

CONTROL UNIT TYPE

MX42A

INSTALLATION AND OPERATING MANUAL



**INDUSTRIAL
SCIENTIFIC**



Made in
France



Réf.: NPM42GB

INDUSTRIAL SCIENTIFIC

GAS DETECTION

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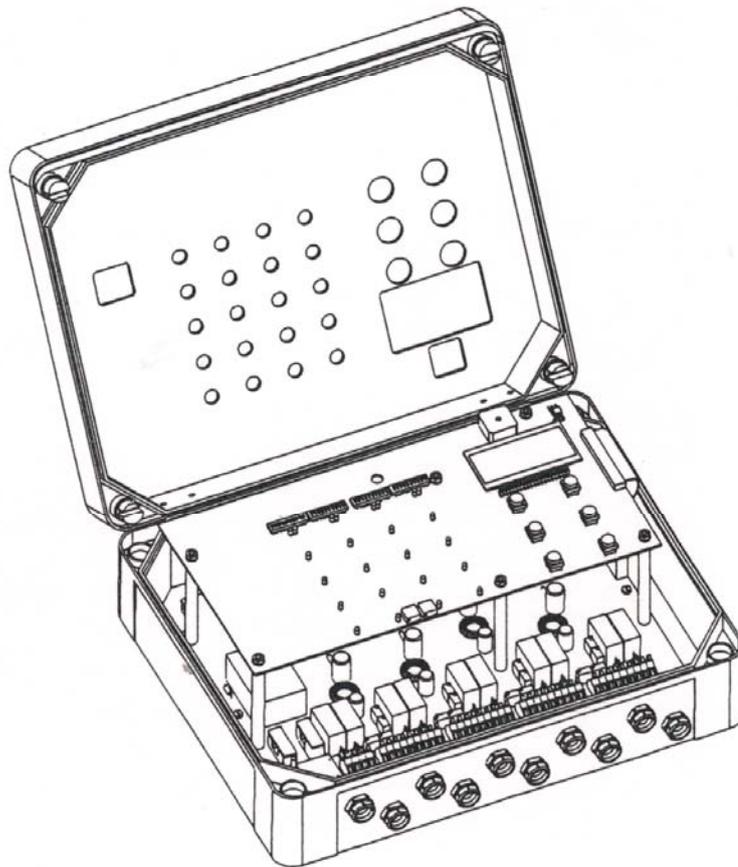
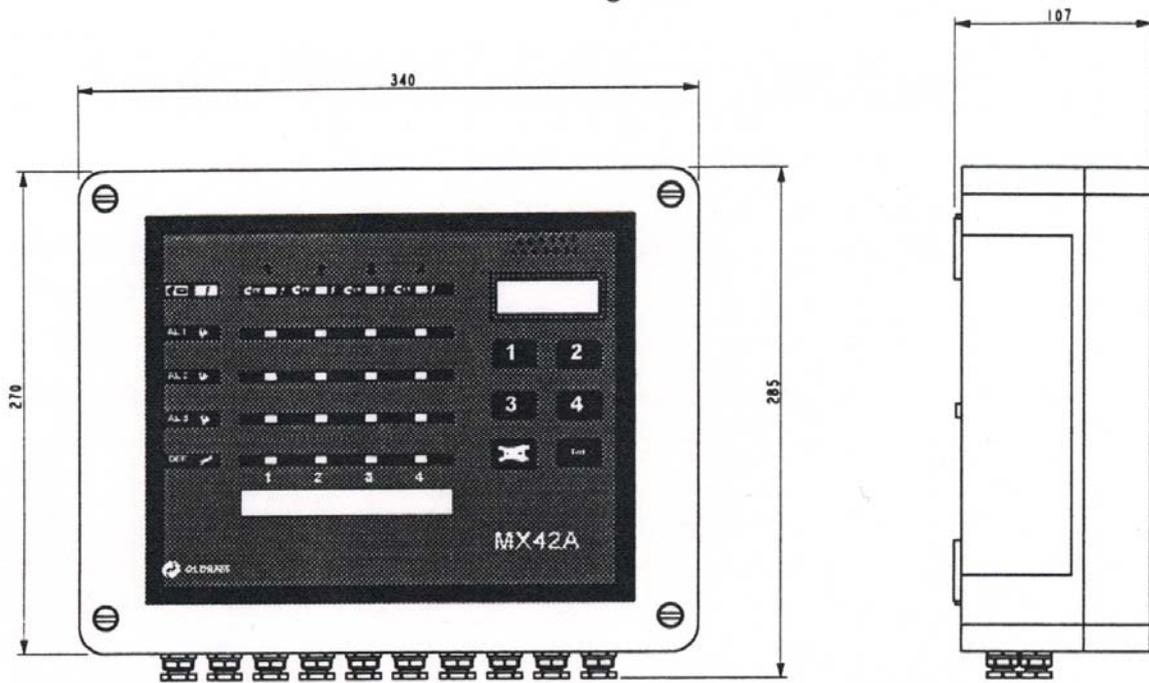
2 years guarantee in normal conditions of use on parts and technical labour, return in our workshops, excluding consumables (sensors, filters, etc.)

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Figure 1



1 DESCRIPTION (fig 1)

The MX 42A detection unit is an apparatus for the detection and measurement of various combustible, toxic or oxygen-carrying gases.

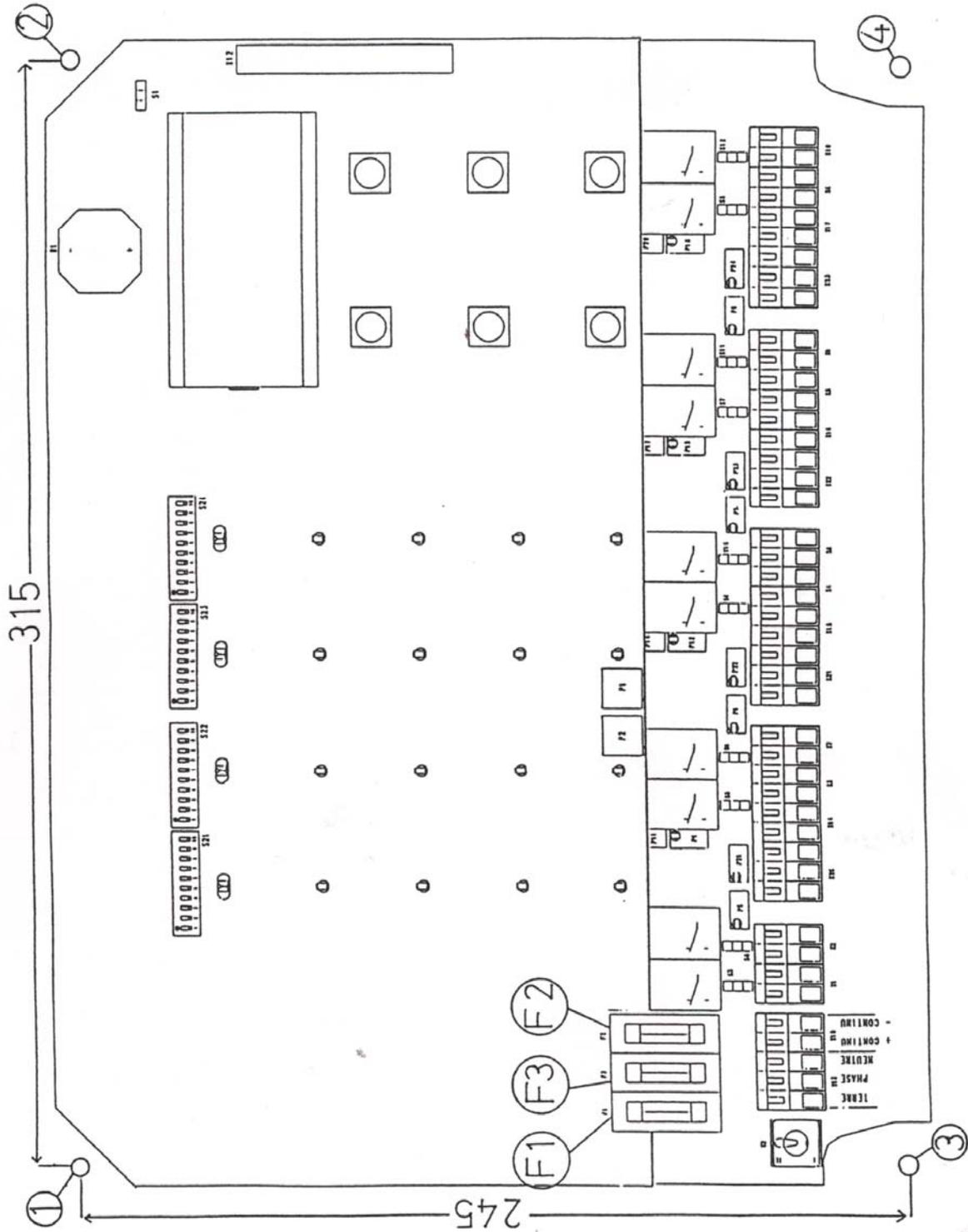
The MX 42A detection unit has 4 independent measuring channels. Each channel is connected to a gas detector located in places to be monitored. The measurement from the detector is displayed on the MX 42A detection unit and compared to alarm thresholds. Should alarm thresholds be exceeded, the MX 42A detection unit actuates relays which can be used for the control of outside devices (horn, telephone call, exhaust fans, etc.).

