

MULTIPARAMETER CHLORINE SENSOR

A breakthrough for drinking water and wastewater testing, Halogen's **HaloMP5™** Multiple Parameter Sensor tests 5 parameters using 3 electrode amperometric chlorine measurement. The HaloMP5™ is unaffected by flow or pressure, is self cleaning, automatically compensates for pH, and is NSF61 certified. It is also highly accurate, requires little to no maintenance, can be installed in a flow cell, directly in a pipe, or in-situ into a tank, channel, or basin. Simple to install and inexpensive to operate, the Halogen HaloMP5™ is unlike any other sensor on the market today.

UNIQUE FEATURES

The **HaloMP5™** is unique in the market.

- Self-cleaning & low maintenance
- No reagents
- Flow independent - insensitive to changing process conditions
- No membranes or electrolyte
- No waste stream required
- Low drift- calibration stable for many months
- Factory calibrated, minimal drift

INSTALLATION ADVANTAGES:

Compared to typical solutions, the HaloMP5 has many advantages when deployed:

- Easy to install
- Installed directly into a wet tap valve, side stream, or submersible
- Remote mounting of more than 100 feet or more from monitor or SCADA input
- Connect to up 5 sensors to a single display
- System is equipped with 4 20mA or MODBUS RTU. Other communication protocols are available upon request.
- 24VDC or 90 to 240 VAC operation

LOW TOTAL COST OF OWNERSHIP

The **HaloMP5™** saves additional money over time due to:

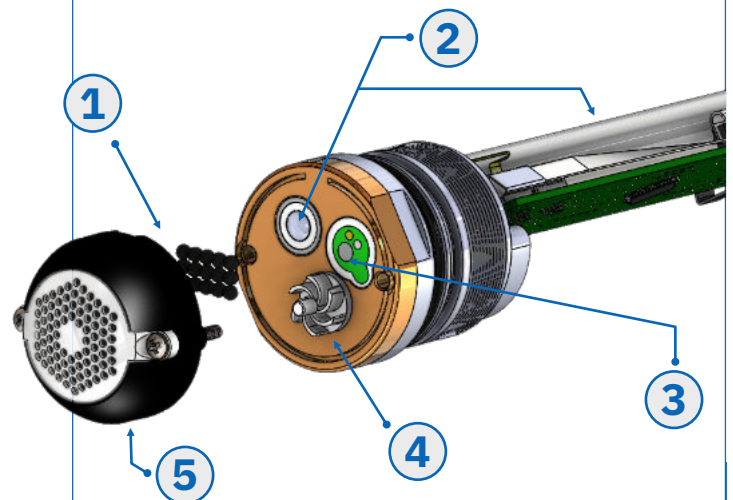
- Low Maintenance Cost
- No membranes, reagents, or electrolyte
- Long calibration intervals
- Easy calibration if needed

MEASUREMENTS

The **HaloMP5™** measures vital information in a reliable and low cost manner.

- Free or Total Chlorine
- Conductivity
- pH
- ORP
- Temperature

FIGURE 1: HaloMP5™ MAIN FEATURES



1. The **SensiCLÈNE™** self-cleaning system reduces maintenance through an always-on cleaning method.
2. **DryGLAS™** technology ensures robust operation even if the line goes totally dry.
3. The **HaloMP5™** constantly samples 5 parameters using a 3 electrode amperometric technology, and is unaffected by flow, pressure, or temperature.
4. HSI's patented impeller system removes flowrate as an issue.
5. HSI's patented sensor system allows for wet-tap, side-stream, immersion and direct pipe insertion, eliminating the need for waste stream membranes, reagents, & electrolyte, while greatly reducing calibration & maintenance.

Our Technology

FEATURES

Flow Independent Measurement

The sensor is unaffected by flow velocity changes from 0 to 4 m/s. An integrated pump that utilizes a long lasting, brushless motor delivers a fixed velocity across the electrodes, creating flow independence in any installation. The high velocity flow across the electrodes improves sensitivity and lowers the Signal to Noise Ratio.

