MULTI-PROCESS PROGRAMMABLE CONTROLLER

PART 1 GENERAL

* 1. SUMMARY

1. Section Includes:
2. Programmable Controller System
   1. REFERENCES
3. Underwriters Laboratories, (UL):
4. UL 508 – Industrial Control Equipment
   1. QUALITY ASSURANCE
5. The manufacturer of the programmable controller system shall also be the control valve manufacturer. The company shall have a minimum of ten years of experience in the design, manufacture, assembly, and field performance of programmable industrial controllers.
6. All control panel enclosures shall be UL listed and designed in accordance with applicable NEMA, ANSI, and UL 508 standards.
7. All wiring and terminations shall be designed, manufactured, and tested in accordance with the latest applicable standards of the National Electric Code as well as state and local codes.
8. Control panels shall conform to third party safety certification. The assembled control panel shall bear a serialized Underwriters Laboratory, Inc. (UL) label listed for “Industrial Control Panels” UL 508A. The enclosure, and all components mounted shall conform to UL descriptions and procedures.
9. Equipment shall be of top quality construction and design, and shall be guaranteed to perform the service required.
10. Equipment and materials shall be new, and if of the same type as other performing parts of the same system, shall be products of the same manufacturer.
    1. SUBMITTALS
11. Submittals shall include
12. Shop Drawings:
13. Submittals shall show door arrangement and device layout, wire ways, subpanel layout, padlock and vault-type locking handle, dimensions, legends, terminal blocks and terminations, etc.
14. Panel schematic wiring diagrams shall be provided to show all panel wiring systematically numbered. All devices shall be identified by device symbol designation. Each line shall be identified by function.
15. Furnish manufacturer’s name, catalog numbers, and product specification for each component and panel.
16. Wiring diagrams showing connections for all equipment:
17. Control schematics for each field I/O point shall identify the module, terminal wiring designation, and individual wire numbers.
18. Programmable controller schematics shall include all internal device connections
19. Information for the Record:
20. Operation and Maintenance Manuals
21. Upon completion of the installation and acceptance by the Owner and Engineer, all electrical (schematic) diagrams, interconnection diagrams, panel layouts, and related support materials shall be corrected and amended to reflect the installed system.

PART 2 PRODUCTS

* 1. SYSTEM DESCRIPTION

1. Operational Requirements:
2. The programmable controller system shall ….. *(write functional description here)*
3. The system shall be programmed with calibration capabilities for each analog input. The calibration shall be independent for each input and shall be enabled when the control panel is in manual mode only or when all control functions are disabled.
4. The system shall be programmed with a failure mode in the event of loss of transmitter signal, remote set-point, or pre-set alarm. It shall have the option to allow the control valve to fail open, fail close, or fail in the last position.
5. The system shall be programmed with an advanced PID algorithm capable of bringing the process to a critically damped response to any given change in set-point. The algorithm shall include a user-configurable duty cycle to control the opening and closing speeds of the valve. It shall also include user-definable hysteresis to prevent the valve from unnecessary cycling for increased process stability and solenoid operating life.
6. Hardware

1. The programmable controller system shall be a complete operating system including a coloured touch screen interface, central control processor, appropriate interface and communication modules, input and output modules, and interconnection cabling.
2. The programmable controller system supplied shall be manufactured by Siemens.
3. Solid state relays with a zero-cross function shall be provided for inductive loads such as solenoids. Mechanical relays shall be provided for alarms and indication.
4. To eliminate the effects of electrical interference for inductive AC devices such as relays, solenoids, motor starters, small motors and the like, a line filter and surge suppressor shall be provided and installed. (OPTIONAL) When required, analog input and output isolators shall be provided to protect the analog I/O modules from voltage transients and surges.
5. Circuit breakers and fuses shall be provided and sized accordingly for isolation and protection or as recommended by the manufacturer.
6. All equipment shall be housed in a NEMA 4X fiberglass enclosure, unless noted otherwise.
   1. PROGRAMMABLE CONTROLLER SYSTEM
7. The programmable controller system shall be capable of controlling multiple processes with autonomy such that the controller can prioritize the process to control based on the operating conditions. The programmable controller system shall be the model MCP-TP Multi-Process Control Panel by Singer Valve Inc. or approved equal.
8. The main control processor shall provide monitoring and control for all devices shown on the specified dual solenoid control valve
9. The system shall be provided with an unmanaged Ethernet switch for networked connection to the Main Programmable Controller System.
10. (OPTIONAL) The status of all hardwired inputs to the system, internally-generated status, alarms, calculated values, and etc. shall be made available via the remote communication. All the status shall be copied into one efficient, continuously updated, and consecutively addressed integer file block of memory. The addressing and communication protocol used shall be MODBUS over TCP/IP.
11. The system shall be furnished with a coloured touch screen interface for local indication, control, and configuration. The graphics shall contain a visual representation of the process or application, and each device includes an indication of the process with user-selectable engineering units.
12. The Input/Output (I/O) equipment and modules shall be furnished to accommodate the quantity of I/O points necessary to meet the operational requirements.
13. All internal cables and connectors necessary to provide required interfacing shall be provided
14. Minimum requirements are as shown in the following listing:

