
1 -888-3NEPTUNE (888-363-7886)  
FAX: 215-699-0370  
Email: [www.pump@neptune1.com](mailto:www.pump@neptune1.com)

# THEORY OF OPERATION

The Neptune Polymaster polymer dilution system has three basic subsystems which are the water and Polymer feed/metering subsystem, the Gatlin distribution head subsystem and the mixing/activation subsystem.

## 1. WATER & POLYMER FEED/METERING SUBSYSTEM

The dilution water is connected to the bulkhead and labeled “water/inlet” at the back of the unit. Dilution water flows through a strainer (to be located outside of the unit), a NEMA 4X solenoid valve, a metering valve, the visual flowmeter, and then into pressure switch assembly. Once through the flowmeter, dilution water goes directly to the GATLIN distribution head where it is introduced to the metered neat polymer. A secondary dilution water flowmeter may have been supplied to accommodate high flow systems, see Post Dilution instructions at end of Manual.

If 40 mesh strainer or finer is not installed in the water line, the Warranty is null and void.

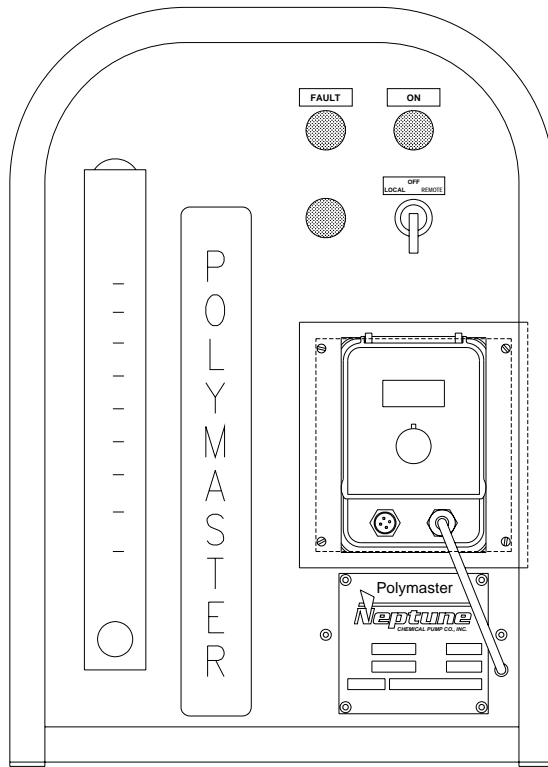
Neat polymer supply is connected to the bulkhead labeled “Polymer Inlet”. A strainer should be mounted in this line. A polymer feed metering pump draws the neat polymer into the system, through a strainer, and then injects it into the motor driven GATLIN distribution head where it is introduced to the dilution water.

## 2. GATLIN DISTRIBUTION HEAD

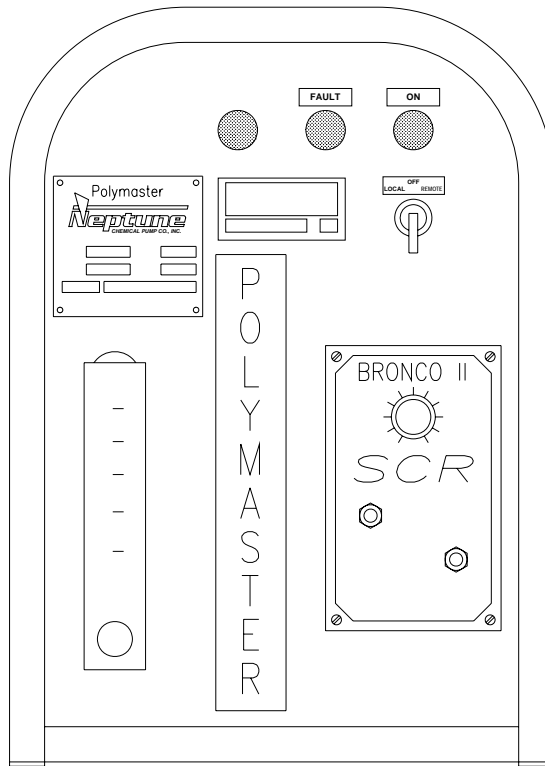
The mechanical distribution head is a patented design which is designed to hydraulically and mechanically spread the incoming polymer into extremely thin sheets, thus maximizing polymer surface area exposed to water. By creating thin sheets, the water contacts a larger surface area of polymer and is more easily and thoroughly wetted. This provides the initial activation.

## 3. MIXING

The Polymaster utilizes Komax Static Mixers to provide complete and thorough mixing of the polymer/water solution. The Komax Static mixer provides three types of mixing actions: Two-by-two division, Cross-current, and most important, a Back-mixing environment Two-by-two division assures that the polymer/water solution is in a constant state of separation and prevents the polymers from recombining into unmanageable product. Cross-current impinges the polymer with the water to fully disperse the one into the other and eliminate any dead zones or areas that are polymer rich. Finally, back mixing fully activates the polymer by exposing it to controlled shear in a localized environment. By using these three mixing actions together, it is possible to achieve a highly uniform mixture of polymer and water without shear damage, fisheyes, and or angel hairs.



**TYPICAL FRONT PANEL  
WITH ELECTRONIC PUMP**



**TYPICAL FRONT PANEL  
WITH SPEED CONTROL  
FOR REMOTE PUMP MODELS**

# OPERATING INSTRUCTIONS

**Please refer to system specific mechanical and electrical drawings and schematics for full information about the particular unit purchased for this site.**

## CONTROL PANEL

1. The power switch supplies power to the entire system when turned to “LOCAL” red run Light will be lighted. When the power switch is in the “REMOTE” position, the unit is unable to run if a remote switch permits operation. Examples of the use of the remote contact would be starting to refill a tank on low level and stopping on high level or starting on water flow in a treated line and stopping when that water flow ceases.
2. The pressure switch located in the dilution water line needs to be activated by dilution water pressure before the polymer pump or Gatlin mixer will operate. If the flow of water is not sufficient to create 20 psi of back pressure, the system will go into a “standby” mode. If a low water pressure condition is sensed, the amber “FAULT” light will come on and the pump and Gatlin will stop. The system will automatically restart once water pressure is restored. Maximum static water line pressure is 100 psi.
3. The solenoid valve will open when the system power is “ON”. The polymer pump will also be energized but individual speed or stroke control settings may cause it to operate anywhere from 0-100% of capacity, i.e., the pump can be turned “OFF” by it’s own control knobs even when the systems power is “ON”.

## FLUSH WATER

1. Normally, the Polymaster is flushed before shutdown. To flush, turnoff the polymer feed pump or turn the stroke speed to “0” using the controls on the face of the pump. Now, only dilution water is flowing through the system. Allow the water to run for 5-10 minutes, while the Gatlin is turning, to completely flush-out the system.
2. **Do not flush the chemical feed pump or pump suction and discharge lines with water as water will mix the polymer in the line and may solidify or gel.**
3. For extended shutdown (more than 3-days) the chemical feed pump head and lines can be filled with mineral oil. Simply connect the suction line to a source of mineral oil, or fill the calibration column with mineral oil, and allow the unit to run until mineral oil has been drawn completely through the suction line, pump head and discharge line up to the Gatlin. Turn off the chemical feed pump as soon as these lines are filled with mineral oil and continue to run dilution water through the system for at least 5-10 minutes before shutting down.

## DILUTION WATER FLOW CONTROL

1. The flowmeter indicates the dilution water flow rate. The water flowing through the flowmeter does not contain any polymer.
2. The flowmeter control knob is used for adjusting the dilution water flow rate.

## POLYMER FLOW CONTROL

1. The feed pump controls the amount of polymer being metered into the system. Depending upon the type of feed pump, there may be pump speed and/or stroke length control. These adjustments are both on the pump for the electronic solenoid pumps. The speed control is on the face of the Polymaster for remote, motor driven pump models. There may also be a stroke length adjustment on remote pump models, depending on type of pump used.
2. For electronic metering pumps, and optional remote control mode may have been provided. Please consult system's specific electrical drawings.
3. Two types of Polymaster are offered, manual or automatic.

Model numbers beginning with PM are "MANUAL" units and allow only for manual adjustment of the polymer flow. For electronic pumps, this may be by manual speed or manual stroke length adjustment or both. For motor driven diaphragm metering pumps, this will be by manual stroke length adjustment only. All other motor driven pumps including Progressive cavity or rotary gear pumps are provided with a variable drive for speed adjustment.

Model numbers beginning with PA are "AUTOMATIC UNITS" control the polymer flow rate automatically in response to a 4-20 mA signal. Electronic metering pumps use the 4-20 mA signal to control stroking speed, while providing a separate stroke length control. Motor driven diaphragm metering pumps also use the 4-20 mA signal to control pump speed while preserving a separate stroke length control. All other motor driven pumps including Progressive cavity or Roto gear types, speed adjustment will be proportionally to the 4-20mA input signal.

Electronic metering pumps will follow the 4-20 mA signal when the speed control mode is turned to the "EXT" position.

Automatic units using motor driven pumps have a speed dial on the front panel of the Polymaster which can be used to manually adjust the motor speed when the "MAN-AUTO" switch of the faceplate of the SCR drive is in the "MAN" position. The 4-20 mA signal will drive the pump when SCR drive toggle is in the "AUTO" position.

**Please refer to the pump instruction manuals furnished for the particular unit.**

## LONG TERM STORAGE INSTRUCTIONS

If the system will not be operating for an extended period of time, all the polymer should be purged from the system. Polymer that is left in the pump head for three or more days may start to set up. If the Polymaster is to be shut down for more than three (3) days, flush carefully per the following procedure.

1. Begin water flush as described in step 5 under maintenance on page 15.
2. Purge all polymer for the chemical feed pump head, suction and discharge lines by filling with mineral oil. Simply connect the suction line into a source of mineral oil, or fill the calibration column with mineral oil and allow the unit to run until mineral oil has been drawn completely through the suction line, pump head, discharge line and polymer injection valve at the Gatlin. Turn off the chemical feed pump as soon as these lines are filled with mineral oil and continue to run dilution water through the unit for at least 5-10 minutes before final shut down.
3. **Do not flush the chemical feed pump of feed pump suction and discharge lines with water as water will mix with the polymer and may solidify or gel.**

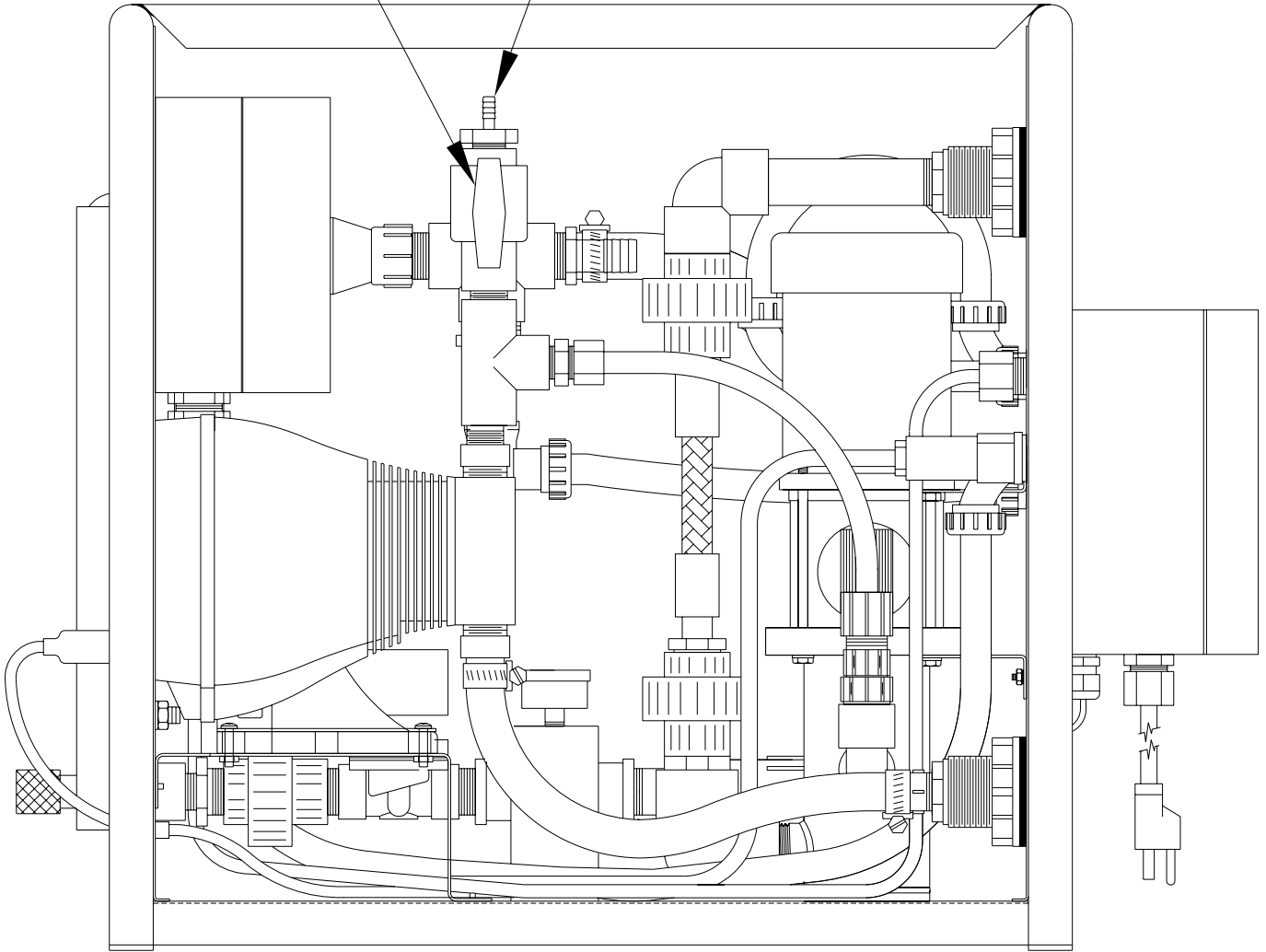
## START-UP

1. Apply power to the unit by turning the switch at the top right of the unit to “LOCAL”. The red “ON” light should come on. Since water has not yet been turned on, expect the amber “FAULT” light to illuminate immediately. This is normal when there is no water flow. The system requires a minimum of 25 psi applied back pressure to sustain the Run mode otherwise the amber “FAULT” light will come on.
2. Allow water to flow into the system. Turn the water flow to maximum. Water flow is controlled by the control knob at the bottom of the flowmeter. All units include a NEMA 4X solenoid valve (normally closed) which will not allow water to flow until the system is turned on.
3. Check for water leaks at all connections within and attached to the system. Tighten the connections, if necessary.
4. Prime the polymer feed pump until polymer is drawn to the pump outlet or bleed port using the priming kit hand pump furnished with the unit. **Continue the water flow at maximum while priming and starting up the polymer feed pump.**  
  
(Priming process may vary slightly, see pump manufacturer’s recommended procedure). For installations that are especially difficult to prime, a hand operated vacuum pump has been included to assist the polymer feed pump in initially pulling in the polymer.
5. Turn the polymer pump to the desired setting. ADJUST PUMP ONLY WHEN THE PUMP IS RUNNING. RECOMMENDED OPERATION IS TO SELECT THE CONVENIENT STROKE LENGTH SETTING AND MAKE ALL FURTHER ADJUSTMENTS, EITHER AUTOMATIC OR MANUAL, BY SPEED CONTROL.
6. Now lower the water flow to the desired level. **At no time do you wish to create a situation where there is too much polymer and too little water or gelling can occur.**
7. Check for polymer leaks at all connections within and attached to the system. Check of air leaks in the pump suction piping. Tighten the connections, if necessary.
8. The system is now fully operational. Initial settings for desired dilution water and polymer flow rates have been made. Proceed to fine tune, depending upon the amount of polymer and desired dilution required and the performance of your process.