Self-Cleaning Amperometric Chlorine Sensor

An electrochemical cleaning method resists polarization and adsorption of organics. Cleaning beads continuously clean the sensor. This keeps the electrode surfaces, including the pH sensor, free from buildup, scaling, and biofouling. Solid metal electrodes last the life of the system.

These features combine to enable very long intervals between calibration.

No Waste Stream

Because the sensor can be installed as a side-stream unit, directly in a pipe, or submerged in a tank, there is no waste.

Easy to Monitor

An optional local Display is available for viewing parameters, troubleshooting and calibration of up to 5 separate HaloMP5™ units.

EASE OF SERVICE

A Wet Tap installation method enables direct insertion into a distribution pipe. The highly integrated design reduces the electronics cost and size, while increasing reliability.

FIGURE 2: MONITORING AT VARIABLE FLOWRATES

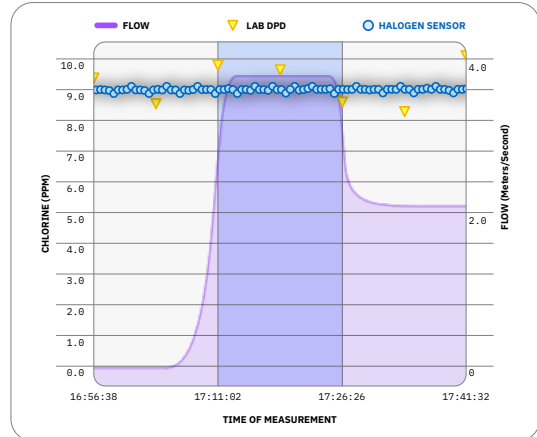


TABLE 1: FEATURE COMPARISONS

FEATURES	HaloMP5 Direct Insertion	Old Tech Amperometric
Flowrate Independant	Yes	No
Direct Insertion	Yes	No
No Membranes	Yes	No
No Waste Stream	Yes	No
Self-Cleaning	Yes	No
High Pressure pH Sensor	Yes	No
Calibration/Maintenance (Mo)	6 to 12	1

TABLE 2: ANNUAL COST SAVINGS

COSTS	HaloMP5	DPD
Reagent Cost †	\$ 0	\$ 735
Water Cost †† †††	\$ 0	\$ 191
Wear Parts††††	\$ 120	No
Annual	\$ 120	\$ 926
Halogen Annual Savings	(\$ 806)	

† Reagent cost: \$61.29 per package †† \$900 acre/foot water cost (MWD 2018) ††† 500 mL DPD water Flow Rate (69,204 gallons per year) †††† Wear parts include: bearing, cover, cleaning beads, pH sensor every two years

Valuable Information From Additional Parameters

The **HaloMP5™** measures Free or Total Chlorine plus 4 additional parameters in a single compact package providing useful information far beyond the free chlorine level. The HaloMP5™ comes with a factory calibration certificate, with no need for recalibration for changing water conditions. Minor calibrations can be easily done in the field.

Competitor discrete sensor systems with a similar number of parameters often cost five to six times as much and have much higher maintenance costs.

PARAMETERS

Amperometric Free or Total Chlorine:

Chlorine is measured every 45 seconds. The readings are pH, temperature and conductivity compensated.

Integrated pH sensor:

This pH cartridge is an integral part of the sensor and is continually cleaned. HSI's unique pH sensor can tolerate pressures up to 175 PSI. The pH sensor is shipped dry, can remain dry for months, and does not require frequent calibrations. It also has a two-year life versus the industry average of six months.

Integrated Conductivity Sensor:

Changes in conductivity are important to water utilities and can indicate contamination, a pollution event, or other problems.

Oxidation Reduction Potential (ORP):

Measuring ORP provides another indicator of possible contamination or piping failure. Our unique method keeps the electrodes clean ensuring accuracy.

