# Operating Instructions ProMinent<sup>®</sup> ProMix-S Polymer Blending System

**ProMinent**<sup>®</sup>

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Please completely read through these operating instructions first! Do not discard! The warranty shall be invalidated by damage caused by operating errors!

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# INTRODUCTION

#### i. Overview:

The ProMix S "TA Series" Polymer Feeder is a skid system designed to control feed water and polymer and combine them to produce a high quality solution. The system is designed to receive liquid neat polymer while mixing it with feed water to produce and discharge a quality solution from the system.

Research in the science of polymer activation indicates that the activation energy must decrease as the polymeric chain is uncoiled to prevent rupture and hence decrease the performance of the product.

The mixing of the Polymer Feeder is accomplished mechanically with three distinct mixing zones separated by baffles. The first zone consists of a fast mixing blade that delivers high shear at the precise point of polymer injection, creating and immediate dispersion before agglomeration takes place. The second zone mixing blade induces a vortex and draws solution down through the center of the chamber from zone one and forces the solution outward to the sides and then down into zone 3. Finally, the third zone mixing blade gently agitates/blends the active polymer solution before it



exits the chamber through the bottom of the discharge tube.

The ProMix S Polymer Feeder can be enabled in local mode (Simple On/Off operation) or remotely via a customer supplied dry contact which will Stop/Start the ProMix S Polymer Feeder. A H-O-A manual switch on the door of the controller permits the user to select the Manual mode by turning the switch to 'H', the Auto mode by turning the switch to 'A' or Off by selecting 'O'. Either mode can be turned on or off remotely via a customer permissive contact.

In Manual mode the H-O-A switch is placed into the 'H' position on the controller door of the ProMix S Polymer Feeder. The neat polymer pump speed is then adjusted manually using the controller keypad to change the pump rate from 0 to 100% of the pump rated output. The user must calculate the required pump speed based upon the polymer concentration desired after manually adjusting the primary and secondary rotameters for the desired dilution water flow.

In Auto mode the H-O-A switch is placed into the 'A' position on the controller door of the ProMix S Polymer Feeder. This offers a remote control option. In this mode, the controller receives a remote customer supplied analog 4-20 mA signal to adjust the desired pump speed from 0 to 100% of the pump rated output. This remote 4-20 mA signal can be scaled at the controller to enhance the resolution of the pump output control and bias the pump response to the remote signal. As in the Manual mode the user must calculate the required pump speed to attain the desired dosage.

The ProMix S Polymer Feeder is equipped with all the necessary components for easy installation. reliable performance and safe operation.

The design incorporates an electric solenoid valve (water inlet), flow meter/switch, manually adjustable rotameters for primary and secondary dilution flow, peristaltic neat polymer pumps, microprocessor based controller, manual ball valves, pump calibration column, PVC piping and components, and polymer mixing chamber mounted on a skid to facilitate proper mixing and delivery.

ProMix Series S User 0111

### ii. ProMix Systems:

*ProMix* S Systems consist of the following skid models:

Peristaltic Pump Type Stenner (TA Series):

PART NUMBER	MODEL	PUMP TYPE	MAX CAPACITY
7746602	ProMix S 60-0.21TA	Stenner SVP	0.21 GPH
7746603	ProMix S 60X2-0.71TA	Stenner SVP	0.71 GPH
7746604	ProMix S 180X2-0.71TA	Stenner SVP	0.71 GPH
7746605	ProMix S 180X2-1.67TA	Stenner SVP	1.67 GPH
7746606	ProMix S 300X2-2.50TA	Stenner SVP	2.50 GPH
7746607	ProMix S 300X2-3.54TA	Stenner SVP	3.54 GPH

\*\*Refer to Appendix C for proper sizing\*\*

Overall Skid Dimensions	.60"H x 30"W x 24"D
Overall Weight of Skid	.150 lbs.
Power Requirements	.120VAC, 60Hz, 1 Phase, 15 Amp
Volume of Mixing Chamber	.2.0 Gallons
Maximum Chamber Pressure	.150 PSIG
Normal Operating Pressure	.25 PSIG or 100 PSIG (Depends on Pump Selected)
Recommended Running Temperature	.+50°F to 100°F
Water Connection Size	.¾" FNPT
Solution Discharge Connection Size	.¾" FNPT

### iii. Polymer Pumps used on S Models:

Sorios	Part	Identification Code	RPM	Flowrat	e (GPH)	Pressure
Series	Number	Identification Code	Max	Minimum	Maximum	(PSIG)
SVP	7746593	SVP4H1A1S	45	0.01	0.21	100
SVP	7746594	SVP4H2A1S	45	0.03	0.71	100
SVP	7746595	SVP4H7A1S	45	0.08	1.67	100
SVP	7746596	SVP4L4A1S	45	0.13	2.50	25
SVP	7746597	SVP4L5A1S	45	0.18	3.54	25

Notes:

- 1 Stenner Peristaltic Pumps
- 2 GPH Rating pumping Water not Polymer
- 3 Connections: 1/4" FNPT
- 4 Power Requirements: 120VAC, 60Hz, Single Phase (1.5 Amps)
- 5 Suction Lift Capabilities: 25ft.
- 6 Tubing: Santoprene

# **1.0 INSTALLATION & QUICK START GUIDE**

### 1.1 Safety:

Utilize appropriate protective safety gear when operating or maintaining this equipment. Recommended safety gear is as follows:

Personal Protective Equipment (PPE):

- Hard Hats (Where overhead hazards exist)
- Safety Glasses with side shields
- PVC Apron
- PVC Gloves
- Safety-Toed Work Boots

### 1.2 Delivery & Storage Checklist:

- 1. Check packing list for completeness and note any missing items immediately.
- Inspect equipment and shipping container for damages before accepting delivery. Make note of the carrier's bill-of-lading the extent of the damage, if any, and notify the carrier.
- 3. Store the equipment on firm level surface in original packing container. Do not store the equipment where it may be exposed to extreme temperatures, precipitation, humidity, or dust. Avoid direct sunlight that could overheat and damage equipment.