Note: the detection unit also comes in a 2-measuring channel version.

Main characteristics: (cf Figure 1)

- Casing for wall mounting made of PVC (length: 340, height: 300, depth: 107) with intern "plating".
- AC or DC power supply
- 4 measuring inputs for detectors of the explosimetric, toxic or oxygen type (or other type on request)
- Visualization of the measurement by LCD
- Alarms per channel:
 - 2 increasing or decreasing thresholds, manual or automatic clearance (control logic of exhaust fans on programming)
 - 1 increasing or decreasing threshold, automatic clearance, triggering on basis of time or on averaging
- Relaying: a total of 10 relays distributed as follows:
 - 2 relays per channel (NO or NC) for the first two alarm thresholds
 - 1 relay common to the channels for the third alarm threshold (or the remote transmission of the alarm on programming)
 - 1 relay common to the channels for detector faults and anomalies
- 4-20 mA output per channel (< 1 mA for fault, 2 mA for maintenance)
- Resettable buzzer should alarms or an anomaly appear

Figure 2



2. INSTALLATION AND CONNECTIONS

Please ensure you read the paragraph: Special Specifications for use in Potentially Explosive Atmospheres in Accordance with European Directive ATEX 94/9/EC

2.1. Installation

The detection unit can be installed in any place without an explosive atmosphere. It should be put in a well ventilated place where it can be watched (guard house, control room, security service...).

It is attached according to Figure 2: 4 attachment points, marked 1, 2, 3 and 4, with centres of 314 x 245 mm, using 5 mm screw.

Caution: So that the cover of the detection unit can be completely opened, there must be at least 30 cm of free space above it.

Before installation, switch off the MX42A with the switch located on the inside (bottom left corner).

2.2. Electrical connection of the MX 42A detection unit (fig 2).

Power supply: connect the power supply wires to the terminal blocks of the detection unit.

- Earth, live and neutral terminals, 220 V AC (207 V to 244 V), 50/60 Hz, protected by an F1 630 mA time-delay fuse.
- or + DC, - DC terminals, 24 V (19 V to 32 V), DC protected by an F2 4A fuse.

On option:

- either 115 V AC (103 V to 122 V), 50/60 Hz, protected by an F1 1.25 A time-delay fuse
- or 48 V (43 V to 60 V), protected by an F3 2 A time-delay fuse

A sticker on the casing gives the power supply voltages.

2.3. Connection of the detection unit to the detectors

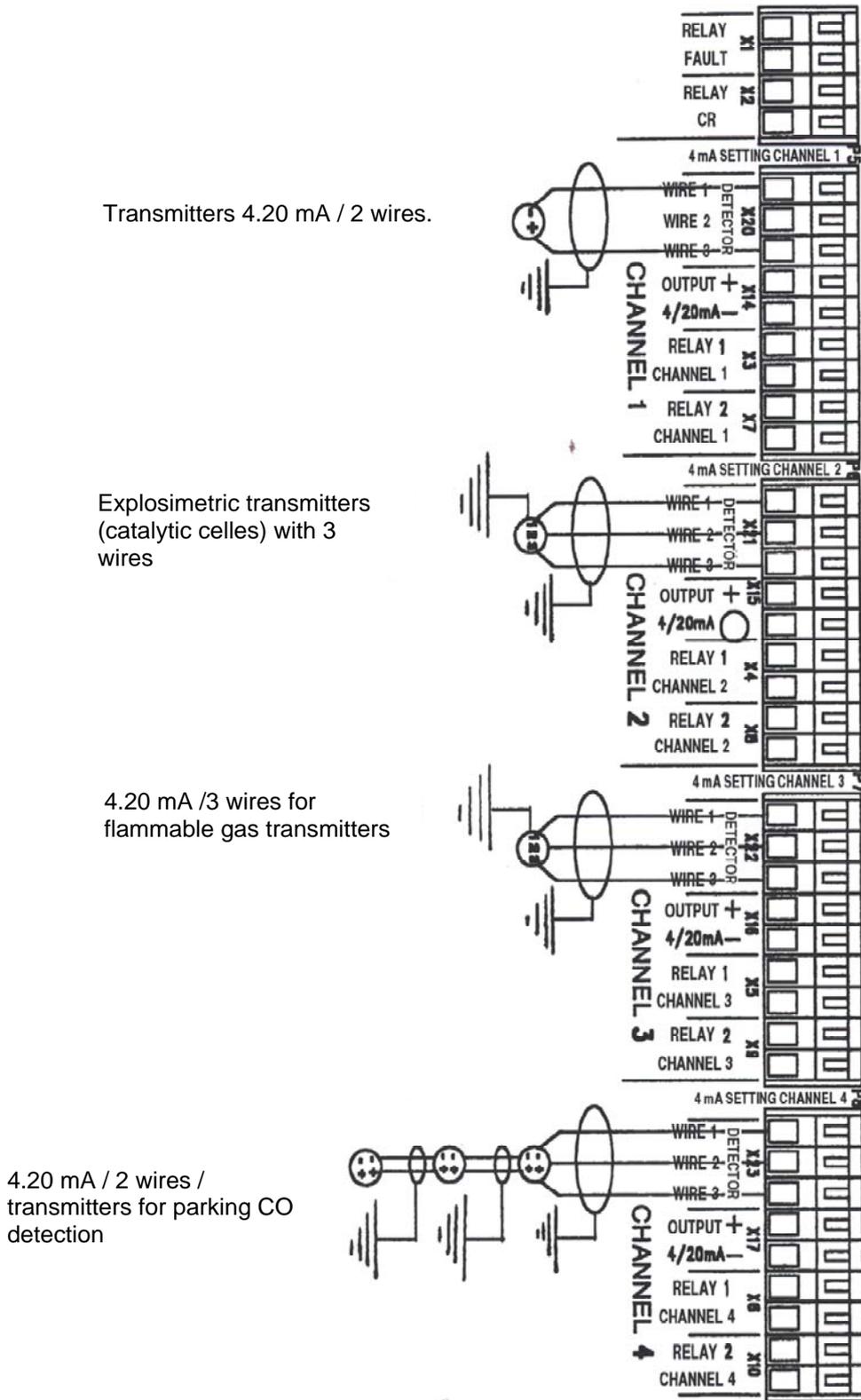
2.3.1. Physical layout of detectors

Their location depends on three main factors:

- Density of gas to be detected: in elevation for gases lighter than air and low down for gases heavier than air
- Leak point: determination of the probable source of a leak
- In the flow of air in ventilated rooms.

Figure 3

CONNECTING DIAGRAM OF DETECTORS ACCORDING TO THEIR TYPE



Transmitters 4.20 mA / 2 wires.

Explosimetric transmitters (catalytic celles) with 3 wires

4.20 mA / 3 wires for flammable gas transmitters

4.20 mA / 2 wires / transmitters for parking CO detection

2.3.2 Type and connection of detectors (fig 3).

3 types of detectors are to be differentiated:

- Explosimetric detectors of the BRIDGE type (no integrated electronics, 3 connecting wires of an armoured cable).

Resistance of detection unit - detector cable: maximum 8 ohms per wire (length 500 m, cable 3 x 1.5 mm²), or 16 ohms in a loop.

- Explosimetric detectors of the 4-20 mA type (a shielded cable with 3 wires of an armoured cable).

Resistance of detection unit - detector cable: maximum 16 ohms per wire (length 1 km, cable 3 x 1.5 mm²), or 32 ohms in a loop.

- Toxic gas or oxygen detectors of 4-20 mA type (a shielded cable with 2 wires).

Resistance of detection unit - detector cable: maximum 16 ohms per wire (length 1 km, cable 3 x 1.5 mm²), or 32 ohms in loop.

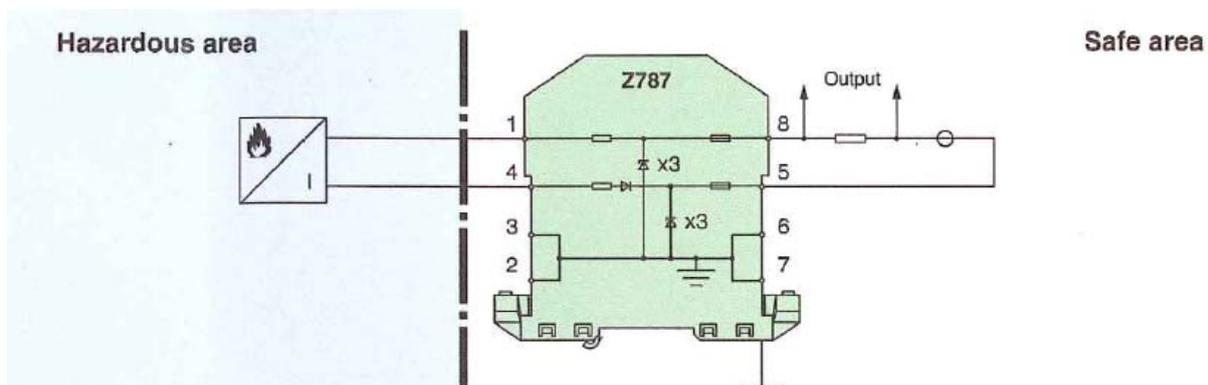
It is specified that

- detectors are connected by SHIELDED CABLES
- using shielded cables is compulsory
- the screen of shielded cables must be connected to the earth at two extremities (detectors and control unit)
- connections to the earth are considered as equipotential.

a) Parking garage application

Toxic gas detectors "Co-parking" type can be mounted in parallel in the event that it is necessary to obtain an average gas concentration. It is absolutely essential that the detectors be located in the same area. A max of, five detectors can be connected in parallel.

