English

OX 2000 / TX 2000
OX 2000+ / TX 2000+

OXYGENOMETER AND TOXIMETER

USE AND MAINTENANCE

OLDHAM Group

AFAQ ISO 9001

CE

Fabrication française

Réf.: CD00001
Code: 03 MT TX2000/TX2000+ GB05

OLDHAM SA

GAS AND FLAME DETECTION

DUST EMISSION ANALYSIS

We thank you for choosing an **OLDHAM SA** instrument.

We have taken every step to ensure that this equipment continues to give you complete satisfaction.

Please read the instruction manual carefully before using the instrument.

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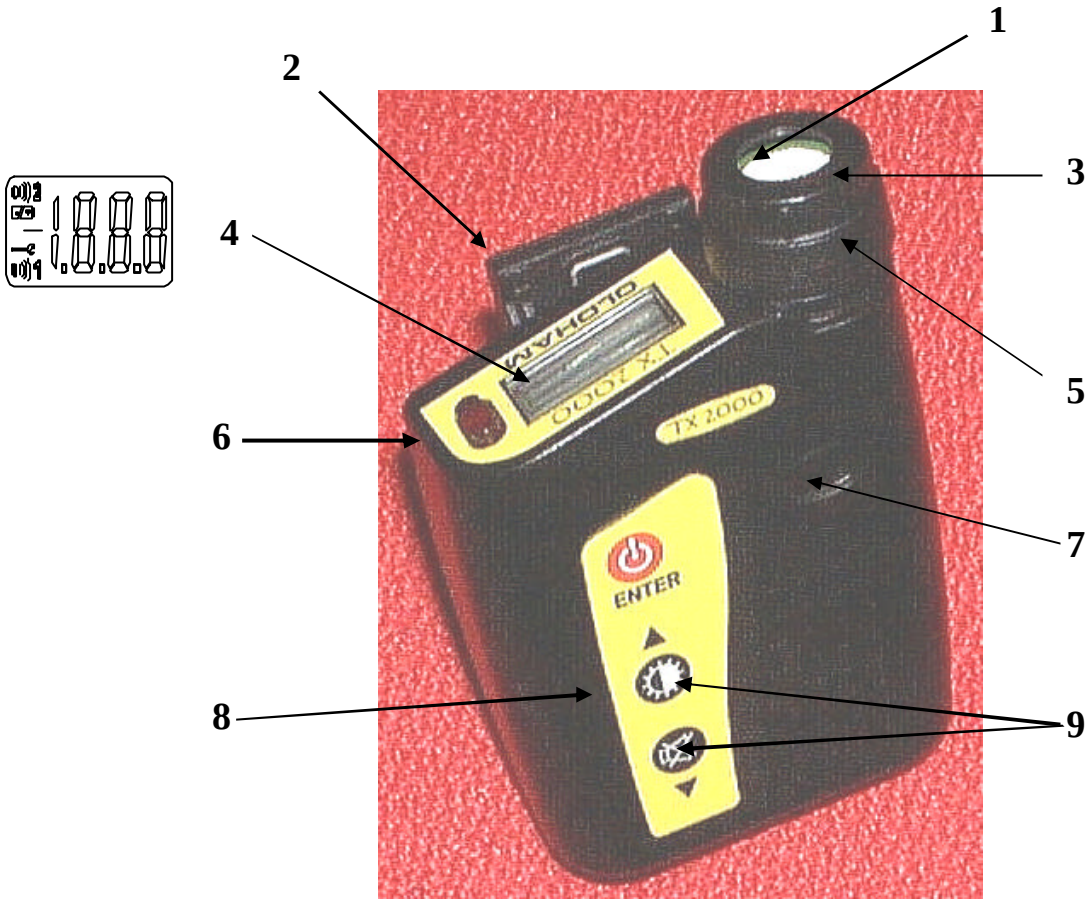
FIGURE 1

General view



1	Protective filter for module
2	clip
3	Protective cover for module
4	Back lighted liquid cristal display
5	Colour ring mentionning type of module
6	Visual indicator
7	Buzzer (audible alarm)
8	Mini and maxi detected at the last utilisation Current batteries voltage
9	Tactile keys

