AMETEK®
DREXELBROOK®

Why Choose a Drexelbrook Cut Monitor?

AMETEK Drexelbrook is the world leader in RF Admittance based level measurements. They have been using their patented RF admittance technology for over 20 years to make water cut (BS&W) measurements. Drexelbrook's cut monitor systems are considered the standard at some of the world's largest oil producers, pipelines, and refineries.

What are the Drexelbrook advantages over other products?

- Insertion probe advantages - Our probes measure a representative sample, starting at the centre of the pipe, which is the preferred sampling location according to API.
- High temperature and pressure ratings - We offer the highest pressure and temperature ratings in the industry. Our probes can handle pressures in excess of 100 BAR. and temperatures up to 232°C
- Price, Price, Price - Why spend $15K + for a device when you can get a reliable, accurate measurement for much less?
- Temperature compensated - Operates within the water cut measurement specification with changes in temperature up to 71° C
- Immunity to paraffin buildup - Our RF Admittance measurement is relatively unaffected by deposits on the pipe and probe.
- Easy to clean - Simply pull the probe, wipe down, and re-insert. No need to take apart spool pieces and tie-off large pipelines.
- Easy to install - Can be configured for NPT or flanged mounting. 4-20 mA can go to any signal processing unit. Can be installed in any pipe size
- Low maintenance - No gaskets or seals that require routine maintenance.
- No coatings - Our Permaseal sensing element does not require epoxy coatings that wear out and require expensive servicing.
- Durability - Sensing element will not wear out in well fluids that include large amounts of sand.
- Easy to calibrate - Calibration that can be done via onboard keypad or through the 4-20mA loop with our HART software. Comes factory pre-calibrated and requires only one point calibration trim. Competitors require multiple samples and recurring calibration adjustment due to less stable electronics.
- Wide selection of cut ranges - Has 11 pre-set ranges that are within 0-50% with custom ranges as high as 0-80% in heavy oil.
- Not affected by changes in salinity - The RF-Admittance technology is inherently immune to the conductivity changes in the fluid.

MEASUREMENT SOLUTIONS AUSTRALIA

❑ Unit 39/10 Gladstone Road Castle Hill NSW 2154 Australia ■ Phone: (02) 9894 4300 ■ Fax: (02) 9894 4301
■ sales@measurement-solutions.com ■ www.measurement-solutions.com ■ ABN: 82 002 914 481

AMETEK®
DREXELBROOK®

The Drexelbrook Technology Advantage

RF Admittance

The Drexelbrook method of using RF Admittance to measure water cut is widely successful because of the large difference between the dielectric constants of oil (k 2.3) and water (k 80). The sensing element and the pipe wall form the necessary two plates of the concentric capacitor. The system electronics transmit a radio frequency voltage to the sensing element that measures changes in capacitance. As the amount of water in the flowing oil increases, the net dielectric of the fluid increases which causes the capacitance to increase. The onboard electronics can then compute the relationship between capacitance change and water cut. Straightforward, Reliable, Proven.

The Cote-shield circuitry that is part of the RF technology offers several key advantages over other capacitance based devices. The low drift components create the necessary circuit stability to make an accurate water cut measurement. The Cote-shield circuitry that is not affected by temperature induced changes in gland capacitance. We have found that the effects of ambient temperature on competitor's gland capacitance can result in error of approximately 2-3 pF. In lower cut ranges, 0-1% water in oil for example, the entire range of the measurement is only 2-3 pF. The temperature effects on gland capacitance results in an error of 100%. The gland capacitance fluctuations cause additional havoc on the calibration of the device. Users will calibrate their device at 12 noon and then need to recalibrate their device at 8 pm. The Drexelbrook RF Admittance removes this unnecessary maintenance.

Sensing Element

One of the more common application problems that Drexelbrook has encountered is independent slugs of oil, gas, or water reaching the sensing element. These slugs are usually caused by some form of separation that occurs before it passes through the sensing area of the instrument. The separation is often more critical at water-cuts above 50% where the fluid property differences (density, viscosity, etc…) will cause a portion of the oil/water emulsion to separate into a free water phase. As this occurs, the sensing element is subjected to multiple parallel, and very different, fluids. The separation phenomenon will interfere with the typical cut monitor that requires a pure homogenous mixture in order to make an accurate measurement.

