3MSF CiTiceL®

Sulfur Dioxide (SO_2) Gas Sensor with mV Output
Part Number: MDF60-014

Key Features & Benefits:

- **Robust 3-Series packaging**
- **Factory calibrated mV output**

Technical Specifications

MEASUREMENT

Sensor Type Used	3SF
Maximum Range	5000 ppm SO_2
Sensitivity	1 mV/ppm ± 5%
Filter	None
Baseline Offset (Clean Air)	±1 mV
Response Time (T_{90})	<30 Seconds at 20°C
Resolution	1 ppm
Zero Shift (-20°C to +40°C)	<5 ppm equivalent
Repeatability	1% of signal
Linearity	Linear

ELECTRICAL

Power Supply Required	7 to 18 VDC single-ended or ±3.5 to ±9 VDC dual
Power Consumption	250 µA @ 9 VDC
Calibration	Via built-in span and zero potentiometers (Refer to OP14)

MECHANICAL

Weight	38 g (with connector)
Body Material	20% glass filled polypropylene
Position Sensitivty	None

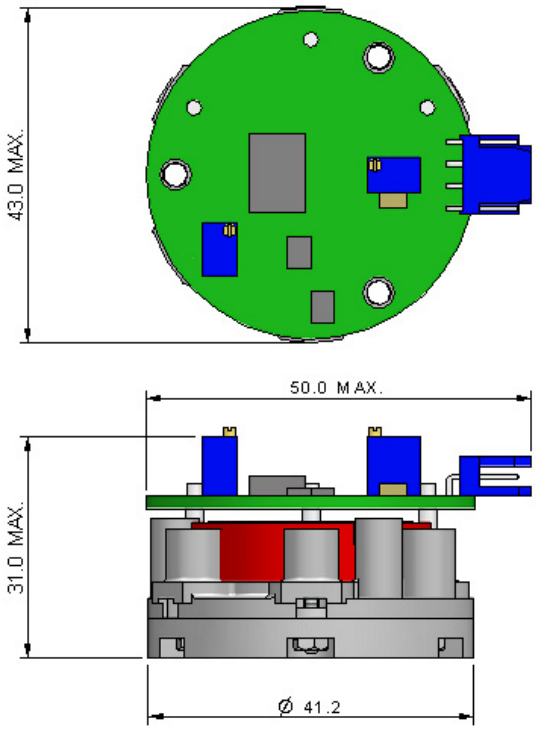
ENVIRONMENTAL

Operating Temperature Range	-15°C to +50°C
Recommended Storage Temp	0°C to 20°C
Temperature Compensation	None
Operating Pressure Range	Atmospheric ± 10%
Pressure Coefficient	0.004% signal/mBar
Operating Humidity Range	15 to 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

Product Dimensions



All dimensions in mm
All tolerances ±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.

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. SO_2 = 100%).

Gas	3MSF (%)
Sulfur Dioxide, SO_2	100
Hydrogen Sulfide, H_2S	~ 200
Carbon Monoxide, CO	<3
Nitric Oxide, NO	0
Nitrogen Dioxide, NO_2	~ -125
Hydrogen, H_2	<3
Hydrogen Chloride, HCl	~ 15
Ethylene, C_2H_4	<50

Note 1 : For applications where a hydrogen compensated output is required, the A3ME/D CiTiceL should be considered

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.

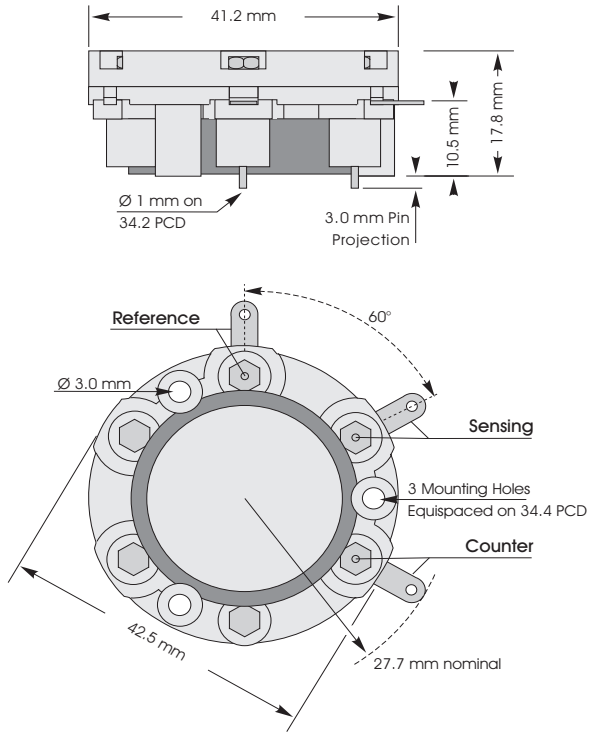
3SF CiTiceL

Performance Characteristics

Nominal Range	0-2000ppm
Maximum Overload	5000ppm
Expected Operating Life	Two years in air
Output Signal	0.10 ± 0.02μA/ppm
Resolution	1ppm
Temperature Range	-20°C to +50°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	0.004 % signal/mBar
T_{90} Response Time	<30 seconds
Relative Humidity Range	15 to 90% non-condensing
Typical Baseline Range (pure air)	0 ± 2ppm equivalent
Maximum Zero Shift (+20°C to +40°C)	5ppm equivalent
Long Term Output Drift	<2% signal loss/month
Recommended Load Resistor	10 Ω
Bias Voltage	Not required
Repeatability	1% of signal
Output Linearity	Linear

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

Outline Dimensions



All tolerances ±0.15mm unless otherwise stated.

3SF shown with side tags and gold pins.

Do not solder to pin connections.

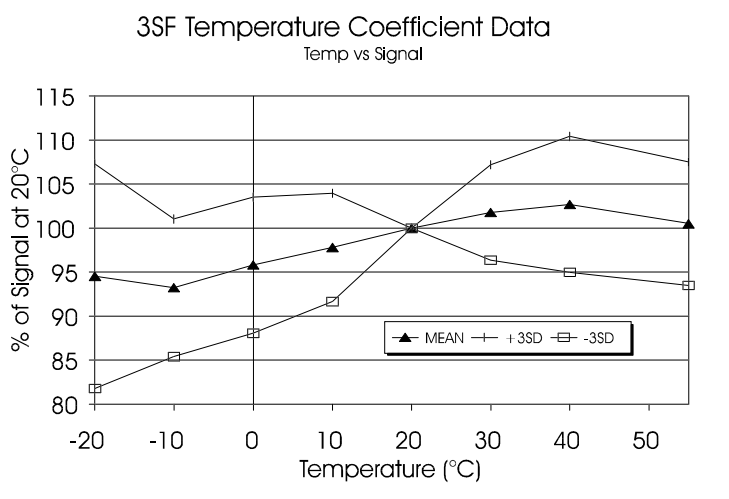
Physical Characteristics

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

Temperature Dependence

The output of a CiTiceL can vary with temperature. The graph here shows the variation in output with temperature for 3SF CiTiceLs based on a sample of about 16 sensors. The results are shown in the graph as a mean for the batch, and expressed as a percentage of the signal at 20°C.

From a statistical viewpoint, for a sample of this size, the range in values observed for all sensors of this type will fall within a range three times the standard deviation above or below the mean. Assuming therefore this sample is typical, then the temperature behaviour of all 3SF CiTiceLs will fall in the band +3SD to -3SD.



Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. The table below shows the typical response of 3SF sensors to a number of common cross-interfering gases. The figures are expressed as a percentage of the primary sensitivity (i.e. sulphur dioxide = 100%).

Gas	Response	Gas	Response
Carbon monoxide:	<3.5	**Hydrogen:**	<3
Hydrogen sulphide:	≈200	**Hydrogen chloride:**	≈15
Nitric oxide:	0	**Ethylene:**	<50
Nitrogen dioxide:	≈-125		

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

Ordering Information

The 3SF Sulphur Dioxide 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.

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

3SF/F CiTiceL

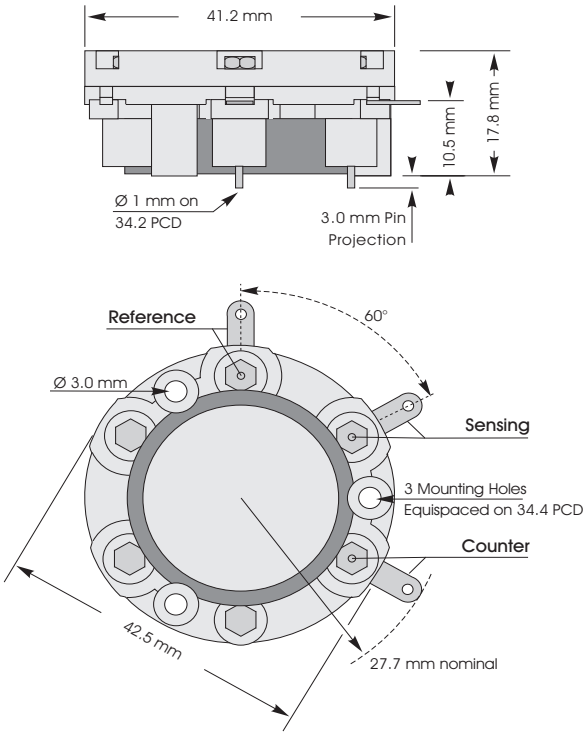
With H_2S/HCl filter

Performance Characteristics

Nominal Range	0-2000 ppm
Maximum Overload	5000 ppm
Expected Operating Life	Two years in air
Output Signal	0.10 ± 0.02 µA/ppm
CO Cross Interference	<5%
Resolution	1 ppm
Temperature Range	-20°C to +50°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	0.004 % signal/mBar
T_{90} Response Time	<35 seconds
Relative Humidity Range	15 to 90% non-condensing
Typical Baseline Range (pure air)	0±2 ppm equivalent
Maximum Zero Shift (+20°C to +40°C)	5 ppm equivalent
Long Term Output Drift	<2% signal loss/month
Recommended Load Resistor	10 Ω
Bias Voltage	Not required
Repeatability	1% of signal
Output Linearity	Linear

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

Outline Dimensions



All tolerances ±0.15 mm unless otherwise stated.
3SF/F shown with side tags and gold pins.
Do not solder to pin connections.

Physical Characteristics

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

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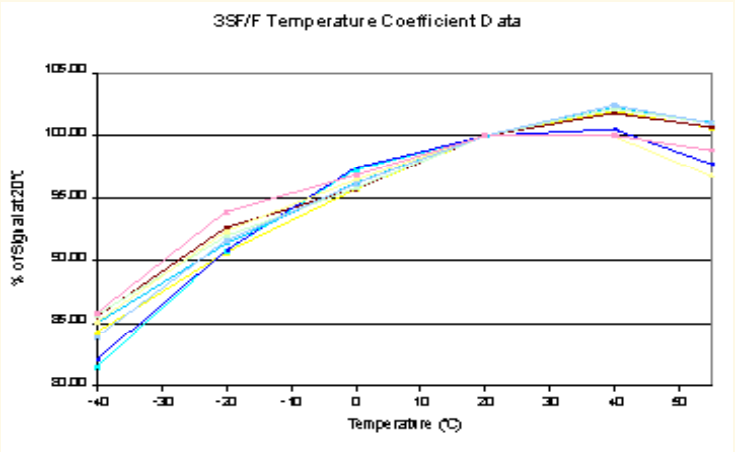
Temperature Dependence

The output from a CiTiceL will vary only slightly with temperature.

The graph here shows the typical variation in output with temperature based on a sample of 3SF/F sensors.

The results are shown in the graph expressed as a percentage of the signal at 20°C.



Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. The table below shows the typical response of 3SF/F Low CO sensors to a number of common cross-interfering gases. The figures are expressed as a percentage of the primary sensitivity (i.e. sulphur dioxide = 100%).

