

## RealShear™ M-Series Wall Shear Stress Sensor

Lenterra's RealShear™ M-series Wall Shear Stress Sensors enable direct measurement of wall shear stress induced by fluids in mixers and pipes. With a housing shaft diameter of 0.135" (3.4 mm) they are half the diameter of our F-series sensors, enabling them to be installed in locations which require a more miniaturized form factor. The sensor is mounted flush with a pipe or vessel wall, or rotor/stator workhead, to provide in-line real-time measurement with no disruption of process flow. When paired with an LOI Optical Interrogator, the RealShear™ sensor provides fast and continuous measurements for a wide range of applications.

### 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 wall shear stress and temperature
- Directional measurement
- Turn-key operation when coupled with Lenterra Optical Interrogator (LOI)
- Wide range of sensitivities (model dependent)

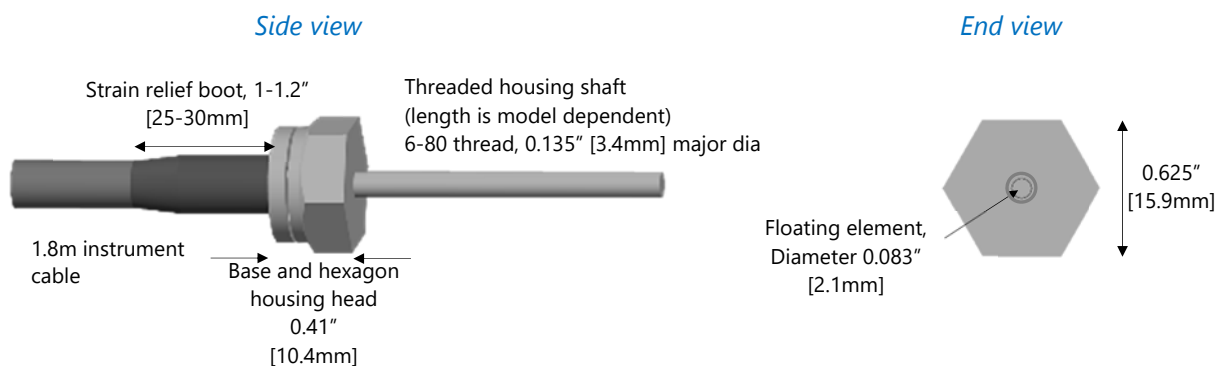
### Models

Model number	Measurement range <sup>1</sup> , Pa	Resolution <sup>2,3</sup> , Pa	Nominal Resonance Frequency, Hz	Housing shaft length, mm
M-200	±200	0.4	70	40.6
M-600	±600	1.6	80	40.6
M-2K	±2,000	5	150	40.6
M-5K	±5,000	11	220	40.6
M-25K	±25,000	40	440	40.6
M-100K	±100,000	80	900	30.6

<sup>1</sup> Custom measurement ranges available

<sup>2</sup> When used with a Lenterra LOI interrogator

<sup>3</sup> Corresponds to standard deviation of the zero wall shear stress noise



Optical wavelength

Operating temperature <sup>4</sup>

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)

<sup>4</sup> Operating temperature is for the pin thermally insulated from the instrument cable

# Specifications

## Probe construction

### Housing

Hollow stainless steel (316L) threaded (6-80 thread) shaft with 5/8" hexagon head.  
Fiber Bragg gratings adhered to the stainless steel (316L) lever inside housing.

### Base

Material: SS 316L

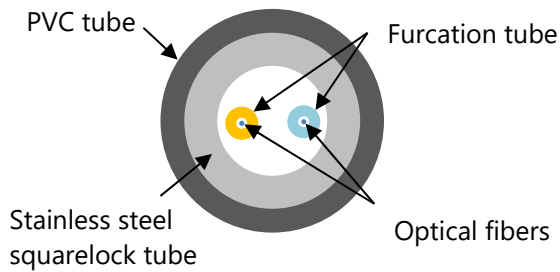
### Floating element

Material: SS 316L

### Strain relief boot

Material: Polyolefin Plastic

## Instrument cable



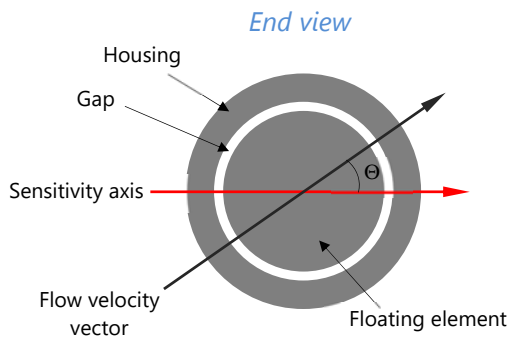
Material: SS squarelock tube covered with PVC tube  
Outside diameter: 0.24" (6.1mm)  
Length: 6.5 ft (2m)  
Operating temperature: -10°C to 60°C (14°F to 140°F)

## Fiber optic connector

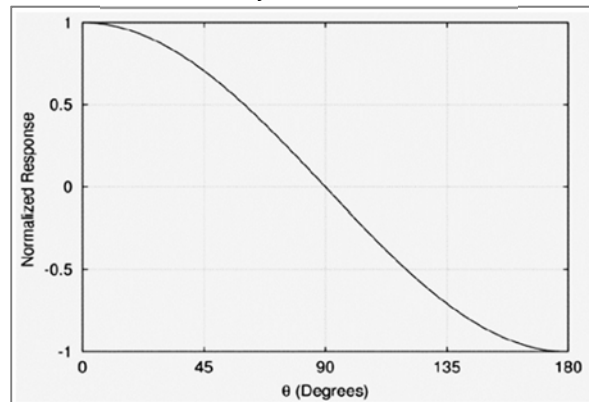


Type: Duplex LC/PC fiber connector  
Ingress Protection: IP67 - Dust Tight, Waterproof  
Operating temperature: -40°C to 85°C (-40°F to 180°F)

## Directional response



Sensitivity vs. flow direction



Specifications are subject to change without notice