

Sequence of Operation And Description of Controls

Oberlin Pressure Filter
Serial Number: OPF12-321MD

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READ AND OBEY ALL OF THE SAFETY LABELS ON THE FILTER.

This document is meant to supplement the Oberlin Filter Company Operator & Maintenance Manual. Prior to operating the filter, the operator should read and understand the manual. Before operating the filter, ALL the sheet metal must be properly installed and fastened in place.

******* DANGER *******

Before performing service work in the areas of the platens, read, understand, and follow the safety instructions described in the Oberlin Filter Company Maintenance Manual.

******* NOTE *******

The electrical control panel has both discrete operators and an Allen-Bradley PanelView Operator Interface Terminal. Within this document, the PanelView will be referred to as HMI.

1. OPERATING SEQUENCE

This section describes the operation of the filter and associated equipment. Specific instructions for the pumps, air heater, etc. follow this section.

1.1 Start-up the filter in the following sequence:

- At the pneumatic control rack:
 - Open the plant air lockout valve.
 - Partially open the cake dry throttling valve as needed to achieve the desired cake dryness, generally 50% open.
 - Verify that the cake dry regulator is set at 35 psig.
- At the filter:
 - Turn the Platen control switch to AUTO.
 - Twist & Pull the mushroom head to release the EMERGENCY STOP push button.
 - Make sure the end doors are closed. The filter will not operate if the doors are open.
- At the electrical control cabinet:
 - Switch the electrical disconnect to the ON position. Before proceeding, wait for the HMI to go through the self-test routine, and display the Main Menu screen.

- Twist & Pull the mushroom head to release the EMERGENCY STOP push button..
- Press the MASTER START push button. The CONTROL POWER light turns ON.
- Press the SYSTEM AUTO START push button.

The discharge cycle will start and the media reroller will operate to advance / wind the media. This ensures that clean media is correctly located in the filter.

When the discharge cycle is complete, the filter will begin sequencing as follows:.

Step	Conditions to Start Step	Conditions to End Step	Notes
Platen Closing	The discharge cycle is complete. The platen control switch is in AUTO.	The upper platen closed position proximity switch is engaged.	The close platen solenoid valve is energized to shift the platen control valve to the close position. The solenoid is de-energized after a time delay. The platen will close, and the airbags will inflate.
Airbags Inflating To Start the Feed Cycle	The airbags continue to inflate from the platen closing step.	The airbag pressure reaches the AB - Start Feed pressure set point.	Compressed air fills the airbags. Air also pressurizes the top of the air cylinder. The airbag pressure must reach the AB – Start Feed pressure set point before the feed cycle will begin.
Feed Cycle	The airbag pressure has reached the AB - Start Feed pressure setting.	The feed cycle is controlled by time or filter pressure. The feed cycle will end when one of the following are true: <ul style="list-style-type: none"> • The filter pressure reaches the FP - Stop Feed pressure set point. • The Feed Cycle Limit timer is done. • The operator presses the STOP FEED / START DRY HMI push 	The open inlet valve solenoid is energized to open the inlet valve on the filter and the filter pump begins pumping liquid through the filter. The filtrate pump runs as required to maintain proper level in the filtrate tank. The close bleedoff valve solenoid is energized to close the bleedoff valve. If the airbag pressure drops below the Required Airbag Pressure (this value is calculated based on filter pressure) the inlet valve will

Step	Conditions to Start Step	Conditions to End Step	Notes
		button. <ul style="list-style-type: none"> • A filter shutdown is enabled. 	<p>close and the bleedoff valve will open. This is done to ensure that there is sufficient sealing force to prevent excessive leaking from the platen. When the airbag pressure reaches the required pressure, the feed cycle will resume.</p> <p>When the feed cycle is complete, the open inlet valve solenoid is de-energized to close the inlet valve and the filter pump stops.</p>
Airbag Inflating To Start the Dry Cycle	The feed cycle is complete.	The airbag pressure reaches the AB - Start Dry pressure set point.	The airbag are fully pressurized in preparation of the cake dry cycle.

Step	Conditions to Start Step	Conditions to End Step	Notes
Cake Dry/Wash Cycle General Conditions	The feed cycle is complete and the airbag pressure reaches the AB - Start Dry pressure set point.		<p>The opening of the cake dry valve is delayed to ensure that the airbag pressure is stabilized.</p> <p>The open cake dry valve solenoid is energized to open the cake dry valve. If heated air is selected, the air heater will operate to heat the cake dry air to the desired temperature.</p> <p>Pressurized air will flow into the upper platen to dry the filter cake. The setting on the cake dry pressure regulator and throttling valve control the amount of air entering the upper platen.</p> <p>If the airbag pressure falls below the Required Airbag Pressure, the cake dry valve will close and the bleedoff valve will open. This is done to ensure that there is sufficient sealing force to prevent excessive leaking from the platen. When the airbag pressure reaches the required pressure, the cake dry cycle will resume.</p>
Cake Dry: Initial	The cake dry valve delay timer is done, and the airbag pressure is at the Required Airbag Pressure.	The Dry - Initial timer is done.	<p>The cake dry valve is open. The bleedoff valve is closed.</p> <p>The free liquid above the filter cake is forced through the filter cake.</p>