NOTE: The system must be calibrated to assure accurate polymer flow rates with the specific polymer and polymer feed setup used. Calibration instructions begin on page 11.

OPEN VALVE  
TO PRIME

CONNECT VACUUM HAND PUMP  
TO PRIME CONNECTION HERE



## CALIBRATION

1. Calibration of the polymer pump is recommended once the system is operational. Differences in the specific gravity and viscosity of polymers, as well as the specific piping arrangement used, require calibration of the pump to determine the precise polymer feed rate at a particular pump setting. A chart is developed to show the flow rates at various pump settings specific to the polymer and the installation site. The dilution water flowmeter requires no calibration.
2. Connect a calibration cylinder with isolation valves to the polymer inlet line. Neptune offers complete calibration kits.
3. Fill the cylinder with polymer using gravity feed for a flooded suction installation or by pouring the cylinder full of polymer if using an arrangement where the polymer is pulled up out of a drum. **Never place water in the calibration cylinder as this could cause gelling and solidifying of polymer in the suction line or pump head.** The cylinder should be isolated from the polymer input line so only polymer from the cylinder is drawn. Measure the amount of polymer drawn out of the cylinder in a 1-2 minute test.
4. With the system on and dilution water flowing **at a rate which ensures the proper polymer percentage make-down.** Set the pump to Length to 100%, and the stroke speed to 25%. Open the polymer cylinder, time the flow being pumped for 1 or more minutes, close the valve, and record the volume. Never run the polymer metering pump without a supply of chemical. Do not starve the pump. When switching from the normal suction line to the calibration cylinder, open the cylinder valve first and close the suction line valve last. When restoring normal flow, open the suction line first and close the calibration cylinder valve last.
5. Repeat Step 4 for pump settings at 50%, 75% and 100%.
6. With the data recorded, plot the pump setting versus the amount of polymer drawn down in the calibration cylinder as measured in milliliters. Convert the data into flow rates using one of the formulas below. Plot the flow rate vs. pump setting on the calibration graph on the next page.

$$\text{Flow (gph)} = \frac{V \text{ (ml)}}{3785 \times T \text{ (sec)}} \times \frac{3600}{1}$$

$$\text{Flow (gph)} = \frac{V \text{ (ml)}}{3785 \times T \text{ (min)}} \times \frac{60}{1}$$

gph - gallons per hour

V - volume in milliliters

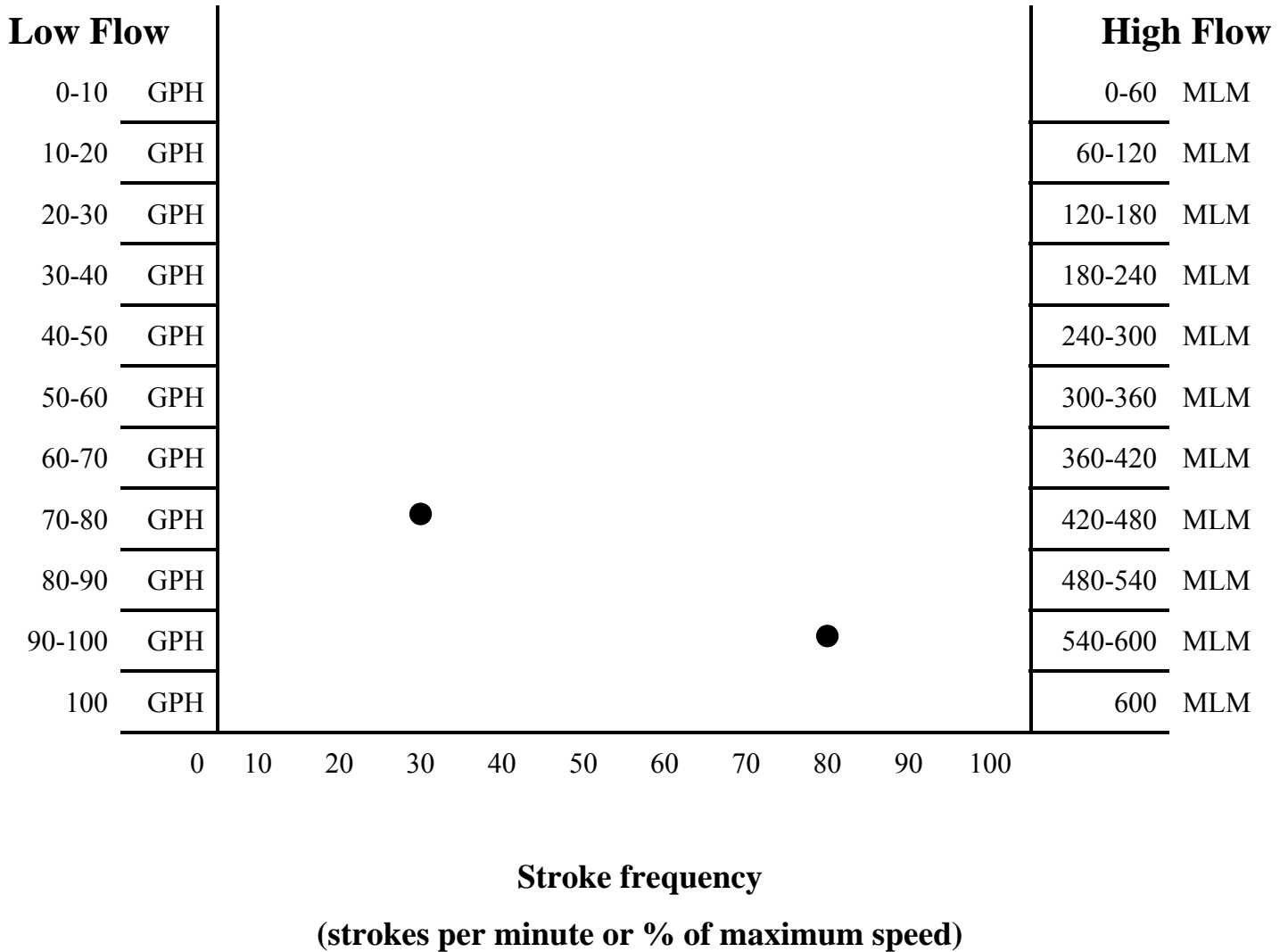
T - time in seconds or minutes

7. Note: Since stroke and speed may both be adjustable, it is recommended to select a stroke length convenient for the application and to develop the calibration graph based on changes in the stroke speed. Additional calibration graphs may then be developed for other stroke length settings repeating 25%, 50%, 75% and 100% of stroke speed for each stroke length tested.

## CALIBRATION GRAPH

For your convenience, the vertical scales on this graph are labeled for English Units (gallons per hour) or Metric Units (milliliters per minute). You cannot use both on the same graph since the scales are not related.

The left axis allows a finer plot on low volume pumps. The right axis allows plotting curves for higher flow rate pumps.



# INSTRUCTIONS FOR OPERATION OF POST-DILUTION UNIT

**(Applies to 2 stage dilution furnished on models PA/PM-3000 and PA/PM-3000R only)**

The models PA/PM-3000 include two separate water flow indicators with separate water flow adjustment knobs. The primary dilution flow meter is located on the front face for the Polymaster. The second dilution or post dilution flow indicator is inside the unit with the rate setting valve at the top of the flow meter.

When using the dual dilution unit, a maximum of 20gpm (1200 gph) of water may be passed through the primary flow circuit into the Gatlin mixing chamber. Up to 30gpm (1800 gph) of water may be added by means of the secondary or post dilution water flow indicator.

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**NOTE:** If the Polymaster stops and the amber fault light comes on when turning on the post dilution unit, sufficient water flow or pressure may not be available from your water source.

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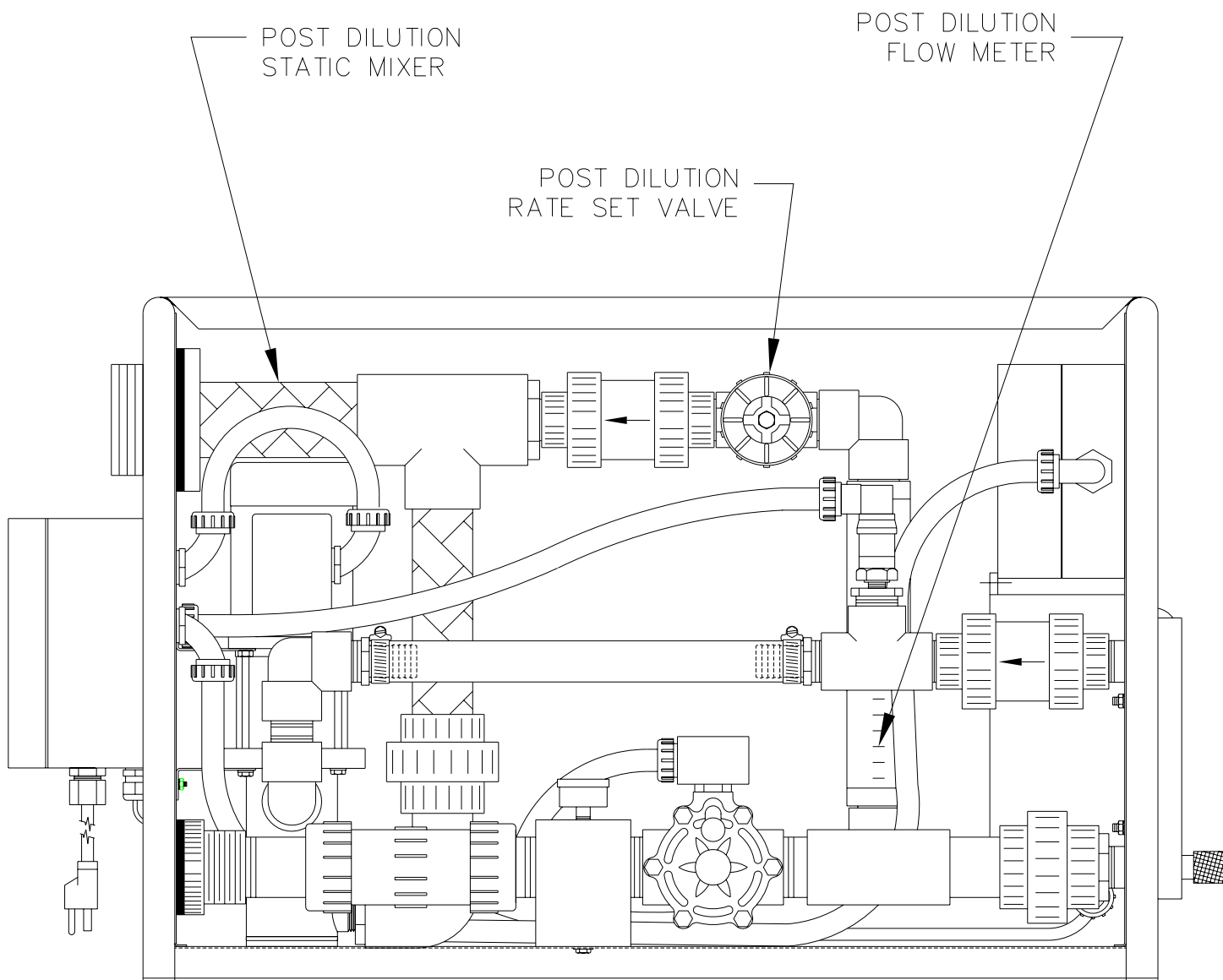
Complete steps 1-6 of the START -UP procedure on page II using only the primary flow indicator on the front panel of the Polymaster. Calculate the desired final solution percentage and set the post dilution flow indicator to provide the balance of dilution water required.

It is recommended that both primary and post dilution flow indicators be set to approximately the same flow rate unless the total water exceeds 2400gph in which case the maximum of 1200gph of water is added by the primary dilution flow meter and the balance is added by the post dilution flow meter.

The post dilution flow control valve is positioned at the top of the internal flowmeter. The Polymaster should produce double the desired final solution and then process down to the desired final concentration.

