

D•420

GAS OR OXYGEN DETECTOR

INSTRUCTION MANUAL



DALEMANS®

G A S D E T E C T I O N



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WARNINGS



PRIOR to carrying out installation, maintenance, or service operations on the gas detector ensure that no gas or vapour is present in the surrounding atmosphere.

INSTALLATION, COMMISSIONING and MAINTENANCE must be carried out by DALEMANS or by an approved service centre only, and in any case by qualified personnel who has received a suitable training.

Gas detection equipment must be calibrated at least once a year to mitigate the loss of sensitivity of the sensor.

- The warranty provided by DALEMANS will be voided if this equipment is not installed, operated and maintained in strict accordance with these instructions, warnings and within the operational limits stated.
- By respecting these instructions you ensure the proper operation of the equipment. Should you require any further information about the installation, the use or the maintenance of this equipment, do not hesitate to contact DALEMANS.
- Always follow the recommendations hereafter so as to avoid premature ageing of the sensor and to guarantee its optimal operation. These recommendations are general directives.
- Refer to local regulations in force before proceeding with installation works (i.e. standards IEC 60079-14 and IEC 60079-29-2). Local regulations have always precedence on the recommendations of the manufacturer.
- Maintenance must be performed according to the procedure given by DALEMANS or his local representative. Maintenance or service attempts without observing these instructions or without the assistance of DALEMANS may prevent the equipment from working properly and from ensuring the safety of the occupants of the monitored premises.
- Modification, disassembling and total or partial destruction of this equipment may invalidate the essential safety requirements of the whole plant.
- Use only DALEMANS original replacement parts. The use of non-original parts may invalidate the certification and warranty of the equipment.

LIMITATIONS

- Persistent exposure to high levels of toxic gas will shorten the sensor life. Sensors may be cross sensitive to other gases.
- Long-term unpowered storage might shorten the electrochemical sensor life. Avoid disconnecting the electrochemical sensor from the amplifier Printed Circuit Board.
- Gas detectors should be installed as late as possible in any program of construction operations (i.e. construction of a new plant, refitting or maintenance) but before the presence of gas or vapours in the system, so as to avoid damage to sensors resulting in particular from such activities as welding and painting. If already installed, detectors should be protected by an airtight seal to avoid contamination during construction works, and should be clearly marked as being non-operational.
- Gas detectors must be protected from direct sunlight, vibrations and mechanical impacts.

DISCLAIMER

DALEMANS cannot be liable for direct or indirect damages arising out of the non-observance of its instructions.

Every effort has been made to ensure the accuracy of the information given in this document. Nevertheless, DALEMANS decline any responsibility in the event of errors or omissions in this document.

ENVIRONMENTAL COMPLIANCE

Waste Electrical & Electronic Equipment (WEEE Directive)



This symbol on the product and/or accompanying documents means that you are held to respect the regulation in force on the collection and recycling of Waste Electrical and Electronic Equipment (WEEE).

These provisions are intended to preserve the natural resources used for manufacturing this product and to avoid the dispersion of substances potentially harmful for the environment and human health.

Therefore, to dispose of your end-of-life product, you **MUST** hand it over to a designated collection point for the recycling of electrical and electronic equipment. For further information about the collection points in your area contact your local city authority.

QUALITY ASSURANCE



This product have been designed, manufactured and controlled within the framework of an ISO 9001 certified Quality Assurance system.

1. INTRODUCTION

The **D•420** are flammable, toxic gas and oxygen detectors intended for monitoring confined areas in industrial and commercial environment. They are designed to operate in association with a suitable control unit or with a Programmable Logic Controller (PLC) to provide early warnings of gas presence or oxygen deficiency.

For further information about the detectable gases or the list of compatible control units, please contact DALEMANS.

1.1. Marking

Target gas and localisation may be indicated on the graphic overlay of the detector lid.

The label below is affixed to the detector side and allows the user to identify:

- The detector type.
- The type of sensor fitted.
- The detector measurement range.
- The detector serial number.
- The year of production.
- The nominal operating voltage.
- The maximum power consumption.
- The operating temperature range.

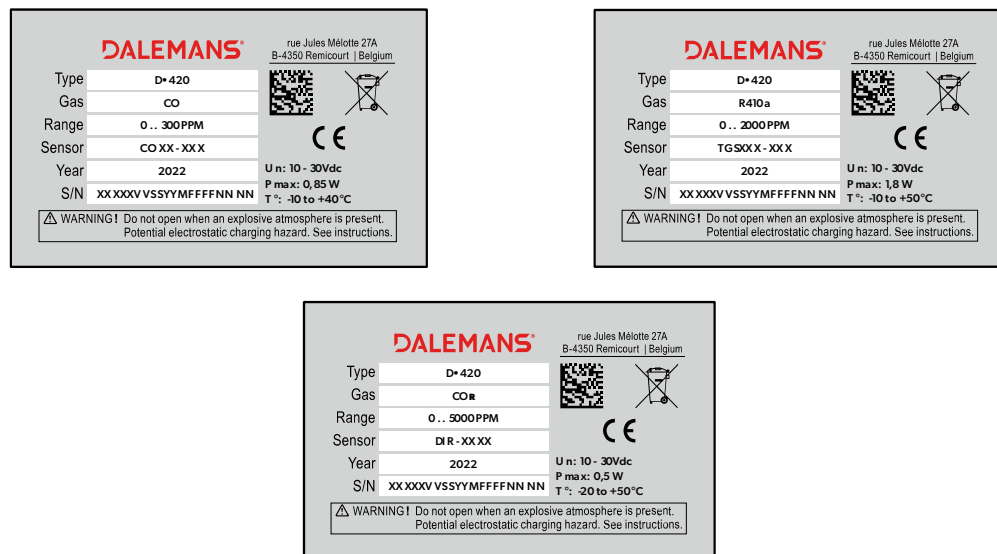


Figure 1: examples of identification labels

Type	: Type of detector	U_n	: Operating voltage
Gas	: Target gas	P_{MAX}	: Power consumption
Range	: Measurement range	T°	: Operating range
Sensor	: Type of sensor		
Year	: Year of production		
S/N	: Serial number		

2. DESCRIPTION

2.1. Overview

The **D•420** is a gas detector designed to detect the presence of toxic gases or oxygen deficiency in ambient air. It operates using electrochemical, infrared or semiconductor sensors. The sensor signal is converted by the “D-BASE 420 Circuit Board” into a 4-20 mA electrical signal which varies according to the gas/oxygen concentration. This signal is delivered to the control unit or to the Programmable Logic Controller (PLC) through a 2-wire or 3-wire current loop.

The **D•420** gas detector comprises the following external components:

- An IP65 flame retardant plastic enclosure.
- An IP68 cable gland.
- A LCD screen which displays, in normal operation, the value of the gas or concentration present in the atmosphere.
- Three touch keys.