Step	Conditions to Start Step	Conditions to End Step	Notes
Cake Dry: Bleedoff	The Dry- Initial timer is done.	The Dry - Bleedoff timer is done.	Draws free liquid from the top of the filter cake by opening the bleedoff valve. The cake dry valve remains open. NOTE: The bleedoff part of the dry cycle is not required for many applications. If this is the case the bleedoff step may be skipped by setting the Dry – Bleedoff timer set point to zero (0).
Cake Dry: Waiting for Break Through	The Dry - Bleedoff timer is done.	The filter pressure drops below the FP – Start Cake Wash set point.	The cake dry valve is open. The bleedoff valve is closed. When all the liquid has drained from the platen, the filter pressure will drop. This decrease in pressure will start the timer for the cake wash cycle.
Cake Dry Wash: Rinse Cycle	The Cake Dry: Waiting for Break Through is complete. Filter pressure has dropped.	The Rinse Cycle timer is done.	The cake wash valve is open and liquid is flowing through the cake to wash it. Rinsing of the cake will occur for a set amount of time. This cycle can be repeated several times depending on the HMI setpoint.
Cake Wash: Rinse Cycle Air Assist	The second half of the Rinse Cycle.	The Rinse Cycle timer is done.	The cake wash valve is open and the cake dry valve is open to help distribute the cake wash liquid throughout the cake.
Cake Wash: Dry	The Rinse Cycle is complete.	The Cake Wash: Dry timer is complete	The cake dry valve is open. Air is forced through the cake to dry it for a set amount of time

Step	Conditions to Start Step	Conditions to End Step	Notes
Cake Dry: Waiting for Break Through	The Cake Wash - Dry - timer is done.	The filter pressure drops below the FP – Start Final Dry set point.	The cake dry valve is open. The bleedoff valve is closed. When all the liquid has drained from the platen, the filter pressure will drop. This decrease in pressure will start the timer for the final stage of the dry cycle.
Cake Dry: Final	The filter pressure drops below the FP – Start Final Dry set point.	The Dry – Final timer is done.	The cake dry valve is open. The bleedoff valve is closed. When all the liquid has been forced from the upper platen, the filter pressure will drop. When the filter pressure drops to the FP – Start Final Dry set point, the Dry - Final timer will start. This stage of the dry cycle will continue until the timer is complete. When the Dry - Final timer is done, the cake dry valve is closed. If the filter pressure increases above the FP - Start Final Dry set point, the final drying timer will pause.
Nitrogen Purge	The final dry timer is done.	The Nitrogen Purge timer is done	The Nitrogen Purge valve is opened to purge the platen with Nitrogen prior to opening the platen.
Platen Pre-Open Venting	The Nitrogen Purge is complete.	The platen pre-open vent timer is done.	While the pre-open vent timer is timing, the bleedoff valve will open to vent any remaining pressure in the platen.

Step	Conditions to Start Step	Conditions to End Step	Notes
Platen Opening	The platen pre-open venting timer is done.	The platen opened position proximity switch is engaged.	The open platen solenoid valve is energized shifting the platen control valve to the open position. The airbags exhaust and the air cylinder is pressurized to open the platen. The solenoid will remain on until the platen is fully opened.
Discharge Cycle	<p>The upper platen is fully opened.</p> <p>The control logic must have commanded the platen to open automatically.</p>	The media advance counter is done.	<p>The reroller motor is energized to run.</p> <p>The discharge cycle will start. The reroller will advance the media and discharge the filter cake.</p> <p>The media advance is monitored by the media counter located on the clean media roll. When the media has advanced the appropriate number of counts, the discharge cycle is complete.</p>
			<p>If the Platen control switch is in AUTO the filter will automatically sequence back to the platen closing step and continue operation.</p> <p>If the Platen control switch is in the HOLD-OPEN position, the filter will remain in STANDBY mode until the switch is switched back to AUTO and the SYSTEM AUTO START push button is pressed.</p>

2. MANUAL OVERRIDES

Override	Description
Open Platen	<p>Turning the Manual Platen Control selector switch to the OPEN position will open the upper platen. The plant air must be on for the platen to open.</p> <p>The platen will open regardless of the operational status. Liquid may spill if the platen is not empty.</p>
Emergency Stop	The control power can be turned off by pressing the EMERGENCY STOP push button on the main electrical enclosure door or at the filter. All filter operation will stop.
Stop Feed / Start Dry	The filter can be forced from a feed cycle to a cake dry cycle by pressing the STOP FEED / START DRY push button on the HMI Manual Overrides screen.
Open Bleedoff Valve	The bleedoff valve can be opened by pressing the OPEN BLEEDOFF VALVE push button on the HMI Manual Overrides screen.
Open Nitrogen Purge Valve	The nitrogen purge valve can be opened by pressing the OPEN NITROGEN PURGE VALVE push button on the HMI Manual Overrides screen.
Abort Dry	<p>The filter can be forced from a cake dry cycle into a discharge cycle by pressing the ABORT DRY CYCLE push button on the HMI Manual Overrides screen.</p> <p>The forced discharge is only allowed when the cake dry/wash cycle is enabled.</p> <p>A forced discharge venting sequence consists of opening the bleedoff valve while the cake dry valve remains open. Liquid above the bleedoff tube in the upper platen is discharged through the bleedoff valve. This operation is for a timed period. At the end of this period the cake dry cycle will end. The filter will sequence to the platen pre-open venting and continue normally. The filter cake may contain more moisture than normal.</p>
Media Jog	The reroller may be manually operated by pressing the Media Jog push button on the main electrical enclosure door. The reroller will only operate if the platen is in the opened position and the end doors are closed.
Platen Hold Open	Following a discharge cycle, if the Platen selector switch is in the HOLD OPEN position, the platen will not close and the filter will pause in STANDBY mode.