**EXAMPLE:** If you need 2400 gph of a 0.5% solution, set the Polymaster to produce 1200 gph on the primary dilution meter and 1200gph of water on the secondary dilution water meter. The Gatlin will produce 1% solution with the primary 1200gph of water and 12gph of neat polymer. The introduction of the secondary 1200gph of post dilution water will result in a total of 2400gph of a 0.5% final solution.

If a model PA/PM-3000 unit has been purchased and it is determined that less than 1200pgh of total solution is required, then all of the dilution water should pass through the primary mixing circuit and the secondary dilution water meter should not be used. This will ensure the maximum velocity of the final solution through the static mixer.



## MAINTENANCE

1. Inspect for polymer or water leakage at the components.
  - A. If joint leakage is observed, tighten carefully. Most joints are plastic (i.e. PVC, Delrin, acrylic) and over-tightening will lead to breakage.
  - B. If component leakage is observed, replace the defective part. Contact Neptune for part replacement.
2. Inspect light and switches for proper operation.
  - A. If a light or switch is inoperative, replace the defective part.
3. Re-calibrate the pump.
  - A. If the brand or type of polymer is changed or if the pump flow rates appear to be different than originally calibrated, recalibrate and update the calibration graph. Inform the system operator so proper system performance will be achieved.
4. Lubrication - No lubrication required other than may be called for in the pump instruction manual.
5. Flush After Each Use
  - A. The Polymaster should be flushed before shutdown. To flush, turn off the polymer feed pump or set the stroke speed to “0” using the controls on the face of the pump. Now, only dilution water is flowing through the system. Allow the water to run for 10 minutes, while the Gatlin is turning, to completely flush-out the system. **Do not flush the chemical feed pump or feed pump suction and discharge lines with water as water will mix with the polymer in the line and may solidify or gel. See long terms storage instructions on page 10 for details on flushing pump head and lines.**
6. Check the Polymer line strainer and water line strainer for debris with every new drum of polymer.
7. Follow manufacturer’s recommendation for routine maintenance of the chemical metering pump.

## RECOMMENDED SPARE PARTS

Polymaster unit 120 volt	Kit No. 003896 Contains:	(3) replacement fuses (3) spare indicating lamp bulbs (1) spare Gatlin mechanical seal (1) spare polymer injection valve
Polymaster unit 220 volt	Kit No. 003866 Contains:	(3) replacement fuses (3) spare indicating lamp bulbs (1) spare Gatlin mechanical seal (1) spare polymer injection valve
Chemical Metering Pump	Refer to specific pump manual	(1) spare parts kit as recommended by pump manufacturer

### Accessories

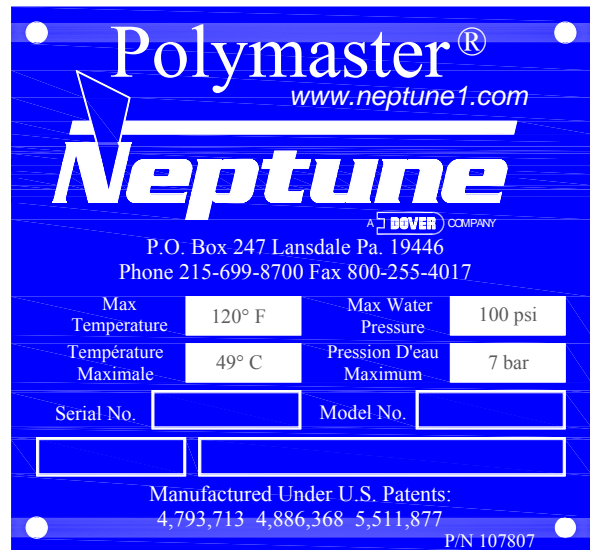
1" Poly y-strainer	Part Number 107825
½" Poly y-strainer	Part Number ST-PVC
Vacuum Hand Pump	Part Number 108233

## PARTS ORDERING INSTRUCTIONS

The complete model number and serial number of the Polymaster must be furnished to insure prompt and accurate parts service. These numbers are found on the name plate (sample below) located on the front panel.

### Send all orders or inquiries for parts to:

Parts Department  
 Neptune Chemical Pump Company  
 P.O. Box 247  
 Lansdale, PA 19446  
 Tel.: 215-699-8700  
 1 -888-3NEPTUNE (888-363-7886)  
 FAX: 215-699-0370  
 Email: [www.pump@neptune1.com](mailto:www.pump@neptune1.com)



### Shipping Address:

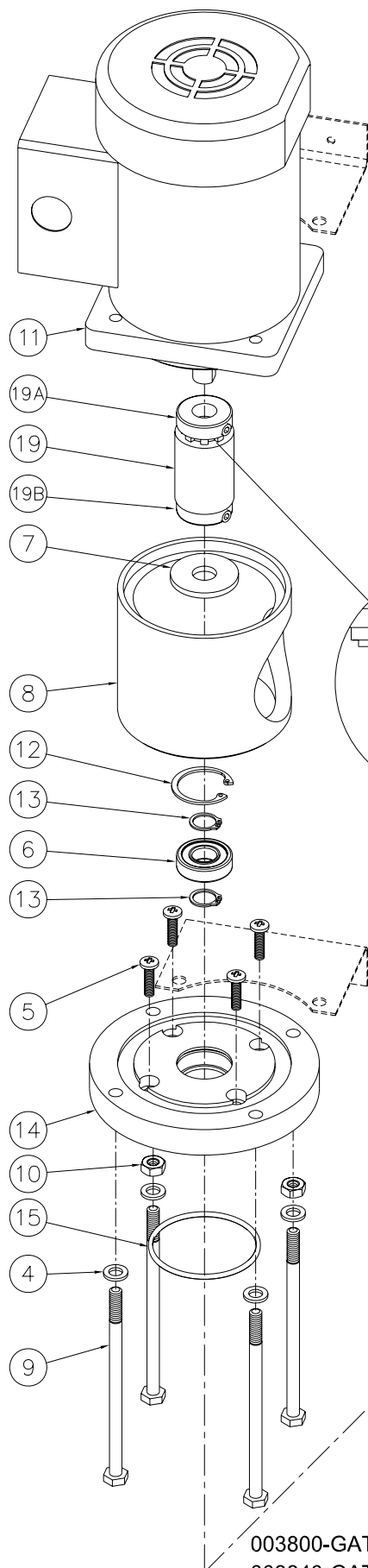
Any material returned to Neptune must first have an RMA# as described in the beginning of this manual.

Neptune Chemical Pump Co.  
 204 DeKalb Pike  
 Lansdale, P A 19446

## TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Pump running but not pumping chemical.	Air leak in suction line.	Tighten hosing and clamps.
		Check a-ring in strainer cap to see if dislodged or cracked. Replace if cracked or missing.
	Empty polymer drum	Check polymer supply.
	Plugged suction line.	Clean suction line, check strainer basket.
	Pump check valves dirty.	Inspect or clean pump valves.
	Clogged or missing foot valve. (Top mount pump only)	Clean or add foot valve.
Pump loses prime after operation.	Pump rate set too low.	Increase stroke speed or length.
	Polymer has hardened in check valve or 90° elbow connection To Gatlin.	Clean out check valves and elbow of all hardened polymer.
	Air leaks in suction line or missing/defective foot valve.	Tighten solution clamps using tape. Install foot valve on end of suction hose. Use drum suction wand with foot valve.  Refer to all remedies under "pump won't prime section" of pump instruction manual.
Pump starts, then stops.	Insufficient water pressure turning off pump power.	Check available water pressure and flow rate.
Incomplete mixing.	Too low a flow.	Use smaller Polymaster unit or increase water flow.
Polymer flow rate low.	System pressure too high.	Double check pressure at outlet to be sure it does not exceed pump nameplate rating or dilution water pressure
	Pump check valves dirty.	Inspect or clean valves.
	4-20 mA signal not correct.	Check instrument providing signal.

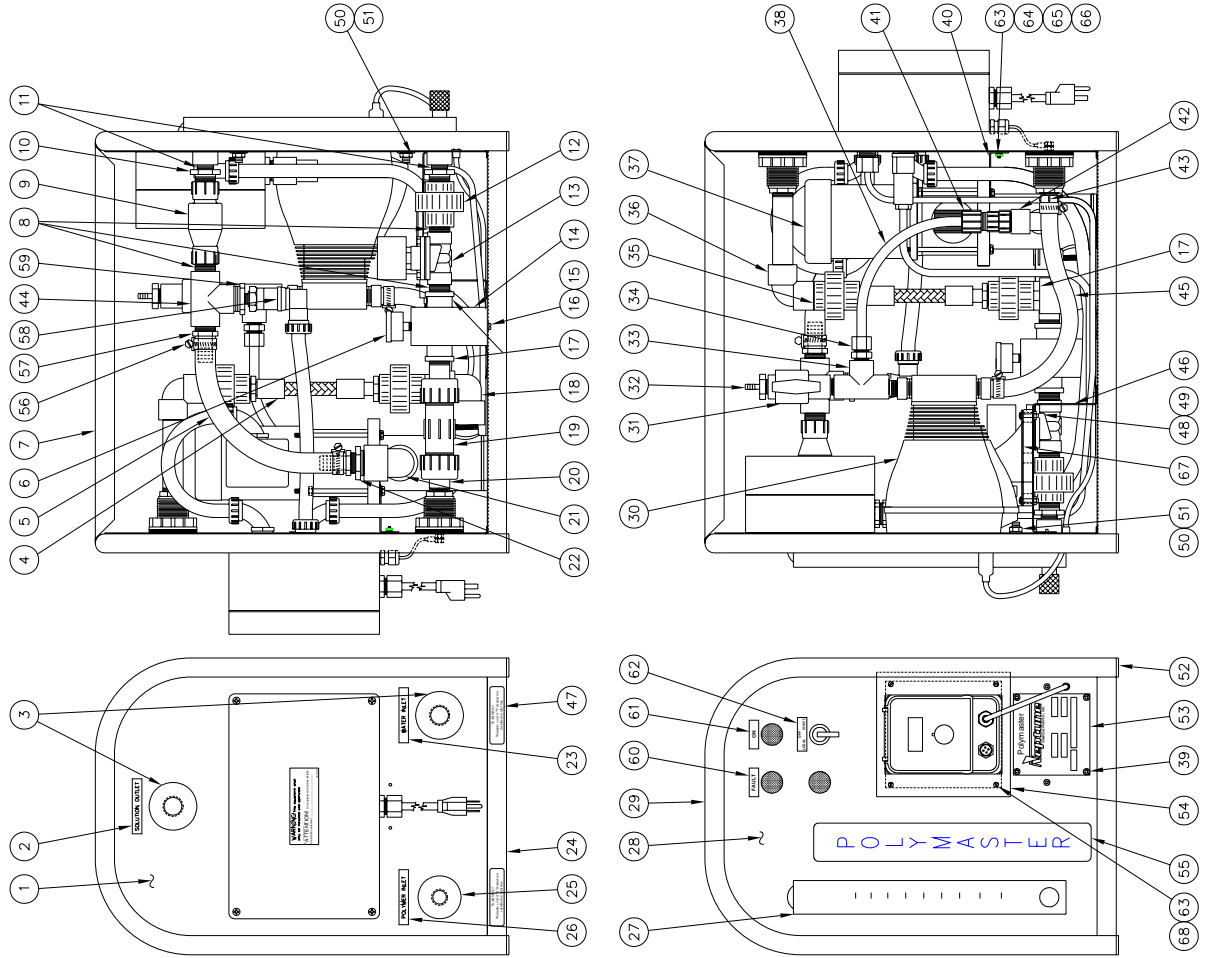
**Refer to the enclosed pump manufacturer's instruction manuals for additional troubleshooting information relating to the polymer feed pump.**



PARTS LIST			
ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	003848	GATLIN ROTOR
2	1	003820	GATLIN BARREL ASSEMBLY
3	1	003849	SHAFT
4	4	100075	1/4" LOCK WASHER
5	4	107824	#10-32 X 3/4" LG. SCREW
6	1	107700	RADIAL BEARING
7	1	003844	SHAFT SLINGER
8	1	003819	GATLIN SHAFT HOUSING
9	4	105810	1/4-20 X 4-1/2" LG. HHC SCREW
10	2	100402	1/4-20 HEX NUT
11	1	107639 107640	GATLIN MOTOR, 115 VOLT GATLIN MOTOR, 220 VOLT
12	1	107302	1 1/8" INTERNAL SNAP RING
13	2	107303	1/2" EXTERNAL SNAP RING
14	1	003817	OUTER BEARING CAP
15	1	107823	O-RING
16	1	107372	SEAL ASSEMBLY
17	1	107702	COTTER PIN
18	1	107844	FLANGED BEARING BUSHING
19	1	107381	SHAFT COUPLING (3 PIECES)

