Instructions

Infrared Hydrocarbon Gas Detector
AutroPoint HC300PL

AUTRONICA

116-P-HC300PL/DGB, rev. A, 2010-08-03. DEC P/N 95-8587-1.1

CE

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1. Introduction

IMPORTANT
Be sure to read and understand the entire instruction manual before installing or operating the gas detection system. This product is intended to provide early warning of the presence of a flammable or explosive gas mixture. Proper device installation, operation, and maintenance is required to ensure safe and effective operation.

1.1 Application

The AutroPoint HC300PL is specially designed for use with the AutroSafe IFG (Integrated Fire and Gas) system.

The AutroPoint HC300PL is a diffusion-based, point-type infrared gas detector that provides continuous monitoring of combustible hydrocarbon gas concentrations in the range of 0 to 100% LEL.

The unit is powered from the power loop. It is furnished with an onboard "status indication" LED, an internal magnetic calibration switch and an external calibration line for use with the optional PIRTB remote calibration termination box.

The AutroPoint HC300PL is ideal for use in harsh outdoor environments and is certified for use in Class I, Division 1, and Zone 1 hazardous areas.

1.2 Operation Overview

1.2.1 Theory Of Operation

Flammable hydrocarbon gases diffuse through the weather baffle assembly into the internal measurement chamber, which is illuminated by an infrared (IR) source. As the IR passes through the gas within the chamber, certain IR wavelengths are absorbed by the gas, while other IR wavelengths are not. The amount of IR absorption is determined by the concentration of the hydrocarbon gas. A pair of optical detectors and associated electronics measure the absorption. The change in intensity of the absorbed light (active signal) is measured relative to the intensity of light at a non-absorbed wavelength (reference signal). See Figure 1. The microprocessor computes the gas concentration and converts the value into an analog signal, which is then communicated to external control and annunciation systems.

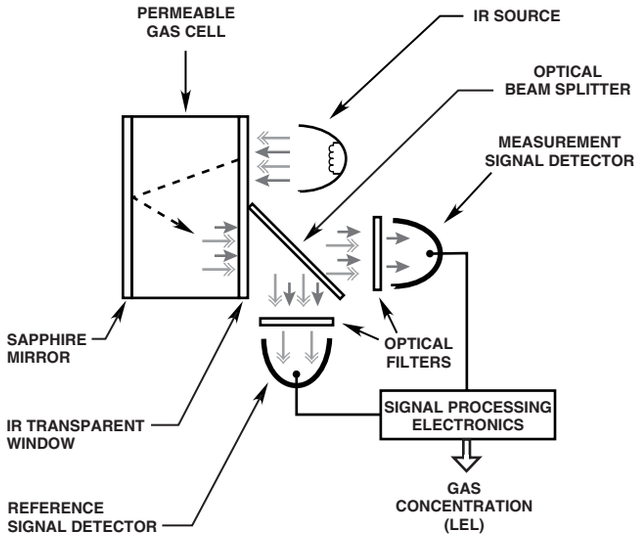


Figure 1—Measurement Scheme for Infrared Gas Detector

1.2.2 Detectable Gases

The AutroPoint HC300PL is capable of detecting hydrocarbon gases and vapours including methane, ethane, propane, butane, ethylene, and propylene. Gas type and other operational parameters are selected via digital communications. Factory default setting is methane.

1.2.3 Outputs

A local HART communication port is provided.

1.2.4 Communication

The AutroPoint HC300PL supports HART and PowerLoop communication protocols.

1.2.5 Data Logging

Non-volatile memory is provided to save the 10 most recent calibrations, alarm/fault events, and minimum/maximum operating temperature history. An hour meter is provided to record operating service time and to give an indication of the relative time between events. This information is accessible using HART communication.

2. Specifications

INPUT VOLTAGE—
Operating range is 20 to 30V DC supplied by the PowerLoop.

POWER CONSUMPTION—
4.8 watts nominal @ 24V DC
5.4 watts peak @ 24V DC
7.0 watts peak @ 30V.DC.

WARMUP TIME—
Two minutes from cold power-up to normal mode;
1 hour minimum recommended.

VISUAL STATUS INDICATOR—
Tri-colour LED:
Red = alarm
Green = power on / OK
Yellow = fault / warm-up.

ALARM SETPOINT RANGE—
Low Alarm: 5 to 60% LEL
High Alarm: 5 to 60% LEL.
Alarm setpoint is programmable from AutroSafe panel or config.
NB! Setpoint set by HART will be overridden by AutroSafe!

DETECTION RANGE—
0 to 100% LEL standard.

DETECTABLE GASES—
Most flammable hydrocarbon vapours are detectable.
Standard gases include methane, ethane, ethylene, propane, butane and propylene. Detection of non-standard gases is configurable using HART communication.

CALIBRATION—
All units are methane-calibrated at the factory. Field calibration may not be required for methane detection applications. Field selectable standard gas settings are provided for methane, ethane, propane, butane, ethylene, and propylene.

Field programming and full calibration is typically required for detection of vapors other than methane. Refer to the “Calibration” section of this manual for details.

Routine calibration of the HC300PL after completion of initial commissioning is supported, but not absolutely required. Generally, an annual gas bump test or full calibration will ensure proper sensitivity and response.

NOTE
Frequent visual inspections of the HC300PL are recommended to confirm that there are no external impediments to proper detection capability.

When routine calibration is required, three calibration methods are available:
- HART
- On-Board magnetic reed switch
- Remote calibration line.

DEVICE CONFIGURATION—
Configuration parameters include gas type, measurement range, alarm setpoints, gas signal processing algorithm, and other selectable parameters.

RESPONSE TIME (Seconds)—

	T50	T60	T90
Without Hydrophobic Filter:	3.8	4.2	5.4
With Hydrophobic Filter:	4.2	4.4	7.4

TEMPERATURE RANGE—
Operating: -40°C to +75°C (–40°F to +167°F).
Storage: -55°C to +85°C (–67°F to +185°F).

HUMIDITY—
0-99% relative humidity (Autronica verified).
5 to 95% relative humidity (FM/DEMKO verified).

ACCURACY—
±3% from 0 to 50% LEL, ±5% from 51 to 100% LEL.

SELF-DIAGNOSTIC TEST—
Fail-Safe operation ensured by performing all critical tests once per second.

INGRESS PROTECTION—
IP67 (DEMKO Verified).

DETECTOR HOUSING MATERIAL—
316 stainless steel (CF8M).

CONDUIT ENTRY OPTIONS—
Two entries, 25 mm.

HART COMMUNICATION PORT—
Intrinsically safe. For live maintenance, follow the Control Drawing in appendix D.

OPTICS PROTECTION—
Three-layer weather baffle assembly is Polythalimide plastic, UV resistant, static dissipating black. Optional internal hydrophobic filter is recommended for areas with high levels of airborne particulates or humidity.

WIRING—
Field wiring screw terminals are UL/CSA rated for up to 14 AWG wire, and are DIN/VDE rated for 2.5 mm 2 wire. Screw terminal required torque range is 3.5–4.4 in.-lbs. (0.4-0.5 N·m).

ELECTRICAL SAFETY CLASSIFICATION—
Installation Category (Overvoltage Category) II & Pollution Degree 2 per ANSI/ISA-S82.02.01, EN 61010-1 & IEC 61010-1.

CERTIFICATIONS—

DNV Maritime Approval

FM: Class I, Div. 1, Groups B, C & D (T4) with intrinsically safe output for HART communication in accordance with control drawing 007283-001.
Class I, Div. 2, Groups A, B, C & D (T4).
Performance verified to Methane in accordance with FM 6310/6320, ANSI/ISA 12.13.01.
Tamb = –40°C to +75°C.
Acidic atmospheres excluded.
Conduit seal not required.

ATEX: Ex de [ib] IIC T4-T5 Gb
(with HART communication port)
DEMKO 01 ATEX 129485X.
(Performance verified to Methane in accordance with EN 60079-29-1).
T5 (Tamb –50°C to +40°C)
T4 (Tamb –50°C to +75°C)
IP67.

ATEX Special Conditions for Safe Use ('X'):

- The field wiring terminal connections are certified for a single wire in size from 0.2 to 2.5 mm2, (or two conductors with same cross section 0.2 to 0.75 mm2). The screws must be tightened down with a torque 0.4 to 0.5 Nm.
- The metal housing of the Model HC300PL Gas Detector must be electrically connected to earth ground.
- The gas detector shall be protected against any impact greater than 4 joules.
- The IS Safety Output on the HART Communicator Port is internally connected to Earth Ground.
- This product is intended for use in air with normal oxygen content (typically 21% v/v).
- Alarm output latching requirement: High alarm outputs must be latching, either as part of the alarm operation of the gas detector itself (in stand-alone applications), or as a function of the 'high alarm" indication within the controller that is directly connected to the gas detector (for remote applications).

Additional Safety Notes:
The following warning is on the product:
Warning: Do not open when an explosive gas atmosphere may be present.

- For ambient temperature above 60°C use field wiring suitable for maximum ambient temperature. For temperature below –10°C use suitable field wiring for the lowest temperature.
- The ambient temperature range is limited –50°C to +75°C.
- Cable, bushings and the conduit entries shall be of a type already certified according to relevant ATEX standard, so the protection principle employed will not be impaired.
- Unused conduit entries shall be closed using stop plugs certified for the conditions of use (IP67 minimum). The stop plugs should be removable only with the aid of a tool.
- The AutroPoint HC300PL can be connected to the AutroSafe system via PowerLoop only.
- The HART communicator tools are not to be used for changingthe alarm set points of the HC300PL. The HC300PL alarm set points are only to be changed using the alarm set points programming menu on the AutroSafe panel.

EN Standards: EN 50270: 2006
EN 50271: 2002
EN 60079-0: 2009
EN 60079-1: 2007
EN 60079-7: 2007
EN 60079-11: 2007
EN 60079-29-1: 2007
EN 60529: 1991+ A1 2000

CE: Conforms to:
EMC Directive: 2004/108/EC,
ATEX Directive: 94/9/EC.

WARNING
Always ensure that the detector/junction box hazardous (classified) location ratings are applicable for the intended use.

DIMENSIONS—
See Figure 2.

SHIPPING WEIGHT (APPROXIMATE)—
11.5 pounds (5.2 kg).

WARRANTY—
Five year limited warranty from date of manufacture.
See Appendix C for details.

