Instructions 95-8440-02

PointWatch™ Infrared Hydrocarbon Gas Detector
PIR9400

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DET-TRONICS®

INSTRUCTIONS

PointWatch™ Infrared Hydrocarbon Gas Detector

PIR9400

APPLICATION

The PointWatch Detector 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% LFL. The detector provides a 4 to 20 milliampere output signal, corresponding to the detected gas concentrations. The explosion-proof sensor housing meets FM, CSA and CENELEC requirements for use in hazardous environments.

PointWatch is ideally suited for use in harsh environments and where the cost of required maintenance for conventional catalytic detectors is prohibitive. The PointWatch IR Detector will perform reliably in the presence of silicone and other catalytic poisoning agents and can also operate in oxygen free environments or where high background gas levels are present. There are no known poisons that affect this technology.

The PointWatch detector can be used alone or as part of a larger system such as Det-Tronics' Infiniti Gas Transmitter, R8471 Controller, or Eagle Quantum Hazard Monitoring System.

FEATURES

- Requires no routine calibration to ensure proper operation.
- Continuous self-test automatically indicates a fault or fouled optics condition.
- Unique multi-layered filtering system protects optics from dirt and water ingress.
- Internal heating system minimizes condensation, allowing reliable operation through temperature extremes.
- Performs well in the presence of high concentrations or constant background levels of hydrocarbons and in oxygen depleted atmospheres.
- There are no known poisons, e.g. silicones or hydrides, that compromise the integrity of the measurement.
- Standard 4 to 20 milliampere output (current source).
- Standard 0 to 100% LFL detection range.
- Compact, lightweight, explosion-proof housing is designed for duty in harsh environments.

SPECIFICATIONS

INPUT VOLTAGE—
+24 vdc nominal (range +18 to +32 vdc).

POWER CONSUMPTION (Watts)—

Input Voltage:	**18 vdc**	**24 vdc**	**32 vdc**
Nominal	3.5	4.6	6.2
Maximum	4.0	5.5	7.0

DETECTION RANGE—
0 to 100% LFL.

GASES —
Will respond to most hydrocarbon gases. Outputs linearized for 0 to 100% LFL are provided for methane, ethane, propane/butane, ethylene, propylene.

All devices are shipped with a 0 to 100% LFL linearized output for methane. Other linearized outputs are field selectable by means of a switch.

CURRENT OUTPUT (NON-ISOLATED)—
Linear 4 to 20 ma current source.

- 4 to 20 ma output indicates 0 to 100% LFL detection range (for linearized gases)
- 23.2 ma indicates over-range condition (120% LFL)
- 0 to 2.4 ma levels indicate calibration, fault and fouled optics conditions.

Refer to Table 1 for a detailed description of current outputs.

Maximum loop resistance: 580 ohms at +24 vdc. See Figure 1 for further information.

Table 1—Current Loop Output Levels and Corresponding Status Indications

Current Level	Status
23.2 ma	Over-range (120% LFL)
20.0 ma	Full scale (100% LFL)
4.0 ma	Zero gas level (0% LFL)
2.2 ma	Zero calibration in progress
2.0 ma	Span calibration in progress
1.8 ma	Calibration complete - remove gas
1.6 ma	Calibration fault
1.0 ma	Fouled optics
0.8 ma	24 vdc line low (less than 17.5 vdc)
0.6 ma	Calibrate input active at power-up (probable wiring fault)
0.4 ma	Active channel fault
0.2 ma	Reference channel fault
0.0 ma	CPU system fault, warmup

NOTE

The following specifications for Accuracy, Stability and Repeatability are based on a 0 to 100% LFL methane calibration.

ACCURACY (Room Temperature)—
±3% LFL from 0 to 50% LFL, ±5% LFL from 51% to 100% LFL.

RESPONSE TIME (Seconds)—

	T50	T90
Multilayered aluminum weather baffle		
With hydrophobic screen	7	14
Without hydrophobic screen	5	10
Polyphthalamide (PPA) weather baffle		
With hydrophobic screen	6	16
Without hydrophobic screen	2	3

STABILITY—
Temperature
Zero: ±2% LFL from –40°F to +167°F (–40°C to +75°C).

Span: ±5% LFL at 50% LFL from –13°F to +167°F (–25°C to +75°C),

±10% LFL at 50% LFL from –40°F to –13°F (–40°C to –25°C).

Time (10 months) ±2% LFL (Det-Tronics verified).

REPEATABILITY (Room Temperature)—
Zero: ±1% LFL.
Span: ±2% LFL at 50% LFL.
(Det-Tronics verified)

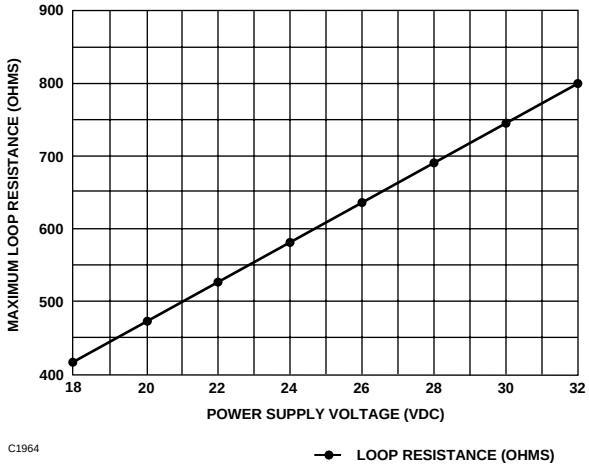


Figure 1—4 to 20 ma Current Loop Resistance

WIRING—
The PointWatch detector has five 22 AWG wires, 20 inches long for wiring into a termination box or the Infiniti transmitter.

Red	=	+ 24 volts dc
Black	=	– (common)
White	=	4 to 20 milliampere signal output
Yellow	=	Calibration input
Green	=	Chassis ground

Power Wiring: 18 AWG minimum is recommended for power wiring. Larger diameter wire may be required to maintain a minimum of 18 vdc (including ripple) at the sensor for all operating conditions (see Figure 2). For maximum EMI/RFI protection, shielded cable is recommended.

OPERATING TEMPERATURE RANGE—
–40°F to +167°F (–40°C to +75°C).

STORAGE TEMPERATURE RANGE—
–55°C to +85°C (-67°F to +185°F).

HUMIDITY (Non-Condensing)—
0 to 99% relative humidity (Det-Tronics verified)
5 to 95% relative humidity (FMRC/CSA verified).

RFI/EMI PROTECTION—
EN50081-1. Class B, EN50270.
Operates properly with 5 watt walkie talkie keyed at 1 meter.

INGRESS PROTECTION—
IP66 (DEMKO certified per EN60529).

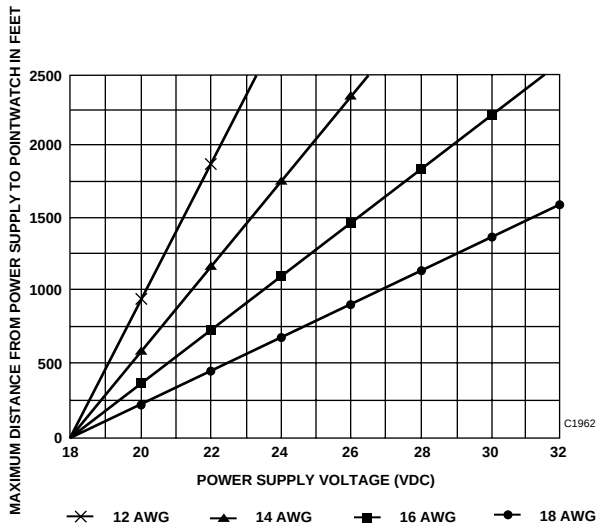


Figure 2—PointWatch Wiring Requirements

ENCLOSURE MATERIALS—
Aluminum (clear anodized) enclosure and weather protection baffles. Content: 0.8% to 1.2% Mg, 0.15% to 0.40% CU.

Stainless Steel (316 electropolished) enclosure, polyphthalamide (PPA) weather protection baffle.

CERTIFICATION—

PointWatch Detector

FM: Class I, Div. 1, Groups B, C & D (T5).
Class I, Div. 2, Groups A, B, C & D (T3C).
Performance verified.
(See Appendix A for approval description.)

CSA: Class I, Div. 1, Groups B, C & D (T5).
Class I, Div. 2, Groups A, B, C & D (T3C).
Performance verified.

CENELEC/CE: See Appendix B for details.

Gosstandart: Certificate No. A-0272; Performance Certificate No. 1039.
1Ex d IIB T6/H2 (Tamb. -40°C to +40°C)
1Ex d IIB T5/H2 (Tamb. -40°C to +75°C).

PIRTB Termination Box

FM: Class I, Div. 1, Groups B, C & D (T6).
Class I, Div. 2, Groups A, B, C & D (T6).

CSA: Class I, Div. 1, Groups B, C & D (T6).
Class I, Div. 2, Groups A, B, C & D (T6).

CENELEC/CE: See Appendix B for details.

Gosstandart: 1Ex d IIC T6 (Tamb –60°C to +40°C)
1Ex d IIC T5 (Tamb –60°C to +75°C).

WARNING

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

MOUNTING—
Det-Tronics tall cover termination box is recommended for optimum ease of installation and calibration of PointWatch detector. Detector can be threaded into any approved termination box suitable for the specific applications. (Termination box spacers may be required for flush mounting.) PointWatch thread options:

- 3/4 inch NPT
- M20.

SHIPPING WEIGHT—
Aluminum: 2.8 pounds (1.3 kilograms).
Stainless Steel: 4.8 pounds (2.2 kilograms).

DIMENSIONS—
See Figures 3 and 4 for the dimensions of the PointWatch Detector and Figure 5 for dimensions of the PointWatch Termination Box.

TERMINALS—
PointWatch termination box terminals UL/CSA rated for 14 to 22 AWG wire; terminals DIN/VDE rated for 2.5 mm^2 wire.