3. PUMPS

CAUTION: Verify valve position prior to starting pumps or filter.

Pump	Description
Filter Pump	<p>The Filter Pump runs when the filter inlet valve is open as long as the filtrate tank level is not high. The Filter Pump continues to run as long as the inlet valve is open.</p> <p>The Filter Pump will shut off whenever the filter inlet valve is closed.</p> <p>The pump Start and Stop push buttons (HMI – Filter Pump screen) can be used to start or stop the pump when the pump is in Manual, overriding the automatic controls.</p> <p>Note: When running a pump in manual, all pump / tank level interlocks are disabled.</p>
Filtrate Pump	<p>The Filtrate Pump starts when the filtrate tank level rises to the Filtrate Tank Level High – Start Pump set point. The pump continues to operate until the level in the filtrate tank drops to the Filtrate Tank Level Low – Stop Pump set point.</p> <p>The pump Start and Stop push buttons (HMI – Clean Pump screen) can be used to start or stop the pump when the pump is in Manual, overriding the automatic controls.</p> <p>Note: When running a pump in manual, all pump / tank level interlocks are disabled.</p>

4. OPTIONAL & AUXILIARY EQUIPMENT

Equipment	Description
4.1 Air Heater	<p>The air heater is used to heat the cake dry/cake wash air to aid in drying the cake. The use of heated air can be enabled or disabled from the HMI. If heated air is enabled, the air heater will operate to heat the air to the desired temperature. The heater is controlled by a separate air heater controller mounted next to the main control panel. Temperature set point and over temperature control is performed from this controller. For the air heater to operate, sufficient air flow must be detected by the air flow transmitter mounted in the cake dry air line. The set point for air flow is adjustable on the HMI.</p>

5. SHUT DOWN PROCEDURE

CAUTION: The filter should not be shut down for extended periods with the airbag pressurized. This can cause premature failure of the platen seals or belts.

	Description
5.1 Automatic	<p>Press the AUTO SYSTEM STOP push button. The following sequence will occur:</p> <ul style="list-style-type: none"> • If active, the feed cycle will end. • The dry cycle will sequence normally. • The filter will discharge the filter cake. <p>This is the preferred method of shutting down the Filter System.</p>
5.2 Manual	<p>This procedure should only be used for short-term shutdowns.</p> <ul style="list-style-type: none"> • Put the PLATEN selector switch in the HOLD-OPEN position. • If the feed cycle is active, press STOP FEED / START DRY HMI push button. • The feed cycle will end. • The dry cycle will sequence normally. • The filter will discharge the filter cake. • After the discharge cycle is complete, the STANDBY status will be active.
5.3 EMERGENCY	<p>Press a MASTER / EMERGENCY STOP push button. This will immediately halt all filter system operations including all pumps.</p> <p>This method should only be used in an EMERGENCY.</p>

6. FAULTS

Active faults will turn on the alarm horn and beacon. The alarm message will appear on the alarm banner on the HMI. To silence the horn, press the ALARM SILENCE / RESET push button. The alarm beacon will remain energized while the fault is active. Holding the ALARM SILENCE / RESET push button for two seconds will reset all faults. Press the CLEAR push button (F1) to clear the alarm banner. There is also an Alarm List on the HMI which gives a historical listing of the last 100 alarms that occurred.

Ref. #	Fault	Description
6.01	Low PLC Battery	If the battery in the PLC needs replacing, this alarm is activated. Replace the battery at the earliest opportunity.
6.02	Long Dry Fault	<p>The filter remains in the dry cycle until the filter pressure drops below the FP – Start Final Dry pressure set point. If something has caused the filter media to “blind over” and not allow the cake dry air to force the liquid through the filter cake, the filter pressure will not drop. If this occurs and the filter remains in the dry cycle too long (Dry Cycle Limit timer set point), this fault occurs.</p> <p>The dry cycle can be aborted by pressing the ABORT DRY CYCLE push button on the HMI Manual Overrides screen. Caution: Aborting the Dry Cycle can cause a liquid spill.</p> <p>MLP Only: no Abort Dry. Check Cake Dry Valve and/or add more time to Dry Cycle Limit.</p>
6.03	High Filter Pressure Fault	<p>If the filter pressure exceeds the FP – High Alarm pressure set point, this fault will occur.</p> <p>This fault normally occurs when the cake dry pressure regulator is improperly adjusted. The cake dry pressure regulator should be set at 35 psig (maximum).</p>
6.04	Reroller Motor Starter Contactor Fault	The controls monitor the status of the motor starter. If the motor is enabled and the starter auxiliary contacts are not engaged, a fault occurs. Check the motor starter overloads. For normal operation, the fault must be reset.
6.05	Out of Media Fault	During a discharge cycle, the media advance is measured by the media proximity switch located on the clean media roll. The proximity switch provides a pulse every 2.5 inches of media advancement. If the switch does not detect a pulse at least once every 2.5 seconds, this fault is generated. This generally indicates that the filter is out of clean media, the media has torn, the media counter has not been returned to its proper position, or the media is not being advanced because it is not properly engaged in the reroller or the reroller clutch (if equipped) is slipping and needs to be adjusted.

