



# Chlorine Gas Detection Device

## Preliminary Technical Data



Experts on Design-In

**AP Angst+Pfister**  
Sensors and Power



## Product Overview

The Chlorine Gas Detection Device, in combination with the principle of coulometry, delivers a high-precision gas detection technology. The higher the chlorine concentration the faster the sensor will be drained. Therefore the sensor lifetime will deteriorate rapidly and more maintenance will be needed. The chlorine concentration in the semiconductor production industry comes with high risks. Continuous monitoring of the double gas pipeline for leakage is very important.

ECtox's big advantage, while continuously working on 200°C of high temperature and in low concentration conditions, is its long lifetime. A pump easily transports the gas to the sensor, without the need for calibration. The sensor can be used in the chemical industry for chlorine disinfection. The output signal, RS485(Modbus), will effortlessly connect with the gas detector, DCS, PLC or wireless systems.

## Features

- Coulometric measuring system
- Works on back Ammonia concentration continually
- Combined with intelligent algorithms it has better adaptability to the environment
- Higher accuracy in detection and stable zero point
- With pump, no calibration with span gas needed
- New microcircuit design, strong anti-electromagnetic interference ability
- No temperature and humidity influence
- RS485 output, 5-12V DC power
- Stainless steel housing, water and dust proof, anti-corrosion
- The detection range is automatically adjusted to the concentration range of the measured gas, from ppb to higher ppm level
- Continuously monitors its own fault conditions, Sensor, Pump, Power etc.
- RoHS eco-friendly design
- Self-monitoring of the sensor function

## Application

- Industrial leakage detection
- High concentration monitoring
- Semiconductor industry high temperature condition
- Chlorine gas production monitorin
- Chlorine Disinfection
- Chlorine Generator

2



Experts on Design-In

## Principle

Coulometric electrochemical sensing technology is a revolutionary innovation in the field of electrochemical detection. Based on the principle of electrochemical reaction, this technology is able to detect all electrochemical active gases and accurately measure the gas concentration through the signal amount. The sensor is composed of three catalytic electrodes, liquid electrolyte and gas diffusion holes. The gas reaches the working electrode of the sensor by a pump with a certain volume, which is always constant. An electrochemical redox reaction occurs on the porous micro-surface of the electrode, the liquid electrolyte conducts ion transfer and generates a current peak signal as an output. The integrated current peak signal is proportional to the gas concentration.

The sampling system is good for different densities, the speed of diffusion and convection is usually vslow or depends on the environment, and temperature and different concentration influenced the speed of molecular motion. Sampling System let gas easy going to sensor.

## Cross Sensitivity

Gas	Formula	Concentration (ppm)	Response(ppm)
Hydrogen fluoride	HF	3	0
Carbon monoxide	CO	100	0
Chlorine dioxide	ClO <sub>2</sub>	1	0.5
Hydrogen	H <sub>2</sub>	1000	0
Hydrogen sulfide	H <sub>2</sub> S	10	0
Diborane	B <sub>2</sub> H <sub>6</sub>	0.6	-0.3
Hydrogen chloride	HCl	20	0
Ammonia	NH <sub>3</sub>	100	0
Fluorine	F <sub>2</sub>	1	0.4
Ozone	O <sub>3</sub>	0.25	0.05
Sulfur dioxide	SO <sub>2</sub>	5	-1

**Note:**

- 1 ) The above interference factors may differ from sensor to sensor and service life, please refer to the actual test results.
- 2 ) This table is not complete for all gases, and the sensor may be sensitive to other gases.

## Order Informations

Product Name	Part Number	Range	Resolution
Chloride Gas Detection Device	04-ECtox-Cl <sub>2</sub> -5-EU-01	0-5ppm	0.001ppm
Chloride Gas Detection Device	04-ECtox-Cl <sub>2</sub> -20-EU-01	0-20ppm	0.01ppm
Chloride Gas Detection Device	04-ECtox-HT-Cl <sub>2</sub> -5-EU-01	0-5ppm	0.001ppm
Chloride Gas Detection Device	04-ECtox-HT-Cl <sub>2</sub> -20-EU-01	0-20ppm	0.01ppm
Cable	02-LEMO-HXT-1423-01		
Fixed Assembly	02-ECtox-Fix-C45-01		

