



## APPLICATION GUIDE

This publication is intended to serve as a guideline for the use of the Macurco products. It is not to be considered all-inclusive, nor is it intended to replace the policy and procedures for any facility. If there are any doubts about the applicability of the equipment to your situation, consult an industrial hygienist or call Macurco Technical Service at 1-877-367-7891



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# GAS DETECTION 101

## THREE TYPICAL GAS HAZARDS TO BE AWARE OF



### FLAMMABLE

- Having the right combination of an ignition source, oxygen, and fuel in a gas or vapor form provides for the necessary means to create a fire or explosion
- The minimum concentration of combustible gas or vapor necessary to support its combustion in air is defined as the Lower Explosive Limit (LEL). Below this level, the gas mixture is too "lean" to burn
- The maximum concentration of a gas or vapor that will burn in the air is defined as the Upper Explosive Limit (UEL). Above this level, the mixture is too "rich" to burn
- The range between the LEL and UEL is known as the flammable range for that gas or vapor
- Gases such as Methane, Hydrogen, Propane



### TOXIC

- Some gases are poisonous and are dangerous to life at very low levels. Some toxic gases have distinct odors ( $\text{H}_2\text{S}$ ,  $\text{NH}_3$ ) and others have no odors at all ( $\text{CO}$ )
- Very low levels inhaled, ingested, or absorbed through the skin pose adverse effects from exposure
- Gases such as Carbon Monoxide, Nitrogen Dioxide, Ammonia, Hydrogen Sulfide



### ASPHYXIAN OR OXYGEN DEPLETING

- Where Oxygen levels are too rich, environments have the potential to become an explosive environment
- Where Oxygen levels are too low, people within the environment can succumb to asphyxiation
- Gases such as Oxygen, Carbon Dioxide, Nitrogen, Helium, Argon

## GAS CHART

# Toxic & Combustible Gas Chart

Gas Type	Chemical Symbol	Color	Smell	Molecular Weight	Vapor Density (Air =1 )	% in Atmosphere	Risks	LEL%	UEL%	Recommended Detector Mounting Height	Electro-Chemical	Catalytic	NDIR
Acetylene	C <sub>2</sub> H <sub>2</sub>	Colorless	Odorless	26	0.91	NA	Flammable	2.5	100	Near Ceiling		X	
Ambient Air	—	Colorless	Odorless	29	1	100%	NA	NA	NA	NA			
Ammonia	NH <sub>3</sub>	Colorless	Pungent Odor	17	0.6	NA	Toxic	15	28	Near Ceiling	X	X	
Argon	Ar	Colorless	Odorless	39.95	1.38	.934%	Asphyxiant	NA	NA	Breathing Zone (4-6 ft)	X		
Butane	C <sub>4</sub> H <sub>10</sub>	Colorless	Odorless	58.12	2.11	NA	Flammable	1.8	8.4	~12" Above Floor		X	X
Carbon Dioxide	CO <sub>2</sub>	Colorless	Odorless	44.01	1.52	.040%	Asphyxiant/Toxic	NA	NA	~12" Above Floor	X	X	
Carbon Monoxide	CO	Colorless	Tasteless / No Smell	28.01	0.97	NA	Toxic/Poisonous	12.5	74	Breathing Zone (4-6 ft)	X		
Chlorine	Cl <sub>2</sub>	Green/Yellow	Pungent Odor	35.45	2.47	NA	Toxic/Oxidizer	NA	NA	~12" Above Floor	X		
Chlorine Dioxide	ClO <sub>2</sub>	Green/Yellow	Pungent Odor	67.45	2.33	NA	Oxidizer	NA	NA	~12" Above Floor	X		
Ethanol	C <sub>2</sub> H <sub>5</sub> O	Colorless	Pungent Taste	46.1	1.59	NA	Flammable	3.3	19	~12" Above Floor		X	
Helium	He	Colorless	Odorless	4.02	0.14	.00052%	Asphyxiant	NA	NA	Breathing Zone (4-6 ft)			
Hydrogen	H <sub>2</sub>	Colorless	Odorless	2	0.7	.000050%	Flammable	4	75	Near Ceiling	X	X	
Hydrogen Chloride	HCl	Yellowish	Pungent Odor	36.46	1.27	NA	Toxic	NA	NA	~12" Above Floor	X		
Hydrogen Cyanide	HCN	Colorless	Bitter Odor	27.03	0.94	NA	Toxic/Flammable	5.4	46	Near Ceiling	X		
Hydrogen Fluoride	HF	Colorless	Irritating Odor	20.01	0.69	NA	Toxic	NA	NA	Near Ceiling	X		
Hydrogen Peroxide	H <sub>2</sub> O <sub>2</sub>	Colorless	Slightly Sharp Odor	34	1.1	NA	Toxic	NA	NA	~12" Above Floor	X		
Hydrogen Sulfide	H <sub>2</sub> S	Colorless	Pungent Odor	34.08	1.19	NA	Toxic	4	44	~12" Above Floor	X		
Methane	CH <sub>4</sub>	Colorless	Odorless	16	.55	.0002%	Flammable	5	15	Near Ceiling		X	X
Methyl Mercaptan	CH <sub>3</sub> SH	Colorless	Rotten Odor	48.11	1.66	NA	Toxic/Flammable	4.1	21	~12" Above Floor	X		
Nitric Oxide	NO	Colorless	Sharp Odor	30	1.04	NA	Toxic	NA	NA	Breathing Zone (4-6 ft)	X		
Nitrogen	N <sub>2</sub>	Colorless	Odorless	28.01	0.967	78.084%	Asphyxiant	NA	NA	Breathing Zone (4-6 ft)	X		
Nitrogen Dioxide	NO <sub>2</sub>	Red/Orange	Pungent Odor	46.01	2.62	NA	Toxic/Poisonous	NA	NA	Breathing Zone (4-6 ft)	X		
Oxygen	O <sub>2</sub>	Colorless	Odorless	32	1.1	20.948%	Oxidizer	NA	NA	Breathing Zone (4-6 ft)	X		
Ozone	O <sub>3</sub>	Colorless/blue	Pungent Odor	47.99	1.66	0.000006	Toxic/Oxidizer	NA	NA	~12" Above Floor	X		
Propane	C <sub>3</sub> H <sub>8</sub>	Colorless	Odorless	44.1	1.56	NA	Flammable	2.1	9.5	~12" Above Floor		X	X
Sulfur Dioxide	SO <sub>2</sub>	Colorless	Pungent Odor	64.06	2.25	NA	Toxic	NA	NA	~12" Above Floor	X		