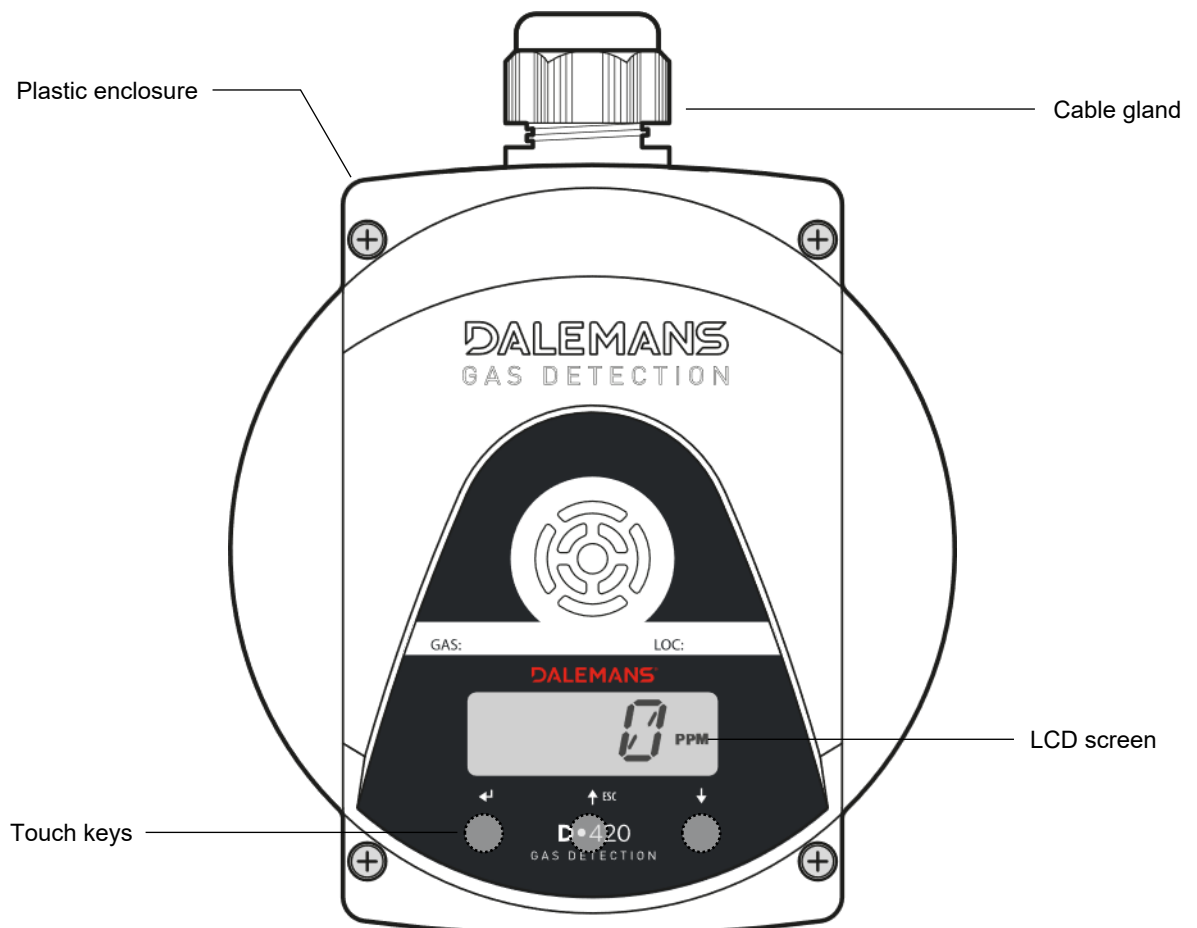


Figure 2: D•420 detector overview

The internal components of the **D•420** gas detector for toxic gases and oxygen:

- The “D•BASE 420 Circuit Board”.
- The “LCD Circuit Board”.
- The electrochemical sensor.
- The 2-pole pluggable connector.

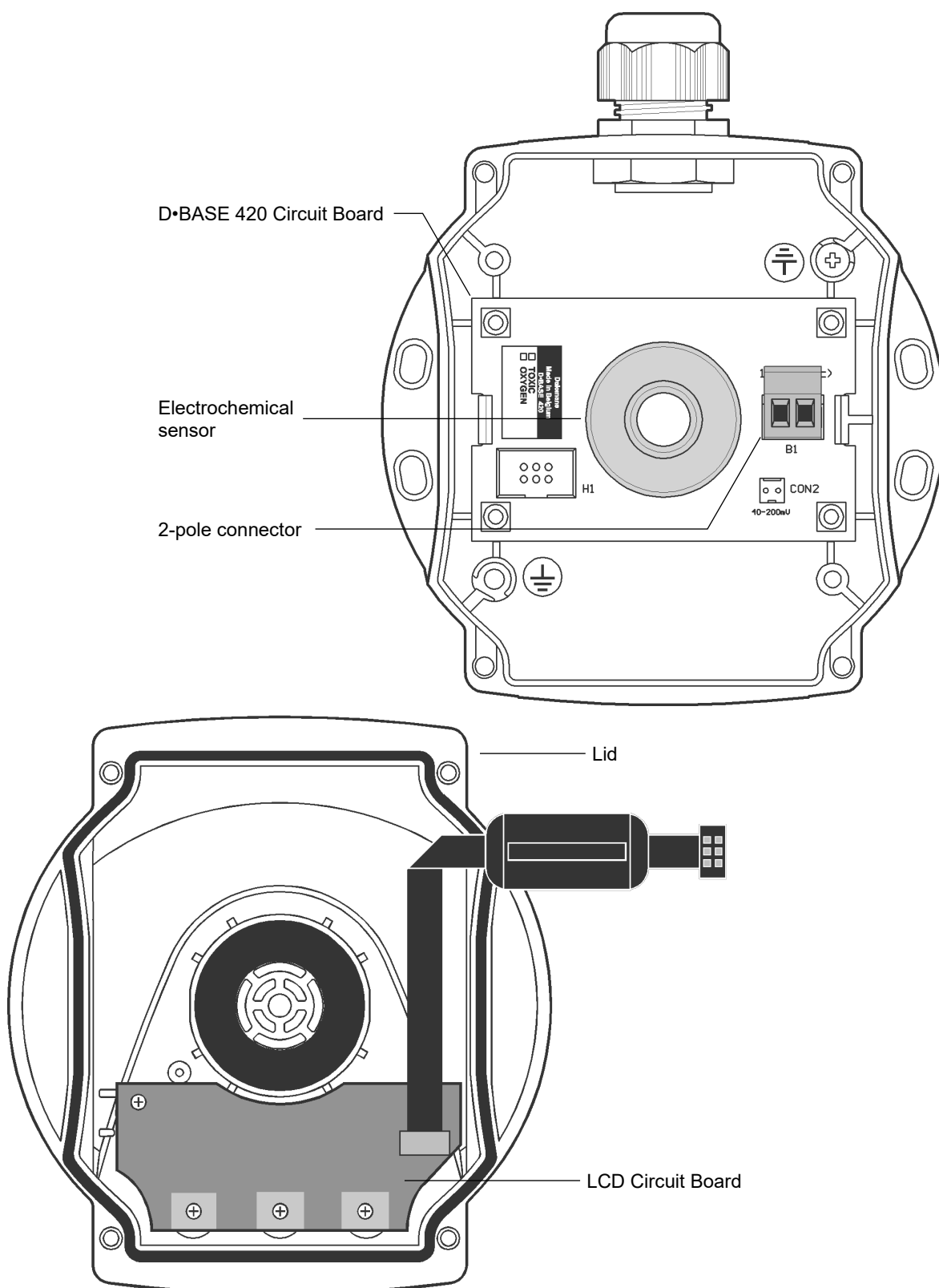


Figure 3: D•420 gas detector for toxic gases and oxygen

The internal components of the **D•420** gas detector for refrigerants and CO₂ are:

- The “D•BASE 420 Circuit Board”.
- The “LCD Circuit Board”.
- The sensing head containing the infrared or the semiconductor sensor.
- The 3-pole pluggable connector.

