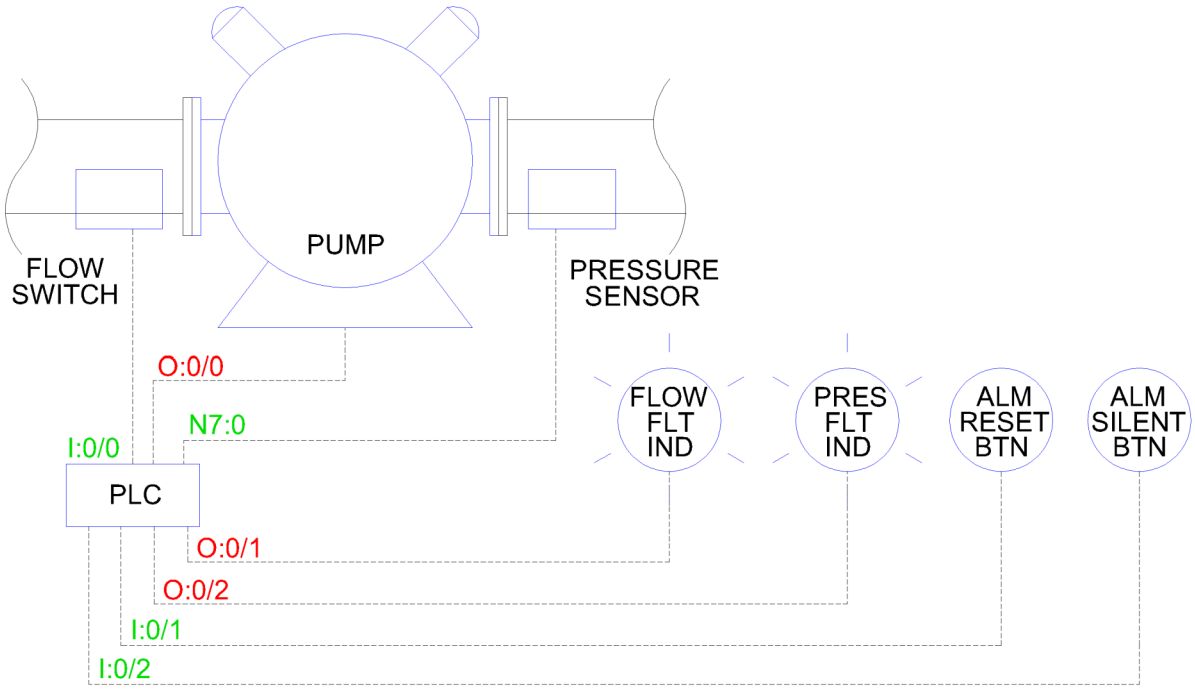
Project 10

PROCESS:



SUMMARY:

Let's control a pump that runs for 30 sec. and then stops for 10 sec. continuously. We'll protect the pump with a flow switch and a pressure sensor. The pump and cycle will terminate if the pump is on and no flow is detected within 5 sec. of the pump starting to run, or if pressure should ever exceed 30 psi for 5 sec. (alarm bits). Fault indicators will alert the user to any problems (alarm notification bits). Oh, and did I mention the HOA?

Yes, we want the pump to have HOA controls, so HAND will energize the pump but only while the button is being pressed! Once released, the pump will return to whichever mode it was in before HAND was pressed (either OFF or AUTO). While there is an active alarm, the pump will not be or go into AUTO mode – only OFF or HAND. Simple enough, right?

IO / ASSIGNED MEMORY:

I:0/0 - Flow switch
I:0/1 - Alarm reset button
I:0/2 - Alarm silence button
B3:0/0 - HAND pushbutton
B3:0/1 - OFF pushbutton
B3:0/2 - AUTO pushbutton

N7:0 - Pressure sensor (0-55psi)
O:0/0 - Pump
O:0/1 - Flow fault indicator
O:0/2 - Pressure fault indicator

TEST CRITERIA:

Okay, you know the drill: run your program on Emulate. At first, your pump cycle should not be running, and you should have no faults. Set N7:0 equal to 8192. Your pressure should be about 27.5 psi.

Toggle B3:0/0 on. Your pump should energize and remain energized for 5 sec., after which it should shut off and O:0/1 should energize. Now toggle B3:0/0 back off. Toggle I:0/2 on and then back off. O:0/1 should be deenergized now. Toggle B3:0/0 on once more. Your pump should not energize! Toggle B3:0/0 back off and toggle B3:0/2 on. Your pump should NOT be cycling. Toggle B3:0/2 back off.

Now force I:0/1 on and then force it back off. Force I:0/0 on. Now toggle B3:0/2 on and then toggle it back off. Your pump should be cycling on and off automatically. Now toggle B3:0/0 on. Your pump should run continuously. Toggle B3:0/0 back off and your pump should return to cycling.

Set N7:0 to 10,000. After 5 sec., your pump should shut down and O:0/2 should energize. Your pressure should be around 33.5 psi.

And that's it! Stick a fork in it because IT IS DOOOONE!

NOTES:

I hope you remember your alarms training from PLC I. If not, now might be a perfect time to go back and review it. This pump must be pretty expensive, because we're even protecting it from cavitation in the event it should be trying to draw when there's no supply. It must be a tough bugger too since we're protecting the downstream devices from over-pressurization. The operators must be nervous about breaking their nice toys.

And you are the genius programmer that's been called in to save the day! Fame and fortune await, but only if your program doesn't allow anything to break or go "BOOM." ☺