OLDHAM
Gas Monitoring Solutions

300 SERIES

LEL DETECTOR
DETECTOR-TRANSMITTER
FOR COMBUSTIBLE, TOXIC GASES AND OXYGEN

OPERATION AND MAINTENANCE MANUAL

ATMOSPHÈRES EXPLOSIVES 94/9/CE SAQ Approuvé INERIS 94/9/EC QAS Approved EXPLOSIVE ATMOSPHERES

AFAQ ISO 9001 VERSION 2000

CE

Made in France

OLDHAM
An Industrial Scientific Company

The Fixed Gas Detection People

Ref.: NP300 GB
Revision G

OLDHAM
An Industrial Scientific Company

The Fixed Gas Detection People

GAS DETECTION

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* Two-year return to factory warranty under normal operating conditions on parts and labor, consumable materials excluded (sensors, filters, etc.)

CONTENTS

I. INTRODUCTION

1. General Information

300 Series gas detectors are designed to measure combustible toxic gases or vapors and oxygen. With robust materials, a specifically-adapted design, appropriate accessories, INOX bolts, and a polyamide case (IP66) (IP55 for the CO_2 version), 300 series detectors are designed to withstand the roughest conditions.

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2. Composition

Sensor type	CEX 300	CTX 300			
		Toxic	Oxygen	Semiconductor	CO_2
Gases detected	Combustible gas	Common toxic gases detected	Oxygen	- Combustible gas - Solvents - Some Freons	CO_2
Detection method	Catalytic oxidation	Electrochemical sensors[1]	Electrochemical sensor	Semiconductor sensor	Infrared absorption
Type of sensor pack	Explosion-proof sensor	Pre-calibrated removable sensor pack[2]	Pre-calibrated removable sensor pack: 0-30% scale or 0-100% volume.	Removable sensor pack, not pre-calibrated	Removable sensor pack Infrared column, not pre-calibrated
Options	Cable gland for flexible cable or armored cable[3]	With display	With display		
Certification	ATEX II 2GD[4]	None	None	None	None

II. INSTALLATION AND CONNECTIONS

For use in explosive atmospheres: in accordance with the European directive ATEX 94/9/EC, you must read the “Particular Specifications” paragraph.

1. INSTALLING THE DETECTORS

1.1 Layout

While the measuring sensor is always located on the underside of the detector, several factors determine where the detector should be located:

- If the gas being measured is lighter than the air, place the detector near the ceiling.
- If the gas is heavier than the air (CO_2 and Freons, for example) place the detector close to the floor.
- Near offtake points.
- Generally, in locations where gas may accumulate, taking into consideration both
  - the effects of temperature, and
  - the direction of winds.

[1] Specific to each gas
[2] Choice between several scales
[3] Requires grounding
[4] EEx ed IIC T6 (-20 to 60°C)

Factors to consider when determining the best placement for the detector:

⇒ Potential sources for vapor and gas emissions
⇒ Characteristics of gases and vapors (density)
⇒ Air circulation
- inside: mechanical or natural ventilation
- outside: wind direction and velocity

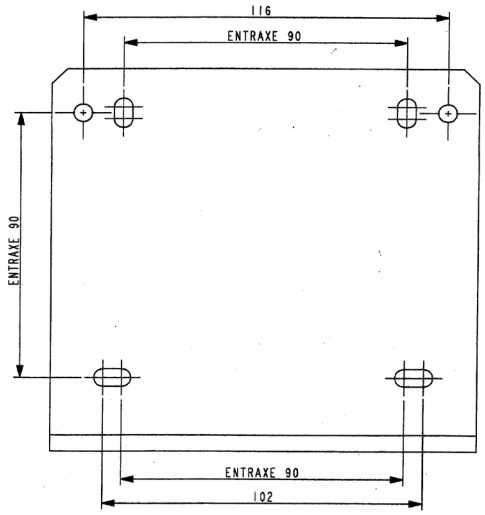
⇒ Effects of temperature
⇒ Local constraints (air flow, water)

Detectors should always be located in an easily accessible location for maintenance purposes.

Special accessories may be necessary to protect the equipment against any liquid projectiles, dust, direct sunlight or low temperatures in the area.

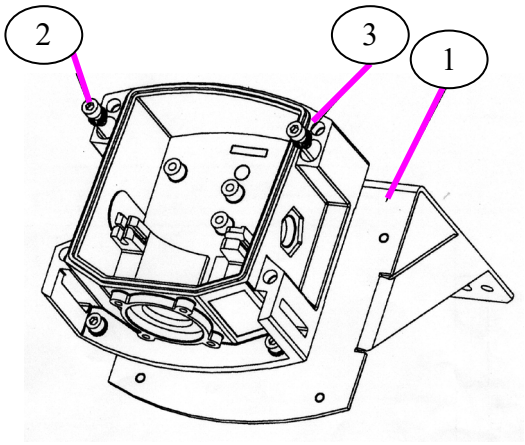
1.2 Mechanical installation

Method 1: wall-mounted



Drilling diagram

Method 2: ceiling-mounted



Same drilling diagram, support brace used

REF.	No.	DESCRIPTION	OFSA REF	MATERIAL
1	1	CEX / CTX300 BRACE	6132380	INOX
2	4	CHC LI2 SCREW	6902218	INOX
3	4	A25 ACCD WASHER	6905518	.

2. ELECTRICAL CONNECTIONS

2.1. *Wiring specifications*

If needed: consult the grounding instructions for INDUSTRIAL SCIENTIFIC instruments and related connection materials in Annex 1.

2.2. Cable glands and cable types

Sensor types	Cable gland type	Cable entry
CTX 300 (TOX and OX) CTX 300 SC CTX 300 CO_2	Nickel-plated brass Neoprene	Between 6–11 mm
CEX 300 with shielded cable	Nickel-plated brass	Between 6–11 mm
CEX 300 with armored cable[5]	Double compression nickel-plated brass	Between 8.5–16 mm

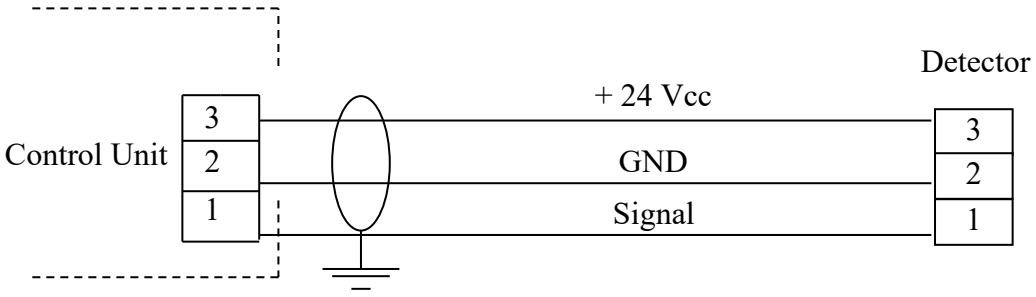
2.3. Connections for the various types of sensors

	CEX 300	CTX 300 (TOX and OX)	CTX 300 (TOX and OX) without display	CTX 300 SC and CO_2 without display
Output signal	voltage	4-20 mA	4-20 mA	4-20 mA
Number of wires	3 wires	3 wires	2 wires	3 wires
Max. impedance (Z) of the line	**Refer to the characteristics for the central controller** **The CEX 300 sensor only connects to INDUSTRIAL SCIENTIFIC central controllers**			

[5] Here, the CEX 300 case is equipped with a grounding reclaim screw to connect the cable armor to the ground cable.

a) Connection of a 3-wire sensor to an INDUSTRIAL SCIENTIFIC central controller

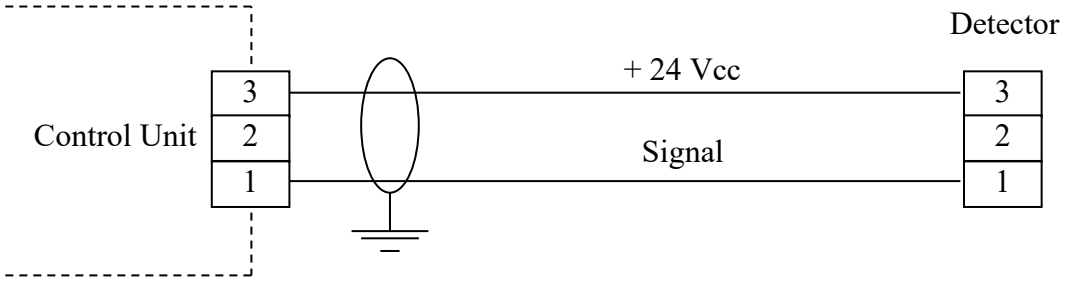
- 1 wire (+) continuous power supply → No. 3
- 1 wire (-) continuous power supply (0 volt mass) → No. 2
- 1 output signal wire → No. 1



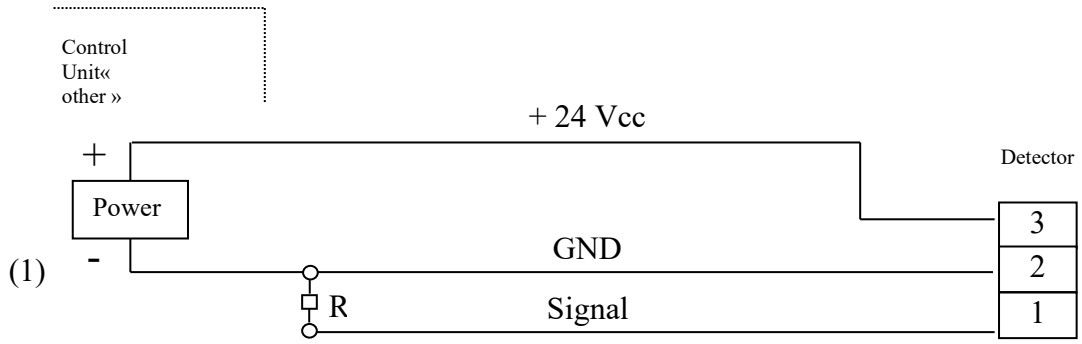
b) Connection of a 2-wire sensor to an INDUSTRIAL SCIENTIFIC central controller

- 1 wire (+) → No. 3
- 1 signal wire → No. 1

} Formant la boucle de courant 4/20 mA sur 2 fils



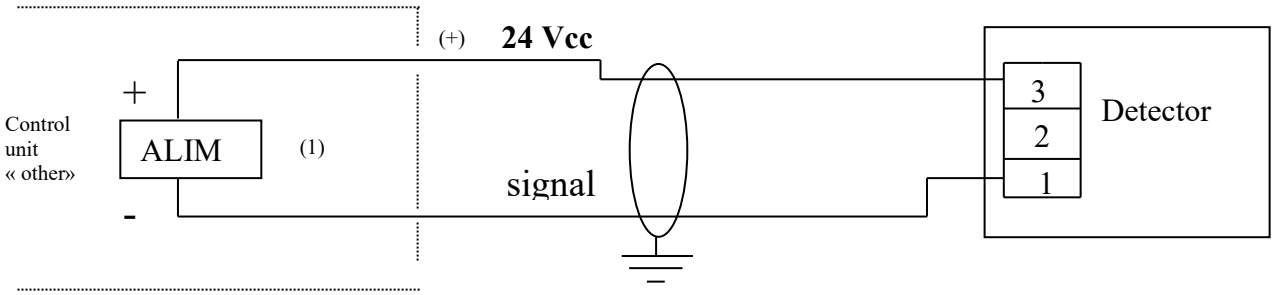
c) Connection of a 3-wire CTX300 sensor to a non-INDUSTRIAL SCIENTIFIC controller and to an internal power supply.



(R) Maximum resistance = 200 Ω.

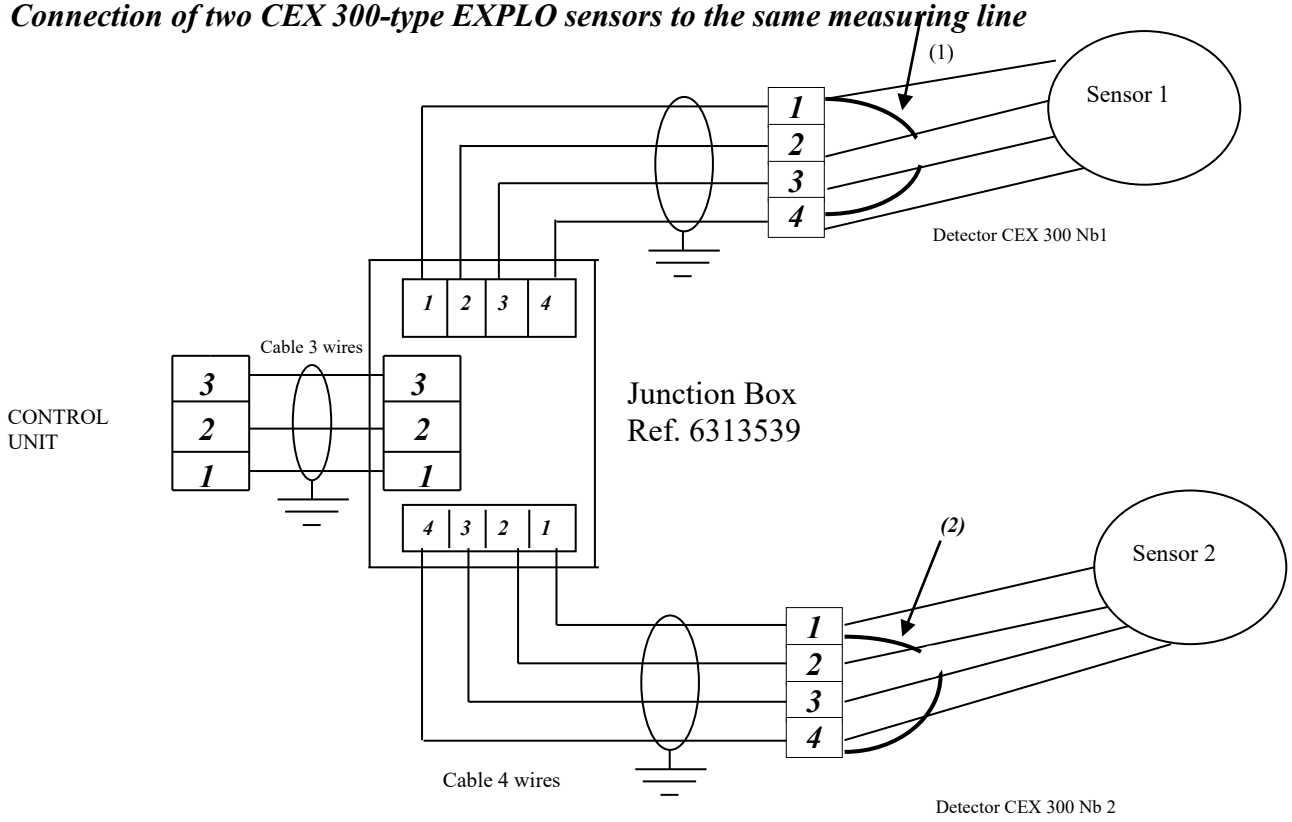
(1) 15 ≤ VCC ≤ 32
18 ≤ VCC ≤ 30 for CO2
Max I: 130 mA

d) Connection of a 2-wire 4-20mA sensor to a non-INDUSTRIAL SCIENTIFIC controller and to an internal power supply.



(1) 15<VCC<32V Max I = 30 mA

e) Connection of two CEX 300-type EXPLO sensors to the same measuring line



(1) and (2) ⚠ Check to ensure that terminals 1 and 4 are not connected

This only applies when the 2 sensors are located in the same room, protecting the same installation.

2.4. *Operating mode*

a) CTX300 with display

FIG. 1

- Remove the 4 screws (Ref. 1 in Fig. 1)
- Remove the cover (Ref. 2 in Fig. 1)

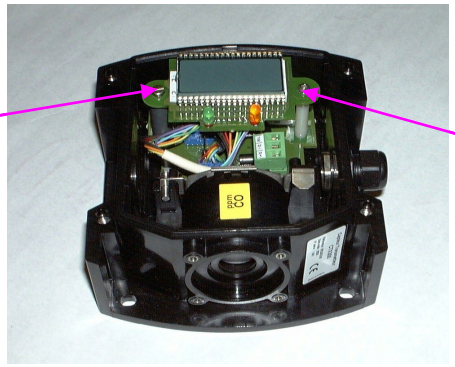


FIG. 2

- Gently remove the screw (Ref. 3 in Fig. 2)
- Completely remove the screw (Ref. 4 in Fig. 2)

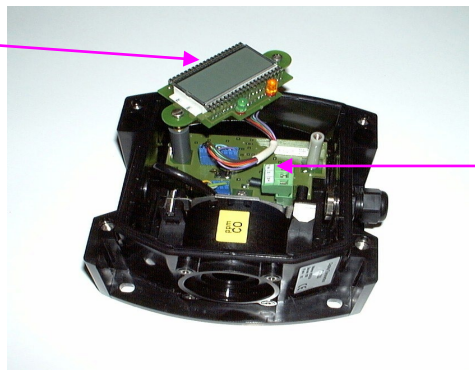


FIG. 3

- Turn the display circuit as shown above (Ref. 5 in Fig. 3)
- Connect the cable (see 2-3: Connections for the various types of sensors) to the connector (Ref. 6, Fig. 3)
- Return the display circuit to its original position and replace the cover

b) CEX 300 and CTX 300 without display

- Lift the cover (Ref. 1 in Fig. 1)
- Remove the cover (Ref. 2 in Fig. 2)

and proceed to wire the sensor according to the terminal location

III. POWERING UP AND USE

1 Powering up

The sensor turns on when connected to a power supply. If the sensor has a display, the green LED will be lit (Ref 1 in Fig 4) and a value will appear on the display screen (Ref. 2 in Fig 4).

Fig. 4

In case of a problem, verify that the maintenance switch (Ref. 1), located on the main circuit is in the "MES" (measure) position.

