EATON DOM0000024 Controller HMI Interface Installation Guide

Powering Business Worldwide

PART NO: DOM0000024

Controller HMI interface for the F/AFC Full Auto
INSTALLATION AND MAINTENANCE

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DESCRIPTION

This manual can be used for both internal and external backwashing Full Auto options.

Reference

Reference Control Philosophy (DOQ0000138-EN) and Sequence Diagram (DOQ0000139-EN) for additional details on full-auto control programming. For Semi-Auto options, reference IB Logic Diagram (DOQ0000159-EN) or EB LogicDiagram (DOQ0000164-EN) for additional details.

Internal Backwash

The Internal Backwash sequence will take each Filter Station offline in sequence. The Drain Valve will energize at the first Filter Station allowing the inlet of the station to be connected to the Drain Header of the unit. Cleaning fluids are then diverted from the Outlet Header to dislodge and discharge accumulated debris collected on the outside of the Filter Element. The Filter Station is then placed back online, and after a short pause, the sequence continues to the remaining Filter Stations.

External Backwash

The External Backwash sequence will take each Filter Station offline in sequence. The Drain Valve and Backwash will energize at the first Filter Station allowing the inlet of the station to be connected to the Drain Header, and the outlet of the station to be connected to the Backwash Header of the unit. The Backwash Supply Valve will then open to supply cleaning fluid to the Backwash Header. Cleaning fluids are then diverted from the Backwash Header to dislodge and discharge accumulated debris collected on the outside of the Filter Element.

The Filter Station is then placed back online, and after a short pause, the sequence continues to the remaining Filter Stations.

The system is controlled by an industrial controller housed in a NEMA rated enclosure. An HMI touch panel display is used to communicate with the controller.

SPECIFICATIONS

SERVICE REQUIREMENTS: Air: minimum 60 psig (4 bar), maximum 116 psig (8 bar) at 5.0 CFM (140 dm^3/m). Backwash, dry, non-lubricated.
Electrical: 120 VAC / 240 VAC (factory set) at 50/60 Hz.
CONNECTIONS: Air: 1/2" NPTI

INSTALLATION INSTRUCTIONS

1. Connect the air supply line (customer supplied) to the air filter/regulator port (1/2" NPTI) mounted on the control panel.
2. Connect the incoming single-phase electrical supply to the panel mounted disconnect switch inside the automation enclosure. Please reference the units wiring diagram for the proper terminal connections for the line and neutral wires. Ground connects to the ground terminal mounted on the face of the switch.

INSTALLATION CHECKLIST

Complete this checklist before operating the system:

- Verify that the input power wiring is attached correctly to the main disconnect switch mounted inside the enclosure.
- Verify that the incoming automation electrical supply is the proper voltage.
  Improper voltage will cause serious damage to the filter's electrical systems. The proper voltage is factory set at 120 volts or 240 volts (single phase VAC)

START-UP VERIFICATION and OPERATION

The drain and backwash valves are in the online process condition by system default. The unit will be filtering if process fluid is present regardless of controller status. Before circulating fluids through the filter system, start the system dry and verify the following:

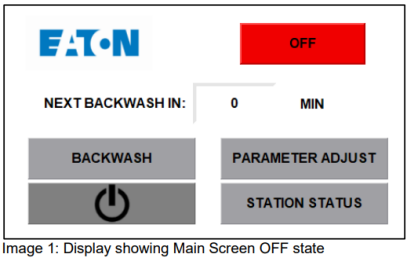

Image 1: Display showing Main Screen OFF state

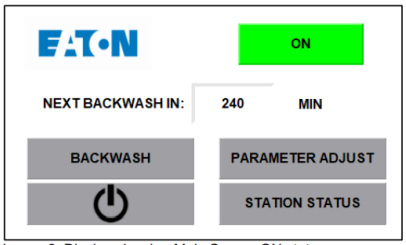

Image 2: Display showing Main Screen ON state

Table 1: Status states that can be display on Main Screen.

ON	Controller is ON
BACKWASHING	Backwashing Cycle is running
HIGH DP	Fault Due to High DP
OFF	Controller is OFF (See warning box below)

WARNING: When the PLC is off, only the PLC control is disabled. The green power light will still be illuminated to indicate that all electrical circuits are powered. Use caution when working on the system in this mode to prevent electrical shock. The ON/OFF button is not intended to be a replacement for following proper lockout procedures.
FAILURE TO FOLLOW THIS WARNING MAY LEAD TO DEATH OR SEVERE INJURY.

1. Turn the main power switch to the ON position (located on the enclosure door). Along with the illumination of the GREEN (power status) light, the display should show the main screen (Image 1).
2. Touch the ON/OFF button (lower left-hand corner of screen). The status box will change from OFF to ON (Image 2).
3. Via main screen navigate to PARAMETER ADJUST, input values as applicable.
4. Via Main Screen navigate to STATION STATUS screen and activate the stations as per connections.
5. Touch the BACKWASH button on The Main Screen. The status box should show BACKWASHING. Reference the sequence diagram (DOQ0000139-EN) for the system to confirm valves are working normally.
   After the system cycles thru each station the status will return to ON.

