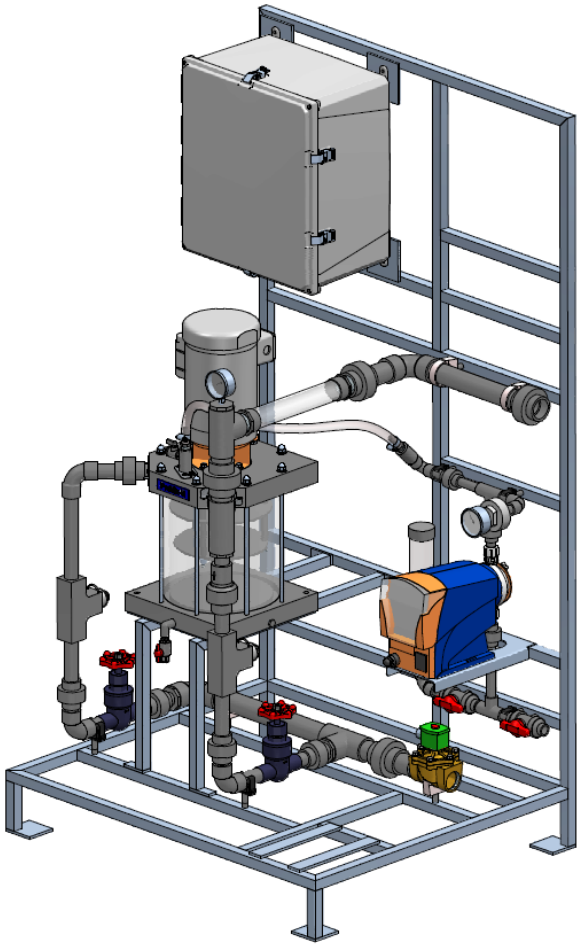
Operating Instructions ProMinent® ProMix-M (Batch/Inline Controls) Polymer Blending System



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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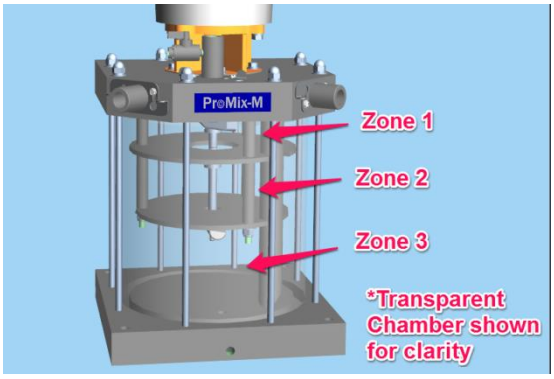
ProMinent ProMix ‘DB' & 'PB’ Polymer Feeder

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 by 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 an 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 controller permits two main methods of operation. These modes and their respective configurations are selected using either the keypad or the Ethernet connection to a laptop. The first mode of operation is the ‘Batch’ mode which uses a % concentration setpoint defined as the ratio of polymer to dilution water by volume. The second basic operation mode is ‘Inline’ which requires the user to calculate and manually adjust the desired polymer pump rate based upon the process requirements. In either mode the type of polymer must be selected: emulsion or Mannich. On/off operation in either mode can be controlled remotely via a customer permissive contact.

In the ‘Inline’ mode the System Start switch on the front door of the controller can be placed in the ON position to immediately enable the controller or in the REMOTE position to require a remote dry contact as a start permissive. Placing this switch in the OFF position after having been in either of the other two positions will initiate a flush cycle before shutting down. The Polymer Pump switch on the controller front door has two positions to choose the source of the pump control signal. In the LOCAL position the controller uses the keypad entry for polymer pump rate. In the REMOTE position the user generated 4-20 mA signal represents 0 – 100% pump speed. The user must manually adjust the primary and post dilution valves for the desired dilution water flow rate. The pump rate must also be manually entered to achieve the desired polymer concentration.

In the ‘Batch’ mode the same operations apply for the two selectable switches on the front controller door. However instead of pump speed the ProMix Batch mode setpoint is % concentration. The user can manually adjust the incoming dilution water flow for the desired flow rates. Thereafter, the controller adjusts the polymer pump speed automatically to maintain the % setpoint concentration based on dilution water flow. The controller maximum input values are up to 1% concentration in the mixing chamber for emulsion polymers and up to 10% for Mannich polymers.

ProMinent ProMix ‘DB' & 'PB’ Polymer Feeder

The ProMix M Polymer Feeder is equipped with all the necessary components for installation, reliable performance and safe operation. Two indicating lights on the front controller door provide operational status.

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:

Diaphragm Pump Type GXLA (DB Series):

PART NUMBER	MODEL	PUMP TYPE	MAX CAPACITY
1048382	300X2-2.3DB	GXLA 1020-120	3.24 GPH
1048383	600X2-3.8DB	GXLA 1020-200	5.18 GPH
1048384	1500X2-6.2DB	GXLA 0730-200	7.76 GPH
1048385	1500X2-10.3DB	GXLA 0450-200	12.95 GPH

Refer to Appendix C for proper sizing

Overall Skid Dimensions (w/Gamma XL).....72"H x 40"W x 34"D
Overall Weight of Skid .....220 lbs. w/Gamma XL
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

Progressive Cavity Pump Type (PB Series):

PART NUMBER	MODEL	PUMP TYPE	MAX CAPACITY
1048386	1500X2-5.0PB	Seepex MD	5.0 GPH
1048387	1500X2-10.0PB	Seepex MD	10.0 GPH
1048388	1500X2-24.0PB	Seepex MD	24.0 GPH

Refer to Appendix C for proper sizing

Overall Skid Dimensions .....72”H x 40”W x 34”D
Overall Weight of Skid .....*250 lbs.*
Power Requirements ..... 220VAC, 60Hz, 1 Phase, 20 Amp
Volume of Mixing Chamber ..... 3.2 Gallons
Maximum Chamber Pressure .....150 PSIG
Normal Operating Pressure .....100 PSIG
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	Identification Code	Factory Default Mode	SPM Max	Flowrate (GPH)		Pressure (PSIG)
				Min @ 100% Stroke	Max @ 100% Stroke	
GXLA	GXLAUS1020PVT4V000UV4030EN	HV2	120	0.019	3.24	145
GXLA	GXLAUS1020PVT4V000UV4030EN	Standard	200	0.019	5.18	145
GXLA	GXLAUS0730PVT4V000UV4030EN	Standard	200	0.031	7.76	102
GXLA	GXLAUS0450PVT2V000UV4030EN	Standard	200	0.11	12.95	58

Notes:

1. ProMinent – Gamma XL Solenoid Driven Metering Pump
2. Original Pump GPH rating is derated 20% due to Polymer viscosity. The actual deration may vary depending on the polymer used
3. Control Modes Available *
    a. Standard – 200 spm: 0-50 cp
    b. HV1 (slightly reduced discharge speed) – 180 spm: 50-200 cp
    c. HV2 (moderately reduced discharge speed) – 120 spm: 200-500 cp
    d. HV3 (maximum reduced discharge speed)– 80 spm: 500-1000 cp
4. Connections: ½" x 3/8" or DN10 Depending on Model Selected
5. Power Requirements: 115VAC, 60 Hz, Single Phase

* Viscosity values are approximate and can vary widely per specific application. Use these values as a guideline only and consult the factory for specific application capabilities

iv. Progressive Cavity Polymer Pumps used on M Models:

Series	Identification Code	RPM Max	Flowrate (GPH)		Pressure (PSIG)
			Min	Max	
MD	MD 003-12 / A6-A7-A7-H0-GA-X	331	0.50	5.0	100
MD	MD 006-12 / A6-A7-A7-H0-GA-X	234	1.00	10.0	100
MD	MD 012-12 / A6-A7-A7-H0-GA-X	252	2.40	24.0	100

Notes:

1. Seepex Progressive Cavity Metering Pump
2. Original Pump GPH rating is derated due to Polymer viscosity. The actual deration may vary depending on the polymer used
3. Power Requirements: 220VAC, 60 Hz, Single Phase

* Viscosity values are approximate and can vary widely per specific application. Use these values as a guideline only and consult the factory for specific application capabilities

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 (For example - Length of Piping Run or 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:
    a. Inspect the piping for breakage. The system may have been jarred during shipping.
    b. 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:
    a. 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!
    b. 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.
    c. 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.
    d. Connect to outlet piping 1-1/2" FNPT from static mixer to associated customer application point.
    e. Connect to make-up water inlet piping 1-1/2" FNPT (25 GPM maximum and 100 psig maximum).
    f. Connect to Neat Polymer pump inlet piping ½" FNPT (GXLA Models) & 1" FNPT (Seepex Models). Flooded Suction ONLY for Seepex PC pump.
    g. 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.

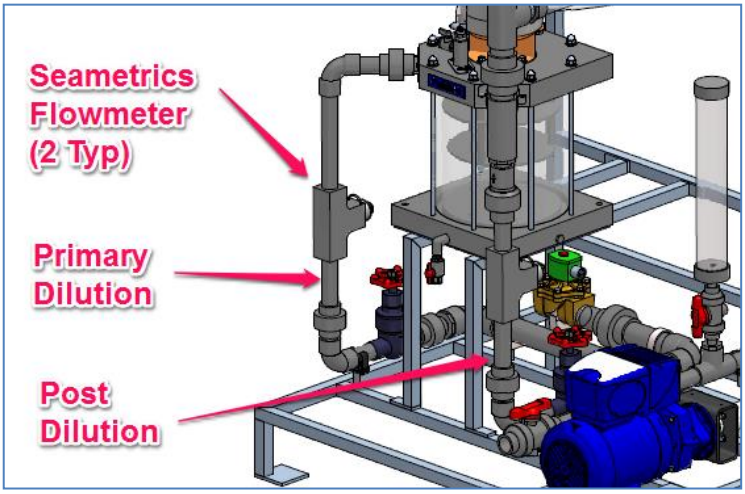
h. Allow provisions for draining the system piping. Skid components will require maintenance. Ensure that chemicals can be evacuated from the skid piping and components for servicing.

8. Electrical Supply Needed for the System:
    a. Note: Review local Electrical Code and follow accordingly.
    b. Connect incoming power to skid mounted control panel *(120VAC, Single Phase, 20 Amp, 60 Hz)*. Ensure panel is properly grounded.
    c. Check electrical connections to be sure proper voltage is supplied to the system.
    d. Power the unit using a dedicated, separate breaker in the local lighting distribution panel.
    e. Do not route the AC power in common conduit with variable frequency pump drives.
    f. 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. The Overload relay should be set to the Motor Nameplate Full Load Amps. Setting this to a higher value will result in possible damage to the motor and associated wiring. Overload conditions should be investigated and possible process changes may need to be made to prevent overload conditions.
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 GXLA 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 (Gamma XL Series only) then ensure liquid in pump suction.
3. Verify GXLA pump/Seepex pump is set with correct settings in the panel, if applicable, according to drawing. Ensure GXLA 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 GXLA/Seepex pump calibration using drawdown calibration cylinder (see section 2.7.4)
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 “Inline” mode the neat polymer pump speed is then adjusted manually according to the switch positions in section 1.6. The pump flow rate and primary and post dilution water flow rates determine the polymer concentration exiting the ProMix system.
12. In “Batch” mode the controller automatically adjusts pump speed to maintain the setpoint concentration based on dilution water flow. Refer to switch positions in section 1.6. Emulsion and Mannich polymers have maximum limitations of 1% and 10% concentration, respectively.
13. Manually adjust flow control valves for the primary and post 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 speed (if used).



18. Test the operation of all remaining circuits.
19. Observe system to assure that nothing looks or sounds abnormal.

1.6 ProMix Mode and Polymer Settings

Begin by first selecting mode of operation (Batch or Inline) and type of polymer (Emulsion or Mannich) see section 2.5.

Batch or Inline — The user must choose the mode of operation from a keypad menu selection. Default is Batch mode and the setpoint is % concentration. The polymer pump is automatically adjusted to maintain the desired % concentration regardless of fluctuations of the dilution water flow. Inline mode requires the user to calculate the percent concentration desired and then manually adjust the pump speed based upon the measured dilution water flow rate.

Emulsion or Mannich — The type of polymer being used by the ProMix feeder is selected. If emulsion then a maximum of 1.0% concentration is permitted in the mixing chamber. If Mannich is selected then the maximum is 10.0% concentration. Batch mode will automatically limit the polymer feed to maintain these concentrations.

After setting operation mode and polymer type, manually adjust the two door switches, ‘System Start’ and ‘Polymer Pump’ for the desired operating conditions:

System Start door switch
Permits use of remote contact to enable system operation in REMOTE position.

Polymer Pump door switch
Determines the setpoint for pump control action which can be from the keypad entry in LOCAL or from a 4-20 mA signal in REMOTE.

Batch / Emulsion door switch options

System Start ON-OFF-REMOTE controller door switch	Polymer Pump LOCAL-REMOTE controller door switch	PROMIX OPERATION
ON	LOCAL	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 1.0% concentration Remote Setpoint: N/A Max. chamber concentration: 1.0%
ON	REMOTE	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0–1.0% concentration Max. chamber concentration: 1.0%
REMOTE	LOCAL	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 1.0% concentration Remote Setpoint: N/A Max. chamber concentration: 1.0%
REMOTE	REMOTE	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0-1.0% concentration Max. chamber concentration: 1.0%

Batch / Mannich door switch options

System Start ON-OFF-REMOTE controller door switch	Polymer Pump LOCAL-REMOTE controller door switch	PROMIX OPERATION
ON	LOCAL	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 10.0% concentration Remote Setpoint: N/A Max. chamber concentration: 10.0%
ON	REMOTE	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0-10.0% concentration Max. chamber concentration: 10.0%
REMOTE	LOCAL	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 10.0% concentration Remote Setpoint: N/A Max. chamber concentration: 10.0%
REMOTE	REMOTE	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0-10.0% concentration Max. chamber concentration: 10.0%

Inline / Emulsion door switch options

System Start ON-OFF-REMOTE controller door switch	Polymer Pump LOCAL-REMOTE controller door switch	PROMIX OPERATION
ON	LOCAL	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 1.0%
ON	REMOTE	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0 –100% pump speed Max. chamber concentration: 1.0%
REMOTE	LOCAL	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 1.0%
REMOTE	REMOTE	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0–100% pump speed Max. chamber concentration: 1.0%

Inline / Mannich door switch options

System Start ON-OFF-REMOTE controller door switch	Polymer Pump LOCAL-REMOTE controller door switch	PROMIX OPERATION
ON	LOCAL	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 10.0%
ON	REMOTE	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0–100% pump speed Max. chamber concentration: 10.0%
REMOTE	LOCAL	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 10.0%
REMOTE	REMOTE	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20mA = 0–100% pump speed Max. chamber concentration: 10.0%

1.7 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.

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**

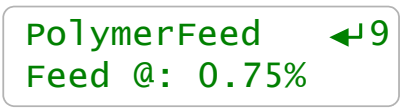
The other main menu displays show information you'll need to set & adjust feed rate and to verify tank level, water flow rates, external control permissives & control levels……

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

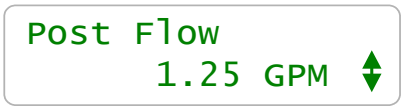
Key **ENTER** @ **Alarms** to reset alarms & view the cause of alarm & its date-time stamp. You may need to acknowledge and clear certain alarms to continue operation.

Key **ENTER** @ **PolymerFeed** to view-adjust the Local Setpoint and view-modify Wait-for-Flow, Mixer Fill and Flush timing.
Displays polymer feed %.

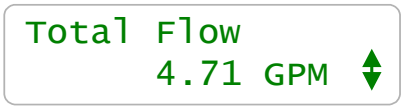


Primary Flow is the water flowing into the polymer mixer. The volume measured by the mixer inlet meter is converted to a flow rate in Gallons/Minute.

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

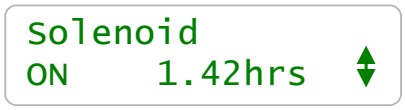


Total Flow is the sum of **Primary Flow** and **Post Flow** and is displayed to help you balance flow with feed rate.
The % concentration setpoint is based upon total flow.



Remote Contact must be **ON** to operate the **PolymerFeed** pump if the System Start switch is in the REMOTE position.
If the **Remote Contact** opens, the feeder **STOP**s

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



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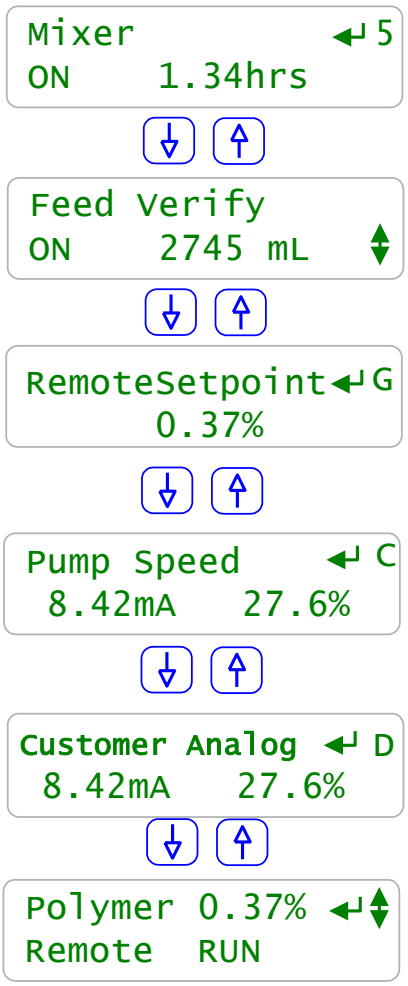
2.2 Main Menu (continued)



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.

RemoteSetpoint displays the % concentration as a function of the remote 4-20 mA signal & controls the **PolymerFeed** pump when **Remote** 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 speed = 4-20mA.

Press **ENTER** to view-adjust the current loop.

Customer Analog can be selected to display pump speed or pump GPH (scalable)

Top of Main Menu.

You can always key **EXIT** until you get to this screen

*If the System Start switch is placed in OFF position or if the switch is in the REMOTE position and the remote start contact is opened for longer than 2 seconds, the controller will initiate a flush cycle.

