**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 minimised or avoided.
- Electrostatic risk - Do not rub or clean with solvents.
- Atmospheres above 100% LEL may suppress the sensor reading.
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- Dispose of in accordance with local disposal regulations. Materials used - Fortron IP (PPS-Polyphenylene Sulphone)
- This equipment is designed and constructed as to prevent ignition sources arising, even in the event of frequent disturbances or equipment operating faults.

**SPECIFICATION**

- **Gases Detected**: Combustible gases in the LEL range with the sensitivity dependant 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.
- **Weight**: 190g.

**Operating Instructions**

**Senspoint**

**LEL Combustible Sensor**

**SAFETY**

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

**APPENDIX A - SPECIFICATIONS**

**APPENDIX B - EC DECLARATION**

**APPENDIX C - MAIN FEATURES**

**OPERATING INSTRUCTIONS**

**Senspoint**

**LEL Combustible Sensor**

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**NOTE**: The control card must have a suitably rated fuse.
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 2.5mm² (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.

4. CALIBRATION

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 nylor 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.

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.

4.2 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:

Table 1 lists the gases according to the reaction they produce at a given concentration. At 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

<table>
<thead>
<tr>
<th>Gas</th>
<th>GAS Number</th>
<th>LEL (%v)</th>
<th>Star Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>67-64-1</td>
<td>2.5</td>
<td>5</td>
</tr>
<tr>
<td>Ammonia</td>
<td>7664-41-7</td>
<td>15.0</td>
<td>7</td>
</tr>
<tr>
<td>Benzene</td>
<td>71-43-2</td>
<td>1.2</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 2 – Correction Factor

<table>
<thead>
<tr>
<th>Star Rating of Calibration Gas</th>
<th>Star Rating of Gas to be Detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>8*</td>
<td>8*</td>
</tr>
<tr>
<td>7*</td>
<td>7*</td>
</tr>
<tr>
<td>6*</td>
<td>6*</td>
</tr>
<tr>
<td>5*</td>
<td>5*</td>
</tr>
<tr>
<td>4*</td>
<td>4*</td>
</tr>
<tr>
<td>3*</td>
<td>3*</td>
</tr>
<tr>
<td>2*</td>
<td>2*</td>
</tr>
<tr>
<td>1*</td>
<td>1*</td>
</tr>
</tbody>
</table>

Butane  106-97-8  1.4  4

Butane  78-93-3  1.4  4
Buty Acetate  126-84-3  1.2  4
Buty Acetate  141-22-2  1.2  7
Cyclohexane  110-82-7  1.2  4
DiEthyl Ether  60-29-7  1.7  4
Ethane  74-86-4  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  133-74-0  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  111-69-9  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  115-07-9  2.0  5
Propane  100-42-5  1.1  2
TetraHydroFuran  109-99-9  1.5  3
Toluene  108-88-3  1.1  3
TriEthylamine  121-64-8  1.2  4
Xylene  1330-23-7  1.0  2

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 / 1.56) = 24% LEL in order to give an accurate reading for Butane using Methane as a calibration gas.

5. MAINTENANCE

5.1 INSTRUCTIONS ON MAINTENANCE

5.1.1 Replacement of the filter

5.1.2 Check for the presence of dust

5.1.3 Replace if necessary

5.1.4 Replace the filters if required

5.1.5 Check the filters for cleanliness

5.2 Replacement of the filter housing

5.2.1 Check that the dust protection cap has been removed.

5.2.2 Check the meter settings for 50% LEL calibration gas

5.2.3 Remove the old filter and replace with a fresh filter.

6. FAULT FINDING

Caution: There are no user serviceable parts within the Sensepoint sensor as they 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.

Routine Maintenance Schedule

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Maintenance Action</th>
<th>Equipment Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 monthly</td>
<td>Check the zero and span</td>
<td>Test Gas, Regulator, Flow Housing</td>
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<td>On gas alarm</td>
<td>Check the zero and span</td>
<td>Test Gas, Regulator, Flow Housing</td>
</tr>
<tr>
<td>3 monthly</td>
<td>Check the filters for cleanliness</td>
<td></td>
</tr>
<tr>
<td>5 yearly</td>
<td>Replace the sensor if required</td>
<td></td>
</tr>
</tbody>
</table>

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.

Main body of sensor
Plastic retainer
Filter

5 yearly
Replace the sensor if required

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• 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.