Polytron FX

Operating Manual

For Your Safety

Strictly follow the assembly and installation instructions
The instrument must be calibrated at intervals recommended in the operating manual or more frequently according to specific use and applications.

Do not calibrate the instrument in the presence of an operating radio transmitter.

Use in areas subject to explosion hazards
The sensor must be screwed in at least 5 threads to maintain the explosion proof rating.
If the extra port at the 3 or 9 o'clock position is not to be used for wiring purposes, the supplied plug must be screwed in completely to maintain the explosion proof rating.
Equipment or components which have been tested and approved according to the national or European regulations on electrical equipment in rooms subject to explosion hazards, may be used only under the conditions specified in the approval.
Modifications of components or the use of faulty or incomplete parts are not permitted. In the case of repairs to equipment or components of this type, the national regulations must be observed.

Maintenance
Dräger warrants this instrument to be free of defects in material and workmanship for a period of one (1) year from date of purchase. Dräger warrants the sensor for a period of one (1) year from the date of purchase.

Liability for proper function or damage
The liability for the proper function is irrevocably transferred to the owner or operator to the extent that the transmitter is serviced or repaired by personnel not employed or authorized by Draeger Service or if the transmitter is used in a manner not conforming to its intended use.

Dräger cannot be held responsible for damage caused by noncompliance with the recommendations given above. The warranty and liability provisions of the terms of sale and delivery of Dräger are likewise not modified by the recommendations given above.

Draeger Safety, Inc.

Contents

1 Introduction

1.1 Intended Use

The Polytron FX is an explosion-proof transmitter for the detection of combustible gases and vapors in ambient air. The transmitter is designed to be installed in permanent locations and is approved for use in hazardous, classified areas (See Section 6.1, Approvals).

1.2 Design

The transmitter is powered by 16 to 30 VDC. Gas concentrations, error messages, and software menu choices are displayed on a 3 digit LCD display. Access to the software is obtained by tapping a magnetic wand on the glass viewport at the appropriate arrow indicators. In this way, the instrument can be configured, calibrated and maintained non-intrusively, so declassification of the area is not necessary for these procedures.

1.2.1 Aluminum Version

The Polytron FX transmitter is housed in a powder-coated aluminum enclosure with 3/4" NPT threaded ports located at the 3 and 9 o'clock positions. The sensor is located at the 6 o'clock position.

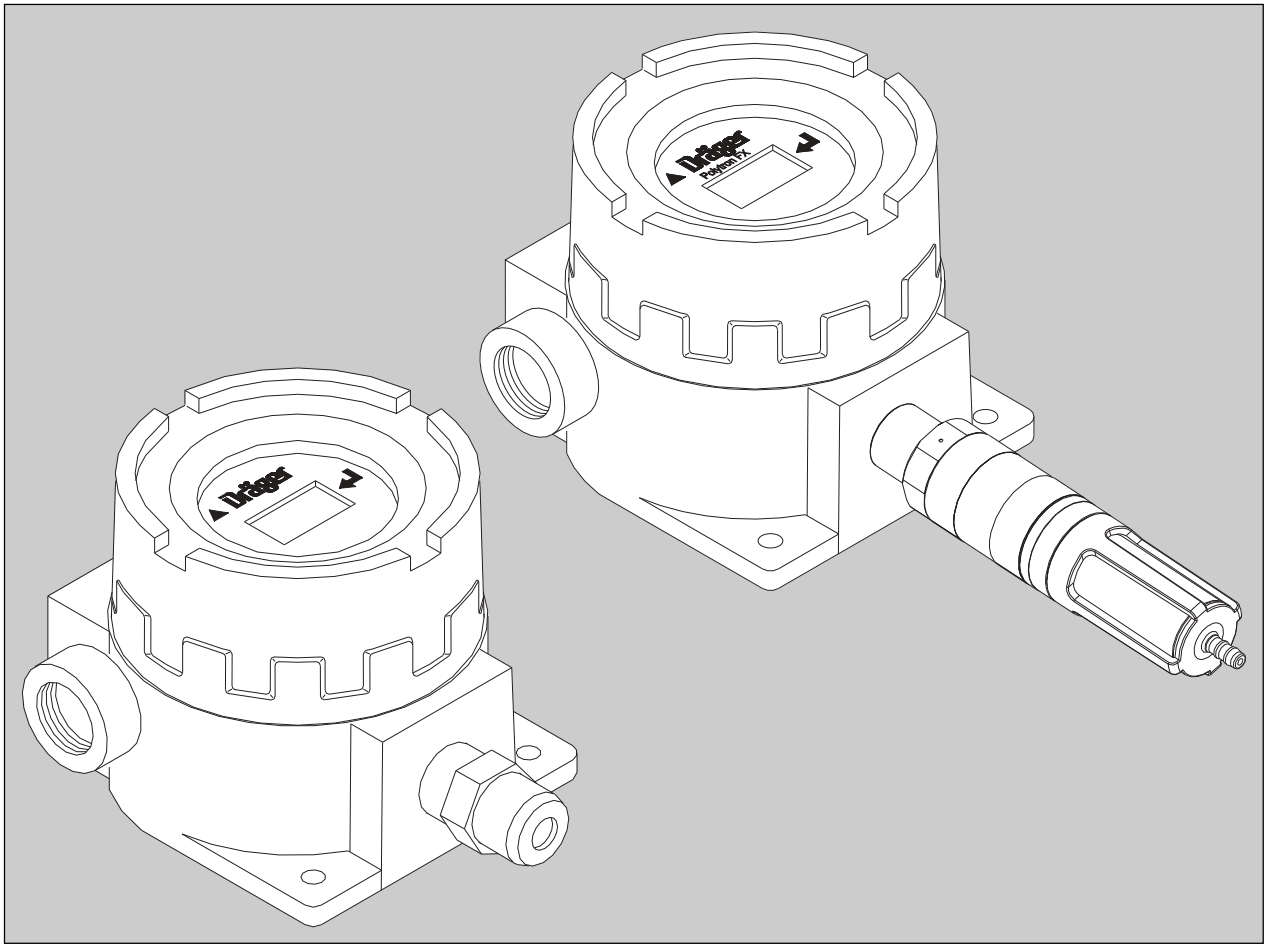


Figure 1: Polytron FX and Polytron FX IR, aluminum version

1.2.2 Stainless Steel Version

The Polytron FX transmitter is housed in an enclosure with 3/4" NPT threaded ports located at the 12 and 6 o'clock positions.