FIGURE 2

Inside view

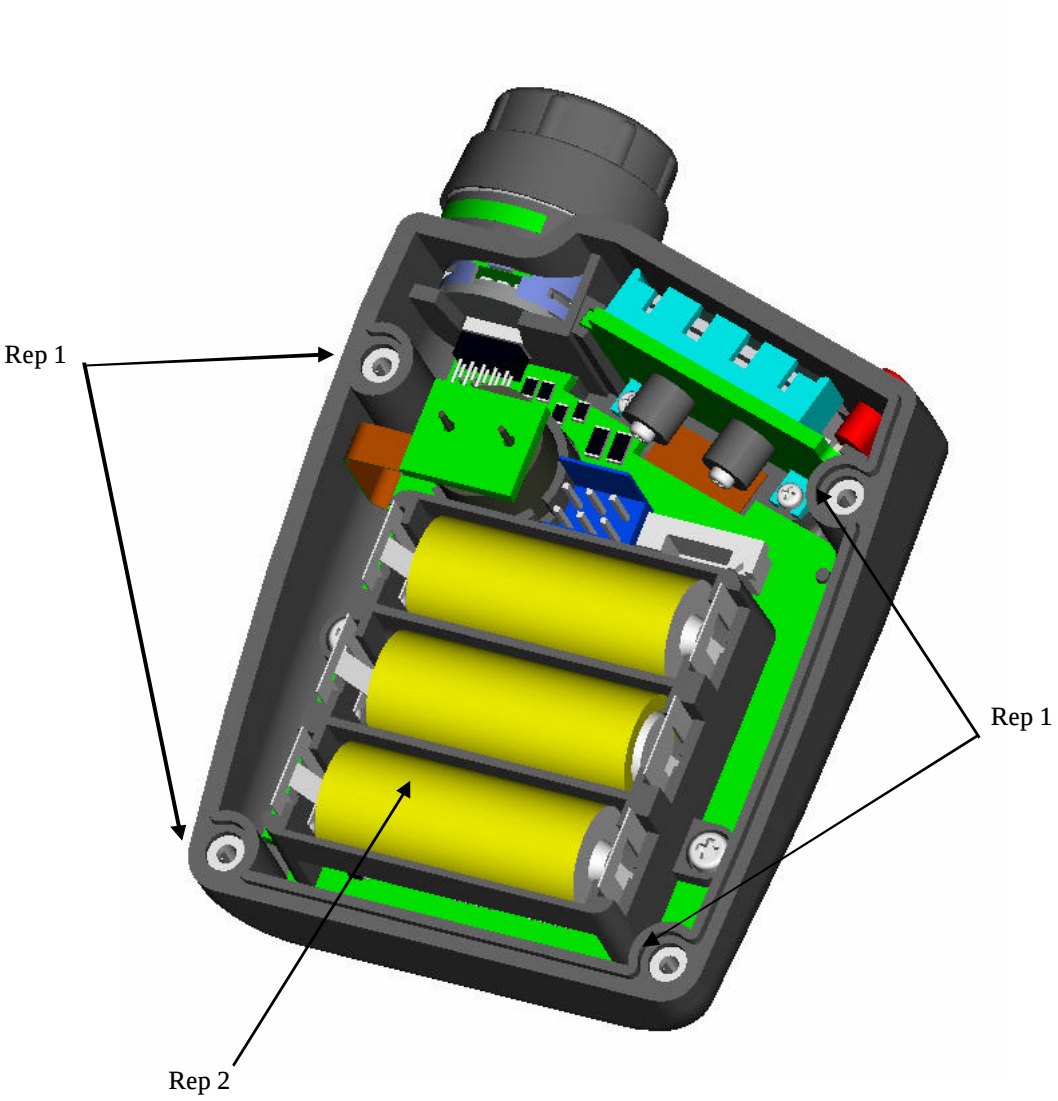
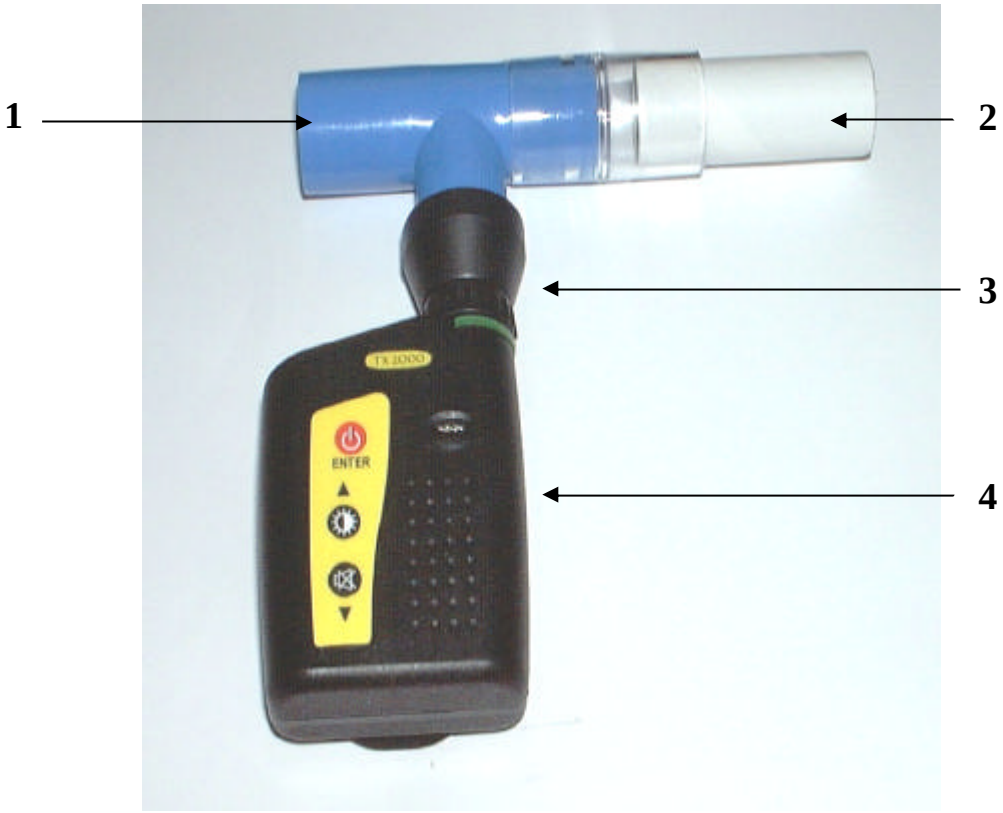


FIGURE 3

TX2000 (+) "HBCO"Version



1	Te shape sampling device (plastical)
2	Interchangeable tip (pasteboard)
3	**CELL CAP (NOZZLE) SPECIFIC TO COHB**
4	TX 2000 (+) "CO"

TABLE OF CONTENTS

I. PRESENTATION.

See figure 1 at the beginning of this manual

The TX/OX2000(+) is a stand-alone, "pocket" oxygenometer or toximeter intended for the (continuous) detection of toxic or oxygen gases or vapours.

The TX/OX2000(+) is equipped with a plug-in sensor which can be accessed after unscrewing the sensor cap on the top of the instrument.

The TX/OX2000(+) displays the gas concentrations on a liquid crystal display fitted with an illumination device. A special version also exists not to display the measurement but the messages GO or GAS.

In the event of an alarm or anomalies the instrument activates an audible and visible alarm.

An periodic audible "BEEP" (factory-programmed intervals : 120 seconds by default) shows that the instrument is working properly or indicates that the TX2000(+) has been switched off deliberately. This "beep" can be disabled during the initialization of this device by the manufacturer.

1. POWER SUPPLY - OX/TX2000 VERSION

It is provided by :

3 ALKALINE DRY BATTERIES 1,5 V
DURACELL MN9100
ENERGIZER (LR1) E90 ALKALINE
PANASONIC (LR1) AM5EU ALKALINE
Battery life = 1300 hours

Dry or rechargeable batteries are not :

- delivered with the instrument
- interchangeable in hazardous area

IMPORTANT: The instrument is certified for use in group I and II explosive atmospheres and only, when it is equipped with dry batteries of a type recommended by the manufacturer.

1.1. Fitting or replacement of dry batteries:

➢ **See figure 2 at the beginning of this manual**

- Remove the rear protective caps of the TX/OX 2000 after having the four screws undone (rep 1)
- Fit the dry batteries into the compartment tought for this purpose (rep 2). Make sure that the polarity is correct as indicated on the label of the dry batteries box.
- Screw the rear caps.

2. POWER SUPPLY – OX/TX2000+ VERSION

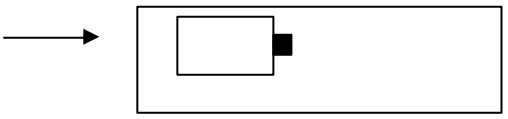
It is provided by :

- A pack of 3V6 lithium dry batteries which gives it an autonomy while 1 year.
- This pack will be completely and easily removed when the dry batteries are discharged.