Gas	Response	Gas	Response
Carbon monoxide:	<5*	**Hydrogen:**	<3
Hydrogen Sulphide:	0	**Hydrogen Chloride:**	0
Nitric oxide:	0	**Ethylene:**	<50
Nitrogen dioxide:	≈-125		

* The cross interference of the 3SF/F to Carbon Monoxide is checked prior to despatch with 200 ppm CO

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

Ordering Information

The 3SF/F Sulphur Dioxide CiTiceL is available with both PCB pins and side tags only.

Type 3SF/F:- With side tag and PCB pin connections - **AD006-J0K**

SAFETY NOTE

Although this product is not designed for use in life safety applications, if it is used in such applications 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, to ensure that the sensor and/or instrument in which it is used, are operating properly. Failure to carry out such tests may jeopardize the safety of people and property.

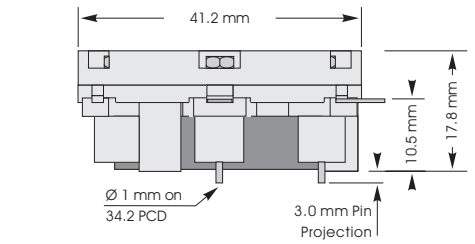
3SH CiTiceL®

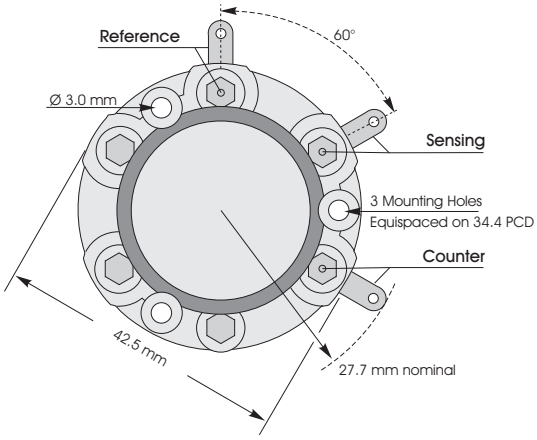
Performance Characteristics

Nominal Range	0-20ppm
Maximum Overload	100ppm
Expected Operating Life	Two years in air
Output Signal	1.25 ± 0.25 µA/ppm
Resolution	0.1ppm
Temperature Range	-20°C to +50°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	No data
T_{90} Response Time	≤15 seconds
Relative Humidity Range	15 to 90% non-condensing
Typical Baseline Range (pure air)	-0.1 to 0.2ppm equivalent
Maximum Zero Shift (+20°C to +40°C)	0.1ppm equivalent
Long Term Output Drift	<2% signal loss/month
Recommended Load Resistor	10Ω
Bias Voltage	Not required
Repeatability	2% of signal
Output Linearity	Linear

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

Outline Dimensions





All tolerances ±0.15mm unless otherwise stated.
3SH shown with side tags and gold pins.
Do not solder to pin connections

Physical Characteristics

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

Ordering Information

The 3SH Sulphur Dioxide 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.

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

Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. 3SH 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.	3SH	Gas	Conc.	3SH
Carbon monoxide:	300ppm	≤3ppm	**Hydrogen:**	100ppm	0ppm
Hydrogen sulphide:	15ppm	≈20ppm	**Hydrogen cyanide:**	10ppm	≈5ppm
Nitric oxide:	35ppm	0ppm	**Hydrogen chloride:**	5ppm	≈0.5ppm
Nitrogen dioxide:	5ppm	≈-6ppm	**Ethylene:**	100ppm	0ppm
Chlorine:	1ppm	≈-0.5ppm			

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.

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咨询电话：400-7181-886

Performance Characteristics

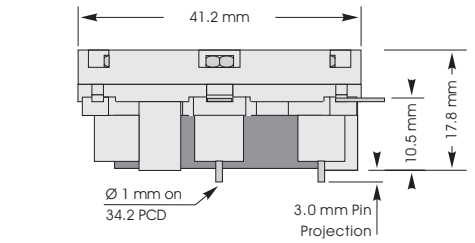
Nominal Range	0-100ppm
Maximum Overload	500ppm
Inboard Filter	To remove H_2S
Expected Operating Life	Two years in air
Output Signal	0.37 ± 0.07 µA/ppm
Resolution	0.5ppm
Temperature Range	-20° to +50°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	0.015 % signal/mBar
T_{90} Response Time	≤20 seconds
Relative Humidity Range	15 to 90% non-condensing
Typical Baseline Range (pure air)	-0.25 to +0.5ppm equiv.
Maximum Zero Shift (+20°C to +40°C)	1ppm equivalent
Long Term Output Drift	<2% signal loss/month
Recommended Load Resistor	10Ω
Bias Voltage	Not required
Repeatability	1% of signal
Output Linearity	Linear

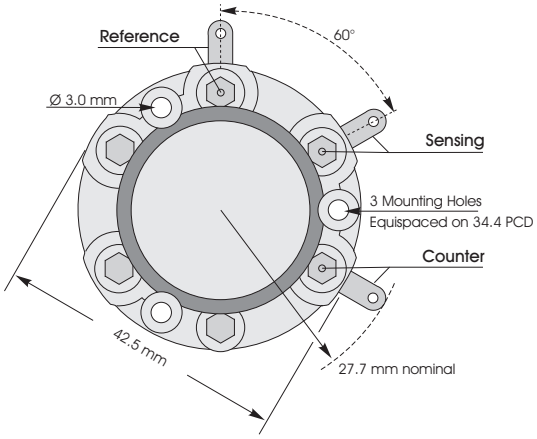
N.B. All performance data is based on conditions at 20°C, 50%RH, and 1013mBar

Physical Characteristics

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

Product Dimensions





All tolerances ±0.15mm unless otherwise stated.
3ST/F shown with side tags and gold pins.

Ordering Information

The 3ST/F Sulphur Dioxide 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.

Type 3ST/F
With side tag and PCB pin connections - **3ST/F**
With side tag connection - **3ST/F(S)**
With gold-plated PCB pin connection - **3ST/F(G)**

Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. 3ST/F 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.	3ST/F	Gas	Conc.	3ST/F
Carbon monoxide:	300ppm	<5ppm	Hydrogen:	100ppm	0ppm
Hydrogen sulphide:	15ppm	0ppm	Hydrogen cyanide:	10ppm	<5ppm
Nitric oxide:	35ppm	0ppm	Hydrogen chloride:	5ppm	0ppm
Nitrogen dioxide:	5ppm	≈-5ppm	Ethylene:	100ppm	0ppm
Chlorine:	1ppm	<-0.5ppm			

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.

4S Rev. 2 CiTiceL®

Sulfur Dioxide (SO_2) Gas Sensor
Part Number: 2112B2015R
Patent : US7794779

Key Features & Benefits:

- **Industry leading reliability**
- **Improved performance variability**

Technical Specifications

MEASUREMENT

Operating Principle	3-electrode electrochemical
Measurement Range	0-20 ppm SO_2
Maximum Overload	150 ppm SO_2
Filter	To remove H_2S
Filter Capacity	1000 ppm hrs @ 25 ppm H_2S
Sensitivity	0.5 ± 0.1 µA/ppm
Response Time (T_{90})	< 25 Seconds at 20°C
Baseline Offset (clean air)	-0.2 to +0.5 ppm equivalent
Zero Shift (+20°C to +40°C)	< 0.1 ppm equivalent
Repeatability	< ±2% of signal
Linearity	Linear over measurement range 0-20 ppm and within ±5%

ELECTRICAL

Recommended Load Resistor	10 Ω
Bias Voltage	Not required
Resolution	Dependent on electronics. (0.1 ppm when using recommended electronics)

MECHANICAL

Housing Material	Noryl 110
Weight	Approx. 4.5 g
Orientation	Any

ENVIRONMENTAL

Typical Applications	Portable life safety
Operating Temperature Range:	
Continuous	-20°C to +50°C
Intermittent	-40°C to +55°C Lifetime will be reduced if regularly exposed to extremes of temperature
Recommended Storage Temp	0 - 20°C
Operating Pressure Range	1 atm ± 20%
Operating Humidity Range	15% to 90%RH non-condensing. Extended exposure to extreme humidity conditions will degrade sensor performance.

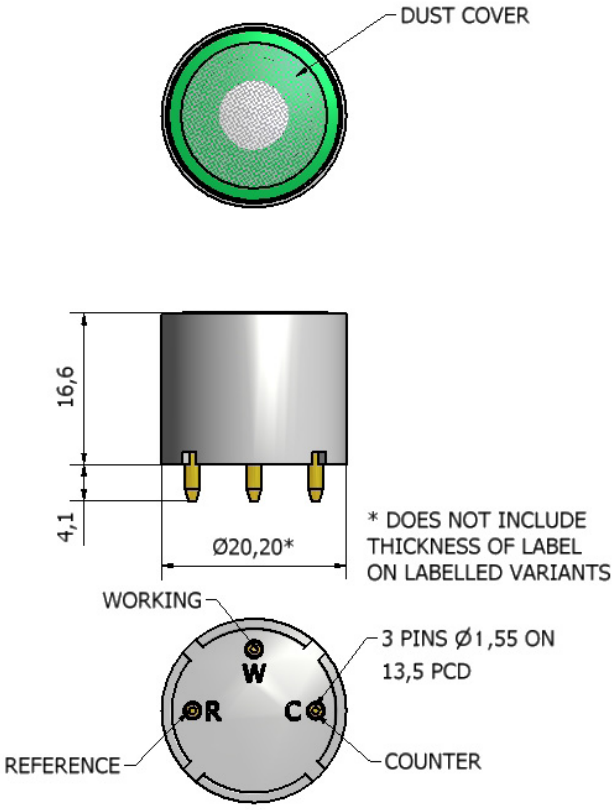
INTRINSIC SAFETY DATA

Maximum current at 150 ppm	0.1 mA
Maximum o/c Voltage	< 0.75 V
Maximum s/c Current	< 1.0 A

LIFETIME

Long Term Output Drift	< 10% per annum
Expected Operating Life	2 years in clean air
Storage Life	6 months in original packaging
Standard Warranty	12 months from date of despatch