Ambient Conditions for storage and transport:

Temperature: $14^{\circ}F$  to  $120^{\circ}F$ Air Humidity: $\leq 92\%$  relative humidity, non-condensing

### **1.3 Installation Considerations:**

- Required Polymer System Voltage
- Available Water Pressure
- Injection Point Pressure
- Number of Injection Points
- Polymer Solution Discharge: For example (Length of Piping Run and Pipe Size)
- Neat Polymer Suction: Flooded or Lift
- Type of Application / Dewatering Device
- Type of Polymer: Emulsion, Dispersion, Solution

### 1.4 Installation:

- 1. Unpack and position equipment on sturdy level surface. Fasten to prevent movement.
- 2. Do not install equipment in areas of extreme heat, cold, dust or humidity. Avoid areas where objects or fluids can drop from overhead.
- 3. Units are to be installed as close to the point of application as possible.
- 4. Inlet pressure is not to exceed 100 psig working pressure.
- 5. System pressure at the discharge is not to exceed 80% of inlet pressure.
- 6. Piping Internal to the System:
  - Inspect the piping for breakage. The system may have been jarred during shipping.
  - Check the tightness on all unions. Hand tighten only no tools. Unions incorporate an oring seal. Ensure that the o-ring is seated properly prior to tightening.
- 7. Piping External to the System (Reference Appendix A for connection location):
  - Install piping so that connections properly meet system termination points. Do not "stretch" field installed piping to meet system termination points. Stressed piping will fail!
  - > Piping should be at a minimum  $\frac{3}{4}$ " to and from the piping on the system.
  - Avoid getting dirt and debris inside the piping during installation. Plug ends of piping with rags if construction activities are underway. All debris must be flushed from piping before system start-up.
  - Connect to outlet piping <sup>3</sup>/<sub>4</sub>" FNPT from static mixer to associated customer application point.
  - Connect to make-up water inlet piping ¾" FNPT (5 GPM maximum at 100 psig maximum).
  - Connect to Neat Polymer pump inlet piping ½" FNPT.
  - Install ¾" pressure regulator and ¾" y-strainer / basket strainer on the clean make-up water line if equipment is currently not installed. (Recommended)
  - Allow provisions for draining the system piping. Skid components will require maintenance. Ensure that chemicals can be evacuated from the skid piping and components for servicing.
- 8. Electrical Supply Needed for the System:

Note: Review local Electrical Code and follow accordingly.

- Connect incoming power to skid mounted control panel (120VAC, Single Phase, 15 Amp, 60 Hz). Ensure panel is properly grounded.
- > Check electrical connections to be sure proper voltage is supplied to the system.
- > Power the unit using a dedicated, separate breaker in the local lighting distribution panel.
- > Do not route the AC power in common conduit with variable frequency pump drives.
- Do not put conduit entries in the top of the control panel. Resulting conduit condensation and failure to seal may damage controller circuit boards.
- 9. Set initial Chamber Mixer Motor Overload at approximately 2 Amps above the mixer FLA (Full Load Amps) rating and adjust as needed during startup to prevent nuisance tripping.
- 10. Connect Digital Remote Start Functions (note wiring termination points in Appendix B) for polymer tank level and remote start permissive. Default jumpers should remain in place for any input not available.
- 11. Refer to the Stenner SVP0610 Installation & Maintenance Manual regarding pump information.

### 1.5 Quick Start Guide:

- 1. After the installation guidelines (Section 1.4) of the manual.
- 2. Open ball valve on the suction of the pump to allow chemical to flow into the system by gravity. If the application is suction lift then ensure liquid is present in pump suction.
- 3. Start up pumps at 100% stroke length and frequency to purge all air and prime the system. To prime the pump press and hold the PRIME button on the keypad until chemical is visible in the suction line.
- 4. Verify motor rotation on Mixing Chamber motor. Normal rotation is CCW.
- 5. Do not run the mixing chamber motor dry. Damage to the mechanical seal could occur.
- 6. Close the Secondary flow control valve and adjust the Primary flow control valve to obtain the flow range required. If additional dilution water is needed adjust the secondary accordingly.



- 7. Verify that the maximum polymer injection pump pressure is higher then the system pressure.
- 8. Perform pump calibration using drawdown calibration cylinder.
- 9. Check flow calibration and be sure pump meets or exceeds the rated flow capacity. Check flows at 100% capacity.
- 10. In Manual "Hand" mode the neat polymer pump speed is adjusted manually using the controller keypad to change the pump rate from 0 to 100% of the pump rated output.
- 11. In Auto mode the controller receives a remote customer supplied analog 4-20 mA signal to adjust the desired pump speed from 0 to 100% of the pump rated output. This remote 4-20 mA signal can be scaled at the controller to enhance the resolution of the pump output control and bias the pump response to the remote signal. A remote start permissive is also needed. If not available jumper these connections.
- 12. Confirm proper operation of all instrumentation. For example: Gauge, Rotometer switch, etc.
- 13. Input functions checked and simulated (remote start/stop, 4-20mA, etc.).
- 14. Output functions checked.
- 15. Test the operation of all remaining circuits.
- 16. Observe system to assure that nothing looks or sounds abnormal.

### **1.6 Servicing Guidelines:**

- Disconnect electrical power to the equipment prior to servicing.
- Relieve all pressure from the unit prior to servicing.
- Close all suction and discharge valves.
- Verify dilution water is closed.
- Drain chemical/water from unit prior to disassembly.
- Maintain protective covers over all moving parts.
- Keep body parts, hair and foreign objects from contact with moving parts.
- Do not allow grease or oil to be used or stored around the feed equipment or chemicals.
- Review the Material Safety Data Sheets of the Polymer utilized and observe appropriate safety measures.
- Mineral Oil can be utilized to aid in the polymer cleaning process.

Ensure all operating & maintenance personnel are instructed regarding the contents of this manual.

# **2.0 CONTROLLER**

### 2.1 Keypad Navigation

The ProMinent ProMix S Polymer Feeder uses a fixed configuration to deliver the operation required to operate the feeder. The main board is not interchangeable with other ProMinent controller hardware.

The top line of the main menu displays the current feeder state on power ON

Press **EXIT** during any main menu display & you'll return to the top of the menu & the current feeder state.

The other main menu displays show information you'll need to set & adjust feed rate and to verify flowswitch, 4-20mA in & out...

UP & DOWN to view options or to EDIT numbers	4
Move <b>RIGHT</b> to select next field when EDITing	
ENTER to select an option & to execute EDITing	
EXIT to escape option, info display or EDITing EXIT goes to top of Main Menu	



### 2.2 Main Menu

This is the power ON, top of the menu display. Press **EXIT** at any display to return here. Displays the **Polymer** feed rate 0-100% and the current state of the feeder. See 1.6 for complete state table.

Displays the **Polymer Pump** feed rate 0-100% and the controlling 4-20mA current level,

Press **ENTER @ Polymer Pump** to view-adjust the Manual Setpoint & Calibrate the 4-20mA controlling the pump.