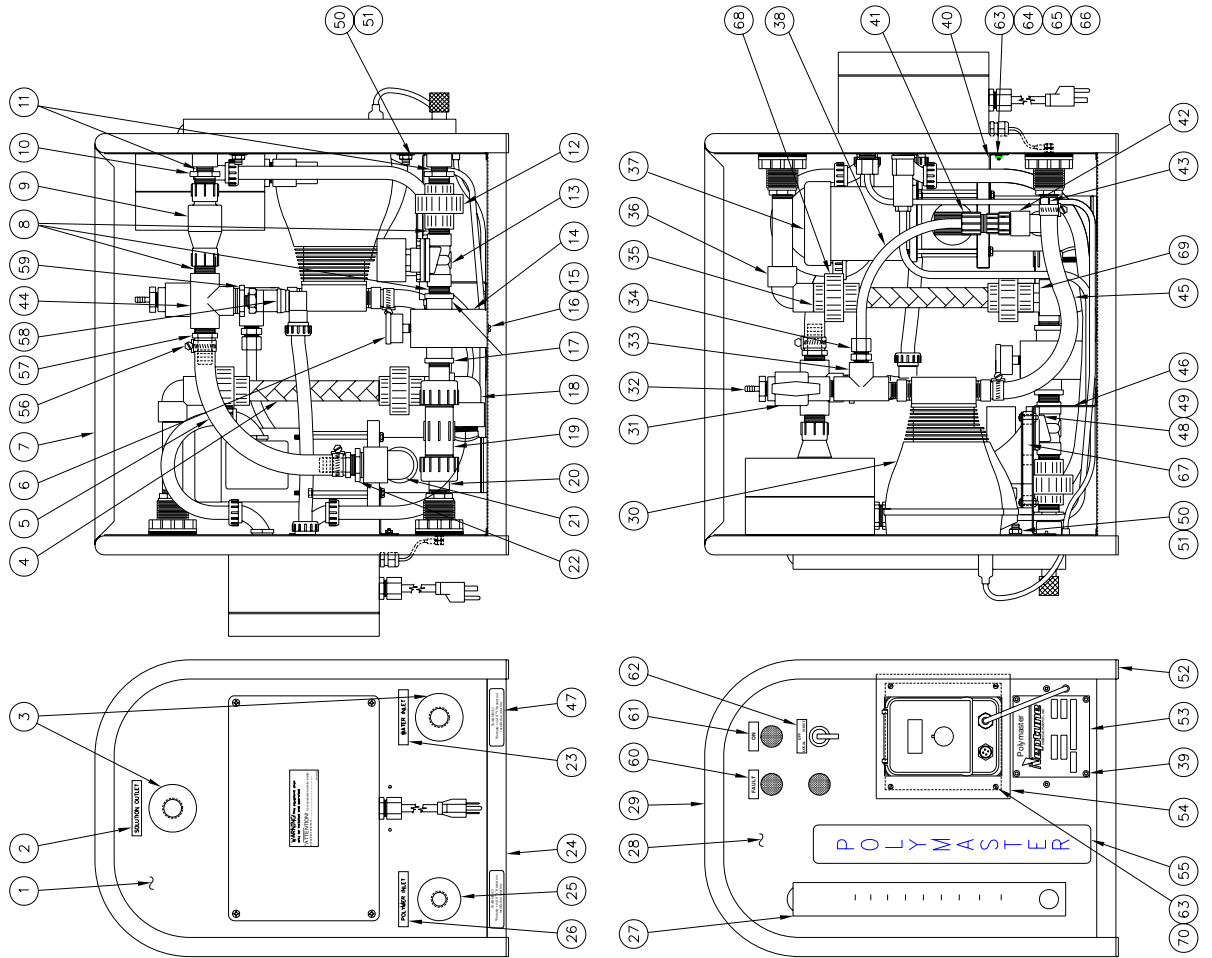
003800-GATLIN MIXER COMPLETE  
003840-GATLIN MIXER COMPLETE LESS MOTOR

# PA/PM-60, PA/PM-100



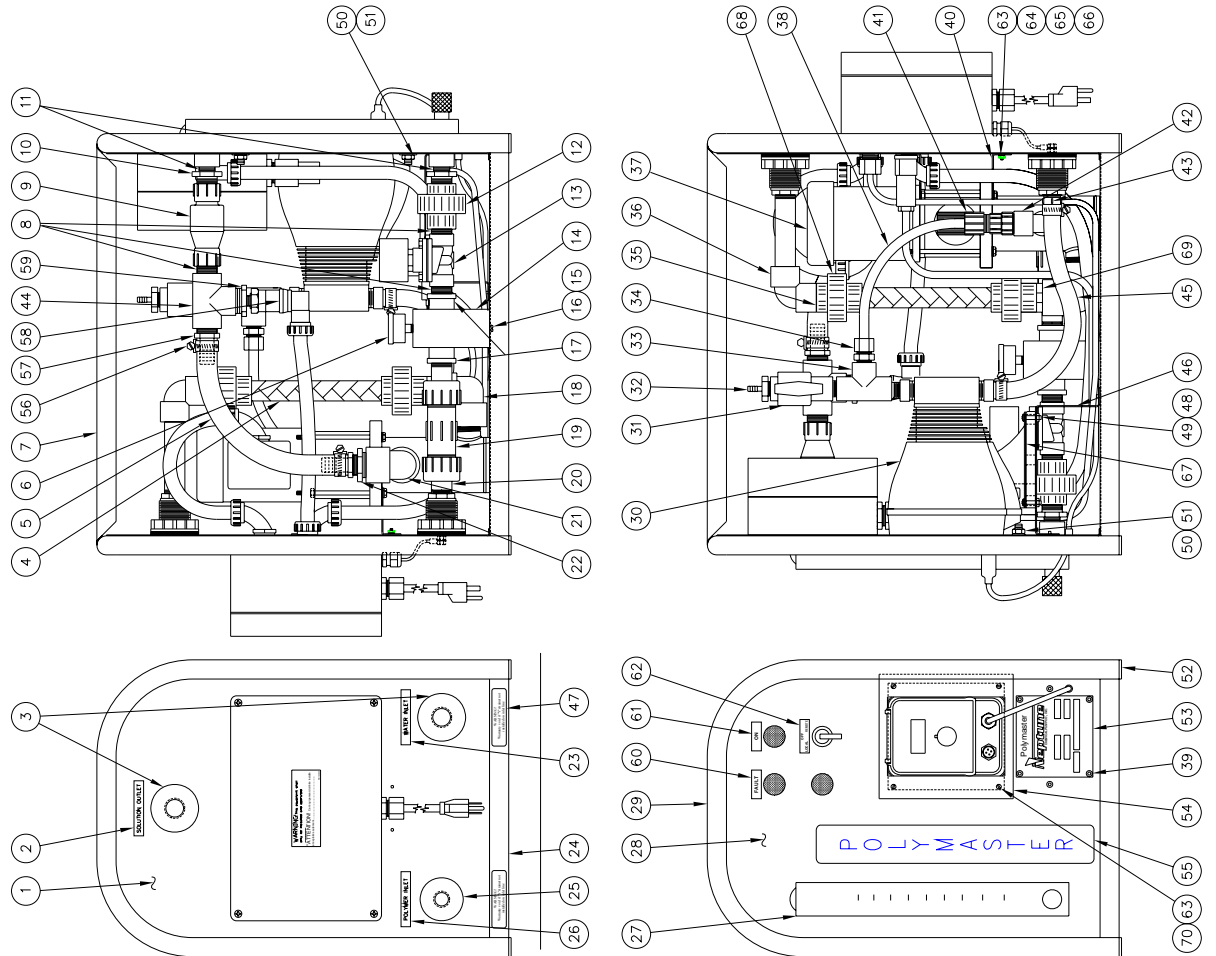
ITEM NUMBER	PART NUMBER	QTY.	DESCRIPTION
1	107437	1	REAR PANEL FACE
2	107460	1	SOLUTION OUTLET LABEL
3	107759	2	3/4" BULKHEAD ADAPTER
4	003892	1	STATIC MIXER ASSEMBLY
5	105984	1	3/4" I.D. X 14" LG. HOSE
6	107498	1	PRESSURE GAGE
7	003863	1	SUPPORT BAR
8	101715	3	3/4" CLOSE NIPPLE
9	107630	2	SPRING CHECK VALVE
10	101935	2	3/4" x 1/2" REDUCER BUSHING
11	101704	3	1/2" CLOSE NIPPLE
12	101961	1	3/4" UNION
13	107611	1	3/4" NC SOLENOID VALVE
14	003867	1	INLET BLOCK
15	107796	1	#10 X 1/2" LG. SELF TAPPING SCREW
16	107314	1	FENDER WASHER
17	107355	2	1" X 3/4" REDUCER BUSHING S X T
18	107316	1	1" ELBOW, S X T
19	107830	1	3/4" SLIP COUPLING
20	101721	2	3/4" X 6" LG. NIPPLE
21	101945	1	1" ELBOW, THREADED
22	101937	1	1" X 3/4" REDUCER BUSHING
23	107465	1	WATER INLET LABEL
24	107451	1	CHASSIS BASE
25	107453	1	1/2" BULKHEAD ADAPTER
26	107462	1	POLYMER INLET LABEL
27	107775	1	FLOWMETER
28	107684	1	FRONT PANEL FACE
29	003861	2	TUBE FRAME ENDS
30	---	1	PUMP
31	107623	1	1/2" BALL VALVE
32	107483	1	1/2" MNPT X 3/16" HOSE BARB
33	101954	1	1/2" TEE
34	107371	1	1/2" MNPT X 1/2"DIA. TUBE ADAPTER
35	100937	2	3/4" PIPE X 1 7/8" LG.
36	102216	1	3/4" ELBOW S/W
37	003800	1	GATLIN ASSEMBLY
38	120428	1	1/2" OD X 12" LG. POLYETH. TUBING
39	107310	8	5/32" X 1/4" LG. RIVETS
40	107435	2	GATLIN SUPPORT BRACKETS
41	107606	1	1/2" POLY INJECTION VALVE
42	101943	1	1/2" ELBOW
43	102152	1	1/2" MNPT X 5/8" HOSE BARB
44	101955	1	3/4" TEE
45	105529	1	5/8" ID X 12" LG. HOSE
46	003868	1	PUMP MOUNTING BRACKET
47	107836	2	"V" STRAINER WARNING LABEL
48	107701	4	#10-32 X 7/8" LG. PAN HD. SCREW
49	WAI70873	4	#10-32 HEX NUT
50	100556	2	3/8-24 HEX NUT, SELF LOCKING
51	106439	2	3/8" FLAT WASHER
52	107434	4	1" ROUND CAPS
53	107807	1	"POLYMASTER" NAMEPLATE
54	107452	1	FRAME PLATE
55	107461	1	POLYMASTER STICKER
56	106955	2	HOSE CLAMPS
57	107484	2	3/4" MNPT X 3/4" HOSE BARB
58	107872	1	PRESSURE SWITCH
59	101932	1	3/4" X 1/4" REDUCER BUSHING
60	107335	1	"FAULT" LABEL
61	107361	1	"ON" LABEL
62	107456	1	LOCAL/REMOTE LABEL
63	100190	8	#6-32 X 3/8" LG. SLOTTED SCREW
64	100624	4	#6 FLAT WASHER
65	105401	4	#6 STAR WASHER
66	105446	4	#6-32 HEX NUT
67	003932	2	SECURING CLIP
68	107737	4	U-TYPE FASTENER

PA/PM-200



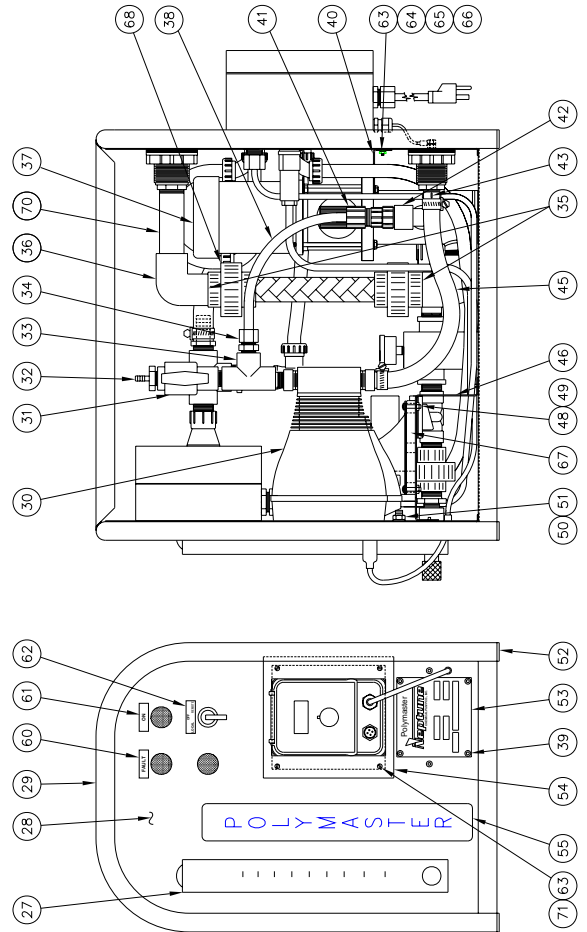
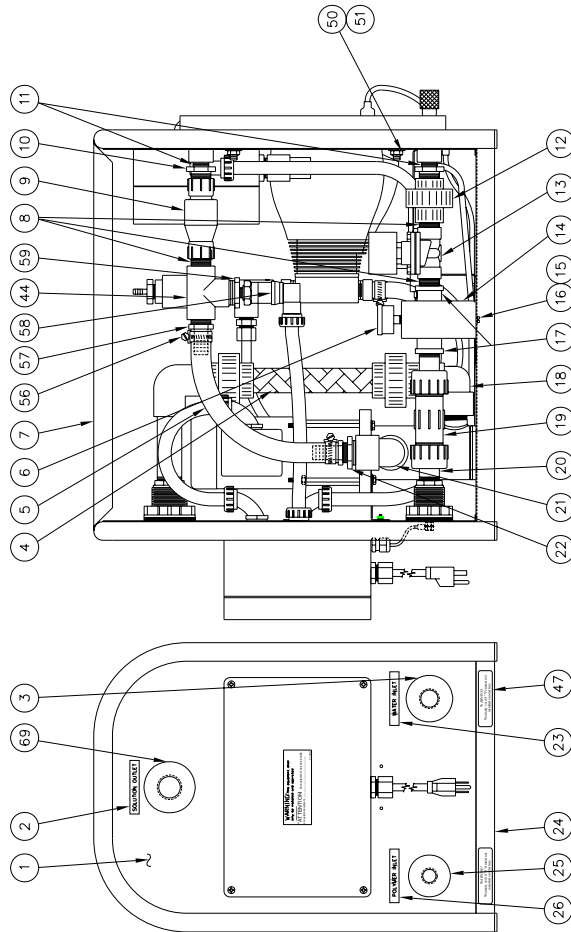
ITEM NUMBER	PART NUMBER	QTY.	DESCRIPTION
1	107437	1	REAR PANEL FACE
2	107460	1	SOLUTION OUTLET LABEL
3	107759	2	3/4" BULKHEAD ADAPTER
4	003876	1	STATIC MIXER ASSEMBLY
5	105984	1	3/4" I.D. X 14" LG. HOSE
6	107498	1	PRESSURE GAGE
7	003863	1	SUPPORT BAR
8	101715	3	3/4" CLOSE NIPPLE
9	107630	1	SPRING CHECK VALVE
10	101935	1	3/4" X 1/2" REDUCER BUSHING
11	101704	3	1/2" CLOSE NIPPLE
12	101961	1	3/4" UNION
13	107611	1	3/4" NC SOLENOID VALVE
14	003867	1	INLET BLOCK
15	107796	1	#10 X 1/2" LG. SELF TAPPING SCREW
16	107314	1	FENDER WASHER
17	107355	2	1" X 3/4" REDUCER BUSHING S X T
18	107316	1	1" ELBOW, S X T
19	107830	1	3/4" SLIP COUPLING
20	101721	2	3/4" X 6" LG. NIPPLE
21	101945	1	1" ELBOW, THREADED
22	101937	1	1" X 3/4" REDUCER BUSHING
23	107465	1	WATER INLET LABEL
24	107451	1	CHASSIS BASE
25	107453	1	1/2" BULKHEAD ADAPTER
26	107462	1	POLYMER INLET LABEL
27	107775	1	FLOWMETER
28	107684	1	FRONT PANEL FACE
29	003861	2	TUBE FRAME ENDS
30		1	PUMP
31	107623	1	1/2" BALL VALVE
32	107483	1	1/2" MNPT X 3/16" HOSE BARB
33	101954	1	1/2" TEE
34	107371	1	1/2" MNPT X 1/2" DIA. TUBE ADAPTER
35	100937	2	3/4" PIPE X 1 7/8" LG.
36	102216	1	3/4" ELBOW S/W
37	003800	1	GATLIN ASSEMBLY
38	120428	1	1/2" OD X 12" LG. POLYETH. TUBING
39	107310	8	5/32" X 1/4" LG. RIVETS
40	107435	2	GATLIN SUPPORT BRACKETS
41	107606	1	1/2" POLY INJECTION VALVE
42	101943	1	1/2" ELBOW
43	102152	1	1/2" MNPT X 5/8" HOSE BARB
44	101955	1	3/4" TEE
45	105529	1	5/8" ID X 12" LG. HOSE
46	003868	1	PUMP MOUNTING BRACKET
47	107836	2	"Y" STRAINER WARNING LABEL
48	107701	4	#10-32 X 7/8" LG. PAN HD. SCREW
49	WAI170873	4	#10-32 KEP NUT
50	100556	2	3/8-24 HEX NUT, SELF LOCKING
51	106439	2	3/8" FLAT WASHER
52	107434	4	1" ROUND CAPS
53	107807	1	"POLYMASTER" NAMEPLATE
54	107452	1	FRAME PLATE
55	107461	2	POLYMASTER STICKER
56	106955	2	HOSE CLAMPS
57	107484	2	3/4" MNPT X 3/4" HOSE BARB
58	107872	1	PRESSURE SWITCH
59	101932	1	3/4" X 1/4" REDUCER BUSHING
60	107338	1	"FAULT" LABEL
61	107361	1	"ON" LABEL
62	107456	1	LOCAL/REMOTE LABEL
63	100190	8	#6-32 X 3/8" LG. SLOTTED SCREW
64	100624	4	#6 FLAT WASHER
65	105401	4	#6 STAR WASHER
66	105446	4	#6-32 HEX NUT
67	003932	2	SECURING CLIP
68	102191	2	3/4" UNION S/W
69	102194	1	1" X 3/4" REDUCER BUSHING S/W
70	107737	4	U-TYPE FASTENER