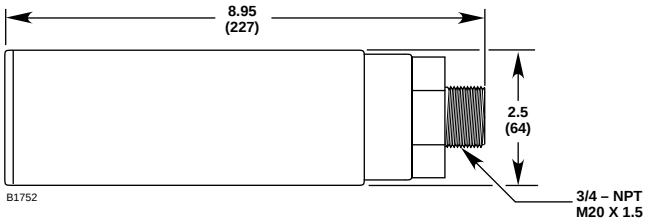


Figure 3—Aluminum PointWatch Unit Dimensions in Inches (MM)

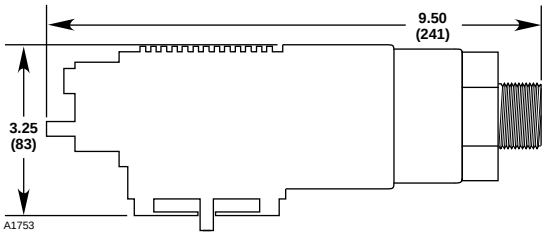
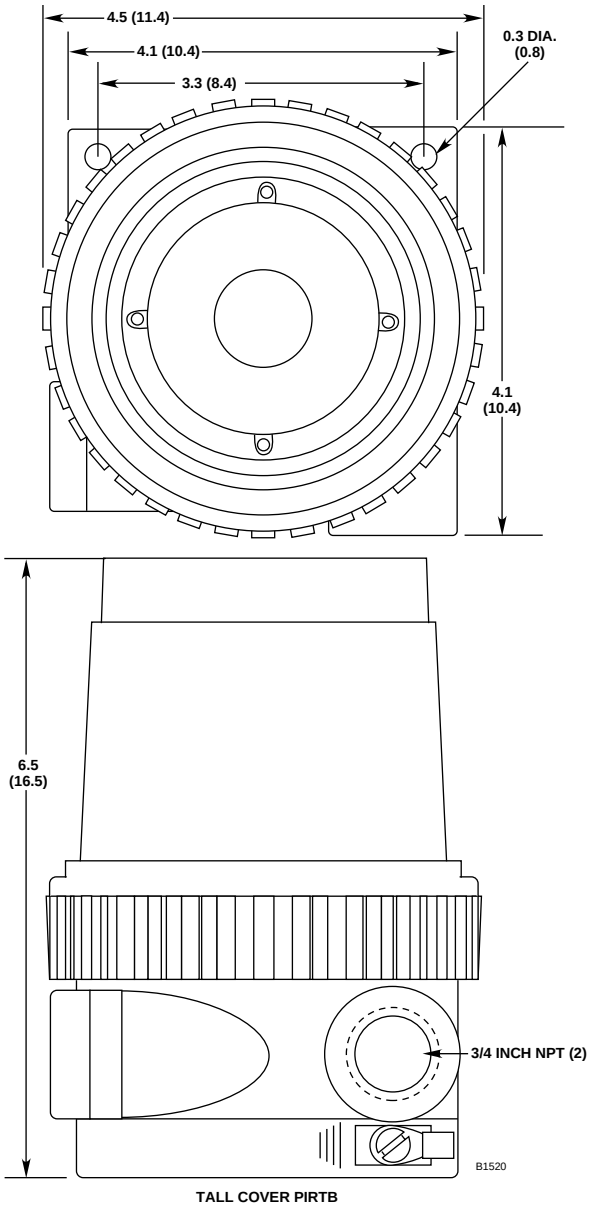


Figure 4—Stainless Steel PointWatch Unit Dimensions in Inches (MM)



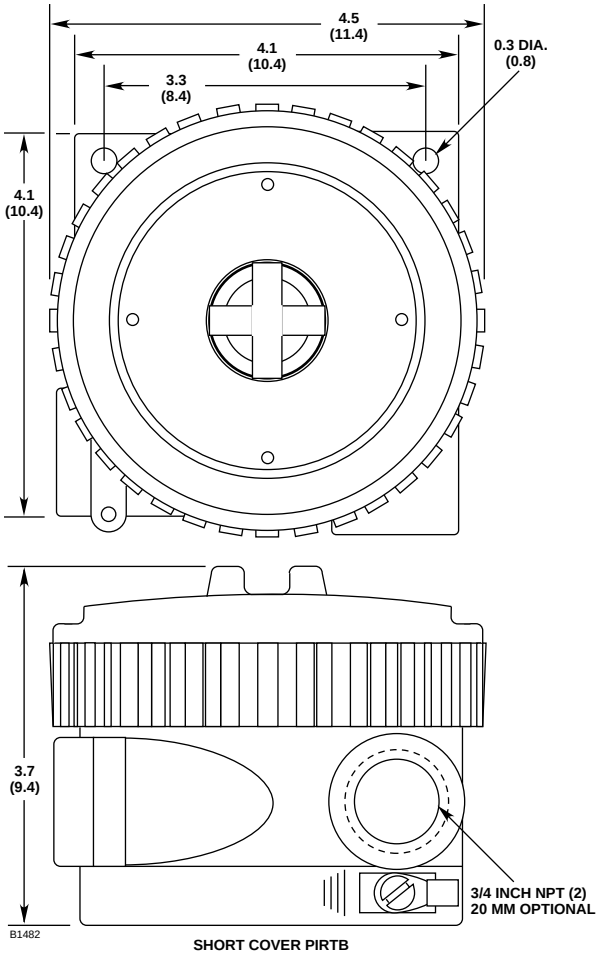


Figure 5—Termination Box Dimensions in Inches (MM)

DESCRIPTION

DETECTION METHOD

PointWatch operates on the infrared absorption principle. A beam of modulated light is projected from an internal infrared source to a reflector, which sends it back to a pair of infrared sensors. One of the sensors is designated reference and the other active, with different optical filters in front of the two sensors to make them selective to different infrared wavelengths. The reference wavelength is unaffected by combustible gases, while the active wavelength is absorbed by combustible gases. The ratio of the active to the reference wavelength is computed within the PointWatch detector to determine the concentration of gas present. This value is then converted into a 4 to 20 milliampere current output for connection to external display and control systems.

CURRENT LOOP OUTPUT

During normal operation, the PointWatch detector has a current output from 4 to 20 milliamperes that is proportional to gas concentrations from 0 to 100% LFL. A current output other than 4 to 20 milliamperes indicates either negative gas level, a fault or over-range condition, or that the unit is in the calibrate mode as indicated in Table 1.

OPERATING MODES

Warmup

When power is applied to the detector, it enters a Warmup mode (for approximately one minute) in which it performs diagnostic checks and allows the sensors to stabilize before beginning normal operation. The current output during this period is 0 milliamperes. At the end of the warmup period with no faults present, the detector automatically enters the Normal operating mode. If a fault is present after the warmup, the detector current output will indicate a fault.

Normal

In the normal operating mode, the 4 to 20 milliampere signal level corresponds to the detected gas concentration. The detector continuously checks for system faults or initiation of calibration, and automatically changes to the appropriate mode.

Fault

Faults detected during warmup, normal operation, or calibration are indicated by the current loop output as shown in Table 1.

Calibration

All PointWatch models are calibrated at the factory with 50% LFL methane, and are normally shipped with the internal gas selection switch set for methane gas detection. For additional information on calibration for other gases, refer to the “Linearized Output Options” section of this manual.

Whenever calibration of the PointWatch is required, a momentary connection of the calibration lead wire to DC negative (common) of the power supply initiates the zero and span calibration sequence.

NOTE

*It is **not** recommended to physically connect or touch the calibration lead wire to DC common in the field to begin calibration. This practice is often less than precise, and may result in a spark or other undesirable result. For optimum ease of installation and calibration, always use a PointWatch Termination Box (furnished with magnetic reed switch, indicating LEDs, and terminal strip), available from Det-Tronics.*

The factory default setting for the output current during calibration is an inhibited state. See Table 1 for specific information. Note that a live current output during calibration can also be programmed, although this is not usually recommended. Refer to the “Calibration” section of this manual for details.

The calibration sequence for a particular PointWatch installation is typically determined by the type of termination box installed with the PointWatch detector:

- For non-intrusive one-person calibration, select the PointWatch Termination Box with Tall Cover. This termination box includes a magnetic reed calibration switch and calibration LED (visible through a viewing window on the cover). By activating the magnetic reed switch with a calibration magnet and then viewing the LED through the window, a one person, non-intrusive calibration can be performed. See Figure 6.

- For intrusive or two-person calibration, select the PointWatch Termination Box with Short Cover. This termination box typically requires removal of the termination box cover to view the calibration LED, or it requires two people to accomplish a remotely initiated non-intrusive calibration. The short cover termination box includes a magnetic reed calibration switch, calibration LED and a solid cover (no viewing window). This termination box can also be used for sensor separation. See Figure 7.

Figure 6—Tall PointWatch Termination Box with Window

Figure 7—Short PointWatch Termination Box

INSTALLATION

IMPORTANT

Hydrocarbon-based grease will emit hydrocarbon vapors which will be measured by PointWatch and will result in inaccurate gas level readings. ***Use only low vapor pressure silicone grease when lubricating threads on the PointWatch detector and associated termination box.*** *Do not get this grease on the optics of the detector. A suitable grease is listed in the "Spare Parts" section at the end of this manual.*

IMPORTANT

In applications where both PointWatch and catalytic type sensors are used, ensure that the silicone grease used to lubricate the PointWatch detector threads does not come into contact with the catalytic sensors or poisoning of the catalytic sensors will result. It is strongly recommended that maintenance personnel wash their hands between handling the two types of sensors.

DETECTOR LOCATION

It is essential that the device be properly located to enable it to provide maximum protection. The most effective number and placement of sensors varies depending on the conditions at the job site. The individual designing the installation must rely on experience and common sense to determine the type and quantity of sensors and the best sensor locations to adequately protect the area. The following factors should be considered for every installation:

1. What kind of gas is to be detected? If it 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 or for vapors resulting from flammable liquid spills. However, note that air currents can cause a gas that is heavier than air to rise. In addition, if the gas is hotter than ambient air or mixed with gases that are lighter than air, it could also rise.

2. How rapidly will the gas diffuse into the air? Select a location for the sensor as close as practical to the anticipated source of a gas leak.

3. Ventilation characteristics of the immediate area must also be considered. Movement of air may cause gas to accumulate more heavily in one area than another. The detector should be placed in the areas where the most concentrated accumulation of gas is anticipated. Also take into consideration the fact that many ventilation systems do not operate continuously.

4. Proper orientation is dependent upon the PointWatch model used and the environmental concerns at the installation. See Table 2.