Mixer ON time resets to zero every time the Mixer turns OFF.

Press **ENTER** during **Auto RUN** or **Manual RUN** to turn OFF the **Polymer Pump** and flush the mixer.

The Remote Setpoint 4-20mA current loop controls the Polymer Pump in Auto RUN mode. Press ENTER to calibrate.

> Flowswitch ON time resets to zero every time the Flowswitch turns OFF. After 24 hours displays >1Day.

The **Remote Start** contacts must be closed for the polymer feeder to run. **Remote Start** time resets to zero every time the contact set opens.

We're now back at the top of the main menu.



#### Sidebar:

Press ENTER at Polymer to view and adjust feeder Fill, Flush & Wait-for-Flow timing.

Press **ENTER** & **UP** at **Polymer** to view feeder **Diagnostics**. Refer to **4.2** for **Diagnostic** displays.

Press **ENTER** & **UP** at **Polymer Pump** to view-modify the pump maximum SPM. Applicable only for feeders NOT using a 4-20mA, current loop controlled pump.

### 2.3 Adjust Setpoint

Press **ENTER @ Polymer Pump** to view or adjust the **Manual Setpoint**.

Manual Setpoint may be adjusted at any time in Auto or Manual mode.

The present Manual Setpoint is 25.0%. Press ENTER to adjust.

Key **RIGHT** to move the cursor & **UP** or **DOWN** to change the digit. Key **EXIT** to abandon or **ENTER** to execute.

Displays new, adjusted **Manual Setpoint**. Press **EXIT** to return to main menu.

If the Auto-Manual switch is in the Manual position, any adjustment takes effect immediately, modifying both the 4-20mA output and the flashing green frequency output.

### **Adjust Manual Setpoint**



#### Sidebar:

Manual Setpoint only controls the polymer pump when the Auto-Manual switch is @ Manual.

If the **Manual Setpoint** is @ 25% and the Auto-Manual switch is @ Manual, the 4-20mA current output loop will be at 8mA (4mA +  $0.25 \times 16$ mA = 8mA). The frequency control pulse output will be at 60 strokes per minute for a 240 SPM rated pump ( $0.25 \times 240 = 60$ )

### 2.4 Modify Timing

Press **ENTER @ Polymer** to view or adjust the feeder timing.

Fill Time may be adjusted to any time from 1 to 60 seconds. Press ENTER to adjust.

Flush Time may be adjusted to any time from 1 to 120 seconds. Press ENTER to adjust

Wait for Flow may be adjusted to any time from 1 to 30 seconds. Press ENTER to adjust.

**Diagnostics** displays the input current loop power voltage. Press **ENTER** to view diagnostic data set. Refer to 4.2 for detail.

#### Polymer 38.6% ◄┛ Auto RUN £ $[\mathbf{A}]$ Fill Time ┛ 30 Seconds $\left( \frac{1}{2} \right) \left( \frac{1}{2} \right)$ or ◄┛ Flush Time 60 Seconds (↓)(↑ or 🔁 Wait for Flow ┛ 5 Seconds [ ↓ ] $\left( \begin{array}{c} \mathbf{A} \end{array} \right)$ or Di agnosti cs ◀┛ 23.9 VDC

**View Timing** 

#### Sidebar:

**Fill Time:** Water inlet solenoid open, ON. Mixer and Polymer Pump both OFF. Factory default = 30 seconds.

Flush Time: Water inlet solenoid open, ON and Mixer ON. Polymer Pump OFF. Factory default = 60 seconds.

**Wait for Flow:** Water inlet solenoid open, ON. Mixer and Polymer Pump both OFF. Factory default = 5 seconds.

The 4-20mA current loop control input may be powered by the site control system or by the ProMix S 24VDC power supply.

### 2.4 Modify Timing (continued)



#### Sidebar:

**Fill Time:** Minimum = 1 second, Maximum = 60 seconds. Factory default = 30 seconds.

**Flush Time:** Minimum = 1 second, Maximum = 120 seconds. Factory default = 60 seconds.

Wait for Flow: Minimum = 1 second, Maximum = 30 seconds. Factory default = 5 seconds.

### 2.5 Flush Mixer

Press ENTER @ Mixer When the Mixer ON time display is alternating with the Flush on ENTER display.

The polymer feed pump will turn OFF. The Mixer & water inlet solenoid will remain ON while the alternating **Mixer** display counts down the flush period.

> At the end of the Flush period the ProMix S will return to the Auto RUN or Manual RUN state unless the user:

- 1. Sets the Auto-Manual-OFF switch to OFF.
- 2. Shuts off the feeder inlet water.
- 3. Opens the Remote Start contacts.

#### Flush Mixer Mi xer ON 49.1 Mins ŧ Alternates every second Mi xer Flush on ENTER (L) Mi xer ON 50.8 Mins ŧ Alternates every second Mi xer 26sec Flush

### Sidebar:

Flush Time: Minimum = 1 second, Maximum = 120 seconds. Factory default = 60 seconds.

### 2.6 Status Message Summary

LCD Displays	Feeder State	
	Feeder powered.	
Offline STOP	Manual-Off-Auto switch at Off.	
	Manual-Off-Auto switch at Auto	
Lin<4mA, Fault	and 4-20mA input less than 4 mA.	
	Exits on 4-20mA $\geq$ 4 mA	
	or Manual-Off-Auto = Off or Manual	
	Waits user set seconds for Flowswitch contact set closed	
Flow Check	after Filling Wixer.	
	Exits on nowswitch closed or Manual-On-Auto = On	
No Water STOP	er Manual Off Auto = Off	
No water STOP		
	Inlet Solenoid ON & Mixer OFF	
Filling Mixer	Waits user set seconds to fill mixer	
	Fxits on Manual-Off-Auto = Off	
	Polymer Pump. Mixer and Solenoid OFF	
No Ext.Run STOP	Exits on Remote Start contacts closed	
	or Manual-Off-Auto = Off	
	Solenoid & Mixer ON. Polymer pump OFF.	
Flushing Mixer Exits on flush time expired or No flow		
	or Manual-Off-Auto = Off	
	No Flow measured while flushing.	
Flush Fail STOP	Exits on flush time expired or flow measured	
	or Manual-Off-Auto = Off	
	Polymer pump @ 4-20mA input controlled setpoint.	
Auto RUN	Exits on no flow, control<0%, flush, Remote Start open,	
	or Manual-Off-Auto = Off or Manual.	
Menuel DUN	Polymer pump @ user setpoint.	
	or Manual Off Auto - Auto or Off	
Flushed Stopped		
Prose 4 to Pup	Polymer Pump, Mixer and Solenoid OFF	
	Any key press restarts.	
Flushing Mixer         Flush Fail STOP         Auto RUN         Manual RUN         Flushed, Stopped         Press ← to Run	or Manual-Off-Auto = OffSolenoid & Mixer ON. Polymer pump OFF.Exits on flush time expired or No flowor Manual-Off-Auto = OffNo Flow measured while flushing.Exits on flush time expired or flow measuredor Manual-Off-Auto = OffPolymer pump @ 4-20mA input controlled setpoint.Exits on no flow, control<0%, flush, Remote Start open,or Manual-Off-Auto = Off or Manual.Polymer pump @ user setpoint.Exits on no flow, flush, Remote Start open,or Manual-Off-Auto = Off or Manual.Polymer pump @ user setpoint.Exits on no flow, flush, Remote Start openor Manual-Off-Auto = Auto or Off.Flush ends.Polymer Pump, Mixer and Solenoid OFFAny key press restarts.	

