

Semi-Auto Control Installation, Operation & Maintenance

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Air: Minimum 60 PSIG (4 bar), Maximum 116 PSIG (8 bar) at 2.5 cfm (70.79 L/min) clean, dry, non-lubricated air.

Materials of Construction

All welded and wetted materials are type 316/316L stainless steel. **The material selection for this vessel was based on the information provided when the unit was ordered. It is the customer's responsibility to ensure material compatibility.**

Connections

Air supply: 1/4" NPTI (standard)

Design Temperature

Temperatures vary based on elastomer and cleaning disc materials.

- Maximum temperature for lid and element elastomers: Viton® and Teflon® 400 °F (204 °C), Buna-N 220 °F (104 °C), EPT 300 °F (149 °C)
- Maximum temperature for cleaning disc materials: Polyethylene 180 °F (82 °C), Kynar® 285 °F (140 °C), Teflon® 400 °F (204 °C), Urethane 175 °F (79 °C)

Airborne Noise Emissions

<70 dB(A) During normal operation

Description

Each filter Station of a DCF filter system consists of a stainless steel cylindrical filter screen sealed within a stainless steel filter housing. Unfiltered process fluid enters the filter housing through the upper port. The process fluid enters the inside of the filter screen from above and the filtrate flows through the filter screen, exiting the filter housing through the lower port. The filter screen traps filtered contaminants on the inside of the filter screen. The contaminants are periodically scraped off the surface of the filter screen by a cleaning disc which travels up and down the surface of the screen. These contaminants are deposited in a collection (purge) chamber in the bottom of the filter housing where they are periodically purged out of the bottom port of the filter housing.



Warning: The use of Teflon® tape is not recommended for all pipe connections. Teflon® tape tends to break off and clog orifices. Electrical supply voltage must match the automation enclosure rating. Incorrect supply voltage will cause damage and may cause injury.

To prevent electrical shock, follow proper safe work procedures when working on electrical circuits.

Installation

This document applies to the installation of the filter unit controls. See additional instructions for the installation of the filter vessel.

Connect Air Supply

1. Install an air supply block valve, air filter and air supply bleed valve (all customer supplied) before the solenoid valves.
2. Connect the air supply line to the air supply block valve (customer supplied).
3. If not already assembled, connect the air lines from the solenoid valves to the filter unit. On the cleaning disc solenoid valve, connect port 'B' to the lower air port on the linear actuator. Connect port 'A' to the upper air port on the linear actuator. When the filter is ON, the solenoid valve is de-energized and the linear actuator is retracted (at the top of the filter element). When the linear actuator solenoid is energized, the cleaning disc is pushed to the bottom of the filter housing.
4. Connect the purge valve solenoid port 'B' to the left port (when facing the actuator with the indicator pointing up) on the purge valve rotary actuator. Connect solenoid port 'A' to the right port (when facing the actuator with the indicator pointing up) on the purge valve rotary actuator. When the filter is ON, the solenoid valve is de-energized and the purge valve is closed. When the solenoid is energized, the purge valve opens.

Connect Electrical Supply

1. All wiring and power connections need to meet local electrical code requirements.
2. No holes have been provided in the automation enclosure for incoming wiring. A hole in the enclosure will need to be made in a suitable location to receive incoming electrical wiring. Protect

Specifications

This lists the general control specifications for a typical Mechanically Cleaned semi automatic filter system.

Service Requirements

Electrical: 24V DC, 120V AC 50/60 Hz, Single phase supply.

internal components from metal chip and debris when making any holes and connections.

Transportation

Move the filter system as close as possible to the installation site before it is removed from the crate or skid. Position the filter frame on a prepared, level foundation. Level the filter frame before it is anchored to the foundation.

Securing to Foundation

Anchor the enclosure stand to the foundation using the three 5/8" diameter anchor holes located at the base of the stand.

Checklist

- Verify that all service connections are secure and meet local codes.
- Verify that the cleaning disc can be activated manually and automatically if so equipped.
- Verify that all lid bolts are tight. Do not over tighten. Damage may occur to the lid and/or castle nuts.
- Verify that the purge valve is closed.
- Check that the purge discharge line is directed in a suitable fashion to accept waste when purged.

Commissioning Procedure

1. Inspect the piping connections to the filter. Verify that the inlet connection on the filter is connected to the pipe containing the incoming process fluid. Repeat this procedure for the outlet and purge connections.
2. All isolation valves to the filter should be closed. If there is a bypass loop around the filter, that loop should be closed to prevent back flushing dirty process fluid into the filter.
3. Open the isolation valve for the outlet piping.
4. If this filter was supplied with a control package, turn on the power to the filter system controls.
5. Open the inlet isolation valve to allow approximately 25% of the flow to reach the filter.



Notice: Opening the inlet valve to the fully open position without proper ramping will cause particles to become wedged into the filter media. If this happens, the filter media will have to be removed and cleaned manually.

6. Over the next ½ hour, slowly introduce more of the flow until you reach 100%. You may want to manually initiate a purge during this time to ensure that piping debris is cleaned from the unit.

Operation



Warning: Do not stroke cylinder when all the block valves are closed. Pressure will increase inside the filter housing and may create a hazardous situation.

1. The cleaning disc should stroke the element clean to keep the differential pressure between the inlet and outlet of the filter below 15 PSID (103 kPa). Stroking too frequently will shorten the life of all wear components.
2. The filter unit is supplied with a valve used to purge the contaminants from the housing. This valve should be opened before the collected contaminants exceed the purge chamber volume and cause a differential pressure increase.