5. The sensor should be accessible for maintenance.

6. Excessive heat or vibration can result in premature failure of any electronic device and should be avoided if possible.

Table 2—Mounting Orientation

Model	Installation Environment	Orientation
Aluminum	Heavy rain or hose down	Vertical
	Blowing dust or sand	Horizontal
Stainless Steel	All applications	Horizontal

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 Instrument Society of America (ISA) Transaction, Volume 20, Number 2.

0 TO 100% LFL LINEARIZED OUTPUT OPTIONS

The PointWatch IR gas detector is provided with five field selectable "standard gas" signal processing program settings. These settings are optimized for detection and measurement of methane, ethane, propane/butane, ethylene, or propylene gases, and are defined as linearized PointWatch gas measurement outputs. This means that the PointWatch is capable of providing an analog signal output that is directly proportional to the % LFL concentration for these gases, provided the proper gas setting has been selected, and the PointWatch has been calibrated with the proper calibration gas type.

The PointWatch detector is factory configured for 0 to 100% LFL methane. To re-configure the PointWatch for one of the other gases, remove the electronic module from the housing and select the desired gas by changing the setting on the rotary gas selection switch. (Refer to "Changing Linearized Output Gas Selection.") The PointWatch must then be calibrated using a 50% LFL mixture of the selected gas.

NOTE

Failure to calibrate the device with a 50% LFL mixture of the selected gas will result in improper operation of the detector.

Response of Methane-Calibrated PointWatch (Factory Setting) to Other Gases

Figure 8 shows the signal output of a PIR9400 that has been properly calibrated for methane in response to other gases. This data should be used as a reference only. It is recommended to always calibrate the detector with the type of gas to be detected.

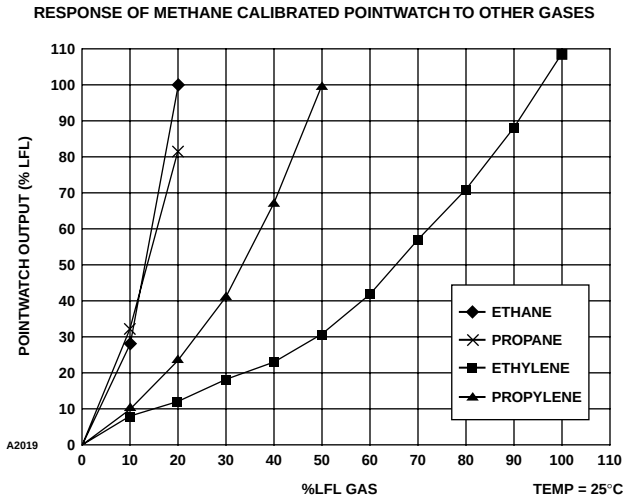


Figure 8—Response of Methane-Calibrated PointWatch (Factory Setting) to Other Gases

PointWatch Transfer Curves

In addition to the five standard gases mentioned, the PointWatch is capable of detecting and measuring many other hydrocarbon gases and vapors. Although linear PointWatch outputs are not offered for most of these gases, an accurate gas concentration measurement can be made by using a cross-reference data sheet known as a "transfer curve." (Available upon request.) The transfer curve data sheet is always based upon the following:

1. The data applies to one specific gas/vapor type only.

2. The data is collected at a specific test temperature. (Significant differences in ambient hazard area temperature as compared to test temperature may impact transfer curve accuracy.)

3. The data compares actual hazardous gas concentration in %LFL to the PointWatch signal output level, using all five standard gas settings.

The transfer curve data is then used:

1. To select the optimum PointWatch standard gas setting.

2. To select the appropriate setpoint levels for proper alarm relay actuation. This will ensure that external alarm response action occurs as required.

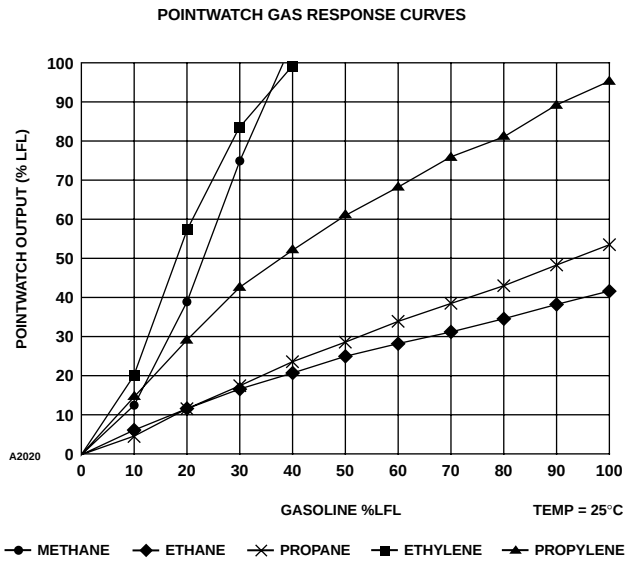


Figure 9—Example of a PointWatch Transfer Curve (Gasoline)

It is important to note that whenever using transfer curve data, the PointWatch analog signal output and any real-time visual display of that output (such as a digital display or bar graph) will be offset by a value indicated by the transfer curve data, and therefore must be externally correlated by the viewer.

The transfer curve data sheet for the gas of interest includes five different curves — one for each standard linearized output setting. To select the appropriate setting for the PointWatch, find the curve that:

1. Provides the closest signal correlation across the desired gas measurement range, and

2. Ensures that the offset in the PointWatch signal output versus gas concentration is an over-reading, as opposed to an unsafe under-reading.

Ideally, at 50% of full scale PointWatch output (12 ma signal level) the detected gas level will equal 50% LFL gas concentration, and this relationship will remain proportional throughout the gas measurement range. In reality, however, transfer curve data is non-linear, and will result in varying offset levels from proportional linearity throughout the gas measurement range. Refer to the example in Figure 9.

To use the transfer curve data, find the concentration (in % LFL) for the gas of interest on the horizontal axis of the graph. Follow the vertical line up from that point until it intersects with a gas response curve. From the point of intersection, follow the horizontal line directly to the left until it intersects with the vertical axis of the graph. The point of intersection with the vertical axis represents PointWatch output (0-100% LFL reading, or 4-20 ma proportionally) in response to the actual gas concentration at the installation using that particular linearized output setting.

In the example for gasoline vapor detection (Figure 9), the recommended PointWatch standard gas setting and calibration gas to use is propylene. When using this setting and calibration gas type, at 50% LFL gasoline concentration, the PointWatch signal output will be 60% (13.6 ma). The propane/butane and ethane settings would not be recommended, since the signal output level is much less than the actual gas concentration in the field. The methane and ethylene settings are acceptable, but will result in much higher readings than the gas level that is actually present in the field.

Contact Detector Electronics for additional information regarding PointWatch transfer curves.

Changing Linearized Output Gas Selection

IMPORTANT

Remove power before removing and disassembling the PointWatch detector.

1. Loosen the two captive screws on the flat end of the detector and slide the filter assemblies off. For the aluminum model, use a standard screwdriver. For the stainless steel model, use a 7/64 inch hex driver. See Figure 10 (aluminum) or Figure 11 (stainless steel).

2. Unscrew and remove the electronics mounting cover by rotating it counter-clockwise. See Figure 12.

3. Slide the electronics mounting cover back to the base of the mirror assembly and pull the IR module out of the base as shown in Figure 13.

4. Using a small screwdriver, rotate the gas selection switch from position 0 (methane) to the desired position. Refer to Figure 14. Ensure that the tip of the arrow on the switch lines up with the position selected.

5. The module is “keyed” using different sized pins on the bottom of the module. Slide the IR module into the base and rotate it until the keyed holes are aligned, then press securely into place.

NOTE

This assembly fits correctly only in one orientation. If it is not seating into place, rotate it 180° and try again.

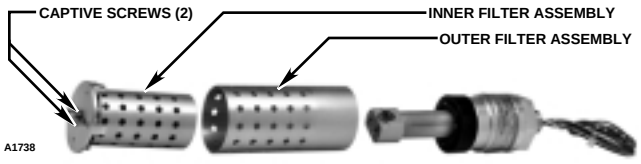


Figure 10—Aluminum PointWatch Disassembly

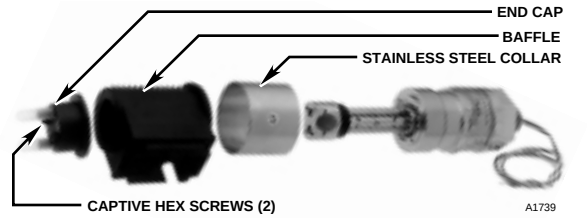


Figure 11—Stainless Steel PointWatch Disassembly

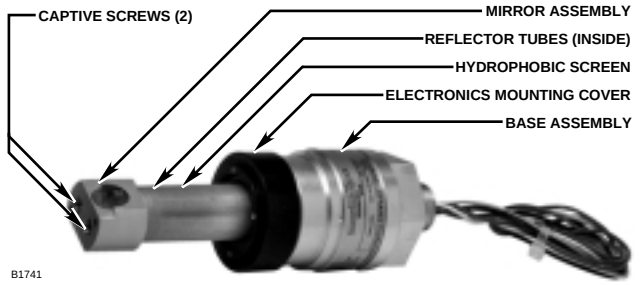


Figure 12—IR Module and Base Assemblies

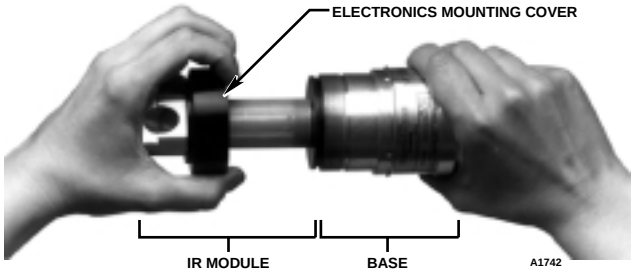


Figure 13—IR Module Removal

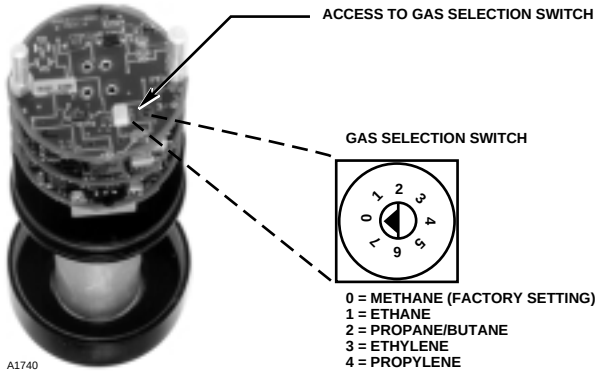


Figure 14—Gas Selection Switch Location at the Bottom of the Electronics Assembly

6. Screw the electronics mounting cover clockwise onto the base assembly as shown in Figure 12.

7. For the aluminum model, slide the outer filter assembly over the mirror assembly. The outer filter should be oriented with the solid portion toward the base of the unit. If it is not oriented correctly, the filter assembly will not slide onto the unit. Slide the inner filter assembly into the outer filter assembly and rotate until it is seated securely, then fasten the two captive screws using a standard screwdriver. See Figure 10.

