The name and contact details of the Company responsible for the product described in this technical file are as follows:

Sensorex Corporation, A Halma Company
Registered: ISO9001-2015
11751 Markon Drive
Garden Grove, CA 92841 USA

Tel: 714-895-4344 Fax: 714-894-4839 Email: Nick.Rudolph@sensorex.com

The name and contact details of the Product Manager in charge of the product(s) described in this technical file are as follows:
Vice President, Sales & Marketing – Stephanie Smith
Stephanie.Smith@sensorex.com

The name and contact details of the person in charge of Regulatory Affairs for the product(s) described in this technical file are as follows:
Quality Engineer- Nick Rudolph
Nick.Rudolph@sensorex.com

The name and contact details of the person in charge of Quality Assurance for the product(s) described in this technical file are as follows:
Quality Engineer- Nick Rudolph
Nick.Rudolph@sensorex.com

Product Description

Sensors are for the analysis of aqueous media to determine water quality for ecosystem, drinking, waste water and suitability for industrial use, as listed in **Annex I** of this Declaration under the following categories:
pH, ORP, ISE
CONDUCTIVITY
BATTERY POWERED
AMPEROMETRIC and DO

EMC

Electromagnetic Compatibility Directive as found in Annex II

The principal protection requirements are set out in Annex III

List of Standards

Sensorex Corporation declares under their sole responsibility that their
Sensors are for the analysis of aqueous media to determine water quality for ecosystem, drinking, waste water and suitability for industrial use, as listed in **Annex 1** of this Declaration under the following categories
pH, ORP, ISE
CONDUCTIVITY
BATTERY POWERED
AMPEROMETRIC
Dissolved Oxygen (DO)
Ultraviolet transmittance (UVT)
which are the subject of this technical file comply with the following Harmonized Standard:

EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements. Electromagnetic compatibility, Electromagnetic radiation.

Conformity Assessment Procedure

Sensorex Corporation declares under their sole responsibility that their:

Sensors for the analysis of aqueous media to determine water quality for ecosystem, drinking, waste water and suitability for industrial use, have been manufactured under guidelines of ISO9001-2015 using documented process controls, goals, and objectives to provide those products listed in **Annex 1** of this declaration under the following categories:
pH, ORP, ISE
CONDUCTIVITY
BATTERY POWERED
AMPEROMETRIC
DISSOLVED OXYGEN (DO)
ULTRAVIOLET TRANSMITTANCE (UVT)

which are the subject of this technical file have been Assessed for Conformity under the sole responsibility of:

Sensorex Corporation, A Halma Company
11751 Markon Drive
Garden Grove, CA 92841

Tel: 714-895-4344 Fax: 714-894-4839 Email: Nick.Rudolph@sensorex.com

Packaging
The above listed products have primary packaging consisting of cardboard. The secondary packaging consists of paper or foam.

Product Label
May be any of the following:

RoHS
COMPLIANT
S200C/BNC

List of Materials used:

pH, ORP, ISE use the following basic materials-brass, nickel, silver, platinum, gold, copper, PVC, CPVC, PVDF, silicone, HDPE, LDPE, Epoxy resin, Lead free glass, Dowicil™, KCl, Polypropylene, silver chloride, potassium nitrate, Lead free solder, PPS.

Conductivity probes use the following basic materials- brass, nylon, epoxy resin, epoxy tube, PVDF, TFE, Noryl, copper, PVC, CPVC, 316 stainless steel, graphite, PPS, PCTFE (KEL-F), silicone, ferromagnetic materials, F4 PCB, Lead free solder.

Battery Powered accessories use the following basic materials – 3.0VDC Batteries, CPVC, PVC, PPS, epoxy resin, brass, nickel, F4 PCB, silicone, silastic RTV, 316 stainless steel, Lead free solder, Viton® DuPont Performance elastomer.

Amperometric and DO sensors use the following basic materials – Brass, epoxy tube, epoxy resin, Delrin™ manufacturer DuPont , CPVC, PPO, Lead free solder, polyolefin, PVC, Viton® DuPont Performance elastomer, EPDM, Silver, gold, zinc, nylon mesh, nylon, Fluopore, Buna-n, diamond sanding sheet, vinyl, silicone, PTFE, HDPE, sodium borate, Hydrochloric acid, sodium chloride.

List of Components:

pH, ORP, ISE use the following components – RTD and/or Thermistor, DIN/BNC/TNR connectors, spade lugs, Cables (RG174 to 4 conductor), top cap (nylon & Ryton), O-ring, bottle, cap.

