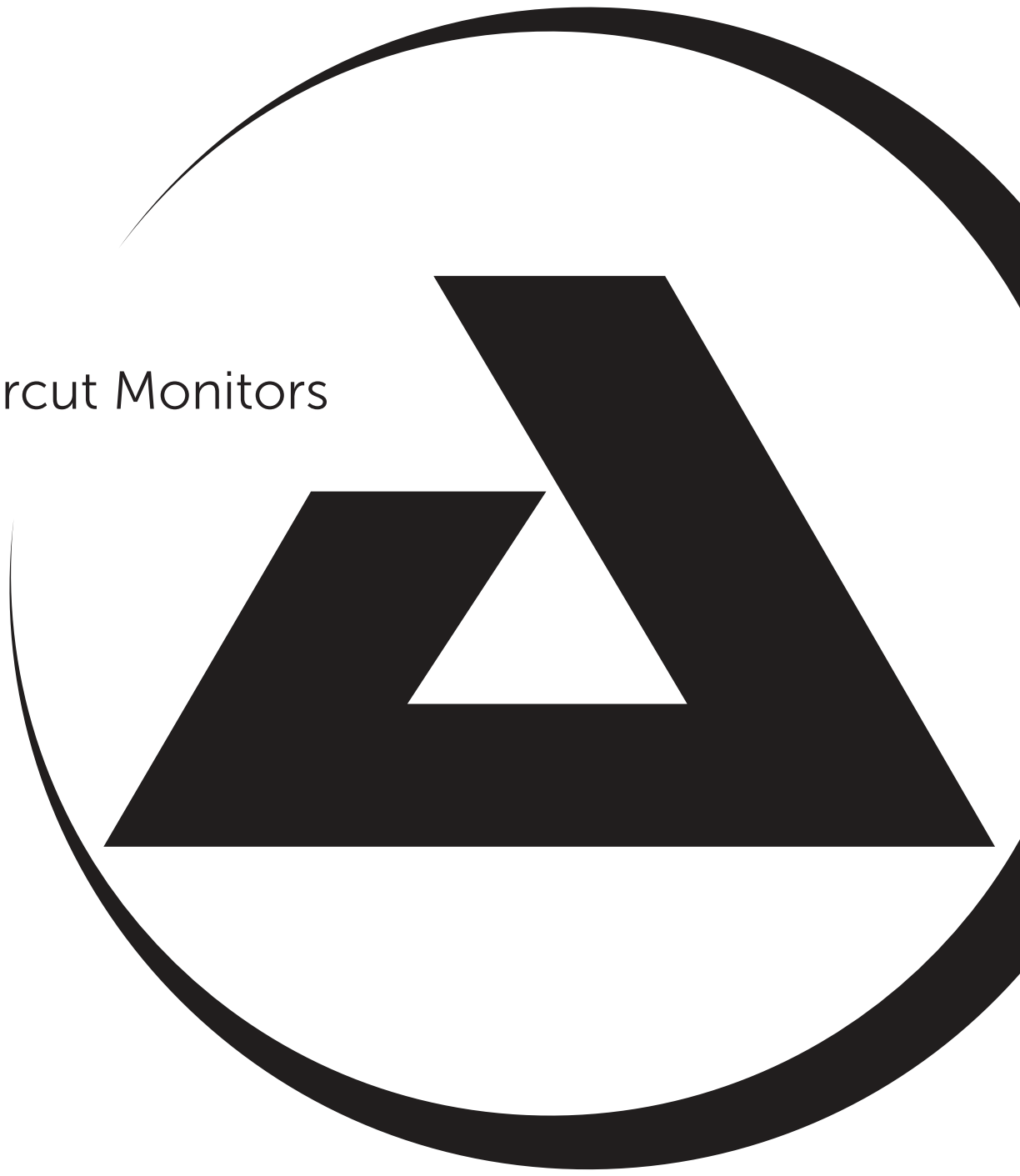


Watercut Monitors



**DELTA**  **C** Technologies Inc.

# OUR COMPANY

Delta C Technologies is an ISO 9001:2008 certified Canadian manufacturer of extremely durable, high-precision watercut monitors. Our unique design approach has redefined the field of capacitance technology resulting in straightforward, trustworthy products with unmatched measurement performance.

