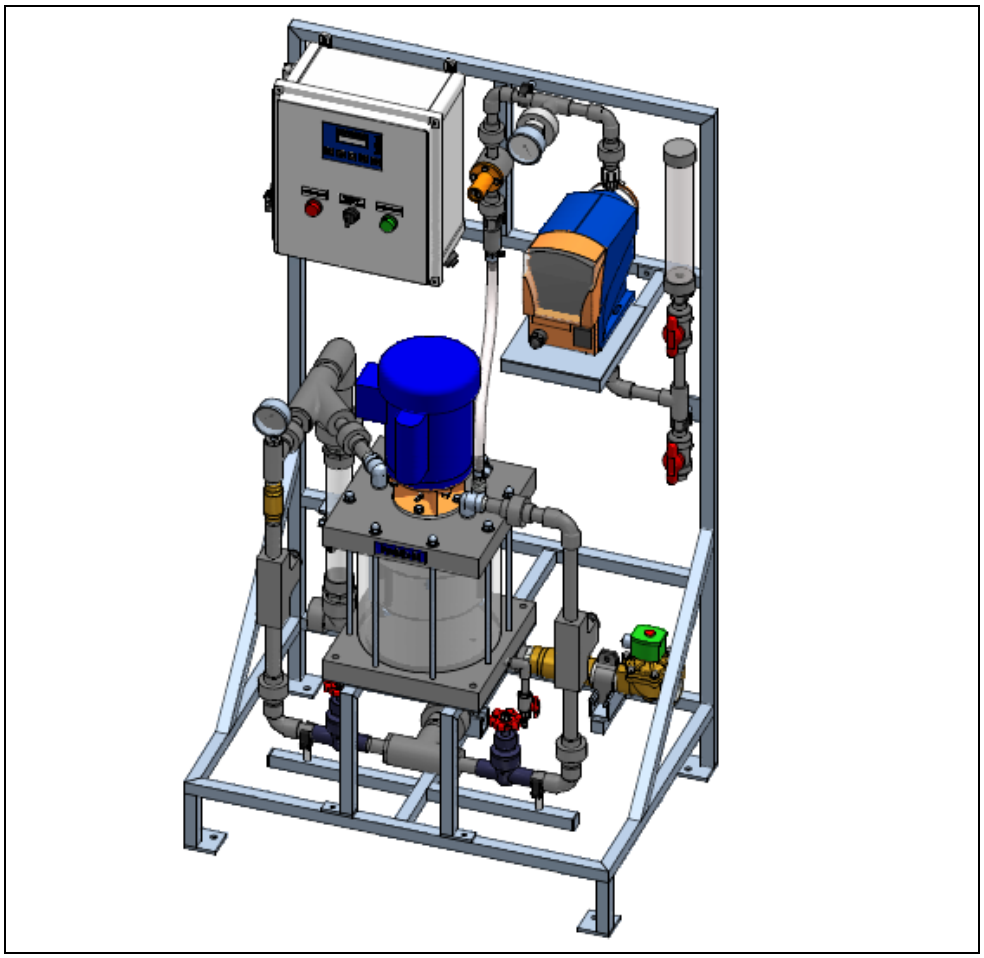
Operating Instructions ProMinent® ProMix-M (B Controls) Polymer Blending System

ProMix_DB/PB_OM.docx (07/20/11): – P/N: 7746718 (Revision B)



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

ProMinent Fluid Controls, Inc. (USA) 136 Industry Drive, Pittsburgh, PA 15275
Tel: (412) 787-2484 www.prominent.us Fax: (412) 787-0704

TABLE OF CONTENTS

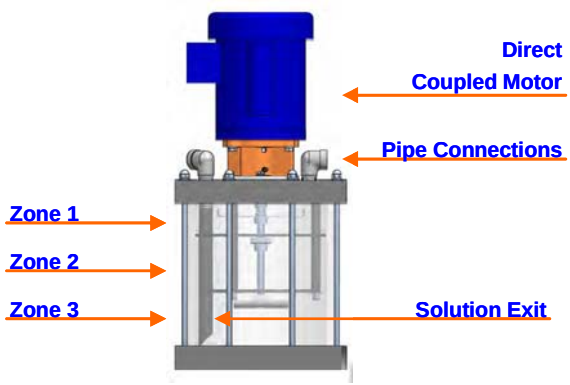
INTRODUCTION

i. Overview:

The ProMix M 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 M 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 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. The unit is designed to operate automatically once the dilution water flows and setpoints are established.

In Manual mode the H-O-A switch is placed into the 'H' position on the controller door of the ProMix M Polymer Feeder. The neat polymer concentration setpoint is then adjusted manually using the controller keypad. The controller prevents the addition of more than 1% concentration in the mixing chamber. The user must manually set the primary and secondary rotameters for the desired dilution water flow. Thereafter, the pump speed is automatically adjusted to maintain the setpoint concentration regardless of dilution water flow. The ProMix is designed for a maximum capacity of 0.5% polymer concentration.

In Auto mode the H-O-A switch is placed into the 'A' position on the controller door of the ProMix M 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 percent polymer concentration desired. As in the Manual mode, the ProMix controls the polymer pump speed automatically to maintain the setpoint concentration regardless of dilution water flow.

The ProMix M 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), primary and secondary flow meters, diaphragm and progressive cavity 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.

ii. ProMix Systems:

ProMix M Systems consist of the following skid models:

Diaphragm Pump Type DLTA (DB Series):

PART NUMBER	MODEL	PUMP TYPE	MAX CAPACITY
7746543	ProMix M 0-300 X2-2.4DB	Delta 1020-120	2.4 GPH
7746544	ProMix M 0-600 X2-4.0DB	Delta 1020-200	4.0 GPH
7746545	ProMix M 0-1500X2-6.2DB	Delta 0730-200	6.2 GPH
7746546	ProMix M 0-1500X2-10.0DB	Delta 0450-200	10.0 GPH

Progressive Cavity Pump Type (PB Series):

PART NUMBER	MODEL	PUMP TYPE	MAX CAPACITY
7746547	ProMix M 0-1500 X2-5.0PB	Seepex MDP	5.0 GPH
7746548	ProMix M 0-1500 X2-10.0PB	Seepex MDP	10.0 GPH
7746549	ProMix M 0-1500X2-24.0PB	Seepex MDP	24.0 GPH

Refer to Appendix C for proper sizing

Overall Skid Dimensions (w/Delta) .....60"H x 34"W x 24"D
Overall Skid Dimensions (w/Seepex) .....60"H x 40"W x 24"D
Overall Weight of Skid .....220 lbs. w/Delta *(250 lbs. w/Seepex)*
Power Requirements .....120VAC, 60Hz, 1 Phase, 20 Amp
Volume of Mixing Chamber .....3.2 Gallons
Maximum Chamber Pressure .....150 PSIG
Normal Operating Pressure .....58 PSIG to 100 PSIG *(Depends on Pump Selected)*
Recommended Running Temperature .....+50°F to 100°F
Water Connection Size .....1-1/2" FNPT
Solution Discharge Connection Size .....1-1/2" FNPT

iii. Polymer Pumps used on M Models:

Series	Model	Identification Code	Mode	SPM	Flowrate (GPH)		Pressure
				Max	Min @ 25% Stroke	Max @ 100% Stroke	(PSIG)
DLTA	1020	DLTA1020PVT4600UD4031EN0	HV2	120	0.60	2.4	145
DLTA	1020	DLTA1020PVT4600UD4031EN0		200	1.00	4.0	145
DLTA	0730	DLTA0730PVT4600UD4031EN0		200	1.55	6.2	102
DLTA	0450	DLTA0450PVT3600UD4031EN0		200	2.58	10.3	58

Notes:

1. ProMinent - Delta Solenoid Driven Metering Pump
2. Original Pump GPH rating is Derated 20% to pump Polymer
3. Control spm Modes Available: *(Maximum flowrates change with different settings)*
   - 80 HV3 Viscosity: 2000-4000 mPa *(Slow Discharge)*
   - 120 HV2 Viscosity: 800-2000 mPa
   - 160 HV1 Viscosity: 200-800 mPa
   - 200 Viscosity: 0-200 mPa
4. Standard spm Mode:
5. Connections: ½" x 3/8" or DN10 Depending on Model Selected
6. Power Requirements: 115VAC, 60 Hz, Single Phase

Series	Model	Identification Code	Mode	SPM	Flowrate (GPH)		Pressure
				Max	Minimum	Maximum	(PSIG)
MDP	006-12	MDP 006-12/A6-P8-P8-H0-GA-X		121		5.0	100
MDP	006-12	MDP 006-12/A6-P8-P8-H0-GA-X		234		10.0	100
MDP	006-12	MDP 006-12/A6-P8-P8-H0-GA-X		552		24.0	100

Notes:

1. Seepex - Progressive Cavity Pumps
2. Flooded Suction Required
3. 1" Suction Connection
4. 1/2" Discharge Connection
5. Viscosity Range: 8,000 mPa (Flowrate Varies w/Viscosity)
6. Motor Specifications: ½ HP, 1750 RPM
7. Power Requirements: 120VAC, 60 Hz, Single Phase

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.
2. 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°F to 120°F
   Air Humidity: ≤ 92% relative humidity, non-condensing

1.3 Installation Considerations:

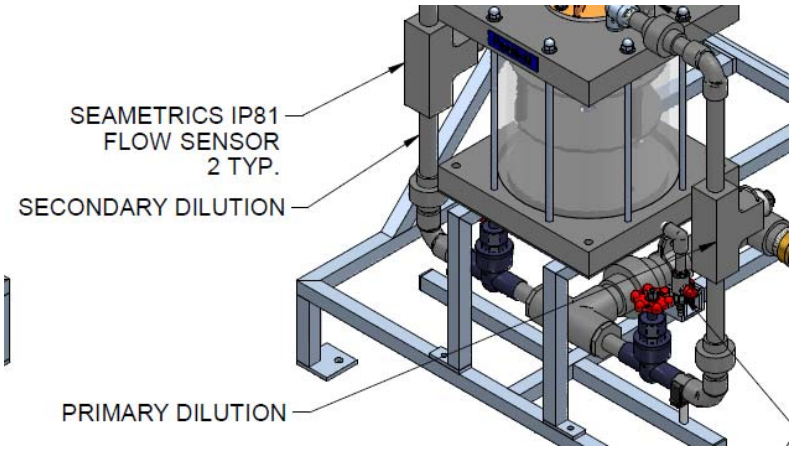
- Required Polymer System Voltage
- Available Water Pressure
- Injection Point Pressure
- Number of Injection Points
- Polymer Solution Discharge
  - Length of Piping Run
  - Pipe Size
- Neat Polymer Suction: Flooded or Lift
- Type of Application / Dewatering Device
- Type of Polymer: Emulsion, Dispersion,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

1.4 Installation Guidelines:

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 o-ring seal. Ensure that the o-ring is seated properly prior to tightening.
7. Piping External to the System:
   - 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 ¾" to and from the piping on the system. 1" or larger piping is recommended. Larger piping sizes would be required for runs over 100 feet in length if utilizing ¾" pipe.
   - 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 1-1/2" FNPT from static mixer to associated customer application point.
   - Connect to make-up water inlet piping 1-1/2" FNPT (25 GPM maximum and 100 psig maximum).
   - Connect to Neat Polymer pump inlet piping ½" FNPT (DLTA Models) & 1" FNPT (Seepex Models). Flooded Suction ONLY for Seepex PC pump.
   - Install 1-1/2" pressure regulator and 1-1/2" y-strainer / basket strainer on the clean make-up water line if equipment is currently not installed. (Recommended). Sizing depends on inlet/outlet piping.
   - 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, 20 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 (see wiring diagram in Appendix) for polymer tank level and remote start permissive. Default jumpers should remain in place for any input not available.
11. Refer to the Delta or Seepex pump manual (Reference Document) for pump operation.

1.5 Quick Start Guide:

1. Review 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 (Delta Series only) then ensure liquid in pump suction.
3. Verify DLTA pump/Seepex pump is set with correct settings in the panel, if applicable, according to drawing. Ensure Delta pump settings match the pump selection in the controller.
4. Start up pumps at 100% stroke length and frequency to purge all air and prime the system. On Seepex pump models ensure that the pump is pre-primed prior to turning the pump on. Otherwise damage to the mechanical seal could occur.
5. Verify motor rotation on Mixing Chamber motor and Seepex pump motor, if applicable. Normal rotation is CCW.
6. Do not run the mixing chamber motor dry. Damage to the mechanical seal could occur.
7. Set backpressure and pressure relief valves on pump discharge line (if applicable). Pressure Relief Valve should not exceed 100 PSIG.
8. Verify that the polymer injection pump pressure is set higher then the system pressure. Review pump maximum pressure capacity to verify setting can be obtained.
9. Perform DLTA/Seepex pump calibration using drawdown calibration cylinder.
10. Check flow calibration and be sure pump meets or exceeds the rated flow capacity. Check flows at 100% stroke frequency and stroke length set at 100%.
11. In Manual "Hand" mode the neat polymer concentration setpoint is then adjusted manually using the controller keypad. The controller prevents the addition of more than 2% concentration in the mixing chamber. The pump speed is automatically adjusted to maintain the setpoint concentration regardless of dilution water flow.
12. In Auto mode the controller receives a remote customer supplied analog 4-20 mA signal to adjust the percent polymer concentration from 0 to 2%. The pump speed is automatically adjusted to maintain the setpoint concentration regardless of dilution water flow. A remote start permissive is also needed. If not available jumper these connections.
13. Manually adjust flow control valves for the primary and secondary dilution water.



14. Confirm proper operation of all instrumentation.
15. Input functions checked and simulated (remote start/stop, 4-20mA, etc.).
16. Output functions checked.
17. Check 4-20mA outputs for pump dosage (if used).
18. Test the operation of all remaining circuits.
19. 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 that all operating and maintenance personnel are fully instructed regarding the contents of this manual.

2.0 CONTROLLER

2.1 Keypad Navigation

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

The top line of the main menu displays the current feeder state.

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 tank level, water flow rates, external control permissives & control levels……

UP & **DOWN** to view options or to EDIT numbers

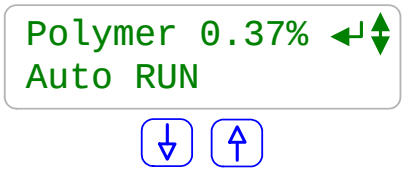
Move **RIGHT** to select next field when EDITing

ENTER to select an option & to execute EDITing

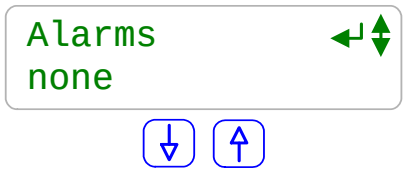
EXIT to escape option, info display or EDITing
EXIT goes to top of **Main Menu**

2.2 Main Menu

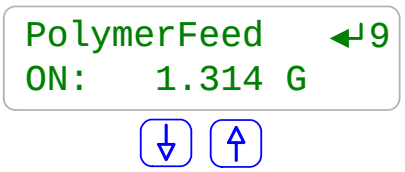
Top of Main Menu. Displays current feeder state.
Key **ENTER** @ to view & adjust System settings
You can always key **EXIT** until you get to this screen



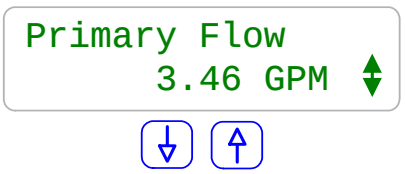
Key **ENTER** @ **Alarms** to reset alarms & view the cause of alarm & its date-time stamp. You may need to acknowledge and clear certain alarms to continue operation.



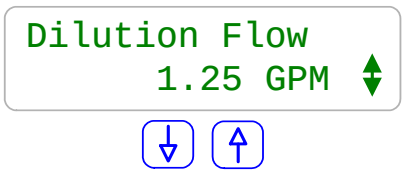
Key **ENTER** @ **PolymerFeed** to view-adjust the Manual Setpoint and view-modify Wait-for-Flow, Mixer Fill and Flush timing.
Displays polymer volume fed from midnight.



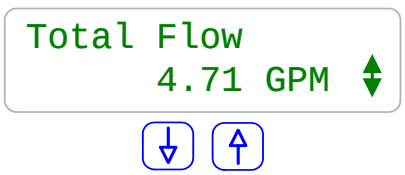
Primary Flow is the water flowing into the polymer mixer. The volume measured by the mixer inlet meter is converted to a flow rate in Gallons/Minute.



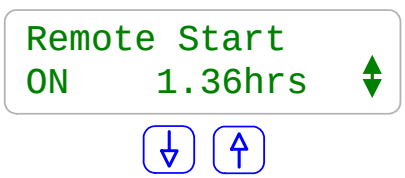
Dilution Flow is the water blended into the mixer outlet flow, which affects the delivered polymer %.
Dilution Flow may be zero GPM.
Zero **Primary Flow** **STOP**s the feeder.



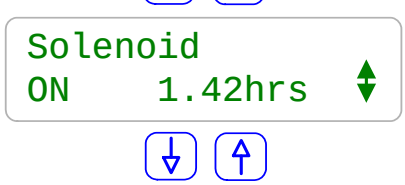
Total Flow is the sum of **Primary Flow** and **Dilution Flow** and is displayed to help you balance flow with feed rate. The % concentration setpoint is based upon total flow.



