Technical Manual

Honeywell


# Signalpoint Pro

# 1 Safety

Ensure that this Operating Manual is read and understood **BEFORE** installing / operating / maintaining the equipment. Pay particular attention to **Warnings** and **Cautions**.

All document **Warnings** are listed here and repeated where appropriate at the start of the relevant chapter(s) of this Operating Manual.

**Cautions** appear in the sections / sub-sections of the document where they apply.

***WARNINGS***

*SIGNALPOINT PRO IS DESIGNED FOR INTRINSICALLY SAFE INSTALLATION AND USE IN ZONE 1 OR 2 HAZARDOUS AREAS IN EUROPE, AND DIVISION 1 AREA APPLICATIONS IN NORTH AMERICA.*

*INSTALLATION MUST BE IN ACCORDANCE WITH THE RECOGNIZED STANDARDS OF THE APPROPRIATE AUTHORITY IN THE COUNTRY CONCERNED.*

*POWER MUST BE OFF AT THE SOURCE DURING WIRING OPEATIONS (REFER TO CONTROL DRAWING P-1446)*

*FOR INTRINTRINSICALLY SAFE INSTALLATION, TO MAINTAIN INTRINSIC SAFETY, THE TRANSMITTER WIRING MUST BE ROUTED THROUGH A GALVANIC ISOLATOR OR ZENER DIODE BARRIER WHICH MEETS THE ENTITY PARAMETERS INDICATED IN THE CONTROL DRAWING P-1446. THE SELECTED BARRIER SHALL BE APPROVED WITH INTRINSICALLY SAFE CIRCUITS FOR THE HAZARDOUS LOCATION CLASS AND GROUP AS APPROPRIATE FOR THE APPLICATION. THE CABLE CAPACITANCE PLUS THE TRANSMITTER CAPACITANCE (Ci) MUST BE LESS THAN OR EQUAL TO THE Ca ON THE BARRIER. THE CABLE INDUCTANCE PLUS THE TRANSMITTER INDUCTANCE (Li) MUST BE LESS THAN OR EQUAL TO THE La ON THE BARRIER. THE BARRIER MUST BE LOCATED IN THE NON-HAZARDOUS AREA.*

*ALL INTRINSICALLY SAFE WIRING SHALL BE KEPT SEPARATE FROM NON-INTRINSICALLY SAFE WIRING. TERMINATE ZENER BARRIER EARTH GROUND TO THE GROUND BUS OF THE POWER DISTRIBUTION PANEL (CONTROLLER). RESISTANCE TO GROUND MUST NOT BE GREATER THAN 1.0 OHM.*

*ELECTRICAL APPARATUS CONNECTED TO AN INTRINSICALLY SAFE SYSTEM MUST NOT USE OR GENERATE MORE THAN 250V (Vrms) WITH RESPECT TO EARTH GROUND.*

*INSTALLATION MUST BE IN ACCORDANCE WITH THE BARRIER MANUFACTURER'S INSTRUCTIONS AND WITH ARTICLE 504/505 IN THE NATIONAL ELECTRIC CODE, ANSI/NFPA 70.*

*BARRIER ENCLOSURE MUST MEET REQUIREMENTS OF ANSI/ISA S82 FOR USE IN NON-HAZARDOUS OR CLASS I, DIVISION 2, GROUPS A,B,C AND D HAZARDOUS LOCATIONS. USE A UL LISTED OR NRTL APPROVED DUST TIGHT ENCLOSURE AND CONDUIT FITTINGS APPROPRIATE FOR ENVIRONMENTAL PROTECTION IN CLASS II, DIVISION 2, GROUPS F AND G, AND CLASS III, HAZARDOUS LOCATIONS.*

*ACCESS TO THE INTERIOR OF THE DETECTOR MUST ONLY BE CONDUCTED BY TRAINED PERSONNEL. TO REDUCE RISK OF IGNITION OF HAZARDOUS ATMOSPHERE, FOLLOW THE 'LIVE MAINTENANCE' INSTRUCTIONS.*

*IT IS RECOMMENDED TO BUMP TEST THE SENSORS FREQUENTLY TO ENSURE PROPER OPERATION*

*DO NOT LEAVE UNIT WITH SENSOR INSTALLED UNPOWERED FOR LONG PERIOD OF TIME AT OR BELOW -10°C*

*TAKE CARE WHEN HANDLING SENSORS AS THEY MAY CONTAIN CORROSIVE SOLUTIONS.*
*DO NOT TAMPER OR IN ANY WAY DIS-ASSEMBLE THE SENSOR.*
*DO NOT EXPOSE TO TEMPERATURES OUTSIDE THE RECOMMENDED RANGE.*
*DO NOT EXPOSE SENSOR TO ORGANIC SOLVENTS OR FLAMMABLE LIQUIDS.*

*SENSORS ARE NOT INTENDED FOR USE IN ATMOSPHERES CONTAINING OXYGEN CONCENTRATIONS GREATER THAN 21% BY VOLUME.*

*AT THE END OF THEIR WORKING LIFE, SENSORS MUST BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER. DISPOSAL SHOULD BE ACCORDING TO LOCAL WASTE MANAGEMENT REQUIREMENTS AND ENVIRONMENTAL LEGISLATION.*
*ELECTROCHEMICAL CELLS SHOULD NOT BE INCINERATED AS THEY MAY EMIT TOXIC FUMES.*
*ALTERNATIVELY, SENSORS MAY BE SECURELY PACKAGED AND RETURNED TO HONEYWELL ANALYTICS CLEARLY MARKED FOR ENVIRONMENTAL DISPOSAL.*

# 2 Information

Honeywell Analytics can take no responsibility for installation and / or use of its equipment if this is not done in accordance with the appropriate issue and / or amendment of the Operating Manual.

The reader of this Operating Manual should ensure that it is appropriate in all details for the exact equipment to be installed and / or operated. If in doubt, contact Honeywell Analytics for advice.

The following types of notices are used throughout this Operating Manual:

***WARNING***

***Identifies a hazardous or unsafe practice which could result in severe injury or death to personnel.***

***Caution: Identifies a hazardous or unsafe practice which could result in minor injury to personnel, or product or property damage.***

*Note: Identifies useful / additional information.*

Every effort has been made to ensure the accuracy of our documents, however, Honeywell Analytics can assume no responsibility for any errors or omissions in our documents or there consequences.

Honeywell Analytics greatly appreciates being informed of any errors or omissions that may be found in the contents of any of our documents.

For information not covered in this document, or there is a requirement to send comments/corrections about this document, please contact Honeywell Analytics.

**Honeywell Analytics reserve the right to change or revise the information supplied in this document without notice and without obligation to notify any person or organization of such revision or change. If information is required that does not appear in this document, contact the local distributor/agent or Honeywell Analytics.**

# 3 Table of contents

# 4 Introduction

The Signalpoint Pro gas detector is designed to detect toxic or Oxygen gas hazards that are commonly found in industrial applications.

A local display provides gas concentration readings. A magnetic wand and magnetic switch, when used in conjunction with the display, enables non intrusive one man calibration. The detector has an integral IP66 (NEMA 4X) plastic junction box that includes 3 mounting holes thereby eliminating the need for additional mounting brackets. 1 x 21mm diameter clearance cable / conduit entry and 1 x 21mm diameter clearance knockout allow for incoming cable connections. The output is an industry standard 2 wire IS 4-20mA loop. Signalpoint Pro is suitable for connection to a wide range of Honeywell Analytics or 3rd party control equipment.

## 4.1 Product overview

The Signalpoint Pro detector is supplied as a toxic or Oxygen transmitter with a separate plug in sensor.

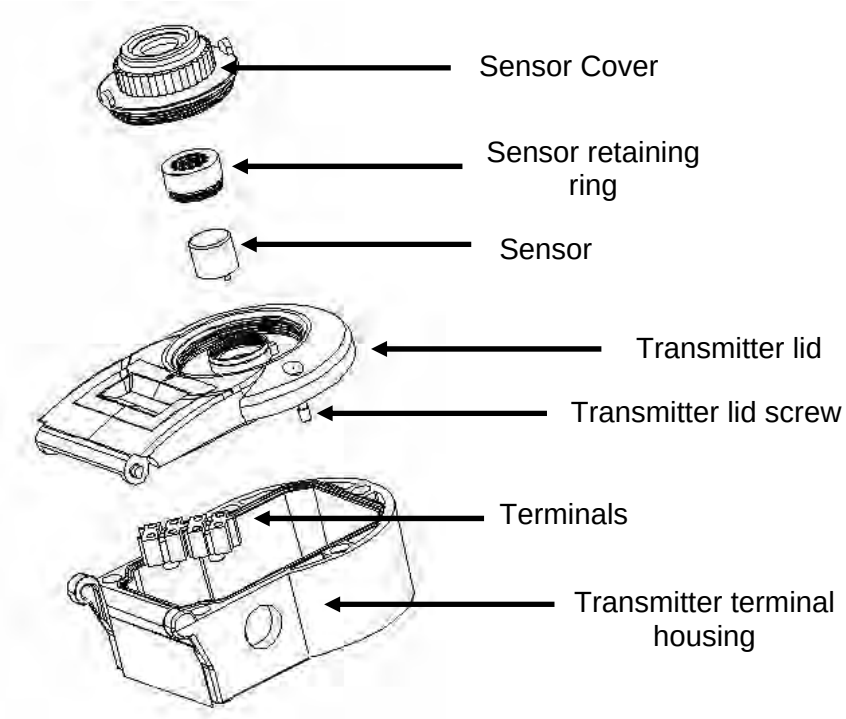



Diagram 1: Signalpoint Pro explode view

### 4.1.1 Transmitter

Two versions of transmitter are available; toxic or Oxygen versions. The toxic version is for use with Hydrogen Sulphide, Carbon Monoxide, Sulphur Dioxide, Ammonia, Nitrogen Dioxide and Hydrogen sensors. The Oxygen version is specifically for use with the Oxygen sensor.

