# DATA SHEET

## Halogen Seawater Cooling System Sensor

### for Biofouling Control on Cooling Systems using Titanium and Duplex Stainless-Steel components

#### **Overview**

The Halogen MP-TI sensor sets a is now new standard that measures five parameters and amperometric chlorine without membranes or reagents. Halogen Systems, Inc., a leading manufacturer of chlorine sensors for diverse applications, recently shipped its first batch of chlorine analyzers to be installed in offshore wind farms. The sensors, designed to measure the residual chlorine levels in seawater cooling systems, will help to prevent the growth of marine organisms that can prevent cooling systems from operating efficiently. Designed for unattended operation of six months or more, they are the lowest maintenance options for direct-free chlorine measurement (not an indirect measurement like ORP).

Biofouling is a major challenge for the offshore wind industry as it can reduce heat transfer and power output. It also increases maintenance and operational costs. Seawater chlorination is a widely used method to prevent biofouling. However, it requires careful monitoring and control to ensure the optimal dosage of chlorine to minimize the environmental impact.

Several versions are available:

- Direct Pipe Insertion for systems that can be shut down for service
- Hot Tap versions for systems that cannot be shut down for service
- Side stream systems that make integration easy





Shown with hot tap valve and remover

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#### **Features and Benefits**

- The latest display technology offered by Halogen Systems
- Measures 4 or 5 parameters:
  - Free Chlorine (ppm)
  - pH (Optional)
  - Conductivity
  - Temperature
  - Oxidation-reduction potential (ORP)

#### Self-cleaning flow independent system

The MP5-A sensor's long-life pump creates continuous flow across the sensor electrodes. This enables the sensor to provide accurate readings while operating in a pipe with varying (or no) flow. Captive cleaning beads continuously polish the electrode surfaces and the pH glass, enabling the sensor to be used in challenging conditions, typically without maintenance.

- Flow independent: can be installed directly in a pipe
- Self-cleaning
- Typical 6+ months of unattended operation
- No reagents or membrane
- Flange Mount DN50 Flange
- Alloys are SS2507 and titanium
- Optional integrated Flange valve for removal without process shutdown



 SensiCLĒNE™ cleaning beads
 DryGLAS''' technology

- **3.** Electrode surfaces
- 4. Impeller
- 5. Sensor cover

**Easy-to-service exchange program:** No expensive service contracts are needed for the MP5-A. (The Halogen D20 display/controller enables easy updates of sensor and display firmware.)

**Replaceable cable lengths:** Three NSF61-certified cable lengths are available for direct immersion in a water tank or reservoir.

#### **Technical Specifications**\*

Overall*	
Measurement method	Reagentless, three electrodes, no membrane or electrolyte
Chlorine measurement range	0 to 20 ppm
- Limit of detection (LOD)	30 ppb (0.03 ppm)
<ul> <li>Limit of quantitation (LOQ)</li> </ul>	90 ppb (0.09 ppm)
Resolution	0.001 ppm (1 ppb)
Chlorine accuracy	±4% of the calibrated value <sup>1</sup> (DPD) at any pH between 6.5 and 8.5
	±4% of the calibrated value <sup>2</sup> (DPD) at any temperature between 15° and 35°C ±10% underflow changes from 0 to 4 meters/second velocity
Turbidity in sample without impact	No effect up to 3000 ppm (Arizona test dust fine, 50-micron size)
Response time (secs) <sup>2</sup>	112 seconds
Calibration stability	6 months (typ)
Measurement interval	60 seconds
pH range (chlorine)	6.5 to 9.5
Conductivity	200 to 10,000 μS
Pressure limit	10 bar (145 psi)
Temperature	5 to 55°C

Overall*	
Sample compensation	Automatic
Factory calibration performed	Yes
Power consumption	24VDC ±10% at 50mA 200 mA startup maximum
Data transfer	Automatic

 $^1$  Calibration at 1.2 ppm @ pH 8.0 and 20°C and 2500  $\!\mu\text{S}$ 

Ambient data*	
Storage temperature	-20 to 60°C (-4 to 140°F)
Operating temperature	0 to 50°C (41 to 122°F)
Maximum flow velocity	0 to 4 meters/sec velocity
Maximum sensor immersion depth/pressure	30' or greater, 140 psi
Cleaning method	Continuous, mechanical cleaning, electrochemical cleaning, every cycle
Cable length	5' standard (up to 100')
Cable connection	M12 4-pin
Certifications	CE-compliant for conducted and radiated emissions:
	CISPOR 11 (Class A limits)
	EMC immunity EN 61326-1 (industrial limits)
Sensor dimensions	1.75" x 14" (45 mm x 305 mm)
Weight	400 grams
Warranty	12 months

### **Models and options**



Sensor Removal Tool



Sensor Removal for Service