Ensuring the safety of individuals and safeguarding property against potential hazards is paramount, making toxic and combustible gas detection an indispensable component of comprehensive safety protocols. The presence of harmful gases poses a significant threat to both human health and the integrity of structures, underscoring the critical need for vigilant monitoring. Toxic gases, even in minute concentrations, can lead to adverse health effects, ranging from respiratory issues to severe illnesses. Meanwhile, combustible gases, if left undetected, may lead to catastrophic fires or explosions with devastating consequences.

Early detection of these gases enables prompt intervention, allowing for timely evacuation and mitigation measures. By deploying sophisticated gas detection systems, the risk of harm can be minimized, ensuring the well-being of occupants and the preservation of property. In industrial settings, these systems are essential for maintaining a secure work environment, meeting regulatory requirements, and preventing potential disasters that may arise from the inadvertent release of hazardous gases. In essence, the incorporation of reliable gas detection technologies is a fundamental aspect of proactive risk management, contributing significantly to overall safety and the protection of both lives and assets.



## GAS CHART

# Refrigerant Gas Chart

Gas Type	Chemical Symbol	Safety Classification	Molecular Weight	Vapor Density (Air = 1)	LEL%	UEL%	Risks
<b>R22</b>	CHClF <sub>2</sub>	A1	86.45	3	NA	NA	Asphyxiants
<b>R32</b>	CH <sub>2</sub> F <sub>2</sub>	A2L	52.02	3.82	14	31	Asphyxiants/Flammable
<b>R125</b>	C <sub>2</sub> HF <sub>5</sub>	A1	120	4.2	NA	NA	Asphyxiants
<b>R134a</b>	CH <sub>2</sub> FCF <sub>3</sub>	A1	102.03	3.5	NA	NA	Asphyxiants
<b>R143a</b>	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	A2L	84.06	2.9	7.1	16.1	Asphyxiants/Flammable
<b>R227ea</b>	C <sub>3</sub> HF <sub>7</sub>	A1	170.03	5.9	NA	NA	Asphyxiants
<b>R404a</b>	(R-125/R-143A/R-134A) 44/52/4%	A1	97.6	3.34	NA	NA	Asphyxiants
<b>R407a</b>	(R-32/R125/R134A) 20/40/40%	A1	90.1	2.54	NA	NA	Asphyxiants
<b>R407c</b>	(R-32/R-125/R-134A) 23/25/52%	A1	86.2	3	NA	NA	Asphyxiants
<b>R407f</b>	(R-32/R125/R124A) 30/30/40%	A1	82.1	2.54	NA	NA	Asphyxiants
<b>R410a</b>	(R-32/R-125) 50/50%	A1	72.6	3	NA	NA	Asphyxiants
<b>R417a</b>	(R-125/R-134A/R-600) 46.6/50/3.4%	A1	106.7	3.8	NA	NA	Asphyxiants
<b>R422d</b>	(R-125/R-134A/R-600) 65.1/31.5/3.4%	A1	109.9	3	NA	NA	Asphyxiants
<b>R448a</b>	(R-32/R-125/R-134A/R1234yf/R-1234ze) 26/26/21/20/7%	A1	189.9	2.98	NA	NA	Asphyxiants
<b>R449a</b>	(R32/R125/R1234yf/R134a) 24.3/24.7/25.3/25.7%	A1	87.2	3.07	NA	NA	Asphyxiants
<b>R450a</b>	(R-134A/R1234ze) 42/58%	A1	109	NA	NA	NA	Asphyxiants
<b>R452b</b>	(HFC-32/C3H2F4) 30-50/50-70%	A2L	63.5	NA	12	23.3	Asphyxiants/Flammable
<b>R454a</b>	(HFC-32/R-1234yf) 35/65%	A2L	80.5	2.83	8	15	Asphyxiants/Flammable
<b>R454b</b>	(HFC-32/R-1234yf) 68.9/31.1%	A2L	62.6	2.2	11.25	22	Asphyxiants/Flammable
<b>R454c</b>	(HFC-32/R-1234yf) 21.5/78.5%	A2L	90.8	3.1	7	15	Asphyxiants/Flammable
<b>R455a</b>	(CO2/R32/R-1234yf) 3/21.5/75.5%	A2L	87.5	NA	11.8	12.9	Asphyxiants/Flammable
<b>R507</b>	(R-125/R-143A) 50/50%	A1	98.9	NA	NA	NA	Asphyxiants
<b>R513a</b>	(R-134A/R-1234yf) 30-50/50-70%	A1	108.4	NA	NA	NA	Asphyxiants
<b>R1234yf</b>	C <sub>3</sub> H <sub>2</sub> F <sub>4</sub>	A2L	114	4	6.2	12.3	Asphyxiants/Flammable
<b>R1233zd</b>	C <sub>3</sub> H <sub>2</sub> ClF <sub>3</sub>	A1	130.5	NA	NA	NA	Asphyxiants
<b>R1234ze</b>	C <sub>3</sub> F <sub>4</sub> H <sub>2</sub>	A2L	114	4	8	15	Asphyxiants/Flammable