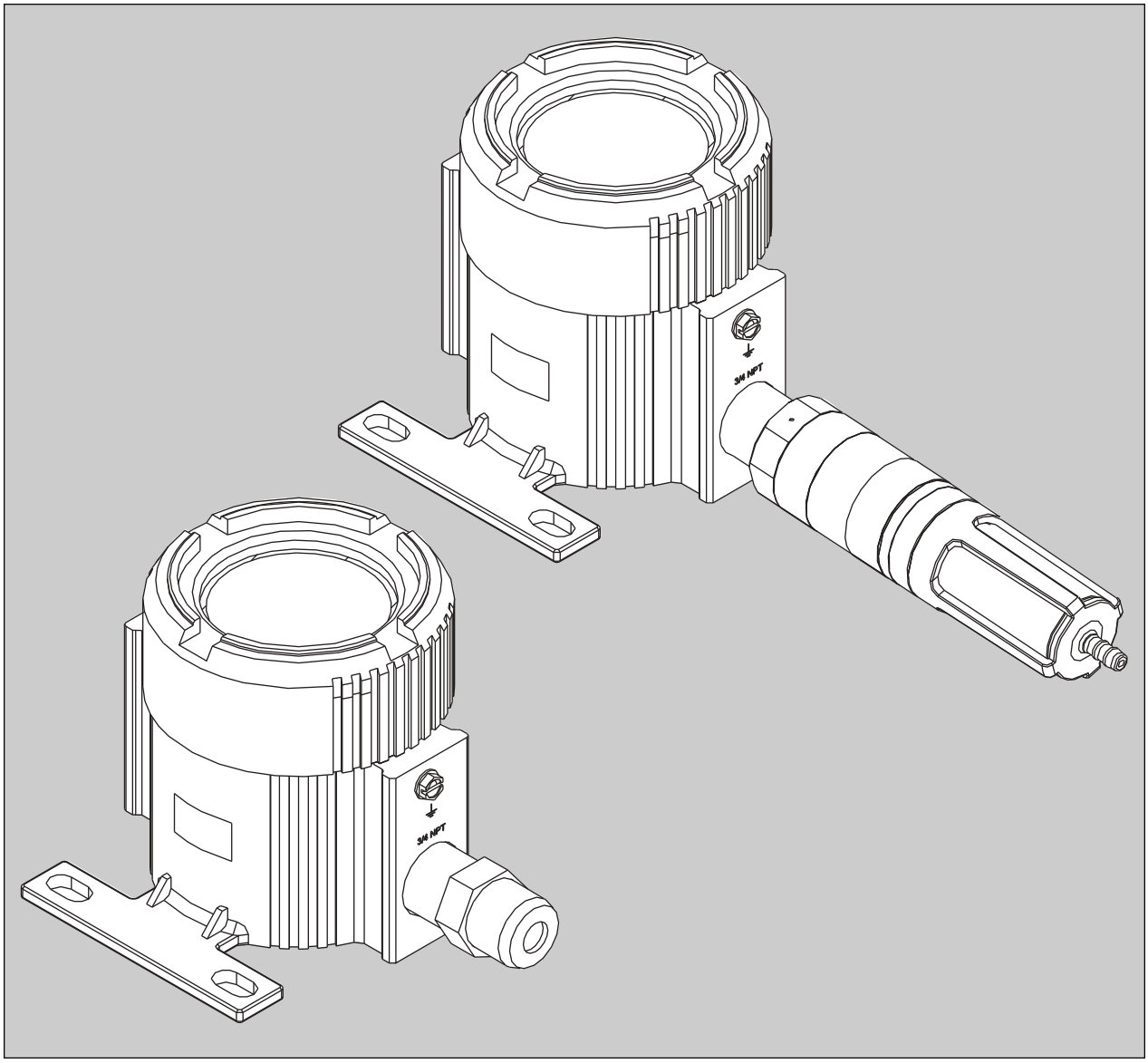


Figure 1a: Polytron FX and Polytron FX IR, stainless steel version

2 Operation

2.1 Installation

Mount the instrument at the appropriate height for the gas to be detected, taking into account the density of the gas, air flow patterns in the room, and personnel considerations. Responsibility for correct placement of the Polytron FX rests with the end user; if in doubt about placement, consult with Draeger application engineers.

Polytron FX is a three-wire device powered by 16 to 30 V DC. Wiring terminals are located on the back of the PCB; pull out the bezel, by grasping the notches on either side of the display with your fingers and pulling up (Figure 2).

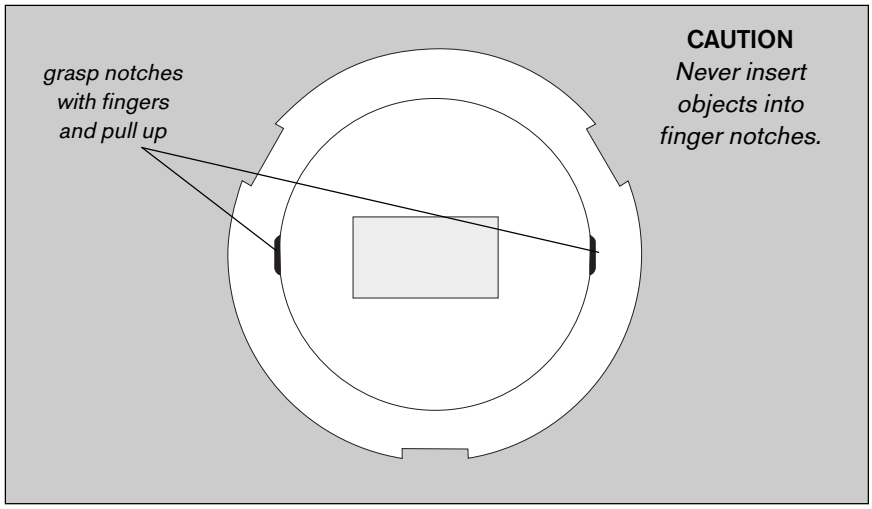


Figure 2: Pulling out the bezel

Connect the wires as shown in Figure 3.

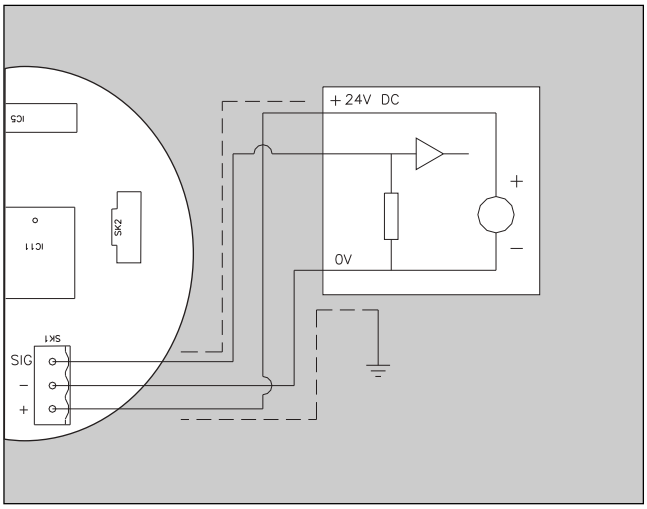


Figure 3: Connections for 24 V DC power supply/controller

Wiring to and from controllers/power supplies must be run through sealed conduit to maintain the explosion-proof status. If only one of the threaded inlet ports is used for external wiring, the other must be sealed with the blanking plug included with the unit (Figure 4).

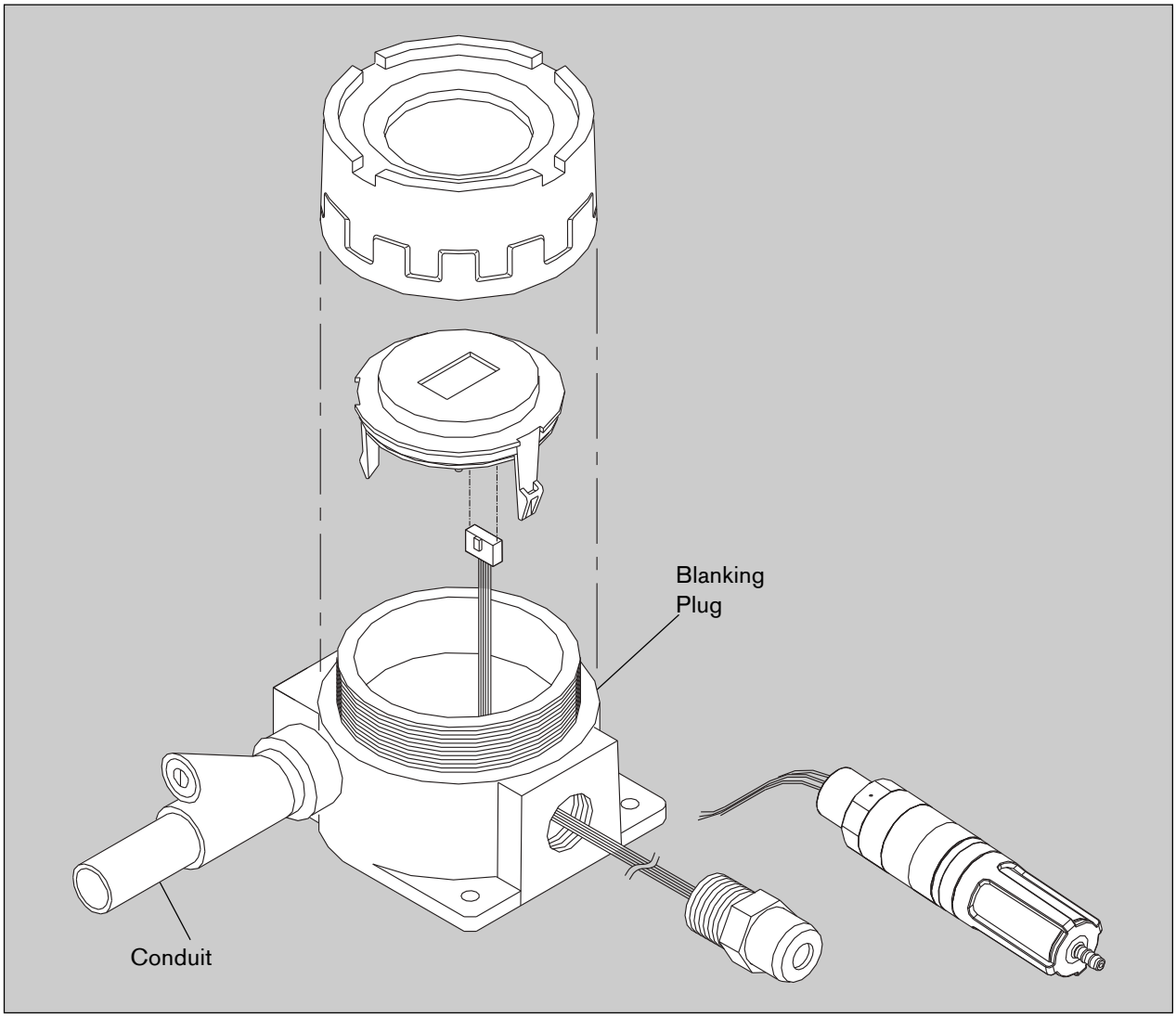


Figure 4: Wiring through sealed conduit

2.2 Replacing the Sensor

To replace the sensor, see Figure 5 for details:

- Declassify the area according to local procedures.
- Turn off power to the unit.
- Remove the housing cover.
- Remove the main PCB, which is attached to the bezel, by grasping the notches on either side of the display with your fingers and pulling up (Figure 2).
- Unplug the sensor cable.
- Unscrew the Dräger Sensor.

