



Screen Filtration

OPERATION,
INSTALLATION AND
MAINTENANCE
MANUAL

**SF Series with
PDA/ATF-MAX**

**Where water
means business.**



PRESSURE DIFFERENTIAL ALARM & AUTOMATIC TIMER FLUSH (PDA/ATF-MAX)

The PDA/ATF-MAX is a dual purpose PLC-based controller, designed specifically for use with a conical screen filter. The PDA/ATFMAX monitors the pressure differential across the filter element and will trigger an audible and visual alarm signal when the PSID increases above the user-defined limit. The PDA/ATF-MAX also automatically controls the strainer flush valve, based on user-defined frequency and duration settings. The controller can be set to suspend flush cycles when the flow through the strainer falls below a user-defined flow rate and has a Dry Contact relay that can be used for remote monitoring. The controller has the capability of receiving a remote signal to initiate a flush sequence and to initiate a remote alarm reset.



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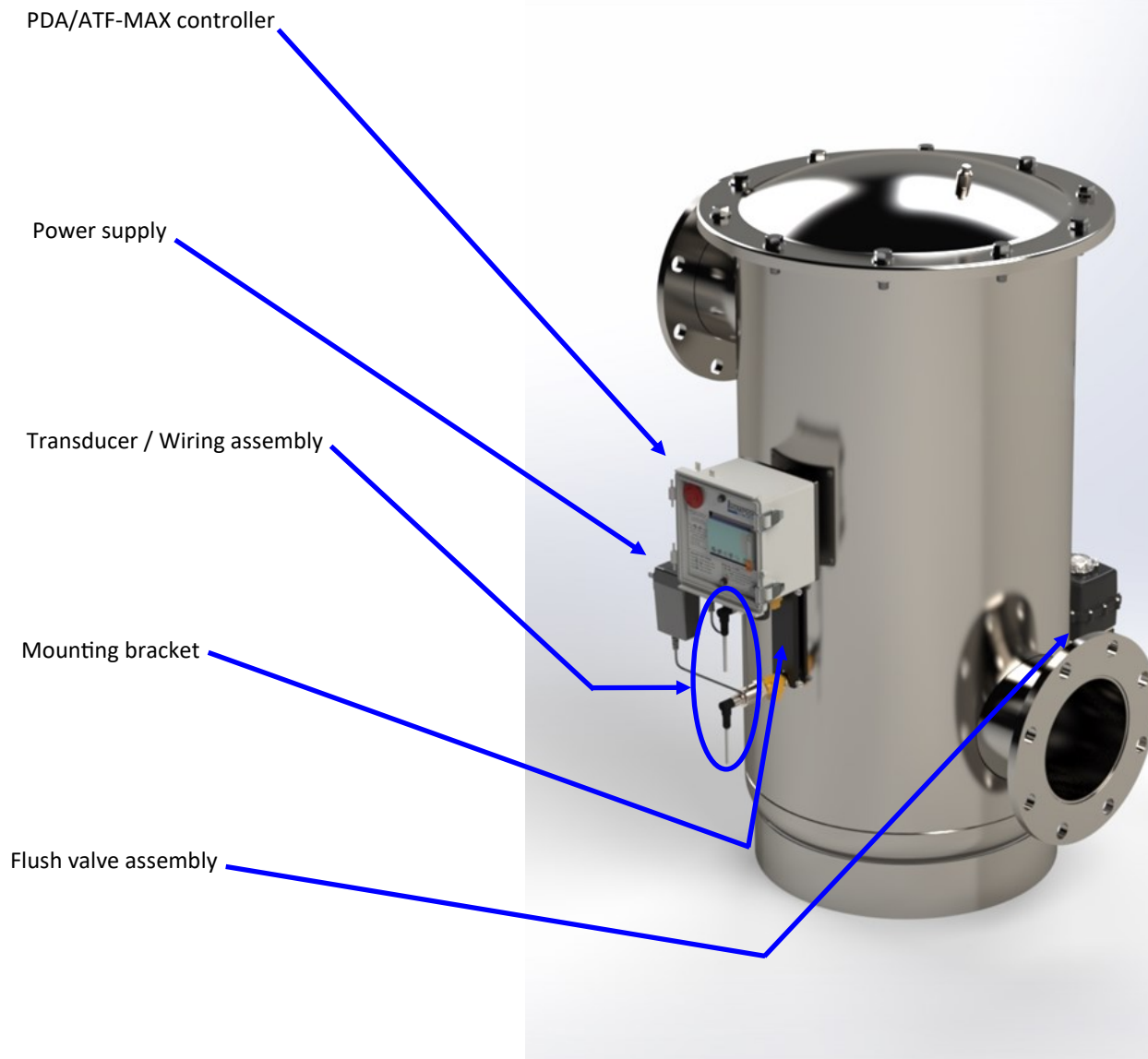
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SAFETY CONSIDERATIONS

