

SPECBOOK - BULLETIN A100 MODEL SSC1/M CONTROLLER

LEVEL/PRESSURE TRANSDUCER

Incorporated into the control shall be a Siemens Water Technologies, Control Systems (fka Consolidated Electric) Bulletin A100 level/pressure transducer.

The transducer shall be piped to an isolation diaphragm to provide an interface between the level sensor and the sensed media and connected to the appropriate pressure tap as directed by the Engineer.

The transducer shall sense water level (pressure) variations and transform these variations directly into a process signal over the desired level range (span). The transducer shall be completely solid-state, with no mechanical linkages or moving parts.

The transducer shall incorporate a variable-capacitance transducer element to convert the sensed pressure to a corresponding electrical value. The sensed media shall exert its pressure against a nitrile diaphragm seal which shall provide sensed media isolation from the transducer pressure sensing elements. The transducer internal ceramic diaphragm shall flex minutely with response to media level/pressure so as to vary its proximity to a ceramic substrate to vary the capacitance of an electrical field created between the two surfaces. A stable, hybrid, operational amplifier assembly shall be incorporated in the transducer to excite and demodulate the sensing mechanism. The transducer shall incorporate laser-trimmed, temperature compensation, and high quality components and construction to provide a precise, reliable, stable output signal directly proportional to the sensed pressure over a factory-calibrated range.

LEVEL/PRESSURE CONTROLLER(S)

Each level/pressure controller shall be an ON/OFF type of automatic control device that responds to pressure excursions with independent ON and OFF settings, with the differential of the two provided as a relay contact output. It shall incorporate highly-stable, accurate state-of-the-art setpoint circuitry with digital signal processing so that its control action is in response to variations in the averaged pressure excursion over a selected time period. This shall allow the controller to provide stable control even in the presence of erratic surge pressures.

Each level/pressure controller shall have five adjustments:

1. Pump-Up/Pump-Down Control Mode Selector Switch
2. HIGH pressure setpoint adjustment: 25-turn potentiometer (uncalibrated)
3. LOW pressure setpoint adjustment: 25-turn potentiometer (uncalibrated)
4. ON delay timing adjustment: 270-degree potentiometer; 3-360 seconds
5. OFF delay timing adjustment: 270 degree potentiometer; 3-360 seconds

Each level/pressure controller shall have three LED (light emitting diode) indicators:

1. HIGH ACTIVE showing that the sensed level/pressure is above the HIGH setpoint adjustment
2. OUTPUT ENABLED showing that the (differential) control output load relay is energized
3. LOW ACTIVE showing that the sensed level/pressure is below the LOW setpoint adjustment

The setpoints shall be adjusted by simulating the pressure through use of the shutoff and bleed valves and the reference pressure gauge.

ON and OFF delay timing adjustments shall provide an integration period of "delay" after the associated setpoint is reached, to deal with erratic and surging pressures. Each timing setpoint shall adjustable from 3-360 seconds.

The pressure setpoints shall be capable of operating ON and OFF repeatedly under surging pressure conditions. Under surging pressure conditions with the pressure hovering around a setpoint, a digital count-up/count-down control shall operate to obtain an indication of what the average pressure (and thus

the system demand) is in comparison with the adjustment of the particular setpoint. The ON and OFF delay timers shall have solid-state counting circuitry which are clocked regularly. When the setpoint is ON the counter shall progress in the "turn-on" direction. When the setpoint is OFF the counter shall progress in the "turn-off" direction. The counter shall require 256 counts to go from full-on to full-off. Surges in the sensed pressure shall thus be "averaged" for sake of obtaining a stable basis for control even in the presence of continuously surging conditions.

The control output load relay shall have a normally-open unpowered output contact wired to terminals rated 10 amp at 240 VAC. Control shall be provided for the following setpoints:

1. Independent ON/OFF control for _____ pump(s)
2. High and low (pressure) (level) alarm
3. (List additional setpoints as required)

BULLETIN A100 OPTIONS

OIL SEAL

Furnish an oil seal unit to prevent damage to the pressure transducer and gauge from freezing conditions. The oil seal unit is to be mounted external to the transducer/control panel in a place not subject to freezing (valve vault). The oil seal shall be connected to the pressure tap and the pressure tubing between the oil seal and transmitter panel shall be filled with hospital grade mineral oil in accordance with the manufacturer's instructions.