- Insert the sensor wires through the threaded port in the housing.
- Screw the Dräger Sensor into the port. **Five threads must be engaged to ensure explosion-proof status.**
- Plug the wires into the socket on the main PCB.
- Re-install sensor electronics by pushing the bezel and main PCB back into place.
- Screw housing cover back onto the unit, being careful not to damage the threads. The cover must be screwed on tightly to compress the o-ring to maintain explosion-proof status.
- Apply power to the unit.
- Calibrate instrument per section 4.1, Calibration.
- Always test a newly-installed sensor with target gas to verify proper operation.

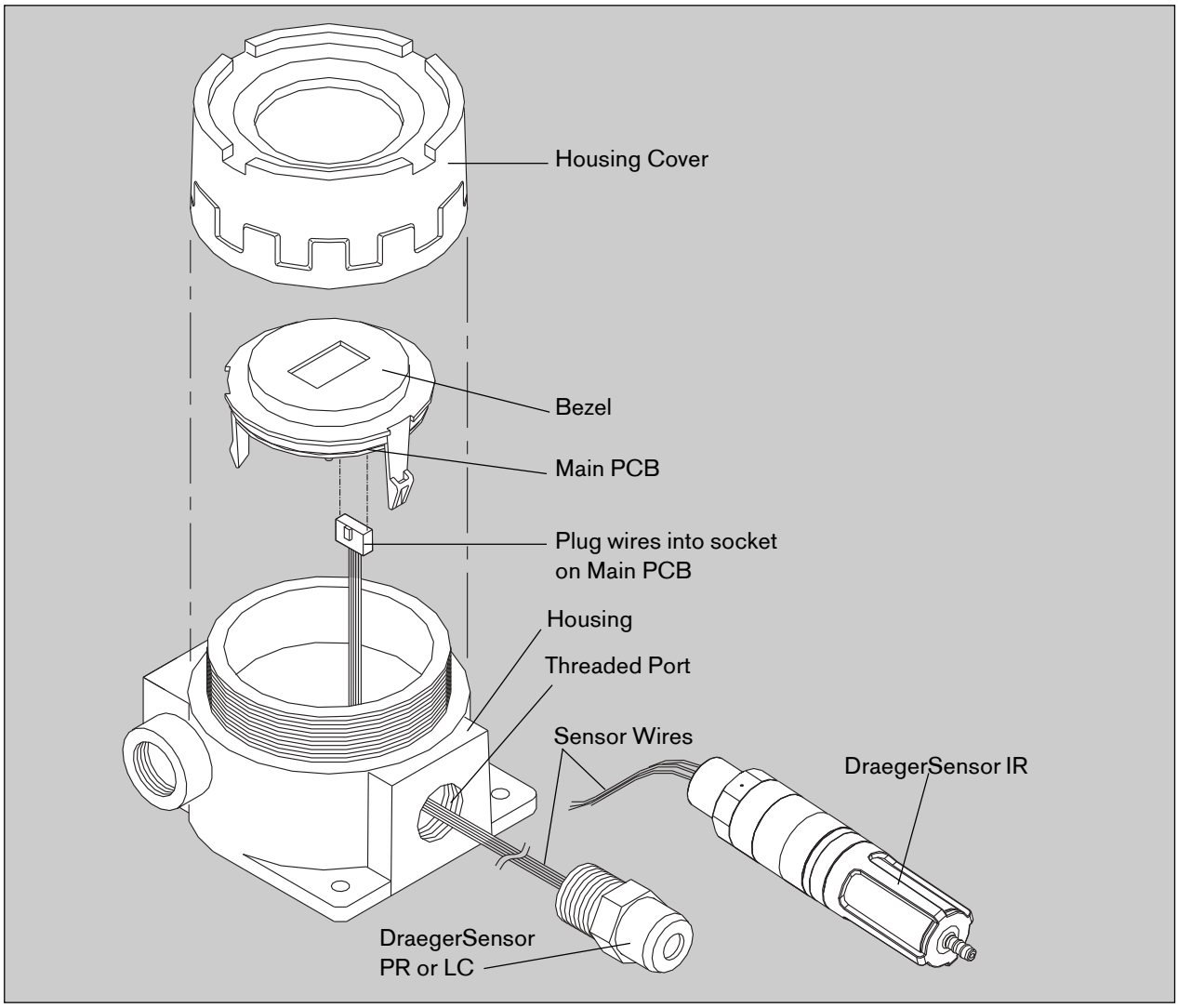


Figure 5: Replacing the sensor

2.3 Change Gas Category of Polytron FX IR

See manual 9023843. This has to be done at the DraegerSensor IR.

3 Menu

In the standard operating mode, the Gas Concentration of the target gas will be displayed. To access the software menu, tap the magnetic wand once against the glass viewport above the Down arrow. The display shows the first menu item, Adj Zero. The displays flashes '-0-', 'Adj', and then shows the target gas concentration.

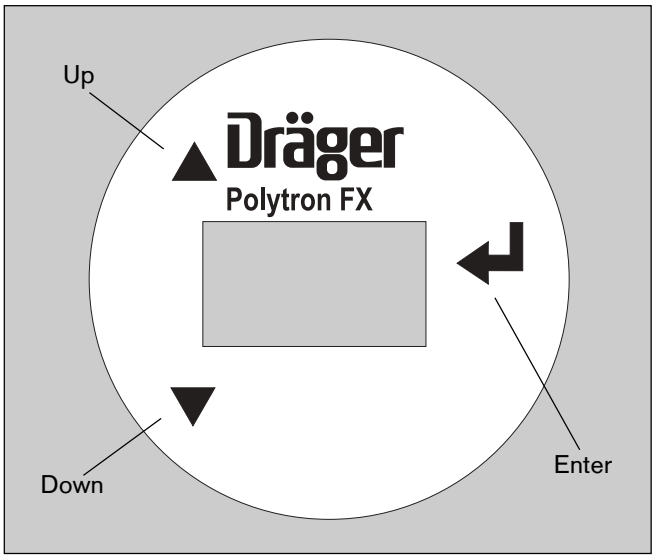


Figure 6: Arrows indicate the location of magnetic contact switches on front display panel

3.1 Menu Navigation

Tap the magnetic wand over the Up and Down arrows to scroll through the menu selections. If the magnetic wand is held over the switch for > 0.5 second, this will be considered multiple taps and the menu will scroll. When you reach the last item (LCD On/Off), the menu will bottom-out, and you will have to use the Up arrow to scroll back up through the menu.
The active menu item as well as its current value or status will flash on the display as it scrolls.

NOTE

The instrument is designed for the magnetic wand to be used with the housing cover in place. If the housing cover is not in place, then the magnetic wand may not work properly.

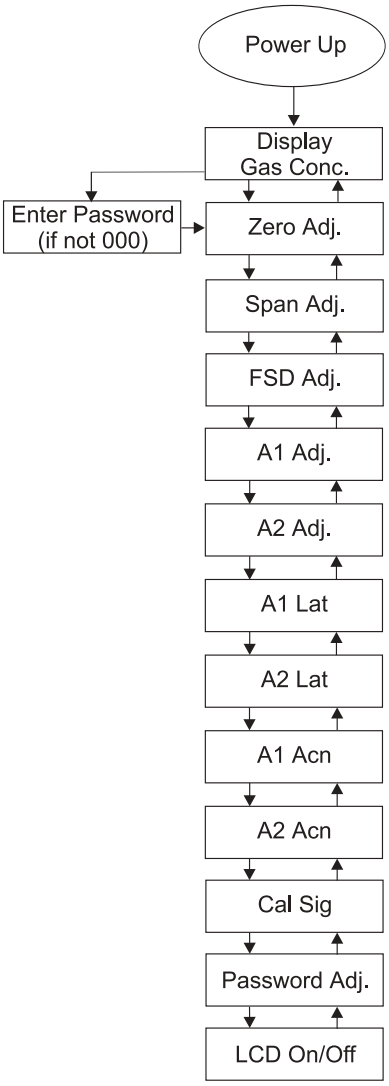
3.2 Changing Parameter Values/Status

To enter a new value, or change a status, tap Enter with the magnetic wand when the desired menu item is displayed. The current value or status will flash to indicate a change to data entry mode. The Up and Down arrows allow you to adjust the value of a numerical parameter or to toggle between preset choices. Once the display shows the desired value or choice, tap Enter to validate the new parameter. This will take you back to the menu, where you can scroll to another menu item, if desired.