Ref. #	Fault	Description
6.06	Media Advance Took Too Long	When the discharge cycle is enabled, the advancement of media is timed. If the appropriate amount of media is not advanced within the allotted time, this fault occurs. This generally indicates that the filter is out of clean media, the media has torn, the media counter has not been returned to its proper position, or the media is not being advanced because it is not properly engaged in the reroller or the reroller clutch (if equipped) is slipping and needs to be adjusted.
6.07	Platen Closing Took Too Long	When the platen is commanded to close, a timer is enabled. If the platen does not reach the closed position before the timer is complete (30 seconds), this fault occurs. This fault can be caused by problems with the platen control valve, the open or close platen solenoid valve, platen movement, or the platen open or closed proximity switch.
6.08	Platen Opening Took Too Long	When the platen is commanded to open, a timer is enabled. If the platen does not reach the opened position before the timer is complete (45-60 seconds depending on filter size), this fault occurs. This fault can be caused by problems with the platen control valve, the open or close platen solenoid valve, platen movement, or the platen open or closed proximity switch.
6.09	Platen Position Proximity Switch Failure	Proximity switches monitor the opened and closed position of the platen. During normal filter operation one or none of the platen position proximity switches will be energized. If both platen position proximity switches are energized, then there has been a failure in one of the switches. The switches must be inspected and tested to verify which one has failed.
6.10	Platen Out Of Position	Proximity switches monitor the opened and closed position of the platen. If the platen is not sensed as being in the proper position, this fault is activated. This fault can be caused by problems with the platen control valve, the open or close platen solenoid valve, platen movement, or the platen open or closed proximity switch. This fault will turn off the Filter Pump.
6.11	Airbag Pressure Too Low To Begin Feed Cycle	When the platen is closed the airbags are pressurized to start a feed cycle. If the airbags do not reach the AB – Start Feed set point within 45 seconds, this fault occurs.
6.12	Airbag Pressure Too Low To Begin Dry Cycle	Following a feed cycle, the airbags are fully pressurized to start a dry cycle. If the airbags do not reach the AB – Start Dry set point within 60 seconds, this fault occurs.

Ref. #	Fault	Description
6.13	Airbag Pressure Less Than Required	When the filter is in a feed or dry cycle, the airbag pressure required for proper filter operation is calculated based on the filter pressure. The required pressure is equal to twice the filter pressure plus 15 psi. If the actual airbag pressure is less than this pressure for 60 seconds, or if the actual airbag pressure drops below the required pressure three times within a two minute period, this fault is activated.
6.14	Low Plant Air Pressure	The plant air pressure switch monitors the air supply pressure to the filter. If the pressure falls below the switch setting for 30 seconds, or if the air pressure drops below the switch set point three times within a two minute period, this fault occurs.
6.15	Airbag Pressure or Filter Pressure Transmitter Signal Out of Range	If the airbag or filter pressure transmitter is outside its normal 4-20mA range, the appropriate fault is activated. It indicates a problem with the transmitter.
6.16	Filtrate Tank Level or Air Flow Transmitter Signal Out of Range	If the filtrate tank level transmitter or air flow transmitter is outside its normal 4-20mA range, the appropriate fault is activated. It indicates a problem with the transmitter.
6.17	Air Heater Controller Fault	The status of the air heater controller is monitored by the filter controls. If a fault in the heater controller is detected, this fault is activated. Check the overtemperature controller.
6.18	Air Heater Contactor Fault	If the electrical contactor to energize the air heater does not engage, this fault is activated. Check the contactor for proper operation.
6.19	Filtrate Tank Level High – Radar	If the filtrate tank level is above the alarm set point, this fault is activated. Inlet, cake dry, cake wash, and nitrogen purge valves are closed. Check the filtrate pump for proper operation.
6.20	Filtrate Tank Level High – Tuning Fork	If the filtrate tank level is above the tuning fork high level sensor, this fault is activated. Inlet, cake dry, cake wash, and nitrogen purge valves are closed. Check the filtrate pump for proper operation.