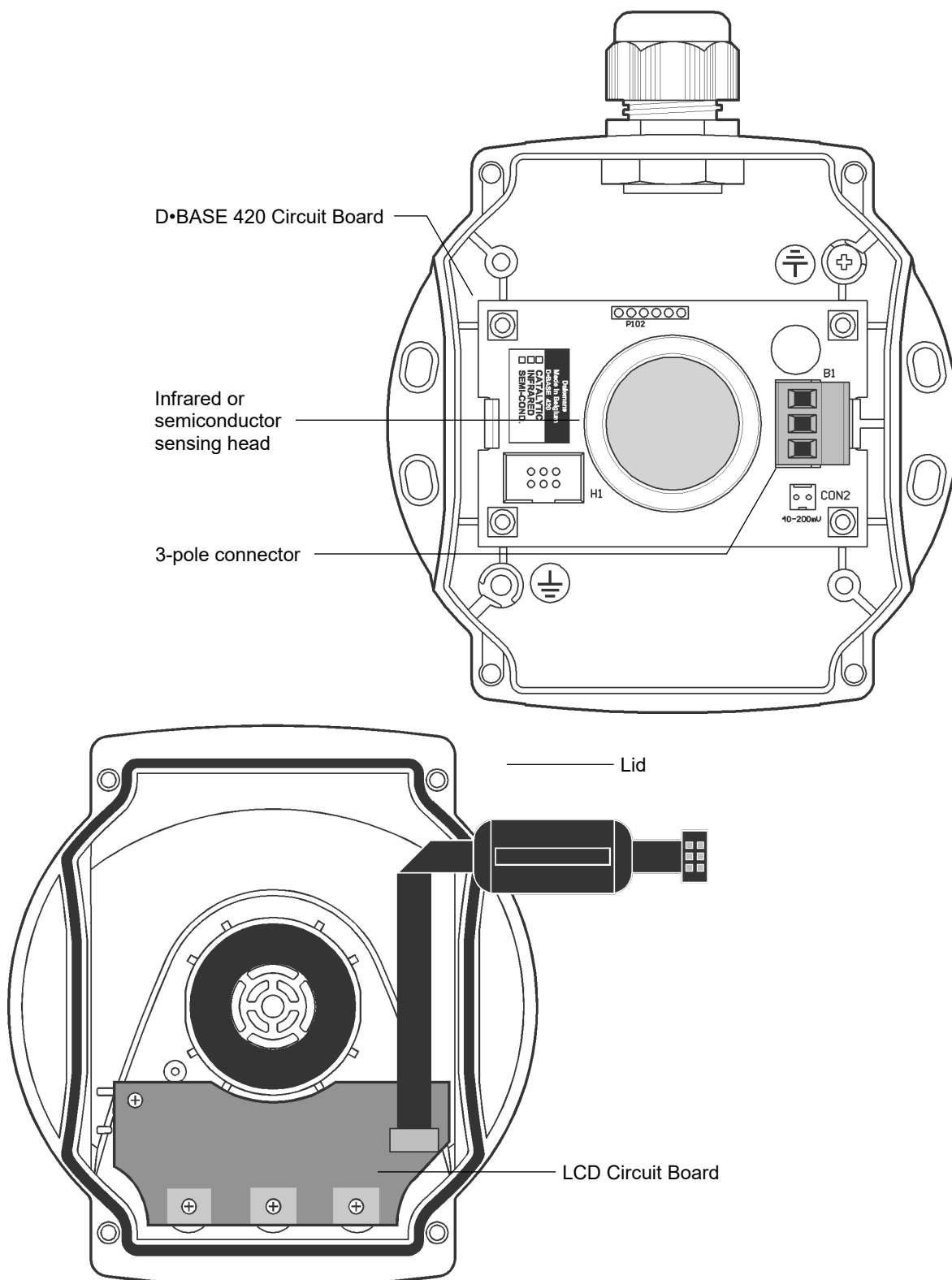


Figure 4: D•420 gas detector for refrigerant gases and CO₂

2.2. Dimensions

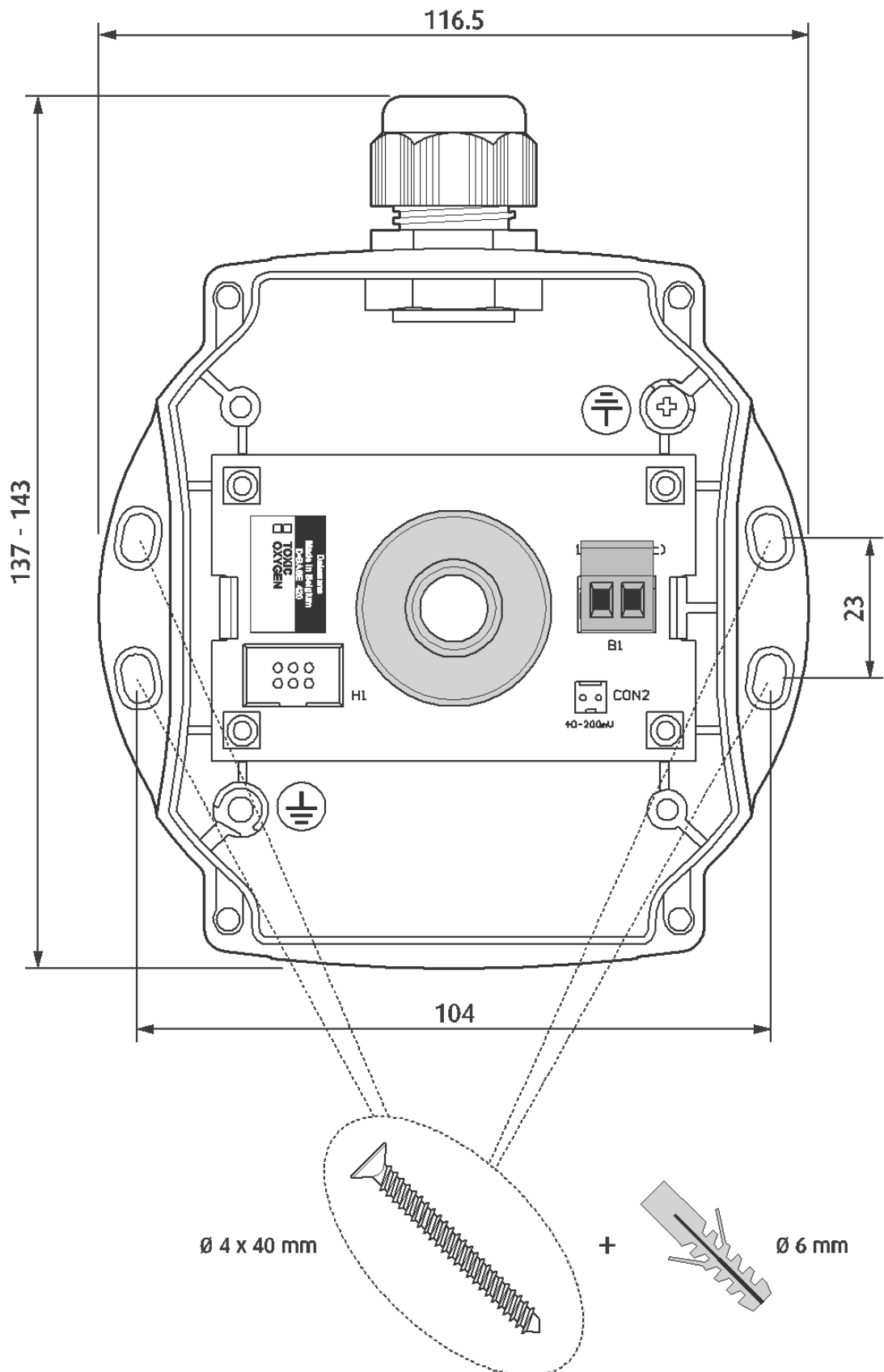


Figure 5: D•420 dimensions in mm

3. INSTALLATION

3.1. Location

Gas detectors must be placed so that potential gas accumulations are detected before they create a significant hazard. Inappropriate location of a detector can nullify the effect and the integrity of the gas detection system.

The placement of the detectors should be determined in consultation with experts having specialist knowledge of gas dispersion, with those who have knowledge of process plant system and equipment involved, and with safety and engineering personnel. The location of every detector must be recorded and available to the safety personnel. Should you require any further guidance or assistance please contact DALEMANS or his local representative.

Consider the following points when positioning a gas detector:

- The detector should be readily accessible for maintenance and electrical safety inspection.
- It must be possible to fit all accessories or test equipment for maintenance and servicing.
- Hazard level and potential sources of gas leak must be taken into account.
- Consider the combination of sources of gas release with propagation effects.
- The detector should be protected against operational hazards of the plant.
- The detector should be protected against vibrations and mechanical impacts.
- The detector should never be positioned directly above or below a water point.
- For outdoor installation, a protection against rain and/or sun exposition shall be installed.
- The detector should not be mounted in air currents.
- Always observe the operational temperature range of the sensor (refer to “Specifications”).
- To detect a gas which is lighter than air, place the detector at a high level.
- To detect a gas which is heavier than air, place the detector at a low level.
- If the gas density is close to air density, place the detector at breast height or one at high level and another one at low level.
- Please note that gas density increases when temperature decreases.

The following table gives examples of detector locations depending on the gas to detect:

Gas *	Formula	Density (air = 1)	Position
Ammonia	NH ₃	0.59	High
Carbone monoxide	CO	0.97	Breast height
Nitrogen monoxide	NO ₂	1.58	
Oxygen	O ₂	1.11	
Carbone dioxide	CO ₂	1.53	Low
Chlorine	Cl ₂	2.49	
Hydrogen sulphide	H ₂ S	1.19	
Sulphur dioxide	SO ₂	2.26	
Refrigerants	R-134A, R-404A, R-407C, R-410A	> 3	

* This list is not exhaustive

3.2. Mounting

The **D•420** detector should be mounted flat on a wall or a ceiling.

Mounting details are given on page 9.

- Attach the detector using suitable screws and plugs.
- Ensure that dust will not block the sensor and that water will not run into the detector.
- The **D•420** may be mounted horizontally or vertically.
- For vertical mounting, the detector may be mounted with the cable gland pointing upwards or downwards but the detector lid must always be in the position shown below.