   For the stainless steel model, slide the stainless steel collar onto the base assembly, then slide the baffle onto the unit. Place the end cap on the baffle and rotate it until it is seated securely, then fasten the two captive screws using a 7/64 inch hex driver. See Figure 11.

8. Calibrate the detector with 50% LFL of the gas that matches the calibration gas switch position following the instructions in the “Calibration” section of this manual.

TERMINATION BOXES (PIRTB)

Two termination box types for use specifically with the PointWatch detector are available from Det-Tronics.

- Tall Cover/Window Termination Box for one person, non-intrusive calibration. This termination box includes a magnetic reed calibration switch, calibration LED and a windowed cover. Activating the magnetic reed switch with the calibration magnet and viewing the LED through the window provides one person, non-intrusive calibration capability. See Figure 6.

- Short Cover Termination Box for PointWatch requires two people to accomplish non-intrusive calibration. This termination box includes a magnetic reed calibration switch, calibration LED and a solid cover. Activating the magnetic reed calibration switch with the calibration magnet or touching the calibration lead to the negative lead (common) of the power supply using an external switch are methods used to initiate calibration. This termination box can also be used for sensor separation. See Figure 7.

The PointWatch detector is designed to be threaded into a termination box, which can be mounted to a solid, vibration free wall or post. A 3/8 inch spacer may be required between the enclosure and the mounting surface to allow adequate room for the sensor and calibration accessory.

Intrusive and Non-Intrusive Calibration

For hazardous locations, it is important to consider the options for calibration of PointWatch. The device can be installed so that calibration can be performed by one person without opening the explosion-proof enclosure (non-intrusive calibration). This is accomplished by incorporating a display or LED that provides information and/or instructions for calibration. When a display is not used or the LED is not visible from the outside, the enclosure must be opened to observe the LED or to insert a meter to read the output of the device (intrusive calibration). With this type of installation, either a permit must be obtained to open the enclosure or the procedure must be accomplished by two people using walkie talkies for communication.

Depending on the control devices selected, PointWatch can be installed for either intrusive or non-intrusive calibration. See Table 3 for a listing of the installation options.

A user-supplied termination box can also be used, provided it has the appropriate sized entries. This termination box must be suitable for use in the application and location in which it is being installed. A properly installed normally open switch should be provided for initiating calibration.

GENERAL WIRING REQUIREMENTS

NOTE

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 applicable regulations relating to the installation of electrical equipment in a hazardous area. If in doubt, consult the authority having jurisdiction before wiring the system.

Table 3—Installation Options
for Intrusive and Non-Intrusive Calibration

Control Device	Non-Intrusive & 1 person	Intrusive or 2 person
Infiniti Transmitter	X	
PointWatch Termination Box w/ tall cover/window	X	
PointWatch Termination Box w/ short cover/no window		X
Eagle 2000 DCU	X	
Eagle 2000 Communication Module		X

The use of shielded cable in conduit or shielded armored cable is recommended for optimum RFI/EMI protection. In applications where the wiring cable is installed in conduit, the conduit must not be used for wiring to other electrical equipment. To assure proper operation of the detector, the resistance of the connecting wire must be within the specified limits. The maximum distance between the detector and power source is determined by the power supply capability and wire size. See Figure 2 to determine the proper wire size and maximum wiring distance allowed.

It is important that moisture not be allowed to come in contact with the electrical connections of the system.

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

DETECTOR WIRING PROCEDURE

IMPORTANT

Do not apply power until the wiring procedure is complete and has been verified.

1. Determine the best mounting location for the detector (refer to the “Detector Location” section above). If it is determined that sensor separation is required, see the following section for details.

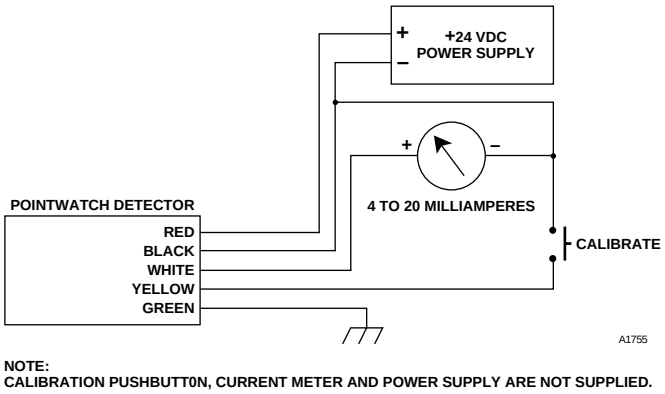
2. The termination box should be electrically connected to earth ground.

3. Figures 15 through 19 show typical wiring for various system configurations using the PointWatch detector. Refer to the appropriate figure as a guide to system connection. Figure 15 shows typical wiring for stand alone operation. Figure 16 shows typical wiring for PointWatch with Det-Tronics supplied termination box. Figure 17 shows the termination box terminals and calibration switch. Figure 18 shows typical wiring for PointWatch/Infiniti transmitter operation. Figure 19 shows typical wiring for PointWatch/Eagle communication module configuration. The PointWatch wiring color code is:

   Red lead = +24 volts dc
   Black lead = – (common)
   White lead = 4 to 20 ma signal output
   Yellow lead* = Calibration input
   Green lead = Chassis ground

   * If the calibration wire (yellow lead) is not being used, do not connect this wire to ground. Trim excess length and insulate wire so no shorting can occur.

4. Check the detector wiring to ensure proper connections, then pour the conduit seals and allow them to dry (if conduit is being used).



NOTE:
CALIBRATION PUSHBUTT0N, CURRENT METER AND POWER SUPPLY ARE NOT SUPPLIED.

Figure 15—Typical PointWatch Wiring, Stand Alone Configuration

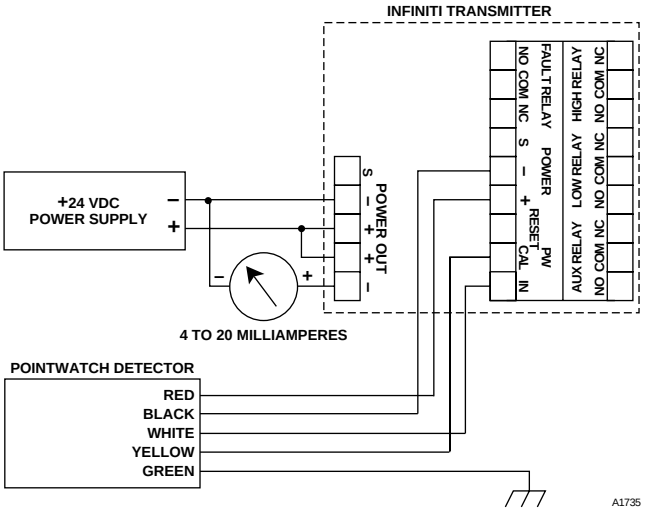


Figure 18—Typical PointWatch Wiring with Det-Tronics Infiniti Transmitter

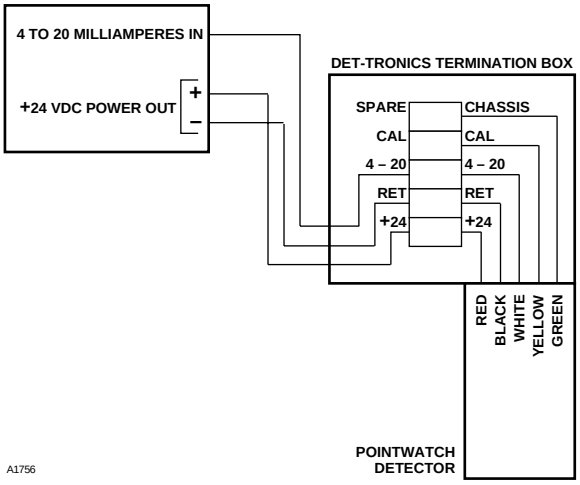


Figure 16—Typical PointWatch Wiring, PointWatch with Det-Tronics Termination Box

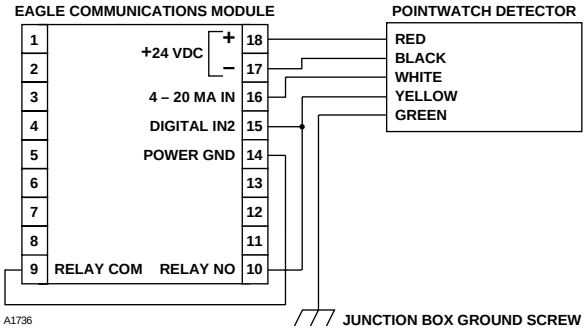


Figure 19—Typical PointWatch Wiring with Eagle Communication Module

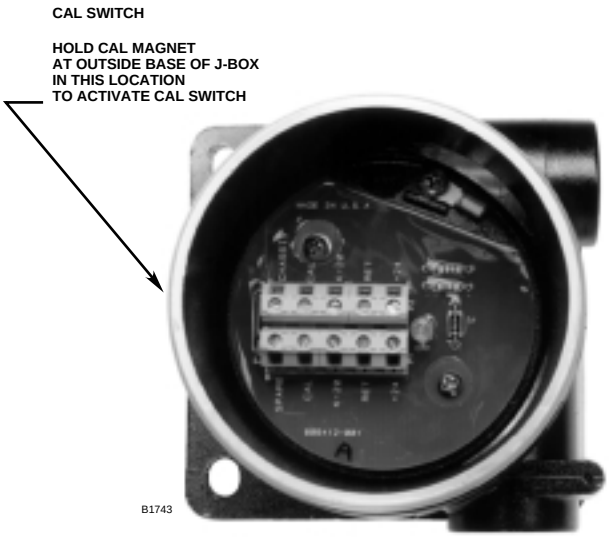


Figure 17—Termination Box Terminals and Calibration Switch

DETECTOR SEPARATION (OPTIONAL)

In applications where the detector must be installed in a different location from the control device, a termination box must be installed at the detector location to make the electrical connection. The control device can be either the Infiniti Transmitter or the tall cover termination box with window. Refer to Figure 20 for a typical separation diagram. For purposes of brevity the following discussion only refers to the Infiniti Transmitter as the control device.