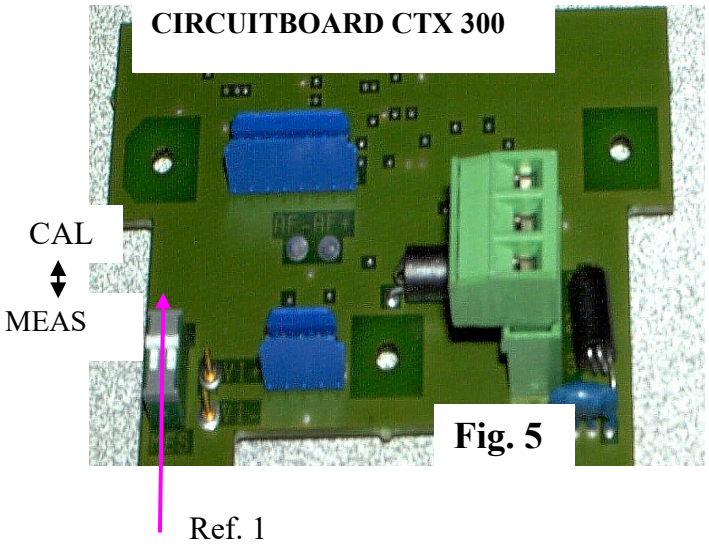


Fig. 5

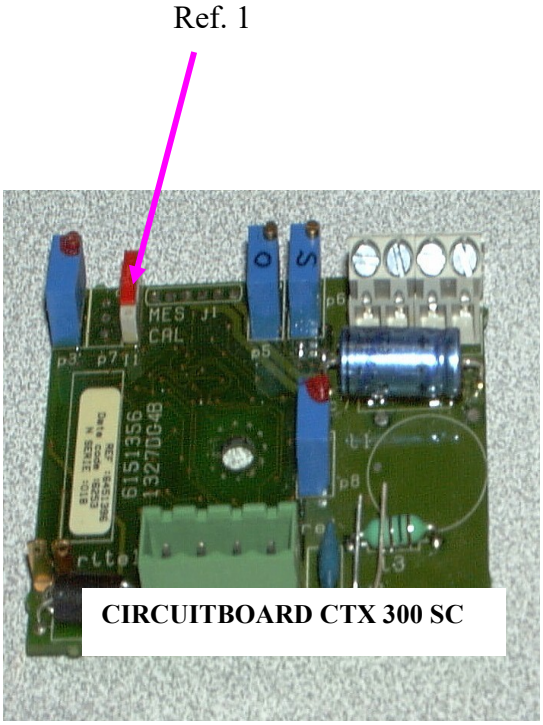


Fig. 6

CO_2 CIRCUIT

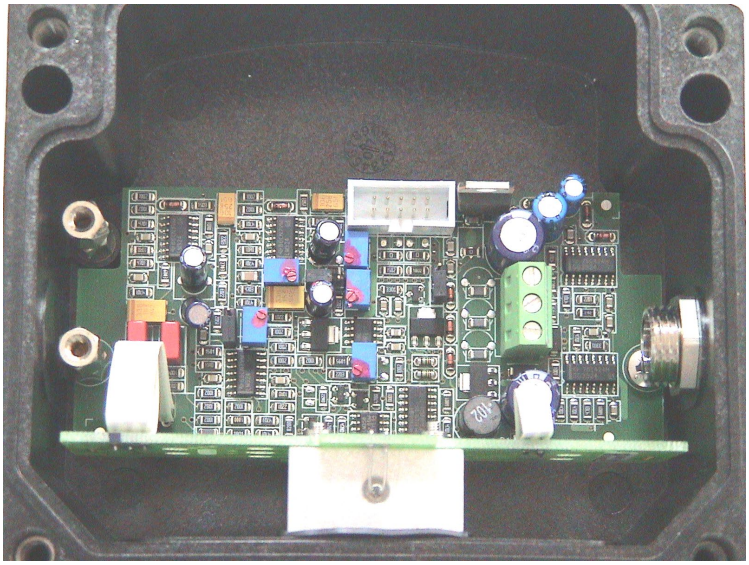


Fig. 7

2. 4-20 mA analog output

For CTX 300 sensors, except for the CO_2 sensor, the 4-20 mA output current is proportional to the gas level.

Notes:

- The CO_2 sensor can be equipped with a linearization board.
- MX 15 and MX 32 central controllers that integrate with the linearization of the CO_2 sensor are available upon request
- The MX6 2 integrates with the linearization of CO_2 sensors.

The various states of the output current include:

- ≤ 1 mA to indicate a fault
- 2 mA in “calibration” position (except for the CO_2 sensor that does not have a calibration function)
- between 4 and 20 mA for measurement values
- ≥ 20 mA if levels exceed measurement range

IV. Maintenance

Warning: The adjustment operations in this paragraph are reserved for authorized, trained personnel because they may compromise detection reliability.

Gas detectors are safety devices. In consideration of this, Industrial Scientific recommends regular testing of fixed gas detection installations. This type of test consists of injecting a standard gas of sufficient concentration into the sensor to set off the pre-adjusted alarms. This test does not, in any event, replace a full calibration of the sensor.
Industrial Scientific also recommends completely calibrating detectors with a known and certified concentration of gas every three or four months.
Frequency of gas testing depends on the industrial application in which the sensors are used. Inspection should occur frequently during the months following installation startup, later it may be spaced out if no significant problem is observed. Time intervals between tests should not exceed three months.

If a detector does not react upon contact with gas, it must be calibrated. Calibration frequency should be adapted based on test results. However, it should not be greater than one year.

Industrial Scientific recommends using a test gas to calibrate detectors.

The site manager is responsible for implementing the safety procedures on his site. Industrial Scientific is not responsible for implementing safety procedures.

The CEX 300

To reach a SIL Capability 1 level according to European standard EN50402, (requirement relative to the functional safety of fixed gas-detection systems), the maintenance period for explosive-gas detectors must be no more than six months. In SIL2 level installations, the maintenance period must be at most three months.

These recommendations are compliant with the standards and directives for safety in industrial sites. Nevertheless, Industrial Scientific – Oldham shall not be held responsible for safety procedures put into effect on a site.

1. *Calibration*

1.1. Recommendations

Calibration consists of adjusting the zero of the clean air sensor and adjusting sensitivity with a test gas. Adjustments are made at the sensor level or on the control unit (as for CEX 300).
To adjust settings (ZERO and SENSITIVITY) on the control unit, refer to the notice displayed therein.

Equipment needed to calibrate the detector correctly:
- flexible plastic tubing (Ref. 1)
- manometer + regulator valve for the compressed gas tanks (Ref. 2 – Fig. 8)
- 0 to 601/h flow meter (if the tank is not equipped with one).
- calibration pipe (Fig. 8 – Ref. 3), which may vary depending on the nature of the gas (see Annex)
- one tank of test gas (Ref. 4)

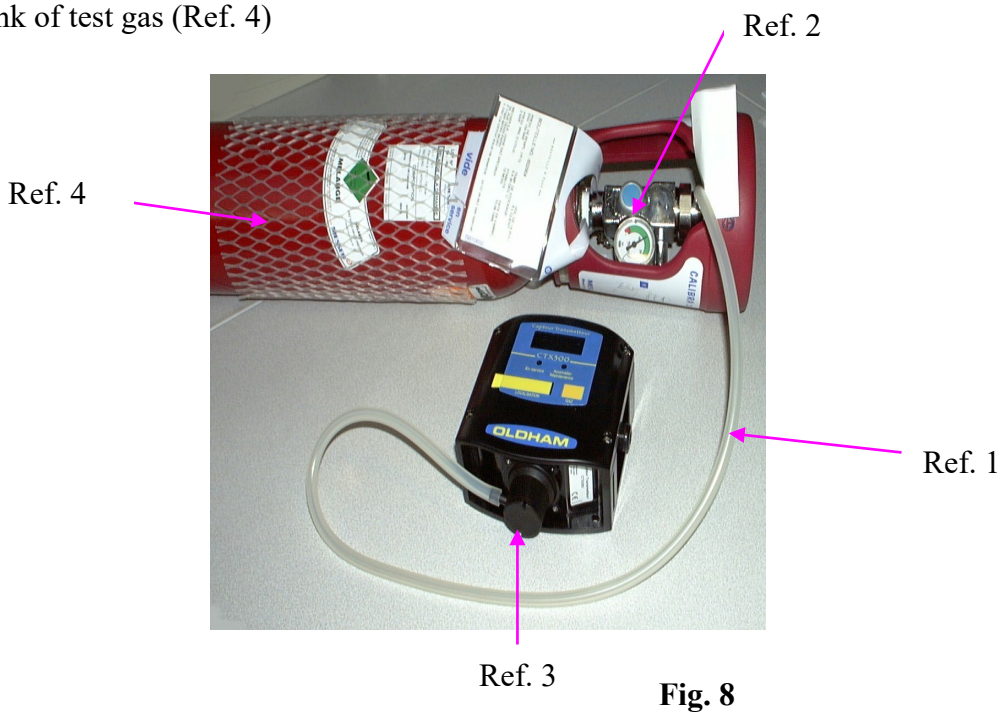


Fig. 8

Zero adjustment should be performed in a gas and vapor free area. If this is not possible, synthetic bottled air can be injected at a rate of 60l/h.

Use a bottle of test gas to adjust sensor sensitivity (concentration close to the alarm threshold or corresponding to 30% of the measurement range at a minimum). The recommended rate is 60l/h.

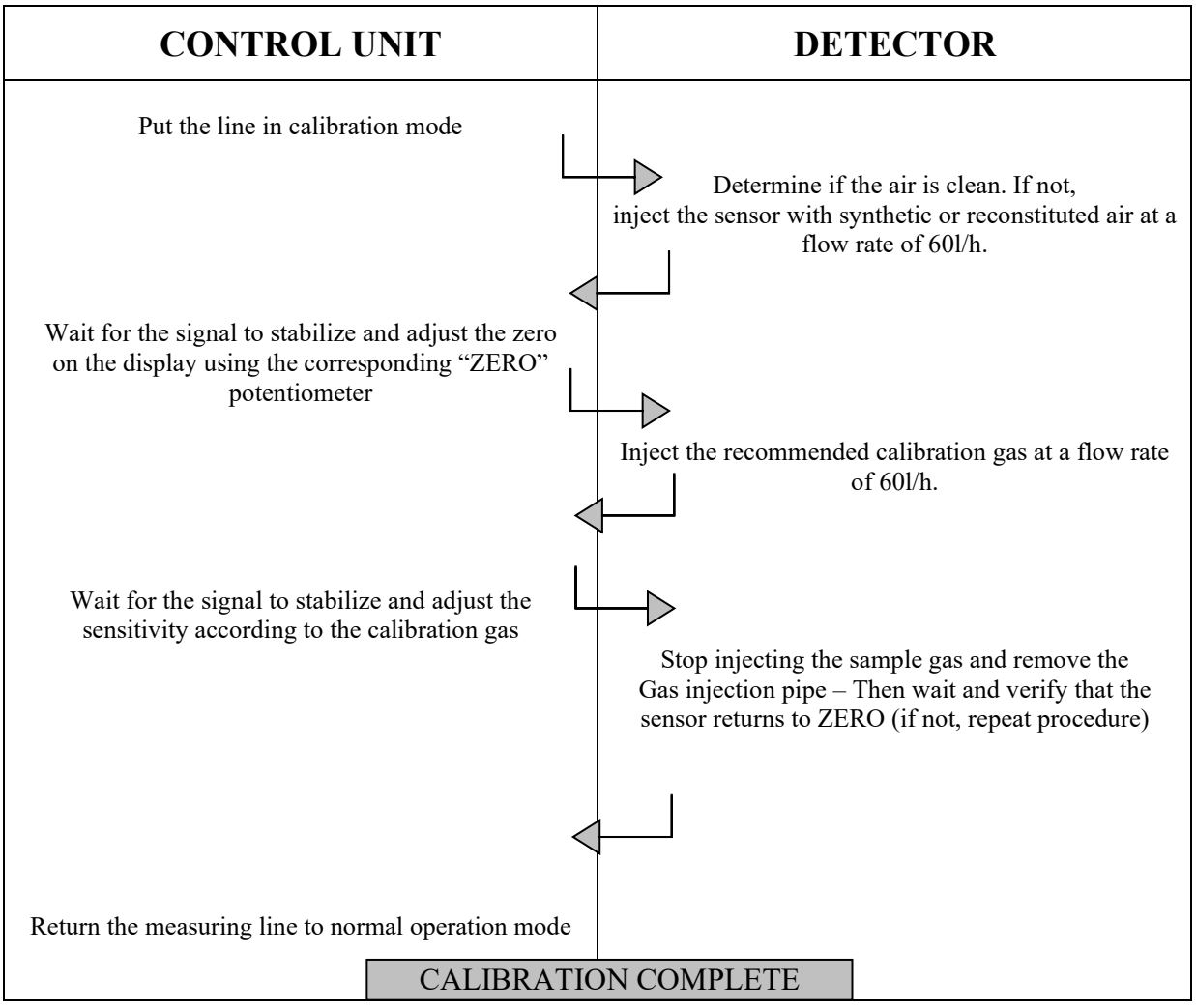
Note: When dealing with dangerous gases, you MUST consult a specialized INDUSTRIAL SCIENTIFIC technician or use another sensor pack recently pre-calibrated at a factory.

Note: The detector should be calibrated using the intended flow-rate. The actual concentration of gas may be underestimated if the detector was calibrated with too high of a flow rate.

IMPORTANT: For CEX 300 sensors, the calibration gas should contain 21% oxygen.

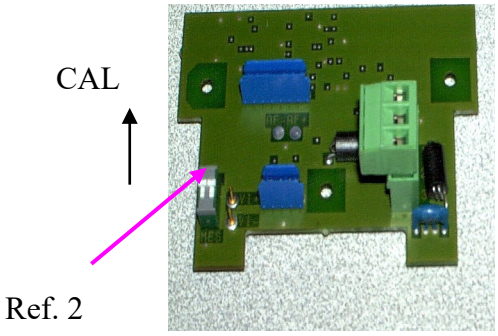
1.2.CEX 300 calibration

PROCEDURE



1.3.CTX 300 calibration

Method 1: CTX 300 with display (excluding O_2, see page 17)



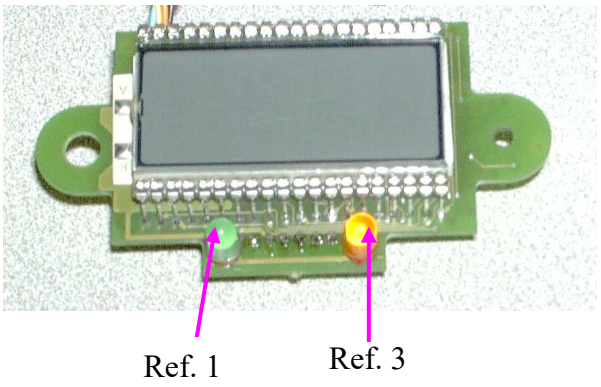


Fig. 9

The sensor is operating: the green light (Ref. 1, Fig. 10) is lit and the display screen shows the measurement level.

↓

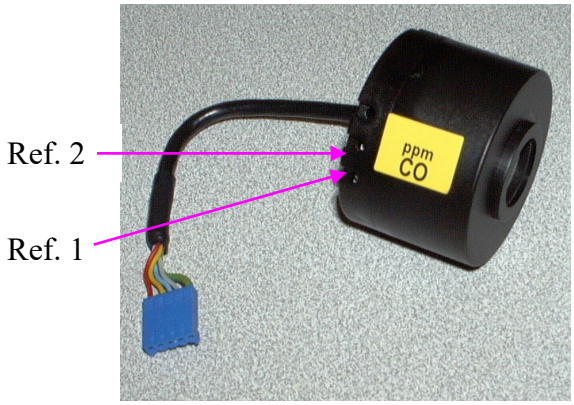
Flip the maintenance switch (Ref. 2, Fig 9) into the "CAL" (calibration) position: the yellow light (Ref. 3, Fig. 10) will be lit and the sensor will send a 2 mA current to the central controller (maintenance mode).

↓

Verify that the sensor is located in a clean-air environment. If not, inject synthetic air at a flow rate of 30 l/h.

↓

Wait for the measurement to stabilize (displayed on screen) and adjust the ZERO by using the ZERO potentiometer located on the sensor pack. (Ref. 1, Fig. 11)



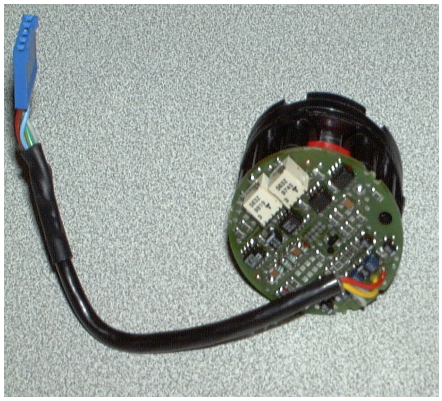


Fig. 11 **Fig. 12**

Inject the recommended calibration gas at a flow rate of 30 l/h.

↓

Wait for the measurement to stabilize and adjust the sensitivity by using the sensitivity potentiometer located on the sensor pack. (Ref. 2, Fig. 11)

Stop injecting the calibration gas. Remove the gas injection pipe, then wait and verify that the signal returns to ZERO (repeat procedure if it does not).

Flip the maintenance switch into the “MES” (measure) position. The yellow light will turn off.

CALIBRATION COMPLETE

Method 2: CTX 300 without display except for O_2 – SC – CO_2

The sensor is operating:

Flip the maintenance switch (Ref. 13, Fig 5) into the “CAL” (calibration) position: the sensor will send a 2 mA current to the central controller (maintenance mode)

Verify that the sensor is located in a clean-air environment. If not, inject synthetic air at a flow rate of 30 l/h (follow the instructions included in the calibration kit)

Connect a voltmeter to the V+ and V- terminals (caliber mV/DC) (Ref. 1, Fig. 13).