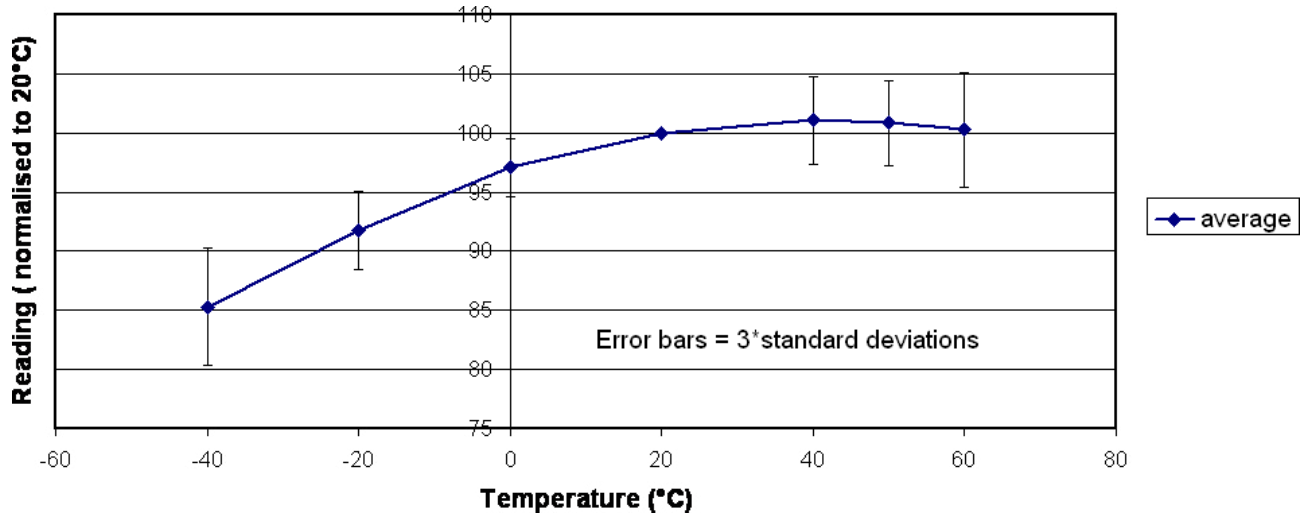
Product Dimensions



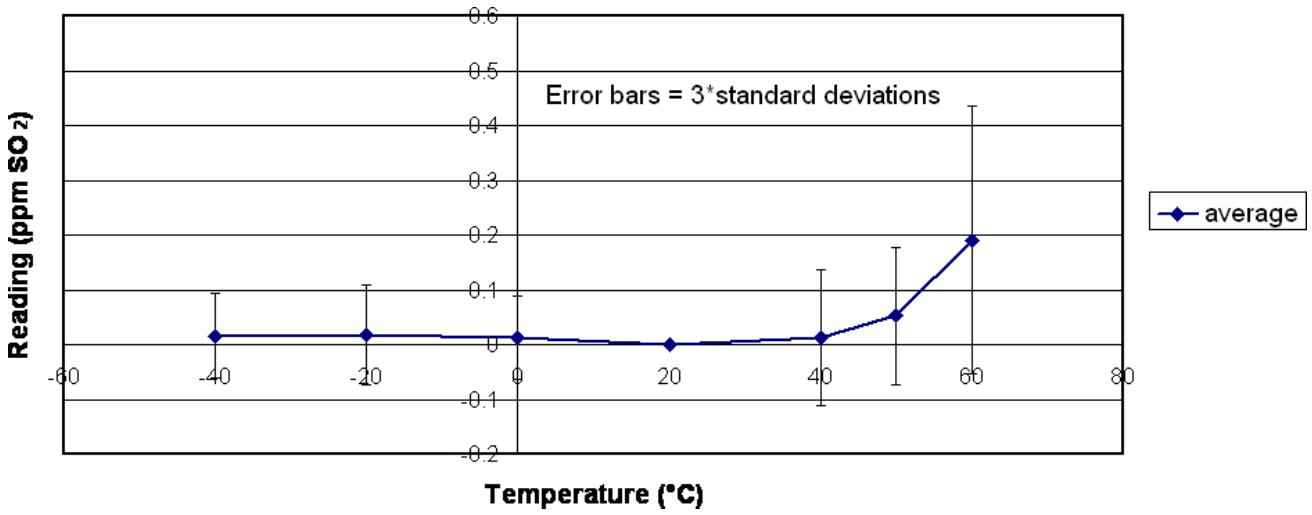
All dimensions in mm
All tolerances ±0.15 mm
unless otherwise stated

IMPORTANT NOTE: All performance data is based on conditions at 20°C, 50%RH and 1 atm, using City Technology recommended circuitry. For sensor performance data under other conditions, please contact City Technology Ltd.

4S Rev. 2 Sulfur Dioxide Cell - Output vs. Temperature



4S Rev. 2 Sulfur Dioxide Cell - Baseline vs. Temperature



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 gases. The table below is not exclusive and other gases not included in the table may still cause a sensor to react.

Gas	Formula	Concentration Used (ppm)	Reading (ppm SO2)
Carbon Monoxide	CO	300	<1
Nitric Oxide	NO	50	0 - 5
Nitrogen Dioxide	NO_2	6	<-10
Hydrogen Sulfide	H_2S	25	<0.1
Chlorine	Cl_2	5	<-2
Ammonia	NH_3	20	0
Hydrogen	H_2	400	<1
Hydrogen Cyanide	HCN	10	<5
Acetylene	C_2H_2	10	<30
Ethene	C_2H_4	50	<45

Note: The figures in this table are typical values and should not be used as a basis for cross calibration. Cross sensitivities may not be linear and should not be scaled. All data based on a 5 minute gassing. For some cross interferents break through will occur if gas is applied for a longer time period.

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.

5SF CiTiceL®

Performance Characteristics

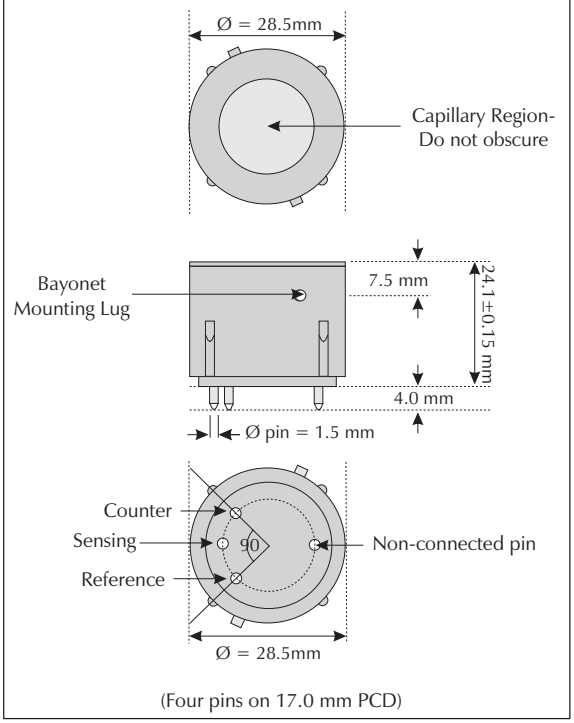
Nominal Range	0-2000ppm
Maximum Overload	5000ppm
Expected Operating Life	Two years in air
Output Signal	0.10 ± 0.02µA/ppm
Resolution	1ppm
Temperature Range	-20°C to +50°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	0.004 % signal/mBar
T_{90} Response Time	<30 seconds
Relative Humidity Range	15 to 90% non-condensing
Typical Baseline Range (pure air)	0 ± 2ppm equivalent
Maximum Zero Shift (+20°C to +40°C)	5ppm equivalent
Long Term Output Drift	<2% signal loss/month
Recommended Load Resistor	10 Ω
Bias Voltage	Not required
Repeatability	1% of signal
Output Linearity	Linear
Colour Coding	Green

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

Physical Characteristics

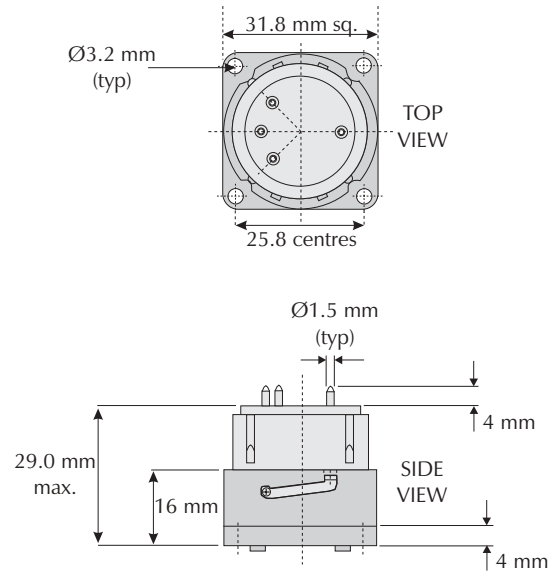
Weight	10g
Position Sensitivity	None
Storage Life	Six months in CTL container
Recommended Storage Temperature	0-20°C
Warranty Period	12 months from date of despatch

Outline Sensor Dimensions

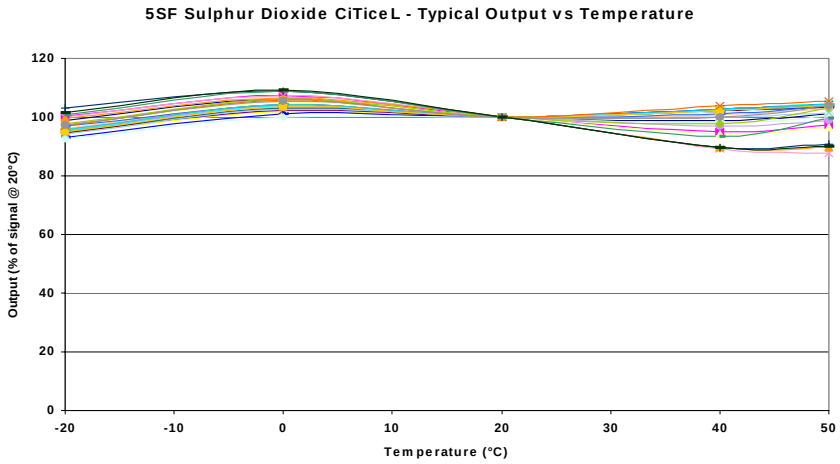


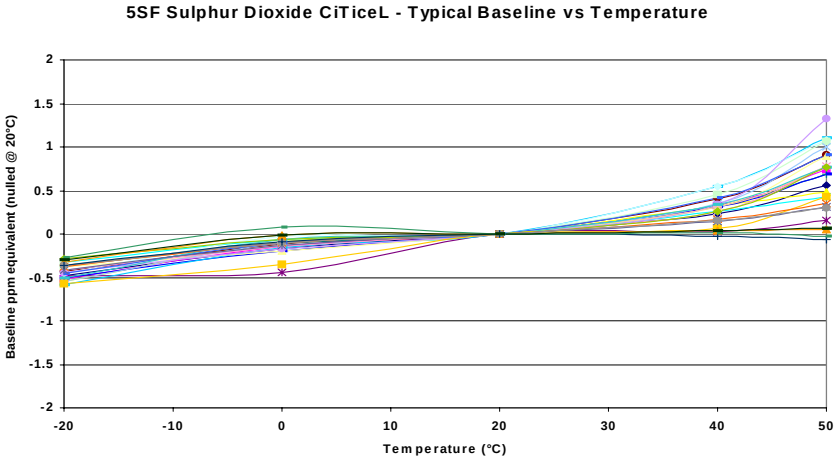
(Four pins on 17.0 mm PCD)

With Bayonet Fitting



All tolerances ±0.15mm unless otherwise stated





Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. The table below shows the typical response of 5SF sensors to a number of common cross-interfering gases. The figures are expressed as a percentage of the primary sensitivity (i.e. sulphur dioxide = 100%).

