

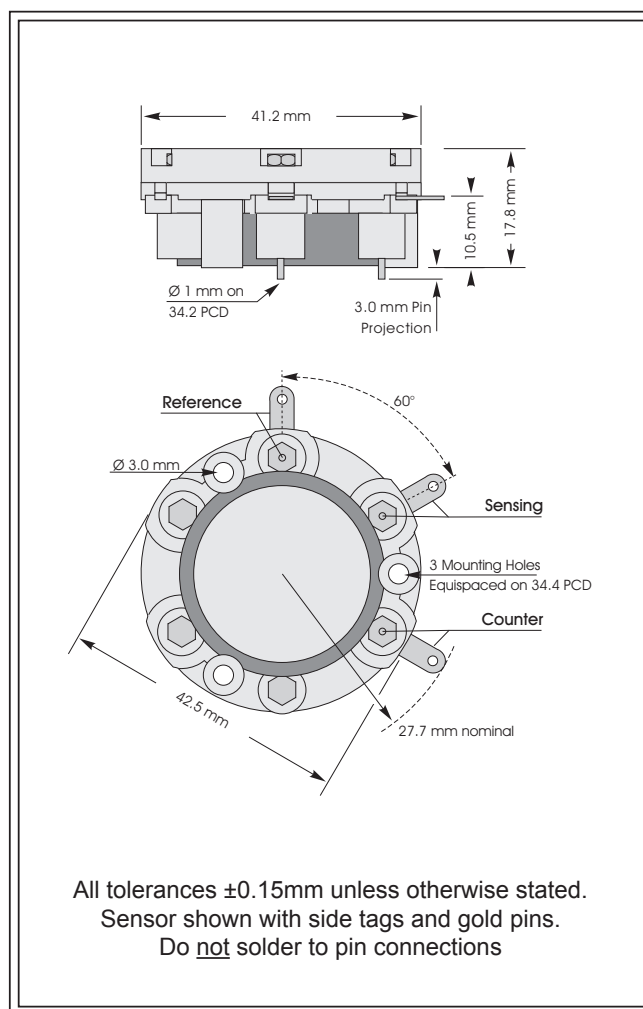


## 3HL CiTiceL<sup>®</sup>

### Performance Characteristics

<b>Nominal Range</b>	0-50ppm
<b>Maximum Overload</b>	100ppm
<b>Expected Operating Life</b>	Two years in air
<b>Output Signal</b>	$0.75 \pm 0.25 \mu\text{A/ppm}$
<b>Resolution</b>	0.5ppm
<b>Temperature Range</b>	-20°C to +50°C
<b>Pressure Range</b>	Atmospheric $\pm 10\%$
<b>Pressure Coefficient</b>	No data
<b>T<sub>90</sub> Response Time</b>	$\leq 120$ seconds (typically 100)
<b>Relative Humidity Range</b>	15 to 90% non-condensing
<b>Typical Baseline Range (pure air)</b>	0 to +1ppm equivalent
<b>Maximum Zero Shift (+20°C to +40°C)</b>	1.5ppm equivalent
<b>Long Term Output Drift</b>	<2% signal loss/month
<b>Recommended Load Resistor</b>	33 $\Omega$
<b>Bias Voltage</b>	+300mV
<b>Repeatability</b>	2% of signal
<b>Output Linearity</b>	Linear

N.B. All performance data is based on conditions at 20°C, 50%RH, and 1013mBar



### Physical Characteristics

<b>Weight</b>	22g
<b>Position Sensitivity</b>	None
<b>Storage Life</b>	Six months in CTL container
<b>Recommended Storage Temperature</b>	0-20°C
<b>Warranty Period</b>	12 months from date of despatch

### Ordering Information

The 3HL Hydrogen Chloride CiTiceL is available with side tags, gold-plated PCB pins, or both PCB pins and side tags. To ensure the appropriate option is supplied care must be taken to provide the correct code when ordering.

With side tag and PCB pin connections - **3HL**  
With side tag connection - **3HL(S)**  
With gold-plated PCB pin connection - **3HL(G)**



## Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. 3HL CiTiceLs have been tested with a number of commonly cross-interfering gases and the results are given below. The table shows the typical response to be expected from a sensor when exposed to a given test gas concentration (relevant to safety, e.g. TLV levels).

