Specifications

Drag Force Flow (DFF) Sensor

Lenterra's DFF sensor is an immersion probe that provides continuous real-time measurement of flow force and temperature in liquids and powders. This novel Process Analytical Technology (PAT) tool enables process monitoring and control in pharmaceutical, food, biotech and other industries.

Probe features

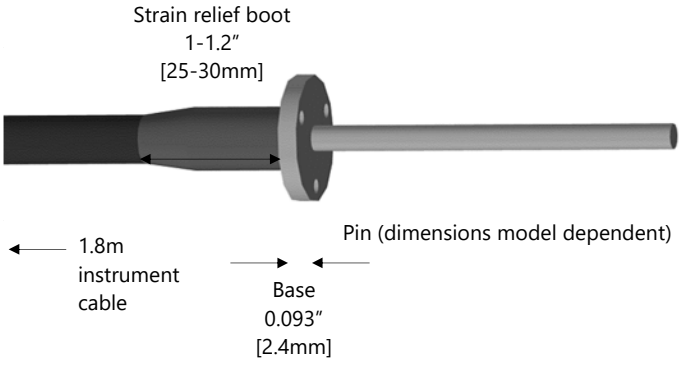
- Stainless steel construction, sterilizable and chemically resistant
- Fiber optic sensing – no electromagnetic interference and no ignition hazard
- High measurement rate (500 per second)
- Simultaneous measurements of force and temperature
- Directional measurement
- Turn-key operation when coupled with Lenterra Optical Interrogator (LOI)
- Wide range of sensitivities (model dependent)

Models

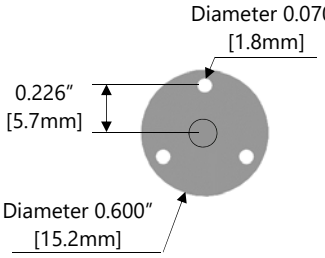
Model number	*Measurement range[1], mN*	*Resolution,[2,3] mN*	*Pin diameter, mm*	*Pin length, mm*
P-15000-30	±15,000	2.3	3.2	30
P-4000-40	±4,000	0.6	2.8	40
P-300-40	±300	0.045	1.27	40

[1] Custom measurement ranges available
[2] When used with a Lenterra LOI interrogator
[3] Corresponds to standard deviation of the zero force noise

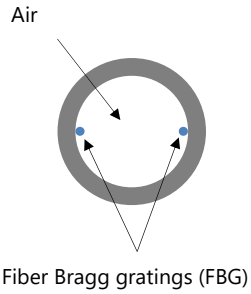
Side view



End view



Pin cross-section



Optical wavelength	Operating temperature[4]	Storage temperature
1556.5 nm	-10°C to 120°C (14°F to 248°F)	-10°C to 60°C (-14°F to 140°F)

[4] Operating temperature is for the pin thermally insulated from the instrument cable

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Specifications

Probe construction

Pin

Cylindrical hollow stainless steel (316L) tube sealed with a stainless steel (316L) cap, Fiber Bragg gratings adhered to the inner surface of the pin.

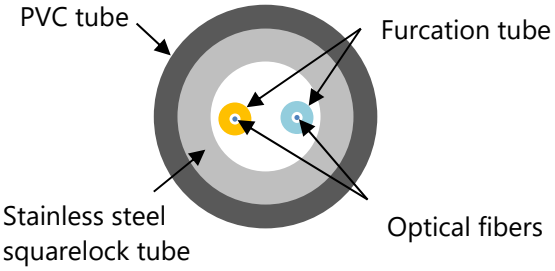
Base

Material: SS 316L

Strain relief boot

Material: Polyolefin Plastic

Instrument cable



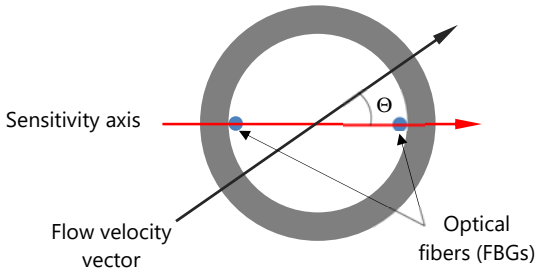
Material: SS squarelock tube covered with PVC tube
Outside diameter: 0.24" (6.1mm)
Length: 6.5 ft (2m)
Operating temperature: -10°C to 60°C (14°F to 140°F)

Fiber optic connector

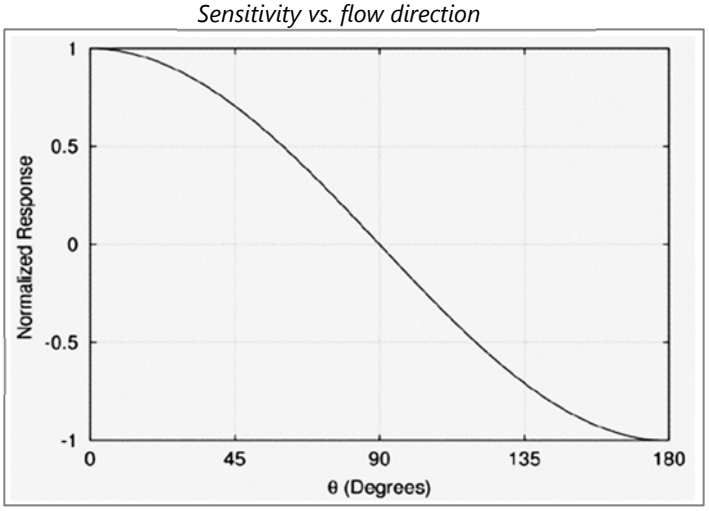
Type: Duplex LC/PC fiber connector
Ingress Protection: IP67 - Dust Tight, Waterproof
Operating temperature: -40°C to 85°C (-40°F to 180°F)

Directional response

Cross-section of the pin



Sensitivity vs. flow direction



Specifications are subject to change without notice

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