Vacuum Filters

Working:

Hydraulic vacuum filter works on the pressure differential created due to suction of pump. This vacuum is less than the suction head available from the pump and is around 3 meters of fluid column. This pressure drop available enables better filtration.

The filter consists of conveyorised dirty tank with inlet chute. The bottom of the tank forms the vacuum chamber. Filter paper (depending on clarity requirement) is laid between the conveyor and vacuum chamber. A perforated sheet & grill forms top of the vacuum chamber. This is to support the filter paper against vacuum force.

A common drive placed at the exit end, moves the conveyor to index the dirty filter paper and also rotates the winding arrangement. The dirt on the paper is scraped off in the bin while the paper is wound on a mandrel.

The vacuum chamber is connected to the pump suction, which is handling the fluid in the system. Small flow from outlet of this pump is diverted to the vacuum brake, tank placed on the top. This tank continuously overflows in the dirty tank.

The vacuum brake tank bottom is connected to the suction of pump through a pneumatically actuated valve, kept normally closed.

Dirty fluid from the machine enters the tank through the inlet chute. The pump suction connected to the vacuum chamber sucks this fluid through the filter paper laid on top.

After the filter paper is choked, a vacuum switch is activated. This opens the valve connecting vacuum brake tank to pump suction. The vacuum in the vacuum chamber is eliminated & the machine is also fed by this fluid.

After a time delay the conveyor is started. This indexes the filter paper for a fixed length. The normal cycle resumes after paper indexing.

Installation:

- Place the Vacuum filter as per attached drawing.
- Connect the outlet of the machine to inlet chute of the vacuum filter. Take care that dirt flow is not obstructed in this connection.
- Assemble a roll of fresh filter paper on the mandrel provided. Lay the filter paper on the bottom of the dirty fluid tank & extend is till the drive end of the tank. Attach the filter paper end to the winding mandrel.
- Place the dirt bin below the scraper at the drive end.
- Arrange for power supply to panel. Check the direction of rotation of the drive motors.
- Arrange for compressed air 5 Kg/cm2 supply for pneumatically actuated valve

Precautions:

- All the dirty fluid is flowing in the dirty tank through inlet chute.
- Paper should be laid according to instruction provided on the Vacuum filter.
- Conveyor movement should be such that the dirty filter paper moves out of the filter.
- Pump is driven in correct direction.
- Check gearbox oil after every two months.
- Never use Vacuum filter without proper Filter Media

Manual Operations:

Note: Set selector switch AUTO/MANUAL on MANUAL

A. MANUAL INDEXING

- When push button manual indexing is pressed a signal parallel to vacuum switch is generated.
- All further actions follow as per normal indexing cycle.
- Manual Indexing will be ineffective in AUTO mode.

B. CONVEYOR INCHING

- When Conveyor Inch push button is pressed, Conveyor motor turns is switched ON
- During inching cycle Dirty pumps are switched OFF
- Conveyor motor remains ON until push button is pressed.

C. TIMER INDEXING

- A settable timer inside the PLC countdowns from a settable time. This time can be set from the MMI.
- Timer is reset after every indexing cycle.

Problems, Causes & Remedies:

1. HIGH DIRT LEVEL IN CLEAN FLUID:

Filter paper absent.

- Add fresh filter paper on stand provided. Wrap around one of the nearest angles of the conveyor.
- Inch the conveyor using inching button provided on panel.
- Both pumps should be turned off while manual inching.
- Continue the inching till paper appears from other end. Tuck the free end of the paper on the expanding mandrel.

Filter paper torn.

- Shut off the pumps.
- Inch the paper manually using the button provided till ruptured portion of the filter paper moves out. Cut off the torn paper and wrap the free end of paper on the mandrel.
- Check for any obstructions if tearing continues.

Filter paper not laid out properly.

- Lay the filter paper according to the path shown on the unit.
- Filter paper edges should always be below conveyor and above tank bottom.
- Use Thermally Bonded filter paper 1000 mm width 70 gsm

2. CONVEYOR PROBLEMS :

- Confirm motor connections.
- Check oil in gearbox. Check motion transmission from motor to gearbox to slip clutch.
- If slip clutch is active, check for any obstruction in conveyor movement.
- Conveyor manual inching will not take place when pumps are working.
- Check continuity of chain and any kind of breakage.

3. PNEUMATICALLY ACTUATED VALVE :

- Check compressed air connection to valve.
- Check electrical connection to solenoid.
- ‘ON’ settings can be adjusted using vacuum switch.
- ‘ON’ time can adjusted using the timer in the panel.

DONOT CHANGE THESE SETTINGS IN ABSENCE OF OUR REPRESENTATIVE.

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