3.3 Exiting the Menu

To get back into the standard measurement mode, just scroll to the Gas Concentration menu item at the top of the menu. The actual gas concentration will be displayed.

3.4 Menu Items



3.4.1 Gas Conc

Displays the current value of the concentration of the target gas in % LEL. This field is read-only, and cannot be modified by the operator.

3.4.2 Password

The use of a password is optional with the Polytron FX. A password consists of a 3-digit number from 000 to 999; a value of 000 disables password protection and allows anyone to access the software interface. The instrument is delivered with the password set to 000.

If a password has been set, it must be entered to gain access to the software menu. Tap the magnetic wand over the Down arrow until the 'PAS' menu item is displayed. The 3-digit LCD will then show '000', with the first zero on the left blinking. Use the Up and Down arrows to increment or decrement this digit, then tap Enter. The second (middle) digit will blink, and the correct value should be set using the Up and Down arrows as before. Repeat the process for the third digit. Tap Enter when the full password is displayed. If the displayed value matches the set password, you will gain access to the rest of the menu. If an incorrect password is entered, the instrument will return to the measurement mode.

3.4.2.1 Password Adj

Use the Down arrow to scroll to the last menu item, Password Adjust. The display will show the message 'PAS', 'ADJ', '000'.

NOTE

If a password other than 000 has already been entered, that number will appear in place of '000'.

Tapping the magnetic wand over Enter causes the 3-digit display to flash. Tap the Up or Down arrows to scroll the value to the desired new password. The display will stop scrolling at a maximum value of 999 or a minimum of 000; it will not roll over.

Tap Enter when the desired password is displayed to accept this as the new password. Once a password is set, you will have to enter it to gain access to the menu.

3.4.3 Zero Adj

Allows you to adjust the zero reference point of the sensor when no target gas is present, such as during calibration. See Section 4.1.1, Calibration Procedure, for details.

3.4.4 Span Adj

Allows you to adjust the displayed gas concentration to match the known concentration of an applied calibration gas. For example, if a 50% LEL calibration gas is applied to the sensor, the Span Adj value should be adjusted to 50 once the sensor reading has stabilized. See Section 4.1.1, Calibration Procedure, for details.

3.4.5 FSD Adj

The Full Scale Deflection is fixed at 100% LEL for the Polytron FX and Polytron FX IR or 10% LEL for the Polytron FX LC.

3.4.6 A1 Adj

This menu item is not active for the Polytron FX.

3.4.7 A2 Adj

This menu item is not active for the Polytron FX.

3.4.8 A1 Lat

This menu item is not active for the Polytron FX.

3.4.9 A2 Lat

This menu item is not active for the Polytron FX.

3.4.10 A1 Acn

This menu item is not active for the Polytron FX.

3.4.11 A2 Acn

This menu item is not active for the Polytron FX.

3.4.12 Cal Sig

Calibration signal is the signal that is transmitted by the 4 to 20mA output anytime you access the software menu. It is user-selectable. The two possibilities are:

a steady 3 mA signal

an oscillating 3 to 5mA signal with a frequency of 1 Hz

The default value is a steady 3 mA signal.

3.4.13 LCD On/Off

This feature allows you to turn the LCD output off if the desired, effectively turning the Polytron FX into a non-display instrument. The 4 to 20mA output remains active independent of the LCD state. If the LCD is Off, pressing the Down arrow when in measurement mode still gives you access to the software functions.

3.5 Output and Display Variations

The following table shows the status of the 4 to 20 mA output, and the LCD display for various conditions.

Condition	Analog Output	LCD Display
Warming-up	actual signal	actual signal
After warm-up	actual signal	actual signal
After power outage	actual signal	actual signal
New sensor installed	actual signal	actual signal
Sensor removed	signal	“pls con snr”
Hardware fault	signal	“flt”
Microprocessor lock-up	signal	frozen display
In menu	maintenance signal	menu function
In cal modes	maintenance signal	cal function displays

The “actual signal” means the unmodified real-time signal in the circuit.

The maintenance signal is the 3 to 5mA oscillating signal, or the steady 3 mA signal chosen in the “cal sig” menu function.

4 Maintenance

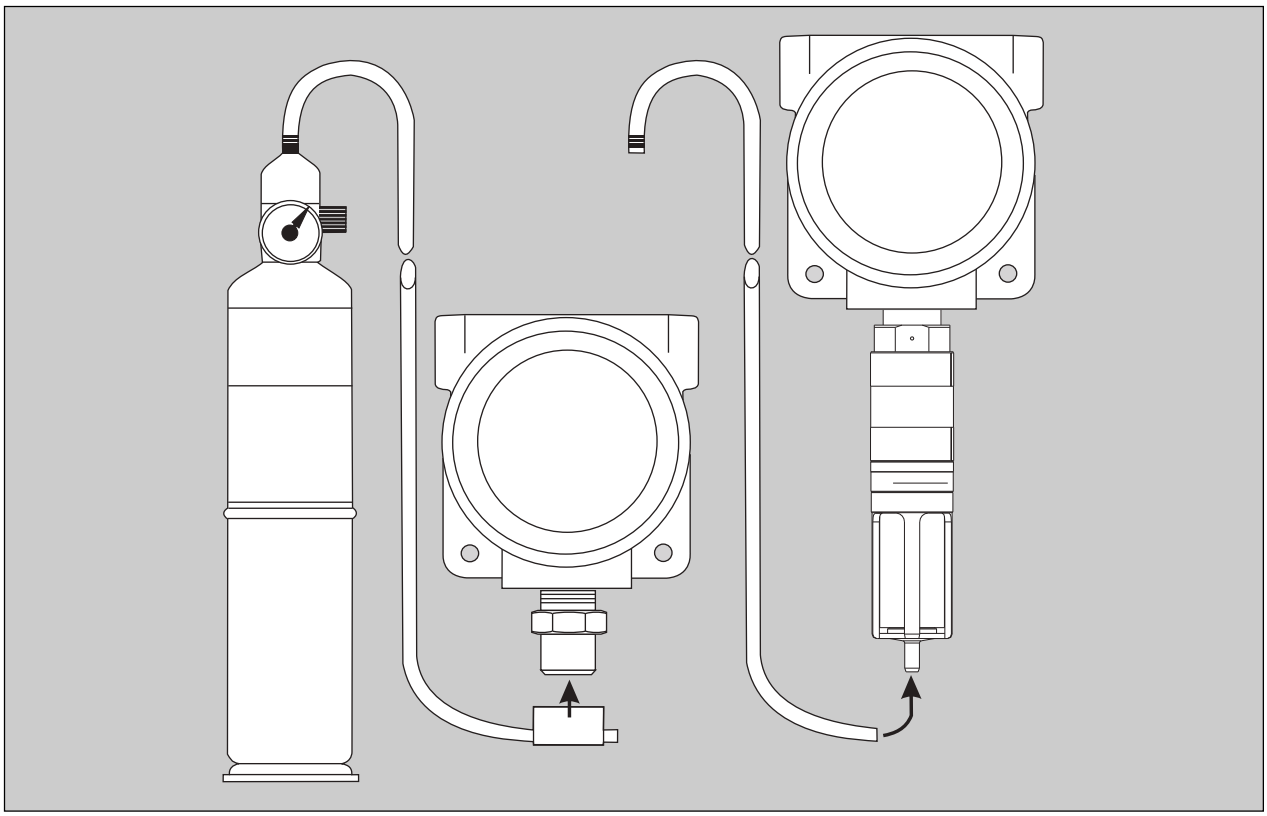


Figure 7: Calibration

4.1 Calibration

4.1.1 Calibration Procedure

Calibration of this unit must be performed at regular intervals as detailed in the sensor data sheet.

DraegerSensor IR:
If the zero signal has drifted significantly, or a calibration fails: calibrate the DraegerSensor IR first (see manual P/N 9023843), then continue with the calibration procedure for Polytron FX.

4.1.1.1 Zero Calibration

- Attach the pressure regulator to the nitrogen (N2) or Zero Air calibration gas cylinder.

  DraegerSensor PR and LC:

  - Fit the calibration adapter tightly to the end of the sensor.

  Draeger Sensor IR:

- Connect the tubing to the barbed fitting of the sensor.