The removable sensor cover and retaining ring allow sensors to plug into the transmitter without having to open the main terminal housing. The LCD display and

magnetic switch target are located on the front of the transmitter lid. The hinged lid opens to reveal the large terminal compartment. Additional user programmable features are made using the pushbuttons on the transmitter electronics assembly located on the inside of the transmitter lid.

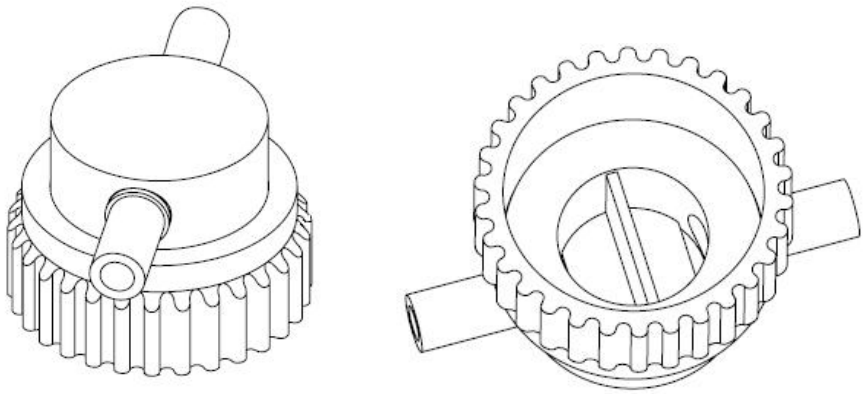
### 4.1.2 Sensor

To ensure maximum operating life, the plug-in sensors are supplied in a separate container with each new Signalpoint Detector. When fitted the gas type and default sensor range for each sensor is automatically recognised. Replacement sensors can be simply installed by removing the old sensor and plugging in a new one, even with the unit under power.

### 4.1.3 Accessories

**Calibration gas flow housing**

The calibration gas flow housing (part number SGPTPPCFA) is used for calibration or sample flow applications.



**Weatherproof cap**

A weatherproof cap is available (part number 02000-A-1635) to offer additional protection against harsh environments. It also includes a remote gassing nozzle to allow the application of response test gas.

*Note: this item is not to be used for calibration purposes. Speed of response will be slower with the weather protection fitted.*
*Do not use with the Sulfur Dioxide or Nitrogen Dioxide ($SO_2$ or $NO_2$) sensor.*

All accessories are supplied with an installation instruction leaflet.

# 5 Installation

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*ELECTRICAL APPARATUS CONNECTED TO AN INTRINSICALLY SAFE SYSTEM MUST NOT USE OR GENERATE MORE THAN 250V (Vrms) WITH RESPECT TO EARTH GROUND.*

*INSTALLATION MUST BE IN ACCORDANCE WITH THE BARRIER MANUFACTURER'S INSTRUCTIONS AND WITH ARTICLE 504/505 IN THE NATIONAL ELECTRIC CODE, ANSI/NFPA 70 AND/OR CANADIAN ELECTRICAL CODE SECTION 18.*

*BARRIER ENCLOSURE MUST MEET REQUIREMENTS OF ANSI/ISA S82 FOR USE IN NON-HAZARDOUS OR CLASS I, DIVISION 2, GROUPS A,B,C AND D HAZARDOUS LOCATIONS. USE A UL LISTED OR NRTL APPROVED DUST TIGHT ENCLOSURE AND CONDUIT FITTINGS APPROPRIATE FOR ENVIRONMENTAL PROTECTION IN CLASS II, DIVISION 2, GROUPS F AND G, AND CLASS III, HAZARDOUS LOCATIONS.*

*ACCESS TO THE INTERIOR OF THE DETECTOR MUST ONLY BE CONDUCTED BY TRAINED PERSONNEL REFER TO THE "LIVE MAINTENANCE" SECTION.*

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*TO REDUCE RISK OF IGNITION OF HAZARDOUS ATMOSPHERE, DISCONNECT THE EQUIPMENT FROM THE SUPPLY CIRCUIT BEFORE REMOVING THE METAL PLATE LOCATED ON THE DETECTOR HOUSING COVER.*

*BEFORE CARRYING OUT ANY WORK ENSURE LOCAL REGULATIONS AND SITE PROCEDURES ARE FOLLOWED. APPROPRIATE STANDARDS MUST BE FOLLOWED TO MAINTAIN THE OVERALL CERTIFICATION OF THE DETECTOR.*

*IT IS RECOMMENDED TO BUMP TEST THE SENSORS FREQUENTLY TO ENSURE PROPER OPERATION*
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## 5.1 Mounting and location of detectors

***Caution: The location of the detectors should be made in accordance with any relevant local and national legislation, standards or codes of practice. Always replace detectors with a detector of the same type.***

The detector should be mounted where the gas is most likely to be present. The following points should be noted when locating gas detectors.

- When locating detectors consider the possible damage caused by natural events e.g. rain or flooding.
- Consider ease of access for functional testing and servicing.
- Consider how escaping gas may behave due to natural or forced air currents.

*Note: The placement of detectors should be determined following the advice of experts having specialist knowledge of gas dispersion, experts having knowledge of the process plant system and equipment involved, safety and engineering personnel. The agreement reached on the location of detectors should be recorded.*

The hinged transmitter lid, when opened, reveals three mounting holes (suitable for M3.5 or No. 6 screws) thereby removing any need for additional mounting brackets. These mounting holes are outside the weatherproof seal to maintain the IP rating.

The hinged lid ensures hands free, unhindered access, to terminals for easy termination of incoming cables. A pre-drilled 21mm diameter clearance entry (LHS) and 21mm clearance knockout (RHS) allow connection via conduit or cable with suitable glands.

The use of 2 core screened cable is required to prevent false alarms due to sources of electromagnetic interference. The use of conduit or suitably mechanically protected cabling and compression glands is recommended for any safety related gas monitoring system.

Industrial applications will typically use 0.5mm$^2$ (20AWG) to 1.0mm$^2$ (16AWG) cross sectional area cable or similar.

To mount a Signalpoint Detector use the following procedure:

1. Mark the location of the 3 mounting holes on the mounting surface using the dimensional diagram below.
2. Prepare the mounting holes using appropriate fixings for the type of mounting surface and suitable for M3.5 or No. 6 screws.
3. Open the hinged transmitter lid and align the enclosure mounting holes with the holes in the mounting surface.
4. Secure the enclosure to the surface using the mounting screws.

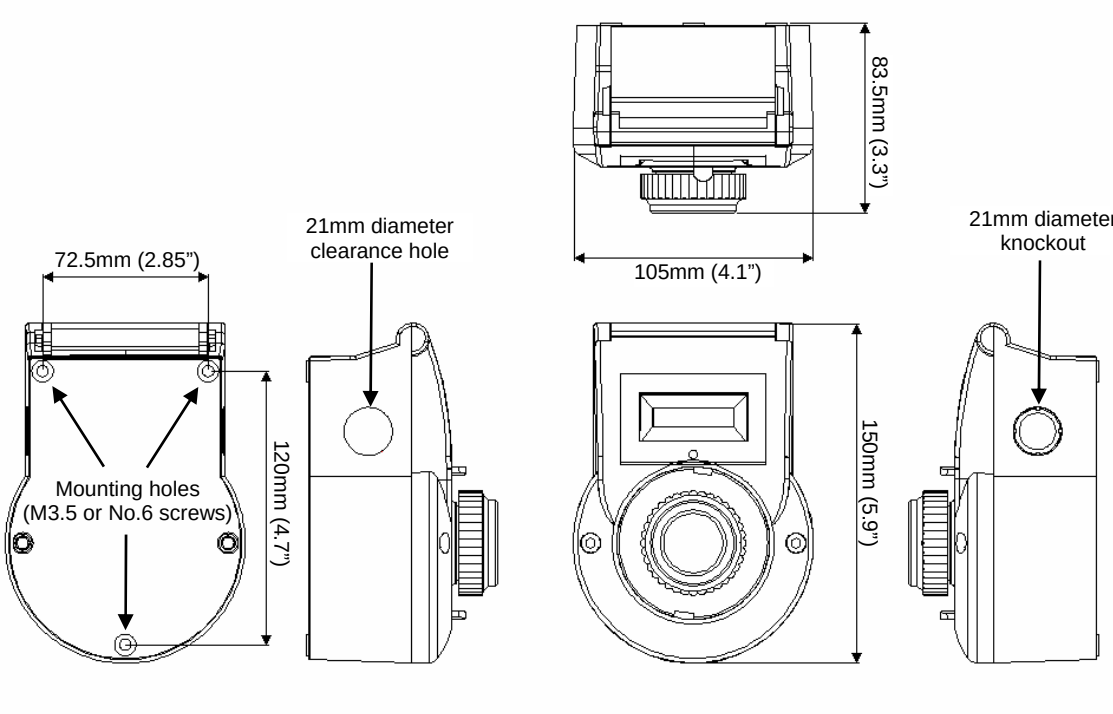


Diagram 2: Detector dimensions and mounting hole locations

# 6 Electrical connections

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## 6.1 Detector wiring schematics

***Caution: All electrical connections should be made in accordance with any relevant local or national legislation, standards or codes of practice.***

For European Zone 1 or 2 or North American Class I Division 1 area installation a suitable barrier or Isolator is required (refer to Section 6.3).