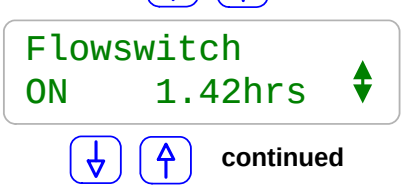
Remote Start must be **ON** to operate the **PolymerFeed** pump. If the **Remote Start** contact set opens, the feeder **STOP**s (jumper input if signal is not available).



Solenoid displays **ON** when water inlet solenoid valve is open. The **Solenoid** is always **ON** when the mixer is filling, running & flushing.

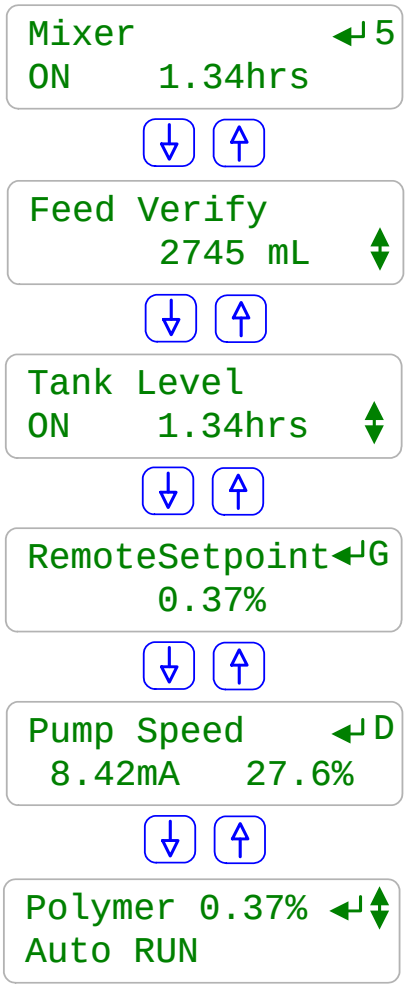


Flowswitch displays **ON** when water is flowing into the mixer and primary flow is registered. The **Flowswitch** is always **ON** when the mixer is filling, running & flushing.



continued

2.2 Main Menu (continued)



Mixer displays **ON** when the mixer motor is running. Alternates with **"ENTER = Flush"** for mix chamber flushing when manually selected.

If the **Feed Verify** option is selected **Feed Verify** ensures that polymer is flowing into the mixer. The mixer **STOP**s if **Feed Verify** faults. Displays polymer volume fed from midnight.

Tank Level must be **ON** to operate the **PolymerFeed** pump. A low polymer tank level turns **OFF Tank Level** and **STOPs** the feeder (jumper input if signal is unavailable)

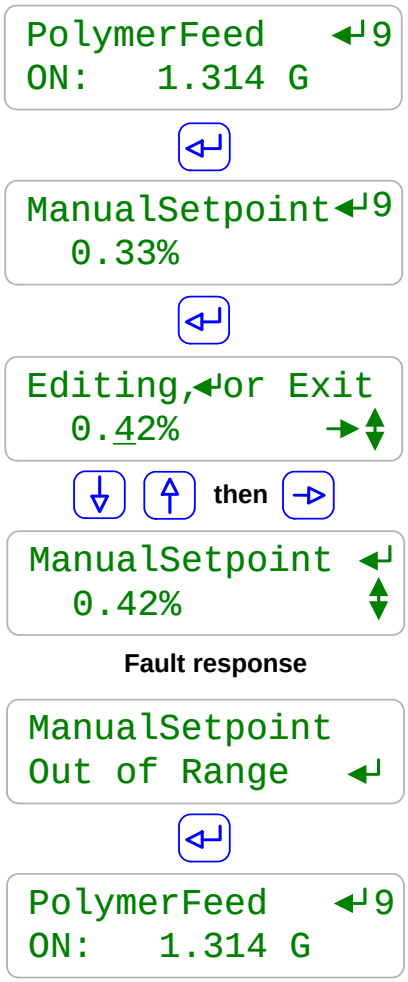
RemoteSetpoint displays the % concentration as a function of the remote 4-20 mA signal & controls the **PolymerFeed** pump when **Auto** is selected. A **RemoteSetpoint** less than 0%, typically an open current loop, **STOP**s the feeder. Press **ENTER** to span the current loop.

Pump Speed displays the 4-20mA output which tracks the percentage **PolymerFeed** pump rate . Typically spanned 0-100% pump dosage = 4-20mA. Press **ENTER** to view-adjust the current loop.

Top of Main Menu.
You can always key **EXIT** until you get to this screen

2.3 Adjust Setpoint

Adjust Setpoint



Key down to **PolymerFeed** and Key **ENTER**. **Manual Setpoint** controls the feed when the enclosure door switch is in the **Manual** position. Displays current setpoint.

Key **ENTER** to adjust.

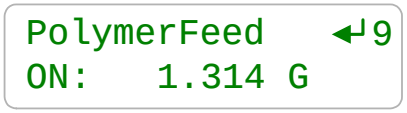
Key **RIGHT** to move the cursor & **UP** or **DOWN** to change the digit.
Key **EXIT** to abandon or **ENTER** to execute.

Displays current, revised setpoint.
If enclosure door switch is in the **Manual** position, feed rate will change immediately.

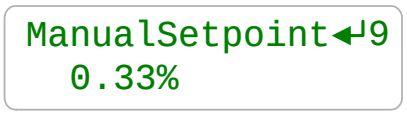
Manual Setpoint outside of the 0.05% to 2% range will display **Out of Range**. Regardless of setpoint, there is a limit of 1.1 % concentration in the mixer chamber.
Key **ENTER** to return to main menu.

2.4 Modify Timing

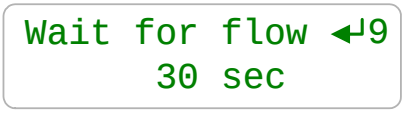
Key **ENTER** @ **PolymerFeed**.



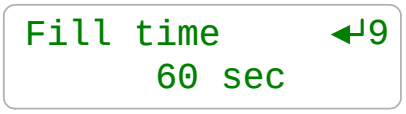
Manual Setpoint controls the feed when the enclosure door switch is in the **Manual** position.



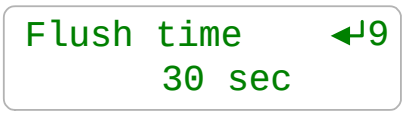
Wait for Flow is the time that the feeder waits to measure a valid **Primary Flow** before filling the feeder. Key **ENTER** to modify.



Fill Time is the time that the feeder waits to fill the feeder prior to turning on the **PolymerFeed** pump. This protects the mechanical seal of the mixer motor shaft by keeping it wet. Minimum time is 30 seconds for the first fill only. Thereafter this step is skipped if operation pauses unless door switch is placed in OFF position for more than 1 second. Key **ENTER** to modify.

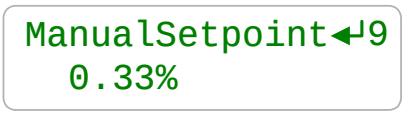


Flush Time is the time mixer water flows after turning off the **PolymerFeed** & **Mixer**. This is a maintenance feature and can only be manually initiated. Key **ENTER** to modify.



The times shown on this page are the factory defaults.
Wait for Flow may be adjusted between 5 & 60 seconds
Fill Time may be adjusted between 30 & 120 seconds.
Flush Time may be adjusted between 5 & 60 seconds.

Pump Settings GPH is the maximum pump gallons per hour output possible at the fixed stroke length and 100% frequency .
Pump Settings Rated SPM is the pump rated strokes per minute frequency maximum possible speed as calibrated.

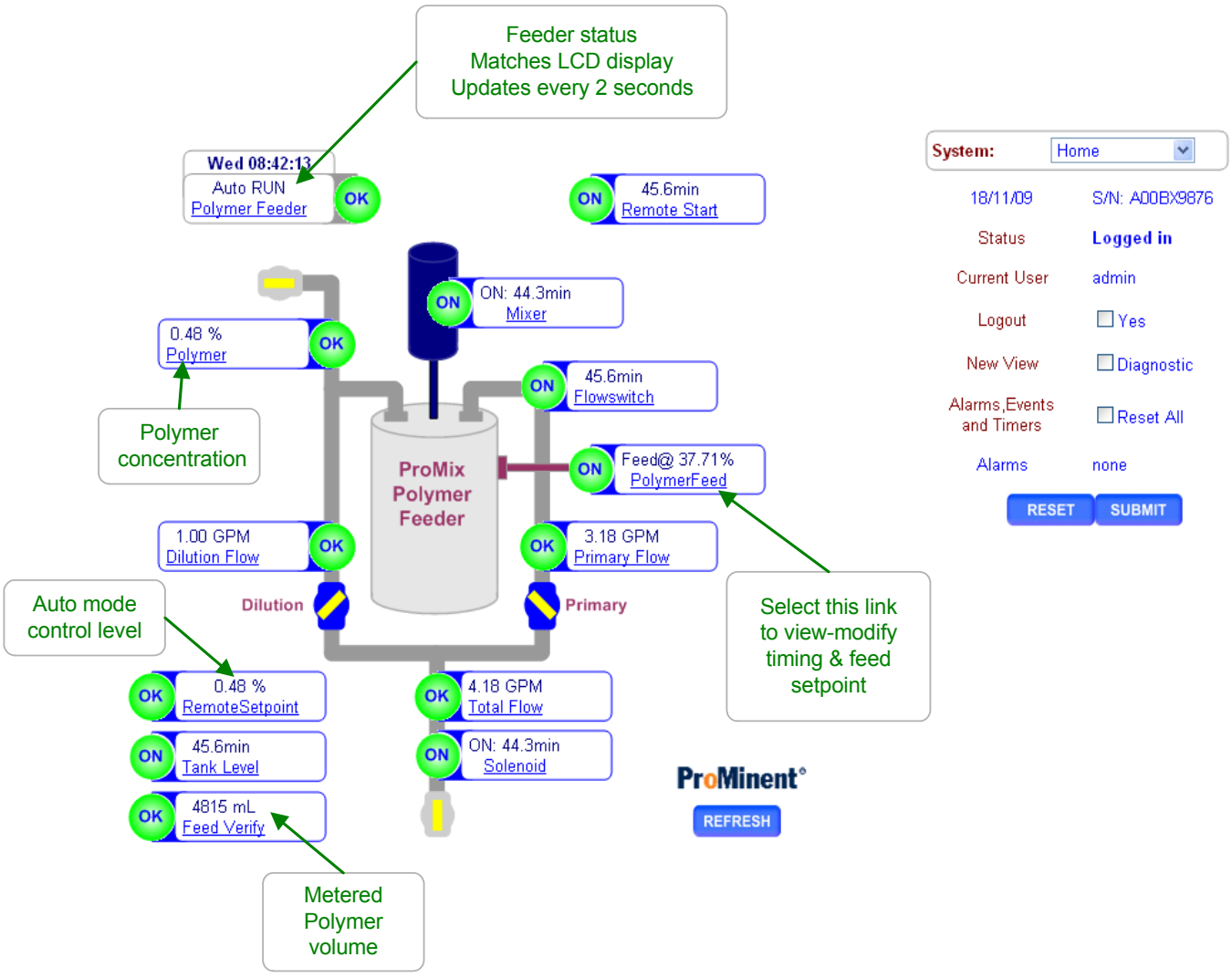


2.5 Browser Controls

2.5.1 The View

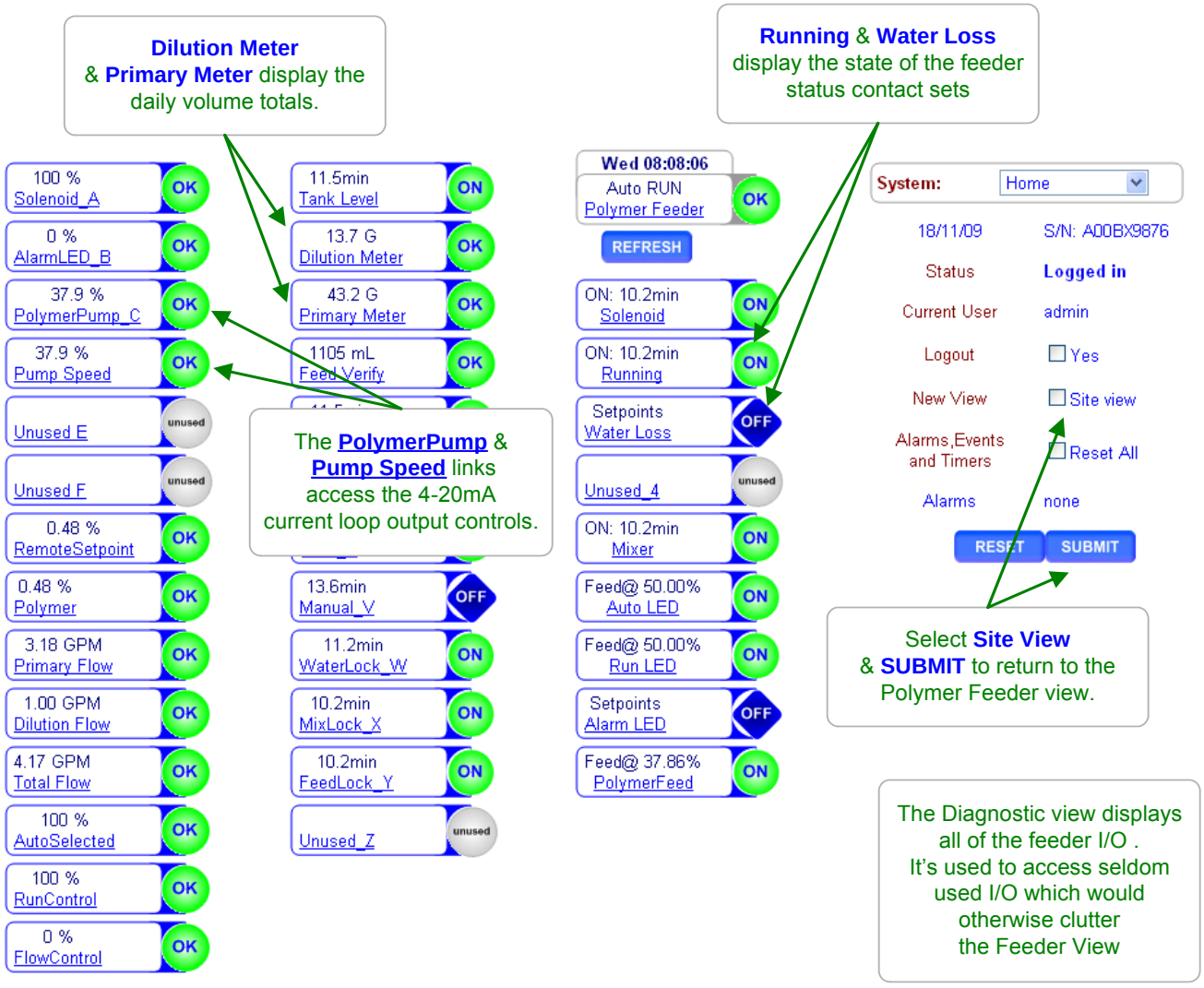
Ethernet connect to the controller with a PC, notebook, netbook or via the site LAN. Refer to the Browser manual (Reference Documents) if you have not previously browsed an Aquatrac type controller. Browse the feeder with Internet Explorer or Mozilla. The reference manual will assist with setup of the browser controls.

Click on links within the View & the right side of the display will update with corresponding diagnostics & configuration menus.