# PA/PM-300



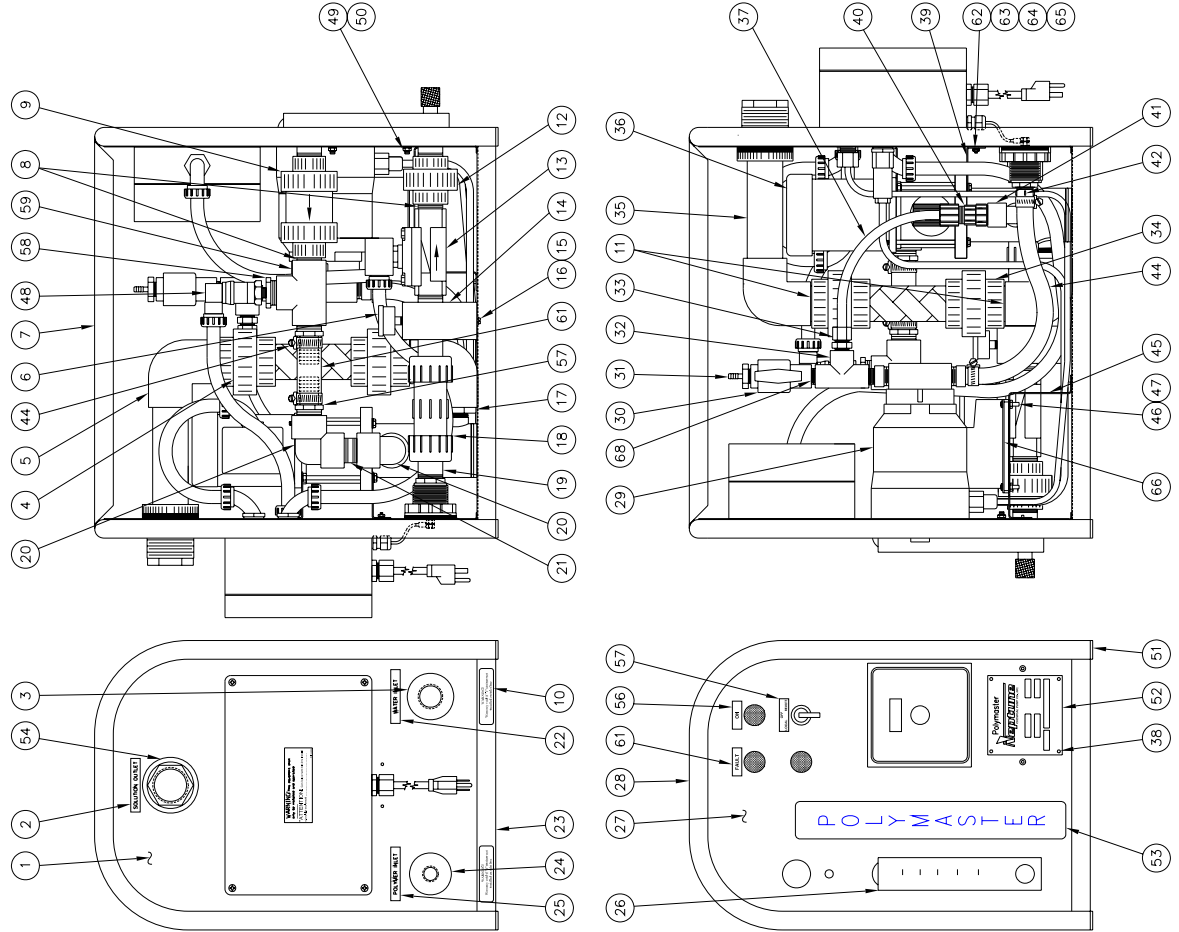
ITEM NUMBER	PART NUMBER	QTY.	DESCRIPTION
1	107437	1	REAR PANEL FACE
2	107460	1	SOLUTION OUTLET LABEL
3	107759	2	3/4" BULKHEAD ADAPTER
4	003876	1	STATIC MIXER ASSEMBLY
5	105984	1	3/4" I.D. X 14" LG. HOSE
6	107498	1	PRESSURE GAGE
7	003863	1	SUPPORT BAR
8	101715	3	3/4" CLOSE NIPPLE
9	107630	1	SPRING CHECK VALVE
10	101935	2	3/4" x 1/2" REDUCER BUSHING
11	101704	3	1/2" CLOSE NIPPLE
12	101961	1	3/4" UNION
13	107611	1	3/4" NC SOLENOID VALVE
14	003867	1	INLET BLOCK
15	107796	1	#10 X 1/2" LG. SELF TAPPING SCREW
16	107314	1	FENDER WASHER
17	107355	2	1" X 3/4" REDUCER BUSHING S X T
18	107316	1	1" ELBOW, S X T
19	107830	1	3/4" SLIP COUPLING
20	101721	2	3/4" X 6" LG. NIPPLE
21	101945	1	1" ELBOW, THREADED
22	101937	1	1" X 3/4" REDUCER BUSHING
23	107465	1	WATER INLET LABEL
24	107451	1	CHASSIS BASE
25	107453	1	1/2" BULKHEAD ADAPTER
26	107482	1	POLYMER INLET LABEL
27	107633	1	FLOWMETER
28	107684	1	FRONT PANEL FACE
29	003861	2	TUBE FRAME ENDS
30		1	PUMP
31	107623	1	1/2" BALL VALVE
32	107483	1	1/2" MNPT X 3/16" HOSE BARB
33	101954	1	1/2" TEE
34	107371	1	1/2" MNPT X 1/2" DIA. TUBE ADAPTER
35	100937	2	3/4" PIPE X 1 7/8" LG.
36	102216	1	3/4" ELBOW S/W
37	003800	1	GATLIN ASSEMBLY
38	120428	1	1/2" OD X 12" LG. POLYETH. TUBING
39	107310	8	5/32" X 1/4" LG. RIVETS
40	107435	2	GATLIN SUPPORT BRACKETS
41	107606	1	1/2" POLY INJECTION VALVE
42	101943	1	1/2" ELBOW
43	102152	1	1/2" MNPT X 5/8" HOSE BARB
44	101955	1	3/4" TEE
45	105529	1	5/8" ID X 12" LG. HOSE
46	003868	1	PUMP MOUNTING BRACKET
47	107836	2	"Y" STRAINER WARNING LABEL
48	107701	4	#10-32 X 7/8" LG. PAN HD. SCREW
49	W170873	4	#10-32 KEP NUT
50	100566	2	3/8-24 HEX NUT, SELF LOCKING
51	106439	2	3/8" FLAT WASHER
52	107434	4	1" ROUND CAPS
53	107807	1	"POLYMASTER" NAMEPLATE
54	107452	1	FRAME PLATE
55	107461	1	POLYMASTER STICKER
56	106965	2	HOSE CLAMPS
57	107484	2	3/4" MNPT X 3/4" HOSE BARB
58	107872	1	PRESSURE SWITCH
59	101932	1	3/4" X 1/4" REDUCER BUSHING
60	107338	1	"FAULT" LABEL
61	107361	1	"ON" LABEL
62	107456	1	LOCAL/REMOTE LABEL
63	100190	1	#6-32 X 3/8" LG. SLOTTED SCREW
64	100624	8	#6 FLAT WASHER
65	105401	4	#6 STAR WASHER
66	105446	4	#6-32 HEX NUT
67	003932	2	SECURING CLIP
68	102191	2	3/4" UNION S/W
69	102194	1	1" X 3/4" REDUCER BUSHING S/W
70	107737	4	U-TYPE FASTENER

PA/PM-600



ITEM NUMBER	PART NUMBER	QTY.	DESCRIPTION
1	107437	1	REAR PANEL FACE
2	107460	1	SOLUTION OUTLET LABEL
3	107759	1	3/4" BULKHEAD ADAPTER
4	003877	1	STATIC MIXER ASSEMBLY
5	105984	1	3/4" I.D. X 14" LG. HOSE
6	107498	1	PRESSURE GAGE
7	003863	1	SUPPORT BAR
8	101715	3	3/4" CLOSE NIPPLE
9	107630	1	SPRING CHECK VALVE
10	101935	2	3/4" x 1/2" REDUCER BUSHING
11	101704	3	1/2" CLOSE NIPPLE
12	101961	1	3/4" UNION
13	107611	1	3/4" NC SOLENOID VALVE
14	003867	1	INLET BLOCK
15	107796	1	#10 X 1/2" LG. SELF TAPPING SCREW
16	107314	1	FENDER WASHER
17	107355	2	1" X 3/4" REDUCER BUSHING S X T
18	107316	1	1" ELBOW, S X T
19	107830	1	3/4" SLIP COUPLING
20	101721	1	3/4" X 6" LG. NIPPLE
21	101945	1	1" ELBOW, THREADED
22	101937	1	1" X 3/4" REDUCER BUSHING
23	107465	1	WATER INLET LABEL
24	107451	1	CHASSIS BASE
25	107453	1	1/2" BULKHEAD ADAPTER
26	107462	1	POLYMER INLET LABEL
27	107636	1	FLOWMETER
28	107684	1	FRONT PANEL FACE
29	003861	2	TUBE FRAME ENDS
30		1	PUMP
31	107623	1	1/2" BALL VALVE
32	107483	1	1/2" MNPT X 3/16" HOSE BARB
33	101954	1	1/2" TEE
34	107371	1	1/2" MNPT X 1/2" DIA. TUBE ADAPTER
35	120467	2	1" PIPE X 2 1/8" LG.
36	102214	1	1" ELBOW S/W
37	003800	1	GATLIN ASSEMBLY
38	120428	1	1/2" OD X 12" LG. POLYETH. TUBING
39	107310	8	5/32" X 1/4" LG. RIVETS
40	107435	2	GATLIN SUPPORT BRACKETS
41	107606	1	1/2" POLY INJECTION VALVE
42	101943	1	1/2" ELBOW
43	102152	1	1/2" MNPT X 5/8" HOSE BARB
44	101955	1	3/4" TEE
45	105529	1	5/8" ID X 12" LG. HOSE
46	003868	1	PUMP MOUNTING BRACKET
47	107836	2	"Y" STRAINER WARNING LABEL
48	107701	4	#10-32 X 7/8" LG. PAN HD. SCREW
49	WAT170873	4	#10-32 KEP NUT
50	100556	4	3/8-24 HEX NUT, SELF LOCKING
51	106439	4	3/8" FLAT WASHER
52	107434	2	1" ROUND CAPS
53	107807	1	"POLYMASTER" NAMEPLATE
54	107452	1	FRAME PLATE
55	107461	1	POLYMASTER STICKER
56	106955	2	HOSE CLAMPS
57	107484	2	3/4" MNPT X 3/4" HOSE BARB
58	107872	1	PRESSURE SWITCH
59	101932	1	3/4" X 1/4" REDUCER BUSHING
60	107338	1	"FAULT" LABEL
61	107361	1	"ON" LABEL
62	107456	1	LOCAL/REMOTE LABEL
63	100190	8	#6-32 X 3/8" LG. SLOTTED SCREW
64	100624	4	#6 FLAT WASHER
65	105401	4	#6 STAR WASHER
66	105446	4	#6-32 HEX NUT
67	003932	2	SECURING CLIP
68	102192	2	1" UNION S/W
69	107670	1	1" BULKHEAD ADAPTER
70	101727	1	1" X 6" LG. NIPPLE
71	107737	4	U-TYPE FASTENER