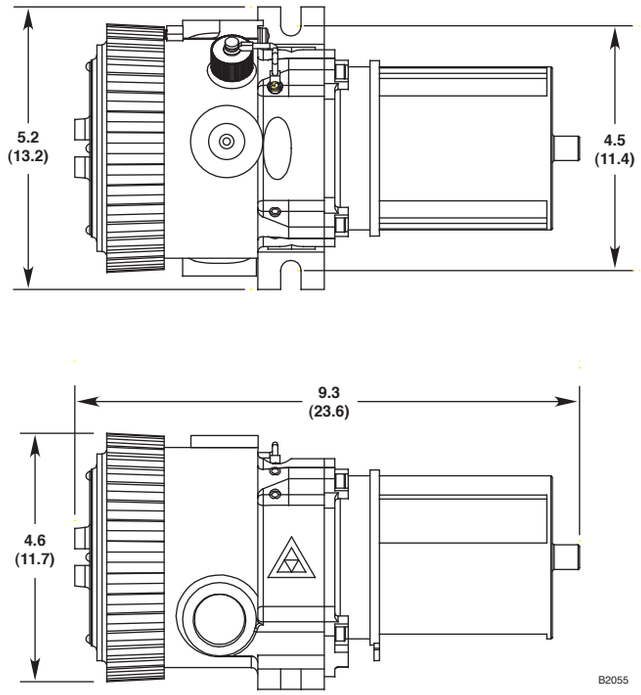


Figure 2—Dimensions of AutroPoint HC300PL Detector in Inches (Centimetres)

3. Important Safety Notes

CAUTION
The wiring procedures in this manual are intended to ensure proper functioning of the device under normal conditions. However, because of the many variations in wiring codes and regulations, total compliance to these ordinances cannot be guaranteed. Be certain that all wiring complies with the NEC as well as all local ordinances. If in doubt, consult the authority having jurisdiction before wiring the system. Installation must be done by a properly trained person.

CAUTION
This product has been tested and approved for use in hazardous areas. However, it must be properly installed and used only under the conditions specified within this manual and the specific approval certificates. Any device modification, improper installation, or use in a faulty or incomplete configuration will render warranty and product certifications invalid.

CAUTION
The detector contains no user serviceable components. Service or repair should never be attempted by the user. Device repair should be performed only by the manufacturer or trained service personnel.

LIABILITIES
The manufacturer's warranty for this product is void, and all liability for proper function of the detector is irrevocably transferred to the owner or operator in the event that the device is serviced or repaired by personnel not employed or authorized by the manufacturer, or if the device is used in a manner not conforming to its intended use.

CAUTION
Observe precautions for handling electrostatic sensitive devices.

NOTE
The AutroPoint HC300PL is intended for detection of hydrocarbon vapours only. The device will not detect hydrogen gas.

4. Installation

Before installing the AutroPoint HC300PL, define the following application details:

4.1 Identification Of Flammable Vapour(s) To Be Detected

It is necessary to always identify the flammable vapour(s) of interest at the job site in order to determine the proper calibration gas setting for AutroPoint HC300PL. In addition, the fire hazard properties of the vapour, such as vapour density, flashpoint, and vapour pressure should be identified and used to assist in selecting the optimum detector mounting location within the area.

The detector must be installed per local installation practices. For IEC/ ATEX hazardous areas, it may be acceptable to utilize EEx e wiring practices with the AutroPoint HC300PL.

4.2 Identification Of Detector Mounting Locations

Identification of leak sources and leak accumulation areas typically provides clues for identifying the best detector mounting locations. In addition, identification of air current/wind patterns within the protected area is useful in predicting gas leak dispersion behaviour. This information should be used to identify optimum sensor installation points.

If the vapour of interest is lighter than air, place the sensor above the potential gas leak. Place the sensor close to the floor for gases that are heavier than air. For heavy vapours, typically locate AutroPoint HC300PL at 2-4 cm above grade elevation. Note that air currents may cause a gas that is slightly heavier than air to rise under some conditions. Heated gases may also exhibit the same phenomenon.

The most effective number and placement of detectors varies depending on the conditions at the job site. The individual designing the installation must often rely on experience and common sense to determine the detector quantity and best locations to adequately protect the area. Note that it is typically advantageous to locate detectors where they are accessible for maintenance, and also where the AutroPoint HC300PL status indication LED can easily be seen. Locations near excessive heat/vibration sources should be avoided if possible.

Final suitability of possible gas detector locations should be verified by a job site survey. Gas detector area of coverage is a subjective

evaluation, and may require long-term empirical data to confirm effectiveness. A typical rule of thumb is that one detector can cover a 900 square foot area. However, this rule of thumb is subject to change depending upon specific application properties and requirements.

NOTE
For additional information on determining the quantity and placement of gas detectors in a specific application, refer to the article titled "The Use of Combustible Detectors in Protecting Facilities from Flammable Hazards" contained in the Instrumentation, Systems and Automation Society (ISA) Transaction, Volume 20, Number 2.

4.3 Physical Installation Requirements

AutroPoint HC300PL is provided with built-in mounting feet that will accept 3/8 inch (M8) diameter mounting bolts. Always ensure that the mounting surface is vibration-free and can suitably support the total weight of the AutroPoint HC300PL without assistance from electrical cabling or conduit system.

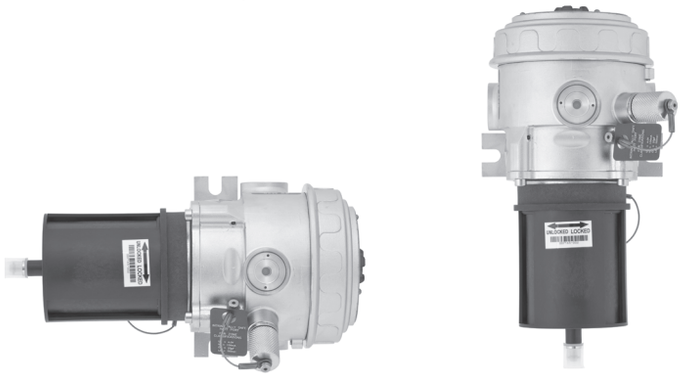
The detector must be installed per local installation practices. For IEC/ATEX hazardous areas, it may be acceptable to utilize EEx e wiring practices with the AutroPoint HC300PL.

Device Mounting Orientation

It is highly recommended that the AutroPoint HC300PL be installed in the horizontal position. The detector is not position sensitive in terms of its ability to detect gas. However, the weather baffle assembly provides superior performance when the AutroPoint HC300PL is installed with the baffle in a horizontal position.

LED Visibility

Select a mounting orientation where the AutroPoint HC300PL status indication LED is visible to personnel within the area.



CORRECT **INCORRECT**

Figure 3 – Recommended Orientation of HC300PL Detector

Calibration Gas Port Cover

A protective cover for the calibration gas injection port is provided to ensure that contaminants are not accidently introduced into the device optics. Ensure that this cover is properly installed over the port when calibration is not being performed.

NOTE
Failure to install the calibration gas port cover or the use of a damaged cover may result in nuisance faults and require cleaning the detector optics.

4.4 Connections

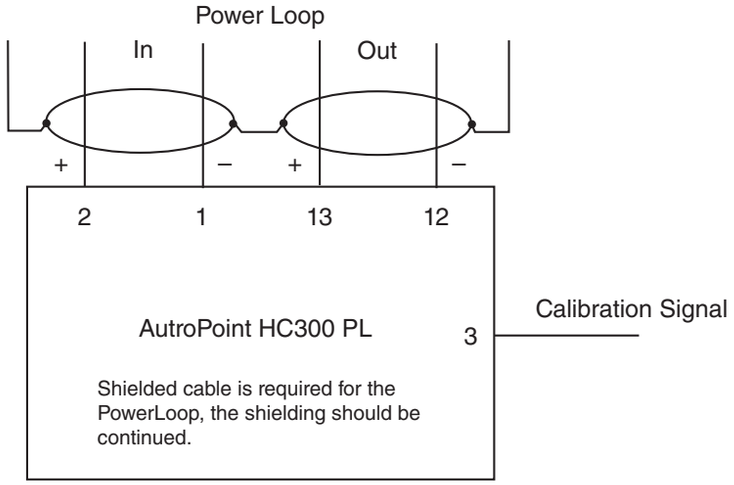


Figure 4– Connections

4.5 Wiring Cable Requirements

Always use proper cabling type and diameter for input power as well as output signal wiring. 14 to 18 AWG shielded stranded copper wire is recommended.

Always install a properly sized, master power fuse or breaker on the system power circuit.

NOTE
The use of shielded cable in conduit or shielded armoured cable is required. In applications where the wiring is installed in conduit, dedicated conduit is recommended. Avoid low frequency, high voltage, and non-signalling conductors to prevent nuisance EMI problems.

CAUTION
The use of proper conduit installation techniques, breathers, glands, and seals is required to prevent water ingress and/or maintain the explosion-proof rating.

4.6 Power Wiring Size And Maximum Length

PowerLoop Calculator Tool must be used to determine the cable dimensions and the maximum number of detectors connected to one loop. Refer to the IFG manual for further information.

4.7 Wiring Procedure

Ensure that all cables are terminated properly.
AutroPoint HC300PL screw terminal torque range is 3.5–4.4 in.-lbs. (0.4–0.5 N·m).

NOTE
The AutroPoint HC300PL housing must be electrically connected to earth ground. A dedicated earth ground lug is provided for this purpose.

4.8 Remote Calibration Wiring

If it is desired to initiate calibration using the remote calibrate line, the use of the PIRTB Termination Box is highly recommended for optimum ease of installation and calibration. The PIRTB module includes a magnetic reed switch, indicating LED, and wiring terminal block. Refer to “Remote Calibration Option” in the “Description” section of this manual for details.

Figure 5 shows the location of the wiring terminals, reed switch and LED inside the calibration termination box. See Figure 6 for wiring details.

WARNING
Do not attempt to physically connect or touch the calibration lead wire to DCV common in the field to begin calibration. This practice is often less than precise, and may result in a spark or other undesirable results. For optimum ease of installation and calibration, always utilize a junction box with magnetic reed-switch, indicating LED, and termination block (Model PIRTB).