#### Sidebar:

Flow Check: The flowswitch measures dilution water flow into the mixer chamber.

**Filling Mixer:** The mixer chamber is filled once after every power ON. If you drain the mixer, switch the power OFF then ON to re-fill the mixer chamber.

### 2.7 Calibrate 4-20mA Input

#### Press ENTER @ 4-20 mA Input

to calibrate the 4-20mA current loop input from the site's control system

**4-20 mA Input** may be calibrated at any time in Auto or Manual mode.

The present **4-20 mA Input** is **38.7%.** Press **ENTER** to calibrate.

Key **RIGHT** to move the cursor & **UP** or **DOWN** to change the digit. Key **EXIT** to abandon or **ENTER** to execute.

Displays new, adjusted **Remote Setpoint**. Press **EXIT** to return to main menu.

If the Auto-Manual switch is in the Auto position, any adjustment takes effect immediately and modifies both the 4-20mA output and the flashing green frequency output.

#### Calibrate 4-20mA In



#### Sidebar:

**'Calibrate lin'** matches the % display on the polymer feeder with the remote operator's % display.

The underlying 4-20mA level is of less importance than having both of the % displays ( the feeder's & the remote operator's) match because the Polymer feed pump operates from OFF at 0% to maximum ON at 100%.

It's simpler to calibrate on a % instead of calibrating on a current and making a non-intuitive 4-20mA loop to 0-100% conversion. So you don't need to know that a 32.4% feed corresponds to a current loop @ 9.18 mA.

The factory default scales the 4-20 mA input for 4mA = 0% Pump to 20 mA = 100% Pump. See Section 2.2 if your site's 4-20 mA input is not scaled 4-20 mA = 0 to 100%

### 2.8 Scale the 4-20mA Input



See the previous page for calibrating the 4-20 mA input loop

Press **DOWN** to view the present 4 mA pump feed percentage. The factory default is as displayed. When the 4-20 mA input is at 4.0 mA the pump will be OFF.

Press **DOWN** to view the present 20 mA pump feed percentage. The factory default is as displayed. When the 4-20 mA input is at 20.0 mA the pump will be 100%.

Press **DOWN** to view the response when the input current loop is less than 4.0 mA. The factory default is as displayed. When the 4-20 mA input is less than 4.0 mA the pump will be OFF.

> Press ENTER at any of the four sub-menu displays to modify the present setting. Press EXIT to leave unchanged.

#### 4-20mA input sub Menu



#### Sidebar:

**Calibration** of the 4-20 mA input ensures that the measured value of the 4-20 mA Input is displayed as the correct mA level.

**Scaling** the 4-20 mA input is required when you do not want 4-20 mA to correspond to a 0-100% polymer feed rate.

Selecting a different response than Pump OFF on loss of the 4-20 mA input allows for a wider range of site operational configurations & control loop reliability.

### 2.8 Scale the 4-20mA Input (continued)

Press ENTER @ 4-20mA Input

to calibrate the 4-20mA current loop input from the site's control system.

Press UP or DOWN to the Scale lin @20mA display & then press ENTER.

Press **RIGHT** to move the underline cursor & **UP** or **DOWN** to modify the value @ the cursor. Press **EXIT** to leave the present setting unchanged.

You can modify either or both of the mA level and the resulting pump feed %. Press ENTER when finished editing.

Displays new, adjusted **Scale lin @20mA** Press **EXIT** to return to main menu.

Scale lin @4mA is modified in the same way.

#### Modify mA @ 100% ON



Edit either or both mA & %

#### Sidebar:

There's a lot of flexibility in the 4-20 mA input scaling & the corresponding pump speed but most users will leave 4mA=0% and adjust the mA @ 100% to allow 0-100% pump operation over a narrower range of 4-20 mA input.

For example, if you wish 0-15% of the 4-20 mA input to control the pump from 0-100% Edit **Scale lin @20mA** for **6.4mA = 100%** & leave **Scale lin @ 4 mA** unchanged at **4.0mA = 0%** 

Setting the mA level below 4.0mA will set the mA level to 4.0mA Setting the mA level above 21.0mA will set the mA level to 21mA

Setting the % above 100% will set the % to 100%. The % level cannot be set below 0%. Refer to Appendix A for notes on 4-20mA Input scaling.

If you set % span to zero in error, the pump will turn OFF.

Note that you could make the current loop response reverse acting so that an increasing loop current will cause a decreasing pump %.

### 2.9 Response on Loss of 4-20 mA Input

Press ENTER at 4-20Ma input.

#### Press UP or DOWN to lin Fail State .

Displays the factory default. **Pump OFF** when **4-20mA Input** less than 4mA. Press **ENTER** to select a different response.

Press **DOWN** to select a user set pump speed on less than 4 mA.

Displays the factory default of 10%. Press **ENTER** to select response & modify value.

Press **DOWN and ENTER** to run the pump at the last input Value greater than 4.0mA when the measured current loop value falls below 4.0mA.

> If you pressed **ENTER @ Pump @ 10%** You will be able to modify the **10%** value.

Press **RIGHT** to move the underline cursor & **UP** or **DOWN** to modify the value at the cursor.

Press **EXIT** to leave unchanged or **ENTER** To set the new value.

