

SCOPE: This specification covers a non-contacting ultrasonic Level/Flow Monitor as manufactured by Greyline Instruments, Largo, Florida / Long Sault, Ontario. This instrument shall provide for indicating, transmitting and control of the material level in a vessel or proximity of a target to the instrument sensor, and indicating, transmitting, and totalizing of the flow rate through a flume, weir, or other primary measuring device.

1. GENERAL

- 1.1 Level/Flow Monitor to consist of an non-contacting ultrasonic sensor, connecting cable, and a remote enclosure with indicating, transmitting and controlling electronics.
- 1.2 Measurement accuracy shall be $\pm 0.25\%$ of Range or 2 mm (0.08"), whichever is greater, and shall be automatically temperature compensated.
- 1.3 Sensor cable length shall be as required by installation, not to exceed 500' (152 m).
- 1.4 System shall have no moving parts and shall not contact the material being measured.
- 1.5 Shall include PC software program disk to determine open channel flow calibration values for non-standard flumes and weirs.

2. TRANSDUCER/SENSOR

- 2.1 Sensor shall be constructed of PVC and Teflon.
- 2.2 The sensor shall have a minimum deadband or blanking of 12" (305 mm) and a maximum range of 32 ft. (10 m), and have an operating frequency of 42 kHz with an ultrasonic beam angle of 8 Degrees.
- 2.3 Sensor shall withstand accidental submersion to 20 psi.
- 2.4 Sensor operating temperature shall be from -40°F to 150°F (-40°C to 65°C).
- 2.5 Sensor shall include integral temperature sensor. Temperature sensors requiring separate mounting and wire runs shall not be accepted.

3. SENSOR CONNECTING CABLE

- 3.1 Provide RG62AU coaxial cable 25' (7.6m) continuous length, with waterproof, potted bond to the Sensor head.
- 3.2 Extended sensor cable shall be RG62AU coaxial to a maximum of 500' (152m). Cable shall be spliced with screw terminal connections in manufacturer's recommended steel NEMA4 Junction Box.
- 3.3 Level and temperature signals shall be conducted on one single coaxial cable. Separate or multiple-conductor cables shall not be accepted.
- 3.4 Sensor cable shall be installed in grounded metal conduit.

4. TRANSMITTER

- 4.1 The transmitter shall provide for field-calibration via built-in 5-key calibration system with menu selection of parameters. Systems requiring calibration by Parameter codes, BCD switches or external calibrators shall not be accepted.
- 4.2 Calibration data shall be password protected and permanently stored through power interruptions for a minimum of 12 months.
- 4.3 Field calibration shall allow selection and automatic conversion of measurement units, measurement span and control relays.
- 4.4 The transmitter shall provide for field calibration in user-selected Range, Level or Open Channel Flow modes. Flow mode shall allow calibration to common primary metering devices, plus allow entry of calibration formula for non-standard flumes, weirs or open channels.
- 4.5 Transmitter shall permit field programmable damping to smooth output with turbulent level.

- 4.6 Transmitter operating temperature shall be from -5° to 140°F (-20° to 60°C). Transmitter shall contain a thermostat-controlled enclosure heater for condensation protection below 30°F (-1°C).
- 4.7 Transmitter shall have an isolated 4-20mA output rated for 1000 ohm maximum load with menu-selectable 0-5VDC alternative.
- 4.8 Provide two relay contacts rated 5 amp SPDT programmable for single set point alarms, dual set point pump control, pump alternation, temperature alarm, flow totalizer pulse and/or echo loss alarm.
- 4.9 Provide a white, backlit matrix LCD display indicating flow rate, level, velocity, totalizer and relay states in user-selected engineering units.
- 4.10 Transmitter display indicating level or flow rate, units of calibration, totalizer and relay states shall be visible without opening cover.
- 4.11 Transmitter shall be housed in a wall-mount, watertight NEMA4X (IP66) enclosure with hinged, clear cover. Mounting hardware shall be included.
- 4.12 Transmitter electronics shall be surge protected on AC power input, sensor and 4-20mA outputs.
- 4.13 Transmitter power input shall be 100-240VAC 50-60Hz with power consumption of 3.5 Watts or less.
- 4.14 The transmitter shall permit plug-in field installation and auto-detection of optional accessories including data logger and additional control relays.

5. OPTIONAL FEATURES FOR INSERTION IN SPECIFICATION AS REQUIRED:

- 5.1 Have 4 additional (6 total) control relays, rated 5 amp SPDT and programmable for single set point alarms, dual set point pump control, pump alternation, temperature alarm, flow totalizer pulse and/or echo loss alarm.
- 5.2 Sensor, connecting cable and junction boxes shall be rated intrinsically safe to Class I,II,III, Div. I,II, Groups C,D,E,F,G.
- 5.3 Have a thermostat controlled enclosure heater for Transmitter operation at temperatures below freezing.
- 5.4 Have an all-Teflon sensor Model PZ32TE rated intrinsically safe when connected through an approved safety barrier, and rated for operation from -40°F to 170°F (-40°C to 76°C).
- 5.5 Have a PVC and Teflon sensor Model PZ52T rated for measurement range on liquids up to 50 ft. (15.6 m).
- 5.6 Have a Teflon-faced flange mount sensor model PZ34TxF rated for 32 ft (10 m) measurement range. Specify flange size of 4" or 6".
- 5.7 Have manufacturer's recommended enclosure sunscreen to permit Transmitter mounting in direct sunlight.
- 5.8 Have manufacturer's recommended Sensor sunscreen to permit temperature-compensated Sensor mounting in direct sunlight.
- 5.9 Have manufacturer's recommended Panel Mount Flange assembly for enclosure installation.
- 5.10 Have a built-in 2 million point Data Logger with USB output to flash drive or mass storage device. Include Windows software.
- 5.11 Have power input of 9-32VDC and power consumption of less than 3.5 Watts.

6. MANUFACTURER

Level/Flow Monitor shall be Model SLT 5.0 as manufactured by Greyline Instruments Inc. and shall be warranted against defects in materials and workmanship for one year.

SLS-201101
(download from www.greyline.com/specssl50.htm)