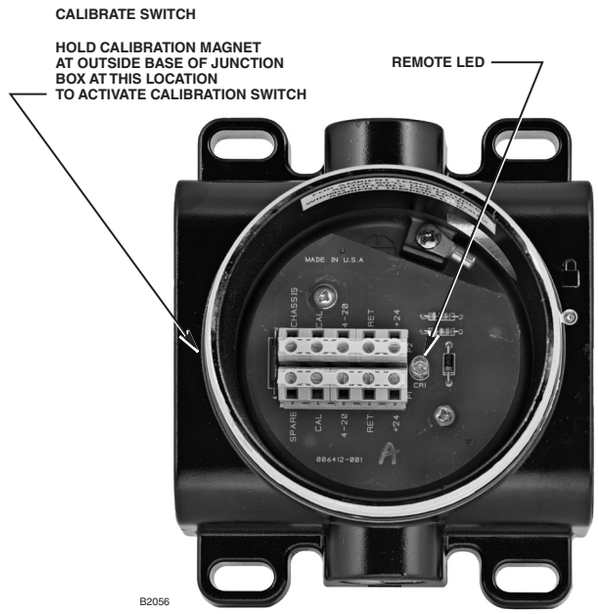


Figure 5—Remote Calibration Switch and LED in Optional PIRTB Termination Box

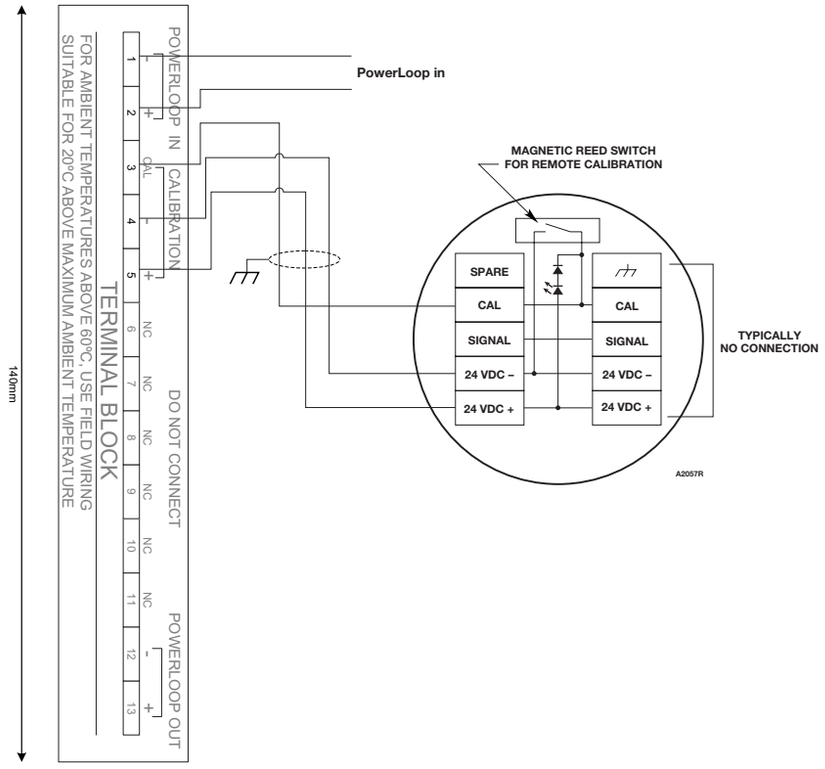


Figure 6—Remote Calibration Module Wired to AutroPoint HC300PL

5. Description

5.1 Internal Magnetic Switch

An internal magnetic switch is provided for initiating calibration. See Figure 7 for switch location. Holding the switch closed for 2 seconds or longer will start the calibration sequence. The switch can also be used to enter “live” calibration mode or terminate the calibration sequence (see “Calibration” section).

NOTE
The detector must be disabled via the AutroSafe panel during calibration. The detector must be re-enabled via the AutoSafe panel after calibration.

NOTE
The detector must be disabled via the AutroSafe panel for external resetting of latched alarms. The detector must be re-enabled via the AutoSafe panel after alarm reset.

5.2 HART Communication Port

A HART communication port is provided for connecting the HART Communicator to the AutroPoint HC300PL. Refer to Figure 7.

CAUTION
The detector must be disabled via the AutroSafe panel during HART Communications. Any alarm set points set by the HART Communicator will be overwritten by the AutoSafe panel.

Connect the HART Communicator, then turn it on by pressing the ON/OFF key. The communicator will indicate when the connection is made. If the connection is not made, the communicator will indicate that no device was found. Refer to the HART appendix in this manual for complete information.

WARNING
Do not open terminal compartment cover when explosive gas atmosphere may be present.

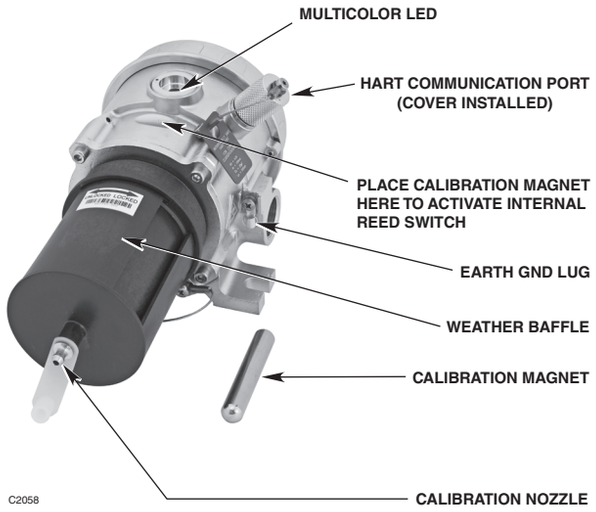


Figure 7—AutroPoint HC300PL

5.3 Multi-Colour LED

An onboard multi-colour LED is provided for indicating faults, alarms, and calibration status. The LED is green during normal operation and turns yellow for fault conditions. It blinks red for low alarms and steady red for high alarms. LED operation for fault status is non-latching. LED operation for alarms is configurable for latching/non-latching.

Table 1—LED Status Indication

LED	Device Status
Green	Normal operation.
Red	Blinking indicates Low Alarm. On steady indicates High Alarm.
Yellow	Fault condition or warmup.

5.4 Weather Baffle Assembly

The black weather baffle is provided to prevent debris and water from entering the optics, while allowing gases and vapours to enter readily. An O-ring is provided on the main AutroPoint HC300PL body to ensure a proper seal with the weather baffle. Two weather baffle configurations are available — one with an internal hydrophobic filter and one without the internal hydrophobic filter.

The weather baffle version without hydrophobic filter is recommended for most outdoor and indoor applications. It provides excellent weather protection with optimized speed of gas alarm response. The weather baffle version with hydrophobic filter is recommended for extremely wet, dirty and humid applications. It provides optimum rejection of airborne water and dirt, with a slightly slower speed of gas alarm response.

The weather baffle assembly is not field-serviceable, but is easily replaceable. To remove the plastic weather baffle from the AutroPoint HC300PL body, rotate it one quarter turn counter-clockwise and pull.

The weather baffle is furnished with a calibration gas nozzle for direct injection of gas to the sensor, allowing the operator to apply gas to the detector without going through the weather baffle.

NOTE
Always cover the calibration gas nozzle with the cap during normal operation, and ensure that the cap is not damaged.

5.5 Clock

An hour meter is provided to give a relative indication of time for historical logs. The meter is zeroed at the time of manufacture and only increments while power is applied. HART communication is required to view the running hours.

Figure 8—HART Communicator Connected to HART Communication Port on AutroPoint HC300PL

5.6 History Logs

All history logs are saved in non-volatile memory and retained through power cycles. HART communication is required to view the history logs.

Event Log (Alarms and Faults)

An event log saves the ten most recent alarms and a selected group of faults with an hour meter time stamp. HART communication is required to view the log. Types of logged events include:

- Low Alarms
- High Alarms
- Optics Fault
- Warm-up
- Calibration Fault

Calibration Log

A log of the ten most recent calibrations with time stamp is saved. HART communication is required to view the log. Types of calibration records include:

- Zero Only Calibration
- Complete Calibration
- Failed Calibration

Min/Max Temperature History

Ambient minimum and maximum exposed temperature measurements are stored in non-volatile memory, and are accessible via HART communication. The measurements are time tagged with respect to total hours of powered operation. The temperature log may be reset, in which case all min/max exposed temperature logs are cleared.

5.7 Remote Calibration Option

In most applications, it is recommended to install the AutroPoint HC300PL where it will contact the vapour of interest as quickly as possible. Unfortunately, the best location for early warning can often result in accessibility problems for the operator when calibration is required. In these applications, the Model PIRTB Termination Box is highly recommended to provide the ability to calibrate the AutroPoint HC300PL from a remote location.

The PIRTB consists of a termination/circuit board, housed within an explosion-proof junction box. The circuit board contains a magnetic reed switch for initiating calibration, an indicating LED to signal the operator when to apply and remove the calibration gas, and a wiring terminal block. The junction box cover is furnished with a small viewing window that enables calibration to be performed without hazardous area de-classification. The PIRTB may be installed up to 100 feet away from the AutroPoint HC300PL. Refer to Figure 9 for remote calibration configuration options.

NOTE
The remote calibration switch is intended for initiating calibration only.

The following recommendations are provided to enhance operator ease and convenience of remote calibration configurations:

1. Install the AutroPoint HC300PL in such a manner that the onboard LED is visible whenever possible. This will aid in checking device status “at a glance.”

2. The AutroPoint HC300PL is provided with a calibration gas nozzle on the weather baffle, which allows the use of permanently attached calibration gas delivery tubing (either polyethylene or stainless steel). The tubing is typically routed in parallel with the remote calibration cabling to the same location as the PIRTB termination box. This arrangement enables a technician to initiate calibration and deliver the calibration gas to the AutroPoint HC300PL from a single location.

3. When permanently installed calibration gas tubing is utilized, always install a shut-off valve at the open end to prevent unwanted vapours or debris from entering the tubing.

4. Always purge the permanent tubing with clean, dry compressed air prior to and immediately after calibration to ensure that residual combustible gases are cleared. Always close the shutoff valve after post-calibration purging is complete. This will ensure that all hydrocarbon vapours are eliminated from the AutroPoint HC300PL optics.

5. Note that permanently installed calibration gas tubing will increase the calibration gas consumption rate as a function of total tubing length.

Other methods of achieving remote AutroPoint HC300PL calibration include utilizing HART communications. Refer to the HART appendix for details.

NOTE
The detector must be disabled via the AutroSafe panel during calibration. The detector must be re-enabled via the AutoSafe panel after calibration.

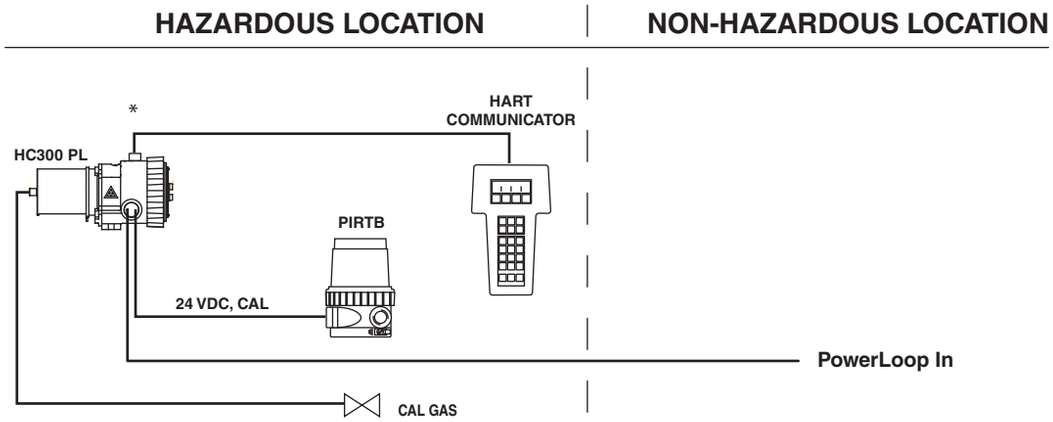


Figure 9—Remote Calibration Configuration Options

5.8 SPECIAL APPLICATIONS

The standard AutroPoint HC300PL is intended for open area combustible gas detection applications. However, special detector configurations are available for applications such as duct-mounting and sample extraction. Contact Autronica Fire and Security AS for information on these special device configurations.

