

Coiled Tubing Diameter and Ovality Gauge

In-the-field, real-time imperfection detection

The coiled tubing diameter and ovality gauge (CT-DOG) is a real-time monitoring device for detecting dimensional tubing imperfections. The CT-DOG can be installed on the coiled tubing between the reel and injector head during operations. The system analyzes the measurements and displays ovality and maximum, minimum, and average diameters fed into the OrionNET™ data acquisition software. The real-time fatigue module (ReelTrak™) is then updated using the actual string condition to enable a higher precision fatigue calculation. The accuracy of the high precision fatigue profile provides opportunity to extend the life of the coiled tubing asset.

Principle of operation

The CT-DOG comprises a sensor head with 12 probes, a dual-function cable for power and data transmission, an operator interface, and a signal processing module. The cylindrical sensor head surrounding the coiled tubing contains three rings, each with four eddy current proximity probes in a radial array.

The sensing element of each probe faces the work string, and each probe measures the distance from its face to the surface of the coiled tubing, in combination with the measurement pair on the diametrically opposite side of the coiled tubing to create the real-time OD and ovality measurements. An easy-to-use clam-shell design allows it to close around the work string, and the sensor head attaches to the reel-level wind.

Features and benefits

- Digitally displays max, min, and average OD; ovality percentage; individual and paired sensor diameters; and alarm flags
- User-defined alarms for diameters and ovality
- Audible alarms for out-of-limit conditions
- 1 Hz reading and recording if paired with OrionNET
- Simple field calibration for specified coiled tubing OD
- Installation on coiled tubing at any time during operations
- Measures coiled tubing diameters from 1¼ to 2⅞-in. OD
- Higher accuracy of ovality calculations enabled by 50% more measurements (Six radials)
- Bidirectional measurement
- Easily maintained

