Dissolved oxygen is required for the survival and growth of many aquatic organisms, including fish. The concentration of dissolved oxygen may also be associated with corrosive and photosynthetic activity. The absence of oxygen may permit anaerobic decay of organic matter and the production of toxic and undesirable esthetic materials in the water. Main applications for this sensor are biotechnology, chemical industry, air surveillance, fish farming, water management and sewage water (gas and liquid phase).

The Visiferm utilizes luminescent technology and eliminates the typical drawbacks of membrane components. The measurement is unaffected by sample fouling or poisoning and virtually maintenance free with no membranes to replace, no electrolyte solution to replenish, no anode or cathode to clean or replace and long calibration intervals.

Features
- Steam sterilizable, autoclavable and CIP suited
- LDO technology is approved by ASTM as standard method (D888-05) for DO and BOD measurement
- No electrolyte solutions
- No membranes on concerns about air bubbles,
- Does not consume oxygen so passive fouling will not affect DO readings
- Measurement not affected by sample color or turbidity
General
The Visiferm sensor is coated with a luminescent material. Blue light from an LED is transmitted to the sensor surface. The blue light excites the luminescent material. As the material relaxes and falls back into its ground state, it emits red light.

The time from when the blue light was sent and the red light is emitted is measured. The more oxygen that is present the shorter the time it takes for the red light to be emitted. The time delay can be expressed as a phase shift between the wave patterns of the Blue LED light and the Fluoresced light. This phase shift is inversely proportional to the oxygen concentration in the fluid.

Calibration
Most calibration techniques may be used, including air calibration, zero calibration, calibration by comparison to a hand-held DO analyzer or concurrent calibration of two sensors.
In most moderate applications it is rarely necessary to calibrate the Visiferm, but still the frequency of calibration needs to be determined by site conditions and customer requirements. The Visiferm can be calibrated in Air or in an oxygen-free environment (zero point). A solution with 0 ppb O₂ can be created by dissolving 2 gram of Sodium Sulfite (Na₂SO₃) in a beaker or cup with 100 ml water.

Functional specifications

- **Measuring range**: 4 ppb / 0.05% up to 300% air saturation
- **Accuracy**: 80 ppb ± 4 ppb / 21 ± 0.2%vol / 50 ± 0.5%vol
- **Temperature**: -10˚C….80˚C
- **Pressure**: -1 ….12 bar (press spikes up to 80 bar)
- **Flow**: No minimal flow required
- **Storage Temperature**: -10 ...50˚C

Dynamic specifications

- **T response 98%**: < 30 sec at 25˚C, from air to Nitrogen
- **Drift**: <0.2% vol Oxygen per week in air at 30˚C

Sensor specifications

- **Wetted parts**: SS 316L DIN1.4435
  Silicone FDA approved*
  EPDM FDA approved*

- **Mounting**: PG13.5 thread
- **Sensor length**: 120, 160, 215, 325 and 425 mm are available
- **Surface Roughness**: Ra = 0.4 μm / N5
- **Connector**: Variopin 8.0 double coax
- **Temperature sensor**: 22k NTC

* Note: FDA approval for these materials can be downloaded from www.hamiltoncompany.com/eu.sensors/certificate_page.asp

Partnumbers

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Description</th>
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<tbody>
<tr>
<td>1W-242450-02</td>
<td>Visiferm DO 120</td>
</tr>
<tr>
<td>1W-242451-02</td>
<td>Visiferm DO 160</td>
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<td>1W-242452-02</td>
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<td>1W-242427</td>
<td>Visiferm DO sensor Cap</td>
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<tr>
<td>1W-242411</td>
<td>USB-RS484 ModBus Converter</td>
</tr>
<tr>
<td>1W-355194-03</td>
<td>Visiferm DO Demo Cable</td>
</tr>
</tbody>
</table>

Fittings

The Visiferm is equipped with a PG13.5 adapter. Together with our PG13.5 -> M25 adapter this sensor can be installed in all our 3 and 4-hole pH fittings:

- **FF20** : pH flowfitting max. sensor length 120mm
- **FD20** : immersion fitting
- **FS20** : Subassembly
- **K1598AC** : Small version flowfitting. With this fitting the K1598JB adapter is needed (see drawing 1.2)
- **PG13.5** : m25 adapters
- **K1520JN** : PVC
- **K1500DV** : PVDF
- **K1520JP** : SS

* Note: The liquid earth cable delivered with the pH fittings does not need to be connected. (see drawing 1.3)
1.1 Visiferm external Dimensions

1.2 K1598 AB flowfitting

1.3 PG13.5 > M25 adapter