2.1. Replacement of dry batteries

➢ See figure 2 at the beginning of this manual

When the dry batteries are discharged, a pictogram "dry battery" appears on the LCD.

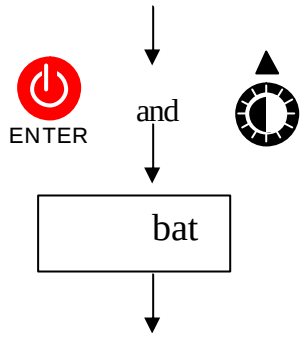


Then it is necessary to replace the "dry batteries pack" :

- Switch off the TX/OX2000+
- Remove the rear protective caps of the TX/OX2000+ after having the four screws undone (rep1)
- Replace the worn dry batteries pack by a new pack
- Screw the rear caps.

2.2. Reinitialization of the dry batteries "controller"

- to do at every replacement of dry batteries
- TX/OX 2000+ switch off



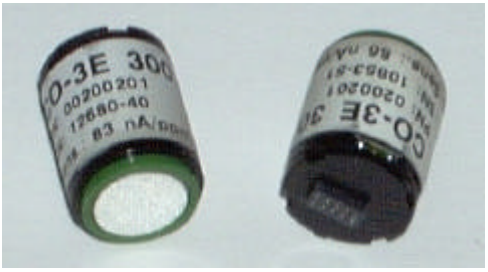
Press 30 seconds on those 2 keys

- Release the keys when bat appears
- bat is still displaying during 5 seconds

End of the réinitialization after 5 seconds

IMPORTANT: The instrument is certified for use in group I and II explosive atmospheres and only, when it is equipped with the dry batteries pack of a type recommended by OLDHAM.

3. MEASUREMENT SENSOR (toxic or oxygen)



3.1. Presentation

Being a vital element of the gas detector, the sensor of the TX/OX2000(+) must be treated with care. Mechanical impacts, splashing with water etc… may impair the quality of the measurement or even, in extreme cases, destroy the sensors.

A water-repellent and anti-dust filter protects the “head” of the sensor.

Each sensor of type electrochemical can detect one toxic or oxygen gas (see chapter VI : List of differents sensors).

3.2. Fitting or replacement

The sensor (fig1-rep1) can be plugged in and is accessible once the rear and the protective caps have been slightly unscrewed (fig.1.-rep3).

IMPORTANT :	This work is reserved for authorized and qualified personnel since it could possibly jeopardize the safety of detection.

4. CARRIAGE OF THE TX2000(+) / OX 2000(+)

- Clip (fig 1.rep2)

The user can get on with his work while leaving the instrument to monitor the surrounding atmosphere: the TX/OX2000(+) is attached to his clothing using the clip provided for the purpose

Attention :	in order to be able to take readings correctly, the sensor should never be obstructed.

II. USE

1. OPERATING THE INSTRUMENT

This is done using the touch areas located on the front panel of the TX/OX2000(+) (fig1. rep9).

- Switching the instrument on or off
- Enter

- Illuminating the liquid crystal display
- Scrolling the parameters and menus
- “down ” key

- Clearance of the gas alarm
- “ up ” key
- "**yes**" or "**no**" for confirmation.

- use of the programming and calibration menus
- Reinitialization of the dry batteries "controller"

 and 

Comment: an interval[1] of 3 minutes minimum and 7 minutes maximum is allowed between two depressions of the keys, otherwise the instrument will "restart" in "normal" mode

[1] Configuration of the interval depends on detected gas

2. DATA GIVEN BY THE DISPLAY (fig1-rep4)

The liquid Crystal **display** allows messages to be read clearly:

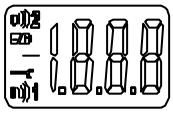
- **3 digits 1/2** for displaying the measurement
- Equipped with back light by light-emitting diodes.
- **4 pictograms** supplementing the audible and visual alarms relating to the exceeding of thresholds, battery faults, maintenance mode.

3. SWITCHING ON

The TX/OX2000(+) is switched on by pressing momentarily on the following key 

A regular audible " beep " signals that the instrument is operating correctly.
The interval between the "beeps" is factory-programmable, and the "beeps" can be disabled.

The following appear in succession on the display, accompanied by a continuous visual and audible signal of 4 seconds :



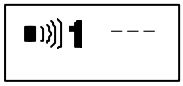
Test display

r **1.6** Software version used

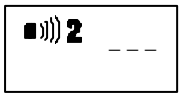
0 Year of manufacturing

004 Day of manufacturing, in the year

001 Serial number



Display of 1st adjustable alarm threshold in toxic gas, or of « low » adjustable gas threshold in oxygen..

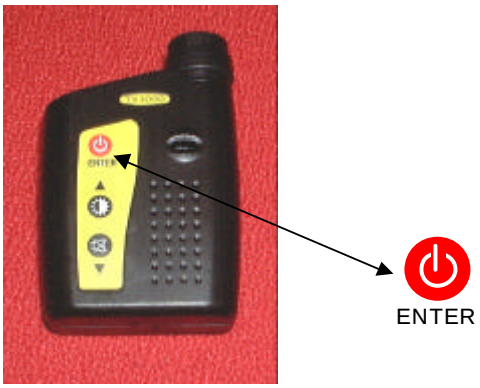


Display of 2nd fixed alarm threshold in toxic gas, or of « high » adjustable gas threshold in oxygen..
Display of the alarm threshold STEL (15 mn) fixed
Display of the alarm threshold TWA (8 hours) fixed

M8H	"Average on 8 hours" (TWA)
5	Alarm threshold on 8 hours
M15	Average on 15 mn (STEL)
IO	Alarm threshold on 15 mn
tSt	Display of test period (stabilisation) (alternatively “tst” and remaining time).
000 or bon	Display of measurement or go (depends on version), after stabilisation time.

Note :
The instrument is initialised to detect only **one type of gas (toxic or oxygen).**
The "detected" gas is programmed in the factory and engraved on a label [sticked on TX/OX2000(+) housing].

4. SWITCHING OFF[1]



Keep the "OFF" key pressed
The display then indicates the following countdown:

-2-

-1-

-0-

and goes out (with confirmation beep).
Then release the key.

[1] We can remove only in factory the « OFF » function if you need (special version).
All parameter existing when the instrument operates will be when dry batteries are replacing

5. ILLUMINATION

In order to read the measurement in dark locations it is possible to illuminate the display by momentarily pressing the following key : 

2 red light-emitting diodes placed on either side of the display provide this illumination for 10 seconds (as standard).