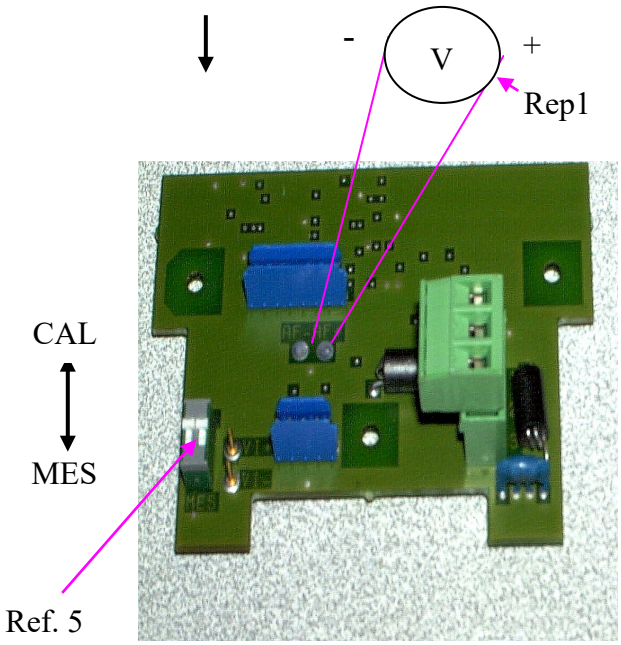


Fig. 13

Wait for the signal to stabilize and adjust the ZERO by using the ZERO potentiometer located on the sensor pack. (Ref. 1, Fig. 14) The output signal should be 0m V

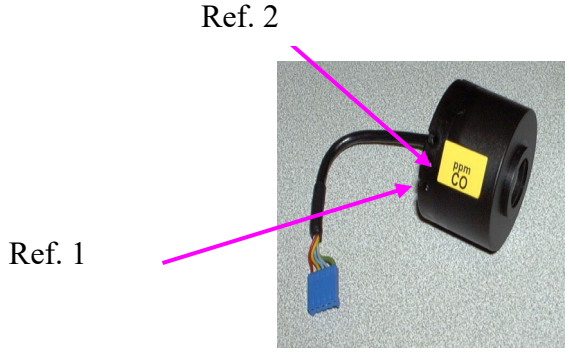


Fig. 14

↓

Now inject the recommended test gas at a flow rate of 30 l/h (use the calibration kit and follow all recommendations)

↓

Wait until the signal has stabilized, read the mV value on the voltmeter (Fig. 13, rep 1), with the full scale at 1600 mV, calculate the value to be read as a function of your test gas. Adjust using the potentiometer (Fig. 14, rep 2).

↓

Example: CO sensor scale 0-300 ppm / test gas injected at a content of 100ppm

↓

Reading
533 mV

↓

Shut off the calibration gas injection and withdraw the gas injection pipe. Then wait and check that the scale has returned to zero (otherwise repeat the procedure).

↓

Switch the maintenance on/off switch to the "MES" (measure) position (rep 5, Fig. 3)

1.4. COX 300 Calibration, "OXYGEN" type

COX 300 "oxygen" with display screen.
See paragraph 1 – 3 (Method 1). Proceed with adjusting sensitivity ONLY by injection of test gas.

COX 300 "oxygen" without display screen or diodes (DEL)
See paragraph 1 – 3.(Method 2). Proceed ONLY with sensitivity adjustment.

Signal value in mV =

- 1600 mV for full scale = 30% O_2
- 1115 mV for 20.9 % O_2
- 0 mV for 0% O_2

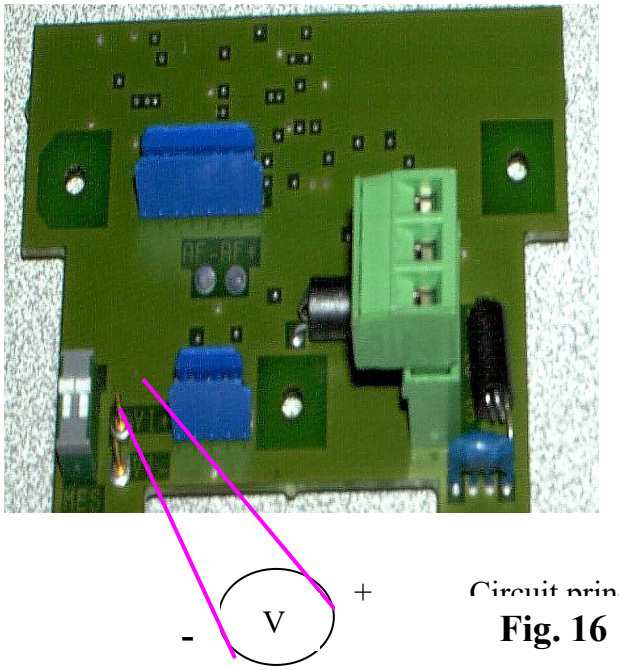


Fig. 16

Notes:
The signal sent from the CTX/COX 300 (toxic or oxygen) sensor to the central controller can be measured on the main circuit by connecting a millivoltmeter to the pins designed for this purpose (Fig. 16).

- 400 mVCC ➔ 4 mA
- 2 VCC ➔ 20 mA

1.5. CSC 300 (semiconductor) calibration

Flip the switch (Ref. 1, Fig. 17) into the "CAL" position.

MES

CAL

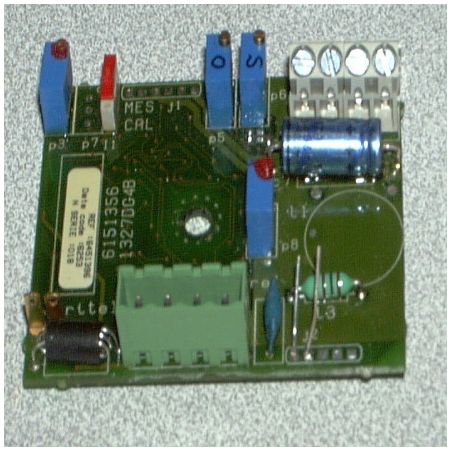
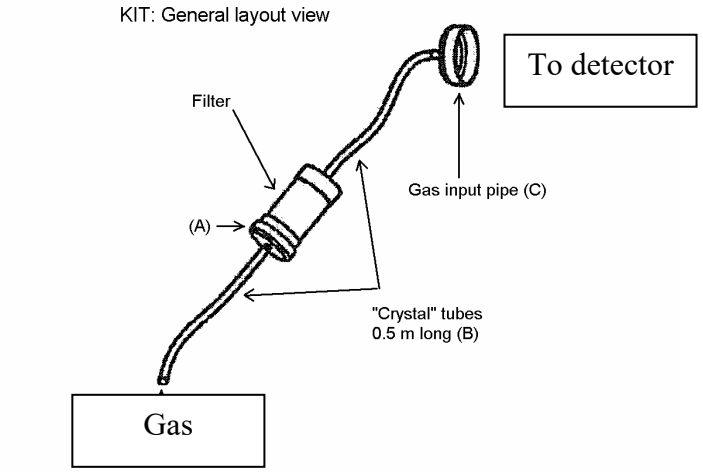


Fig. 17

Circuit du capteur CTX/CSC 300

Ensure that the sensor is in clean air, otherwise inject synthetic air into it using the calibration kit and referring to the recommendations below:

Important: to correctly calibrate a sensor equipped with a semi-conductor cell, use of a humidifier kit is MANDATORY (ref: 6335919) – Fig. 18



USING THE HUMIDIFIER KIT

Lift the lid (Fig. 18 ref. A) and, using a washbottle, moisten the filter, without saturating it, with distilled water.

Replace the lid and check that all parts are properly assembled and that the assembly is fully airtight.

Adjust the flow rate to 60 l/h and wait 10 minutes until the humidifier is fully purged.

Apply the gas introduction pipe to the nose of the sensor and wait at least five minutes for the measurement to stabilize.

Note: the sensor must be powered for at least two hours before any adjustment can be made.

Connect a voltmeter as indicated (Fig. 19 – Ref. 3) and adjust, using potentiometer P5 (Fig. 19, Ref. 1). The output signal must be equal to **880 mV**.

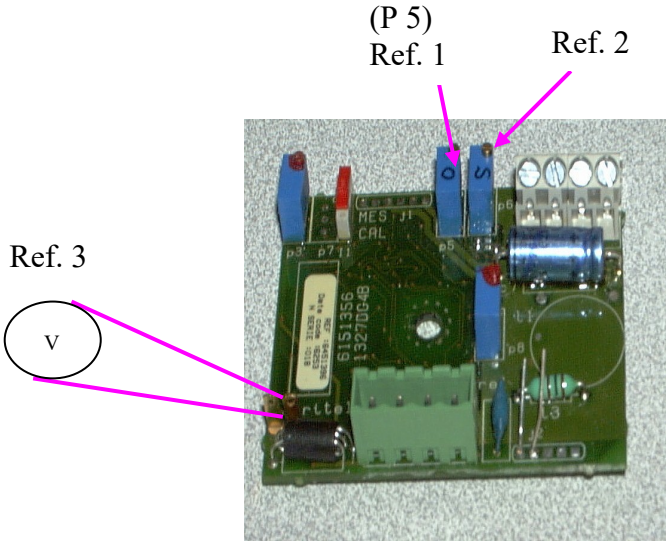


Fig. 19

Next, inject the calibration gas at a flow rate of 30 l/h (See Annex 2).

Wait for the signal to stabilize and adjust the signal with the sensitivity potentiometer (Ref. 2, Fig. 19).

The output signal should be:

$$U = 880\ mV + \frac{3520\ mV}{\text{Sensor measurement range}}$$

EXAMPLE:

Sensor measure (% of full range)	Output signal (mV)
0	880
50	2640
100	4400

Stop injecting the calibration gas and verify that the reading returns to zero (880 mV). If it does not, repeat the procedure.

CALIBRATION COMPLETE

Flip the switch (Ref. 1, Fig. 17) into the "MES" position.

1.6. CTX300 CO_2 calibration

Warning: the sensor should be turned on for 15 minutes before adjustments are made.
The following text describes the steps necessary to adjust the transmitter (first calibration)

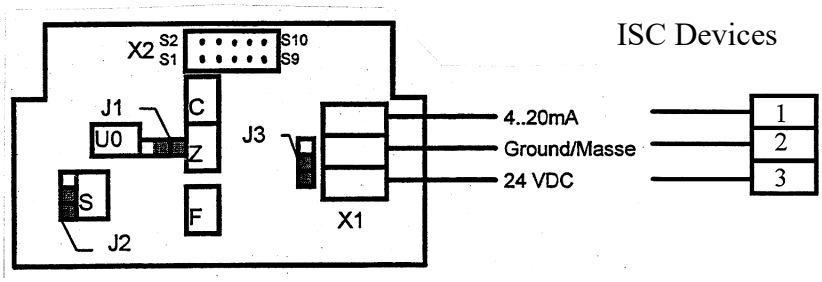


Fig. 20

! ! WARNING! !

Adjustment

If the current loop of the output signal has an impedance of 500 ohms, the power supply should never fall below 23 V DC.

OUTPUT SIGNAL ZERO ADJUSTMENT = 4 mA

Inject nitrogen at a rate of 30 l/h.

On the X1 terminal board, place an ammeter between terminals 1 and 2 (-). With the potentiometer Z, adjust the current to 4 mA.

With the ammeter still connected, inject the test gas at a rate of 60 l/h. Adjust the sensitivity with the potentiometer S (Ref. 1, Fig 21). Refer to the following calibration curves for sensors without linearization cards.

If this fails, flip the J2 jumper and begin again.

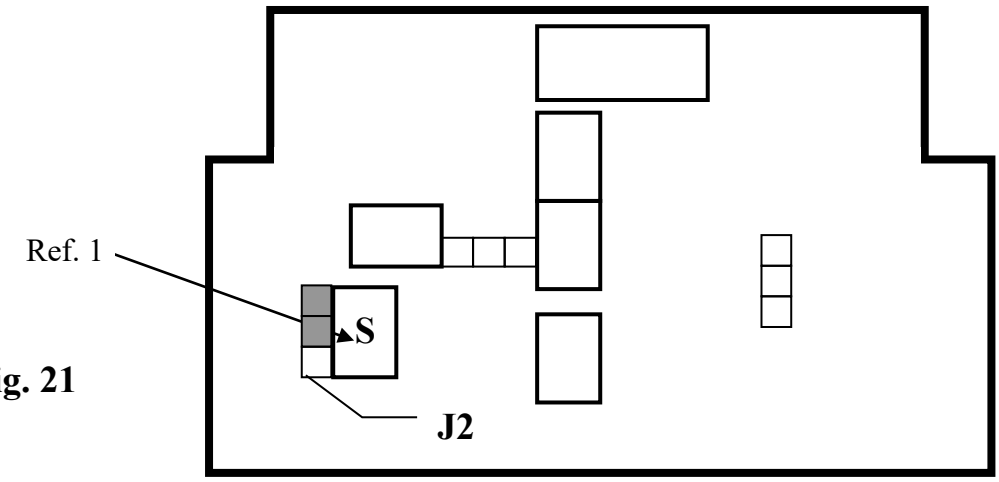
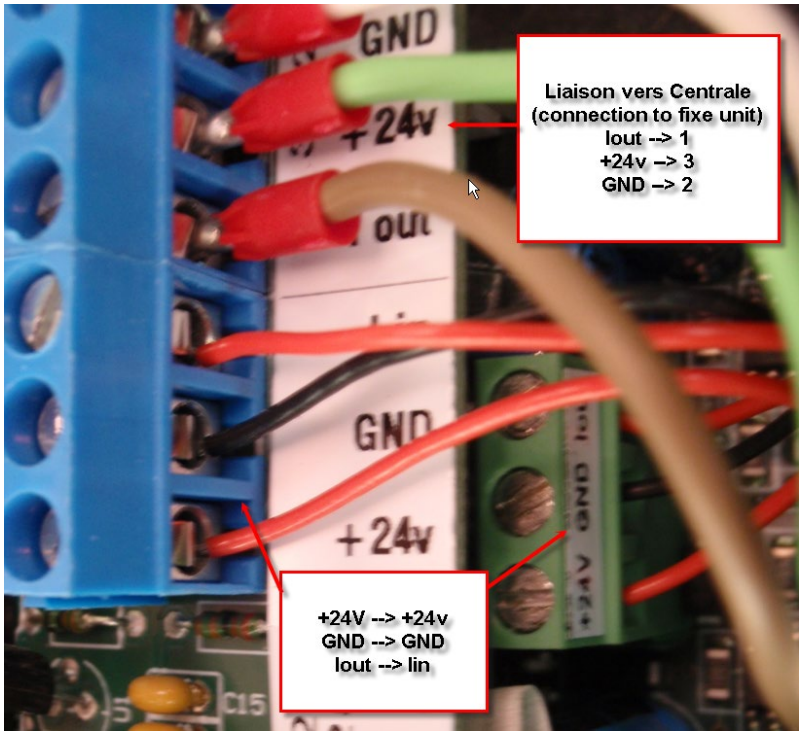


Fig. 21

1.7.CTX300 CO2 Linearization card

If you use a linearization card, the connection is the following :