**Color** - Colorless

**Smell** - Faint Ethereal Odor

**Sensor Type** - NDIR

**% in Atmosphere** - NA

**Mounting Height** - ~12" Above Floor

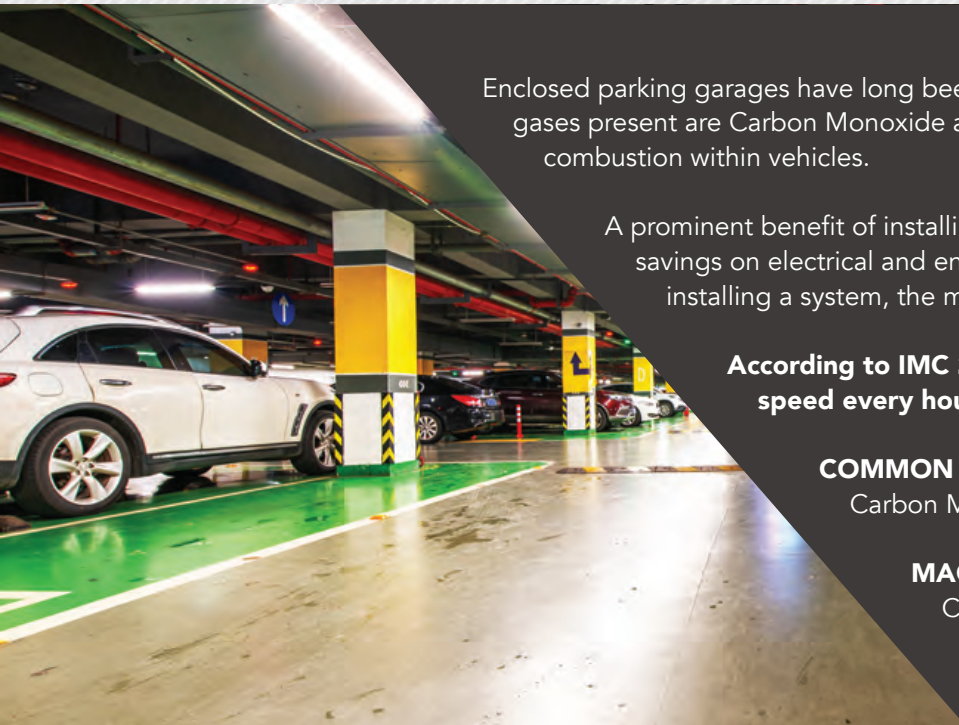
Refrigerant gas detection is a crucial aspect of maintaining safety and environmental compliance in various industries, particularly those that use refrigeration systems, air conditioning units, or heat pumps. Refrigerant gases, such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs), can pose health risks and contribute to environmental issues if they leak into the atmosphere.

### Purpose of Detection:

**Safety:** Refrigerant leaks can lead to the formation of harmful and potentially lethal concentrations in enclosed spaces. Detection systems help to identify and mitigate these risks.

**Environmental Compliance:** Many refrigerants contribute to ozone depletion or global warming. Detecting and repairing leaks is essential to comply with environmental regulations.

## PARKING GARAGES



Enclosed parking garages have long been using detection for vehicle exhaust. The primary gases present are Carbon Monoxide and Nitrogen Dioxide resulting from incomplete combustion within vehicles.

A prominent benefit of installing a gas detection system in a garage is the cost savings on electrical and energy consumption. On average within one year of installing a system, the money spent on a gas detection system is recouped.

**According to IMC 2018 – the only alternative to running fans at full speed every hour of every day is to install a CO/NO<sub>2</sub> system.**

### COMMON GASES:

Carbon Monoxide, Nitrogen Dioxide, Combustibles

### MACURCO PRODUCTS:

CX-6 (CO & NO<sub>2</sub>), CM-6 (CO), TX-6-ND (NO<sub>2</sub>),  
GD-6 (Combustibles)

## CAR DEALERSHIPS / MAINTENANCE BAYS

Car dealerships and maintenance bays are considered occupied spaces. Ventilation equipment is heavily relied upon to mitigate vehicle exhaust that results in potential fumes from Carbon Monoxide and Nitrogen Dioxide.

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GD-6 (Combustibles)





## AMBULANCE / FIRETRUCK BAYS



Ambulance and firetruck bays are typically connected to another occupied building where people reside. It is extremely critical to monitor toxic gases and exhaust appropriately to ensure the safety of the residents and crews.

A prominent benefit of installing a gas detection system in a garage is the cost savings on electrical and energy consumption. On average within one year of installing a system, the money spent on a gas detection system is recouped.

**According to IMC 2018 – the only alternative to running fans at full speed every hour of every day is to install a CO/NO<sub>2</sub> system.**

### COMMON GASES:

Carbon Monoxide, Nitrogen Dioxide, Combustibles

### MACURCO PRODUCTS:

CX-6 (CO & NO<sub>2</sub>), CM-6 (CO), TX-6-ND (NO<sub>2</sub>),  
GD-6 (Combustibles)

## LOADING DOCKS

With large vehicles coming and going regularly, vehicle exhaust is a major hazard within loading docks. If not properly ventilated, employees could be exposed to toxic fumes regularly.

Much like a parking garage, a gas detection system can cut costs on ventilation equipment operations and noise pollution.

**According to IMC 2018 – the only alternative to running fans at full speed every hour of every day is to install a CO/NO<sub>2</sub> system.**

### COMMON GASES:


Carbon Monoxide, Nitrogen Dioxide, Combustibles

### MACURCO PRODUCTS:

CX-6 (CO & NO<sub>2</sub>), CM-6 (CO), TX-6-ND (NO<sub>2</sub>),  
GD-6 (Combustibles)



# BEVERAGE DISPENSING



New legislation dictates any storage of a Carbon Dioxide 100lb tank or more for beverage dispensing must result in a Carbon Dioxide monitor present. This is a state by state code which is indicated on what year of IFC the State has adopted.

