



Everything all right?

**Oil on Water Monitor Model**

## **FLUCOmat (FLU 103)**

**Non Contact Detection of:**

- Mineral oils
- Synthetic oils
- Oil- Emulsions
- Free Hydrocarbons



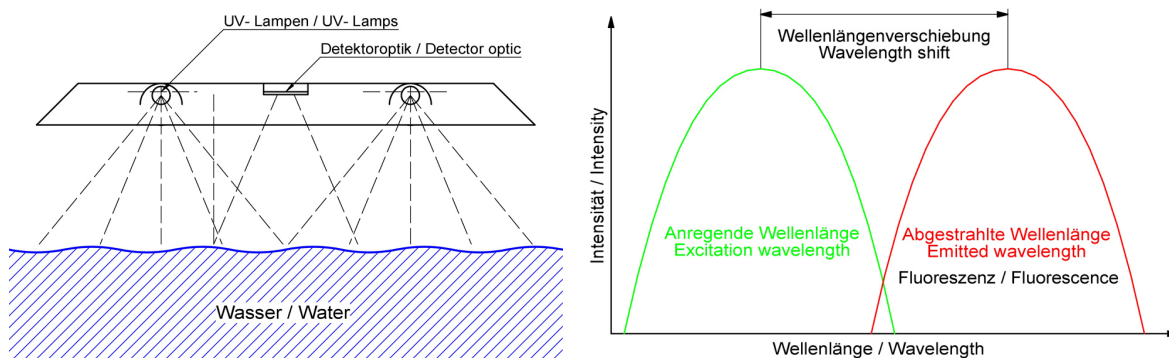
## What does Fluorescence mean?

Fluorescence is defined as the characteristic of solid, liquid or gaseous products, after irradiation with light, UV-, Roentgen- or electron rays, to return a part of the absorbed energy with the same or a longer wavelength.

## The detection of oil on water

The water surface will be irradiated by UV – light. Oil, located on the water surface will absorb a part of this UV– light. This absorbed energy will be given off immediately with a different wavelength as visible light.

The visible light created by this effect will be detected by a photomultiplier, and transformed.



## Why oil on water and not oil in water?

This question is easy to answer, oil swims!

The conception of the oil on water monitor, model FLUCOMat is mainly for the monitoring of open channels, surface water, basins, etc. These applications make it impossible to take a representative sample with the average oil content of the total volume, because the oil is not homogenously mixed in the water.

### Example:

In case a sample is taken in a depth of 1m, you may find no oil at all. In a depth of 0,5m you may find 1ppm of oil, in 10mm depth 1000ppm, and at the surface you find a 3 mm thick oil film. Even small quantities of oil can be a problem. Especially in cases where the water is drained directly into a river or into a public waste water system. Different government laws will oblige everybody to keep care to the environment. So facilities that accidentally put oil into the environment need to monitor their water continuously.

## Typical measurement units

The monitoring results of model FLUCOMat will display, how many percent under the detection area is covered by the specific oil used for calibration. Due to the fact that the total quantity of water and the distribution of oil and type of oil is typically unknown, it is not possible to calibrate the system in ppm, mg/l, etc. at installations in open channel. An installation in Bypass (flow through) allows a ppm calibration.

## Detection sensitivity

The fluorescence method shows an excellent sensitivity against the unsettled hydrocarbons in oil. So typically you can detect 1 drop of oil per m<sup>2</sup> without any problem.

## Description Model FLUCOmat:

The oil in water monitor model FLUCOmat detects even small amounts of oil on water surfaces. The device uses the principle of UV- stimulated fluorescence. The sensor emits UV- light to the water surface. These UV- light will be absorbed by floating oil. The absorbed UV- radiation changes its wavelength and is emitted as visible light. This effect is referred as fluorescence. The fluorescent light caused by oil, is detected with the sensor and used to calculate the measuring results. The sensor can be configured to detect an additional part of the reflected light, in order to increase the responsiveness of the system. The measurement of fluorescence and reflection guaranties an unprecedented sensitivity of the system. This measuring method allows the detection of 0.1ml oil per square meter water surface easily. The sensor requires a constant distance to the water surface to provide best measurement results. Larger level fluctuations must be compensated by pontoons or by using the optional ultrasonic controlled level lift system. The measurement by using the optional bypass vessel guaranties automatically the perfect measuring distance and a of minimum cross- interferences. A defined flow rate into the bypass vessel allows a calibration in ppm or mg/l at specific oils.