Gas	Response	Gas	Response
Carbon monoxide:	<3	**Hydrogen:**	<3
Hydrogen sulphide:	≈200	**Hydrogen chloride:**	≈15
Nitric oxide:	0	**Ethylene:**	<50
Nitrogen dioxide:	≈-125	** For details of other possible cross-interfering gases contact City Technology.**	

5SF/F CiTiceL®

Performance Characteristics

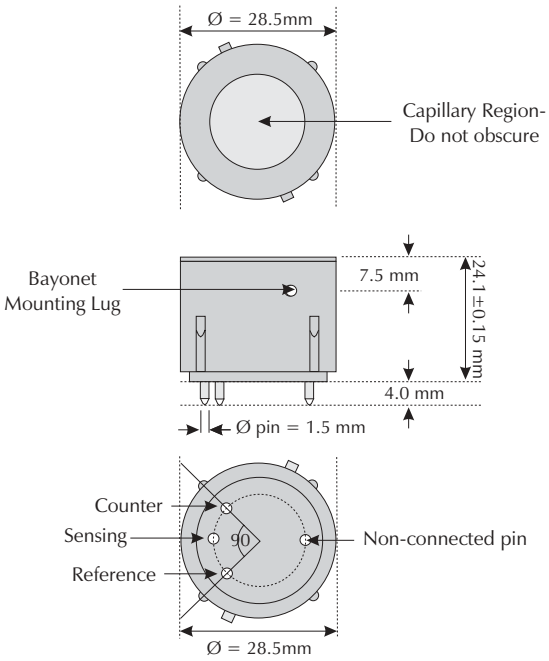
Nominal Range	0-2000ppm
Maximum Overload	5000ppm
Internal Filter	to remove effects of H_2S & HCl
Internal Filter Life	>200,000 ppm hrs (1000ppm H_2S @ 500ml/min)
Expected Operating Life	Two years in air
Output Signal	0.10 ± 0.02µA/ppm
Resolution	1ppm
Temperature Range	-20°C to +50°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	≈ 0.08 % signal/mBar
T_{90} Response Time	<40 seconds
Relative Humidity Range	15 to 90% non-condensing
Typical Baseline Range (pure air)	± 2ppm equivalent
Maximum Zero Shift (+20°C to +40°C)	5ppm equivalent
Long Term Output Drift	<2% signal loss/month
Recommended Load Resistor	10 Ω
Bias Voltage	Not required
Repeatability	1% of signal
Output Linearity	Linear

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

Physical Characteristics

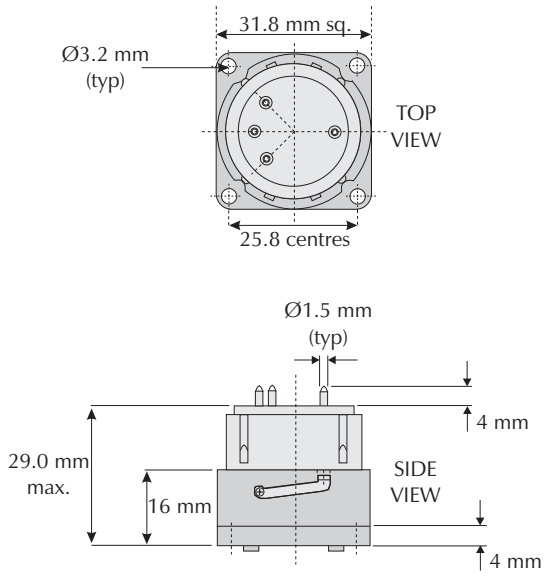
Colour Coding	Green
Weight	10g
Position Sensitivity	None
Storage Life	Six months in CTL container
Recommended Storage Temperature	0-20°C
Warranty Period	12 months from date of despatch

Outline Sensor Dimensions

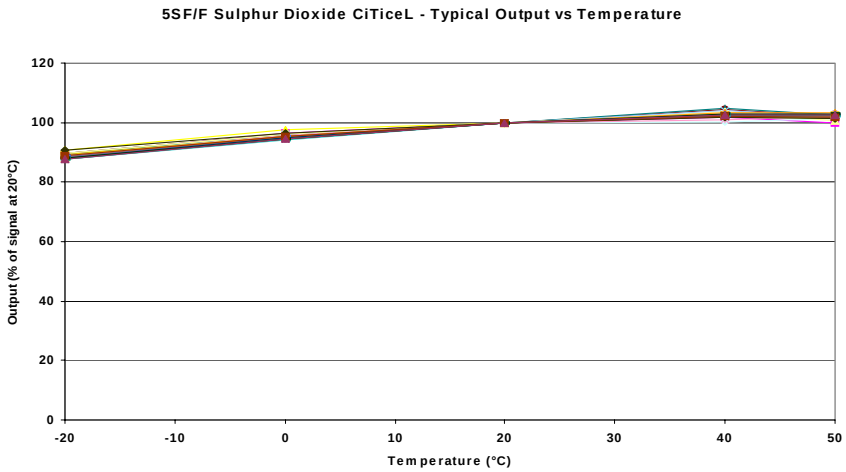


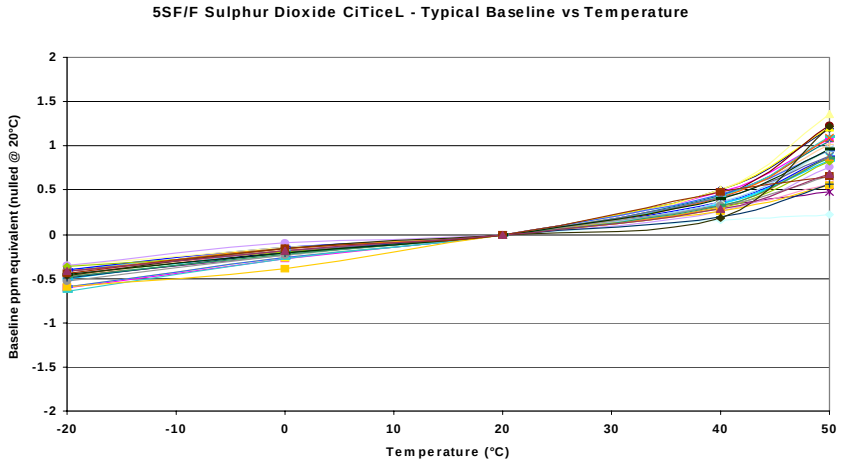
(Four pins on 17.0 mm PCD)

With Bayonet Fitting



All tolerances ±0.15mm unless otherwise stated





Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. The table below shows the typical response of 5SF/F sensors to a number of common cross-interfering gases. The figures are expressed as a percentage of the primary sensitivity (i.e. sulphur dioxide = 100%).

Gas	Response	Gas	Response
Carbon monoxide:	≈ 3.5	**Hydrogen:**	< 2
Hydrogen sulphide:	< 2	**Nitric oxide:**	< -5
Nitrogen dioxide:	< -150		

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

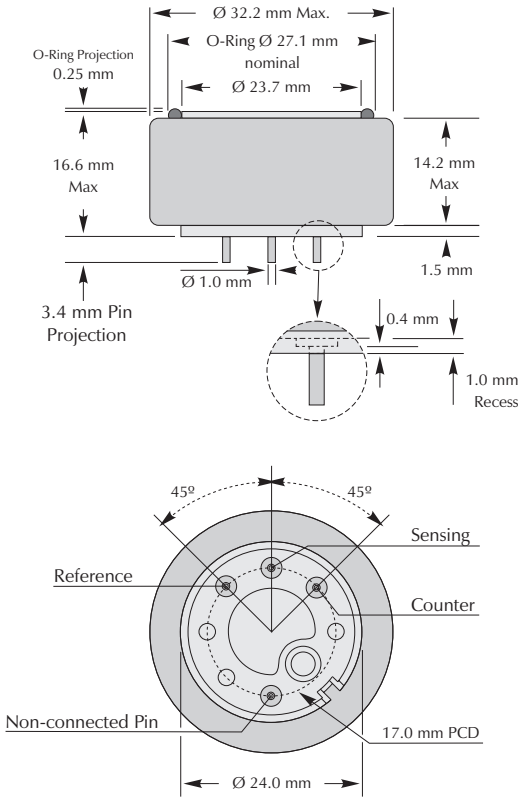
7SH Compact CiTiceL®

Performance Characteristics

Nominal Range	0-20 ppm
Maximum Overload	100 ppm
Expected Operating Life	Two years in air
Output Signal	1.25 ± 0.25 µA/ppm
Resolution	0.1 ppm
Temperature Range	-20°C to +50°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	No data
T_{90} Response Time	≤15 seconds
Relative Humidity Range	15 to 90% non-condensing
Typical Baseline Range (pure air)	-0.1 to 0.2 ppm equivalent
Maximum Zero Shift (+20°C to +40°C)	0.1 ppm equivalent
Long Term Output Drift	<2% signal loss/month
Recommended Load Resistor	10 Ω
Bias Voltage	Not required
Repeatability	2% of signal
Output Linearity	Linear

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

Outline Dimensions



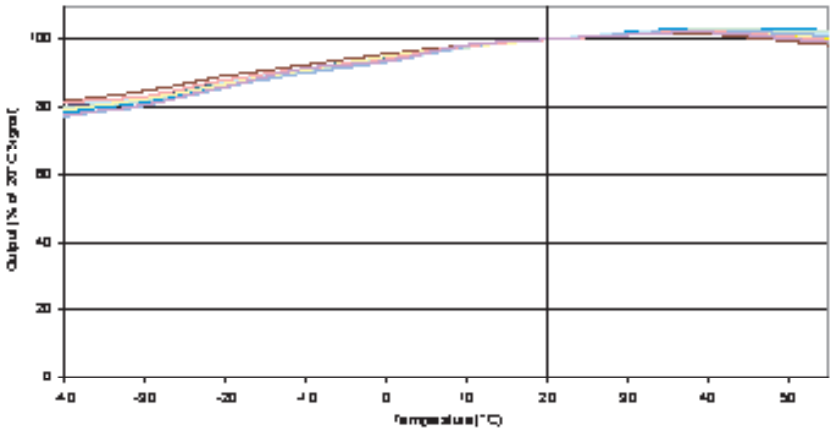
All tolerances ±0.15 mm unless otherwise stated.
Do not solder to pin connections

Physical Characteristics

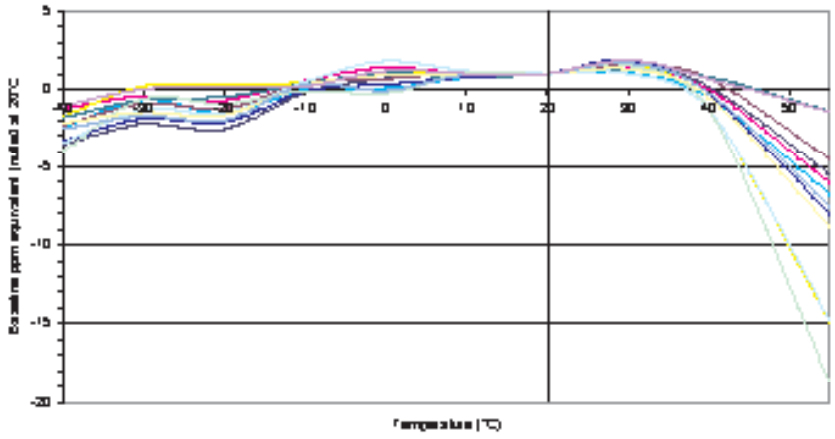
Weight	17 g
Position Sensitivity	None
Storage Life	Six months in CTL container
Recommended Storage Temperature	0-20°C
Warranty Period	12 months from date of despatch

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

7SH Sulphur dioxide CiTiceL - Output vs Temperature



7SH Sulphur dioxide CiTiceL - Baseline vs Temperature



Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. 7SH 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.	7SH	Gas	Conc.	7SH
Carbon monoxide:	300ppm	≤3ppm	**Hydrogen:**	100ppm	0ppm
Hydrogen sulphide:	15ppm	≈20ppm	**Hydrogen cyanide:**	10ppm	≈5ppm
Nitric oxide:	35ppm	-1<x$<0ppm	**Hydrogen chloride:**	5ppm	≈1ppm
Nitrogen dioxide:	5ppm	≈-6ppm	**Ethylene:**	100ppm	0ppm
Chlorine:	1ppm	-0.5<x$<0ppm			

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.