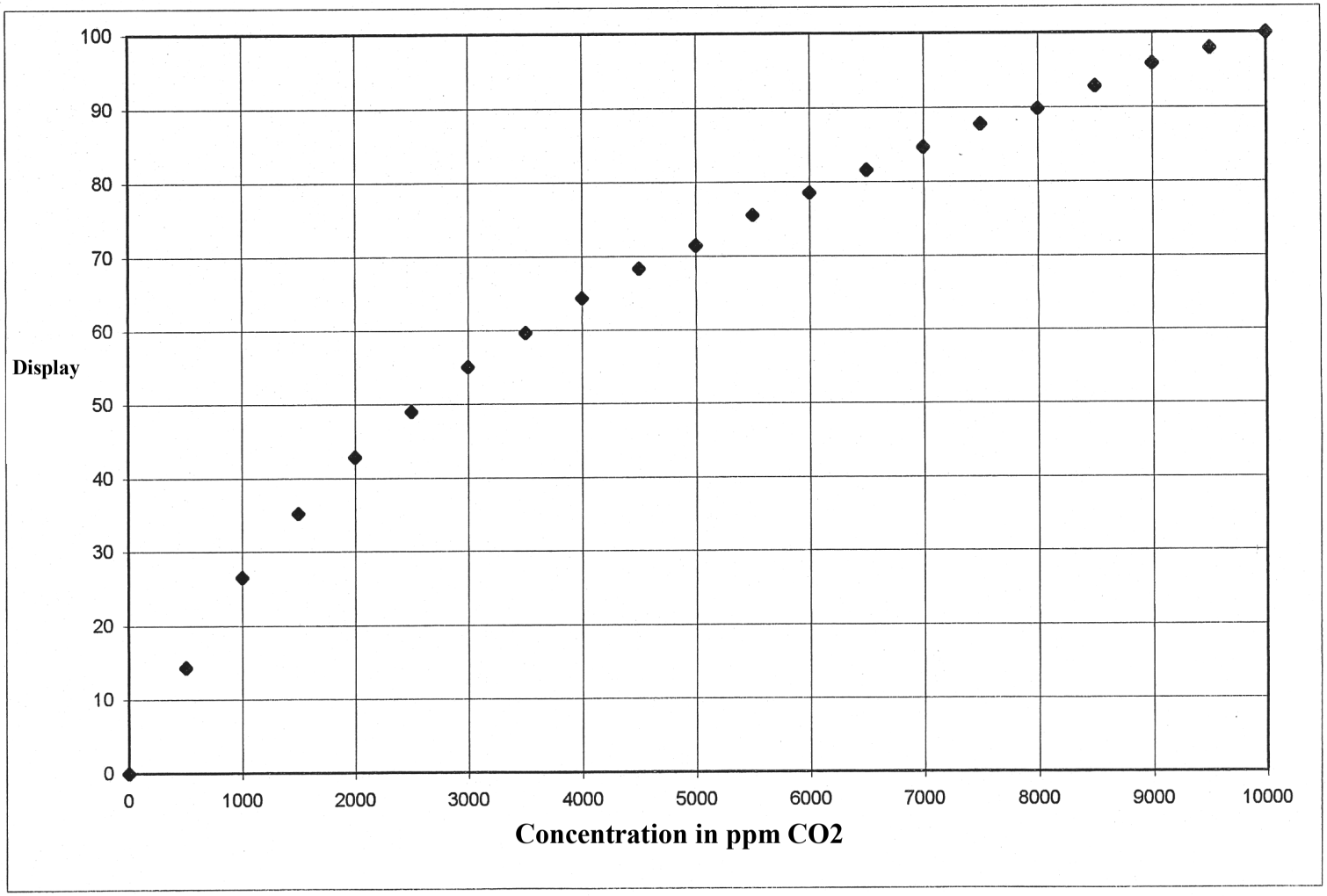


CALIBRATION CURVES

CO2 – IR Transmitter Output Signal

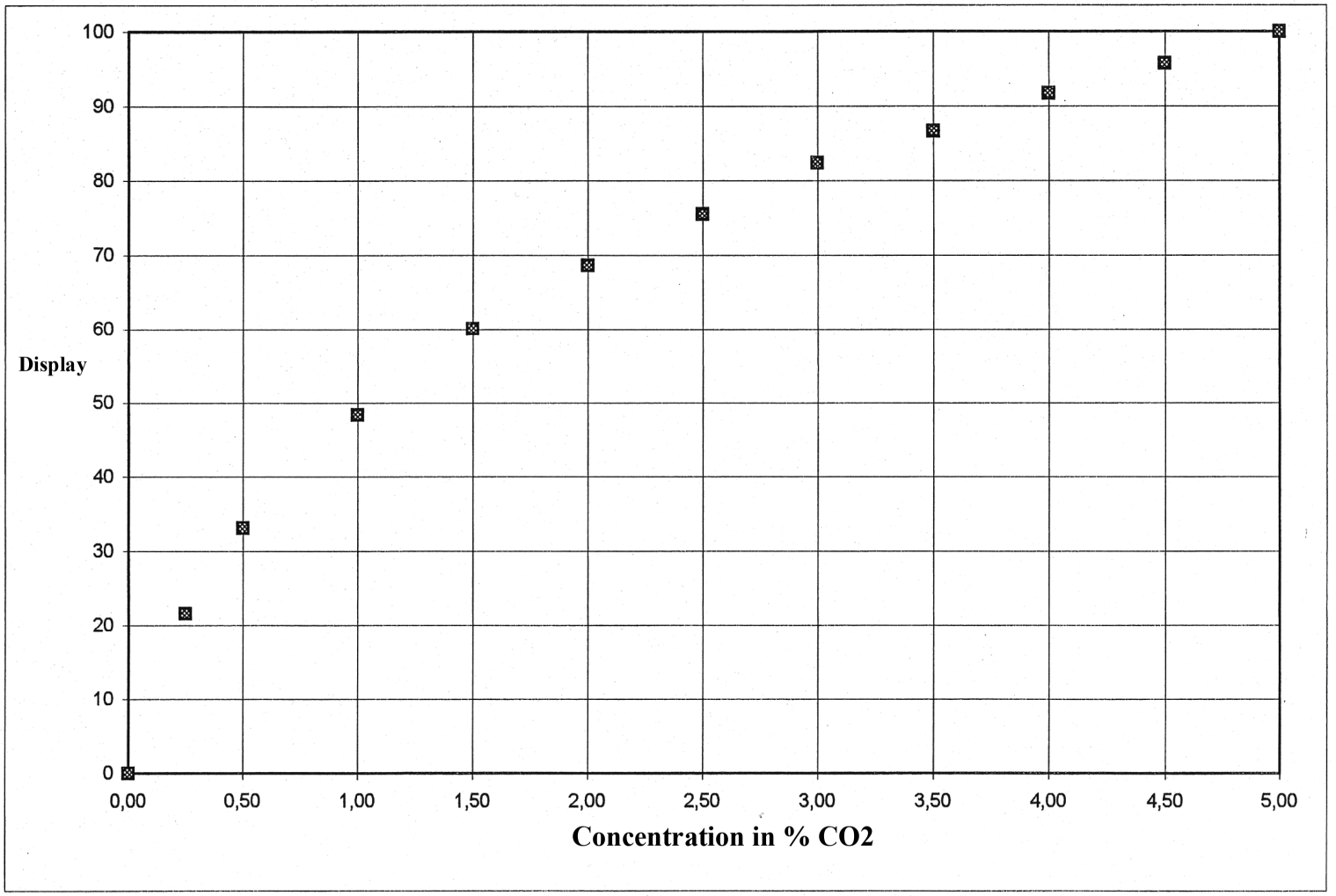
CO2 DETECTOR 0-10000 ppm (1%) measurement range

ppm CO2	DISPLAY
0	0
500	14
1000	27
1500	35
2000	43
2500	49
3000	55
3500	60
4000	64
4500	68
5000	71
5500	76
6000	79
6500	82
7000	85
7500	88
8000	90
8500	93
9000	96
9500	98
10000	100



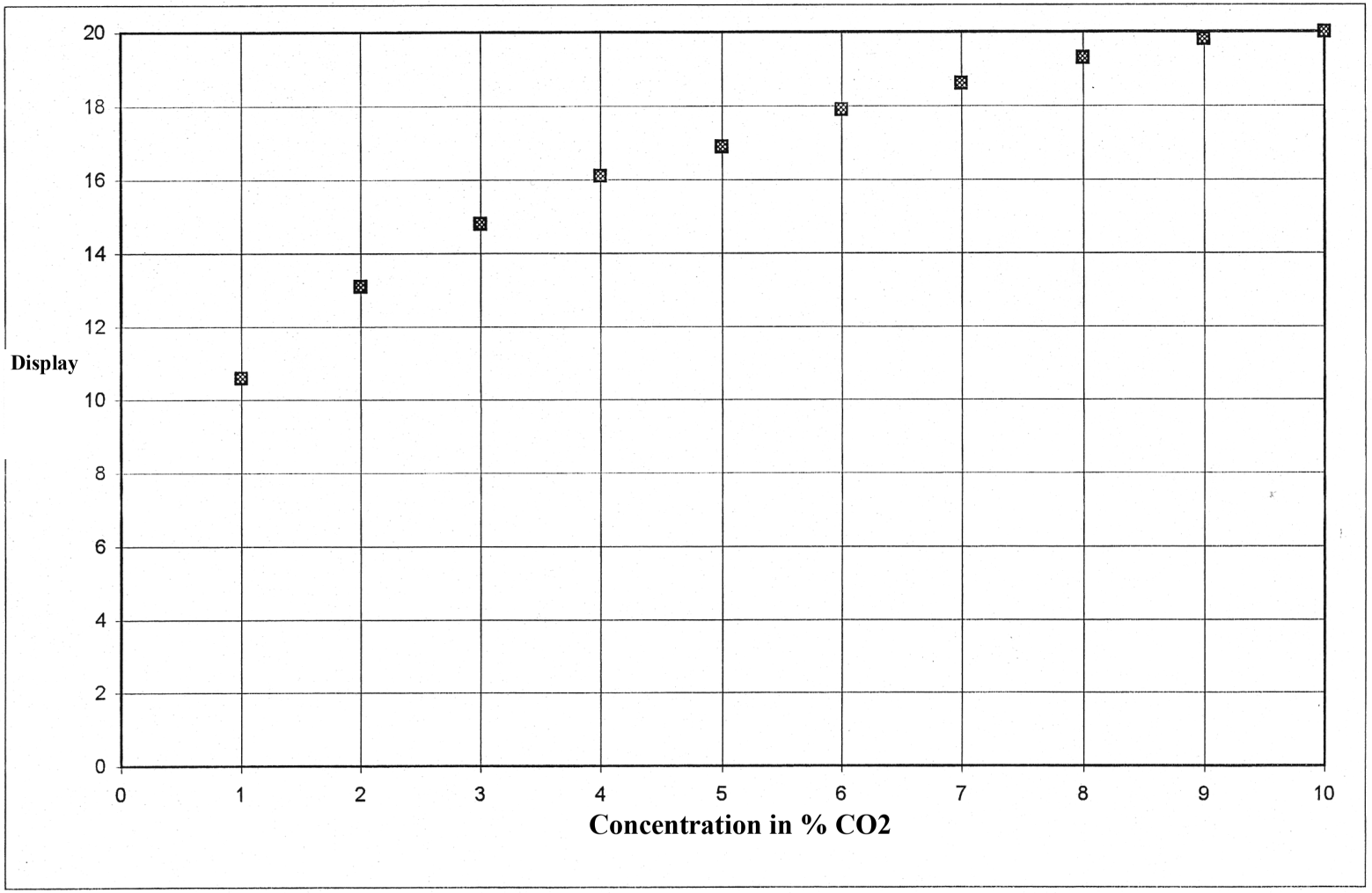
CO2 DETECTOR 0-5% CO2 measurement range

% CO2	DISPLAY
0,00	0,0
0,25	21,6
0,50	33,1
1,00	48,4
1,50	60,1
2,00	68,6
2,50	75,6
3,00	82,4
3,50	86,7
4,00	91,7
4,50	95,8
5,00	100,0



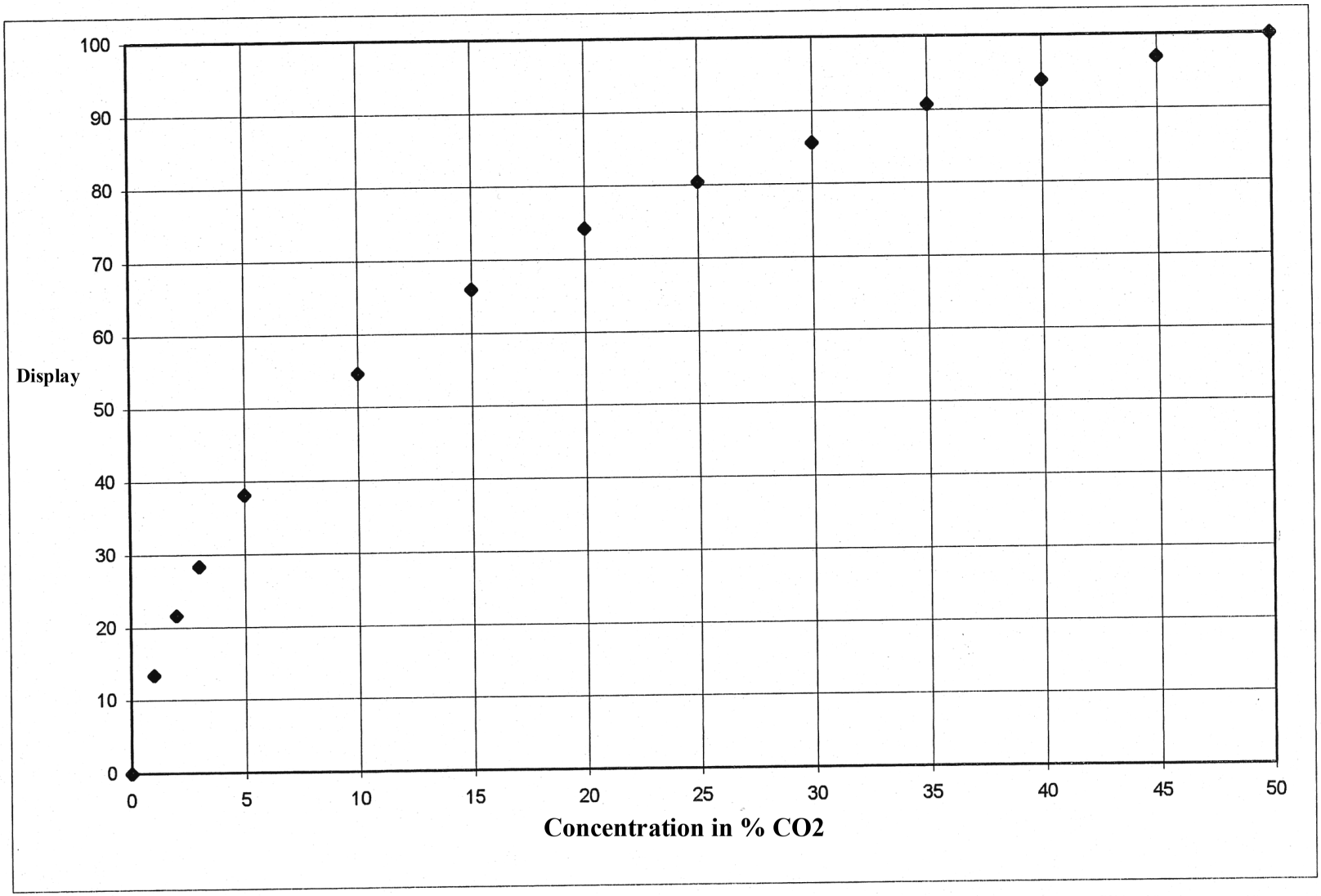
CO2 DETECTOR 0-10% CO2 measurement range

% CO2	DISPLAY
0,00	0
1,00	10,6
2,00	13,100
3,00	14,8
4,00	16,1
5,00	16,9
6,00	17,9
7,00	18,6
8,00	19,3
9,00	19,8
10,00	20,0



CO2 DETECTOR 0-50% CO2 measurement range

% CO2	DISPLAY
0	0,0
1	13,4
2	21,6
3	28,4
5	38,1
10	54,6
15	66,0
20	74,2
25	80,4
30	85,6
35	90,7
40	93,8
45	96,9
50	100,0

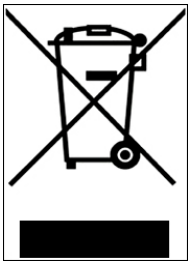


2. Replacing a sensor

Sensors must be replaced:
- when calibration is no longer possible (no sensitivity)
- during preventative maintenance, the replacement sensor should be identical to the original sensor (same gas, same range)

After a sensor has been replaced, a calibration or test (for pre-calibrated sensors) must be conducted.

3. Disposal

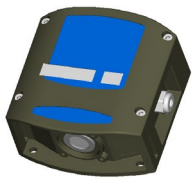


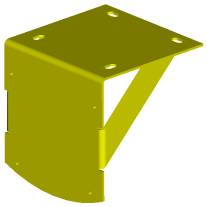
For the preservation, protection and improvement of environmental quality, and for the protection of human health and the prudent and rational utilization of natural resources, the CEX/CTX 300 must be disposed of separately from electronic equipment and cannot be disposed of with normal household waste. The user therefore has an obligation to separate the CEX/CTX 300 sensor from other waste to ensure that it is recycled safely for the environment. For further details on existing collection sites, contact the local administration or seller of the product.

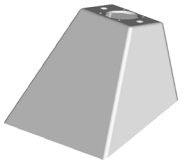
4. Replacement Parts List

4.1. CEX 300-type Combustible Sensor

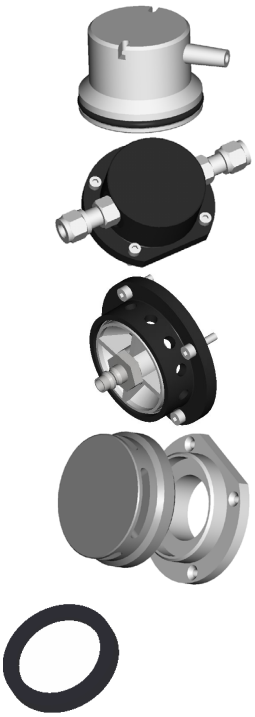
DESCRIPTION	REF
CEX 300 standard: **CEX 300 with cable glands for armored cable**	**WCE30FD** **WCE30FA**
TOOLS **CEX 300 TOOL KIT**	**6147867**
ACCESSORIES **MOUNTING BRACE + bolts** **(CEX 300 ceiling mount)**	**6322420**
GAS COLLECTOR (INOX)	**6323607**



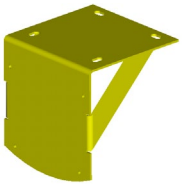
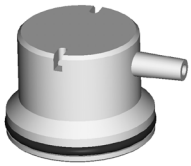
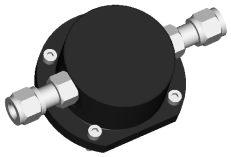




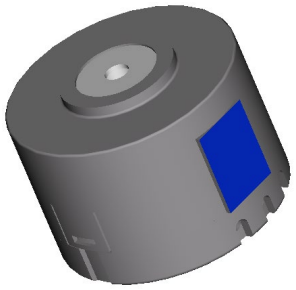
GAS INTRODUCTION DEVICE	**6331141**
GAS FLOW HEAD	**6327905**
DEVICE FOR REMOTE GAS INTRODUCTION	**6327906**
ANTI-PROJECTION DEVICE	**6331166**
REPLACEMENT FILTERS PTFE PROTECTOR FILTER ACTIVE CHARCOAL PROTECTOR FILTER	 **6335953** **6335954**
REPLACEMENT SENSORS **Standard explosimetric sensor**	 **6313662**
REPLACEMENT PARTS **Metallic cable glands (6-11 mm)** **Double compression cable gland for armored cable** **Self-adhesive front panel** **Sticker labels**	 **6143442** **6143395** **6815918** **6815923**



4.2 CTX/COX 300 Toxic or Oxygen Sensor

DESCRIPTION	OFSA REF	
TOOLS **CTX 300 TOOL KIT**	**6147868**	
ACCESSORIES **MOUNTING BRACE + bolts (CTX 300 ceiling mount)**	**6322420**	
GAS COLLECTOR (INOX)	**6323607**	
GAS INTRODUCTION DEVICE FOR O_2, CO, H_2S, NO, H_2 **FOR COMBUSTIBLE AND OTHER TOXIC GASES**	**6331137** **6331141**	
GAS FLOW HEAD	**6327905**	
Device for remote gas introduction	**6327906**	
REPLACEMENT FILTERS **PTFE PROTECTOR FILTER**	**6335953**	
PRE-CALIBRATED O2 SENSOR PACK **CTX 300 O2 0-30% vol SENSOR PACK** **CTX 300 O2 0-100% vol SENSOR PACK**	**6313754** **6313660**	

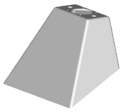
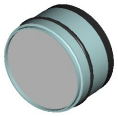
PRE-CALIBRATED TOX SENSOR PACK		
CTX 300 SENSOR PACK	100 ppm	6313627
	CO – 300 ppm	6313628
	CO – 1,000 ppm	6313629
	CO – 1% vol	6313631
	CO – 10% vol	6313632
CTX 300 SENSOR PACK	H_2S - 30 ppm	6313633
	H_2S – 100 ppm	6313634
	H_2S – 1,000 ppm	6313635
CTX 300 SENSOR PACK	NO -100 ppm	6313636
	NO – 300 ppm	6313637
	NO – 1,000 ppm	6313638
CTX 300 SENSOR PACK	NO_2 -10 ppm	6313639
	NO_2 – 30 ppm	6313640
CTX 300 SENSOR PACK	ETO - 30 ppm	6313645
CTX 300 SENSOR PACK	SO_2 -10 ppm	6313646
	SO_2 – 30 ppm	6313647
	SO_2 – 100 ppm	6313648
CTX 300 SENSOR PACK	CL_2 -10 ppm	6313649
CTX 300 SENSOR PACK	H_2- 2000 ppm	6313650
	H_2 - 2% vol	6313651
CTX 300 SENSOR PACK	HCL - 30 ppm	6313652
	HCL – 100 ppm	6313653
CTX 300 SENSOR PACK	HCN - 10 ppm	6313654
	HCN – 30 ppm	6313655
CTX 300 SENSOR PACK	NH_3 -100 ppm	6313656
	NH_3 – 1000 ppm	6313657
	NH_3 0 to 5,000 ppm	6313893
CTX 300 SENSOR PACK	HF – 10 ppm	6313675
CTX 300 SENSOR PACK	03-1 ppm	6313676
CTX 300 SENSOR PACK	PH_3-1 ppm	6313677
CTX 300 SENSOR PACK	CLO_2 - 3 ppm	6313678



MISC. REPLACEMENT PARTS	
Cover without display	6323608
Cover with display	6323609
CTX 300 without display label	6815919
CTX 300 with display label	6815921
Display card	6451466
Sticker labels	6815923
Motherboard	6451465

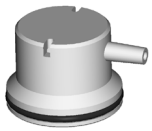
4.3 CSC300 Semiconductor Sensor

DESCRIPTION	OFSA REF
TOOLS	
CSC 300 TOOL KIT	6147868
ACCESSORIES	
MOUNTING BRACE + bolts (CSC 300 ceiling mount)	6322420
GAS COLLECTOR (INOX)	6323607
Calibration KIT (humidifier filter + pipe)	6335919
HUMIDIFIER FILTER	6335918
AVAILABLE SENSORS	
CSC50 FG 318 SENSOR	WC30CLM
SENSOR	WC3050L
SENSOR	WC30F22
SENSOR	WC30F13
SENSOR	WC30C0V
REPLACEMENT PARTS	
MOTHERBOARD	6451396
PG9 CABLE GLAND	6143428

4.4 CTX300 CO2 Sensor

DESCRIPTION	OFSA REF
TOOLS	
CTX 300 TOOL KIT	6147868
MOTHERBOARD	6451618
GAS INTRODUCTION DEVICE	6799188
REPLACEMENT SENSOR	
CO_2 SENSOR 0-1%	6451612
CO_2 SENSOR 0-5% or 0-10%	6451611
CO_2 SENSOR 0-50%	6451610
REPLACEMENT PARTS	
STICKER LABELS	6815923
SELF-ADHESIVE FRONT PANEL	6815919
PG9 CABLE GLAND	6143429
LINEARIZATION CARD	6351233



V. Particular Specifications for use in Explosive Atmospheres in Accordance with the European ATEX 94/9/CE Directive.

The CEX 300 detector meets all requirements of the European ATEX 94/9/EC Directive pertaining to explosive atmospheres.