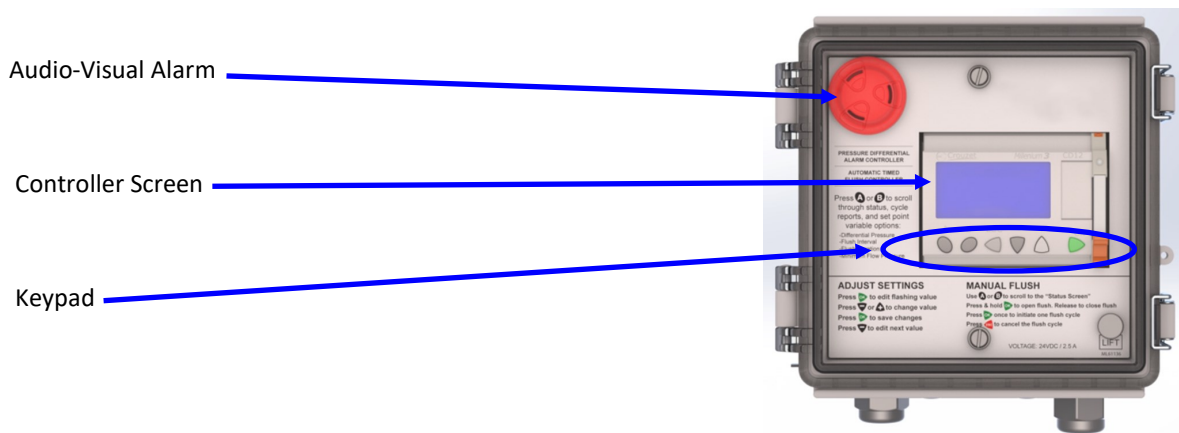
	GENERAL WARNING Ensure all appropriate personnel read owner’s manual prior to installation and/or operation of controller. Failure to comply with instructions and safety precautions could lead to personal injury or product damage. Personal Protective Equipment (PPE) must be used when operating and servicing this controller and strainer.
	ELECTRICAL SHOCK HAZARD This device receives power from a 120VAC power source. The power supply must be plugged into a circuit breaker protected receptacle that is suitable for the location conditions. All required electrical work must be performed by a qualified electrician and must comply with all local, state and national electrical codes. Disconnect controller from power source before servicing or removing face plate.

SYSTEM OVERVIEW

The PDA/ATF-MAX system consists of the following primary components:



The controller interface contains the Audio-Visual Alarm, Controller screen and Keypad interface as shown. The clear cover provides protection for the controller and can be opened with the two latches on the side of the controller housing to access the keypad.



OPERATION

Startup

- 1) Plug in the power plug into a standard 115VAC wall outlet
- 2) Upon power-up, the company information screen will be shown for 15 seconds.
- 3) After 15 seconds, the screen will change to the manifold pressure screen and will begin monitoring differential pressure across the strainer.

Automatic Flushing

Under normal operation, a timed flush will be initiated on a periodic schedule defined by the PDA/ATF-MAX programmed setting. (every 24 hours per factory setting).

In addition, a timed flush will be initiated when the differential pressure reaches the setpoint defined by the PDA/ATF-MAX settings.

See the *MENU SCREENS* section for information on changing factory settings.

Consecutive Flush Alarm

If three consecutive flushing operations are detected by the PDA/ATF-MAX, a consecutive flush alarm will be triggered and no additional flush cycles will be initiated until the alarm is cleared.