Conductivity probes use the following components – DIN male connector, electronic PCB, Cable 2, 4 and 6 conductor with shield and drain, wire- white, green, red, black; O-ring.

Battery Powered accessories use the following components – Coax cable, electronic PCB, PCB Assy w/dual battery-3.0VDC, DIN connector, O-ring, electrical module housing, top cap housing.

Amperometric and DO sensors use the following components – Body, Bottom Cap, Cable 4 conductor, thermistor, RTD, O-rings, bottle, cap.

Principles of Operation and Intended purpose:

These components are used with analytical control and process instrumentation that provides the input drive signal (current, frequency and/or voltage) to measure the pH, oxidation reduction potential (ORP), dissolved oxygen (DO), chlorine and conductivity of water.

pH Measuring System consists of:

1. A pH electrode: an electrode whose output voltage changes as the pH (hydrogen ion concentration) changes.
2. A reference electrode: an electrode whose voltage output stays constant.
3. A pH meter: a millivolt meter with a special high impedance input circuit and circuits to change the electrode's millivolts into pH unit readouts.
4. Optionally, an automatic temperature compensator: a device that senses temperature so that the meter can correct for the effects of temperature changes.

ORP is an abbreviation for Oxidation Reduction Potential, also known as REDOX, and is a useful measurement for monitoring and controlling chemical reactions.

- Oxidation: addition of oxygen/reduction of electrons
- Reduction: reduction of oxygen/addition of electrons

Characteristics of ORP**:**

- Non-specific measurement of total activity
- mV output allows automated control of chemical reactions

ISE

Ion Selective Electrode types available: Fluoride (F-), Chloride (Cl-), Ammonium (NH4+), Potassium (K+) and Nitrate (NO3-). All are available as lab style 12mm units or can be used on-line for simple installations with use of our FC75P or FC50P mounting glands. These are combination electrodes so the reference is built internally. Constructed in durable plastic bodies and available hard wired or with quick disconnect designs.

Conductivity

That is a measurement of the ability of a solution to conduct an electric current. An instrument measures conductivity by placing two plates (electrodes) of conductive material with known area and distance apart in a sample. Then a voltage potential is applied and the resulting current is measured. Cell constants define the volume between the electrodes. Cell constant k is directly proportional to the distance separating the two conductive plates and inversely proportional to their surface area. K = L/a, where a(area) = A x B. The basic two-pin conductivity cell is all we have discussed to this point. There is four-pin technology that tries to better control the field surrounding the conductivity sensor to improve stability. These are known as contacting type conductivity cells.

Another type of technology is the non-contacting (Toroidal) cell, which uses a magnetic field to sense conductivity. A transmitting coil generates a magnetic alternating field that induces an electric voltage in a liquid. The ions present in the liquid enable a current flow that increases with increasing ion concentration. The ionic concentration is then proportional to the conductivity. The current in the liquid generates a magnetic alternating field in the receiving coil.

DO Probes

There are three fundamental techniques for measuring DO— galvanic, polarographic and optical. Both galvanic and polargraphic probes use an electrode system where the DO that transfers across a permeable membrane, reacts with the cathode to produce a current. The system is called galvanic if an external potential is not required and the electrode materials are selected so that the difference in potential is -0.5 volts or greater between the cathode and anode. If an external voltage is applied, the system is called polarographic. Galvanic DO sensors consist of two electrodes: an anode and cathode that are both immersed in electrolyte (inside the sensor body). An oxygen permeable membrane separates the anode and cathode from the water being measured. Oxygen diffuses across the membrane. It interacts with the probe internals to produce an electrical current (more detail is shown below the DO sensor graphic). Higher pressure allows more oxygen to diffuse across the membrane and more current to be produced. The actual output from the sensor is in millivolts. This is achieved by passing the current across a thermistor (a resistor that changes output with temperature). The thermistor corrects for membrane permeability errors due to temperature change.

In other words, increasing permeability at higher temperature allows more oxygen to diffuse into the sensor, even though the oxygen pressure has not changed. This would give falsely high DO if the thermistor were not used. Optical Dissolved oxygen measurement applies luminescence-based optical measurement technology. The principle is that dissolved oxygen quenches the luminescence associated with chemical dyes in the sensor. The probe measures dissolved oxygen by emitting a blue light that causes the sensing element to luminesce or glow red. When no oxygen is present, the luminescence signal is at its maximum. As oxygen is introduced, luminescence decreases.