Restaurants & Bars / Gas Stations / Cafeterias etc. are all common applications where the Carbon Dioxide code is prevalent.

**Per IFC 2015 (5307.5.2) and IFC 2018 (5307.3.2), there are different alarm values required.**

- 2015 – Activate alarm at 5,000ppm of CO<sub>2</sub> (CD-6MC)
- 2018 - Activate low alarm at 5,000ppm of CO<sub>2</sub> (CD-6B)
- 2018 - Activate high alarm at 30,000ppm of CO<sub>2</sub> (CD-6B)


## COMMON GASES:

Carbon Dioxide

## MACURCO PRODUCTS:

CD-6G (CO<sub>2</sub>), CD-6B (CO<sub>2</sub>)

# BREWERIES / WINERIES



High levels of Carbon Dioxide are found in pits, storage tanks, bottling rooms and the fermentation process within wineries. Carbon Dioxide is heavier than air and will fall to the floor if leaking from a tank displacing the Oxygen.

Carbon Monoxide has the potential to be present in these applications due to the incomplete combustion of combustible gases during their manufacturing process and heating of the venue.

**OSHA and NIOSH have regulations on exposure to these gases (CO, CO<sub>2</sub>, Combustible) over some time.**

## COMMON GASES:

Carbon Dioxide, Carbon Monoxide, Oxygen Deficiency, Combustibles

## MACURCO PRODUCTS:

CD-6MC (CO<sub>2</sub>), CD-6B (CO<sub>2</sub>), CM-6 (CO), OX-6 (O<sub>2</sub>), GD-6 (Combustibles)



## RESTAURANTS / COMMERCIAL KITCHENS

Appliances in kitchens such as grills, stoves, and fryers are often using natural gas and/or propane for their heating source. Carbon Monoxide is a by-product of these gases and if methane (natural gas) or propane leak it may cause an explosion.

Legislation for commercial kitchens may change depending on the state but following NFPA 54 regarding the National fuel gas code is a good place to start.

### COMMON GASES:

Carbon Monoxide, Combustibles

### MACURCO PRODUCTS:

CM-6 (CO), GD-6 (Combustibles)



## BOILER / MECHANICAL ROOMS

Mechanical rooms are often forgot about as unsafe spaces. Since Methane and/or Propane are commonly used for heating, a leak can become catastrophic. If the gases are not fully combusted a harmful poisonous gas can result in Carbon Monoxide. Carbon Monoxide poisoning can become fatal if concentrations become high enough.

Chillers are also found in mechanical rooms and have the potential to leak refrigerant gases and that can become costly and extremely hazardous.

**PER OSHA – 50ppm of CO Permissible Exposure Level over 8 hours.**

### COMMON GASES:

Carbon Monoxide, Combustibles, Refrigerants

### MACURCO PRODUCTS:

CM-6 (CO), GD-6 (Combustibles), AIRESHIELD (Refrigerants)



## GENERAL WAREHOUSE / FORKLIFTS

Warehouses are a busy place with personnel and forklifts. Whether gas powered or battery powered, gases are present. Carbon Monoxide and Nitrogen Dioxide are present due to vehicle exhaust and Hydrogen gas can be present due to the charging of the forklift batteries.

Fixed gas detection is present in these applications for the safety of employees and the prevention of loss of goods due to explosions from Hydrogen.

### COMMON GASES:

Carbon Monoxide, Nitrogen Dioxide, Hydrogen, Combustibles

### MACURCO PRODUCTS:

CX-6 (CO & NO<sub>2</sub>), CM-6 (CO), TX-6-ND (NO<sub>2</sub>), GD-6 (Combustibles)



## BATTERY CHARGING / DATA CENTERS



Hydrogen is a common gas present in any atmosphere where battery charging exists.

Golf cart charging/storage facilities with forklifts have become a popular application due to the volatile nature of Hydrogen gas.

Data centers are also using Hydrogen as a footprint to replace greenhouses gases that in the past were produced at much higher levels.

**The Uniform Fire Code, International Fire Code allows Hydrogen levels at 1% by volume or 25% of the lower explosion limit (LEL).**

### COMMON GASES:

Hydrogen

### MACURCO PRODUCTS:

GD-6 (Combustibles)





## GROW / EXTRACTION FACILITIES



The grow industry has evolved and become one of the hotbeds in America. Whether growing tomatoes, lettuce or cannabis, gas detection is prevalent throughout this application.

Carbon Dioxide is injected into these rooms at a constant PPM value of 1000-2000ppm. Other gases found within these grow houses are Carbon Monoxide and Oxygen.

Everyday consumer products like lettuce, tomatoes, and others are being cultivated indoors. These operations also are injecting Carbon Dioxide into the growth areas for the optimum product.

### COMMON GASES:

Carbon Dioxide, Carbon Monoxide, Oxygen (enrichment or depletion), Combustibles

### MACURCO PRODUCTS:

CD-6G (CO<sub>2</sub>), CD-6B (CO<sub>2</sub>), CD-6MC (CO<sub>2</sub>), CM-6 (CO), OX-6 (O<sub>2</sub>), GD-6 (Combustibles)

## ICE RINKS

Several gases can be found in ice rinks but Ammonia is the most common gas as it is a chilling agent to keep the ice from melting. Exposure to high concentrations of Ammonia can cause extreme health issues and needs to be constantly monitored.

Other gases that can be found include Carbon Monoxide and Combustible gases due to the vehicles on ice.