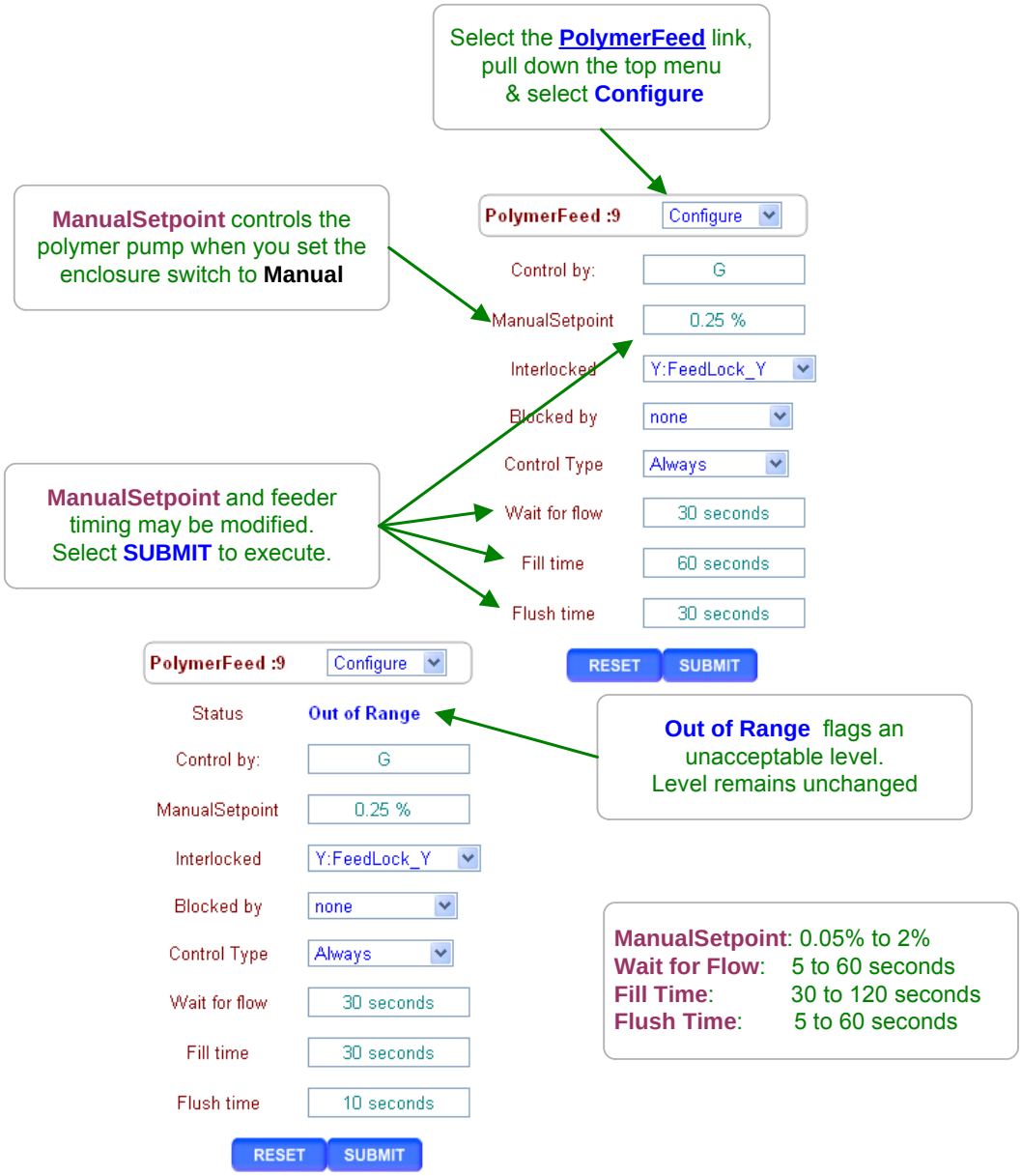
Password login is not required to view the Diagnostic. Select **Diagnostic** & **SUBMIT**.

2.5.2 Diagnostic View

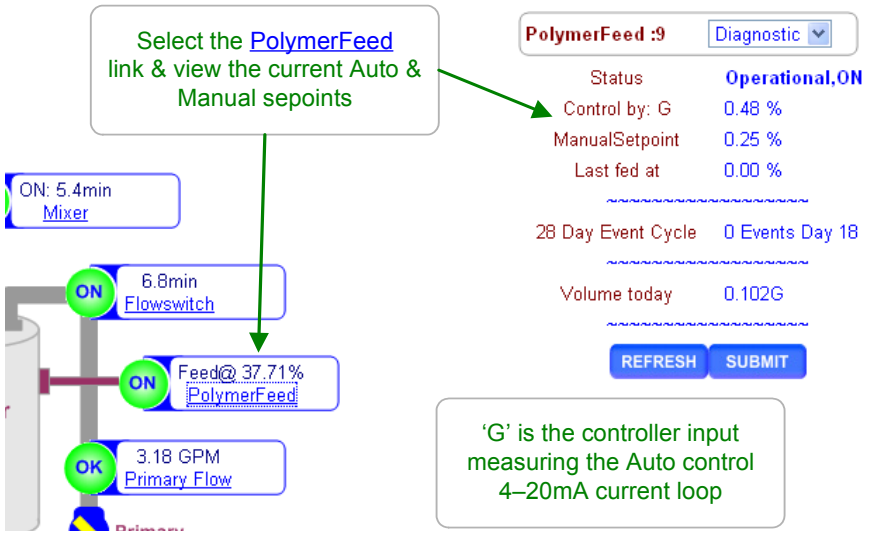


2.5.3 Setpoints

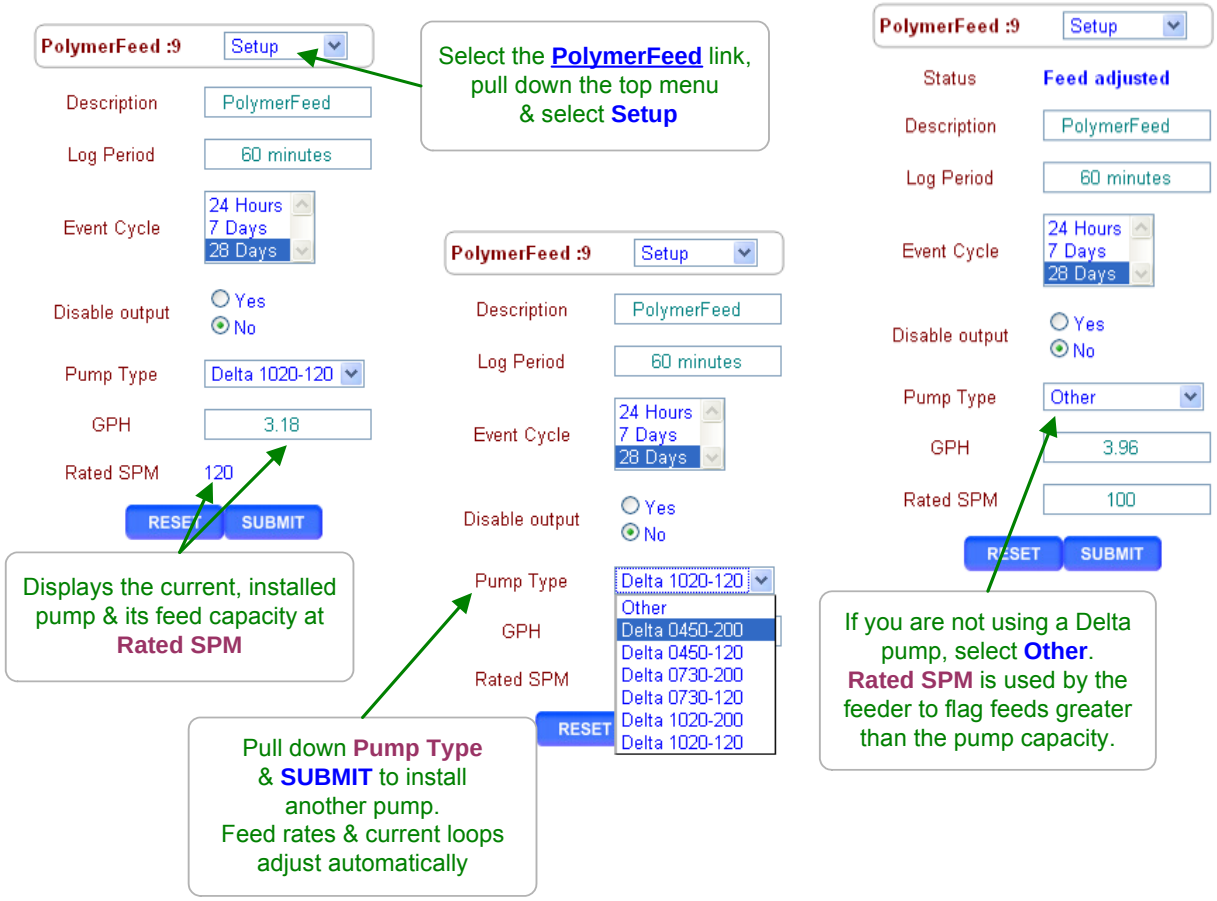
Control of the polymer feed pump is set by the **Manual-Off-Auto** switch located on the feeder enclosure door. In **Auto** mode the pump is controlled by a user provided remote 4-20mA current loop representing the desired polymer feed % setpoint; 4 – 20 mA = 0 – 2% concentration (This current loop is connected to '**G**' input).
In **Manual** mode the pump is controlled by the **ManualSetpoint** as entered via keypad.
NOTE: The ProMix feeder adjusts the pump speed as the measured Primary & Dilution flow rates vary to maintain the setpoint polymer concentration.


Select the PolymerFeed link, pull down the top menu & select Configure
ManualSetpoint controls the polymer pump when you set the enclosure switch to Manual
ManualSetpoint and feeder timing may be modified. Select SUBMIT to execute.
PolymerFeed :9
Configure
Control by:
G
ManualSetpoint
0.25 %
Interlocked
Y:FeedLock_Y
Blocked by
none
Control Type
Always
Wait for flow
30 seconds
Fill time
60 seconds
Flush time
30 seconds
RESET
SUBMIT
PolymerFeed :9
Configure
Status
Out of Range
Control by:
G
ManualSetpoint
0.25 %
Interlocked
Y:FeedLock_Y
Blocked by
none
Control Type
Always
Wait for flow
30 seconds
Fill time
30 seconds
Flush time
10 seconds
RESET
SUBMIT
Out of Range flags an unacceptable level. Level remains unchanged
ManualSetpoint: 0.05% to 2%
Wait for Flow: 5 to 60 seconds
Fill Time: 30 to 120 seconds
Flush Time: 5 to 60 seconds

When you select any I/O link, the feeder displays its respective diagnostic.

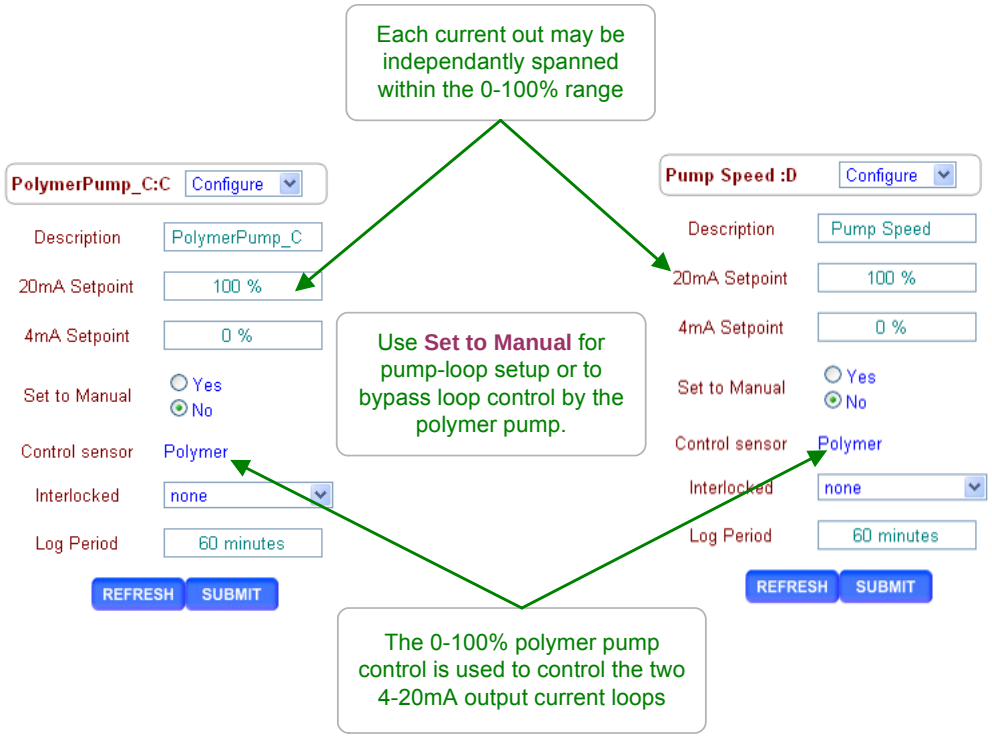


2.5.4 Pump Controls



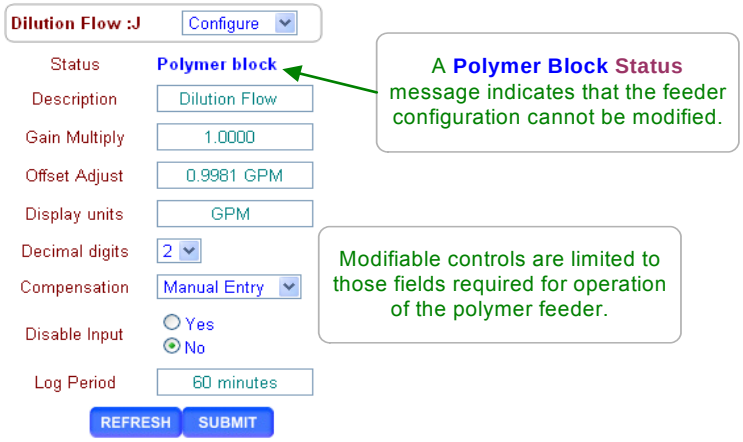
2.5.5 4-20mA Outputs

The polymer feeder includes two DC isolated 4-20mA outputs. Typically, **Pump Speed:D** would be used for monitoring the pump control signal and sent to a customer device, and **PolymerPump:C** used as the actual 4-20 mA feed control signal to the polymer pump (alternative is a simultaneous frequency signal available from P9 to a frequency controlled pump).



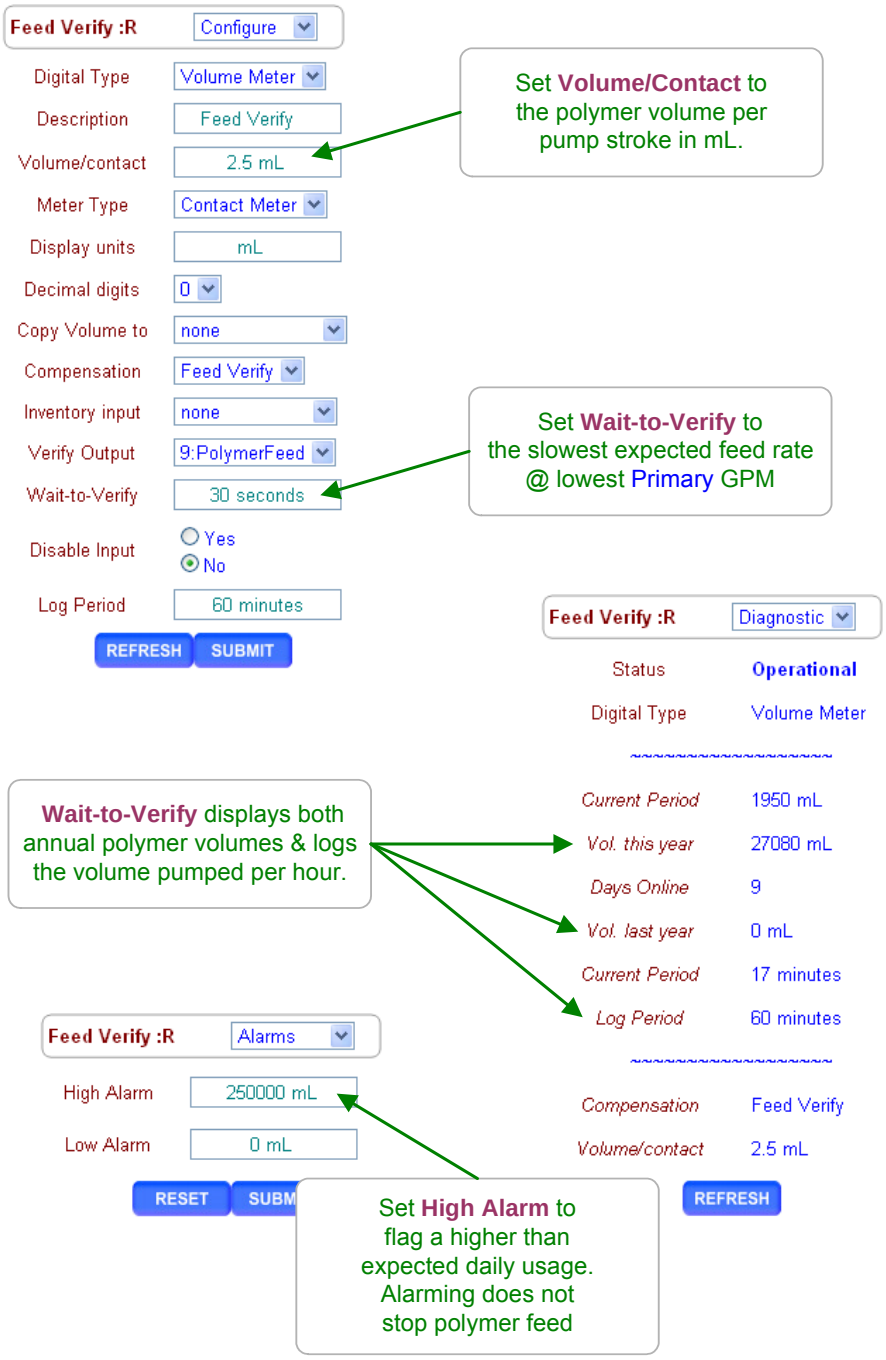
2.5.6 Reconfiguration Blocking

The polymer feeder blocks any modification which would prevent correct feeder operation.