By connecting a length of tubing (1/4 inch O.D.) from the direct inject calibration nozzle back to the control device location, the operator can accomplish calibration from the remote location.

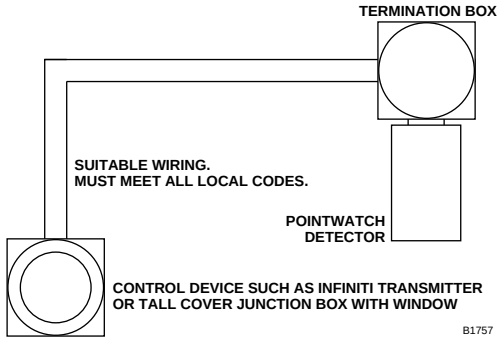


Figure 20—Options for Detector Separation

Wiring Requirements for Detector Separation

Shielded four wire cable is recommended for connecting the detector termination box to the transmitter. Cable with a foil shield is recommended. The shield of the cable should be open at the detector termination box and connected to earth ground at the transmitter termination box. Ensure that the shield wire is clipped short and insulated with electrical tape to prevent accidental grounding at the open end.

The maximum distance between the detector termination box and the transmitter is limited by the resistance of the connecting wiring, which is a function of the gauge of the wire being used. Refer to Figure 2 to determine the maximum separation distance for a given wire size.

NOTE

It is important to maintain a minimum of +18 volts dc (including ripple) at the PointWatch detector. When determining the appropriate wire size for the installation, refer to Figure 2. Be sure to take into account the distance from the power supply to the PointWatch or to the Infiniti and then to the PointWatch to ensure that the power requirements are met.

Mounting and Connecting Procedure for Detector Separation

The PointWatch termination box can be mounted to a wall or post, or it can be suspended by the conduit if this does not result in excessive vibration. A 3/8 inch spacer may be needed between the termination box and the mounting surface to allow adequate room for the sensor and calibration accessory. The termination box should be electrically connected to earth ground.

1. Lubricate the sensor threads with low vapor pressure silicone grease, then install the sensor in the conduit entry of the termination box. It should be tight to ensure an explosion-proof installation, however, do **not** overtighten.
2. Connect the detector wires to the terminal strip in the termination box as shown in Figure 21.
3. Connect the cable leadwires from the Infiniti or termination box to the same terminals inside the separated termination box. **Do not** ground the shield at the termination box. Ground the sensor wire shield at the transmitter end only.
4. Check the connections inside the termination box and place the cover on the termination box.
5. If used with the Infiniti Transmitter, mount and wire the Infiniti Transmitter as shown in Figure 21 and as described in the Infiniti Instruction Manual.

STARTUP PROCEDURE

1. Inhibit the output loads that are actuated by the system to prevent activation of these devices.
2. Check that the detector has been wired properly.
3. Apply power to the system and allow the detector to operate for a minimum of 2 hours, then check zero and verify gas response. Perform a zero and span calibration, if necessary.

NOTE

If the device is being used with a gas other than methane, it must be calibrated with 50% LFL of the gas selected with the gas selection switch.

4. Place the system in normal operation by reactivating the output loads.

CALIBRATION

The PointWatch detector is factory calibrated for methane and, unlike catalytic detectors, does not require routine calibration to ensure proper operation. Guidelines for when calibration should be performed or checked are listed in Table 4.

Table 4—Calibrate or Check

Function	Calibrate	Check
Startup		X
Gas selection switch 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

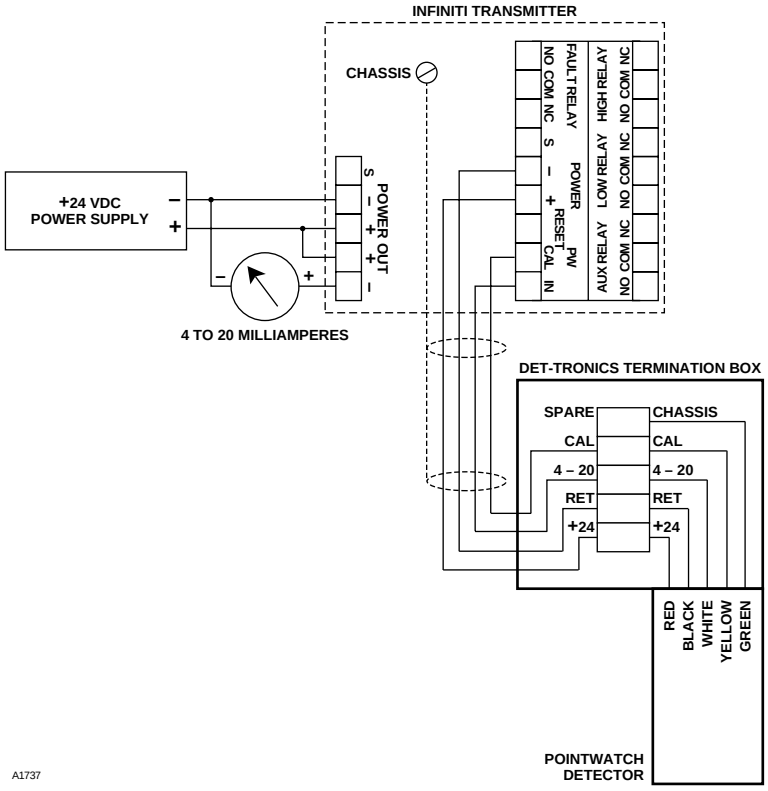


Figure 21—Sensor Separation with Infiniti Transmitter and PointWatch

NOTE

To check calibration, inhibit output loads as necessary, then apply 50% LFL calibration gas to the detector using the equipment provided in the calibration kit. Ensure that the correct calibration gas is used. Check the current output for the appropriate response (12 milliamperes).

NOTE

Drift will be indicated by a constant zero offset in one direction either above or below 4 milliamperes. The presence of background gas would be indicated by a small but constantly changing output.

CALIBRATION EQUIPMENT

The following equipment is required to calibrate the PointWatch detector (calibration kits from Det-Tronics contain all items below):

- 50% LFL calibration gas
- Calibration nozzle (for aluminum model)
- Wind shield (for calibration in high wind situations)
- Regulator (minimum 2.5 liter/minute flow rate)
- Three feet of tubing.

CALIBRATION PROCEDURES

The procedures in this section explain calibration sequences for both stand alone PointWatch applications (when a user supplied or no termination box is used) and for applications where PointWatch is used with the Det-Tronics supplied termination box (containing a magnetic reed switch and LED). For applications where the PointWatch detector is used with the Infiniti Transmitter or the Eagle System, refer to those instruction manuals for the calibration procedure.

When PointWatch is used as a stand alone unit or with transmitters or controllers other than those supplied by Det-Tronics, the current loop output must be monitored in order to calibrate (for both inhibited and live current loop configurations).

When PointWatch is used with a Det-Tronics termination Box, the magnetic switch and LED in the termination box are used to initiate and annunciate the calibration sequence. The current loop output also indicates the calibration sequence (for both inhibited and live current loop configurations).

IMPORTANT CALIBRATION NOTES

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

• Do not open the explosion-proof enclosure when power is applied to the system unless the appropriate permits have been procured.

• The calibration gas used must be the same as the gas selected on the Gas Selection Switch. The factory setting is for methane, so use methane to calibrate if the Gas Selection Switch is set in position "0." If the Gas Selection Switch is set in any other position, ensure that the correct gas is used to calibrate. See Figure 14. Only 50% LFL calibration gas can be used to calibrate the PointWatch detector.

• If the PointWatch is being used in a stand alone configuration, the use of an inhibited current loop is recommended. Live current loop calibration was designed primarily for use with the Infiniti Transmitter or the Eagle 2000 system. Accomplishing live current loop calibration manually is possible but not recommended. Instructions for live current loop calibration are provided after the "Calibration Procedure - Inhibited Current Output During Calibration" procedure.

• The calibration sequence is initiated by momentarily connecting the calibration lead to the negative lead (common) of the power supply using the Cal Magnet or an external switch. If the Det-Tronics PIRTB box with magnetic Cal Switch is being used, this is accomplished by holding the Cal Magnet near the side of the PIRTB box for one second. The location of the Cal Switch is shown in Figure 17. An alternate way of accomplishing this is to install a pushbutton switch between the yellow lead and the power supply common (–), as shown in Figure 15. Use of the Cal Magnet to activate the Cal Switch in the PIRTB box will be referred to throughout the following procedures. If an alternate method of initiating calibration is used, substitute that method in all places in which the Cal Magnet/Cal Switch activation are referenced.

• The calibration sequence can be exited at any time during the span calibration by holding the Cal Magnet near the Cal Switch in the PIRTB box for one second.

• At all times other than when calibration is being performed, all calibration ports must be capped. This prevents dirt and water from entering the direct path into the optics. Failure to protect the optics can result in a fouled optics fault. If a permanent gas delivery system is used, the delivery tube must be plugged when not in use.

Calibration Procedure-
Inhibited Current Output During Calibration

See Table 5 for an overview of the calibration sequence.

1. Be sure that only clean air is present at the sensor. (The microprocessor begins taking zero readings immediately upon entering the Calibrate mode.) If the possibility of background gases exists, purge the sensor with clean air to ensure accurate calibration.