With performance test tested by INERIS (*the French National Institute for Industrial Environment and Risks*), the CEX 300 is designed to measure explosive gases and is categorized as a security device and is used to limit the risks of explosion.

Information in following paragraphs must be taken into account and followed by the person responsible for the equipment installation site. Refer to the provisions of European ATEX Directive 99/9/EC, concerning the improvement of safety protection and the health of workers exposed to the risks of explosive atmospheres.

1. Specifications for mechanical and electrical installations in Explosive Zones.

All installations must be in compliance with currently enforced standards, notably standards EN 60079-14, EN 60079-17, and EN 50281-1-2.

- This equipment is intended for surface industries in Group II, Category 2, Zone 1 and 2 (Gas) and for Zone 21 or 22 (Dust) for ambient temperatures between -20°C to 60°C for a T6 temperature class and between -20°C to 70°C for a T5 temperature class.
- The cables will be mechanically protected.
- The transmitter body will be grounded with an external or internal terminal, both being protected against corrosion. The operator should regularly clean the equipment to prevent the build-up of dust on equipment surfaces.
- Detectors will be mechanically installed in such a way that the sensor will be oriented on the underside of the detector. Tilting the detector at an angle of 45° or more past vertical can cause measurement errors.
- Power supply: voltage at sensor terminals = 2.8 V max., Max. power = 0.8 Watts
- Consumption: 400 mA max.

2. Performance Specifications for the CEX 300 Explosive Gas Detector

The CEX 300 sensor is classified as a safety device and can help to mitigate the risks of explosion.

The detector conforms to the following European standards:

- European standards EN 50054 and EN 50057 for Methane gas (test gas), Propane and Hydrogen (gas following response curves), when used with INDUSTRIAL SCIENTIFIC central detection controllers types SV4B, MX 15, MX 32, MX 42A, MX 48, and MX 52.
- Explosive gas detectors are conform with the European standard EN50402. These detectors have SIL-capability level 1 with a calibration period of six months and SIL-capability level 2 with a calibration period of three months.

2.1. Technical Specifications and Particular Instructions for the CEX300 Explosive Gas Detector

2.1.1. Metrological Specifications

Sensor type			C1000		
Max. concentration			100% LEL		
System			Catalytic		
Life expectancy			> 36 months		
Storage			Keep away from extreme temperatures (-10°C < T < 35°C) (10% < Relative Humidity < 60%) 6 months max.		
Temperature range			-25°C to 55°C		
Humidity range			0% RH to 95% RH		
Pressure range			1 bar ± 10 %		
Linear variation (methane scale)			Between 0 and 70% LEL: ≤ 1% LEL Between 70 and 100% LEL: ≤ 7 % LEL		
Measurement reproducibility			± 2 % of the measured value ± 1 LEL (or ± 0.05 % CH_4)		
Long-term drift under normal operating conditions	Zero point: Sensitivity Methane Propane/Butane		< 5% LEL methane / year Standard drifts < 20% of the measured value / year < 10% of the measured value / year		
Humidity effect (10 to 90% RH) at 40°C			± 5% of relative sensitivity		
Max. recommended interval between calibrations (under normal operating conditions)			6 months		
Calibration content			30-80% of the LEL		
Response time (can vary ± 10% from one sensor to another)	**Gas and injected quantity**	Methane (50 % LEL)	Hydrogen (50 % LEL)	Pentane (52% LEL)	Styrene (45% LEL)
	t25	4 s	3 s	8 s	12 s
	t50	8 s	6 s	12 s	40 s
	t90	15 s	10 s	27 s	60 s

Detectors CTX 300 SC are compliant with the standard EN14624 which defines tests and methodology in order to specify performance of portable and fixed detectors.

Measuring range	**2000 ppm pour R134A ou R22**
Maximum sensitivity threshold	**5000 ppm during 90s without sensitivity loss**
Recommended Alarm Threshold	**200 ppm**
Minimum sensitivity threshold	**10 ppm**
Minimum time to detect the lowest concentration	**less than 25s after injection of 500 ppm R134A**
Recovery time	**less than 160s after injection of 8 min of 1000 ppm R134A**

2.1.2 Particular Precautions for Combustible Gas Detectors

- The sensors may be desensitized if exposed to certain poisons: silicate vapors at concentrations > 10 ppm, chlorinated or sulfated products at concentrations > 100 ppm
- A lack of oxygen (<15% O_2) or an excess of oxygen (>23% O_2) can respectively cause an under estimation or an over estimation of the actual gas measurement.
- Sensors must be placed upside down during installation.

2.1.3 Response to other explosive gases

The detector should be calibrated with the gas to be measured. If a user wishes to calibrate the detector with a different gas than the gas it was programmed for at the factory, refer to the table below, using the recommended gas and the corresponding coefficient.

Table 1: COEFFICIENTS FOR CALIBRATION

Gas	Molecular Structure	LEL	LSE	Vapor Density	Coefficient	Coefficient	Coefficient
Acetone	C_3H_6O	2.15%	13.0%	2.1	1.65	1.2	0.95
Acetylene	C_2H_2	1.5%	100%	0.9	2.35	1.75	1.35
Ammonia	NH_3	15.0%	30.2%	0.6	0.9	0.65	0.5
Butane	C_4H_{10}	1.5%	8.5%	2	1.75	1.25	1.0
Ethane	C_2H_6	3.0%	15.5%	1.04	1.5	1.1	0.85
Ethanol	C_2H_6O	3.3%	19.0%	1.6	1.5	1.1	0.85
Ethylene	C_2H_4	2.7%	34.0%	0.98	1.65	1.2	0.95
Hexane	C_6H_{14}	1.2%	7.4%	3.0	**2.1**	**1.7**	**1.2**
Hydrogen	H_2	4.0%	75.6%	0.069	1.25	1.0	0.8
L.P.G.	Prop+But	1.65%	~9.0%	1.85	1.65	1.2	0.95
Methane	CH_4	5.0%	15.0%	0.55	1.0	0.75	0.55
Natural Gas	CH_4	5.0%	15.0%	0.55	1.0	0.75	0.55
Octane	C_8H_{18}	1.0%	6.0%	3.9	2.7	2.0	1.5
Pentane	C_5H_{12}	1.4%	8.0%	2.5	2.1	1.7	1.2
Propane	C_3H_8	2.0%	9.5	1.6	1.5	1.1	0.85
Toluene	C_7H_8	1.2%	7%	3.14	4.0	2.95	2.3
Unleaded gas 95	/	1.1%	~6.0%	3 to 4	1.8	1.35	1.05

Recommended gas for calibrating the sensor

Example (first line of the table): calibrate an “Acetone” detector with a 1% volume butane test gas

Value to display: $\frac{1\% \text{ (injected butane)}}{1.5\% \text{ (LEL butane)}} \times 100 \times 0.95 \text{ (butane/acetone coefficient)} = 63\% \text{ LEL}$

Note:

- LELs vary according to the source. The LEL values reported here come from European standard EN 50054
- Coefficients are accurate to ± 15%

3 Markings:

OLDHAM
CE 0080
CEX 300
Ex II 2GD
IP66
U max.: 2.8V I max.: 0.4 A P max = 0.8 W
For Ambient T = 60°C EEx e d IIC T6 (85°C)
INERIS 01ATEX0006X
WARNING ELECTROSTATIC CHARGE
CLEAN OR WIPE ONLY WITH A DAMP CLOTH

The serial number is located on the sump case

VI CERTIFICATIONS

MANUFACTURER DECLARATION OF CONFORMITY

INDUSTRIAL SCIENTIFIC

The Company **Industrial Scientific Oldham**, ZI Est 62000 Arras France, declares that the following new material intended for use in Explosive Atmospheres, complies with the requirements of the European Directives:

Gas Detector CEX300

I) European Directive ATEX 94/9/CE of 23/03/94: Explosive Atmospheres

N° of EC type examination certificate:	**INERIS 01ATEX0006X**
N° of the Production Quality Assurance Notification of the Arras factory:	INERIS 00ATEXQ403
Issued by the Notified Body n°0080:	INERIS, 60550 Verneuil, France.

Rules of construction: **EN50014, EN50018, EN50019, EN50281-1-1**

Ex II 2 GD / EEx e d IIC T6 (T85°C)Tamb +60°C IP66

Note: the equipment is not impacted by the substantial modifications of the applicable harmonized standards series EN 60079-0, -1 and -7

Performance Standards: **EN 50054, EN 50057**
(reference gas methane – standard sensor C1000)

- CEX300, when connected to control unit MX15: system of category Ex II 3 G
- CEX300, when connected to control units MX32, MX42A, MX48, MX52: system of category Ex II 2 G

Functional Safety Standard: **EN 50402**

- CEX300 presents an architecture in conformity with the standard according to following levels:
  - Level SIL Capability 1, with a period of maintenance no more than 6 months.
  - Level SIL Capability 2, with a period of maintenance no more than 3 months.

II) The European Directive EMC 89/336/CEE of 3/05/89: Electromagnetic compatibility

European Standard: **EN 50270**

Functional Safety: Reliability Data

The reliability analysis, based on INERIS report n° CGR 74448 of 06 July 2006 has determined:

Annual failure rate of detectors CEX300 for combustible gas: λ_{du} **annual** = **4.42 10** $^{-2}$

Note: The calculated failure rate is only valid on the real lifetime of the sensitive elements (limited time, about 3 to 5 years). Beyond that, due to ageing of the measuring cells, the rate is not significant any more. The Standard EN50402 assumes for the simple modules like detector CEX300, an effective Safety Failure Fraction (SFF) between 60% and 90%.

CE/ATEX126 Eng c

Arras, 20/10/09 **ATEX Authorized Representative**

Lionel Witrant

Engineering Director

AFAQ ISO 9001 VERSION 2000

Industrial Scientific Oldham
Z.I. EST - B.P. 20417
62027 ARRAS Cedex – FRANCE
Tel +33 3 21 60 80 80
Fax +33 3 21 60 80 00

INDUSTRIAL SCIENTIFIC

DECLARATION DE CONFORMITE CONSTRUCTEUR
Manufacturer Declaration of Conformity

CE

La **Société Industrial Scientific Oldham,** ZI Est 62000 Arras France, atteste que les matériels neufs désignés ci-après:

*(The **Company Industrial Scientific Oldham**,* ZI Est 62000 Arras France, *declares that the following new material:)*

.

Détecteurs de gaz *(Gas detectors)* type

COX300 - CSC300 - CTX300 – CTX300 IR

sont conformes aux exigences de la

Directive Européenne CEM 89/336/CEE du 3/05/89 : Compatibilité Electromagnétique
The European Directive EMC 89/336/CEE of 3/05/89: ELECTROMAGNETIC COMPATIBILITY

Normes harmonisées appliquées : EN 50270
(Harmonised applied Standards)

CE/CM104 ind b

Arras, le 23/11/07

Lionel Witrant

Directeur Technique
Engineering Director

AFAQ ISO 9001 VERSION 2000

Industrial Scientific Oldham
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Fax +33 3 21 60 80 00

INDUSTRIAL SCIENTIFIC

DECLARATION DE CONFORMITE CONSTRUCTEUR

CE

La **Société Industrial Scientific Oldham SAS**, ZI Est, 62000 Arras France, atteste que les matériels neufs destinés à la détection de fluides frigorigènes halogénés désignés ci-après,

Détecteurs OLCT10 & CTX300

sont conformes aux normes Française et Européenne NF EN 14624 :

Performances des détecteurs de fuite mobiles et des contrôleurs d'ambiance de fluide frigorigènes halogénés.

Données techniques

Catégorie d'équipement :	Contrôleurs d'ambiance non sélectifs
Gamme de mesure :	0-2000 ppm R134A
Seuil de sensibilité minimal :	10 ppm R134A
Seuil de sensibilité maximal :	5000 ppm R134A pendant 90s sans perte de sensibilité
Seuil d'alarme minimal :	200 ppm R134A
Temps minimal de détection de la concentration la plus faible :	inférieur à 25s suite injection de 500 ppm R134A
Temps de remise à zéro :	inférieur à 160s suite injection pendant 8 mn de 1000 ppm R134A

Note 1 : pour plus de renseignements sur le mode d'installation, le mode opératoire et les précautions d'emploi, se reporter à la notice d'utilisation du Constructeur.

Note 2 : pour les obligations réglementaires, se référer au Décret du 7 mai 2007 relatif au contrôle d'étanchéité des éléments assurant le confinement des fluides frigorigènes utilisés dans les équipements frigorifiques et climatiques.

Arras, le 19/03/09

Michel Spellemaeker

Responsable Produits Fixes
Fixed Products Director

AFAQ ISO 9001 VERSION 2000

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ANNEXES

ANNEX 1: GENERAL WIRING SPECIFICATIONS

ANNEX 2: INSTRUCTIONS FOR CALIBRTING THE CTX 300 SEMICONDUCTOR

ANNEX 3: VIEW OF THE CTX 300

ANNEX 1

WIRING SPECIFICATION

SUBJECT

This specification defines the general principles that apply to the design and manufacture of grounding devices for INDUSTRIAL SCIENTIFIC instrumentation.

REFERENCE DOCUMENTS

The electrical installation shall comply with French regulations in force, with all European directives, all AFNOR standards and codes in force, insofar as they apply, as well as the client's general and particular specifications.

- NFC 15-100 Requirements for Low Voltage electrical installations
- NFC 17-100 Protection against lightning – Installation of lightning rods
- EMC Electromagnetic compatibility - Directive 89/336/EEC

APPLICABLE REGULATIONS

- Decree No. 88-10546 of 11/14/88 (worker protection)
- Edict of 12/19/88 (conditions for equipment installation in places presenting a risk of explosion)
- Decree No. 78-779 of 07/17/78 modified by Decree No. 81-440 of 05/05/81 amended on 07/01/91
- Edict of 04/06/81 and 09/07/82
- Edict of 03/31/80 (regulations for electrical installations in facilities regulated as part of the legislation on classed installations likely to present a potential risk of explosion.)

GENERAL DESIGN

See all attachments, as well as the particular specifications below

Raceways:

Metal raceways are grounded using "Force" metal masses; cross-sectional area of the grounded network is 10 mm^2.

Junction boxes:

If polyester junction boxes are used, they must be equipped with:

- a tapped metal plate so as to interconnect the mass of the metal cable glands;

- an external ground connection of 4 mm^2.

The connection to the metal masses grounding network is made with a bare galvanized steel conductor.

The loop resistance for the central controller/sensor cable connection will vary according to the type of sensor and type of central controller being used.

Refer to the technical manuals appropriate for your use.

ACCEPTABLE CABLE TYPES SUBJECT TO
ADHERENCE TO THE RECOMMENDATIONS OF THIS SPECIFICATI

Examples (yellow/green not included)

Non-exhaustive list.

Non-ATEX Zone	CNOMO FRN05 VC4V5-F
ATEX Zone	GEUELYON (U 1000RHC1)
ATEX Zone	GVCSTV RH (U 1000)
ATEX Zone	xx-xx-09/15- EG-SF (U 300 compatible M87202) EG-FA EG-PF
Non-ATEX Zone	LYCY

* THE CABLES LISTED BELOW WERE NOT INCLUDED IN THE ELECTROMAGNETIC COMPATABILITY TESTS FOR OUR PRODUCTS.
USE AT YOUR OWN RISK.

