

## COMPLETION SOLUTIONS | PERMANENT MONITORING

## DataSphere® Opsis® Permanent Downhole Gauges

Reliable, real-time monitoring of downhole conditions

## FEATURES

- ASIC hybrid electronics qualified to 205°C
- Demonstrated downhole gauge reliability 10 years @185°C
- Onboard intelligent gauge diagnostics
- Bellows to isolate quartz crystal from well fluids
- Designed for harsh environments up to 30,000 psi and 205°C
- Extensive qualification testing performed
- Simplified system with multiple sensor options
- Field-testable dual metal-to-metal seal
- Fault-tolerance features for maximum reliability

## BENEFITS

- Continuous pressure and temperature data without the need for well intervention
- Enhanced reservoir management
- Increased system reliability using stable pressure/temperature measurements
- Quartz-based sensor for high accuracy, low drift

## APPLICATIONS

- Life of the well production monitoring
- Life of the field reservoir monitoring
- SmartWell® completion system optimization
- Artificial lift optimization

## GAUGE DESIGNS

- Quartz transducer
- ASIC technology
- Maximum 205°C operating temperature
- 0.75-in OD slim line design
- Improved shock and vibration performance

## Overview

In today's challenging environments, there is an increasing need for reliable and accurate reservoir data, driving the need for continuous improvement of monitoring technology.

Opsis® permanent downhole gauges are the latest addition to the DataSphere® permanent monitoring suite, providing real-time downhole data for increased productivity throughout the life of the well.

Opsis gauges feature ASIC (Application Specific Integrated Circuit) technology in combination with field-proven resonating quartz crystal sensors. The result is highly accurate pressure and temperature measurements, even under extreme temperature conditions.

Opsis gauges can be used for single or multi-zone monitoring applications. These gauges may be ported to tubing, annulus, or control line. The addition of feed-through or splitter block assemblies enables the monitoring of multiple zones.

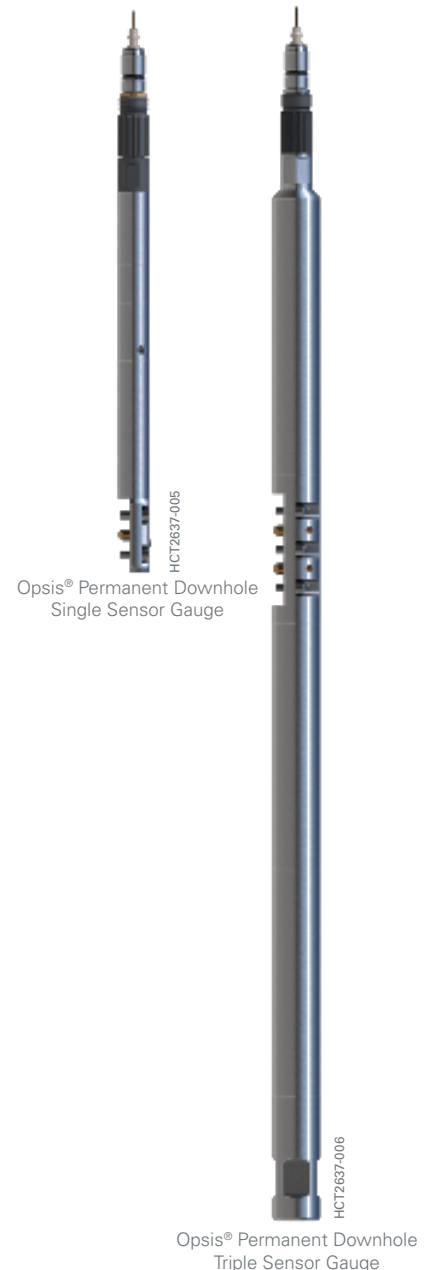
## FMJ Cable Termination

Opsis gauges use a high performance cable termination with a sealing arrangement based on our highly reliable intelligent completion FMJ connector. This cable termination incorporates a pressure-testable dual metal-to-metal ferrule seal arrangement for isolating the downhole cable outer metal sheath from the well fluid.

## Testing

Opsis gauges are tested to the full pressure and temperature rating during Factory Acceptance Testing (FAT), and each gauge comes with an independently checked calibration certificate.

New gauge designs are subjected to Reliability Demonstration Testing (RDT) per AWES Recommended Practices.



## Opsis® Gauge Temperature Performance



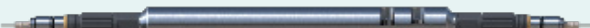




Accuracy (°C)	0.5
Typical Accuracy (°C)	0.15
Achievable Resolution (°C/sec)	<0.005
Repeatability (°C)	<0.01
Drift at 177°C (°C/year)	<0.1

## Opsis® Gauge Pressure Performance

PRESSURE RANGE PSI/BAR	ACCURACY* PSI	TYPICAL ACCURACY* PSI	ACHIEVABLE RESOLUTION PSI/SEC	DRIFT AT 14 PSI AND 25°C**	MAXIMUM DRIFT AT MAXIMUM PRESSURE AND TEMPERATURE** PSI
200 to 10,000 13.8 to 690	0.015 (1.5)	0.012 (1.2)	<0.006	Negligible	0.02 (2.0)
200 to 16,000 13.8 to 1,100	0.02 (3.2)	0.015 (2.4)	<0.008	Negligible	0.02 (3.2)
200 to 20,000 13.8 to 1,1380	0.02 (4.0)	0.015 (3.0)	<0.008	Negligible	0.02 (4.0)
200 to 25,000 13.8 to 1,725	0.02 (5.0)	0.015 (3.75)	<0.010	Negligible	0.02 (5.0)
200 to 30,000 13.8 to 2070	0.025 (7.5)	0.02 (6.0)	<0.010	Negligible	0.025 (7.5)

\*% FS, \*\* %FS/Year

## Opsis® Gauge Variants

CONFIGURATIONS	150°C GAUGE	175°C GAUGE		205°C GAUGE	
	10K	16K	20K	25K	30K
Single Sensor	 HCT2637-005			 HCT2637-001	
Single Sensor + Feedthrough	 HCT2637-002				
Dual Sensor	 HCT2637-003				
Dual Sensor + Feedthrough	 HCT2637-004				
Triple Sensor	 HCT2637-006				
Triple Sensor + Feedthrough	 HCT2637-008				

Special calibration available upon request. Single sensor non feedthrough variants for 150°C and 175°C have 0.75-in. OD. All feedthrough and dual/triple sensor variants have 1.125-in. OD

For more information, contact your local Halliburton representative or visit us on the web at [www.halliburton.com](http://www.halliburton.com)

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