In addition to the advantages of the RF Admittance, the Drexelbrook insertion probe enables it to get a large representative sample of the fluid that other manufacturers cannot. The grey colour sensing element show below will extend directly into the process for a minimum of 380 mm. The advantage of this is the capacitive property of the fluid is taken over the entire length of the probe to create an averaging effect. The measurement is now taking a better sample of the fluid over a larger range. Another advantage of the Drexelbrook Permaseal sensing element is its ability to be installed directly into the main process without requiring side-arms or slipstreams.

The diagrams (Next Page) demonstrate how the water cut measurements can be made incorrectly. The competitor's method takes a sample only over the width of their sensor, typically around 50 mm. Utilizing this approach, any time a slug of water or air passes by the 50 mm sensing element, the measured water cut of the device will immediately shift. This shift can cause needless alarms and valve actions that are mostly unwarranted. The Drexelbrook solution takes a different approach by extending the sensing range. The extension of the sensing element takes a better sample of the entire fluid and results in a smoother, more accurate, faster response.

Temperature Compensation

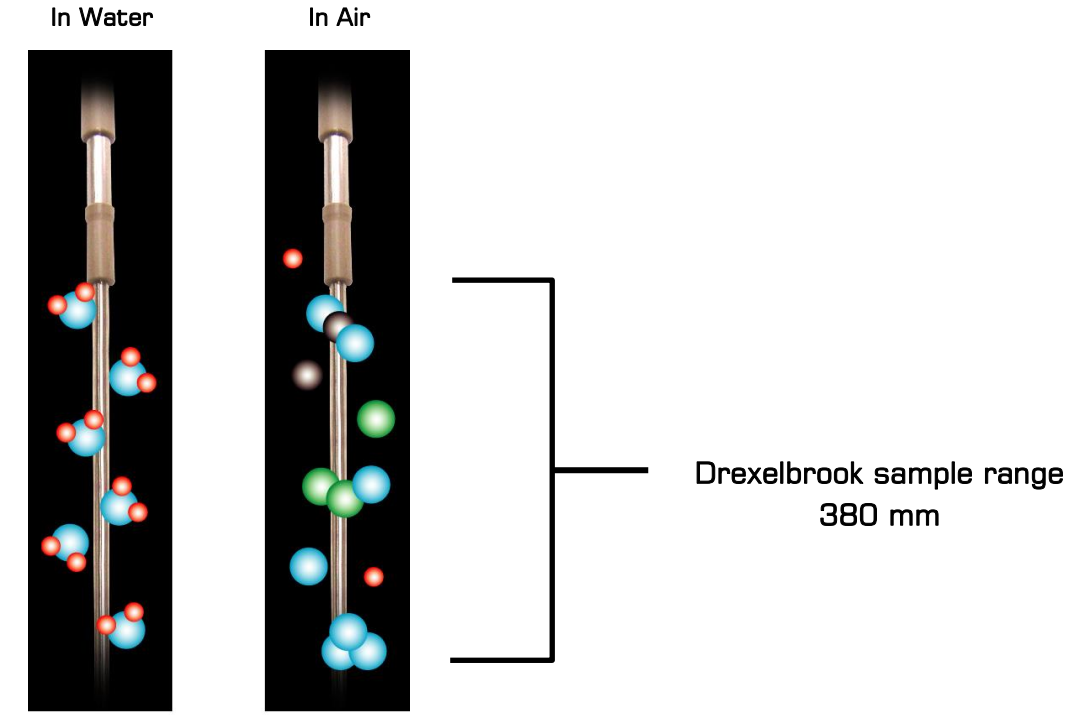
The dielectric constant of crude oil can change with any changes in temperature. These changes may cause standard cut monitors to change without any variance in water content. The Universal IV Water Cut Monitor measures product temperature internally and calculates a true water cut reading at any temperature up to 71° C.