U1000 R2V(FV)*

U1000 RGPFV- RH*

A/H07 RN-F*

FRN07 RN-F*

GVS-RH*

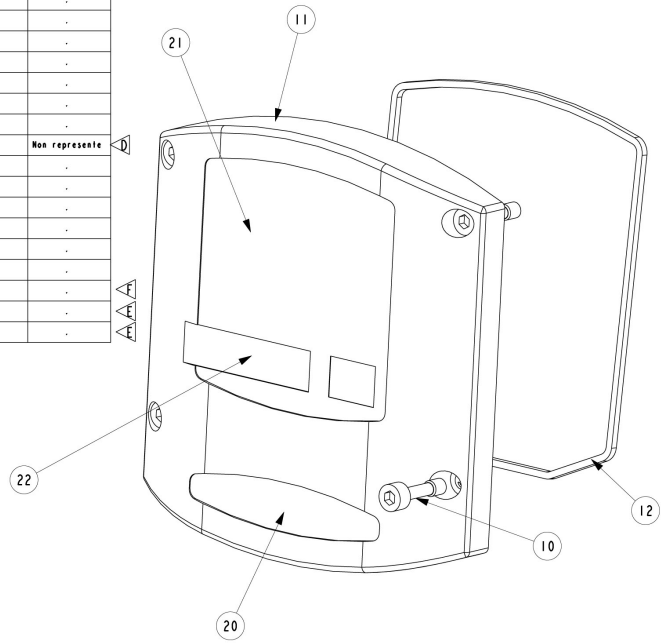
ANNEX 2

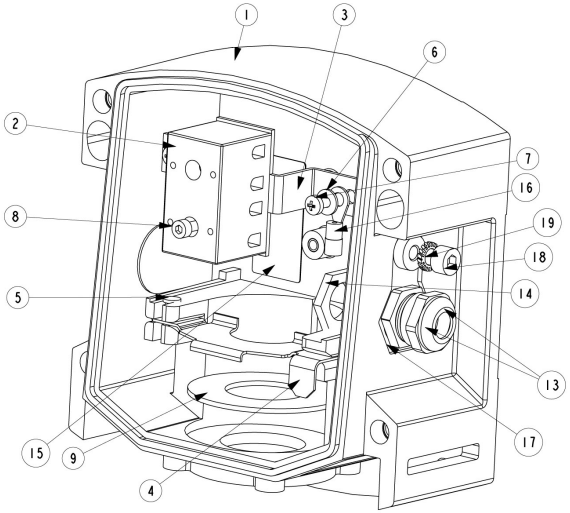
CTX 300 SEMI CONDUCTEUR

Sensor type and reference number	Gas types	Measurement Ranges	SAV test gas	Control gas
6313545	Methane CH_4 Hydrogen H_2 Butane C_4H_{10} Propane C_3H_8 Methyl Chloride CH_3Cl Chlorure de méthylène CH_2Cl_2	100% LEL 100% LEL 100% LEL 100% LEL 500 ppm 500 ppm	20% LEL – 1 % CH_4 20% LEL – 0.8 %H_2 20% LEL – 0.37 %C_4H_{10} 20 % LIE – 0.4 %C_3H_8 50 ppm LEL CH_3Cl	2,000 ppm H_2=190ppm+-25ppm 100 ppm CO=80ppm-+15ppm
6313546	Trichloroethylene C_2HCl_3 Toluene $C_6H_5CH_3$ Xylene C_6H_4 $(CH_3)2$ Ethanol C_2H_5OH	500 ppm 2,000 ppm 2,000 ppm 5,000 ppm	75 ppm Trichloroethylene 100 ppm Toluene 100 ppm Xylene 1,000 ppm Ethanol	300 ppm CO=120 ppm+-35ppm 300 ppm CO=330ppm+-50ppm 300 ppm CO=330ppm+-50ppm 1,000ppm H_2=880ppm+-150ppm
6313547	Freon R12 Freon R22	1 % volume 2,000 ppm	1,000 ppm R12 1,000 ppm R22	0.5%CH_4=out of range 0.5%CH_4=750ppm+-200ppm
6313544	Freon R134A Freon R141 Freon R142B Freon R11 Freon R23	2,000 ppm 2,000 ppm 2,000 ppm 1% volume 1% volume	1,000 ppm R134A 1,000 ppm R22=500ppm 1,000 ppm R22=600ppm 1,000 ppm R11 1,000 ppm R134A=1,100ppm	0.5%CH_4=2000ppm+-500ppm 0.5%CH_4=250ppm+-70ppm 0.5%CH_4=150ppm+-50ppm

ANNEX 3

REP.	Nbr	DESIGNATION	N° PLAN	REF. OFSA	MATIERE	TRAITEMENT	OBSERVATIONS
1	1	CARTER	17262G3	6121556	Polycarbonate	.	
2	1	BORNIER DE JONCTION PHOENIX Securite E	.	6131954	.	.	.
3	1	PLAQUE REHAUSSE BORNIER	18629G3	6132384	.	.	.
4	1	CLIP METALLIQUE	17888G3	6142238	INOX	.	.
5	1	AXE CLIP CEX300	18579G4	6145847	INOX	.	.
6	2	RONDELLE LARGE M3	.	6905514	.	.	.
7	2	VIS TB PZ M3 L8	.	6902146	.	.	.
8	2	VIS AUTOFORMEUSE TC PZ M3 L20	.	6902520	.	.	.
9	1	JOINT CELLULE	18027G4	6136045	NEOPRENE	.	.
10	4	VIS CHC M5 L20-6	18054G4	6136966	INOX	.	.
11	1	COUVERCLE	17264G1	6123564	Polycarbonate	.	.
12	1	JOINT COUVERCLE	17711G3	6136040	NEOPRENE	.	.
13	1	PRESSE ETOUPE PG9 LT NI	.	6143502	.	.	Non representé
14	1	ECROU PE PG9 LT NI	.	6143429	.	.	.
15	1	ETIQUETTE CABLAGE CEX300	18905G4	6830170	.	.	.
16	1	COSSE RONDE AMP	.	6152966	.	.	.
17	1	REPRISE DE MASSE EXTERNE CTX300	18872G4	6152947	.	.	.
18	1	VIS CHC M5 L6 INOX	.	6902528	.	.	.
19	1	RONDELLE GROWER D5	.	6905560	.	.	.
20	1	ETIQUETTE CTX300 LOGO ISC	21282G4	6816090	.	.	.
21	1	ETIQ FAV CEX300	17846G4	6815918	.	.	.
22	1	ETIQ CTX300 LOCALISATION	17852G4	6815923	.	.	.





IND	DATE	DESSINE	MODIFICATIONS	FOLIO
F	23/03/07	CD	Change REP 20	
E	08/01/02	PAGNIEZ	Ajout REP 20,21,22	
D	02/08/01	CD	Change REP 13	
C	15/11/00	GAROT-TISON	Modif plan et nomenclature	
B	28/09/00	PERRY	Modif nomenclature	
A	26/03/07	PERRY	CREATION	

MATIERE	NA	ETATS SURFACES	Ra: NA	TOL.GENE. LINEAIRE	±0.1
TRAITEMENT	NA	POIDS NET	NA KG	ANGULAIRE	±1°

TITRE

PLAN D'ENSEMBLE
CAPTEUR CEX 300 APPRETE

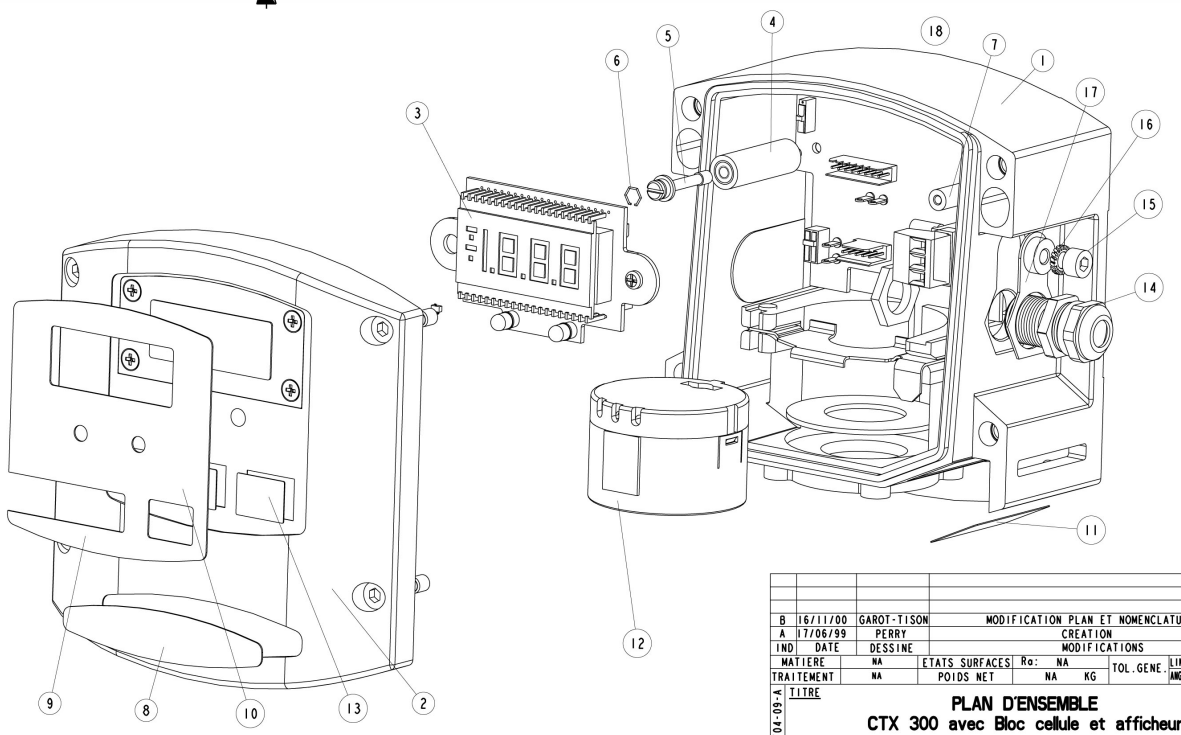
	DATE	NOM	VISA	ECHELLE
DESSINE	23/03/07	CHEVALIER		NA
REVUE				PLAN CERTIFIE NDC/RD/---
REVUE ATEX				
APPROUVE				

INDUSTRIAL SCIENTIFIC
OLDHAM

REF OFSA	FORMAT	N° D'IDENTIFICATION	FOLIO
6 5 1 3 4 9 4	A 3	1803063	1 / 1

INDICE A B C D E F

REP.	Nbr	DESIGNATION	N° PLAN	REF. OFSA	MATIERE	TRAITEMENT	OBSERVATIONS
1	1	CTX 300 DE BASE	18031G3	6513495	.	.	
2	1	COUVERCLE CTX300 AFFICHEUR	18324G3	6323609	.	.	.
3	1	CARTE AFFICHEUR	18197G3	6451466	.	.	.
4	1	GUIDE CIMP AFFICHEUR CTX300	18347G4	6332453	.	.	.
5	1	AXE CEX 870	.	6124855	.	.	.
6	1	CERCLAN DIAM 5	.	6136980	.	.	.
7	1	ENTRETOISE WFR 3-6,5-32-PA66	.	6132379	.	.	.
8	1	ETIQUETTE LOGO OLDHAM	17845G4	6815917	.	.	.
9	1	FACE AVANT AFFICHEUR	17849G4	6815921	.	.	.
10	1	ETIQUETTE LOCALISATION	17852G4	6815923	.	.	.
11	1	ETIQUETTE SERIE	17854G4	6830101	.	.	.
12	1	BLOC CELLULE PRECALIBRE CTX300	.	.	.	.	.
13	1	ETIQUETTE GAZ	.	.	.	.	.
14	1	PRESSE ETOUPE PG9 LT NI	.	6143442	.	.	.
15	1	VIS CHC M5 L6 INOX	.	6902528	.	.	.
16	1	RONDELLE GROWER D5	.	6905560	.	.	.
17	1	REPRISE DE MASSE INTERNE	18882G3	6152948	.	.	.
18	1	ECROU PE PG9 LT NI	.	6143429	.	.	.



Monter les entretoises 4 et 7 a la place des vis M3 et des rondelles
Coller l'etiquette gaz 13 avant l'etiquette face avant 9

IND	DATE	DESSINE	MODIFICATIONS	FOLIO
B	16/11/00	GAROT-TISON	MODIFICATION PLAN ET NOMENCLATURE	
A	17/06/99	PERRY	CREATION	

MATIERE	NA	ETATS SURFACES	Ra: NA	TOL.GENE.	LINEAIRE	±0.1
TRAITEMENT	NA	POIDS NET	NA KG		ANGULAIRE	±1°

F04-09-A

TITRE

PLAN D'ENSEMBLE
CTX 300 avec Bloc cellule et afficheur

	DATE	NOM	VISA	ECHELLE
DESSINE	17/06/99	PERRY		1
REVUE				DIFFUSION 17
APPROUVE				

OLDHAM

DIVISION DETECTION GAZ

REF OFSA - - -

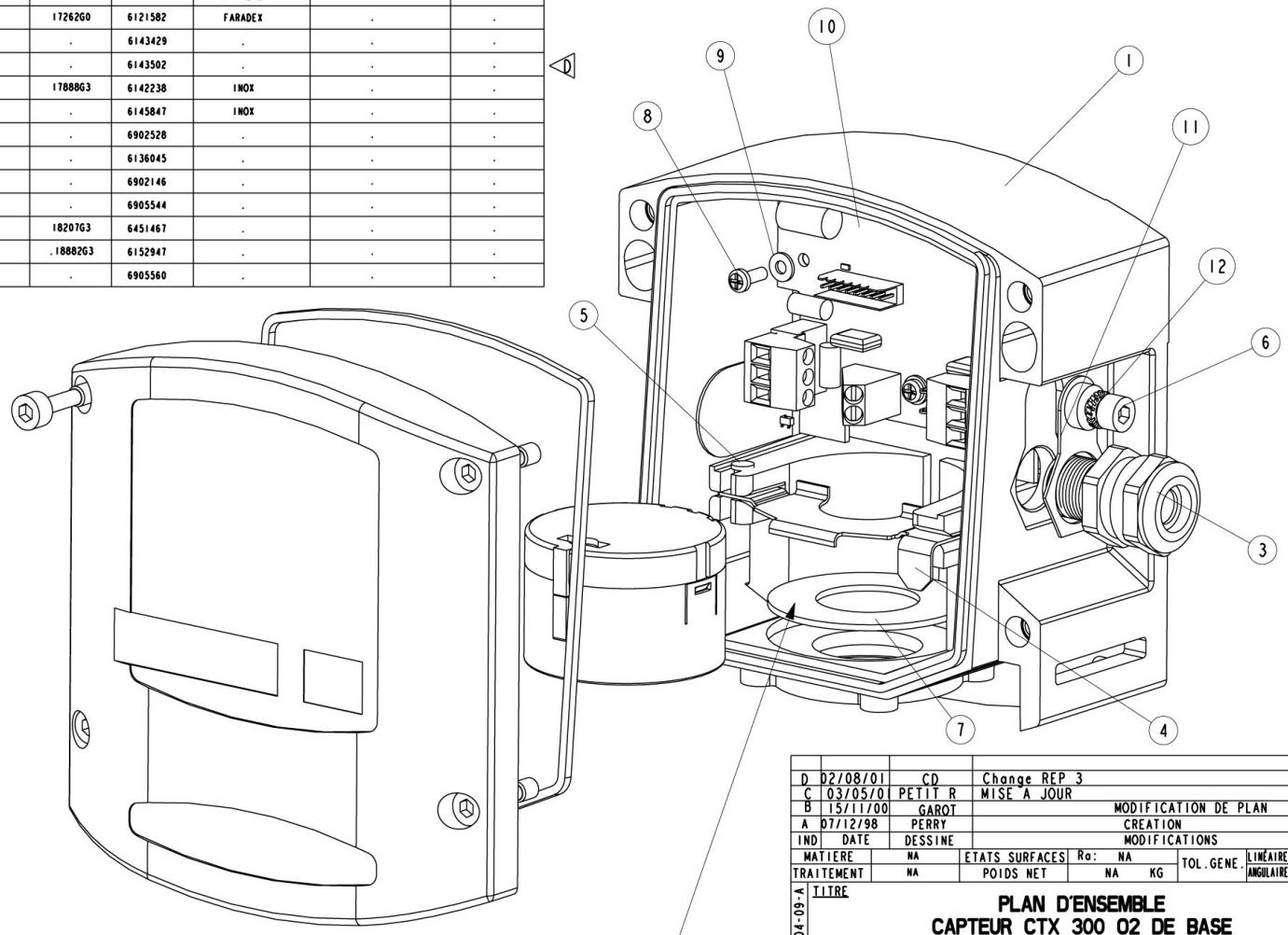
FORMAT A3

N° D'IDENTIFICATION 1803263

FOLIO 1 / 1

INDICE A B

REP.	Nbr	DESIGNATION	N° PLAN	REF. OFSA	MATIERE	TRAITEMENT	OBSERVATIONS
1	1	CARTER	17262G0	6121582	FARADEX	.	.
2	1	ECROU PE PG9 LT NI	.	6143429	.	.	.
3	1	PRESSE ETOUPE PG9 LT NI	.	6143502	.	.	.
4	1	CLIP METALLIQUE	17888G3	6142238	INOX	.	.
5	1	AXE CLIP CEX300	.	6145847	INOX	.	.
6	1	VIS CHC M5 L6 INOX	.	6902528	.	.	.
7	1	JOINT DE CELLULE	.	6136045	.	.	.
8	3	VIS TB PZ M3 L8	.	6902146	.	.	.
9	3	RONDELLE ISOLANTE D3	.	6905544	.	.	.
10	1	CARTE CTX300 PRINCIPALE O2	18207G3	6451467	.	.	.
11	1	REPRISE DE MASSE EXTERNE CTX 300	.18882G3	6152947	.	.	.
12	1	RONDELLE GROWER D5	.	6905560	.	.	.