### 6.1.1 Hazardous Zone 1 or Div 1 installation type 1

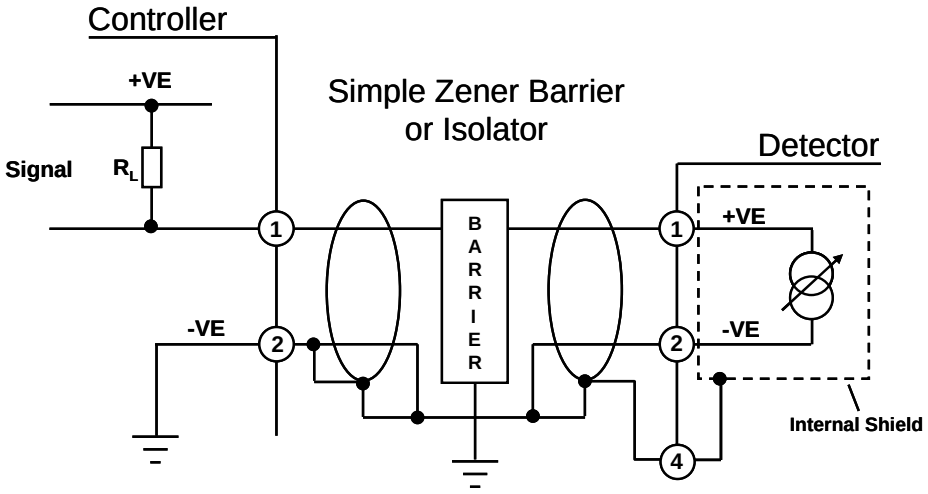



Diagram 3: Single barrier schematic

### 6.1.2 Hazardous Zone 1 or Div 1 installation type 2

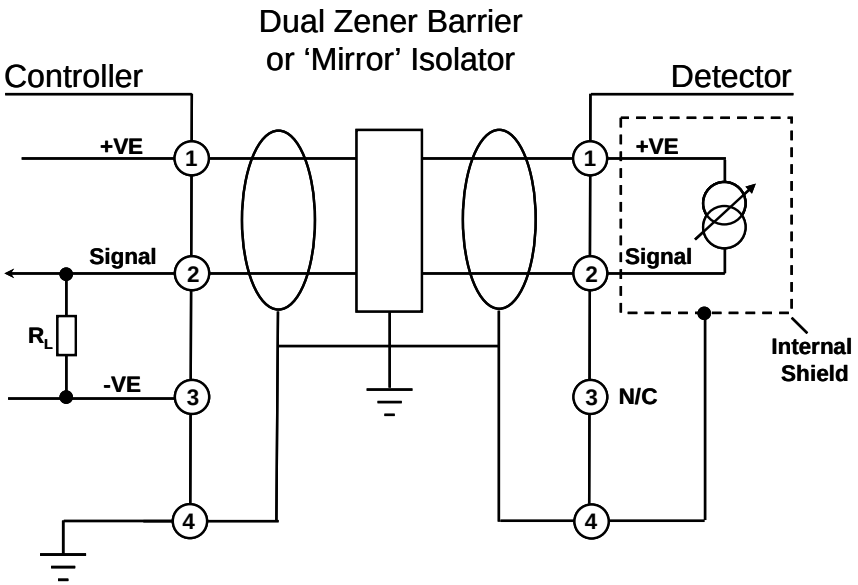
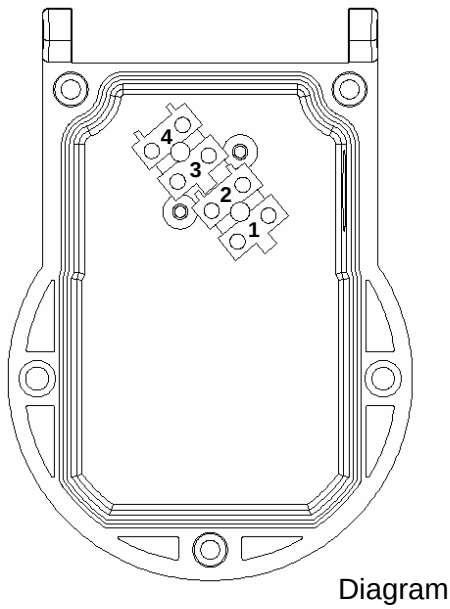



Diagram 4: Dual barrier schematic

## 6.2 Terminal connections




| | Connection | Sensor Wire Colour |
|---|---|---|
| **Terminal 1** | +VE | Red |
| **Terminal 2** | Signal | White |
| **Terminal 3** | Not used | Black |
| **Terminal 4** | Screen | Braid |

*Note: The maximum cable length is determined by the capacitance and inductance of the cable, but must be equal to, or less than, the capacitance (Ca) and inductance (La) values indicated on the barrier used. If the cable capacitance and inductance are not known, 60 pico-farads and 0.20 micro-henry per foot should be used for calculation.*

Diagram 5: Terminal connections

## 6.3 Maximum cable length calculation

The limiting factors in calculating maximum cable lengths when using barriers and isolators are the total capacitance and inductance. Barriers and isolators have a fixed amount of capacitance and inductance that can be connected to their outputs. The cable between the field device and barrier/isolator will have a value for capacitance and inductance per metre or kilometre that will be available from the manufacturer or supplier.

To calculate the maximum cable lengths, calculate the total capacitance and inductance for the length of cable, add any capacitance or inductance due to the field device (Signalpoint Pro capacitance and inductance = 0). The resulting totals should not be greater than the value shown for the barrier or isolator.

**Example using MTL7787+ dual channel zener barrier:**

Capacitance permitted by the barrier = Cb
Inductance permitted by the barrier = Ib
Internal capacitance of the field device = Cf
Internal inductance of the field device = If
Capacitance of the cable per metre = Cc
Inductance of the cable per metre = Ic
Total allowable capacitance for the cable = Ca
Total allowable inductance for the cable = Ia

All capacitance measurements are in microfarads, all inductance measurements are in millihenries. Using the Safety Description of an MTL7787+ for a IIC gas as an example:

Safety Description: 28v, 93mA 0.651W
Cb = 0.083 microfarads
Ib = 3.05 millihenries

Total allowable capacitance Ca= Cb-Cf, Ca = 0.083-0 = 0.083

Total allowable inductance Ia = Ib-If, Ia = 3.05-0 = 3.05

If the cable type is known, then the parameters from the manufacturer should be used otherwise refer to the Signalpoint Pro control drawing P-1446, page 2 of 2 which suggests values of:-

**In North American Installations:**

Cc = 60pF/foot (0.00006 microfarads) and lc = 0.2 microhenries/foot (0.0002 millihenries)

**In European Installations:**

Cc = 200pF/m (0.0002 microfarads) and lc = 0.66 microhenries/m (0.00066 millihenries)

**Using the values per metre for European Installations:**

Maximum length of cable due to capacitance = Ca/Cc = 0.083/0.0002 = **415 metres**

Maximum length of cable due to inductance = Ia/Ic = 3.05/0.00066 = **4621.21 metres**

As is often the case, capacitance is the most limiting figure and so the maximum cable length will be **415 metres.**

*Note: Due to circuit limitations, do not run cable in excess of 1219metres (4,000ft) even if the above formulas allow a longer length.*

## 6.4 Suggested barriers and isolators

Listed below are some suggested barriers and isolators for use with Signalpoint Pro.

MTL7728+ (single channel zener barrier)
MTL7787+ (2-channel zener barrier)
MTL5042 (Galvanic Isolator)
Pepperl+Fuchs KFD2-STC4-EX1 (Galvanic Isolator)

*Note: It is up to the user to ensure that the barrier or isolator used is suitable for their application.*

***Caution: A single channel barrier solution is only suitable when used with a controller that provides the load resistor in the source or positive supply line where the negative of the barrier input is tied to earth ground (see section 6.1.1)***

## 6.5 Cable screening

In order to ensure the cable screen length and diameter is suitable for the terminal, it is recommended that a short length of wire is crimped to the cable shield braid as shown in the diagram below.