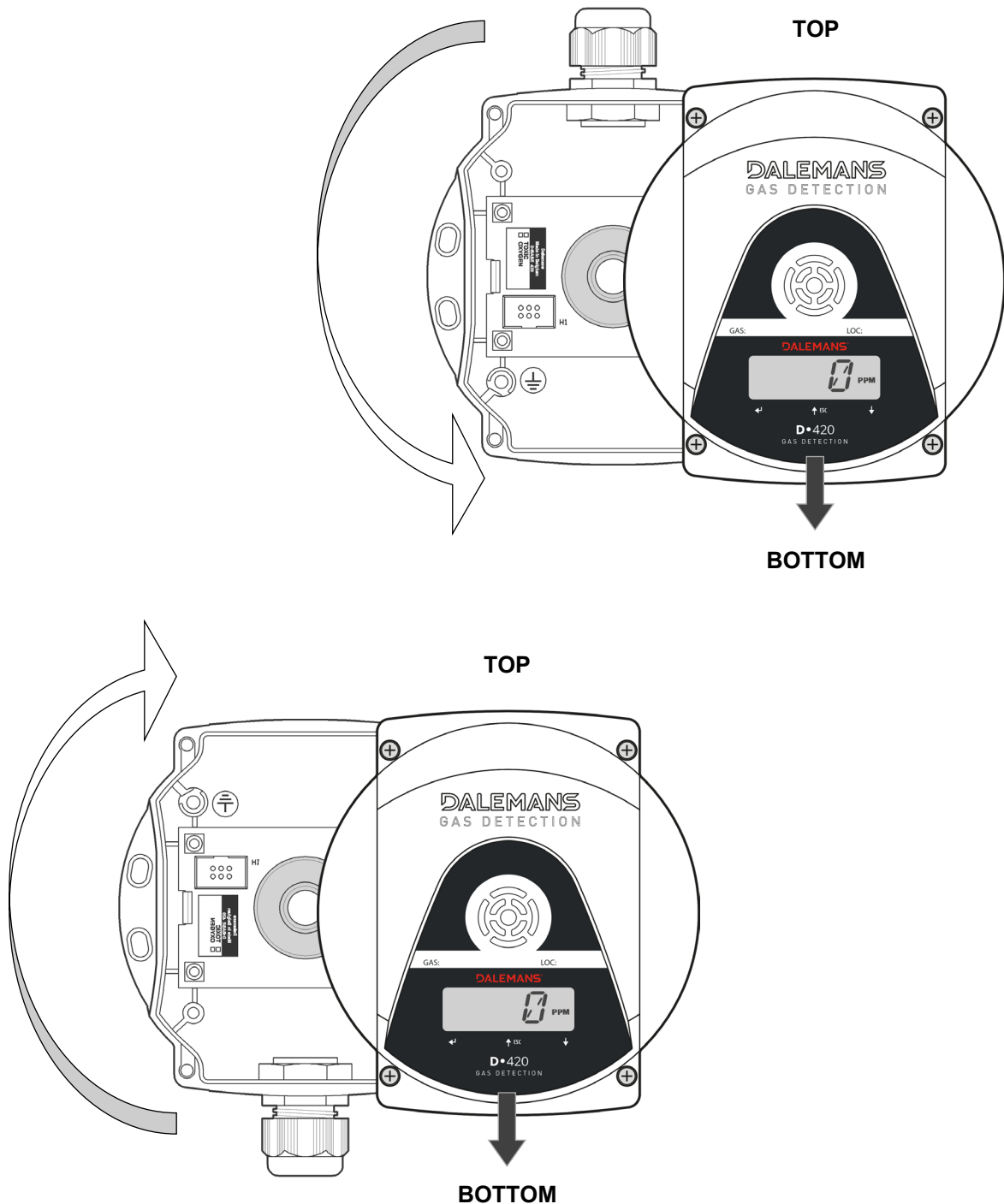


Figure 6: D•420 vertical mounting

3.3. Connection to a DALEMANS control unit



For instructions about the electrical connection of the control unit, please refer to the original equipment instruction manual.

Please follow the following instructions:

- Field wiring must comply with local regulations and standards in force
- The overall cable diameter must be within the range given below.
- The cable wires must be stripped and plugged so that the gap between insulation and the metal edge of the terminal connection does not exceed 1 mm.
- The cable gland must be sufficiently tightened on the cable to ensure a good sealing.
- The cable shielding or screening must be grounded at the control unit.

Electrical connections are made by means of the B1 connector inside the detector enclosure:

- Unscrew the four metal screws of the detector lid and remove the lid.
- Unscrew the cable gland cap nut.
- Insert the cable into the cable gland and tighten to ensure a good sealing.
- Connect the wires to the B1 connector according to Figure 7 or Figure 8 below.
- Arrange the wires so that they do not cross over the sensor or the sensing head.
- Put the lid back onto the detector and screw the four metal screws of the lid back on again.

3.3.1. 2-wire connection (toxic gases and oxygen)

- DALEMANS recommend using a shielded or a screened twisted pair cable with a cross sectional area of **0.5 mm²** and a maximum length of **1000 m**.
- Strip the wires and connect them to the B1 connector according to the diagram below.

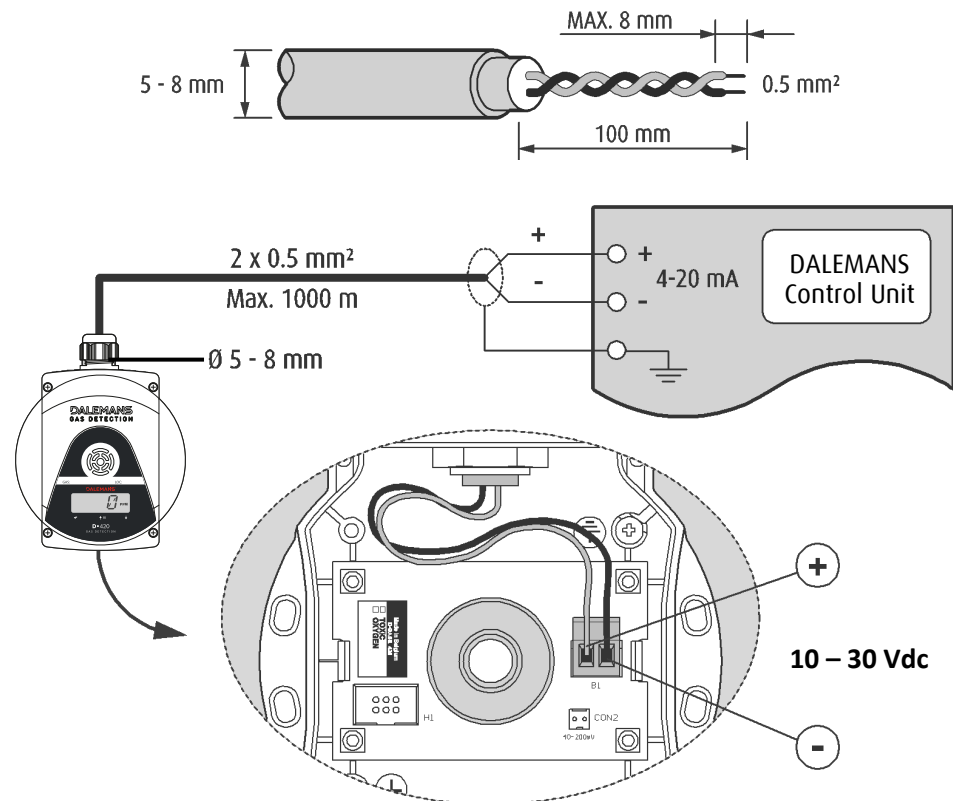


Figure 7: 2-wire connection to a DALEMANS control unit

3.3.2. 3-wire connection (refrigerants and CO₂)

- DALEMANS recommend using colour coded cable with solid wires.
- The acceptable cross sectional area of the cable is **0.75 to 2.5 mm²**.
- Strip the wires and connect them to the B1 connector according to the diagram below.
- The maximum acceptable cable length depends on the level of the supply voltage applied to the detector and the cross sectional area of the wires.

