Pump Control & Protection System

Softwares: RSLogix Micro English(Logix 500), RS Linx Classic, RS Emulate 500
Inputs: Flow Switch, Pressure Sensor, Alarm Silence Button, Alarm Reset Button
Outputs: Pump Motor, Alarm Indicators
Key Instructions Used: Timers, Comparators, Safety Interlocks

Project Overview

This project demonstrates a PLC-based control system for a pump operating in a timed duty cycle with integrated protection logic and a manual override function..

In **AUTO** mode, the pump runs for **30 seconds**, then stops for **10 seconds**, repeating continuously. Safety and equipment protection are enforced using a **flow switch** and a **pressure sensor**.

If the pump runs for more than **5 seconds** without confirming flow, or if system pressure exceeds **30 PSI** for over **5 seconds**, the system will trigger an **alarm**, stop the pump, and enter a **FAULTED** state. Fault indicators notify the operator of either a **flow fault** or **pressure fault** condition.

HOA Mode Descriptions

- **HAND:** Runs the pump only while the HAND button is actively pressed, and only if **no alarms are active**. Upon release, the system reverts to the previously selected mode (OFF or AUTO).

- **OFF:** The pump remains off under all conditions.

- **AUTO:** Enables automatic **30s run / 10s stop** cycling, unless an alarm is active.

Alarm Handling Logic

- Triggering an alarm sets both an **alarm bit** and an **alarm notification bit**, stops the pump, and places the system in a **FAULTED** state.

- In the FAULTED state, the system **blocks entry into both HAND and AUTO modes**. The pump cannot be restarted until the alarm condition is cleared and the system is reset.

- Pressing the **Silence** button clears the **notification bits** and de-energizes the alarm indicators, but the **alarm bits remain active**, and the system stays in the FAULTED state.

- Pressing the **Reset** button clears both the **alarm bits** and **notification bits**, and moves the system into the **OFF** state.