Honeywell

Sensepoint
LEL Combustible Sensor

SAFETY

WARNINGS

- This apparatus is not suitable for use in oxygen enriched atmospheres (>21%v/v). Oxygen deficient atmospheres (<10%v/v) may suppress sensor output.
- Refer to local or national regulations relative to installation at the site.
- Operators should be fully aware of the action to be taken if the gas concentration exceeds an alarm level.
- Installation should consider not only the best placing for gas leakage related to potential leak points, gas characteristics and ventilation, but also where the potential of mechanical damage is minimized or avoided.
- Electrostatic risk - Do not rub or clean with solvents. Clean with a damp cloth. High velocity airflows and dusty environments can cause hazardous electrostatic charges

CAUTIONS

- Atmospheres above 100% LEL may suppress the sensor reading.
- Do not modify or alter the sensor construction as essential safety requirements may be invalidated.
- Install using certified Ex e or Ex d junction box, connectors and glanding.
- Dispose of in accordance with local disposal regulations. Materials used –Fortron ® (PPS-Polyphenylene Sulphide)
- This equipment is designed and constructed as to prevent ignition sources arising, even in the event of frequent disturbances or equipment operating faults.

NOTE: The control card must have a suitably rated fuse.

1. INTRODUCTION & 2. ASSOCIATED DOCUMENTATION

ATEX SPECIAL CONDITIONS FOR SAFE USE

The detector must be protected from impact.
The integral supply cables must be protected from impact and terminated in a suitable terminal facility.
The detector is considered to present a potential electostatic risk and must not be located in high air flows or rubbed.

1. INTRODUCTION

Sensepoint is a sealed disposable sensor for the detection of flammable gases and is designed for use with an approved junction box.

It employs a catalytic pellistor sensor device which is used as part of a bridge measuring circuit.

Sensepoint is certified for hazardous areas to EN60079 and is protected against water and dust ingress to IP67. The installation must be consistent with the certification approval.

The sensor is available in M20, M25, M26 or 3/4 NPT thread versions. The sensors can be fitted with accessories such as Weather Protection, Flow Housings (for use when calibrating the sensor and in sampling systems), and a Collecting Cone for the detection of gases which are lighter than air

2. ASSOCIATED DOCUMENTATION

2106M0502 Sensepoint Technical Handbook.

Refer to the relevant control system manual for connection information.

Find out more
www.honeywellanalytics.com

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SPECIFICATION

Gases Detected
Combustible gases in the LEL range with the sensitivity dependent on gas type.
Range
0 - 100% LEL Methane. Other gas ranges may vary.
Operating Temperature Range
-40°C to +80°C (See Certification)
Operating Humidity Range
20% to 90% RH continuous.
10% to 99% intermittent - non condensing.
Operating Pressure Range
90 to 110kPa.
Warm-up Time
10 minutes
Voltage Range
2.9V to 3.5V bridge (at 200mA drive current).
Power Consumption
700mW.
Signal Output
mV bridge.
Sample Flow Rate
Recommended 1 to 1.5 litres/minute.
Poisoning
The sensing elements may become inactive after extensive exposure to silicones, halogenated hydrocarbons, heavy metals or sulphur compounds.
Expected Operating Life
5 years.
IP Rating
IP65 standard; IP67 with Weather Protection.
Dimensions
56mm diameter x 74mm long (maximum)
Weight
190g.

Honeywell

EC Declaration of Conformity

The undersigned of

Honeywell Analytics Limited
4 Stinsford Road
Poole
Dorset
BH17 0RZ
United Kingdom

Declares that the product listed below:

SENSEPOINT Combustible Gas Sensor

Sensepoint is a catalytic flammable hydrocarbon gas sensor certified for use in potentially explosive atmospheres.

