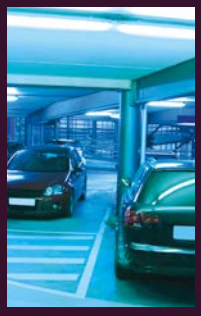
D•420

toxic and oxygen gas detector

Cl_2 - CO - NH_3 - O_2 - CO_2

FREONS ...



- ✔ Principles: **ELECTROCHEMICAL SEMICONDUCTOR INFRARED**
- ✔ Connection: 3 wires
- ✔ Output signal: 4..20 mA
- ✔ LCD display

DALEMANS
GAS DETECTION

THE BELGIAN PIONEER IN GAS DETECTION

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

D·420

CHARACTERISTICS

Material	Flame retardant (UL-94V0) and UV stabilized plastic		
Dimensions (HxWxD)	142 x 119 x 51 mm		
Weight	300 g		
Output	4-20 mA current loop		
Measurement principle	**ELECTROCHEMICAL**	**SEMICONDUCTOR**	**INFRARED**
Operating voltage	10 - 30 Vdc	18 - 30 Vdc	18 - 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 % full scale	± 10 % full scale	± 1,5 % full scale
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	1 x M20
Wiring	2 x 0,5 mm² - 3 x 0,75 - 2,5 mm□ (solid wires)		
Max. cable length	1000 m		
Loop resistance	50 - 750 ohms		
Display	LCD - 4 characters		
Housing ingress protection	IP65		
Standards	EN 50270 Type 1		

*Typical value, depends on the target gas.

GASES CONCERNED

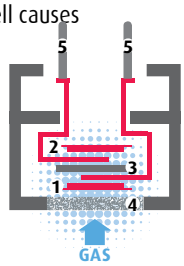
	MEASUREMENT RANGES		
Gas	**ELECTROCHEMICAL**	**SEMICONDUCTOR**	**INFRARED**
Ammonia (NH_3)	0 - 1000 ppm	-	-
Carbon diooxide (CO_2)	-	-	0 - 4 % vol
Carbon monoxide (CO)	0 - 300 ppm	-	-
Chlorine (Cl_2)	0 - 10 ppm	-	-
Cooling gases	-	0 - 2000 ppm	-
Hydrogen sulphide (H_2S)	0 - 50 ppm	-	-
Nitrogen dioxide (NO_2)	0 - 30 ppm	-	-
Oxygen (O_2)	0 - 25 % vol	-	-
Sulphur dioxide (SO_2)	0 - 20 ppm	-	-

Other gases and measurement ranges upon request.

MEASUREMENT PRINCIPLES

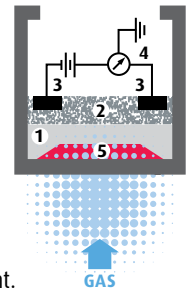
ELECTROCHEMICAL

The electrochemical cell is made up of a measurement electrode (1), a counter-electrode (2) and a reference electrode (3).
These electrodes are bathed in an electrolyte inside the cell casing, which is itself fitted with a gas permeable membrane (4).
The gas which is diffused inside the cell causes a **chemical reaction on the measurement electrode** and on the counter-electrode.
The result is an **electric current, proportionate to the concentration of the gas present**, which circulates between these two electrodes.
This current is measured by the external circuit (5) to which the cell is connected.



SEMICONDUCTOR

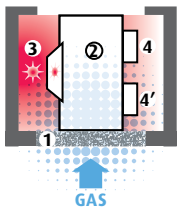
The cell is composed of a **non-conductive element,** for example silicon (1) to which a **semiconductor metal oxide** (2) is applied.
Two electrodes connected to a measuring device are connected to the semiconductor material (3).
In the absence of gas, oxygen is ionised onto the surface of the sensor, **which then becomes a semiconductor.**
When a gas enters the cell, its molecules take the place of the oxygen ions, resulting in **a drop in resistance between the two electrodes.**
This variation is measured electrically (4) and is proportional to the concentration of the gas present.
A heating element (5) allows the temperature in the sensor to be stabilised, which improves the measurement and reduces the effect of external temperature changes.



INFRARED

The infrared cell functions according to the non-dispersive infrared (NDIR) principle.
It is made up of a casing comprising:
- a diffusion membrane (1),
- a measurement chamber (2),
- an IR radiation source (3),
- an active sensor (4) and
- a reference sensor (4').

The gas that reaches the measurement chamber absorbs - within a very precise range of wavelengths - a part of the radiation emitted by the IR source.
The active sensor measures the remaining IR radiation and thereby determines the concentration of the gas present. The reference sensor measures the IR radiation within a range of wavelengths that is not influenced by the incoming gas. Its signal serves to compensate any variation in IR radiation which is not due to absorption caused by the targeted gas, such as a variation in temperature, humidity level, etc.
This enables us to obtain an accurate and reliable measurement in all conditions.



DALEMANS GAS DETECTION
rue Jules Mélotte 27 - B-4350 Remicourt
Tel.: +32 (0)19 33 99 43 • Fax: +32 (0)19 33 99 44 • sales@dalemans.com **www.dalemans.com**