Ultraviolet Transmittance-LED

UV Transmittance refers to the percentage of light at the wavelength of 254 nm that passes through a sample of water. UVT relates to the organics, colloidal solids, and suspended particles that absorb and scatter this wavelength of UV light. The amount of UV light absorbed by the sample is known as UV Absorbance (expressed as A_{254}). Commonly, UVT measurements are used to optimize energy efficiency of and ensure adequate dosing by the UV disinfection system. UV dose is dependent on UV light intensity, contact time (controlled by flow rate), and UVT. Most UV disinfection systems are programmed for a 4-20 mA input of UVT to modulate lamp intensity for the system meets dosing requirements.

Smart Sensor Series

Sensorex smart sensor series include pH, ORP, DO, chlorine and conductivity sensors. An embedded microprocessor and ADC (analog to digital converter) change the analog signal into digital signal and 4-20mA power loop current. Smart sensors use Modbus RTU communication for standard industrial digital interface.

Marketing Material

Please see www.sensorex.com for all product details and complete information on products offered. Select Support in the header and then Specifications. Specifications may be copied and translated using Google translator or other software.
Contact Sensorex Technical Support if you do not find what you need. 714-895-4344

Photographs

pH/ORP/ISE

S222CD

S265D

S271CD/S272CD

S150,S200,S300, S350,S450, S900

S175 SPEAR TIP

ISE 222 SERIES

ISE 200 SERIES

S651CD

S650CD with S653

SD7000CD
SD7420CD
SD7500CD

S8000CD with EA899 & EA855

ORP: Plastic or glass body, Platinum, gold or silver Tip or band.

CONDUCTIVITY

CS150/CS200

CS675/CS875

CS676

CS615/CS620 Sanitary

TCS3020

TCS2000

CS300

BATTERY POWERED or 24VDC

EM800

EM801

EM802, EM803

PHAMP-1

UVT-LED H

AMPEROMETRIC and DO

DO1200

DO6400 or DO7400

FCL or CLD

ODO8000, ODO9000

ANNEX I

Sensorex Corporation Product List

Amperometric and Dissolved Oxygen			
index	**Model number**	**Sensor name**	**Remark**
1	CLD 502	Chlorine	
2	CLD510	Chlorine	
3	CLDA 5015	Chlorine	
4	CLDA 5016	Chlorine	
5	CLDA 5017	Chlorine	
6	DO1200	Dissolved Oxygen	
7	DO6051	Dissolved Oxygen	
8	DO6400	Dissolved Oxygen	
9	DO6441	Dissolved Oxygen	
10	DO6442	Dissolved Oxygen	
11	DO7400	Dissolved Oxygen	
12	ODO8000, ODO9000	Optical DO	
13	FCL 502	Free Chlorine	
14	FCL 505	Free Chlorine	
15	FCL 510	Free Chlorine	
16	FCLA 5015	Free Chlorine	
17	FCLA 5016	Free Chlorine	
18	FCL 5017	Free Chlorine	
19	FCL502-MB	Free Chlorine	
20	FCL505-MB	Free Chlorine	
21	FCL510-MB	Free Chlorine	
22	FCL520-MB	Free Chlorine	
pH, ORP , ISE			
index	**Model number**	**Sensor name**	**Remark**
1	DA650CD	Differential pH	
2	DA651CD	Differential pH	
3	DA660CD	Differential pH	
4	DA662CD	Differential pH	
5	IS200CD	ISE sensor	
6	IS222CD	ISE sensor	
7	PH1000	pH Sensor	
8	PH2000	pH Sensor	

9	PH2100	pH Sensor	
10	PH2200	pH Sensor	
11	PH2400	pH Sensor	
12	S100C	pH Sensor	
13	S120C	pH Sensor	
14	S150C	pH Sensor	
15	S150CD	pH Sensor	
16	S150CD-ORP	ORP-Sensor	
17	S175C	pH Sensor	
18	S200CD	pH Sensor	
19	S222CD	pH Sensor	
20	S223C	pH Sensor	
21	S224CD	pH Sensor	
22	S257CD	pH Sensor	
23	S265CD	pH Sensor	
24	S267CD	pH Sensor	
25	S268CD	pH Sensor	
26	S271CD	pH Sensor	
27	S272CD	pH Sensor	
28	S300CD	pH Sensor	
29	S350CD	pH Sensor	
30	S353CD	pH Sensor	
31	S354CD	pH Sensor	
32	S420C	pH Sensor	
33	S450CD	pH Sensor	
34	S500CD-ORP	pH Sensor	
35	S550CD-ORP	pH Sensor	