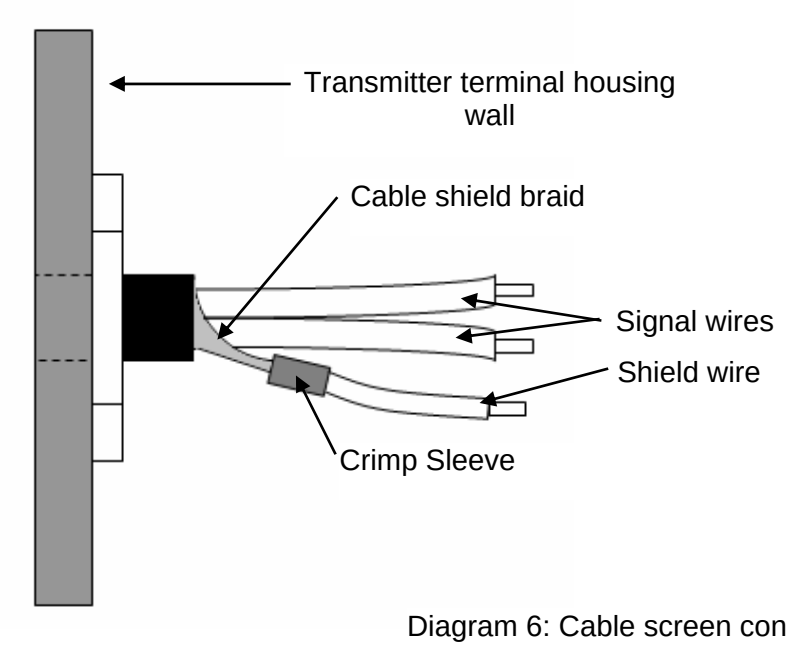



Diagram 6: Cable screen connection

*Note: Cable shield "pigtail" and conductors must be as short as possible.*

# 7 Default configuration

The Signalpoint Pro toxic and Oxygen gas detectors are supplied with the following default configuration.

| **Detector 4-20mA output signal** | |
|---|---|
| Fault / Under-range | ≤3mA |
| Inhibit | 4mA (toxic) or 17.38mA (for Oxygen) |
| Zero signal | 4mA |
| Full scale | 20mA |
| Overrange / Fault | Greater than 20mA |
| Maximum current | 23mA |

| **Gas** | **Full Scale Range** | | | **Span Calibration Point** | | |
|---|---|---|---|---|---|---|
| | **Default** | **Range** | **Steps** | **Default** | **Range** | **Steps** |
| Oxygen | 0.0-25.0%/Vol | 25%Vol only | - | 20.9%/Vol | 20.9%/Vol only | N/A |
| Hydrogen Sulphide | 0-15.0ppm | 10.0 to 50.0ppm | 1.0 | 10ppm | 5 to 30ppm | 5.0ppm |
| Hydrogen Sulphide | 0-100ppm | 50 to 500ppm | 10 | 50ppm | 20 to 300ppm | 5ppm |
| Carbon Monoxide | 0-300ppm | 100 to 999ppm | 100 | 100ppm | 40 to 600ppm | 5ppm |
| Sulfur Dioxide | 0.0-15.0ppm | 5.0 to 20.0ppm | 5.0 | 7.5ppm | 2.0 to 12.0ppm | 0.5ppm |
| Ammonia | 0-200ppm | 50 to 200ppm | 50 | 100ppm | 20 to 120ppm | 5ppm |
| Ammonia | 0-1,000ppm | 200 to 1,000ppm | 50 | 300ppm | 80 to 600ppm | 10ppm |
| Nitrogen Dioxide | 0.0-10.0ppm | 5.0 to 50.0ppm | 5.0 | 5.0ppm | 2.0 to 30.0ppm | 1.0ppm |
| Hydrogen | 0-1,000ppm | 1,000ppm only | - | 500ppm | 400 to 600 ppm | 10ppm |

For details of how to change the full scale range or span calibration point refer to section 8.1 and 8.2

# 8 First time switch on

After mounting and wiring the transmitter, the plug in sensor should be fitted and the installation visually and electrically tested as below.

***WARNING***
***Prior to carrying out any work ensure local and site procedures are followed. Ensure that the associated control panel is inhibited so as to prevent false alarms.***
***Minimum and maximum controller alarm levels should not be set at less than 10% or greater than 90% of the full scale range of the detector.***

***Caution: The following procedure should be followed carefully and only performed by suitably trained personnel***

1. Check that the transmitter is the correct type for the plug in sensor to be used.
2. Check that the transmitter is wired correctly according to this manual and the associated control equipment manual.
3. Unscrew the sensor cover and retaining ring.
4. The sensor is supplied in a sealed pot. Pull off the plastic seal strip and remove the sensor pot lid. Unpack the sensor from the plastic bag and remove the shorting spring.
5. Plug in the sensor taking care to align the sensor pins with the connector holes provided.

***Caution: For toxic sensors, remove the shorting spring from the bottom of the sensor prior to installation. For $O_2$ sensor, there is no shorting spring provided.***

6. Refit the sensor retaining ring and sensor cover. Ensure the gasket that fits between the sensor and sensor retaining ring is located in retaining ring.
7. Apply power to the associated controller which will in turn provide power to the detector.

***WARNING***
***Review 'Live Maintenance' procedures in section 10.1 prior to proceeding***

8. The detector display will enter a start up routine first displaying all the LCD segments, then the software version number, then the detection range and finally a countdown to 0. (Countdown time varies from 30 seconds to 4 minutes, depending on the sensor type). During this 'start up' sequence, the current output will remain at 4mA.
9. Once countdown is complete, the detector will enter normal operating mode.
10. Check the voltages at the transmitter terminals are above the minimum requirement.
11. Calibration is mandatory before the detector can be used for gas monitoring. Refer to Section 8.3 Calibration for the proper procedure.

*Note: The Signalpoint Pro detector will not turn on if powered up within 5 seconds of power off.*

## 8.1 Setting full scale detection range

Each plug in sensor has a default (recommended) full scale detection range. For most sensors this range is user adjustable. The associated controller's alarm level should not be set less than 3% of the detector's full scale detection range. Refer to Section 7 for default full scale ranges and available adjustable ranges.

To set the full scale range to a new value follow the procedure below:

1. Loosen the 2 transmitter lid screws and carefully open the hinged lid.
2. Locate the two push button switches marked Mode and Set located on the back of the transmitter lid.
3. With the instrument in normal operating mode, press and release the Mode button once. Then, press and hold down the Mode button for about 5 seconds until it reads "SPA xxx" where "xxx" is the detection range.
4. To change the range, press and release the Set button to increment the display reading until the desired value is reached.
5. With the range set to the new value, press the Mode button to return to the normal operating mode.
6. Close the transmitter lid and re-tighten the two screws.

*Note: The unit will be inhibited during this mode. It will exit this mode if no button is pressed within 30 seconds*

## 8.2 Changing span calibration point

Each plug in sensor has a default (recommended) span calibration point. For most sensors this point is user adjustable. Refer to Section 7 for default span calibration points and adjustable calibration point ranges.

To set the span calibration point to a new value follow the procedure below:

1. Loosen the 2 transmitter lid screws and carefully open the hinged lid.
2. Locate the two push button switches marked Mode and Set located on the back of the transmitter lid.
3. With the instrument in normal operating mode, press and release the Mode button.
4. The display will read CAL 'xx'. 'xx' is the recommended default level if no adjustment has previously been made (e.g. '100' for CO)
5. To change the span calibration point, press and release the Set button to increment the display reading until the desired value is reached.
6. With the span calibration point set to the new value, press the Mode button to return to the normal operating mode.
7. Close the transmitter lid and tighten the two screws.

*Note: The span calibration point may be checked at any time by pressing the Mode button while the instrument is in normal operating mode. Pressing the Mode button again will return the unit to normal operating mode. The unit will be inhibited during this mode. It will exit this mode if no button is pressed within 30 seconds*

## 8.3 Calibration

***WARNINGS***
***It is recommended to bump test the sensors frequently to ensure proper operation***

There are different procedures for calibrating the toxic and Oxygen versions of the Signalpoint Pro gas detector. For the toxic version see section 8.3.1. For the Oxygen version see section 8.3.2.

### 8.3.1 Zeroing and span calibration of the toxic version detector

***Caution: Before initial calibration allow the detector to stabilize for 30 minutes after applying power. When in zeroing and span calibration mode the current output from the detector is inhibited at 4mA to avoid false alarms. Certain gasses (such as $SO_2$) may require preconditioning of tubing, regulators and other components used for calibration to ensure accurate calibration.***

To calibrate the detector, use an appropriate span gas cylinder, zero air cylinder (if required), 300-375mL/min flow regulator, tubing, activation magnet and calibration flow housing. Contact your Honeywell Analytics representative for details of suitable calibration kits.