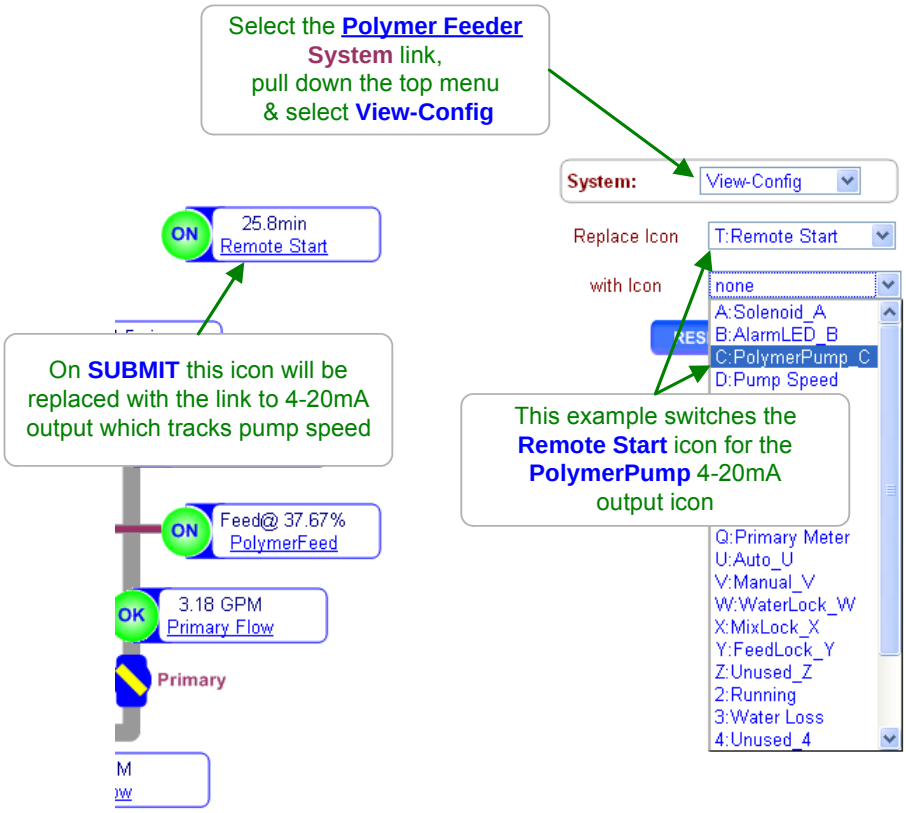
2.5.7 Feed Verification

Feed verification ensures that the polymer pump is actually delivering polymer by metering the output of the pump. A thermal flow switch is employed for this purpose as an optional feature for 'other' type pumps The Delta pump utilizes an integral relay for feed verification.

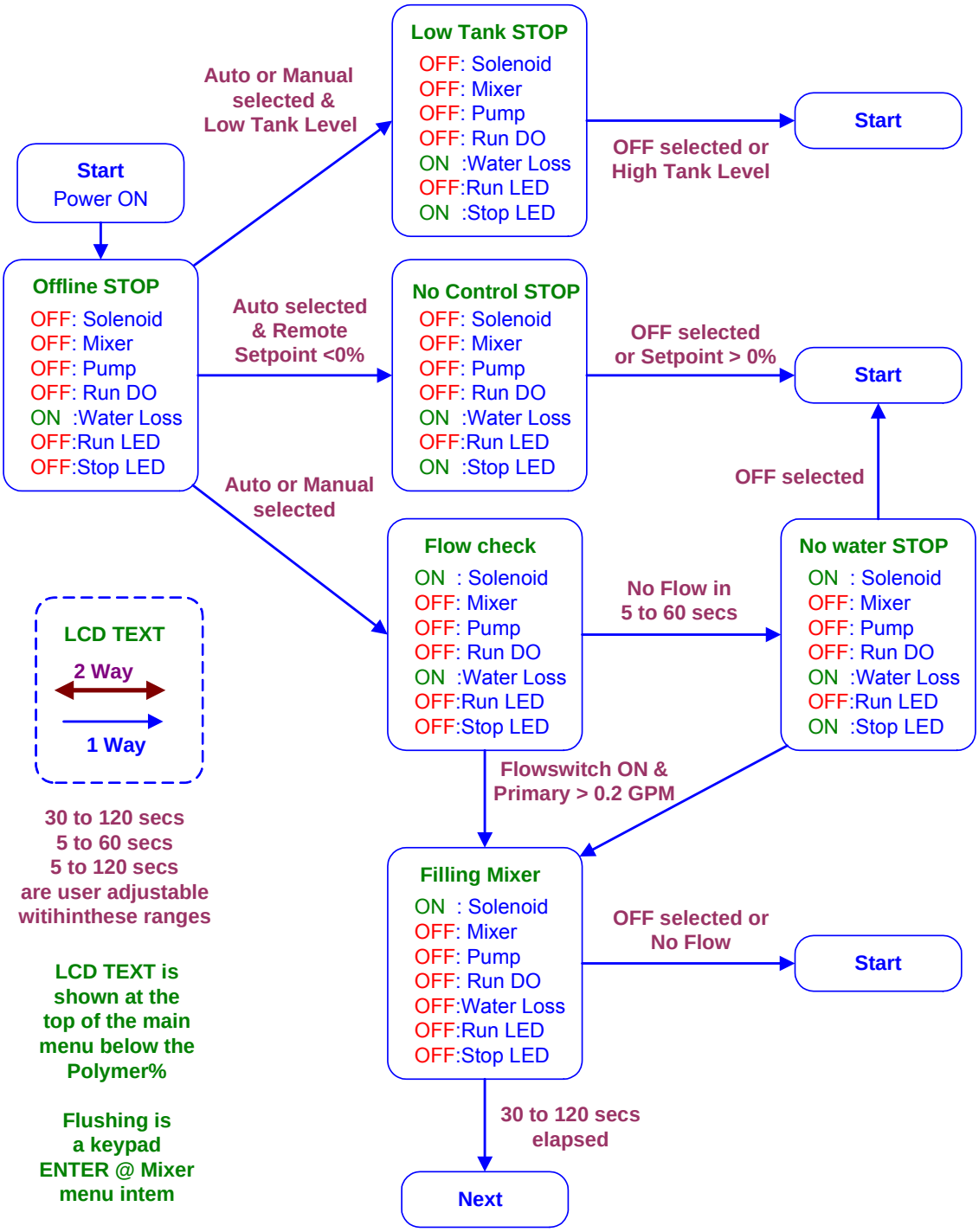


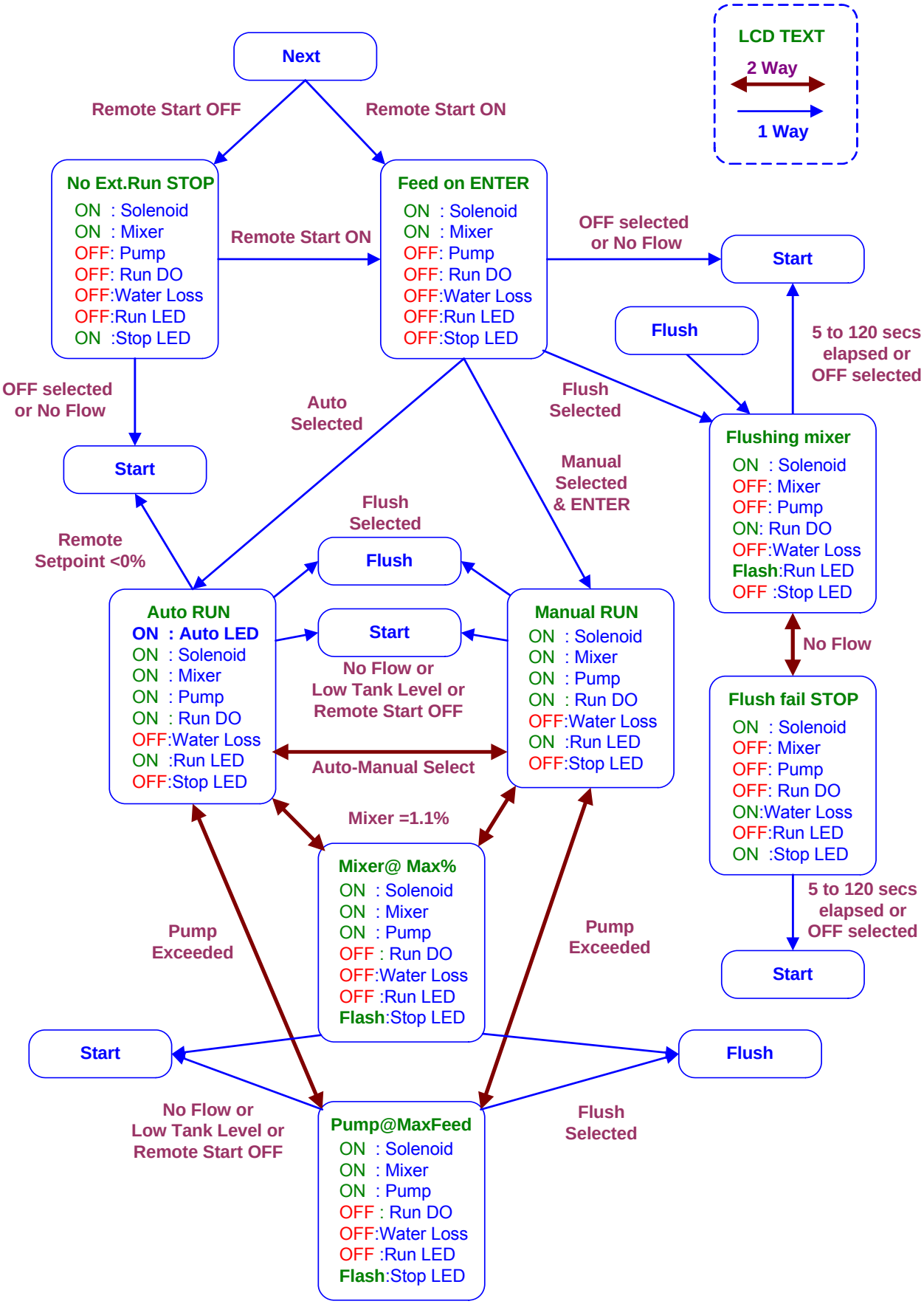
2.5.8 Site View Modification

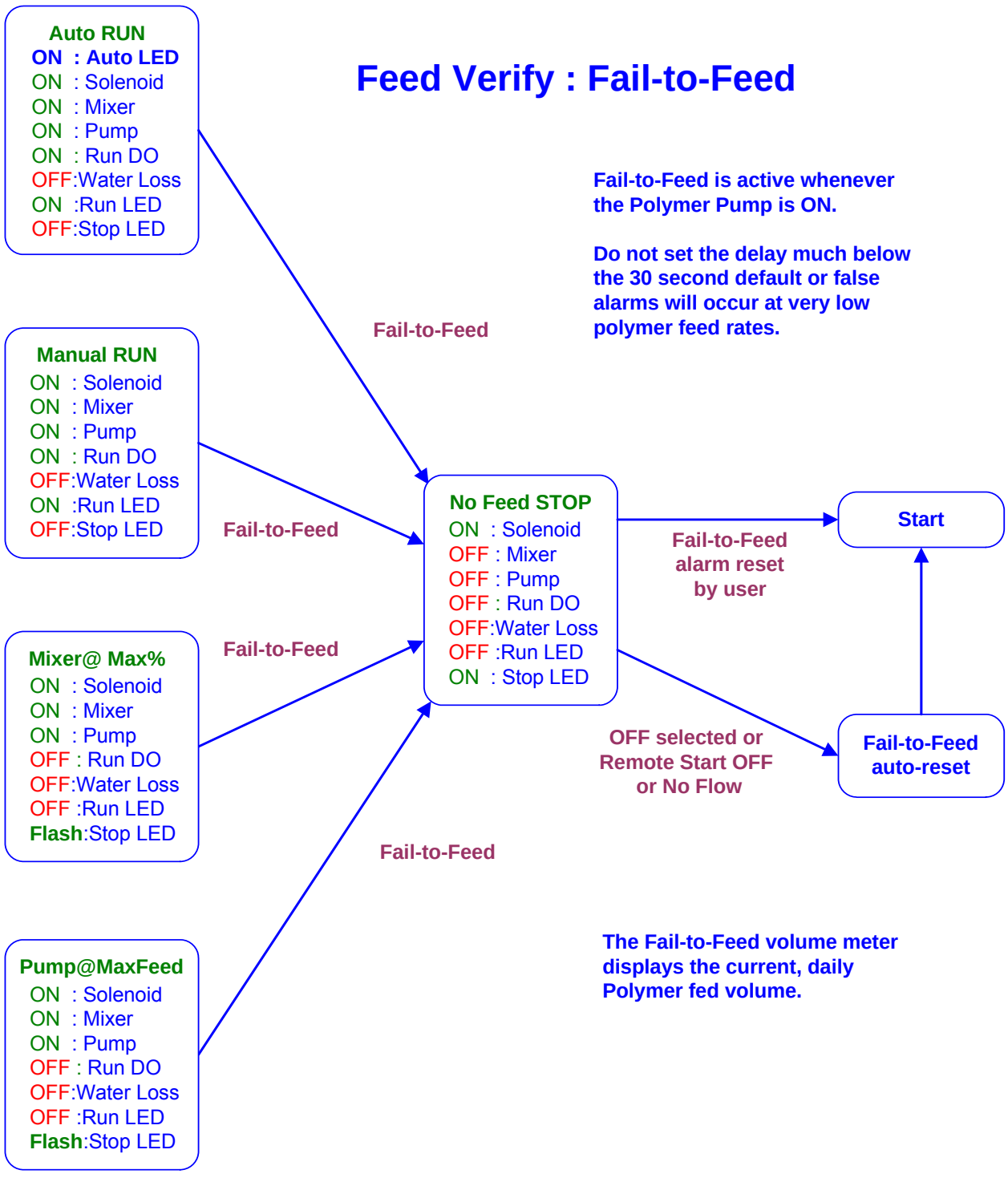
Your site may require I/O that's only available in the Diagnostic View, to be accessible within the Site View. The browser includes tools to switch view icons within the Site View. This is an advanced option and should be attempted only by experienced browser users.



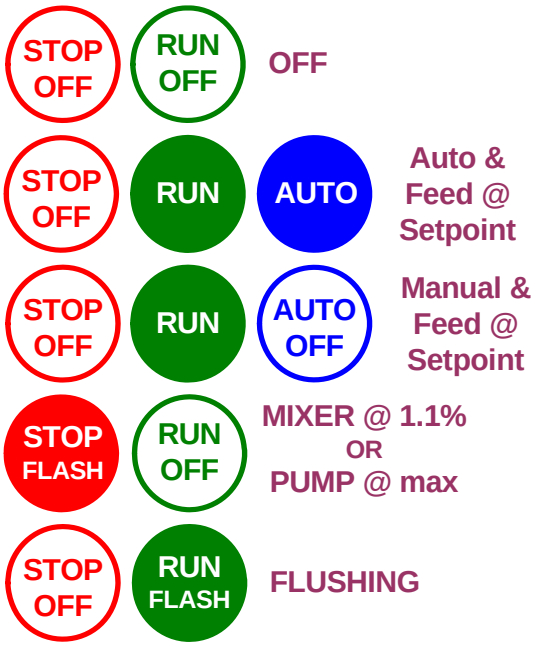
2.6 Feeder States




LCD TEXT
2 Way
1 Way
Next
Remote Start OFF
Remote Start ON
No Ext.Run STOP
ON : Solenoid
ON : Mixer
OFF: Pump
OFF: Run DO
OFF:Water Loss
OFF:Run LED
ON :Stop LED
Feed on ENTER
ON : Solenoid
ON : Mixer
OFF: Pump
OFF: Run DO
OFF:Water Loss
OFF:Run LED
OFF:Stop LED
Remote Start ON
OFF selected or No Flow
Start
Flush
5 to 120 secs elapsed or OFF selected
OFF selected or No Flow
Auto Selected
Flush Selected
Start
Manual Selected & ENTER
Flushing mixer
ON : Solenoid
OFF: Mixer
OFF: Pump
ON: Run DO
OFF:Water Loss
Flash:Run LED
OFF :Stop LED
Flush Selected
Remote Setpoint <0%
Flush
Auto RUN
ON : Auto LED
ON : Solenoid
ON : Mixer
ON : Pump
ON : Run DO
OFF:Water Loss
ON :Run LED
OFF:Stop LED
Start
Manual RUN
ON : Solenoid
ON : Mixer
ON : Pump
ON : Run DO
OFF:Water Loss
ON :Run LED
OFF:Stop LED
No Flow
No Flow or Low Tank Level or Remote Start OFF
Flush fail STOP
ON : Solenoid
OFF: Mixer
OFF: Pump
OFF: Run DO
ON:Water Loss
OFF:Run LED
ON :Stop LED
Auto-Manual Select
Mixer =1.1%
Mixer@ Max%
ON : Solenoid
ON : Mixer
ON : Pump
OFF : Run DO
OFF:Water Loss
OFF :Run LED
Flash:Stop LED
Pump Exceeded
Pump Exceeded
5 to 120 secs elapsed or OFF selected
Start
Start
Flush
No Flow or Low Tank Level or Remote Start OFF
Pump@MaxFeed
ON : Solenoid
ON : Mixer
ON : Pump
OFF : Run DO
OFF:Water Loss
OFF :Run LED
Flash:Stop LED
Flush Selected

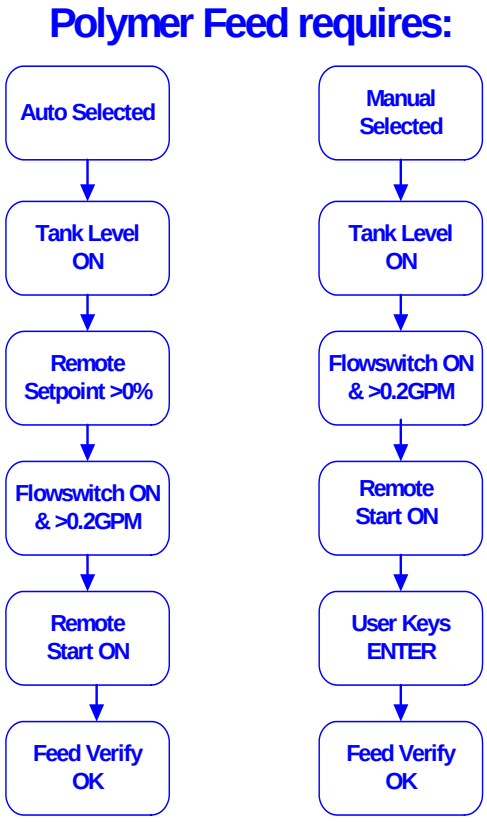

Auto RUN
ON : Auto LED
ON : Solenoid
ON : Mixer
ON : Pump
ON : Run DO
OFF:Water Loss
ON :Run LED
OFF:Stop LED
Feed Verify : Fail-to-Feed
Fail-to-Feed is active whenever the Polymer Pump is ON.
Do not set the delay much below the 30 second default or false alarms will occur at very low polymer feed rates.
Fail-to-Feed
Manual RUN
ON : Solenoid
ON : Mixer
ON : Pump
ON : Run DO
OFF:Water Loss
ON :Run LED
OFF:Stop LED
Fail-to-Feed
No Feed STOP
ON : Solenoid
OFF : Mixer
OFF : Pump
OFF : Run DO
OFF:Water Loss
OFF :Run LED
ON : Stop LED
Start
Fail-to-Feed alarm reset by user
Mixer@ Max%
ON : Solenoid
ON : Mixer
ON : Pump
OFF : Run DO
OFF:Water Loss
OFF :Run LED
Flash:Stop LED
Fail-to-Feed
OFF selected or Remote Start OFF or No Flow
Fail-to-Feed auto-reset
Fail-to-Feed
Pump@MaxFeed
ON : Solenoid
ON : Mixer
ON : Pump
OFF : Run DO
OFF:Water Loss
OFF :Run LED
Flash:Stop LED
The Fail-to-Feed volume meter displays the current, daily Polymer fed volume.