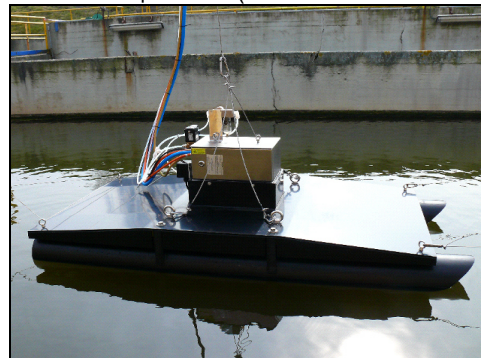
## Advantages:

- > Detection of Mineral Oils
- > Detection of Emulsions
- > Detection of free hydrocarbons
- > Non contact surface scanning
- > High sensitivy
- > Factory calibration
- > Transfer standard, calibration without liquid samples
- > Big measurement area of approx. 20 cm diameter
- > High long term stability, calibration interval 1 year
- > Low maintenance
- > No moving parts
- > Long life UV- Lamps (optional UV- LED's)
- > Automatic selve diagnostic routine

## Application:

Continuous monitoring of water surfaces. Swimming oil will be detected with excellent sensitivity. Oil contaminations will be recognized in an early stage, environment und process problems will be avoided.

Installation at pontoons (Stormwater detention basin)



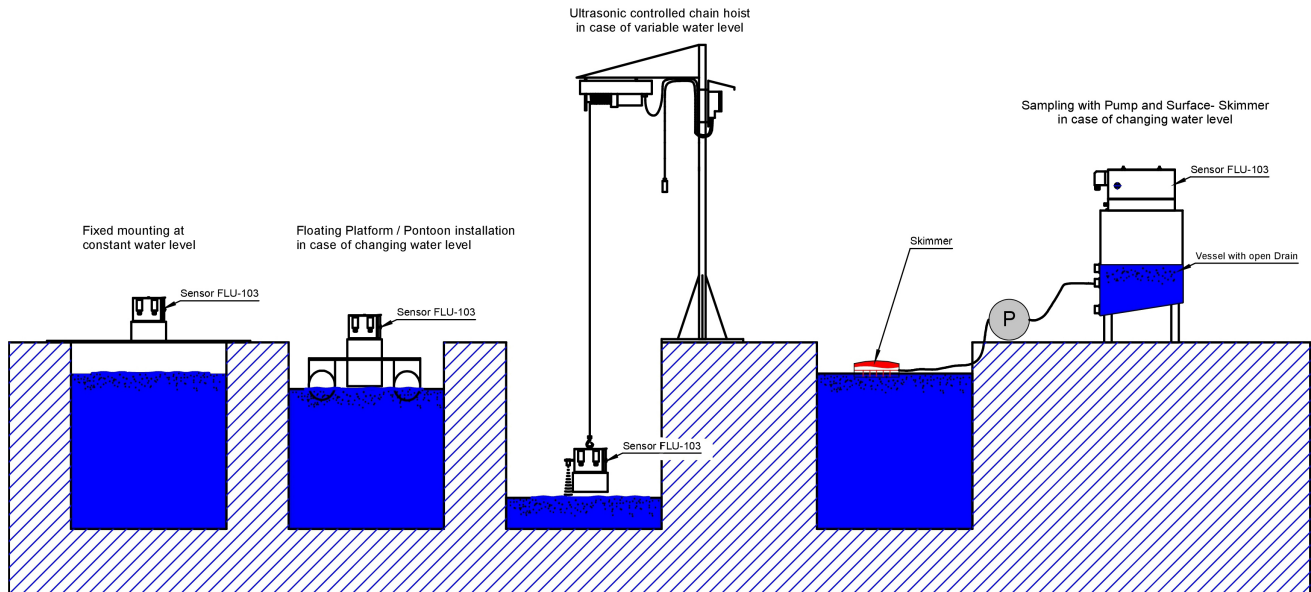
Installation at bypass container



FLUCOmat with ultrasound controlled elevation system



## Installation Examples at open Channel or Basins Oil on Water Monitor Model FLUCOmat (FLU-103)



A fixed mounting by using a mounting frame or a mounting rod with swivel clamp requires a constant water level. Please ensure that the water level does not change more than +/- 3cm.

The Pontoon installation compensates changes in the water level in a simple manner. The swimming platform keeps the sensor in a constant position above the Water surface.

The ultrasonic controlled chain hoist keeps the sensor position in the optimal distance above the water surface. The chain hoist moves the Sensor in correlation to the changes in water level. This technique allows the use of the sensor under tight spatial conditions. A wall mounted rail system is available as an additional option. The rail system leads the sensor and ensures that he not tilts.

The floating skimmer ensures, that the self sucking pump transports surface water only into the bypass vessel. Floating oil will together with the water pumped into the bypass container. The open drain of the container guarantees a constant water level, so that the sensor works with the optimal distance to the water surface.

Other application specific mounting equipment is available on request!