Connection of the Zener barrier



The Figure 4 describes the connection between the detector and the barrier

Figure 4

Connection of intrinsic safety detectors

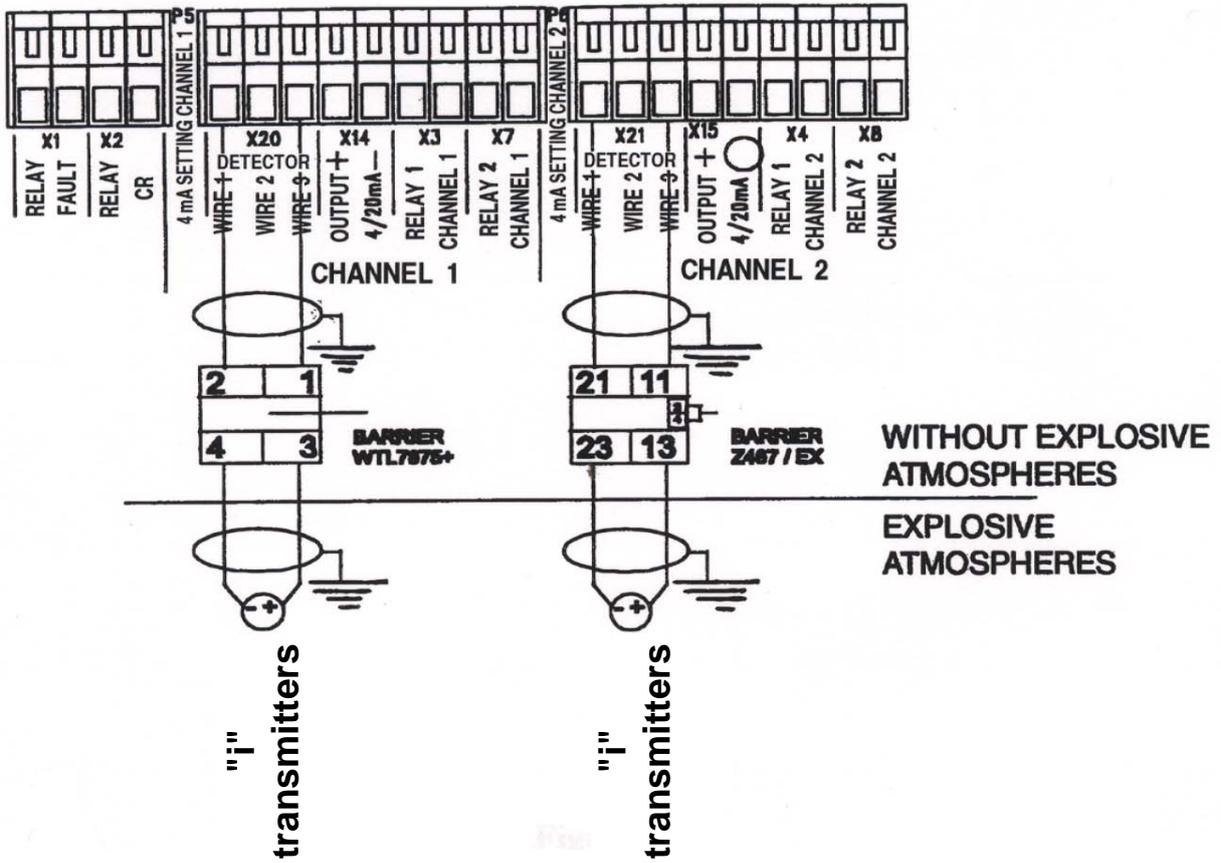
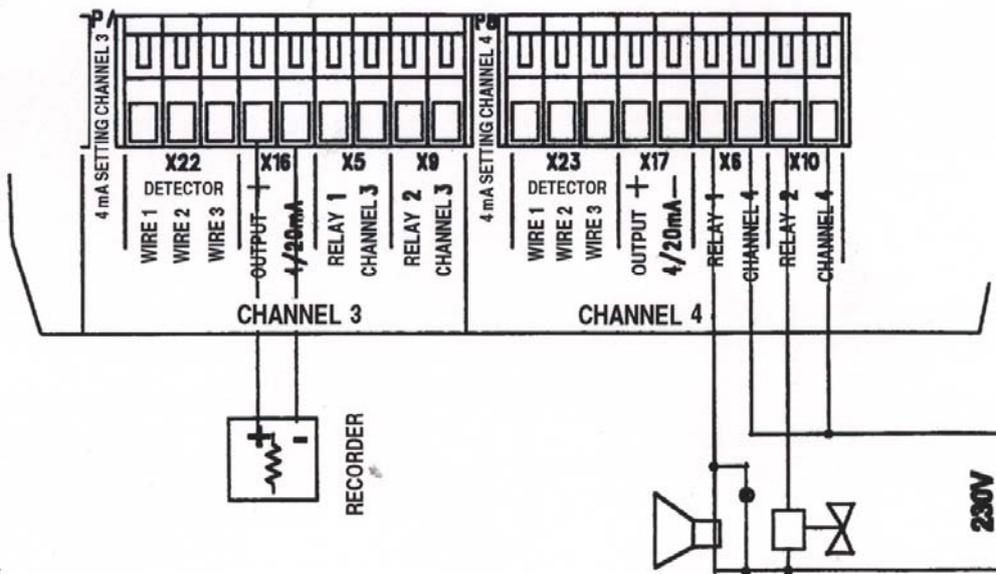


Figure 5

Example of connection to external devices



b) Special case of intrinsic safety detectors

In an area classified as having an explosive atmosphere, the electrical connection between the detection unit and the detector must be of the intrinsic safety type.

This requires the use of:

- a certified barrier
- the conformity of the connecting cable (electrical parameters stipulated in the certificate of conformity of the detector to the legislation in force).

Figure 4 shows the connection of the detector and of the barrier according to the type of barrier employed.

CAUTION: The conformity of the complete electrical safety system is not the responsibility of INDUSTRIAL SCIENTIFIC.

2.4. Connection of the detection unit to external devices

2.4.1. Connection to servocontrols

The MX 42A detection unit has 10 relays which can be used to control external devices: horn, solenoid valve, telephone call, exhaust fans,...

The relays are assigned to functions as follows:

- for each channel:
 - one relay, «RELAY 1», for triggering of alarm 1
 - one relay, «RELAY 2», for triggering of alarm 2 (or a total of 8 relays)
- for all channels:
 - a common relay, «CR RELAY», for triggering of alarms 3 of the channels
 - one relay, «FAULT RELAY», associated with faults detected on the channels (detector malfunctions, poor electrical connections)

An example of a connection is given in Figure 5:

- a light and buzzer, connected to «RELAY 1» of channel 4 will be actuated when alarm 1 of channel 4 is present.
- a solenoid valve, connected to «RELAY 2», of channel 4 will be actuated when alarm 2 of channel 4 is present.

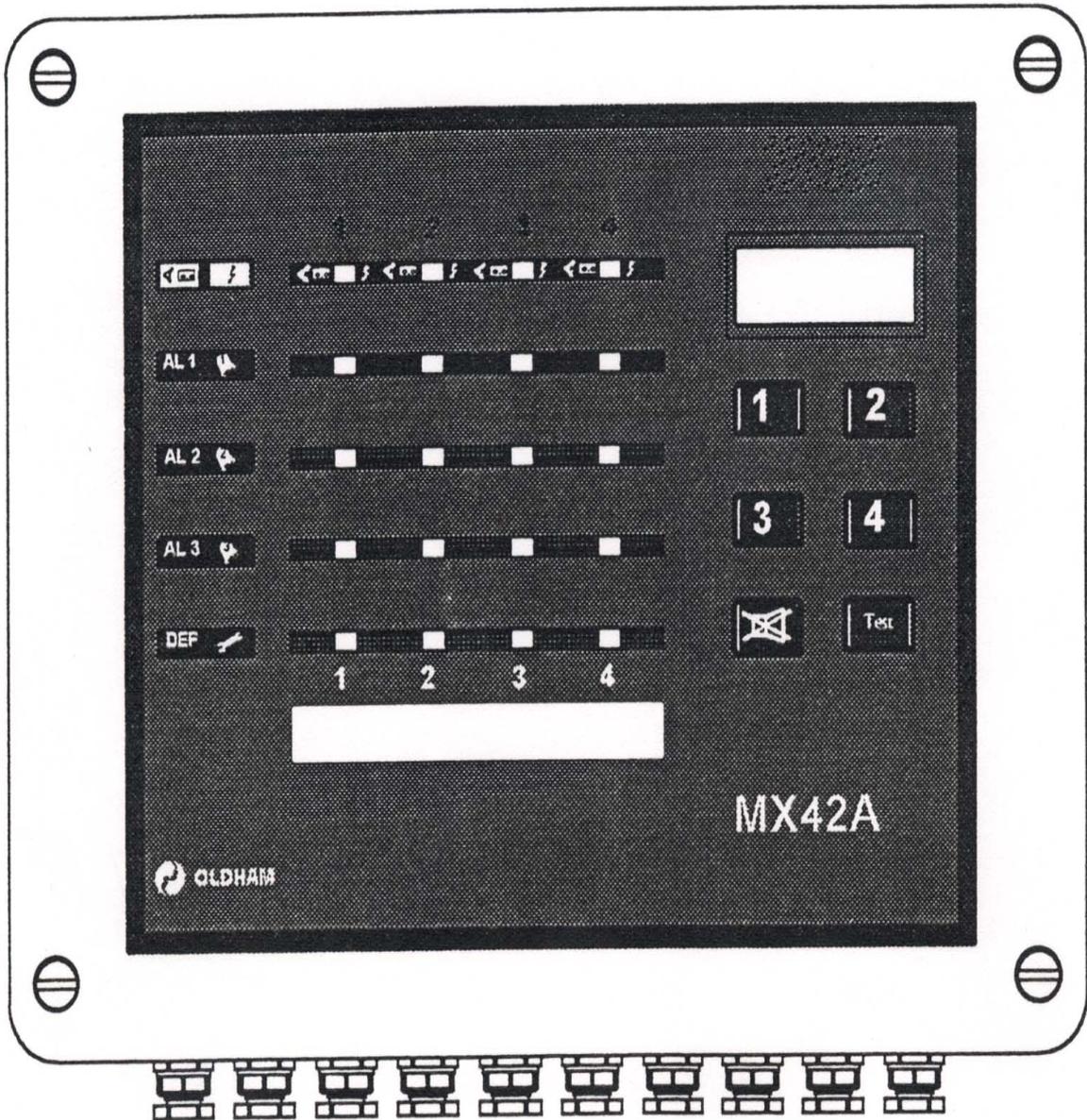
Note: Considering the low breaking power of the MX 42A relays (2 A with 240 V AC or 30 VDC), external relays must be interposed if the devices to be controlled have high power.