7ST/F CiTiceL®

Performance Characteristics

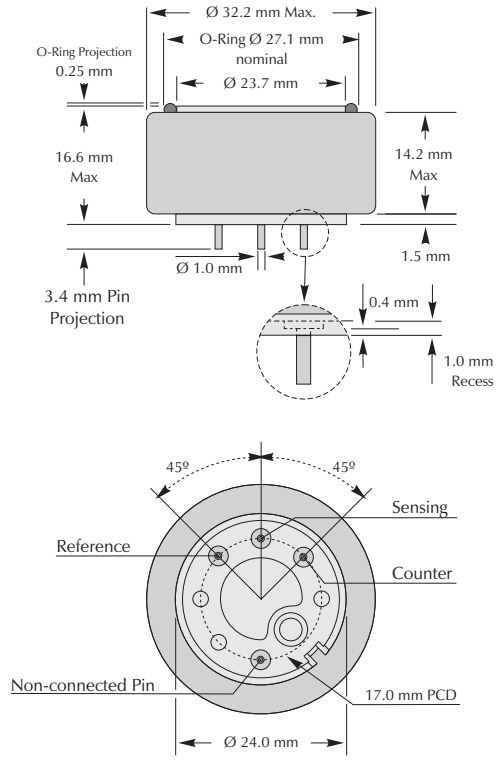
Nominal Range	0-100 ppm
Maximum Overload	500 ppm
Inboard Filter	To remove H_2S
Expected Operating Life	Two years in air
Output Signal	0.37 ± 0.07 µA/ppm
Resolution	0.5 ppm
Temperature Range	-20°C to +50°C
Pressure Range	Atmospheric ± 10%
Pressure Coefficient	0.015 % signal/mBar
T_{90} Response Time	≤20 seconds
Relative Humidity Range	15 to 90% non-condensing
Typical Baseline Range (pure air)	-0.25 to +0.5 ppm equiv.
Maximum Zero Shift (+20°C to +40°C)	1 ppm equivalent
Long Term Output Drift	<2% signal loss/month
Recommended Load Resistor	10 Ω
Bias Voltage	Not required
Repeatability	1% of signal
Output Linearity	Linear

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

Physical Characteristics

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

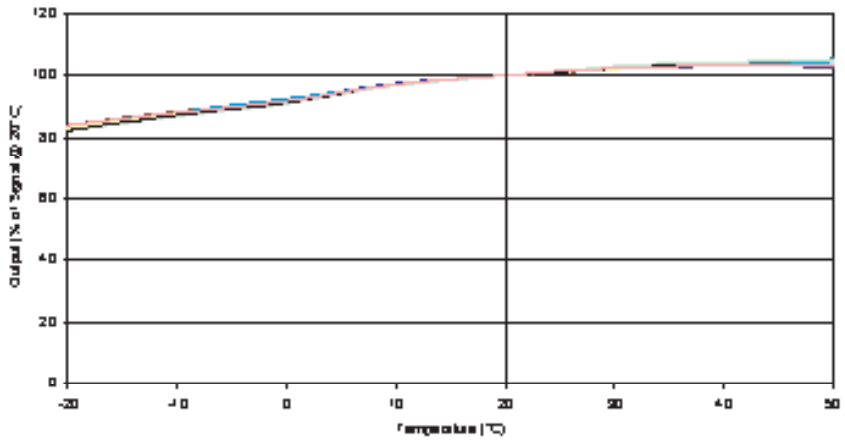
Outline Dimensions



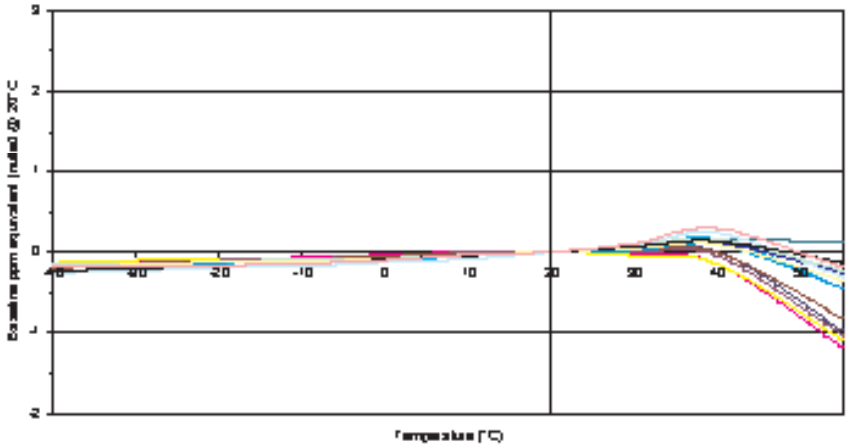
All tolerances ±0.15 mm unless otherwise stated.
Do not solder to pin connections

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

7ST/F Sulphur dioxide - Output vs Temperature



7ST/F Sulphur dioxide CiTiceL - Baseline vs Temperature



Cross-sensitivity Data

CiTiceLs may exhibit a response to certain gases in a sample other than the target gas. 7ST/F 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.	7ST/F	Gas	Conc.	7ST/F
Carbon monoxide:	300ppm	<5ppm	**Hydrogen:**	100ppm	0ppm
Hydrogen sulphide:	15ppm	0ppm	**Hydrogen cyanide:**	10ppm	<5ppm
Nitric oxide:	35ppm	-7<x$<0ppm	**Hydrogen chloride:**	5ppm	0ppm
Nitrogen dioxide:	5ppm	≈-5ppm	**Ethylene:**	100ppm	0ppm
Chlorine:	5ppm	-1.5<x$<0ppm	**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.

A3ST/F CiTiceL®

Sulfur Dioxide (SO_2) Gas Sensor
Part Number: AD045-H04

Key Features & Benefits

- 4th electrode for compensation of environmental changes
- Electrical connection via PCB pins or solder tags

Technical Specifications

MEASUREMENT

Operating Principle	4-electrode electrochemical
Measurement Range	0-10 ppm SO_2
Maximum Overload	100 ppm
Filter	To remove H_2S and HCl
Sensitivity	0.60 ± 0.12 µA/ppm
Response Time (T_{90})	< 40 s at 20°C
Baseline Offset (clean air)	0 to 0.1 ppm equivalent
Linearity	Linear

ELECTRICAL

Recommended Load Resistor	10 Ω
Bias Voltage	Not Required

MECHANICAL

Weight	22 g nominal
Housing Material	Polycarbonate
Pin Material	Mild steel with gold flash over nickel plate
Orientation	Any

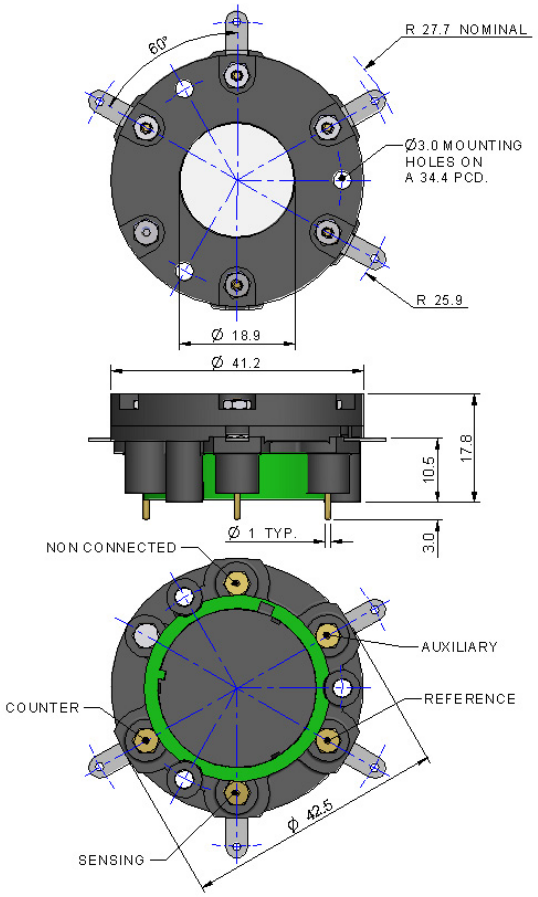
ENVIRONMENTAL

Typical Applications	Ambient Environmental Monitoring
Operating Temperature Range	-20°C to +50°C
Recommended Storage Temp	0°C to 20°C
Operating Pressure Range	Atmospheric ± 10%
Pressure Coefficient	0.020 ± 0.008 % signal/mBar
Operating Humidity Range	15 - 90% RH non-condensing

LIFETIME

Long Term Sensitivity Drift	< 10% signal loss/year
Expected Operating Life	Three years in air
Storage Life	6 months in CTL container
Standard Warranty	24 months from date of despatch

Product Dimensions



All dimensions in mm
All tolerances ±0.15 mm
unless otherwise stated

IMPORTANT NOTE:

Connection to PCBs should be made via PCB sockets only. Soldering to the pins will seriously damage your sensor and invalidate the warranty.

All performance data is based on conditions at 20°C, 50% RH and 1013 mBar, using City Technology recommended circuitry. For sensor performance data under other conditions, refer to the relevant Operating Principle or contact City Technology.

Evaluating the A3ST/F Output

The A3ST/F EnviroceL differs from standard three electrode sensors by the introduction of a second working electrode, known as the *Auxiliary.*
When no gas is present, there is a small zero gas (baseline) signal fom each electrode. Upon exposure to sulfur dioxide, the sensing electrode produces a signal proportional to the concentration of gas. Virtually all the CO is reacted on contact with this electrode so the *auxiliary* remains largely unaffected, and the signal remains at its baseline level. It can therefore be assumed that the *auxiliary* signal is wholly attributed to the baseline.

The baseline signal of both electrodes is slightly affected by changes in atmospheric conditions (eg. temperature). As both are subject to the same conditions, any shift in baseline on the sensing electrode will be followed by a similar shift in the *auxiliary*. By comparing the two signals any baseline changes may be compensated.

Evaluating the sulfur dioxide concentration of a sample from the two signals is a straightforward subtraction:-

Let	I_S	=	*Sensing* electrode signal
	I_A	=	*Auxiliary* electrode signal
	I_{SO2}	=	Baseline compensated sulfur dioxide signal
Then	I_{SO2}	=	$I_S - I_A$

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 gases. The table below is not exclusive and other gases not included in the table may still cause a sensor to react.

Gas	Cross Interference
Carbon Monoxide CO	None
Hydrogen Sulfide H_2S	None
Nitrogen Dioxide NO_2	-100%

SAFETY NOTE
Although this product is not designed for use in life safety applications, if it is used in such applications 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, to ensure that the sensor and/or instrument in which it is used, are operating properly. Failure to carry out such tests may jeopardize the safety of people and property.

EZT3SF CiTiceL®

Sulfur Dioxide (SO_2) Gas Sensor with EasyCal Transmitter

Key Features & Benefits:

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

Technical Specifications

MEASUREMENT

Sensor Type Used	3SF
Filter	None
Output	4-20 mA d.c., two wire loop powered
Response Time (T_{90})	<30 Seconds at 20°C
Resolution	1 ppm
Zero Shift (-20°C to +40°C)	< 5 ppm equivalent
Repeatability	1% of signal
Linearity	Linear

ELECTRICAL

Power Supply Required	10 - 35 VDC single-ended
Calibration	Via built-in push buttons

MECHANICAL

Mounting	Via mounting nose supplied
Weight	58 g including mounting accessory
Position Sensitivty	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	0.004% signal/mBar
Operating Humidity Range	15 - 90% RH non-condensing

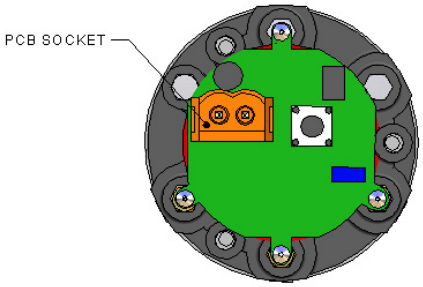
LIFETIME

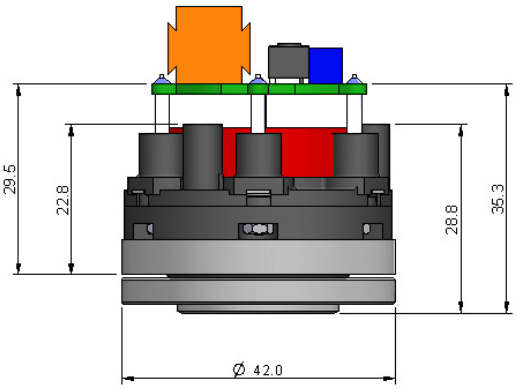
Long Term Sensitivity Drift	<2% signal loss/month
Expected Operating Life	Two years in air
Storage Life	6 months in CTL container
Standard Warranty	12 months from date of despatch

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 EasyCal 4-20mA transmitters, please refer to OP-13.