7. HUMAN MACHINE INTERFACE (HMI)

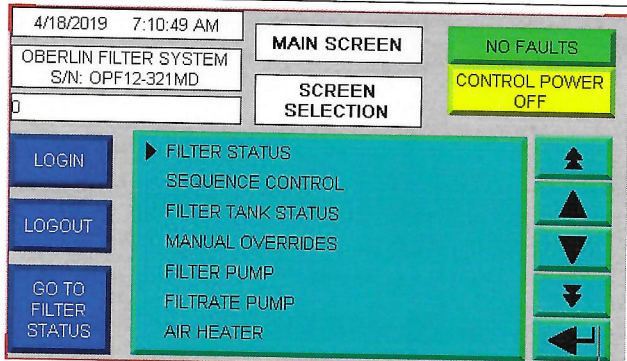
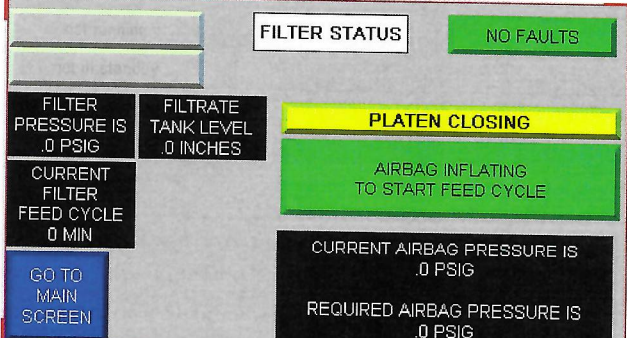
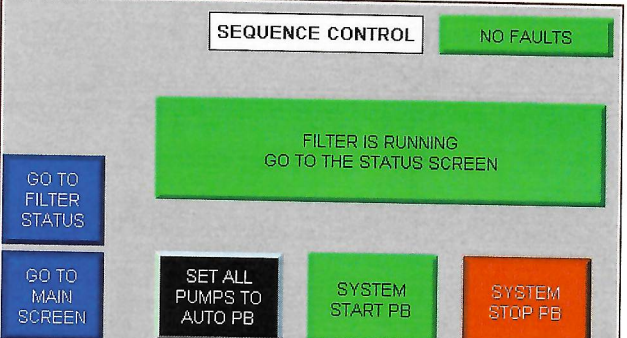
The filter control status indication and manual controls are contained within the Allen-Bradley PanelView PV800 operator interface, HMI. The HMI will provide various information depending which screen is displayed.

Each screen has an indicator if there is an active fault. Also, each screen has one or more of the following default function keys.

- F1 Main Menu
- F2 Filter Status

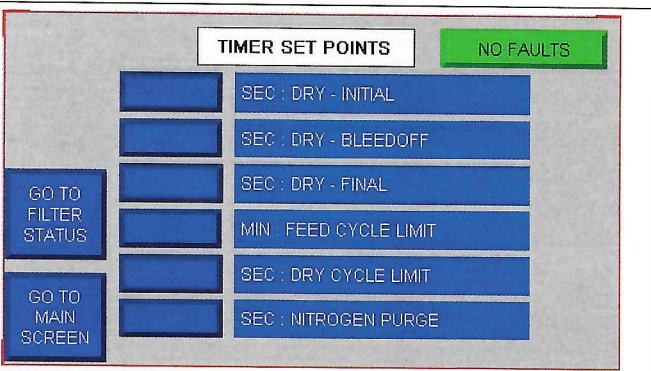
During normal operation the Filter Status screen should be displayed. It indicates which operating step is active.

A summary of each of the operator accessible screens is listed below.

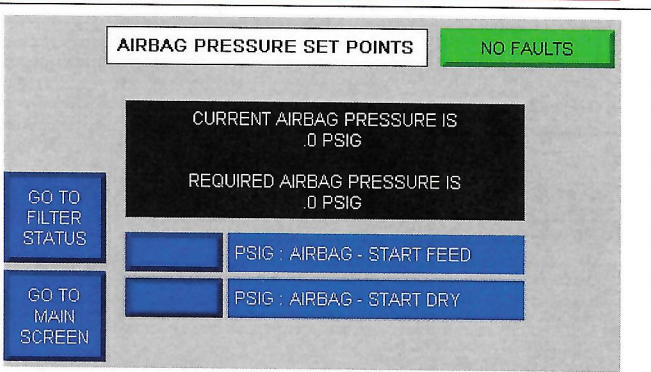
<p>7.01 Main Menu The main menu provides access to the other control screens. The PAGE UP, UP, DOWN or PAGE DOWN cursor keys are pressed to highlight the desired screen. When the cursor is next to the desired screen, press the ENTER key to select the screen. The screen list will wrap scroll. IF password protection has been enabled, LOGIN and LOGOUT on this screen.</p>	
<p>7.02 Filter Status The screen will display the current operating step. Refer to Section 1 for details.</p>	
<p>7.03 Sequence Control The operator can start or stop the filter by pressing the appropriate screen box push button. All pumps can be placed in Auto by pressing SET ALL PUMPS TO AUTO box.</p>	

<p>7.04 Filtrate Tank Status The actual tank level as well as some of the tank set points are shown on this display. These set points can NOT be changed from this screen.</p>	
<p>7.05 Manual Overrides The specifics of each manual override are described in Section 2. Push the appropriate box push button to activate the action.</p>	
<p>7.06 Pump Control All pump control screens are similar. They display the status of the pump and permit the pump to be operated in Manual.</p>	
<p>7.07 Air Heater The air heater status is displayed. Operation of the air heater can also be allowed or disabled. The minimum air flow setpoint for heater operation can also be adjusted on this screen.</p>	

7.09 Timer / Counter Presets
 Press the box area to the left of the item to be changed. A numeric pad will pop up on the screen. Enter the new value. Press the ENTER key on the pop up numeric display to accept the new value.



7.10 Airbag Pressure Presets
 Press the box area to the left of the item to be changed. A numeric pad will pop up on the screen. Enter the new value. Press the ENTER key on the pop up numeric display to accept the new value.