#### View-Modify response On 4-20mA Input fail



#### Sidebar:

The feeder defines a failed 4-20mA input @ -1% which is nominally 3.85mA. (4.0mA - 0.01 x 16.0mA = 3.84mA)

3.85mA allows 4.0mA, a valid pump control signal some headroom prior to a fault response

### 2.10 Calibrate 4-20mA Output

Press ENTER & DOWN @ Polymer Pump to calibrate the 4-20mA current loop output that controls the pump feed rate

The present **Polymer Pump** control is 38.0% But the on-pump display is @ 39.5% Press **ENTER** to calibrate.

Key **RIGHT** to move the cursor & **UP** or **DOWN** to change the digit. Key **EXIT** to abandon or **ENTER** to execute.

The ProMix S reduces the pump 4-20mA current So that the on-pump display will measure 38.0%. Press **EXIT** to return to main menu.

Any adjustment takes effect immediately and modifies both the 4-20mA output and the flashing green frequency output.



#### Sidebar:

'Calibrate lout' matches the % display on the polymer feeder with the polymer feed pump's % display ( not all pump types display %, some display mA )
Note: 50% will not display 12mA after calibration. It will display the mA required for the pump to display 50% which could be 11mA to 13mA.. Refer to 4.3 for 4-20mA reset.
Correction >10% blocked, displays "Advice >10% Adj.Error". Press EXIT to clear.

#### Modifying Zero, <4%

At less than 4% the 4-20mA zero is modified to correct loop offset. Example: Pump shows 0% and the ProMix S displays 1.5%.

#### Modifying Span, >6%

At more than 6% the 4-20mA span is modified to correct loop gain. Example: Pump shows 52% and the ProMix S displays 50%

#### Modifying Stenner SVP4 Type pumps @ 4 to6%

When the pump current is less than 4.7mA, this pump type will shut OFF and display 0%. This is a feature of this pump & not a cause for 4-20mA output calibration. Do not calibrate the 4-20mA output to correct, you'll cause problems at SVP4 operating loop currents The ProMix S will block correction in the range of 4% to 6% & display "Advice >4% Adj.Error"

### 2.11 Adjust Pump

#### Press ENTER & UP @ Polymer Pump

to view or modify the maximum pump stroke rate. Ignore this page if you are controlling the pump using the feeder 4-20mA current output.

> The present **Polymer Pump** is rated @ **240 SPM** Press **ENTER** to modify.

> > Key **RIGHT** to move the cursor & **UP** or **DOWN** to change the digit. Key **EXIT** to abandon or **ENTER** to execute.

Displays new, adjusted **Polymer Pump** maximum strokes-per-minute. Press **EXIT** to return to main menu.

Any pump speed adjustment takes effect immediately, modifying the flashing green frequency output rate.

### **Adjust Pump**



#### Sidebar:

Feeders using frequency controlled pumps can intentionally limit the pump polymer feed rate at the 100% manual and auto setpoints by reducing the pump maximum SPM.

#### No effect on 4-20mA controlled Pumps

Changing the pump maximum SPM has no effect on the 4-20mA current loop output.





ProMix Series\_S User 0111

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### 2.13 4-20mA & Frequency Controls

The flashing green **Pump** LED on the lower, left top of the ProMix S circuit board flashes at the pulse feed rate.

The pulse feed rate is locked to the 4-20mA output level so any user activity that modifies or calibrates the 4-20mA output, alters the pulse feed rate.

0% defaults to 4.0mA and zero SPM.

100% defaults to 20mA and the maximum pump SPM.

The correspondence between 4-20mA input current & SPM may be changed by adjusting the 4-20mA input scaling.

### 2.14 Troubleshooting Guide

Adjustment and bypass fixes to operational problems.

LCD Display	Operational Problem
No Control STOP	Switch the Manual-Off-Auto to Manual while you figure out the
	problem with the 4-20mA current loop connected to <b>mA In</b> input
	terminals 'I+' & Ground 🛨 terminal.
	If the ProMix S mA In 24V is powering the loop, view Polymer /
	Diagnostic to ensure >23VDC
No Water STOP	Flowswitch OK?
	If a flowswitch – differential pressure switch problem, jumper controller <b>Interlock</b> input terminal ' <b>FS</b> ' to the adjacent Ground symbol $\pm$ terminal while you resolve.
	Verify that the solenoid has been actuated during the Filling Mixer and Flow Check states by cracking a downstream union. Verify 120VAC between AC Power terminal 'S'olenoid & Neutrals terminals during the Filling Mixer and Flow Check states. Fuse Fails? If no AC solenoid power, verify solenoid wiring & coil not
	shorted & replace the solenoid fuse. It's the brown 2.5A fuse in the white socket above the <b>Neutrals</b> terminals. <u>www.digikey.com</u> Part# 7500413 Note that power to the mixer motor start relay coil shares the 2.5A solenoid fuse.
No Ext.Run STOP	If a Remote Start contact set problem, jumper controller Interlock input terminal 'RC' to the adjacent Ground symbol terminal.
Flush Fail STOP	This state occurs if flow lost during flushing. After flush time expires, goes to <b>No Water STOP</b>
Offline STOP	It the Auto-Manual-OFF switch is not in the OFF position then there is either a lose connection @ the door mounted switch terminals or the red 3 wire connector below the keypad ribbon connector has been disconnected.

### 2.15 Diagnostic Display

Press ENTER & UP @ Polymer for Diagnostics.

When initially programmed, the ProMix S serial number 1<sup>st</sup> letter is set to '**U**'. Manufacturing sets the 1<sup>st</sup> letter to '**P**'

> **Firmware Ver:** is the software issue date. In this example 4/06/10.

An increasing number of **Watchdog Resets** indicates that the software is halting, typically as a result of an external electrical fault. Disconnect the **Interlock RC** inputs first, followed by the **mA In I+** & common inputs next.

If the feeder runs continuously or the **RC** input is used to STOP the feeder, there should be a low number of **Power OFF-ONS**. An unexplained, high number usually indicates accidental shutdown or AC power wiring problems.

Relay ON/OFF display in the same order as wired and labeled on the ProMix S circuit board. Polymer enable, Running, Water Loss, Mixer, Solenoid. P,R & W are dry NO contacts, M & S are NO hot, 120VAC.

This is the elapsed time on the Polymer enable contact set & therefore tracks the time spent in the Auto RUN & Manual RUN states. It's saved to flash every hour so if powered OFF before an hour of ON time, ON time is lost.

This is the elapsed ProMix S AC powered time & meant to be compared to the previous **Pump ON** time. It's saved to flash every hour so if powered OFF before an hour of ON time, ON time is lost.