# PA/PM-1200

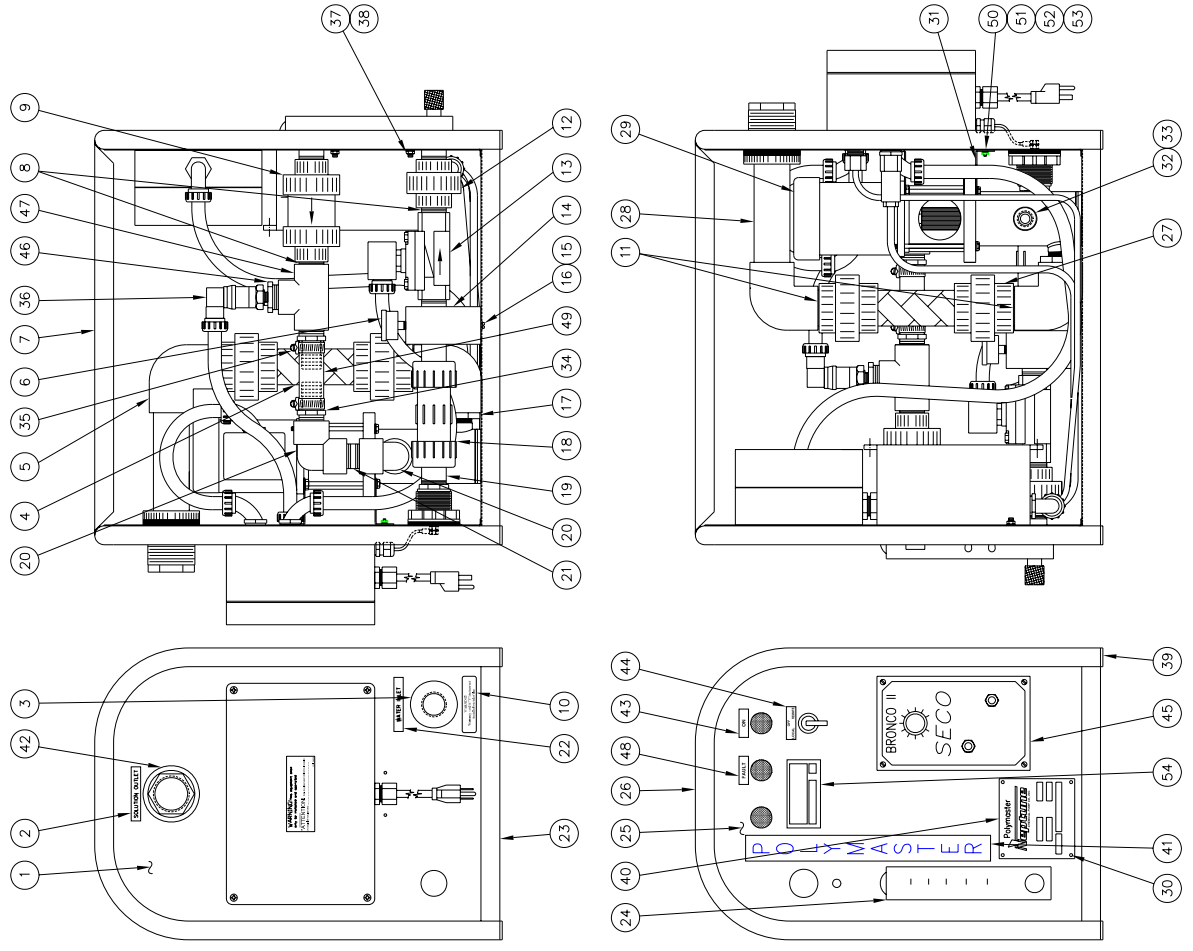


ITEM NUMBER	PART NUMBER	QTY.	DESCRIPTION
1	003845	1	REAR PANEL FACE
2	107460	1	SOLUTION OUTLET LABEL
3	107670	1	1" BULKHEAD ADAPTER
4	003929	1	STATIC MIXER ASSEMBLY
5	102215	1	1-1/2" ELBOW, S/W
6	107498	1	PRESSURE GAGE
7	003863	1	SUPPORT BAR
8	101722	2	1" CLOSE NIPPLE
9	107617	2	1" CHECK VALVE
10	107836	2	"Y" STRAINER WARNING LABEL
11	100939	2	1-1/2" X 2 3/4" LG. PIPE
12	101962	1	1" UNION
13	107654	1	1" NC SOLENOID VALVE
14	003867	1	INLET BLOCK
15	107796	1	#10 X 1/2" LG. SELF TAPPING SCREW
16	107314	1	FENDER WASHER
17	107317	1	1-1/2" X 1" REDUCER BUSHING S X T
18	107831	1	1" SLIP COUPLING
19	106625	1	1" X 10" LG. NIPPLE
20	101945	2	1" ELBOW, THREADED
21	101723	1	1" SHORT NIPPLE
22	107465	1	WATER INLET LABEL
23	107451	1	CHASSIS BASE
24	107453	1	1/2" BULKHEAD ADAPTER
25	107462	1	POLYMER INLET LABEL
26	107632	1	FLOWMETER
27	107684	1	FRONT PANEL FACE
28	003861	2	TUBE FRAME ENDS
29		1	PUMP
30	107623	1	1/2" BALL VALVE
31	107483	1	1/2" MNPT X 3/16" HOSE BARB
32	101954	1	1/2" TEE
33	107371	1	1/2" MNPT X 1/2"DIA. TUBE ADAPTER
34	107673	2	1-1/2" UNION S/W
35	100939	1	1-1/2" PIPE X 7 15/16" LG.
36	003800	1	GATLIN ASSEMBLY
37	120428	1	1/2" OD X 12" LG. POLYETH. TUBING
38	107310	8	5/32" X 1/4" LG. RIVETS
39	107435	2	GATLIN SUPPORT BRACKETS
40	107606	1	1/2" POLY INJECTION VALVE
41	101943	1	1/2" ELBOW
42	102152	1	1/2" MNPT X 5/8" HOSE BARB
43	106431	2	HOSE CLAMPS
44	105529	1	5/8" ID X 12" LG. HOSE
45	003868	1	PUMP MOUNTING BRACKET
46	107701	4	#10-32 X 7/8" LG. PAN HD. SCREW
47	W1170873	4	#10-32 KEP NUT
48	107872	1	PRESSURE SWITCH
49	107637	2	1/4-20 HEX NUT, SELF LOCKING
50	105811	2	1/4" FLAT WASHER
51	107434	1	1" ROUND CAPS
52	107807	1	"POLYMASTER" NAMEPLATE
53	107461	1	POLYMASTER STICKER
54	102107	1	1-1/2" BULKHEAD ADAPTER
55	107361	1	"ON" LABEL
56	107456	1	LOCAL/REMOTE/OFF LABEL
57	102151	2	1" NPT X 1" HOSE ADAPTER
58	W1170475	1	1" X 1/4" REDUCER BUSHING
59	101956	1	1" TEE
60	107338	1	"FAULT" LABEL
61	105821	1	1" ID X 4" LG. HOSE
62	100190	4	#6-32 X 3/8" LG. SLOTTED SCREW
63	100624	4	#6 FLAT WASHER
64	105401	4	#6 STAR WASHER
65	105446	4	#6-32 HEX NUT
66	003932	2	SECURING CLIP
67	101704	1	1/2" CLOSE NIPPLE

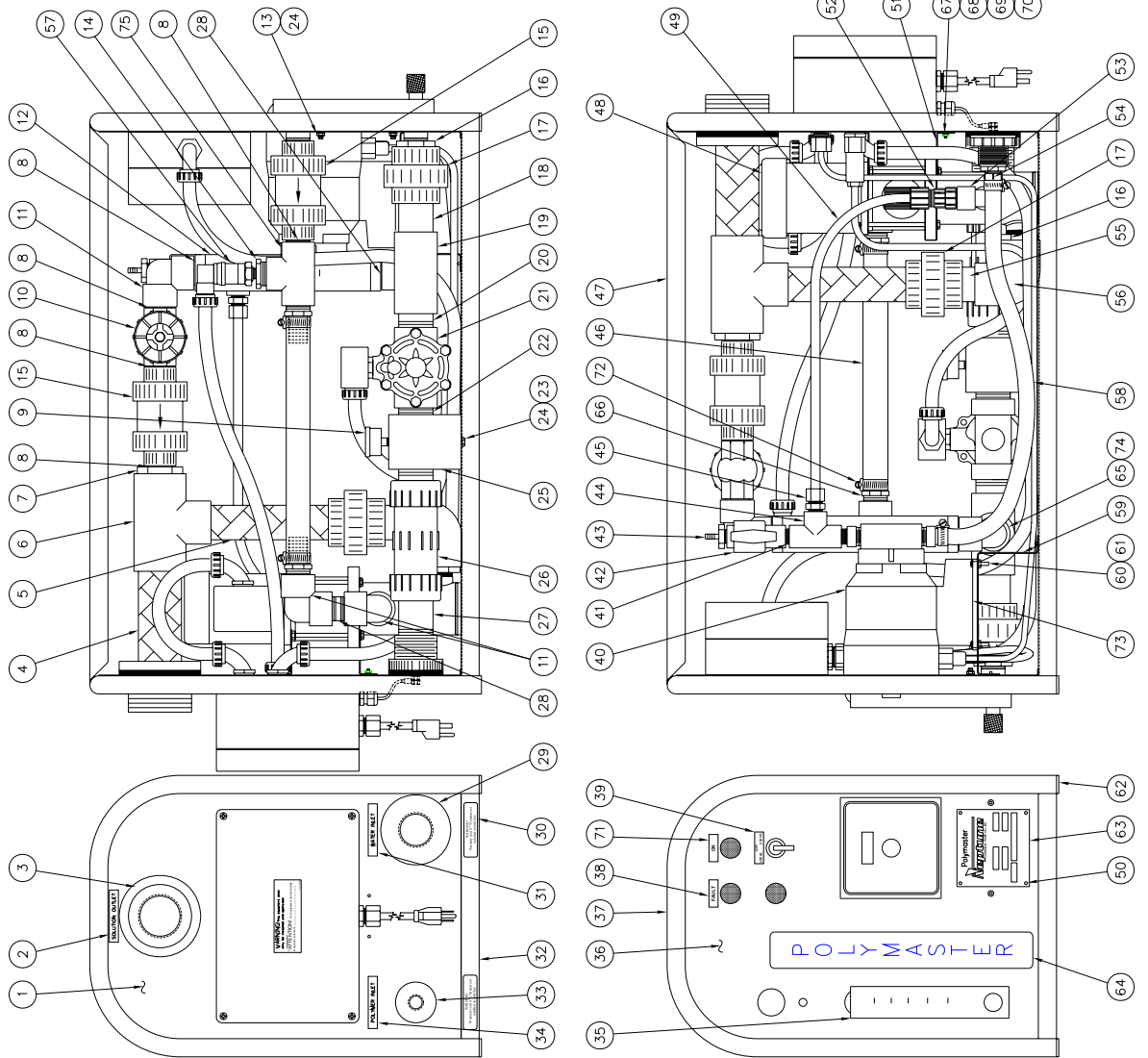
# PA/PM-1200R

ITEM NUMBER	PART NUMBER	QTY.	DESCRIPTION
1	003845	1	REAR PANEL FACE
2	107460	1	SOLUTION OUTLET LABEL
3	107670	1	1" BULKHEAD ADAPTER
4	003929	1	STATIC MIXER ASSEMBLY
5	102215	2	1 1/2" ELBOW S/W
6	107498	1	PRESSURE GAGE
7	003863	1	SUPPORT BAR
8	101722	2	1" CLOSE NIPPLE
9	107617	1	1" CHECK VALVE
10	107836	2	"Y" STRAINER WARNING LABEL
11	100939	2	1 1/2" X 2 3/4" LG. PIPE
12	101962	1	1" UNION
13	107654	1	1" NC SOLENOID VALVE
14	003867	1	INLET BLOCK
15	107796	1	#10 X 1/2" LG. SELF TAPPING SCREW
16	107314	1	FENDER WASHER
17	107317	1	1 1/2" X 1" REDUCER BUSHING S X T
18	107831	1	1" SLIP COUPLING
19	106625	1	1" X 10" LG. NIPPLE
20	101945	2	1" ELBOW, THREADED
21	101723	1	1" SHORT NIPPLE
22	107465	1	WATER INLET LABEL
23	107451	1	CHASSIS BASE
24	107632	1	FLOWMETER
25	107845	1	FRONT PANEL FACE
26	003861	2	TUBE FRAME ENDS
27	107673	1	1 1/2" UNION S/W
28	100939	2	1 1/2" PIPE X 7 15/16" LG.
29	003800	1	GATLIN ASSEMBLY
30	107310	4	5/32" X 1/4" LG. RIVETS
31	107435	2	GATLIN SUPPORT BRACKETS
32	107606	1	1/2" POLY INJECTION VALVE
33	101966	1	1/2" COUPLING
34	102151	2	1" NPT X 1" HOSE ADAPTER
35	106431	2	HOSE CLAMPS
36	107872	1	PRESSURE SWITCH
37	107637	2	1/4"-20 HEX NUT, SELF LOCKING
38	105811	2	1/4" FLAT WASHER
39	107434	4	1" ROUND CAPS
40	107807	1	"POLYMASTER" NAMEPLATE
41	107461	1	POLYMASTER STICKER
42	102107	1	1 1/2" BULKHEAD ADAPTER
43	107361	1	"ON" LABEL
44	107456	1	LOCAL/REMOTE/OFF LABEL
45	109922	1	SPEED CONTROLLER
46	WAI170475	1	1" X 1/4" REDUCER BUSHING
47	101956	1	1" TEE
48	107338	1	"FAULT" LABEL
49	105821	1	1" ID X 4" LG. HOSE
50	100190	4	#6-32 X 3/8" LG. SLOTTED SCREW
51	100624	4	#6 FLAT WASHER
52	105401	4	#6 STAR WASHER
53	105446	4	#6-32 HEX NUT
54	107876	1	SPEED READOUT