2.4.2. 4-20 mA current output

For each channel, the MX 42A detection unit has a 4-20 mA output which can be used for the copy of measurements on a recorder or an external controller. In a loop configuration, the maximum resistance is 600 ohms. The 4-20 mA outputs have common outer earth connections.

An example of a connection to a recorder on channel 3 is shown in Figure 5

Figure 6



3. START-UP AND OPERATION

Once the detection unit has been installed and connected, it is started up with the switch located on the inside (bottom left corner).

The MX42 goes on test mode checking the proper operation of the LEDS, LCD and the buzzer. All alarms are inhibited during test mode.

Then, the MX 42 displays channel 1 during one minute before starting scrutening all channels.

2 cases can happen:

a) Channel 1 is off (inter 8)

The display indicates « STOP », the green signal lamp « display » is steady on and the green signal lamp « channel in operation » is off.

b) Channel 1 is in operation (inter 8)

The display indicates « INIT » and then displays the actual measurement value, and the green signal lamp « channel in operation » blinks, the green signal lamp « display » is steady on.

During the scrutening of all channels, each channel is scanned by the MX 42 every 9 seconds, and the reading is held during 3 seconds.

On the front of the detection unit (Figure 6), the keys 1, 2, 3 and 4 are used to display the measurements of channels 1, 2, 3 and 4 respectively on the common LCD display window.

The «TEST» key triggers the lighting of all signal lamps and all segments of the LCD display and the functioning of the buzzer.

The «BUZZER» key resets the alarms and clears the buzzer alarm.

For each channel, 5 signal lamps indicate the status of the channel.

- a double signal lamp (Operation/Display):
 - channel in operation: LED green colour, blinking or steady on (left LED).
 - channel on display: LED colour green, steady on (right LED)
 - display signal if channel displayed on LCD window
- Alarm 1 signal: red when alarm
- Alarm 2 signal: red when alarm
- Alarm 3 signal: red when alarm
- Fault signal:
 - malfunction on line: LED colour yellow, steady on
- Calibration signal:
 - calibration mode: LED colour yellow, blinking

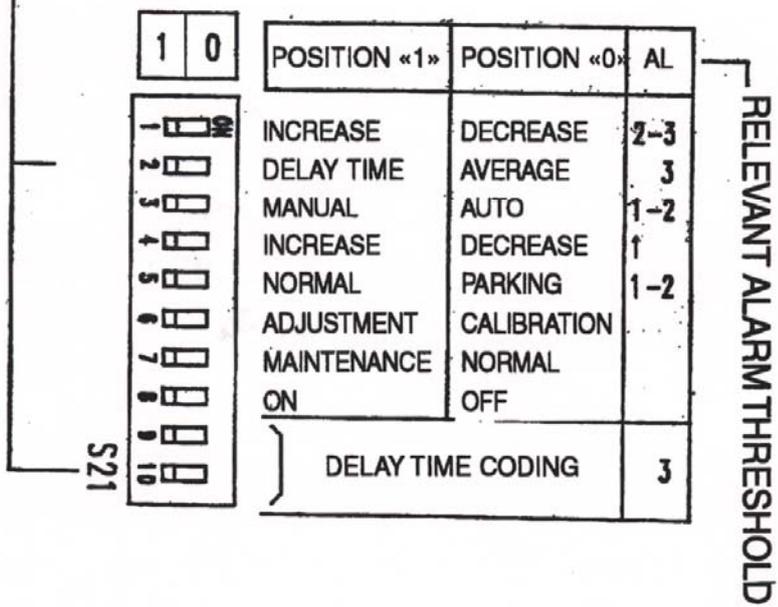
In the event of an alarm or fault, the detection unit's buzzer is actuated until cleared by the key «BUZZER».

Note: The buzzer can be inhibited by moving the strap on the display board (top right corner) to the OFF position.

Figure 7

TABLE GIVING THE DELAY TIME OF ALARM 3 WHEN MICRO-SWITCH 2 IS POSITIONED ON «DELAY TIME».

DELAY TIME CODING OF ALARM 3		
S21	CHANNEL NO 1	
9	1	0
0	0	5 SEC
1	0	10 MIN
0	1	15 MIN
1	1	20 MIN



4. CONFIGURATION OF ALARMS AND SERVOCONTROL

Caution: Adjustments described in this section are to be performed by authorized personnel only, as they are likely to jeopardize detection on which safety depends.

4.1. Characteristics of alarm triggering

There are three alarm thresholds associated with each channel:

- Threshold 1 controls Alarm 1 signal lamp and relay 1.
- Threshold 2 controls Alarm 2 signal lamp and relay 2.
- Threshold 3 controls Alarm 3 signal lamp and the CR relay (common relay).

Note: The CR relay is common to all channels.

For each channel, a block of micro switches are located on the display board and are used to program the characteristics of alarm thresholds (Figure 7).

Each channel is put into service by micro switch 8 (ON-OFF).

* The alarms can be given increasing or decreasing values. Programed by micro switche 4 for alarm 1 and 1 for alarms 2 and 3.

* The alarms can be set:

- With automatic clearance: (micro switch 3)

When a threshold is reached, the associated lamp and relay are activated. When the threshold decreases, the signals are automatically deactivated.

- With manual clearance: (micro switch 3)

When a threshold is reached, the lamp and relay are activated.

When a threshold decreases, the signals are deactivated by the manual reset button being pressed.

Note: Threshold alarm 3 has automatic clearance.

a) Special case of the 3rd alarm threshold:

The 3rd alarm relay, common to the channels are energized:

- either after a period of time set by micro switches 9 and 10.
The «ALARM 3 DELAY TIME CODING» table gives the position according to the desired lapse time required.
- or when the average value reaches the 3rd alarm threshold.
The time of averaging is set in the maintenance-adjustment Section 4.2.