6. SCROLLING THE PARAMETERS

By pressing momentarily and successively on the following key 

 In first press on key, display is back-lighed then :

LO The lowest measurement detected since the instrument was switched on (refreshed each time the instrument is switched back on)

TM Cyclic display of measurement if no new depression appears

– – – – – – – – – – –

HI The hightest measurement detected since the instrument was switched on (refreshed each time the instrument is switched back on)

TM Cyclic display of measurement if no new depression appears

– – – – – – – – – – –

NB : these measurement displays LO and HI do not be available in « detector » special version go or . GAS

– – – – – – – – – – –

M15 Averaged alarm on 15 mn : STEL

100 "STEL" current value permanently[1] calculated (sample)

[1] This value is put back to zero at every start of the device.

M8H Averaged alarm on 8 hours : TWA

10 "TWA" current value permanently calculated

_ _ _ _ _ _ _ _ _ _ _

bAt Test of dry batteries

IIII Segments indicating dry batteries or batteries operating
(the number of segments depends on remaining of autonomy)

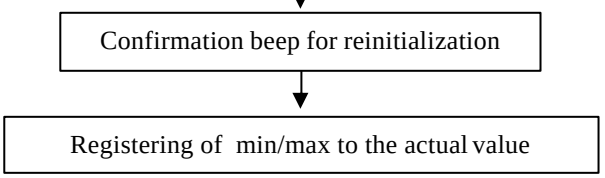
_ _ _ _ _ Cyclic display_ _ _ _ _

TM Return to display of the current measurement in ppm of the toxic measurement detected or in % oxygen

6.1. Manual acknowlegment of « MINI » et « MAXI »

It is possible to reinitialize (up-date) manually in normal operating (measurement display) the lowest measurement LO and the highest measurement HI :

- press simultaneously on the 2 following keys  and 



- release the keys…

7. THE ALARMS

Visual:

Red indicator clearly visible on 4 sides and located at the top of the instrument (see figure 1 rep 6).

Audible:

Loud buzzer located above the front panel of the instrument (see figure 1 rep.7).

GAS:

The " gas " audible and visual alarm is triggered when at least one of the two preprogrammed thresholds is exceeded (instantaneous or STEL/TWA for the taximeter version)

*** Toximeter version[1] :**

- **The instantaneous adjustable threshold[2]**: can be altered as desired by the user with the help of the maintenance / programming mode, and identified by the following pictogram 1
- **The instantaneous fixed threshold[3]**: programmed by OLDHAM. It is identified by the following pictogram 2
- **The STEL threshold**[3] : Programmed by OLDHAM. Display of M15 alternatively with the value
- **The TWA threshold**[3] : Programmed by OLDHAM. Display of M8H alternatively with the value.
- **The STEL/TWA thresholds**[3] : The STEL and TWA thresholds are programmed by OLDHAM at the reinitialization of the device and cannot be modified by the user. The thresholds are programmed by default following the certificated values. It is identified by the pictogram 2

*** Oxygenometer version :**

- **The " down " threshold[2]** : adjustable from 0% oxygen to the "up" threshold and identified by the following pictogram 1
- **The " up " threshold[2]** : adjustable up to 25% oxygen and identified by the following pictogram 2

[1] the instantaneous and STEL/TWA alarms are not available for the range 0-5 % COHB (HBCO)°
[2] Threshold 1 = 1 beep every 2 seconds
[3] Threshold 2 = 1 beep each second

Table of " pulsed " audible and visual alarms

DISPLAY	CAUSE	REMEDY
GAS (special version)	Instantaneous or averaged threshold exceeded	Alarm can be cleared manually [1]
XPPM or % O_2 Alarm pictogram	Instantaneous or averaged threshold exceeded	Alarm can be cleared manually
Dry battery pictogram	The battery is beginning to discharge	Audible and visual alarms can be cleared Change dry batteries

FAULTS[2]

The faults can be classed into 2 families:

- Those relating to the sensor (out-of-range, sensor worn out, unsuccessful calibration etc...).
- Those relating to the instrument itself : worn out dry batteries, OX / TX2000(+) fault.

Visual alarm
(red indicator)

Audible alarm
(buzzer)

[1] Notes ! In special version, you can obtain an automatic reset of alarm (without manual acknowledgment) and when measurement leaves alarm. The altering is made possible before shipment (untested by DMT).
[2] The various faults generates a "continuous" audible and visual alarm.
Note : If several faults are simultaneously present, the display will indicate the sum of the faults

DISPLAY	CAUSE	REMEDY
BAT pictogramme	Dry batteries are worn : the instrument is no longer usable.	- Switch off the instrument - Alarm cannot be cleared - Replace dry batteries pack
OR	Measurement range exceeded	- Alarm can be cleared manually
DEF 1 **(cyclic)**	Zero fault : sensor zero too much shifted to low or high	- Calibrate
DEF 2 **(cyclic)**	Sensibility fault : low sensitivity	- Recalibrate and if the fault persists : the sensor must be replaced.
DEF 4 **(cyclic)**	Worn out sensor fault : low sensitivity	- alarm cannot be cleared : - Replace sensor and calibrate again
DEF 8 **(cyclic)**	Eeprom fault : eeprom memory is not initialized	- Return the instrument into factory to be reinitialised.
DEF 16 **(cyclic)**	Measurement too negative or sensor faulty	- Recalibrate and if the fault persists : the sensor must be replaced
ERR 35 69	Problem of communication between micro and eeprom	- Return the instrument into factory to be repaired
DEF à 64 **(cyclic)**	Component fault : T° detector is faulty	- Return the instrument into factory to be repaired
DEF 128 **(cyclic)**	Wrong type of sensor.	Alarm cannot be cleared Connect the correct type of sensor
DEF 128 **(cyclic)**	Sensor absent	- Alarm cannot be cleared : fit the sensor after switching off the instrument

8. CLEARING THE ALARMS

*** <u>Clearing the instantaneous GAS, STEL and TWA alarms</u>:**

by pressing momentarily on the following button 

Clearing[1] the alarm involves cancelling the " pulsed " audible signal and turning off the alarm indicator on condition that the user has left the danger area.[2]

NB : if the audible alarm is cleared while a threshold is still exceeded : the indicator will continue to flash and the corresponding pictogram will remain "steady".
Otherwise, the indicator will switch off when measurement is under the alarm threshold.

*** <u>Clearing the FAULT alarms</u>:**

In the event of a fault it is not possible to clear the " continuous " audible and visual alarms, except in case of over range | OR | which can be cleared.