The table and the diagram below give examples:

Cross-section	Cable length (L)	
	+20 Vdc	+24 Vdc
0.75 mm ²	200 m	900 m
1.50 mm ²	350 m	1000 m
2.50 mm ²	600 m	1000 m

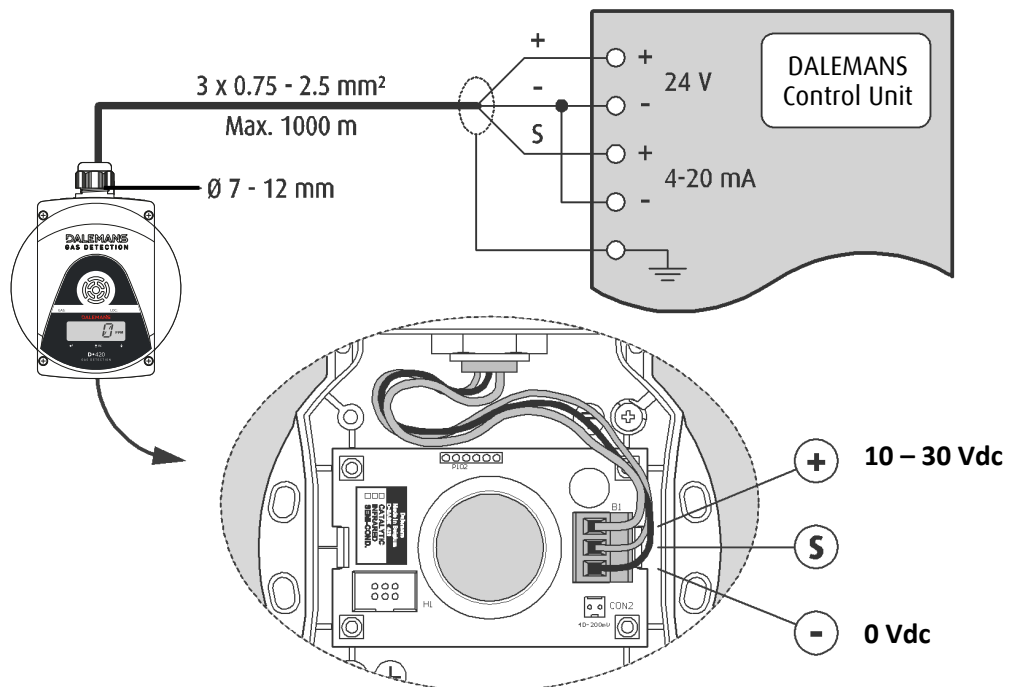
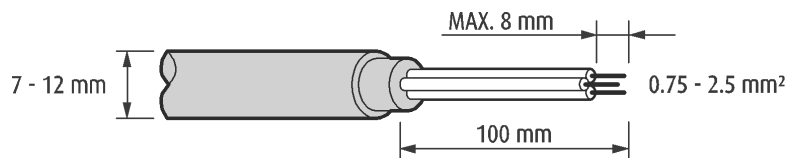
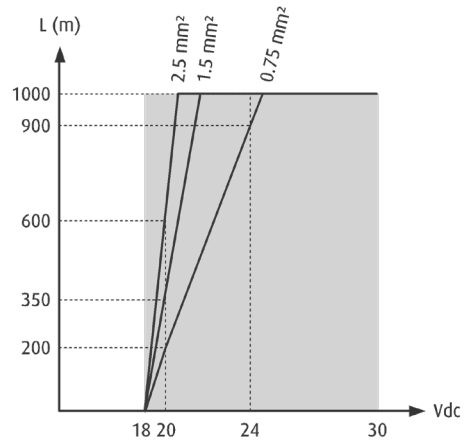


Figure 8: 3-wire connection to a DALEMANS control unit

3.4. Connection to a Programmable Logic Controller (PLC)



For instructions about the electrical connection of the PLC, please refer to the original equipment instruction manual.

Please follow the following instructions:

- Field wiring must comply with local regulations and standards in force
- The overall cable diameter must be within the range given below.
- The cable wires must be stripped and plugged so that the gap between insulation and the metal edge of the terminal connection does not exceed 1 mm.
- The cable gland must be sufficiently tightened on the cable to ensure a good sealing.
- The cable shielding or screening must be grounded at the PLC.
- Use an external stabilized power supply for the detector (+24 Vdc).
- Ensure that the polarity of the detector output signal matches the polarity of the PLC input.

Electrical connections are made by means of the B1 connector inside the detector enclosure:

- Unscrew the four metal screws of the detector lid and remove the lid.
- Unscrew the cable gland cap nut.
- Insert the cable into the cable gland and tighten to ensure a good sealing.
- Connect the wires to the B1 connector according to Figure 9 or Figure 10 below.
- Arrange the wires so that they do not cross over the sensor or the sensing head.
- Put the lid back onto the detector and screw the four metal screws of the lid back on again.
- Put a shunt resistor across the PLC input. Choose the resistor value according to the PLC input scale. The resistor must have a power rating of at least 1 Watt.

Example

For a 1 to 5 Vdc input scale, the shunt resistor to put across the PLC input will be:

$$R_{\text{Shunt}} = \frac{5}{I_{\text{Loop}}} = \frac{5}{0.02} = 250 \text{ ohms}$$

3.4.1. 2-wire connection (toxic gases and oxygen)

Loop resistance

The supply voltage applied to the detector has direct influence on the MAXIMUM loop resistance. This resistance includes the cable resistance and the shunt resistor of the PLC.

Example

Consider a supply voltage of 24 Vdc. The minimum operating voltage of the **D•420** is 18 Vdc. The allowable voltage drop due to the loop resistance is 6 Vdc.

The MAXIMUM loop resistance will be:

$$R_{\text{Loop}} = \frac{24 - 18}{I_{\text{Loop}}} = \frac{6}{0.02} = 300 \text{ ohms}$$

$$\text{With } I_{\text{Loop}} = 20 \text{ mA}$$

For a 1 to 5 Vdc input scale, the shunt resistor to put across the PLC input will be:

$$R_{\text{Shunt}} = \frac{5}{I_{\text{Loop}}} = \frac{5}{0.02} = 250 \text{ ohms}$$

Therefore, the maximum allowable resistance for the cable will be:

$$R_{\text{Cable}} = 300 - 250 = 250 \text{ ohms}$$

To connect the **D•420** to a PLC using a **2-wire** connection:

- DALEMANS recommend using a shielded or a screened twisted pair cable.
- The cross sectional area of the cable should be **0.5 mm²**.
- The cable length should not exceed **1000 m**.
- Strip the wires and connect them to the B1 connector according to the diagram below.

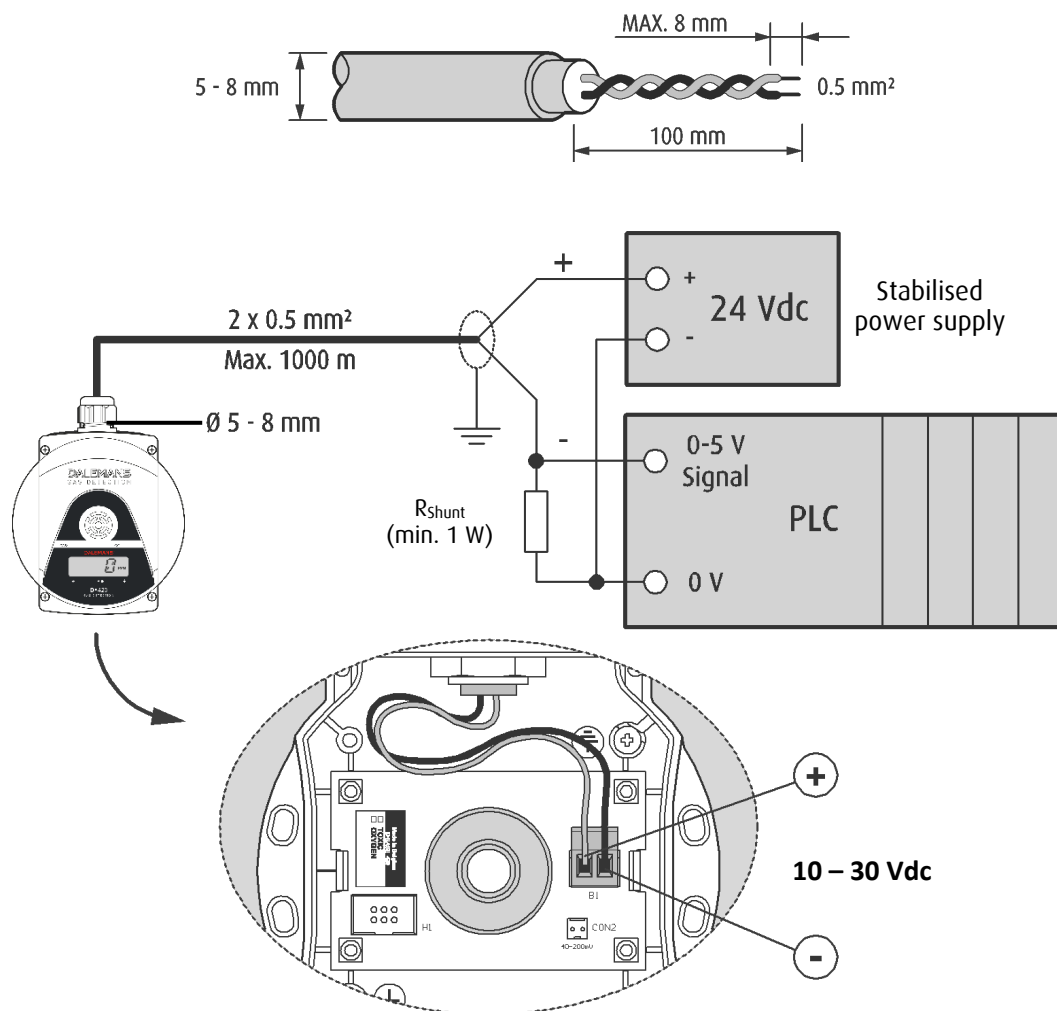


Figure 9: 2-wire connection to a PLC

3.4.2. 3-wire connection (refrigerants and CO₂)

- DALEMANS recommend using colour coded cable with solid wires.
- The acceptable cross sectional area of the cable is **0.75 to 2.5 mm²**.
- Strip the wires and connect them to the B1 connector according to the diagram below.
- The maximum acceptable cable length depends on the level of the supply voltage applied to the detector and the cross sectional area of the wires.