While originally designed for use in conventional crude oil production and distribution systems, our range of proven applications is continually expanding. We eagerly explore new measurement challenges and we encourage our customers to put our technology to the test in non-traditional ways.

Delta C has specialized in the measurement of water in oil for over twenty-five years. We take pride in sharing our experience as we strive to enhance liquid measurement accuracy across all industry segments.

# OUR PRODUCTS

## FEATURES

Delta C Watercut Monitors are known for their robust mechanical and electrical design. Unaffected by salinity variation, they offer high resolution, sensitivity and stability with full temperature compensation and rigorous certification for use in hazardous locations.

## ADVANTAGES

Since 1989, Delta C Watercut Monitors have demonstrated proven reliability combined with low maintenance requirements, user-friendly calibration and application versatility. This has resulted in broad industry appreciation of their measurement performance and extended service life.

## BENEFITS

Along with reduced manual sampling and decreased manpower costs, Delta C Watercut Monitors contribute to better measurement, improved process optimization and more cost-effective regulatory compliance.



**WATER IN OIL MEASUREMENT**

**WHEN EVERY DROP COUNTS**

# OUR CUSTOMERS

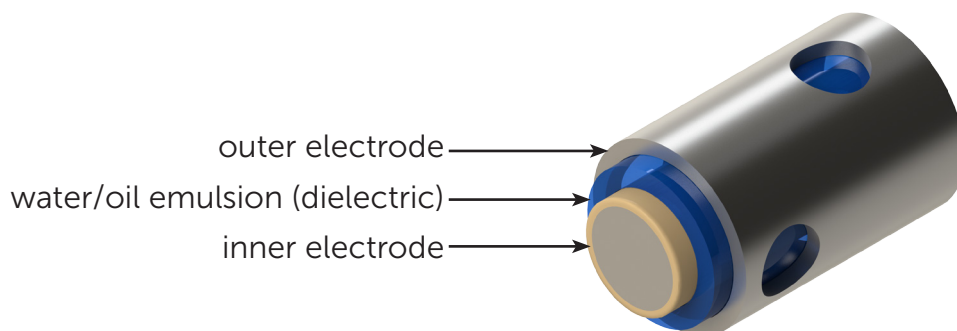
The versatility of the Delta C Watercut Monitor is evident in the wide array of applications our customers encounter. From refined petroleum products to high-temperature SAGD emulsions, our technology is being deployed successfully across a variety of customer applications including custody transfer, quality assurance and regulatory compliance. Some of the fluids our customers work with include:

- Crude Oil
- Diluted Bitumen
- Liquefied Natural Gas (LNG)
- Diesel
- Gasoline
- Lubricants
- Natural Gas Condensate
- Bitumen Emulsion
- Liquefied Petroleum Gas (LPG)
- Bio-Diesel
- Transmission Fluid
- Oil-Based Coolants

# OUR TECHNOLOGY

In basic terms, the Delta C Watercut Monitor is a highly sensitive capacitor constructed from two coaxial electrodes which are separated by a fixed gap. As the water and oil mixture (emulsion) flows through the gap it acts as a dielectric (insulator) which enables the capacitor to store a certain electrical charge. During process flow, variations in the water/oil ratio affects the dielectric which causes the capacitance to vary. The Delta C Watercut Monitor measures the Delta (change) in C (capacitance), hence the name of our company.

The Delta C design brings capacitance measurement to an entirely new level of stability, sensitivity and operating range. Our technology is so responsive it can effectively monitor changes in water volume of 50ppm or less in many refined petroleum applications.