Clearing button

[1] An option allows to automatically regenerate the buzzer 5 minutes after the acknowledgement if the alarm is still on.
[2] An option makes possible the automatic acknowledgement of alarms : the alarms automatically acknowledge as soon as the value gets under the threshold. If this option is requested, the manual acknowledgement is no longer possible (also the « OVER RANGE ») (untested by DMT).

III. MAINTENANCE AND SERVICING

Important

Being a safety instrument , it is necessary to calibrate the TX2000(+) or OX 2000(+) at least **once a year following use**

This work is reserved for authorized and qualified personnel since it could possibly jeopardize the safety of detection.

1. MAINTENANCE

A maintenance program, integrated to the instrument allows to modify easily alarm threshold (s) (programming) and to proceed with prevent calibrations or further to the change of a cell.

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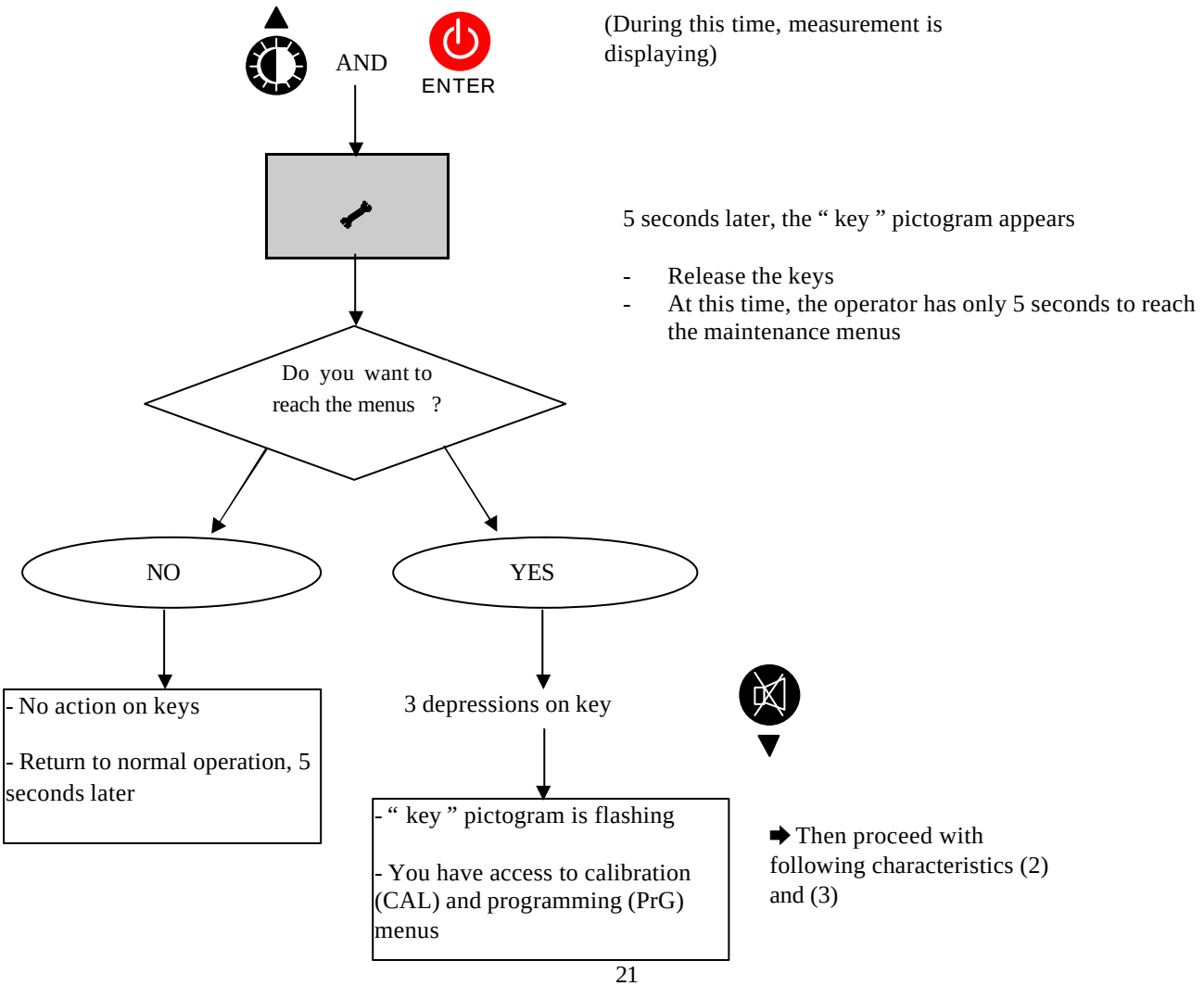
Use of the program:

The instrument being under normal operation, press simultaneously, and this during 5 seconds at least, on the following keys:



2. PROGRAMMING

The "programming" menu allows manual programming of the adjustable alarm threshold: threshold 1 for toxic version [TX2000(+)], or up or down thresholds in oxygen version [OX 2000(+)].

Programming example in toximeter version :

PrG	Display the "**PROGRAMMING** menu
ENTER	Enter the programming menu
40	Display the current alarm threshold
+	Alter the alarm threshold
-	
ENTER	Enter the new threshold
CnF	Display "request for confirmation"
ENTER	
nO	Display confirmation : NO
	Display "yes or no" of confirmation (with each depression of the button)
Yes	Display confirmation: YES
ENTER	Enter the confirmation chosen[1]
š	Return to the normal display of the current measurement

[1] In order to keep old programming, confirmation " NO " cancels every changes

3. CALIBRATION

The only means of checking that the instrument's detection function is working properly is the **calibration** performed with the help of a **standard gas**.

Calibration must be done :

- At least once a year following the use and the type of sensor
- whenever the instrument has been exposed to overly high concentrations of gas
- when an instrument has been stored for more than one month and without use
- when changing of sensors
- when fault appears

Within the calibration the menu "visible and audible" alarms are not triggered.

3.1. Calibration procedure

" Calibration " menu consists of

- setting the zero in clean air and the sensitivity with calibration gas in TX2000(+) version (toxic gases).
- Adjust oxygen sensitivity in OX 2000(+) version.

3.2. Adjusting the zero in clean air (only for toximeter version)

PrG Display the " programming " menu

To display the "calibration" menu

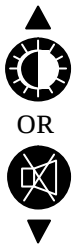
CAL Display the"calibration" menu

To enter the " calibration "menu

-0- Zero adjustment

To enter the zero adjustment procedure

— Display the current value "zero".



