

## **A1000i Suggested Specification**

The liquid level of the \_\_\_\_\_ shall be sensed by maintenance free Loop Powered Submersible Level Transducer system that uses reliable hydrostatic head pressure sensing principle to provide an accurate and reliable proportional 4-20 mA signal representing level/pressure. Other technologies that can be affected by foaming, turbulence, grease, suspended solids build up, atmospheric changes, condensation, or false echoing shall not be acceptable. Submersible sensor systems that use protective caps or cages to protect the sensing diaphragm, are susceptible to solids build up, shall be considered high maintenance and unreliable, and shall not be acceptable.

The transducer shall be suitable for continuous submergence and operation and shall be installed in accordance with manufacturer's instructions. The bottom diaphragm face of the sensor shall be installed 6 inches above the floor at elevation \_\_\_\_\_. The sensor shall be mounted using a (CHOOSE ONE: vertical 1" pipe -or- stainless steel cable system; see Mounting Methods below) in a location and as shown on the job plans.

The transducer housing shall be fabricated of a Teflon™ coated 316 stainless steel with a bottom diaphragm 2-5/8" diameter of heavy-duty, limp, foul-free, molded Teflon™ bonded to a synthetic rubber back/seal. System design shall allow maintenance free operation in both water and wastewater environments (high solids). Housing construction shall resist and be unaffected by the build up of solids on its surfaces or sensing diaphragm. The transducer electronics shall be encased within the protective housing and shall be electrically and mechanically isolated from the sensed media via non-conductive fluid filled pressure transference cavity and barometric compensated transducer electronics chamber. Metallic or ridged diaphragms shall not be acceptable in that they are subject to damage or distortion.

The submersible level transducer shall be a two-wire type and shall operate from a supply voltage of 9 to 30 VDC and produce a 4-20 mA signal in direct proportion to the measured level excursion over a precalibrated range of 0 to (1.5, 5, 15, 30-Select One) PSI. The unit shall have ample instrument loop load capacity and shall be able to drive a minimum load of 750 Ohms @ 24 VDC loop power. The sensor technology shall be based on the use of a highly reliable and stable piezo-resistive pressure element with a .25% full scale accuracy with compensation for non-linearity, hysteresis and repeatability. The unit shall operate over a wide -40 to 185 Deg F. temperature range and shall have not more than a 3% full scale error over a -4 to 180 Deg F. range. The transducer element shall incorporate high over-pressure protection and be designed to withstand intermittent overpressures (8X (1.5 PSI) 4X (5 PSI) 2X (15 & 30 PSI) -Select One) times the full-scale range being sensed. Sensing principles employing less reliable technologies including LVDTs, capacitance or pneumatic elements shall not be acceptable.

The internal pressure of the transducer assembly shall be relieved to atmospheric pressure through a heavy-duty urethane jacketed hose/cable assembly with a dedicated breather tube. The tube shall be ridged to prevent compression that may result from mounting or folding of the cable through installation. The breather system shall be sealed through the use of a rugged maintenance free air bladder assembly connected to the breather tube and mounted within a junction box or monitoring panel. The sealed breather system shall compensate for variations in barometric pressure including expansion and contraction of air due to temperature changes and altitude as well as prevent fouling from moisture and other corrosive/atmospheric elements. Barometric compensation systems that are not closed or use desiccant air-drying devices requiring periodic maintenance shall not be accepted. Systems that do not use a dedicated breather tube, or can be rendered inoperative due to pinching or folding of the cable shall not be acceptable.

The transducer shall be installed where directed by the Engineer and connected with other system elements and placed in successful operation. It shall be provided with input power and output signal transient protection, associated control elements as specified herein and in accordance with manufacturer's instructions.

The submersible level transducer system shall an A1000i as manufactured by Siemens Water Technologies, Control Systems.

### **MOUNTING METHODS (Choose A or B below)**

#### **A. 1" PIPE MOUNTING CLAMPS**

The sensor shall be mounted using a vertical 1" pipe (supplied by the contractor) and secured in place by Siemens Water Technologies, Control Systems Model 9GCL3 type 304 stainless steel mounting clamps or equivalent.

#### **B. CABLE SUSPENSION MOUNTING KIT**

The sensor shall be suspension-mounted using a Siemens Water Technologies, Control Systems cable suspension mounting kit or equivalent, consisting of a 2' long 1-inch NPT type 316 stainless steel pipe with coupling, bolt, cable clamps and hardware along with the required length of 1/8 inch diameter 7 x 19

## INTRINSICALLY-SAFE BARRIER

Provide an intrinsically safe barrier between the control panel and lower assemblies. The barrier shall render the level sensing system suitable for use in Class 1, Division 1 Groups A, B, C and D, Class 2, Division 1, Groups E, F and G, and Class 3, Division 1 hazardous locations.

## TCB (TRANSDUCER JUNCTION BOX)

A weatherproof fiberglass junction box shall be provided to terminate the submersible transducer electronics/breather cable. The junction box shall include a corrosion resistant incoming strain relief connector, breather system PVC bellows and a terminal block. The installing contractor shall furnish three-wire shielded cable between the junction box and the control panel.

## DIGITAL INDICATING METER (LCD)

Furnish a 3-1/2 digit digital panel meter with a .5" high numeric LCD display calibrated in "feet and tenths of a foot", "inches of water" or other engineering units as desired. The meter shall provide a 0-1999 count range produced by a 4-20 ma DC signal. Lesser values shall be produced by an attenuated signal. Mount on the front hinged door of the transducer junction box with a weatherproof clear polycarbonate cover over the meter.