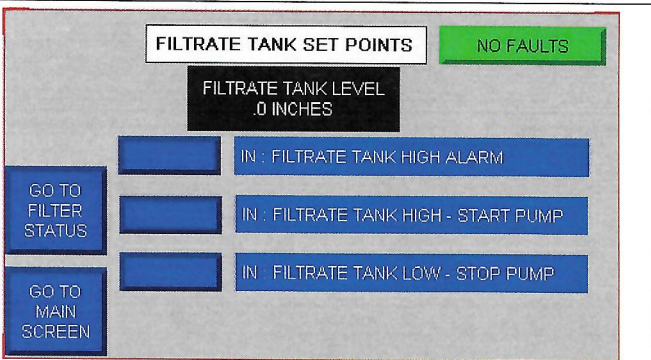
7.11 Filter Pressure Presets
 Press the box area to the left of the item to be changed. A numeric pad will pop up on the screen. Enter the new value. Press the ENTER key on the pop up numeric display to accept the new value.



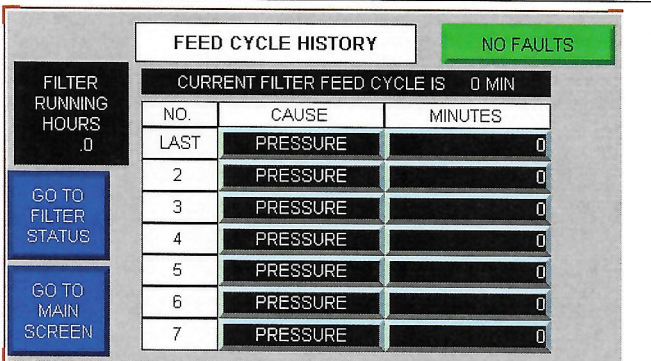
7.12 Cake Wash Presets
 Press the box area to the left of the item to be changed. A numeric pad will pop up on the screen. Enter the new value. Press the ENTER key on the pop up numeric display to accept the new value.



7.14 Filtrate Tank Level Set Points
 Press the box area to the left of the item to be changed. A numeric pad will pop up on the screen. Enter the new value. Press the ENTER key on the pop up numeric display to accept the new value.
 To go to the next TANK SET POINT screen push the NEXT SCREEN box.

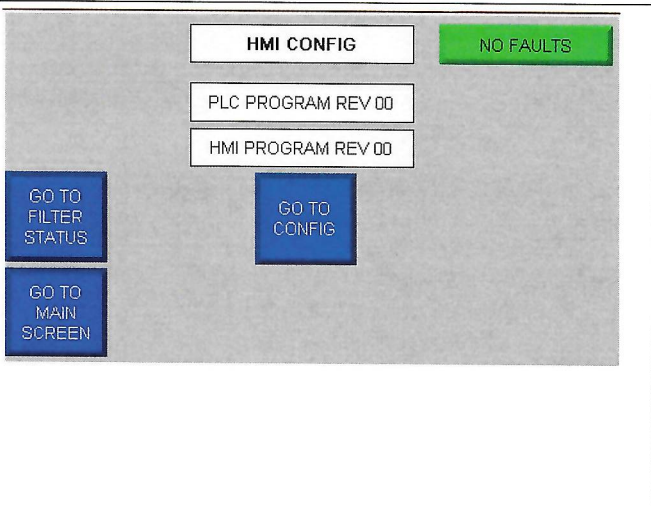


7.17 Feed Cycle History
 The duration of the last seven (7) feed cycles are displayed on this screen. The condition that caused the feed cycle to end is displayed next to the duration. Total filter running time is also displayed here.

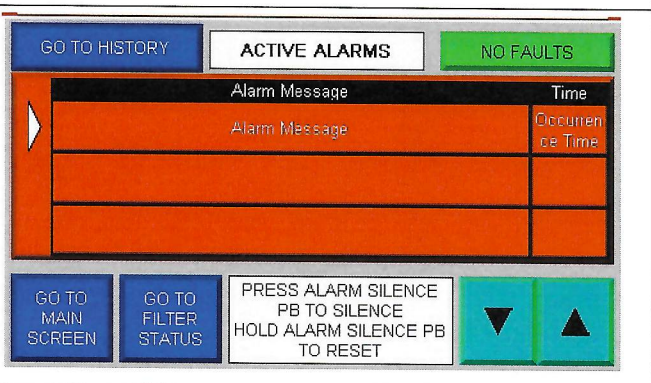


7.18 Configuration Screen
 This screen is PASSWORD protected. Default Username = **oberlin**
 Default Password = **oberlin** or Filter model+S/N: ##### (ex. 06020).

 This screen is used to access the PanelView configuration settings by pushing the GO TO CONFIG box. Things such as Date, Time, Baud Rate, etc. are accessed through the Configuration. File management and ethernet addressing are also accessed on the configuration screen. This screen also displays the revision of the PLC and HMI programs.



7.19 Active Alarm List
 This screen provides a listing of up to 100 ACTIVE faults conditions. The list is maintained as a First In First Out table. The most recent fault is at the top of the list. The operator can scroll through the list using the UP and DOWN arrow keys. Each alarm is logged with the date and time that the alarm occurred.
 To see the Alarm History screen push the GO TO HISTORY box.