3. If the filter element is removed from the unit, avoid high pressure washing from the inside of the element. This may force contaminants into the filter media and cause permanent blockage and/or element damage.

4. When first pressurizing the filter, it may be necessary to tighten the lid/actuator rod seal. See Figure 1. The viscosity of the process fluid will determine whether this is necessary. If the seal begins to leak, compress the seal by rotating the packing wheel in one-sixth of a turn increments. For maximum seal life, do not use excessive force to tighten the packing wheel.

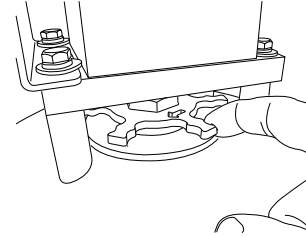


Figure 1

5. Always pressurize the unit slowly on start up and watch for leakage.
6. The unit is equipped with a plug in the lid for placement of overpressure vent, for use as an air release and/or connection for fluid filling of vessel.
7. Monitoring of the differential pressure between the inlet and outlet pressures should be used to determine stroking and purging rates. Normal operation should exhibit low differential pressure that is maintained throughout.

Operational Modes

Filtering

Dirty process fluid enters thru the inlet port, is pushed thru the filter screen where contaminants are removed and clean process exits thru the outlet port.

Cleaning

The cleaning process occurs periodically during the filtering process. As the dirty process fluid passes thru the filter screen, contaminants are collected on the inside of filter screen. The cleaning disc scrapes the length of the filter screen and pushes the contaminants into the purge chamber.

Purging

The purging process occurs to remove contaminants collected in the purge chamber. Once the cleaning disc assembly reaches the bottom of the housing, the purge valve is opened, forcing the concentrated contaminants collected in the purge chamber out of the filter.

Reference Sequence Diagram and Control Philosophy for complete details.

Control Logic

Your control logic should be configured to allow the purge sequence to occur by the following methods. Reference Sequence Diagram and Control Philosophy supplied by EATON with the unit. The end user is responsible for system function.

Troubleshooting

Symptoms

- A** Actuator doesn't operate properly
- B** Purge valve will not operate properly
- C** Leakage at lid seal
- D** Leakage where drive shaft enters lid
- E** Reduction in flow rate or high differential pressure
- F** Drop in filtrate quality

Possible Faults

- A** Actuator doesn't operate properly
 - 1 No power
 - a Check to see if the filter system is receiving adequate power.
 - b Check to see if the filter system is set to the proper voltage.
 - c Check all wiring connections.
 - 2 No air
 - a Check to see if the filter system is receiving adequate air.
 - b Check for air leaks.
 - c Check to see if the air bleed valve is closed and the air block valve is open.
 - d Check to see if the air lines are connected to the correct ports.
 - 3 Actuator seals have been destroyed
 - a Order a factory repair kit and replace the seals.
 - 4 Faulty solenoid valve
 - a Check to see whether the manual override button on the solenoid valve actuates the cylinder
 - 5 Cleaning disc not cleaning the filter screen
 - a Inspect and clean the filter screen.
 - b Inspect and replace the cleaning disc.
- B** Purge valve will not operate properly
 - 1 No power
 - a Check to see if the filter system is receiving adequate power.
 - b Check to see if the filter system is set to the proper voltage.
 - c Check all wiring connections.
 - 2 No air
 - a Check to see if the filter system is receiving adequate air.
 - b Check for air leaks.
 - c Check to see if the air bleed valve is closed and the air block valve is open.
 - d Check to see if the air lines are connected to the correct ports.
 - 3 Actuator seals have been destroyed
 - a Order a factory repair kit and replace the seals.
 - 4 Faulty solenoid valve

- a Check to see whether the manual override button on the solenoid valve actuates the cylinder
- 5 Damaged purge valve
 - a Replace or rebuild purge valve
- 6 Debris caught in purge valve
 - a Remove debris from purge valve
- C** Leakage at lid seal
 - 1 Loose lid nuts/bolts
 - a Tighten lid/nut bolts to
 - 2 Dirty lid sealing surfaces
 - a Clean lid sealing surfaces
 - 3 Damaged sealing surfaces
 - a Repair or replace filter station
 - 4 Worn lid O-ring
 - a Remove and replace with factory lid O-ring
- D** Leakage where drive shaft enters lid
 - 1 Damaged or worn drive shaft seal
 - a Inspect and replace the drive shaft seal
- E** Reduction in flow rate or high differential pressure
 - 1 Purge time too long
 - a Decrease purge timer setting
 - 2 Purge valve not functioning
 - a Inspect and replace purge valve
 - 3 Dirty or damaged filter screen
 - a Inspect and clean or replace filter screen
 - 4 Flow, viscosity or solids increase
 - a Consult factory
 - 5 Cleaning disc not cleaning
 - a Inspect cleaning disc for wear and replace if necessary
- F** Drop in filtrate quality
 - 1 High differential pressure
 - a Refer to reduction in flow rate or high differential pressure above
 - 2 Damaged filter screen O-rings
 - a Remove and replace with factory filter screen O-rings
 - 3 Damaged filter screen
 - a Remove and replace with factory filter screen
 - 4 Filter screen too coarse
 - a Consult factory for ability of filter system to accept a finer screen retention. Remove and replace with factory filter screen.

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 start 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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