

RealShear™ M-Series Shear Stress Sensors

LENTERRA

Lenterra's RealShear™ M-Series 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 rotorstator workhead, to provide in-line measurement with no disruption of process flow. When paired with an LOI Optical Interrogator or LOC-F Optical Controller, the RealShear™ sensor provides fast and continuous measurements for a wide range of applications.

Applications

- Viscosity and flow rate measurement of flowing or mixing fluids
- Scale up of high-shear mixer (HSM) processes from the laboratory to the factory floor
- Continuous monitoring of mixing operations to prevent under/overprocessing
- 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: 6-80 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 / -20 to 400 °F)
- High measurement rate (up to 10 kHz with LOC-F controller)

Ordering Information

Model Number	Shear Stress Meas. Range ¹	Resolution ²	Nominal Resonance Freq.
M-200 ³	± 200 Pa	0.4 Pa	100 Hz
M-600 ³	± 600 Pa	1 Pa	170 Hz
M-2K	± 2 kPa	3 Pa	230 Hz
M-5K	± 5 kPa	8 Pa	350 Hz
M-25K	± 25 kPa	40 Pa	700 Hz
M-100K	± 100 kPa	160 Pa	1000 Hz

Standard models are rated for up to 100°C / 200 °F operation. Append -HT to model number for high temperature operation (up to 200°C / 400 °F).

¹ Custom measurement ranges available.

² When used with an LOI interrogator.

³ Sensor with and below ±600 Pa measurement range are particularly sensitive to vibration and sensor orientation effects

Specifications

Optical

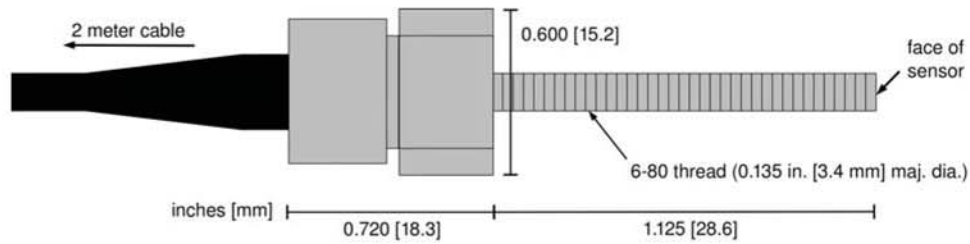
Connector: IP67 Sealed Duplex Single-Mode LC
Nominal Operating Wavelength: 1555 nm

Physical

Installation Thread: 6-80
Dimensions: see drawing
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)

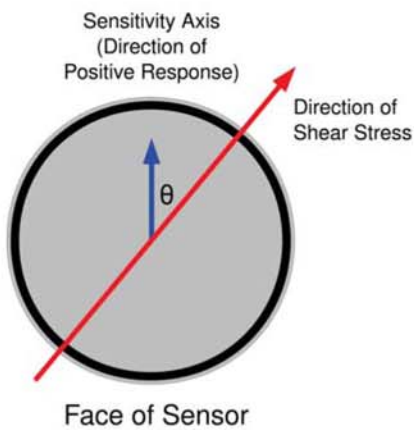
Units are supplied with mounting hardware. RealShear™ sensors have a bidirectional response and should be aligned in the desired flow/shear direction for maximum sensitivity.

Dimensions

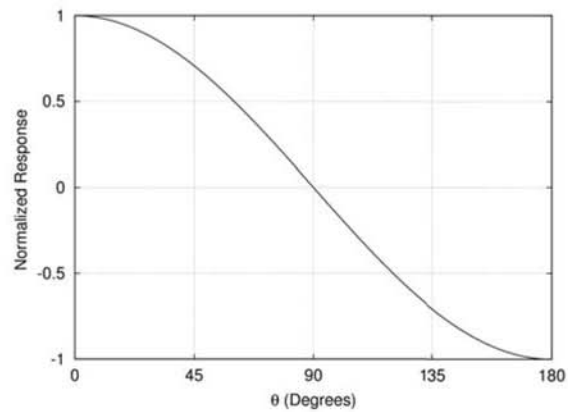


Directional Response

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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