<u>Gas</u>	<u>Conc.</u>	<u>3HL</u>	<u>Gas</u>	<u>Conc.</u>	<u>3HL</u>
<b>Carbon monoxide:</b>	300ppm	<3ppm	<b>Chlorine:</b>	1ppm	0ppm
<b>Hydrogen sulphide:</b>	15ppm	9ppm<math>\leq</math>30ppm	<b>Hydrogen:</b>	100ppm	<0.5ppm
<b>Sulphur dioxide:</b>	5ppm	2.5ppm<math>\leq</math>4ppm	<b>Hydrogen cyanide:</b>	10ppm	0ppm
<b>Nitric oxide:</b>	35ppm	0ppm	<b>Ethylene:</b>	100ppm	0ppm
<b>Nitrogen dioxide:</b>	5ppm	<1ppm			

\*\*For details of other possible cross-interfering gases contact City Technology.\*\*

### **SAFETY NOTE**

This sensor is designed to be used in safety critical applications. To ensure that the sensor and/or instrument in which it is used, are operating properly, it is a requirement that the function of the device is confirmed by exposure to target gas (bump check) before each use of the sensor and/or instrument. Failure to carry out such tests may jeopardize the safety of people and property.

Every effort has been made to ensure the accuracy of this document at the time of printing. In accordance with the company's policy of continued product improvement City Technology Limited reserves the right to make product changes without notice. No liability is accepted for any consequential losses, injury or damage resulting from the use of this document or from any omissions or errors herein. The data is given for guidance only. It does not constitute a specification or an offer for sale. The products are always subject to a programme of improvement and testing which may result in some changes in the characteristics quoted. As the products may be used by the client in circumstances beyond the knowledge and control of City Technology Limited, we cannot give any warranty as to the relevance of these particulars to an application. It is the clients' responsibility to carry out the necessary tests to determine the usefulness of the products and to ensure their safety of operation in a particular application.

Performance characteristics on this data sheet outline the performance of newly supplied sensors. Output signal can drift below the lower limit over time.

## Key Features & Benefits:

- Robust 3-Series packaging
- Factory calibrated mV output

## Technical Specifications

### MEASUREMENT

<b>Sensor Type Used</b>	3HL
<b>Maximum Range</b>	100 ppm HCl
<b>Sensitivity</b>	
Standard	1 mV/ppm $\pm$ 5%
High	10 mV/ppm $\pm$ 5%
<b>Filter</b>	None
<b>Baseline Offset (Clean Air)</b>	$\pm$ 1 mV
<b>Response Time (<math>T_{90}</math>)</b>	<120 Seconds at 20°C
<b>Resolution</b>	0.5 ppm
<b>Zero Shift (-20°C to +40°C)</b>	<1.5 ppm equivalent
<b>Repeatability</b>	2% of signal
<b>Linearity</b>	Linear

### ELECTRICAL

<b>Power Supply Required</b>	7 to 18 VDC single-ended or $\pm$ 3.5 to $\pm$ 9 VDC dual
<b>Power Consumption</b>	250 $\mu$ A @ 9 VDC
<b>Calibration</b>	Via built-in span and zero potentiometers (Refer to OP14)

### MECHANICAL

<b>Weight</b>	38 g (with connector)
<b>Body Material</b>	Polycarbonate
<b>Position Sensitivity</b>	None

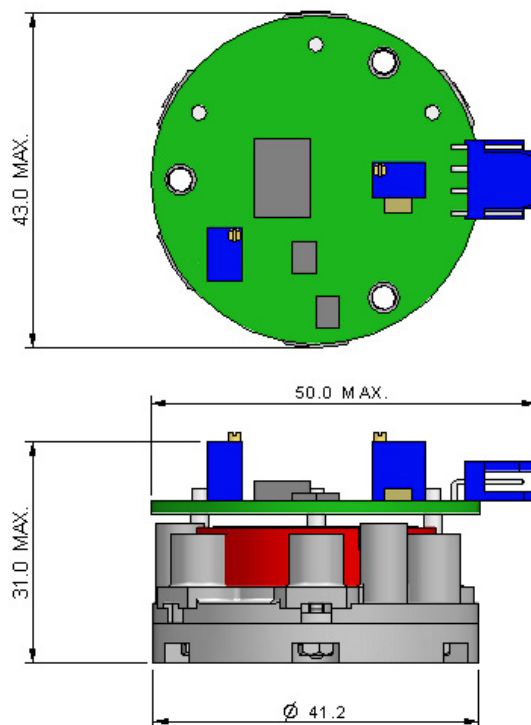
### ENVIRONMENTAL

<b>Operating Temperature Range</b>	-20°C to +50°C
<b>Recommended Storage Temp</b>	0°C to 20°C
<b>Temperature Compensation</b>	None
<b>Operating Pressure Range</b>	Atmospheric $\pm$ 10%
<b>Operating Humidity Range</b>	15 to 90% RH non-condensing

### LIFETIME

<b>Long Term Sensitivity Drift</b>	<2% signal loss/month
<b>Expected Operating Life</b>	Two years in air
<b>Storage Life</b>	6 months in CTL container
<b>Standard Warranty</b>	12 months from date of despatch

## Product Dimensions



All dimensions in mm

All tolerances  $\pm$ 0.15 mm unless otherwise stated

## IMPORTANT NOTE:

All performance data is based on conditions at 20°C, 50% RH and 1013 mBar. For further information on the operation and calibration of City Technology mV output sensors, please refer to OP14.