To calibrate the toxic detector follow the procedure below:

1. Apply zero air to the sensor using the flow calibration housing if the area where the detector is located contains any residual amount of the target gas. If no residual gas is present then the background air can be used to perform the zero calibration.
2. To access the calibration mode, swipe the end of the activation magnet once over the oval mark located at the bottom center of the detector front label until the display indicates ‘tESt’. This will be displayed for 15 seconds. Do not swipe the magnet during this time. If there is no new magnet swipe by the end of the “tESt” display, the instrument will automatically proceed to the calibration mode.”
3. The display will indicate ‘CAL’ and the calibration level.
4. The display will then indicate ‘ZEr XXX’ (where ‘XXX’ is the length of time 30 seconds to 4 minutes dependent on gas type) and commence counting down to “0”.
5. When “0” is reached, if the zero is successful the display will show ‘APPLY’ then ‘GAS’. If not successful ‘ZEr Err’ is displayed and the detector returns to normal operating mode.
6. The display alternates between “APP GAS” and the gas reading to indicate that the unit is expecting gas to be applied to the sensor.
7. If using the zero-air, turn it off. Zeroing is complete and saved. If span calibration is required, proceed to the next step. Otherwise, wait until the unit automatically returns to the normal monitoring mode.
8. Connect the regulator to the span gas cylinder.
9. Apply the span gas to the detector using the calibration flow housing.

10. The gas reading will begin to rise. When 50% of the calibration gas level is reached, a countdown to zero (length of time 30 secs to 4 minutes dependant on gas type) will commence and appear on the left side of the display while the current gas reading will be indicated on the right. If 50% of the expected concentration is not reached 'Cal Err' is displayed and the detector returns to normal operating mode.
11. After the countdown reaches '0', if the span is successful the instrument will briefly display 'PURGE' then 'GAS' and then indicate the current gas level.
12. The display alternates between "Pur GAS" and the gas reading to indicate that the unit is expecting gas to be removed from the sensor.
13. Promptly switch off the calibration span gas and remove the calibration cap from the detector to allow the gas to disperse.
14. When the instrument reads below 50% of the calibration gas level, it displays 'Pur' on the left for purging and indicates a countdown on the right (30 seconds to 4 minutes dependant on gas type). During this time, it continues to output a 4mA inhibit signal to the controller to help prevent false alarms.
15. When the countdown is finished, the calibration procedure is complete. Then, the instrument returns to the normal operating mode.

### 8.3.2 Calibrating the Oxygen version detector

***Caution: When in zeroing and span calibration mode the current output from the detector is inhibited at 17.38mA to avoid false alarms.***

To calibrate the detector, use an appropriate span gas cylinder, zero air cylinder (if required), 300-375mL/min flow regulator, tubing, activation magnet and calibration flow housing. Contact your Honeywell Analytics representative for details of suitable calibration kits.

Zeroing of the Oxygen version detector does not require user to apply gas. Normally the span can be set using background air which contains 20.9%VOL Oxygen. If for any reason background air cannot be used then span the detector using a zero air cylinder, 300-375mL/min flow regulator, tubing, and calibration flow housing. Contact your Honeywell Analytics representative for details of suitable calibration kits.

To calibrate the Oxygen detector follow the procedure below:

1. If necessary apply zero air to the sensor using the flow calibration housing.
2. To access the calibration mode, swipe the end of the activation magnet once over the oval mark located at the bottom center of the detector front label until the display indicates 'tESt'. This will be displayed for 15 seconds. Do not swipe the magnet during this time. If there is no new magnet swipe by the end of the "tESt" display, the instrument will automatically proceed to the calibration mode.
3. The display will indicate 'CAL 20.9'. 20.9 is the span calibration level and is fixed for Oxygen detectors.
4. The display will then indicate 'ZEr 45' and commence counting down to '0'.
5. When '0' is reached, if the zero is successful the display will show 'APPLY' then 'GAS'. If not successful 'ZEr Err' is displayed and the detector returns to normal operating mode.
6. After successful zero the display automatically switches to span calibration and shows a 45 second count down on the left of the display and the current detector reading on the right of the display.

7. After the count down reaches ‘0’, if the span calibration is successful the instrument will return to normal operation. If not successful ‘Cal Err’ is displayed and the detector returns to normal operating.
8. If using zero air switch off the regulator and remove the calibration flow housing.
9. The calibration procedure is complete.

# 9 Normal operation

## 9.1 Normal operating display

In normal operating mode the detector display shows gas type it is configured for and the current gas reading (e.g. NH3 and 17ppm in the example below).


## 9.2 Detector fault/message display

The table below shows the fault / messages shown on the display, their description, corrective action advised and latching / non-latching status.

| Fault / Message | Action or Reason | Latching / Non-latching |
|---|---|---|
| Orr | Sensor overrange | Non-latching |
| SEn Er0 | Excessive negative reading. Recalibrate. | Non-latching |
| SEn Err | Sensor error. Replace sensor. | Non-latching |
| EE Err | EEPROM error. Contact service center. | Non-latching |
| nO SEnS | No sensor is installed. Install a sensor. | Non-latching |
| ZEr Err | Zeroing error. Re-zero the unit. | Non-latching |
| CAL Err | Calibration error. Recalibrate the unit. | Non-latching |

## 9.3 General normal operation notes

The Signalpoint Pro detector will not turn on if powered up within 5 seconds of power off.

The detector will automatically return to normal operation from calibration mode within a timeout period of 30 seconds to 4 minutes, dependent on the gas type.

# 10 General Maintenance

***WARNINGS***

***Appropriate standards must be followed to maintain the specified operation of the detector.***

***It is recommended to bump test the sensors frequently to ensure proper operation.***

***See 'Live Maintenance' procedures below, prior to performing any maintenance or service.***

*Note: It is recommended that the system is visually and functionally checked regularly to ensure correct operation. The frequency of the checks should be determined subject to particular site conditions.*

As a guide Honeywell Analytics recommend the following checks and frequency.

| Frequency | Check |
|---|---|
| Every 3 months | Visual check of controller, detectors and installation for mechanical damage. Ensure the sensor is clear of obstruction. |
| Every 6 months | Functional gas test (see below). Adjust frequency according to site conditions. |

***Caution: The following procedure should be followed carefully and only performed by suitably trained personnel. The system will produce alarms unless suitably inhibited at the controller.***

## 10.1 Live Maintenance

***WARNING***
***Live Maintenance is to be performed only within the guidelines indicated below.***

This procedure does not allow disconnection or connection to any of the terminals located on the terminal block located inside the enclosure.

The only live maintenance that can be performed inside the main housing, with the power connected, is the operation of the "Mode" and "Set" switches, located on the rear of the front portion of the enclosure, when opened. Instructions for the operation of these switches, is indicated in section 7. Any other Maintenance / Service functions needed to be done inside the main housing will require disconnection of power to the instrument.

The only other live maintenance function allowed is sensor replacement, which is covered in section 11. These procedures do not require opening of the main housing.

## 10.2 Functional gas test

It is recommended that the detector is tested frequently to ensure the system is operating properly. Keep in mind different sensor types may require more frequent maintenance depending on the environmental conditions and gases present.

1. Inhibit the associated control panel in accordance with local or site practice.
2. In the detector's monitoring mode, swipe the end of the activation magnet once over the oval mark located at the bottom center of the detector front label until the display indicates 'tESt'. This will be displayed for 15 seconds. The output current loop will transmit 4mA for toxic sensors (equivalent to 0ppm) or 17.4mA for Oxygen sensor (equivalent to 20.9%).
3. To enter the test mode, during the "tESt" display mode, swipe the magnet once over the oval mark. It then displays "tSt " and the gas level. The instrument will be in the test mode for 30 minutes if no magnet swipe is sensed during this period, and it will automatically exit to monitoring mode.
4. Using the calibration cap apply a suitable concentration of gas greater than the highest alarm set point of the controller.
5. If the difference between the detector's gas reading and the applied gas concentration is outside the acceptable limits for the application, you should re-calibrate the detector (see instructions in step 6a). Otherwise, if the accuracy is within acceptable range, the instrument should be returned to monitoring mode (see instructions in step 6b).
6. In either case, allow the gas to purge and then exit the test mode by swiping the magnet once over the oval mark during the test mode. The instrument then displays " rESEt " for 15 seconds.
    a. To enter the calibration mode, wait for the instrument to time out of the " rESEt " display mode and the instrument enters the calibration mode (for more details on calibration, see step 3 of section 8.3.1 for toxic version or step 3 of section 8.3.2 for Oxygen version). After calibration, if reading is still inaccurate, replace the sensor (see section 11.1).
    b. During the " rESEt " display mode, if the instrument detects a magnet swipe, the instrument will reset itself, start from the power-on sequence and go back to the monitoring mode.
7. Repeat for all detectors in the system.
8. When complete ensure the control panel is taken out of inhibit.

## 10.3 Detector operational life

Typical life of a toxic gas sensor is dependant on the application, frequency and amount of gas exposure. Under normal conditions (3 monthly visual inspection and 6 monthly test / re-calibration) the toxic sensor has an expected life equal to or greater than the lifetime as listed below:

12 months for Ammonia sensor
24 months for Oxygen and other toxic sensors

Refer to section 11 for sensor replacement procedures.