The table and the diagram below give examples:

Cross-section	Cable length (L)	
	20 Vdc	+24 Vdc
0.75 mm ²	200 m	900 m
1.50 mm ²	350 m	1000 m
2.50 mm ²	600 m	1000 m

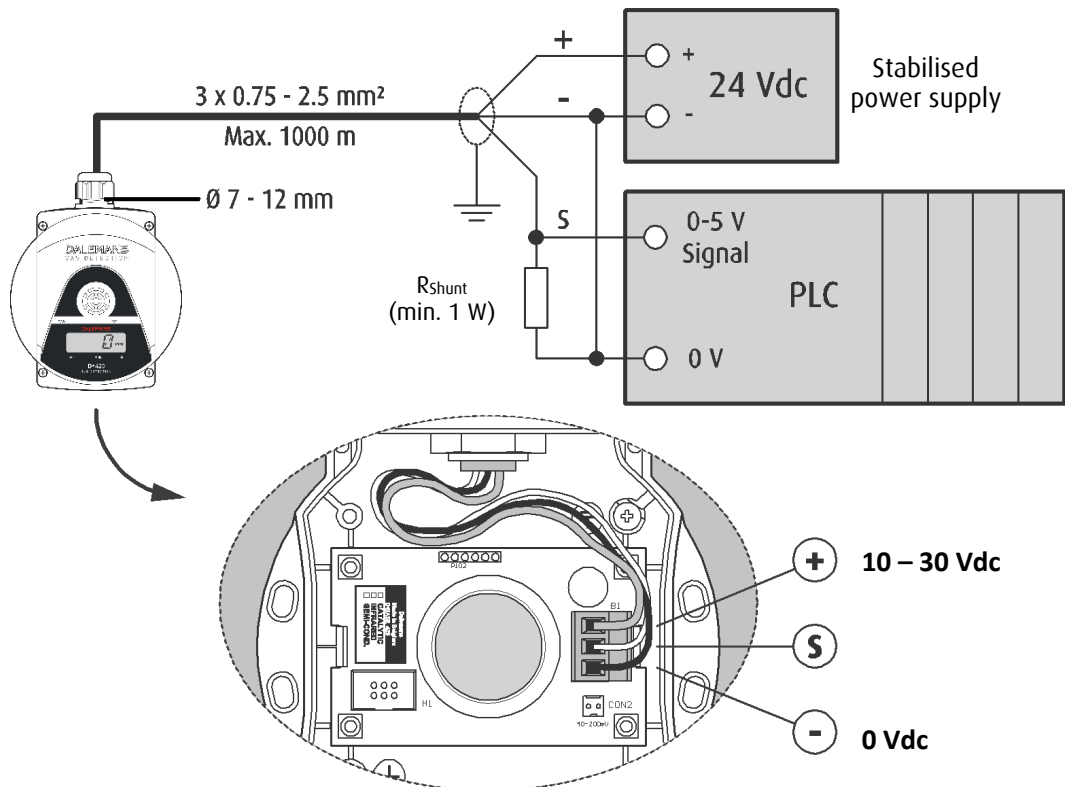
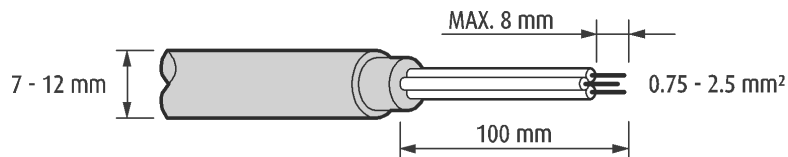
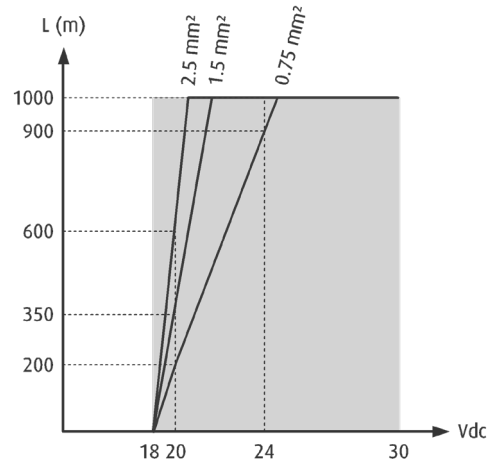
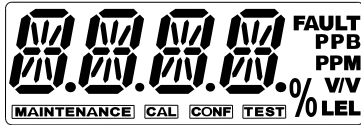


Figure 10: 3-wire connection to a PLC

4. OPERATING

4.1. Display



FAULT

PPB

PPM

% V/V

% LEL

MAINTENANCE

CAL

CONF

TEST

The **D•420** is equipped with a LCD screen for displaying:

- The gas/oxygen concentration value.
- The operating menu navigation.
- Information about the detector operational status.

Direct reading of the gas/oxygen concentration

Options and messages

Detector in “Fail” mode

Measurement unit in “Part Per Billion”

Measurement unit in “Part Per Million”

Measurement unit in “Volume percent”

Measurement unit in “Lower Explosive Limit percent”

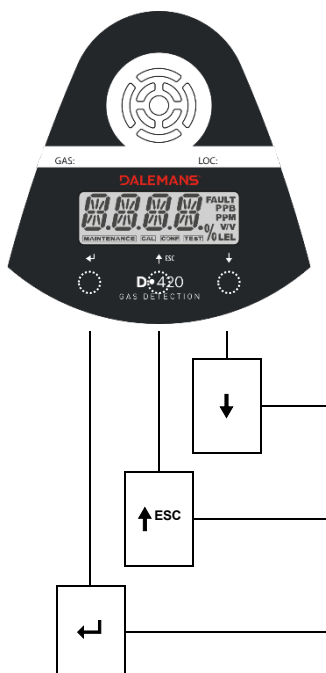
Detector in “Maintenance” mode and non-operational

Detector in “Calibration” mode

Detector in “Configuration” mode

Detector in “Test” mode

4.2. Touch keys



The three touch keys of the **D•420** detector allow:

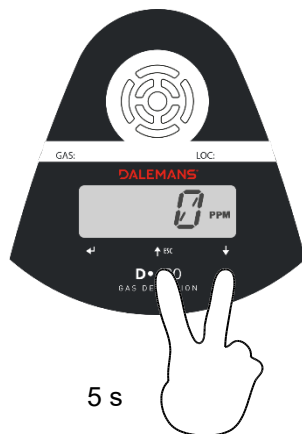
- Browsing the operating menu of the detector.
- Performing functions.
- Entering values.

Decrease value
Select next option

Increase value
Select previous option
Cancel or escape >> hold for 3 seconds

Enter
Move to next digit

4.3. Menus



P000

↵ 3 x

EVT

↑ ↓

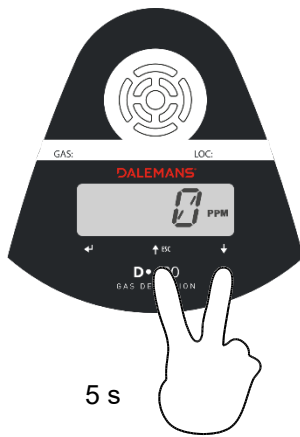
Hold the two right keys pressed for ± 5 seconds to access the detector menu.

Press the ↵ key three times to enter and confirm the “P000” access code.

Use ↑ ↓ to select the desired option and confirm by ↵ .