6. Operation

6.1 Factory Default Settings

The AutroPoint HC300PL is shipped from the factory pre-calibrated and set for detection of 0-100% LEL methane. Detection of gases other than methane will require changing the factory gas setting and performing field calibration of the device. HART communication is required to change the factory default settings. Refer to the HART Communications Appendix within this document for additional guidance.

6.2 Operating Modes

The AutroPoint HC300PL has three operating modes: warm-up, normal, and calibrate.

Warm-up
Warm-up mode is entered upon application of 24V DC operating power. During warm-up, the indicating LED is yellow, and the alarm outputs are disabled. The warm-up mode lasts nominally two (2) minutes after power-up.

Normal
After warm-up mode is completed, the device automatically enters the Normal mode, and all analogue and alarm outputs are enabled.

Calibrate
Calibration of the AutroPoint HC300PL is normally not required; however, the user has the option to verify proper calibration or to perform calibration procedures if necessary. Guidelines for when to perform a calibration or a response test are listed in Table 2. The user has the choice of three methods to place the device into the Calibrate mode. Refer to the “Calibration” section in this manual for details.

Table 2—Calibration or Response Test

Function	Calibration	Response Test
Startup		X
Gas selection changed	X	
Non-standard gas (using linearization other than methane)	X	
Replace any part	X	
Constant zero offset	X	
Periodic Functional Testing (at least once a year)		X

7. Startup

When the AutroPoint HC300PL is installed and wired as described in the “Installation” section, it is ready for commissioning.

If the application requires that specific changes be made to the factory settings, communication will be required.
Refer to the appropriate Appendix for details.

NOTE
The safety function (gas input-to-actuation/ notification) must always be verified upon completion of installation and/or modification.

7.1 Startup/Commissioning Checklists

Electrical Checklist

- All PowerLoop conductors are properly sized and are properly terminated.
- The BSD-340 PowerLoop driver provides sufficient load capacity for all gas detectors.
- Using a DC voltmeter, 24 Vdc has been measured at the detector.
- All screw terminals have been tightened and all wires pull-tested to confirm proper termination has been accomplished.

Mechanical Checklist

- AutroPoint HC300PL is mounted to a solid surface not prone to high vibration, shock, traumatic impact or other undesirable condition.
- AutroPoint HC300PL is installed in proper orientation (horizontal).
- AutroPoint HC300PL detector is installed to achieve weatherproof status, e.g. conduit seals or cable glands have been properly installed. If there is an unused conduit entry, this entry has been sealed with a weathertight plug.
- AutroPoint HC300PL threaded covers are tightened to engage all O-rings.
- The hex head set screw is tightened to secure the cover and prevent access to the wiring compartment without the use of a tool.

Gas Detection and Measurement Checklist

- Vapour(s) to be detected have been identified, and appropriate calibration gas setting for the AutroPoint HC300PL has been confirmed.
- Area(s) of coverage have been identified, and optimum detector locations for installation are documented.
- Detector installation location is suitable for intended purpose, e.g. no obvious impediments to contact with the gas or vapour of interest exist or are likely to exist.
- Proper calibration gas(es) are available to perform proof of response test or calibration during commissioning.
- HART communicator or similar field communicator is available if field programming is expected or required.
- Calibration magnet is available to initiate quick calibration or reset.

8. Calibration

NOTE
Before initiating calibration the detector must be disabled via the AutroSafe panel.

8.1 Calibration Overview

Although routine calibration of the AutroPoint HC300PL is normally not required, the device supports non-intrusive field calibration capability. Two (2) calibration procedure options are provided:

1) **Normal Calibration** is a two-step process consisting of clean air (zero) condition and mid-scale (span) adjustment. Calibration gas must be applied by the operator to enable span adjustment. Normal calibration is required whenever the gas type setting has been changed from the factory-default methane setting. Purge the AutroPoint HC300PL optics with clean, dry air prior to calibration initiation to ensure that an accurate zero (clean air) condition is present.

   The following Normal Calibration guidelines always apply:

   a) The AutroPoint HC300PL is factory set for detection of methane. If the gas setting is changed (using HART communication), the AutroPoint HC300PL must be recalibrated (normally with the matching gas type).

   b) The calibration gas type normally should match the selected gas setting for the AutroPoint HC300PL. Different calibration gas types are selectable using HART communication. The factory default calibration gas is methane.

   c) The recommended calibration gas concentration is 50% LEL, although other calibration concentrations may be utilized if previously defined in the AutroPoint HC300PL using HART communication.

2) **Zero Only Calibration** is a one-step process consisting of clean air (zero) condition adjustment only, which is performed automatically by the device. This procedure adjusts the “clean air” signal output only, and is normally used if the signal level has drifted. The cause of drift is typically due to the presence of background gas during calibration. Purge the AutroPoint HC300PL optics with clean, dry compressed air prior to calibration initiation to ensure an accurate zero (clean air) condition is present.

8.2 Additional Calibration Notes

IMPORTANT
Always ensure that the correct gas type is used for calibration. (2.5 LPM flow rate is recommended.)

NOTE
Ensure that the detector has been operating for at least two hours before calibrating.

NOTE
Always ensure that the AutroPoint HC300PL optics are totally free of all hydrocarbons before initiating calibration. This may require purging of the AutroPoint HC300PL with pure air prior to initiating calibration.

NOTE
Under very windy conditions, it may not be possible to successfully calibrate the AutroPoint HC300PL. This situation is easily corrected by using the AutroPoint HC300PL Calibration Bag (P/N 006672-002).

NOTE
Always place the protective cap back on the calibration nozzle after completion of span calibration.

8.3 Calibration Initiation

AutroPoint HC300PL calibration may be initiated by any of the following means:

- The onboard magnetic calibration switch
- The magnetic calibration switch in the remote termination box.
- Digital communication (via HART communication).

Calibration using Magnetic Switch

1) Onboard Switch and LED
The AutroPoint HC300PL provides an onboard magnetic calibration/ reset switch for non-intrusive calibration capability. The magnetic switch is located on the device bulkhead. See Figure 7 for switch location. An onboard tri-colour LED is also provided to signal the operator when to apply and remove calibration gas.

2) Remote Switch and Indicating LED
A special Remote Termination Box (Model PIRTB) is available for initiating calibration from a remote location. The PIRTB provides an internal magnetic switch and indicating LED (LED is on/off only, not tri-colour). The PIRTB is provided with a clear window on the cover, enabling non-intrusive calibration capability.

Either magnetic switch must be actuated for 2 seconds using a calibration magnet to initiate AutroPoint HC300PL calibration. Upon initiation, the AutroPoint HC300PL automatically performs the zero calibration adjustment, and then signals the operator when it is time to apply calibration gas. Upon completion of the span adjustment, the AutroPoint HC300PL returns to normal mode after the calibration gas has cleared. The indicating LED (either onboard LED or PIRTB LED, if used) provides visual signals to the operator regarding the proper time to apply and remove the calibration gas.

For Zero Only Calibration, the operator must reactuate the magnetic switch upon LED signal to apply calibration gas. This action instructs the AutroPoint HC300PL to utilize the previous span setting, and return to normal mode without requiring application of calibration gas.

Digital Communication Calibration

HART communication may be utilized to initiate AutroPoint HC300PL calibration. Refer to the appropriate appendix for details.

8.4 Detailed Calibration Procedure Using Magnetic Switch

Refer to Tables 3 and 4 for a quick summary of the standard calibration sequence.

1. Apply magnet for 2 seconds minimum to initiate calibration.
    A. The onboard LED turns to steady red.
    B. The LED within the PIRTB (if used) turns on.

2. When zero calibration is complete:
    A. The onboard LED changes from steady red to flashing red.
    B. The LED within the PIRTB (if used) begins flashing.
    C. The operator should now apply the appropriate calibration gas to the AutroPoint HC300PL if conducting Normal Calibration.
    D. If conducting Zero Only Calibration, the operator should re-apply the magnet to the switch. This will conclude the Zero Only calibration sequence.

3. When Span Calibration is complete:
    A. The onboard LED changes from flashing red to “off”.
    B. The operator should now close the valve and remove the calibration gas from the AutroPoint HC300PL.

NOTE
It is normal for the AutroPoint HC300PL LED to go off or turn blank (no colour displayed) until the calibration gas is cleared from the optics chamber. Remove the weather baffle if necessary to clear residual gas.

    C. The LED within the PIRTB (if used) changes to steady on.

Table 3—Quick Reference Guide for Normal Calibration Procedure Using Magnetic Switch

Description	Indicating LED (on-board/PIRTB)	Operator Action
Normal-ready to calibrate	steady green/off	Purge with clean air if required
Initiate Calibration	steady red/on-steady	Apply Magnet for 2 seconds min.
Zero Calibration complete	flashing red/on-flashing	Apply Calibration Gas to device
Span Calibration in progress	flashing red/on-flashing	Continue cal gas flow
Span Calibration complete	off/on-steady	Remove Calibration Gas
Output Returns to Normal	steady green/off	Calibration Completed
Normal Operation	steady green/off	None

Table 4—Quick Reference Guide for Zero Only Calibration Procedure Using Magnetic witch

Description	Indicating LED (on-board/PIRTB)	Operator Action
Normal-ready to calibrate	steady green/off	Purge with clean air if required
Initiate Calibration	steady red/on-steady	Apply Magnet for 2 seconds min.
Zero Calibration complete	flashing red/on-flashing	Re-initiate magnetic switch to terminate calibration
Return to Normal Mode	steady green/off	Zero Calibration Completed

8.5 Time Out

If calibration is not completed within 10 minutes, a calibration-failed fault is generated, and the unit returns to normal operation using the previous calibration values.

NOTE
Under normal conditions, span calibration is typically completed in 3 minutes or less.

8.6 Calibration Abort

Calibration can be aborted at any time after zero calibration is completed. This is done by activating the onboard or PIRTB magnetic switch, or by a command from the HART interface. If calibration is terminated, the new zero point is retained, and a zero calibration code is saved in the calibration history buffer. The unit will immediately return to normal operation.

9. Maintenance

9.1 Routine Inspection

The AutroPoint HC300PL detector should be inspected periodically to ensure that external obstructions such as plastic bags, mud, snow, or other materials do not block the weather baffle, thereby impairing the performance of the device. In addition, the weather baffle assembly should be removed and inspected to ensure that the diffusion paths into the measurement chamber are clear. See Figure 10.

9.2 Weather Baffle Cleaning

Remove the weather baffle assembly and clean with a soft brush and soap and water. Rinse and allow to dry.

Replace the weather baffle if damaged or if fouling of the baffle vents is evident.

NOTE
Solvents may damage the weather baffle assembly. If contamination is not removed using soap and water, then replacement of the baffle may be required.

9.3 Optics Cleaning

Cleaning of the AutroPoint HC300PL optical surfaces is normally required only if an optical fault is indicated.

Thoroughly douse the mirror and window using a liberal amount of isopropyl alcohol to clear away contaminant particles. Repeat the alcohol flush to remove any remaining contaminants. Allow the assembly to air-dry in a dust-free location.