***Caution: Oxygen deficient atmospheres (less than 6%V/V) may suppress the sensor output.***

# 11 Servicing

***WARNINGS***

***See 'Live Maintenance' procedures in section 10.1, prior to performing any Maintenance or Service.***
***Take care when handling sensors as they may contain corrosive solutions. Do not tamper or in any way dis-assemble the sensor. Do not expose to temperatures outside the recommended range. Do not expose sensor to organic solvents or flammable liquids. Do not leave unit with sensor installed unpowered for long period of time at or below -10°C.***
***At the end of their working life, sensors must be disposed of in an environmentally safe manner. Disposal should be according to local waste management requirements and environmental legislation. Alternatively, sensors may be securely packaged and returned to Honeywell Analytics clearly marked for environmental disposal. Sensors should NOT be incinerated as they may emit toxic fumes.***

.

***Caution: The following procedure should be followed carefully and only performed by suitably trained personnel.***
***A fault condition will be signalled by the detector if the sensor is removed with the unit under power.***

## 11.1 Sensor replacement

***Caution: If a different sensor type is to be fitted, contact your local Honeywell Analytics product support group to ensure the detector has the required version software installed. If fitting the same type of sensor, ensure it is re calibrated as per details in section 8.***
***For toxic sensors, remove the shorting spring from the bottom of the sensor prior to installation. For $O_2$ sensor, there is no shorting spring provided.***

1. Check that the label on the new sensor is the correct gas type.
2. In the detector's monitoring mode, swipe the end of the activation magnet once over the oval mark located at the bottom center of the detector front label until the display indicates 'tESt'. This will be displayed for 15 seconds. The output current loop will transmit 4mA for toxic sensors (equivalent to 0ppm) or 17.4mA for Oxygen sensor (equivalent to 20.9%).
3. To enter the test mode, during the "tESt" display mode, swipe the magnet once over the oval mark. It then displays "tSt " and the gas level. The instrument will be in the test mode for 30 minutes if no magnet swipe is sensed during this period, and it will automatically exit to monitoring mode.
4. Unscrew the sensor cover and retaining ring.
5. Carefully pull the old sensor off the pcb.
6. Plug in the new sensor taking care to align the sensor pins with the connector holes in the pcb.
7. Refit the sensor retaining ring and sensor cover.
8. Wait about 5 to 10 minutes for the gas reading to stabilise.

9. When the gas reading is stabilised, exit the test mode by swiping the magnet once over the oval mark during the test mode. The instrument then displays " rESEt " for 15 seconds.
10. Wait for the instrument to time out of the " rESEt " display mode and the instrument then enters the calibration mode.
11. Recalibrate the detector (see step 3 of section 8.3.1 for toxic version or step 3 of section 8.3.2 for Oxygen version).

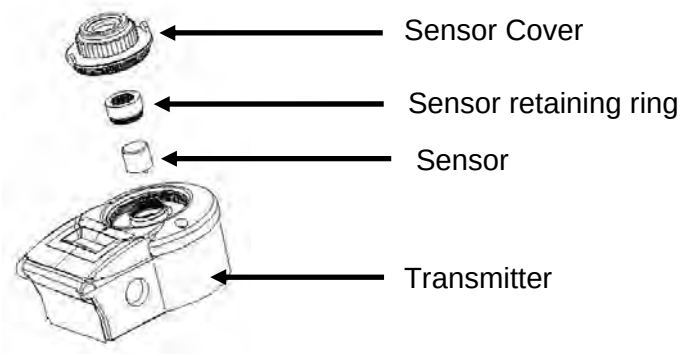



Diagram 7: Replacing plug in sensor

# 12 General specifications

| Signalpoint Pro Detector | |
|---|---|
| **Use** | Fixed point gas detector designed to detect toxic or Oxygen gas hazards that are commonly found in industrial applications. When installed with a suitable barrier it is suitable for safe area and European Zone 1 or 2 and North American Class I Division 1 areas. |

**Detectable Gases**[1]

| Gas | Default Gas Range | User Selectable Gas Range (Step Value) | Selectable Cal Gas Range | Default Cal Point | Operating Temp. Range, deg. C | Response Time* ($T_{90}$) secs | Accuracy +/- (%FSD or % of applied gas) | Zero Drift (+/-) |
|---|---|---|---|---|---|---|---|---|
| Oxygen | 0.0-25.0% Vol | 25%VOL only | 20.9%/Vol (Fixed) | 20.9%/Vol | -20 to 55 deg. C | 15 | 3% FSD | n/a |
| Hydrogen Sulfide | 0-15.0ppm | 10.0 to 50.0ppm (1.0) | 5.0 to 30.0ppm | 10ppm | -20 to 55 deg. C | 30 | 10% (*) | <1% FSD (****) |
| Hydrogen Sulfide | 0-100ppm | 50 to 500ppm (10) | 20 to 300ppm | 50ppm | -20 to 55 deg. C | 30 | 10% (*) | <1% FSD (****) |
| Carbon Monoxide | 0-300ppm | 100 to 999ppm (100) | 40 to 600ppm | 100ppm | -20 to 55 deg. C | 45 | 10% (*) | <3% FSD (****) |
| Sulfur Dioxide | 0.0-15.0ppm | 5.0 to 20.0ppm (5.0) | 2.0 to 12.0ppm | 7.5ppm | -20 to 55 deg. C | 90 | 20% (**) | n/a |
| Ammonia | 0-200ppm | 50 to 200ppm (50) | 20 to 120 ppm | 100ppm | -20 to 55 deg. C | 180 | 20% (***) | 0 |
| Ammonia | 0-1,000ppm | 200 to 1,000ppm (50) | 80 to 600ppm | 300ppm | -20 to 55 deg. C | 210 | 20% (***) | 0 |
| Nitrogen Dioxide | 0.0-10.0ppm | 5.0 to 50.0ppm (5.0) | 2.0 to 30.0ppm | 5.0ppm | -20 to 40 deg. C | 60 | 15% (#) | 0 |
| Hydrogen | 0-1,000ppm | 1,000ppm only | 400 to 600 ppm | 500ppm | -10 to 40 deg. C | 90 | 25% | 0 |

| | |
|---|---|
| **Electrical** | |
| **Connections** | 2 wire loop powered (source) |
| **Input Voltage Range:** | 14 volts min. to 28 volts max., DC |
| **Max Power Consumption:** | Less than 1.0 W |
| **Output Current range:** | 3mA. to 23mA |
| **Max loop resistance:** | Refer to section 6.3 |
| **Loop Distance (MAX):** | 1km (3000ft) using 1mm$^2$ CSA cable or equivalent. |
| **Barrier requirements:** | Ca > Ci+C, La > Li+L, Voc<Vmax=28V, Isc<Imax=125mA. |
| **Recommended Cable** | 2 wire with screen<br>0.5mm$^2$ (20AWG) to 1mm$^2$ (16AWG) |
| **Signal** | 0-100% FSD 4-20mA<br>Max. over range 23mA<br>4mA (for toxic) and 17.38mA (for $O_2$) auto inhibit during calibration<br>Fault ≤ 3mA |
| **Construction** | |
| **Material** | Grey ABS/PPS |
| **Maximum Dimensions** | 150 x 105 x 83.5mm (5.9 x 4.1 x 3.3") |
| **Weight** | 479g (15.4oz.) |
| **Entries** | 1 x M20 clearance (LHS), 1 x M20 clearance knockout (RHS) |
| **Environmental** | |
| **IP Rating** | IP66 as standard suitable for use in and out of doors (EN 60529:1991 / A1:2001) |
| **Operating Temperature** | -20°C to +55°C (-4°F to 131°F) |
| **Operating Humidity** | Continuous 20-90% RH (non condensing) |
| **Operating Pressure** | 90-110kPa |
| **Storage Conditions** | 15°C to 30°C (59°F to 86°F) 30-70% RH (non condensing) |
| **Approvals** | CE compliant in accordance with:<br>EMC Directive 89 / 336 / EEC as amended by 92 / 31 / EEC<br>EN50270 Type 2 Heavy Industrial for susceptibility<br>EN55011B Light Industrial for emissions |
| **Certification**<br>US and Canadian:<br>European: | <br>Intrinsically Safe; Class I, Division 1, Groups A, B, C, D, E, F & G<br>Intrinsically Safe: Ⓔx II 2 G Ex ia IIC T4 |

[1] Detection performance is temperature and humidity dependent. Listed data is based at 20°C, 50% RH only. Response time is longer when operating in colder temperatures.

* Based on a 20-25°C temperature, 50 to 80% RH, using a calibration gas flow housing on a freshly calibrated instrument. If different cylinders are used, other that the calibrating source, the cylinder tolerance will be taken into consideration.

(*) -20°C to +40°C; 20% from +40°C to +55°C
(**) 0 to +40°C, 30% from -20°C to 0°C and +40°C to +55°C
(***) -10°C to +40°C, 30% outside of -10°C to +40°C
(****) Over temp. range -20°C to +40°C
(#) +10.0 to +50.0 ppm
Less than +10.0ppm
+/-10% -10°C to +40°C
+/-20% less than -10°C
+/-35% more than +40°C
Do not use the weather proof cap with a $SO_2$ or $NO_2$ sensor.

