

- Inductive measurement
- High accuracy oil/water interface determination
- Detect sand build-up
- Tolerant to deposits
- No export restrictions

## iPhase™ Level Measurement and Water Profiler

The Sulzer iPhase™ profiler measures the oil water interface, provides accurate measurements of water conductivity and thereby the oil in water profile inside hydrocarbon separators.

### General description

Several independent sensors are located above each other in order to measure a vertical profile of the separator contents.

Each sensor measures the bulk properties of the surrounding fluid.

The measurement is conducted without electrodes and over a large volume which makes it less sensitive to deposits.

The iPhase™ electronic module is located on the top of the separator vessel and is connected to the iPhase™ Measurement Rod, located inside the vessel. It performs all calculations onboard and can directly be accessed by the plant control system via MODBUS RTU or 4-20mA signalling.

### Key features

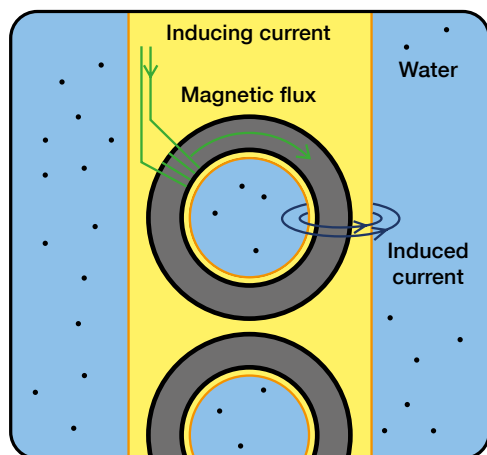
- Inductive measurement principle
- Tolerant to deposits
- No export restrictions
- Minimum nozzle size: 4" (Top Mounted)  
Minimum nozzle size: 2" (Retrofit)
- High accuracy oil/water interface determination excellent reliability and robustness.
- Separator water profiling
- Intrinsically safe electronics
- No active components inside vessel
- ATEX Ex ia IIB T4
- UL Marks for the United States and Canada Class I Division 2, Groups C & D, T4 Class I, Zone 2, Group IIA and IIB, T4
- Control system interface MODBUS RTU (RS485)
- 4-20mA for interface signalling
- Rugged electronics design and 316L instrument enclosure
- Detection of sand build-up
- Integrated temperature sensor

## Measurement principle

The Sulzer iPhase™ profiler measures the electrical conductivity of the water/oil mixture surrounding each sensor.

Dispersed oil droplets are non-conductive compared to the surrounding water. The overall conductivity will therefore decrease with increasing concentration of oil. The iPhase™ profiler measures the oil-water interface, provides accurate measurements of water conductivity and thereby the oil in water profile inside hydrocarbon separators.

The conductivity is measured by setting up an electric field and measure the current flowing. The electric field is an induced field and is therefore very tolerant to deposits.



iPhase measurement principle



Spool piece, instrument housing and measurement rod

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## SPECIFICATIONS

Electrical Supply (via IS-isolator)	
Max current consumption:	70 mA
Typical current consumption:	50 mA
Minimum supply voltage at full load:	11.7 V
Process temperature:	-20 °C < T < 120°C
Ambient temperature:	-20 °C < T < 75 °C
Conductivity measurement range:	3 S/m < $\sigma$ < 50 S/m
Resolution:	20 mS/m
Level measurement range:	1430 / 2200mm
Interface accuracy:	±20 / 40mm

## MECHANICAL

Instrument housing:	316L
Ingress protection electronics:	IP 66/UL50 Type 4x Electronics encapsulated in polyurethane/ aluminium
Measurement rod:	Sensors moulded in epoxy with a 316L support structure (Other materials available on request)
Minimum nozzle size:	4" (Top mounted)
Minimum nozzle size:	2" (Retrofit entry through manhole)
Pressure barrier/flange:	22 Cr Duplex

## SAFETY DESCRIPTION

ATEX Ex ia IIB T4	-20 °C < Ta < 75 °C
UL Class I Division 2, Groups C & D, T4	
Class I, Zone 2, Group IIA and IIB, T4	
Process control equipment for use in hazardous locations	

## CERTIFICATE NO:

DNV 11 ATEX 91889  
IECEX DNV  
EMC HF 124302  
UL E361702

## REFERENCES

Troll Pilot Subsea module (Norsk Hydro)	The world's first subsea separator (ILMS)
Statoil flow loop in Porsgrunn (Statoil)	
Petrojarl Cidade de Rio das Ostras FPSO (Teekay Petrojarl / Petrobras)	Heavy Oil, API 12
Sulzer separation laboratory	Used in test separators for level control
Waimea project, OGX/OSX FPSO OSX	Heavy Oil, API 18. Level measurement and water profile in HP and test separator.
Cardemom project, Shell Auger TLP	Level measurement and water profile in LP separator.
Petrobras	Level measurement and water profile in 3 off test separators.
Mariner project, Statoil	10 level measurement and water profilers for the following separators: Inlet, 2nd stage, test, electrostatic coalescer A, electrostatic coalescer B, water reject and reclaimed oil sump.