

## 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 Nm<sup>3</sup>/h to 3,140 Nm<sup>3</sup>/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

#### ■ Accuracy

**Flow:** ±1% reading, 0.5% full scale standard accuracy

**Temperature:** ±2 °F [±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 ±0.015% of reading / °F up to 850 °F  
[±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]

**ST98HT 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)

FM/CSA – 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.*