9.4 O-Ring

Periodically the O-ring must be inspected for breaks, cracks and dryness. To test the ring, remove it from the enclosure and stretch it slightly. If cracks are visible, it must be replaced. If it feels dry, a thin coating of lubricant must be applied. See “Spare Parts” section for recommended lubricant. When re-installing the ring, be sure that it is properly seated in the groove.

9.5 Protective Caps And Covers

The calibration nozzle cap must always be installed, except while performing calibration. Also ensure that the HART Communication Port cover and the wiring compartment cover are installed and fully engaged.

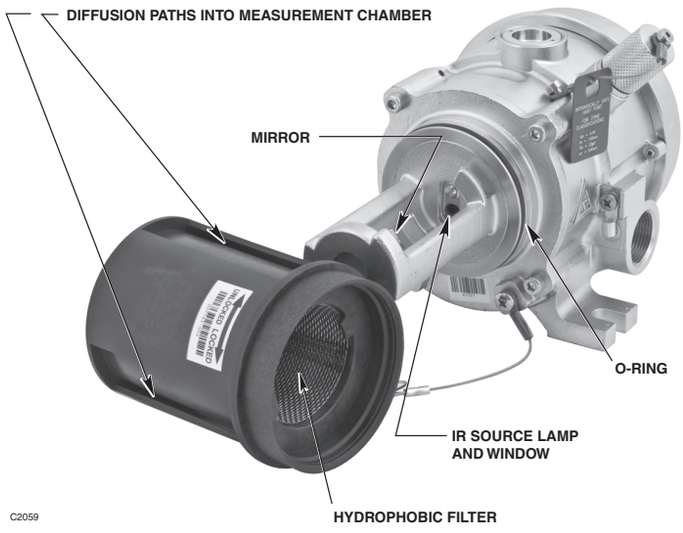


Figure 10—AutroPoint HC300PL with Baffle Removed

10. Troubleshooting

A Fault status is indicated by a yellow LED and a fault warning displayed in the AutroSafe panel display.

Fault Warning (AutroSafe display)	Problem	Corrective action
Low temperature shut down	The temperature at the detector is below -40ºC. Gas readings from the detector can not be relied on.	The detector has to be heated.
Low temperature warning	The temperature at the detector is below -35ºC. The temperature is close to the limit for reliable gas readings.	The detector has to be heated.
High temperature warning	The temperature at the detector is above 85ºC. The temperature at the detector is at the limit for safe use.	The detector has to be cooled down. Remove power.
High temperature shut down	The temperature at the detector is above 100ºC. The temperature at the detector is outside the limit for safe use.	The detector has to be cooled down. Remove power.
CPU supply voltage monitor	Internal fault	Replace detector
Interface Memory fault	Internal fault	Replace detector
Interface General fault	Internal fault	Replace detector
Calibration fault (0x11)	The detector is out of calibration	Recalibrate the detector
Dirty Optics (0x12)	The optical components in the gas sensing chamber is polluted.	Clean the optics
Open lamp (0x13)	The IR lamp is broken	Replace detector
Zero drift (0x16)	The sensor signal has drifted.	Recalibrate the detector. (Zero calibration)
HC300PL memory error (0x14)	Internal fault	Replace detector
HC300PL voltage supply fault (0x15)	Internal fault	Replace detector
HC300PL ADC fault (0x17)	Internal fault	Reset detector. If the fault condition is persistent, replace detector

11. Device Repair And Return

The AutroPoint HC300PL IR Hydrocarbon Gas Detector is not designed to be repaired in the field. If a problem should develop, first carefully check for proper wiring, programming and calibration. If it is determined that the problem is caused by an electronic failure, the device must be returned to the factory for repair.

Prior to returning devices or components, contact the nearest local Autronica authorized supplier so that a Service Order number can be assigned. A written statement describing the malfunction must accompany the returned device or component to expedite finding the cause of the failure.

12. Ordering Information

12.1 AutroPoint HC300PL

When ordering, please specify:

AutroPoint HC300PL	116-5861-011.5300

12.2 Calibration Equipment

AutroPoint HC300PL calibration kits consist of a sturdy carrying case containing two 3.6 cubic foot (103 liter) cylinders of specified gas, a regulator and pressure indicator, three feet of tubing, barbed nozzle for direct application to the device, and a calibration wind shield to contain the gas in high wind applications.

Methane, 50% LEL, 2.5% by volume	116-006468-001
Ethane, 50% LEL, 1.5% by volume	116-006468-002
Propylene, 50% LEL, 1% by volume	116-006468-005
AutroPoint HC300PL Regulator	116-162552-002
AutroPoint HC300PL Calibration Bag	116-006672-002

12.3 Spare Parts

Weather Baffle with Inlet Nozzle, with Hydrophobic Filter	116-007165-002
Weather Baffle with Inlet Nozzle, without Hydrophobic Filter	116-007165-001
Weather Baffle w 1/8” NPT cal gas inlet, with Hydrophobic Filter	116-007165-004
Weather Baffle w 1/8” NPT cal gas inlet, without Hydrophobic Filter	116-007165-003
Cal gas fitting cap, black	116-103035-001
Calibration Magnet	116-102740-002
Silicone Free Grease	116-005003-001
O-Ring, 3.75” i.d., for wiring compartment cover	116-107427-040
O-Ring, 3.25” i.d., for front flange (internal)	116-107427-052
O-Ring, 2.43” i.d., for weather baffle	116-107427-053

12.4 Assistance

For assistance in ordering a system to meet the needs of a specific application, contact:

Autronica Fire and Security AS
P.O. Box 5620
NO-7483 Trondheim, Norway
Tel: (+47) 73 58 25 00
Fax: (+47) 73 58 25 01
E-mail: info@autronicafire.no
Web page: www.autronicafire.com

Appendix A

A.1 HART Communication

Before connecting the HART communicator the detector has to be disabled from the AutroSafe panel. Digital communication with the AutroPoint HC300PL is necessary to monitor internal status and to modify the factory settings. This appendix provides guidance on establishing HART communication, and describes the communication menu structure when using the AutroPoint HC300PL with the HART handheld communicator.

NOTE
Any change in alarm setpoints will be overridden by the AutroSafe system.

A.2 HART Handheld Communicator Interconnection With AutroPoint HC300PL

Unscrew the protective cap from the HART communication port on the side of the AutroPoint HC300PL gas detector. Connect the HART communicator to the two terminals inside the port. Press the “on” key to switch on the HART communicator handheld communicator. The Online menu is the first menu to appear when the Communicator is properly connected to the AutroPoint HC300PL. This menu is structured to provide important information about the connected device immediately on powering up the Communicator. This menu displays up-to-date device information
including primary variable, analogue output, lower range value, and upper range value.

NOTE
The HART protocol incorporates a concept called the “Device Description Language” that enables all suppliers of HART instruments to define and document their products in a single consistent format. This format is readable by handheld communicators, PC’s and other process interface devices that support DDL. DDL enables full interoperability of devices, regardless of manufacturer, allowing full functionality from any HART device.

In the event that your Communicator does not establish communications with the AutroPoint HC300PL, you may need to ensure that the appropriate DDLs for the AutroPoint HC300PL are included within your Communicator.

To review the device descriptions programmed into your HART communicator:

1) From the Main menu, press to access Offline menu.

2) From the Offline menu, press New Configurations to access the list of device descriptions programmed into your HART Communicator. The Manufacturer menu displays a list of each manufacturer with device descriptions currently installed in your Communicator's Memory Module. The standard 12 MB Memory Module is recommended, as it allows for more device descriptions.

3) Select a manufacturer (Det-Tronics), and the Model menu displays, containing a list of currently installed device models provided by the selected manufacturer. Select the PIRECL model.

4) Review the different manufacturers and models to determine the installed HART-compatible devices in your Communicator.

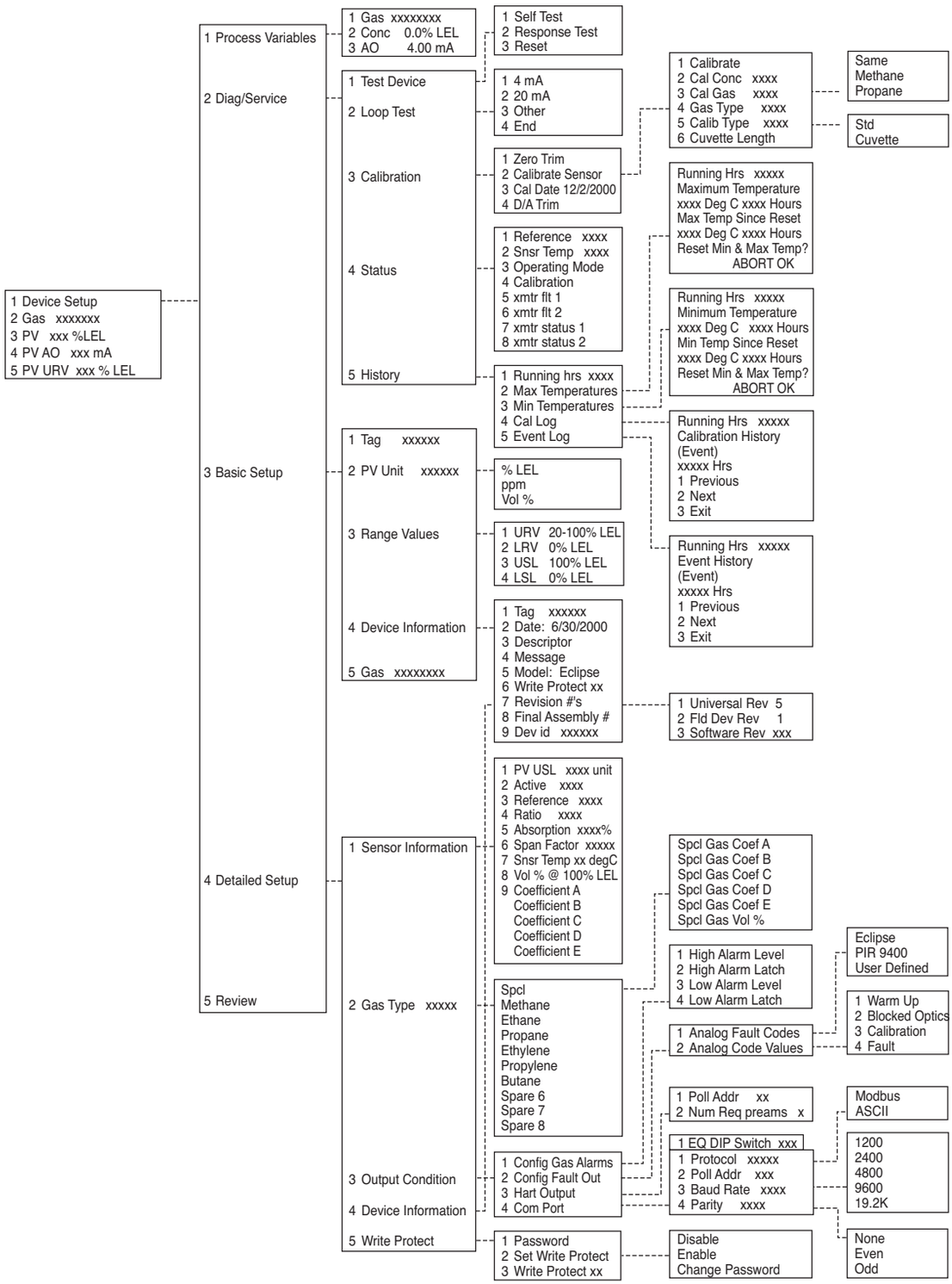
If you cannot find the AutroPoint HC300PL device on your communicator, the device revision you are looking for is not programmed into the Memory Module. In this instance, you are limited to what is available using the generic interface built into your HART Communicator.