### COMMON GASES:


Ammonia, Carbon Monoxide, Combustibles

### MACURCO PRODUCTS:

TX-6-AM (NH<sub>3</sub>), CM-6 (CO), GD-6 (Combustibles)



## CRYOSAUNA / LABS



Many labs use inert gases such as Nitrogen, Helium, and Argon during their processes. These inert gases can readily deplete Oxygen level and cause asphyxiation.

Cryosaunas are popping up everywhere as a new way to rehabilitate the body. This cold chamber uses liquid Nitrogen to get temperatures below -100 degrees Fahrenheit. Oxygen depletion has become a concern should a tank ever leak.

Storage of Combustible gas tanks in labs also have the potential to leak combustible gases.

### COMMON GASES:

Oxygen (depletion & enrichment), Combustibles

### MACURCO PRODUCTS:

OX-6 (O<sub>2</sub>), GD-6 (Combustibles)

## LANDFILLS

Due to growing cities, old landfills are being converted into commercial or residential developments. Due to the dangers of methane seeping up through the ground the need to monitor methane levels is being required.

The decomposition of garbage results in both Methane and Hydrogen Sulfide being by-products in these environments. These landfills can have dangerous gases rising to the surface or accumulating in the area, Methane and/or Hydrogen Sulfide. High levels of Methane can displace Oxygen in the air resulting in an array of health issues and at high concentrations can be explosive. Hydrogen Sulfide is a toxic gas that has a pungent rotten egg smell and very high levels can be deadly.

### Common Gases:

Methane, Hydrogen Sulfide

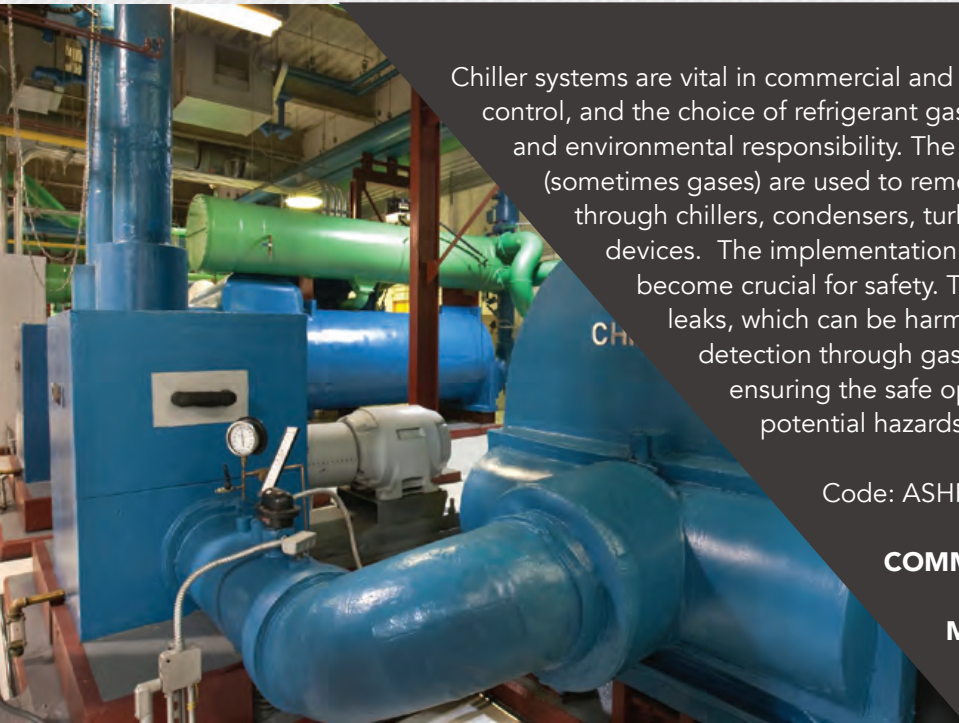
### Macurco Products:

GD-6 (Combustibles), TX-6-HS (H<sub>2</sub>S)





## CHILLER ROOM



Chiller systems are vital in commercial and industrial applications for precise temperature control, and the choice of refrigerant gases significantly impacts both operational efficiency and environmental responsibility. The process is relatively straightforward: chemicals (sometimes gases) are used to remove heat, creating cooler water or air. This is done through chillers, condensers, turbo air conditioners, coolers, and other refrigeration devices. The implementation of gas detection systems within chiller rooms has become crucial for safety. These systems monitor the presence of refrigerant leaks, which can be harmful to both personnel and the environment. Early detection through gas sensors enables prompt response measures, ensuring the safe operation of chiller systems and reducing the risk of potential hazards.

Code: ASHRAE 15 & 34

**COMMON GASES:** Refrigerant

**MACURCO PRODUCTS:** AIRESHIELD (Refrigerants)

## REFRIGERATION/GROCERY/STORAGE

Grocery refrigeration systems are fundamental in maintaining the quality and safety of perishable goods, playing a critical role in supermarkets and grocery stores. These systems typically utilize various refrigerants to control temperatures in display cases, walk-in coolers, and freezers. The choice of refrigerant is pivotal, with an industry-wide shift towards environmentally friendly options due to concerns about global warming potential. Gas detection systems are integral for monitoring potential refrigerant leaks, as these leaks can lead to harmful exposure for store personnel and contribute to environmental pollution. Early detection through gas sensors allows for swift response actions, preventing health risks, minimizing product loss, and ensuring the overall safety of the grocery store environment.

