# Turbidity/Temperature Sensor 3712

## TURBIDITY/TEMPERATURE SENSOR 3712

*A rugged sensor for measuring the turbidity of the water based on scattered infra-red light and temperature by means of a thermistor.*

The Turbidity Sensor 3712 measures scattered light. This measurement is known to have a good correlation to the amount of suspended matter in water and can be used to monitor sediment, algae, or particle pollution. It is designed for use together with the Aanderaa Dataloggers or Display Units.

The sensor head is cylindrically shaped, molded in Durotong and installed in an adapter made of Titanium. The sensor is furnished with a 10-pin receptacle for connection to the sensor cable. Two light emmiting diodes and one photo diode are pointing towards a common center at an angle of 15°. The photodiode is furnished with a daylight filter. The electronic circuitry is molded in the sensor housing.
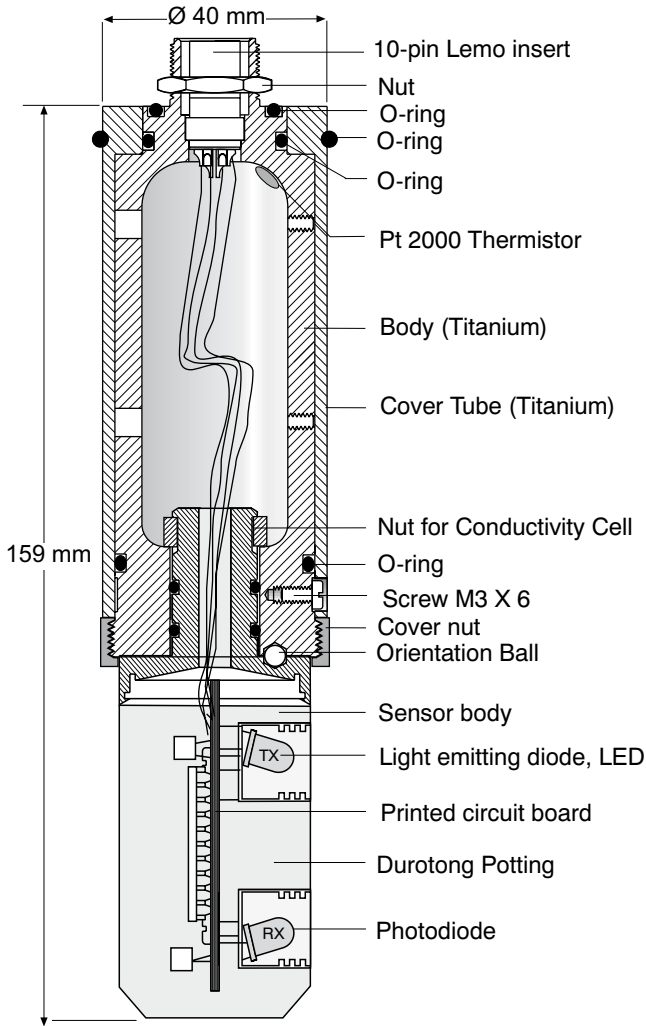
When a measurement is taken the IR light emitting diode is switched on for half a second and sends a light beam into the water. If the surrounding water is clean and clear the photodiode will not detect this light. On the other hand, if the water is contaminated, scattered light from particles in the water will be sensed by the photodiode and a photocurrent will flow in the diode. This current gives a signal that signifies the amount of light that has been scattered. The signal is independent of the ambient light intensity and it is fully temperature compensated.

The output is in the standard Aanderaa SR-10 format. The adapter also has a temperature probe measuring the exact water temperature and the output is in the standard Aanderaa VR22 format.

The sensor is designed to avoid marine fouling. In any case, it is important to keep the plastic surfaces, covering the IR-LED and the photodiode, clean to ensure accurate measurements. When exposed to air, the sensor should read 0.1 NTU.
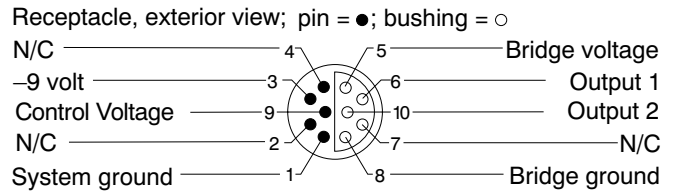
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# Specifications

Labels on diagram:
- Ø 40 mm
- 10-pin Lemo insert
- Nut
- O-ring
- O-ring
- O-ring
- Pt 2000 Thermistor
- Body (Titanium)
- Cover Tube (Titanium)
- Nut for Conductivity Cell
- O-ring
- Screw M3 X 6
- Cover nut
- Orientation Ball
- Sensor body
- Light emitting diode, LED
- Printed circuit board
- Durotong Potting
- Photodiode
- 159 mm

| Turbidity: | Output 1 |
|---|---|
| **Range:** | 3712: 0 - 20 NTU .............................. □ |
| | 3712A: 0 - 100 NTU .............................. □ |
| | 3712B: 0 - 500 NTU .............................. □ |
| | 3712S: .............................. NTU .............. □ |
| | (NTU=Nephelometric Turbidity Unit) |
| **Accuracy:** | 2% of full scale. |
| **Wave Length:** | 880nm |
| **Angle of measured diffused radiation:** | 30° |
| **Output Type:** | SR10 |

| TEMPERATURE: | Output 2 |
|---|---|
| **Temperature Range:** | -7.5 to 41°C |
| **Accuracy:** | ±0.1°C |
| **Resolution:** | 0.05°C |
| **Output Type:** | VR22 |
| **Time constant(63%):** | 30 seconds |
| **Depth Capability:** | 200 meters |
| **Current consumption:** | 150μA average when read every 10 minutes |
| **Weight:** | 385g (in air). 196g (in water) |
| **Packing:** | Cardboard box |
| **Gross weight:** | 425 grams |
| **Materials:** | Hostaform, Durotong, Titanium |
| **Electrical Connection:** | 10-pin plug part no. 3216A |
| **Warranty:** | Two years against faulty materials and workmanship |

## PIN CONFIGURATION

Receptacle, exterior view; pin = ●; bushing = ○



| | | | |
|---|---|---|---|
| N/C | 4 | 5 | Bridge voltage |
| –9 volt | 3 | 6 | Output 1 |
| Control Voltage | 9 | 10 | Output 2 |
| N/C | 2 | 7 | N/C |
| System ground | 1 | 8 | Bridge ground |

**CALIBRATION:  Serial No.**

During calibration the sensor is submerged in six different formazine solutions and connected to a Datalogger 3660 which gives the following raw data readings(N):

| Turbidity (NTU) | Reading | Turbidity (NTU) | Reading |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

These readings give a set of calibration coefficients to be used when converting the sensor raw data readings to engineering units.

The coefficients for Turbidity are:

| A | | C | |
|---|---|---|---|
| B | | D | |

To convert the raw data readings to engineering units use the formula: Turbidity (NTU) = $A + BN + CN^2 + DN^3$

Temperature:

| Temp. (°C) | | | | |
|---|---|---|---|---|
| Reading, N | | | | |

The coefficients for Temperature are:

| A | | C | |
|---|---|---|---|
| B | | D | |

Temperature (°C) = $A + BN + CN^2 + DN^3$

Representative's Stamp

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*Reliable Solutions 2*