2.3 Adjust Setpoint

Key down to **PolymerFeed** and Key **ENTER**. **Local Setpoint** controls the feed when the enclosure door switch is in the **Local** 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.

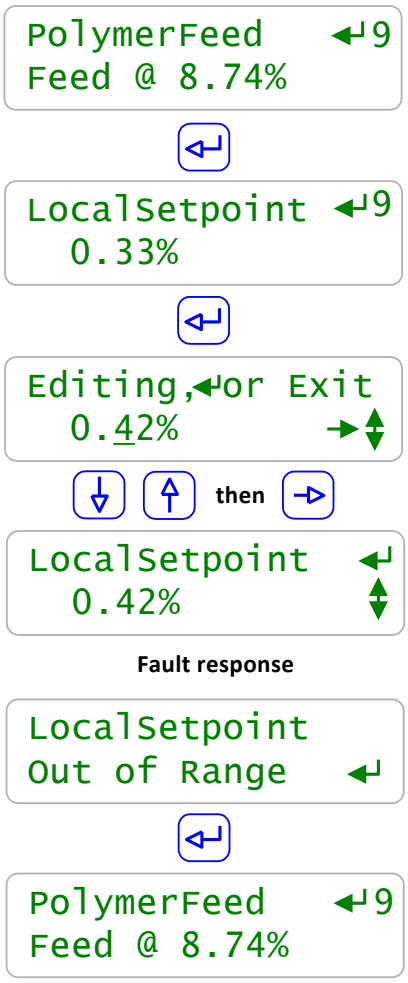
If enclosure door switch is in the **Local** position,

feed rate will change immediately.

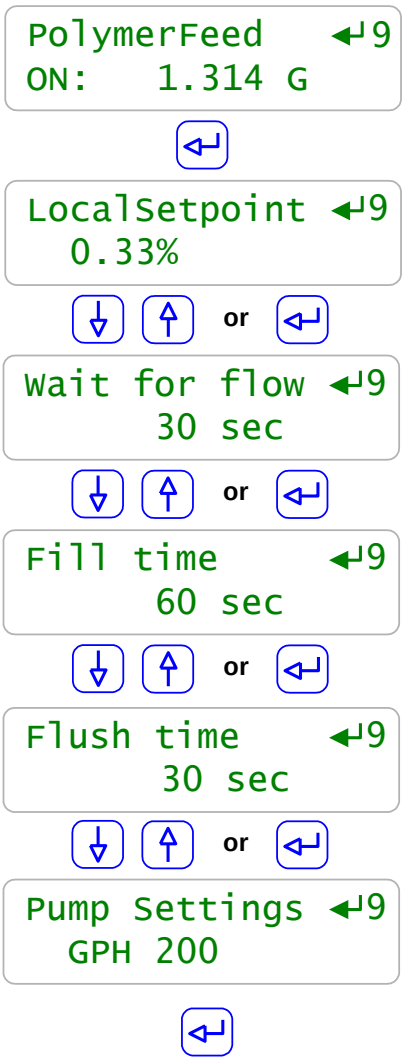
Local Setpoint limits are 0.05 to 1.00% for emulsion polymer and 0.05 to 10.0% for Mannich.. If entries are made outside of these limit ranges the configured setpoint will default to either the maximum or minimum limit. However, these values must be accepted by pushing the Enter key which also turns off the alarm.

Key **ENTER** to return to main menu.

Adjust Setpoint



2.4 Modify Timing



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

Local Setpoint controls the feed when the enclosure door switch is in the **Local** 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 electrical power to the controller is cycled. Key **ENTER** to modify.

Flush Time is the time water flows after initiation of a Flush Cycle. This is a maintenance feature and can be manually initiated by (1) placing the controller door System Start Switch in the OFF position for more than 2 seconds or (2) by opening the remote start contact for longer than 2 seconds or (3) by using the keypad menu. Key **ENTER** to modify time.

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 currently selected stroke length and 100% frequency. This value will need to be updated if the pump stroke length is changed.

2.5 Change Feed Mode and Polymer type

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** @ **Configure** and use **DOWN** key to access **Feed Mode**.

Key **ENTER** @ **Feed Mode** to view-adjust the

Feed Mode to either **Batch** or **Inline**.

Batch mode automatically adjusts the pump rate to changes in dilution flow to maintain the percent setpoint and **Inline** requires manual adjustment of the polymer pump.

Key **ENTER** when the desired feed mode is displayed.

Key **DOWN** to **Batch Type** and Key **ENTER**. View-adjust the **Batch Type** to either **Emulsion** or **Mannich.** **Key ENTER** when the desired polymer type is displayed.

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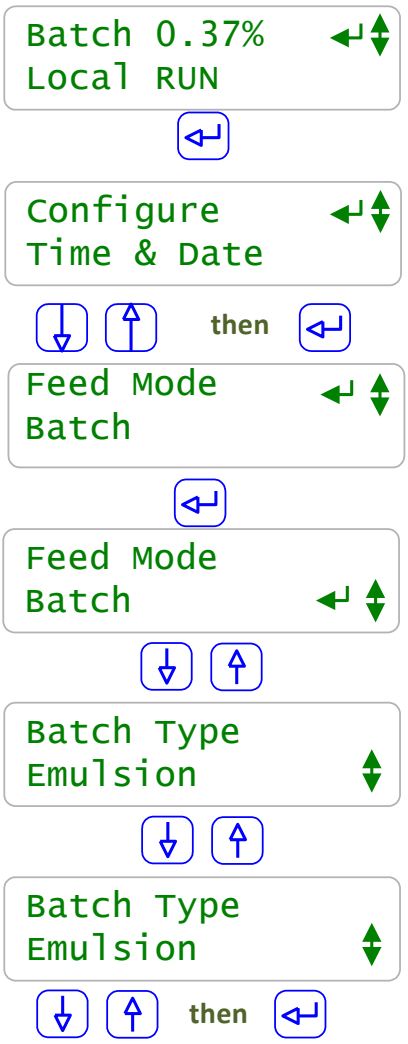


2.6 Browser Controls

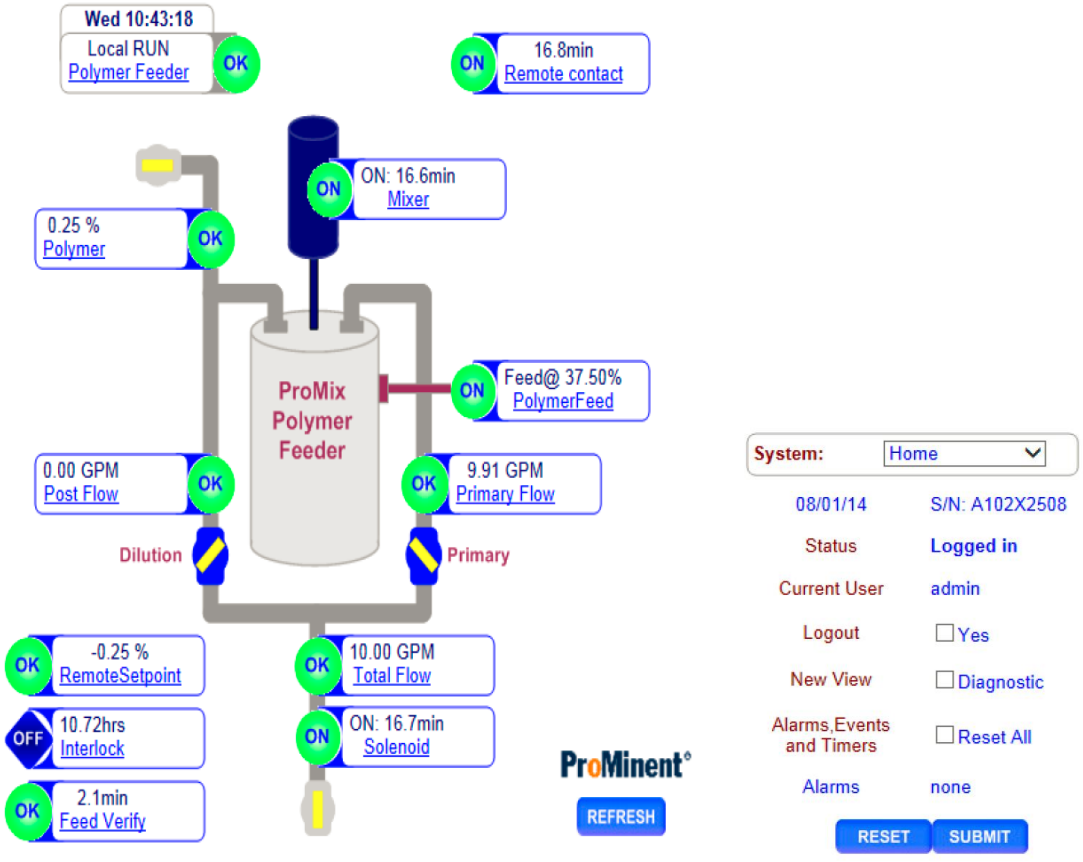
2.6.1 The Site View

Ethernet connect to the controller with a PC, notebook, netbook or via the site LAN.

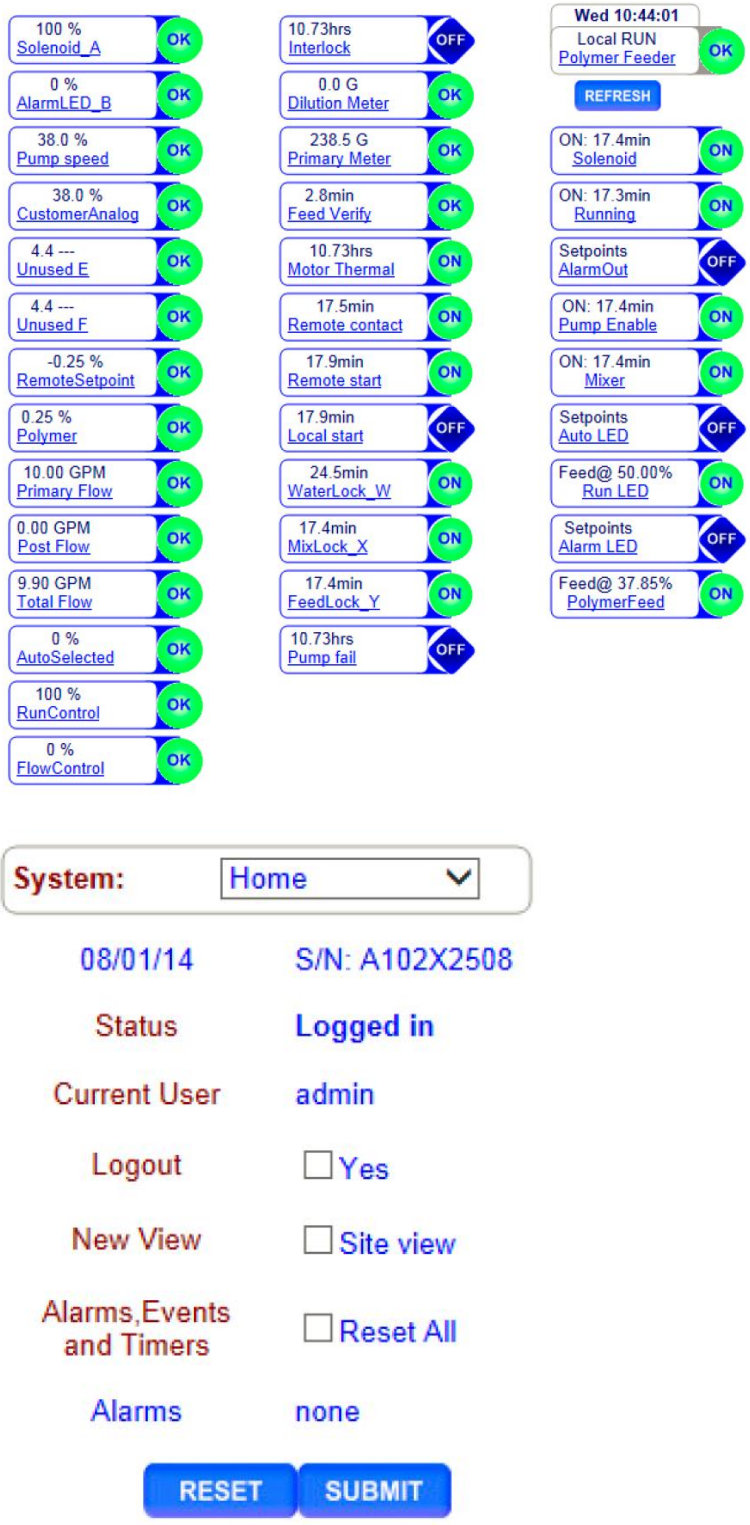
Refer to the separate Browser manual (Reference Documents) if you have not previously browsed a ProMix type controller. Browse the feeder with Internet Explorer or Mozilla. The reference manual will assist with browser setup of the controls.

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

Your application may require inputs/outputs that are only available in the Diagnostic View, which is accessible from 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.



2.6.2 Diagnostic View



2.7 Operation Configuration

2.7.1 Setpoints

Control of the neat polymer feed pump is set by the **System Start** and **Polymer Pump** switches located on the ProMix control panel door. The type of polymer, either **emulsion** or **Mannich**, and the operation, either **Inline** or **Batch,** are selected via the controller keypad or browser interface. Refer to the ProMix Mode and Polymer charts in section 1.6.

NOTE: In Batch mode the ProMix feeder adjusts the pump speed as the measured Primary & Post dilution flow rates vary to maintain the setpoint polymer concentration.

2.7.2 mA Outputs

The polymer feeder includes two DC isolated 4-20mA controller outputs. Typically, **Customer Analog:D** would be used for monitoring the pump control signal and is sent to a customer device as max pump speed or partial speed if signal is scaled. **PolymerPump:C** is used as the actual 4-20 mA feed control signal to the polymer pump.

2.7.3 Feed Verification

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

2.7.4 Pump Calibration

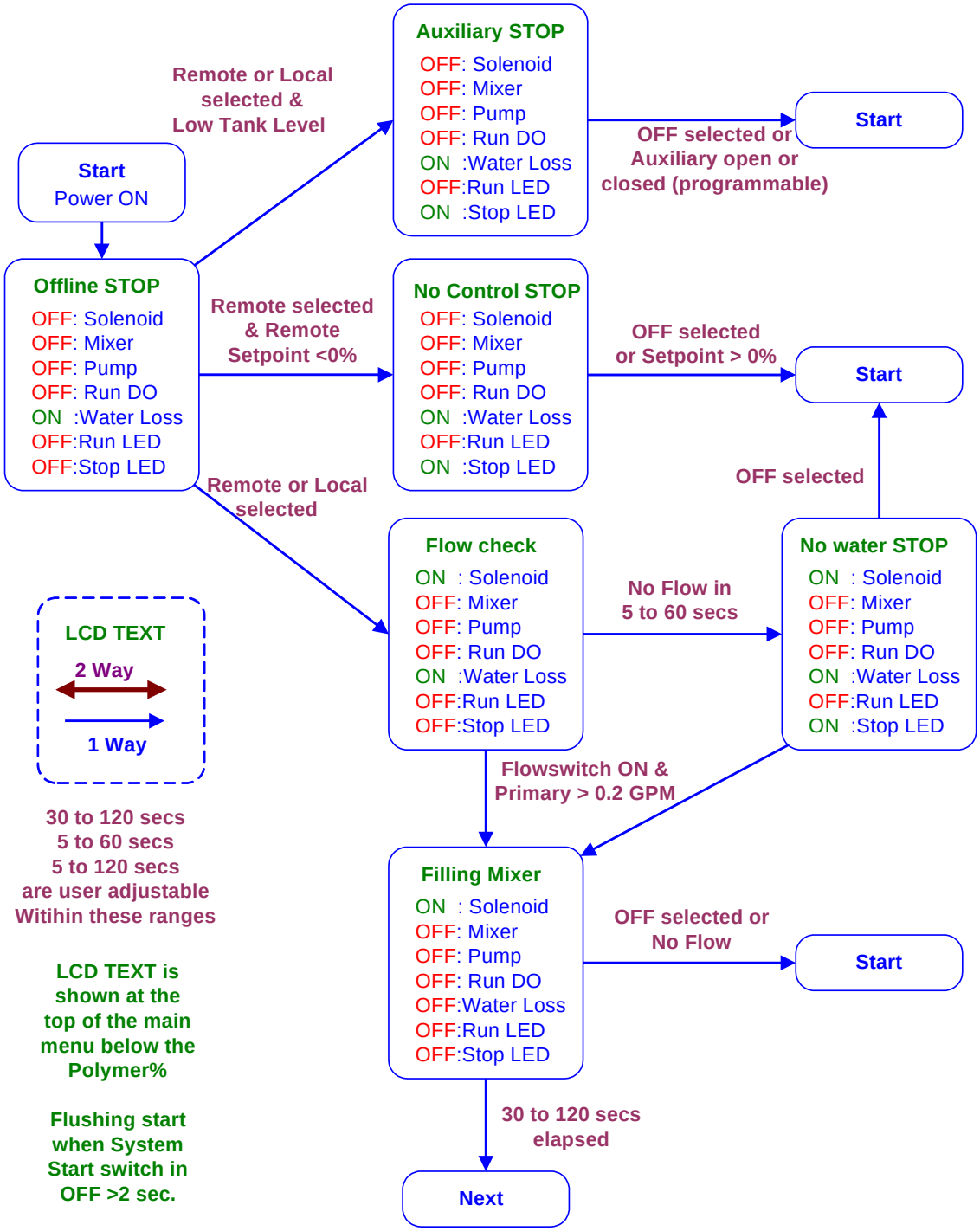
Before placing the ProMix system in operation the polymer pump should be calibrated at maximum dosing and the resultant gph rate entered into the configuration menu for pump size (see pump setting in section 2.4). A calibration cylinder is provided on most ProMix systems to assist in the calibration of the polymer pump. The following procedure should be followed to calibrate a GXLA type pump, assuming all installation requirements are met:

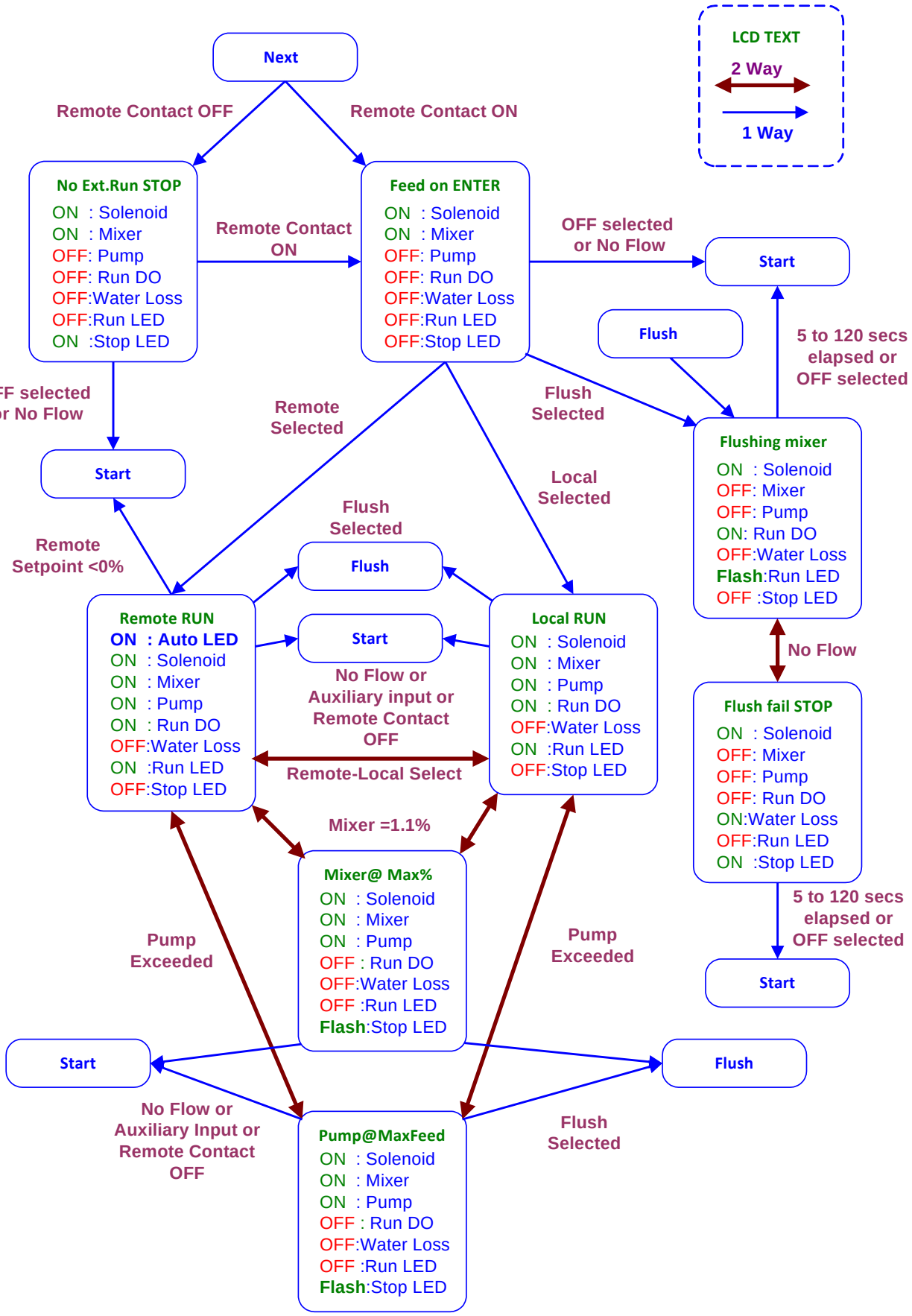
1. Configure pump for manual operation, set desired suction viscosity spm, and set stroke length to 100%.
2. Fill calibration cylinder to top mark by manipulating valves & pump to allow neat polymer into the cylinder. Manually fill the calibration cylinder if it is not possible to use the pump output.
3. Keep ProMix feeder connected to the actual system so that maximum application back pressure is realized.
4. Open primary dilution water valve so that the mix chamber fills when system is started.
5. Manipulate pump valves so that pump suction is connected to the calibration cylinder only.
6. Manually run pump at maximum rated strokes per minute and time the calibration column drawdown for at least 30 seconds taking note of beginning and end marks. Calculate the gph pump rate from the volume and time.

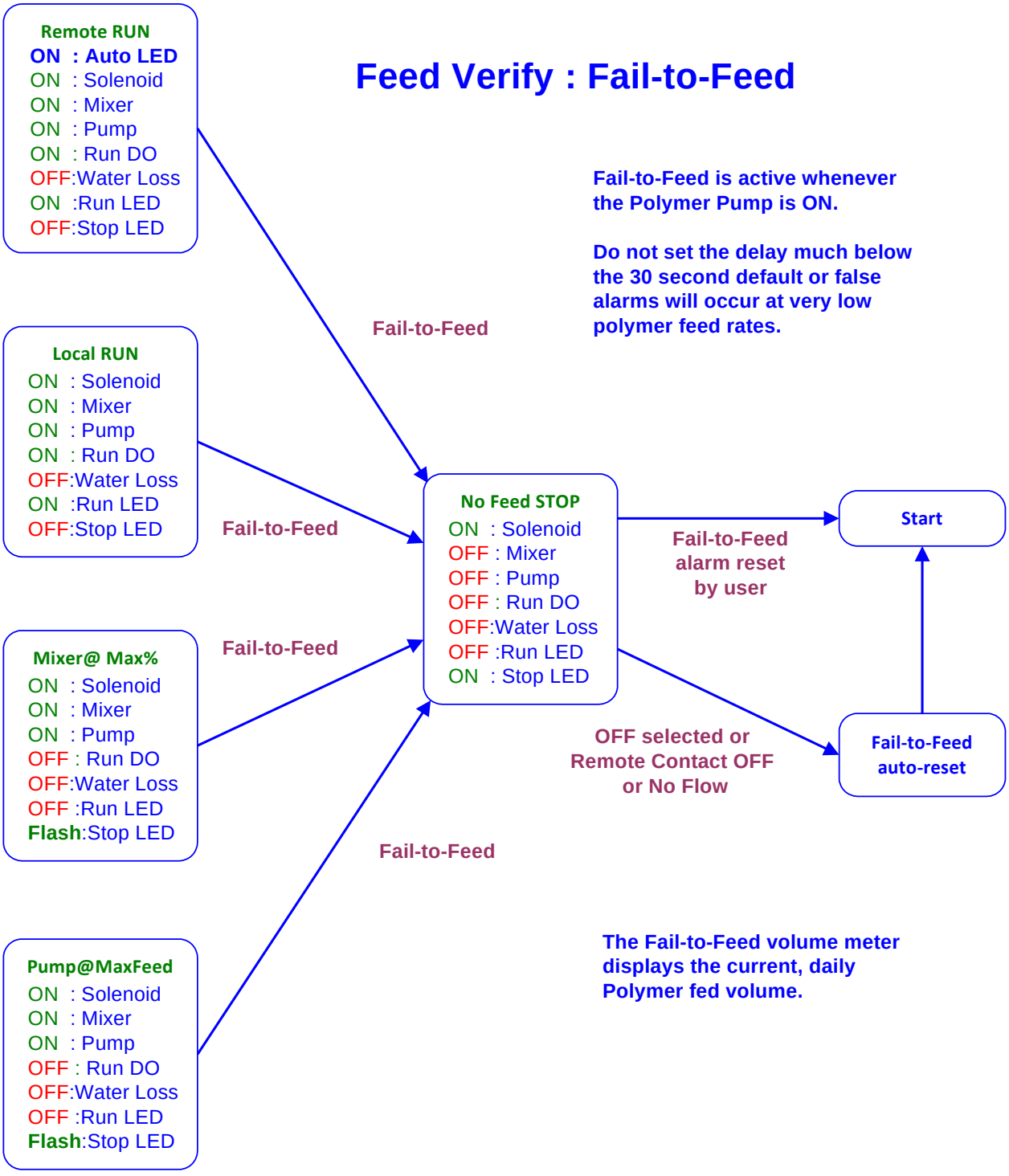
7. Using the controller keypad, enter the calculated pump rate in gph (see section 2.4 pump settings)
8. Place the pump back into the analog mode.

Follow the same procedure for a Seepex pump but do not use water for testing and/or calibration. Connect suction side of the Seepex pump to neat polymer or mineral oil only. Also use ‘other’ for the type of pump selected in the controller menu in section 2.4.

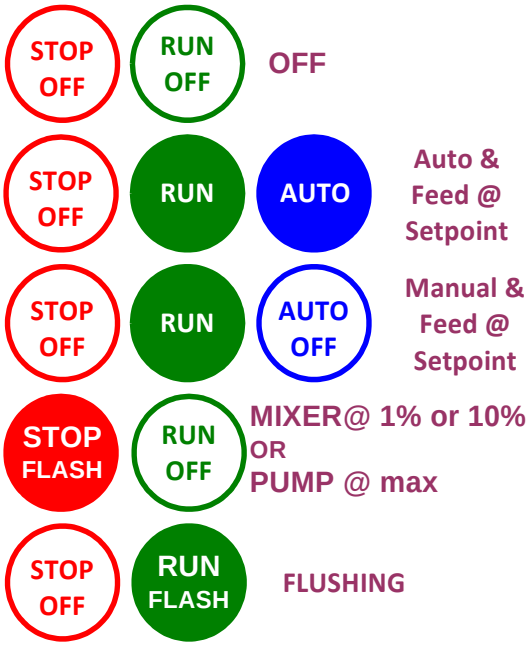
2.8 Feeder States




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


Feed Verify : Fail-to-Feed
Remote RUN
ON : Auto LED
ON : Solenoid
ON : Mixer
ON : Pump
ON : Run DO
OFF:Water Loss
ON :Run LED
OFF:Stop LED
Local RUN
ON : Solenoid
ON : Mixer
ON : Pump
ON : Run DO
OFF:Water Loss
ON :Run LED
OFF:Stop LED
Mixer@ Max%
ON : Solenoid
ON : Mixer
ON : Pump
OFF : Run DO
OFF:Water Loss
OFF :Run LED
Flash:Stop LED
Pump@MaxFeed
ON : Solenoid
ON : Mixer
ON : Pump
OFF : Run DO
OFF:Water Loss
OFF :Run LED
Flash:Stop LED
Fail-to-Feed
Fail-to-Feed
Fail-to-Feed
Fail-to-Feed
No Feed STOP
ON : Solenoid
OFF : Mixer
OFF : Pump
OFF : Run DO
OFF:Water Loss
OFF :Run LED
ON : Stop LED
Fail-to-Feed alarm reset by user
Start
OFF selected or Remote Contact OFF or No Flow
Fail-to-Feed auto-reset
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.
The Fail-to-Feed volume meter displays the current, daily Polymer fed volume.

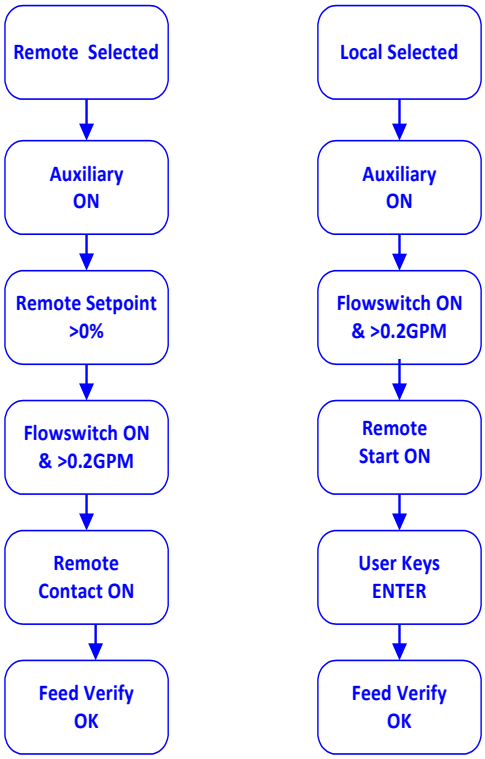
2.9 Enclosure Lights & Status



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 1.0% (emulsion) or 10.0% (Mannich) maximum mixer concentration.

Polymer Feed requires:



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 Remote or Local mode the user can transition between modes by changing the System Start door switch from one position to the other without pausing at OFF.

In both Local and Remote modes, the mixer may be filled but the polymer pump will not start unless the System Start switch is in the ON or Remote position.

2.10 Status Message Summary

LCD & Browser Status	Feeder State
System Off	ON-OFF-REMOTE switch at OFF
Auxiliary STOP	Can be programmed for any interlock purpose. Alarm in open or close programmable, e.g. tank level
No Control STOP	LOCAL-REMOTE switch at REMOTE and 4-20mA control level less than 0%. Exits on 4-20mA>0% or ON-OFF-REMOTE = OFF
Flow Check	Opens solenoid & waits user set seconds for Flowswitch contact closed AND Primary flow > 0.2 GPM. Exits on flow measured or ON-OFF-REMOTE = OFF
No Water STOP	Exits on flow measured or ON-OFF-REMOTE = OFF
Filling Mixer	Solenoid open & mixer OFF. Waits user set seconds to fill mixer. Exits on no flow measured or ON-OFF-REMOTE = OFF
No Ext.Run STOP	Polymer feed OFF, Mixer and Solenoid ON Exits on Remote Start contacts closed or ON-OFF-REMOTE = OFF
Feed on ENTER	LOCAL-REMOTE=LOCAL. Mixer & Solenoid ON.Exits on user keying ENTER, flush or ON-OFF-REMOTE = OFF
Flushing Mixer	Solenoid ON. Polymer feed & Mixer OFF. Exits on flush time expired or No flow or ON-OFF-REMOTE = OFF
Flush Fail STOP	No Flow measured while flushing. Exits on flush time expired or flow measured or ON-OFF-REMOTE = OFF

Polymer Pump Remote	Polymer feed @ 4-20mA input controlled setpoint. Exits on no flow, auxiliary contact, control<0%, flush, feed verify fail, Remote Start open, mixer @ >1% or 10%, pump at max SPM or ON-OFF-REMOTE = OFF.
Polymer Pump Local	Polymer feed @ user setpoint. Exits on no flow, auxiliary contact, flush, feed verify fail, Remote Start open, mixer @ >1% or 10%, pump at max SPM or ON-OFF-REMOTE = OFF.
No Feed STOP	Feed Verify fails to measure polymer feed. Exits on user reset of alarm, no flow, Remote Start open, ON-OFF-REMOTE = OFF
Mixer @ Max%	Controls so that mixer is at 1% polymer Exits on no flow, auxiliary contact, flush, feed verify fail, Remote Start open, pump at max SPM, <1% or 10% Polymer or ON-OFF-REMOTE = OFF.
Pump @ MaxFeed	Controls so that pump is at 100%. Exits on no flow, auxiliary contact, flush, feed verify fail, Remote Start open, pump at max speed, or ON-OFF-REMOTE = OFF

2.11 Troubleshooting Guide

Adjustment and bypass fixes to operational problems.

LCD & Browser Status	Operational Problem
Auxiliary 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 LOCAL-REMOTE to LOCAL 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.
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 Local or Remote 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 pump capacity is set correctly both in the pump and within the feeder. As in **Mixer @ Max%,** you can also reduce the Local or Remote 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.
Exceeding 1% or 10%	For Inline mode if the pump speed % or 4-20 mA input G causes high concentration it will display Exceeding 1% for emulsion polymer and 10% for Mannich. Enter a lower percent speed or decrease the 4-20 mA input.

3.0 SPARE PARTS & PREVENTIVE MAINTENANCE

3.1 GAMMA XL (GXLA) Pump Spare Parts

P/N:	*Description:*
1027082	GXLA1020 Spare Parts Kit**
1000249	GXLA1020 Diaphragm
1017393	GXLA1020 Liquid End
1027083	GXLA0730 Spare Parts Kit**
1000250	GXLA0730 Diaphragm
1017404	GXLA0730 Liquid End
1027084	GXLA0450 Spare Parts Kit**
1000251	GXLA0450 Diaphragm
1025138	GXLA0450 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 Pump Spare Parts

Consult Factory

3.3 PVC Mixing Chamber Spare Parts

P/N:	*Description:*
7746474	Seal, Mech, Shaft, 1/2", ProMix-U
7747244	Injection Valve, SG, ProMix
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
7745788	0-160PSI, Gauge, SS, 2-1/2, Bottom MTD
7746152	0-160PSI 316SS Back gauge & CPVC/PTFE Isolator
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:*
7747276	C3C Overload 10-16 Amps Adjustable
7746223	CBI UL 489 Circuit Breaker 20 Amp
7500413	Littlefuse 2.5A 250V for Circuit Board
7746094	GLD2 Time Delay Fuse

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 (Gamma XL Pump)		Every 3 Months (Approx 30% continuous operation.)
Check the liquid end for tightness (Gamma XL 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)

MAINTENANCE		
Description / Task	**Remarks**	**Frequency**
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 1-1/2 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 is a ball bearing motor. The bearings have been lubricated at the factory. Motors that do not have regrease capability are factory lubricated for the normal life of the bearings.

Relubrication Intervals (For motors with regrease capability)

New motors that have been stored for a year or more should be relubricated. Lubrication is also recommended at these intervals:

Relubrication Intervals

NEMA (IEC) Frame Size	Rated Speed (RPM)			
	3600	1800	1200	900
Up to 210 incl. (132)	5500Hrs.	12000Hrs.	18000Hrs.	22000Hrs.
Over 210 to 280 incl. (180)	3600Hrs.	9500Hrs.	15000Hrs.	18000Hrs.
Over 280 to 360 incl. (225)	*2200Hrs.	7400Hrs.	12000Hrs.	15000Hrs.
Over 360 to 5000 incl.(300)	*2200Hrs.	3500Hrs.	7400Hrs.	10500Hrs.