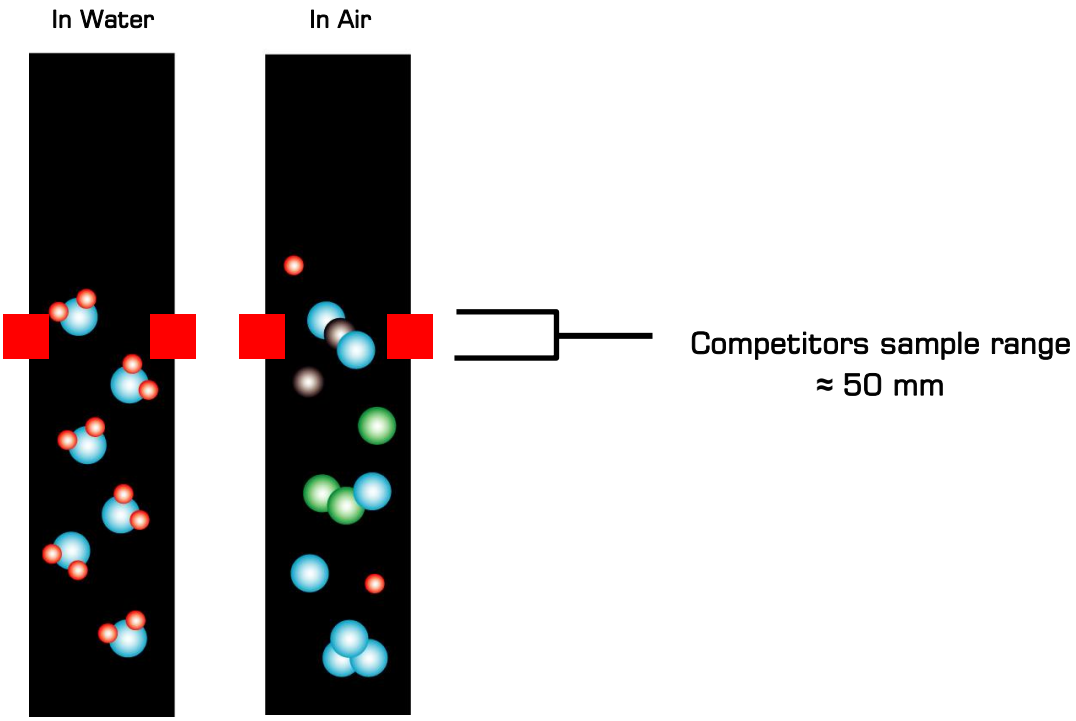
❑ Unit 39/10 Gladstone Road Castle Hill NSW 2154 Australia ■ Phone: (02) 9894 4300 ■ Fax: (02) 9894 4301
■ sales@measurement-solutions.com ■ www.measurement-solutions.com ■ ABN: 82 002 914 481

AMETEK®
DREXELBROOK®

The Sensing element

Drexelbrook Standard Perm-A-seal Probe





MEASUREMENT SOLUTIONS AUSTRALIA

❑ Unit 39/10 Gladstone Road Castle Hill NSW 2154 Australia ■ Phone: (02) 9894 4300 ■ Fax: (02) 9894 4301
■ sales@measurement-solutions.com ■ www.measurement-solutions.com ■ ABN: 82 002 914 481

AMETEK®
DREXELBROOK®

The Drexelbrook sensing element utilizes a PEEK (Poly Ether Ether Keytone) material and stainless steel sensing rod that is extremely durable and does not require epoxy coatings. These epoxy coatings are a maintenance burden because they degrade over time when placed in the turbulent process flow. The picture (R) shows the cracking and erosion of the epoxy coatings. This degradation of the epoxy coating will result in erratic outputs and requires expensive, reoccurring maintenance by field personnel.

❑ Unit 39/10 Gladstone Road Castle Hill NSW 2154 Australia ■ Phone: (02) 9894 4300 ■ Fax: (02) 9894 4301
■ sales@measurement-solutions.com ■ www.measurement-solutions.com ■ ABN: 82 002 914 481