Product Dimensions





All dimensions in mm
All tolerances ±0.15 mm unless otherwise stated

RANGES AVAILABLE

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

Range	Order Code
0-100 ppm	2TD3F-1A
0-500 ppm	2TD3I-1A
0-1000 ppm	2TD3J-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)	3SF(ppm SO_2)
Carbon Monoxide, CO	300	<10
Hydrogen Sulfide, H_2S	15	≈30
Nitric Oxide, NO	35	0
Nitrogen Dioxide, NO_2	5	≈ -6
Hydrogen, H_2	100	<3
Hydrogen Chloride, HCl	5	≈1
Ethylene, C_2H_4	100	<50

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.

EZT3SH CiTiceL®

Sulfur Dioxide (SO_2) Gas Sensor with EasyCal Transmitter

Key Features & Benefits:

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

Technical Specifications

MEASUREMENT

Sensor Type Used	3SH
Filter	None
Output	4-20 mA d.c., two wire loop powered
Response Time (T_{90})	<15 Seconds at 20°C
Resolution	0.1 ppm
Zero Shift (-20°C to +40°C)	< 0.1 ppm equivalent
Repeatability	2% of signal
Linearity	Linear

ELECTRICAL

Power Supply Required	10 - 35 VDC single-ended
Calibration	Via built-in push buttons

MECHANICAL

Mounting	Via mounting nose supplied
Weight	58 g including mounting accessory
Position Sensitivty	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

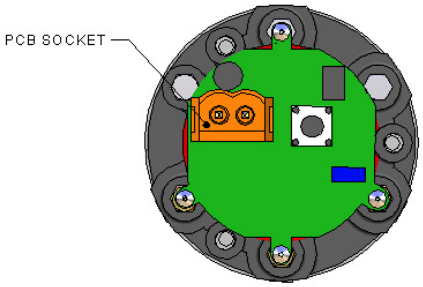
LIFETIME

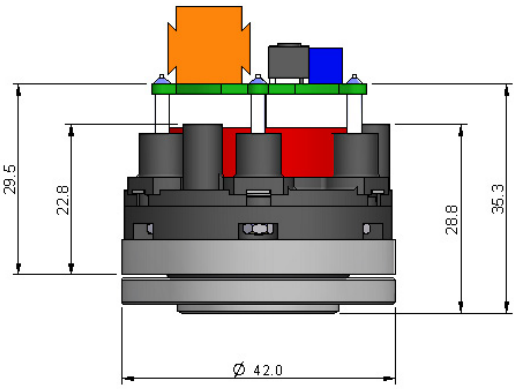
Long Term Sensitivity Drift	<2% signal loss/month
Expected Operating Life	Two years in air
Storage Life	6 months in CTL container
Standard Warranty	12 months from date of despatch

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 EasyCal 4-20mA transmitters, please refer to OP-13.

Product Dimensions





All dimensions in mm
All tolerances ±0.15 mm unless otherwise stated

RANGES AVAILABLE

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

Range	Order Code
0-5 ppm	2TD9A-1A
0-10 ppm	2TD9B-1A
0-20 ppm	2TD9C-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)	3SH (ppm SO_2)
Carbon Monoxide, CO	300	<3
Hydrogen Sulfide, H_2S	15	≈20
Nitric Oxide, NO	35	0
Nitrogen Dioxide, NO_2	5	≈ -6
Chlorine, Cl_2	1	≈ -0.5
Hydrogen, H_2	100	0
Hydrogen Cyanide, HCN	10	≈5
Hydrogen Chloride, HCl	5	≈0.5
Ethylene, C_2H_4	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.

EZT3ST/F CiTiceL®

Sulfur Dioxide (SO_2) Gas Sensor with EasyCal Transmitter

Key Features & Benefits:

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

Technical Specifications

MEASUREMENT

Sensor Type Used	3ST/F
Filter	To remove H_2S
Output	4-20 mA d.c., two wire loop powered
Response Time (T_{90})	<20 Seconds at 20°C
Resolution	0.5 ppm
Zero Shift (-20°C to +40°C)	< 1 ppm equivalent
Repeatability	1% of signal
Linearity	Linear

ELECTRICAL

Power Supply Required	10 - 35 VDC single-ended
Calibration	Via built-in push buttons

MECHANICAL

Mounting	Via mounting nose supplied
Weight	58 g including mounting accessory
Position Sensitivty	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	0.015% signal/mBar
Operating Humidity Range	15 - 90% RH non-condensing

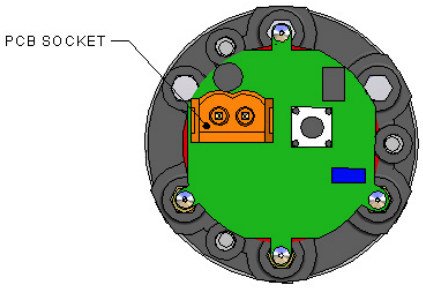
LIFETIME

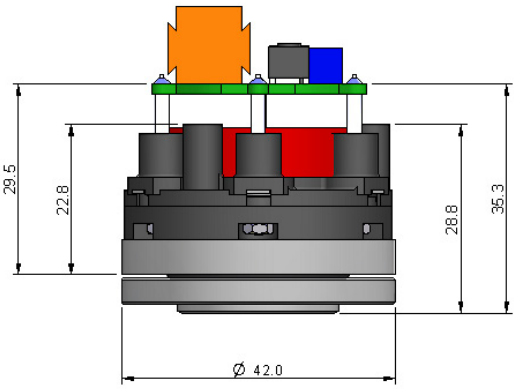
Long Term Sensitivity Drift	<2% signal loss/month
Expected Operating Life	Two years in air
Storage Life	6 months in CTL container
Standard Warranty	12 months from date of despatch

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 EasyCal 4-20mA transmitters, please refer to OP-13.

Product Dimensions





All dimensions in mm
All tolerances ±0.15 mm unless otherwise stated

RANGES AVAILABLE

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

Range	Order Code
0-20 ppm	2TD2C-1A
0-30 ppm	2TD2D-1A
0-50 ppm	2TD2E-1A
0-100 ppm	2TD2F-1A
0-200 ppm	2TD2G-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)	3ST/F (ppm SO_2)
Carbon Monoxide, CO	300	<5
Hydrogen Sulfide, H_2S	15	0
Nitric Oxide, NO	35	0
Nitrogen Dioxide, NO_2	5	≈ -5
Chlorine, Cl_2	1	< -0.5
Hydrogen, H_2	100	0
Hydrogen Cyanide, HCN	10	<5
Hydrogen Chloride, HCl	5	0
Ethylene, C_2H_4	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.

T3S/F CiTiceL®

Sulfur Dioxide (SO_2) Gas Sensor with Transmitter

Key Features & Benefits:

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

Technical Specifications

MEASUREMENT

Sensor Type Used	3S/F
Filter	None
Output	4-20 mA d.c.
Response Time (T_{90})	<30 Seconds at 20°C
Resolution	1 ppm
Zero Shift (-20°C to +40°C)	<5 ppm equivalent
Repeatability	1% 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 Sensitivty	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	0.004% signal/mBar
Operating Humidity Range	15 - 90% RH non-condensing

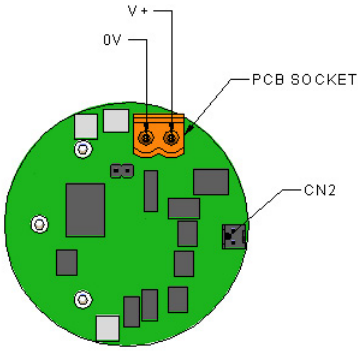
LIFETIME

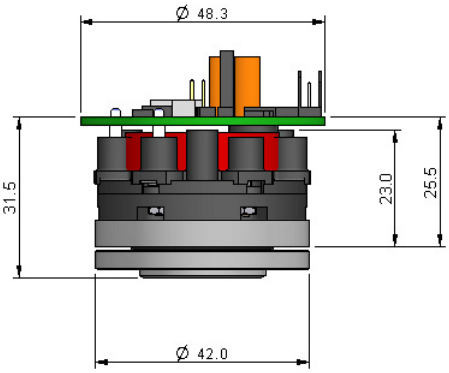
Long Term Sensitivity Drift	<2% signal loss/month
Expected Operating Life	Two years in air
Storage Life	6 months in CTL container
Standard Warranty	12 months from date of despatch

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

3S/F CiTiceL 4-20 mA Transmitters are available with the following precalibrated ranges, but can be recalibrated to intermediate ranges.

Range	Order Code
0-100 ppm	TD3F-1A
0-200 ppm	TD3G-1A
0-300 ppm	TD3H-1A
0-500 ppm	TD3I-1A
0-1000 ppm	TD3J-1A
0-2000 ppm	TD3K-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. The figures are expressed as a percentage of the primary sensitivity (i.e. SO_2 = 100%).

Gas	3SF (%)
Sulfur Dioxide, SO_2	100
Carbon Monoxide, CO	<3
Hydrogen Sulfide, H_2S	≈ 200
Nitric Oxide, NO	0
Nitrogen Dioxide, NO_2	≈ -125
Hydrogen, H_2	<3
Hydrogen Chloride, HCl	≈ 15
Ethylene, C_2H_4	<50

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.

T3ST/F CiTiceL®

Sulfur Dioxide (SO_2) Gas Sensor with Transmitter

Key Features & Benefits:

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

Technical Specifications

MEASUREMENT

Sensor Type Used	3ST/F
Filter	To remove H_2S
Output	4-20 mA d.c.
Response Time (T_{90})	<20 Seconds at 20°C
Resolution	0.5 ppm
Zero Shift (-20°C to +40°C)	<1 ppm equivalent
Repeatability	1% 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 Sensitivty	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	0.01% signal/mBar
Operating Humidity Range	15 - 90% RH non-condensing

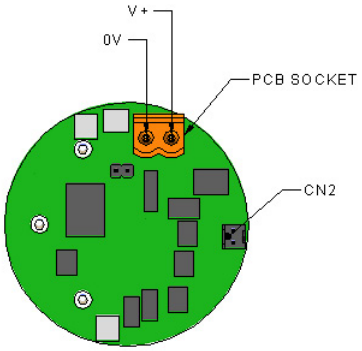
LIFETIME

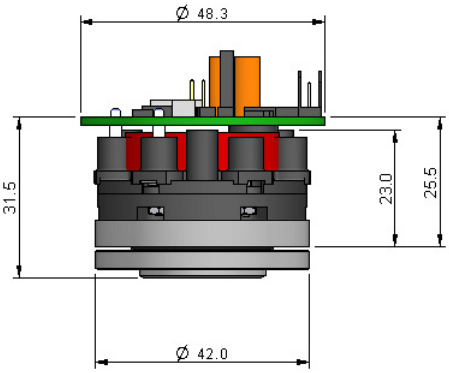
Long Term Sensitivity Drift	<2% signal loss/month
Expected Operating Life	Two years in air
Storage Life	6 months in CTL container
Standard Warranty	12 months from date of despatch

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

3ST/F 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	TD2B-1A
0-20 ppm	TD2C-1A
0-30 ppm	TD2D-1A
0-50 ppm	TD2E-1A
0-100 ppm	TD2F-1A
0-200 ppm	TD2G-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)	3ST/F (ppm SO_2)
Carbon Monoxide, CO	300	<5
Hydrogen Sulfide, H_2S	15	0
Nitric Oxide, NO	35	0
Nitrogen Dioxide, NO_2	5	≈ -5
Chlorine, Cl_2	1	< -0.5
Hydrogen, H_2	100	0
Hydrogen Cyanide, HCN	10	<5
Hydrogen Chloride, HCl	5	0
Ethylene, C_2H_4	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.w-

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.

