



Référence : NPS4BGB  
Révision : E.0

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The information contained in this manual is accurate to our knowledge.

As a result of continuous research and development, the specifications of this product may be modified at any time without prior notice.

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# Chapter 1 | General Information

## User Manual

The instructions given in this manual must be read thoroughly before installation and start-up, particularly those concerning the points related to the safety of the end-user. This user manual must be made available to every person involved in the activation, use, maintenance, and repair of the unit.

The information, technical data, and diagrams contained in this manual are based on the information that is available at a given time. In case of doubt, contact *Oldham* for additional information.

The aim of this manual is to supply simple and accurate information to the user. *Oldham* cannot be held liable for any misinterpretations in the reading of this manual. In spite of our efforts to produce an error-free manual, it may nonetheless contain some unintentional technical inaccuracies.

In the client's interest, *Oldham* reserves the right to modify the technical characteristics of its equipment to increase their performance without prior notice.

The present instructions and their content are the inalienable property of *Oldham*.

## Symbols used

Icon	Significance
	This symbol indicates useful additional information.
	This symbol indicates: Earth ground connection.
	This symbol indicates: DC voltage
	This symbol indicates: AC voltage
	This symbol indicates: Double insulated
	This symbol denotes: <b>Attention! In the present mode of use, failure to adhere to the instructions preceded by this symbol can result in a risk of electric shock and/or death.</b>



This symbol indicates:

You must refer to the instructions.

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European Union (and EEA) only. This symbol indicates that this product must not be discarded with household waste, as per the EEA directive (2002/96/EC) and your own national regulations.

This product must be disposed of at a collection point that is reserved for this purpose, for example, an official site for the collection of electrical and electronic equipment (EEE) in view of their recycling, or a point of exchange for authorized products that is accessible when you acquire a new product of the same type.

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## Safety Instructions

Labels intended to remind you of the principal precautions of use have been placed on the unit in the form of pictograms. These labels are considered an integral part of the unit. If a label falls off or becomes illegible, please ensure it is replaced. The significance of the labels is detailed below.

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The installation and electrical connections must be carried out by qualified personnel according to the instructions of the manufacturer and the standards of the competent authorities.

Failure to adhere to the instructions can have serious consequences on the safety of persons. Please be extremely rigorous as regards electricity and assembly (coupling, network connections).

Cables with an operating temperature of 60°C minimum (140 °F) must be used because the temperature inside the controller can reach 65°C (149 °F).

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## Important Information

The modification of the material and the use of parts of an unspecified origin shall entail the cancellation of any form of warranty.

The use of the unit has been projected for the applications specified in the technical characteristics. Exceeding the indicated values cannot in any case be authorized.

## Liability Limits

Neither *Oldham* nor any other associated company under any circumstances can be held liable for any damage, including, without limitations, damages for loss or interruption of manufacture, loss of information, defect of the *Surveyor 4B* controller, injuries, loss of time, financial or material loss, or any direct or indirect consequence of loss occurring in the context of the use or impossibility of use of the product, even in the event that *Oldham* has been informed of such damage.

## Warranty

Under normal conditions of use and on return to the factory, parts and workmanship carry a one year warranty, excluding consumables such as backup power supplies, audio and visible alarms, etc.

## Chapter 2 | Description

This controller is intended for the continuous measurement and control of the gases present in the atmosphere.

The *Surveyor 4B* is intended for indoor use only and shall be installed in premises without explosive atmospheres.

The central controller is intended for use in areas that meet the Class II requirements for overvoltage and degree of pollution 2. *Surveyor 4B* is Class II equipment.

*Surveyor 4B* is equipped with a small "NORMAL" box (58 x 105 x 90 mm). It can be snap-fastened onto a standard symmetrical DIN rail and should **imperatively** be integrated in a closed electrical equipment cabinet.

The components used in operation are located on the front of the appliance:

- adjustments and tests on the top (Item 1, Figure 1),
- indicator lights on the FRONT face (Item 2, Figure 1),
- connections at the bottom (Item 3, Figure 1).



Figure 1

## Chapter 3 | Mounting of the *SURVEYOR 4B*



The *surveyor 4B* appliance fitted on its symmetrical DIN rail must be installed in a closed electrical equipment cabinet.

A space of 100 mm is necessary around of the *Surveyor 4B*.

The *Surveyor 4B* should preferably be located in a monitored location (such as a guardhouse, control room or instrumentation room).

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# Chapter 4 | Connections



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The *Surveyor 4B* does not have a start/stop switch.

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Certain voltage levels are capable of causing serious injuries or even death. It is advised to install the material and cabling before applying live voltage.

Since an incorrect or poor installation may cause measurement errors or system failures, it is necessary to strictly follow all the instructions in this manual in order to guarantee the proper operation of the system.

Cables with an operating temperature of 60°C minimum (140 °F) must be used because the temperature inside the controller can reach 65°C (149 °F).

---

The electrical connections must be carried out by qualified personnel in compliance with the different directives in force in the country of installation.

The nature of the current and line voltage must be checked. The line voltage must match the voltage specified on the plate fitted on the *Surveyor 4B*. The voltage is configured in the factory.

The wires to be connected to the *Surveyor 4B* must have a minimum cross section of 1.5 mm<sup>2</sup>.

The *Surveyor 4B* appliance can be supplied with either 230 Vac<sup>1</sup> or 12 Vcc<sup>2</sup>.