Conforms to the provisions of the following European Directive(s), when installed, operated, serviced and maintained in accordance with the installation/operating instructions contained in the product documentation:

2004/108/EC — **EMC Directive**
94/9/EC — **ATEX Directive – Equipment for use in Potentially Explosive Atmospheres**

The standards and/or technical specifications referenced below have been applied or considered:

Harmonised Standard	Description
EN 50270:2006	Electromagnetic compatibility. Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen
EN 60079-0:2012	Explosive atmospheres. Equipment. General requirements
EN 60079-1:2007	Explosive atmospheres. Equipment protection by flameproof enclosures "d"
EN 60079-29-1:2007 *	Explosive atmospheres. Gas detectors. Performance requirements of detectors for flammable gases
EN 60079-31:2009	Explosive atmospheres. Equipment dust ignition protection by enclosure "t"

** When used with an approved controller*

Notified Body for ATEX
Baseefa Ltd
Rockhead Business Park
Staden Lane
Buxton
Derbyshire
SK17 9RZ

Certificate Number
Baseefa08ATEX0265X

Quality Assurance Notification Number
SIRA 11 ATEX M518

Type Approval
Ⓔx II 2 G D Ex d IIC T6 Gb Ex tb IIIC T85°C Db (-40°C ≤Ta ≤+55°C) IP67

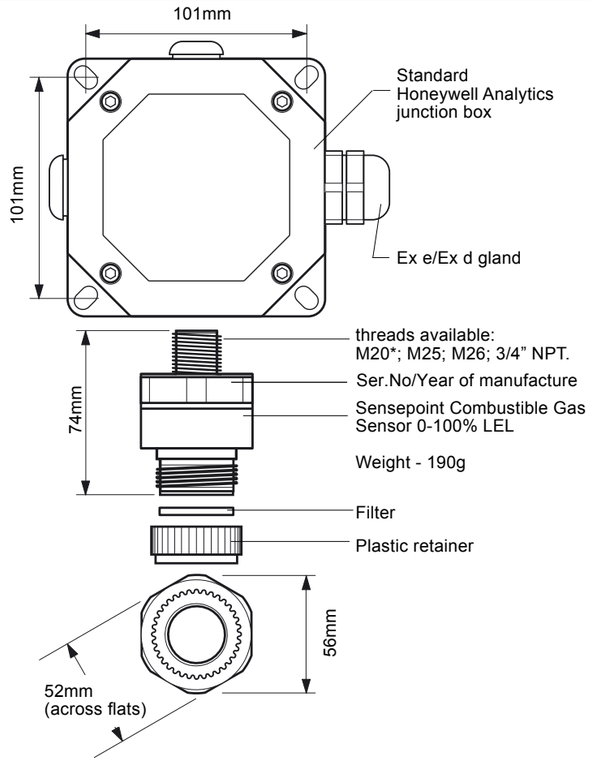
Alternative Marking T5/T100°C (-40°C ≤Ta ≤+70°C)
T4/T135°C (-40°C ≤Ta ≤+80°C)

Year of CE Marking: 1999

Signature:
Name: **Richard King**
Authorised Signatory
Date: **10th January 2013**
Declaration Number: **2004Y0002_03/A03939**
Declaration of Conformity in accordance with EN ISO/IEC 17050-1:2010

INVESTOR IN PEOPLE

Registered Office: Honeywell House, Arlington Business Park, Bracknell, Berkshire RG12 1EB
Registered in England No. 412076



SPARE PARTS

Sensor 2106B1200 (M20)
Sensor 2106B1201 (M25)
Sensor 2106B1202 (M26)
Sensor 2106B1204 (3/4NPT)
Weather protection 02000-A-1640
Sensor filter 00780-F-0018
Flow housing 02000-A-1645
Collecting cone.....02000-A-1642
Junction box (std).....00780-A-0100
High temperature junction box 2052D0001
High temperature weather protection 00780-A-0076

To reorder a complete new sensor, see the label on the product leads, or contact Honeywell Analytics.

CERTIFICATION LABEL

CE 0518 Honeywell Analytics Ltd Poole BH17 0RZ UK MADE IN UK
Sensepoint Combustible Baseefa08ATEX0265X Ⓔx II 2 GD IECEx BAS08.0068X
Ex d IIC T6 Gb, Ex tb IIIC T85°C Db (–40°C TO +55°C) T5/T100°C (–40°C TO +70°C)
T4/T135°C (–40°C TO +80°C) IP67 WARNING–STATIC RISK–READ MANUAL Vmax=35Vac/dc Pmax=2W

3. INSTALLATION

Installation and service must be performed by a qualified installation engineer with the power to the sensor disconnected.

The Sensepoint must be fitted into a suitably approved Ex e or Ex d junction box fitted with a suitably approved cable gland. This should be correctly installed before use.