MAIN SCREEN

The top of the main screen (Images 1 and 2) will display the status states of the filter (Table 1). When the timed backwash function is activated it will show a countdown to the next backwashing cycle in minutes. If the Backwash Interval time setting is set to zero, this timer will be disabled and the TIMED BACKWASH DISABLED message will be displayed (Image 6). If a manual or differential pressure backwash cycle is performed the time interval will reset to the Backwash Interval time setting. Below is a description of each button function on the main screen.

A. The ON/OFF  power button – See warning box on the first page. Turns the PLC ON and OFF. In the event of power failure, the operator will have to turn the system back ON. To reset the system and clear all error messages, turn the system OFF and back ON.
B. BACKWASH button – Allows the operator to initiate a manual backwashing sequence. When the button is touched, BACKWASHING will be displayed in the status box.
C. PARAMETER ADJUST button – Touching this button will display the parameter adjustment screen. This is where changes can be made to the backwash sequences (Image 3 for Internal Backwash, Image 4 for External Backwash).
D. STATION STATUS button – Touching this button will display the station adjustment screen. This is where stations may be enabled or disabled. (Image 7).

PARAMETER ADJUSTMENTS

Parameter adjustments can be made by touching the button at the right of the field you want to change. The numeric keypad (Image 5) will appear and allow you to enter a new parameter. The range that can be entered will be displayed.
Below is a description of each button function on the Parameter Adjustment screen (Image 3 for Internal. Image 4 for External).

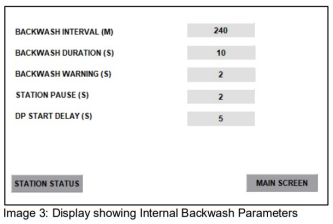

Image 3: Display showing Internal Backwash Parameters

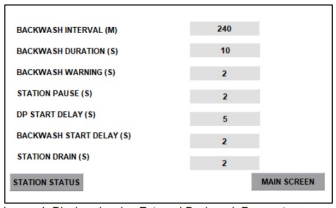

Image 4: Display showing External Backwash Parameters

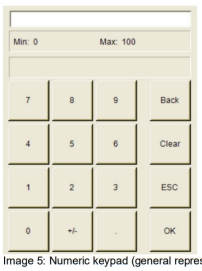

Image 5: Numeric keypad (general representation)

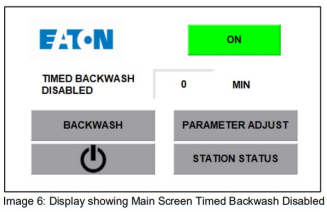

Image 6: Display showing Main Screen Timed Backwash Disabled

A. BACKWASH INTERVAL (M) – The Backwash Interval is the amount of time between automatic backwashing cycles. Backwash sequences will automatically occur based on this time. Units are in minutes and it is preset to 240 minutes. Range is 0-1440 minutes. Setting this value to zero (0) will disable the timed backwash function. (See Image 6).
B. BACKWASH DURATION (S) – The Backwash Duration is the amount of time each station backwashes during a backwashing sequence. Units are in seconds and it is preset to 10 seconds. Range is 0-30 seconds.
C. BACKWASH WARNING (S) – Backwash Warning is the delay between the backwash sequence request and the start of valves actuation. The backwash in process relay (RL2) is energized to indicate the sequence will start. Units are in seconds and is preset to 2 seconds. Range is 0-90 seconds.
D. STATION PAUSE (S) – Station Pause is the pause between stations during the backwashing sequence. Units are in seconds and it is preset to 2 seconds. Range is 0-30 seconds.
E. DP START DELAY (S) – DP Start Delay is the amount of time the signal from the differential pressure switch must be present prior to initiating a backwashing sequence. Units are in seconds and is preset to 5 seconds Range is 0-30 seconds.
F. BACKWASH START DELAY (S)– (EXTERNAL backwashing systems only) Backwash Start Delay is the amount of time between taking a station offline and opening the backwash supply valve. This delay allows the process fluid to drain from the filter body. Units are in seconds and is preset at 2 seconds. Range is 0-30 seconds.
G. STATION DRAIN (S)– (EXTERNAL backwashing systems only). The Station Drain duration is the amount of time between closing the backwash supply valve and placing the station back online. This delay allows the backwash fluid to drain from the filter body. Units are in seconds and is preset at 2 seconds. Range is 0-30 seconds.
H. MAIN SCREEN button – Touching this button will return the user to the Main Screen (Image 1 or 2).
I. STATION STATUS button – Touching this button will display the station adjustment screen. This is where stations may be enabled or disabled. (Image 7)