36	S650CD	pH Sensor	
37	S651CD	pH Sensor	
38	S655CD	pH Sensor	
39	S656CD	pH Sensor	
40	S660CD	pH Sensor	
41	S661CD	pH Sensor	
42	S662CD	pH Sensor	
43	S1010CD	pH Sensor	
44	S1021CD	pH Sensor	
45	S1030CD	pH Sensor	
46	SD7000CD	pH Sensor	
47	SD7500CD	pH Sensor	
48	SD7420CD	pH Sensor	
49	S8000CD	pH Sensor	
50	S8075CD	pH Sensor	
51	S900CD	pH Sensor	
52	SG200C	pH Sensor	
53	SG350CD	pH Sensor	
54	SG200CD	pH Sensor	
55	SG201C	pH Sensor	
56	S656CD-ORP	ORP Sensor	
57	S272CDTC/MA	pH Sensor	
58	S27CDTC/MB	pH Sensor	
59	S272CD-ORP/MA	ORP Sensor	
60	S27CD-ORP/MB	ORP Sensor	
61	EM802-pH-MB	pH electronic module	

62	EM803-pH	pH electronic module	
63	SSRE-P	pH electronic module	
64	SSRE-R	ORP electronic module	
Battery Powered			
1	EM800	Unity gain amplifier	
2	EM801	Differential amplifier	
3	PHAMP-1	Unity gain amplifier	
4	SD7500CD	pH Sensor	
UVT-LED			
index	**Model number**	**Sensor name**	**Remark**
1	UVT-LED-H	Handheld	
2	UVT-LED-SW	Submersible	
Conductivity			
index	**Model number**	**Sensor name**	**Remark**
1	CS150	Contact conductivity	
2	CS200	Contact conductivity	
3	CS665	Contact conductivity	
4	CS620	Contact conductivity	
5	CS650	Contact conductivity	
6	CS675	Contact conductivity	
7	CS300	Contact conductivity	
8	TCS2000	toroidal conductivity	
9	TCS3000	toroidal conductivity	
10	TCS3020	toroidal conductivity	

11	EM802-EC-MA	Electronic module contacting conductivity	
12	EM802-EC-MB	Electronic module contacting conductivity	
13	iTS3020	Toroidal conductivity sensor	
14	SSRE-C	Remote electronic module contacting conductivity	
15	SSRE-T	Remote electronic module toroidal conductivity	
Cable Assembly			
index	**Model number**	**Sensor name**	**Remark**
1	S653	Cable Assembly	

ANNEX II
ESSENTIAL REQUIREMENTS

(in the following text the word product also means component, equipment, apparatus, assembly and machine)

1. **Protection requirements**
Products shall be so designed and manufactured, having regard to the state of the art, as to ensure that:
(a) The electromagnetic disturbance generated does not exceed the level above which radio and telecommunications equipment or other equipment cannot operate as intended;
(b) It has a level of immunity to the electromagnetic disturbance to be expected in its intended use which allows it to operate without unacceptable degradation of its intended use.

2. **Specific requirements for fixed installations**
Installation and intended use of components:
A fixed installation shall be installed applying good engineering practices and respecting the information on the intended use of its components, with a view to meeting the protection requirements set out above in paragraph 1. Those good engineering practices shall be documented and the documentation shall be held by the person(s) responsible at the disposal of the relevant national authorities for inspection purposes for as long as the fixed installation is in operation.

ANNEX III EMC Directive

Illustrative list of the principal protection requirements

The maximum electromagnetic disturbance generated by the product shall be such as not to hinder the use of in particular the following apparatus:

(a) domestic radio and TV receivers

(b) industrial manufacturing equipment

(c) mobile radio equipment

(d) mobile radio and commercial radiotelephone equipment

(e) medical and scientific apparatus

(f) information technology equipment

(g) domestic appliances and household electronic equipment

(h) aeronautical and marine radio apparatus

(i) educational electronic equipment

(j) telecommunications networks and apparatus

(k) radio and television broadcast transmitters

(l) lights and fluorescent lamps.

Products, and especially the apparatus referred to in (a) to (l) above, should be constructed in such a way that they have an adequate level of electromagnetic immunity in the usual electromagnetic compatibility environment where the product is intended to work so as to allow its unhindered operation.

The information required to enable use in accordance with the intended purpose of the product must be contained in the instructions accompanying the product.

Conformity

The product or products, which are the subject of this Technical File, conform to the above Essential Requirements of the EMC Directive.