neptune oceanographics

SNIFFIT FOR DETECTION OF SUBSEA HYDROCARBONS

Neptune Oceanographics' unique SNIFFIT system for the detection of subsea leaks of hydrocarbons is a proven, real time, in situ method that has been used world-wide and has many applications in diverse underwater markets. The small, lightweight detector combines with its control unit and Windows based software to warn the user of the presence of Hydrocarbons (as oil including crude) and Methane ahead of the more obvious physical clues such as the presence of bubbles.

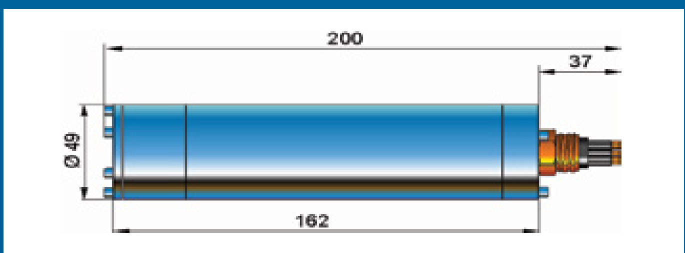
SNIFFIT significantly simplifies current leak detection techniques in that it eliminates the use of dyes and fluorescence detectors and therefore is environmentally and financially superior.

The Sniffit was developed specifically to allow fast, real time in situ detection of dissolved and gaseous methane in water, whatever the source, and has been successful in hydrocarbon surveys to depths of over 3000m world-wide. Although it is essentially a methane detector it is equally a hydrocarbon detector and will respond well to all hydrocarbons including oil.

The very high sensitivity of Sniffit makes it ideal for the detection of hydrocarbons leaking from the seabed or pipeline installations.

The sensor can be used as a quick pass for general 'look and see' surveys or used in detail mode to detect the exact location of a subsea leak.

The Sniffit is easily mounted on a ROV, AUV, towed vehicle, cable profiler or can be diver held.



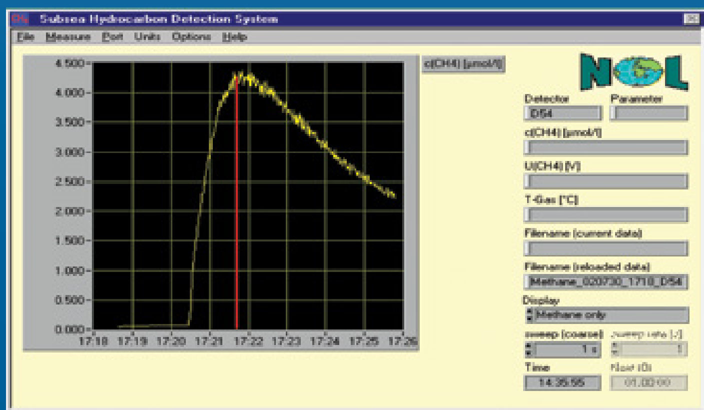
EXPLANATION OF THE SENSOR PRINCIPLE

The hydrocarbon desorbs together with water vapour from the water to the chamber behind the membrane. The liquid water stays outside. The diffusion from water to the gas phase behind the membrane is driven by Henry's law:

HCH4 = pCH4/XCH4 and XCH4 = CCH4/CCH4+CH2O

The mole-concentration (XCH4) from in water dissolved hydrocarbon is in a thermodynamic balance with the partial pressure (pCH4) of methane in the gas phase. For small concentrations of the methane/hydrocarbon in water there is a linear relationship (Henry's Constant) between pCH4 and XCH4. The direction is conditional on the concentration gradient between water and gas phase.

Behind the membrane is a 5 mm thick sinter-metal plate with pores between 0,5 to 25 Am. The sinter-metal supports the membrane against the high pressure in deep water. Because of the micro-pores the hydrocarbon molecules penetrate the sinter-metal plate and react with the oxygen on the surface of the tin-dioxide layer (surface temperature nearly 380 °C). This reaction releases free electrons in the layer and the conductivity increases. The change of conductivity depends directly on the hydrocarbon concentration. With a constant current passing through the layer the conductivity is converted to a voltage signal. With an A/D converter the signal is digitised.



OPERATIONAL RANGES

Depth	0 – 2000 m
Temperature	2 – 20 °C nominal
Methane	50 nmol/l – 10 Amol/l
Power	24-36 VDC - current upon switch-on (at 24 V) - 400 mA normal current consumption (at 24 V) - 100 mA
Weight in air	approx 1.5 kg
Sensor output	Normally RS 485 but versions are available with analogue output or parallel RS 235.
Mounting	ROV – two wire signal conductors through umbilical for RS 485 transmission

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