2. There are two methods of applying the calibration gas. For windy situations, a calibration wind shield is supplied in the calibration kit and can be slipped over the sensor to capture the calibration gas for accurate readings. Once in place, tighten the velcro strap and connect the flexible tubing to the nozzle on the wind shield. Otherwise, calibration gas

Table 5—Calibration Sequence, Inhibited Current Output

Description	Current	LED	Operator Action
Normal operation/no gas present	4.0 ma	Off	If the possibility of background gases exists, purge the sensor with clean air to ensure accurate calibration.
Initiate calibration	2.2 ma	On steady	Use calibration magnet, calibrate pushbutton or manually connect cal lead to power supply common for one second.
Zero calibration complete	2.0 ma	Flashing	Apply 50% LFL calibration gas.
Span calibration complete *	1.8 ma	Off	Shut off and remove calibration gas and cap the calibration nozzle (or replace it with the allen head plug).
Calibration fault indication	1.6 ma	Off	See Troubleshooting Table 6.

* Span calibration can be aborted by using the calibration magnet, the calibrate pushbutton or manually connecting the cal lead to power supply common for one second. The device will revert to live operation using data from the last calibration.

can be applied directly to the sensor through the calibration nozzle.

3. Initiate calibration by either momentarily activating the Calibrate pushbutton shown in Figure 15 or by holding the Cal Magnet near the Cal Switch in the PIRTB box (if used) for one second.
   - — The LED will go on steady (if used).
   - — The current output will drop to 2.2 milliamperes.

4. Wait for the zero calibration point to stabilize (typically 1 minute).

   After successful zero calibration:
   - — The LED will begin flashing (if used),
   - — The current will drop to 2.0 milliamperes.

   Proceed to step 5.

   If zero calibration fails:
   - — The LED will turn off,
   - — The current output will drop to 1.6 milliamperes.

   Reset the detector by cycling power to the detector or by holding the Cal Magnet near the Cal Switch in the PIRTB box (if used) for one second. Begin calibration again at step 1.

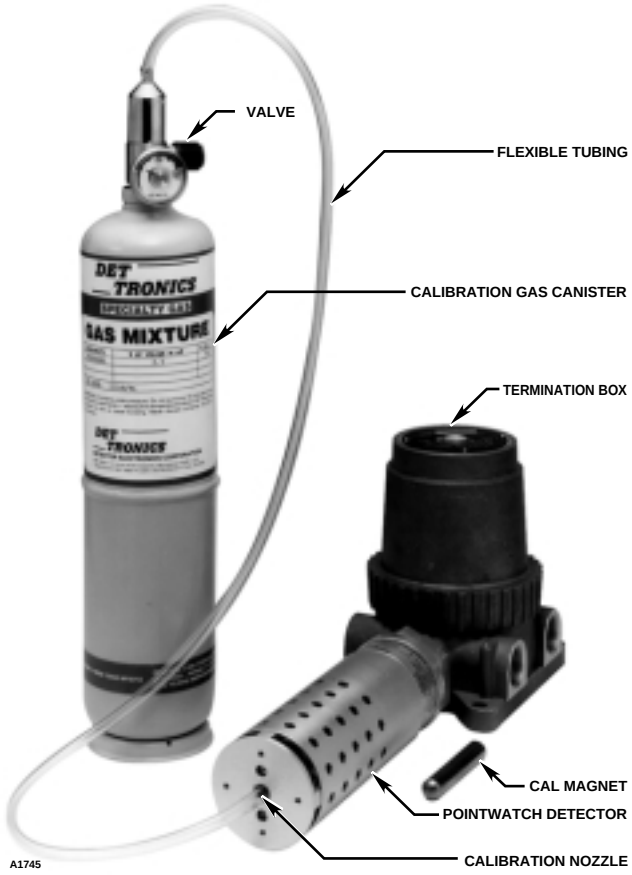


Figure 22—Aluminum PointWatch Detector Calibration Configuration

5. Connect the calibration gas canister, valve and tubing to the direct input nozzle as shown in either Figure 22 (aluminum model) or Figure 23 (stainless steel model) or to the windshield nozzle, depending on the method used.

6. Apply 50% LFL calibration gas to the detector. This is accomplished by opening the valve on the calibration gas canister (see Figure 22 or Figure 23). A 2.5 liter per minute flow rate is recommended.
   - — The LED will continue flashing (if used).
   - — The current will remain at 2.0 milliamperes as the gas concentration increases.

7. The detector will automatically accept the span calibration when the detected gas level is stable (typically 1 to 2 minutes).

   After successful span calibration:
   - — The LED will turn off (if used),
   - — The current will drop to 1.8 milliamperes.

   Proceed to step 8.

   If for any reason a successful calibration is not accomplished within 10 minutes, a calibration fault will occur:
   - — The LED will turn off,
   - — the current output will drop to 1.6 milliamperes.

   Turn off the gas, then reset the detector by cycling power to the detector or by holding the Cal Magnet near the Cal Switch (if used). Begin calibration again at step 1.

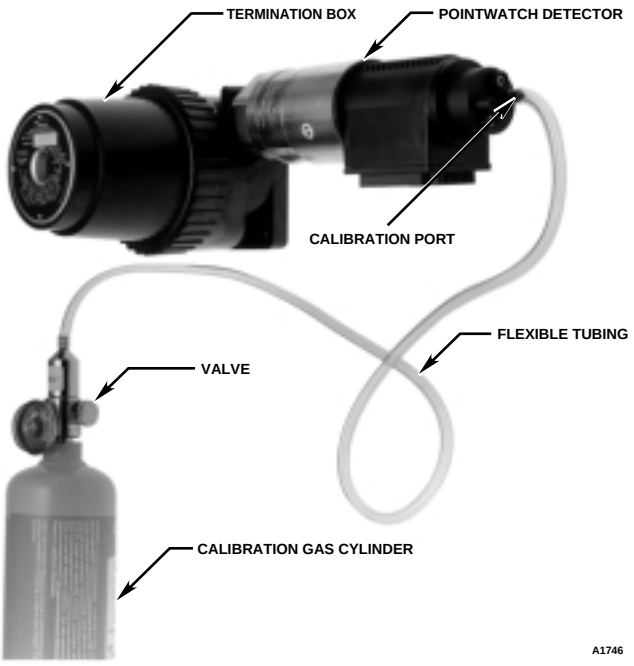


Figure 23—Stainless Steel PointWatch Detector Calibration Configuration

8. After successful calibration, close the valve on the calibration gas canister, remove the flexible tube from the calibration nozzle and replace the nozzle cap. If the calibration wind shield was used, remove it from the PointWatch. The detector will return to normal operation after the gas level has returned below 5% LFL.

IMPORTANT

The calibration ports must be capped to prevent dirt and water from entering the direct path into the optics. Failure to protect the optics can result in a fouled optics fault. If a permanent gas delivery system is used, the delivery tube must be plugged when not in use.

Calibration Procedure - Live Current Output During Calibration

Sequence Summary: During calibration with a live current loop output, the current output drops to 2.2 milliamperes during the zero calibration then rises to reflect the actual gas level for the span calibration. At the end of calibration, the current level locks to indicate that the calibration is complete. These current levels and their significance are summarized as follows:

4.0 ma	Zero gas level (0% LFL), initial state - normal operation, no gas present
2.2 ma	Zero calibration in progress
12.0 ma	Span calibration lock-in
1.6 ma	Calibration fault - reset unit

IMPORTANT
LIVE CURRENT OUTPUT CALIBRATION NOTES

• If the PointWatch is being used in a stand alone configuration, the use of an inactive current loop is recommended. Live current loop calibration was designed primarily for use with the Infiniti Transmitter or the Eagle 2000 system. Accomplishing live current loop calibration manually is difficult because precision timing is required.

• Inhibit alarm outputs before performing this calibration procedure. Alarm levels will be exceeded using the live current output calibration procedure.

• All calibration notes listed at the beginning of the "Calibration Procedures" section also apply to this procedure. Review those notes prior to proceeding.

1. Be sure that only clean air is present at the sensor. (The microprocessor begins taking zero readings immediately upon entering the Calibrate mode.) If the possibility of background gases exists, purge the sensor with clean air to ensure accurate calibration.

2. There are two methods of applying the calibration gas. For windy situations, a calibration wind shield is supplied in the calibration kit and can be slipped over the sensor to capture the calibration gas for accurate readings. Once in place, tighten the velcro strap. Otherwise, calibration gas can be applied directly to the sensor through the calibration nozzle.

3. Initiate calibration by either momentarily activating the Calibrate pushbutton shown in Figure 15 or by holding the Cal Magnet near the Cal Switch in the PIRTB box (if used) for one second.
   — The LED will go on steady and the current output will drop to 2.2 milliamperes. After the zero is stable (typically 1 minute), the LED will start to flash and the current level changes to 2.0 milliamperes. **When the LED goes off for the first flash, immediately reactivate the calibration switch for one second only.** This places the current loop output in the live mode.
   — The current level rises to 4.0 milliamperes and the LED begins flashing.

   If unsuccessful at entering live calibration mode, abort calibration by momentarily reactivating the magnetic calibration switch or pressing the calibrate pushbutton. Repeat steps 1 - 3.

   Proceed to step 4.

   If calibration mode was inadvertently exited:
   — The LED will turn off,
   — the current output will remain at 4.0 milliamperes (normal operation).

   This occurs when the Cal switch is activated for too long when the LED begins flashing. Repeat all of step 3 and proceed.

   If zero calibration fails:
   — The LED will turn off,
   — the current output will drop to 1.6 milliamperes.

   Reset the detector by cycling power to the detector or by holding the Cal Magnet near the Cal Switch in the PIRTB box (if used) for one second. Begin calibration again at step 1.

4. Connect the calibration gas canister, valve and tubing to the direct input nozzle as shown in either Figure 22 (aluminum model) or Figure 23 (stainless steel model) or to the windshield nozzle, depending on the method used.

5. Apply 50% LFL calibration gas to the detector. This is accomplished by opening the valve on the calibration gas canister (see Figure 22 or Figure 23). A 2.5 liter per minute flow rate is recommended.
   — The LED will continue flashing.
   — The current output will increase proportionally as the gas concentration increases.

6. The detector will automatically accept the span calibration when the detected gas level is stable (typically 1 to 2 minutes).

   After successful span calibration:
   — The LED will turn off steady,
   — the current will lock in steadily at 12.0 milliamperes, indicating a successful span calibration.