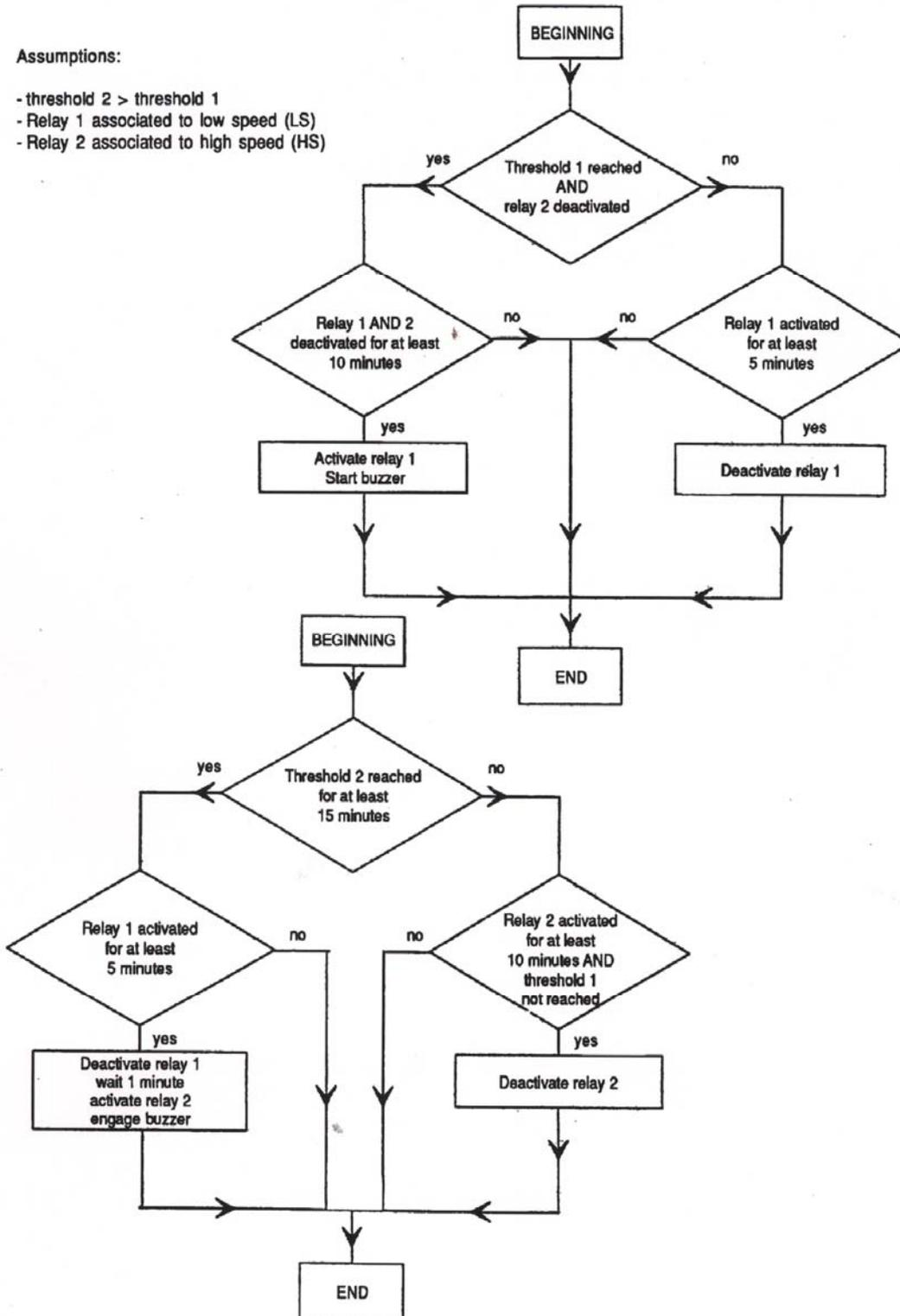
Microswitch 2 is used to set alarm 3 on either delay time or averaging.

Figure 8

Tripping of alarms 1 and 2 in parking garage cycle

Assumptions:

- threshold 2 > threshold 1
- Relay 1 associated to low speed (LS)
- Relay 2 associated to high speed (HS)



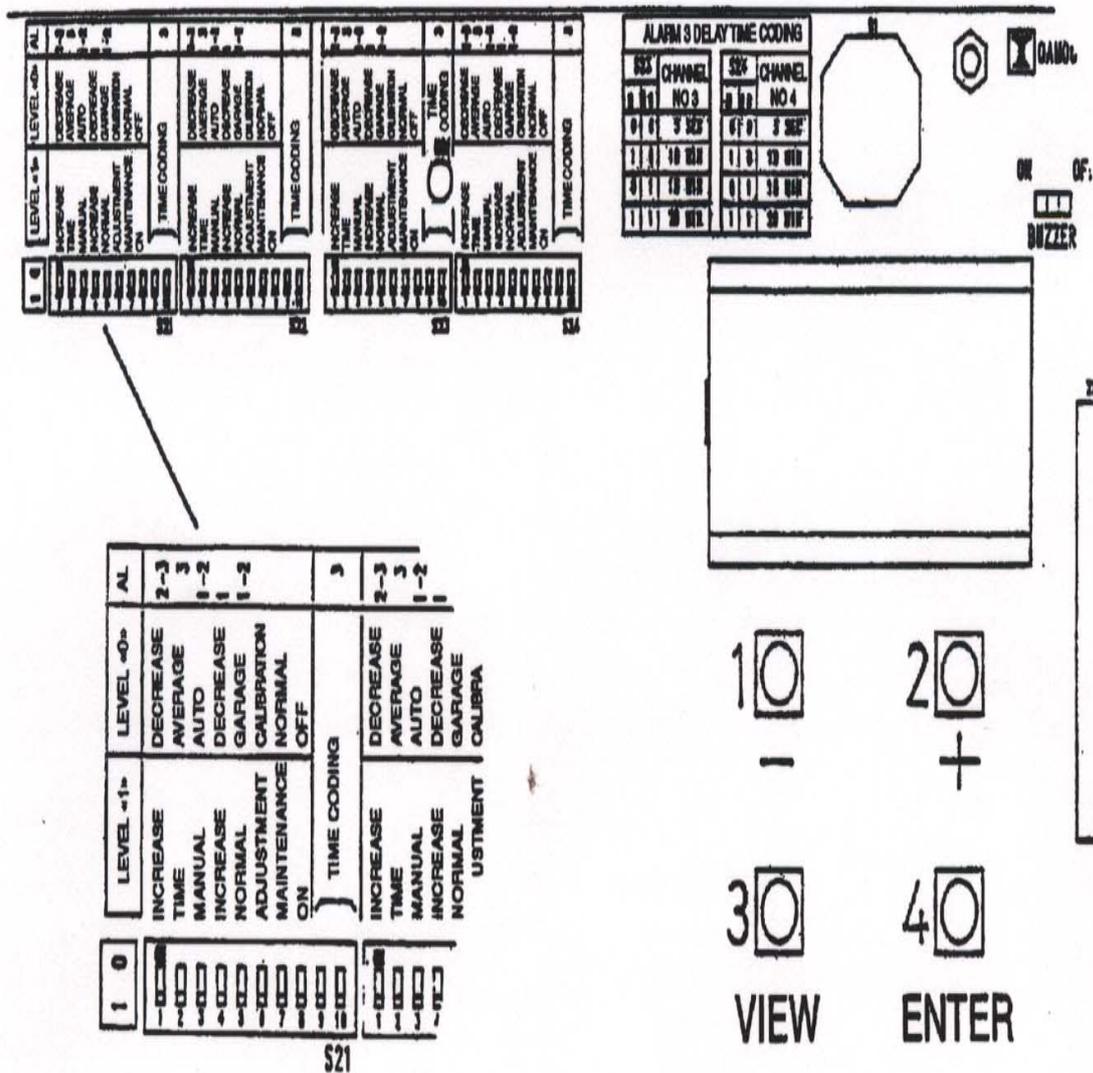
b) Special case of alarms 1 and 2 in parking garage cycle

With micro switch 5, it is possible to select the way in which relays 1 and 2 will be activated, i.e.

- according to a special control cycle, used only to start extractor fans, especially in parking garages.

In this case, alarm 1 is generally associated with the low speed (LS) of the extractor fan. Alarm 2 is associated with the high speed (HS) of the fan. The control cycle in the parking garage mode is provided to avoid destruction of the fan due to sudden change over from low speed to high speed. The control logic is shown in Figure 8.

Figure 9



4.2. Programming of parameters

The alarms are adjusted in the factory. However, these adjustments can be changed:

For the selected channel, use the following configuration (Figure 9).

Switch 8 : on
Switch 7 : maintenance
Switch 6 : adjustment

In this mode, keys 1, 2, 3 and 4 have the following functions:

Key 4 = «enter + change over to following parameter»
Key 3 = «view the value of the parameter»
Key 2 = «key +» increments the parameter
Key 1 = «key -» decrements the parameter

The following parameters are accessed successively:

AL1: alarm 1 threshold
AL2: alarm 2 threshold
AL3: alarm 3 threshold
T1 : averaging time of alarm 3 (0=<val=<1999 minutes)
PT : sets the position of the decimal point according to the detector measuring range.
SUP : overrange

EXAMPLE 1 : positioning alarm 3 at 150 for channel 2:

- On the micro switch block of channel 2, position micro switch 7 to MAINTENANCE, 6 to ADJUSTMENT. The LCD displays AL1.
- Press the «enter» key. The LCD displays AL2.
- Press the « enter» key. The LCD displays AL3.
- Press the «view» key. The LCD displays the present value of the alarm 3 threshold.
- With the «+» and «-» keys, set the desired threshold.
- Press the «enter» key. The threshold is memorized.
- Set micro switch 7 to normal.

