

# RealShear™ F-Series Shear Stress Sensors

LENTERRA

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 rotorstator workhead, to provide in-line measurement with no disruption of process flow. When paired with a LOI Optical Interrogator or 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
- Operation over wide range of temperatures (-30 to 200 °C)
- High measurement rate (up to 10 kHz 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 <sup>1</sup>	Resolution <sup>2</sup>	Nominal Resonance Freq.
F-100 <sup>3</sup>	± 100 Pa	0.1 Pa	90 Hz
F-400 <sup>3</sup>	± 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

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

<sup>2</sup> When used with an LOI interrogator.

<sup>3</sup> Sensor with and below ±400 Pa measurement range are particularly sensitive to vibration and sensor orientation effects.

## Specifications

### Optical

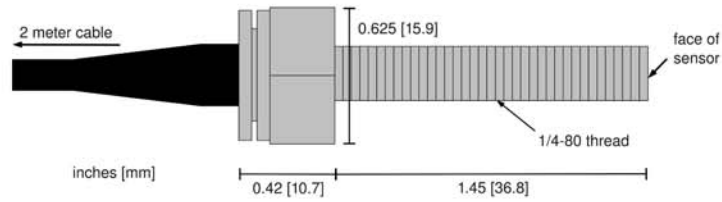
Connector:	IP67 Sealed Duplex Single-Mode LC
Nominal Operating Wavelength:	1555 nm

### 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)

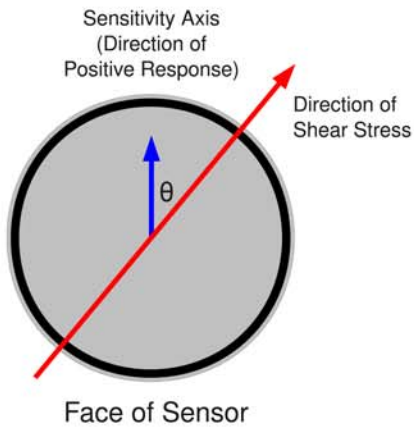
Units are supplied with mounting hardware. RealShear™ sensors have a bidirectional response and should be aligned in the desired flow/shear direction for maximum sensitivity.

## Dimensions

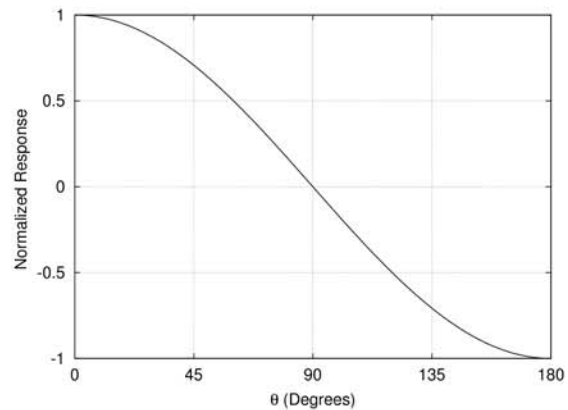


## Directional Response

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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