* Lubrication interval for 6313 or 6314 bearings that are used in 360 through 5000 frame, 2 pole motors. If roller bearings are used, bearings must be lubricated more frequently, divide the interval by 2.

Lubricant

Baldor motors are pregreased, normally with Polyrex EM (Exxon Mobil). If other greases are preferred, check with a local Baldor Service Center for recommendations.

Procedure

Clean the grease fitting (or area around grease hole, if equipped with slotted grease screws). If motor has a purge plug, remove it. Motors can be regreased while stopped (at less than 80°C) or running.

Apply grease gun to fitting (or grease hole). Too much grease or injecting grease to quickly can cause premature bearing failure. Slowly apply the recommended amount of grease, taking 1 minute or so to apply. Operate motor for 20 minutes, then reinstall purge plug if previously removed.

Caution: Keep grease clean. Mixing dissimilar grease is not recommended.

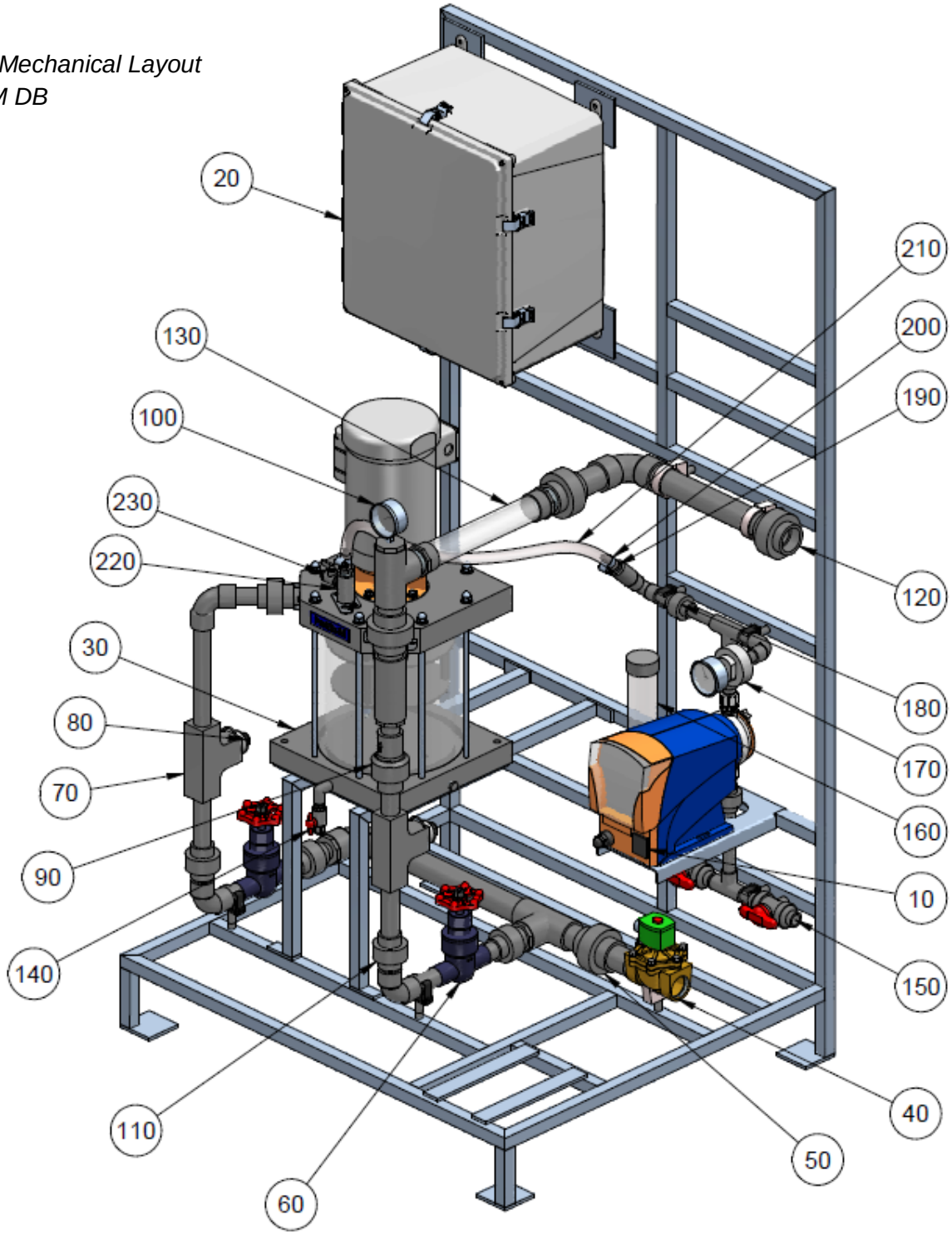
Amount of Grease to Add

Frame Size NEMA (IEC)	Weight of grease to add ounce (gram)	Volume of grease to add	
		inches^3	teaspoon
Up to 210 incl. (132)	0.30 (8.4)	0.6	2.0
Over 210 to 280 incl. (180)	0.61 (17.4)	1.2	3.9
Over 280 to 360 incl. (225)	0.81 (23.1)	1.5	5.2
Over 360 to 5000 incl.(300)	2.12 (60.0)	4.1	13.4

Appendix A – DB & PB Series Bill of Material

Mechanical & Electrical List

General Mechanical Layout
ProMix M DB

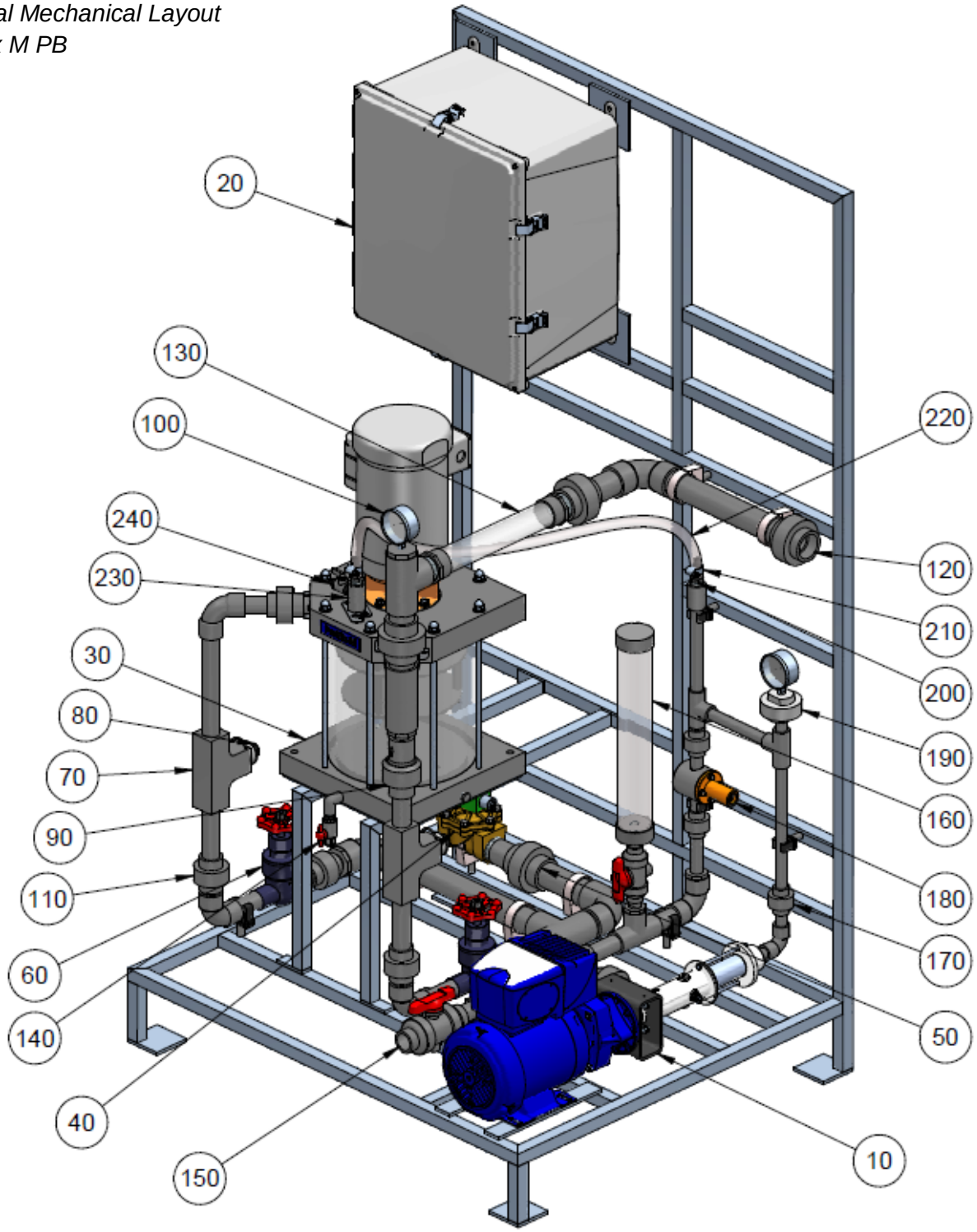


PROMIX M DB

PROMIX M (DB SERIES) BILL OF MATERIAL

ITEM	PART DESCRIPTION	PART NO	1048382	104/8383	1048384	1048385
10	GXLA 1020 SERIES PUMP ON HV2 SETTING	GXLAUS1020PVT4V000UV4030EN	X			
	GXLA 1020 SERIES PUMP	GXLAUS1020PVT4V000UV4030EN		X		
	GXLA 0730 SERIES PUMP	GXLAUS0730PVT4V000UV4030EN			X	
	GXLA 0450 SERIES PUMP	GXLAUS1020PVT2V000UV4030EN				X
20	CONTROL PANEL	1048418	X	X	X	X
30	PROMIX M MIXING CHAMBER	7747253	X	X	X	X
40	SOLENOID VALVE, 1-1/2", FNPT, BRASS	7746526	X	X	X	X
50	UNION, 1-1/2", SOCKET, PVC/EPDM, SCH. 80	7744564	X	X	X	X
60	GLOBE VALVE, 1", SOCKET, PVC/EPDM	1048507	X	X	X	X
70	TEE, FLOW SENSOR, 1" SKT, PVC	1048506	X	X	X	X
80	FLOW SENSOR, 3/4"	7746524	X	X	X	X
90	CHECK VALVE, 1", SKT, PVC	1048408	X	X	X	X
100	PRESSURE GAUGE, 316 SST, 0 – 100 PSI	7741084				X
	PRESSURE GAUGE, 316 SST, 0 – 160 PSI	7745788	X	X	X	
110	UNION, 1", SOCKET, PVC/VITON, SCH.80	7744563	X	X	X	X
120	UNION, 1-1/2", FNPT, PVC/VITON, SCH. 80	7744559	X	X	X	X
130	STATIC MIXER, 1-1/2", MNPT, CLEAR PVC, SCH. 40, 6 ELE	7746529	X	X	X	X
140	LAB COCK, 1/4", FNPT, PVC/VITON	7746331	X	X	X	X
150	BALL VALVE, 1/2", PVC/VITON, SCH. 80, TYPE 21	7000309	X	X	X	X
160	CALIBRATION COLUMN, PVC, 500 ML	7500139	X	X	X	X
170	PRESSURE GAUGE, 316 SST, CPVC/PTFE ISOLATOR, 0 – 100 PSI	7746151				X
	PRESSURE GAUGE, 316 SST, CPVC/PTFE ISOLATOR, 0 – 160 PSI	7746152	X	X	X	
180	UNION, 1/2", SOCKET, PVC/VITON, SCH. 80	7744562	X	X	X	X
190	HOSE BARB ADAPTER, 1/2" ID TUBING X MNPT, PVC	7740541	X	X	X	X
200	HOSE CLAMP, 1/2", SST	7741354	X	X	X	X
210	TUBING, 1/2" ID, PVC, NYLON BRAID	7744091	X	X	X	X
220	INJECTION VALVE	7747244	X	X	X	X
230	BLEED VALVE, 1/8", PVC/VITON	7747244	X	X	X	X

General Mechanical Layout
ProMix M PB

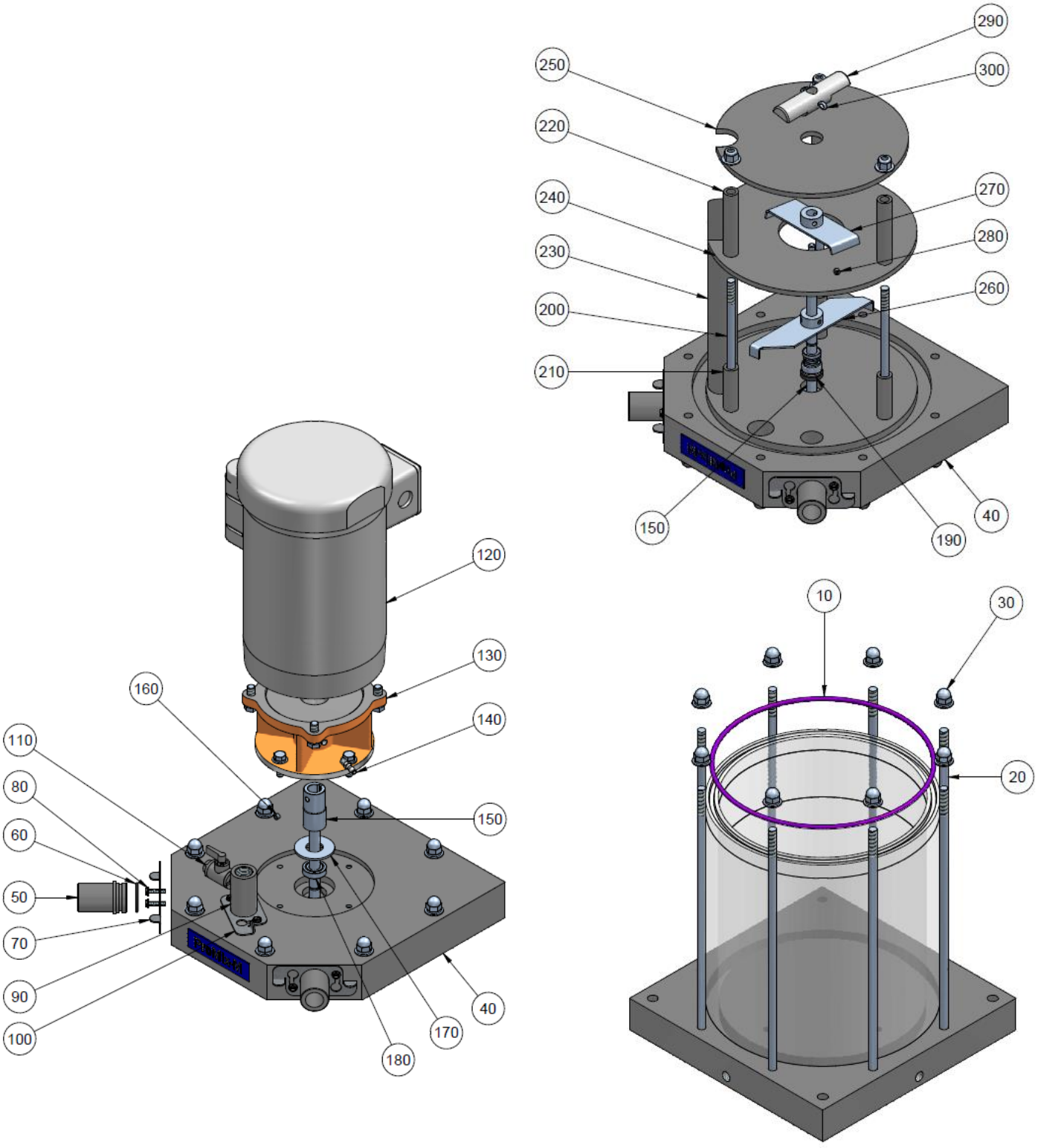


PROMIX M PB

PROMIX M (PA SERIES) BILL OF MATERIAL

ITEM	PART DESCRIPTION	PART NO	1048379	1048380	1048380
10	PUMP, 5 GPH, SEEPEX MODEL MD-003-012	1048415	X		
	PUMP, 10 GPH, SEEPEX MODEL MD-006-012	1048416		X	
	PUMP, 24 GPH, SEEPEX MODEL MD-012-012	1048417			X
20	CONTROL PANEL	1048419	X	X	X
30	PROMIX M MIXING CHAMBER	7747253	X	X	X
40	SOLENOID VALVE, 1-1/2", FNPT, BRASS	7756526	X	X	X
50	UNION, 1-1/2", SOCKET, PVC/EPDM, SCH. 80	7744564	X	X	X
60	GLOBE VALVE, 1", SOCKET, PVC/EPDM	1048407	X	X	X
70	TEE, FLOW SENSOR, 1" SKT, PVC	1048506	X	X	X
80	FLOW SENSOR, 3/4"	7746524	X	X	X
90	CHECK VALVE, 1", SKT, PVC	1048408	X	X	X
100	PRESSURE GAUGE, 316 SST, 0 – 160 PSI	7745788	X	X	X
110	UNION, 1", SKT, PVC	7744563	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, 500 ML	7500139	X	X	
	CALIBRATION COLUMN, PVC, 1000 ML	7500130			X
170	UNION, 1/2", SOCKET, PVC/VITON, SCH. 80	7744562	X	X	X
180	BACK PRESSURE VALVE, 1/2", SOCKET, PVC, 0 – 150 PSI	1019883	X	X	X
190	PRESSURE GAUGE, 316SST, CPVC/PTFE ISOLATOR, 0 – 160 PSI	7745318	X	X	X
200	HOSE BARB ADAPTER, 1/2" ID TUBING X MNPT, PVC	7740541	X	X	X
210	HOSE CLAMP, 1/2", SST	7741354	X	X	X
220	TUBING, 1/2", ID, PVC, NYLON BRAID	7744091	X	X	X
230	INJECTION VALVE	7747244	X	X	X
240	BLEED VALVE, 1/8", PVC/VITON	7747237	X	X	X