2.7 Enclosure Lights & Status



The enclosure door lights complement the LCD state display messages & understandably can be seen from a greater distance than the LCD display.

The flashing **STOP** light is useful when adjusting the Primary flow rate to prevent the mixer from exceeding the 1.1% maximum mixer concentration.



The **AUTO** light allows quick confirmation of the switch from **AUTO** to **MANUAL**

The parts of previous state diagrams that enable polymer feed are summarized in this graphic.

There has be polymer in the tank and both the flow switch has to be closed and the Primary flow rate greater than 0.2GPM for the feeder to operate.

Note that in either Auto 'A' or Manual 'M' mode the user can transition between modes by changing the HOA door switch from one position to the other without pausing at OFF.

In both Manual and Auto modes, the mixer may be filled but the polymer pump will not start unless the Remote Start contact set is closed.

2.8 Status Message Summary

LCD & Browser Status	Feeder State
Offline STOP	Manual-Off-Auto switch at Off
Low Tank STOP	Tank level switch open, indicates low polymer tank level. Exits on level switch closed or Manual-Off-Auto = Off
No Control STOP	Manual-Off-Auto switch at Auto and 4-20mA control level less than 0%. Exits on 4-20mA>0% or Manual-Off-Auto = Off
Flow Check	Opens solenoid & waits user set seconds for Flowswitch contact closed AND Primary flow > 0.2 GPM. Exits on flow measured or Manual-Off-Auto = Off
No Water STOP	Exits on flow measured or Manual-Off-Auto = Off
Filling Mixer	Solenoid open & mixer OFF. Waits user set seconds to fill mixer. Exits on no flow measured or Manual-Off-Auto = Off
No Ext.Run STOP	Polymer feed OFF, Mixer and Solenoid ON Exits on Remote Start contacts closed or Manual-Off-Auto = Off
Feed on ENTER	Manual-Off-Auto = Manual. Mixer & Solenoid ON. Exits on user keying ENTER, flush or Manual-Off-Auto = Off
Flushing Mixer	Solenoid ON. Polymer feed & Mixer OFF. Exits on flush time expired or No flow or Manual-Off-Auto = Off
Flush Fail STOP	No Flow measured while flushing. Exits on flush time expired or flow measured or Manual-Off-Auto = Off
Auto RUN	Polymer feed @ 4-20mA input controlled setpoint. Exits on no flow, low tank level, control<0%, flush, feed verify fail, Remote Start open, mixer @ >1.1%, pump at max SPM or Manual-Off-Auto = Off or Manual.
Manual RUN	Polymer feed @ user setpoint. Exits on no flow, low tank level, flush, feed verify fail, Remote Start open, mixer @ >1.1%, pump at max SPM or Manual-Off-Auto = Auto or Off.
No Feed STOP	Feed Verify fails to measure polymer feed. Exits on user reset of alarm, no flow, Remote Start open, Manual-Off-Auto = Off.
Mixer @ Max%	Controls so that mixer is at 1.1% polymer Exits on no flow, low tank level, flush, feed verify fail, Remote Start open, pump at max SPM, <1.1% Polymer or Manual-Off-Auto = Off.
Pump @ MaxFeed	Controls so that pump is at 100% of rated SPM. Exits on no flow, low tank level, flush, feed verify fail, Remote Start open, pump at max SPM, pump @ <rated SPM or Manual-Off-Auto = Off.

2.9 Troubleshooting Guide

Adjustment and bypass fixes to operational problems.

LCD & Browser Status	Operational Problem
Low Tank STOP	If you have a level switch fault, jumper controller input terminal '**O**' to the adjacent Ground symbol, ⏚ terminal & fix the level switch.
No Control STOP	Switch the Manual-Off-Auto to Manual while you figure out the problem with the 4-20mA current loop connected to controller input terminals '**G**' '+' & Ground ⏚ terminal.
No Water STOP	**Motor Overload** If a motor thermal overload problem, jumper controller input terminal '**S**' to the adjacent Ground symbol ⏚ terminal. **Solenoid** Verify that the solenoid has been actuated during the **Flow Check** state by cracking a downstream union. Remove the shock shield from the lower controller circuit board & check for 120VAC between **Solenoid L&N** terminals during the **Flow Check** state. If no AC solenoid power, verify solenoid wiring & coil not shorted & replace the solenoid fuse. It's the brown 1A fuse in the white socket above the blue RUN light. www.digikey.com Part# 7500412 **Primary Water Meter** Verify 3 wires of mixer inlet meter firmly connected to controller terminals **+DC Power**, '**Q**' & Ground ⏚ terminal. Pull the meter & spin the rotor for 30-60 seconds & verify that Primary Flow shows GPM. There's no easy way to bypass this meter.
No Ext.Run STOP	If a Remote Start problem, jumper controller input terminal '**T**' to any adjacent Ground symbol ⏚ terminal.
No Feed STOP	This fault occurs because the feeder isn't getting confirming pulses from the pump or the flow measuring device on the pump outlet. Verify the wiring is tightly connected to controller input terminal '**R**' to and an adjacent Ground symbol ⏚ terminal. Some devices may also require **+DC Power.** You can bypass by disconnecting '**R**' & then jumpering '**R**' terminal to **'Q'**, stealing pulses from the primary water meter. '**R**' won't display correct fed polymer volume, but you'll be feeding polymer.

LCD & Browser Status	Operational Problem
Mixer @ Max%	Reduce the Dilution flow GPM. OR Increase the Primary flow GPM. Either change lowers the mixer polymer concentration. You can also reduce the Manual or Auto setpoint, although that's usually a less desirable fix.
Pump @ MaxFeed	Decreasing the Primary flow GPM and or the Dilution flow GPM will reduce the pump feed rate. Verify that the actual pump matches the pump set in the feeder and that the maximum SPM is set correctly both in the pump and within the feeder. As in **Mixer @ Max%,** you can also reduce the Manual or Auto setpoint, although that's usually a less desirable fix. If you need more polymer than the feeder can deliver, consider a pump upgrade.
Open Loop Alarms	The 4-20mA current output loops will immediately alarm if the loops are not powered and terminated. These alarms have no effect on the operation of the feeder. If you wish to terminate the loops, connect **+DC Power** to either or both current output '**+**' terminal(s) and connect the '**-**' terminal(s) to any Ground symbol ⏚ terminal
Feeder Alarms	All of the feeder inputs and outputs can have alarms set on value, volume, time… These alarms will not prevent polymer feed but may be used to flag operational, setpoint, usage or maintenance problems.

3.0 SPARE PARTS & PREVENTIVE MAINTENANCE

3.1 DELTA (DLTA) Pump Spare Parts

P/N:	*Description:*
1027082	DLTA1020 Spare Parts Kit**
1000249	DLTA1020 Diaphragm
1017393	DLTA1020 Liquid End
1027083	DLTA0730 Spare Parts Kit**
1000250	DLTA0730 Diaphragm
1017404	DLTA0730 Liquid End
1027084	DLTA0450 Spare Parts Kit**
1000251	DLTA0450 Diaphragm
1025138	DLTA0450 Liquid End

**Spare Parts Kit above includes the following:
(1) Diaphragm
(1) Suction Valve Set
(1) Discharge Valve Set
(2) Ball Valves (Check)
(1) Set of O-rings
(1) Connector Set

3.2 SEEPEX (MDP006-12) Pump Spare Parts

P/N:	*Description:*	*Manufacturer P/N:*
7746697	Lantern Flange, Seepex, ProMix-M	LATB2103M1200NXXAA
7746698	Shaft Pin, Seepex, ProMix-M	SBOL6062M1200XXXXX
7746699	Splash Ring, Seepex, ProMix-M	RSPF0062M1200XXXXX
7746700	Mech Seal, Seepex, ProMix-M	GRDB15025U41H0A7A7
7746701	Mech Seal Casing, Seepex, ProMix-M	GRGPP103M1200GB5MA
7746702	Support Ring, Seepex, ProMix-M	RSZPP00B5C80C00000
7746703	Suction Casing, Seepex, ProMix-M	SAGA6103M1200N02SP
7746704	O-Ring, Casing, FPM, Seepex	R-OH00250D80000000
7746705	Sealing Plug, Seepex, ProMix-M	SSVA7G018000000910
7746706	Sealing Ring, Seepex, ProMix-M	RDIP1G01800A007603
7746707	Rotating Units, Seepex, ProMix-M	RTEP8133M060CN00AY
7746708	Stator, Seepex, ProMix-M	STAH0103M060CENX00
7746709	Bolts, M6x100, Seepex, ProMix-M	SSKA7M060100000931
7746710	Pressure Branch, Seepex, ProMix-M	DRSA6103M1200R02SP

3.3 PVC Mixing Chamber Spare Parts

P/N:	Description:
7746474	Seal, Mech, Shaft, 1/2", ProMix-U
7746471	Injection Valve Assembly, ProMix-U
7746470	O-Ring, Injection Valve, Viton, ProMix-U
7746491	O-Ring, Chamber, Viton, ProMix-M
7500346	PVDF Insert - 1/16 NPT x 3/16 Hose Barb *(Seal Failure Fitting)*
7037004	Tubing PVC 3/16" x ¼" *(Seal Failure Tubing)*

3.4 Piping Components Spare Parts

P/N:	Description:
1019883	1/2" PVC Back Pressure/Pressure Relief Valve SOC pfc
1006813	Diaphragm BPV/PRV 1/4"-1/2"
7741084	0-100PSI, Gauge, SS, 2-1/2, Bottom MTD
7745788	0-160PSI, Gauge, SS, 2-1/2, Bottom MTD
7746151	0-100PSI 316SS Back gauge & CPVC/PTFE Isolator
7746152	0-160PSI 316SS Back gauge & CPVC/PTFE Isolator
7037009	Tubing PVC 3/8" X 1/2" *(Calibration Column)*
7744091	1/2" ID PVC Nylobraid Hose
7741354	1/2" SS Hose Clamp
7740541	1/2" PVC Hose Barb Adapter H x MNPT

3.5 Control Panel Spare Parts

P/N:	Description:
7746553	C3C Overload 8-12.5Amps Adjustable
7746403	C3C 3 POS NEMA Selector Switch
7745962	C3C 22MM Green LED 24DVC Light Unibody
7745961	C3C 22MM Red LED 24DVC Light Unibody
7746223	CBI UL 489 Circuit Breaker 20 Amp
7500412	Littlefuse 1A 250V for Power Board

3.6 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 or abnormal noises	Weekly
Check the electrical connections for integrity		Quarterly
Check tubing for wear or cuts		Weekly
Check Mixing Chamber Motor amperage. Check fan cover for obstruction or Dirt		Monthly
Check dosing diaphragm for damage (Delta Pump)		Every 3 Months (Approx 30% continuous operation.)
Check the liquid end for tightness (Delta Pump)	Torque Settings for screws 40 - 44 in/lb	Every 3 Months (Approx 30% continuous operation.)
Check leakage rate and tighten/loosen packing to allow 1-6 drops per minute (Seepex Pump)	Adjust tightening nuts only 1/2 turn per minute until stabilized	Weekly
Check flow pump rate at rated pressure (Seepex Pump)	Replace Rotor/stater as required	Weekly
Check Bearing End play and Temperature. Change Grease (Seepex Pump)	See Lubrication Chart	Monthly (3,000 Operation Hours)
Check Universal Joint Seal, Bushing and joint integrity. Replace Grease (Seepex Pump)	See Lubrication Chart	Upon rotor/stator replacement
Check Motor RPM/amperage. Drain. Check fan cover for obstruction or Dirt (Seepex Pump)		Monthly
Check Gear reducer temperature and oil level (Seepex Pump)	See Lubrication Chart	Monthly
Change Gear reducer oil (Seepex Pump)	See Lubrication Chart	3 Years
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 3/4 Hp (See Chart Below)	Ball Bearing Grease	5,000 Hours of Service per Year
Check Gear Reducer Oil Level (Seepex Pump)	210cSt @ 40°C (Gulf EP Lube-S 100 or equal)	Weekly
Change Gear Reducer Oil Level (Seepex Pump)	210cSt @ 40°C (Gulf EP Lube-S 100 or equal)	3 Years
Repack Motor Bearing w/Grease	Gulf EP No. 2 or equal	3 Years
Repack Pump Bearing	Shell Alvania EP 2 or equal	3,000 Operating Hours
Repack Pump Universal Joints	Seepex Grease Type 30321 "ONLY"	Rotor Replacement or 10,000 operating hours whichever is first

Mixing Chamber Motor Details:

Lubrication
This motor is supplied with pre-lubrication ball bearings. No lubrication required before start up.

Relubrication Intervals
The following intervals are suggested as a guide:

SUGGESTED RELUBRICATION INTERVALS		
HOURS OF SERVICE PER YEAR	H.P. RANGE	RELUBE INTERVAL
5,000	Sub Fractional to 7 1/2 10 to 40 50-200	5 Years 3 Years 1 Year
Continuous Normal Applications	Sub Fractional to 7 1/2 10 to 40 50 to 200	2 Years 1 Year 9 Months
Season Service Motor Idle 6 Months or More	All	1 Year (Beginning of Season)
Continuous High Ambients Dirty or Moist Locations High Vibrations Where Shaft End is Hot (Pumps-Fans)	Sub Fractional to 40 50 to 200	6 Months 3 Months

Lubrication

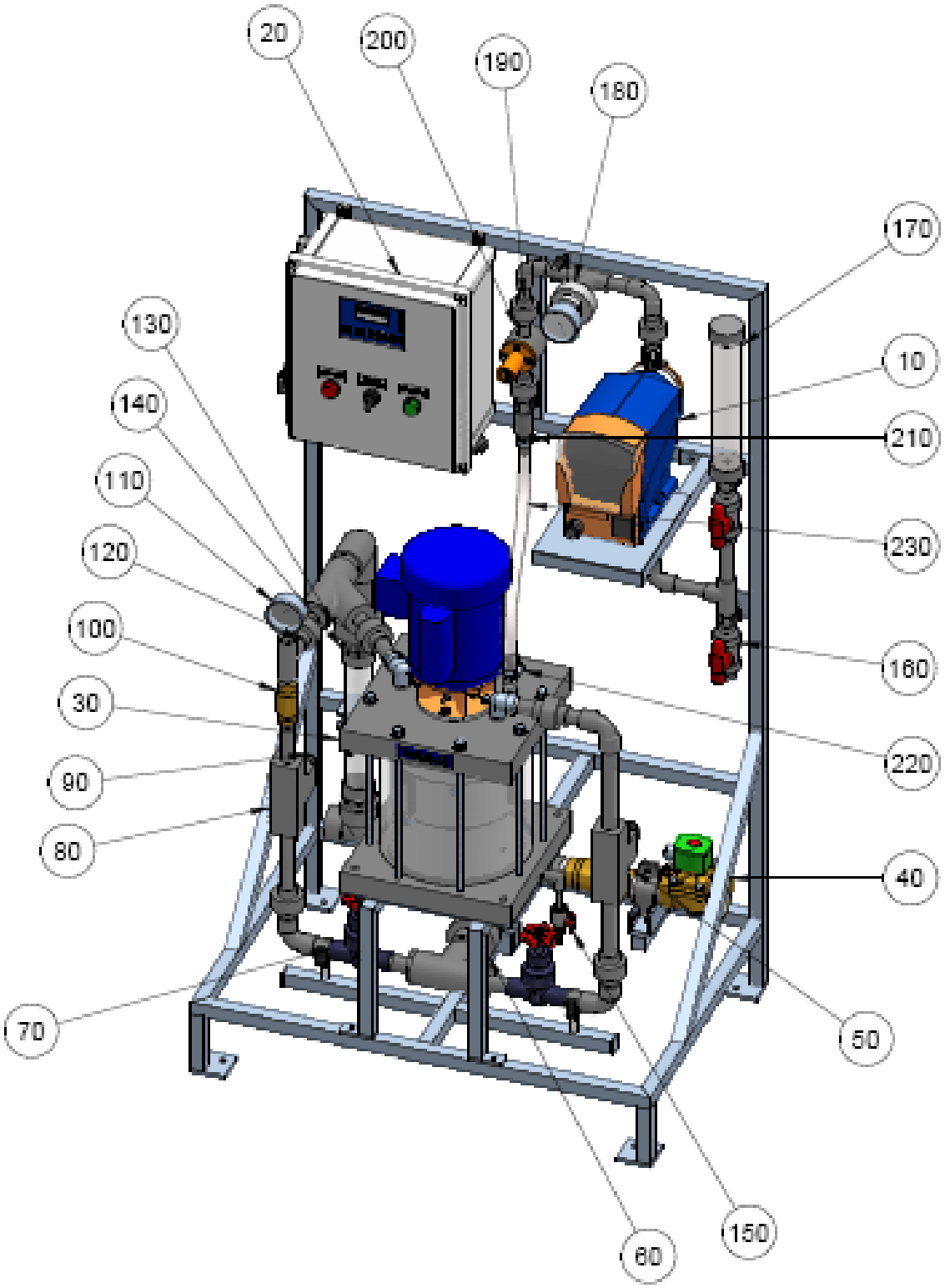
Use high quality ball bearing lubricant. Use consistency of lubricant suitable for class of insulation stamped on nameplate as follows:

LUBRICATION CONSISTENCY				
INSULATION CLASS	CONSISTENCY	TYPE	TYPICAL LUBRICATION	FRAME TYPE
B & F F & H	Medium	Polyurea	Shell Dolium R and/or Chevron SR1 2	Sub Fractional to 447T All

APPENDIX A – DB & PB Series Bill of Material

Mechanical & Electrical List

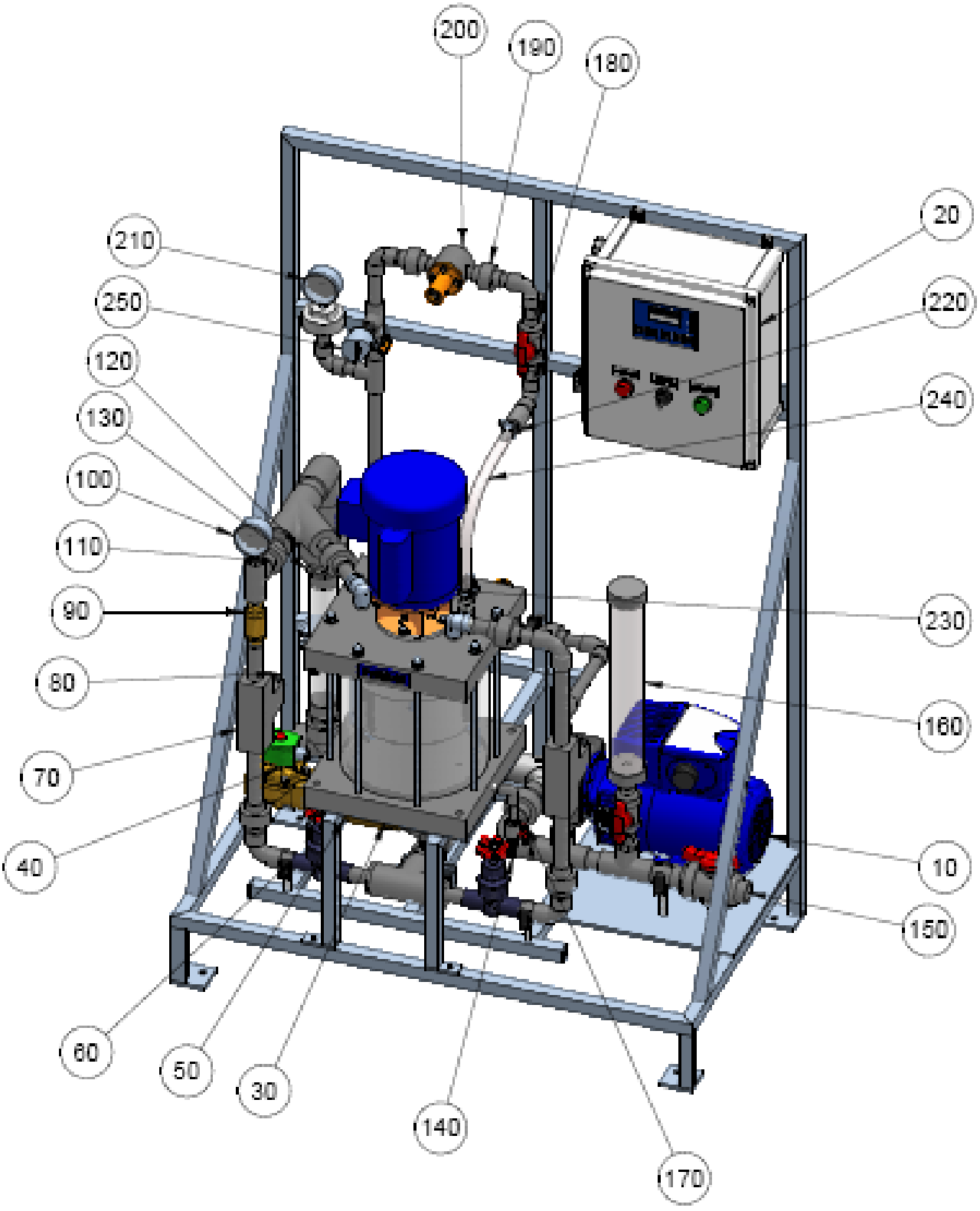
General Mechanical Layout



PROMIX M CONTROL DB

PROMIX M (DB SERIES)
BILL OF MATERIAL

ITEM	PART DESCRIPTION	PART NO.	7746543	7746544	7746545	7746546
10	DELTA 1020 SERIES PUMP ON HV2 SETTING	DLTA1020PVT4600UD4031EN0	X			
	DELTA 1020 SERIES PUMP	DLTA1020PVT4600UD4031EN0		X		
	DELTA 0730 SERIES PUMP	DLTA0730PVT4600UD4031EN0			X	
	DELTA 0450 SERIES PUMP	DLTA0450PVT3600UD4031EN0				X
20	CONTROL PANEL	7746539	X	X	X	X
30	PROMIX M MIXING CHAMBER	7746503	X	X	X	X
40	SOLENOID VALVE, 1-1/2", FNPT, BRASS	7746526	X	X	X	X
50	CHECK VALVE, 1-1/2", FNPT, BRASS	7746625	X	X	X	X
60	UNION, 1-1/2", SOCKET, PVC/VITON, SCH. 80	7744564	X	X	X	X
70	GLOBE VALVE, 3/4", SOCKET, PVC/EPDM	7741479	X	X	X	X
80	TEE, FLOW SENSOR, 3/4" SKT, PVC	7746625	X	X	X	X
90	FLOW SENSOR, 3/4", PVC, .5-50 GPM	7746624	X	X	X	X
100	CHECK VALVE, 3/4", FNPT, BRASS	7746527	X	X	X	X
110	PRESSURE GAUGE, 316 SST, 0-100PSI	7741084				X
	PRESSURE GAUGE, 316 SST, 0-160PSI	7745788	X	X	X	
120	UNION, 3/4", SOCKET, PVC/VITON, SCH. 80	7744555	X	X	X	X
130	UNION, 1-1/2", FNPT, PVC/VITON, SCH. 80	7744559	X	X	X	X
140	STATIC MIXER, 1-1/2", MNPT, CLEAR PVC, SCH. 40, 6 ELE	7746529	X	X	X	X
150	LAB COCK, 1/4", FNPT, PVC/VITON	7746331	X	X	X	X
160	BALL VALVE, 1/2", PVC/VITON, SCH. 80, TYPE 21	7000309	X	X	X	X
170	CALIBRATION COLUMN, PVC, 500mL	7500139	X	X	X	X
180	PRESSURE GAUGE, 316SST, CPVC/PTFE ISOLATOR, 0-100PSI	7746151				X
	PRESSURE GAUGE, 316SST, CPVC/PTFE ISOLATOR, 0-160PSI	7746152	X	X	X	
190	UNION, 1/2", SOCKET, PVC/VITON, SCH. 80	7744562	X	X	X	X
200	BACK PRESSURE VALVE, 1/2", SOCKET, PVC, 0-150 PSI	1019883	X	X	X	X
210	HOSE BARB ADAPTER, 1/2" ID TUBING X MNPT, PVC	7740541	X	X	X	X
220	HOSE CLAMP, 1/2", SST	7741354	X	X	X	X
230	TUBING, 1/2" ID, PVC, NYLOBRAID	7744091	X	X	X	X

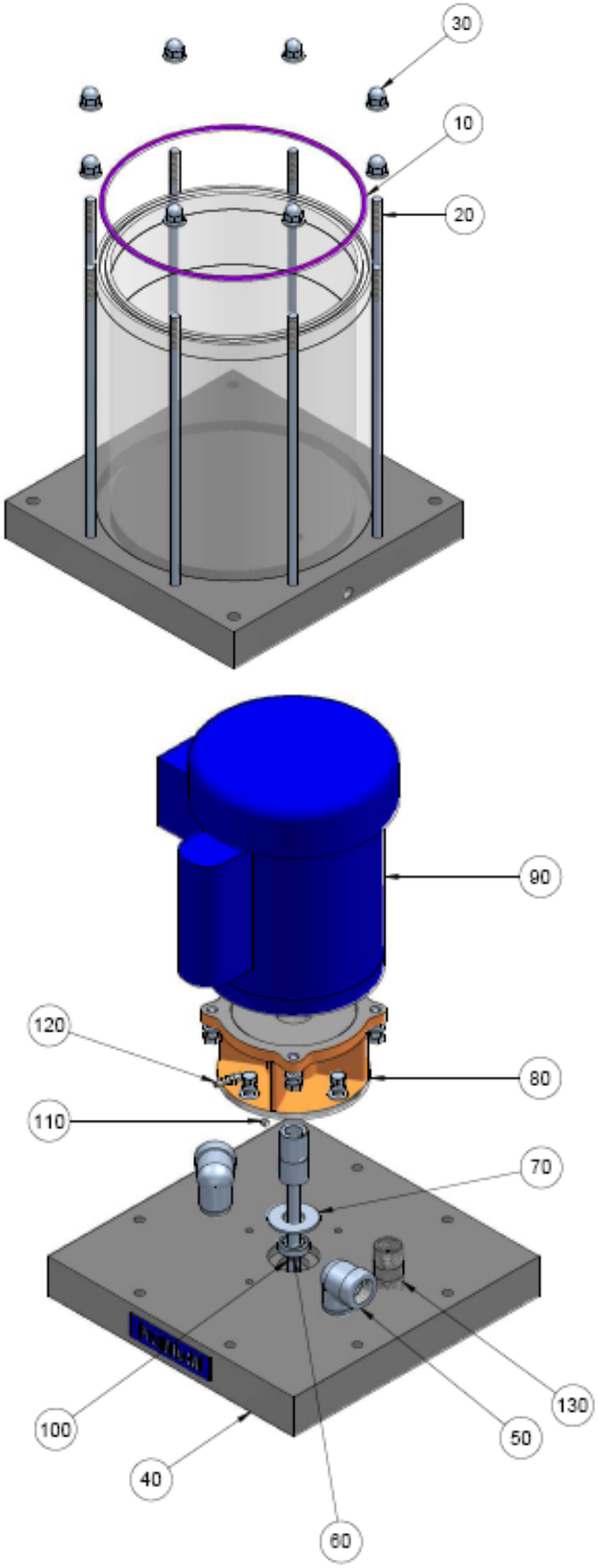


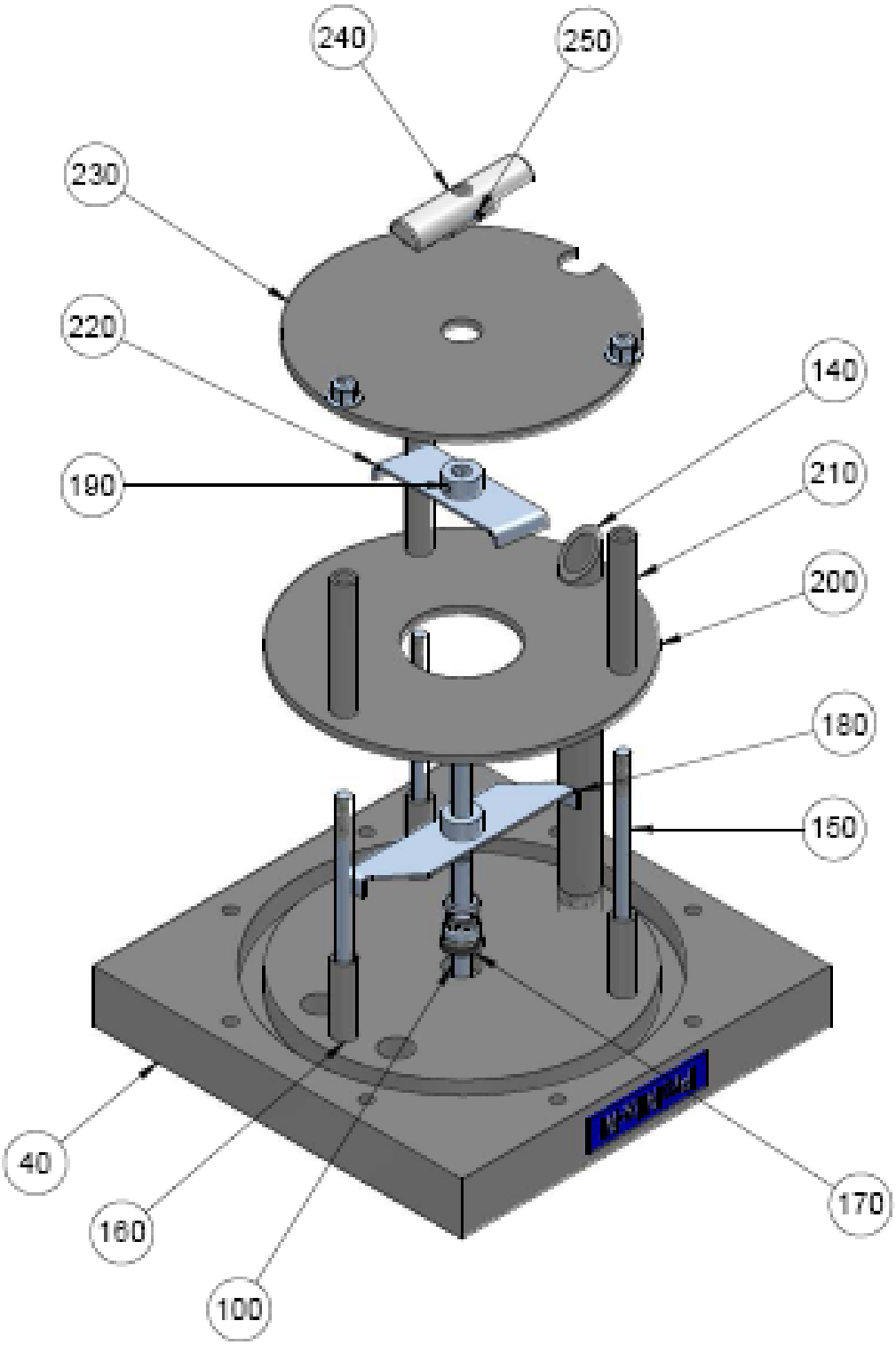
PROMIX M CONTROL PB

PROMIX M (PB SERIES)
BILL OF MATERIAL

ITEM	PART DESCRIPTION	PART NO.	7746547	7746548	7746549
10	SEEPEX MODEL MDP PUMP SET AT 121 RPM	7746577	X		
	SEEPEX MODEL MDP PUMP SET AT 234 RPM	7746577		X	
	SEEPEX MODEL MDP PUMP SET AT 552 RPM	7746577			X
20	CONTROL PANEL	7746567	X	X	X
30	PROMIX M MIXING CHAMBER	7746503	X	X	X
40	SOLENOID VALVE, 1-1/2", FNPT, BRASS	7746526	X	X	X
50	CHECK VALVE, 1-1/2", FNPT, BRASS	7746625	X	X	X
60	GLOBE VALVE, 3/4", SOCKET, PVC/EPDM	7741479	X	X	X
70	TEE, FLOW SENSOR, 3/4" SKT, PVC	7746625	X	X	X
80	FLOW SENSOR, 3/4", PVC, .5-50 GPM	7746624	X	X	X
90	CHECK VALVE, 3/4", FNPT, BRASS	7746527	X	X	X
100	PRESSURE GAUGE, 316 SST, 0-160PSI	7745788	X	X	X
110	UNION, 3/4", SOCKET, PVC/VITON, SCH. 80	7744555	X	X	X
120	UNION, 1-1/2", FNPT, PVC/VITON, SCH. 80	7744559	X	X	X
130	STATIC MIXER, 1-1/2", MNPT, CLEAR PVC, SCH. 40, 6 ELE	7746529	X	X	X
140	LAB COCK, 1/4", FNPT, PVC/VITON	7746331	X	X	X
150	BALL VALVE, 1", PVC/VITON, SCH. 80, TYPE 21	7741335	X	X	X
160	CALIBRATION COLUMN, PVC, 500mL	7500139	X	X	
	CALIBRATION COLUMN, PVC, 1000mL	7500130			X
170	UNION, 1", SOCKET, PVC/VITON, SCH. 80	7744563	X	X	X
180	BALL VALVE, 1/2", PVC/VITON, SCH. 80, TYPE 21	7000309	X	X	X
190	UNION, 1/2", SOCKET, PVC/VITON, SCH. 80	7746151	X	X	X
200	BACK PRESSURE VALVE, 1/2", SOCKET, PVC, 0-150 PSI	1019883	X	X	X
210	PRESSURE GAUGE, 316SST, CPVC/PTFE ISOLATOR, 0-160PSI	7745318	X	X	X
220	HOSE BARB ADAPTER, 1/2" ID TUBING X MNPT, PVC	7740541	X	X	X
230	HOSE CLAMP, 1/2", SST	7741354	X	X	X
240	TUBING, 1/2" ID, PVC, NYLOBRAID	7744091	X	X	X
250	FLOW SENSOR OPTION, PROMIX M (IF SELECTED)	7746575	X	X	X