## Alternative power supply

### 230 volt AC power supply

The *Surveyor 4B* must be protected on the upstream side by a two-pole earth leakage circuit breaker (1A) installed near the *Surveyor 4B* and is considered as main cut-off device.

The response curve must be of type D.

The mains power supply must be wired on the two points marked N (Neutral) and P (Phase) on the *Surveyor 4B* terminal block (see Figure 2, Item 1).

The wires to be connected to the *Surveyor 4B* must have a minimum cross section of 1.5 mm<sup>2</sup>

Power consumption: 5.8 W max. (detector connected).

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<sup>1</sup> from 207 to 253 Vac

<sup>2</sup> from 11.5 to 14 Vdc

## DC power supply

### 12-volt power supply

The 12 volt power supply can be connected to the points marked 0 and 12 V  $\text{---}$  on the *Surveyor 4B* terminal block (see Figure 2, Item2).

The *Surveyor 4B* must be protected on the upstream side by a fuse (630mA) with time-delay.

The cable must have a minimum cross section of 1.5 mm<sup>2</sup>.

Power consumption: 5.8 W max. (detector connected).

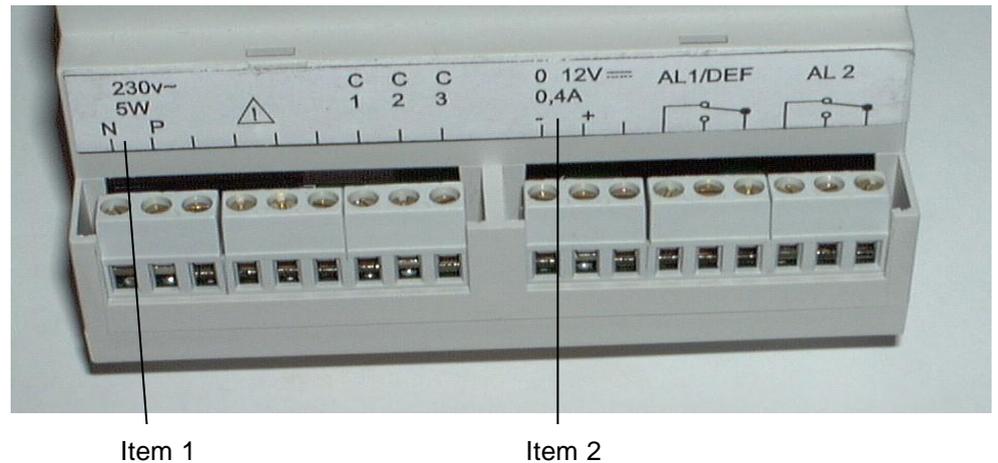
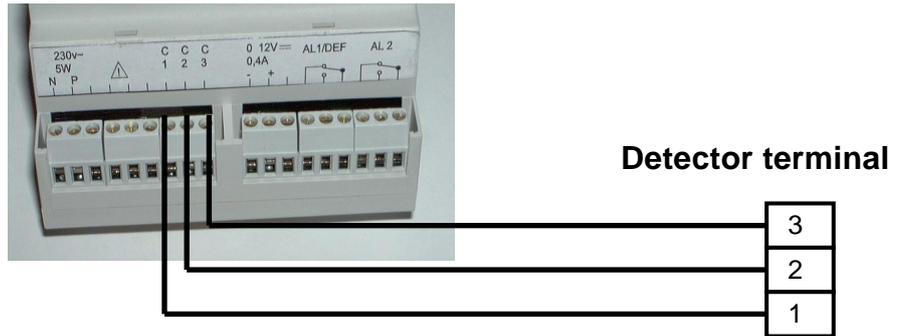


Figure 2 : power supply connections

## Explosimetric detectors

- Only explosimetric detectors of the "bridge" type can be connected to the SV 4B.
- *Surveyor 4B* and the detector are connected together by a shielded cable with three active conductors. The shielded cable is to be connected to the earth to EMC constraints at one end only.
- Terminals C1, C2 and C3 of *Surveyor 4B* and the detector are to be connected in opposite mode (Figure 3).

Figure 3 : Detector connections



- The maximum loop resistance is 1.4 ohms.

For example: the maximum distance between *Surveyor 4B* and the detector will be 40 m with conductors with a cross section of 1.5 mm<sup>2</sup>.

## External components

*Surveyor 4B* is equipped with the following two relays:

- Relay 1 (REL 1), which is in mode, corresponds to the first gas alarm threshold and to the "FAULT" alarm.

This relay is equipped with SPDT contacts available on the SV 4B terminal block (Item 3, Figure 4).

- Relay 2 (REL 2), which is "negative safety" mode, corresponds to the second gas threshold only. This relay is also equipped with SPDT contacts available on the SV 4B terminal block (item 4, Figure 4).
- These both relays could be configured in positive and negative security (programming by welding slots on the printed circuit board: made only by OLDHAM or a skilled personal).