### Applications:

- Oil at drinking water reservoirs
- Turbine Oil in power stations
- Oil of Hydraulik- maschine parks
- Oil in cooling water (heat exchanger oil)
- Oil in produced water
- Oil in stormwater detension basins
- Water return of plants to rivers or lakes
- Water return to public waste water systems

### Typical locations:

- Chemical Industry
- Petrochemical / Refineries
- Power Stations / Power Generation
- Water Plants
- Etc.

### Technical data: Transmitter FLUCOmat (FLU 103)

#### FLU-103-WA (IP 65 / Nema 4x wall mount enclosure)

Supply voltage:	115, 230 VAC, 50 - 60 Hz (24 VAC/DC)	Ambient temperature:	-20°C – +45°C
Power requirement:	maximal 80 VA	Analog- output:	0/4 - 20 mA
Set point relay:	48V / 2A	Dimensions transmitter: Protection class transmitter:	ca.355 x 235 x 325mm IP65 / Nema 4X
System fail relay:	48V / 2A	Dimensions Sensor:	approx. 360 x 240 x 280 mm
Self test relay:	48V / 2A	Protection class Sensor :	IP65 / Nema 4X
Range:	application specific	Optional Ex-cert. (ATEX):	Ex-Zone I und Ex-Zone II
Reproducibility:	± 2 %		
Cable length:	maximum 60 m		

### Technical Data: Transmitter FLUCOmat (FLU 103)

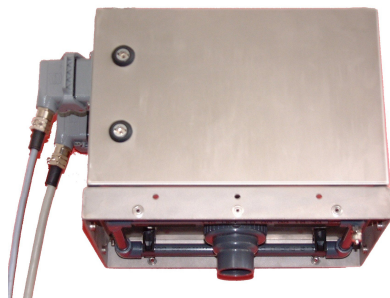
#### FLU-103-19 (19"- Rack)

Supply Voltage:	115, 230 VAC, 50 - 60 Hz (24 VAC/DC)	Ambient temperature:	-20°C – +45°C
Power requirement:	maximal 80 VA	Analog- output:	0/4 - 20 mA
Set point relay:	48V / 2A	Dimensions transmitter: Protection class transmitter:	19" / 3HE / 84TE IP30
System fail relay:	48V / 2A	Dimensions Sensor:	approx. 360 x 240 x 280 mm
Self test relay:	48V / 2A	Protection class Sensor :	IP 65
Range:	application specific	Optional Ex-cert. (ATEX)	Ex-Zone I und Ex-Zone II
Reproducibility:	± 2 %		
Cable length:	maximum 60 m		

## Model FLUCOmat (FLU 103) / Summary



FLUCOmat Transmitter



FLUCOmat Sensor

- Principle of measurement: UV- stimulated fluorescence
- Non-contact measurement
- Low maintenance
- Long live UV- lamps
- optional sensor with high power UV- LED's available
- High detection sensitivity
- High reproducibility
- High selectivity / low cross interferences
- Large measurement surface of approx. 20cm diameter
- Adjustable setpoint relay
- Automatic self diagnostic routine
- 3 1/2 digit LED display and additional bargraph
- Installation via bypass container, pontoons or NiveauTron

### Description:

The oil on water monitoring system Model FLUCOmat is used for continually monitoring of water surfaces for the presence of oil. The instrument provides a very high sensitivity. Oil leakage can be recognised at an early stage, and damage to facilities and the environmental can be avoided or minimised. The system uses the principle of UV stimulated fluorescence. To raise the sensitivity, the instrument is adjustable to detect fractions of reflection in addition to the fluorescence signal. The use of modulated light compensates, for ambient light, ageing of lamps and contamination of the detector, to a high degree. Thus assures highly stable and reproducible monitoring results. The sensor requires a constant distance of approx. 40cm above the water surface. Level fluctuations in open channels can be compensated by using pontoons or the ultrasonic level elevation. An optional bypass container is also available to allow flow through measurements and a calibration in ppm.

### Applications:

- Cooling water
- Rainwater catchment's
- Water reservoirs
- Turbine Water

### Operational areas:

- Chemical industry
- Petrochemical industry
- Drinking water
- Power stations

### Technical Data:

Supply voltage: 115, 230 AC / 50 – 60 Hz  
 Power consumption: maximum 80 VA  
 Set point: 1 Relay (48V / 2A)  
 System fail: 1 Relay (48V / 2A)  
 Self test: 1 Relay (48V / 2A)  
 Analogue output: 0/4 - 20mA / 800Ohm

Measurement range: typical 1 drop/m<sup>2</sup>  
 Reproducibility: ± 1 %  
 Detector: Photo Multiplier  
 Protection: IP65 / NEMA4X  
 Enclosure: 1.4571 / 316SS (alternative ABS)  
 optional hazardous area: ATEX div. I or div. II