P/N: 7747253 Mixing Chamber Components



PROMIX M - MIXING CHAMBER BILL OF MATERIALS P/N: 7747253

ITEM	USA P/N	QTY	DESCRIPTION
10	7746491	1	O-RING, CHAMBER, VITON, PROMIX-M
20	7747246	8	ROD, 316SS, 3/8-16 X 14.75, PROMIX-U
30	7746492	8	NUT, ACORN, 3/8-16, 18-8 SST
40	7747252	1	PLATE, TOP, PVC, 1.75, PROMIX-M, SG
50	7747270	2	INSERT, MALE, 1”, PVC, PROMIX-M
60	7747288	2	O-RING, VITON, 1.174 ID X .103 CS, AS568B-123
70	7747272	2	RETAINER, MALE INSERT, 1” 316 SST, PROMIX-M
80	7747238	6	SCREW, 10-24X3/4”, 18-8, HEX HEAD WITH WASHER
90	7747244	1	INJECTION VALVE, SG, PROMIX
100	7747239	1	RETAINER, INJECTION VALVE, 316 SST
110	7747237	1	VALVE, BALL, 1/8”, MANPT X FNPT, PVC, VITON
120	1105295	1	MOTOR, 1-1/2 HP, TEFC, 115/230 VAC, 1 PH, 56C, BALDOR VWDL3414
130	7746478	1	FLANGE, MOTOR, C56/135, PROMIX-M
140	7500346	1	HOSE BARB, 1/16” MNPT X 3/16” ID, PVDF
150	7746484	1	SHAFT, MIXER, 303SS, PROMIX-M
160	851405	1	SCREW, SET, 316SS, 1/4-28 PROMIX-U
170	7746473	1	WASHER, 316SS. 1.88X.81X.09, PROMIX-M
180	7746472	1	BEARING, 440SS, 1.125X.5X.31, PROMIX-M
190	7746474	1	SEAL, MECH, SHAFT, 304SS, 1/2", PROMIX-U
200	7746497	3	ROD, 316SS, 3/8-16 X 8, PROMIX-M
210	7747249	3	SPACER, TOP BAFFLE, PROMIX-M
220	7747248	3	SPACER, BOTTOM BAFFLE, PROMIX-M
230	7747247	1	PIPE, DISCHARGE, PVC, 3/4", PROMIX-U
240	7747251	1	BAFFLE, TOP, PVC, .25, PROMIX-S
250	7747250	1	BAFFLE, BOTTOM, PVC, .25, PROMIX-S
260	1108105	1	BLADE, PRIMARY, 316SS, PROMIX-M (PFC)
270	1108106	1	BLADE, SECONDARY, 316SS, PROMIX-M (PFC)
280	7746476	4	SCREW, SET, 316SS, 1/4-28 PROMIX-U
290	7746481	1	PROP, AGITATOR, CPVC, PROMIX-M
300	7746475	1	PIN, COTTER, 316 SST, 3/16 D X 1-1/4 L, MCMASTER 98355A235

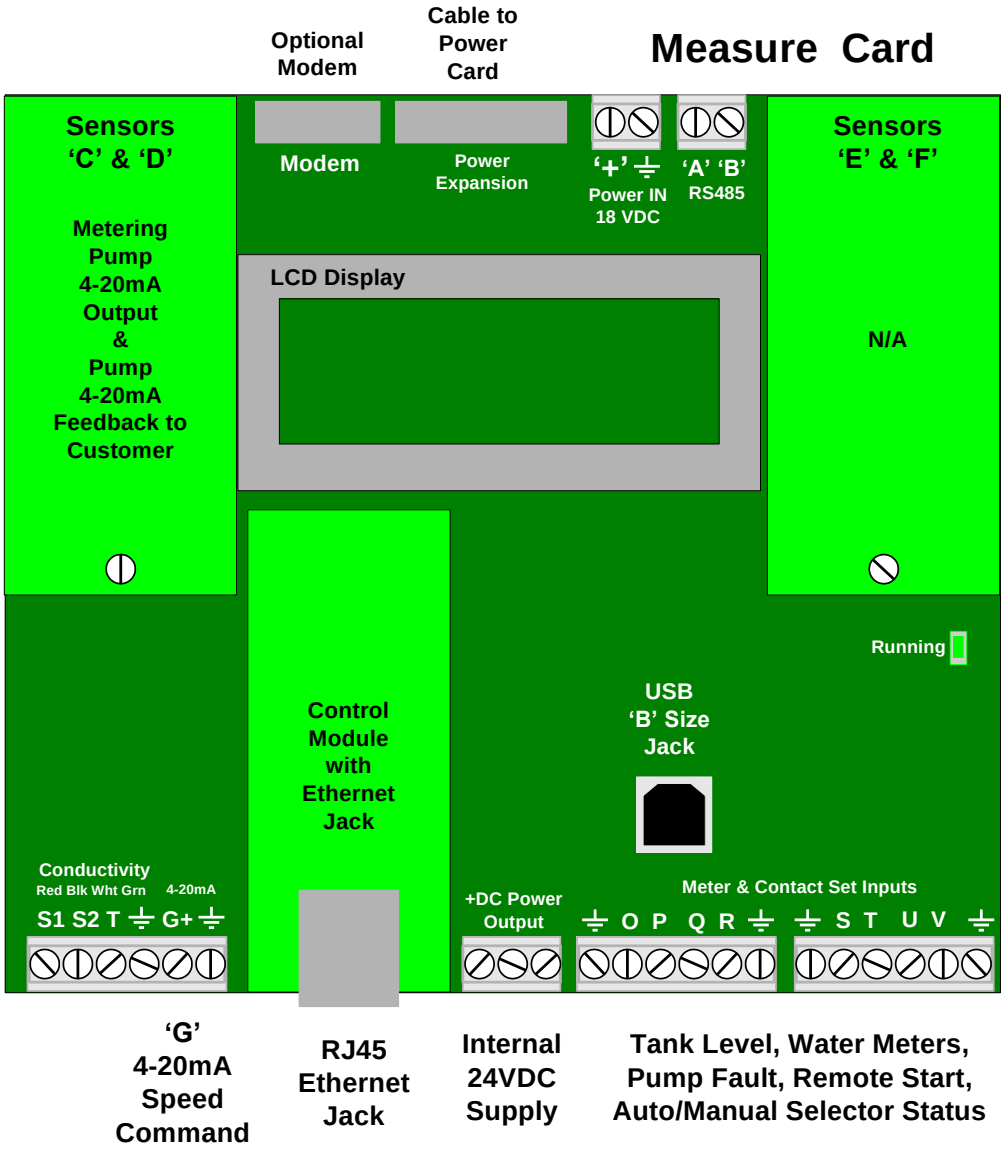
Appendix B – Control Panel “B Controls”

B.1 Controller Board Layout

The controller consists of three circuit boards, a front **Measure** circuit board, a back **Power** board, and an auxiliary digital input 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.

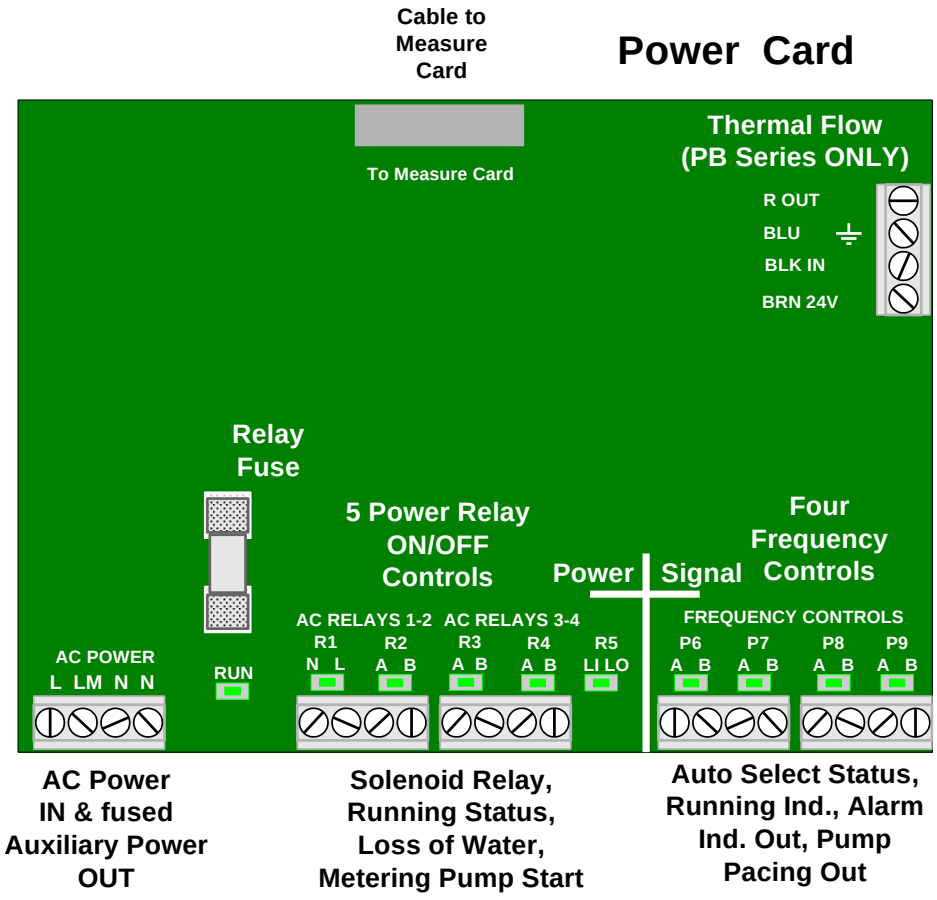


Ethernet CAT5 LAN cabling is limited to a maximum of 300ft / 100m from controller to access hub. Do not exceed this limit.

Terminals ‘O’ through ‘V’ and a ground terminal. 5VDC limited by 10K puts 1/2mA through a closed contact set.

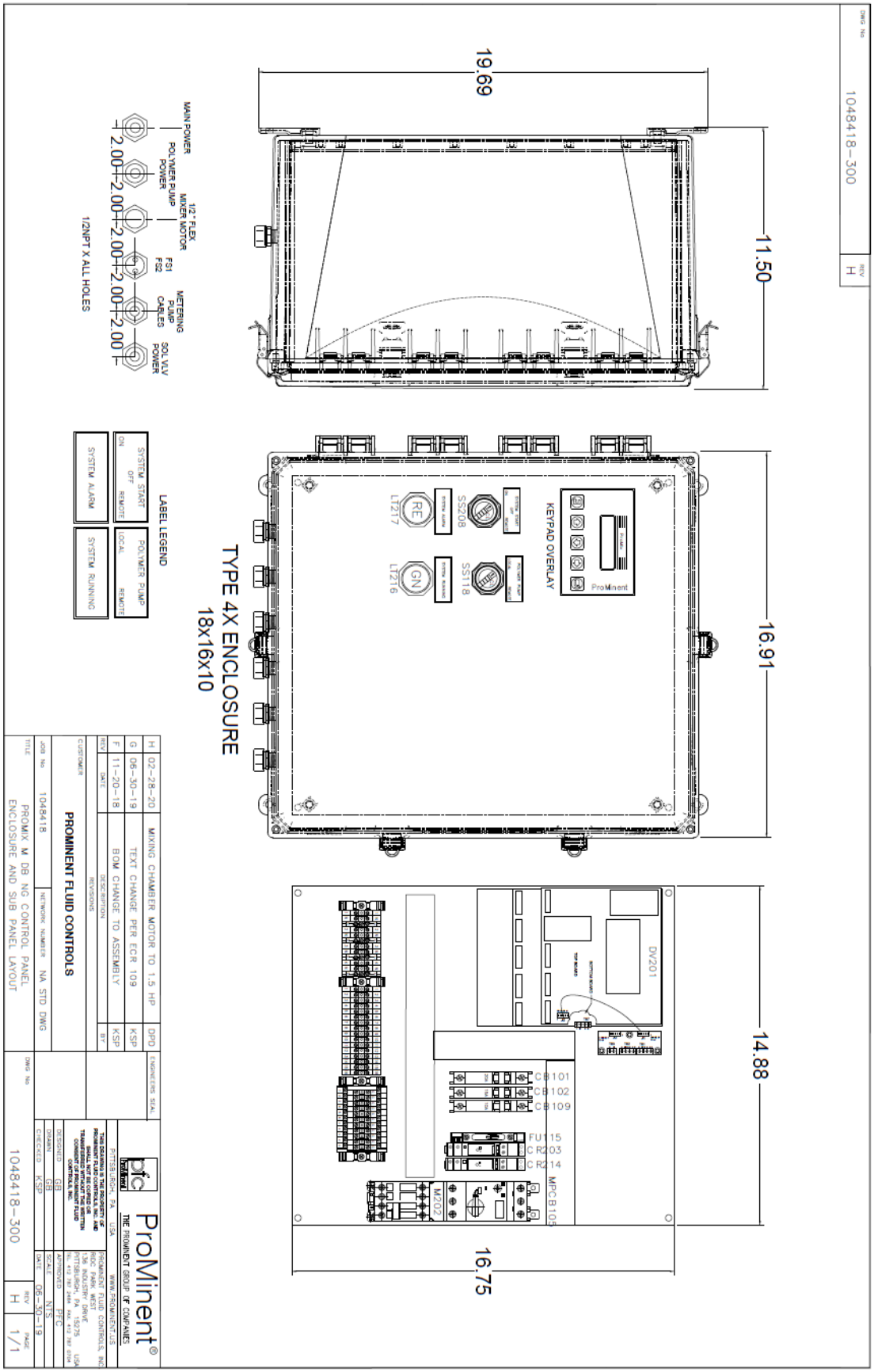
Hall effect Turbines and Paddlewheel water meters are powered by the 15-22VDC controller supply, thermally fused at 100mA.

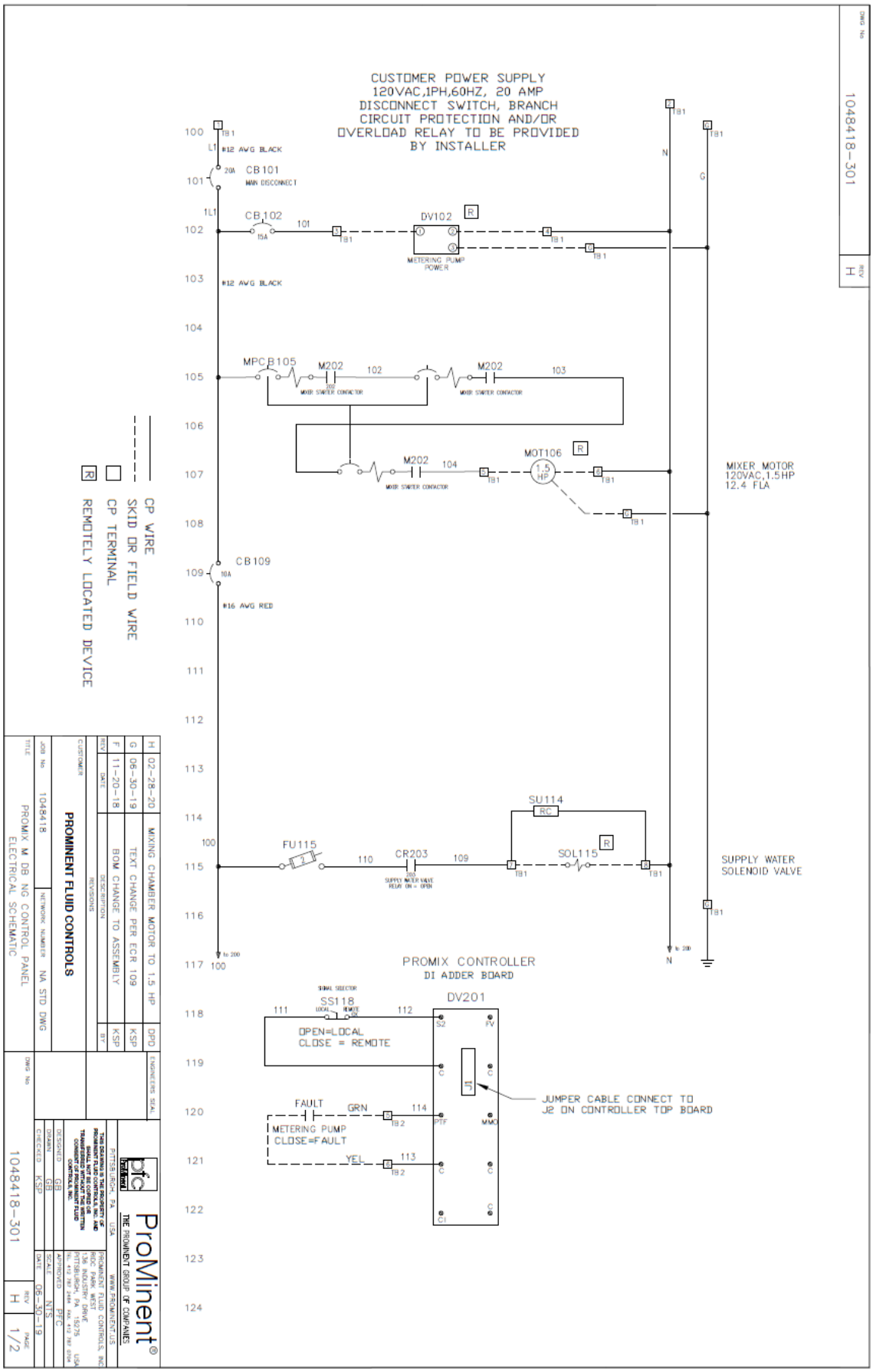
The back, **Power** circuit board has 5 ON/OFF Power Relays, 4 Signal Frequency Feed outputs and the controller power supply.