- IMPORTANT: Turn the gas on and allow to flow for at least one minute before proceeding.
- Scroll through software menu to Zero Adj and tap Enter. The current zero value will be displayed.
- Wait for the zero to stabilize.
- If the display is not already reading zero, trim the stabilized value to zero on the display using the Up and Down arrows.
- Accept the value by tapping Enter with the magnetic wand.
- Turn off the gas flow and remove the calibration adapter from the sensor, or disconnect tubing.

NOTE

Ambient air can be used to zero the sensor instead of nitrogen or Zero Air if the area is known to be free of the target gas or any gas to which the sensor may be cross-sensitive (as listed on the sensor data sheet). In this case, no cylinder or calibration adapter is needed for the zero calibration.

4.1.1.2 Span Calibration

WARNING

Never adjust the span before completing zero adjustment. Performing these operations out of order will cause the calibration to be faulty.

- Attach the pressure regulator to the calibration gas cylinder.

  DraegerSensor PR and LC:

  - Fit the calibration adapter tightly to the end of the sensor.

  Draeger Sensor IR:

  - Connect the tubing to the barbed fitting of the sensor.

- IMPORTANT: Turn the gas flow on and allow to flow for at least one minute before proceeding.
- Scroll through software menu to Span Adj and tap Enter. The span value will be displayed.
- Wait for the span value to stabilize.
- Using the Up and Down arrows, trim the stabilized value to the calibration gas concentration that is being applied to the sensor. If the sensor has reached the end of its life, the span value will not be able to be reached. In this case, replace the sensor.
- Accept the value by tapping Enter with the magnetic wand.
- Turn off the gas flow and remove the calibration adapter from the sensor, or disconnect tubing.

4.2 Error Messages

Error Code	Condition	Solution
Pls Con Snr	No sensor is connected, sensor connection is bad, or sensor “bead” is open	1) Connect sensor 2) Check to ensure sensor is seated in connector 3) Contact Draeger Safety technical service
Snr Err	Sensor EEPROM data is corrupted	Contact Draeger Safety technical service
Flt	Hardware fault	Contact Draeger Safety technical service
AFE Err	Wrong software version installed in the Analog Front End (AFE)	1) Install most recent AFE software 2) Contact Draeger Safety technical service
AFE Out	AFE microcontroller is out of its socket, or not installed	Contact Draeger Safety technical service

5 Sensor Principle

5.1 Operating Principle for DraegerSensor PR and LC

The DrägerSensor is a transducer for measuring the partial pressure of combustible gases and vapors contained in ambient air. It uses the heat-of-combustion principle.

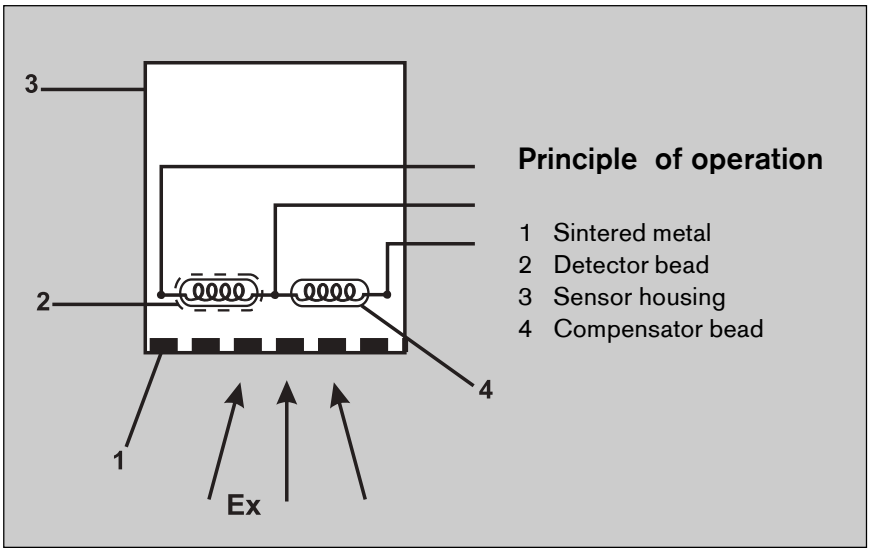
The monitored air diffuses through the sintered metal disc into the sensor. There the mixture of combustible gases and vapors are catalytically combusted at a heated detector element (pellistor). The monitored air supplies the Oxygen required for the combustion. Due to the resulting heat-of-combustion, the detector element gets hotter. This increase in heat causes a change of resistance in the detector element, which is proportional to the concentration of the mixture of combustible gases and vapors in the monitored air.

In addition to the catalytically active detector element, there is an inactive compensator element. Both elements are parts of a Wheatstone bridge. Thus environmental effects like changes in temperature or humidity are almost entirely compensated.

5.2 Contaminating Gases for DraegerSensor PR and LC

Vaporous silicon- and lead-compounds, sulfurous compounds such as hydrogen sulfide and sulfur dioxide, phosphorous compounds such as phosphine. Acidic vapors such as hydrogen fluoride, hydrogen chloride, hydrogen bromide and halogenated organic compounds such as refrigerants and tri- or tetrachloroethene.

A calibration check might be necessary, if the sensor was exposed to a high concentration of combustible gases or vapors for an extended period of time or to contaminants as listed above.



5.3 Operating Principle for DraegerSensor IR

The DrägerSensor IR infrared gas sensor is a gas transmitter designed to determine the concentration of gases and vapors in the ambient air. The principle of measurement is based on the concentration-dependent absorption of infrared radiation in measured gases.

The monitored ambient air diffuses through sintered material into the flameproof housing of a measuring cuvette. The broad-band light emitted by the radiator passes through the gas in the cuvette and is reflected by the cuvette walls from where it is directed towards the inlet window of a dual element detector. One channel of the detector measures the gas-dependent light transmission of the cuvette (measuring channel), the other channel is used as reference. The ratio between measuring and reference signal is used to determine the gas concentration in the cuvette. The cuvette is heated to avoid condensation of the atmosphere's moisture content.

Internal electronics and software are used to calculate the concentration. As an output signal, the gas sensor emulates the half bridge of a catalytic Ex sensor.

Die to its robust design and the measuring method the gas sensor has long maintenance and calibration intervals (see manual 9023843, Maintenance). A gas sensitivity drift is practically excluded by the infrared-optical principle of measurement and in addition, the zero point stability is enhanced by an automatic tracking system.

6 Technical Information

6.1 Approvals

6.1.1 Aluminum Version

UL	DraegerSensor PR			Class I, Div 1, Group B, C, D
	DraegerSensor IR			Class I, Div 1, Group B, C, D
				Class II, Div 1, Group E, F, G
CSA	DraegerSensor PR			Class I, Div 1, Group B, C, D
ATEX				EEx d IIC
	DraegerSensor LC and PR	II 2 D	T135	(Ta = -40 to +80 °C)
			T85	(Ta = -40 to +40 °C)
		II 2 G	T4	(Ta = -40 to +80 °C)
			T6	(Ta = -40 to +40 °C)
	DraegerSensor IR	II 2 D	T135	(Ta = -40 to +65 °C)
			T85	(Ta = -40 to +40 °C)
		II 2 G	T4	(Ta = -40 to +65 °C)
			T6	(Ta = -40 to +40 °C)
CE marking	Electromagnetic Compatibility (Directive 89/336/EEC)			

6.1.2 Stainless Steel Version

ATEX				EEx d IIC
	DraegerSensor LC and PR	II 2 G	135 °C	-20 °C ≤ Ta ≤ +60 °C
			85 °C	-20 °C ≤ Ta ≤ +40 °C
		II 2 D	T135	-20 °C ≤ Ta ≤ +60 °C
			T85	-20 °C ≤ Ta ≤ +40 °C
	DraegerSensor IR	II 2 G	T6	-20 °C ≤ to +60 °C
		II 2 D	T80	-20 °C ≤ to +60 °C
CE marking	Electromagnetic Compatibility (Directive 89/336/EEC)			

6.2 Signal Transmission to Central Control Unit

Analog	Transmission by 3-core shielded cable
– Measurement current	4 to 20 mA
– Transmitter fault	<2 mA
– Maintenance Signal	4 ± 1 mA, 1 Hz modulation or steady 3 mA signal (user selectable)

6.3 Voltage of Power Supply

Operating Voltage	16 to 30 VDC
In-rush Current	160 mA for 40 msec
Operating Current (maximum)	90 mA @ 24 VDC
Connector accepts 16 to 22 gauge wire AWG (0.5 to 1.5 mm^2)	

6.4 Physical Specifications

6.4.1 Aluminum Version

Enclosure	NEMA 4X (IP66)
Size ..... L x W x D approx., **FX PR**	6.5" x 4.5" x 4"; (165 x 115 x 100mm)
FX LC	7.2" x 4.5" x 4"; (185 x 115 x 100mm)
FX IR	11.5" x 4.5" x 4"; (295 x 115 x 100mm)
Weight approx. ..... FX PR, FX LC	3.3 lbs. (1.5 kg)
FX IR	4.2 lbs. (1.9 kg)

6.4.2 Stainless Steel Version

Enclosure	NEMA 4X (IP66)
Size ..... L x W x D approx., **FX PR**	6.6" x 5.1" x 4.7"; (170 x 130 x 120mm)
FX IR	11.6" x 5.1" x 4.7"; (295 x 130 x 120mm)
Weight approx. ..... FX PR	7.1 lbs. (3.2 kg)
FX IR	8.0 lbs. (3.6 kg)

6.5 Environmental Parameters

Temperature ..... FX PR, FX LC	–40 to 175 °F, (–40 to 80 °C)
FX IR	–40 to 150 °F, (–40 to 65 °C)
Pressure	20.7 to 38.4 in. of Hg (700 to 1300 mbar)
Humidity	5 to 95% RH, non-condensing
Maximum Air Velocity	≤ 19.5 ft/s (≤ 6 m/s)

6.6 Ambient Influences

See sensor data sheets.