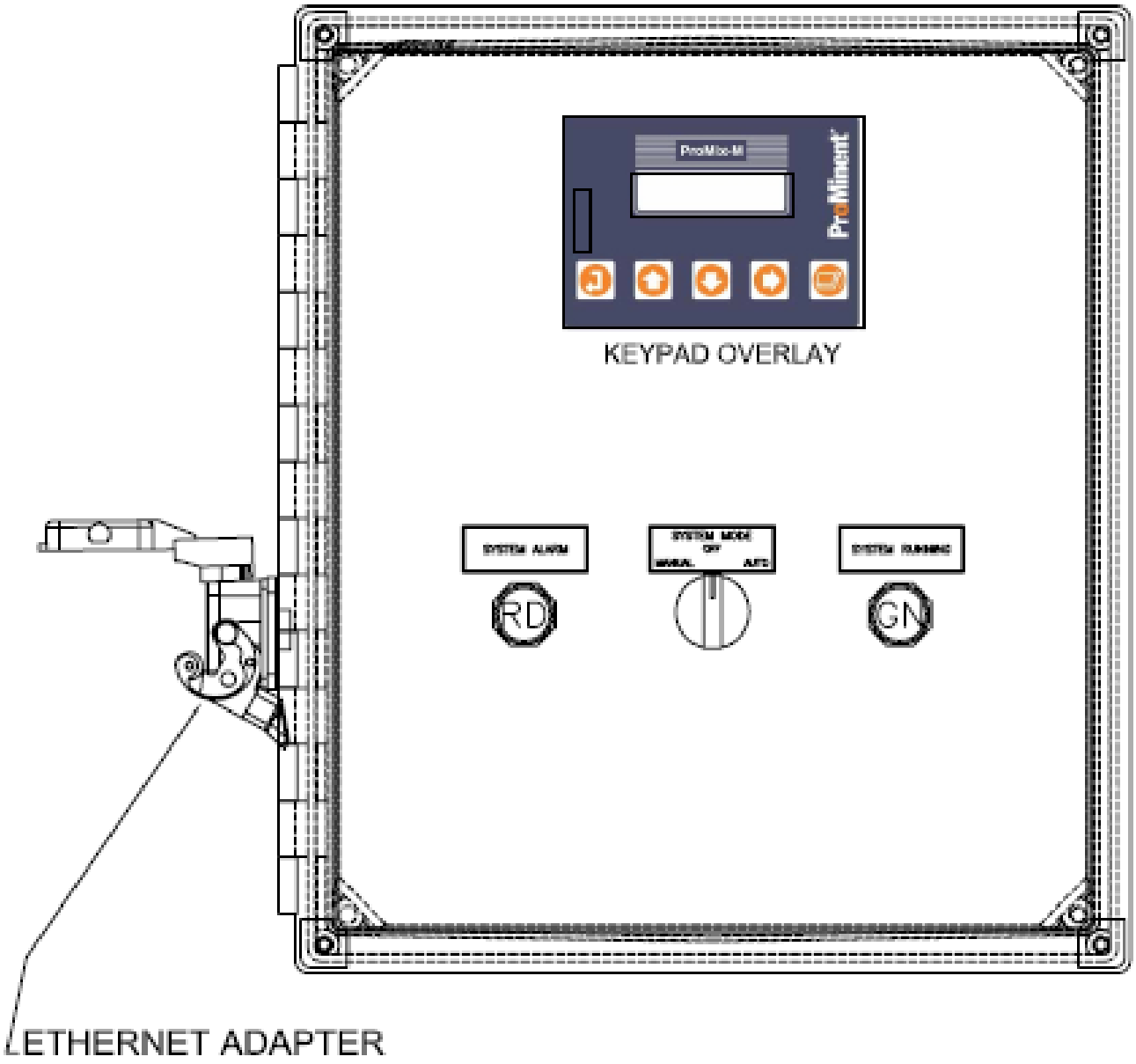
P/N: 7746503 Mixing Chamber (Utilized on both models)




240
250
230
220
140
190
210
200
180
150
40
160
100
170

PROMIX M - MIXING CHAMBER BILL OF MATERIALS			
ITEM	**QTY.**	**PART DESCRIPTION**	**PART NO.**
10	1	O-RING, CHAMBER, VITON, PROMIX-M	7746491
20	8	ROD, 316SS, 3/8-16 X 14.5, PROMIX-U	7746494
30	8	NUT, ACORN, 3/8-16, 18-8 SST	7746492
40	1	PLATE, TOP, PVC, 1.75, PROMIX-M	7746485
50	2	ELBOW, STREET, 3/4", FNPT X MNPT, 316 SST, 150#	7746520
60	1	BEARING, 440SS, 1.125X.5X.31, PROMIX-M	7746472
70	1	WASHER, 316SS, 1.88X.81X.09, PROMIX-M	7746473
80	1	FLANGE, MOTOR, C56/135, PROMIX-M	7746478
90	1	MOTOR, 3/4 HP, TEFC, 56C, 115/230VAC, LEESON, 110057	7951060
100	1	SHAFT, MIXER, 303SS, PROMIX-M	7746484
110	1	SCREW, SET, 316SS, 1/4-28 PROMIX-U	851405
120	1	HOSE BARB, 1/16" MNPT X 3/16" ID, PVDF	7500346
130	1	INJECTION VALVE ASSEMBLY, PROMIX-U	7746471
140	1	PIPE, DISCHARGE, PVC, 3/4", PROMIX-U	7746490
150	3	ROD, 316SS, 3/8-16X8, PROMIX-M	7746497
160	3	SPACER, TOP BAFFLE, PROMIX-M	7746495
170	1	SEAL, MECH, SHAFT, 304SS, 1/2", PROMIX-M	7746474
180	1	BLADE, PRIMARY, 316SS, PROMIX-M	7746482
190	4	SCREW, SET, 316SS, 1/4-28 PROMIX-U	7746476
200	1	BAFFLE, TOP, PVC, .25, PROMIX-M	7746487
210	3	SPACER, BOTTOM BAFFLE, PROMIX-M	7746496
220	1	BLADE, SECONDARY, 316SS, PROMIX-M	7746483
230	1	BAFFLE, BOTTOM, PVC, .25, PROMIX-M	7746488
240	1	PROP, AGITATOR, CPVC, PROMIX-M	7746481
250	1	PIN, SPRING, 18-8SS, .187X1.25, PROMIX-M	7746475

P/N: 7746539 Control Panel “B Controls” (Utilized on DLTA models)
P/N: 7746567 Control Panel “B Controls” (Utilized on Seepex models)



P/N: 7746539 Control Panel "B Controls" (Utilized on DLTA models)

PROMIX M - "B" Controls Bill of Material P/N: 7746539		
QTY.	**PART DESCRIPTION**	**PART NO.**
1	ProMix Control Assembly	7746534
1	Driver IO2 Dual 4-20mA Output Board	7760254
1	Fibox 14 x 12 Machined Enclosure	7746559
1	Fibox Subpanel	7746228
1	CBI UL 489 Circuit Breaker 20 Amp	7746223
1	C3C 300-S25N30D10 120V, 1NO AUX CONT	7746346
1	C3C 320-B2U12 OVLD 8-12.5AMPS ADJUSTABLE	7746553
1	C3C 3 POS NEMA SELECTOR SWITCH	7746403
2	C3C 22CB2NO CONTACT BLOCK	7746464
1	MOV ZA SERIES V180ZA1P NEWARK 58K7343	7745305
2	PHOENIX USLKG5 GROUND TERMINAL	7746750
13	PHOENIX UK5N SINGLE FEED THRU TERMINAL	7746748
14	PHOENIX UKK5N DUAL FEED THRU TERMINAL	7746744
1	PHOENIX MULTI LEVEL SPACER	7746746
4	PHOENIX E/NS 35N END BARRIER	7746751
2	Z BRACKET TERMINAL STAND-OFF	7746540
1	GREEN PILOT LIGHT	7745962
1	RED PILOT LIGHT	7745961
1	PHOENIX TERMINAL BLOCK END PLATE FOR 7746748	7746749
1	PHOENIX TERMINAL BLOCK END PLATE FOR 7746744	7746747
1	AUTO DIRECT DN-F6 1X1 1/4 INCH FUSE TERM	7745052
1	FS FUSE 2A GLASS BODY TIME DELAY GDL2	7746094
1	PHOENIX 0819330 UC-EMLP DEVICE LABEL	7500386
1	POWER CORD 12 AWG SOW BLK W/PLUG	7500424
3	SKINTOP FITTING PG11 BLACK SL11 W/NUT	7744823
1	CONNECTOR PG9 BLACK (7735074.2)	703885
1	PG-9 Nut	7500067
1	POWER CORD 14 AWG	7740819
1	ETHERNET ADAPTER TYPE 4X	7746535
1	12" CAT5/6 CABLE	7746542
2	PG13 3/8NPT DOUBLE HOLE GLAND	7744578
2	PG13 CABLE GLAND	7744824
2	12 CONDUCTOR 18 AWG CABLE	7500201
2	FLEX TYPE 1/2" SWIVEL FITTING	7745763
2	1/2" BLACK FLEX TITE	7745762
1	KEYPAD DISPLAY OVERLAY	7746533
5	RR150PV-0250 ROUND ROD .250" PVC	7746532
2	SURGE SUPPRESSOR MOV	7745305

P/N: 7746567 Control Panel "B Controls" (Utilized on Seepex models)

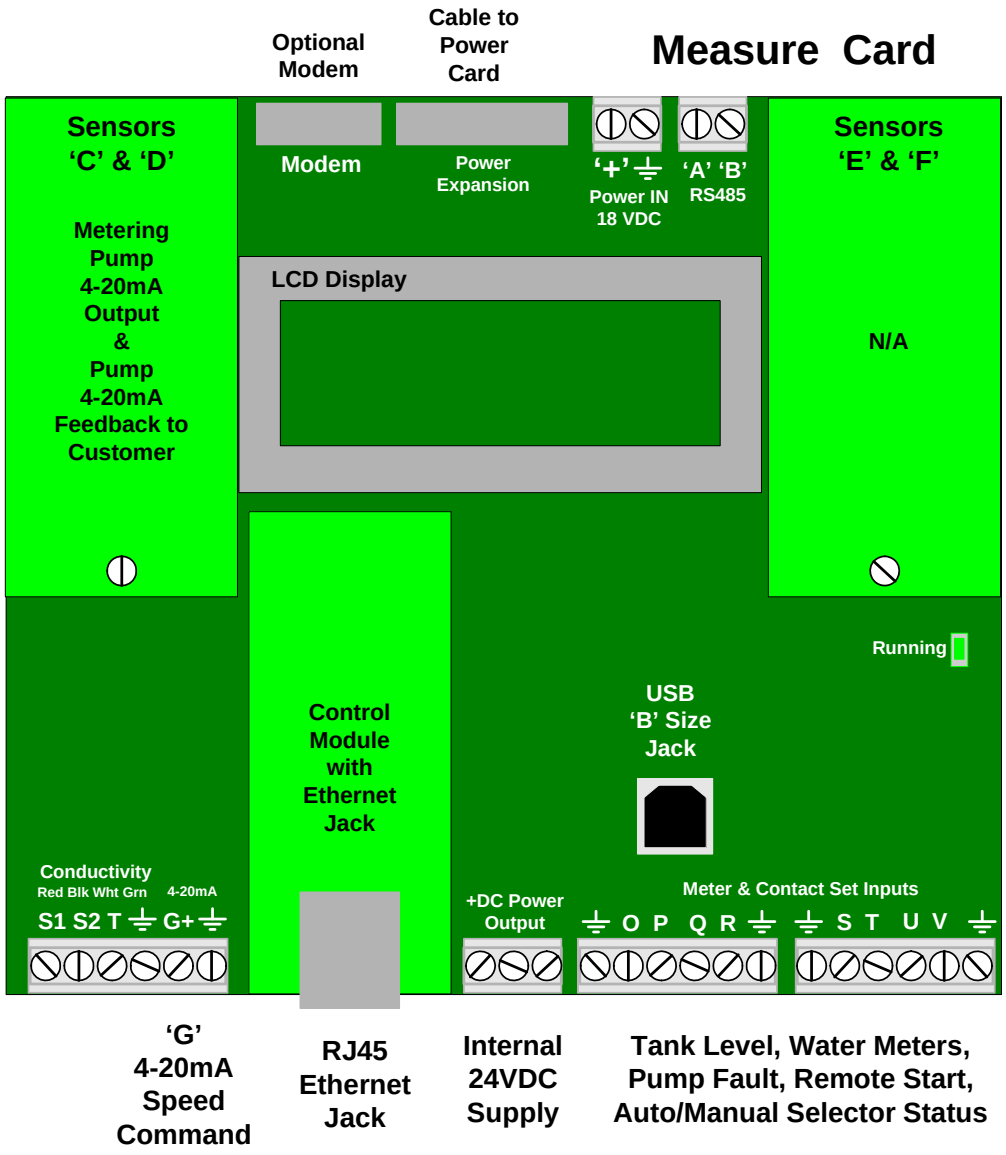
PROMIX M - "B" Controls Bill of Material P/N: 7746567		
QTY.	**PART DESCRIPTION**	**PART NO.**
1	ProMix Control Assembly	7746534
1	Driver IO2 Dual 4-20mA Output Board	7760254
1	Fibox 14 x 12 Machined Enclosure	7746559
1	Fibox Subpanel	7746228
1	CBI UL 489 Circuit Breaker 20 Amp	7746223
1	C3C 300-S25N30D10 120V, 1NO AUX CONT	7746346
1	C3C 320-B2U12 OVLD 8-12.5AMPS ADJUSTABLE	7746553
1	C3C 3 POS NEMA SELECTOR SWITCH	7746403
2	C3C 22CB2NO CONTACT BLOCK	7746464
1	MOV ZA SERIES V180ZA1P NEWARK 58K7343	7745305
2	PHOENIX USLKG5 GROUND TERMINAL	7746750
13	PHOENIX UK5N SINGLE FEED THRU TERMINAL	7746748
14	PHOENIX UKK5N DUAL FEED THRU TERMINAL	7746744
1	PHOENIX MULTI LEVEL SPACER	7746746
4	PHOENIX E/NS 35N END BARRIER	7746751
2	Z BRACKET TERMINAL STAND-OFF	7746540
1	GREEN PILOT LIGHT	7745962
1	RED PILOT LIGHT	7745961
1	PHOENIX TERMINAL BLOCK END PLATE FOR 7746748	7746749
1	PHOENIX TERMINAL BLOCK END PLATE FOR 7746744	7746747
1	AUTO DIRECT DN-F6 1X1 1/4 INCH FUSE TERM	7745052
1	FS FUSE 2A GLASS BODY TIME DELAY GDL2	7746094
1	PHOENIX 0819330 UC-EMLP DEVICE LABEL	7500386
1	POWER CORD 12 AWG SOW BLK W/PLUG	7500424
3	SKINTOP FITTING PG11 BLACK SL11 W/NUT	7744823
1	CONNECTOR PG9 BLACK (7735074.2)	703885
1	PG-9 Nut	7500067
1	POWER CORD 14 AWG	7740819
1	ETHERNET ADAPTER TYPE 4X	7746535
1	12" CAT5/6 CABLE	7746542
2	PG13 3/8NPT DOUBLE HOLE GLAND	7744578
2	PG13 CABLE GLAND	7744824
2	12 CONDUCTOR 18 AWG CABLE	7500201
2	FLEX TYPE 1/2" SWIVEL FITTING	7745763
2	1/2" BLACK FLEX TITE	7745762
1	KEYPAD DISPLAY OVERLAY	7746533
5	RR150PV-0250 ROUND ROD .250" PVC	7746532
2	SURGE SUPPRESSOR MOV	7745305
1	PHOENIX 4-20MA IN, 0-10VDC OUT AMPLIFIER	7746766

APPENDIX B – Control Panel "B Controls"

B.1 Controller Board Layout

The controller consists of two circuit boards, a front **Measure** circuit board and a back **Power** board.