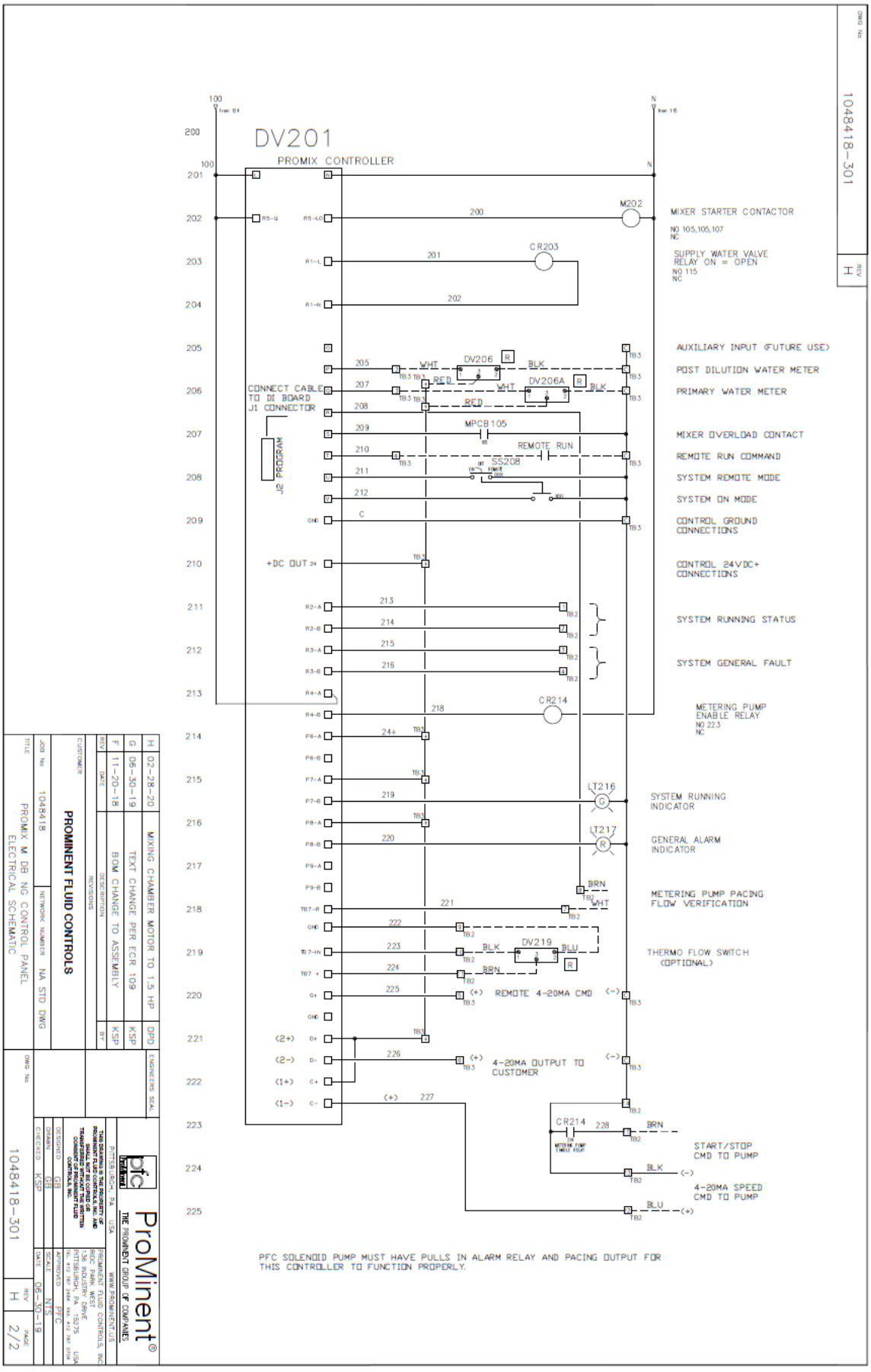


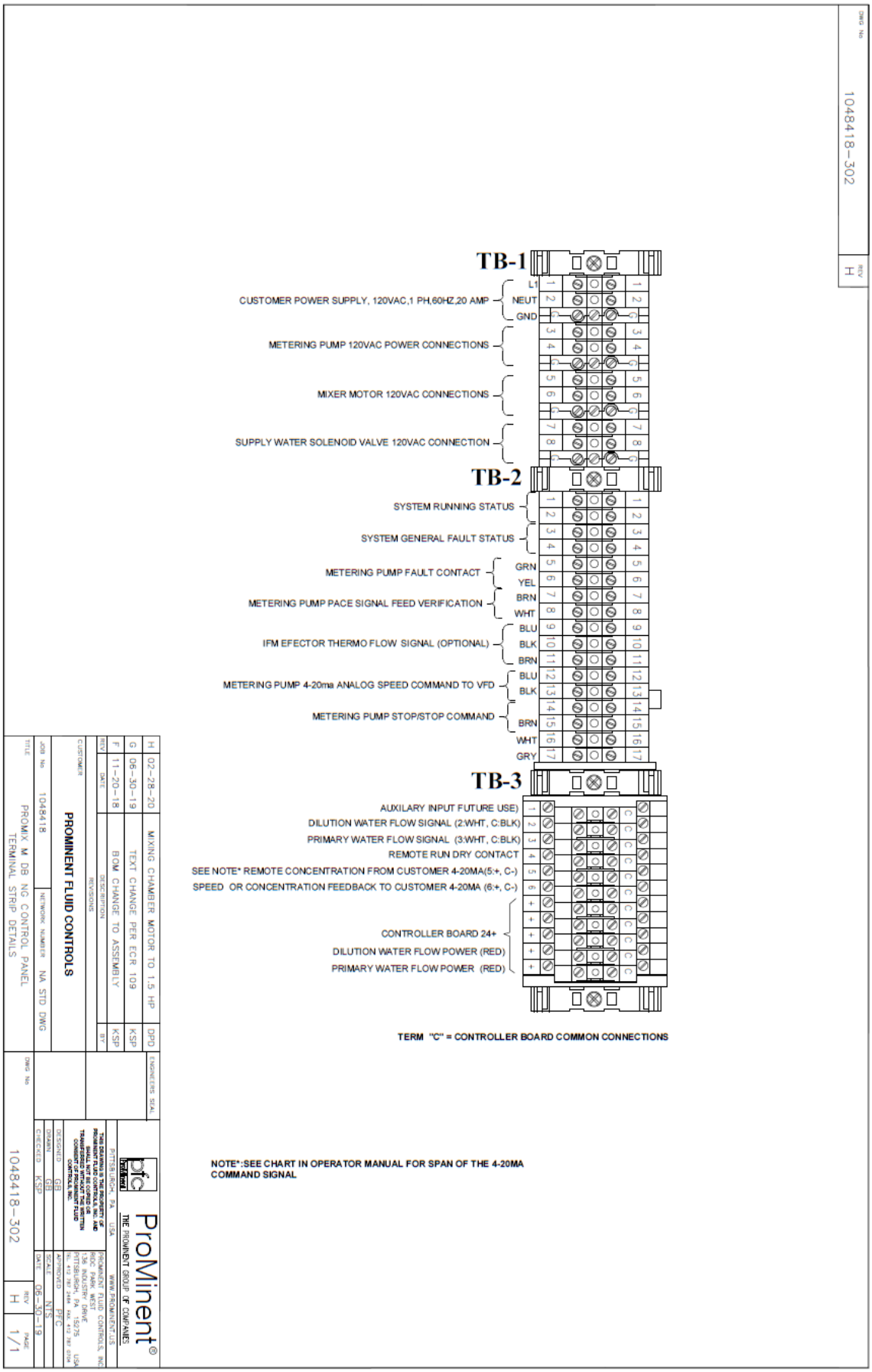
Auxiliary digital input card – only PTF and S2 required for Batch or Inline control. Connect cable from Digital card J1 to Measure Card J2.

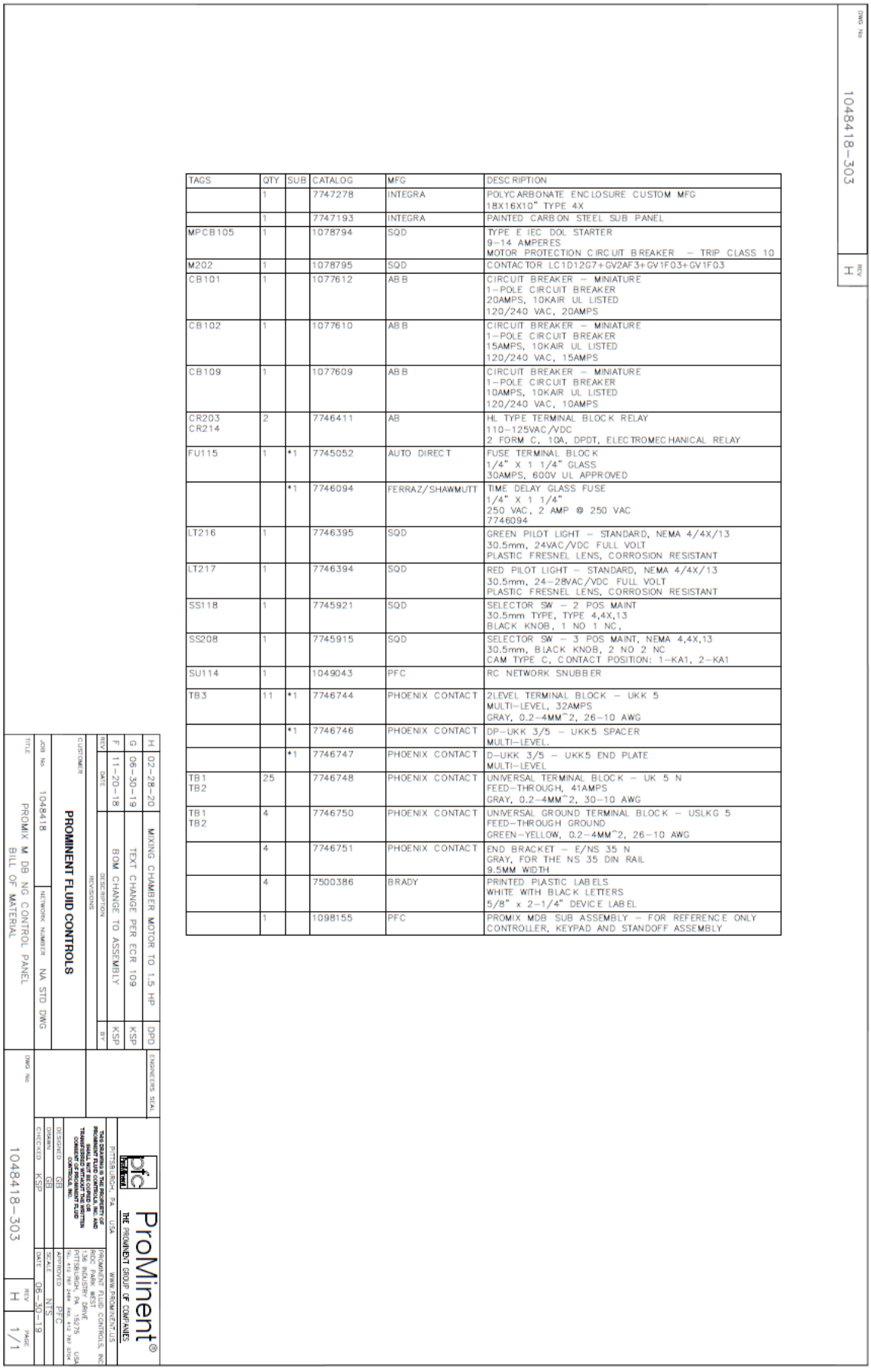
B.2 Controller Wiring (DB/PB Series)



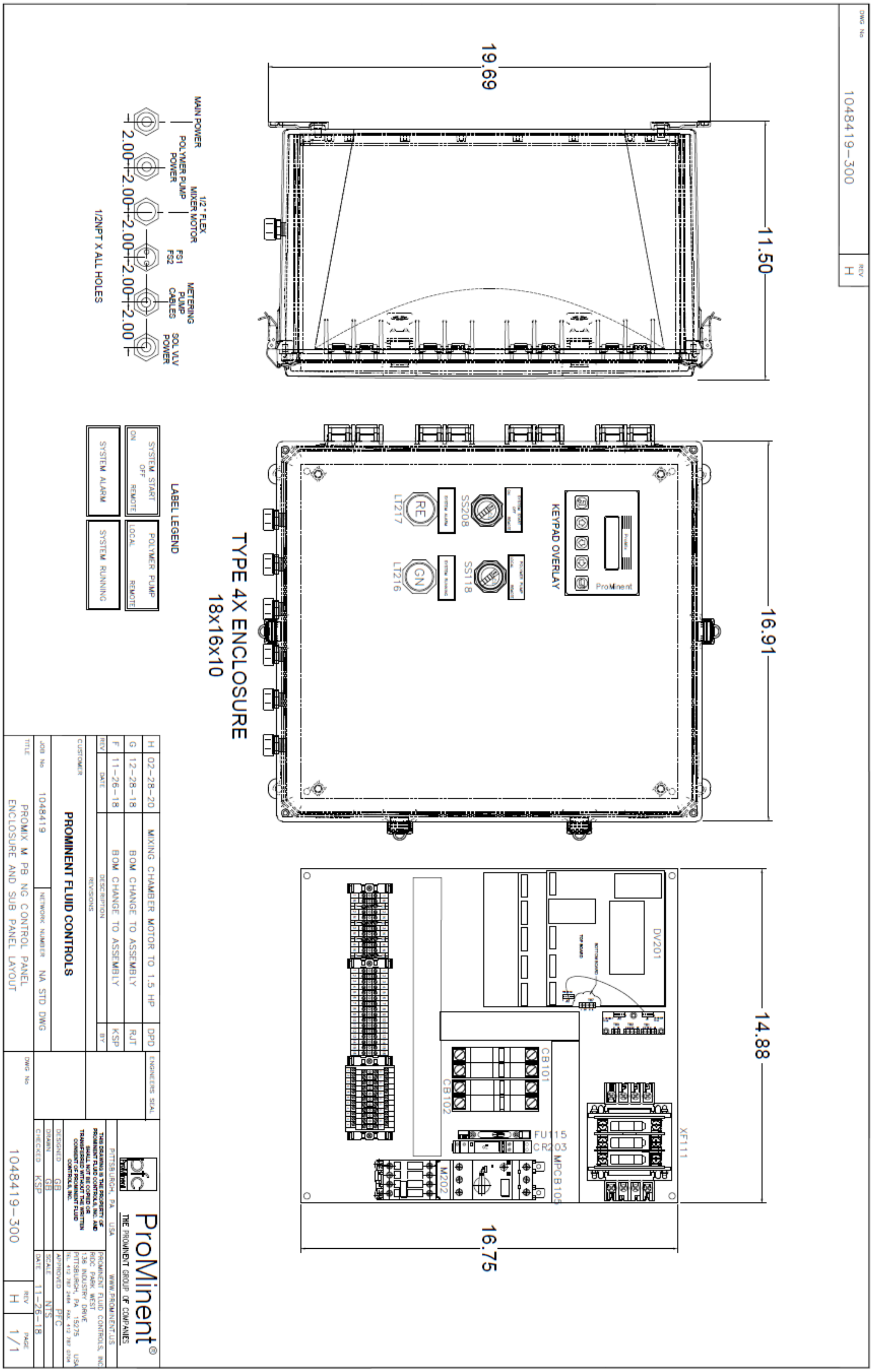

CUSTOMER POWER SUPPLY
120VAC,1PH,60HZ, 20 AMP
DISCONNECT SWITCH, BRANCH
CIRCUIT PROTECTION AND/OR
OVERLOAD RELAY TO BE PROVIDED
BY INSTALLER
CB101
MAN DISCONNECT
CB102
DV102
METERING PUMP POWER
MPCB105
M202
MOT106
1.5 HP
MIXER MOTOR
120VAC,1.5HP
12.4 FLA
CB109
SU114
FU115
CR203
SOL115
SUPPLY WATER
SOLENOID VALVE
PROMIX CONTROLLER
DI ADDER BOARD
DV201
SS118
OPEN=LOCAL
CLOSE = REMOTE
METERING PUMP
CLOSE=FAULT
JUMPER CABLE CONNECT TO
J2 ON CONTROLLER TOP BOARD
CP WIRE
SKID OR FIELD WIRE
CP TERMINAL
REMOTELY LOCATED DEVICE
PROMIX M DB NG CONTROL PANEL
ELECTRICAL SCHEMATIC
PROMINENT FLUID CONTROLS
1048418-301