7 Order Information

Order #	Description
4543445	Polytron FX, UL Version
4543450	Polytron FX, CSA/ATEX Version
4543457	Polytron FX LC, ATEX Version (0 - 10% LEL)
4543464	Polytron FX IR, CSA/ATEX Version
4543465	Polytron FX IR, UL Version

7.1 Replacement Sensors

Order #	Description
6809755	DraegerSensor PR, Poison Resistant, UL Version (0 - 100% LEL)
6809790	DraegerSensor PR, Poison Resistant, CSA/ATEX Version (0 - 100% LEL)
6810675	DraegerSensor LC, ATEX Version (0 - 10% LEL)
6811111	DraegerSensor IR, UL, CSA/ATEX Version (0 - 100% LEL)

7.2 Accessories

Order #	Description
4594620	Calibration Kit Contains pressure regulator, calibration adapter, 100% nitrogen (N2) zero gas, tubing, and carrying case *Please note: calibration span gas is not included in the calibration kit. Consult with Dräger application engineers for required part number.* Calibration adapter for DraegerSensor IR included w/sensor.
4543449	Operating Manual, Polytron FX
9023843	Operating Manual, DraegerSensor IR

7.3 Spare Parts

Order #	Description
4543428	Magnetic Wand
4543452	PCB/Bezel Assembly, Polytron FX and Polytron FX IR
4543462	PCB/Bezel Assembly, Polytron FX LC
6810796	Filter/Splash Guard for DraegerSensor IR

ONLINE CERTIFICATIONS DIRECTORY

JTOL.E180306

Gas and Vapor Detection Equipment Enclosures for Use in Hazardous Locations

Page Bottom

Gas and Vapor Detection Equipment Enclosures for Use in Hazardous Locations

See General Information for Gas and Vapor Detection Equipment Enclosures for Use in Hazardous Locations

DRAEGER SAFETY INC E180306
101 TECHNOLOGY DR
PITTSBURGH, PA 15275 USA

Class I, Groups B, C and D.

Catalog designation Polytron 2 XP-Ex Sensing Head Enclosure with Sensor PR.

Catalog designations Polytron ND-Ex, Polytron FX and Polytron NDSE-Ex Sensing Head Enclosures with Sensor PR.

Class I, Groups C and D.

Catalog designations Polytron ND-TOX, Polytron TX and Intellisense Sensor.

Class I, Groups A, B, C and D.

Catalog designation IR gas sensor enclosure Series IR followed by 00 to 99 incl.

Class I, Groups B, C and D; Class II, Groups E, F and G Hazardous Locations.

Polytron 2 XP-Ex Sensing Head Enclosures with Sensor IDS 0002.

Polytron FX Sensing Head Enclosures with Sensor IDS 0002.

Last Updated on 2006-07-07

Questions? Notice of Disclaimer Page Top

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1214446 (LR 42713) **Master Contract:** 152605

Project: 1785384 **Date Issued:** 2006/09/12

Issued to: **Draeger Safety Inc.**
101 Technology Dr
Pittsburgh, PA 15275
USA
Attention: Mr. Richard Abt

The products listed below are eligible to bear the CSA Mark shown

Issued by: Mr. Glenn Black

Authorized by: Patricia Pasemko, Operations Manager

PRODUCTS

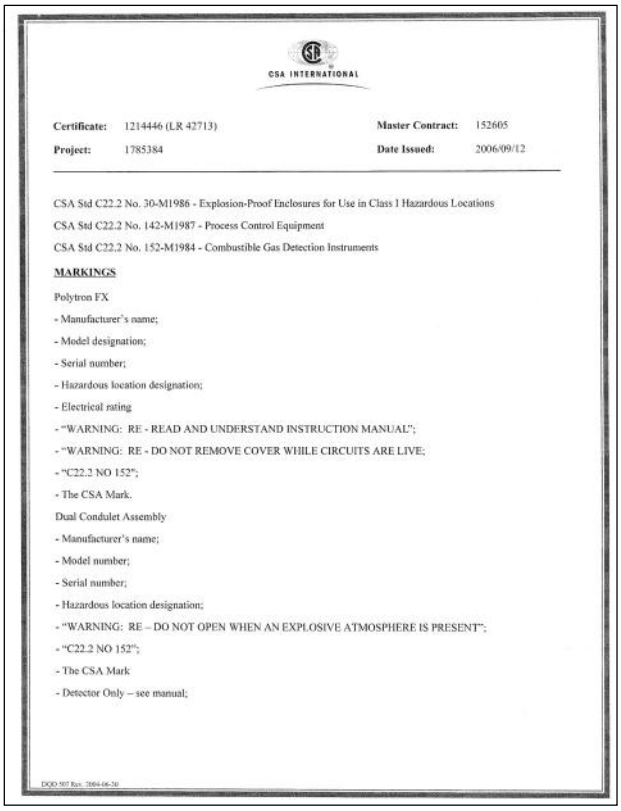
CLASS 4828 01 - SIGNAL APPLIANCES - - Combustible Gas Detection Instruments-For Hazardous Locations

Class I, Groups B, C and D:

- Combustible Gas Detector Transmitter, stationary (stand alone), Model "Polytron FX"; input rated 16-30V dc; 125mA, 4-20mA output. May be used with Model "Dual Condulet Assembly" for remote sensor installation per instructions 4520563.

APPLICABLE REQUIREMENTS

DQD 507 Rev. 2004-06-30



CSA INTERNATIONAL

Certificate: 1214446 (LR 42713) **Master Contract:** 152605

Project: 1785384 **Date Issued:** 2006/09/12

CSA Std C22.2 No. 30-M1986 - Explosion-Proof Enclosures for Use in Class I Hazardous Locations

CSA Std C22.2 No. 142-M1987 - Process Control Equipment

CSA Std C22.2 No. 152-M1984 - Combustible Gas Detection Instruments

MARKINGS

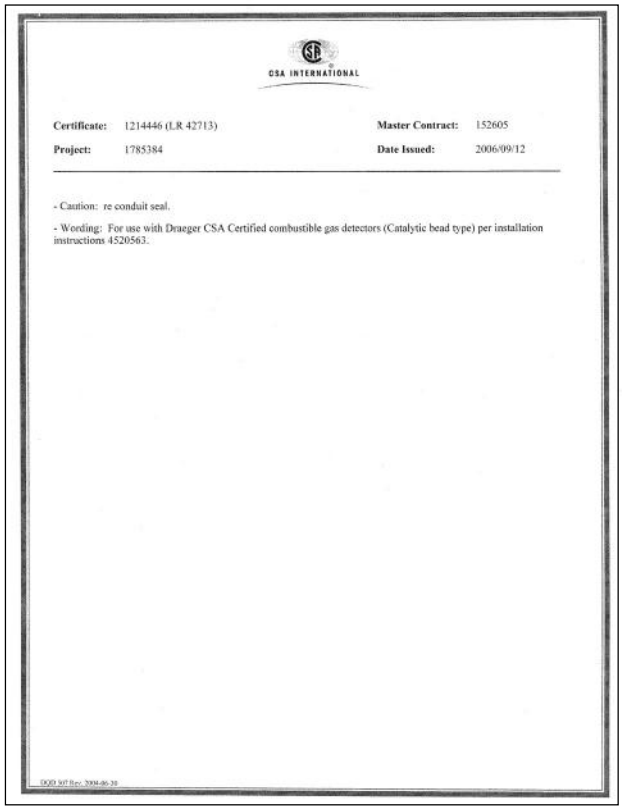
Polytron FX

- Manufacturer's name;
- Model designation;
- Serial number;
- Hazardous location designation;
- Electrical rating
- "WARNING: RE - READ AND UNDERSTAND INSTRUCTION MANUAL";
- "WARNING: RE - DO NOT REMOVE COVER WHILE CIRCUITS ARE LIVE;
- "C22.2 NO 152";
- The CSA Mark.