To adjust value " zero " if necessary
(in reality, 1 pression on "+" or "-" put the value to "0")

to enter the zero adjustment

3.3. Adjusting the sensitivity [TX2000(+) and OX 2000(+)] :

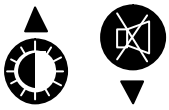
- Position the gas inlet pipe level with the sensor
- Connect up the hose from the calibration kit and inject the standard gas (>30% range of the gas detected otherwise only the zero will be confirmed [auto-zero] for toxic version), maintaining a flow rate of 30 l/h.
- In oxygenometer version, this adjustement can be done without gas but be sure to be in clean air.

Then continue scrolling the calibration menu:

-S- Display the adjustment of sensitivity

To enter the sensitivity adjustment procedure

I00 Display the measurement corresponding almost to the value of standard gas :
Wait for the signal to stabilize.



To adjust calibration gas correct value

To enter the adjustment of sensitivity

Display confirmation of sensibility requested

Acceptance of request for confirmation

Display the confirmation: NO

Display of "YES or NO" for confirmation
(with each depression of the button)

Display the confirmation: YES

Enter the chosen confirmation

NO: The measurements are not entered
YES: The measurements are entered

Return to normal display of current measurement

Note: When the calibration procedure has been completed, do not forget to remove the calibration cap from instrument.

4. SENSOR REPLACEMENT

Necessary when :

- Calibration not to be done (low sensibility) so sensor is worn out (DEF4).
- Wrong type of sensor connection (DEF128), for example (see table of faults).

IMPORTANT :	This work is reserved for authorized and qualified personnel since it could possibly jeopardize the safety of detection.

IV. ACCESSORIES

DESIGNATION	RERERENCES
Calibration kit (cap + hose) without gas	6 331 135
Screw driver	6 145 848
Leather carrying case for OX/TX2000	6.121.571
Leather carrying case for OX/TX2000+	6.121.588
Anti-condensation filter	6.335.966
Active carbon filter	6.335.814

V. SPARE PARTS LIST

DESIGNATION	PART NUMBER
Clip	6 142 251
Seal for sensor cover	6 136 039
Oxygen sensor filter	6 335 957
Standard toxic sensor filter (Teflon)	6 335 956
Chlorine sensor filter for CL_2, HCL and HCN	6 335 956
FHC screw M 2,5x12	6 902 505
Seal for sensor TX2000	6.136.030
Lithium dry batteries pack (OX/TX2000+)	6 111 214
Sensor cover for TX2000+	6.123.562[1]
Sensor cover for OX 2000+	6.123.566
LR01 dry batteries	6.111.204
OX/TX2000 housing	6.121.549

WARNING :

Only use guaranteed original OLDHAM spare parts ; the safety of the equipment could be jeopardized if you use any other parts.

The device is intrinsically safe, substitution of components may impair intrinsic safety.

1 For users which have the oldest version of OX/TX2000 (i.e. before May 2000), we have created two updating kits (new version releasing of the cell cap).
TX2000 kit : 6 323 616
OX2000 kit : 6 323 617

VI. LIST OF THE DIFFERENTS SENSORS

Gas	Range	Part Number	Color Ring
CO	500 ppm	6 313 615	GREEN
CO	300 ppm	6 313 615	GREEN
CO ou HBCO	2000 ppm 50%	6 313 672	GREEN
H2S	100 ppm	6 313 616	BLUE (ral 5015)
NO	100 ppm	6 313 617	RED
NO2	30 ppm	6 313 618	ROUGE CLAIR
NH3	100 ppm	6 313 619	BROWN
CL2	10 ppm	6 313 620	YELLOW
Oxygen	30 %	6 313 630	WHITE
HCL	30 ppm	6 313 641	PURPLE
HCN	30 ppm	6 313 642	BLUE (ral 5002)
NH3	1000 ppm	6 313 643	BROWN
O3	1 ppm	6 313 673	GREY
H2	2000 ppm	6 313 674	PINK

VII. TECHNICAL DATA

1. GAS DETECTOR

Manufacturer	:	OLDHAM ARRAS (France)
Function	:	Gas detector
Type	:	TX2000(+) or OX 2000(+)
Gas detected	:	toxic or oxygen gas or vapours
Measurement	:	continuous
Mode	:	Clear display on content (% or ppm)
Sensor	:	can be unplugged for maintenance
Display	:	liquid crystal
Screen	:	illuminated momentarily on request
Sensor fault	:	visual and audible " continuous " alarm
Battery fault	:	audible, visual and " continuous " alarm + pictogram

Checking of correct operation :

- Intermittent luminous and audible signals (adjustable intervals)
- Self-test when switching on

Indications :

- An alarm indicator
- Pictograms

Alarms :

⇒ **Toximeter version**

- An adjustable instantaneous threshold
- An fixed instantaneous threshold (preset in the factory)
- 2 averaged thresholds : STEL en TWA (preset in the factory)

⇒ **Oxygen version**

- An adjustable up threshold
- An adjustable down threshold

Audible alarm : buzzer, 80db at 30 cm

Power supply :

- 1 lithium dry batteries pack : autonomy maxi : 7000 hours
- 3 LR01 dry batteries : averaged autonomy : 1500 hours

Miscellaneous :

- Keypad control with 3 buttons
- Maintenance menu

Waterproofing : IP 66

Casing : antistatic polycarbonate

Weight : about 95 gr.

Operating temperature : -10°C to +40°C

Dimensions : 87 x 60 x 30 mm (OX/TX2000+ Version)
87 x 60 x 25 mm (OX/TX2000 Version)

Certification :

" Industrial "	Σ X
	EEx i a IIC T4
	INERIS 98.E 5087X
" Mining "	Σ X
	EEx ia I
	INERIS 98.D 7019X

CENELEC standards EN 50014 A1 to A5
EN 50018 A1 to A3
EN 50020 A1 to A5

The performing tests in OX2000 oxygenometer version have been made by DMT : n°PFG – Nr -41300301

CSA N° LR 104516-6

DECLARATION DE CONFORMITE
Declaration of conformity

CE

La **Société OLDHAM S.A.**, ZI Est 62000 Arras France, atteste que le matériel neuf destiné à être utilisé en Atmosphères Explosives désigné ci-après:
*(The **Company OLDHAM S.A.**, ZI Est 62000 Arras France, declares that the following new material intended for use in Explosive Atmospheres:)*

Détecteurs de gaz *(Gas detectors)* TX2000, TX2000+, OX2000, OX2000+

sont conformes aux exigences des Directives Européennes suivantes :
(comply with the requirements of the following European Directive :)

