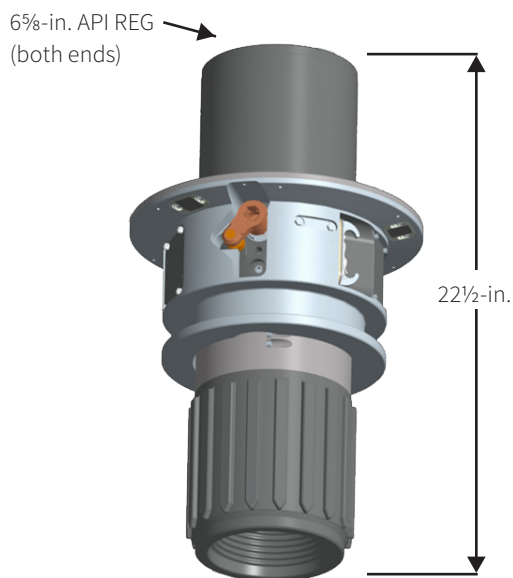


StringSense Integrated Drillstring Measurement System: TDS-4

NOV's StringSense™ integrated drillstring measurement system provides a means of making surface measurements directly on the drillstring and uses that data to develop a complete picture of the drilling process from downhole to surface. As a patented instrumented internal blowout preventer (IBOP), the StringSense system delivers more accurate and dependable surface drilling data and allows you to extend the operating envelope when drilling near the technical limits of the well.



Features and Benefits

Accurate mechanical work measurement for topdrive

- Provides the necessary data for improved torque and drag modeling
- Facilitates decreased nonproductive time

Same form factor and operation as existing upper IBOP for drop-in replacement

- Requires no change from original installation procedures

Direct measurement of multiple variables at the drillstring

- Eliminates external elements that would affect accuracy of measurements

Driller can adjust quickly to correct many issues

- Reduces wear on the topdrive and drillstring

Technical Specifications

Sensor	Range	Accuracy (FS)
String weight (+tension, -compression)	+1,500k lb; -100k lb	+/-1.50%*
Torque	+/-60k lb *ft	+/-1.25%*
RPM	+/- 250	+/-0.05%
Pressure	+15,000 psi	+/-0.50%
Axial acceleration (optional)	+/- 10 G	+/-0.50%
Radial acceleration (optional)	+/- 10 G	+/-0.50%
Bending (standard)	+/- 45k lb *ft	+/-5.00%*

* Includes combined loading effects over the operating temperature of the system