Code: ASHRAE 15 & 34

**COMMON GASES:** Refrigerant

**MACURCO PRODUCTS:** AIRESHIELD (Refrigerants)



# MACURCO CONTROL PANEL OVERVIEW

**DVP FAMILY** DVP-120 (Analog), DVP-120M (Digital), DVP-120B/120C (Digital w/ BACnet Output), DVP-1200 (Digital, BACnet IP, 4-20 mA Outputs)



## Key Features:

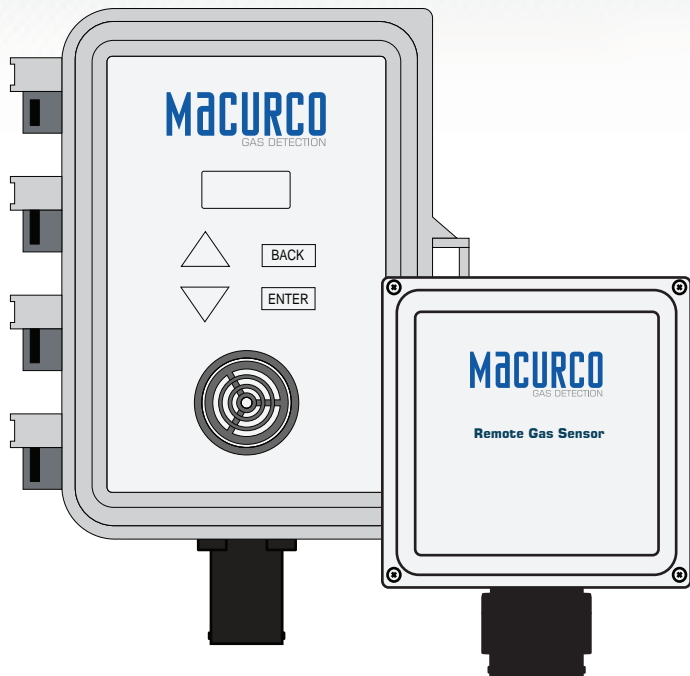
- 12 analog (4-20mA) sensor connections
- DVP-120M: 87 digital sensor connections (RS-485) + 12 analog (4-20mA) sensor connections
- Three 10A SPDT fan/alarm relays
- Two 24VDC drivers for horn/strobe
- Compatible with Macurco 6-Series
- Auto recognizes Macurco detectors
- Settings are customizable, default is per OSHA
- DVP-120B: BACnet MSTP output
- DVP-120C: Title 24 compliant (CO & NO<sub>2</sub> only)
- DVP-1200: BACnet IP, 4-20 mA outputs

## DVP-120 CONTROL PANEL OUTPUT OPTIONS

	DVP-120	DVP-120M	DVP-120B	DVP-120C	DVP-1200
<b>Analog Connections</b>	12	12	0	0	0
<b>Digital Connections</b>	0	87	99	99	192
<b>10 AMP Relays</b>	3	3	3	3	8*
<b>24VDC Output</b>	2	2	2	2	4
<b>BacNET</b>	N/A	N/A	✓	✓	✓
<b>Title 24</b>	N/A	N/A	N/A	✓	✓