## RANGES AVAILABLE

3MHL is available with the following precalibrated sensitivities.

Sensitivity	Order Code
1 mV/ppm	MLT60-014
10 mV/ppm	MLT60-024

## **Poisoning**

CiTiceLs are designed for operation in a wide range of environments and harsh conditions. However, it is important that exposure to high concentrations of solvent vapours is avoided, both during storage, fitting into instruments and operation.

When using sensors with printed circuit boards (PCBs), degreasing agents should be used before the sensor is fitted. Do not glue directly on or near the CiTiceL as the solvent may cause crazing of the plastic.

## **Cross Sensitivity Table**

Whilst CiTiceLs are designed to be highly specific to the gas they are intended to measure, they will still respond to some degree to various other gases. The table below is not exclusive and other gases not included in the table may still cause a sensor to react. The figures are expressed as a percentage of the primary sensitivity (i.e. HCl = 100%).

Gas	Concentration Used (ppm)	3MHL (%)
Carbon Monoxide, CO	300	<1
Hydrogen Sulfide, H <sub>2</sub> S	15	~ 66
Sulfur Dioxide, SO <sub>2</sub>	5	~ 40
Nitric Oxide, NO	35	0
Nitrogen Dioxide, NO <sub>2</sub>	5	0
Chlorine, Cl <sub>2</sub>	1	0
Hydrogen, H <sub>2</sub>	100	<0.5
Hydrogen Cyanide, HCN	10	~ 1
Ethylene, C <sub>2</sub> H <sub>4</sub>	100	0

### **SAFETY NOTE**

This sensor is designed to be used in safety critical applications. To ensure that the sensor and/or instrument in which it is used, are operating properly, it is a requirement that the function of the device is confirmed by exposure to target gas (bump check) before each use of the sensor and/or instrument. Failure to carry out such tests may jeopardize the safety of people and property.

Every effort has been made to ensure the accuracy of this document at the time of printing. In accordance with the company's policy of continued product improvement City Technology Limited reserves the right to make product changes without notice. No liability is accepted for any consequential losses, injury or damage resulting from the use of this document or from any omissions or errors herein. The data is given for guidance only. It does not constitute a specification or an offer for sale. The products are always subject to a programme of improvement and testing which may result in some changes in the characteristics quoted. As the products may be used by the client in circumstances beyond the knowledge and control of City Technology Limited, we cannot give any warranty as to the relevance of these particulars to an application. It is the clients' responsibility to carry out the necessary tests to determine the usefulness of the products and to ensure their safety of operation in a particular application.

Performance characteristics on this data sheet outline the performance of newly supplied sensors. Output signal can drift below the lower limit over time