The 4-20mA current input is locked to the 4-20mA current output when Auto selected. Both can be calibrated & occasionally mis-calibrated. Press **ENTER** to return to the factory defaults & a known state.



### 2.16 Stenner SVP4 Pump

#### Cabling 4-20mA Input

**RED** to **mA IN**, **I+ BLACK** to **mA IN**, Ground (SVP4 manual page16)

SVP4 pump manual (page 20) states OFF @ 4.0mA to 4.7mA. Tested ON until loop current @ 4.1mA so there may be a range of loop currents where a SVP4 will be OFF. This pump should not be operated at this low level

Stenner pump loop is terminated by 100 ohms & thermal fuse. 4mA is nominally 600mV & 12mA nominally 1750mV at ProMix S terminals. (Noted for users with mA measuring problems)

# **3.0 SPARE PARTS & PREVENTIVE MAINTENANCE**

### 3.1 STENNER (SVP4) Pump Spare Parts

<u>P/N:</u> <u>Description:</u>

7746712 MC3ASYD Pump Roller Assembly

- 7746713 MCCP400 Plastic Tube Housing
- 7746714 MCCP100 Tube Housing Cover
- 7746715 MCCPSOB Housing, Cover Screw
- 7746735 MCCP201 Santoprene Pump Tube (utilized on Pump P/N: 7746593 only)
- 7746736 MCCP202 Santoprene Pump Tube (utilized on Pump P/N: 7746594 only)
- 7746737 MCCP204 Santoprene Pump Tube (utilized on Pump P/N: 7746596 only)
- 7746738 MCCP205 Santoprene Pump Tube (utilized on Pump P/N: 7746597 only)
- 7746739 MCCP207 Santoprene Pump Tube (utilized on Pump P/N: 7746595 only)



### 3.2 PVC Mixing Chamber Spare Parts

- <u>P/N:</u> <u>Description:</u>
- 7746474 Seal, Mech, Shaft, 1/2", ProMix-U
- 7746471 Injection Valve Assembly, ProMix-U
- 7746470 O-Ring, Injection Valve, Viton, ProMix-U
- 7746516 O-Ring, Chamber, Viton, ProMix-S

#### **3.3 Piping Components Spare Parts**

- <u>P/N:</u> <u>Description:</u>
- 7741084 0-100PSI, Gauge, SS, 2-1/2, Bottom MTD
- 7741089 0-60PSI, Gauge, SS, 2-1/2, Bottom MTD
- 7037009 Tubing PVC 3/8" X 1/2" (Calibration Column)
- 7741514 3/8" OD Natural PE Tubing
- 7744577 JACO 10-6-4-K-PG 3/8" Male Adapter (Pump Connection)
- 7744813 JACO 10-6-8-K-PG 3/8" Male Adapter (Injection Valve Connection)

### **3.4 Control Panel Spare Parts**

- <u>P/N:</u> <u>Description:</u>
- 7746665 C3C Overload 1.8-2.8 Amps Adjustable
- 7746403 C3C 3 POS NEMA Selector Switch
- 7746222 CBI UL 489 Circuit Breaker 15 Amp
- 7500413 Littlefuse 2.5A 250V for Circuit Board

### 3.5 Maintenance and Lubrication Schedule

MAINTENANCE				
Description / Task	Remarks	Frequency		
Visual inspection of unit		Weekly		
Check dosing line fittings and valves for tightness		Every 3 Months (Approx 30% continuous operation.)		
Verify equipment is operating properly	No leaks in the piping or at the "weep hole" or abnormal noises	Weekly		
Check the electrical connections for integrity		Quarterly		
Check process tubing for wear or cuts		Weekly		
Check Mixing Chamber Motor amperage. Check fan cover for obstruction or Dirt		Monthly		
Check pump tubing for wear or cuts		Weekly		
Short Term - Flushing of Piping & Chamber	24 Hour Shut Down	Run 60 Second Flush		
Long Term – Flushing of Piping & Chamber	24 Hour + or if large amount of polymer is dosed into chamber w/o water running	Run Water until piping is visibly clear in static mixer		

LUBRICATION			
Description / Task	Lubrication	Frequency	
Mixing Chamber Motor 1/8 Hp - Standard Bearings	Ball Bearing Grease	5,000 Hours of Service per Year or every three vears	

### APPENDIX A – TA Series Bill of Material Mechanical & Electrical List

**General Mechanical Layout** 



PROMIX S CONTROL A

<b>ITEM</b> 10	PROMIX S (TA SERIES) BILL OF MATERIAL PART DESCRIPTION PUMP, 0.21 GPH, STENNER SVP4H1A1S	<b>PART</b> <b>NO.</b> 7746593	× 7746602	7746603	7746604	7746605	7746606	7746607
	PUMP, 0.71 GPH, STENNER SVP4H2A1S	7746594		X	X	V		
	PUMP, 1.67 GPH, STENNER SVP4H7A1S	7746595				X	v	
	PUMP, 2.50 GPH, STENNER SVP4L4A1S	7746596					X	X
	PUMP, 3.54 GPH, STENNER SVP4L5A1S	7746597	X	X	X	X	X	X
20		7746568	X	X	X	X	X	X
30	PROMIX S MIXING CHAMBER	7746589	X	X	X	X	X	X
40	SOLENOID VALVE, 3/4", FNPT, BRASS	7746305	X	X	X	X	X	X
50	CHECK VALVE, 3/4", FNPT, BRASS	7746527	X	X	X	X	X	X
60	GLOBE VALVE, 1/2", FNPT, PVC/EPDM	7740561	X	X	X	Х	Х	Х
70	FLOW METER, 1 GPM, 1/2", FNPT, PVC, W\SWITCH	7746672	X	X				
	FLOW METER, 3 GPM, 1/2", FNPT, PVC, W\SWITCH	7746673			Х	Х		
	FLOW METER, 5 GPM, 3/4", FNPT, PVC, W\SWITCH	7746674					Х	Х
80	FLOW METER, 1 GPM, 1/2", FNPT, PVC	7746342		Х				
	FLOW METER, 2 GPM, 1/2", FNPT, PVC	7746304			X	Х		
	FLOW METER, 5 GPM, 1/2", FNPT, PVC	7746343					Х	Х
90	CHECK VALVE, 1/2", FNPT, BRASS	7746611	Х	Х	Х	Х	Х	Х
100	PRESSURE GAUGE, 316 SST, 0-60PSI	7741089					Х	Х
	PRESSURE GAUGE, 316 SST, 0-160PSI	7745788	Х	Х	Х	Х		
110	UNION, 3/4", SOCKET, PVC/VITON, SCH. 80	7744555	Х	Х	Х	Х	Х	Х
120	UNION, 3/4", FNPT, PVC/VITON, SCH. 80	7744556	Х	Х	Х	Х	Х	Х
130	STATIC MIXER, 3/4", MNPT, CLEAR PVC, SCH. 40, 6 ELE	7746301	Х	Х	Х	Х	Х	Х
140	LAB COCK, 1/4", FNPT, PVC/VITON	7746331	Х	Х	Х	Х	Х	Х
150	BALL VALVE, 1/2", PVC/VITON, SCH. 80, TYPE 21	7000309	Х	Х	Х	Х	Х	Х
160	UNION, 1/2", SOCKET, PVC/VITON, SCH. 80	7744562	Х	Х	Х	Х	Х	Х
170	CALIBRATION COLUMN, PVC, 250mL	7500138	Χ	Χ	Х	Х		
	CALIBRATION COLUMN, PVC, 500mL	7500139					Х	Х
180	MALE CONNECTOR, 3/8" O.D. TUBING X 1/4" MNPT, PVDF	7744577	Χ	Χ	Х	Χ	Χ	Χ
190	MALE CONNECTOR, 3/8" O.D. TUBING X 1/2" MNPT, PVDF	7744813	Χ	Χ	Х	Х	Χ	Χ
200	TUBING, 3/8" OD, HDPE	7741514	Х	Х	Х	Х	Х	Х