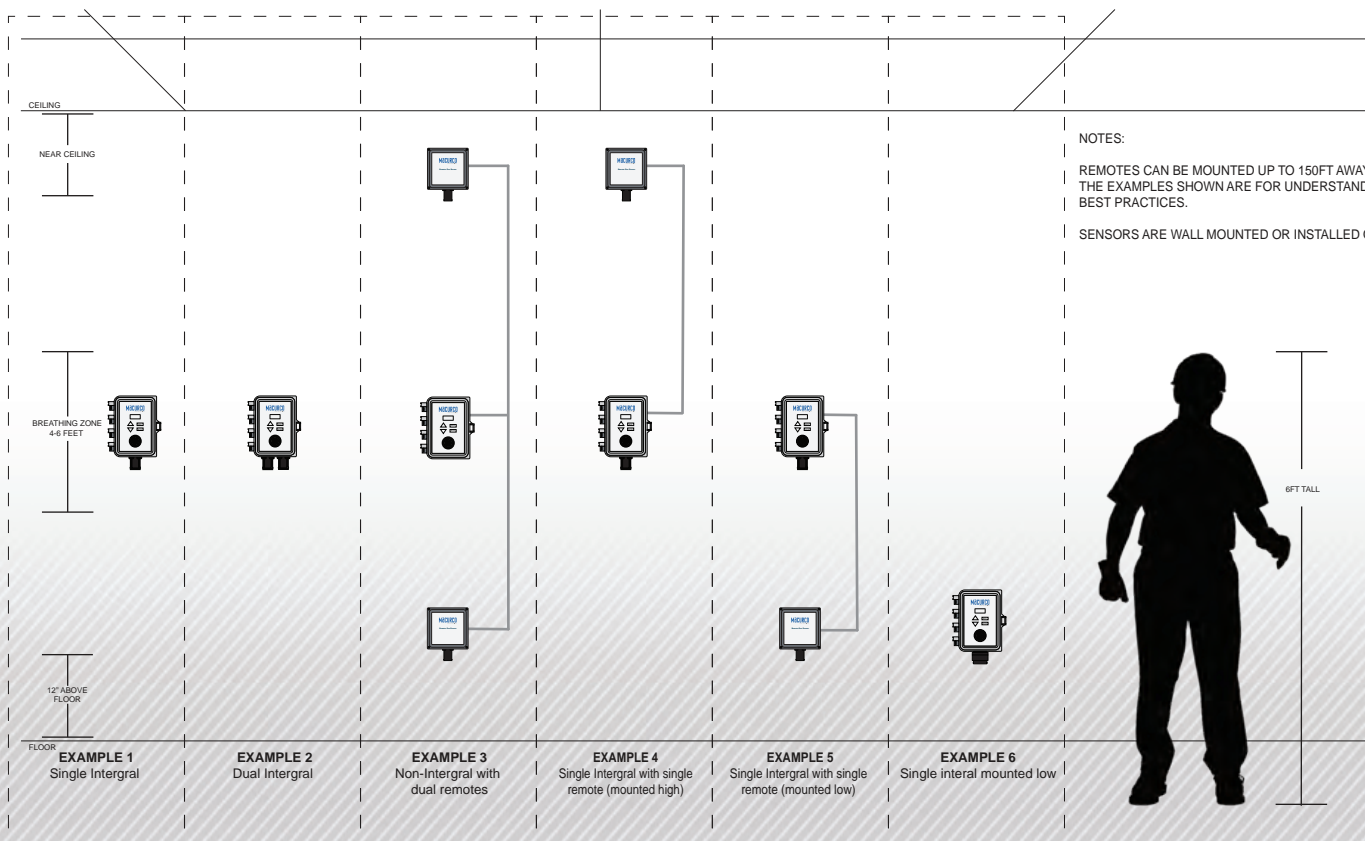
# COMING SOON - MACURCO AIRESHIELD



## Key Features:

- Easy installation in the wall or 4x4 electrical box
- NEMA4X/IP65 enclosure
- Field replaceable smart sensor
- Temperature compensation technology
- Optional Buzzer
- Event Logging
- User Selectable Settings
- Analog/digital output options
- 5A SPDT and 0.5A relays to control fans, valves, louvers, horns and strobes
- Colored notification LED's – (alarm, warning, trouble, calibration)
- Intuitive calibration Process

## AIRESHIELD MOUNTING OPTIONS



# MACURCO COMMERCIAL PRODUCT OVERVIEW



Grey Housing (Standard)



White Housing (Optional)

## Key Features:

- Easy installation to 4x4 electrical boxes via mud plate
- User-selectable settings (Default to industry standards) via two-button interface
- 5 A SPDT fan relay, 0.5A alarm relay to control fans, valves, louvers, horn, and strobes
- 4-20mA output to control VFD's and send to BMS
- LED display to easily show gas concentrations
- Field calibration kits available

## 6-SERIES DETECTOR OUTPUT OPTIONS

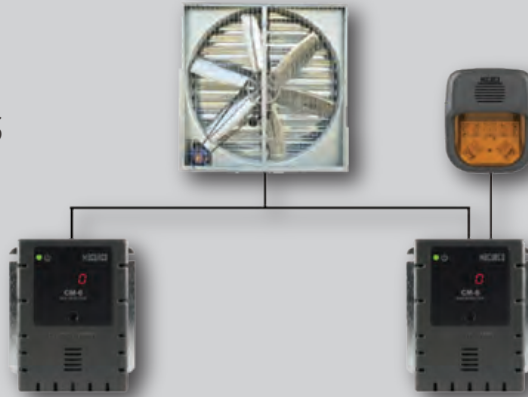
	CX-6 (CO&NO <sub>2</sub> )	CM-6 (CO)	GD-6 (LEL)	TX-6-ND (NO <sub>2</sub> )	TX-6-HS (H <sub>2</sub> S)	TX-6-AM (NH <sub>3</sub> )	OX-6 (O <sub>2</sub> )	CD-6MC (CO <sub>2</sub> )	CD-6G (CO <sub>2</sub> )
<b>Display</b>	LED (On/OFF)	LED (On/OFF)	LED (On/OFF)	LED (On/OFF)	LED (On/OFF)	LED (On/OFF)	LED (On/OFF)	LED (On/OFF)	LED (On/OFF)
<b>Range</b>	0-200 PPM CO <sub>2</sub> 0-50 PPM NO <sub>2</sub>	0-200 PPM	0-50% LEL	0-20 PPM	0-50 PPM	0-100 PPM	0-25%V/V	0-5,000 PPM	0-5% V/V 0-50,000 PPM
<b>Low Level</b>	5 AMP	5 AMP	5 AMP	5 AMP	5 AMP	5 AMP	5 AMP	5 AMP	5 AMP
<b>High Level</b>	1/2 AMP	1/2 AMP	1/2 AMP	1/2 AMP	1/2 AMP	1/2 AMP	1/2 AMP	1/2 AMP	1/2 AMP
<b>Buzzer</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Expected Sensor Life</b>	2-3 Years	10 Years	5 Years	2 Years	2 Years	2 Years	2 Years	15 Years	15 Years
<b>Coverage</b>	Up to 7,500 sq. ft.	Up to 7,500 sq. ft.	Up to 1,257 sq. ft.	Up to 7,500 sq. ft.	Up to 1,257 sq. ft.	Up to 1,257 sq. ft.	Up to 1,257 sq. ft.	Up to 5,000 sq. ft.	Up to 5,000 sq. ft.
<b>4-20mA</b>	Scaling / Peak	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off	On/Off



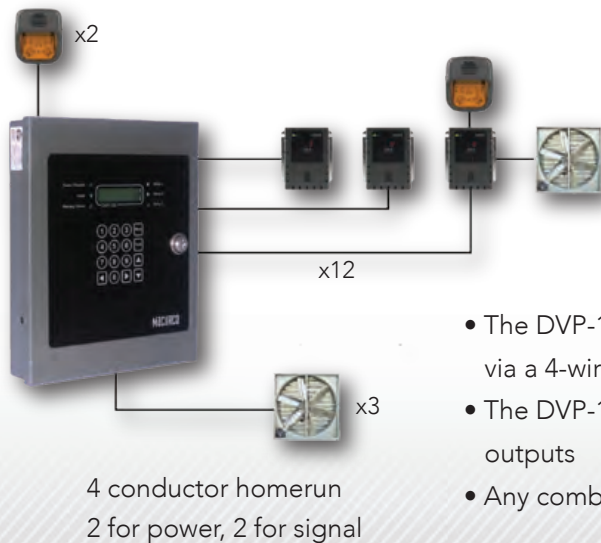
## TYPES OF SYSTEMS

### STAND-ALONE DETECTORS

Dry contact relays or 4-20mA outputs to control fans, louvers, valves, horn and strobes, etc.



