LEVEL CONTROLLER SYSTEM

PART 1 GENERAL

* 1. SUMMARY

1. Section Includes:
2. Valve Controller System
   1. REFERENCES
3. Underwriters Laboratories, (UL):
4. UL 508 – Industrial Control Equipment
   1. QUALITY ASSURANCE
5. The manufacturer of the valve 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, 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. Valve 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 valve controller system shall regulate the level of a tank to cycle between an upper setpoint and a lower drawdown level. The setpoint and drawdown shall be selectable either via the user interface, or according to the positioning of two level switches. The tank level shall be recorded and transmitted to the controller system via a 4-20mA level transmitter signal, or via two digital level switches.
3. The system shall include 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 when all control functions are disabled.
4. The system shall activate a failure mode in the event of loss of transmitter signal or alarm. It shall have the option to allow the valve solenoid to fail energized or fail de-energized.
5. The system shall include an ON/OFF control algorithm for discrete valve control. It shall have a programmable opening and closing setpoint. The valve shall close when the level is above the closing setpoint, and the valve shall open when the level is below the opening setpoint.
6. Hardware

1. The valve controller system shall be a complete operating system including a screen and keypad interface, central control processor, appropriate interface and communication modules, input and output modules, and interconnection cabling.
2. The valve controller system supplied shall be manufactured by Singer Valve Inc.
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 surge suppressor shall be provided and installed on the analog inputs.
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 polycarbonate enclosure, unless noted otherwise. The enclosure shall have a clear polycarbonate cover to allow operators to quickly view the valve and process conditions.
   1. VALVE CONTROLLER SYSTEM
7. The valve controller system shall be the model LCP-TP Singer Level Control Panel or approved equal.
8. The main control processor shall provide monitoring and control for one analog process signal, a remote setpoint, and the solenoid of a single solenoid control valve.
9. The system shall have data logging capabilities. The data can be stored in a MicroSD card with a capacity of up to 2GB. The maximum sampling rate shall be 1 sample per second. The system shall log the level, setpoints, and alarms.
10. 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 Serial.
11. The system shall be furnished with a 128x64 pixel transflective LCD screen and keypad interface for local indication, control, and configuration.
12. All internal cables and connectors necessary to provide required interfacing shall be provided