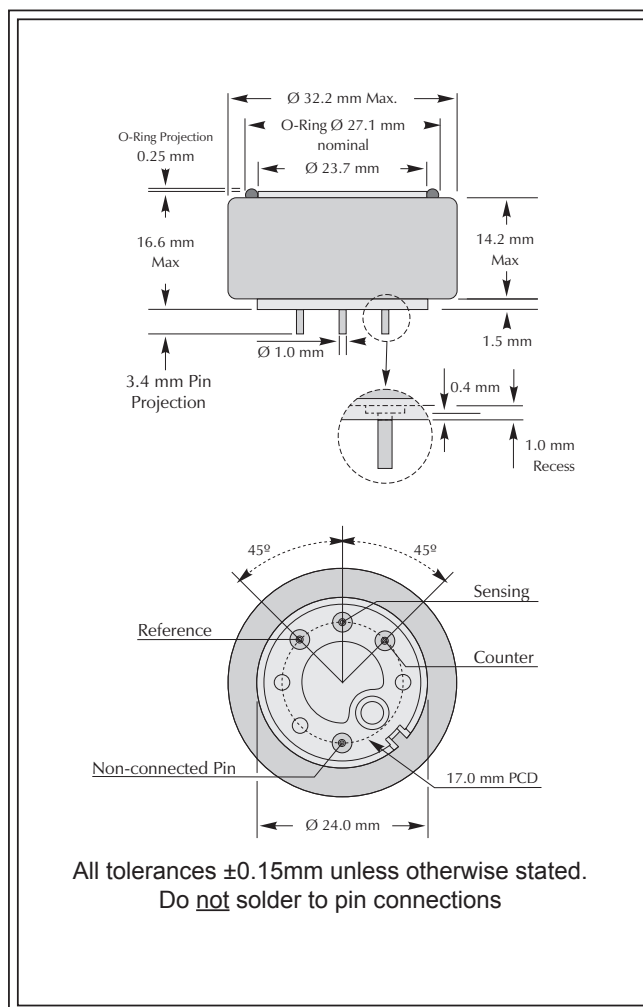


## 7HL CiTiceL®

### Performance Characteristics

<b>Nominal Range</b>	0-50ppm
<b>Maximum Overload</b>	100ppm
<b>Expected Operating Life</b>	Two years in air
<b>Output Signal</b>	$0.75 \pm 0.25 \mu\text{A/ppm}$
<b>Resolution</b>	0.5ppm
<b>Temperature Range</b>	-20°C to +50°C
<b>Pressure Range</b>	Atmospheric $\pm 10\%$
<b>Pressure Coefficient</b>	No data
<b>T<sub>90</sub> Response Time</b>	$\leq 120$ seconds (typically 100)
<b>Relative Humidity Range</b>	15 to 90% non-condensing
<b>Typical Baseline Range (pure air)</b>	0 to +2ppm
<b>Maximum Zero Shift (+20°C to +40°C)</b>	4ppm equivalent
<b>Long Term Output Drift</b>	<2% signal loss/month
<b>Recommended Load Resistor</b>	33 $\Omega$
<b>Bias Voltage</b>	+300mV
<b>Repeatability</b>	2% of signal
<b>Output Linearity</b>	Linear

N.B. All performance data is based on conditions at 20°C, 50%RH, and 1013mBar



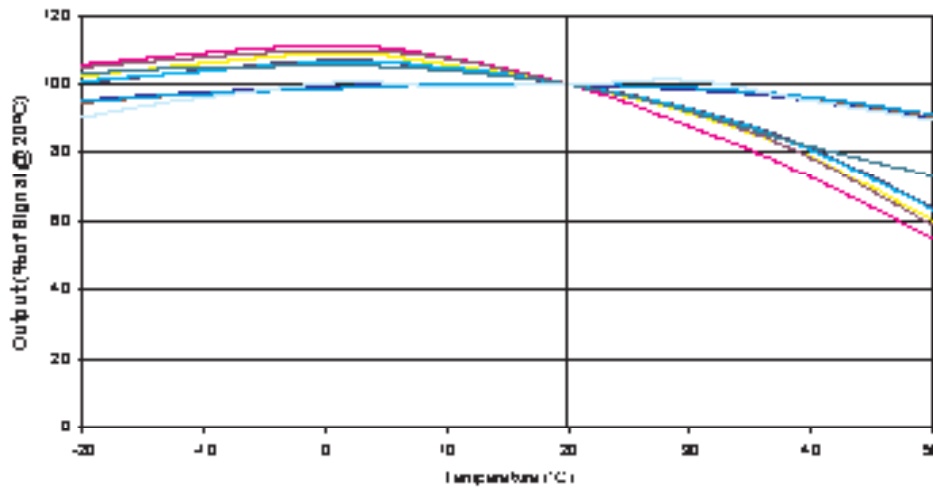
### Physical Characteristics

<b>Weight</b>	17g
<b>Position Sensitivity</b>	None
<b>Storage Life</b>	Six months in CTL container
<b>Recommended Storage Temperature</b>	0-20°C
<b>Warranty Period</b>	12 months from date of despatch

**IMPORTANT NOTE:** Connection should be made via PCB sockets only. Soldering to the pins will render your warranty void.



7HL Hydrogen chloride CiTiceL - Output vs Temperature



## Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. 7HL CiTiceLs have been tested with a number of commonly cross-interfering gases and the results are given below. The table shows the typical response to be expected from a sensor when exposed to a given test gas concentration (relevant to safety, e.g. TLV levels).

Gas	Conc.	7HL	Gas	Conc.	7HL
Carbon monoxide:	300ppm	<3ppm	Chlorine:	1ppm	$-0.05 < x < 0.1$ ppm
Hydrogen sulphide:	15ppm	$27 < x < 45$ ppm	Hydrogen:	100ppm	<0.5ppm
Sulphur dioxide:	5ppm	$1.5 < x < 3.5$ ppm	Hydrogen cyanide:	10ppm	<0.3ppm
Nitric oxide:	35ppm	0ppm	Ethylene:	100ppm	<6ppm
Nitrogen dioxide:	5ppm	$0.5 < x < 1$ ppm	**For details of other possible cross-interfering gases contact City Technology.**		

### Ordering Information:

Also available with bias board (7BHL)



## **SAFETY NOTE**

This sensor is designed to be used in safety critical applications. To ensure that the sensor and/or instrument in which it is used, are operating properly, it is a requirement that the function of the device is confirmed by exposure to target gas (bump check) before each use of the sensor and/or instrument. Failure to carry out such tests may jeopardize the safety of people and property.