I) DIRECTIVE EUROPEENNE 94/9/CE du 23 mars 1994
relative aux Atmosphères Explosives
The European Directive 94/9/CE of 23 march 1994
Concerning the Explosive Atmospheres

Normes harmonisées appliquées : *(Harmonised applied Standards)*	EN 50014 de Juin 1997 + amendements 1 et 2 EN 50020 de Août 1994 EN 50284 de Janvier 1999 EN 50303 de juillet 2000 EN 50104 de juillet 1999
N° de l'Attestation CE de type du matériel : *(N° of EC type examination certificate)*	INERIS 02ATEX0050
N° de la Notification Assurance Qualité de Production de l'usine de fabrication de Arras : *(N° of the Production Quality Assurance Notification of the Arras factory)*	INERIS 00ATEXQ403
Délivrés par l' Organisme notifié sous le numéro 0080: *(Issued by the Notified Body n°0080)*	INERIS, rue Taffanel, 60550 Verneuil en Halatte, France.

II) DIRECTIVE EUROPEENNE 89/336/CEE du 3 mai 1989
relative à la Compatibilité Electromagnétique
The European Directive 89/336/CEE of 3 may 1989
Concerning the ELECTROMAGNETIC COMPATIBILITY

Normes harmonisées appliquées : *(Harmonised applied Standards)*	EN 50270
Essais effectués par *(Tests issued by)*:	**LCIE** 92260 Fontenay aux Roses France **Mines de Douai** 59508 Douai France
N° des rapports d'essais *(N° of tests reports)*:	N° 3261 020-2 & N° CEM 2000/04

CE/ATEX103

Arras, le 31/07/02

Le Représentant de l'entreprise
On Behalf of the firm

Lionel Witrant

Directeur Technique
Technical Director

AFAQ ISO 9001

2. SENSORS

Sensors can be unplugged for replacement

Data chart of different sensors

	O2 ([1])	H2S	CO	CO	H2	HCN	HCL	NO	NO2	NH3	NH3	O3	CL2	Partial pressure O2 (1)
Standard range	30 %	100 ppm	500 ppm CO or 50% HBCO	2000 ppm	2000 ppm	30 ppm	30 ppm	100 ppm	30 ppm	100 ppm	1000 ppm	1 ppm	10 ppm	20 à 300 mbars 02
Accuracy in % of full scale	< 0,5 % **volume O2**	< 5 %	< 5 %	< 5 %	< 5 %	< 5 %	< 5 %	< 5 %	< 5 %	< 5 %	< 5 %	De 0 à 0,2 ppm ⇒ ± 0,03 ppm De 0,2 à 1 ppm ⇒ ± 0,05 ppm	< 5 %	< 5 mbar 02 (à 20°C)
Zero drift	< 2% relative per month	< 1 ppm / 6 months	< 10 ppm / 6 months	< 20 ppm / 6 months	< 50 ppm / 6 months	< 0,5 ppm / 6 months	< 1 ppm / 6 months	< 2 ppm / 6 months	< 1 ppm / 6 months	< 3 ppm / 6 months	< 15 ppm / 6 months	< 0,05 ppm / 6 months	< 0,5 ppm / 6 months	
Response time	< 15 s	< 30 s	< 40 s	< 40 s	< 150 s	< 90 s	< 120 s	< 30 s	< 100 s	< 220 s	< 5 mn	< 120 s	< 180 s	< 15 s
Lifetime	> 12 months	24 months	24 months	24 months	24 months	18 months	24 months	> 12 months	> 12 months	> 12 months	12 months	12 months	> 12 months	> 16 mois
Warranty	12 mois	12 months	12 months	12 months	14 months	12 months	12 months	12 months	12 months	9 months	42 weeks	12 months	12 months	12 mois
Alarm 1 factory set	19 %	5 ppm	50 ppm	50 ppm	200 ppm	5 ppm	5 ppm	25 ppm	3 ppm	25 ppm	50 ppm	0,2 ppm	1 ppm	19 %
Alarm 2 factory set	23 %	10 ppm	100 ppm	100 ppm	1000 ppm	10 ppm	10 ppm	50 ppm	5 ppm	50 ppm	150 ppm	0,5 ppm	2,5 ppm	23 %

[1] Oxygen sensors : Range of pressure in use = atmospherical pressure ±10%
Range of humidity in use = from 10 to 60 % of humidity
Temperature of storage = from 4 to 12 °C

2.1. Interferents :

	Interferences	Reading
TX2000(+) CO 500 ppm	H_2 1000 ppm	450
	H_2S 30 ppm	0
	HCN 30 ppm	0
	NH_3 100 ppm	0
	NO 49 ppm	7
	SO_2 11 ppm	0
	NO_2 30 ppm	0
	C_2H_4 100 ppm	75
TX2000(+) CO 2000 ppm	H_2 1000 ppm	450
	H_2S 30 ppm	0
	HCN 30 ppm	0
	NH_3 100 ppm	0
	NO 49 ppm	7
	SO_2 11 ppm	0
	NO_2 30 ppm	0
	C_2H_4 100 ppm	75
TX2000(+) H_2S 30.0 not interferent to unsaturated	H_2 1000 ppm	0
	CO 300 ppm	0
	C_2H_2 300 ppm	0
	NH_3 100 ppm	0
TX2000(+) H_2S 100	H_2 1000 ppm	15
	CO 300 ppm	18
	NH_3 110 ppm	0
	NO 49 ppm	2
	SO_2 11 ppm	4
	NO_2 10 ppm	0
	C_2H_4 100 ppm	3
TX2000(+) NH_3 100	H_2S 25 ppm	31
	CO 100 ppm	76
	SO_2 25 ppm	-21
	C_2H_4 100 ppm	0
	NO 49 ppm	-3
TX2000(+) NH_3 1000	Cl_2 9 ppm	-6
	H_2S 29 ppm	80
	CO 300 ppm	300
	SO_2 10 ppm	12
	H_2 1000 ppm	25
TX2000(+) NO 100	H_2S 30 ppm	21
	CO 300 ppm	0
	SO_2 29 ppm	0
	C_2H_4 100 ppm	0
TX2000(+) NO_2 30.0	H_2S 30 ppm	47
	CO 100 ppm	102
	SO_2 11 ppm	20
	C_2H_4 100 ppm	0
	Cl_2 1 ppm	1.5 to 3 ppm
	O_3 1 ppm	0.7
	NO 49 ppm	-3
TX2000(+) Cl_2 10.0	H_2S 30 ppm	Yes undetermined coeff.
	CO 100 ppm	Yes undetermined coeff.
	SO_2 11 ppm	Yes undetermined coeff.
	C_2H_4 100 ppm	No
	O_3 0.6 ppm	0.1 ppm
	NO 49 ppm	Yes undetermined coeff.