The Delta C watercut measurement is based on monitoring changes in capacitance. During field calibration a reference capacitance "signature" of the water/oil emulsion is established with the help of physical sample analysis. There are several calibration methods available to suit the measurement range and process conditions and the Delta C Watercut Monitor is entirely user configurable for maximum versatility.

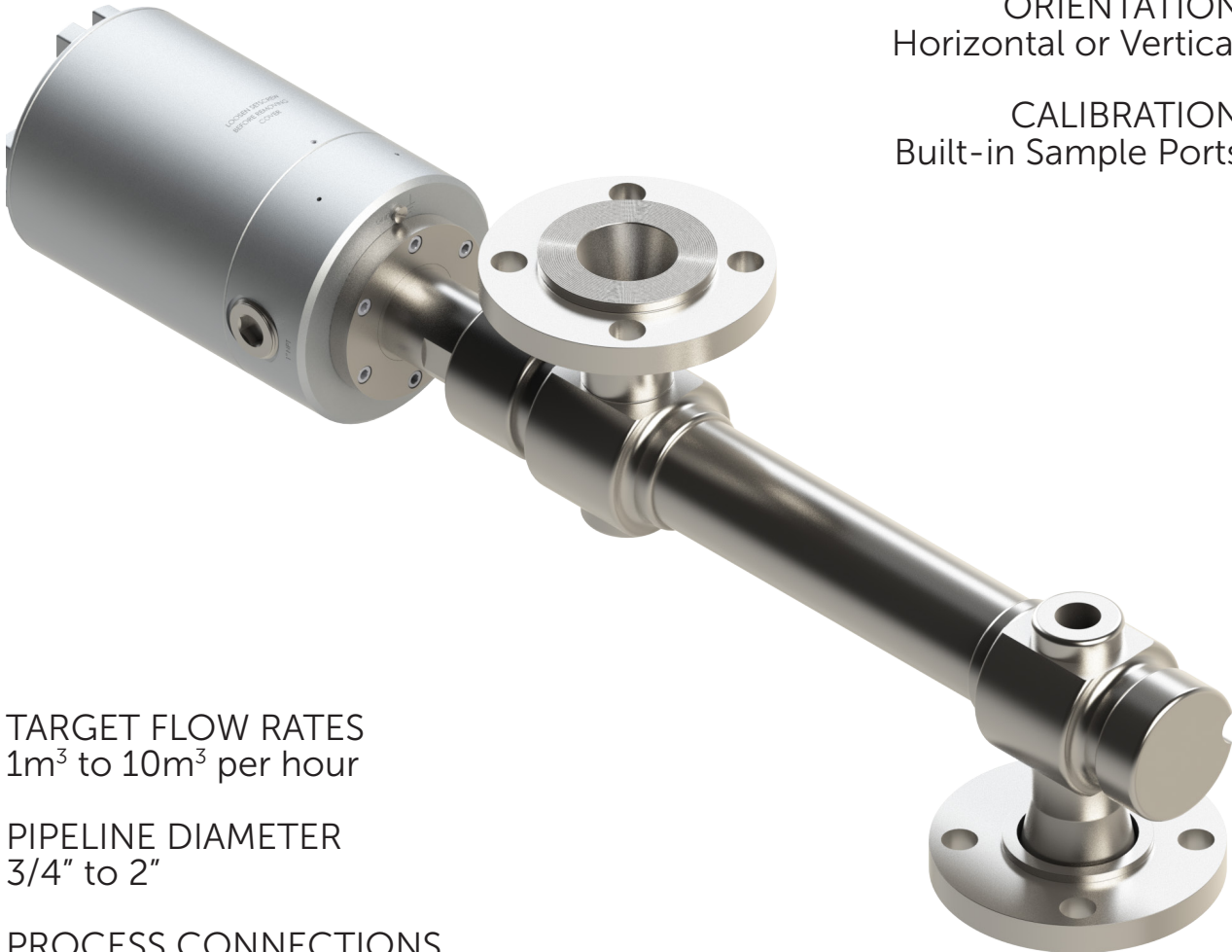
# INLINE WATERCUT METER

## Model DC-1510

FLOW  
Either Direction

ORIENTATION  
Horizontal or Vertical

CALIBRATION  
Built-in Sample Ports

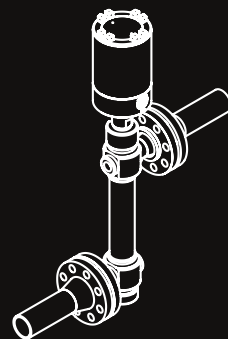
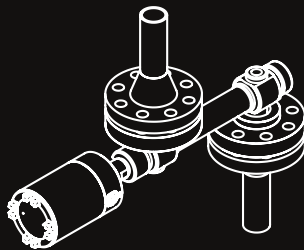
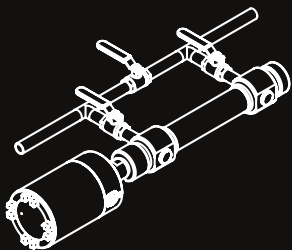


TARGET FLOW RATES  
1m<sup>3</sup> to 10m<sup>3</sup> per hour

PIPELINE DIAMETER  
3/4" to 2"