EXAMPLE 2 : How to program the function "overrange " (SUP)

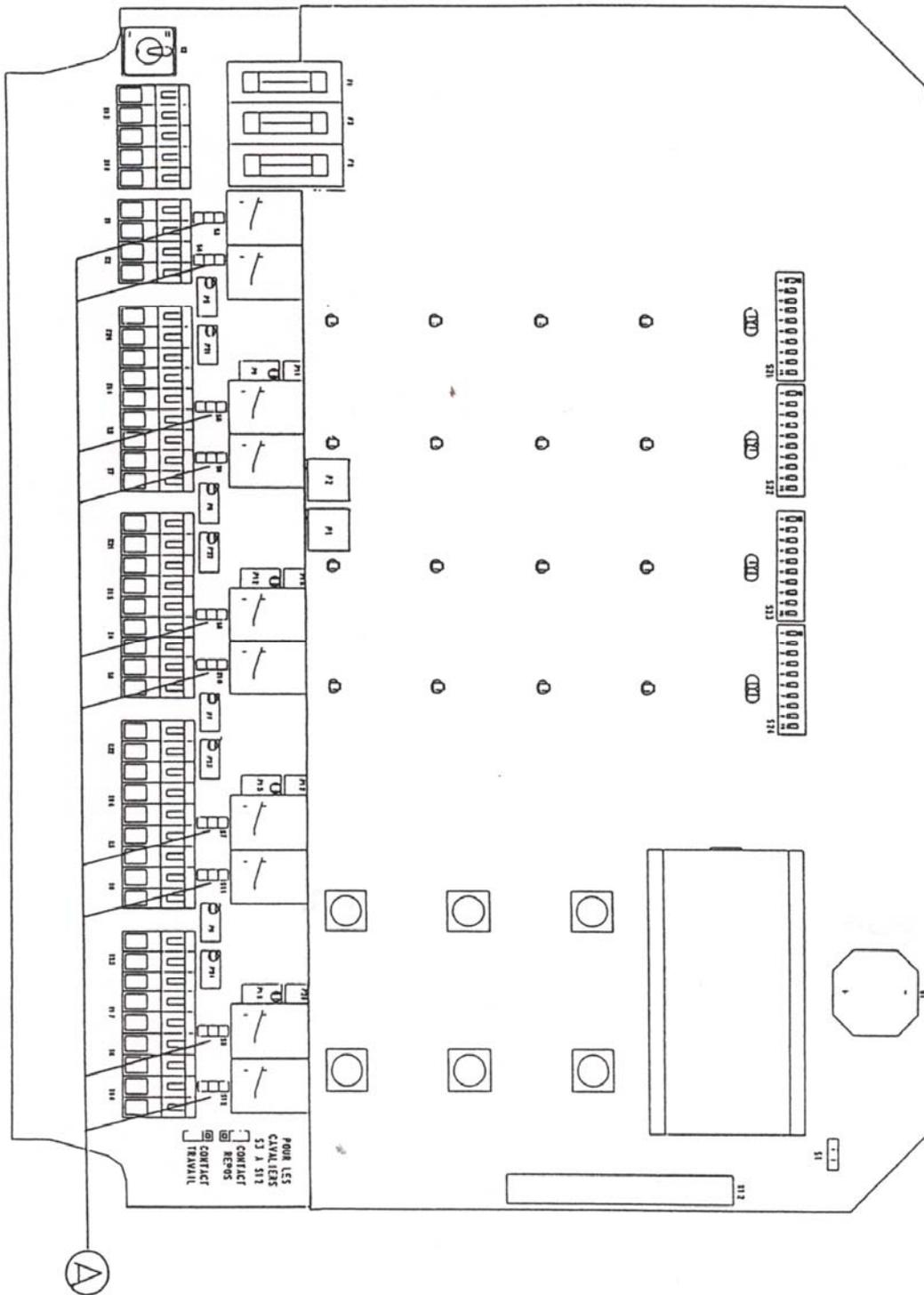
- Concerning a new function "100 % LEL overrange" (software version : V9)
- That function can be preprogrammed in operation or not
- Procedure of programming :
 - Consult chapter 4.2 informations (technical manual) to use the keypad
 - The new list of programmable parameters will be :
 - AL1/AL2/AL3/TI/PT and now SupX (X=preprogrammed channel number)
 - The parameter "SUP" will be inhibited if "OFF" (touche 1) validated (touche 4)
 - The parameter "SUP" will be in operation if "ON" (touche 2) validated
 - If the function "SUP" is validated and if your are detecting a concentration of 100 % LEL or more : the display will show this message "SUP" and you will be blocked
 - If the function "SUP" is triggered, all the alarms "gas and default" will be activated
 - To acknowledge this alarm "SUP" :
 - Either you move the switch 7 (see picture 7)
 - Or you move the switch 8 (see picture 7)
 - Or you move the switch of power supply (see picture 2)

Note:

The fault lamp blinks to signal the maintenance mode. The maintenance mode lasts for 30 minutes. Beyond that time, the channel automatically changes over to fault. Only one channel can be programmed at a time.

When a channel is in the maintenance mode, the 4-20 mA current output is set to 2 mA.

Figure 10



4.3. Servocontrol

4.3.1. Relays

With the position of straps S3 to S12 (Figure 10), the open or closed contacts of the relays can be selected on the output of the terminal blocks.

This selection is made by simply moving the corresponding straps. As standard, the relays (except for the fault relay) are in positive safety, which means energized without an alarm.

4.3.2. 4-20 mA current output

A 4-20 mA output is available on the terminal block for each channel. It serves to connect the MX 42A detection unit to a chart recorder or to any other data acquisition system (maximum load resistance 600 ohms).

In the event of malfunction, the output is set to a current < 1 mA.

In the maintenance position, it is set to a current of 2 mA.

Note:

The 4-20 mA output is preset in the factory: 4 mA corresponds to a display of 0 and 20 mA corresponds to a full-scale value. Potentiometers P5, P6, P7 and P8 (for channels 1, 2, 3 and 4 respectively) adjust the 4 mA. Potentiometers P21, P22, P23 and P24 (for channels 1, 2, 3 and 4 respectively) adjust the 20 mA.

5. PERIODIC SERVICING

Gas detection instruments are potential life-saving devices. Recognizing this fact, Industrial Scientific Corporation recommends that a functional “bump” test be performed on every fixed gas-monitoring instruments as part of a regular maintenance program. A functional test is defined as a brief exposure of the detector to a concentration of gas(es) in excess of the lowest alarm set-point for each sensor for the purpose of verifying sensor and alarm operation and is not intended to be a measure of the accuracy of the instrument.

Industrial scientific further recommends that a full instrument calibration be performed using a certified concentration(s) of calibration gas(es) quarterly, every 3 months.* Calibrations may be necessary more or less frequently based, for example, on application, field conditions, exposure to gas, sensor technology, and environmental conditions. The frequency of calibration is best determined by company policy or local regulatory agencies. If an instrument fails to operate properly during any functional “bump” test, a full instrument calibration should be performed successfully prior to use.

These recommendations are based on safe work procedures, industry best practises, and regulatory standards to ensure worker safety. Industrial scientific is not responsible for setting safety practices and policies.

** For new installations it may be prudent to carry out bump tests frequently at first (perhaps weekly), increasing the time intervals (to, perhaps, monthly or more) as confidence grows with experience in the installation concerned, on the basis of the maintenance record.*

Caution: The adjustments described in this section are to be carried out by authorized personnel only, since they are likely to jeopardize detection on which safety depends.

5.1. Adjustment of detectors from the MX 42A detection unit

Adjustment consists of calibrating the zero of the detector in pure air and the sensitivity of the detector to the reference gas.

For each channel, use the following configuration (Figure 7).

Switch 8 = on
Switch 7 = maintenance
Switch 6 = calibration

* Adjustment of detector zero

Use potentiometer P9 for channel 1, P12 for channel 2, P15 for channel 3 and P18 for channel 4 (Figure 11, «ZERO») to display 0000 on the channel in question. If the ambient air is not pure, inject air from a cylinder containing synthetic air.

* Adjustment of the sensitivity of the detector

- Inject the reference gas with the calibration tube at the recommended flow rate (30 to 60 l/h, depending upon the detector).
- When the reading has stabilized, adjust display to the value of the reference gas using potentiometer P11 for channel 1, P14 for channel 2, P17 for channel 3 and P20 for channel 4 (Figure 11, «SENS»).

Return to the configuration:

Switch 8 = on
Switch 7 = normal
Switch 6 = calibration

In the maintenance mode, the current output is set to 2 mA.

Caution: If forgotten, the channel automatically changes over to fault after 1/2 hour.

5.2. Local adjustment at the detectors

For some types of detectors, in particular the 4-20 mA detectors, the zero and sensitivity can be adjusted directly on the detector (refer to the detector instruction manual).

Note:

We are at your disposal to supply you with calibration gas or an annual servicing contract. The work under this contract is performed by our specialists, and this contract will guarantee perfect operation of the installation. Between the dates of the scheduled servicing work performed by INDUSTRIAL SCIENTIFIC, no adjustment is necessary. The maintenance department of the user is thus not burdened by any additional work load.