COLLER LE JOINT SUR LE CARTER

D	02/08/01	CD	Change REP 3
C	03/05/0	PETIT R	MISE A JOUR
B	15/11/00	GAROT	MODIFICATION DE PLAN
A	07/12/98	PERRY	CREATION
IND	DATE	DESSINE	MODIFICATIONS

FOLIO

MATIERE	NA	ETATS SURFACES	Ra: NA	TOL.GENE.	LINEAIRE	±0.1
TRAITEMENT	NA	POIDS NET	NA KG		ANGULAIRE	±1°

F04-09-A

TITRE

PLAN D'ENSEMBLE
CAPTEUR CTX 300 O2 DE BASE

	DATE	NOM	VISA
DESSINE	02/08/01	CHEVALIER	
REVUE			
APPROUVE			

ECHELLE 1

DIFFUSION 17

OLDHAM

DIVISION DETECTION GAZ

REF OFSA 651349 7

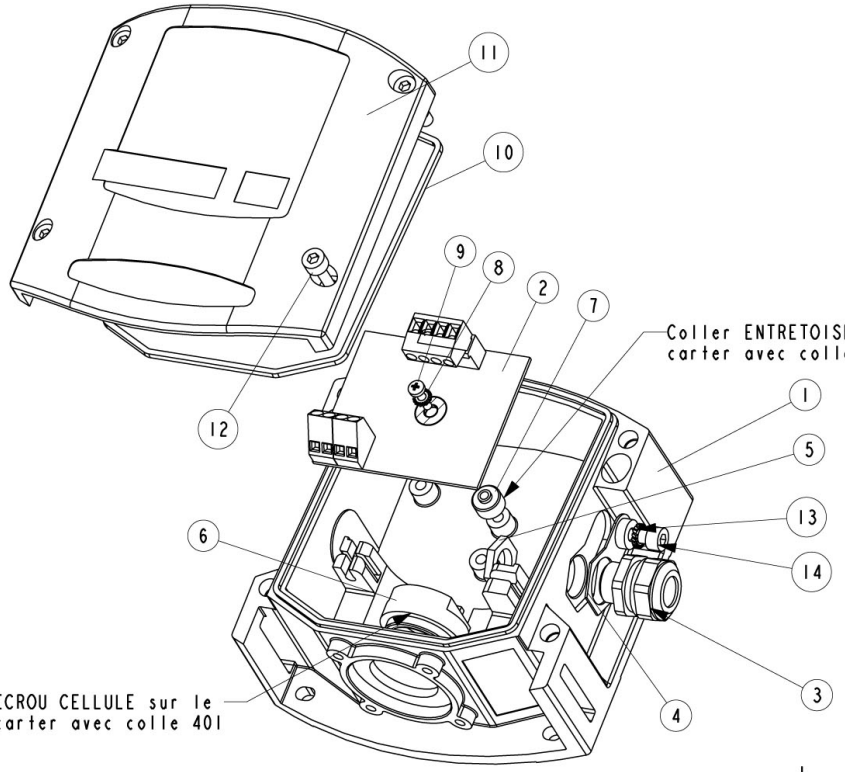
FORMAT A3

N° D'IDENTIFICATION 1803363

FOLIO 1 / 1

INDICE A B C D

REP.	Nbr	DESIGNATION	N° PLAN	REF. OFSA	MATIERE	TRAITEMENT	OBSERVATIONS
1	1	CARTER CTX300 FARADEX	18930G0	6121582	FARADEX	.	.
2	1	CARTE PRINCIPALE CSC50	1328DG4	6451396	.	.	.
3	1	PRESSE ETOUPE PG9 LT NI	.	6143502	.	.	.
4	1	REPRISE DE MASSE EXTERNE	.	6152947	.	.	.
5	1	ECROU PE PG9	.	6143429	LT NI	.	.
6	1	ECROU CELLULE	18531G4	6323612	PVC noir	.	.
7	1	ENTRETOISE CIMP	18532G4	6332456	PVC noir	.	.
8	1	RONDELLE A DENT D3	.	6905511	.	.	.
9	1	VIS TB PZ M3 L10	.	6902151	.	.	.
10	1	JOINT COUVERCLE	.	6136040	.	.	.
11	1	COUVERCLE CTX300 FARADEX	18931G1	6123576	FARADEX	.	.
12	4	VIS CHC M5 L20-6	.	6136966	INOX	.	.
13	1	RONDELLE GROWER D5	.	6905560	.	.	.
14	1	VIS CHC M5 L6 IN	.	6902528	.	.	.



IND	DATE	DESSINE	MODIFICATIONS
C	03/09/01	CD	Change rep 3
B	10/01/01	GAROT	MODIFICATION NOMENCLATURE
A	13/09/99	PERRY	CREATION

FOLIO

MATIERE	NA	ETATS SURFACES	Ra: NA	TOL.GENE.	LINÉAIRE	±0.1
TRAITEMENT	NA	POIDS NET	NA KG		ANGULAIRE	±1°

F04-09-A

TITRE

PLAN D'ENSEMBLE
CTX 300 SEMI CONDUCTEUR

	DATE	NOM	VISA	ECHELLE
DESSINE	03/09/01	CHEVALIER		NA
REVUE				DIFFUSION
APPROUVE				17

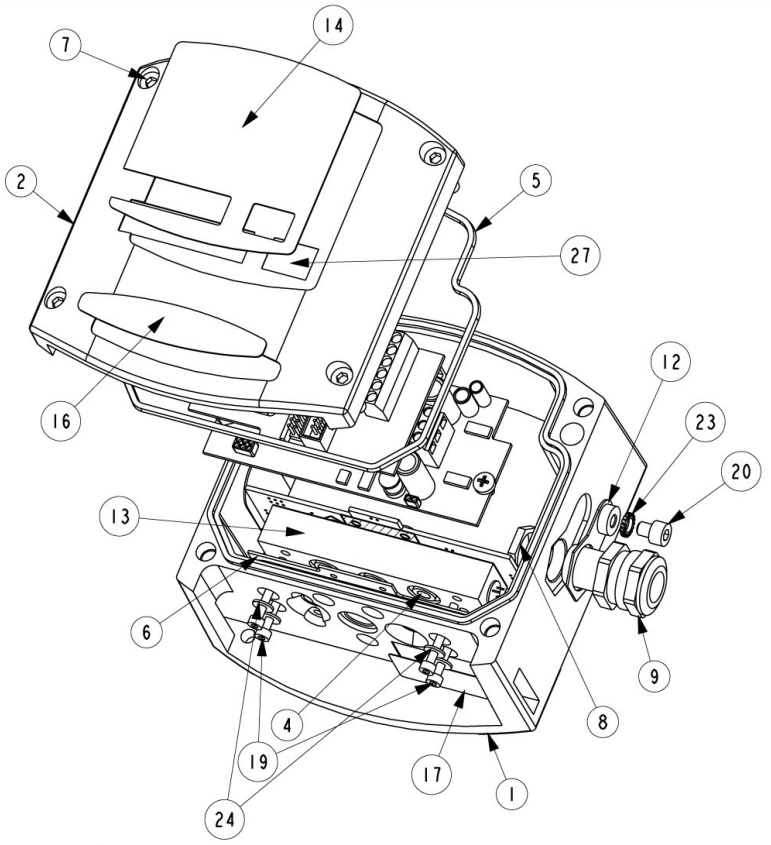
OLDHAM

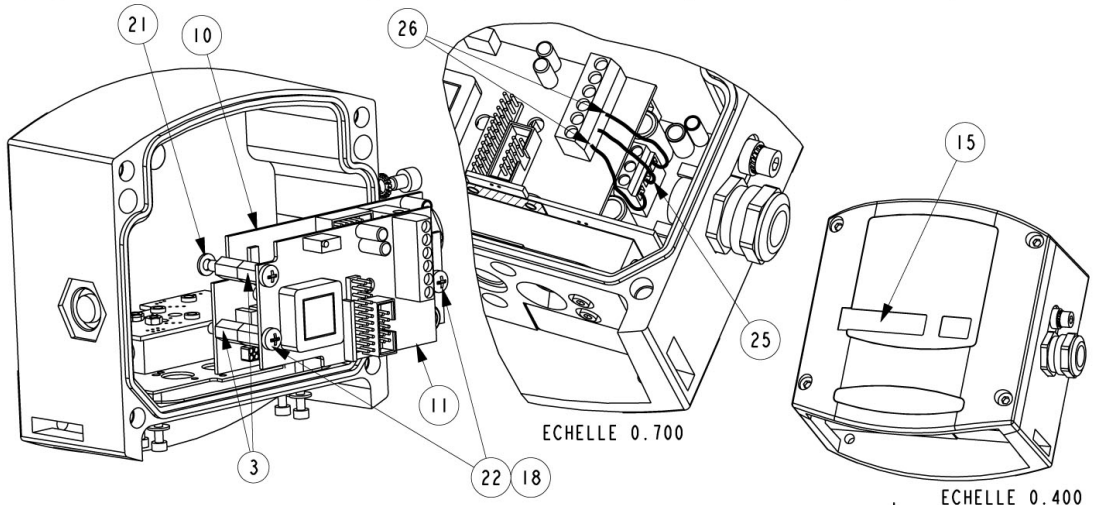
DIVISION DETECTION GAZ

REF OFSA	FORMAT	N° D'IDENTIFICATION	FOLIO
651350 1	A3	1849703	1 / 1

INDICE A B C

REP.	Nbr	DESIGNATION	N° PLAN	REF. OFSA	MATIERE	TRAITEMENT	OBSERVATIONS
1	1	CARTER CTX300 IR	21269G1	6121680	FARADEX DS1002 FR ECO	.	.
2	1	COUVERCLE CTX300 IR	21270G1	6123725	FARADEX DS1002 FR ECO	.	.
3	4	ENTRETOISE MFH M4-12	.	6132401	LAITON	NICKELE	.
4	3	DISQUE N°8 CELLULE COMPACT	.	6136147	ZITEX G106	.	NON REPRESENTE
5	1	JOINT COUVERCLE CTX300 IR	21266G3	6136273	NBR	.	.
6	1	JOINT CELLULE CTX300 IR	21267G3	6136274	NEOPRENE	.	.
7	4	VIS CHC M5 L20-6	18054G4	6136966	INOX	.	.
8	1	ECROU PRESSE-ETOUPE PG9	.	6143429	LAITON	NICKELE	.
9	1	PRESSE-ETOUPE PG9 LONG=15	.	6143502	LAITON	NICKELE	.
10	1	CARTE SIGNAL CTX300 IR	.	6451618	.	.	.
11	1	CARTE LINEARITE CTX300 IR	.	6451617	.	.	OPTION
12	1	REPRISE DE MASSE EXTERIEUR CTX300	18872G4	6152947	INOX	.	.
13	1	CARTE CELLULE CTX300 IR CO2 1% VOL	.	6451612	.	.	.
14	1	ETIQUETTE CTX300 SANS-AFFICHEUR	17847G4	6815919	POLYCARBONATE	.	.
15	1	ETIQUETTE CTX300 LOCALISATION	17852G4	6815923	PVC	.	.
16	1	ETIQUETTE CTX300 LOGO ISC	21282G4	6816090	POLYCARBONATE	.	.
17	1	ETIQUETTE CTX300 IR N° DE SERIE	21303G4	6830254	.	.	.
18	3	VIS TB PZ M4x6	.	6902395	INOX	.	.
19	4	VIS CHC M3x25	.	6902470	INOX	.	.
20	1	VIS CHC M4x5	.	6902528	INOX	.	.
21	1	RONDELLE PLATE D4.2/D8 Epaisseur=1mm	.	6905551	BAKELITE	.	.
22	3	RONDELLE GROWER D4	.	6905555	INOX	.	.
23	1	RONDELLE GROWER D5	.	6905560	INOX	.	.
24	4	RONDELLE PLATE M3	.	6905514	INOX	.	.
25	1	FIL EPDX000 NOIR LONG=65mm	.	6116068	.	.	OPTION
26	2	FIL EPDX000 ROUGE LONG=65mm	.	6116069	.	.	OPTION
27	1	ETIQUETTE GAZ CTX300 IR 0-1% CO2	21357G4	6830261	POLYESTER	.	.





IND	DATE	DESSINE	MODIFICATIONS	FOLIO
B	17/09/07	MIERSMAN	Mise à jour	
A	17/07/07	MIERSMAN	CREATION	

MATIERE	NA	ETATS SURFACES	Ra: 3.2	TOL.GENE.	LINÉAIRE	±0.1
TRAITEMENT	NA	POIDS NET	NA KG		ANGULAIRE	±1°

TITRE

PLAN D'ENSEMBLE
CTX300 IR 1% VOL CO2

	DATE	NOM	VISA
DESSINE	17/07/07	MIERSMAN.C	
REVUE			
REVUE ATEX			
APPROUVE			

ECHELLE 0.6

PLAN CERTIFIE NDC/RD/---

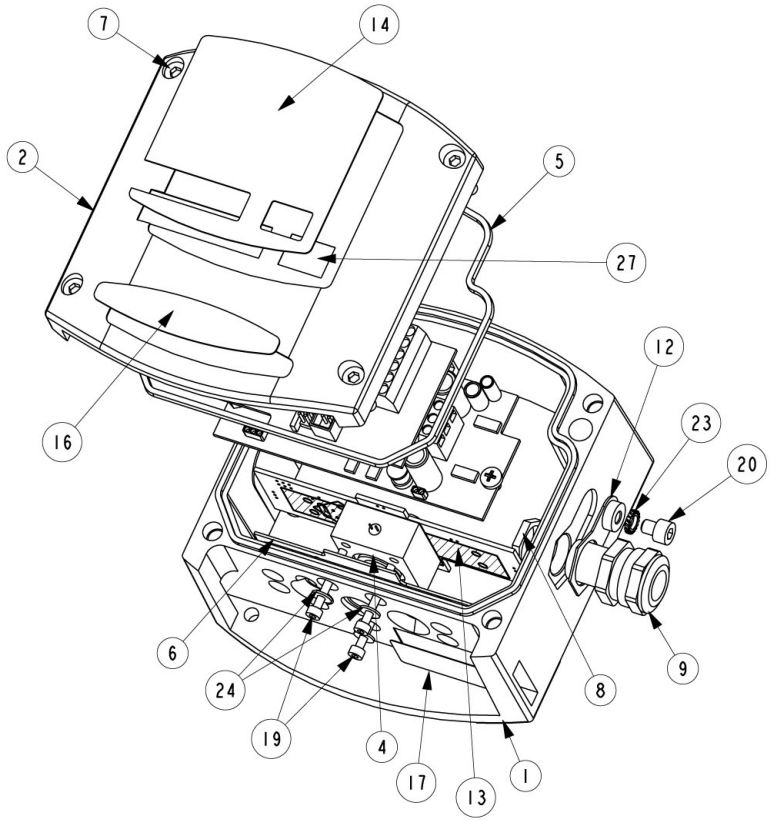
INDUSTRIAL SCIENTIFIC

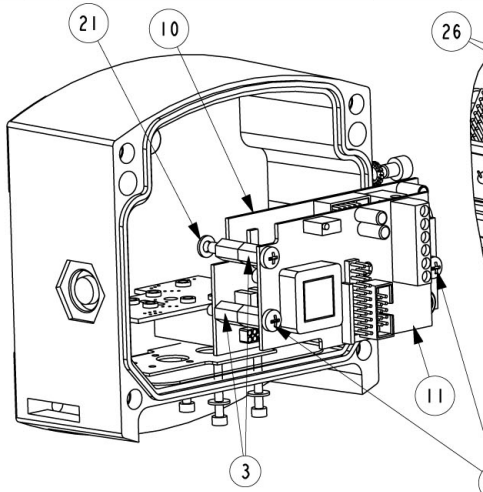
OLDHAM

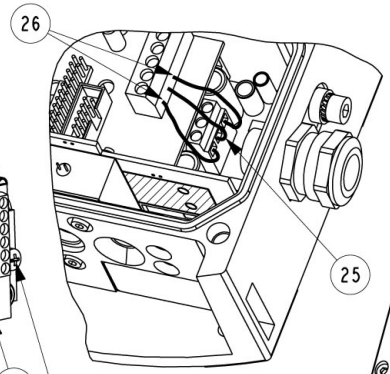
REF OFSA	FORMAT	N° D'IDENTIFICATION	FOLIO
6514881	A3	2133203	1 / 1

INDICE B

REP.	Nbr	DESIGNATION	N° PLAN	REF. OFSA	MATIERE	TRAITEMENT	OBSERVATIONS
1	1	CARTER CTX300 IR	21269G1	6121680	FARADEX DS1002 FR ECO	.	.
2	1	COUVERCLE CTX300 IR	21270G1	6123725	FARADEX DS1002 FR ECO	.	.
3	4	ENTRETOISE MFH M4-12	.	6132401	LAITON	NICKELE	.
4	1	DISQUE N°8 CELLULE COMPACT	.	6136147	ZITEX G106	.	NON REPRESENTE
5	1	JOINT COUVERCLE CTX300 IR	21266G3	6136273	NBR	.	.
6	1	JOINT CELLULE CTX300 IR	21267G3	6136274	NEOPRENE	.	.
7	4	VIS CHC M5 L20-6	18054G4	6136966	INOX	.	.
8	1	ECROU PRESSE-ETOUPE PG9	.	6143429	LAITON	NICKELE	.
9	1	PRESSE-ETOUPE PG9 LONG=15	.	6143502	LAITON	NICKELE	.
10	1	CARTE SIGNAL CTX300 IR	.	6451618	.	.	.
11	1	CARTE LINEARITE CTX300 IR	.	6451617	.	.	OPTION
12	1	REPRISE DE MASSE EXTERIEUR CTX300	18872G4	6152947	INOX	.	.
13	1	CARTE CELLULE CTX300 IR CO2 5% VOL	.	6451611	.	.	.
14	1	ETIQUETTE CTX300 SANS AFFICHEUR	17847G4	6815919	POLYCARBONATE	.	.
15	1	ETIQUETTE CTX300 LOCALISATION	17852G4	6815923	PVC	.	.
16	1	ETIQUETTE CTX300 LOGO ISC	21282G4	6816090	POLYCARBONATE	.	.
17	1	ETIQUETTE CTX300 IR N° DE SERIE	21303G4	6830254	.	.	.
18	3	VIS TB PZ M4x6	.	6902395	INOX	.	.
19	3	VIS CHC M3x25	.	6902470	INOX	.	.
20	1	VIS CHC M5x6	.	6902528	INOX	.	.
21	1	RONDELLE PLATE D4.2/D8 Epaisseur=1mm	.	6905551	BAKELITE	.	.
22	3	RONDELLE GROWER D4	.	6905555	INOX	.	.
23	1	RONDELLE GROWER D5	.	6905560	INOX	.	.
24	3	RONDELLE PLATE M3	.	6905514	INOX	.	.
25	1	FIL EPDX000 NOIR LONG=65mm	.	6116068	.	.	OPTION
26	2	FIL EPDX000 ROUGE LONG=65mm	.	6116069	.	.	OPTION
27	1	ETIQUETTE GAZ CTX300 IR 0-5% CO2	21352G4	6830258	POLYESTER	.	NON REPRESENTE