The HART Communication Foundation (www.ccsi.com/hart) manages a library of Manufacturer Device Descriptions which are distributed to programming sites for inclusion in master devices. A complete listing of the HCF DD Library is available for download in manufacturer and device type sequence.

NOTE
If a device is found, the HART Communicator displays the Online menu. If no device is found, the Communicator displays the Main menu. If no device is found, check the connections, verify the presence of a minimum of 250 ohms load resistance in series in the loop, and retry by selecting 'Online.' To poll multiple devices in the loop, refer to HART communicator manual.

A.3 AutroPoint HC300PL HART Menu Structure

This section displays the menu trees for the AutroPoint HC300PL. The menu tree shows the primary commands and options available when using menu selections.



A.4 Connections And Hardware

The HART communicator can interface with the AutroPoint from the onboard I.S. communication port, from the control room, or any wiring termination point in the analogue output signal loop. To communicate, connect the HART communicator in parallel with the AutroPoint analogue signal or load resistor. The connections are non-polarized.

NOTE
The HART communicator needs a minimum of 250 ohms resistance in the loop to function properly. The HART Communicator does not measure loop resistance. Any external ohmmeter is required.

A.5 Commonly Used HART Commands

The most commonly used HART commands for the AutroPoint HC300PL are:

1. Performing basic setup functions such as:
    - Assigning a tag number to the detector
    - Assigning unit of measure (%LEL, PPM, % Vol)

2. Performing detailed setup functions such as:
    - Assigning a special gas type
    - Configuration of HART communication protocols
    - Write-protecting the HART programming, or assigning a password to protect the setup.

3. Performing Diagnostic and Service functions such as:
    - Performing a Calibration
    - Monitoring detector history/data logs

It is important for the user to understand how to correctly operate the HART communicator, and how to navigate through the various programming options and either select or de-select the desired parameters. This document does NOT cover this fundamental information on the HART communicator. Please refer to the HART communicator instruction manual for specific guidance on how to operate the communicator.

A.6 Typical Setup Of AutroPoint HC300PL

After HART communication has been established with the AutroPoint HC300PL, the following operational parameters are generally verified:

1. Inspect the Root menu to confirm that the gas type selected is proper for the gas hazard to be detected. Methane gas is the factory default gas type. If methane is not the desired gas type, then change the setting using the detailed setup programming option, and perform a field calibration using the same gas type as is selected. Refer to the Calibration section of this manual.

2. Inspect the Gas Alarm level thresholds and Fault output signals using the Detailed setup option, and modify these settings if required.

3. Enter a device Tag number and/or descriptor for future traceability and guidance. While these three operations are typical, these steps may not be satisfactory for your application.

The following data provides basic guidance on HART menu navigation. Refer to the HART communicator manual for additional guidance.

A.7 Online Menu

When HART communication is established with the AutroPoint HC300PL, the first menu displayed is the Root menu:

1 Device Setup
2 Gas xxxxx
3 PV xxx %LEL
4 PV AO xxx mA
5 PV URV xxx %LEL

To select any of the 5 menu options shown, highlight the desired option using the up/down arrow key, and then press the “right arrow” key.

1) Device Setup

Press to access the Device Setup menu from the Online menu. The Device Setup menu accesses every configurable parameter of the connected device. Refer to the Device Setup SubMenu for more information.

2) Gas

This shows gas type selected for detection. Factory default setting is methane.

3) PV (Primary Variable)

This shows the gas concentration being detected in %LEL.

4) PV AO (Analogue Output)

This shows the analogue output level in selected units, typically milliamperes

5) PV URV (Upper Range Value)

Select URV to view the upper range value and related engineering units.

A.8 Device Setup Submenu

1 Process Variables

2 Diag/Service

3 Basic Setup

4 Detailed Setup

5 Review

The Device Setup menu accesses every configurable parameter of the connected device.

The first accessible setup parameters include:

1) Process Variables

Selecting this menu item will list all process variables and their values.
These process variables are continuously updated, and include:
Gas xxxxx (gas type being detected).
Conc 0.0 % (concentration of gas in % full scale).
AO 4.00 mA (analogue output of device).

2) Diag/Service Menu

Selecting this menu offers device and loop tests, calibration, and status/history options. Refer to the Diag/Service Submenu for more information.

3) Basic Setup

This menu provides quick access to a number of configurable parameters including tag, unit, range values, device information, and gas type. Refer to the Basic Setup Submenu for additional information.

The options available in the Basic Setup menu are the most fundamental tasks that can be performed with a given device. These tasks are a subset of the options available under the Detailed Setup menu.

4) Detailed Setup

Press to access the Detailed setup menu.
This menu provides access to:

1 Sensor information
2 Gas Type
3 Output Condition
4 Device information
5 Write protect

Refer to the Detailed Setup Submenu for additional information.

5) Review

Press to access the Review menu. This menu lists all of the parameters stored in the connected device, including information about the measuring element, signal condition, and output. It also includes stored information about the connected device such as tag, materials of construction, and device software revision.

A.9 Diagnostics/Service Menu

The specific diagnostic and/or service functions available are:

1 Test Device

2 Loop Test

3 Calibration

4 Status

5 History

1) Test Device

a) Self-test. Internal tests are performed and any problems are reported in xmtr flt 1 and xmtr flt 2.
b) Response Test. Gas response is indicated by the PV.
c) Reset. Latched relay outputs are reset.

2) Loop Test

This test allows the operator to manually set the analogue signal output to a selected constant value.

3) Calibration

This menu option initiates the calibration routine and is used to set device calibration preferences.
Calibration Submenus include:

a) Zero Trim. The current sensor input is used as the new zero reference.
b) Calibrate Sensor. This is the command used to calibrate the AutroPoint Detector. Submenus include:
   i) Calibrate. Zero and span calibrations are performed.
   ii) Cal Concentration. The output will be set to this value when gas is applied during calibration.
   iii) Cal Gas
   iv) Gas Type. Submenu includes optional gases:
      (1) Methane
      (2) Propane
   v) Calibration Type. Submenu includes options:
      (1) Standard
      (2) Cuvette
   vi) Cuvette Length (in millimetres)
c) Calibration Date (CalDate). Shows date of last calibration
d) D/A trim (internal use only).

4) Status

This menu option shows extensive status information about the detector. Data available includes:

a) Reference xxxx (output value of the reference sensor).
b) Snsr temp xxxx (temperature of the sensor that is making the process measurement).
c) Operating mode (calibration, normal, reset)
d) Calibration
e) xmtr flt 1. Xmtr flt and xmtr status provide status information relating to failures, warnings and status of processes.
f) xmtr flt 2
g) xmtr status 1
h) xmtr status 2

5) History

This menu option shows extensive historical information about the detector. Data available includes:

1) Running hrs xxxx (the number of hours the unit has been powered).
2) Max temperatures (the maximum temperatures recorded in the device).

See max temperature submenu below.

3) Min temperatures (the minimum temperatures recorded in the device).

See min temperature submenu below.

4) Cal log (data regarding stored calibrations). The most recent calibration is shown first. Calibrations are recorded as zero only cal, cal OK (zero and span were successfully completed), and cal failed. See cal log submenu below.
5) Event log (data regarding stored events). The most recent event is shown first.

Recorded events include blocked optics, warm-up, zero drift, low alarms and high alarms.
See event log submenu below.

Max Temperature Submenu:
Running hrs xxxx
Maximum Temperature
xxxx degC xxxx hours
Max temp since reset
xxxx degC xxxx hours
Reset min&max temp?
ABORT OK

Min Temperature Submenu:
Running hrs xxxx
Minimum Temperature
xxxx degC xxxx hours
Min temp since reset
xxxx degC xxxx hours
Reset min&max temp?
ABORT OK

Cal Log Submenu:
Running hrs xxxx
Calibration history
(Event)
xxxxx Hrs
1 Previous
2 Next
3 Exit

Event Log Submenu:
Running hrs xxxx
Event history
(Event)
xxxx Hrs
1 Previous
2 Next
3 Exit

A.10 Basic Setup Submenu

The tag number identifies a specific device. Changing units affects the engineering units that are displayed. Re-ranging changes the analogue output scaling.

1 Tag

2 PV Unit xxxxx

3 Range Values

4 Device Information

5 Gas xxxxxx

1) Tag

Press to access the Tag number menu. Enter the device tag number as desired.

2) PV Unit

Press to access PV Unit submenu. Select %LEL for standard combustible applications.
– % LEL
– ppm
– Vol %

3) Range Values

Press to access Range Values submenu.

1. URV 60% LEL (upper range value).
2. LRV 5.0% LEL (lower range value).
3. USL 60% LEL (upper sensor limit).
4. LSL 5.0% LEL (lower sensor limit).

4) Device Information

Press to access device information submenu:

1. Tag xxxx
2. Date 6/30/2000
3. Descriptor (text associated with the field device that can be used by the operator in any way).
4. Message (text associated with the field device that can be used by the operator in any way).
5. Model: ECLIPSE
6. Write protect xx. This indicates whether variables can be written to the device, or whether commands that cause actions to be performed in the device can or cannot occur.
7. Revision #'s. See Revision #'s submenu below.
8. Final asmbly num
9. Dev id xxxx (a number is used to identify a unique field device).

Revision # submenu offers selection options for:
1. Universal rev
2. Fld dev rev
3. Software rev xx

5) Gas

Type of gas being detected.

A.11 Detailed Setup Menu

1. Sensor Information

This menu provides detailed information on the internal detector operations.