Every effort has been made to ensure the accuracy of this document at the time of printing. In accordance with the company's policy of continued product improvement City Technology Limited reserves the right to make product changes without notice. No liability is accepted for any consequential losses, injury or damage resulting from the use of this document or from any omissions or errors herein. The data is given for guidance only. It does not constitute a specification or an offer for sale. The products are always subject to a programme of improvement and testing which may result in some changes in the characteristics quoted. As the products may be used by the client in circumstances beyond the knowledge and control of City Technology Limited, we cannot give any warranty as to the relevance of these particulars to an application. It is the clients' responsibility to carry out the necessary tests to determine the usefulness of the products and to ensure their safety of operation in a particular application.

Performance characteristics on this data sheet outline the performance of newly supplied sensors. Output signal can drift below the lower limit over time.

## Key Features & Benefits:

- Robust 3-Series packaging
- Industry standard 4-20 mA output

## Technical Specifications

### MEASUREMENT

Sensor Type Used	3HL
Filter	None
Output	4-20 mA d.c.
Response Time (T <sub>90</sub> )	<120 Seconds at 20°C
Resolution	0.5 ppm
Zero Shift (-20°C to +40°C)	< 1.5 ppm equivalent
Repeatability	2% of signal
Linearity	Linear

### ELECTRICAL

Power Supply Required	10 - 35 VDC single-ended
Output Impedance	4 MΩ
Calibration	Via built-in span and zero potentiometers

### MECHANICAL

Mounting	Via mounting nose supplied
Weight	58 g including mounting accessory
Position Sensitivity	None

### ENVIRONMENTAL

Operating Temperature Range	-20°C to +50°C
Recommended Storage Temp	0°C to 20°C
Temperature Compensation	None
Operating Pressure Range	Atmospheric ± 10%
Pressure Coefficient	No data
Operating Humidity Range	15 - 90% RH non-condensing

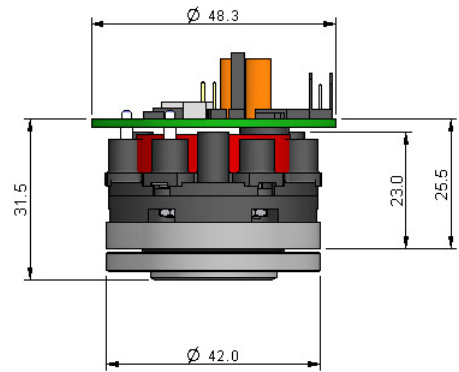
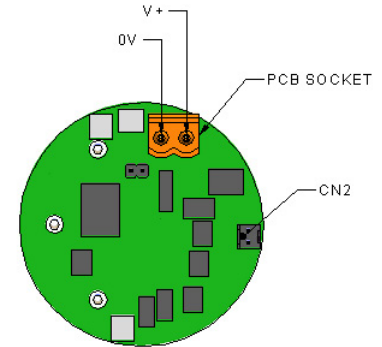
### LIFETIME

Long Term Sensitivity Drift	<2% signal loss/month
Expected Operating Life	Two years in air
Storage Life	6 months in CTL container
Standard Warranty	12 months from date of despatch

## IMPORTANT NOTE:

All performance data is based on conditions at 20°C, 50% RH and 1013 mBar. For further information on the operation and calibration of City Technology 4-20mA transmitters, please refer to OP-12.

## Product Dimensions



All dimensions in mm

All tolerances ±0.15 mm unless otherwise stated

## RANGES AVAILABLE

3HL CiTiceL 4-20 mA Transmitters are available with the following precalibrated ranges, and can be recalibrated to intermediate ranges.

Range	Order Code
0-10 ppm	TL1B-1A
0-20 ppm	TL1C-1A
0-50 ppm	TL1E-1A
0-100 ppm	TL1F-1A
0-200 ppm	TL1G-1A



## **Poisoning**

CiTiceLs are designed for operation in a wide range of environments and harsh conditions. However, it is important that exposure to high concentrations of solvent vapours is avoided, both during storage, fitting into instruments and operation.

When using sensors with printed circuit boards (PCBs), degreasing agents should be used before the sensor is fitted. Do not glue directly on or near the CiTiceL as the solvent may cause crazing of the plastic.

## **Cross Sensitivity Table**

Whilst CiTiceLs are designed to be highly specific to the gas they are intended to measure, they will still respond to some degree to various other gases. The table below is not exclusive and other gases not included in the table may still cause a sensor to react.

Gas	Concentration Used (ppm)	3HL (ppm HCl)
Carbon Monoxide, CO	300	<3
Hydrogen Sulfide, H <sub>2</sub> S	15	9 < x < 30
Sulfur Dioxide, SO <sub>2</sub>	5	2.5 < x < 4
Nitric Oxide, NO	5	0
Nitrogen Dioxide, NO <sub>2</sub>	100	<1
Chlorine, Cl <sub>2</sub>	1	0
Hydrogen, H <sub>2</sub>	100	<0.5
Hydrogen Cyanide, HCN	10	0
Ethylene, C <sub>2</sub> H <sub>4</sub>	100	0

The cross-sensitivity values quoted are based on tests conducted on a small number of sensors. They are intended to indicate sensor response to gases other than the target gas. Sensors may behave differently with changes in ambient conditions and any batch may show significant variation from the values quoted.

### **SAFETY NOTE**

This sensor is designed to be used in safety critical applications. To ensure that the sensor and/or instrument in which it is used, are operating properly, it is a requirement that the function of the device is confirmed by exposure to target gas (bump check) before each use of the sensor and/or instrument. Failure to carry out such tests may jeopardize the safety of people and property.

Every effort has been made to ensure the accuracy of this document at the time of printing. In accordance with the company's policy of continued product improvement City Technology Limited reserves the right to make product changes without notice. No liability is accepted for any consequential losses, injury or damage resulting from the use of this document or from any omissions or errors herein. The data is given for guidance only. It does not constitute a specification or an offer for sale. The products are always subject to a programme of improvement and testing which may result in some changes in the characteristics quoted. As the products may be used by the client in circumstances beyond the knowledge and control of City Technology Limited, we cannot give any warranty as to the relevance of these particulars to an application. It is the clients' responsibility to carry out the necessary tests to determine the usefulness of the products and to ensure their safety of operation in a particular application.

Performance characteristics on this data sheet outline the performance of newly supplied sensors. Output signal can drift below the lower limit over time

## 氯化氢传感器 0-50 ppm

### 性能表征

产品型号	CLE-1431-400
量程	0 to 50 ppm
最大荷载	100 ppm
灵敏度	$0.3 \pm 0.1 \mu\text{A/ppm}$
基线 (20 °C)	-0.2 to 1.0 $\mu\text{A}$
基线漂移 (-20 to 50 °C)	相当于 0 to 5 ppm
分辨率	1 ppm
响应时间 (T <sub>90</sub> )	≤ 70 秒
线性度	线性
长期稳定性	< 2% 信号值/月

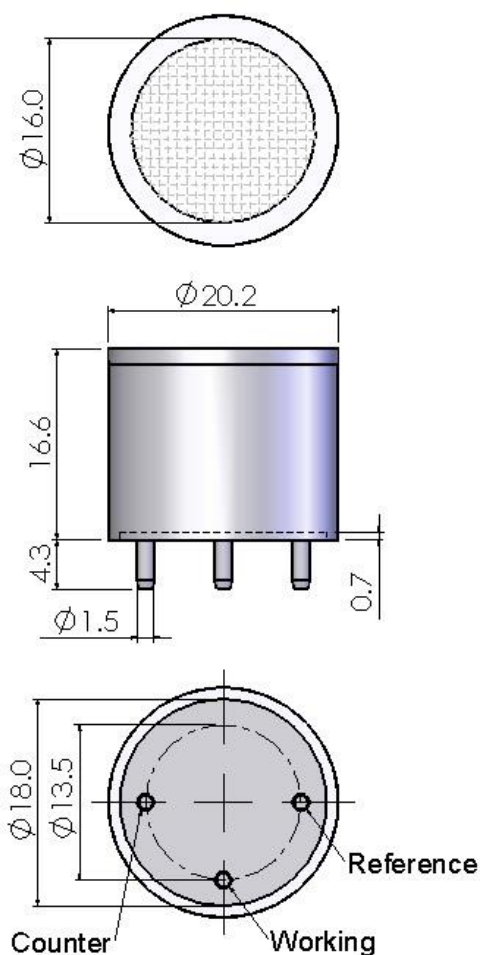
### 工作条件

工作温度	-20 °C to 50 °C
工作湿度	15 to 90%RH (无冷凝)
工作压力	90 to 110 kPa
偏压	+ 200 mV
储存时间	6 个月 (专用包装盒中)
储存温度	0 °C to 20 °C
使用寿命	空气中 2 年
质保期	交货后 12 个月