<p>EVT</p>	<p>Page 19</p>	<p>Displays the detector events log.</p>
<p>INFO</p>	<p>Page 20</p>	<p>Displays additional detector information.</p>
<p>AGE</p>		<ul style="list-style-type: none"> ▪ Time elapsed since last SPAN calibration.
<p>WRT</p>		<ul style="list-style-type: none"> ▪ Time elapsed since last sensor initialisation.
<p>OUTP</p>		<ul style="list-style-type: none"> ▪ Direct reading, in milliamps, of the detector output current on the 4-20 mA loop.
<p>VER</p>		<ul style="list-style-type: none"> ▪ Firmware version of the detector.
<p>LCD</p>	<p>Page 21</p>	<p>Timer function for the LCD screen.</p>

4.3.1. EVT menu (event log)



P000

↵ 3 x

EVT

↵

0101

0101

0101

A
D
I
W
E

0101

0101

↓ ...5 s

NONE

EVT

↑ESC ...3 s

The **EVT** menu allows you to browse the events that occurred and that have been logged on the detector.

Hold the two right keys pressed for ± 5 seconds to access the detector menu.

Press the ↵ key three times to enter and confirm the “P000” access code.

Press ↵ to proceed.

Use ↑ ↓ to scroll the logged events:

Sequence number (0 = most recent event).

Event type:

- Event active
- Event inactive
- Information
- Warning
- Error

The displayed event caused a detector fault.

Event identification code (refer to sections 5.2 to 5.5 for further details).

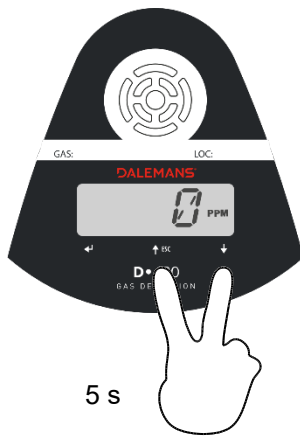
Clear log

Press ↓ for ± 5 seconds.

Events log cleared.

Press ↑ESC for ± 3 seconds to exit submenu.

4.3.2. INFO menu (information)



P000

↵ 3 x

EV T

↑ ↓

INFO

↵

AGE

↑ ↓

AGE

WKT

06.24

06.24

OUTP

04.00

VER

V 1R0

INFO

↑ESC ...3 s

The **INFO** menu allows you to display information about the detector operational status or the firmware version.

Hold the two right keys pressed for ± 5 seconds to access the detector menu.

Press the ↵ key three times to enter and confirm the “P000” access code.

Use ↑ ↓ to select the **INFO** option.

Press ↵ to proceed.

Use ↑ ↓ to select the desired option and press ↵ to confirm.

Time elapsed since last SPAN calibration.

Time elapsed since last sensor initialisation (SENS).

Number of months elapsed

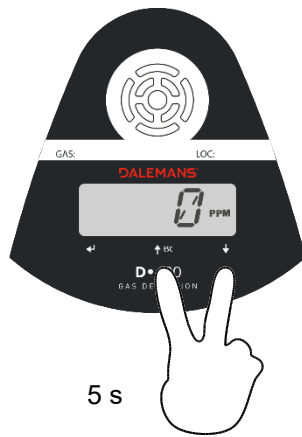
Number of days elapsed

Direct reading, in milliamps, of the detector output current on the 4-20 mA loop.

Firmware version of the detector.

Press ↑ESC for ± 3 seconds to exit submenu.

4.3.3. LCD menu (display)



The **LCD** menu allows you to turn the LCD screen timer ON or OFF.

Hold the two right keys pressed for ± 5 seconds to access the detector menu.

P000

↵ 3 x

EVT

↑ ↓

LCD

↵

ON

↑ ↓

OFF

ON

OFF

↵

LCD

↑ESC ...3 s

Press the ↵ key three times to enter and confirm the “P000” access code.

Use ↑ ↓ to select the **LCD** option.

Press ↵ to proceed.

Use ↑ ↓ to select the **ON** or **OFF** option.

The LCD screen is always ON.

The LCD screen turns OFF after 5 minutes of keys inactivity.

Press ↵ to confirm your choice.

Press ↑ESC for ± 3 seconds to exit submenu.

5. MAINTENANCE



Prior to carrying out maintenance operations, inhibit the safety function of the detector on the associated control unit or PLC and secure any output device connected to the system to prevent false alarms and unintended actuations.

Regularly remove dust from the detector.

If contamination of the sintered metal filter by solvent, gas or vapour has occurred, the sensing head must be replaced and the inspection frequency should be increased twofold.

Gas detectors must be calibrated at least once a year to mitigate the loss of sensitivity of the sensor. This calibration must be performed according to the procedure given by DALEMANS or his local representative, and in any case by qualified personnel who will have received a suitable training.

5.1. Sensor replacement

Sensors are supplied fitted into the D•BASE 420 circuit board to allow easy plug-in replacement:

- Unscrew the four metal screws of the detector lid and remove the lid.
- Disconnect the B1 connector from the D•BASE 420 circuit board.
- Unclip and remove the D•BASE 420 circuit board from the detector enclosure.
- Fit the replacement circuit board inside the enclosure and reconnect the B1 connector.
- Put the lid back onto the detector and screw the four metal screws of the lid back on again.
- Please follow the procedure given by DALEMANS or its local representative for commissioning (warm-up / stabilisation time) and calibrating the detector
- Restore the detector safety function on the associated control unit or PLC.

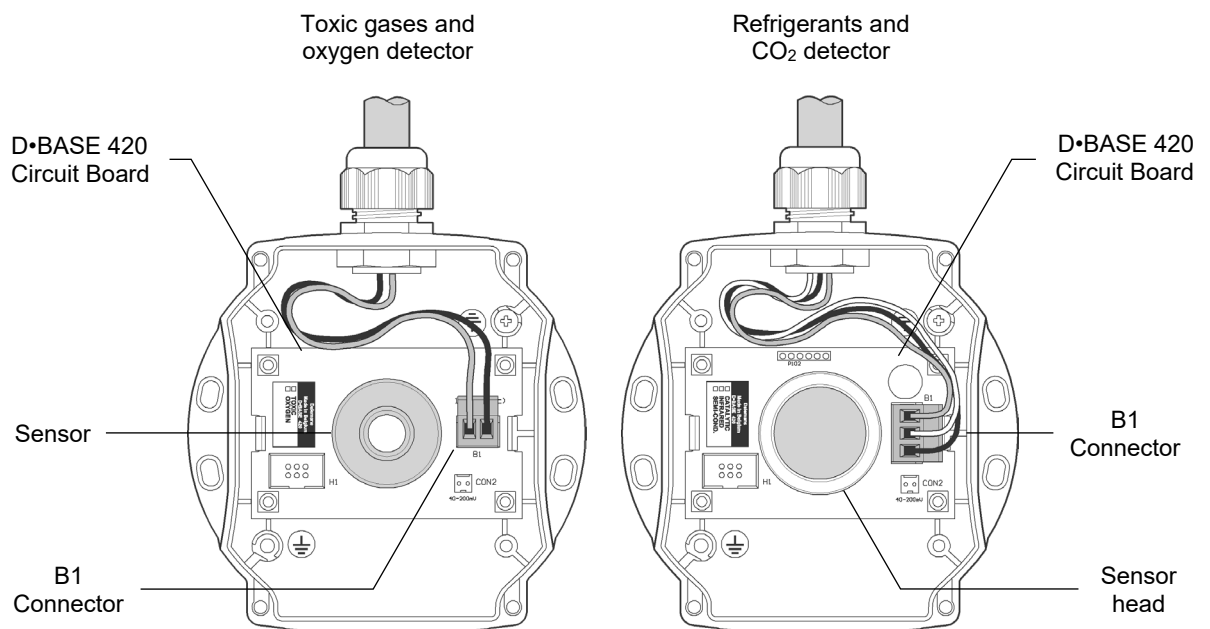


Figure 11: sensor replacement

5.2. “Axx” or “Dxx” event codes

If known errors occur on the detector, “Axx” or “Dxx” event codes display on screen and/or in the EVT menu which records the events log.

A or D Code	Event A = active / D = inactive	Solution(s)
01	Parameter not supported	Perform factory reset
02	OS main tasks execution too long	Contact DALEMANS
03	Communication errors on the I2C bus	Replace D-BASE 420 circuit board
04	Communication errors on 4-20 mA circuit	Replace D-BASE 420 circuit board
05	LCD/Keyboard communication errors	Check LCD circuit board connection Replace LCD circuit board Replace D-BASE 420 circuit board
06	Data communication errors on 4-20 mA	Replace D-BASE 420 circuit board
07	Incorrect loop current Loop voltage out of range	Check end-loop resistor Check wiring Check voltage on B1 connector Replace D-BASE 420 circuit board
08	Temperature on 4-20 mA circuit too high	Check climatic conditions Check end-loop resistor Check output current (max. 24 mA) Replace D-BASE 420 circuit board
09	General fault in the 4-20 mA output circuit	See A/D 07 and A/D 08 Replace D-BASE 420 circuit board
10	Error in sensor power supply circuit	Check sensor configuration Check/replace sensor
11	Unknown sensor, sensor disconnected or sensor failure	Check sensor configuration Check/replace sensor
12	Sensor voltage out of range	Check/replace sensor
13	Wrong sensor	Check/replace sensor
14	Temperature out of range	Check ambient temperature
15	Calibration required within 1 month	Recalibrate the detector
16	Calibration interval has expired	Recalibrate the detector
17	Incorrect LCD parameters or sensor code	Check LCD or sensor parameters
18	Incorrect manufactory settings	Perform factory reset
19	Incorrect timer parameters	Perform factory reset
20	Incorrect calibration parameters	Recalibrate detector
21	Keyboard failure	Check LCD circuit board connection Replace LCD circuit board

5.3. “Ixx” event codes (Information)

The following “Ixx” information codes may display on screen, and/or in the **EVT** menu which records the events log, to indicate a change in the detector operational status.