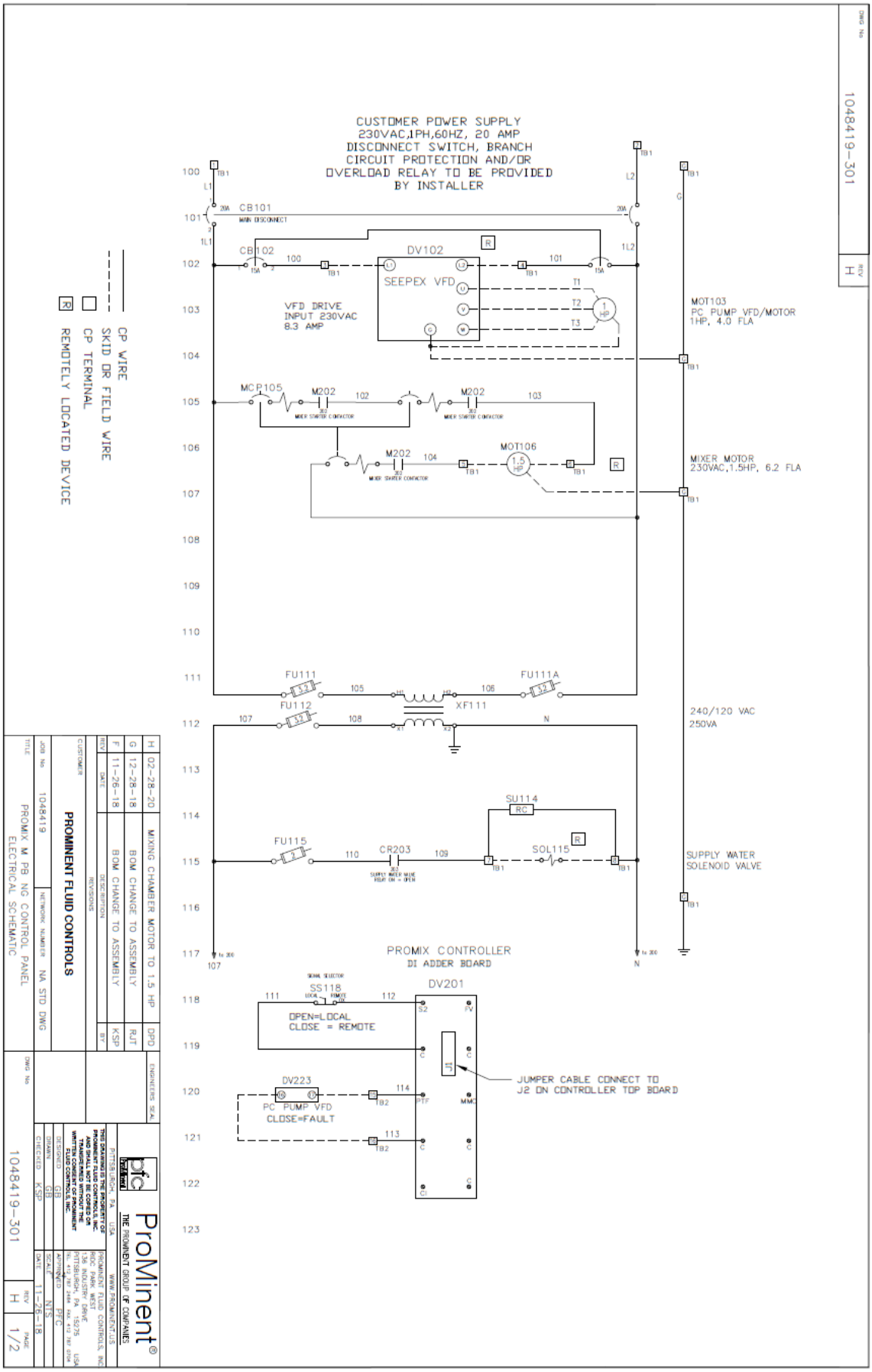

DV201
PROMIX CONTROLLER
MIXER STARTER CONTACTOR
SUPPLY WATER VALVE RELAY ON = OPEN
AUXILIARY INPUT (FUTURE USE)
POST DILUTION WATER METER
PRIMARY WATER METER
MIXER OVERLOAD CONTACT
REMOTE RUN COMMAND
SYSTEM REMOTE MODE
SYSTEM ON MODE
CONTROL GROUND CONNECTIONS
CONTROL 24VDC+ CONNECTIONS
SYSTEM RUNNING STATUS
SYSTEM GENERAL FAULT
METERING PUMP ENABLE RELAY
SYSTEM RUNNING INDICATOR
GENERAL ALARM INDICATOR
METERING PUMP PACING FLOW VERIFICATION
THERMO FLOW SWITCH (OPTIONAL)
REMOTE 4-20MA CMD
4-20MA OUTPUT TO CUSTOMER
START/STOP CMD TO PUMP
4-20MA SPEED CMD TO PUMP
CONNECT CABLE TO DI BOARD J1 CONNECTOR
J2 PROGRAM
PFC SOLENOID PUMP MUST HAVE PULLS IN ALARM RELAY AND PACING OUTPUT FOR THIS CONTROLLER TO FUNCTION PROPERLY.
PROMINENT FLUID CONTROLS
PROMIX M DB NG CONTROL PANEL ELECTRICAL SCHEMATIC
1048418-301

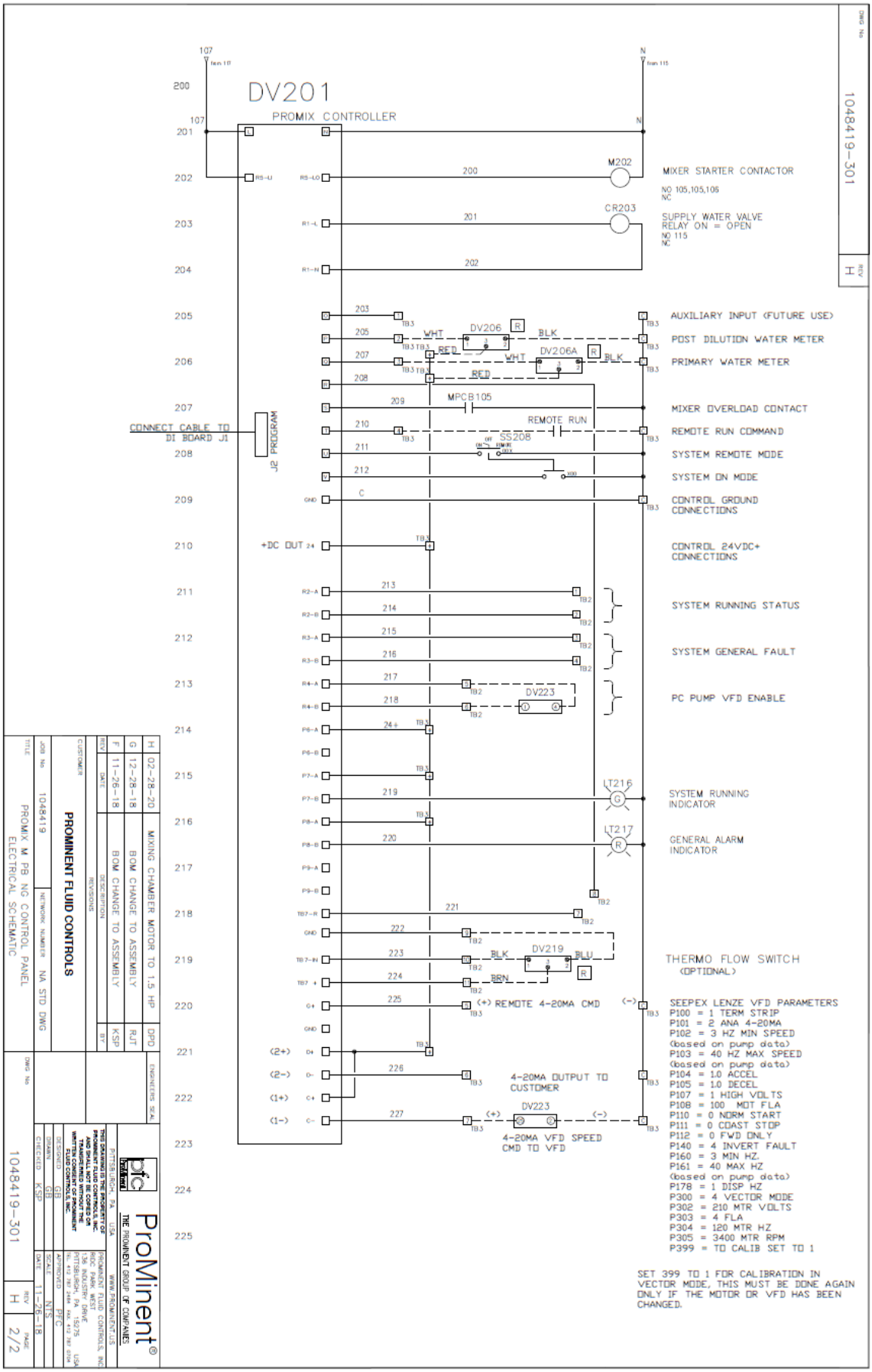

DWG No
1048418-302
REV
H
TB-1
CUSTOMER POWER SUPPLY, 120VAC,1 PH,60HZ,20 AMP
L1
NEUT
GND
METERING PUMP 120VAC POWER CONNECTIONS
MIXER MOTOR 120VAC CONNECTIONS
SUPPLY WATER SOLENOID VALVE 120VAC CONNECTION
TB-2
SYSTEM RUNNING STATUS
SYSTEM GENERAL FAULT STATUS
METERING PUMP FAULT CONTACT
GRN
YEL
METERING PUMP PACE SIGNAL FEED VERIFICATION
BRN
WHT
IFM EFECTOR THERMO FLOW SIGNAL (OPTIONAL)
BLU
BLK
BRN
METERING PUMP 4-20ma ANALOG SPEED COMMAND TO VFD
BLU
BLK
METERING PUMP STOP/STOP COMMAND
BRN
WHT
GRY
TB-3
AUXILARY INPUT FUTURE USE)
DILUTION WATER FLOW SIGNAL (2:WHT, C:BLK)
PRIMARY WATER FLOW SIGNAL (3:WHT, C:BLK)
REMOTE RUN DRY CONTACT
SEE NOTE* REMOTE CONCENTRATION FROM CUSTOMER 4-20MA(5:+, C-)
SPEED OR CONCENTRATION FEEDBACK TO CUSTOMER 4-20MA (6:+, C-)
CONTROLLER BOARD 24+
DILUTION WATER FLOW POWER (RED)
PRIMARY WATER FLOW POWER (RED)
TERM "C" = CONTROLLER BOARD COMMON CONNECTIONS
NOTE*:SEE CHART IN OPERATOR MANUAL FOR SPAN OF THE 4-20MA COMMAND SIGNAL
REV
DATE
DESCRIPTION
BY
ENGINEERS SEAL
H 02-28-20 MIXING CHAMBER MOTOR TO 1.5 HP DPD
G 06-30-19 TEXT CHANGE PER ECR 109 KSP
F 11-20-18 BOM CHANGE TO ASSEMBLY KSP
REVISIONS
CUSTOMER
PROMINENT FLUID CONTROLS
JOB No 1048418
NETWORK NUMBER NA
STD DWG
TITLE
PROMIX M DB NG CONTROL PANEL
TERMINAL STRIP DETAILS
DWG No
1048418-302
REV H
PAGE 1/1
DRAWN GB
CHECKED KSP
DESIGNED GB
APPROVED PFTC
SCALE NTS
DATE 06-30-19
ProMinent
THE PROMINENT GROUP OF COMPANIES
PROMINENT FLUID CONTROLS, INC.
136 INDUSTRY DRIVE
PITTSBURGH, PA 15275 USA
TEL 412 787 2484 FAX 412 788 0514
WWW.PROMINENT.US
PITTSBURGH, PA USA
THIS DRAWING IS THE PROPERTY OF PROMINENT FLUID CONTROLS, INC. IT SHALL NOT BE COPIED OR TRANSMITTED IN ANY FORM WITHOUT THE CONSENT OF PROMINENT FLUID CONTROLS, INC.

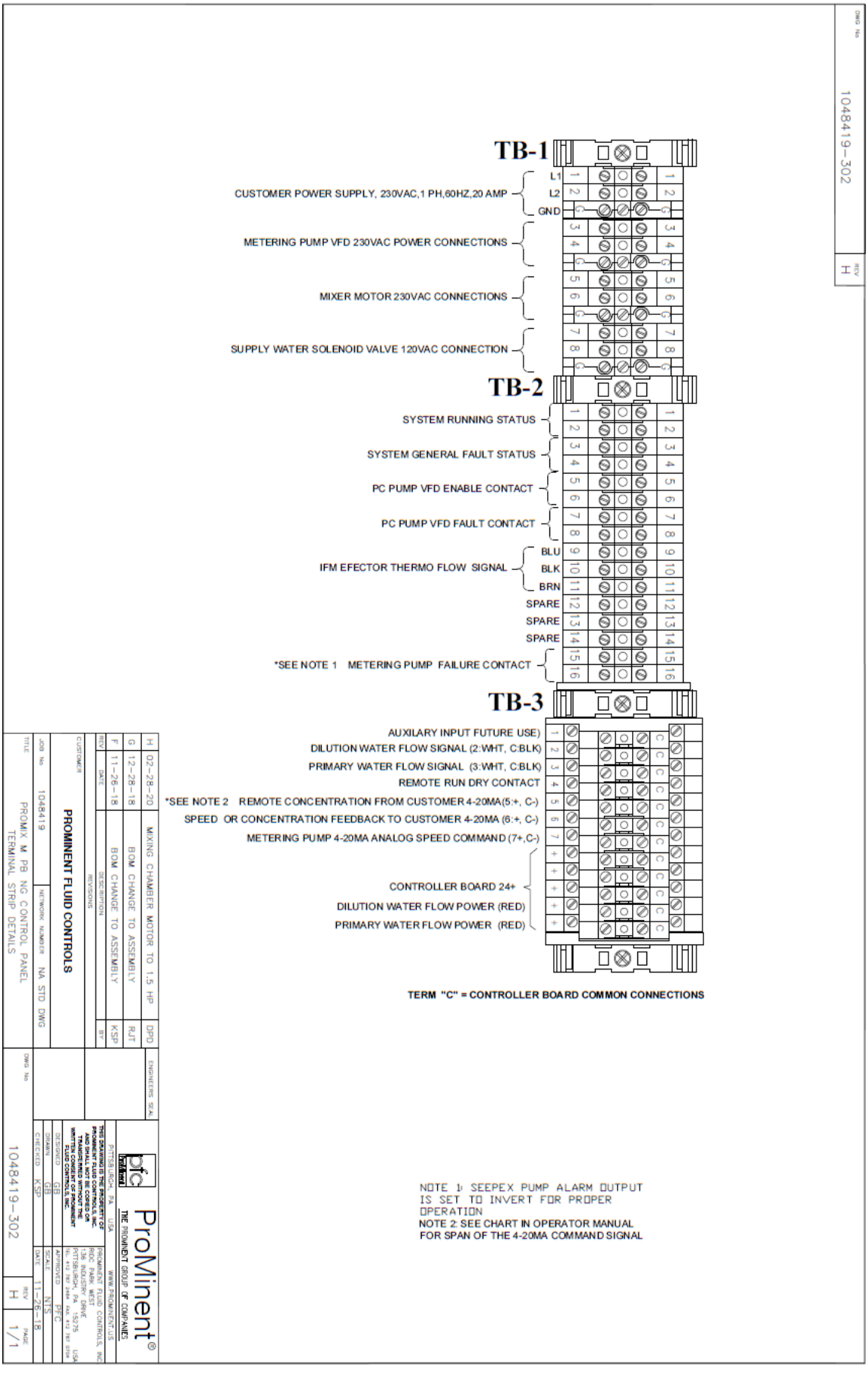


TAGS	QTY	SUB	CATALOG	MFG	DESCRIPTION
	1		7747278	INTEGRA	POLYCARBONATE ENCLOSURE CUSTOM MFG 18X16X10" TYPE 4X
	1		7747193	INTEGRA	PAINTED CARBON STEEL SUB PANEL
MPCB105	1		1078794	SQD	TYPE E IEC DOL STARTER 9-14 AMPERES MOTOR PROTECTION CIRCUIT BREAKER - TRIP CLASS 10
M202	1		1078795	SQD	CONTACTOR LC1D12G7+GV2AF3+GV1F03+GV1F03
CB101	1		1077612	ABB	CIRCUIT BREAKER - MINIATURE 1-POLE CIRCUIT BREAKER 20AMPS, 10KAIR UL LISTED 120/240 VAC, 20AMPS
CB102	1		1077610	ABB	CIRCUIT BREAKER - MINIATURE 1-POLE CIRCUIT BREAKER 15AMPS, 10KAIR UL LISTED 120/240 VAC, 15AMPS
CB109	1		1077609	ABB	CIRCUIT BREAKER - MINIATURE 1-POLE CIRCUIT BREAKER 10AMPS, 10KAIR UL LISTED 120/240 VAC, 10AMPS
CR203 CR214	2		7746411	AB	HL TYPE TERMINAL BLOCK RELAY 110-125VAC/VDC 2 FORM C, 10A, DPDT, ELECTROMECHANICAL RELAY
FU115	1	*1	7745052	AUTO DIRECT	FUSE TERMINAL BLOCK 1/4" X 1 1/4" GLASS 30AMPS, 600V UL APPROVED
		*1	7746094	FERRAZ/SHAWMUTT	TIME DELAY GLASS FUSE 1/4" X 1 1/4" 250 VAC, 2 AMP @ 250 VAC 7746094
LT216	1		7746395	SQD	GREEN PILOT LIGHT - STANDARD, NEMA 4/4X/13 30.5mm, 24VAC/VDC FULL VOLT PLASTIC FRESNEL LENS, CORROSION RESISTANT
LT217	1		7746394	SQD	RED PILOT LIGHT - STANDARD, NEMA 4/4X/13 30.5mm, 24-28VAC/VDC FULL VOLT PLASTIC FRESNEL LENS, CORROSION RESISTANT
SS118	1		7745921	SQD	SELECTOR SW - 2 POS MAINT 30.5mm TYPE, TYPE 4,4X,13 BLACK KNOB, 1 NO 1 NC,
SS208	1		7745915	SQD	SELECTOR SW - 3 POS MAINT, NEMA 4,4X,13 30.5mm, BLACK KNOB, 2 NO 2 NC CAM TYPE C, CONTACT POSITION: 1-KA1, 2-KA1
SU114	1		1049043	PFC	RC NETWORK SNUBBER
TB3	11	*1	7746744	PHOENIX CONTACT	2LEVEL TERMINAL BLOCK - UKK 5 MULTI-LEVEL, 32AMPS GRAY, 0.2-4MM^2, 26-10 AWG
		*1	7746746	PHOENIX CONTACT	DP-UKK 3/5 - UKK5 SPACER MULTI-LEVEL.
		*1	7746747	PHOENIX CONTACT	D-UKK 3/5 - UKK5 END PLATE MULTI-LEVEL
TB1 TB2	25		7746748	PHOENIX CONTACT	UNIVERSAL TERMINAL BLOCK - UK 5 N FEED-THROUGH, 41AMPS GRAY, 0.2-4MM^2, 30-10 AWG
TB1 TB2	4		7746750	PHOENIX CONTACT	UNIVERSAL GROUND TERMINAL BLOCK - USLKG 5 FEED-THROUGH GROUND GREEN-YELLOW, 0.2-4MM^2, 26-10 AWG
	4		7746751	PHOENIX CONTACT	END BRACKET - E/NS 35 N GRAY, FOR THE NS 35 DIN RAIL 9.5MM WIDTH
	4		7500386	BRADY	PRINTED PLASTIC LABELS WHITE WITH BLACK LETTERS 5/8" x 2-1/4" DEVICE LABEL
	1		1098155	PFC	PROMIX MDB SUB ASSEMBLY - FOR REFERENCE ONLY CONTROLLER, KEYPAD AND STANDOFF ASSEMBLY