# P/N: 7746589 Mixing Chamber Components





PROMIX S - MIXING CHAMBER BILL OF MATERIALS			
		P/N: 7746589	
ITEM	QTY.	PART DESCRIPTION	PART NO.
10	1	O-RING, CHAMBER, VITON, PROMIX-S	7746516
20	6	ROD, 316SS, 3/8-16 X 14.5, PROMIX-U	7746494
30	6	NUT, ACORN, 18-8, 3/8-16, PROMIX-U	7746492
40	1	PLATE, TOP, PVC, 1.75, PROMIX-S	7746511
50	1	1/2" ST.ST. STREET 90 ELBOW,SCH 40,THREA	7741816
60	1	3/4" 316SS STREET ELBOW FNPT X MNPT 150#	7746520
70	4	STUD, MTR, 1/4-20X2-1/4", 316SS, PROMIX-	7746585
80	1	FLANGE, MOTOR, PVC, PROMIX-S	7746504
90	1	MOTOR, 1/8 HP, 115VAC, 1620RPM, PROMIX S	7746517
100	1	SHAFT, MIXER, 316SS, PROMIX-S	7746510
110	2	SET SCREW MOTOR TO WORM	851405
120	1	INJECTION VALVE ASSEMBLY, PROMIX-U	7746471
130	1	PIPE, DISCHARGE, PVC, 3/4" , PROMIX-U	7746490
140	3	ROD, 316SS, 3/8-16 X 6, PROMIX-S	7746588
150	3	SPACER, BOTTOM BAFFLE, PROMIX-S	7746587
160	1	SEAL, MECH, SHAFT, 304SS, 1/2", PROMIX-U	7746474
170	1	BLADE, PRIMARY, 316SS, PROMIX-S	7746508
180	4	SCREW, SET, 316SS, 1/4-28 PROMIX-U	7746476
190	1	BAFFLE, TOP, PVC, .25, PROMIX-S	7746513
200	3	SPACER, TOP BAFFLE, PROMIX-S	7746586
210	1	BLADE, SECONDARY, 316SS, PROMIX-S	7746509
220	1	BAFFLE, BOTTOM, PVC, .25, PROMIX-S	7746514
230	1	PROP, AGITATOR, 316 SST, PROMIX-S	7746507

P/N: 7746568 Control Panel "A Controls"



	PROMIX S - "A" Controls Bill of Materia P/N: 7746568	l
QTY.	PART DESCRIPTION	PART NO.
1	FIBOX PN 501336 PROMIX TA ENCLOSURE	7746679
1	FIBOX 12X10 PAINTED STEEL SUB PANEL	7746226
1	CBI UL 489 Circuit Breaker 15 Amp	7746222
1	AB TERMINAL RELAY 120VAC DPDT 8 AMP	7746522
1	AB TERMINAL RELAY SOCKET 120VAC DPDT	7746523
1	C3C 300-S25N30D10 120V, 1NO AUX CONT	7746346
1	C3C 320-B2D28 OVERLOAD 1.8-2.8AMP	7746665
1	C3C 3 POS NEMA SELECTOR SWITCH	7746403
2	C3C 22CB2NO CONTACT BLOCK	7746464
1	MOV ZA SERIES V180ZA1P NEWARK 58K7343	7745305
3	WEID WPE4 YEL/GRN GROUND TERMINAL	7745704
13	WEID WDU4 SINGLE FEED THRU TERMINAL	7745700
7	WEID WDK4N DUAL FEED THRU TERMINAL	7745702
2	WEID WAP/WDK4N END PLATE	7745703
4	WEID WEW35/2 END BARRIER	7745699
1	WEID WS16/2 1X1 1/4 INCH FUSE TERMINAL	7745711
1	FS FUSE 2A GLASS BODY TIME DELAY GDL2	7746094
1	PHOENIX 0819330 UC-EMLP DEVICE LABEL	7500386
1	POWER CORD 12' 14/3 SOW BLK W/PLUG	7740819
2	PG13 SKINTOP FITTING - BLACK SL13 W/NUT	7744824
2	SKINTOP FITTING PG11 BLACK SL11 W/NUT	7744823
3	CONNECTOR PG9 BLACK (7735074.2)	703885
3	PG-9 Nut	7500067
1	PROMIX-S "A" CONTROL BOARD	7746655
1	PROMIX KEYPAD DISPLAY CONTROL A_	7746682
1	TYCO 3-640440-3 PC BOARD RECEPTICLE	7746684
1	RR150PV-0250 ROUND ROD .250" PVC	7746532
1	1/2" SWIVEL FITTING FOR POLYTUFF II	7745763
1	1/2" CORD GRIP 2 HOLE X 0.24"	7744578
3	All thread Rod 316SS 8x32THD 5 1/4" L	7500409
1	LCD HEADER	7760569
1	Display, 2X16 Char	7760286

### **APPENDIX B – Control Panel "A Controls"**

### **B.1 Controller Board Layout**

The controller consists of one circuit board.