TX2000(+) HCl 30.0	Cl_2 10 ppm	0
	SO_2 10 ppm	2
	H_2S 25 ppm	58
	NO 50 ppm	14
	NH_3 100 ppm	0
	H_2 1000 ppm	0
	CO 100 ppm	0
	Ethanol 100 ppm	0
TX2000(+) HCN 30.0	NO_2 10 ppm	-3.7
	Cl_2 10 ppm	-1.5
	SO_2 30 ppm	4.6
	H_2S 10 ppm	27
	NO 50 ppm	0.5
	NH_3 100 ppm	0
	H_2 1000 ppm	0.1
	CO 100 ppm	0.3
	Ethanol 100 ppm	0

VIII. "HBCO" VERSION

1. With direct reading in "ppm CO" or "% COHB"

- You can forecast when purchasing the use of the TX 2000 "CO" or TX2000+ "CO"

  as TX 2000(+) "COHB" : direct reading in % COHB
  as TX 2000(+) CO : display in ppm CO
  or TX 2000(+) united "CO" and "COHB" : programmable display in ppm CO or % COHB.

- - The user can then pass from a display to the other (ppm CO ➔ % COHB)

  pressing twice on the key 

Note : For this version TX2000(+) COHB "direct reading", option "MIN/MAX" is not available and there is no alarm's releasing.

2. Preparation of the patient

The patient is conscious, without any major breathing troubles.

After having, quickly, breathed in and out several times, the patient deeply breathes in, and then blocks his breath during 10 to 15 seconds, …then blows, without breathing, in the interchangeable tip of the TX2000(+) COHB taking care of fully emptying his lungs.

Wait for measurement stabilisation.
Read the indication in % COHB.

OLDHAM s'engage - OLDHAM undertakes

Parce que la sécurité des hommes et la protection de l'environnement sont notre priorité,
OLDHAM s'engage et définit ses normes qualité :
Because safety for personnel and protection of the environment are our priorities,
OLDHAM gives the following undertakings and defines its quality standards :

1 Les Plus

OLDHAM s'engage au travers de son personnel qualifié, à répondre rapidement et efficacement à vos besoins de conseil, de suivi de commande, et ce, partout dans le monde.
OLDHAM s'engage à répondre dans les plus brefs délais à toutes questions d'ordre technique.

2 Qualité

OLDHAM s'engage à vous assurer une qualité de produits et de services à la hauteur de vos exigences, conformément au cahier des charges de la norme **ISO 9001** et **ATEX**.

3 Fiabilité & Contrôles

OLDHAM s'engage à vous fournir un matériel fiable. La qualité de notre production est une condition essentielle à cette fiabilité. Elle est garantie grâce à des vérifications très strictes réalisées dès l'arrivée des matières premières, en cours et en fin de fabrication (tout matériel expédié est configuré selon vos besoins).

4 Mise en service

OLDHAM s'engage, si vous le désirez, à la mise en service de votre matériel par nos techniciens spécialisés. Un gage de sécurité supplémentaire.

5 Formation

OLDHAM s'engage à faire disposer aux utilisateurs de ses produits, d'un service de formation complet : plusieurs ingénieurs pédagogues, salle de conférences, matériels disponibles pour les manipulations, matériel informatique et de visualisation, etc.

6 Contrat d'entretien

OLDHAM s'engage à vous proposer des contrats d'entretien évolutifs au regard de vos besoins pour vous garantir une parfaite sécurité :

- une ou plusieurs visites par an, garantie totale ou partielle,
- renouvelable par tacite reconduction,
- incluant le réglage des centrales de mesure, l'étalonnage des appareils et le contrôle des asservissements.

7 Dépannage sur site

OLDHAM s'engage à faire intervenir ses techniciens du **Service Après Vente** rapidement. Ceci est possible grâce à la répartition judicieuse de nos agences en **France** et de nos agents à l'étranger.

8 Dépannage en usine

OLDHAM s'engage à traiter tout problème qui ne pourrait être résolu sur site par le renvoi du matériel en usine. Des équipes de **techniciens spécialisés** seront mobilisées pour réparer votre matériel, dans les plus brefs délais, limitant ainsi au maximum la période d'immobilisation.
Pour toute intervention du Service Après Vente en France, un numéro Indigo a été mis en place : le 0 825 842 843

1 *Strong points*

*Through its qualified personnel, **OLDHAM undertakes** to respond to your needs for advice and order follow-up services wherever in the world you may be.*
***OLDHAM undertakes** to answer all your technical questions as quickly as possible.*

2 *Quality*

***OLDHAM undertakes** to provide you with products and services of a quality that meets your requirements, in accordance with the specifications of **ISO 9001** and **ATEX** standards.*

3 *Reliability and inspections*

***OLDHAM undertakes** to supply you with reliable equipment. The quality of our production is essential to achieve reliability. Quality is ensured by extremely strict verifications carried out as soon as raw materials are received, during production and at the end of manufacture (all shipped equipment is configured to meet your requirements).*

4 *Start-up*

***OLDHAM undertakes** that our expert technicians will start up your equipment, if you so wish. This gives you the guarantee of additional safety.*

5 *Training*

***OLDHAM undertakes** to provide the users of its products with a complete training service : a number of engineers specialized as instructors, conference rooms, equipment available for practical exercises, computer equipment, display equipment, etc.*

6 *Maintenance contract*

***OLDHAM undertakes** to offer you open-ended maintenance contracts according to your needs so as to give you the guarantee of complete safety :*

- *one or more visits a year, comprehensive or partial warranty,*
- *renewal by tacit agreement,*
- *including the adjustment of measuring units, the calibration of equipment and the verification of servo-control systems.*

7 *Field servicing*

***OLDHAM undertakes** to send out its **After-Sales Service** technicians quickly for servicing on your site. This is made possible by the efficient network of our branches throughout **France** and other countries.*

8 *Factory repairs*

***OLDHAM gives the undertaking** that any problem that cannot be solved in the field will be dealt with by the return of the equipment concerned to our factory. Teams of **specialized technicians** are on hand to ensure the immediate repair of your equipment in the shortest possible time, so keeping downtimes for your equipment to a minimum.*
For any specific technical question, please contact our After-Sales Service (M. Miguel RIESGUO) : 00 33 3 21 60 80 80

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