**Project overview:**

Project includes 2 chemical pumps which supply chemical to a cleaning station. The lead pump will start when a demand for chemical is received. The lead pump will recirculate chemical for 10 seconds before supplying it to the system. The pumps will switch lead/lag position every time they stop or after 1 min of run time. If both pumps are unable to run due to alarms the system will notify operator with an alarm

**Sequence of operations:**

1. When system is off, recirc valve should be in recirc position
2. When demand for chemical is received, start lead pump and open lead pump inlet valve
3. Recirc for 10 seconds
4. Switch recirc valve to system supply
5. After 1 min of run time pumps switch position
6. When demand for signal not present switch pumps off, turn of all valves and return recirc valve to recirc position. Switch lead/lag position

**IO List:**

|  |  |  |  |
| --- | --- | --- | --- |
| Tag name | Description | PLC Address | Tag type |
| P1\_Running | Pump 1 Running | I:0/0 | DI |
| P1\_Fault | Pump 1 Faulted | I:0/1 | DI |
| P1\_Run\_CMD | Pump 1 Run Command | O:0/0 | DO |
| P2\_Running | Pump 2 Running | I:0/2 | DI |
| P2\_Fault | Pump 2 Faulted | I:0/3 | DI |
| P2\_Run\_CMD | Pump 2 Run Command | O:0/1 | DO |
| Chem\_Demand | Chemical Demand | I:0/4 | DI |
| P1\_Inlet\_VLV | Pump 1 inlet valve | O:0/2 | DO |
| P2\_Inlet\_VLV | Pump 2 inlet valve | O:0/3 | DO |
| Recirc\_VLV | Recirculation Valve | O:0/4 | DO |

**Alarm List:**

|  |  |  |  |
| --- | --- | --- | --- |
| Tag name | Description | Alarm Type | Alarm Condition |
| P1\_Fault\_ALM | Pump 1 Fault Alarm | Digital | ON |
| P1\_FTS\_ALM | Pump 1 Fail to Start Alarm | Digital | ON |
| P2\_Fault\_ALM | Pump 2 Fault Alarm | Digital | ON |
| P2\_FTS\_ALM | Pump 2 Fail to Start Alarm | Digital | ON |
| NO\_PMP\_ALM | No Pump Alarm | Digital | ON |
| B5\_Fault\_ALM | Belt 5 Fault Alarm | Digital | ON |
| B5\_FTS\_ALM | Belt 5 Fail to Start Alarm | Digital | ON |