RealShear™ F-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. 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**

<table>
<thead>
<tr>
<th>Model number</th>
<th>Measurement range, Pa</th>
<th>Resolution, Pa</th>
<th>Nominal Resonance Frequency, Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-100</td>
<td>±100</td>
<td>0.2</td>
<td>80</td>
</tr>
<tr>
<td>F-400</td>
<td>±400</td>
<td>0.7</td>
<td>150</td>
</tr>
<tr>
<td>F-1K</td>
<td>±1,000</td>
<td>1.5</td>
<td>230</td>
</tr>
<tr>
<td>F-5K</td>
<td>±5,000</td>
<td>6</td>
<td>450</td>
</tr>
<tr>
<td>F-25K</td>
<td>±25,000</td>
<td>20</td>
<td>820</td>
</tr>
</tbody>
</table>

1 Custom measurement ranges available
2 When used with a Lenterra LOI interrogator
3 Corresponds to standard deviation of the zero wall shear stress noise

**Threaded housing shaft**

1.45” [36.8mm] 1/4-80 thread, 0.25” [6.3mm] major dia

**Strain relief boot**

1-1.2” [25-30mm]

**Base and hexagon housing head**

0.41” [10.4mm]

**Floating element**

Diameter 0.205” [5.2mm]

**1.8m instrument cable**

**0.625” [15.9mm]**

**Optical wavelength**

1556.5 nm

**Operating temperature**

-10°C to 120°C (14°F to 248°F)

**Storage temperature**

-10°C to 60°C (-14°F to 140°F)

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

Probes construction

Housing

Hollow stainless steel (316L) threaded (1/4-80 thread) shaft with 5/8” hexagon head. Fiber Bragg gratings adhered to the stainless steel (316L) lever inside housing.

Floating element

Material: SS 316L

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

End view

Sensitivity vs. flow direction

Specifications are subject to change without notice.