### 物理性能

重量	约 5 克
方位要求	无

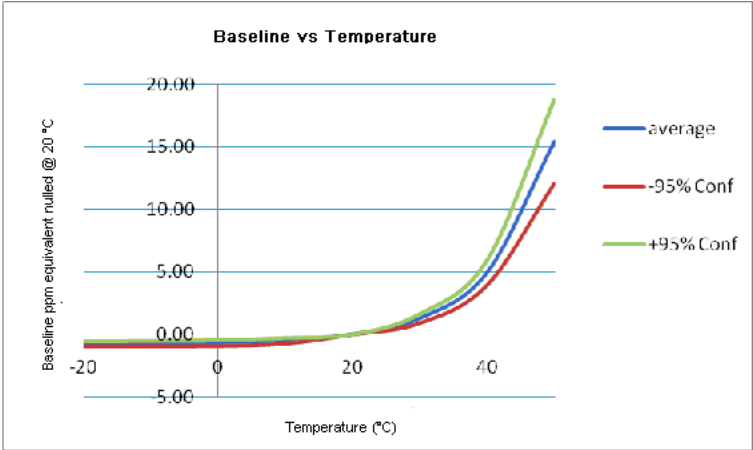
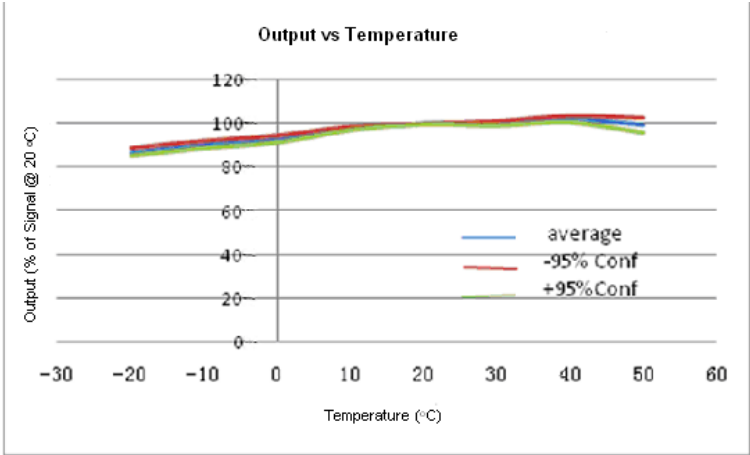
### Outline Dimensions



All dimensions are in millimeters.  
All tolerances are  $\pm 0.2\text{mm}$ .

**Note:** 推荐使用 PCB 插座来连接传感器，焊接会损害传感器。

温度影响



交叉灵敏度

气体	浓度 (ppm)	输出信号(相当于 ppm HCl)
氢气	2000	0
一氧化碳	100	0
一氧化氮	20	50
二氧化氮	10	1
硫化氢	25	130
二氧化硫	20	35
氮气	100%	0

使用须知

1. 以上所有性能规格都是在环境条件：温度 20 °C, 相对湿度 50% RH, 一个大气压（100 kPa 或环境压力）下测得。
2. 推荐用目标气体进行标定。如果用交叉敏感气体进行标定，我们不保证其标定和测量的准确度。
3. 交叉灵敏度会有+/- 30%的浮动，并且可能随着传感器的生产批次不同和传感器的寿命而变化。
4. 上述交叉灵敏度包括但不限于上述气体，该传感器有可能对其他气体有响应。

## 氯化氢传感器 0-50 ppm

## 性能表征

产品型号	CLE-1431-700
量程	0 to 50 ppm
最大荷载	100 ppm
灵敏度	$0.33 \pm 0.13 \mu\text{A/ppm}$
基线	-0.2 to 1.0 $\mu\text{A}$
基线漂移 (-20 to 40°C)	相当于 0 to 5 ppm HCl
分辨率	1 ppm
响应时间( $T_{90}$ )	≤ 70 秒
线性度	线性
长期稳定性	< 2% 信号值/月
<b>Warm-Up Time</b>	
第一次使用需要	24 小时
测量完最大量程后使用需要	3 小时
测量完最大量程后校准需要	10 小时