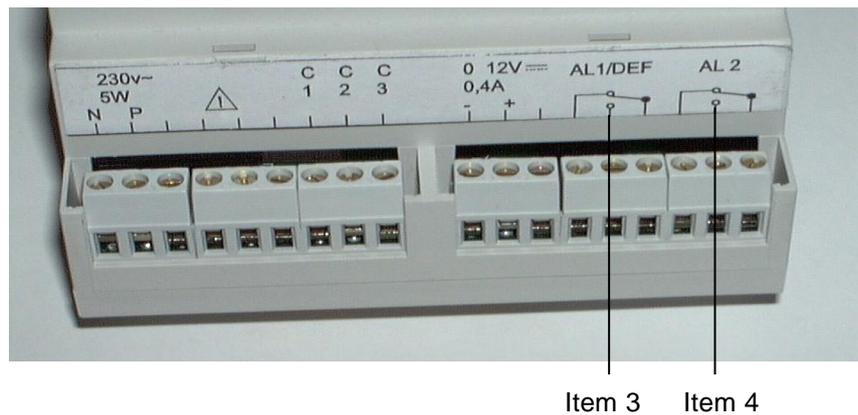


Figure 4 : relays terminals

N.B. : The relay contacts are dry contacts, corresponding to the appliance without power supply.

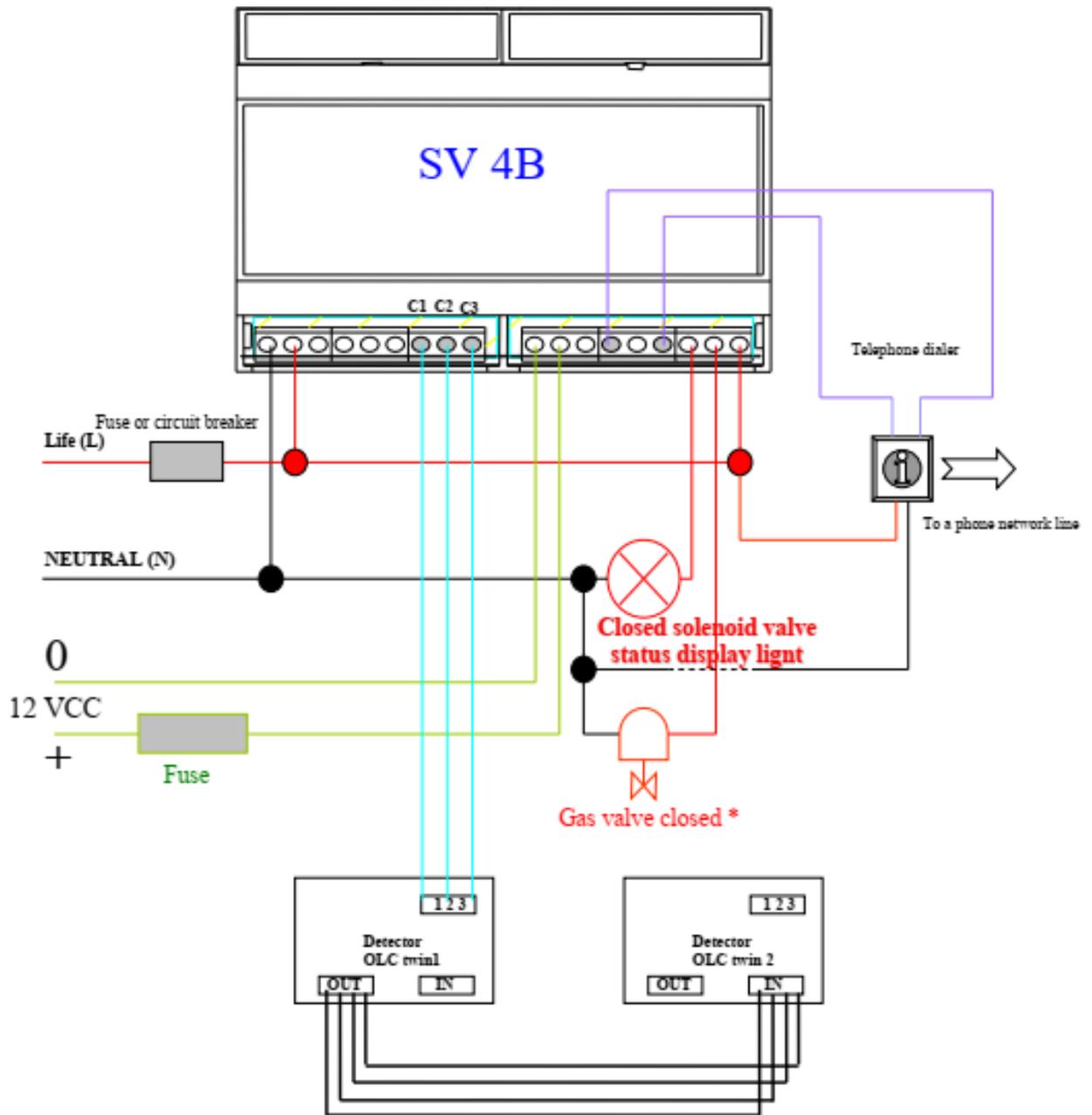
Caution: The high-power solenoid valves cannot be directly remote controlled<sup>3</sup>. A power relay is required.

---

<sup>3</sup> The maximum current through the relay contacts will be 2 A and the maximum voltage will be 250 Vac ou 30 Vdc.

## Examples of installation

### Example of installation set up of a SV 4B with TWO OLC 10 TWIN detectors



\* Breaking capacity of rating relays switch contact: 2A / 250Vca - 30Vdc

#### **Important :**

The relay's contacts are shown on the SV 4B label, unit switch off.

The AL1/ DEF relays are normally energized and the AL2 relay is unenergized.