HEAT TAPE

Furnish thermostatically-controlled heat tape to prevent freezing damage to the water system pressure tap line between the line tap and the pressure transducer. Wrap the tape around that portion of the line exposed to frost and make the necessary electrical connections according to standard industry practice.

ENCLOSURE

The transducer and associated controller(s) shall be housed in a weatherproof fiberglass enclosure. The enclosure shall be hot compression molded from 25 percent glass reinforced polyester giving corrosion resistance and high strength. The front door shall have a stainless steel hinge and fasteners. It shall have molded-in tongue and groove labyrinth seals and ventilation.

SHUTOFF & BLEED VALVES AND REFERENCE PRESSURE GAUGE

Install a 3-1/2" pressure gauge calibrated in PSI in the control enclosure. Brass shut-off and bleed needle valves shall be provided, with 1/4" female external bulkhead pressure connections in the bottom of the enclosure.

A. (ALTERNATE "FORM"-TYPE SPEC) BULLETIN A100 LEVEL/PRESSURE CONTROLLER

1. General:
 - a. Function: Monitors system pressure or liquid level and provides single contact closure output.
 - b. Type: Variable capacitance type transducer with integral setpoint controller
 - c. Components:
 1. Pressure/Level transducer element with 1/4" NPT connection
 2. Signal conditioner/setpoint controller
 3. Housing (OPTIONAL)
 4. 3-1/2" Pressure Gauge (OPTIONAL)
 5. 4-1/2" Pressure/Level (Dual Scale) Gauge (OPTIONAL)
 6. NEMA type _____ Housing (OPTIONAL)
2. Service: Potable water
3. Performance:
 - a. Accuracy: +/-0.3% best straight line of full span
 - b. Temperature Error: Less than 1/2 of 1% span over a 0-50° C range
 - c. Stability: (Over one year; typical) +/- 1/2 of 1% of full span
 - d. Range: (0-5#)(0-15#)(0-30#)(0-75#)(0-150#) (SELECT ONE)
4. Environmental:
 - a. Temperature: 0 to +70° C
 - b. Humidity: 0-95%, non-condensing
 - c. Enclosure: NEMA _____ (OPTIONAL)
 - d. Mounting: (Enclosure interior mount)(Wall mount)
5. Power Requirements:
 - a. Input Voltage: 110 VAC, +/- 10 %
 - b. Power Consumption: 10 VA
 - c. With 1/4 amp. Slo-blo fuse and Varistor transient protector
6. Displays:
 - a. Pressure ABOVE setpoint LED
 - b. Pressure BELOW setpoint LED
 - c. Control Relay output ON LED
 - d. 5" Analog indicating meter (with weatherproof viewing window) (OPTIONAL)
 - e. LED Digital indicating meter (with weatherproof viewing window) (OPTIONAL)
 - f. LCD Digital indicating meter (with weatherproof viewing window) (OPTIONAL)
7. Signal Interface:
 - a. Inputs: (Analog) signal from integral pressure transducer, ON control interlock, OFF control interlock
 - b. Outputs: (Analog) signal output from integral pressure transducer, ON control interlock, OFF control interlock, Control relay output rated 10 amperes at 240 VAC
8. User Adjustments:
 - a. Pump-UP (filling) or Pump-DOWN (draining) control mode selector
 - b. HIGH setpoint 25-turn potentiometer
 - c. LOW setpoint 25-turn potentiometer
 - d. Control Output ON surge quelling integrator; 3-360 second (270 degree) potentiometer
 - e. Control Output OFF surge quelling integrator; 3-360 second (270 degree) potentiometer
9. Features:
 - a. Line protection: Slo-Blo fuse and Metal Oxide Varistor (MOV) transient protector
 - b. Customer connections: Screw clamp, barrier type terminals rated 12-22 AWG
 - c. Oil filled isolation diaphragm protects transducer from sensed media and contaminants
 - d. Multiple controllers can be interlocked for complex control schemes
 - e. Solid-state pressure transducer with digital pressure averaging circuitry
10. Manufacturer:
 - a. U.S. Filter Control Systems/Consolidated Electric, Bulletin A100
 - b. Or PRE-APPROVED equal