To reset the Consecutive Flush Alarm, first, correct the cause of the alarm, then push the red ESC button on the controller while a Status screen is displayed. The optional Customer's Remote Reset input, Input iB, allows for a remote reset of the Consecutive Flush Alarm.

Scrolling through Menu Screens

The PDA/ATF-MAX allows the operator to scroll through a selection of menu screens by pressing the **A** or **B** buttons. Press **A** to scroll backward to the previous menu or press **B** to scroll forward to the next menu. The LCD backlight will automatically turn on for 5 minutes when a button is pressed, thus allowing the operator to easily view the menus in low light situations.



Changing Parameter Values

To change an adjustable value, first scroll to the appropriate menu screen using the A or B button. Follow the directions below to modify the value.

- 1) The current selected value will show flashing blocks. Use the + or - keys to select another value if desired.
- 2) Press OK on the selected value. The value will change from flashing blocks to flashing numbers. Flashing blocks indicate the value is locked into memory. Flashing numbers indicates the value is unlocked and can be changed.
- 3) Press the + or - buttons to change the value. Holding the + or - button will allow the value to increase at a faster rate after the first 10 increments have passed.
- 4) When finished, press OK to save the change to memory. The value will return to flashing blocks.

NOTE: REFER TO THE MENU SCREEN FOR DETAILED INFORMATION ON EACH SCREEN AND/OR PARAMETER.

MENU SCREENS

Power Up Screen

The Power Up screen will be displayed for 15 seconds each time the PDA/ATF-MAX is plugged in, or when power is returned after a loss. The Power Up screen can be viewed by unplugging the PDA/ATF-MAX's power, then plugging it back on again.

Manifold Pressure Screen:

After 15 seconds, the Power Up screen displays the pressure in PSI for inlet manifold, outlet manifold, and the calculated differential pressure between the inlet and outlet manifolds. The Manifold Pressure screen will automatically display 15 seconds after power up.

Status Screens

The status screens provide system feedback, allowing the operator to monitor when and how the Flush cycle is occurring. A Flush cycle can be started manually, automatically via the Flush Interval Timer or the Pressure Differential Transducers (PSID), or remotely by optional Customer Input Signal.

The current status of the controller is displayed as follows:

Status: FILTRATION

The system is operating in normal filtration mode and sensing pressure from flowing water. The PSID reading will display while the inlet transducer reading is above the minimum setpoint and the pressure differential across the screen is less than the PSID setpoint and no other flush cycle has been initiated.

At this point, a Flush will occur if the Flush Interval Setting has been reached, if the PSID value is higher than the PSID setpoint (the message >> High PSID << will be flashing on the display), manually by the operator by pressing the green OK button on the controller, or by the Customer Input Signal.

Status: FLUSH CYCLE

The system is in a Flush cycle lasting the length of time entered in the user-defined "Flush Duration" setpoint. A Flush will occur if the Flush Interval Setting has been reached, if the PSID value is higher than the PSID setpoint, manually by the operator by pressing the green OK button on the controller, or by the Customer In-put Signal.

The Alarm Light/Sounder will provide an audible alarm and the light will flash during the Flush cycle. The Flush Duration setpoint is user-defined and the default factory setting is 8 seconds. After this Flush duration time, the Flush Cycle is complete. The Open Flush Valve Output will be turned off, the Alarm Light/Sounder will be turned off, and the Status Screen will return to Status: FILTRATION. Inspect the strainer to determine if maintenance is required.

Miller-Leaman Inc.
800-881-0320
millerleaman.com

Manifold Pressure

Inlet : 0034.0
Outlet : 0032.0
PSID : 0002.0

Status: FILTRATION
PSID : 0003.0
Press OK to Start
A Flush Cycle

Status: FILTRATION
>> High PSID <<
Press OK to Start
A Flush Cycle

Status: FLUSH CYCLE
VALVE OPEN
Press ESC to Stop

Status: FILTRATION
PSID : 0003.2
Press OK to Start
A Flush Cycle

MENU SCREENS (Continued)

Status: OFF

The Inlet Pressure transducer is monitored to sense sufficient Inlet Pressure and allow Timed Flushes, and Differential Pressure Flushing.

When the inlet pressure falls below the user-defined setpoint, the top line of the Status Screen will display: "OFF". alternating with "Inlet Pressure Low". The Flush Interval timer will be paused, and a timed Flush will not occur. Differential Pressure Flushing will also be inhibited. DP sensing will continue, and the Status Screen will display >> High PSID << on the second line. If the PSID setpoint is exceeded while the Inlet Pressure is below the setpoint, the message "High PSID" will also display. If this condition persists, routine inspection and maintenance may be needed.

Status: OFF
PSID : 00.0

Inlet Pressure Low
PSID : 00.0

Status: OFF
>> High PSID <<

Status - Consecutive Flush Alarm

The Consecutive Flush Alarm notification will display when the Flush cycle has been initiated three times in a row by the Pressure Transducers (PSID) within one minute. When this occurs, the message >ConsecFlushAlarm< will display on the screen, the Alarm Light/Sounder will change from flashing to steady ON and the Controller will disable additional flush cycles. Also, the Controller will energize Relay 1, which is available as a Dry Contact signal for the customer to monitor remotely if a Consecutive Flush Alarm event has occurred.

The operator should inspect the strainer to determine if maintenance is required.

Pressing the ESC button during the third flush will terminate the Consecutive Flush Alarm signal; the flush valve will return to closed position, the Alarm Light/Sounder will turn off, and the Status Screen will return to Status: FILTRATION. If the PSID value remains higher than PSID setpoint, the Flush Cycle and Alarm will begin again, and if a third flush sequence is initiated within one minute, the Consecutive Flush Alarm will be triggered again. The operator should inspect the strainer to determine if maintenance is required. If maintenance is not performed, the PSID level will continue to climb, which could result in damage to the strainer element and allow debris to pass downstream.

Status: FLUSH CYCLE
>ConsecFlushAlarm<

Press ESC to Stop

MENU SCREENS (Continued)

Flush Interval & PSID Setpoint Screen

The Flush Interval is the time parameter at which the system will initiate an automatic Flush cycle. The Flush Interval timer resets after any Flush cycle occurs (by timer, PD Transducers, operator, or User Input Signal). This value is adjustable from 1 minute to 1000 hrs. Setting both values to zero will turn off the Flush timer. It is recommended that the operator adjust the Flush interval timer so that the system Flushes by time before the pressure differential set point is reached. Factory Preset value is 24 hours.

The PSID Setpoint is the pressure parameter, which, when compared to the calculated Differential Pressure from the Inlet and Outlet pressure transducers, will cause a Flush cycle to begin when exceeded. The recommended PD setpoint is 1-2 PSID above the “clean” PSID reading at the systems MAXIMUM flow rate. Setting this PSID Setpoint at low flow may result in continuous Flushing at higher flow rates, since the Pressure Differential increases with flow rate. This value is adjustable from 1 to 30 PSID. Factory preset is 7 PSID.

Flush Interval
HOURS:MM 00024:00
Enter
PSID Setpoint 07

Flush Duration Screen

Flush Duration is the time parameter that controls the duration of the flush cycle. This time should be set according to the application and the rate at which debris accumulates. This value is adjustable from 5 to 300 seconds. Factory Preset value is 8 seconds.

Note: The valve will only be partially open during the valve actuation cycle (switching from fully closed to fully open and back to fully closed) which is approximately 6 seconds. The valve will be fully open for the remainder of the flush duration setting.

Efficiency Tip: To conserve water, the user should select the minimum cycle time required to complete a satisfactory flush cycle.

Flush Duration
Seconds: 00008

Inlet Low Pressure Setpoint Screen

The Inlet Low Pressure is the pressure parameter used by the Controller to sense sufficient Inlet Pressure and to allow Timed Flushes and Differential Pressure Flushing. When the Inlet Pressure falls below the user-defined setpoint, the top line of the Status Screen will display Status: “OFF”, alternating with “Inlet Pressure Low”. The Flush Interval timer will be paused, and a timed Flush will not occur. Differential Pressure Flushing will also be inhibited. This value is adjustable from 5 PSI to 20 PSI. Factory Preset value is 15 PSI.