- The 6 and 12 series gas detectors can be used as a stand-alone setup
- This family of detectors is offered in low voltage or line voltage and can tie directly into many different pieces of equipment using one of the two dry contact relays or the 4-20mA output
- Customizable settings are done from each detector



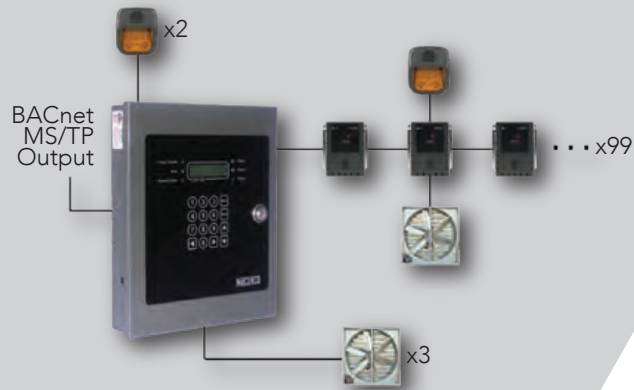
### DETECTION AND VENTILATION CONTROL PANEL (DVP-120)

- The DVP-120 has the capacity to handle up to 12 of the 6 series detectors via a 4-wire homerun from each detector
- The DVP-120 has three 10 amp form relays along with two 24VDC outputs
- Any combination of gases within the 6-series will work with the DVP-120

## TYPES OF SYSTEMS

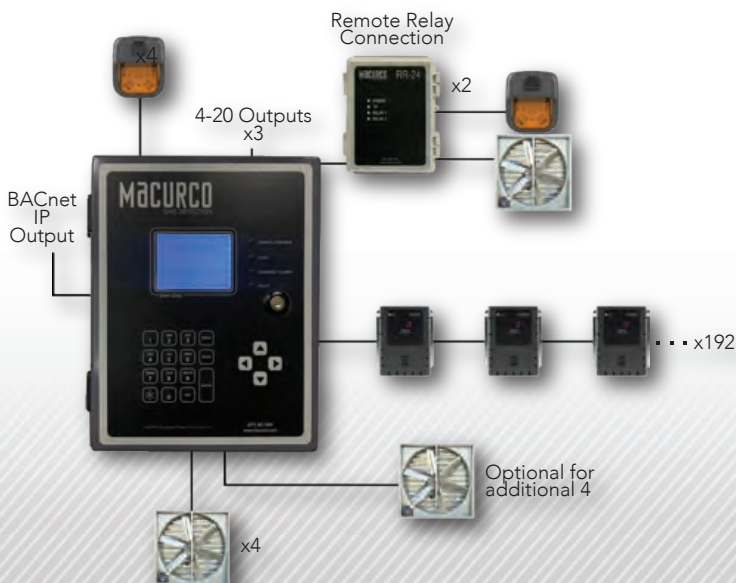
### ADDRESSABLE GAS DETECTION AND CONTROL (DVP-120M / DVP-120B)

Use shielded 3-conductor wire with one twisted pair providing a pair for signal (A&B), common (COM) and shield ground (SHD) connections.



- DVP-120M connects to 87 addressable 6 series detectors using the MRS-485 on each of the detectors in the field converting the analog signal to a digital signal
- Cost of installation decreases due to a daisy chain loop, equaling less wire and conduit costs
- The DVP-120M has three 10-amp form C relays along with two 24VDC outputs
- The DVP-120B adds an additional BACnet MSTP output being the major difference from the DVP-120M

### ADDRESSABLE WITH ANALOG OUTPUT (DVP-1200)



- DVP-1200 connects up to 192 addressable 6 series detectors using the MRS-485 on each of the detectors in the field converting the analog signal to a digital signal
- Four 10-amp form C relays with the ability to add an additional 4 relay board if needed. Also includes four 24 VDC outputs
- Includes three 4-20mA outputs for VFD control
- Includes 2 Remote Relay outputs for the optional RR-24 (Remote Relay)
- Event Logging found within DVP-1200 including Trouble/Warning/Alarms
- BACnet IP output as well as a USB port for firmware upgrades



## COMMON ACCESSORIES



Horn and Strobes



Addressable Adapter



Power Supplies



Calibration Kits



Weatherproof Housing Kit  
(Detector Sold Separately)

- Horn/strobe combo with temporal 4 option
- MRS-485 modbus adapter for addressable systems
- Calibration/test kits
- Weatherproof/duct mounting housings
- Power supplies

## MAINTENANCE

### DEMONSTRATION AND TRAINING

Inspect the components, equipment installation and electrical connections for optimum functionality of the product. Test the alarm setpoints of the gas detection system with calibration and test gases and verify the sequence of operation. Perform demonstrations and train maintenance personnel to adjust, operate, troubleshoot, calibrate and maintain the gas detection and ventilation control systems. Calibration and test kits should be provided with the gas detection system. Calibration and test intervals must comply with the manufacturer's recommendations. If required, prepare a written report to record test procedures, test results, and corrective actions. The report should also cover the requirements for accessories like the acceptability of alarm types, signs and protective equipment. Any repair or replacement of malfunctioning units should be performed by Macurco.



# MACURCO

GAS DETECTION



Celebrating over 50 years of gas detection, the Macurco product line offers equipment for residential, commercial and industrial applications. Since 1972 Macurco has been providing detection options for a number of different gases including carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), hydrogen (H<sub>2</sub>), propane (LP), methane (natural gas), hydrogen sulfide (H<sub>2</sub>S), ammonia (NH<sub>3</sub>), oxygen (O<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and refrigerants. Headquartered in Sioux Falls, South Dakota, Macurco strives to provide the highest quality detection, safety and security solutions to customers worldwide. Whether you are looking for gas detection for a security system, building automation or HVAC system, for personal safety or for monitoring specific gases in potentially hazardous environments, Macurco has a gas detector to meet your needs.

## GAS DETECTION IS ALL WE DO, AND WE DO IT BEST.

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