4R 0 ~ 20 ppm SO_2 电化学传感器

特性指标

产品型号	**CLE-0421-400**
正常检测范围	0 - 20 ppm
最大检测浓度	150 ppm
灵敏度	0.5 ± 0.1 μA/ppm
底电流（20 ºC）	< ± 0.4 μA
基线漂移 (-20 to 50 ºC)	相当于 0~0.5 ppm
分辨率	0.1 ppm
响应时间 (T_{90})	≤ 45 秒
线性度	线性
长期稳定性	< 2%信号值/月

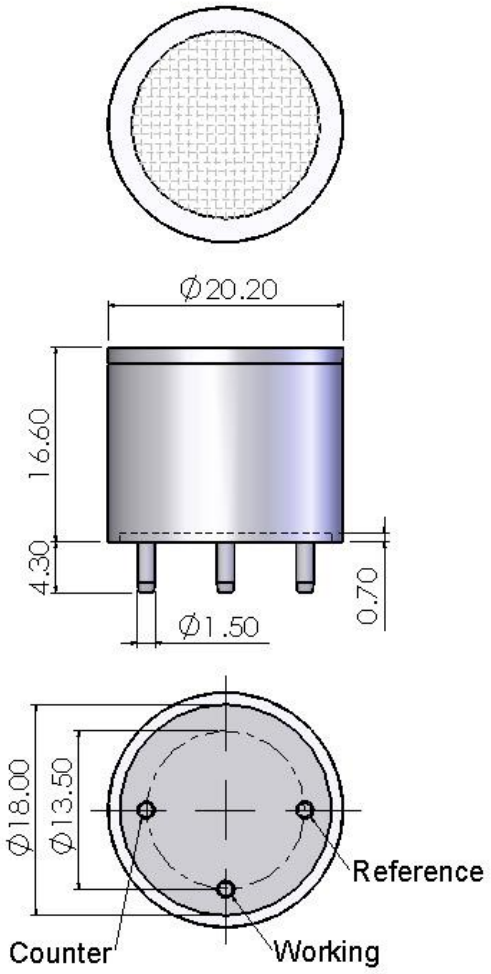
工作条件

工作温度	-20℃ ~ 40℃
工作湿度	15 ~ 90%RH （无冷凝）
工作压力	91 ~ 111 kPa
偏压	0 mV
储存时间	6 个月（专用包装盒中）
储存温度	0℃ ~20℃
使用寿命	2 年
质保期	交货后 12 个月

物理指标

重量	约 5 克
方位要求	无

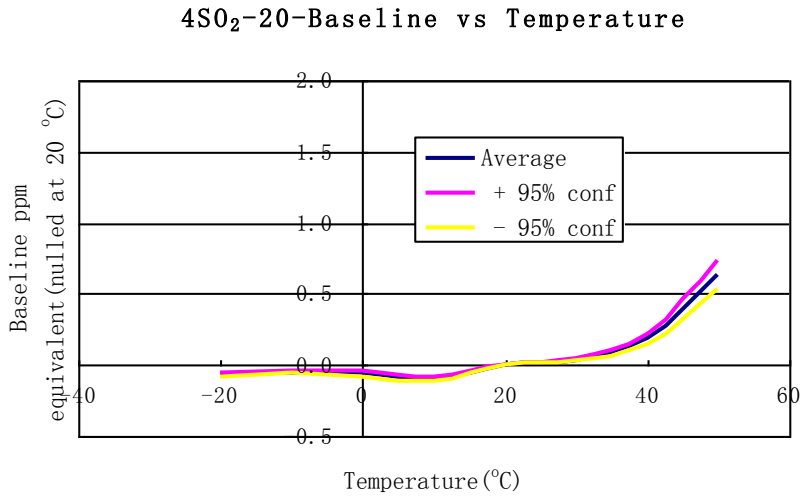
Outline Dimensions

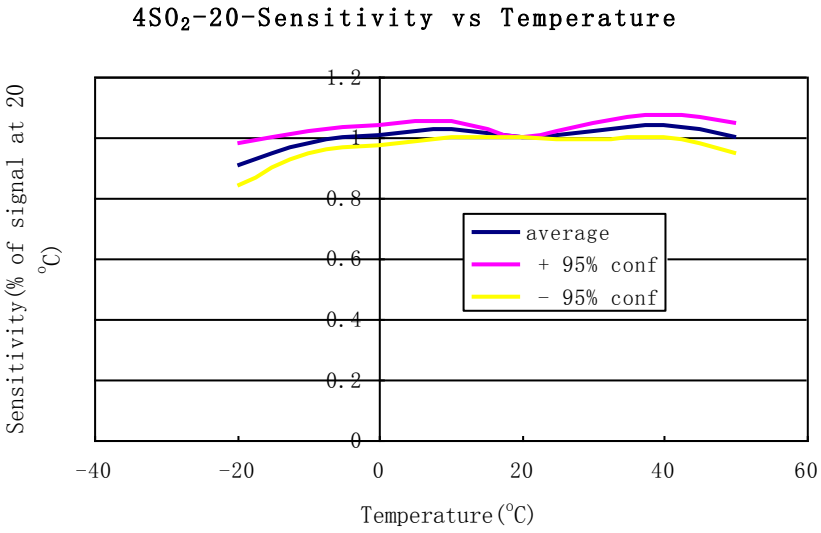


All dimensions in mm
All tolerances ±0.20mm
unless otherwise stated

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

Gas	浓度 (ppm)	输出信号（相当于 SO_2 浓度，ppm)
一氧化碳	300	<3
硫化氢	15	0
一氧化氮	35	0
二氧化氮	5	<-5

使用须知

1. 以上所有性能规格都是在环境条件：温度 20 ℃, 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。

二氧化硫传感器 0-20 ppm

性能表征

产品型号	CLE-0421-700
量程	0 to 20 ppm
最大荷载	100 ppm
灵敏度	0.34 ± 0.1 μA/ppm
基线	< ± 0.4 μA
基线漂移 (-20 °C to 50 °C)	相当于 0 to 3 ppm
分辨率	0.2 ppm
响应时间 (T_{90})	≤ 70 秒
线性度	线性
长期稳定性	< 2% 信号值 /月

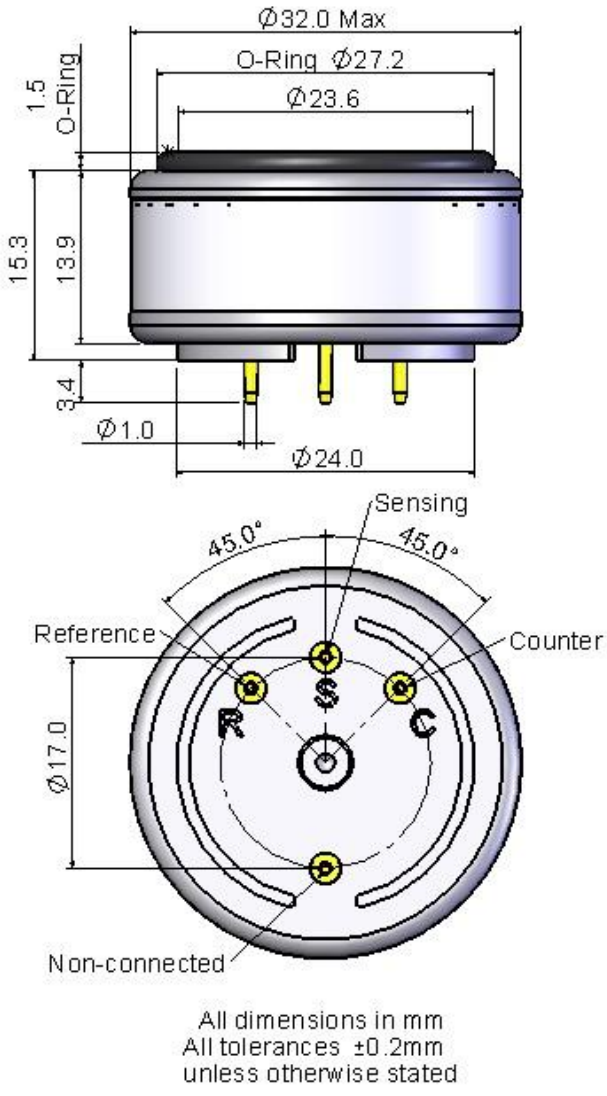
工作条件

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	0 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 8 克
方位要求	无

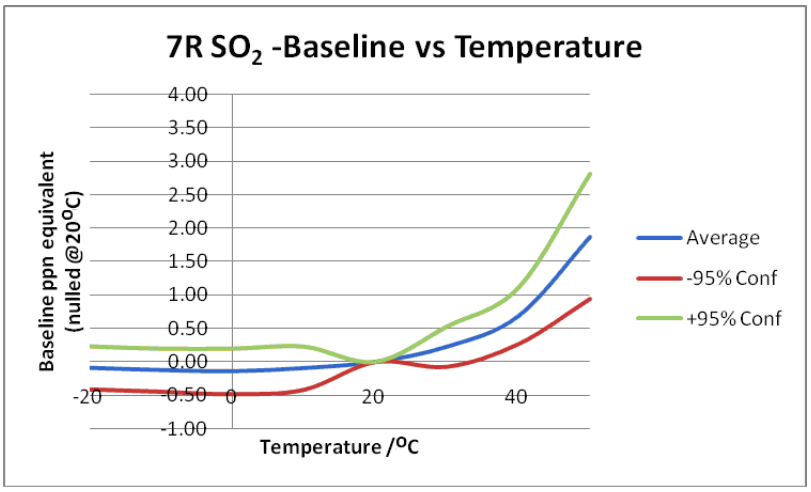
Outline Dimensions

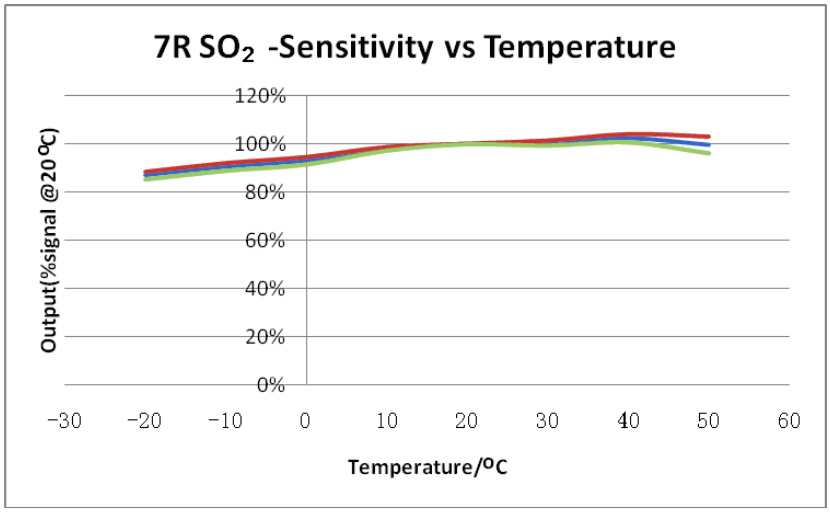


All dimensions in mm
All tolerances ±0.2mm
unless otherwise stated

Note: 推荐使用 PCB 插座来连接传感器，焊接会损害传器。

温度影响





交叉灵敏度

气体	浓度 (ppm)	输出信号 (相当于 ppm SO_2)
一氧化碳	300	<3
硫化氢	15	0
一氧化氮	35	0
二氧化氮	5	~-5

使用须知

1. 以上所有性能规格都是在环境条件：温度 20 ℃, 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。

二氧化硫传感器 0-2000 ppm

性能表征

产品型号	CLE-0423-400
量程	0 - 2000 ppm
最大荷载	4000 ppm
灵敏度	0.020 ± 0.008 μA/ppm
基线 (20 ºC)	< ± 0.4 μA
基线漂移 (-20 to 40 ºC)	相当于 0 to 4ppm SO_2
分辨率	5 ppm
响应时间（T_{90})	≤ 60 秒
线性度	线性
长期稳定性	< 2% 信号值/月