TRANSMITTING THE DATA

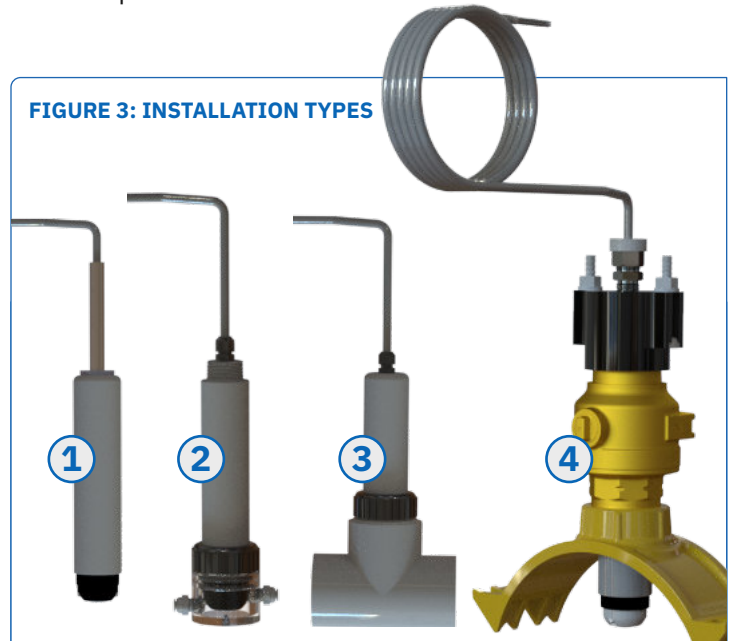
Parameter measurements are transmitted via the MODBUS communication protocol. An optional local display is available for realtime parameter viewing, troubleshooting and calibration.

POWER OPTIONS

Several power options are available.

- 120V AC or 24 VDC power
- Remote power, battery, and solar panel

FIGURE 3: INSTALLATION TYPES



1: Wet Tap Sensor **2:** Side Stream or Immersion Sensor (uses adapter cap) **3:** Pipe Installed sensor with deep-set flange for PVC Tee-collar install **4:** Wet tap removal system with remove components installed

APPLICATION TYPES

Direct Pipe Insertion: Unaffected by variable flow-rates, it can accurately monitor 5 parameters in real-time at flows from 0-4m/s and up to 175 PSI.

Side Stream: The side stream option can be installed for either temporary or permanent monitoring of water treatment applications. The sensor requires only a small flow of 0 to 0.5 GPH for operation.

In Tank Installation: Since the sensor does not require any flow, it can be installed in a tank.

Submersible Installation: The sensor is installed on the end of a pipe and submerged into a tank or basin, unaffected by flow or pressure.

MODELS & OPTIONS

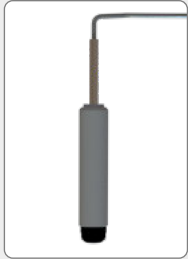






	Wet Tap	Immersion/Sidestream	Pipe Tee
Sensor Models	 Wet Tap sensor for in-pipe installations Use with Wet Tap Valve (not supplied) and remover kit (below) WT-01	 Sidestream or Immersion installations (Flow Cell Shown) FC-02	 Specifically designed for PVC tee installs PT-01
Kits and Extras	 Flow-cell Kit: Converts FC-01 to FC-02 FC-0	 Removal tool: for Wet Tap sensors. RMR-01	
Display Transmitter	 2) 4-20 mA Outputs; 24 VDC Input Modbus RTU Output D01		 4) 4-20 mA Outputs; 24 VDC Input Modbus RTU Output D01-4

TABLE 3: HaloMP5™ SENSOR RANGE AND ACCURACY

Measurement Specifications	Range
Chlorine Total	0.03 to 20 PPM ±15% or 0.06 ppm, whichever is greater
Chlorine Free (-F suffix)	0.03 to 8 PPM ±15% or 0.06 ppm, whichever is greater
Oxidation Reduction Potential (ORP)	-1100 to 1100 mV
Conductivity	300 to 50,000 µS
pH	5 to 12
Temperature	0 to 100° C
Cycle time (depends on selected measurements)	45-55 seconds
Communication	Modbus RTU