

Sensors and Measurements

Depth/Speed (coiled tubing, slick line)

Depth is measured using a quadrature encoder. A quadrature encoder is an up/down counter and can detect direction of motion. The rate of change is the speed: running in or pulling out.



Depth Encoder

String Weight (coiled tubing)

Weight can either be measured using a pressure sensor (see Circulating/ Wellhead Pressure) or using an electronic load cell.

The electronic load cell will give direct readings of the string weight and is mounted on the injector, replacing the hydraulic load cell.



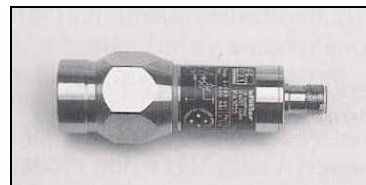
Electronic Load Cell

Circulating/Wellhead Pressure

These are measured using pressure sensors with a suitable range (up to 20,000 psi). The pressure sensors are available with process connection of G 1/4", 1/2" NPT, or WECO union pressure fitting.



Pressure Sensor with 1502
WECO connection



Pressure Sensor with 1/4" NPT



Pressure Sensor with 1/4" NPT

Flow Rate/Flow Total

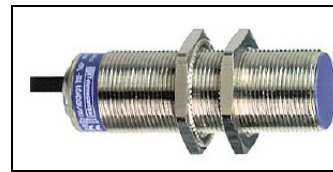
Flow rates and totals are measured using either a proximity switch or a magnetic pickup.

The proximity switch is mounted close to some rotating part of the pump and will therefore count the number of revolutions of the pump. This in turn is interpreted as a flow volume/rate.

The magnetic pickup is mounted in an insert on a flow meter. The magnetic pickup will then produce pulses that are proportional to the speed of the flow turbine.



Magnetic Pickup



Proximity Switch - M18



Proximity Switch - M12

Temperature

A complete temperature assembly for any Single Point measurement application.

The temperature transmitter is designed to meet common single point measurement application requirements. This transmitter with HART® protocol can easily be ordered with a variety of sensors (RTDs and thermocouples) and thermowells. The transmitter is provided in a head mount configuration suitable for installation in a wide variety of connection heads and housings.



Temperature Transmitter

Differential Pressure

With its time-tested reliability and over 4 million installations, the Rosemount 3051 is more than field proven – it is the Industry Standard.

Easy to install on Daniel Senior Orifice meter, suitable for well testing applications.



Differential Pressure Transmitter