6. TROUBLESHOOTING

FAULT-MESSAGE	CAUSES	CORRECTIVE ACTION
Display off or no signal lamp lighted	<ul style="list-style-type: none"> - fuse blown - switch on OFF 	<ul style="list-style-type: none"> - check power supply voltages and change the fuses if necessary (cf 22) - set the switch to ON (cf III)
«STOP» displayed	channel out of service	put the channel in service (cf 41)
«INIT» displayed	channel undergoing initialization	message displayed as soon as a channel is put into service (cf III)
Fault signal lamp lighted (yellow)	<ul style="list-style-type: none"> - bad detector electrical connections - defective detector - the type of detector does not correspond to the factory configuration of the channel - channel very badly adjusted 	<ul style="list-style-type: none"> - check the connections - change the detector - change the type of detector (Caution: The channel could have been damaged) - adjust the channel (cf V)
Fault signal lamp lighted and «DEF» displayed	channel in maintenance mode for more than 30 minutes	reset the channel on «NORMAL» (cf Figure 7)
Yellow LED lighting and display "SUP"	Explosible channel overrange (> 100 % LEL) triggering	Remove switches 7 or 8 (for concerned channel)
Fault signal lamp blinking	channel in maintenance position	reset the channel on «NORMAL» (cf Figure 7)
External servocontrol controlled in opposite direction, in relation to the tripping of the alarm	bad choice of relay contact	move the strap to use the common NO contact or the common NC contact (cf 431)

7. DETAILED TECHNICAL CHARACTERISTICS

7.1. Casing

Casing	:	PVC (polyvinyl chloride), completely shielded inside
Operating temperature	:	-10°C to +40°C
Storage temperature	:	-20°C to +55°C
Relative humidity	:	0 to 95%, non condensing
Tightness	:	IP54
Dimensions	:	340 x 300 x 107 mm (length x height x depth)
Weight	:	4.75 kg
Positioning	:	wall-mounted
Guarantee	:	1 year
Function	:	wall-mounted monitoring unit for gas detection
Capacity	:	4 channels (2 on option)
Measurement	:	continuous
Connection	:	1 to 5 gas detectors per channel (depending on type)
Manufacturer	:	INDUSTRIAL SCIENTIFIC

7.2. Display

Display	:	Digital LCD
Measuring scale	:	0 to 100 0 to 300 0 to 1000 0 to 2000
Signal lamps	:	24 DELs, see details in Section «ALARM»

7.3. Power supply

Electrical supply accessible in casing

- * 103 V to 122 V AC, 50/60 Hz (option)
- * 207 V to 244 V AC, 50/60 Hz
- * 19 V to 32 V DC
- * 43 to 60 V DC (option)

Fuses:

0.63 A, time-delayed, for 230 V and 110 V

4 A for 24 V

2 A, time-delayed, for 48 V

Power consumption: 85 VA or 67 W

On/off switch inside casing

Earth terminal: yes

Cable outlet through 10 metallic cable glands, connected to the earth.

Maximum shielded cable diameter: 10 mm

7.4. Measurement inputs

Line resistances (loop) in ohms between detector and detection unit

- * Explosimetric detector of the BRIDGE type, 3 wires: 16 ohms (500 m long, cable 3 x 1.5mm²)
- * Explosimetric detector of 4-20 mA type, 3 wires or 2 wires: 32 ohms (1 km long, cable 3 x 1.5mm²)

7.5. Alarm

Visual alarms provided: for each channel

- * fault signal lamp:
 - channel in service: green color
 - channel off or malfunction of microprocessor: off
 - disturbance on line: steady yellow color
 - calibration/adjustment mode: blinking yellow color
- * alarm 1 signal lamp: red color when alarm
- * alarm 2 signal lamp: red color when alarm
- * alarm 3 signal lamp: red color when alarm

Alarms 1 and 2

- activation after 5 seconds
- by increasing or decreasing value
- manual or automatic clearance

Alarm 3

- activation after elapsed delay time or on basis of average value
- automatic clearance
- by increasing or decreasing value

Disturbance

- complete check of short circuit or cut out of at least one wire (with just one detector)
- display per channel with yellow signal lamp

Buzzer

Triggered if:

- microprocessor malfunction
- anomaly of connecting cable or detector
- alarm threshold level exceeded
- maintenance time longer than 30 minutes

7.6. Control functions

Accessible after removal of front panel

For each channel:

- A set of 10 microswitches
 - Microswitch no. 8: on/off
 - Microswitch no. 7: maintenance/normal
 - Microswitch no. 6: programming/normal
 - Microswitch no. 5: normal/parking garage (alarm 1 and 2)
 - Microswitch no. 4: increase/decrease (alarm 1)
 - Microswitch no. 3: manual/auto (alarm 1 and 2)
 - Microswitch no. 2: time delay/average (alarm 3)
 - Microswitch no. 1: increase/decrease (alarm 2 and 3)
 - Microswitch no. 9: time delay coding (alarm 3)
 - Microswitch no. 10: time delay coding (alarm 3)
- Potentiometers for the adjustment of zero and sensitivity of detector
- Programming by keys of alarms thresholds, averaging time (alarm 2)

7.7. Relaying

Relay contacts

- * 2 relays per channel for alarm 1 and alarm 2 (positive safety)
- * 1 common relay for alarm 3 (or on option for remote transmission of alarm) (positive safety)
- * 1 common relay for malfunction (negative safety)
- * for each relay, choice of common closed contact or common open contact (by positioning of straps S3 to S12)
- * characteristics of contact: 2A-250 V AC or 30 VDC

7.8. Output of measurements

4-20 mA current outputs per channel (common earth)

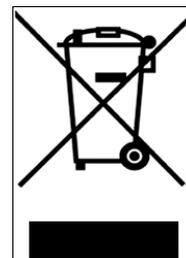
Load resistance (loop): maximum 600 ohms

In case of fault: output < 1 mA

In maintenance position: output = 2 mA

8. Scrapping of mx42a

Concerning the conservation, of the protection and the improvement of the quality of the environment, as well as for the protection of the health of the persons and the careful and rational use of natural resources, MX42A has to be the object of a selective collection for the electronic equipments and cannot be scrapped with the normal domestic waste. The user thus has the obligation to separate the MX42A of the other waste so as to guarantee that it is recycled in a sure way at the environmental level. For more details of the existing sites of collection, contact the local administration or the distributor of this product.



9. LIST OF MX42A SPARE PARTS

9.1. Spare parts

DESIGNATION	REFERENCE
Analog bus card	6451403
µp/display card	6451402
LCD	6133511
MX42A casing	6321280
PG 9 cable gland	6143442
MX42A sticked front panel	6122435
5 x 20 : 630 mA fuse	6154627
5 x 20 : 4 A fuse	6154715
tool kit	6147840

9.2. Intrinsic barriers and accessories

MODELS OF SI BARRIERS	REFERENCE	TYPES	INDUSTRIAL SCIENTIFIC CASING	
Z787 / EX	6184703	rail DIN mounted model		
MTL787S+	6797100	Obligatory flammeproof casing mounted model	for 2 zener barriers	6797192
			for 5 zener barriers	6797547
			for 12 zener barriers	6797101

10. Special Specifications for use in Potentially Explosive Atmospheres in accordance with European Directive ATEX 94/9/EC.

The MX42A detection device designed to measure explosive gasses and oxygen complies with the requirements of European Directive ATEX 94/9/EC on potentially explosive atmospheres.

As a result of its metrological performance, as tested by the research and testing organisation INERIS, the MX42A device, is classified as a safety device when used with INDUSTRIAL SCIENTIFIC CEX300 and OLC/OLCT 20, 40, 50 and 60 series detectors. The device may therefore contribute to limiting the risk of explosion as a consequence of the data it supplies to external units.

The information contained in the following paragraphs should be adopted and complied with by the person responsible for the site on which the equipment is installed. Please refer to the provisions of European Directive ATEX 1999/92/EC on improving health and safety conditions for workers exposed to potentially explosive atmospheres.

10.1. Specifications for mechanical and electrical installation in Classified Areas.

Installation will comply with all applicable standards, and particularly with EN 60079-14, EN 60079-17 and EN 50281-1-2.

The MX42A device must not be subject to intense mechanical vibration and must be installed in a safe area away from potentially explosive atmospheres.

It is essential to refer to the user and installation manuals for the gas detectors referred to above, particularly the paragraph entitled 'Special Specifications for use in Potentially Explosive Atmospheres in Accordance with European Directive ATEX 94/9/EC'

Where intrinsic safety installations are concerned, it should be borne in mind that the person responsible for IS installation (the "System Designer") must draw up a system document demonstrating that every aspect of the Power Cable Detector system complies with intrinsic safety. Please refer to EN 50039 for group II and EN 50394-1 for group I when drafting this document.

10.2. Metrological Specifications

The device complies with the following European standards:

With explosive gas detectors:

- European standards EN 50054 and EN 50057 for Methane (calibration gas), Propane and Hydrogen (gasses following response curves) where the device is used with CEX300 and OLC/OLCT 20, 40, 50 and 60 series gas detectors. Where the device is used with other types of sensor producing an output measurement current of 4/20 mA, these must comply with paragraph 1.5 of Appendix II of the ATEX 94/9/EC Directive and be compatible with their characteristics (cf. device transfer curve).
- European Standard EN 50271

Oxygen detectors:

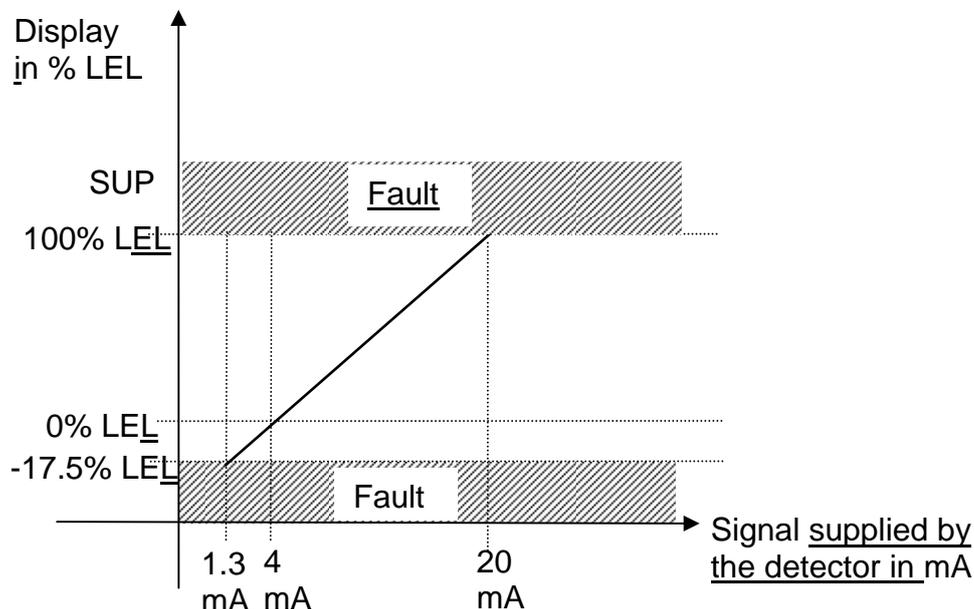
- European Standard EN 50104 where the device is used with OLCT 20, 40, 50 and 60 gas detectors. Where the device is used with other types of sensor producing an output measurement current of 4/20 mA, they must comply with paragraph 1.5 of Appendix II of the ATEX 94/9/EC Directive and be compatible with their characteristics (cf. device transfer curve).
- European Standard EN 50271

10.3. Connecting detectors other than INDUSTRIAL SCIENTIFIC detectors to the MX42A device

As previously explained, users wishing to connect detectors other than those manufactured by INDUSTRIAL SCIENTIFIC, must ensure their compatibility with the device in order that the resulting combination may be considered as a safety device.