I Code	Information
01	Detector start-up
02	Detector in operational mode
03	Detector in service mode
04	PC connected to the detector
05	PC disconnected
06	ZERO calibration started
07	ZERO calibration parameters saved
08	SPAN calibration started
09	SPAN calibration parameters saved

5.4. “Wxx” event codes (Warning)

The following “Wxx” codes may display on screen, and/or in the **EVT** menu which records the events log, to give warnings on the use of PIN codes or on the detector operation.

W Code	Warning
01	User PIN code used
02	Calibration PIN code used
03	Manufacturer PIN code used
04	Sensor configuration PIN code used
05	Sensor warm-up not finished yet

5.5. “Exx” event codes (Error)

If known errors occur in the execution of the detector functions, “Exx” event codes display on screen and/or in the **EVT** menu which records the events log.

E Code	Error	Solution(s)
01	Incorrect parameters/ranges found at ZERO calibration start	Check parameters and start calibration over again
02	Sensor voltage offset out of range	Check/replace D-BASE 420 circuit board Check/replace sensor
03	Incorrect zero during calibration	Check zero gas Check/replace D-BASE 420 circuit board Check/replace sensor
04	Incorrect parameters/range found at SPAN calibration start	Check parameters and start calibration over again
05	ZERO calibration failed	Check/replace D-BASE 420 circuit board Check/replace sensor
06	SPAN calibration failed	Check calibration gas Replace sensor (sensitivity loss)
07	Calibration timeout	Start calibration over again
08	Measured value decreases during SPAN calibration	Check gas
09	Calibration failed - SPAN is too high	Check/replace D-BASE 420 circuit board Check/replace sensor
10	Communication error with I.R. sensor	Check/replace sensor
11	I.R. sensor returns internal error	Check/replace sensor

5.6. “Exxx” system errors codes

The following **Exxx** error codes may display on screen to indicate that an error occurred in the execution of the detector firmware.

Code	Error
E100	Memory stack pointer out of range
E110	Execution key / flow control fail
E111	Warm-up time incorrect value
E112	Timers issue
E113 E115	Warm-up memory variables issue
E200 E201 E202 E204	State machine memory variables issue
E300	General MCU register test failed
E301	MCU program count test failed
E302	MCU stack count failed
E303	MCU Extra Segment (ES) register test failed
E304	MCU Code Segment (CS) register test failed
E305	Incorrect firmware CRC
E306	MCU RAM memory test failed
E400	FAULT memory variable issue
E401	Start-up stack test failed
E402	ROM memory start-up CRC failed
E403	ROM memory runtime CRC failed
E406	Memory variable runtime CRC issue
E500	Memory timer variable issue


5.7. Spare parts and accessories

Part or accessory	Part number
D•420 complete enclosure for electrochemical sensor	0 1 0 2 4 (B 0 1 0 0 0 0 0 2 3 3)
D•420 complete enclosure for infrared & semiconductor sensors	0 1 0 2 2 (B 0 1 0 0 0 0 0 2 3 1)
Retainer for plastic enclosure lid	0 1 0 1 7 (B 0 1 0 0 0 0 0 2 2 6)
M16 Polyamide Ex e cable gland - Black 5 - 8 mm	0 2 3 9 9 (P R E 0 0 0 0 0 0 4 4)
M20 Polyamide Ex e cable gland - Black 7 - 12 mm	0 2 3 8 8 (P R E 0 0 0 0 0 0 1 8)
M16 metric plastic nut	0 2 4 0 0 (P R E 0 0 0 0 0 0 4 5)
M20 metric plastic nut	0 2 4 0 1 (P R E 0 0 0 0 0 0 4 6)
D•BASE 420 pour gaz toxiques	<i>Depends on sensor used</i>
D•BASE 420 circuit board + infrared sensor for CO ₂ 5000 ppm	0 0 8 2 7 (B A S D L I N E 0 1 1)
D•BASE 420 circuit board + infrared sensor for CO ₂ 4 % v/v	0 0 8 2 8 (B A S D L I N E 0 1 2)
D•BASE 420 circuit board + semiconductor sensor for R-134A	0 0 8 2 9 (B A S D L I N E 0 1 3)
D•BASE 420 circuit board + semiconductor sensor for R-404A	0 0 8 3 1 (B A S D L I N E 0 1 5)
D•BASE 420 circuit board + semiconductor sensor for R-407C	0 0 8 3 2 (B A S D L I N E 0 1 6)
D•BASE 420 circuit board + semiconductor sensor for R-410A	0 0 8 3 3 (B A S D L I N E 0 1 7)
D•BASE 420 circuit board + semiconductor sensor for R-22	0 0 8 3 4 (B A S D L I N E 0 1 9)
Aluminium sensing head for infrared sensor	0 2 0 2 0 (M E C 0 0 0 0 0 0 4 6)
Screw for sensing head - M2.5 x 6 mm	0 2 9 7 3 (V I S V I S 0 0 0 7 6)
Screw for plastic enclosure lid	0 2 9 7 4 (V I S V I S 0 0 0 7 7)
D•LINE kit for remote gas injection	0 0 6 4 8 (A C C K I T 0 0 0 0 6)
D•LINE IP65 weatherproof protection kit	0 0 6 4 9 (A C C K I T 0 0 0 0 7)
D•LINE collecting cone	0 0 6 5 0 (A C C K I T 0 0 0 0 8)
D•LINE kit for remote gas tight sampling	0 0 6 5 1 (A C C K I T 0 0 0 0 9)

6. SPECIFICATIONS

MODEL	D•420		
Material	Flame retardant (UL-94V0) and UV stabilized plastic		
Dimensions	142 x 119 x 51 mm		
Weight	300 g		
Output	4-20 mA current loop		
Measurement principle	Electrochemical	Semiconductor	Infrared
Measurement range	<i>Other gases/ranges upon request</i>		
Ammonia (NH ₃)	0 - 1000 ppm	-	-
Carbone dioxide (CO ₂)	-	-	0 - 4 % v/v
Carbone monoxide (CO)	0 - 300 ppm	-	-
Chlorine (Cl ₂)	0 - 10 ppm	-	-
Hydrogen sulphide (H ₂ S)	0 - 50 ppm	-	-
Nitrogen dioxide (NO ₂)	0 - 30 ppm	-	-
Oxygen (O ₂)	0 - 25 % v/v	-	-
Refrigerants	-	0 - 2000 ppm	-
Sulphur dioxide (SO ₂)	0 - 20 ppm	-	-
Operating voltage	10 - 30 Vdc	10 - 30 Vdc	10 - 30 Vdc
Power consumption	0.85 W	1.8 W	0.5 W
Operating temperature	-20 °C to +40 °C	-10 °C to +50 °C	-20 °C to +50 °C
Response time (T90)	< 45 s	< 60 s	< 30 s
Accuracy	± 1.5 % range	± 10 % range	± 1.5 % range
Expected operating life	> 2 years	> 5 years	> 5 years
Humidity (non-condensing)	20 - 90 % RH	10 - 90 % RH	0 - 95 % RH
Cable entry	1 x M16	1 x M20	
Wiring	2 x 0.5 mm ² (solid)	3 x 0.75 - 2.5 mm ² (solid)	
Cable length	max. 1000 m		
Loop resistance	50 - 750 ohms		
Display	4 digit LCD		
Ingress protection	IP65 (with accessory)		
Standards	EN 50270 Type 1 (EMC - Electromagnetic Compatibility)		

* Typical value, depends on the target gas.

 All gas detection installations must be calibrated and maintained regularly in accordance with the manufacturer's instructions to guarantee safety and performance.



D•420

GAS OR OXYGEN DETECTOR

**INSTRUCTION
MANUAL**

DALEMANS®

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