Example of installation set up of a SV 4B with a single detector

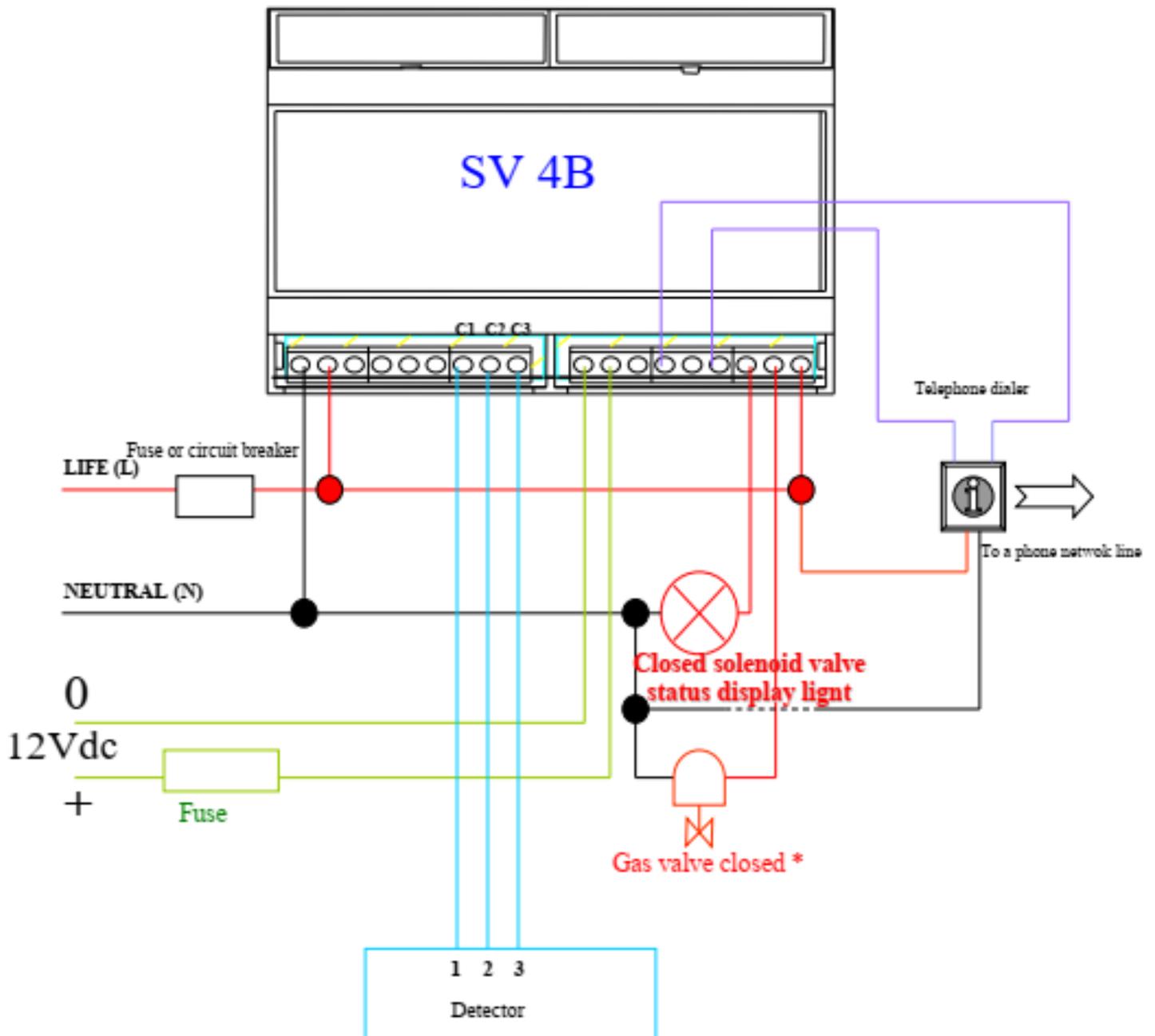


Figure 6: Exemple d'installation d'un Surveyor 4B avec un capteur

\* Breaking capacity of rating relays switch contact : 2A / 250Vca – 30Vcc

**Important :**

The relay's contacts are shown on the SV 4B label, unit switch off.

The AL1/ DEF relays are normally energized and the AL2 relay is unenergized.

# Chapter 5 | Operating instructions

## Switching on

It is assumed that all the necessary connections have been made and that the whole installation complies with the standards currently in force.

As soon as the SV 4B is supplied with power, it is ready to use and the GREEN light-emitting diode lights up (rep 1, Figure 7).

Relay 1 is operated ("positive safety" position).

## Switching off

The SV 4B is switched off by cutting off the power supply on an electrical equipment cabinet.

## Alarms

### GAS alarm

The SV 4B has two adjustable GAS alarm thresholds but the second threshold (AL 2) must be twice the first (AL 1).

Therefore, the red light-emitting diodes "AL1" and "AL2" (rep 3, Figure 7) come on as soon as the alarm thresholds are exceeded (time delay of 7 seconds): LED flashing. The audio alarm (buzzer) is activated and the corresponding relays are tripped.