PROCESS CONNECTIONS  
3/4" or 1" NPT  
1" to 2" Flanged - 150# to 1500# ANSI

INSTALLATION  
EXAMPLES



# INSERTION WATERCUT METER

## Model DC-3510

**FLOW**  
Either direction

**ORIENTATION**  
Horizontal Preferred (to avoid water and gas traps)

**PROBE LENGTH**  
20" Standard (14" and 16" Optional)

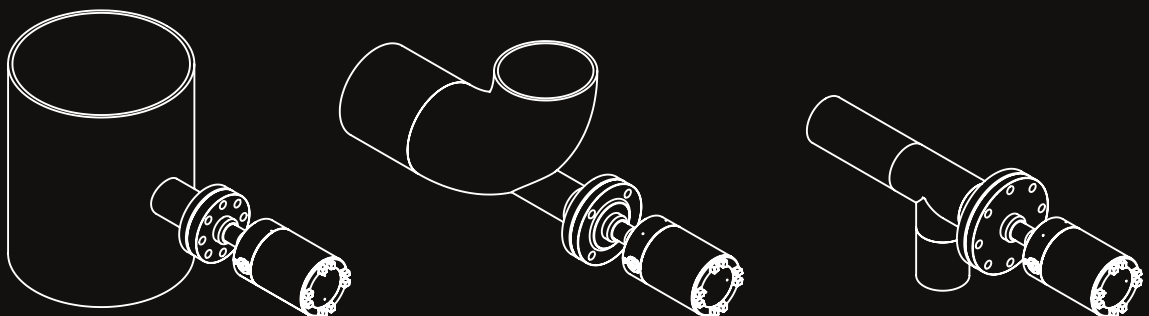