   Proceed to step 7.

   If for any reason a successful calibration is not accomplished within 10 minutes, a calibration fault will occur:
   — The LED will turn off,
   — the current output will drop to 1.6 milliamperes.

   Turn off the gas, then reset the detector by cycling power to the detector or by holding the Cal Magnet near the Cal Switch. Begin the calibration sequence again at step 1.

7. After successful calibration, close the valve on the calibration gas canister, remove the flexible tube from the calibration nozzle and replace the nozzle cap. If the calibration wind shield was used, remove it from the PointWatch. After the detector output falls below 45% LFL, the current loop will unlock and will track the declining gas concentration back to 4 milliamperes.

IMPORTANT

The calibration ports must be capped to prevent dirt and water from entering the direct path into the optics. Failure to protect the optics can result in a fouled optics fault. If a permanent gas delivery system is used, the delivery tube must be plugged when not in use.

TROUBLESHOOTING

Use Table 6 to isolate and correct malfunctions with the PointWatch Detector.

Table 6—Troubleshooting Table

Current Level	Status	Corrective Action
2.4 to 3.9 ma	Negative Zero Indication (–10% LFL)	*NOTE:* This fault can be caused by the presence of background gas during calibration. Ensure that background gas is not present and recalibrate the unit. If fault does not clear, perform disassembly and cleaning procedure, then recalibrate. If fault still does not clear, replace electronics assembly.
1.6 ma	Calibration fault	Make sure that the calibration gas being used matches the Gas Selection Switch setting. If these match and the fault is still present, perform disassembly and cleaning procedure, then recalibrate.
1.0 ma	Fouled optics	Perform disassembly and cleaning procedure, then recalibrate.
0.8 ma	+24 vdc line low (less than +17.5 vdc)	Ensure that input voltage is correct and that power connections are good. If fault does not clear, replace the electronics assembly.
0.6 ma	Calibrate input active at power-up	Ensure that calibration line is not shorted and that the calibration switch is open. If fault does not clear, replace the unit.
0.4 ma	Active channel fault	Replace electronics assembly.
0.2 ma	Reference channel fault	Replace electronics assembly.
0.0 ma	CPU system fault, warmup	Ensure that power is applied and that the warmup period is complete (1 minute). If fault does not clear, replace the unit.

MAINTENANCE

It is recommended to have spare IR Modules on hand (see "Spare Parts" section). Use Table 6 to isolate and correct malfunctions.

IMPORTANT MAINTENANCE NOTES

• Hydrocarbon-based grease will emit hydrocarbon vapors, which will be measured by PointWatch and will cause inaccurate gas level readings. ***Use only silicone grease (not hydrocarbon-based grease) when lubricating threads on the PointWatch detector and associated termination box.*** *A suitable grease is listed in the "Spare Parts" section at the end of this manual.*

• In applications where both PointWatch and catalytic type sensors are used, ensure that the silicone grease used to lubricate the PointWatch detector threads does not come into contact with the catalytic sensors or poisoning of the catalytic sensors will result. It is strongly recommended that maintenance personnel wash their hands between handling the two types of sensors.

• It is recommended to keep spare IR modules (See "Spare Parts" section) for field replacement in the event of a malfunction.

DISASSEMBLY AND CLEANING PROCEDURE

The PointWatch detector should be inspected periodically to ensure that its performance is not impaired by fouled optics or by clogging of the filter or hydrophobic screen. Inspection and/or periodic maintenance involves three different areas of the detector.

IMPORTANT

Remove power before disconnecting and removing the PointWatch detector for maintenance.

Filter/Baffle. Perform a visual inspection of the filter/baffle, checking for a variety of environmental contaminants including nests of insects, spiders, etc. Disassemble the PointWatch and clean as necessary.

Hydrophobic Screen (used on all aluminum and select stainless steel models). While clogging of the hydrophobic screen is rare in most installations, the flow of gas through the screen can be inhibited by an accumulation of extremely fine particles of airborne contaminants. To inspect the hydrophobic screen, disassemble the PointWatch as described below. If the screen appears to be fouled, replace it. As an alternate to a visual inspection of the screen, the PointWatch can be tested using the PointWatch Calibration Wind Shield, available from Detector Electronics as part of the PointWatch Calibration Kit. (Plug the PointWatch calibration port, then attach the Wind Shield snugly to the detector. Apply calibration gas through the tubing connected to the Wind Shield).

IMPORTANT

The hydrophobic screen should be replaced whenever the mirror assembly and reflector tubes are cleaned or replaced, or when the screen appears fouled upon visual inspection.

Optics. Cleaning of the optical surfaces is required only if an optical fault is indicated (1.0 milliampere current output signal from the PointWatch detector, or an "optics fault" message on the Infiniti™ transmitter display). This procedure is most easily accomplished on a bench.

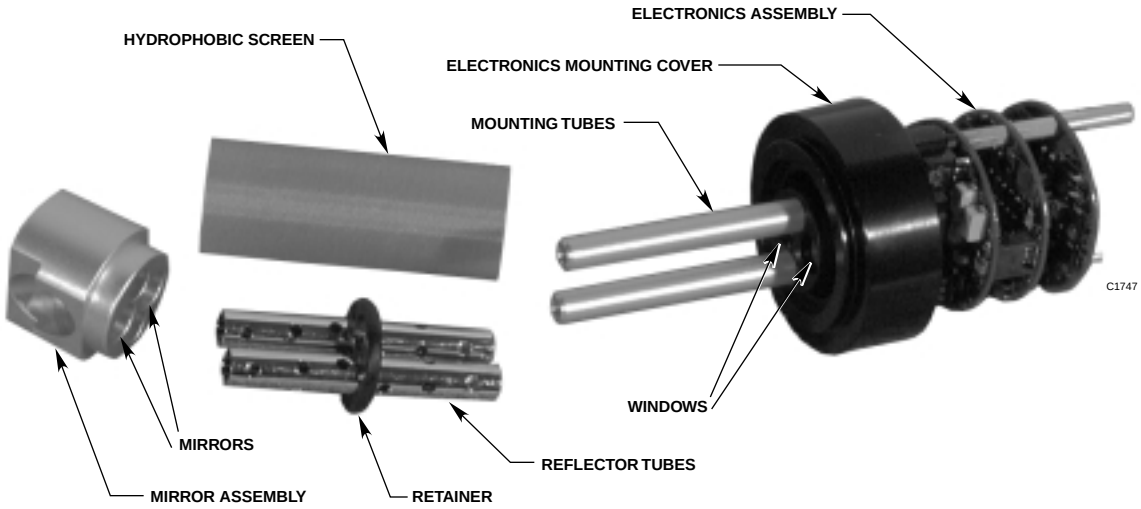


Figure 24—Aluminum PointWatch Detector Disassembly for Cleaning

IMPORTANT

If the PointWatch optics system is disassembled, ***calibration is required*** *after re-assembly.*

Required materials: Clean, flat work surface, foam tipped swabs (no cotton), isopropyl alcohol, screwdriver or hex wrench.

CAUTION

The PointWatch contains semiconductor devices that are susceptible to damage by electrostatic discharge. An electrostatic charge can build up on the skin and discharge when an object is touched. Therefore, use caution when handling the device, taking care not to touch electronic components or terminals. If the electronics assembly is removed, it should be placed in an anti-static bag or box while stored or transported. A static safeguarded work area is highly recommended (if available) for disassembly and cleaning of the PointWatch.

1. Disassemble the detector as shown in Figure 10 (aluminum) or Figure 11 (stainless steel). For aluminum models, loosen the two captive screws on the end of the detector and remove the filter assemblies. For stainless steel models, loosen the two captive screws on the end cap, then remove the baffle and stainless steel collar.

2. Unscrew the electronics mounting cover (rotate counter-clockwise). See Figure 12.

3. Slide the electronics mounting cover back to the base of the mirror assembly and pull the IR module out of the base as shown in Figure 13. Do not grasp the hydrophobic screen (if used) to pull the IR module from the base as this may damage the screen. Once the IR module assembly is pulled from the base, slide the electronics mounting cover back to the electronics assembly as shown in Figure 24. Place the IR module in an anti-static bag or box and take it to a clean work area for further disassembly.

4. Loosen the two captive screws on top of the mirror assembly (Figure12) and slide the mirror assembly, hydrophobic screen and reflector tubes away from the electronics assembly and electronics mounting cover. See Figure 24 (aluminum model) and Figure 25 (stainless steel model).

5. Disassemble the mirror assembly, reflector tubes and hydrophobic screen as shown in Figure 24 and Figure 25. Do not remove the electronics mounting cover.

6. Thoroughly douse the interior of the mirror assembly as well as the foam tipped swab with isopropyl alcohol. Use the swab to gently cleanse the surfaces of the reflecting mirrors inside the mirror assembly. After cleaning with the swab, flush out the mirror assembly using a liberal amount of isopropyl alcohol. Tip the mirror assembly with mirror openings downward to remove accumulated isopropyl alcohol and particle contaminants. Repeat the alcohol flush to remove any remaining contaminants. Allow the mirror assembly to air dry in a dust-free location.