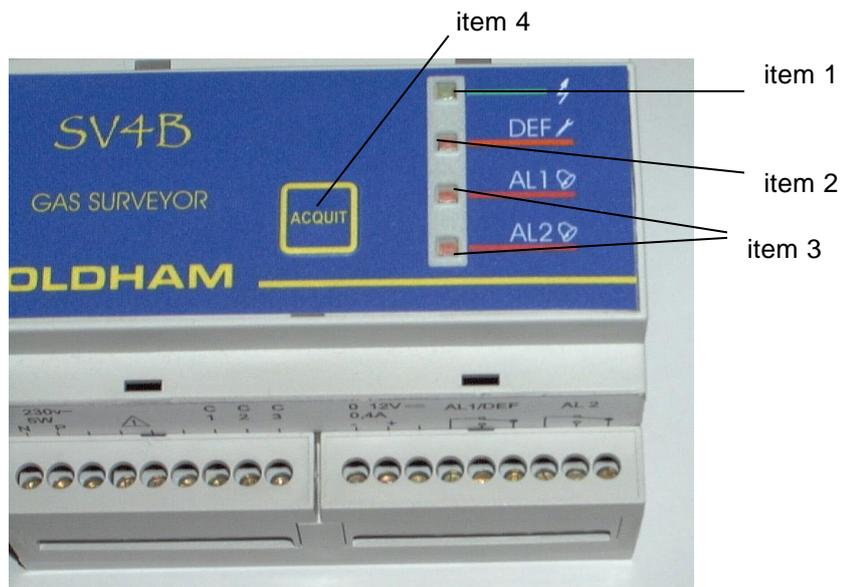


Figure 7

## FAULT alarms

The SV 4B is equipped with a fault alarm (visual alarm (rep 2, Figure 7), audio alarm and relay 1) which is activated in the following cases:

- One or more wires of the telemetry line interrupted
- One or more wires of the telemetry line short-circuited or with excessive power consumption.

NB : The ALARM LEDs may also be activated depending on the circumstances of the interruption or the short circuit.

## Adjustments



The operations and adjustments described in this chapter must be performed by authorized personnel only as they can affect the appliance's reliability in detection.

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Gas detectors are safety devices. OLDHAM recommends the regular testing of fixed gas detection installations. This type of test consists of injecting the calibration gas into the detector at a sufficient concentration to activate the pre-set alarms. It is to be understood that this test is in no way a replacement for a detector calibration.

The frequency of gas tests depends on the industrial application where the detector is in use. Frequent inspections should be made in the months following the commissioning of the installation, and should then become more widely spaced provided that no significant deviation is observed. If a detector should fail to react in contact with the gas, calibration is essential. The frequency of calibrations shall be appropriate according to the results of the tests (humidity, temperature, dust, etc.); however, it must not exceed one year.

The general manager should put safety procedures in place on-site. OLDHAM cannot be held responsible for their enforcement.

## Adjusting the "gas alarm" thresholds

Using a "reference gas kit" (gas cylinder + pressure regulator, etc.), inject the reference gas with a content level higher than the first threshold desired. (For example, threshold 1 will be 20% LEL, so a minimum of 25% LEL should be injected).

Adjust the alarm potentiometer (rep 1, Figure 8) to trigger the first threshold (AL1): the red LED (AL1) flashes (for 7 seconds) and then remains on in

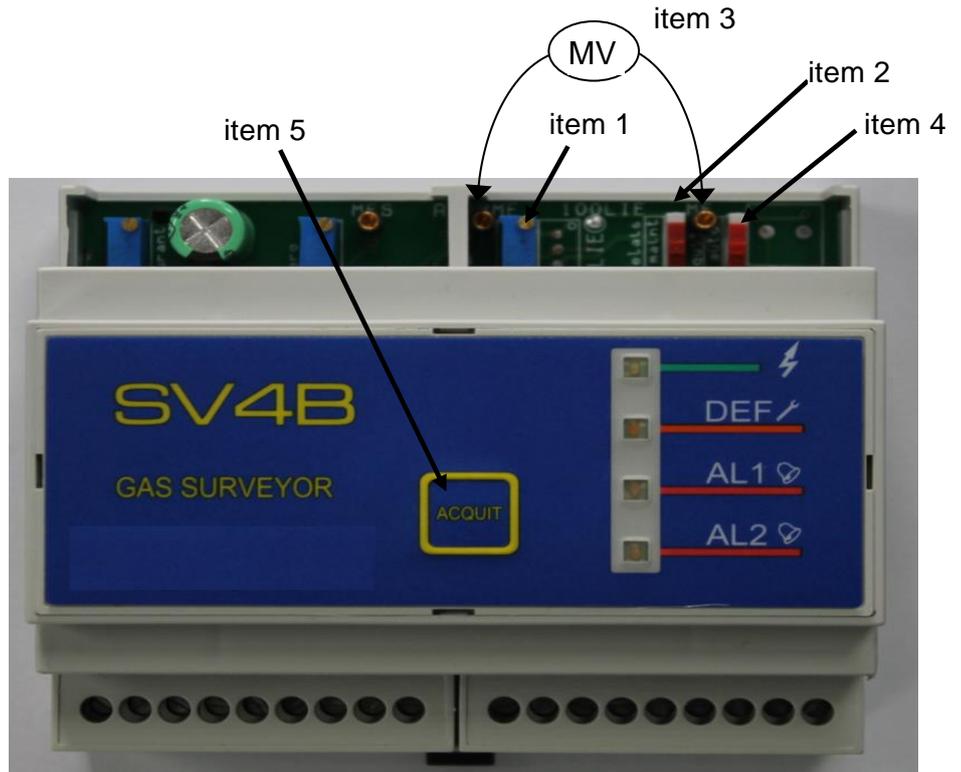


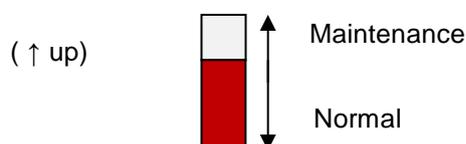
Figure 8

steady mode, trip the corresponding alarm relay.