**TARGET FLOW RATES**  
10m<sup>3</sup> per hour and greater

**PIPELINE DIAMETER**  
3" and larger

**PROCESS CONNECTIONS**  
1 1/2" NPT  
2" to 8" Flanged - 150# to 1500# ANSI

INSTALLATION  
EXAMPLES



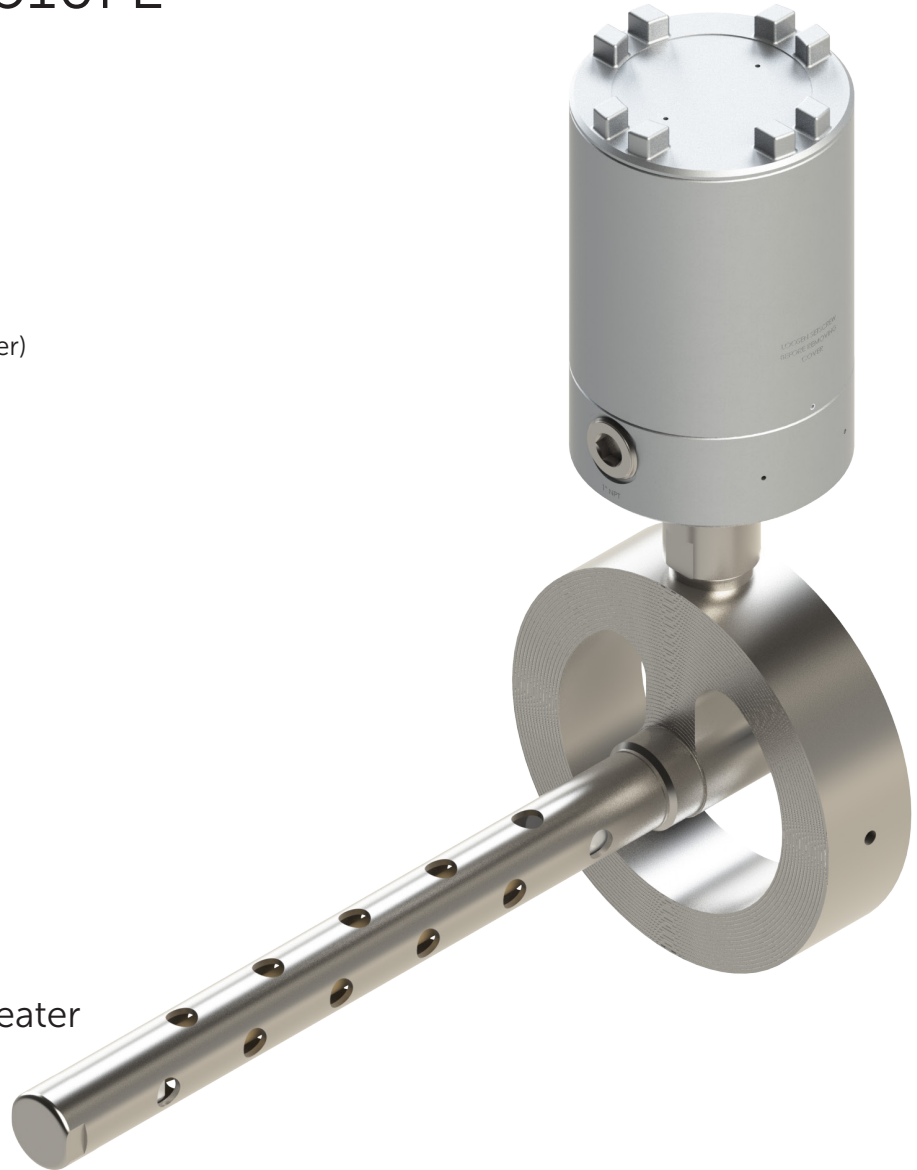
# INLINE WAFER WATERCUT METER

## Model DC-3510FL

FLOW  
Either direction

ORIENTATION  
Horizontal or Vertical

OVERALL LENGTH  
19.4" (Pipe spool by customer)