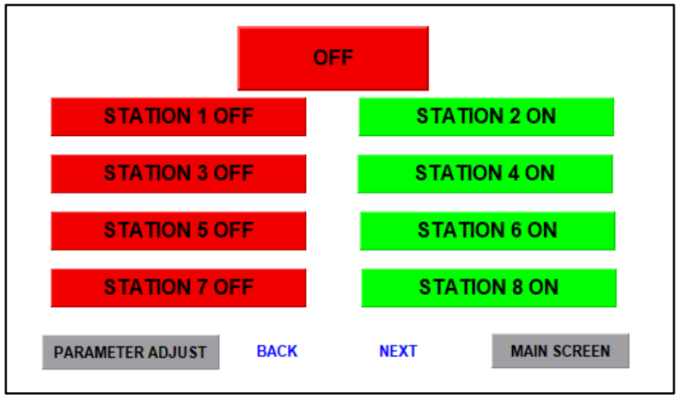

Image 7: Station Status

STATION STATUS

The Station Status screen (Image 7) allows the operator to add or remove individual stations from the backwash sequence. Pressing the button for the station to be modified will turn that station ON or OFF. Stations that are ON will be included in the backwash sequence; stations that are OFF are not included (skipped). Pressing Next Screen or Back Screen button will cycle to the next or previous set of stations (when it applies).

FAULT MESSAGES

Below is a description of each fault message on the HMI operator interface. To reset the system and clear all fault messages and outputs, turn the system OFF and back ON. The System Fault Relay (RL-1) will be de-energized when a fault is present.

A. HIGH DP – When the system initiates four backwashing cycles due to differential pressure within 60 minutes, a fault is set and the message HIGH DP (Image 8) will be indicated on display. Backwash sequences will occur as normal. Possible causes: plugged elements, insufficient backwash duration or insufficient inlet pressure to properly backwash the element.

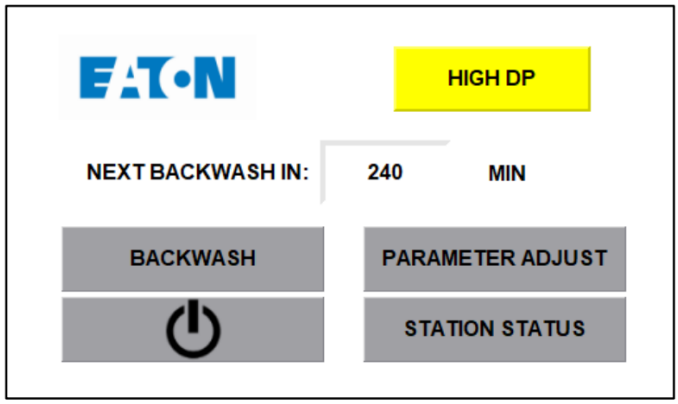

Image 8: Display showing main screen with the HIGH DP fault

DIFFERENTIAL PRESSURE SWITCH ADJUSTMENT

The differential pressure switch senses a difference in pressure between the inlet and outlet piping. When the factory pressure preset has been reached, it triggers a backwashing sequence. The factory preset is 15 PSID (1 bar).

To adjust the preset, remove the DP switch cover and turn the hex-adjusting nut. Turn it clockwise to decrease the allowable differential pressure between the inlet and outlet piping. Turn the hex nut counterclockwise to increase the allowable differential pressure between the inlet and outlet piping. One flat turn (1/6 th of a turn) of the hex-adjusting nut changes the setting by approximately 2 PSID (0.14 bar).

CUSTOMER INTERFACE

A. GENERAL FAULT (RL-1) – This relay is energized during normal operation. It will de-energize to indicate power loss, system is OFF or if an HIGH DP condition is present (if there are four differential pressure clean sequences in 60 minutes). See electrical schematic for connection details.

B. BACKWASH IN PROCESS (RL-2) – This relay is energized when the system is cleaning (backwashing). Reference the electrical schematic for contact connections.

C. REMOTE BACKWASH SWITCH – Use a momentary normally open dry contact across the Remote Backwash terminals to initiate a backwash. Reference the electrical schematic for contact connections.

WARRANTY

All products manufactured by Seller are warranted against defects in material and workmanship under normal use and service for which such products were designed for a period of eighteen (18) months after shipment from our factory or twelve (12) months after starting up, whichever comes first. OUR SOLE OBLIGATION UNDER THIS WARRANTY IS TO REPAIR OR REPLACE, AT OUR OPTION, ANY PRODUCT OR ANY PARTS OR PARTS THEREOF FOUND TO BE DEFECTIVE. SELLER MAKES NO OTHER REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WE SHALL NOT BE LIABLE FOR CARTAGE, LABOR, CONSEQUENTIAL DAMAGES OR CONTINGENT LIABILITIES. OUR MAXIMUM LIABILITY SHALL NOT IN ANY EVENT EXCEED THE CONTRACT PRICE FOR THE PRODUCT.

If you are interested in ordering spare parts or having service performed on your filter, please contact Customer Service.

Eaton reserves the right to change specifications, dimensions and model designations without prior notice.

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Documents / Resources

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