PARTS NOT SHOWN:  
 107825---1" POLY. "Y" STRAINER  
 ST-PVC---1/2" POLY. "Y" STRAINER  
 108233---VACUUM HAND PUMP

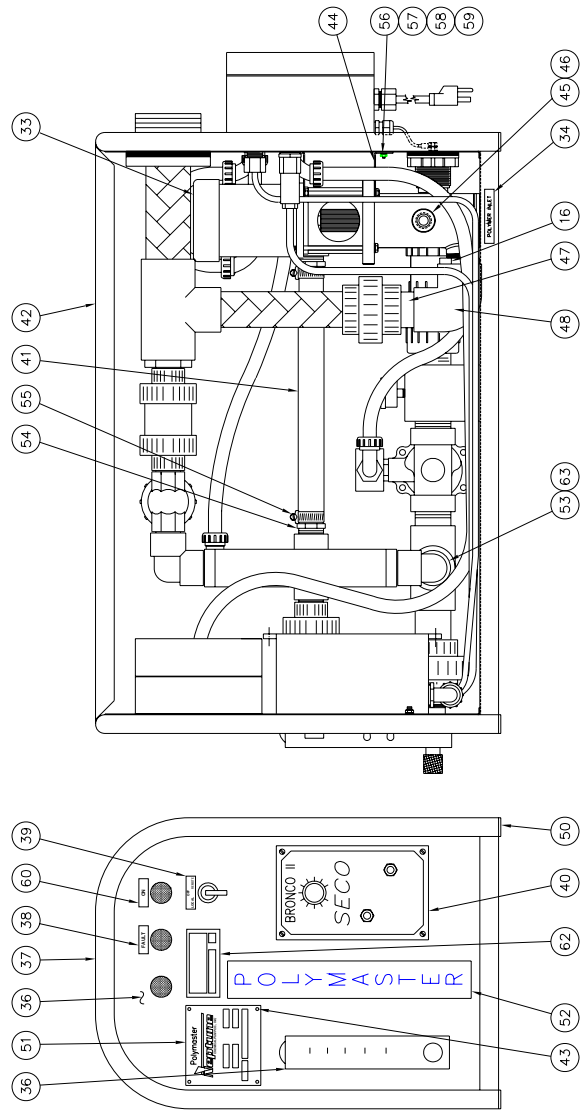
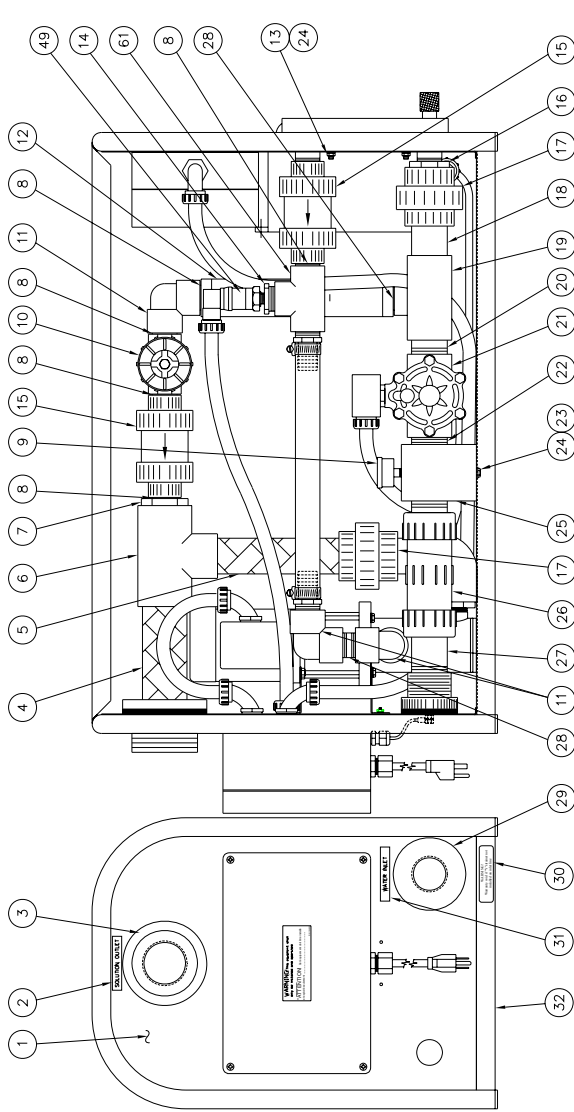


# PA/PM-3000



ITEM NUMBER	PART NUMBER	QTY.	DESCRIPTION
1	003846	1	REAR PANEL FACE
2	107460	1	SOLUTION OUTLET LABEL
3	107460	1	BULKHEAD ADAPTER
4	003879	1	1/2" STATIC MIXER ASSEMBLY
5	003878	1	1/2" STATIC MIXER ASSEMBLY
6	107838	1	2" X 2" X 1/2" REDUCER TEE
7	107838	1	2" X 2" X 1/2" REDUCER TEE
8	107846	1	1" X 1/2" REDUCER BUSHING, S X T
9	107846	1	1" X 1/2" REDUCER BUSHING, S X T
10	107498	1	1" GATE VALVE
11	107498	1	1" GATE VALVE
12	107643	3	ELBOW, THREADED
13	107637	2	ROTMETER, 0-51 GPM
14	107617	2	1/4-20 HEX NUT, SELF LOCKING
15	107617	2	1" X 1/4" REDUCER BUSHING
16	107317	2	1" CHECK VALVE
17	107673	2	1" X 1" REDUCER BUSHING, S X T
18	100939	2	1/2" X 1/2" UNION, S/W
19	107837	1	1/2" X 4" LG. APPROX. NIPPLE, S/W
20	107837	1	1/2" X 4" LG. APPROX. NIPPLE, S/W
21	101733	1	1/2" X 3/8" LG. NIPPLE, T.O.E.
22	107646	1	1/2" SOLENOID VALVE
23	101728	1	1/2" CLOSE NIPPLE
24	105811	3	1/4" WASHER
25	003883	1	1/2" INLET BLOCK
26	107832	1	1/2" COMPRESSION COUPLING
27	107848	1	1/2" X 10" LG. NIPPLE
28	101723	2	1" SHORT NIPPLE
29	107671	1	1/2" BULKHEAD ADAPTER
30	107836	2	"Y" STRAINER WARNING LABEL
31	107465	1	WATER INLET LABEL
32	107454	1	32" CHASSIS BASE
33	107453	1	1/2" BULKHEAD ADAPTER
34	107462	1	POLYMER INLET LABEL
35	107632	1	FLOWMETER
36	107684	1	FRONT PANEL FACE
37	003861	2	TUBE FRAME ENDS
38	107338	1	"FAULT" LABEL
39	107456	1	LOCAL/REMOTE/OFF LABEL
40	107456	1	PUMP
41	101704	1	1/2" CLOSE NIPPLE
42	107623	1	1/2" BALL VALVE
43	107483	1	1/2" MNPT X 3/16" HOSE BARB
44	101954	1	1/2" TEE
45	107371	1	1/2" MNPT X 1/2" DIA. TUBE ADAPTER
46	105821	1	1" ID X 13-3/4" LG. HOSE
47	003862	1	SUPPORT BAR
48	003800	1	GATLIN ASSEMBLY
49	120428	1	1/2" OD X 24" LG. POLYETH. TUBING
50	107310	8	5/32" X 1/4" LG. RIVETS
51	107435	2	GATLIN SUPPORT BRACKETS
52	107606	1	1/2" POLY INJECTION VALVE
53	101943	1	1/2" ELBOW
54	102152	1	1/2" MNPT X 5/8" HOSE BARB
55	100939	1	1/2" PIPE X 3/8" LG.
56	102215	1	1/2" ELBOW, S/W
57	107872	1	PRESSURE SWITCH
58	105529	1	5/8" ID X 24" LG. HOSE
59	003868	1	PUMP MOUNTING BRACKET
60	107701	4	#10-32 X 7/8" LG. PAN HD. SCREW
61	107701	4	#10-32 KEP NUT
62	107434	4	1" ROUND CAPS
63	107807	1	"POLYMASTER" NAMEPLATE
64	107461	1	POLYMASTER STICKER
65	107316	1	1" ELBOW, S X T
66	102151	2	1" NPT X 1" HOSE ADAPTER
67	100190	4	#6-32 X 3/8" LG. SLOTTED SCREW
68	100624	4	#6 STAR WASHER
69	105401	4	#6-32 HEX NUT
70	105446	1	"ON" LABEL
71	107361	1	HOSE CLAMPS
72	106431	2	SECURING CLIP
73	003932	2	1" NPT PIPE X 3-1/8" LG.
74	120467	1	1" NPT TEE
75	101956	1	1" NPT TEE

# PA/PM-3000R

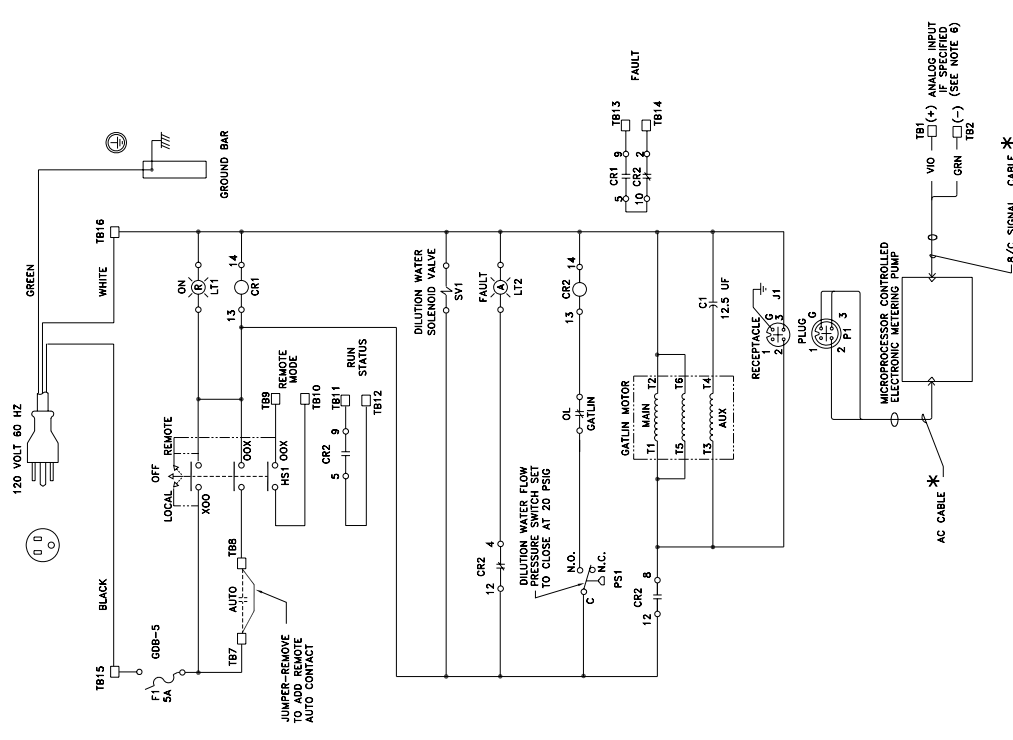
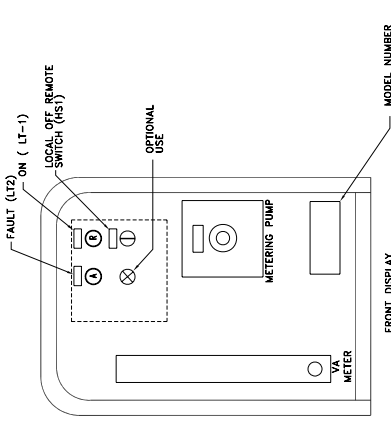