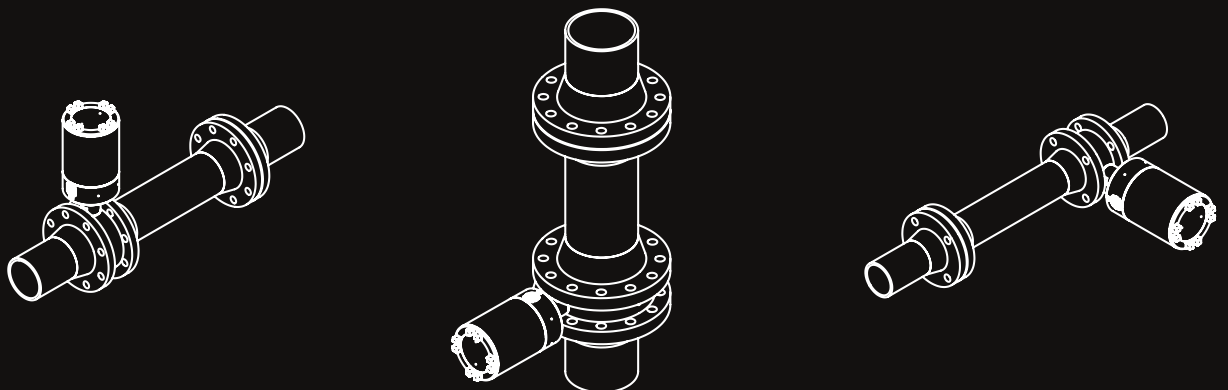


FLOW RATES  
10m<sup>3</sup> per hour and greater

PIPELINE DIAMETER  
3" to 8"

PROCESS CONNECTIONS  
3" to 8" Flanged - 150# to 1500# ANSI

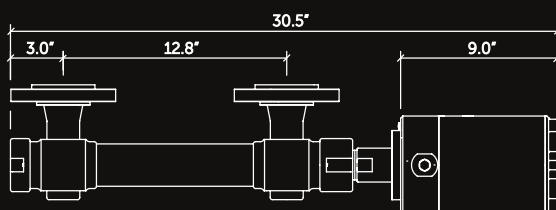
INSTALLATION  
EXAMPLES



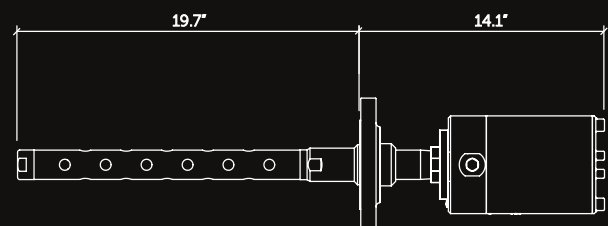
# GENERAL SPECIFICATIONS

Operating Principle:	Advanced digital capacitance
Water in Oil Range:	0-50%
Resolution:	0.001%
Repeatability:	Up to 0.01%
Precision:	Up to 0.01%
Temperature Variation:	Auto-compensated
Temperature Compensation Range:	0°C to 260°C
Wetted Parts:	316/316L SS (Standard) Duplex 2205, Inconel 625, Monel 400, Super Duplex 2507 (Optional)
O-ring Material:	Viton A (Standard) Nitrile, PTFE, Kalrez (Optional)
Maximum Fluid Temperature:	135°C
Ambient Temperature (electronics):	-40 to 85°C
Transmitter Mounting:	Integral with sensor
Electrical Enclosure:	Anodized Aluminum (Standard) 316/316L SS (Optional)
Corrosion Protection:	NACE MR-0175/ISO 15156 2009 Sour service compliant
Hazardous Area Class:	ATEX: Ex II 2 G , Ex d IIB T4 Gb , Zone 1 IECEX: Exd IIB T4 Gb , Zone 1
Ingress Protection:	IP66
Power Supply:	24 VDC @ 150mA floating
Electrical Connections:	(1) 1" NPT & (1) M25
Humidity Protection:	Conformal coated CB
Analog:	4-20mA DC, isolated, self-powered
RS-232:	9600 baud, max. 100m
RS-485:	9600 baud, max. 1500m
Maximum Load:	600 ohm load to control room
Isolation Voltage:	500 volts peak
Relay Contacts:	SPST-NO 2A @ 24 VDC, non-inductive
Adjustable Delay:	One second increments

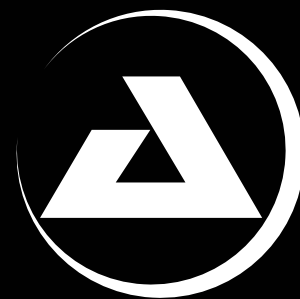
DIMENSION  
EXAMPLES



DC-1510



DC-3510



Made in Canada By

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