Inlet Low Pressure
Setpoint: 00015

MENU SCREENS (Continued)

Time Since Last Flush & Triggered By Screen

This screen is READ ONLY for information and is not adjustable. The screen shows the amount of time that has elapsed since the system last Flushed (example: 00011:30 is 11 hours and 30 minutes) and how the last Flush was triggered. There are four trigger possibilities:

- 1) *Local Operator* - Flush triggered manually by an operator.
- 2) *Timer* - the backflush was triggered by time as set on the Backflush Interval screen.
- 3) *PD Transducer* - the Flush was triggered by a high pressure differential, as set on the PSID setpoint
- 4) *Customer Input* - Optional Customer's Input signal at input I1 initiated the Flush Cycle.

This screen is READ ONLY for information and is not adjustable.

Flush Counters Screen

Trip: The number of Flush cycles that have occurred since the counter was last reset. This includes cycles initiated both manually and automatically. This counter can be reset by pressing the red **ESC** button from the Flush Counters screen.

Life: The number of Flush cycles that have occurred in the controller's lifetime. This includes cycles initiated both manually and automatically. This counter cannot be reset.

Controller ID Screen

This screen is READ ONLY and is used to identify the controller version and ID.

```
Time Since Last
Flush          00000:04
Triggered By:
PD Transducers
```

```
Flush Counters
Trip:          00010
Life:          000000010
Press ESC to Reset
```

```
Maxim4 PDA/ATF-MAX
Controller v.3.5
Copyright(c)2023
ML31155-R1
```

LAYOUT & I/O CONFIGURATION

Inputs

I1 - The optional Customer Initiate Flush input will signal the PDA/ATF-MAX to start a Flush cycle.

IB - The optional Customer Remote Alarm Reset input will signal the PDA/ATF-MAX to remotely reset the Consecutive Flush Alarm.

The Analog/Digital Input locations allow flexibility to design user-specific programs. These programs are then able to receive and process both digital and analog signals from devices such as Pressure Transducers, Flow-meters, Level Switches, etc. Inputs IC & ID are the Inlet and Outlet Pressure Transducer connections. These provide a 0-10Vdc signal into the controller. These signals are converted into pressure level values and compared to each other for the pressure differential value. When the PD value exceeds the PD setpoint, the PDA/ATF-MAX is signaled to start a Flush cycle. The Inlet Pressure Transducer also is used to disable the Flush Timer and Flush Signal from Differential Pressure, should the Inlet Pressure be less than the Inlet Low Pressure Setpoint.

Outputs

(Note - each assigned output's left terminal has been connected to the 24VDC power. The output's right terminal provides the output signal.)

Output #1 controls the Flush valve.

Output #2 is not assigned.

Output #3 is a relay output for the Alarm Light/Sounder - DP Alarm is flashing and Consecutive Flush Alarm is steady.

Output #4 Consecutive Flush Alarm signal - relay output turned on when the Consecutive Flush count reaches the setpoint. This output is wired to the coil of Relay 1 (see above) to provide a Dry Contact output.

ELECTRICAL CONNECTIONS



NOTE: When using an external power source, the input power to the Controller must be the same as indicated on the upper left side of the PDA/ATF-MAX. Typically the controller is 24 volts DC. Plug the provided 24VDC Power Supply into a standard 120VAC Outlet, observing all state and local codes.

Flush Valve

The **Flush Valve** is connected to *Output#1* terminal(+ signal, white wire), *Common (-)* power terminal (Power Common, black wire), and 24VDC (+) power terminal (Power +, red wire). **Please Note: with power on and no signal, the Flush Valve will move to its closed position, until it is closed.**

Pressure Transducers

The **Pressure Transducers** have a three wire connection, white assigned to the input (IC or ID), blue to the *Common (-)* terminal, and the brown to the 24VDC Power (+) terminal.