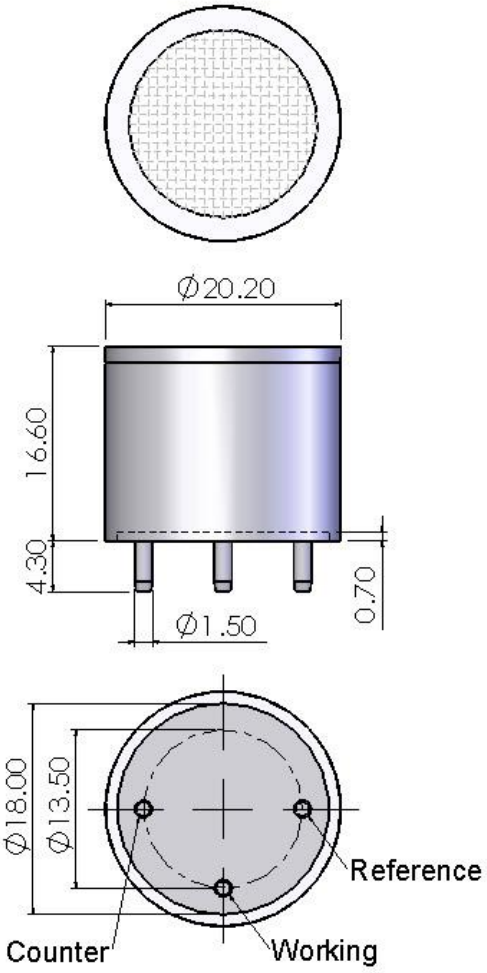
工作条件

工作温度	-20 to 50ºC
工作湿度	15 ~ 90%RH（无冷凝）
工作压力	90 to 110 kPa
偏压	0 mV
储存时间	6 个月（专用包装盒中）
储存温度	0 ºC to 20ºC
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

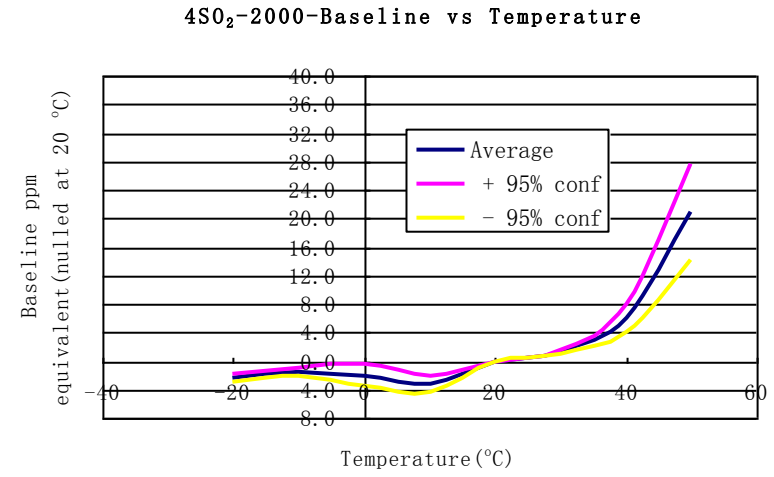
Outline Dimensions

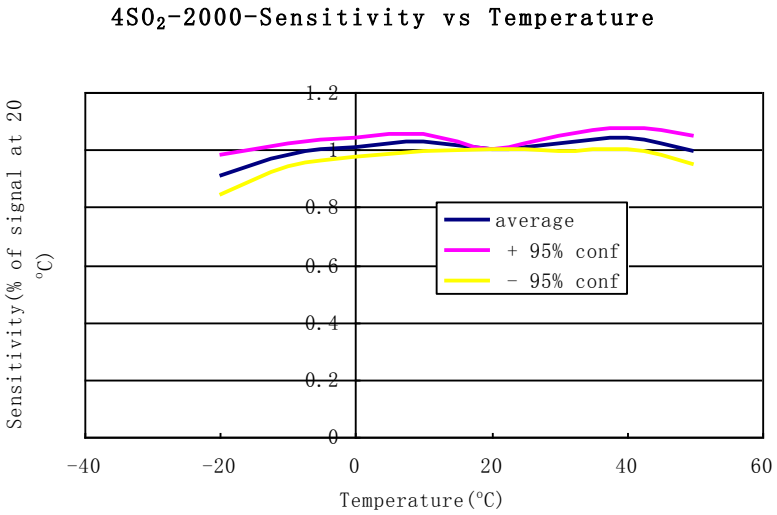


All dimensions in mm
All tolerances ±0.20mm
unless otherwise stated

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 SO_2)
一氧化氮	300	<30
硫化氢	15	0
一氧化氮	35	21
二氧化氮	5	<-5

使用须知

1. 以上所有性能规格都是在环境条件：温度 20 ℃, 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。

二氧化硫传感器 0 ~ 2000 ppm

性能表征

产品型号	CLE - 0423 -700
正常检测范围	0-2000 ppm
灵敏度	0.023± 0.011 μA/ppm
基线（20 °C）	< ± 0.4 μA
基线漂移(-20 ~ 40 °C)	相当于 0 ~ 20ppm SO_2
分辨率	5 ppm
响应时间(T_{90})	≤70 秒
线性度	线性
长期稳定性	<2% 信号值/月

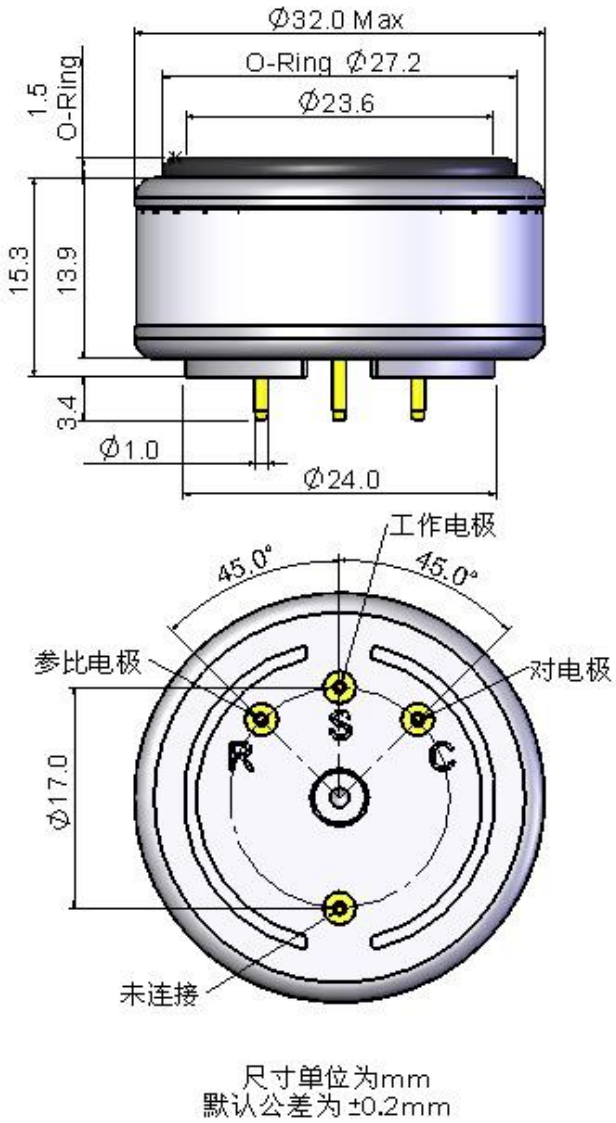
工作条件

工作温度	-20 ~ 50°C
工作湿度	15 ~ 90%RH （无冷凝）
工作压力	91 ~ 111 kPa
偏压	0 mV
储存时间	6 个月 （专用包装盒中）
储存温度	0 ~ 20°C
使用寿命	2 年
质保期	交货后 12 个月

物理指标

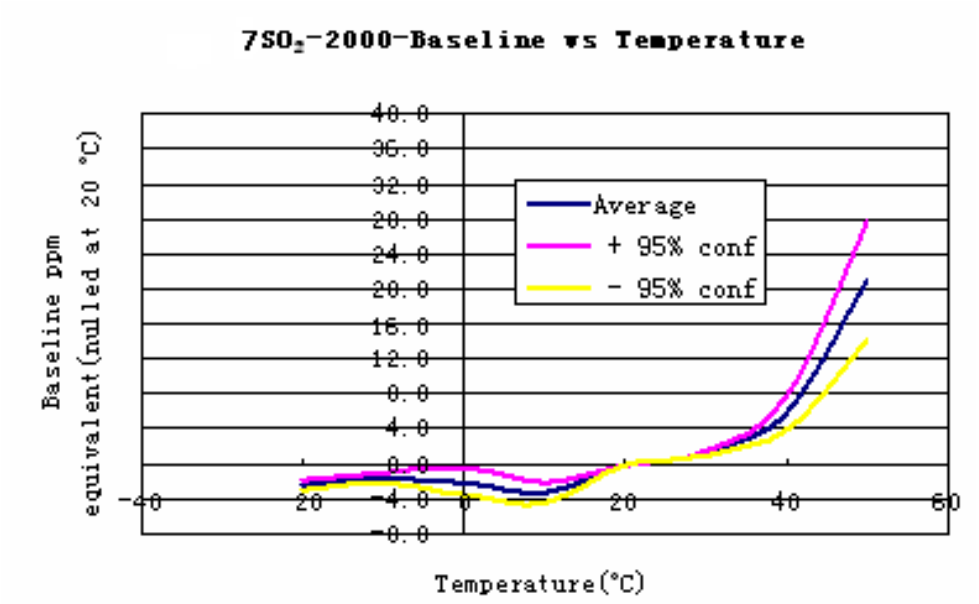
重量	约 8 克
方位要求	无

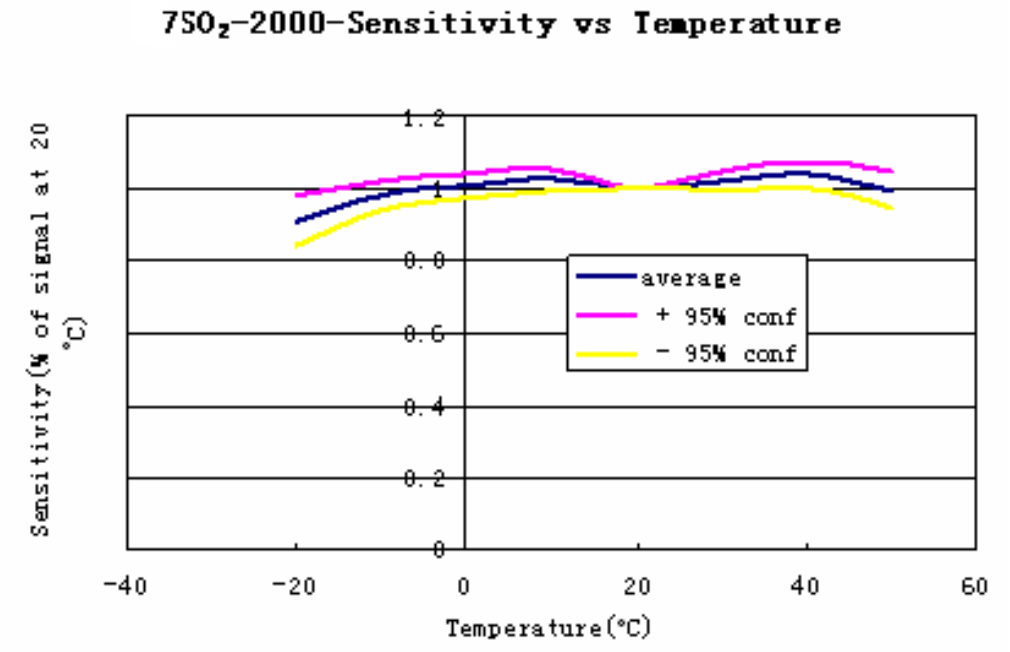
外形尺寸



尺寸单位为mm
默认公差为 ±0.2mm

温度影响





交叉灵敏度

气体种类	浓度 (ppm)	输出信号 (相当于 SO_2 浓度，ppm)
一氧化碳	300	<30
硫化氢	15	0
一氧化氮	35	21
二氧化氮	5	<-5