If you stop at this point, alarm 2 will be set to twice the level of alarm 1.

If you continue until alarm 2 is triggered: alarm 1 will be set to half the level of alarm 2.

If you wish to lock the alarm relays (inhibiting the relays) during these alarm threshold adjustments: set the maintenance switch to the high position (item 2, Figure 8).





When the adjustments have been made, do not forget to place the switch back in its normal position.

Terminal posts item 3, Figure 8) are used to connect up a voltmeter for the reading of a signal (in mV) corresponding to the content level of the injected gas.

Then, using a rule of three, it is possible to calculate and adjust another signal (in mV) for an alarm threshold (potentiometer: item 1, Figure 8) corresponding to a different gas content level.

**For example** : when you inject 1% methane, you read 1,000 mV (for instance).

If you set the alarm potentiometer to read 1,500 mV, the alarm is triggered at 1.5% methane.

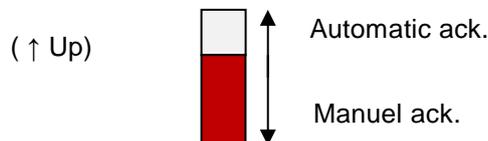
$$\text{Signal} = \frac{1000mV \times 1\%}{1000mV} = 1500mV$$

Or

$$\text{Threshold (\%)} = \frac{1\% \times 1500mV}{1000mV} = 1.5\%$$

## Acknowledgement of gas alarms

A switch (item 4, Figure 8) is used to acknowledge gas alarms in manual mode <sup>4</sup> or automatic mode <sup>5</sup>



<sup>4</sup> manuel : Manual mode: When a gas alarm is triggered, it must be cleared manually even if the content level has fallen to zero (or to below the threshold). This is done by pressing the Ack. key (item 5, Figure 8).

<sup>5</sup> Automatic mode: When a gas alarm is triggered, it is cleared automatically as soon as the content level falls below the alarm threshold.



**As long as there is a high enough concentration of gas to trigger an alarm, it is impossible to clear that alarm manually (with the Ack. button).**

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## Adjusting the ZERO

- Necessary when a cell is replaced
- At least twice a year
- Connect a voltmeter to the two terminal posts provided for that purpose (MF and MES), as shown below:

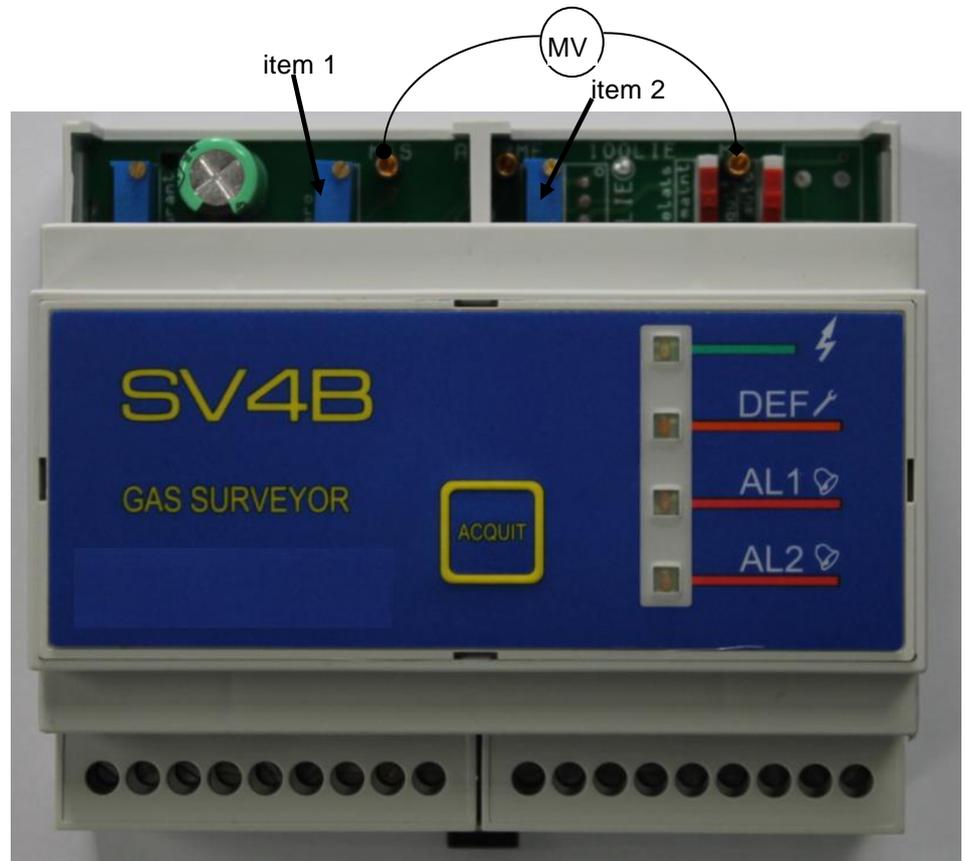


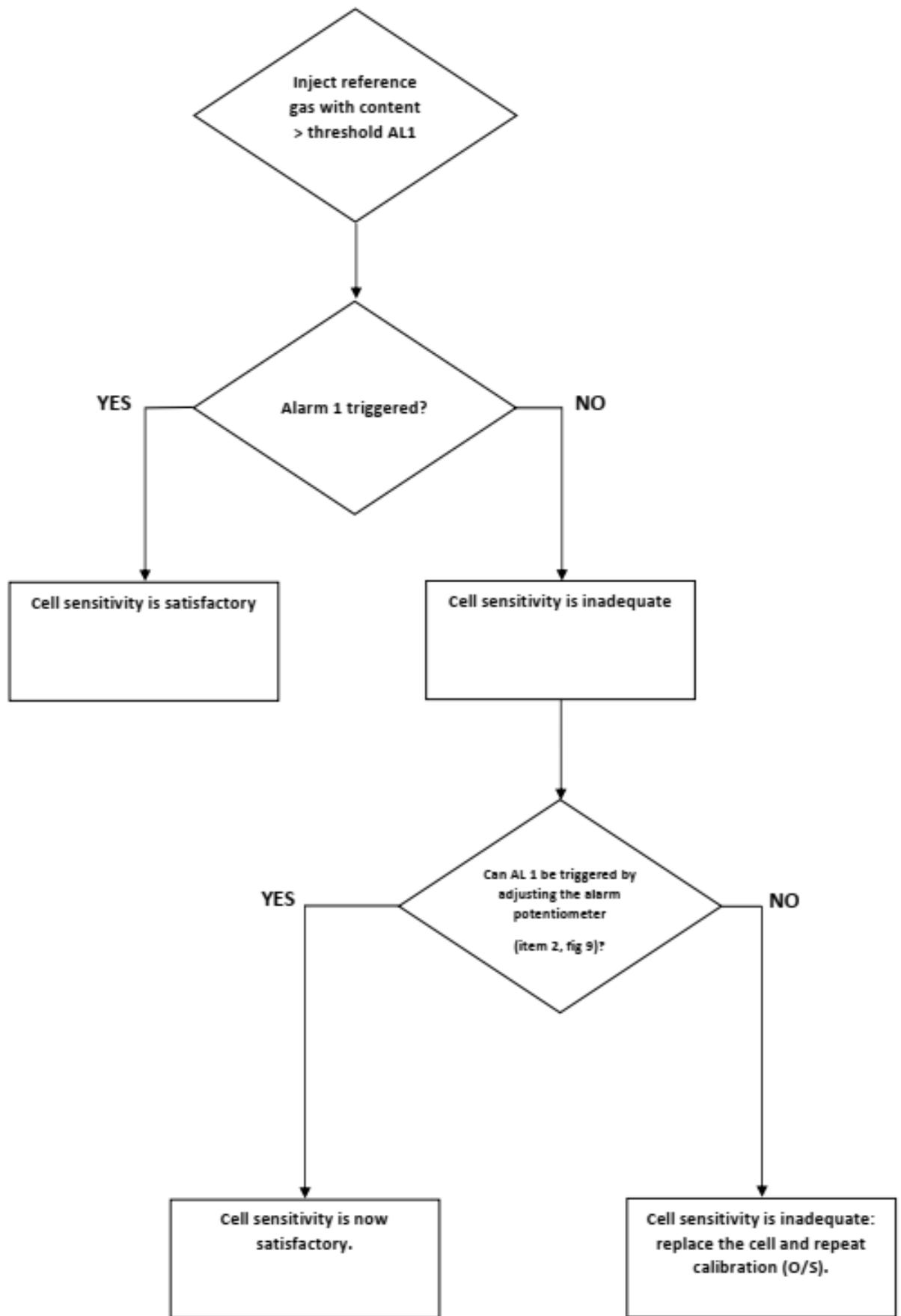
Figure 9

- Be sure to be in pure atmosphere (without gas) (If not, inject air)
- Adjust the ZERO (0 mV) with the potentiometer, item 1. Figure 9.

## Checking the sensitivity

- Necessary when a cell is replaced.
- At least twice a year.
- Prepare the calibration kit and secure the gas input pipe to the detector.
- Adjust the flow rate of the reference gas<sup>6</sup> to 60 l/h before injecting.
- Allow to stabilize for at least 10 seconds.
- Check that the alarm or alarms are triggered (as applicable <sup>6</sup>) and carry out the following procedure.

<sup>6</sup> La valeur du gaz étalon sera supérieure au moins au premier seuil d'alarme.



## Replacing the fuse



It is mandatory that spare parts must be guaranteed original OLDHAM parts as, otherwise, the reliability of the equipment could be adversely affected.

The fuse (Figure 10, item 1) must be replaced by qualified personnel only. The fuse is, and must be, in compliance with CEI 127, with time-delay, low breaking capacity and a voltage of 250 V ~.