**Note:** 04-ECtox-HT in above order information are for higher temperature application.

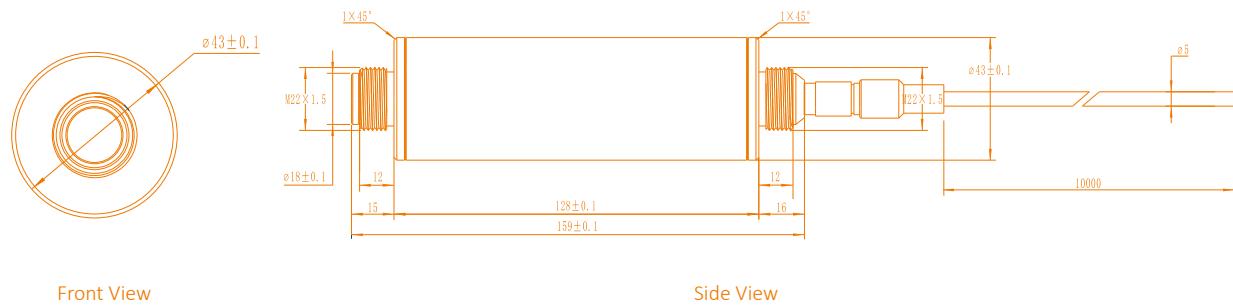
## Specification

Principle	Coulometric Solid Polymer Electrochemical Detection Technology		
Detection of gas	Chlorine		
Detection Range	0-5ppm; Resolution: 0.001ppm	0-20ppm; Resolution: 0.01ppm	Lowest Detection Limit: 0.1ppm Lowest Detection Limit: 0.1ppm
Full-scale accuracy error	$\pm 5\%$ F.S		
Repeatability	$\leq 2\%$		
Settling time	Store under measurement condition power for the first 60 min become to stable		
Response time	Dependent on the selected measuring period, between 1 to 10min		
Sensor expected life time	$\geq 2$ years		
Output	RS485(Modbus protocol), Baud rate: 9600 4Pin Lemo Cable with 10m(Other length by request)		
Get data command	See ECtox protocol document for details		
Working Voltage	5- 12V DC		
Maximum Current Consumption	1A		
Maximum Power Consumption	5W		
Working temperature	-20- 55°C		
Optimal working temperature	25°C		
Working humidity	5-95% RH. Non-condensing		
Optimum working humidity	50% RH.		
Working pressure	Atm $\pm 10\%$ Keep Stable Pressure		
Temperature and humidity range	-20- 200°C , 5-95% RH. Non-condensing		
Size	159x 43 (mm)		
Weight	ECtox : 450g, Lemo with 10m cable: 400g		
Temperature and humidity sensor data	Temperature Range:-40- 85°C Humidity measurement range: 10- 95% RH. non-condensing	Relative error: $\pm 0.2$ °C Relative error: $\pm 2\%$	
Warranty	12 months from the date of shipment		

## Structure Diagram (unit: mm)

Chlorine Gas Detection Device Standard Version

04-ECtox-Cl<sub>2</sub>-5-EU-01, 04-ECtox-Cl<sub>2</sub>-20-EU-01

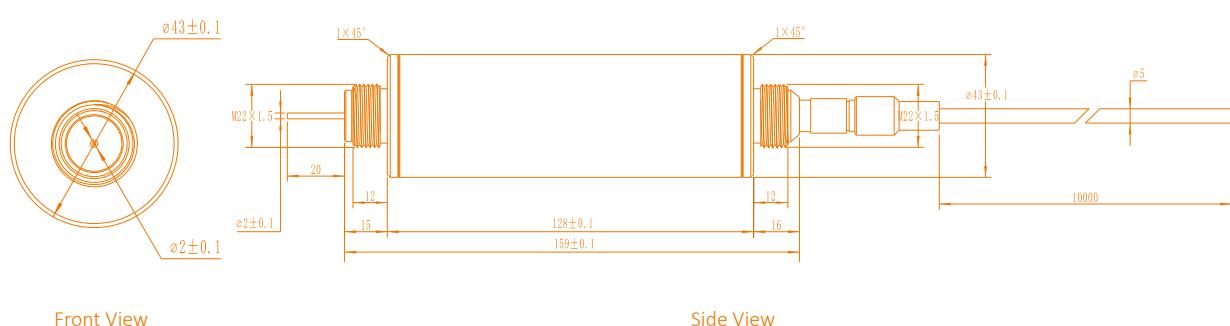


Front View

Side View

Chlorine Gas Detection Device High Temperature Version

04-ECtox-HT-Cl<sub>2</sub>-5-EU-01, 04-ECtox-HT-Cl<sub>2</sub>-20-EU-01



Front View

Side View

## Disclaimer

EC Sense Performance data stated is based on test conditions with new sensors at 25°C, 55%rH and 1 atm, using EC-Sense calibration Systems and AQS Testing System. Cross sensitivity gases are not target gases. Relations and performance can change, also with ageing of the sensor. In the interest of continued product improvement, EC-Sense reserves the right to change design features and specifications without prior notification. We do not accept any legal responsibility for customer applications of our sensors. EC-Sense accepts no liability for any consequential losses, injury or damage resulting from the use of this document, the information contained within or from any omissions or errors here in. This document does not constitute an offer for sale and the data contained is for guidance only and may not be taken as warranty. Any use of the given data must be assessed and determined by the user there of to be in accordance with federal, state and local laws and regulations. All specifications outlined are subject to change without notice.

## Warning

The EC-Sense sensor is designed to be used under various environmental conditions. During storage, assembly and operation, due to the principle and characteristics of the liquid electrochemical sensor, in order to ensure normal use, users should strictly follow this article when using this module. General-purpose PCB circuit board application methods and illegal applications will not be covered by the warranty. Although our products have high reliability, we recommend checking the module's response to the target gas before use to ensure on-site use. At the end of the product's service life, please do not discard any electronics in household waste. Please dispose it in accordance with local government regulations on electronic waste recycling.



## We are here for you. Addresses and Contacts.

---

Headquarter Switzerland:

Angst+Pfister Sensors and Power AG  
Thurgauerstrasse 66  
CH-8050 Zurich  
Phone +41 44 877 35 00  
[sensorsandpower@angst-pfister.com](mailto:sensorsandpower@angst-pfister.com)

Office Germany:

Angst+Pfister Sensors and Power Deutschland GmbH  
Edisonstraße 16  
D-85716 Unterschleißheim  
Phone +49 89 374 288 87 00  
[sensorsandpower.de@angst-pfister.com](mailto:sensorsandpower.de@angst-pfister.com)

---

Scan here and get an overview of personal contacts!



[sensorsandpower.angst-pfister.com](http://sensorsandpower.angst-pfister.com)

---