1 Sensor Information
2 Gas Type xxxxx
3 Output Condition
4 Device Information
5 Write Protect

Submenu options include:

1. PV USL xxxx. The upper sensor limit value defines the maximum usable value for the upper range of the sensor.
2. Active xxxx (output value of the active sensor).
3. Reference xxxx (output value of the reference sensor).
4. Ratio xxxx (the ratio of the active sensor over the reference sensor).
5. Absorption xxxx % (the gas absorption expressed in percent).
6. Span Factor xxxx (the number used in calibrating this specific device).
7. Snsr temp xx degC (the temperature of the sensor that is making the process measurement).
8. Vol % @ 100%LEL (the % volume of gas equal to 100% LEL).
9. Coefficient A
   Coefficient B
   Coefficient C
   Coefficient D
   Coefficient E

2. Gas Type

Select the gas to be detected here. Submenu options include:

– Spcl
Spcl Gas Coef A
Spcl Gas Coef B
Spcl Gas Coef C
Spcl Gas Coef D
Spcl Gas Coef E
Spcl Gas Vol %
– Methane
– Ethane
– Propane
– Ethylene
– Propylene
– Butane
– Spare 6
– Spare 7
– Spare 8

3. Output Condition

NOTE
Any settings will be overridden by the AutroSafe system

Select and configure the output signal options for the AutroPoint detector. Submenu options:

1) Config Gas Alarms. Submenu options include:
    a) High Alarm Level. The high alarm level cannot be set higher than 60% LEL or lower than the low alarm level.
    b) High Alarm Latch
    c) Low Alarm Level. The low alarm level cannot be set lower than 5% LEL or higher than the high alarm level.
    d) Low Alarm Latch

2) Config fault out. Submenu options include:
    a) Analog fault codes. This programs the analogue output used to indicate faults. Submenu options include:
        – Eclipse
        – PIR 9400
        – User defined
    b) Analog code values. Submenu options include:
        i) Warm up
        ii) Blocked Optics
        iii) Calibration
        iv) Fault

3) Hart output. Submenu options include:
    a) Poll addr xx (address used by the host to identify a field device).
    b) Num req preams x (Number of Request Preambles).

NOTE: Do not use the Com Port menu options with the AutroPoint HC300PL.

4) Com Port. Submenu options include:
    1 EQ DIP switch xxx (used with Eagle Quantum systems only).
    1 Protocol xxxx (protocol for RS-485 communications). Submenu options:
        – Modbus
        – ASCII
    2 Poll addr xxx (polling address for RS-485 communications).
    3 Baud Rate xxxx (baud rate for RS-485 communications). Submenu options include:
        – 1200
        – 2400
        – 4800
        – 9600
        – 19.2k

    4 Parity xxxx (parity for RS-485 communications). Submenu options include:
    – None
    – Even
    – Odd

4. Device Information

Press to access device information submenu:

1. Tag xxxx
2. Date 6/30/2000
3. Descriptor (text associated with the field device that can be used by the operator in any way).
4. Message (text associated with the field device that can be used by the operator in any way).
5. Model: ECLIPSE
6. Write protect xx. This indicates whether variables can be written to the device, or whether commands that cause actions to be performed in the device can or cannot occur.
7. Revision #'s. See Revision #'s submenu below.
8. Final asmbly num
9. Dev id xxxx (a number used to identify a unique field device).

Revision # submenu
offers selection options for:
1. Universal rev
2. Fld dev rev
3. Software rev xx

5. Write Protect

Enable/disable password and write protection capability. Submenu options include:

1) Password. A password is required to enable writing to the device.
2) Set Write Protect
   – Disable
   – Enable
   – Change Password
3) Write Protect xx. This indicates whether variables can be written to the field device or whether commands that cause actions to the performed in the device can or cannot occur.

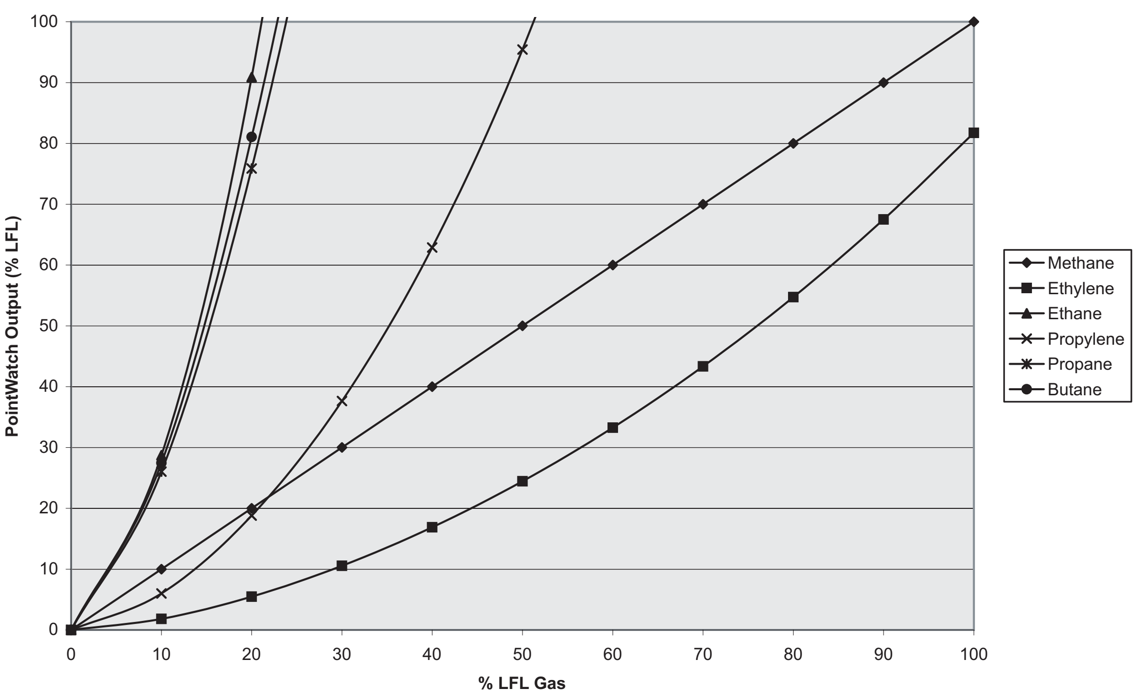
Appendix B

B.1 Detection Of Other Gases

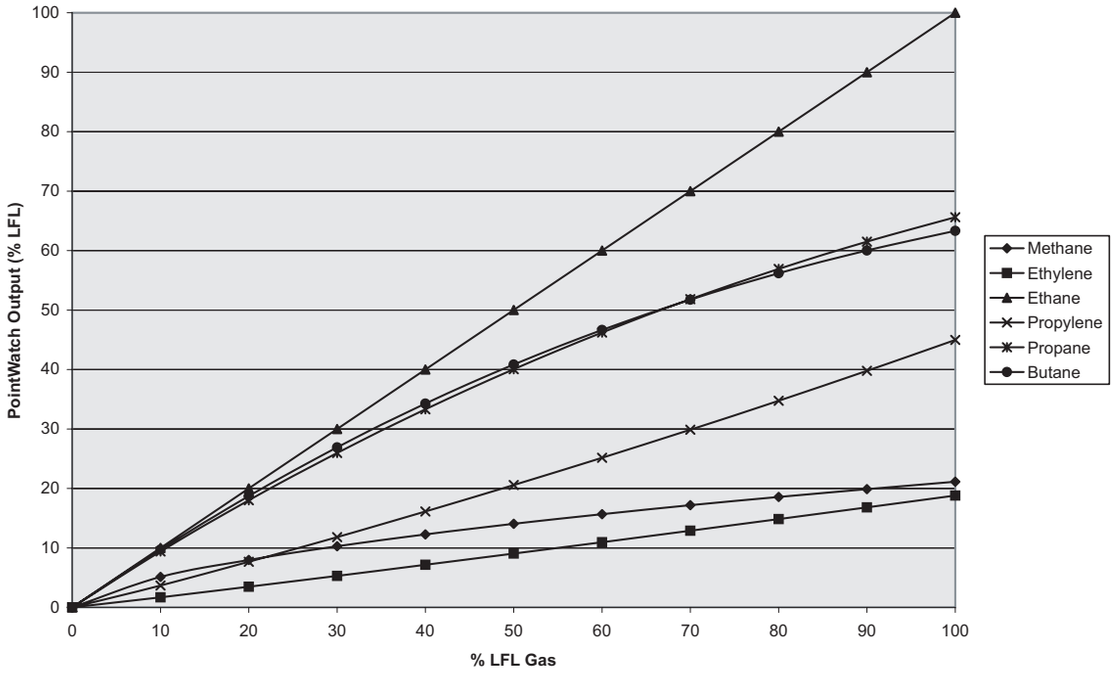
AutroPoint HC300PL is provided with field-selectable "standard gas" signal processing program settings. These settings are provided for detection and measurement of methane, ethane, propane, ethylene, and propylene gases, and are defined as linearized gas measurement outputs. This means that the AutroPoint HC300PL is capable of providing an analog signal output that is directly proportional to the %LEL concentration for these gases, provided the proper gas setting has been selected, and the AutroPoint HC300PL has been calibrated with the proper calibration gas type. The factory default gas setting is methane gas. The AutroPoint HC300PL has been agency certified for methane gas. The HART communicator is required to confirm the current setting and change it if required.

In addition to the five standard gases mentioned, the AutroPoint HC300PL is capable of detecting and measuring many other hydrocarbon gases and vapours. AutroPoint HC300PL can be configured to provide a linear output for detection of non-standard gases. For detection of many commonly encountered gases, one of the standard settings will usually suffice. Please consult the factory for details.

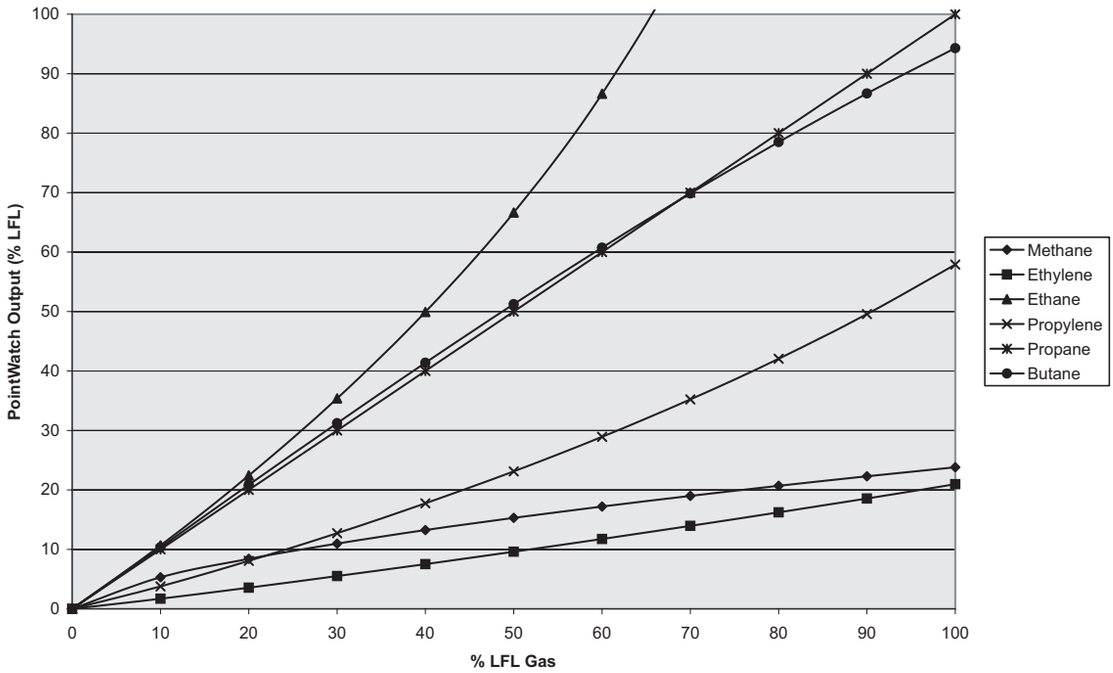
Methane Calibrated PointWatch - Response to Standard Gases