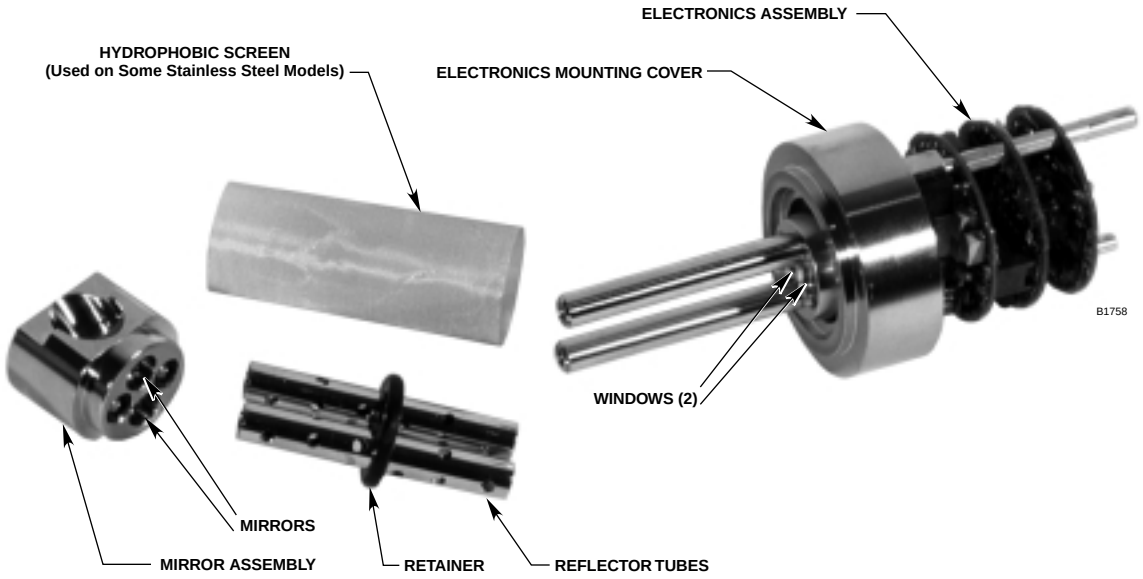


Figure 25—Stainless Steel PointWatch Detector Disassembly for Cleaning

IMPORTANT

Do not insert any sharp object into the mirror assembly. Scratching of the mirrors will void the PointWatch warranty. Do not use cotton tipped swabs or buds as they are likely to leave fiber residue.

7. Clean the two reflector tubes and windows using the procedure described above. When the mirror assembly and reflector tubes are thoroughly dry, replace the hydrophobic screen (if used) and proceed with re-assembly.

8. Insert the two reflector tubes into the larger holes in the mirror assembly and ensure that they are fully seated. Make sure that the retaining ring that holds the reflector tubes in place is centered on the tubes and not blocking any holes.

NOTE

Check the new hydrophobic screen to ensure that the overall length matches the length of the existing screen, or the reflector tubes if no screen was present. If the new screen appears longer than the existing screen, trim off 0.23 inch (slightly less than 1/4 inch) of material from the new screen using a scissors. Take care to not trim the screen too short, as this will allow contaminants direct access to the PointWatch optics and cause nuisance optics faults.

9. If a hydrophobic screen is used, slide a new screen over the two mounting tubes, being careful not to fold or crumple it. The screen should be centered loosely around the two mounting tubes.

10. Carefully slide the mirror/reflector tube assembly into the hydrophobic screen and seat the reflector tubes securely into the windows in the base. Again, be careful not to crumple or fold the hydrophobic screen.

11. Tighten the two captive screws on the top of the mirror assembly. See Figure 10 (aluminum) or Figure 11 (stainless steel). Tighten the screws evenly. Do not over-tighten (6 inch-pounds recommended).

12. Slide the IR module into the base and rotate it until the keyed holes are aligned, then press securely into place. See Figure 13.

NOTE

This assembly fits correctly only in one orientation. If it is not seating into place, rotate it 180° and try again.

13. Screw the electronics mounting cover clockwise onto the electronics assembly as shown in Figure 12.

14. For aluminum models, slide the outer filter assembly over the mirror assembly. The outer filter should be oriented with the solid portion toward the base of the unit. If it is not oriented correctly, the filter assembly will not slide onto the unit. Slide the inner filter assembly into the outer filter assembly and rotate until it is seated securely, then fasten the two captive screws. See Figure 10.

    For the stainless steel model, slide the stainless steel collar onto the base assembly, then slide the baffle onto the unit. Place the end cap on the baffle and rotate it until it is seated securely, then fasten the two captive screws. See Figure 11.

15. Calibrate the detector with 50% LFL of the gas that matches the calibration gas switch position following the instructions in the “Calibration” section of this manual.

TO REPLACE THE IR MODULE

Remove the IR module as described in the “Disassembly and Cleaning Procedure” above.

To Replace the Base/Wire Assembly

1. Disconnect external PointWatch wiring.

2. Unscrew the base from its mounting (termination box, Infiniti, or Eagle).

3. Install the new base by screwing it into the termination box.

4. Connect the wires (refer to the “PointWatch Wiring” section of this manual).

5. Reassemble the unit following the instructions in the “Disassembly and Cleaning Procedure” above.

DEVICE REPAIR AND RETURN

The PIR9400 PointWatch 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 a mechanical or electronic failure, the device must be returned to the factory for repair.

Prior to returning devices or components, contact the nearest local Detector Electronics office 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.

Pack the unit or component properly. Use sufficient packing material in addition to an anti-static bag or aluminum-backed cardboard as protection from electrostatic discharge.

Return all equipment transportation prepaid to the factory in Minneapolis.

ORDERING INFORMATION

POINTWATCH DETECTOR

Aluminum 3/4 inch threads, 0 to 100%LFL, 4 to 20 ma	006300-001
Aluminum M20 threads, 0 to 100%LFL, 4 to 20 ma	006300-002
Stainless Steel 3/4 inch threads, 0 to 100%LFL, 4 to 20 ma	006300-003
Stainless Steel M20 threads, 0 to 100%LFL, 4 to 20 ma.	006300-004

TERMINATION BOXES – PIRTB

Short Cover Termination Box, two port (solid cover - two person calibration)	
3/4 inch entries (2)	006414-001
25 mm (1) 20 mm with bushing (1)	006414-002
Tall Cover Termination Box, two port (with window - one person calibration)	
3/4 inch entries (2)	006414-003
25 mm (1) 20 mm with bushing (1)	006414-004

CALIBRATION EQUIPMENT

PointWatch 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 aluminum models and a calibration wind shield to contain the gas in high wind applications.

Methane, 50% LFL, 2.5% by volume	006468-001
Ethane, 50% LFL, 1.5% by volume	006468-002
Ethylene, 50% LFL, 1.35% by volume	006468-003
Propane, 50% LFL, 1.1% by volume	006468-004
Propylene, 50% LFL, 1% by volume	006468-005

SPARE PARTS

Description	Part Number
Hydrophobic Screen	006389-001
IR Module	SP006487-xxx
Base/Wire Assembly	
Aluminum, 3/4 inch threads	SP006298-001
Aluminum, 20 mm threads	SP006298-002
Stainless steel, 3/4 inch threads	SP006298-003
Stainless steel, 20 mm threads	SP006298-004
Threaded Plug (for aluminum model calibration port)	102790-001
Direct Inject Calibration Nozzle (for aluminum model calibration port)	102821-001
Nozzle Cap	102823-001
Calibration Magnet	102740-002
Silicone Grease for PointWatch threads (6 cc syringe)	006680-001
Grease for termination box threads	102868-001

ASSISTANCE

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

Detector Electronics Corporation
6901 West 110th Street
Minneapolis, Minnesota 55438 USA
Operator: (952) 941-5665 or (800) 765-FIRE
Customer Service: (952) 946-6491
Fax: (952) 829-8750
Web site: www.detronics.com
E-mail: detronics@detronics.com

APPENDIX A

Factory Mutual Approvals (FMA)
The following items, functions and options describe the FMA approval.

APPROVAL

PointWatch Infrared Hydrocarbon Gas Detector Model PIR9400 Series.

Explosion-proof for Class I, Division 1, Groups B, C, & D (T5) Hazardous (Classified) Locations per FM 3615.
Non-incendive for Class I, Division 2, Groups A, B, C & D (T3C) Hazardous (Classified) Locations per FM 3611.
Performance verified for 0 to 100% LFL Methane-in-air atmospheres per FM 6320.

NOTE

Model PIR9400 must be used in conjunction with an FMA Approved control device.

PointWatch Termination Box Part Number 006414-XXX

Explosion-proof for Class I, Division 1, Groups B, C, & D (T6) Hazardous (Classified) Locations per FM 3615.
Non-incendive for Class I, Division 2, Groups A, B, C & D (T6) Hazardous (Classified) Locations per FM 3611.

NOTE

Approval of the PointWatch and termination box does not include or imply approval of the apparatus to which the PointWatch may be connected and which processes the electronic signal for eventual end use.

ATTACHMENTS/OPTIONS

Aluminum or Stainless Steel Explosion-proof Enclosure, with Aluminum or Plastic Baffle.

3/4 inch NPT and M20 Conduit Entry Thread Types. (Metric straight thread is for use in non-North American applications.)

Calibration Kit (006468-xxx)
- 50% LFL Calibration Gas (226166-xxx)
- Calibration Nozzle (102821-001)
- Regulator (162552-xxx)
- Tubing (101678-007)

CALIBRATION

The PointWatch Model PIR9400 can be calibrated as a stand-alone device.
PointWatch Termination Box (006414-xxx) can be used to calibrate the PointWatch Detector.

NOTE

It is required that calibration of PointWatch be conducted as well as calibration of the system in which it is installed.

APPENDIX B

CE MARK

The PIR9400 PointWatch Infrared Hydrocarbon Gas Detector was tested and found to be compliant with EN50270 when wired in conduit or with shielded cable. All screen drains shall be terminated to the chassis.

ATEX CERTIFICATION

PIR9400 PointWatch IR Hydrocarbon Gas Detector

CE 0539 ⟨Ex⟩ II 2 G
EEx d IIB +H_2 T4-T6
DEMKO 02 ATEX 131322 X
T6 (T_{amb} = –55°C to +50°C)
T5 (T_{amb} = –55°C to +60°C)
T4 (T_{amb} = –55°C to +75°C)
IP66.

Read and understand instruction manual before operating.

Special Conditions for Safe Use of PIR9400 —

The performance ambient temperature rating is limited to –40°C to +75°C.

The PIR9400 IR Hydrocarbon Gas Sensor must be used in conjunction with a CENELEC certified combustible gas detector control unit for compliance with EN 61779 Series standards.

The flying leads shall be terminated in a CENELEC certified terminal box (EEx d or EEx e) for use in a hazardous location.

PIRTB PointWatch Termination Box

CE 0539 ⟨Ex⟩ II 2 G
EEx d IIC T5-T6
DEMKO 02 ATEX 131326
T6 (T_{amb} = –55°C to +60°C)
T5 (T_{amb} = –55°C to +75°C)
IP66.

Performance conforms to EN 61779 Series standards.

All cable entry devices and blanking elements shall be certified in type of explosion protection flameproof enclosure “d”, suitable for the conditions of use and correctly installed. Unused apertures shall be closed with suitable certified blanking elements.

For ambient temperatures above 60°C, use field wiring suitable for maximum ambient temperature.