10.3.1. Device transfer curves in 0% to 100% LEL configuration

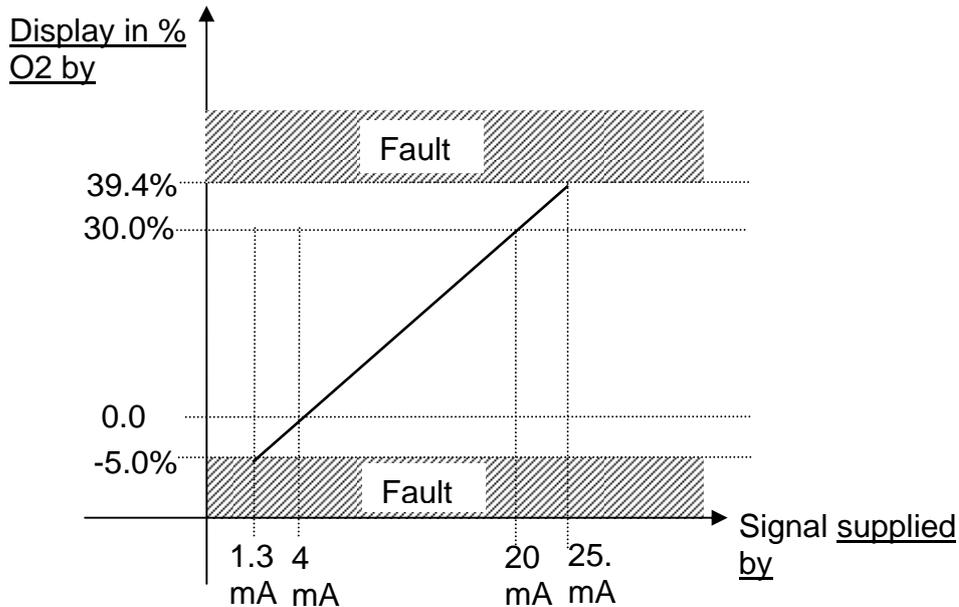
The following curve shows the response of the device in terms of value measured, and fault processing as a function of the input current value supplied by the detector. Where the user connects a brand of detector other than INDUSTRIAL SCIENTIFIC to the MX42A device, he must check carefully that the transfer curve is fully compatible with the device input characteristics, to ensure that the data generated by the detector is correctly interpreted. Equally, the device must supply a suitable power supply voltage, allowing for cable voltage losses.



Please note: When the value measured is $\geq 100\%$ LEL, the measuring device memorises the fact that the value has exceeded the scale and the channels switch to alarm and fault mode. Resetting these statuses is a manual operation to be performed by the user, who must follow the safety regulations specific to the site. The reset is checked either by turning the device on and off or by a maintenance inspection.

10.3.2. Device transfer curves in 0% to 30.0% OXYGEN configuration

The following curve shows the response of the device in terms of value measured, and fault processing as a function of the input current value supplied by the detector. Where the user connects a brand of detector other than INDUSTRIAL SCIENTIFIC to the MX42A device, he must check carefully that the transfer curve is fully compatible with the device input characteristics, to ensure that the data generated by the detector is correctly interpreted. Equally, the device must supply a suitable power supply voltage, allowing for cable voltage losses.



10.3.3. Power supply and load resistance characteristics

Maximum current available between terminals 2 and 3: 250 mA at 19 V.

Maximum no-load voltage between terminals 2 and 3: 30 V

Load resistance (outside the IS barrier) between terminals 1 and 2: 47 ohms

N.B.: This data applies only where detectors other than INDUSTRIAL SCIENTIFIC are used. Where different types are mixed, please contact INDUSTRIAL SCIENTIFIC to establish the feasibility of the combination.

10.4. MARKING

INDUSTRIAL SCIENTIFIC

CE 0080



II 2 (G)

INERIS 04ATEX0064



La Société **OLDHAM S.A.**, ZI Est 62000 Arras France, atteste que le matériel neuf :
(The Company **OLDHAM S.A.**, ZI Est 62000 Arras France, declares that the following new material:)

CENTRALE DE MESURE (control unit) MX42A

**Reliée aux détecteurs de gaz (connected to Gas detectors) type
CEX300 / OLC-OLCT 20 - 40 - 50 - 60**

est conforme aux exigences des Directives Européennes suivantes :
(comply with the requirements of the following European Directives :)

I) Directive Européenne ATEX 94/9/CE du 23/03/94 : Atmosphères Explosives
The European Directive ATEX 94/9/CE of 23/03/94: Explosive Atmospheres

Normes harmonisées appliquées : **EN 50054, EN 50057, EN 50104, EN 50271**
(Harmonised applied Standards) Performances métrologiques pour la détection des gaz combustibles et de l'oxygène (Performance requirements for combustible gases and oxygen)

N° Attestation CE de Type du matériel : **INERIS 04ATEX0064**
(N° of EC type examination certificate)

Catégoric (Category):  **II (2) G**

N° de la Notification Assurance Qualité de Production de l'usine de fabrication de Arras : **INERIS 00ATEXQ403**
(N° of the Production Quality Assurance Notification of the Arras factory)

Délivrés par l' Organisme notifié sous le numéro 0080: **INERIS, rue Taffanel, 60550 Verneuil en Halatte, France.**
(Issued by the Notified Body n°0080)

II) 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 50081-1-2 / EN 50082-1-2**
(Harmonised applied Standards)

III) Directive Européenne DBT 73/23/CEE -93/68/CEE du 22/07/93 : Basse Tension
The European Directive LVD 73/23/CEE -93/68/CEE of 22/07/93 Concerning Low Voltage

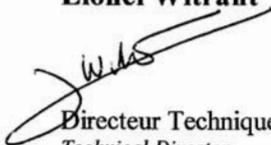
Normes harmonisées appliquées : **EN 61010-1**
(Harmonised applied Standards)

Arras, le 17/12/04

Le Représentant de l'entreprise
On Behalf of the firm

Lionel Witrant




Directeur Technique
Technical Director

Nous nous engageons

We undertake

1 Les Plus

Au travers de notre service client, à répondre rapidement et efficacement à vos besoins de conseil, de suivi de commande, et ce, partout dans le monde.
A répondre dans les plus brefs délais à toutes questions d'ordre technique.

2 Qualité

A vous assurer la meilleure qualité de produits et de services conformément aux normes et directives internationales en vigueur.

3 Fiabilité & Contrôles

A 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

A mettre en service, sur demande, votre matériel par nos techniciens qualifiés Ism.ATEX. Un gage de sécurité supplémentaire.

5 Formation

A dispenser des formations ciblées.

6 Contrat d'entretien

A 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 détecteurs de gaz fixes ou portables et le contrôle des asservissements.

7 Dépannage sur site

A faire intervenir nos techniciens du **Service Après Vente** rapidement. Ceci est possible grâce à nos implantations de proximité en France et à l'étranger.

8 Dépannage en usine

A 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 our customer service to respond to your needs for advice and order follow-up services wherever in the world you may be.
To answer all your technical questions as quickly as possible.*

2 Quality

To provide you with products and services of the best quality, in accordance with current international directives and regulations.

3 Reliability and inspections

To supply you with reliable equipments. 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 equipments are configured to meet your requirements).

4 Start-up

That our Ism.ATEX qualified technicians will start up your equipment, if you wish so. This gives you the guarantee of additional safety.

5 Training

Will train on risks, on products and on consulting: Highlights that meet your needs.

6 Maintenance contract

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 fixed or portable gas detectors, the calibration of equipment and the verification of servo-control systems.

7 Field servicing

To send out our After-Sales Service technicians quickly for servicing on your site. This is made possible by our efficient network in France and other countries.

8 Factory repairs

We give 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 technical support service : 00 33 3 21 60 80 80

NOTRE MISSION

Protéger l'Homme dans ses activités professionnelles.
Fournir la plus haute qualité et le meilleur service client à chaque échange, à chaque instant.

OUR MISSION :

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

**INDUSTRIAL
SCIENTIFIC**

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