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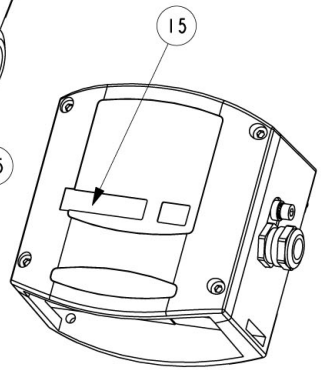


ECHELLE 0.400

B	17/09/07	MIERSMAN	Mise à jour			
A	17/07/07	MIERSMAN	CREATION			
IND	DATE	DESSINE	MODIFICATIONS			FOLIO
MATIERE	NA	ETATS SURFACES	Ra: 3.2	TOL.GENE.	LINEAIRE	±0.1
TRAITEMENT	NA	POIDS NET	NA KG		ANGULAIRE	±1°

TITRE

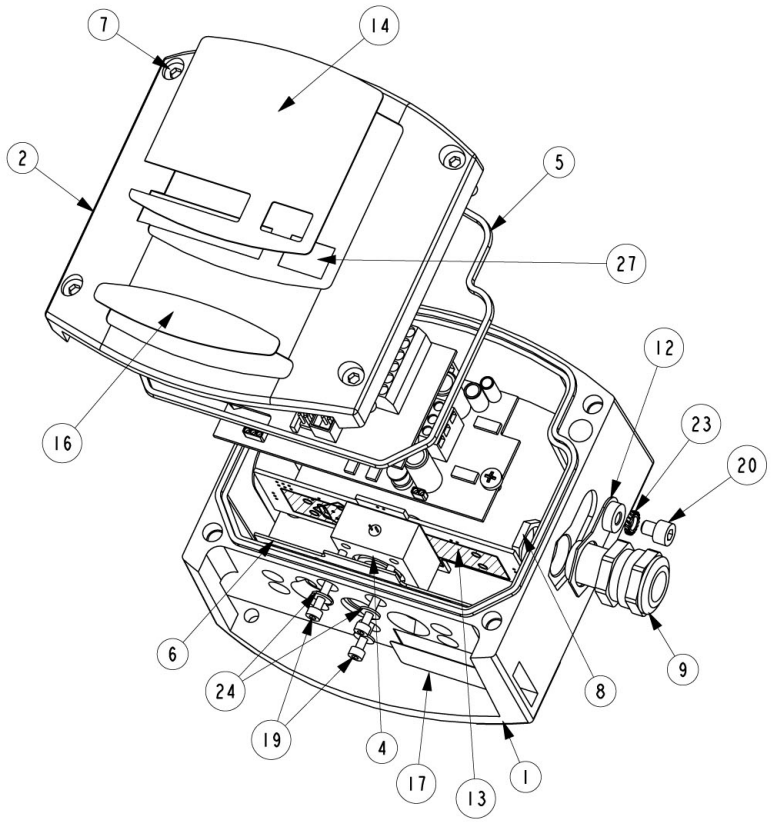
PLAN D'ENSEMBLE
CTX300 IR 5% VOL CO2

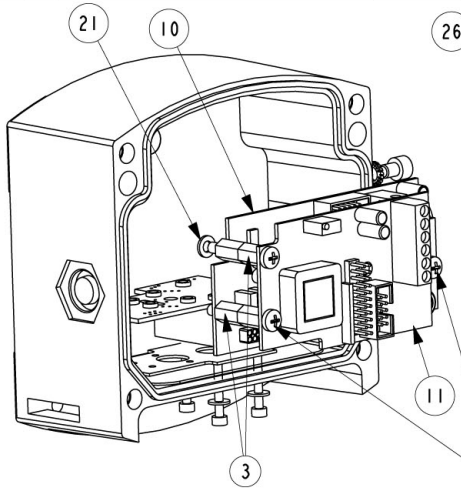
	DATE	NOM	VISA	ECHELLE	
DESSINE	17/07/07	MIERSMAN.C		0.6	INDUSTRIAL SCIENTIFIC
REVUE				PLAN CERTIFIE	OLDHAM
REVUE ATEX				NDC/RD/----	
APPROUVE					

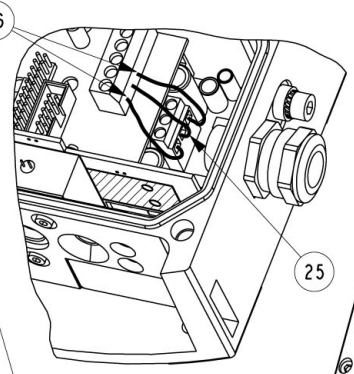
REF OFSA	FORMAT	N° D'IDENTIFICATION	FOLIO
651488O	A3	2133163	1 / 1

INDICE A B

REP.	Nbr	DESIGNATION	N° PLAN	REF. OFSA	MATIERE	TRAITEMENT	OBSERVATIONS
1	1	CARTER CTX300 IR	21269G1	6121680	FARADEX DS1002 FR ECO	.	.
2	1	COUVERCLE CTX300 IR	21270G1	6123725	FARADEX DS1002 FR ECO	.	.
3	4	ENTRETOISE MFH M4-12	.	6132401	LAITON	NICKELE	.
4	1	DISQUE N°8 CELLULE COMPACT	.	6136147	ZITEX G106	.	NON REPRESENTE
5	1	JOINT COUVERCLE CTX300 IR	21266G3	6136273	NBR	.	.
6	1	JOINT CELLULE CTX300 IR	21267G3	6136274	NEOPRENE	.	.
7	4	VIS CHC M5 L20-6	18054G4	6136966	INOX	.	.
8	1	ECROU PRESSE-ETOUPE PG9	.	6143429	LAITON	NICKELE	.
9	1	PRESSE-ETOUPE PG9 LONG=15	.	6143502	LAITON	NICKELE	.
10	1	CARTE SIGNAL CTX300 IR	.	6451618	.	.	.
11	1	CARTE LINEARITE CTX300 IR	.	6451617	.	.	OPTION
12	1	REPRISE DE MASSE EXTERIEUR CTX300	18872G4	6152947	INOX	.	.
13	1	CARTE CELLULE CTX300 IR CO2 5% VOL	.	6451611	.	.	.
14	1	ETIQUETTE CTX300 SANS AFFICHEUR	17847G4	6815919	POLYCARBONATE	.	.
15	1	ETIQUETTE CTX300 LOCALISATION	17852G4	6815923	PVC	.	.
16	1	ETIQUETTE CTX300 LOGO ISC	21282G4	6816090	POLYCARBONATE	.	.
17	1	ETIQUETTE CTX300 IR N° DE SERIE	21303G4	6830254	.	.	.
18	3	VIS TB PZ M4x6	.	6902395	INOX	.	.
19	3	VIS CHC M3x25	.	6902470	INOX	.	.
20	1	VIS CHC M5x6	.	6902528	INOX	.	.
21	1	RONDELLE PLATE D4.2/D8 Epaisseur=1mm	.	6905551	BAKELITE	.	.
22	3	RONDELLE GROWER D4	.	6905555	INOX	.	.
23	1	RONDELLE GROWER D5	.	6905560	INOX	.	.
24	3	RONDELLE PLATE M3	.	6905514	INOX	.	.
25	1	FIL EPDX000 NOIR LONG=65mm	.	6116068	.	.	OPTION
26	2	FIL EPDX000 ROUGE LONG=65mm	.	6116069	.	.	OPTION
27	1	ETIQUETTE GAZ CTX300 IR 0-10% CO2	21358G4	6830262	POLYESTER	.	NON REPRESENTE







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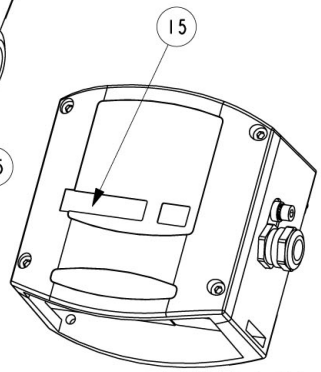


ECHELLE 0.400

B	17/09/07	MIERSMAN	Mise à jour				
A	17/07/07	MIERSMAN	CREATION				
IND	DATE	DESSINE	MODIFICATIONS				FOLIO
MATIERE	NA	ETATS SURFACES	Ra: 3.2	TOL.GENE.	LINEAIRE	±0.1	
TRAITEMENT	NA	POIDS NET	NA KG		ANGULAIRE	±1°	

TITRE

PLAN D'ENSEMBLE
CTX300 IR 10% VOL CO2

	DATE	NOM	VISA	ECHELLE
DESSINE	17/07/07	MIERSMAN.C		0.6
REVUE				
REVUE ATEX				PLAN CERTIFIE NDC/RD/---
APPROUVE				

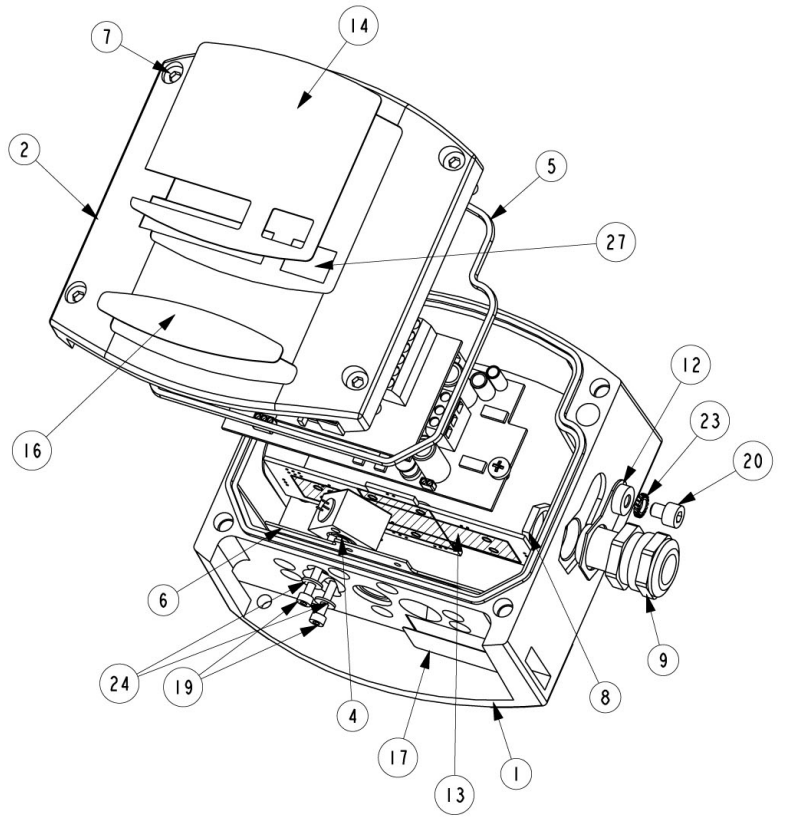
INDUSTRIAL SCIENTIFIC

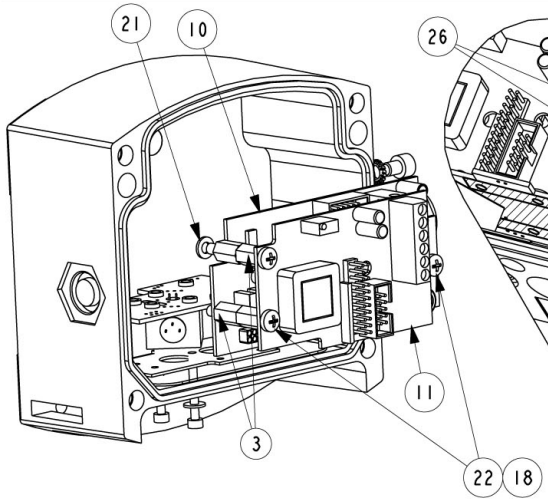
OLDHAM

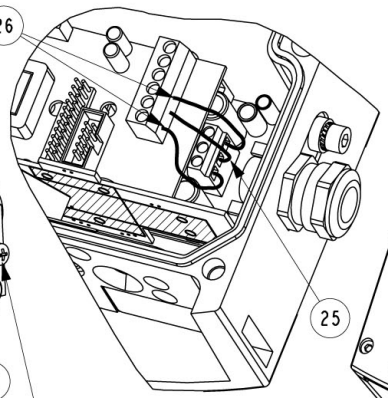
REF OFSA	FORMAT	N° D'IDENTIFICATION	FOLIO
6514882	A3	2136163	1 / 1

INDICE A B

REP.	Nbr	DESIGNATION	N° PLAN	REF. OFSA	MATIERE	TRAITEMENT	OBSERVATIONS
1	1	CARTER CTX300 IR	21269G1	6121680	FARADEX DS1002 FR ECO	.	.
2	1	COUVERCLE CTX300 IR	21270G1	6123725	FARADEX DS1002 FR ECO	.	.
3	4	ENTRETOISE MFH M4-12	.	6132401	LAITON	NICKELE	.
4	1	DISQUE N°8 CELLULE COMPACT	.	6136147	ZITEX G106	.	NON REPRESENTE
5	1	JOINT COUVERCLE CTX300 IR	21266G3	6136273	NBR	.	.
6	1	JOINT CELLULE CTX300 IR	21267G3	6136274	NEOPRENE	.	.
7	4	VIS CHC M5 L20-6	18054G4	6136966	INOX	.	.
8	1	ECROU PRESSE-ETOUPE PG9	.	6143429	LAITON	NICKELE	.
9	1	PRESSE-ETOUPE PG9 LONG=15	.	6143502	LAITON	NICKELE	.
10	1	CARTE SIGNAL CTX300 IR	.	6451618	.	.	.
11	1	CARTE LINEARITE CTX300 IR	.	6451617	.	.	OPTION
12	1	REPRISE DE MASSE EXTERIEUR CTX300	18872G4	6152947	INOX	.	.
13	1	CARTE CELLULE CTX300 IR CO2 50% VOL	.	6451610	.	.	.
14	1	ETIQUETTE CTX300 SANS-AFFICHEUR	17847G4	6815919	POLYCARBONATE	.	.
15	1	ETIQUETTE CTX300 LOCALISATION	17852G4	6815923	PVC	.	.
16	1	ETIQUETTE CTX300 LOGO ISC	21282G4	6816090	POLYCARBONATE	.	.
17	1	ETIQUETTE CTX300 IR N° DE SERIE	21303G4	6830254	.	.	.
18	3	VIS TB PZ M4x6	.	6902395	INOX	.	.
19	2	VIS CHC M3x25	.	6902470	INOX	.	.
20	1	VIS CHC M5x6	.	6902528	INOX	.	.
21	1	RONDELLE PLATE D4.2/D8 Epaisseur=1mm	.	6905551	BAKELITE	.	.
22	3	RONDELLE GROWER D4	.	6905555	INOX	.	.
23	1	RONDELLE GROWER D5	.	6905560	INOX	.	.
24	2	RONDELLE PLATE M3	.	6905514	INOX	.	.
25	1	FIL EPDX000 NOIR LONG=65mm	.	6116068	.	.	OPTION
26	2	FIL EPDX000 ROUGE LONG=65mm	.	6116069	.	.	OPTION
27	1	ETIQUETTE GAZ CTX300 IR 0-50% CO2	21356G4	6830260	POLYESTER	.	NON REPRESENTE







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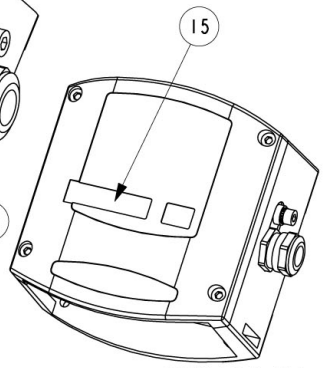

ECHELLE 0.400

B	17/09/07	MIERSMAN	Mise à jour				
A	17/07/07	MIERSMAN	CREATION				
IND	DATE	DESSINE	MODIFICATIONS				FOLIO
MATIERE	NA	ETATS SURFACES	Ra: 3.2	TOL.GENE.	LINEAIRE	±0.1	
TRAITEMENT	NA	POIDS NET	NA KG		ANGULAIRE	±1°	

TITRE

PLAN D'ENSEMBLE
CTX300 IR 50% VOL CO2

	DATE	NOM	VISA	ECHELLE
DESSINE	17/07/07	MIERSMAN.C		0.6
REVUE				
REVUE ATEX				PLAN CERTIFIE NDC/RD/---
APPROUVE				

INDUSTRIAL SCIENTIFIC

OLDHAM

REF OFSA	FORMAT	N° D'IDENTIFICATION	FOLIO
6514879	A3	2133003	1 / 1

INDICE A B

Garanty

1 Plus Points

To respond quickly and efficiently to your consultancy needs or order tracking throughout the world via our customer service department.
To respond as rapidly as possible to all questions of a technical nature.

2 Quality

To assure you of the best quality of our products and service in conformity with the international standards and directives in force.

3 Inspection and Reliability

To provide you with reliable equipment. The quality of our production is an essential condition for this reliability. This is guaranteed by virtue of very strict checks that are carried out when raw materials come in, both during the course of and at the end of manufacture (all equipment that is sent out is configured to your individual requirements).

4 Commissioning

If required, to commission your equipment by our Ism-ATEX qualified specialists.

5 Training

To provide detailed training programs.

6 Project department

Our team will investigate all gas and flame detection projects via on-site investigations or from drawings. We can suggest pre-project studies, design, installation and maintenance of safety systems in ATEX or non-ATEX zones with full respect of all standards in force.

7 Maintenance contract

To suggest rolling maintenance contracts tailored to your needs in order to guarantee you maximum safety:

- One or more annual visits, including consumables
- Renewable by agreement
- Including adjustment of fixed or portable gas detectors, and inspection of control systems.

8 On-site repair

To rapidly send our Service Technicians to you. This is possible on account of our hubs in France and abroad.

9 Factory repair

To deal with any problem that cannot be resolved on-site by dispatching the equipment back to the factory. Teams of technicians will work on repairing your equipment as quickly as possible, thereby reducing the time spent out of commission to a minimum. Cost efficient replacement solutions are available if equipment is deemed not repairable.
For all After Sales Service in France, contact us by email at servicecenter@oldhamgas.com
Or by telephone at + 33 (0)3 21 60 80 80. For locations near you, please visit us at indsci.com and click on the Oldham Division.

OUR MISSION

Preserving human life on, above and below the earth
Delivering highest quality, best customer service...
every transaction, every time.

OLDHAM
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The Fixed Gas Detection People

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