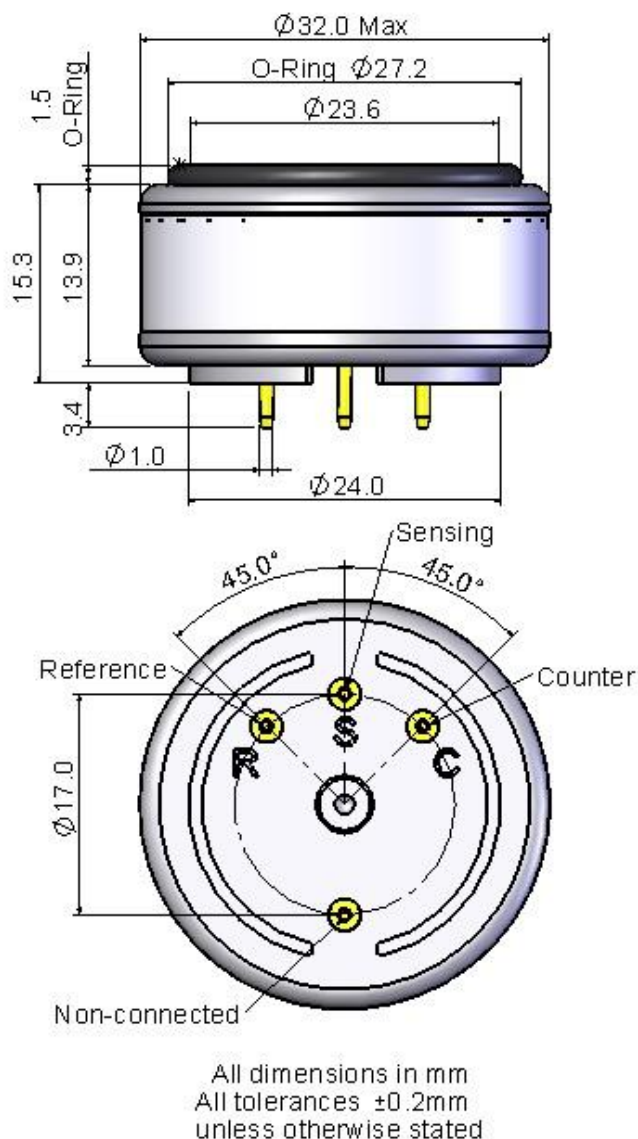
## 工作条件

工作温度	-20 to 50°C
工作湿度	15 to 90%RH (无冷凝)
工作压力	90 to 110 KPa
偏压	+200 mV
储存时间	6 个月 (专用包装盒中)
储存温度	0 to 20°C
使用寿命	空气中 2 年
质保期	交货后 12 个月

## 物理性能

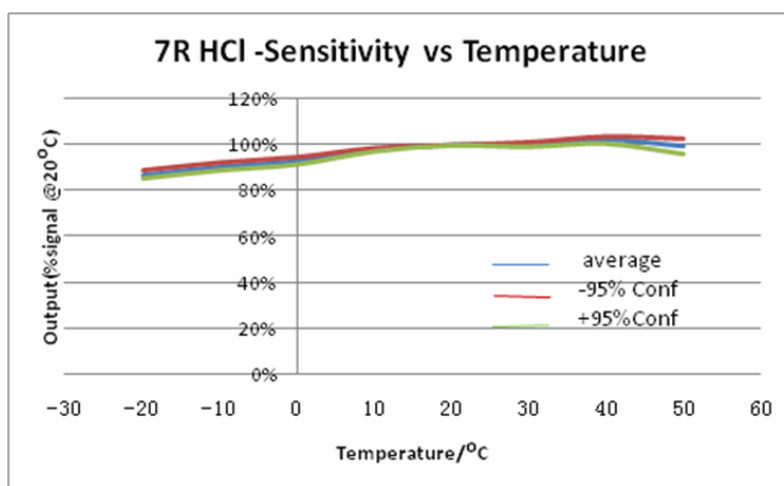
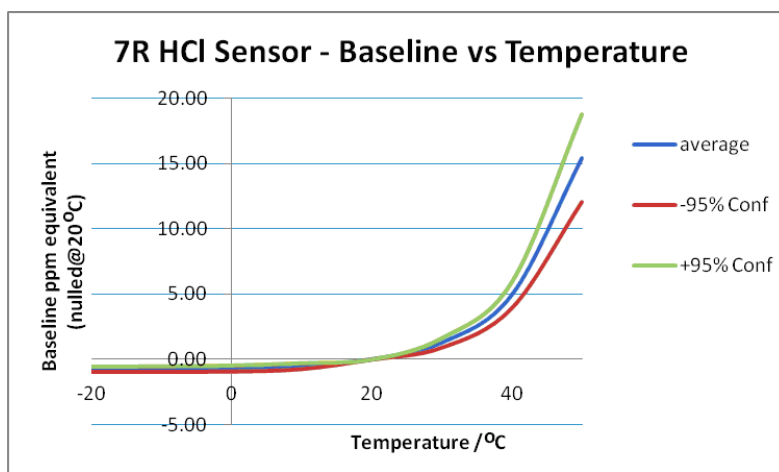
重量	约 8 克
方位要求	无

## Outline Dimensions



**Note:** 推荐使用 PCB 插座来连接传感器，焊接会损害传感器。

## 温度影响



## 交叉灵敏度 (20 °C)

气体	浓度(ppm)	输出信号 (相当于 ppm HCl)
氢气	2000	0
一氧化碳	100	0
一氧化氮	20	50
二氧化氮	10	1
硫化氢	25	130
二氧化硫	20	35
氮气	100%	0

## 使用须知

1. 以上所有性能规格都是在环境条件：温度 20 °C, 相对湿度 50% RH, 一个大气压 (100 kPa 或环境压力) 下测得。
2. 推荐用目标气体进行标定。如果用交叉敏感气体进行标定，我们不保证其标定和测量的准确度。
3. 交叉灵敏度会有 +/- 30% 的浮动，并且可能随着传感器的生产批次不同和传感器的寿命而变化。
4. 上述交叉灵敏度包括但不限于上述气体，该传感器有可能对其他气体有响应。