Dual Condulet Assembly

- Manufacturer's name;
- Model number;
- Serial number;
- Hazardous location designation;
- "WARNING: RE – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT";
- "C22.2 NO 152";
- The CSA Mark
- Detector Only – see manual;

DQD 507 Rev. 2004-06-30



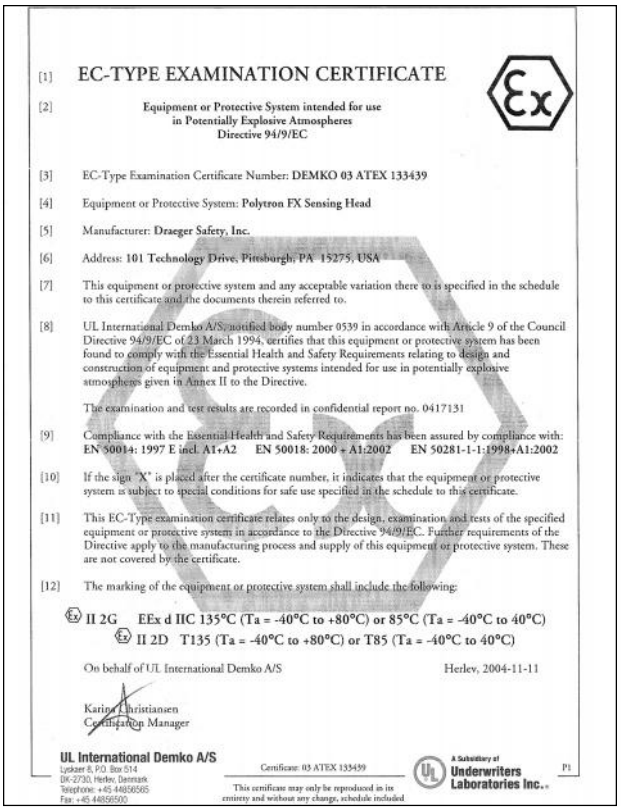
CSA INTERNATIONAL

Certificate: 1214446 (LR 42713) **Master Contract:** 152605

Project: 1785384 **Date Issued:** 2006/09/12

- Caution: re conduit seal.
- Wording: For use with Draeger CSA Certified combustible gas detectors (Catalytic bead type) per installation instructions 4520563.

DQD 507 Rev. 2004-06-30



[1] EC-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

[3] EC-Type Examination Certificate Number: **DEMKO 03 ATEX 133439**

[4] Equipment or Protective System: **Polytron FX Sensing Head**

[5] Manufacturer: **Draeger Safety, Inc.**

[6] Address: **101 Technology Drive, Pittsburgh, PA 15275, USA**

[7] This equipment or protective system and any acceptable variation there to is specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S, notified body number 0539 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 0417131

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with: **EN 50014: 1997 E incl. A1+A2 EN 50018: 2000 + A1:2002 EN 50281-1-1:1998+A1:2002**

[10] If the sign 'X' is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

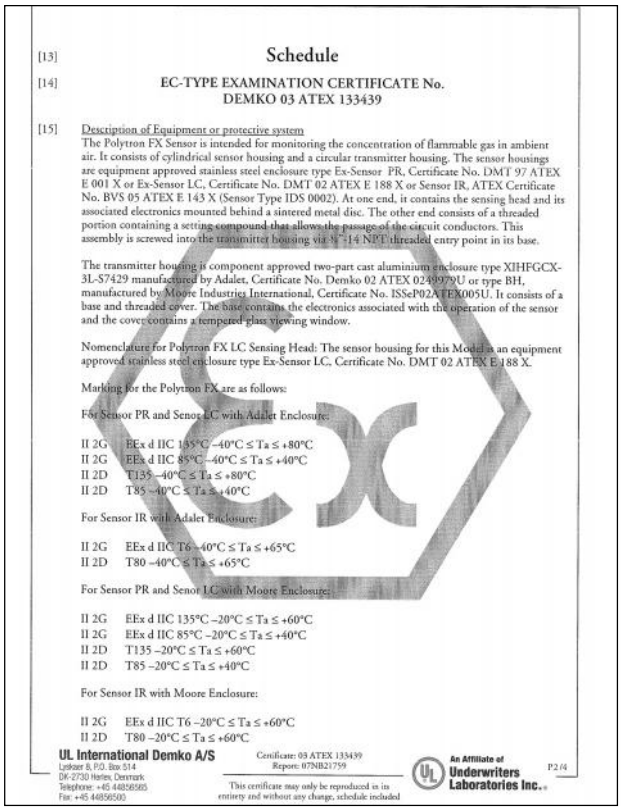
[11] This EC-Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by the certificate.

[12] The marking of the equipment or protective system shall include the following:

Ex II 2G EEx d IIC 135°C (Ta = -40°C to +80°C) or 85°C (Ta = -40°C to 40°C)
Ex II 2D T135 (Ta = -40°C to +80°C) or T85 (Ta = -40°C to 40°C)

On behalf of UL International Demko A/S Herlev, 2004-11-11

Karina Christiansen
Certification Manager



[13] Schedule

[14] EC-TYPE EXAMINATION CERTIFICATE No. DEMKO 03 ATEX 133439

[15] Description of Equipment or protective system

The Polytron FX Sensor is intended for monitoring the concentration of flammable gas in ambient air. It consists of cylindrical sensor housing and a circular transmitter housing. The sensor housings are equipment approved stainless steel enclosure type Ex-Sensor PR, Certificate No. DMT 97 ATEX E 001 X or Ex-Sensor LC, Certificate No. DMT 02 ATEX E 188 X or Sensor IR, ATEX Certificate No. BVS 05 ATEX E 143 X (Sensor Type IDS 0002). At one end, it contains the sensing head and its associated electronics mounted behind a sintered metal disc. The other end consists of a threaded portion containing a setting compound that allows the passage of the circuit conductors. This assembly is screwed into the transmitter housing via ¾"-14 NPT threaded entry point in its base.

The transmitter housing is component approved two-part cast aluminium enclosure type XIHFGCX-3L-S7429 manufactured by Adalet, Certificate No. Demko 02 ATEX 024397U or type BH, manufactured by Moore Industries International, Certificate No. ISSeP02ATEX005U. It consists of a base and threaded cover. The base contains the electronics associated with the operation of the sensor and the cover contains a tempered glass viewing window.

Nomenclature for Polytron FX LC Sensing Head: The sensor housing for this Model is an equipment approved stainless steel enclosure type Ex-Sensor LC, Certificate No. DMT 02 ATEX E 188 X.

Marking for the Polytron FX are as follows:

For Sensor PR and Senor LC with Adalet Enclosure:

II 2G EEx d IIC 135°C –40°C ≤ Ta ≤ +80°C
II 2G EEx d IIC 85°C –40°C ≤ Ta ≤ +40°C
II 2D T135 –40°C ≤ Ta ≤ +80°C
II 2D T85 –40°C ≤ Ta ≤ +40°C

For Sensor IR with Adalet Enclosure:

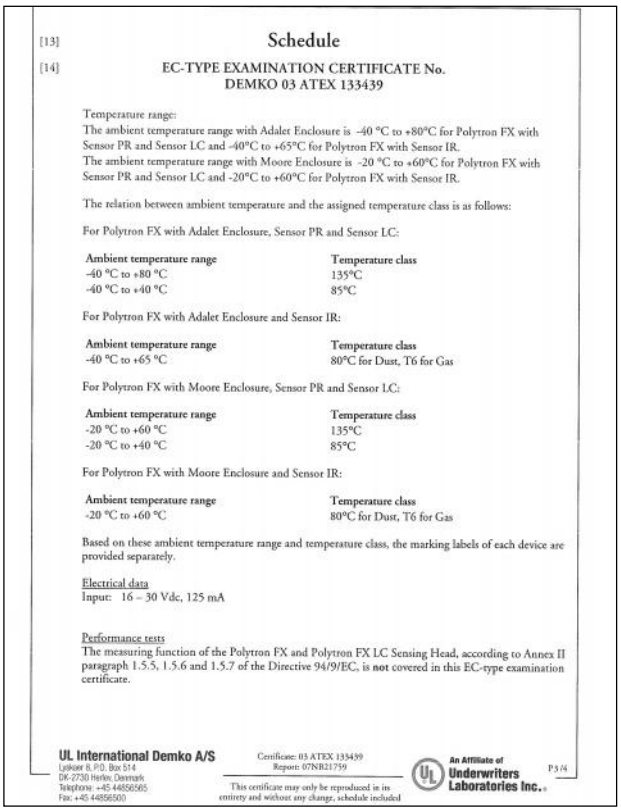
II 2G EEx d IIC T6 –40°C ≤ Ta ≤ +65°C
II 2D T80 –40°C ≤ Ta ≤ +65°C