User Initiated Flush Signal (Optional)

The optional **User Initiate Flush Signal** input is connected to Input I1. **Please Note: this signal must be a discrete 24VDC signal, that references the Common (-) terminals.**

User Remote Alarm Reset Signal (Optional)

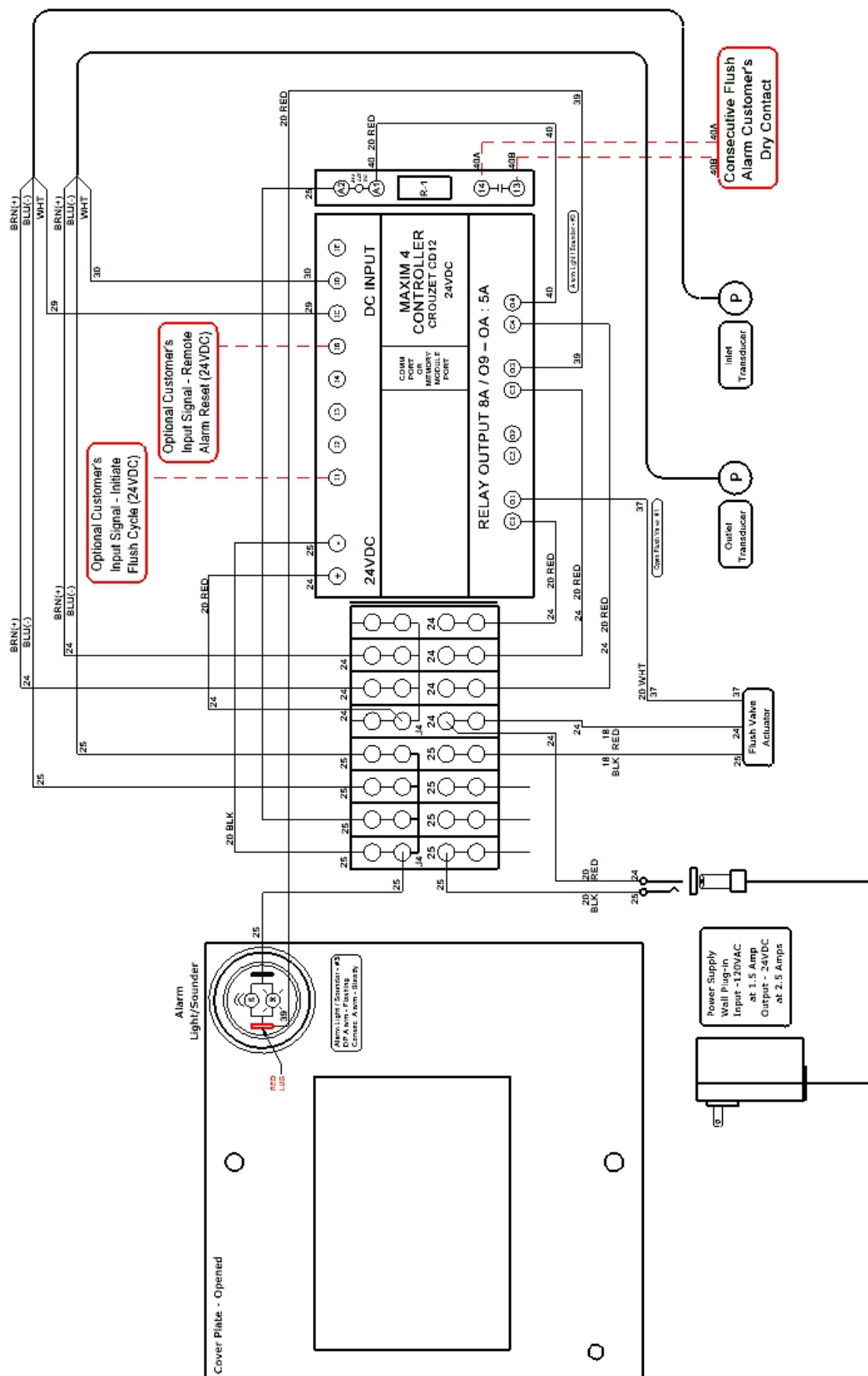
The optional **User Remote Alarm Reset Signal** input is connected to Input IB. Please note: signal must be a discrete 24VDC signal, that references the Common (-) terminals.

