SUGGESTED SPECIFICATIONS

MULTI-POINT INSERTION MASS FLOW METERS

Series K-BAR24-HHT Using Multi-Point Insertion Mass Flow Elements and Series 155 Mass Flow Computer for Combustion Air Flow Measurements

DESCRIPTION: The Thermal Convection Mass Flowmeter shall include one or more Multi-Point Mass Flow Elements and a Mass Flow Computer and shall directly measure, indicate, totalize and transmit a linear 4-20 mA signal corresponding to the mass flow and temperature of the air (gas) in pipe, duct or stack.

1. **Multi-Point Insertion Mass Flow Element Required Features**:

   a) ***Mass Velocity Sensor***. Constant temperature thermal anemometer circuit using two industrial grade Platinum RTD's, having two-wire, loop-powered sensor electronics, including automatic sensor lead wire resistance compensation, low-self-heat temperature sensor circuitry and five-wire RTD construction using Inconel sheathed mineral insulated (MI) cable, surface mounted electronics technology with sensor protection circuitry and environmental PCB coating, and CE Compliance for EMI, RFI and surges.

   b) ***Velocity Range***: 0 - 18,000 SFPM (300 SFPS), air at standard conditions of 25°C and 760 mmHg, calibration data entered into Series 155 Mass Flow Computer. NIST Traceable Velocity Calibration.

   c) ***Velocity Measurement Accuracy/Interchangeability (each mass flow sensor)***: ±(3% of Reading + 30 SFPM) over entire velocity and temperature range using computerized double interpolation of velocity calibration data for three temperatures (VTM).

   d) ***Repeatability***: 0.25%.

   e) ***Process Temperature Rating***: 0°C to +500°C.

   f) ***Process Pressure Rating***: 150 PSIG.

   g) ***Mass Flow Time Constant***: Velocity changes: 1 second; Temperature changes: at constant temperature: 1 second; at constant velocity: 1 second.

   h) ***Separate Temperature Sensor Time Constant***: 8 seconds.

   i) ***Sensitivity to Velocity Angle of Incidence***: Less than ±2% for yaw or pitch angles of up to ±20°.

   j) ***Sensor Material***: Alloy C-276, all-welded construction, Helium leaked checked.

   k) ***Sensor Support***: 316L Stainless Steel, all-welded construction; 1 1/2" diameter (Alloy C-276 optional).

   l) ***Insertion Length***: Up to 22" single-ended, supported.

   m) ***Sensor Electronics Enclosure***: NEMA 4 enclosure mounted on the end of the K-BAR24-

HHT sensor support or remotely mounted; dual chamber construction with built-in RFI, EMI and Lightning Protection Circuitry.

n) ***Sensor Enclosure Temperature Rating***: -25°C to +60°C (other sizes optional).

o) ***Process Connection***: 1 1/2" Flange.

p) ***Field Wiring***: One pair of twisted and shielded 14-18 gauge wire having a maximum loop resistance of 4 ohms for each velocity or separate temperature element.

q) ***EMI Approval***: CE compliance: light industrial (EN 50081-2) for emissions, heavy industrial (EN 50082-2) for immunity and (EN 61000-4-5) for surges.

r) ***Burn-In***: All electronics and sensors shall successfully pass a 24-Hour burn-in at 50°C above the operating temperature.

2. Mass Flow Computer Required Features:

a) ***Enclosure***: NEMA 4, wall or rack mounted with a temperature rating of -25°C to + 60°C. Microprocessor based with two-line, sixteen character LCD display and 4 x 5 character keypad mounted on enclosure cover with battery back-up and a user friendly interface.

b) ***Features***: Display of flow rate, velocity, flow area, time, date, flow totalization, alarms, elapsed time; digital input of all data including 12 character I.D., two access codes, built-in input/output calibration, optically isolated 4-20 mA outputs, sealed alarm relays, user entry of flow area, velocity or mass flow range, I.D., Flow Perfect redundant variable velocity flow and configuration correction factors and bias correction, built-in RS-232C "Echo" terminal port for IBM laptop upload/download/record, CE Compliance meeting EN 50081-1, EN 50082-2 and EN 61000-4-5, 12 bit analog outputs, 18 bit input signal resolution, EPA approved, auto-zero/span input calibration, all units interchangeable by simple data entry for the mass flow elements being used, Automatic "Kick-Out" of out-of-calibration sensors, RS485 data port, loop-powered isolated 4-20 mA outputs, 5 amp., 24 volt sealed relays. Mass Flow Computer to operate up to 22 sensors, 16 METERS, 8 alarms and 4-20 mA outputs and 4 P.I.D. control loops, 1/2K compliant paper tape printer optional.

c) ***Burn-In***: All units shall successfully pass a 24-Hour active burn-in procedure at 60°C.

d) ***Safety Approvals***: Non-Incendive IEC-79-15, Ex n C II C T4.

3. **Field Service**: The Vendor shall provide start-up assistance, check-out, training, perform the in-situ flow calibration and input of flow calibration correction factors into the Mass Flow Computer. The flow calibration may be accomplished using an EPA type Pitot tube traverse for applications in which the upstream unobstructed L/D is greater than 8:1; or a Kurz Trace Gas Calibration for applications having less than an 8:1 L/D ratio. The Kurz Trace Gas Method is recommended if improved accuracy is required.

4. **Product and Manufacturer**: Series K-BAR24-HHT Multi-Point Insertion Mass Flow Element and Series 155 Mass Flow Computers and accessories as manufactured by Kurz Instruments, Inc., 2411 Garden Road, Monterey, CA 93940.