

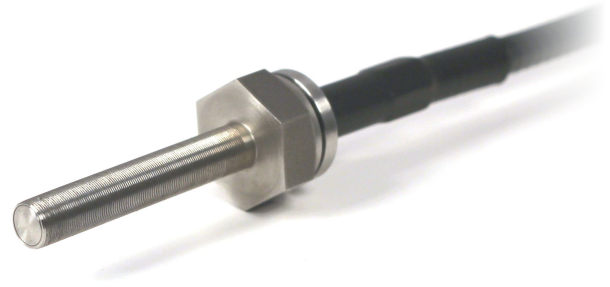
RealShear™ F-Series Shear Stress Sensors



Lenterra's **RealShear™ F-Series 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 measurement with no disruption of process flow. When paired with a **LOC-F Optical Controller**, the RealShear™ sensor provides fast and continuous measurements for a wide range of applications.

Applications

- Scale up of high-shear mixer (HSM) processes from the laboratory to the factory floor
- Continuous monitoring of mixing operations to prevent under/overprocessing
- Viscosity and flow rate measurement of flowing or mixing fluids
- Characterization of multiphase flows



Features

- Direct measurement of wall shear stress
- Enables viscosity or flow rate measurement (in combination with known flow/mixing parameters)
- In-line, continuous measurement with no disruption of process flow
- Bidirectional sensitivity
- Chemically resistant construction
- Miniature size: 1/4-80 threaded housing for precise alignment when mounting on pipe, vessel, or mixer
- Fiber optic connection for interface with compatible controller (LOC-F)
- Operation over wide range of temperatures (-30 to 200 °C)
- High measurement rate (up to 10 kHz¹ with LOC-F controller)

Ordering Information

Order with **F-X** where X = shear stress range in Pa.
(ex. 400 for ± 400 Pa, 5K for ± 5000 Pa)

Standard models are rated for up to 100°C operation.
Append -HT to model number for high temperature operation (up to 200°C).

Model Number	Shear Stress Meas. Range ²	Resolution ³	Nominal Resonance Freq.
F-100⁴	± 100 Pa	0.1 Pa	90 Hz
F-400	± 400 Pa	0.4 Pa	160 Hz
F-1K	± 1 kPa	1 Pa	240 Hz
F-5K	± 5 kPa	5 Pa	450 Hz
F-25K	± 25 kPa	25 Pa	790 Hz
F-100K	± 100 kPa	100 Pa	1200 Hz

Specifications

Optical

Connector:	IP67 Sealed Duplex Single-Mode LC
Nominal Operating Wavelength:	1555 nm

Physical

Installation Thread:	1/4-80
Dimensions:	see below
Optical Cable Length:	2 meters
Operating/Storage Temp. (std.):	-20 to 200 °F (-30 to 100 °C)
Operating/Storage Temp. (-HT):	-20 to 400 °F (-30 to 200 °C)

Units are supplied with mounting hardware. RealShear™ sensors have a bidirectional response and should be aligned in the desired flow/shear direction for maximum sensitivity.

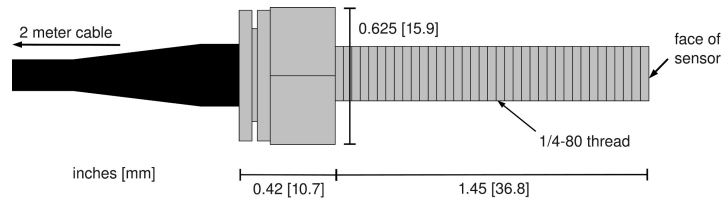
1. 10 kHz represents the maximum data acquisition rate for tracking the displacement of the floating element of the sensor. The mechanical frequency response of the sensor (which varies by model) should be taken into account when interpreting acquired data.

2. Custom sensitivity ranges available.

3. When used with a LOC-F controller under stable measurement conditions.

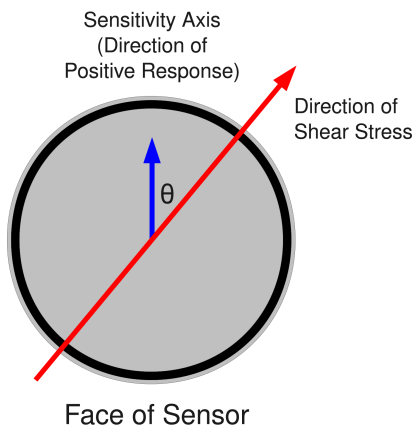
4. Sensors below ±400 Pa measurement range are particularly sensitive to vibration and sensor orientation effects.

Dimensions

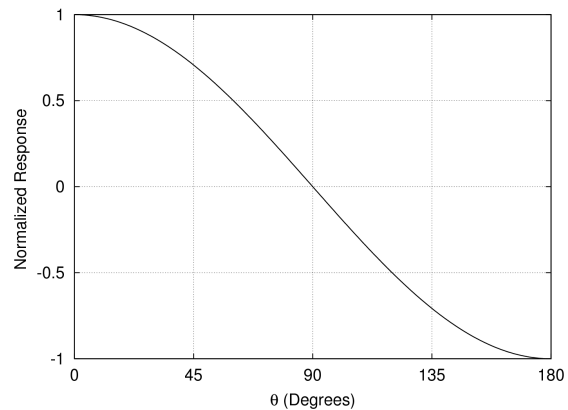


Directional Response

RealShear™ sensors have a bidirectional response and should be aligned in the desired flow/shear direction for maximum sensitivity. The sensitivity axis is indicated on the hexagonal portion of the sensor housing with an indentation, such that a positive response results from flow emerging from this side.



Sensitivity to Off-Axis Shear Stress



Sealed duplex LC optical connector and protective cap

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