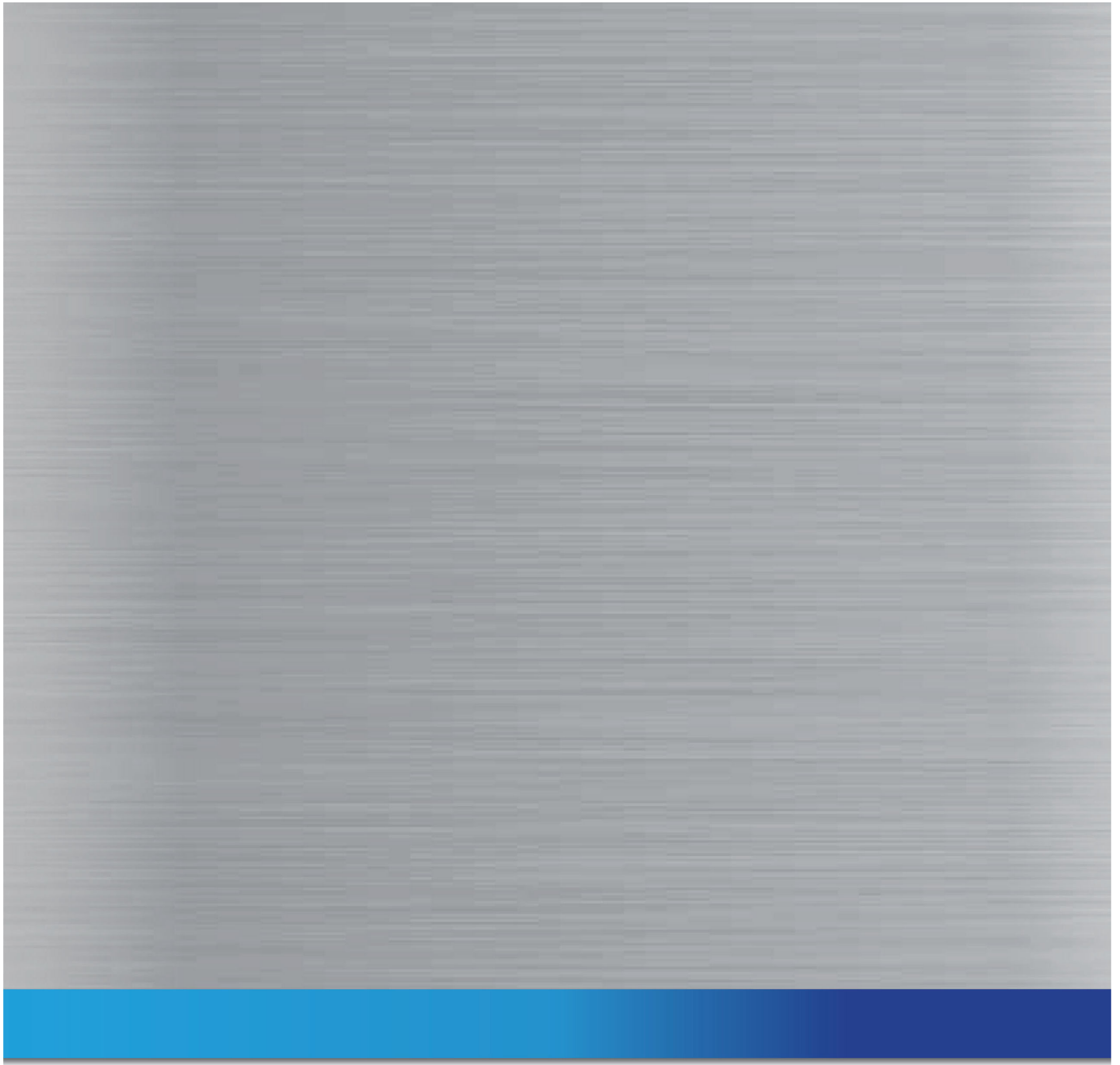
Consecutive Flush Alarm Output Signal (Dry Contact, Optional)

Output #4 is the discrete **Consecutive Flush Alarm** 24VDC output signal, that is connected to the coil of Relay 1 (R-1). This relay provides a Dry Contact connection for Customer **Consecutive Flush Alarm** signal.

Review the *Electrical Schematic* section prior to making any connections to the controller.

ELECTRICAL SCHEMATIC





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