Technical Specification

Instrument

Flow Range

ST98 Insertion Flow Element: 0.75 SFPS to 600 SFPS [0.21 NMPS to 172 NMPS]

ST98L In-Line Flow Accessory: 0.0062 SCFM to 1850 SCFM [0.01 Nm3/h to 3,140 Nm3/h]

Air at standard conditions; 70 °F and 14.7 psia
 [0 °C and 1013,25 bar (a)]

Media: All gases that are compatible with the flow element material

Flow: \pm 1% reading, 0.5% full scale standard accuracy Temperature: \pm 2 °F [\pm 2 °C] (display only, flow rate must be greater than 5 AFPS [1,5 m/sec])

Special higher accuracy calibration options available; contact FCI

Repeatability

Flow: ±0.5% reading

Temperature: ±1 °F [±1 °C] (flow rate must be greater than 5 AFPS)

Temperature Coefficient

With optional temperature compensation. Valid from 10% to 100% of full scale calibration. Flow: Maximum $\pm 0.015\%$ of reading / °F up to 850 °F

 $[\pm 0.03\%$ of reading / °C up to 454 °C]

Turndown Ratio

Standard: Factory set and field adjustable from 10:1 to 100:1 within calibrated flow range

Temperature Compensation

Standard: ± 30 °F [± 16 °C] **Optional:** ± 100 °F [± 55 °C]

- **Calibration:** Performed on NIST traceable equipment
- MTBF (calculated): 110 years

Flow Element

Material of Construction

All-welded 316L stainless steel; Hastelloy-C optional

- Operating Pressure Metal ferrule: 250 psig [17 bar (g)] Teflon ferrule: 150 psig [10 bar (g)]
- Operating Temperature (Process) ST98 Insertion Style:

-40 °F to 350 °F [-40 °C to 177 °C] (optional) -40 °F to 500 °F [-40 °C to 260 °C] **ST98 HT Insertion Style** (High Temperature Service): *†

-40 °F to 850 °F [-40 °C to 454 °C]

ST98L In-Line Style:

-40 °F to 257 °F [-40 °C to 125 °C]

ST98 Insertion Flow Element

Process Connection:

3/4" or 1" male NPT stainless steel compression fitting: adjustable Teflon ferrule; 150 psig [10 bar (g)] and 200 °F [93 °C] max., or metal ferrule; 250 psig [17 bar (g)] and 350 °F [177 °C] max.; thread-on flange optional; 1 1/4" male NPT or flanged retractable packing gland optional*

Insertion Length: Field adjustable lengths –

1" to 6" [25 to 152 mm]

- 1" to 12" [25 to 305 mm]
- 1 " to 21 " [25 to 533 mm]

Custom lengths optional*

ST98L In-Line Flow Tube

Insertion flow element is threaded and keyed in an in-line flow tube, calibrated and supplied as a spool-piece; accessories include low flow injection tubes and built-in Vortab flow conditioners for optimum low flow rangeability and performance Size: 1 " diameter tubing; 1 ", 1 1/2 " or 2 " schedule 40 pipe Length: 9 nominal diameters Process Connection: Female NPT, male NPT, ANSI or DIN Flanges **Option:** Flanges sized for flow tube

Remote Transmitter Configuration: Transmitter may be mounted remotely from flow element using interconnecting cable (up to 1000 ' [300 m])*

Flow Transmitter

- Operating Temperature: 0°F to 140°F [-18° to 60°C]
- Input Power: 85 Vac to 265 Vac or 22 Vdc to 30 Vdc, 7 Watts maximum, 230 mA maximum
- Outputs

Analog: Single output selectable as 4-20 mA** (700 Ω max. load), 1-5 Vdc, 0-10 Vdc or 0-5 Vdc. (Vdc: 100K Ω min. load)

** With fault indication per NAMUR, NE43 guideline: field selectable for high (≥21.6 mA) or low (≥3.75 mA) output signal is isolated from

input power on AC Powered mode only)

Digital: Standard: RS232C Serial I/O

Optional: HART, full two-way communications *;

PROFIBUS, DP Profile 3 (Certification #Z01212)

Digital Display (optional): LCD, 2 line/16 character per line, indicating flow rate and process temperature and/or totalized flow

Approvals

Agency Approvals

FM, ATEX, CSA, CRN, IEC, CPA, NEPSI, GOST/RTN, CE, PED (system approvals)

<u>FM/CSA</u> – Nonincendive Class I, Division 2, Groups A,B,C,D Class II and III, Division 2, Groups F and G

Explosion Proof Class I, Division 1, Groups B,C and D Electronics enclosure: T6 at 40°C or T5 at 60°C Sensing Element: T4 at 40°C or T2A at 177°C

Dust-ignitionproof Class II and III, Groups E, F and G

Indoor and Outdoor Type 4 and 4X

 ATEX
 I
 2
 G
 Ex
 d
 IIC
 T6
 T1

 II
 2
 D
 Ex
 tD
 A21
 IP6X
 T
 85 °C
 ...
 T
 450 °C

 Electronics enclosure:
 T6/T85°C, Tamb
 -40°C
 to
 +40°C

T5/T100°C, Tamb -40°C to +60°C

Sensing Element: T4/T135°C, Tamb -40°C to +40°C T2/T300°C, Tamb -40°C to +177°C T1/T450°C, Tamb -40°C to +450°C

IECEx – Ex d IIC T6 or T5 Tamb (Housing) = -40°C to +40°C, T6 Tamb (Housing) = -40°C to +60°C, T5 Tp (Sensing Element) = -40°C to +177°C,

Tp = Process temperature

* Some configuration restrictions apply to ST98HT configured for 850 °F [454 °C] service. These include, but may not be limited to the following: Must select remote transmitter configuration. Insertion element is fixed length with 1 " male NPT or adjustable with selection of packing gland. Contact FCI for more information.