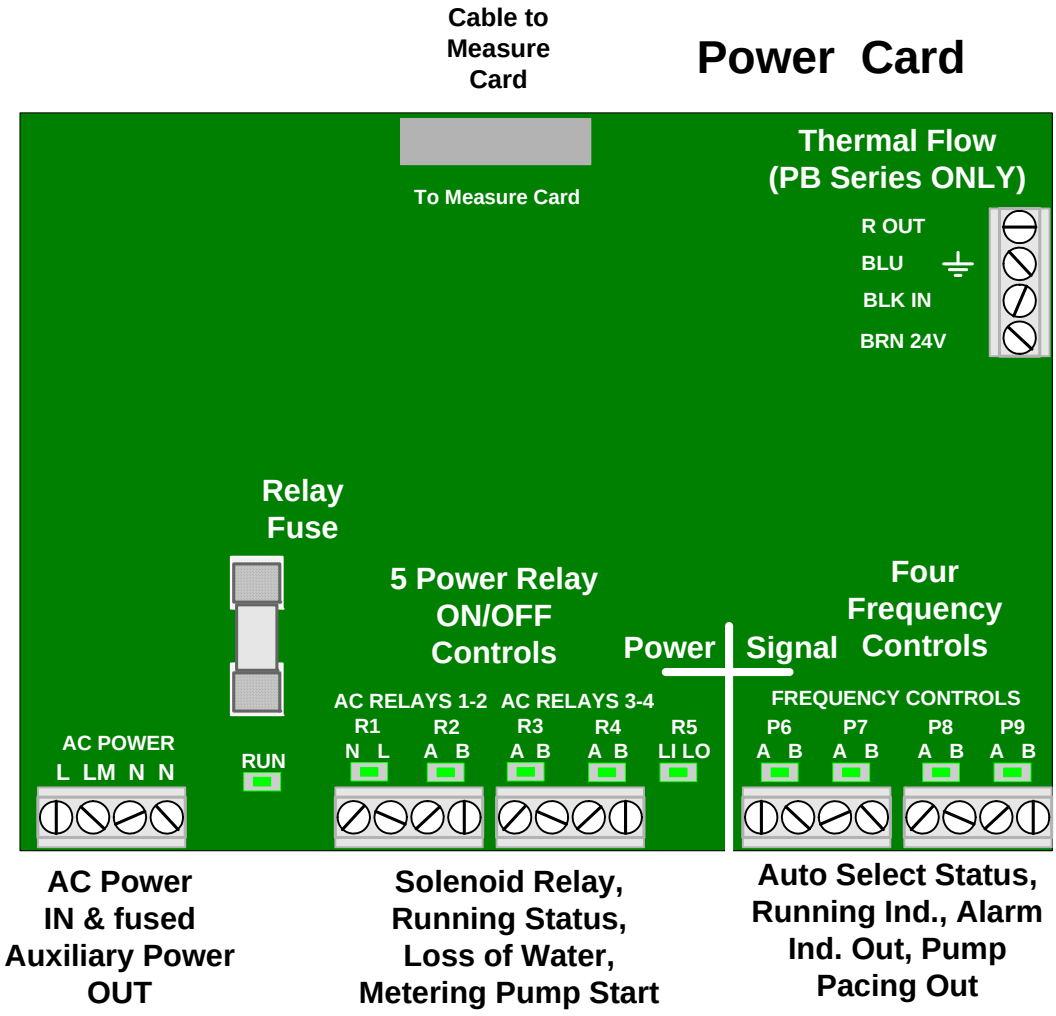
The front, **Measure** circuit board supports 7 sensor inputs & 8 digital Inputs.
It includes a 2 line x 16 character LCD display, USB Type 'B' jack and a microcontroller module.



Ethernet CAT5 LAN cabling is limited to a maximum of 300ft / 100m from controller to access hub. Do not exceed this limit.

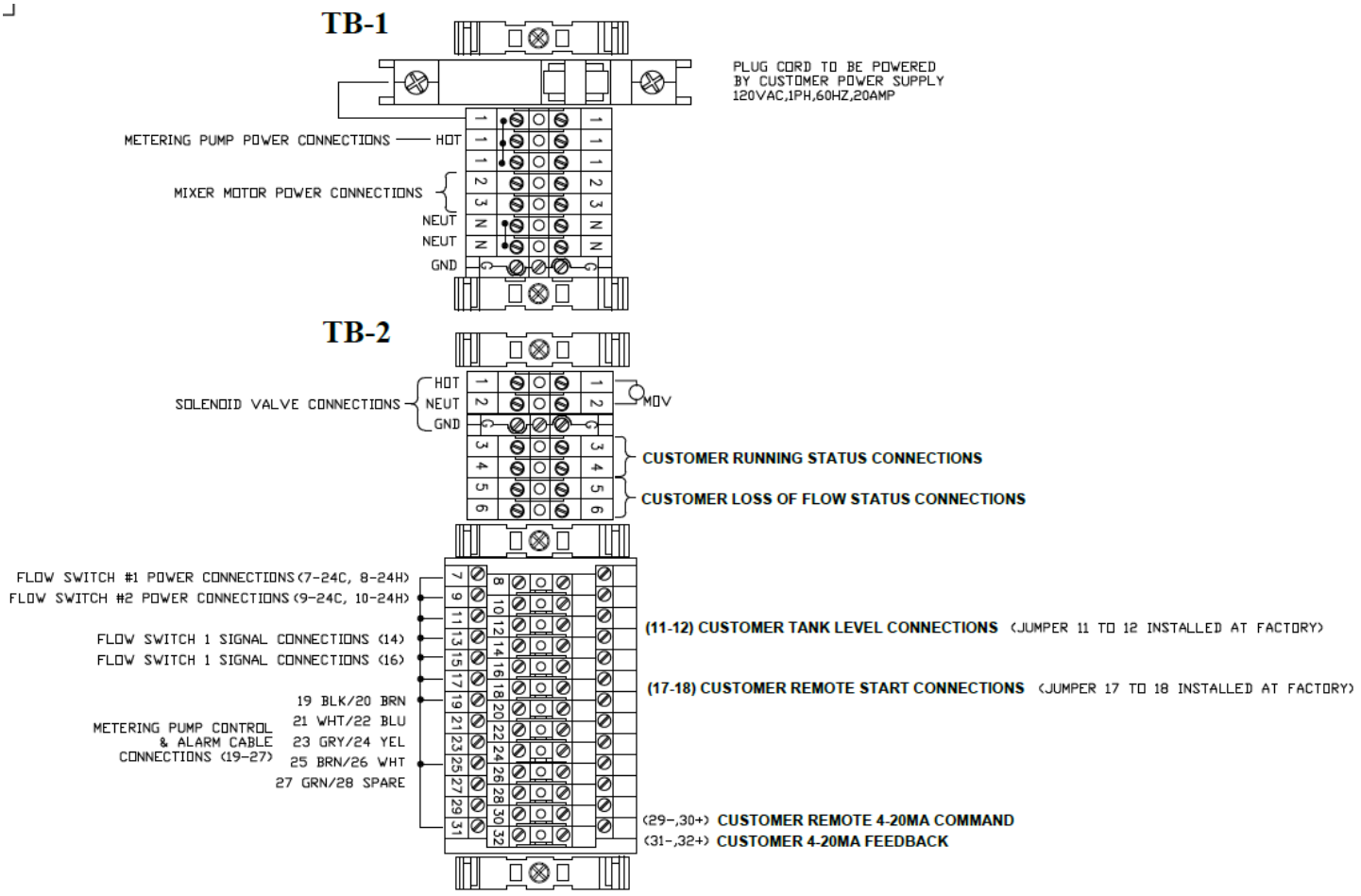
Terminals 'O' through 'V' and a ground terminal. 5VDC limited by 10K puts 1/2mA through a closed contact set.
Hall effect Turbines and Paddlewheel water meters are powered by the 15-22VDC controller supply, thermally fused at 100mA.

The back, **Power** circuit board has 5 ON/OFF Power Relays, 4 Signal Frequency Feed outputs and the controller power supply.

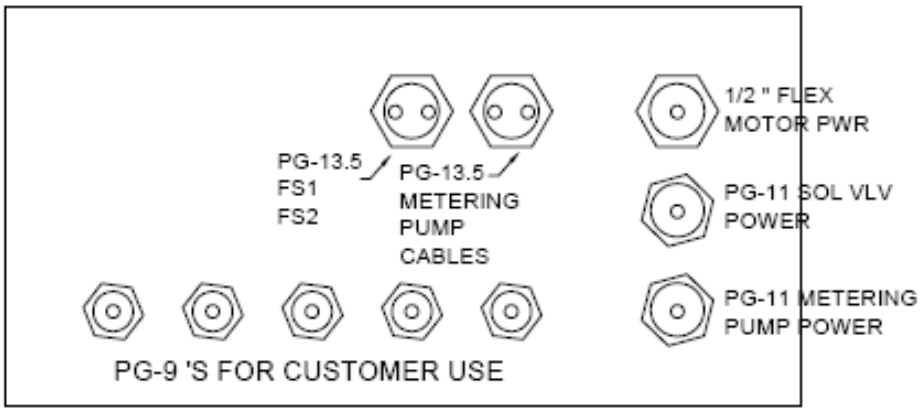


B.2 Controller Wiring (DB Series) P/N: 7746539 w/Delta Pump

Thermal flow switch not used for polymer feed verification
Reference Supplement Drawing: 7746539-300 for further wiring details

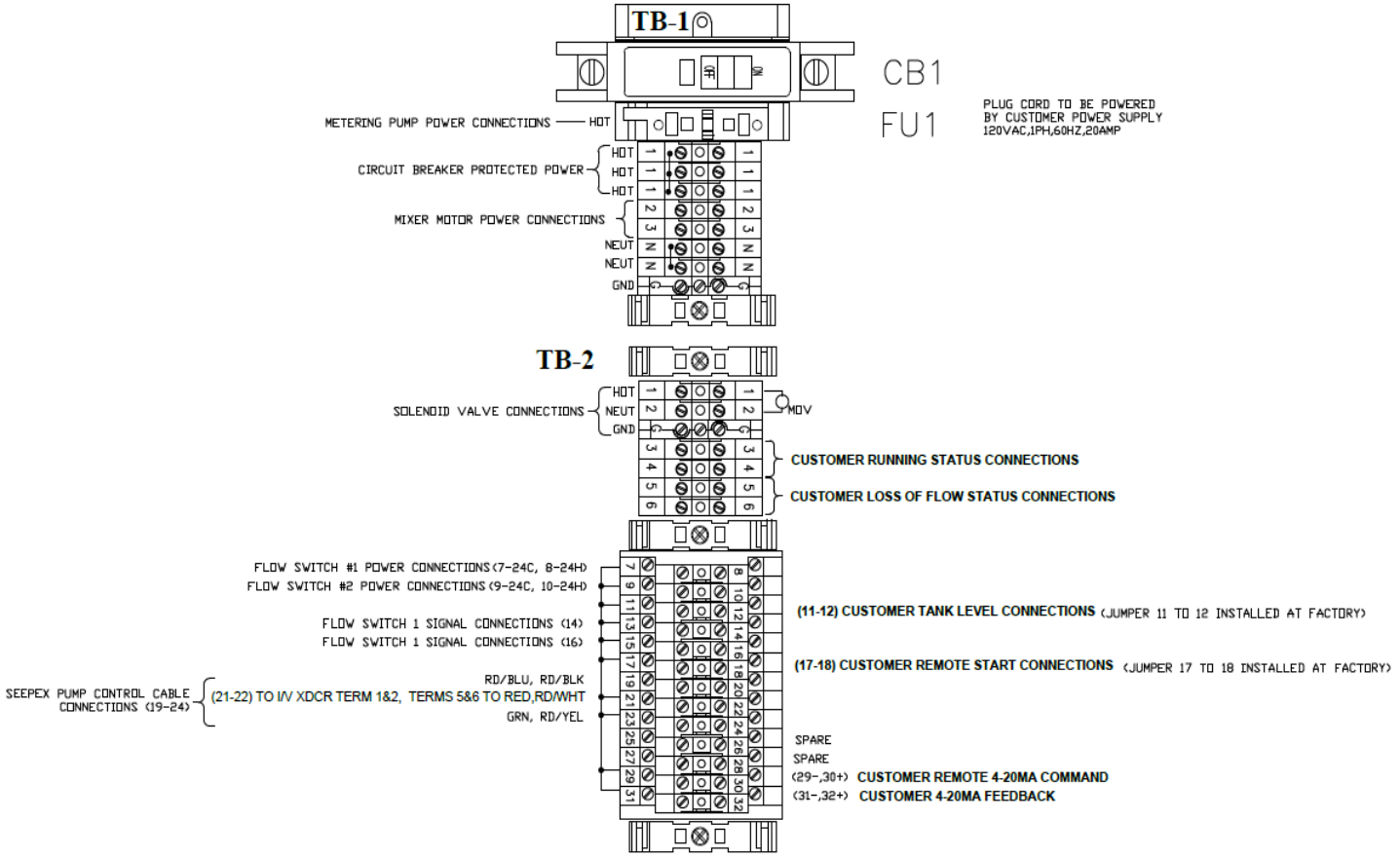


VIEW A-A FROM INSIDE LOOKING DOWN

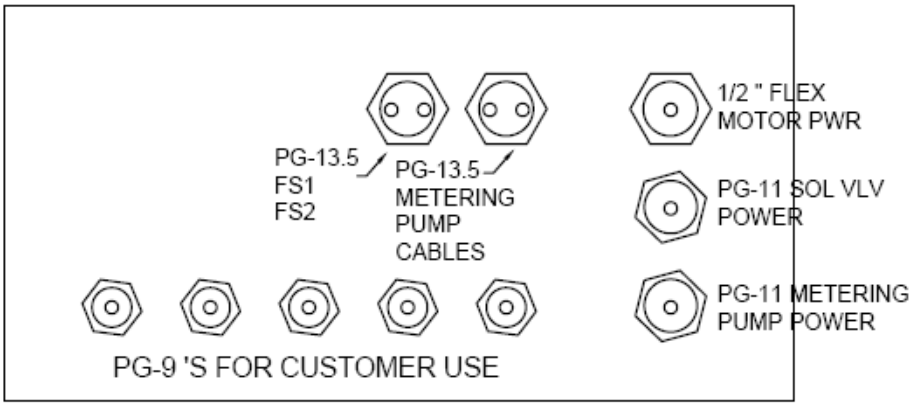


B.3 Controller Wiring (PB Series) P/N: 7746567 w/Seepex Pump

Thermal flow switch <u>used</u> for polymer feed verification
Reference Supplement Drawing: 7746567-300 for further wiring details



VIEW A-A FROM INSIDE LOOKING DOWN



APPENDIX C – Polymer Sizing / Dosage

The ProMix M H-O-A switch on the controller door enables the user to select either Manual or Auto operation. In 'H' or Manual, the polymer concentration setpoint is selectable from 0 - 2% by using the controller keypad. In 'A' or Auto, the polymer concentration is set proportionally by a remote 4-20 mA signal representing 0- 2%. It is assumed the pump stroke length is maintained at 100%.

The desired polymer dosage must be considered prior to selecting the ProMix M 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 M Polymer feeder is based upon the neat polymer pump rate divided by the total water flow through the primary and secondary flow-meters. For example, if the neat polymer feed rate is 1.5 gph and the flow through the primary flow-meter is 15 gpm and the flow through the secondary flow-meter 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:

7746543-200	PROMIX-M_0-300X2-2.4DB Skid System
7746544-200	PROMIX-M_0-600X2-4.0DB Skid System
7746545-200	PROMIX-M_0-1500X2-6.2DB Skid System
7746546-200	PROMIX-M_0-1500X2-10.0DB Skid System
7746547-200	PROMIX-M_0-1500X2-5.0PB Skid System
7746548-200	PROMIX-M_0-1500X2-10.0PB Skid System
7746549-200	PROMIX-M_0-1500X2-24.0PB Skid System

Electrical Schematic Drawings:

7746539-300	PROMIX-M Delta "B" Control Panel
7746567-300	PROMIX-M Seepex "B" Control Panel
	Aegis Browser Manual

Pump Manuals:

DLTA QSG	Delta Pump Quick Start Guide
986691	Delta Pump Operating Manual
MDP006-12	Seepex Pump Operating Manual

Instructional Manuals:

7746471-400	Injection Valve Cleaning Instructions
7746503-400	Mixing Chamber Mechanical Seal Replacement
7746575-700	Flow Sensor Option (Seepex Models ONLY)

Catalog Component Cut Sheets:

7746543-701	PROMIX-M_0-300X2-2.4DB Skid System
7746544-701	PROMIX-M_0-600X2-4.0DB Skid System
7746545-701	PROMIX-M_0-1500X2-6.2DB Skid System
7746546-701	PROMIX-M_0-1500X2-10.0DB Skid System
7746547-701	PROMIX-M_0-1500X2-5.0PB Skid System
7746548-701	PROMIX-M_0-1500X2-10.0PB Skid System
7746549-701	PROMIX-M_0-1500X2-24.0PB Skid System
7746539-701	PROMIX-M Delta "B" Control Panel
7746567-701	PROMIX-M Seepex "B" Control Panel

(Provided upon request)

Documents noted in this section are not in this manual