7.20 Alarm History

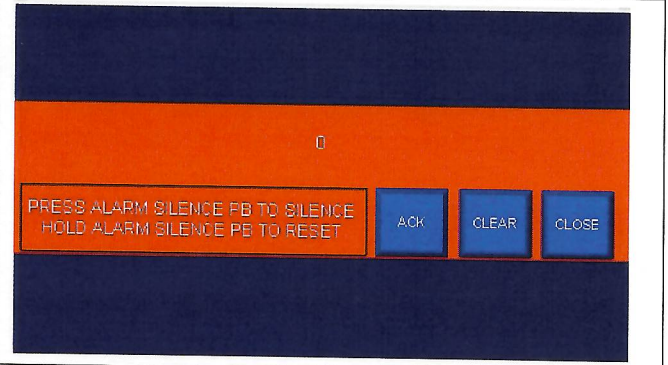
This screen provides a listing of the last 100 faults conditions. The list is maintained as a First In First Out table. The most recent fault is at the top of the list. The operator can scroll through the list using the UP and DOWN arrow keys. Each alarm is logged with the date and time that the alarm occurred.

The history table can be cleared using the Clear All Alarms box push button.



7.1002 Alarm Banner

The current alarm condition is displayed in the banner. When the banner is displayed the entire remaining screen is disabled. The banner is cleared by pressing one of the three ACK, CLEAR or CLOSE box push buttons.



8. SETTINGS

Device Type Description	Device Number		Setting	
	ID #	PLC Address	Value	Units
Pressure Regulators				
Airbag	026	N/A	100	Psig
Cake Dry	012	N/A	35	Psig
Pressure Settings				
Plant Air Pressure Switch	033	I:0/13	70	Psig
Airbag: AB - Start Feed	N/A	F17:12	30	Psig
Airbag: AB - Start Dry	N/A	F17:13	70	Psig
Filter: FP - Start Final Dry	N/A	F17:15	25	Psig
Filter: FP – Start Cake Wash	N/A	F17:16	27	Psig
Filter: FP - Stop Feed	N/A	F17:17	30	Psig
Filter: FP – High Alarm	N/A	F17:18	40	Psig
PLC Timers				
Dry – Initial	N/A	T4:1	30	Sec
Dry - Bleedoff	N/A	T4:2	0	Sec
Dry – Final	N/A	T4:3	30	Sec
Nitrogen Purge	N/A	T4:22	10	Sec
Feed Cycle Limit	N/A	C5:0	480	Min
Dry Cycle Limit	N/A	T4:9	900	Sec

Cake Wash Settings				
Start Cake Wash Pressure	N/A	F17:16	27	Psig
Cake Wash Rinse	N/A	T4:26	20	Sec
Cake Wash Air Assist	N/A	N7:90	10	Sec
Cake Wash Dry	N/A	T4:27	60	Sec
Cake Wash Cycles	N/A	C5:20	1	
Tank Levels				
Filtrate: Low – Stop Pump	N/A	F17:20	4	Inches
Filtrate: High – Start Pump	N/A	F17:21	16	Inches
Filtrate: High Alarm	N/A	F17:23	20	Inches
Air Flow				
Air Flow OK to Enable Air Heater	N/A	F17:26	101	CFM
For other presets refer to the PLC software listing.				

9. REMOTE FILTER INTERFACES

The filter is connected into an Ethernet network.
The filter PLC I/P addresses is:

Oberlin Serial Number OPF12-321MD
Ethernet I/P 010.010.010.001
Subnet Mask 255.255.255.000

Communication with the Customer's control system is via UPC-UA.

Oberlin PLC Address	Discrete PLC Input Status Signals from Oberlin to CUSTOMER
I:0/0	PLC Control Power On
I:0/1	Platen Opened Proximity Switch
I:0/2	Platen Closed Proximity Switch
I:0/3	Media Advance Proximity Switch
I:0/4	Filter E-Stop Push Button is Pressed (Junction Box)
I:0/5	Platen Selector Switch in Auto
I:0/6	Media Job Push Button
I:0/7	Filtrate Tank Level Switch (Input is ON when level is OK)
I:0/8	Auto System Start Pushbutton
I:0/9	Auto System Stop Pushbutton (NC)
I:0/10	Alarm Silence/Reset Push Button
I:0/11	Spare Input
I:0/12	Reroller Motor is Running
I:0/13	Plant Air Pressure is OK
I:0/14	Air Heater Contactor is Enabled
I:0/15	Air Heater is Faulted
I:0/16	Main E-Stop Push Button is Pressed (Control Panel)
I:0/17	Spare Input
I:0/18	Spare Input
I:0/19	Spare Input

Oberlin PLC Address	PLC Analog Input Status from Oberlin to CUSTOMER Values are in units of psi (Real Variable)	
F17:1	Airbag Pressure	PSI
F17:2	Filter Pressure	PSI
F17:3	Filtrate Tank Level	Inches
F17:4	Cake Dry Air Flow	Cubic Meters/Hr