19.69
11.50
16.91
14.88
16.75
MAIN POWER
POLYMER PUMP POWER
1/2" FLEX MIXER MOTOR
FS1 FS2
METERING PUMP CABLES
SOL VLV POWER
1/2NPT X ALL HOLES
LABEL LEGEND
SYSTEM START
POLYMER PUMP
SYSTEM ALARM
SYSTEM RUNNING
KEYPAD OVERLAY
TYPE 4X ENCLOSURE
18x16x10
SS208
SS118
LT217
LT216
RE
GN
DV201
CB101
CB102
FU115
CR203
M202
MPCB105
XF111
H 02-28-20 MIXING CHAMBER MOTOR TO 1.5 HP DPD
G 12-28-18 BOM CHANGE TO ASSEMBLY RJT
F 11-26-18 BOM CHANGE TO ASSEMBLY KSP
PROMINENT FLUID CONTROLS
1048419
NA STD DWG
PROMIX M PB NG CONTROL PANEL
ENCLOSURE AND SUB PANEL LAYOUT
1048419-300
ProMinent
THE PROMINENT GROUP OF COMPANIES
PITTSBURGH, PA USA
DRAWN GB
CHECKED KSP
DESIGNED GB
APPROVED PFC
SCALE NTS
DATE 11-26-18
REV H
PAGE 1/1


CUSTOMER POWER SUPPLY
230VAC,1PH,60HZ, 20 AMP
DISCONNECT SWITCH, BRANCH
CIRCUIT PROTECTION AND/OR
OVERLOAD RELAY TO BE PROVIDED
BY INSTALLER
CB101
MAIN DISCONNECT
CB102
DV102
SEEPEX VFD
VFD DRIVE
INPUT 230VAC
8.3 AMP
MOT103
PC PUMP VFD/MOTOR
1HP, 4.0 FLA
MCP105
M202
MOT106
MIXER MOTOR
230VAC,1.5HP, 6.2 FLA
FU111
FU111A
FU112
XF111
240/120 VAC
250VA
SU114
FU115
CR203
SOL115
SUPPLY WATER
SOLENOID VALVE
PROMIX CONTROLLER
DI ADDER BOARD
SS118
OPEN=LOCAL
CLOSE = REMOTE
DV201
DV223
PC PUMP VFD
CLOSE=FAULT
JUMPER CABLE CONNECT TO
J2 ON CONTROLLER TOP BOARD
CP WIRE
SKID OR FIELD WIRE
CP TERMINAL
REMOTELY LOCATED DEVICE
PROMINENT FLUID CONTROLS
PROMIX M PB NG CONTROL PANEL
ELECTRICAL SCHEMATIC
1048419-301
02-28-20
MIXING CHAMBER MOTOR TO 1.5 HP
BOM CHANGE TO ASSEMBLY
11-26-18
12-28-18
ProMinent®
THE PROMINENT GROUP OF COMPANIES


DV201
PROMIX CONTROLLER
MIXER STARTER CONTACTOR
SUPPLY WATER VALVE RELAY ON = OPEN
AUXILIARY INPUT (FUTURE USE)
POST DILUTION WATER METER
PRIMARY WATER METER
MIXER OVERLOAD CONTACT
REMOTE RUN COMMAND
SYSTEM REMOTE MODE
SYSTEM ON MODE
CONTROL GROUND CONNECTIONS
CONTROL 24VDC+ CONNECTIONS
SYSTEM RUNNING STATUS
SYSTEM GENERAL FAULT
PC PUMP VFD ENABLE
SYSTEM RUNNING INDICATOR
GENERAL ALARM INDICATOR
THERMO FLOW SWITCH (OPTIONAL)
4-20MA OUTPUT TO CUSTOMER
4-20MA VFD SPEED CMD TO VFD
CONNECT CABLE TO DI BOARD J1
SEEPEX LENZE VFD PARAMETERS
P100 = 1 TERM STRIP
P101 = 2 ANA 4-20MA
P102 = 3 HZ MIN SPEED (based on pump data)
P103 = 40 HZ MAX SPEED (based on pump data)
P104 = 1.0 ACCEL
P105 = 1.0 DECEL
P107 = 1 HIGH VOLTS
P108 = 100 MOT FLA
P110 = 0 NORM START
P111 = 0 COAST STOP
P112 = 0 FWD ONLY
P140 = 4 INVERT FAULT
P160 = 3 MIN HZ
P161 = 40 MAX HZ (based on pump data)
P178 = 1 DISP HZ
P300 = 4 VECTOR MODE
P302 = 210 MTR VOLTS
P303 = 4 FLA
P304 = 120 MTR HZ
P305 = 3400 MTR RPM
P399 = TO CALIB SET TO 1
SET 399 TO 1 FOR CALIBRATION IN VECTOR MODE, THIS MUST BE DONE AGAIN ONLY IF THE MOTOR OR VFD HAS BEEN CHANGED.
PROMIX M PB NG CONTROL PANEL ELECTRICAL SCHEMATIC
PROMINENT FLUID CONTROLS
MIXING CHAMBER MOTOR TO 1.5 HP
BOM CHANGE TO ASSEMBLY
1044419-301
2/2


TB-1
CUSTOMER POWER SUPPLY, 230VAC,1 PH,60HZ,20 AMP
L1
L2
GND
METERING PUMP VFD 230VAC POWER CONNECTIONS
MIXER MOTOR 230VAC CONNECTIONS
SUPPLY WATER SOLENOID VALVE 120VAC CONNECTION
TB-2
SYSTEM RUNNING STATUS
SYSTEM GENERAL FAULT STATUS
PC PUMP VFD ENABLE CONTACT
PC PUMP VFD FAULT CONTACT
IFM EFECTOR THERMO FLOW SIGNAL
BLU
BLK
BRN
SPARE
SPARE
SPARE
*SEE NOTE 1 METERING PUMP FAILURE CONTACT
TB-3
AUXILARY INPUT FUTURE USE)
DILUTION WATER FLOW SIGNAL (2:WHT, C:BLK)
PRIMARY WATER FLOW SIGNAL (3:WHT, C:BLK)
REMOTE RUN DRY CONTACT
*SEE NOTE 2 REMOTE CONCENTRATION FROM CUSTOMER 4-20MA(5:+, C-)
SPEED OR CONCENTRATION FEEDBACK TO CUSTOMER 4-20MA (6:+, C-)
METERING PUMP 4-20MA ANALOG SPEED COMMAND (7+,C-)
CONTROLLER BOARD 24+
DILUTION WATER FLOW POWER (RED)
PRIMARY WATER FLOW POWER (RED)
TERM "C" = CONTROLLER BOARD COMMON CONNECTIONS
NOTE 1: SEEPEX PUMP ALARM OUTPUT IS SET TO INVERT FOR PROPER OPERATION
NOTE 2: SEE CHART IN OPERATOR MANUAL FOR SPAN OF THE 4-20MA COMMAND SIGNAL
1048419-302
H
H 02-28-20 MIXING CHAMBER MOTOR TO 1.5 HP DPD
G 12-28-18 BOM CHANGE TO ASSEMBLY RJT
F 11-26-18 BOM CHANGE TO ASSEMBLY KSP
PROMINENT FLUID CONTROLS
PROMIX M PB NG CONTROL PANEL
TERMINAL STRIP DETAILS
1048419
NA STD DWG
1048419-302
ProMinent®
THE PROMINENT GROUP OF COMPANIES
PROMINENT FLUID CONTROLS, INC.
1/1

DWG No 1048419-303 REV H

TAGS	QTY	SUB	CATALOG	MFG	DESCRIPTION
	1		7747278	INTEGRA	POLYCARBONATE ENCLOSURE CUSTOM MFG 18X16X10" TYPE 4X
	1		7747193	INTEGRA	PAINTED CARBON STEEL SUB PANEL
MCP105	1		1078793	SQD	TYPE E IEC DOL STARTER 6.3-10 AMPERES MOTOR PROTECTION CIRCUIT BREAKER - TRIP CLASS 10
M202	1		1078795	SQD	CONTACTOR LC1D12G7+GV2AF3+GV1F03+GV1F03
CB101	1		1077629	ABB	CIRCUIT BREAKER - MINIATURE 2-POLE CIRCUIT BREAKER 20AMPS, 10KAIR UL LISTED 120/240 VAC, 20AMPS
CB102	1		1077628	ABB	CIRCUIT BREAKER - MINIATURE 2-POLE CIRCUIT BREAKER 15AMPS, 10KAIR UL LISTED 120/240 VAC, 15AMPS
CR203	1		7746411	AB	HL TYPE TERMINAL BLOCK RELAY 110-125VAC/VDC 2 FORM C, 10A, DPDT, ELECTROMECHANICAL RELAY
FU111 FU111A	2		1050239	MERSEN	TRANSFORMER PRIMARY FUSE ATQR3.2
FU112	1		1050240	MERSEN	TRANSFORMER SECONDARY FUES TRM3.2
FU115	1	*1	7745052	AUTO DIRECT	FUSE TERMINAL BLOCK 1/4" X 1 1/4" GLASS 30AMPS, 600V UL APPROVED
		*1	7746094	MERSEN	TIME DELAY GLASS FUSE 1/4" X 1 1/4" 250 VAC, 2 AMP @ 250 VAC 7746094
XF111	1		1050238	SQD	TRANSFORMER 9070TF250D1 250VA 240/480V-120V
LT216	1		7746395	SQD	GREEN PILOT LIGHT - STANDARD, NEMA 4/4X/13 30.5mm, 24VAC/VDC FULL VOLT PLASTIC FRESNEL LENS, CORROSION RESISTANT
LT217	1		7746394	SQD	RED PILOT LIGHT - STANDARD, NEMA 4/4X/13 30.5mm, 24-28VAC/VDC FULL VOLT PLASTIC FRESNEL LENS, CORROSION RESISTANT
SS118	1		7745921	SQD	SELECTOR SW - 2 POS MAINT 30.5mm TYPE, TYPE 4,4X,13 BLACK KNOB, 1 NO 1 NC,
SS208	1		7745915	SQD	SELECTOR SW - 3 POS MAINT, NEMA 4,4X,13 30.5mm, BLACK KNOB, 2 NO 2 NC CAM TYPE C, CONTACT POSITION: 1-KA1, 2-KA1
SU114	1		1049043	PFC	RC NETWORK SNUBBER
TB3	11	*1	7746744	PHOENIX CONTACT	2LEVEL TERMINAL BLOCK - UKK 5 MULTI-LEVEL, 32AMPS GRAY, 0.2-4MM^2, 26-10 AWG
		*1	7746746	PHOENIX CONTACT	DP-UKK 3/5 - UKK5 SPACER MULTI-LEVEL
		*1	7746747	PHOENIX CONTACT	D-UKK 3/5 - UKK5 END PLATE MULTI-LEVEL
TB1 TB2	24		7746748	PHOENIX CONTACT	UNIVERSAL TERMINAL BLOCK - UK 5 N FEED-THROUGH, 41AMPS GRAY, 0.2-4MM^2, 30-10 AWG
TB1 TB2	4		7746750	PHOENIX CONTACT	UNIVERSAL GROUND TERMINAL BLOCK - USLKG 5 FEED-THROUGH GROUND GREEN-YELLOW, 0.2-4MM^2, 26-10 AWG
	4		7746751	PHOENIX CONTACT	END BRACKET - E/NS 35 N GRAY, FOR THE NS 35 DIN RAIL 9.5MM WIDTH
	1		7746749	PHOENIX CONTACT	ATP-UK END PLATE
	4		7500386	BRADY	PRINTED PLASTIC LABELS WHITE WITH BLACK LETTERS 5/8" x 2-1/4" DEVICE LABEL
	1		7746534	PFC	PROMIX\AEGIS CONTROL B SUB-ASSEMBLY
	1		1098157	PFC	PROMIX MPB SUB ASSEMBLY CONTROLLER, KEYPAD AND STANDOFF ASSEMBLY

NOTE: DV223 SHOWN IN THE SCHEMATICS IS THE PUMP VFD ON THE SKID

REV	DATE	DESCRIPTION	BY
H	02-28-20	MIXING CHAMBER MOTOR TO 1.5 HP	DPD
G	12-28-18	BOM CHANGE TO ASSEMBLY	RJT
F	11-26-18	BOM CHANGE TO ASSEMBLY	KSP

REVISIONS

ENGINEERS SEAL

CUSTOMER: PROMINENT FLUID CONTROLS

JOB No: 1048419 NETWORK NUMBER: NA STD DWG

TITLE: PROMIX M PB NG CONTROL PANEL BILL OF MATERIAL

pfc ProMinent® THE PROMINENT GROUP OF COMPANIES WWW.PROMINENT.US

PITTSBURGH, PA USA

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DRAWN	GB	SCALE	NTS
DESIGNED	GB	APPROVED	PFC
CHECKED	KSP	DATE	11-26-18

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Appendix C – Polymer Sizing / Dosage

The ProMix M Polymer Pump switch on the controller door enables the user to select either LOCAL or REMOTE operation. In 'LOCAL', the polymer concentration setpoint is selectable from 0 - 1% for emulsion polymer and 0 – 10% for Mannich by using the controller keypad. In 'REMOTE', the polymer concentration is set proportionally by a remote 4-20 mA signal representing 0- 1% for emulsion polymer and 10% for Mannich. 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:

1048382 -200	ProMix M SG 300X2-2.3DB System
1048383 -200	ProMix M SG 600X2-3.8DB System
1048384 -200	ProMix M SG 1500X2-6.2DB System
1048385 -200	ProMix M SG 1500X2-10.3DB System
1048386 -200	ProMix M SG 1500X2-5.0PB System
1048387 -200	ProMix M SG 1500X2-10.0PB System
1048388 -200	ProMix M SG 1500X2-24.0PB System

Electrical Schematic Drawings:

1048418-300	PROMIX M DB NG CONTROL PANEL
1048419-300	PROMIX M PB NG CONTROL PANEL
	Aegis Browser Manual

Pump Manuals:

GXLA QSG	Gamma XL Pump Quick Start Guide
986691	Gamma XL Pump Operating Manual
	Seepex Pump Operating Manual

(Provided upon request)

Documents noted in this section are not in this manual

Appendix E – Operation Modes & Controller Switch Settings

System Start **ON-OFF-REMOTE** controller door switch	**Polymer Pump** **LOCAL-REMOTE** controller door switch	**Inline/ Batch** mode	**Emulsion/ Mannich** polymer	**PROMIX OPERATION**
ON	LOCAL	Inline	Emulsion	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 1.0%
ON	LOCAL	Inline	Mannich	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 10.0%
ON	LOCAL	Batch	Emulsion	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 1.0% concentration Remote Setpoint: N/A Max. chamber concentration: 1.0%
ON	LOCAL	Batch	Mannich	Remote Start Contact: N/A Keypad Local Setpoint: 0 – 10.0% concentration Remote Setpoint: N/A Max. chamber concentration: 10.0%
ON	REMOTE	Inline	Emulsion	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0 –100% pump speed Max. chamber concentration: 1.0%
ON	REMOTE	Inline	Mannich	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0–100% pump speed Max. chamber concentration: 10.0%
ON	REMOTE	Batch	Emulsion	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0–1.0% concentration Max. chamber concentration: 1.0%

System Start **ON-OFF-REMOTE** controller door switch	**Polymer Pump** **LOCAL-REMOTE** controller door switch	**Inline/ Batch** mode	**Emulsion/ Mannich** polymer	**PROMIX OPERATION**
ON	REMOTE	Batch	Mannich	Remote Start Contact: N/A Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0-10.0% concentration Max. chamber concentration: 10.0%
REMOTE	LOCAL	Inline	Emulsion	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 1.0%
REMOTE	LOCAL	Inline	Mannich	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 100% pump speed Remote Setpoint: N/A Max. chamber concentration: 10.0%
REMOTE	LOCAL	Batch	Emulsion	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 1.0% concentration Remote Setpoint: N/A Max. chamber concentration: 1.0%
REMOTE	LOCAL	Batch	Mannich	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: 0 – 10.0% concentration Remote Setpoint: N/A Max. chamber concentration: 10.0%
REMOTE	REMOTE	Inline	Emulsion	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0–100% pump speed Max. chamber concentration: 1.0%
REMOTE	REMOTE	Inline	Mannich	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20mA = 0–100% pump speed Max. chamber concentration: 10.0%
REMOTE	REMOTE	Batch	Emulsion	Remote Start Contact: Close=start, open=stop

System Start ON-OFF-REMOTE controller door switch	Polymer Pump LOCAL-REMOTE controller door switch	Inline/ Batch mode	Emulsion/ Mannich polymer	PROMIX OPERATION
				Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0-1.0% concentration Max. chamber concentration: 1.0%
REMOTE	REMOTE	Batch	Mannich	Remote Start Contact: Close=start, open=stop Keypad Local Setpoint: N/A Remote Setpoint: 4-20 mA = 0-10.0% concentration Max. chamber concentration: 10.0%

System Start Controller door 3 position selector switch. Determines if controller is enabled locally (ON) or is enabled remotely (REMOTE) by a dry contact to start or stop control action. The middle switch position OFF disables the controller and initiates a flush cycle if this switch is left in this position >2 seconds after first operating in either ON or REMOTE.

Polymer Pump Controller door 2 position selector switch. Determines the setpoint for pump control action which can either be pump speed or % concentration. If set to the LOCAL position the setpoint is based on the keypad entry and if set to REMOTE then the setpoint input is from a remote 4-20 mA signal.

Inline / Batch The user must choose the mode of operation from a keypad menu selection. Default is Batch mode and the setpoint is % concentration. The polymer pump is automatically adjusted to maintain the desired % concentration regardless of fluctuations of the dilution water flow. Inline mode requires the user to calculate the percent concentration desired and then manually adjust the pump speed based upon the measured dilution water flow rate.

Emulsion / Mannich The user must choose the type of polymer being used by the ProMix feeder. If emulsion then a maximum of 1.0% concentration is permitted in the mixing chamber. If Mannich is selected then the maximum is 10.0% concentration. Batch mode will automatically limit the polymer feed to maintain these concentrations.