The sensor should be installed in a location free from direct heat sources. For optimum protection against water ingress ensure that the sensor is installed facing downwards.

See the Sensepoint Gas Sensors Technical Handbook for installation in a duct or in forced air conditions.

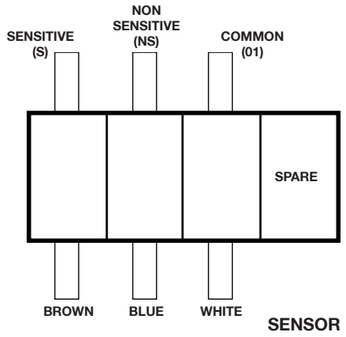
Remove the sensor's protective disc before use by unscrewing the filter housing, removing the filter and then the disc. Discard the protective disc. Refit the filter into the filter housing and replace the filter housing on the sensor.

The field connections should be three-core multi-strand cable with a maximum conductor size of 2.5mm^2 (14AWG). A screened cable is recommended for optimum performance.

The sensor should be fitted into a threaded hole within the junction box and locked in place with a lock nut. Ensure that junction box thread is compatible with sensor thread.

Connect the field and Sensepoint wiring to the junction box connector block as shown in the following diagram. The unit requires 200mA current with a nominal 3V supply.

Wiring connections are:-



Following installation the sensor must be calibrated.

4. SENSOR CALIBRATION

Caution: Calibration procedures should only be carried out by qualified personnel.

Note: Sensors should be calibrated at concentrations representative of those to be measured. It is always recommended that the Sensepoint sensor is calibrated with the target gas it is to detect. If this is not possible, cross calibration should be performed.

Since combustible sensors require oxygen for correct operation, a mixture of gas in air should be used for calibration purposes.

4.1 CALIBRATION PROCEDURE

The calibration adjustments are carried out at the control card and gassing is performed at the sensor.

(1) Apply power and allow the sensor to warm up for 10 minutes.

(2) First ensure there is no gas present on the sensor. If combustible gas is suspected to be in the vicinity of the Sensepoint sensor, fit a Flow Housing accessory and flow clean air over the sensor.

(3) Set the zero reading on the control system.

(4) Remove the filter housing or accessory and replace it with a Flow Housing accessory, if not already fitted.

(5) Connect the Flow Housing input to a regulated cylinder, containing a known concentration of target gas at approximately the sensor alarm point (e.g. 50% LEL Methane in air), using nylon or PTFE tubing.

Caution: As some test gases may be hazardous, the Flow Housing outlet should exhaust to a safe area.

(6) Pass the gas through the Flow Housing at a flow rate of approximately 1 to 1.5 litres per minute. Allow the sensor two to three minutes to stabilise.

(7) Adjust the control card to indicate the concentration of the target gas being applied

Note: It is useful to record the mV output of the sensor, via the control card, throughout the life of the sensor to ensure that there are no poisoning effects that will reduce the sensor performance. This would be indicated by a reduction in the mV output for the same gas concentration. It is recommended that the sensor is replaced when 60% loss has occurred.

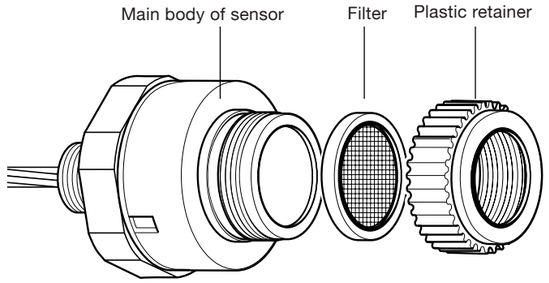
For calibration using the Weather Protection in high flow applications refer to the technical handbook.

Routine Maintenance Schedule

Frequency	Maintenance Action	Equipment Required
6 monthly	Check the zero and span	Test Gas, Regulator, Flow Housing
On gas alarm	Check the zero and span Replace the sensor if necessary	Test Gas, Regulator, Flow Housing
3 monthly	Check the filters for cleanliness	
5 yearly	Replace the sensor if required	

Changing the Filter

1. Unscrew and remove the filter housing/retainer or accessory from the sensor body.
2. Remove the old filter and replace with a fresh filter.
3. Replace the filter housing/retainer or accessory.