Oberlin PLC Address	Discrete PLC Output Status Signals from Oberlin to CUSTOMER	
O:0/0	Open Platen Solenoid Valve	
O:0/1	Close Platen Solenoid Valve	
O:0/2	Open Cake Dry Solenoid Valve	
O:0/3	Close Bleedoff Solenoid Valve	
O:0/4	Open Inlet Solenoid Valve	
O:0/5	Open Cake Wash Solenoid Valve	
O:0/6	Open Nitrogen Purge Solenoid Valve	
O:0/7	Run Filer Pump Solenoid Valve	
O:0/8	Run Filtrate Pump Solenoid Valve	
O:0/9	Spare Output	
O:0/10	Run Reroller Motor Starter	
O:0/11	Enable Air Heater Contactor	
O:2/0	Spare Output	
O:2/1	Spare Output	
O:2/2	Alarm Horn	
O:2/3	Alarm Beacon	
O:2/4	Spare Output	
O:2/5	Spare Output	
O:2/6	Spare Output	
O:2/7	Spare Output	

Oberlin PLC Address	Filter Fault Status Signals from Oberlin to CUSTOMER
B3:25/0	Low PLC Battery
B3:25/1	Long Dry Fault
B3:25/2	High Filter Pressure Fault
B3:25/3	Reroller Motor Starter Fault
B3:25/4	Out of Media Fault
B3:25/5	Media Advance is Taking Too Long
B3:25/6	Not Used
B3:25/7	Not Used
B3:25/8	Not Used
B3:25/9	Not Used
B3:25/10	Platen Closing Took Too Long
B3:25/11	Platen Opening Took Too Long
B3:25/12	Platen Position Proximity Switch Failure
B3:25/13	Platen Out Of Position
B3:25/14	Not Used
B3:25/15	Airbag Pressure Too Low To Begin Feed Cycle
B3:26/0	Airbag Pressure Too Low To Begin Dry Cycle
B3:26/1	Airbag Pressure Less Than Required
B3:26/2	Plant Air Pressure Low
B3:26/3	Not Used
B3:26/4	Airbag Pressure Transmitter Fault
B3:26/5	Filter Pressure Transmitter Fault
B3:26/6	Filtrate Tank Level Transmitter Fault
B3:26/7	Cake Dry Air Flow Transmitter Fault
B3:26/8	Not Used
B3:26/9	Not Used
B3:26/10	Not Used
B3:26/11	Not Used
B3:26/12	Not Used
B3:26/13	Not Used

Oberlin PLC Address	Filter Fault Status Signals from Oberlin to CUSTOMER
B3:26/14	Not Used
B3:26/15	Not Used
B3:27/0	Filtrate Tank Level High Fault (Radar Probe)
B3:27/1	Filtrate Tank Level High Fault (Tuning Fork)
B3:27/2	Not Used
B3:27/3	Not Used
B3:27/4	Not Used
B3:27/5	Not Used
B3:27/6	Not Used
B3:27/7	Not Used
B3:27/8	Not Used
B3:27/9	Not Used
B3:27/10	Not Used
B3:27/11	Not Used
B3:27/12	Not Used
B3:27/13	Air Heater Contactor Fault – Failed to Engage
B3:27/14	Air Heater Controller Fault
B3:27/15	Not Used
B3:28/0	Cake Dry Air Flow is Too Low for Heater

PLC Address = N7:30	Filter Operating Status Signals from Oberlin to CUSTOMER
Value = 1	Filter is Running
Value = 2	Filter is Running – The Shutdown is Enabled
Value = 3	Filter Shutdown is Complete
Value = 4	Filter is Off – Press Auto Start to Run
Value = 5	Control Power is Off – Press Master Start to Turn On Control Power
Value = 6	Filter is in Standby – Platen Switch is not in Auto
Value = 7	Filter is in Standby – Press Auto Start to Resume Operation
Value = 8	Filter is in Standby Due to a Fault – Reset the Fault
Value = 9	Filter is Off – Main E-Stop is Pressed
Value = 10	Filter is Off – Junction Box E-Stop is Pressed

PLC Address = N7:31	Filter Sequence Step Status Signals from Oberlin to CUSTOMER
Value = 1	Airbag inflating to start feed cycle
Value = 2	Feed cycle
Value = 3	Airbag inflating to start the dry cycle
Value = 4	Cake dry cycle: initial
Value = 5	Cake dry cycle: bleedoff
Value = 6	Cake dry cycle: pre-break through
Value = 7	Cake dry cycle: final
Value = 8	Abort dry cycle / forced discharge venting
Value = 9	Upper platen pre-open venting
Value = 10	Cake Discharge cycle
Value = 11	Filter in standby – platen switch in hold open
Value = 12	Filter Shut Down
Value = 13	Filter in standby – Press auto start to resume
Value = 14	No Cycle Active
Value = 15	Feed cycle pending
Value = 16	Cake dry cycle pending
Value = 17	Filter in standby – due to a fault
Value = 18	Cake Wash Pending – Delay before wash
Value = 19	Cake Wash Pending – Waiting for filter pressure to drop
Value = 20	Cake Wash – Rinsing the cake with air assist
Value = 21	Cake Wash – Rinsing the cake without air assist
Value = 22	Cake Wash – Drying the cake
Value = 23	Cake Wash Pending – Airbag pressure too low
Value = 24	Nitrogen Purge Pending
Value = 25	Nitrogen Purge prior to opening platen

PLC Address = N7:32	Filter Upper Platen Status from Oberlin to CUSTOMER
Value = 1	Platen closing
Value = 2	Platen closed
Value = 3	Platen opening
Value = 4	Platen opened
Value = 5	Platen out of position while running
Value = 6	Platen proximity switch failure