ITEM NUMBER	PART NUMBER	QTY.	DESCRIPTION
1	003846	1	REAR PANEL FACE
2	107460	1	SOLUTION OUTLET LABEL
3	107833	1	BULKHEAD ADAPTER
4	003879	1	2" STATIC MIXER ASSEMBLY
5	003878	1	1 1/2" STATIC MIXER ASSEMBLY
6	107838	1	2" X 2" X 1 1/2" REDUCER TEE
7	107846	1	2" X 1" REDUCER BUSHING, S X T
8	101722	5	1" CLOSE NIPPLE
9	107498	1	PRESSURE GAGE
10	107615	1	1" GATE VALVE
11	101945	3	1" ELBOW, THREADED
12	107637	1	ROTMETER, 0-31 GPM
13	107637	2	1/4"-20 HEX NUT, SELF LOCKING
14	WA170475	1	1" X 1/4" REDUCER BUSHING
15	107617	2	1" CHECK VALVE
16	107317	2	1 1/2" X 1" REDUCER BUSHING, S X T
17	107673	2	1 1/2" UNION, S/W
18	100939	1	1 1/2" X 4" LG. APPROX. NIPPLE, S/W
19	107837	1	1 1/2" X 1 1/2" X 1" REDUCING TEE, S/W
20	101733	1	1 1/2" X 3" LG. NIPPLE, T.O.E.
21	107646	1	1 1/2" SOLENOID VALVE
22	101728	1	1 1/2" CLOSE NIPPLE
23	100403	1	1/4"-20 X 1 1/2" LG. SCREW
24	105811	3	1/4" WASHER
25	003883	1	1 1/2" INLET BLOCK
26	107832	1	1 1/2" COMPRESSION COUPLING
27	107848	1	1 1/2" X 10" LG. NIPPLE
28	101723	2	1" SHORT NIPPLE
29	107671	1	1 1/2" BULKHEAD ADAPTER
30	107836	2	"Y" STRAINER WARNING LABEL
31	107465	1	WATER INLET LABEL
32	107454	1	32" CHASSIS BASE
33	003800	1	GATLIN ASSEMBLY
34	107462	1	POLYMER INLET LABEL
35	107632	1	FLOWMETER
36	107845	1	FRONT PANEL FACE
37	003861	2	TUBE FRAME ENDS
38	107338	1	"FAULT" LABEL
39	107456	1	LOCAL/REMOTE/OFF LABEL
40	109922	1	SPEED CONTROLLER
41	105821	1	1" ID X 13- 3/4" LG. HOSE
42	003862	1	SUPPORT BAR
43	107310	4	5/32" X 1/4" LG. RIVETS
44	107435	2	GATLIN SUPPORT BRACKETS
45	107606	1	1/2" POLY INJECTION VALVE
46	101966	1	1/2" COUPLING
47	100939	1	1 1/2" PIPE X 3 3/8" LG.
48	102215	1	1 1/2" ELBOW, S/W
49	107872	1	PRESSURE SWITCH
50	107434	4	1" ROUND CAPS
51	107807	1	"POLYMASTER" NAMEPLATE
52	107461	1	POLYMASTER STICKER
53	107316	1	1" ELBOW, S X T
54	102151	2	1" NPT X 1" HOSE ADAPTER
55	106431	2	HOSE CLAMPS
56	100190	4	#6-32 X 3/8" LG. SLOTTED SCREW
57	100624	4	#6 FLAT WASHER
58	105401	4	#6 STAR WASHER
59	105446	4	#6-32 HEX NUT
60	107361	1	"ON" LABEL
61	101956	1	1" TEE
62	107876	1	SPEED READOUT
63	120467	1	1" NPT PIPE X 3-1/8" LG.

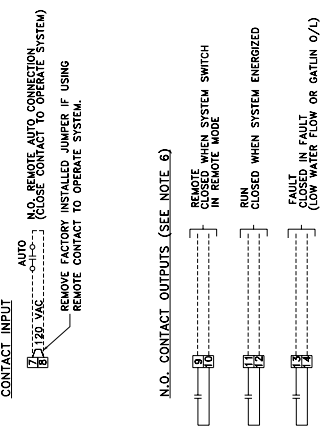
PARTS NOT SHOWN: 107825---1" POLY. "Y" STRAINER  
 ST-PVC---1/2" POLY. "Y" STRAINER  
 108233---VACUUM HAND PUMP

**ELECTRICAL NOTES:**

1. REVIEW ALL SAFETY AND OPERATING INSTRUCTIONS BEFORE USING THIS EQUIPMENT
2. POLYMASTER IS INTENDED FOR USE IN A INDOOR NON-HAZARDOUS AREA
3. **WARNING- RISK OF ELECTRIC SHOCK:**  
OPERATING VOLTAGE IS 120 VOLTS, 60 HERTZ, SINGLE PHASE.  
FOR PORTABLE USE POLYMASTER IS PROVIDED WITH A POWER CORD AND A NEMA 5-15P TYPE PLUG. CONNECT TO A PROPERLY INSTALLED AND PROTECTED GROUNDING TYPE RECEPTACLE.
4. USE LOCAL-OFF-REMOTE SWITCH (HST) TO TURN OFF POLYMASTER BEFORE PLUGGING OR UNPLUGGING.
5. DISCONNECT POLYMASTER FROM POWER SOURCE BEFORE SERVICING.  
IT IS STRONGLY RECOMMENDED POLYMASTER BE USED WITH A POWER CIRCUIT CONTAINING GROUND FAULT PROTECTION.
6. PORTABLE DEVICE FOR DIRECT CONDUIT POWER CONNECTION REMOVE THE REAR COVER AND ATTACH TO REAR ENCLOSURE GROUND BAR.
7. CONSUMABLES:  
FUSE: BUSS GDB-5 OR EQUAL  
LAMPS: 130 VOLT SIZE T-3 1/4 MINIATURE BAYONET TYPE  
CONTACT OUTPUT RATING: 10 AMPS @ 120 VAC (RESISTIVE)
8. CUSTOMER WIRING NOTE: IF METERING PUMP WITH REMOTE ANALOG CONTROL INPUT IS SPECIFIED, WIRE ANALOG SIGNAL USING TWISTED, SHIELDED ELECTRONIC INSTRUMENT CABLE. RUN SIGNAL CABLE SEPARATE FROM AC WIRING.



**CUSTOMER CONNECTIONS**



**ANALOG INPUT IF SPECIFIED:**



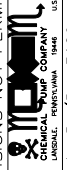
STANDARD PRODUCT DRAWING  
REVISIONS NOT PERMITTED

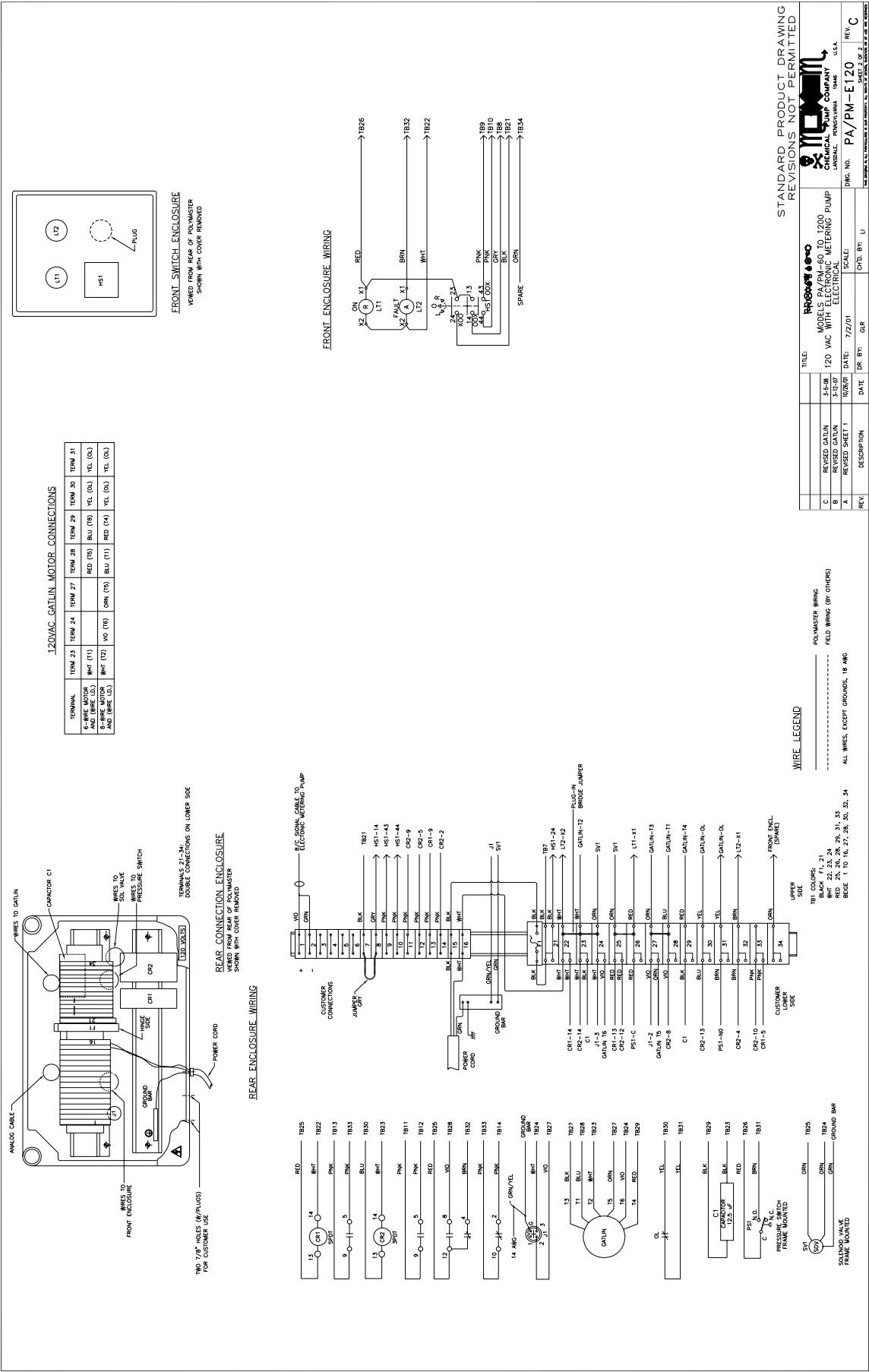
REV	DESCRIPTION	DATE	DR. BY:	JFS	CHK. BY:	U
A	REVISED NOTE 7	7/2/01	SCALE			
B	REVISED GATLIN HST-P					
C	REVISED GATLIN HST-P					

TITLE:	MODELS PA/PM-60 TO 1200 120 VAC WITH ELECTRIC MOTOR
DATE:	7/2/01
SCALE:	
DRG. NO.:	PA/PM-E120
REV. C	

WIRE LEGEND  
POLYMASTER WIRING  
FIELD WIRING (BY OTHERS)

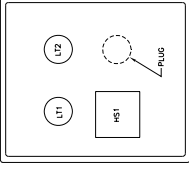
\* CABLE LENGTH EXTENDED FOR REMOTE PUMPS



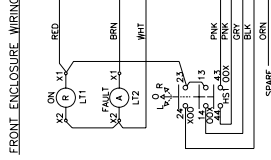


**120VAC GATLIN MOTOR CONNECTIONS**

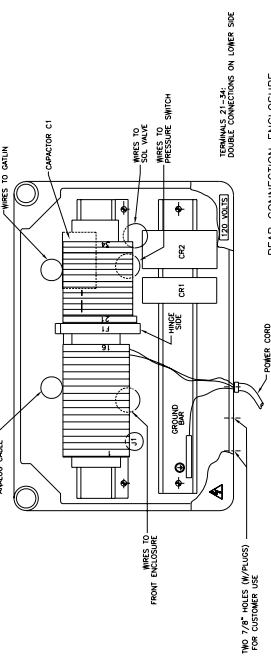
TERMINAL	TERM 23	TERM 24	TERM 27	TERM 28	TERM 29	TERM 30	TERM 31
6-WIRE MOTOR AND (RELOC.)	WHT (T1)			RED (T6)	BLU (T8)	YEL (O2)	YEL (O2)
3-WIRE MOTOR AND (RELOC.)	WHT (T2)	VO (T9)	ORN (T7)	BLU (T1)	RED (T4)	YEL (O4)	YEL (O4)



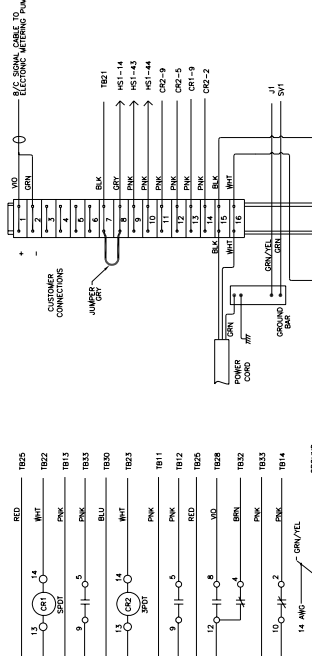
**FRONT SWITCH ENCLOSURE**  
VIEWED FROM REAR OF POLYMASTER  
SHOWN WITH COVER REMOVED



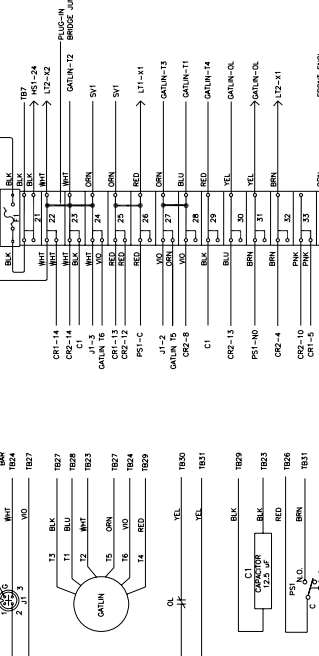
**FRONT ENCLOSURE WIRING**



**REAR CONNECTION ENCLOSURE**  
VIEWED FROM REAR OF POLYMASTER  
SHOWN WITH COVER REMOVED



**REAR ENCLOSURE WIRING**



**120VAC GATLIN MOTOR CONNECTIONS**

**STANDARD PRODUCT DRAWING**  
REVISIONS NOT PERMITTED

REV.	DESCRIPTION	DATE	DR.	BY:	CHK.	BY:
C	REVISED GATLIN	3-3-88				
B	REVISED GATLIN	3-12-87				
A	REVISED SHEET 1	7/2/81				

TITLE: **POLYMASTER**  
 MODEL: **PA/PM-60 TO 1200**  
 DESCRIPTION: **120 VAC WITH METERING PUMP**  
 ELECTRICAL  
 LANSDALE, PENNSYLVANIA 19446 U.S.A.  
 DWG. NO. **PA/PM-E120**  
 SHEET 2 OF 2  
 REV. **C**

**WIRE LEGEND**

----- POLYMASTER WIRING  
 ----- FIELD WIRING (BY OTHERS)  
 ----- ALL WIRES, EXCEPT GROUNDS, 18 AWG

TERMINAL COLORS:  
 BLACK, FL, 21  
 RED, 22, 23, 24, 25, 29, 31, 33  
 BLUE, 1 to 16, 27, 28, 30, 32, 34