4.2 CROSS CALIBRATION

Caution: Where the user calibrates any sensor using a different gas, responsibility for identifying and recording calibration rests with the user. Refer to the local regulations where appropriate.

When the Sensepoint Combustible LEL sensor is to be calibrated with a gas which is different to the gas or vapour to be detected, it is necessary to calculate the effective concentration of the calibration gas as follows:

Note: Table 1 lists the gases according to the reaction they produce at a given detector. An eight star (8) gas produces the highest output, while a one star (1*) gas produces the lowest output.*

1. Obtain the star rating for the calibration gas and the gas to be detected from table 1.
2. Using table 2, look up the correction factor.
3. Multiply the Calibration Gas concentration (in %LEL) by the correction factor to get the effective concentration.
4. Use the effective concentration when setting up the control card during the calibration procedure.

Table 1 – Star Rating of gases

Gas	CAS Number	LEL (%v/v)	Star Rating
Acetone	67-64-1	2.5	5
Ammonia	7664-41-7	15.0	7
Benzene	71-43-2	1.2	3

Butane	106-97-8	1.4	4
Butanone	78-93-3	1.8	4
Butyl Acetate	123-86-4	1.3	2
Butyl Acrylate	141-32-2	1.2	2
Cyclohexane	110-82-7	1.2	4
DiEthyl Ether	60-29-7	1.7	4
Ethane	74-84-0	2.5	5
Ethanol	64-17-5	3.1	5
Ethyl Acetate	141-78-6	2.2	4
Ethylene	74-85-1	2.3	5
Heptane	142-82-5	1.1	3
Hexane	110-54-3	1.0	3
Hydrogen	1333-74-0	4.0	6
Methane	74-82-8	4.4	6
Methanol	67-56-1	5.5	5
MIBK	108-10-1	1.2	3
Octane	111-65-9	0.8	2
Pentane	109-66-0	1.4	3
Propan-2-ol	67-63-0	2.0	3
Propane	74-98-6	1.7	4
Propylene	115-07-1	2.0	5
Styrene	100-42-5	1.1	2
TetraHydroFuran	109-99-9	1.5	3
Toluene	108-88-3	1.1	3
TriEthylAmine	121-44-8	1.2	4
Xylene	1330-20-7	1.0	2

Table 2 – Correction Factor

Star Rating of Calibration Gas	Star Rating of Gas to be Detected							
	8*	7*	6*	5*	4*	3*	2*	1*
8*	1.00	1.24	1.52	1.89	2.37	2.98	3.78	4.83
7*	0.81	1.00	1.23	1.53	1.92	2.40	3.05	3.90
6*	0.66	0.81	1.00	1.24	1.56	1.96	2.49	3.17
5*	0.53	0.66	0.80	1.00	1.25	1.58	2.00	2.55
4*	0.42	0.52	0.64	0.80	1.00	1.26	1.60	2.03
3*	0.34	0.42	0.51	0.64	0.80	1.00	1.27	1.62
2*	0.26	0.33	0.40	0.50	0.63	0.79	1.00	1.28
1*	0.21	0.26	0.32	0.39	0.49	0.62	0.78	1.00

IMPORTANT
Assuming an average sensor performance, the sensitivity information in tables 1 and 2 is normally accurate to ± 20%.

Example
- Target gas to be detected is Butane. The calibration gas available is 46%LEL Methane.
- The star rating of Methane is 6 and Butane is 4.
- From Table 2, the correction factor is 1.56.
- The control card should therefore be told the concentration is (46.0 x 1.56) = 72%LEL in order to give an accurate reading for Butane using Methane as a calibration gas.

6. FAULT FINDING

Caution: There are no user serviceable parts within the Sensepoint and attempted changes may invalidate the certification requirements.

Sensor reads non zero all the time:
- Gas could be present, ensure there is no target gas in the atmosphere.

Sensor reads non zero when no gas is present:
- Adjust the control system zero.

Sensor reads low when gas is applied:
- Adjust the control system span.

Sensor reads high when gas is applied:
- Adjust the control system span.

Sensor reads zero when gas is applied:
- Check the wiring.
- Check the dust protection disc is removed from the filter housing.
- Check the sensor is not obstructed.
- Check the sinter and filters are not obstructed.
- Replace the sensor if failure is suspected.