

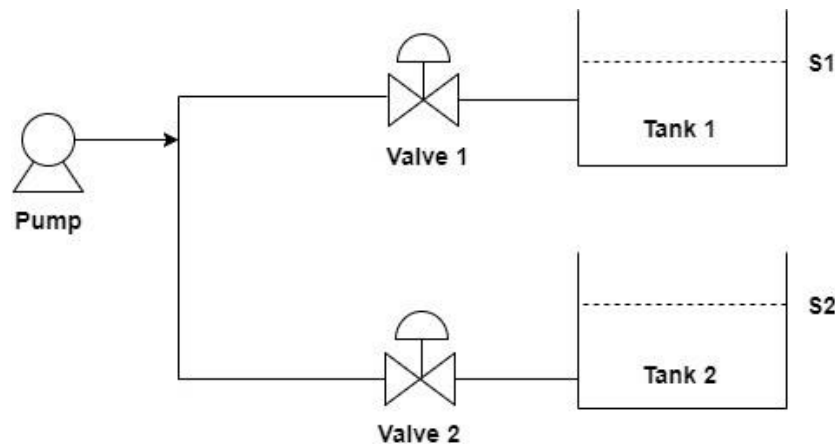


Lab 2

It is required to design a ladder diagram for the following operation:

A pump is used to fill 2 storage tanks. The pump is manually started by the operator (using a pushbutton) and can also be closed manually by another pushbutton. The pump stops after 3 seconds from pressing the close pushbutton. When the pump is started, the circuit will fill the first tank. When the first tank is full, the circuit must be able to automatically fill the second. If the first tank was emptied while filling the second tank, the circuit should continue filling the second tank until it is full and then start refilling first tank. When both tanks are full, the pump must automatically shut down and an “end operation” lamp will light.

The following diagram illustrates the system:



Where

- S1 and S2 are level switch 1 and level switch 2, for tanks 1 and 2 respectively, and are active (ON) when the respective tank is full.
- Both valve 1 and valve 2 are solenoid operated valves, such that when their solenoid is ON the valve will fully open and when the solenoid is OFF the valve will fully close.
- Each of valve 1 and valve 2 are equipped with limit switch, which indicates if the valve is fully open or not, how can you benefit from these switches to make the system safe?
- If neither of the two valves is fully open, the pump should automatically shut down.

- **Notes**

- ✓ You should deliver a report showing the Ladder Logic using Simulation Software “LadSim”.
- ✓ You have to work in groups of five students.
- ✓ All teams should submit their programs and report before the start of the first lab period on Wednesday 17/10/2018.