It includes a 2 line x 16 character LCD display and a microcontroller module.

DIM +	LC	D Display				
1 HOA						AC Line Fuse
m Pump Ol F1 F2 +	A JT mA IN I+	Interlock /	Pump P1 P2	Status Run Water	AC Power Mix S Line	NEUTRALS
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All field terminations are to be landed on terminals as per Appendix Section B.2.

### B.2 Controller Wiring (TA Series) P/N: 7746568 w/Stenner Pump

Reference Supplement Drawing: 7746568-300 for further wiring details



### B.3 4-20 mA Input Scaling

- Feeding More Polymer when the 4-20mA Input Current Decreases:
   If you set Scale lin @ 4mA to 4mA = 100% and Scale lin @20mA to 20mA = 0%, the feeder will accommodate a logically inverted controlling 4-20mA current loop.
   However the default lin Fail State is polymer pump OFF at 3.85mA.
   If a current signal <4.0mA does not represent a control loop fault at your site, you may wish to set the lin Fail State to Pump @ 100%.</p>
- Non-Zero % at 4.0mA & 100% @ <20mA: To verify a non-standard 4-20mA input scaling, Set Scale lin @4mA to 4mA = 20% and Scale lin @ 20mA to 12mA= 100%. For a controlling current loop is at each of the following values: Greater than 12mA = 100% pump speed 4.0mA =20% pump speed 12 to 4mA = (100%-20%) x (mA-4)/(12-4)) + 20% Example: At 10.4mA control current: (80% x (10.5-4)/8) + 20% = 85% pump speed

#### • Correct Pump Response buy more Complex than needed:

If you also logically invert the 4-20mA pump response it may get confusing for you to verify the pump response to the 4-20mA input. If you set **Scale lin @4mA** to **6mA = 100%** and **Scale lin @ 20mA** to **16mA= 10%** 16 to 6mA =  $(10\%-100\%) \times (mA - 16)/6-16)$  + 10% Example: At 13.6mA control current:  $(-90\% \times (10.5 - 4)/8) + 20\% = 31\%$  pump speed

Few users will need to re-scale more than one of the current or percentage parameters. Many users will not have to re-scale the 4-20mA input; 4-20mA will be 0-100% pump speed.

#### • Dual Logical Inversion:

Be careful how you set the scaling currents and percentages. The effect is not always obvious.

If you set **Scale lin @4mA** to **20mA = 100%** and **Scale lin @ 20mA** to **4mA= 0%** You've logically inverted both the control current and the pump response – you are then back to factory default span & control response

This is not a fault but could be confusing to other users

#### • Keying Error Response:

Be aware not to accidentally set both the 4mA and 20mA scaling to the same values! For example if you set Scale lin @ 4mA to 10mA = 100% and Scale lin @ 20mA to 10mA= 0%, the feeder forces a 0.1mA difference If you set Scale lin @4mA to 4mA = 50% and Scale lin @ 20mA to 20mA= 50%, the feeder forces a 1% difference.

#### Correct any keying error prior to operating the ProMixS

### **APPENDIX C – Polymer Sizing / Dosage**

The ProMix S H-O-A switch on the controller door enables the user to select either Manual or Auto operation. In 'H' or Manual, the polymer pump speed is selectable from 0 -100% by using the controller keypad. In 'A' or Auto, the polymer pump speed is controlled proportionally by a remote 4-20 mA signal representing 0-100% pump speed. It is assumed the pump stroke length is maintained at 100%.

The desired polymer dosage must be considered prior to selecting the ProMix S model and pump speed. Typically the user will know how much polymer is required. This information is from jar tests or from prior experience. Otherwise the dosage can be derived from an initial manual calculation which must be adjusted based upon actual operation.

Below are typical guidelines to estimate polymer feed dosage:

- 1. For a Clarifier / Filter application:
  - A = MGD Plant Flow
  - B = ppm active polymer
  - C = desired solution concentration (%)

 $(A^*B)/24 = GPH$  active polymer

GPH active polymer/C = Required dilution range

- 2. For a Sludge Dewatering application: User must have the following information to estimate GPH neat polymer:
  - A = GPM sludge
  - B = % solids (concentration)
  - C = lbs polymer per dry ton
  - D = percent active polymer
  - E = desired solution concentration (%)

(((A\*8.34)\*B)\*60)/2000 = Tons/Hr dry sludge

(((Tons/Hr dry sludge\*C)/8.34)/D)/E = Required dilution range

The polymer concentration from the ProMix S Polymer feeder is based upon the neat polymer pump rate divided by the total water flow through the primary and secondary rotameters. For example, if the neat polymer feed rate is 1.5 gph and the flow through the primary rotameter is 15 gpm and the flow through the secondary rotameter is 10 gpm then the polymer concentration is:

((1.5 gph / 60) / (15 gpm + 10 gpm)) = 0.001 = 0.1%

Further post dilution is possible with equipment by others.

### **APPENDIX D – Reference Documents**

#### **Mechanical General Arrangement Drawings:**

7746602-200	PROMIX-S_60-0.21TA Skid System
7746603-200	PROMIX-S_60X2-0.71TA Skid System
7746604-200	PROMIX-S_180X2-0.71TA Skid System
7746605-200	PROMIX-S_180X2-1.67TA Skid System
7746606-200	PROMIX-S_300X2-2.50TA Skid System
7746607-200	PROMIX-S_300X2-3.54TA Skid System

#### **Electrical Schematic Drawings:**

	-	
7746568-300	PROMIX-S Peristaltic "A" C	Control Panel

#### Pump Manuals:

SVP0610	Stenner Pumn -	Operating Manual
3460010	Steriner Fump -	Operating Manual

#### **Instructional Manuals:**

7746471-400	Injection Valve Cleaning Instructions
7746589-400	Mixing Chamber Mechanical Seal Replacement

#### **Catalog Component Cut Sheets:**

7746602-701	PROMIX-S_60-0.21TA Skid System
7746603-701	PROMIX-S_60X2-0.71TA Skid System
7746604-701	PROMIX-S_180X2-0.71TA Skid System
7746605-701	PROMIX-S_180X2-1.67TA Skid System
7746606-701	PROMIX-S_300X2-2.50TA Skid System
7746607-701	PROMIX-S_300X2-3.54TA Skid System
7746568-701	PROMIX-S Peristaltic "A" Control Panel

(Provided upon request) \*\*Documents noted in this section are not in this manual\*\*