Note: the calibration gas level used must be between 30% and 70% of the full scale level for best accuracy.

# 13 Ordering information

| European, North American and Canadian Certified Transmitter and Sensor kit | |
|---|---|
| Part number | Description |
| SGPTPRXXO1 | 0.0-25.0%VOL Oxygen (fixed) |
| SGPTPRXXC1 | 0-300ppm Carbon Monoxide (100-999ppm, 100ppm steps) |
| SGPTPRXXH1 | 0.0-15.0ppm Hydrogen Sulphide (10.0-50.0ppm, 1.0ppm steps) |
| SGPTPRXXH2 | 0-100ppm Hydrogen Sulphide (50-500ppm, 10ppm steps) |
| SGPTPRXXS1 | 0.0-15.0ppm Sulphur Dioxide (5.0-20.0ppm, 5.0ppm steps) |
| SGPTPRXXN1 | 0.0-10.0ppm Nitrogen Dioxide (5.0-50.0ppm, 5.0ppm steps) |
| SGPTPRXXG1 | 0-1,000ppm Hydrogen (fixed) |
| SGPTPRXXA1 | 0-200ppm Ammonia (50-200ppm, 50ppm steps) |
| SGPTPRXXA2 | 0-1,000ppm Ammonia (200-1000ppm, 50ppm steps) |
| | Standard gas range shown with adjustable range in brackets. Each Transmitter and sensor is supplied complete with 1 x activation magnet, 1 x Allen Key, 1 x 21mm diameter cable/conduit entry, 1 x 21mm diameter knockout, instruction manual and suitable transport packaging. |
| Accessories | |
| SGPTPPCFA | Calibration gas flow housing |
| 02000-A-1635 | Weatherproof cap including remote gassing nozzle |
| SGPTPRMTL1 | Single channel zener barrier MTL7728+ |
| SGPTPRMTL2 | 2 channel zener barrier MTL7787+ |
| SGPTPRMTL3 | Galvanic Isolator MTL 5042 |
| SGPTPRPFG1 | Galvanic Isolator P&F KFD2-STC4-EX1 |
| SGPTPRCBLG | Hummel cable gland HSK-K-Ex, blue, M20x1.5, elongated (15mm).<br>Part number 1.291.2002.30, including locking nut Part number 1.262.2001.50. |
| | For calibration gas contact your local representative |
| Spares | |
| S3KMAG | Magnet |
| SGPTPPSCA | Sensor cover assembly (including hydrophobic barrier) |
| SGPTPRXXOX | Replacement Oxygen transmitter kit |
| SGPTPRXXTX | Replacement toxic transmitter kit |
| SGPTPPSSO1 | 0.0-25%VOL Oxygen replacement plug in sensor |
| SGPTPPSSC1 | 0-999ppm Carbon Monoxide replacement plug in sensor |
| SGPTPPSSH1 | 0-50ppm Hydrogen Sulphide replacement plug in sensor |
| SGPTPPSSH2 | 0-500ppm Hydrogen Sulphide replacement plug in sensor |
| SGPTPPSSS1 | 0.0-20.0ppm Sulphur Dioxide replacement plug in sensor |
| SGPTPPSSN1 | 0.0-50.0ppm Nitrogen Dioxide replacement plug in sensor |
| SGPTPPSSG1 | 0-1,000ppm Hydrogen replacement plug in sensor |
| SGPTPPSSA1 | 0-200ppm Ammonia replacement plug in sensor |
| SGPTPPSSA2 | 0-1,000ppm Ammonia replacement plug in sensor |

# 14 Warranty statement

All products are designed and manufactured to the latest internationally recognised standards by Honeywell Analytics under a Quality Management system that is certified to ISO 9001. As such Honeywell Analytics warrants its products against defective parts and workmanship and will repair or (at its option) replace any instruments which are or may become defective under proper use within 12 months from date of commissioning by an approved Honeywell Analytics representative or 18 months from date of shipment from Honeywell Analytics, whichever is the sooner. This warranty does not cover disposable batteries or damage caused by accident, abuse, abnormal operating conditions or poisoning of sensor.

Defective goods must be returned to Honeywell Analytics premises accompanied by a detailed description of any issue. Where return of goods is not practicable Honeywell Analytics reserves the right to charge for any site attendance where any fault is not found with he the equipment. Honeywell Analytics shall not be liable for any loss or damage whatsoever or howsoever occasioned which may be a direct or indirect result of the use or operation of the Contract Goods by the Buyer or any Party.

This warranty covers instrument and parts sold to the Buyer only by authorized distributors, dealers and representatives as appointed by Honeywell Analytics. The warranties set out in this clause are not pro rata, i.e. the initial warranty period is not extended by virtue of any works carried out there under.

# 15 CE Certificate

## EC Declaration of Conformity

*The undersigned, representing the Manufacturer:*

Honeywell Analytics Inc.
405 Barclay Boulevard
Lincolnshire, Illinois 60069

*Hereby declares that the product(s) listed below:*
Signalpoint Pro Toxic and Oxygen Remote Gas Detector.

*are in conformity with the provisions of the following EC Directive(s), when installed, operated, serviced and maintained in accordance with the installation/operating instructions supplied in the product documentation:*

| | |
|---|---|
| 2004/108/EC | EMC directive |
| 94/9/EC | ATEX Directive, construction requirements for explosive atmospheres. |

EMC Standard(s):

| | |
|---|---|
| EN 50270, 1999 | Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases and oxygen |

ATEX Standard(s):

| | |
|---|---|
| EN60079-0: 2006 | Electrical apparatus for Explosive gas atmospheres - General Requirements |
| EN60079-11:2007 | Electrical apparatus for explosive gas atmospheres, Part 11, Equipment Protection by Intrinsic Safety "I". |
| EN60529:1991/A1:2001 | Degrees of Protection provided by Enclosures, IP-66 |

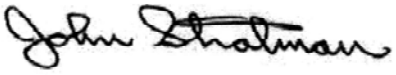
Manufactured in accordance with article 9, Annexes IV and VII of the council directive 94/9/EC.

| Notified Body for ATEX: | Certificate No: | QA Notification No: |
|---|---|---|
| UL International DEMKO A/S<br>Lyskaer 8, P.O. Box 514<br>DK-2730 Herlev, Denmark | 08 ATEX 0710490X<br><br>Type Approval:<br>II 2 G Ex ia IIC T4, IP-66 | Baseefa (2001) Ltd.<br>No. Baseefa ATEX 5192<br>Notified Body No. 1180 |

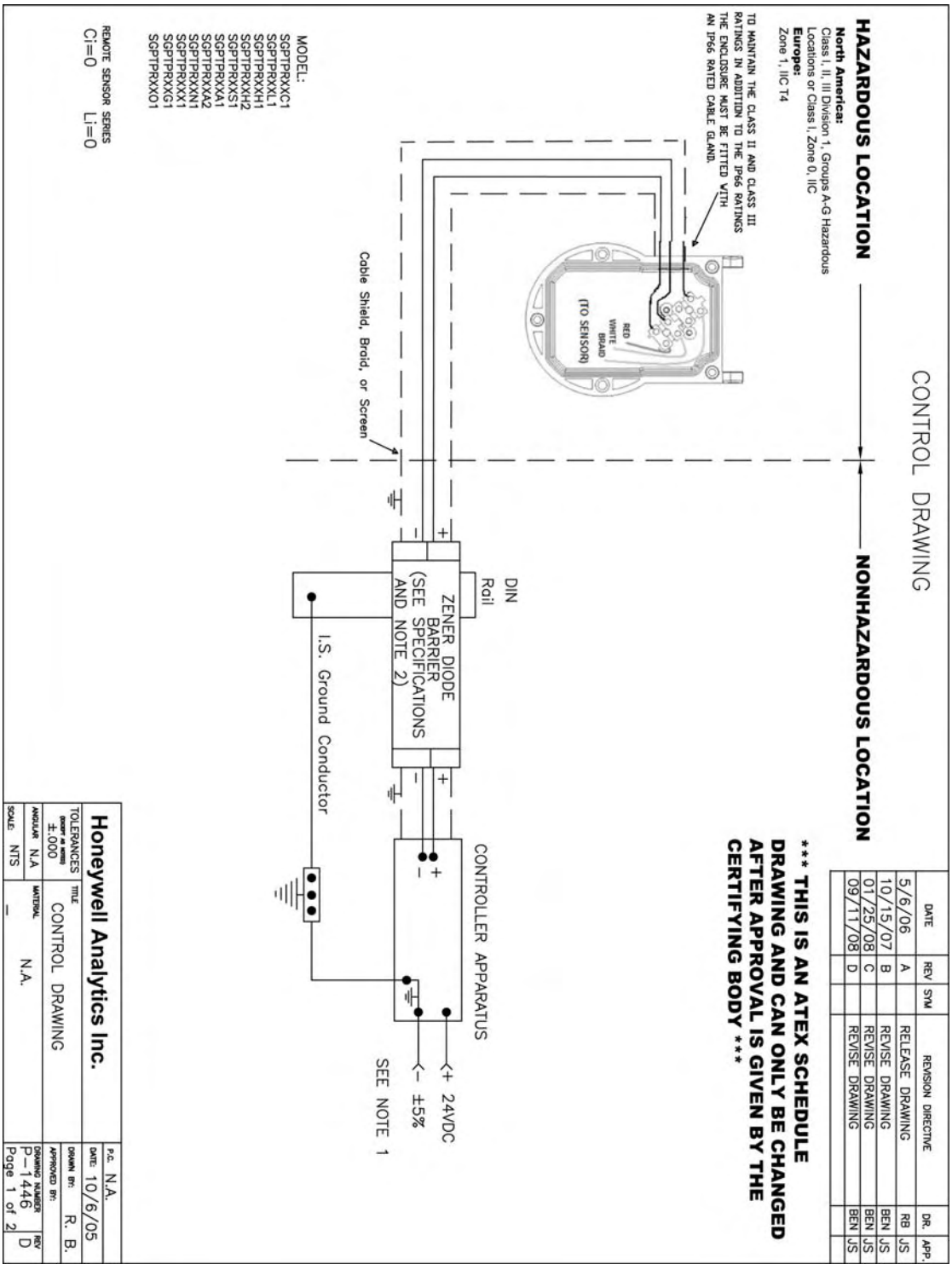
Year of CE marking: 2008

For and on behalf of the authorized manufacturer in the community:

Name: John Stratman
Position: Director of Certification Relations

Signature:  Date: **18-Sep-08**

# 16 Control Drawing



**North America Installation Notes:**

Intrinsically Safe Entity Parameters:

Vmax = 28 Vdc
Imax = 0.125 A
Pmax = 0.875 W
Ci = 0.0 uF
Li = 0.0 mH

Selected barriers must be galvanic isolator or dual channel shunt zener diode with linear outputs, used channel to channel and having entity parameters such that:

Voc ≤ Vmax
Isc ≤ Imax
Po ≤ Pmax
Co ≥ Ci + Ccable
Lo ≥ Lcable

If Po of the associated apparatus is not known, it may be calculated using the formula
Po = (Voc * Isc)/4

For Ccable and Lcable, if the capacitance per foot or the inductance per foot is not known, then the following values shall be used: Ccable = 60 pF/foot and the Lcable = 0.2 uH/foot.

**Calculate Cable Parameters:**
The shortest of these two distances is the maximum distance.

Because of circuit limitations, do not run cable in excess of 4,000ft even if the above formulas allow a longer length.

Selected barriers must be installed in accordance with the barrier manufacturer's control drawing and Article 504 of the National Electrical Code ANSI/NFPA 70 or Canadian Electrical Code Section 18.

**Europe Installation Notes:**

Intrinsically Safe Circuit Parameters:
Ui : 28 Vdc
Ii : 0.125 A
Pi : 0.875 W
Ci : 0.0 uF
Li : 0.0 mH

Selected barriers must be galvanic isolator or dual channel shunt zener diode with linear outputs, used channel to channel and having entity parameters such that:

Uo ≤ Vmax
Io ≤ Imax
Po ≤ Pmax
Co ≥ Ci + Ccable
Lo ≥ Lcable

If Po of the associated apparatus is not known, it may be calculated using the formula
Po = (Uo * Io)/4.

For Ccable and Lcable, if the capacitance per meter or the inductance per meter is not known, then the following values shall be used: Ccable = 200 pF/meter and the Lcable = 0.66 uH/meter

**Calculate Cable Parameters:**
The shortest of these two distances is the maximum distance.

Because of circuit limitations, do not run cable in excess of 1219 meters even if the above formulas allow a longer length.

The wiring of the intrinsically safe circuit may be installed in accordance with EN60079-14 or according to national installation requirements.

| DATE | REV | SYM | REVISION DIRECTIVE | DR. | APP. |
|---|---|---|---|---|---|
| 5/23/06 | A | | RELEASE DRAWING | RB | JS |
| 10/15/17 | B | | REVISED DRAWING | BEN | JS |
| 01/25/08 | C | | REVISED DRAWING | BEN | JS |
| 09/11/08 | D | | REVISED DRAWING | BEN | JS |
| | | | | | |
| | | | | | |

-WARNING-

ALL INTRINSICALLY SAFE WIRING SHALL BE KEPT SEPARATE FROM NON-INTRINSICALLY SAFE WIRING.

-WARNING-

TO MAINTAIN INTRINSIC SAFETY, THE TRANSMITTER WIRING MUST BE ROUTED THROUGH A ZENER DIODE BARRIER WHICH MEETS THE ENTITY PARAMETERS SHOWN ABOVE. THE SELECTED BARRIER SHALL BE LISTED WITH INTRINSICALLY SAFE CIRCUITS FOR THE HAZARDOUS LOCATION CLASS & GROUP AS APPROPRIATE FOR THE APPLICATION. THE CABLE CAPACITANCE PLUS THE TRANSMITTER CAPACITANCE(Ci) MUST BE LESS THAN OR EQUAL TO THE Ca (Ca) ON THE BARRIER. THE CABLE INDUCTANCE PLUS THE TRANSMITTER INDUCTANCE(Li) MUST BE LESS THAN OR EQUAL TO THE La (La) ON THE BARRIER. THE BARRIER MUST BE LOCATED IN THE NON-HAZARDOUS AREA AS SHOWN ON PAGE 1.

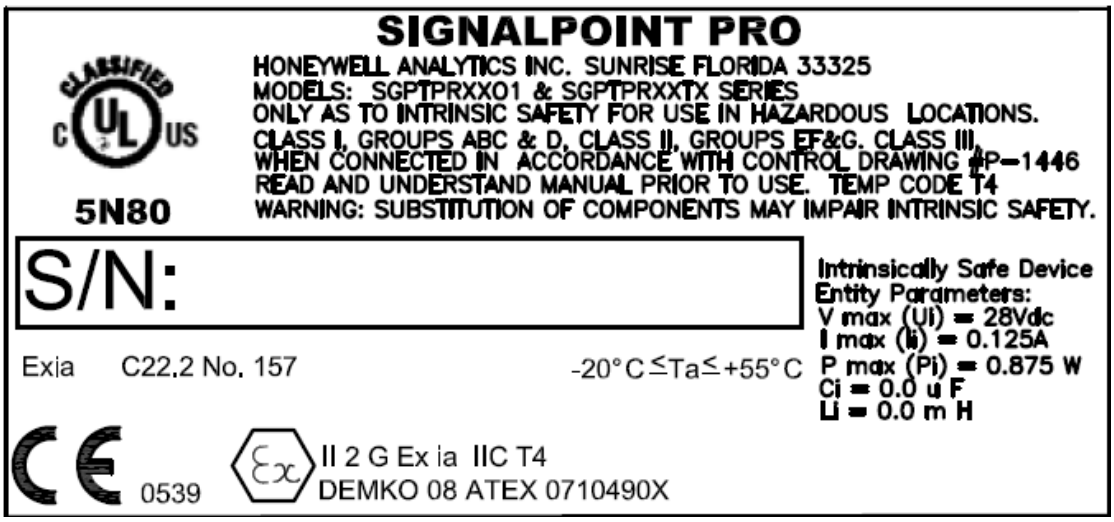
Notes:

1. Barriers shall be installed in accordance with the barrier manufacturers instructions and with Article 504/505 in the National Electrical Code, ANSI/NFPA 70 and/or Canadian Electrical Code Section 18.
2. To maintain IP66 ratings the enclosure must be fitted with an IP66 rated cable gland.

***** THIS IS AN ATEX SCHEDULE DRAWING AND CAN ONLY BE CHANGED AFTER APPROVAL IS GIVEN BY THE CERTIFYING BODY *****

| | | |
|---|---|---|
| **Honeywell Analytics Inc.** | | P.O. N.A |
| | | DATE: 1/6/06 |
| TOLERANCES (EXCEPT AS NOTED) ±.000 | TITLE: CONTROL DRAWING | DRAWN BY: R. B. |
| | | APPROVED BY: |
| ANGULAR N.A | MATERIAL: — | DRAWING NUMBER: P-1446 Page 2 of 2 |
| SCALE: NTS | — | REV: D |

# 17 Certification Label



**Find out more**
www.honeywellanalytics.com

**Contact Honeywell Analytics:**

**Europe, Middle East, Africa, India**
Life Safety Distribution AG
Wilstrasse 11-U31
CH-8610 Uster
Switzerland
Tel: +41 (0)44 943 4300
Fax: +41 (0)44 943 4398
gasdetection@honeywell.com

**Americas**
Honeywell Analytics Inc.
405 Barclay Blvd.
Lincolnshire, IL 60069
USA
Tel: +1 847 955 8200
Toll free: +1 800 538 0363
Fax: +1 847 955 8208
detectgas@honeywell.com

**Asia Pacific**
Honeywell Analytics Asia Pacific
#508, Kolon Science Valley (I)
187-10 Guro-Dong, Guro-Gu
Seoul, 152-050,
Korea
Tel: +82 (0)2 2025 0300
Fax: +82 (0)2 2025 0329
analytics.ap@honeywell.com

**Technical Services**
ha.emea.service@honeywell.com

www.honeywell.com





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