For Sensor PR and Senor LC with Moore Enclosure:

II 2G EEx d IIC 135°C –20°C ≤ Ta ≤ +60°C
II 2G EEx d IIC 85°C –20°C ≤ Ta ≤ +40°C
II 2D T135 –20°C ≤ Ta ≤ +60°C
II 2D T85 –20°C ≤ Ta ≤ +40°C

For Sensor IR with Moore Enclosure:

II 2G EEx d IIC T6 –20°C ≤ Ta ≤ +60°C
II 2D T80 –20°C ≤ Ta ≤ +60°C



[13] Schedule

[14] EC-TYPE EXAMINATION CERTIFICATE No. DEMKO 03 ATEX 133439

Temperature range:
The ambient temperature range with Adalet Enclosure is -40 °C to +80°C for Polytron FX with Sensor PR and Sensor LC and -40°C to +65°C for Polytron FX with Sensor IR.
The ambient temperature range with Moore Enclosure is -20 °C to +60°C for Polytron FX with Sensor PR and Sensor LC and -20°C to +60°C for Polytron FX with Sensor IR.

The relation between ambient temperature and the assigned temperature class is as follows:

For Polytron FX with Adalet Enclosure, Sensor PR and Sensor LC:

Ambient temperature range	Temperature class
-40 °C to +80 °C	135°C
-40 °C to +40 °C	85°C

For Polytron FX with Adalet Enclosure and Sensor IR:

Ambient temperature range	Temperature class
-40 °C to +65 °C	80°C for Dust, T6 for Gas

For Polytron FX with Moore Enclosure, Sensor PR and Sensor LC:

Ambient temperature range	Temperature class
-20 °C to +60 °C	135°C
-20 °C to +40 °C	85°C

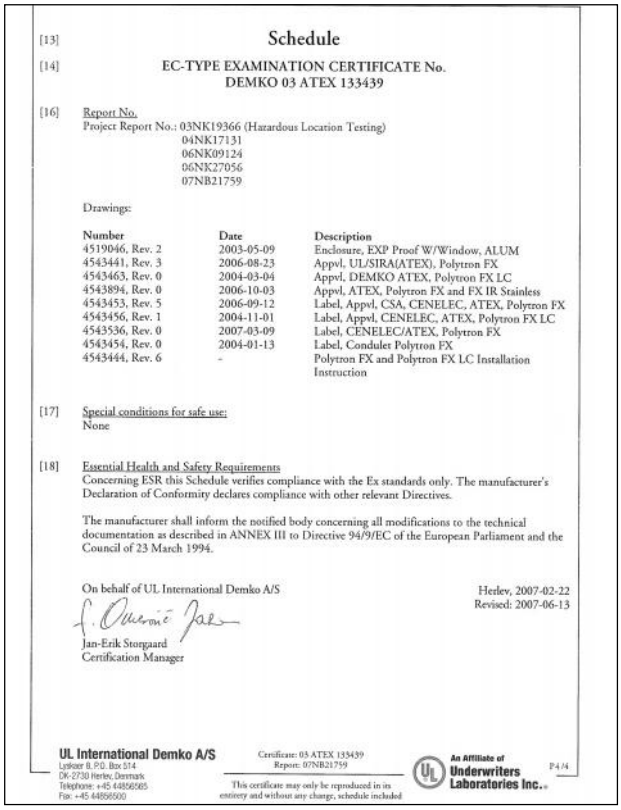
For Polytron FX with Moore Enclosure and Sensor IR:

Ambient temperature range	Temperature class
-20 °C to +60 °C	80°C for Dust, T6 for Gas

Based on these ambient temperature range and temperature class, the marking labels of each device are provided separately.

Electrical data
Input: 16 – 30 Vdc, 125 mA

Performance tests
The measuring function of the Polytron FX and Polytron FX LC Sensing Head, according to Annex II paragraph 1.5.5, 1.5.6 and 1.5.7 of the Directive 94/9/EC, is **not** covered in this EC-type examination certificate.



[13] Schedule

[14] EC-TYPE EXAMINATION CERTIFICATE No. DEMKO 03 ATEX 133439

[16] Report No.
Project Report No.: 03NK19366 (Hazardous Location Testing)
04NK17131
06NK09124
06NK27056
07NB21759

Drawings:

Number	Date	Description
4519046, Rev. 2	2003-05-09	Enclosure, EXP Proof W/Window, ALUM
4543441, Rev. 3	2006-08-23	Appvl, UL/SIRA(ATEX), Polytron FX
4543463, Rev. 0	2004-03-04	Appvl, DEMKO ATEX, Polytron FX LC
4543894, Rev. 0	2006-10-03	Appvl, ATEX, Polytron FX and FX IR Stainless
4543453, Rev. 5	2006-09-12	Label, Appvl, CSA, CENELEC, ATEX, Polytron FX
4543456, Rev. 1	2004-11-01	Label, Appvl, CENELEC, ATEX, Polytron FX LC
4543536, Rev. 0	2007-03-09	Label, CENELEC/ATEX, Polytron FX
4543454, Rev. 0	2004-01-13	Label, Condulet Polytron FX
4543444, Rev. 6	-	Polytron FX and Polytron FX LC Installation Instruction

[17] Special conditions for safe use:
None

[18] Essential Health and Safety Requirements
Concerning ESR this Schedule verifies compliance with the Ex standards only. The manufacturer's Declaration of Conformity declares compliance with other relevant Directives.

The manufacturer shall inform the notified body concerning all modifications to the technical documentation as described in ANNEX III to Directive 94/9/EC of the European Parliament and the Council of 23 March 1994.

On behalf of UL International Demko A/S Herlev, 2007-02-22
Revised: 2007-06-13

Jan-Erik Storgaard
Certification Manager

EC Declaration of Conformity

We Draeger Safety, Inc.
101 Technology Drive
Pittsburgh, PA 15275-1057
USA

Declare that the product(s): Polytron FX Sensing Head

Following the provisions of:
Article 9 of Directive 89/336/EEC (Electromagnetic compatibility) as amended by Directives 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/97/EEC, and Article 9 of 94/9/EC (Essential Health and Safety Requirements) of 23 March 1994 is in conformity with the EC-Type Examination certificate: DEMKO 03 ATEX 133439.

Aluminum
For Sensor PR and Sensor LC
II 2G 135°C -40 °C ≤ Ta ≤ +80 °C
II 2G 85°C -40 °C ≤ Ta ≤ +40 °C
II 2D T135 -40 °C ≤ Ta ≤ +80 °C
II 2D T85 -40 °C ≤ Ta ≤ +40 °C

For Sensor IR
II 2G T6 -40 °C ≤ Ta ≤ +65 °C
II 2D T80 -40 °C ≤ Ta ≤ +65 °C

Stainless Steel
For Sensor PR and Sensor LC
II 2G 135°C -20 °C ≤ Ta ≤ +60 °C
II 2G 85°C -20 °C ≤ Ta ≤ +40 °C
II 2D T135 -20 °C ≤ Ta ≤ +60 °C
II 2D T85 -20 °C ≤ Ta ≤ +40 °C

For Sensor IR
II 2G T6 -20 °C ≤ Ta ≤ +60 °C
II 2D T80°C -20 °C ≤ Ta ≤ +60 °C

Type of Protection: d
Explosion Group: IIC

And is in conformity with the harmonized standard(s) or other normative document(s) as listed in the annex.

Dräger

Annex of Declaration of Conformity

Document No.: 4543262

Product(s): Polytron FX Permanent Gas Detection Instrument

The conformity of the product described above with the provisions of Directive 94/9/EC is provided by the observance of the following standards:

EN 50014	1997 (Inc. Amendments A1 and A2)
EN 50018	2000 + A1:2002
EN 50281-1-1	1998 + A1:2002

The conformity of the product described above with the provisions of Directive 89/336/EEC is provided by the observance of the following standards:

EN 50270 1999

Notified Body:
UL International DEMKO A/S
Notified Body Number – 0539
Lyskaer 8, P.O. Box 514
DK – 2730 Herlev, Denmark

DEKRA EXAM - GmbH
Dinnendahlstrasse 9
D-44809 Bochum
Identification Number 0158

The product has been manufactured, finally inspected and tested under a quality system that has been approved by the Notified Body.

Keith Lorenz
Manager of R & D
Draeger Safety, Inc.
101 Technology Drive
Pittsburgh, PA 15275-1057
USA

DSI APPVL No. 4543262, Rev 6

sales@norrscope.com