Engineering Specifications: Doppler Flow Meter Greyline DFM 5.0

GREYLINE DOPPLER FLOW METER SPECIFICATIONS

SCOPE: This specification covers a non-intrusive, ultrasonic Doppler-type flow meter as manufactured by Greyline Instruments Inc., Massena, New York / Long Sault, Ontario. The instrument shall provide for velocity or volumetric indicating and transmitting of the flow rate in a full pipe.

A. PERFORMANCE SPECIFICATIONS

- The flow meter shall operate with a single-head flow sensor mounted externally on any contiguous pipe material that conducts sound including: carbon steel, stainless steel, ductile iron, copper, FRP, PVC, ABS, or cement lined pipe from 1/2" to 180" (12.5 mm to 4.5 m) ID.
- Measure and indicate flow rates from +0.25 to +40 ft/sec and -0.25 to -40 ft/sec (+0.075 to +12.2 m/sec and -0.075 to -12.2 m/sec) with accuracy of ±2% of full scale on liquids with entrained particles or gases of 100 microns or larger and minimum concentrations of 75 ppm.

B. TRANSDUCER (FLOW SENSOR)

The flow sensor shall be single-head, ultrasonic in a stainless steel housing. It shall be installed on the outside of a pipe without interrupting flow. The sensor shall be capable of continuous operation at temperatures from -40°F to 300°F (-40°C to 150°C), and to withstand accidental submersion pressures to 10 psi. Manufacturer's recommended coupling compound and stainless steel mounting clamp shall be included.

Shall include 20 ft (6m) Sensor cable, shielded coaxial pair.

Shall be capable of extending sensor cable up to 500 ft (152m) without requirement for operator adjustment.

Shall be transformer isolated and designed to meet intrinsic safe requirements. Shall be designed for maximum RFI rejection, and include automatic high voltage bleeds for nearby lightning strikes.

Sensor shall be rated Non-incendive for Class I, Division 2, Groups A,B,C,D.

C. TRANSMITTER

- The transmitter indicator shall be housed in a watertight and dust tight NEMA4X (IP 66) polyester and polycarbonate enclosure with a gasketed shatter proof window, and suitable for wall mounting.
- Flow meter electronics shall be designed to operate at temperatures from -5°F to 140°F (-20°C to 60°C). Electronic circuits are interchangeable with other flow meters having the same model number. The transmitter circuit and calibration frequency standard shall be crystal controlled. The transmitter shall be powered by 100-240VAC 50/60Hz requiring less than 5 Watts.
- The transmitter shall include a built-in 5-Key calibration system with operator selection of parameters through visual prompts from a Menu calibration system. Systems requiring calibration by Parameter codes or external calibrators shall not be accepted.
- The 4-20mA shall be flow proportional and isolated, with programmable zero and full scale offsets. Maximum resistive load shall be 1000 ohms. It shall include automatic high voltage bleeds for nearby lightning strikes.
- Shall include noise suppression circuitry to filter electrical interference.
- Have a white, backlit matrix LCD display indicating flow rate in user-selected engineering units, units of calibration, relay states, signal strength and 16-digit totalizer.
- Have 2 control relays rated 5 ampere SPDT. Relays shall be programmable for flow proportional pulse output, or as flow rate alarms with separate ON/OFF set points.
- Shall display and totalize forward and reverse flow.
- Electronics shall be modular and field replaceable by means of plug-in circuit boards. The instrument shall detect and load software menus automatically for field-installed options.

D. ADDITIONAL FEATURES FOR INSERTION IN SPECIFICATION AS REQUIRED:

- Sensor shall be rated intrinsically safe to Class I, Groups C,D; Class II, Groups E,F,G; Class III with Intrinsic Safety Barriers.
- Sensor cable shall be 50 ft (15m) length shielded coaxial pair.
- Sensor cable shall be 100 ft (30 m) length shielded coaxial pair.
- Have a Sensor Cable Junction Box and up to 500 ft (152m) length total shielded coaxial pair cable installed in conduit for mechanical protection.
- Have a thermostatically controlled AC-powered enclosure heater for condensation protection in locations with temperature below -5°F (-20°C).
- Have power input of 9-32VDC.
- Have a built-in 2 million point Data Logger with USB output to flash drive or mass storage device. Include Windows software.

E. MANUFACTURER

The instrument shall be a Model DFM 5.0 Doppler Flow Meter as manufactured by Greyline Instruments Inc., and warranted against defects in materials and workmanship for one year.