- Fuse 5x20- T125 mA 250 V- OLDHAM reference = 6154701

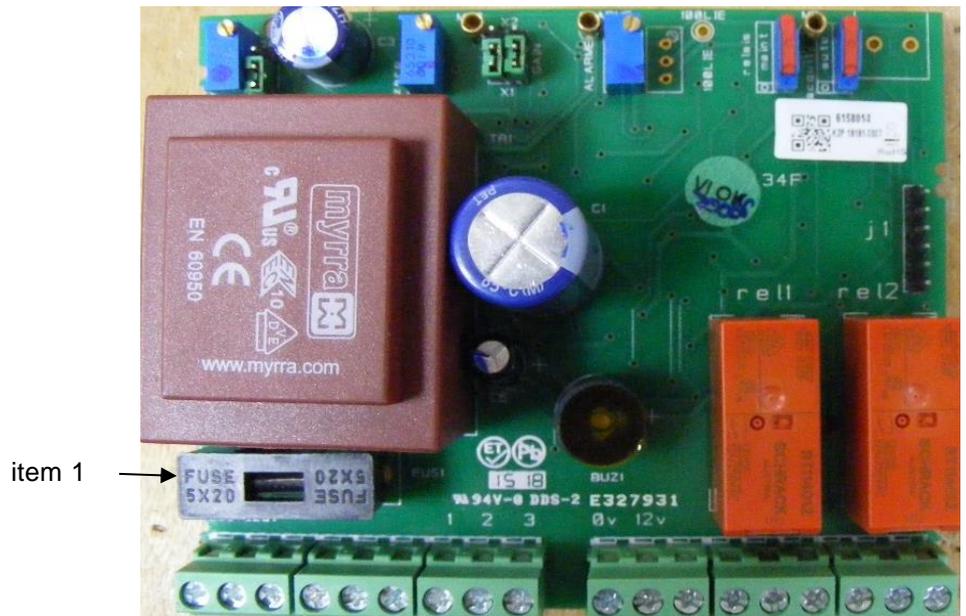


Figure 10

## Chapter 6 | Technical specifications

Manufacturer	OLDHAM
Type	SURVEYOR 4 B
Function	Control station for explosive gas detectors
Capacity	1 measurement chanel 1 detector type CEX 300 or OLC10/100 or 2 OLC 10Twin detectors
Measurement	
<i>Measurement</i>	Continious
<i>Display unit</i>	None
Visual alarms	Failure: yellow Gas, 1st threshold: red Gas, 2nd threshold: red
Audio alarm	Integrated
Alarm Acknowledgement	Manual ou automatic
Electric power supplies	
<i>Alternative</i>	230 VCA (207 à 253 V) – 50Hz Accepts category II transient overvoltages and pollution degree 2
<i>Continue</i>	12 VCC (11.5 à 14 V)
Power consumption	5.8 W (detector connected) @230Vac 0.4A (detector connected) @12 Vdc
Electrical protection	Fuse
Relays	
<i>Relay 1</i>	Common to gas (alarm 1) and fault
<i>Relay 2</i>	Gas alarm 2
Contact	SPDT, relay 1 (positive safety) SPDT, relay 2
Max. breaking capacity	2A sous 250Vca ou 30Vcc
Measuring line	
<i>Cable</i>	3 conductors
<i>Maximum line length</i>	40 m (with conductor 1.5 mm <sup>2</sup> )
<i>Maximum loop resistance</i>	1.4 ohms
Mounting	On symmetrical DIN rail and into a closed cabinet
Miscellaneous	
<i>Technology</i>	SMC (surface mounted component)
<i>Mains visual indicator</i>	Green LED
<i>Housing</i>	NORYL
<i>Warranty</i>	1 year
Dimensions	58 x 105 x 90 mm
Weight	0.360 kg
Cable inlets/outlets	Screw type terminal block
Ingress Protection	IP 20
Mecanical protection	IK 08
Operating conditions	
<i>Ambient temperature</i>	+ 10 °C to + 45 °C
<i>Relative humidity</i>	5 % to 95 % non-condensed
<i>Altitude</i>	≤2000m



## Chapter 7 | Disposal

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, SV 4B 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 SV 4B 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.



## Chapter 8 | Main Part Numbers

Désignation	Reference	
<i>Surveyor 4B</i> controller for 340mA wheatstone bridge sensor	6 514 807	
Fuse 5x20 - T125 mA 250 V	6 154 701	



# Chapter 9 | Maintenance

## Fuse replacement

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Fuse replacement should only be performed by qualified personnel and power must be first switched off.

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Fuses shall comply with IEC 60127 standard (time-delay fuse, low breaking capacity, 250Vac). Please see Chapter 8 | .

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Oldham does not allow any other repairs than those listed here above.

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# Chapter 10 | Certificate of Compliance

The document hereafter (1 page) reproduces the EU declaration of conformity.



DECLARATION UE DE CONFORMITE  
EU Declaration of Conformity



La société **Oldham S.A.S.**, ZI Est 62000 Arras France, atteste que la  
**Oldham S.A.S.** company, ZI Est 62000 Arras France, declares that the

**Centrale de détection de gaz type Surveyor 4B**  
***Surveyor 4B Gas Controller***

est conforme aux exigences des Directives Européennes suivantes:  
*complies with the requirements of the following European Directives:*

**I) Directive Européenne CEM 2014/30/UE du 26/02/14: Compatibilité Electromagnétique**  
*The European Directive EMC 2014/30/UE dated from 26/02/14: Electromagnetic Compatibility*

Normes harmonisées appliquées : **EN 50270:2015** for type 1&2 CEM-Appareils de détection de gaz  
*Harmonised applied Standards* *EMC-Apparatus for the detection of gases*

**II) Directive Européenne DBT 2014/35/UE du 26/02/14: Basse Tension**  
*The European Directive LVD 2014/35/UE dated from 26/02/14: Low Voltage*

Normes harmonisées appliquées: **EN 61010-1:2010** Règles de sécurité pour appareils  
*Harmonised applied Standard* *électriques de mesurage*  
*Safety requirements for electrical*  
*equipment for measurement*

*Arras, le 22/11/2018 (November 22<sup>nd</sup>, 2018)*

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UE\_SV 4B\_rev. B





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