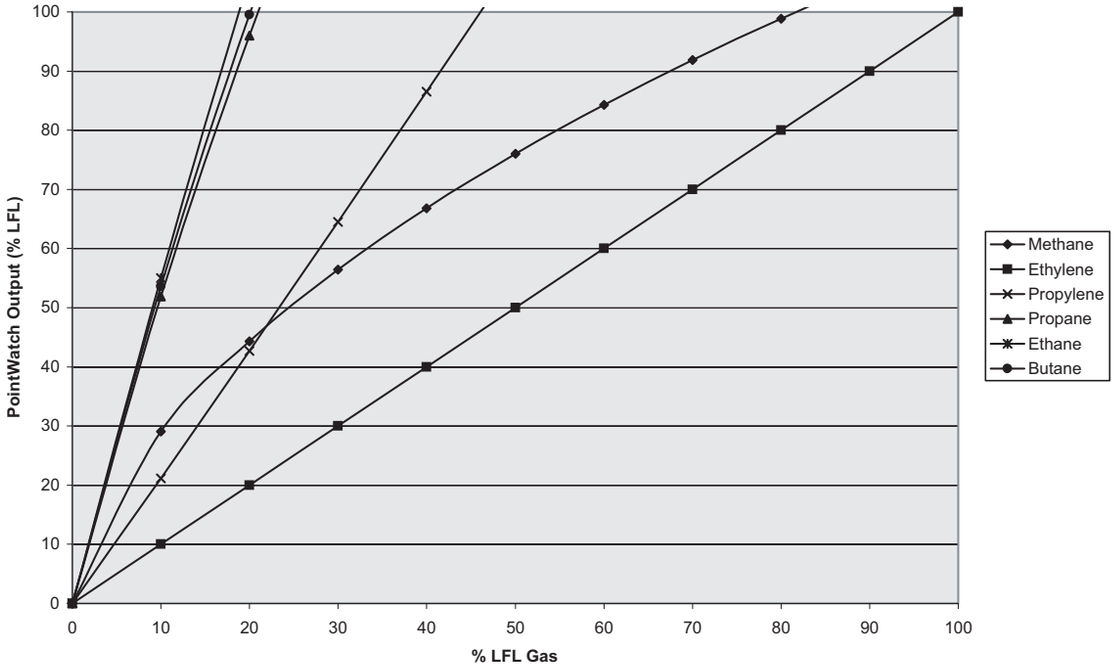
Ethane Calibrated PointWatch - Response to Standard Gases



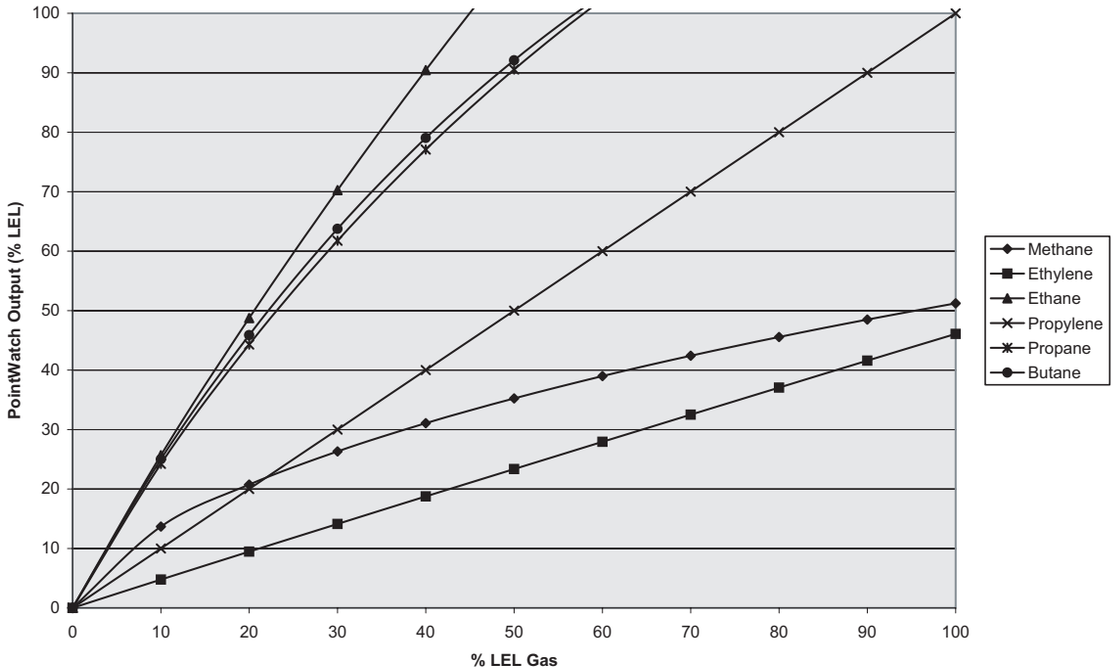
Propane Calibrated PointWatch - Response to Standard Gases



Ethylene Calibrated PointWatch - Response to Standard Gases



Propylene Calibrated PointWatch - Response to Standard Gases



Appendix C

Warranty

Autronica Fire and Security AS products are manufactured from high quality components and the completed device is rigorously inspected and tested before shipment; however, any electronic device is subject to failure beyond the control of the manufacturer. To ensure system reliability, it is important for the user to maintain the system as recommended by the instruction manuals and to determine the frequency of functional checking of the system required for each specific installation. The more frequent the checking, the greater the system reliability. For the highest reliability, a completely redundant system is necessary. The manufacturer warrants the AutroPoint HC300PL against defective parts and workmanship, and will replace or repair equipment returned to the manufacturer for these reasons within five years after purchase date. Please note that no other warranties, written or implied, will be honoured by the manufacturer.

CAUTION

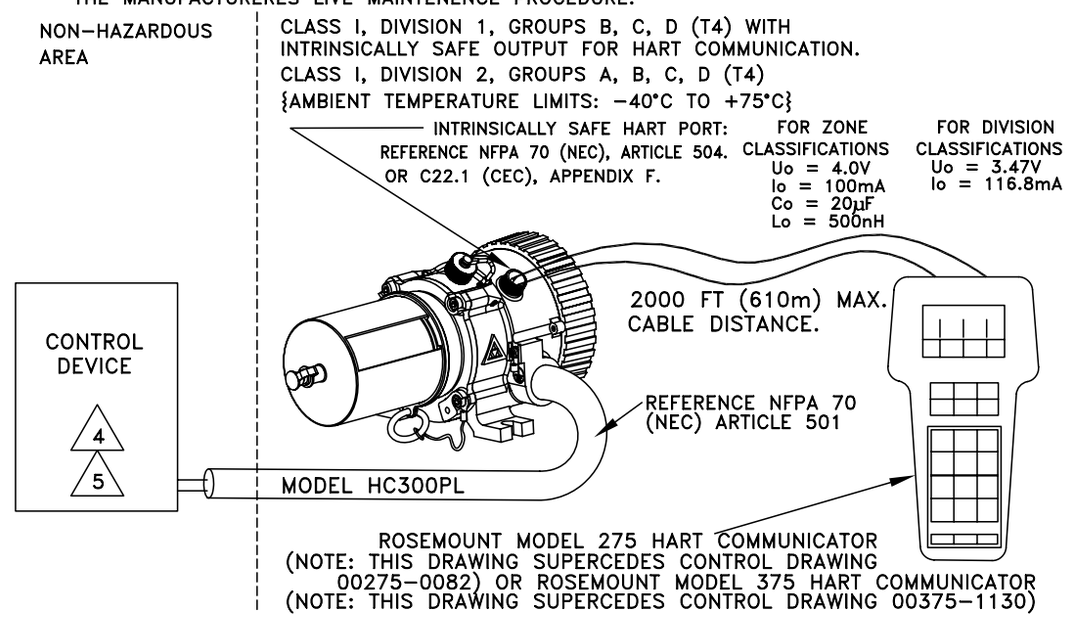
The detector contains no user serviceable components. Service or repair should never be attempted by the user. The manufacturer's warranty for this product is void, and all liability for proper function of the detector is irrevocably transferred to the owner or operator in the event that the device is serviced or repaired by personnel not employed or authorized by the manufacturer, or if the device is used in a manner not conforming to its intended use.

Appendix D

Control Drawing

THE MODEL HC300PL INFRARED HYDROCARBON GAS DETECTORS PROVIDE AN FM APPROVED AND CERTIFIED INTRINSICALLY SAFE OUTPUT FOR CONNECTION WITH THE HART COMMUNICATOR WHEN INSTALLED PER THE NATIONAL ELECTRICAL CODE (NEC), NFPA 70, ARTICLES 501 & 504.

NOTE: TO PREVENT IGNITION OF EXPLOSIVE ATMOSPHERES, READ, UNDERSTAND, AND ADHERE TO THE MANUFACTURERES LIVE MAINTENENCE PROCEDURE.



5 IN ORDER TO MAINTAIN SYSTEM APPROVAL, THE CONTROL UNIT CONNECTED TO THE HC300PL DETECTOR, SHALL HAVE THE APPROPRIATE THIRD PARTY CERTIFICATION TO PROCESS THE SPECIFIED SIGNAL AND PROVIDE THE APPROPRIATE INDICATION.

4 APPROVAL OF THE MODEL HC300PL DOES NOT INCLUDE OR IMPLY APPROVAL OF THE APPARATUS TO WHICH THE DETECTOR MAY BE CONNECTED AND WHICH PROCESSES THE ELECTRONIC SIGNAL FOR EVENTUAL END USE.

2. THE MODEL HC300PL IS FM APPROVED FOR COMBUSTIBLE GAS PERFORMANCE IN ACCORDANCE WITH FM 6310/6320 & ANSI/ISA-12.13.01.

1. FM APPROVED CERTIFIED DRAWING - NO MODIFICATIONS PERMITTED WITHOUT REFERENCE TO APPROVAL AGENCY.

Reader's Comments

Please help us to improve the quality of our documentation by returning your comments on this manual:

Title: Installation Handbook
Infrared Hydrocarbon Gas Detector, HC300PL

Ref. No.: 116-P-HC300PL/DGB, rev. A 2010-08-03

DEC P/N 95-8587

Your information on any inaccuracies or omissions (with page reference):

Suggestions for improvements

Thank you! We will investigate your comments promptly.

Would you like a written reply? Yes No

Name: _____

Title: _____

Company: _____

Address: _____

_____

_____

Telephone: _____

Fax: _____

Date: _____

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